



## **TIMEZERO USER GUIDE**

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## Getting Started

### Registering TimeZero

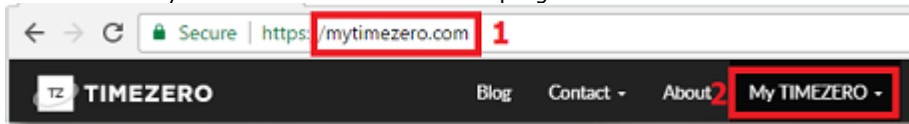
It is highly recommended to register your software as this will help us provide better technical support. A registration is also required to access our online services (Weather, Chart Update Notification, Own Ship Cloud Monitoring, Anchor Watch Cloud Monitoring...)

Your TimeZero software can be registered online using a web browser or directly within the software (if you have an Internet access on the computer where the software is running).

#### Register using the My TIMEZERO Website

If the computer you are running TimeZero on does not have an Internet connection, you can register your software from another computer at [www.mytimezero.com](http://www.mytimezero.com).

- Go to [www.mytimezero.com](http://www.mytimezero.com)
- Click on the "My TIMEZERO" located on the top right:



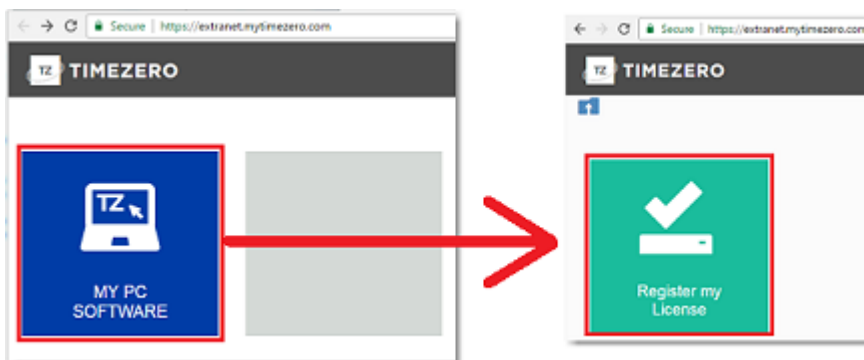
- Enter your "My TIMEZERO" credential. If you do not have a My TIMEZERO account yet, click on the "Create an account" button (you will just have to provide a valid email and your name or use a Facebook or Apple login):

 A screenshot of the "Log In" page on the My TIMEZERO website. The page features the TZ TIMEZERO logo, a "Log In" heading, and a link to "Create an account" for users who do not have an account. There are input fields for "Email" and "Password". A "Forgot password?" link is located below the password field. At the bottom, there are three buttons: "Log In", "Continue with Facebook", and "Continue with Apple".

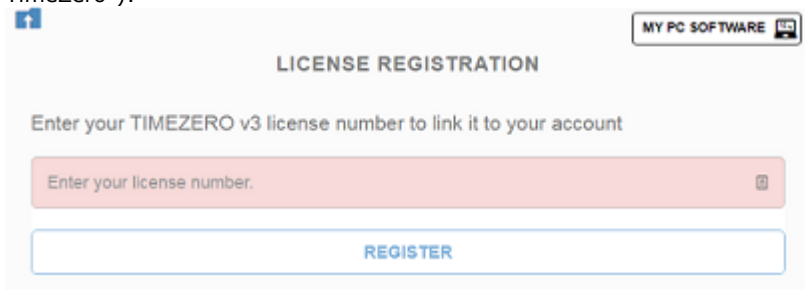
**Note:** After creating the My TIMEZERO account with an e-mail, your e-mail address needs to be verified. Make sure to check your e-mail Junk/Spam folder if you do not receive the account verification e-mail within 1 hour. After validating your account, repeat steps 1 to 3 and continue with the steps below.



- Once logged in, click on "My PC Software" and then, click on "Register my License":



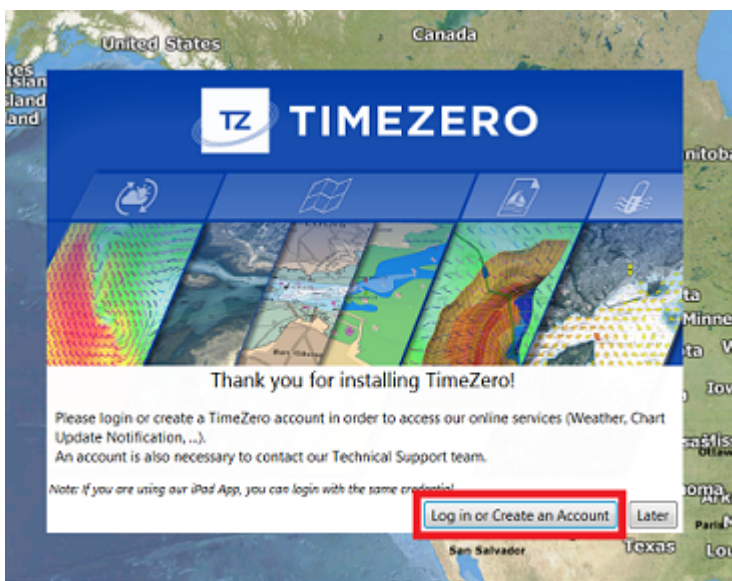
- Enter your TIMEZERO Serial Number (your serial number starts with "TZ" and can be found under "About TimeZero"):



- If the serial number is valid, it will be linked to your account and you will be able to access your product information.

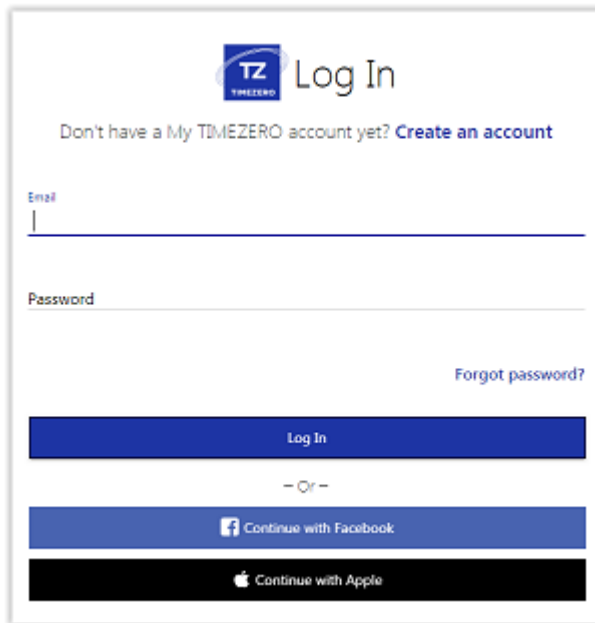
### Register directly from the Software

When you launch TimeZero with an active Internet connection, the following screen will appear, allowing you to register your license directly from the software:



**Note:** If you missed the startup screen to login, you can manually click on the "Login" button from the [My TIMEZERO Options](#)

If your license has not been registered yet, the following screen will appear, allowing you to either create an account (click on the "Create an account" button) or enter your credential if you already have a My TIMEZERO account:

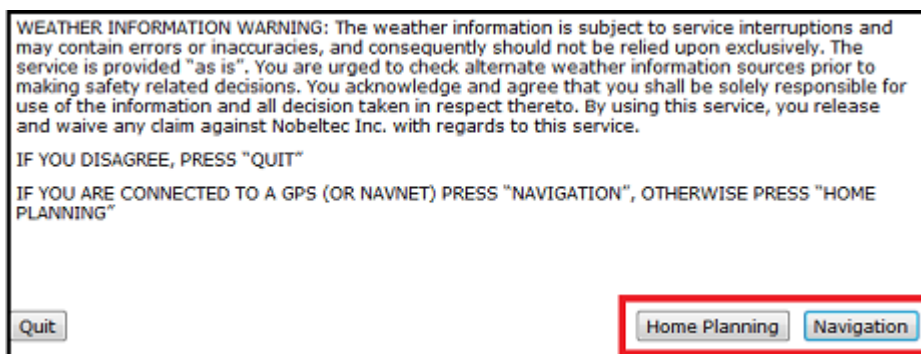


**NOTE:** After creating the My TIMEZERO account using an e-mail, your e-mail address needs to be verified. Make sure to check your Junk/Spam folder if you do not receive the account verification e-mail within 1 hour. After validating your account, repeat steps 1 to 3 and continue with the instructions below.

After entering your credential, your license will be automatically linked to your My TIMEZERO account.

## Home Planning Vs. Navigation

TimeZero can be used in two modes. Upon starting the software, choose "Home Planning" or "Navigation" mode:



## Home Planning

Choose the "Home Planning" mode when planning on shore (at home for example). In "Home Planning" mode, the vessel icon is not displayed on the chart, the alarms are disabled and routes cannot be activated. All other functions such as creating marks, planning routes, or updating and viewing weather files are available.

The Status Bar (Title Bar) appears in yellow with a "Home Planning" notification.

## Navigation

Choose the "Navigation" mode when the computer is physically connected to sensors and instruments (GPS, AIS, NavNet...)

In this mode, the sensor and instrument data is displayed, alarms are enabled, and a route can be activated.

**Note:** The "Home Planning" and "Navigation" start-up mode are independent from the WorkSpaces (which can be used to plan a route while in the navigation mode). Make sure to review the [WorkSpaces](#) chapter for more information about this important concept of TimeZero.

## Chart Compatibility

### Mapmedia TZ Maps charts

TimeZero is compatible with the latest Mapmedia "TZ Maps" charts. TZ Maps is a revolutionary development in the world of maritime cartography, combining multiple types of charts, overlays, and features unlike anything seen before! TZ Maps includes Vector Charts, Raster charts (on selected areas), and the new BathyVision (high resolution bathy data). A fantastic way to compare data and make sure you get the best information available.

TZ Maps includes all these innovative features with a single purchase:

- Vector and Raster charts (raster charts only available on selected areas)
- BathyVision: High Resolution Depth Shading and Depth Contour Lines (Fishing Charts) dynamically generated from bathymetric data
- Community Maps: Charts improvements made and shared by TimeZero users
- Smart Zone: Automatic notification based on vector chart data
- Dynamic Lights: Context sensitive light display
- Dynamic Mooring: Mooring recommendation based on coastline and weather forecasts
- Smart Search: Unified search across multiple sources of data
- Vector display configuration: Streamlined Vector chart display customization

Mapmedia TZ Maps charts are licensed and must be purchased. Visit the [Mapmedia TZ Maps Catalog](#) to view the TZ Maps chart coverage.

### Mapmedia .mm3d charts

TimeZero is also compatible with the older generation ".mm3d" charts. Mapmedia .mm3d charts are available in Raster Chart format or in Vector Chart format (requiring a separate purchase). Mapmedia Raster Charts are scanned from official hydrographic offices paper charts (called "MM3D Raster"). Mapmedia Vector Charts are manufactured from official hydrographic office vector charts (called "MM3D S-57") or from privately furnished vector charts from C-MAP (called "MM3D C-MAP").

Mapmedia .mm3d charts for the USA (MM3D S-57) are free and can be downloaded and updated at any time without unlock code:

- [Click here to download the latest revision of the NOAA Raster Charts](#)
- [Click here to download the latest revision of the NOAA Vector Charts](#)
- [Click here to download the free USA High Resolution Satellite Picture](#)

Mapmedia .mm3d charts for outside the USA are licensed and require purchasing an unlock code. Visit the [Mapmedia .mm3d Catalog](#) to view the .mm3d chart coverage.

**Note:** All Mapmedia charts (.mm3d and TZ Maps) are produced in the WGS84 coordinate reference. Make sure that your GPS is set to output its position in this format (which is the default format of most GPS units).

## Official ENC charts

The "S63/S57 Module" needs to be unlocked to access this feature

### S57 Charts ("ENC")

TimeZero is compatible with the official S57 charts. In the USA, these charts are free and can be directly downloaded from TimeZero using the "Manage ENC" window.

### S63 Charts ("Encrypted ENC")

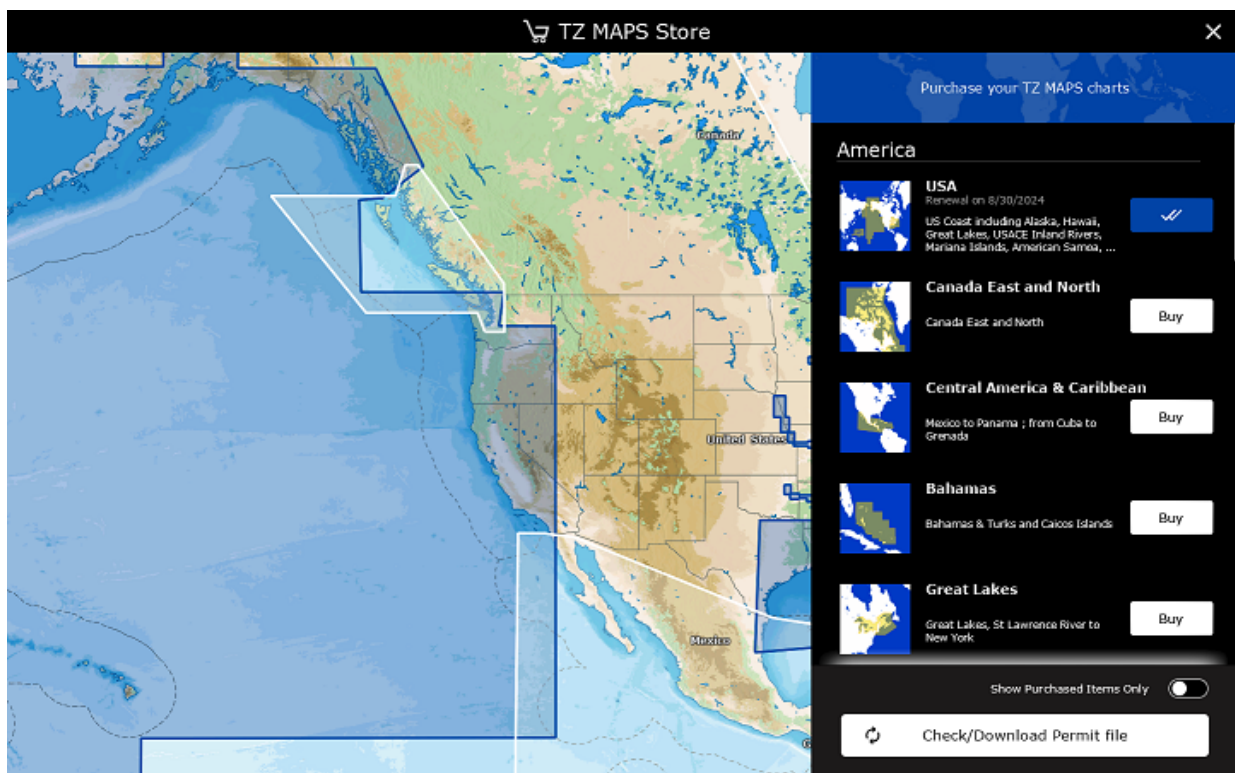
TimeZero is compatible with the official S63 encrypted charts. These charts can be purchased from official ENC distributors (UKHO, Primar, Chartworld, ...). In order to purchase official S63 charts, a "User Permit" must be provided to the S63 chart distributor. The "User Permit" is available from the "Manage ENC" window under the "Manage S-63 Permits" tab.

## Installing Charts

### TZ Maps

#### Buying TZ Maps

TZ Maps area(s) can be purchased directly from TimeZero. Simply click on the "TZ MAPS Store" button located under the "TIMEZERO" button to open the TZ Maps Store:



If you have an Internet connection, you can purchase TZ Maps area(s) directly within TimeZero. If no Internet connection has been detected on your computer, a QR code will appear on your screen. You can scan this QR code with your phone to be redirected to the TimeZero Online Web Store where you can purchase the charts from your phone.

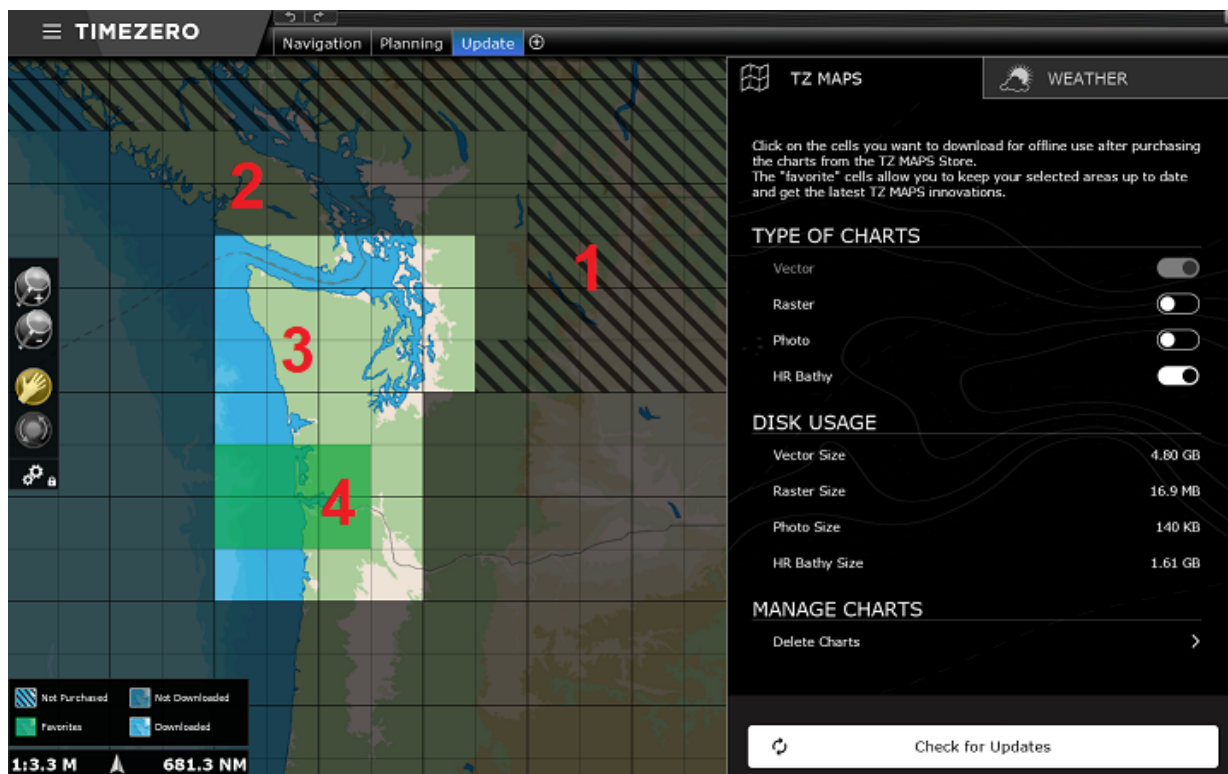
**IMPORTANT:** If you decide to purchase TZ Maps area(s) from your phone because your computer does not have an Internet connection, you will have to download the TZ Maps data and the Permit file from another computer (that has an Internet connection). You will then have to transfer those files using a USB drive following the "Chart Installation from files" chapter below.

TZ Maps charts can also be purchased from one of our reseller. In this case, to synchronize TZ Maps areas that may have already been purchased on your license, click on the "Check/Download Permit file".

### Direct Chart Installation (Internet connection required)

After purchasing a TZ Maps area, you will be able to stream the chart directly on your computer over the Internet as you pan and zoom the screen (Internet Connection required). However, before using TimeZero on the water, it is highly recommended to store the chart locally on your hard-disk so that you can access them without any Internet connection at sea.

TZ Maps data can be downloaded for offline use directly from the "Update" WorkSpace. Simply select the "Update" tab located at the top of your screen and select "TZ MAPS" to download and manage your TZ Maps charts:



- (1) : Cells that have black stripe (hash-mark) indicate areas that do not currently exist, or areas that have no permit (a corresponding TZ Maps area has not been purchased, or the permit has not been downloaded/installed).
- (2): Cells that are gray indicate areas that have been purchased, but not yet downloaded on your computer. You can click on these cells to initiate a download.
- (3): Cells that are bright indicate areas that you already have purchased and downloaded on your computer.



- (4): Cells that are green indicate areas that you have purchased, downloaded, and that will be updated when clicking on the button "Check for Updates"

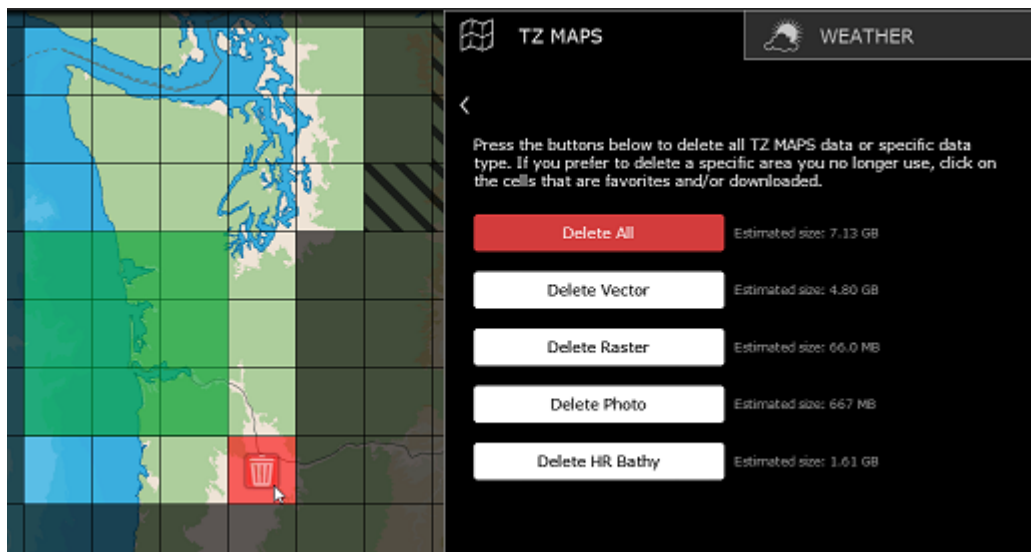
Note that the cells size will automatically adjust in size as you zoom in or zoom out on the chart to make larger or smaller selection easier.

To download chart data, just click once on one or multiple gray cells. As soon as you start clicking on grey cells, a progress bar will be displayed at the bottom with the size and the remaining time. It is recommended to leave TimeZero on this screen while downloading data, however, if you decide to select another WorkSpace, the download will continue in the background (albeit slower).

**Tip:** After clicking on a gray cell, it will automatically switch to green (once the download of that cell is completed). This means that, by default, all cells you decide to download will also be kept updated. If you do not want to update an entire area while at sea (because of a limited Internet access), simply click on a green cell to turn it bright. This cell will remain on your computer, but will not be kept up to date (thus saving some bandwidth). Click on it again to turn it green if you want to update that cell again.

Note that by default, for each cell you download, TimeZero will only download vector data and HR bathymetric data (the HR Bathy is used to create BathyVision charts consisting of Fishing Charts and Depth Shading). If you would like to download Raster charts (in addition to Vector charts), you can change the selection under "Type of Charts".

If you want to delete chart data, select "Delete Charts" under Manage Charts. This will display a series of buttons that will allow you to delete all data, or a specific category of data (for example allowing you to delete all raster charts, but leave vector and bathy data). Note that when you are in this mode, clicking on cells on the map will allow you to delete targeted areas that you may no longer need. Click once on a cell to display the trash icon and click again to validate:



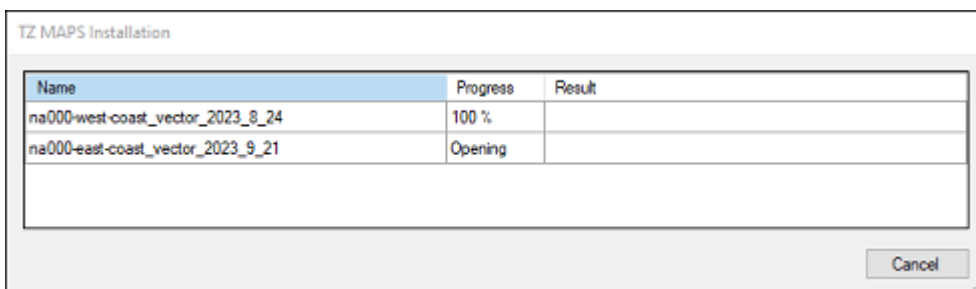
## Chart Installation from files (downloaded from another computer)

If the computer running TimeZero has no Internet connection, you will need to download and transfer TZ Maps files (files ending with the .tzmaps extension) from another computer. You will also need to transfer the permit file that will unlock the TZ Maps area (file whose name matches your serial number ending with a .zuc extension).

Every TZ Maps charts can be downloaded online from the [Mapmedia TZ Maps Catalog](#). The chart data consists of multiple files that are downloaded individually. All files have the .tzmaps extension.

After downloading the files from another computer, use a USB drive or external Hard-Drive to copy them and transfer them to the boat computer. Make sure to also copy the .zuc file that contains all your permits. You can then copy the files in the "My Documents | My TimeZero | Downloaded Charts" of the boat computer and start TimeZero. TimeZero will scan this folder and prompt you if you want to install the charts.

Alternatively, you can also double click on each .tzmaps file from the USB drive. This will open TimeZero and install the chart automatically for you. Note that you can double click on multiple files (select multiple files and open them simultaneously). This will queue the installation of all the files in TimeZero:



After installing the charts, make sure to double click on the .zuc file to install your permit and unlock the TZ Maps area(s).

### MM3D Charts

Every MM3D charts can be downloaded online from the [Mapmedia MM3D Catalog](#). The chart data consists of multiple files that are downloaded individually. Chart data files are stored as .zip files.

If you download the charts from the computer running TimeZero, simply save the files in *"My Documents | My TimeZero | Downloaded Charts"*. The next time you open TimeZero, it will scan this folder and prompt you if you want to install the charts (TimeZero will automatically unzip the files then transfer them to the correct location).

If you downloaded the chart files from another computer, use a USB drive or external Hard-Drive to copy them and transfer them on the boat computer. You can then copy the files in the *"My Documents | My TimeZero | Downloaded Charts"* of the boat computer and start TimeZero.

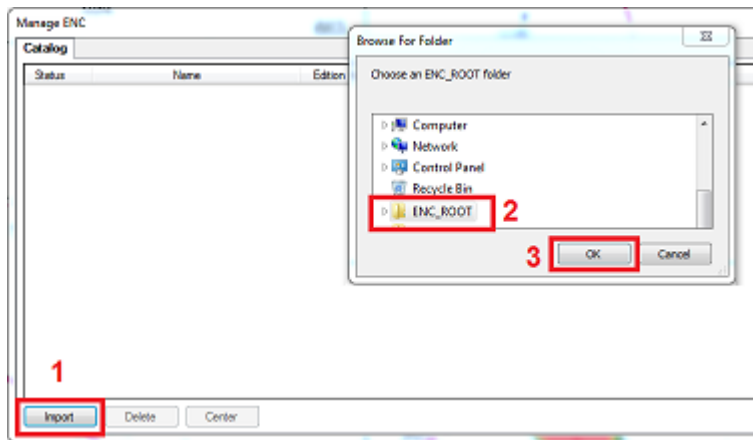
**Note:** You can also manually unzip the chart files, and then double click on them to install the chart in TimeZero.

### S57 Charts ("ENC")

The "S63/S57 Module" needs to be unlocked to access this feature.

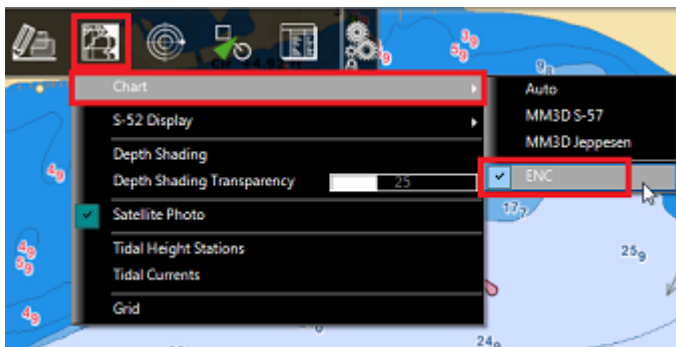
#### Generic S57 Charts

S57 charts are official charts that are not encrypted. S57 charts are always distributed inside an "ENC\_ROOT" folder. If you downloaded the charts online, make sure to unzip the "ENC\_ROOT" folder somewhere on your computer (on the desktop for example). Open TimeZero, select "Manage S57/S63 Charts" located under the TIMEZERO button and click on "Import". Select the "ENC\_ROOT" folder containing the S57 charts you wish to import and click on "OK":



TimeZero will convert the chart cells and import them on your computer. Once the charts are successfully imported, you can erase the "ENC\_ROOT" folder from your computer.

To display the charts in TimeZero, make sure to select "ENC" under the "Chart" selection of the "Chart" button located in the ribbon:

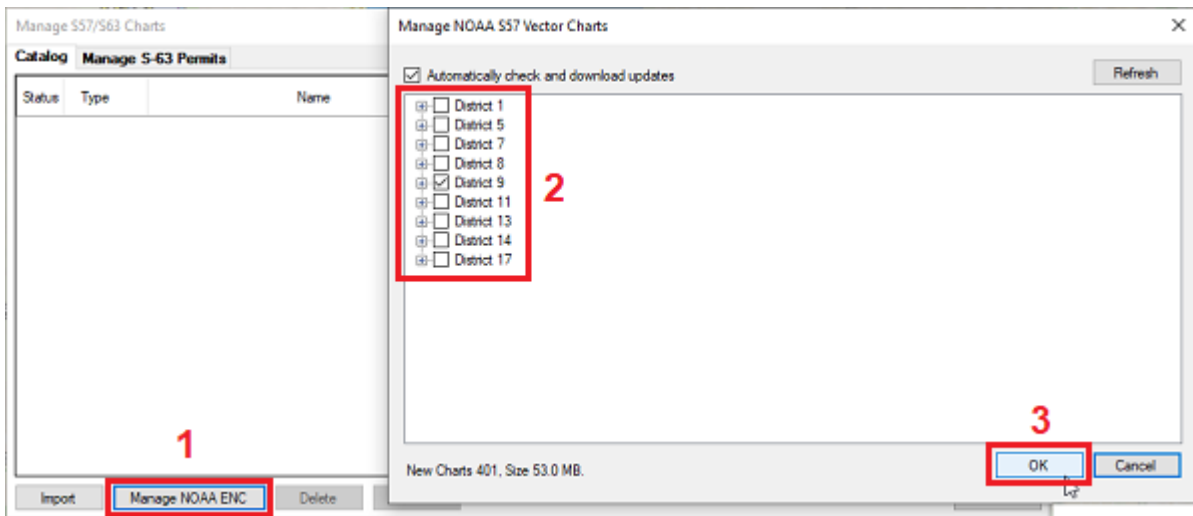


To update the charts, simply repeat the procedure above and re-import an updated "ENC\_ROOT" folder.

## USA NOAA S57 Charts

NOAA S57 Vector charts for the USA are free and do not need to be installed manually. TimeZero can automatically download and keep the NOAA S57 charts updated for you. This is specifically important if you want to operate TimeZero as an ECS in the USA.

In order to download the NOAA S57 charts, select "Manage S57/S63 Charts" located under the TIMEZERO button and click on "Manage NOAA ENC". This will open a window that will allow you to select the NOAA S57 charts you want to download and optionally keep them up to date. Note that NOAA S57 charts are grouped by Coast Guard district, but you can expand a group to select individual ENC if you prefer. Once you made your selection click on "OK" to start the download:



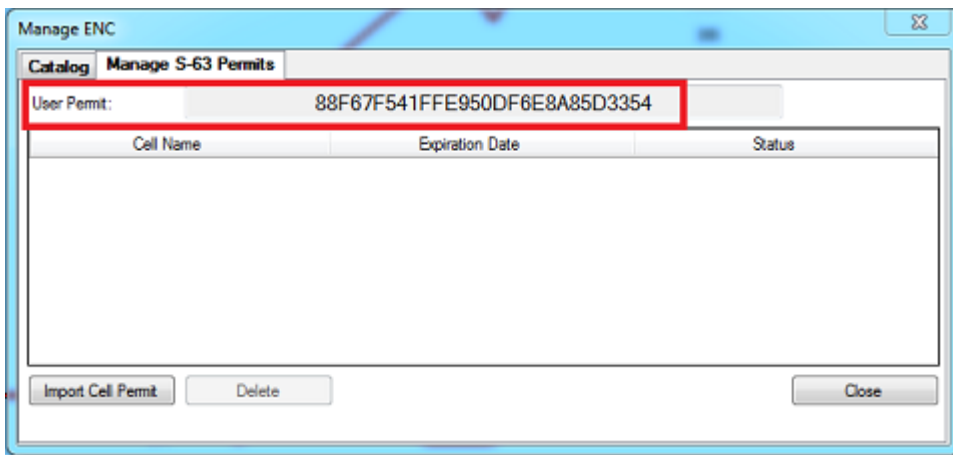
If you leave the "Automatically check and download updates" selected, TimeZero will automatically check for new NOAA Chart Update every time you start the software (or every 12 hours). A notification displayed in the status bar will let you know that updates are being downloaded and installed.

### S63 Charts ("ENC Encrypted")

The "S63/S57 Module" needs to be unlocked to access this feature

S63 charts are similar to S57 charts but are encrypted and require a permit and other additional files in order to be imported and viewed in TimeZero. S63 charts can be purchased from official hydrographic chart distributors such as ChartWorld (DirectENC S63), UKHO (Admiralty AVCS) and Primar (ENC).

In order to purchase charts from one of these agencies, you need to provide them with your "User Permit". The "User Permit" is uniquely generated from your TimeZero Serial Number and can be found in TimeZero (if the software was activated using the Internet) or in your confirmation e-mail after purchasing the "ENC Encrypted Module". To view if your User Permit was automatically entered in TimeZero, select "Manage ENC" under the TimeZero button and select the "Manage S-63 Permits" tab:



If TimeZero was activated with an Internet connection, the User Permit should be displayed (a long string of characters) like in the screenshot above.

If the User Permit is not available, you will have to enter it manually by contacting our technical support or referring to the confirmation e-mail containing your unlock code.

Once you have your User Permit, communicate it to the chart distributor when purchasing your S63 charts.

**Note:** The User Permit allows the Chart Distributor to identify you as a customer and issue a chart license (chart permit) that will work for you.

After purchasing the S63 charts, the chart distributor will give you a "PERMIT.TXT" (containing your chart license) and a DVD or link to access the Chart data.





#### Install Chart License:

Start by importing the charts permit (also named "cell permit") by clicking on the "Import Cell Permit" in TimeZero. Browse and select the file "PERMIT.TXT" that was provided by the chart distributor (usually sent by e-mail in a ZIP file). After opening the file, you will see the list of all the charts (cells) for which you have a valid license and their expiration date.

#### Install Chart Data:

The chart data will be provided by the chart distributor either on DVD(s) or as a download link. The data usually consists of a "Base" data set (all the charts) and an "Update" data set (incremental chart update since a specific date). Always start by importing the "Base" data set.

**IMPORTANT:** If you download the S63 chart data set, make sure to unzip the file and keep the entire content and folder structure intact. Below is an example of valid data set. You should have an "ENC\_ROOT" folder with at minimum a "SERIAL.ENC" file:

 ENC_ROOT	1/14/2016 7:09 AM	File folder	
 INFO	1/14/2016 7:09 AM	File folder	
 IHO.CRT	1/13/2016 10:24 AM	Security Certificate	1 KB
 SERIAL.ENC	1/13/2016 10:24 AM	Wireshark capture...	1 KB

Once you have located the "ENC\_ROOT" folder, select the "Catalog" tab in TimeZero, click on "Import" and select the "ENC\_ROOT" folder containing the chart data. TimeZero will only import charts that have a corresponding valid permit.

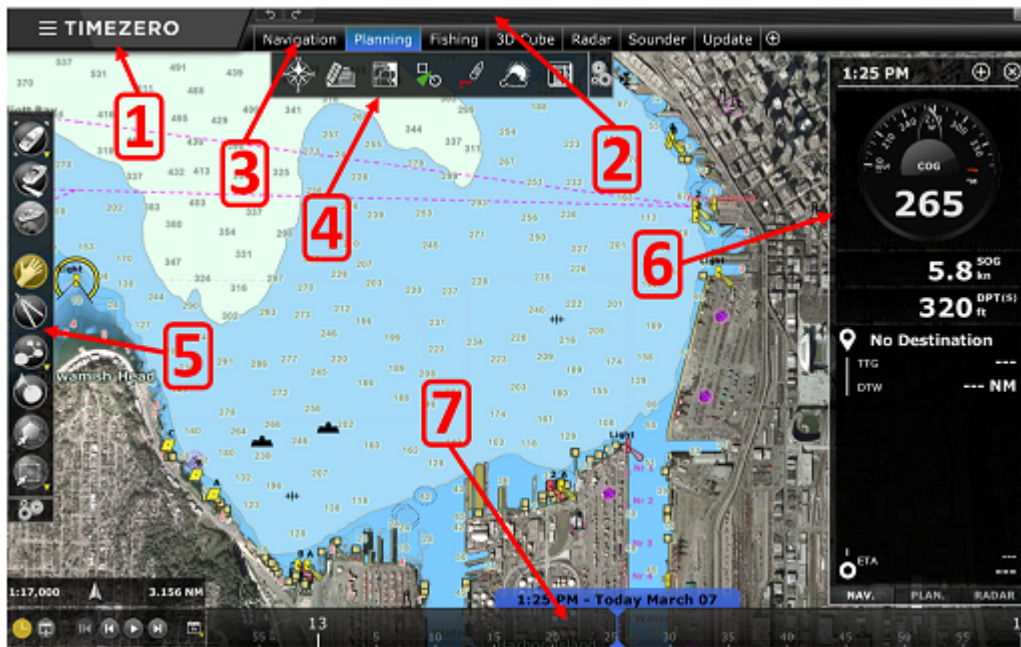
Repeat this process with the "Update" data set if available.

The chart distributor might send you chart updates at a regular interval. Sometimes, the chart distributor will send you an updated Permit.txt file (when new charts are issued for example). In this case, make sure to import the updated Permit file first before importing the Updated data set.



## Using TimeZero

### User Interface Overview



1. **"TIMEZERO" button:** Click on this button to access the Menus and Options of TimeZero and to exit the software. You will also find a built in User Guide located here.

2. **Status Bar:** This area provides access to the "Undo/Redo" functions and displays the general status of the software; Gray for regular Navigation Mode, yellow when the software is running in Home Planning mode or displaying a notification, and red when an alarm is active. The minimize button (minus sign) can be found on the far right of the Status Bar.

3. **WorkSpaces:** Click on any of the WorkSpaces to select the activity you want to display on your screen. Refer to the [WorkSpaces](#) Chapter for more information.

**Note:** Your WorkSpaces configuration might differ from the screenshot above according to your software configuration and optional Modules.

4. **Ribbons:** The Ribbons display a series of buttons according to the selected window and Workspace. Left click on any button to open a menu offering various options

5. **Toolbar:** The Toolbar displays all the tools that can be used with the selected window. Once a Tool is selected, a cursor action is required on the chart, such as creating a Mark. The first button of the Toolbar centers the chart display over the vessel icon.

6. **NavData:** The NavData displays the data received from external instruments such as the GPS, wind sensor, depth sounder etc... It also displays the cursor position and the range and bearing of the cursor from the vessel icon. Route information including Course to Steer, Range to Waypoint, ETA and other graphic data can also be displayed. To configure the NavData, right click on any of the items to select the value to display or to remove it. To add a new value, click on the "Plus" sign (+) located on the top of the NavData.

7. **Timeline:** The timeline (only available in the Planning Workspace) allows you to play Weather & Tides animations. Click on the Calendar icon to select a date & time to view the Tide and/or Weather Forecast. When you click on a route, the timeline also allows you to perform route simulation and see all the conditions evolving (tides, currents, weather) according to your route departure time and projected speed.

**Tips:** The Ribbons and Toolbar can be customized by clicking on the Configure Button:

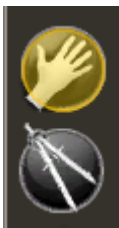


**Note:** After customizing the user interface to your preferences, you can save all the settings to a file. Click on the TimeZero button and select "Save UI As...". To reset the user interface to your default settings, simply open TimeZero by double clicking on the User Configuration file. Note that you can make multiple User Configuration files for multiple users or various uses of the software.

## Toolbar & Ribbons

### Toolbar

The Active Tool (the tool currently selected) appears surrounded in yellow. In the example below, the Panning Tool (hand icon) is selected:



When you want to change tool, left click on it to select it.

When you see a tool icon with a little down arrow in its lower right corner, it means that you can right click on the tool to view additional options:

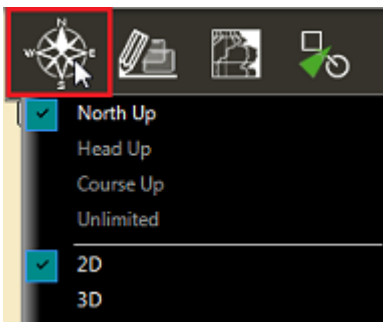


In this case, right clicking on the "Selection" tool allows you choose in between the regular selection method (square) or the free selection method:

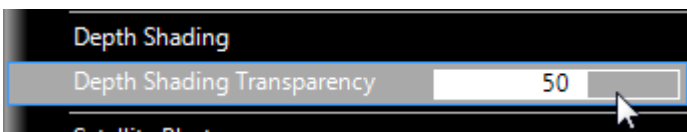


### Ribbons

To open a menu in a Ribbon, left click on the corresponding button. Use your mouse to click on an item you want to enable or disable:



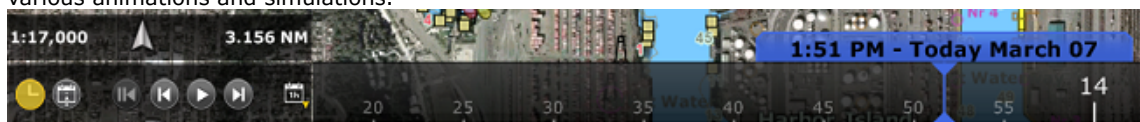
Some menus have drop down items with sliders. Click on the slider directly or use the mouse wheel (with the cursor over the slider) to adjust the value.



## WorkSpaces

TimeZero is designed to perform multiple navigation tasks such as planning a voyage, navigating a route, downloading weather information, and viewing and controlling a Radar. These activities require different tools and options. The WorkSpaces are our way of separating and differentiating different activities that occur on a navigation system, so the user interface is not cluttered with unnecessary functions and buttons that are not useful to the primary task. Also, since the Workspace configurations are independent, users can keep their navigation mode 100% intact while they plan the next phase of their journey and instantly snap back to their desired navigation view without needing to undo or re-configure the software.

- **"Navigation" Workspace:** This Workspace is selected by default when TimeZero is started in "Navigation" mode. This Workspace intentionally has limited functionality to simplify operation while underway. To access more advanced planning functions such as animation, route simulation or managing a list of objects, select the Planning Workspace.
- **"Planning" Workspace:** The Planning Workspace is selected by default when TimeZero is started in "Home Planning" mode. This Workspace allows you to plan and simulate routes, display weather forecast, display tidal height and current predictions and replay data that has been previously recorded. The Planning Workspace has a timeline at the bottom of the screen that allows you to change the date/time to perform various animations and simulations.



- **"Fishing" Workspace (requires PBG module):** The Fishing Workspace offers specific tools and buttons that are useful while fishing. It also displays large sliders on the right side that allows to customize depth shading and contour lines. Note that this Workspace will only appear when the PBG Module has been unlocked.
- **"3D Cube" Workspace (requires PBG module):** The 3D Cube Workspace offers a dedicated 3D view that allows you to display bottom structure with great detail. The altitude of the camera and bathymetry exaggeration are automatically adjusted to provide the best view possible. It is possible to rotate the view around the boat by left clicking and dragging the mouse over the screen. As the boat moves and changes heading, the view stays locked providing the same camera angle relative to the bow of your vessel. Please refer to the [3D Cube Workspace](#) chapter for more information. Note that this Workspace will only appear when the PBG Module has been unlocked
- **"Update" Workspace:** The Update Workspace allows you to download TZ Maps charts and Weather Forecasts. This Workspace has two modes: Weather and TZ Maps. In weather mode, the "Update Area" tool in the Toolbar defines the Weather Forecast area and the panel on the right side allows you to select


the weather parameters. In TZ Maps mode, you can click on cells to manage the download of TZ Maps data.

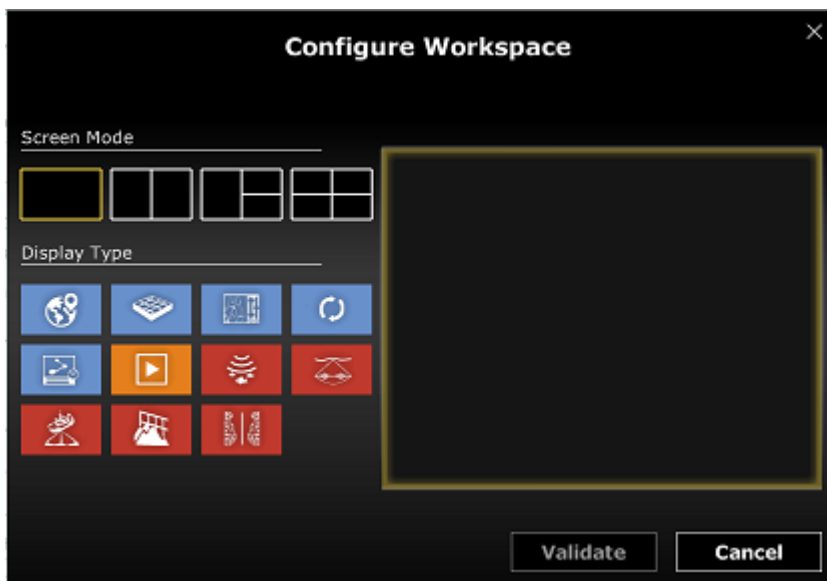
- "Camera" WorkSpace: The Camera WorkSpace allows you to display a full screen video stream.

**Tips:** A video stream can also be displayed in a small window using the "Camera" NavData

- "Radar" WorkSpace: The Radar WorkSpace allows the user to display and control the Radar. This WorkSpace provides all the Radar tools and controls such as Gain, Sea Clutter and Rain Clutter. Note that this WorkSpace will only appear when the Radar Module has been unlocked and a Radar has been detected.
- "Sounder" WorkSpace (requires Furuno Sounder module): The Sounder WorkSpace allows the user to display and control the Sounder. This WorkSpace provides all the Sounder controls. Note that this WorkSpace will only appear when the Sounder Module has been unlocked.
- "Section" WorkSpace (requires WASSP module): The Section WorkSpace allows to display the real time echo sonar below your vessel (requires WASSP Generation 3)
- "MultiBeam" WorkSpace (requires WASSP module): The MultiBeam WorkSpace allows to display the sounder echo and its history (requires WASSP Generation 3)
- "3D History" WorkSpace (requires WASSP module): The 3D History WorkSpace allows to display the water column data and its history (requires WASSP Generation 3)
- "Side Scan" WorkSpace (requires WASSP module): The Side Scan WorkSpace allows to display the Side Scan echo and its history (requires WASSP Generation 3)
- "Ocean-O" WorkSpace (requires Oceanography service subscription): The Ocean-O WorkSpace allows to display high resolution oceanography data

## Creating a Custom WorkSpace

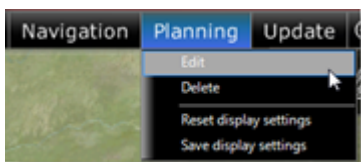
New WorkSpaces and Split Screen configurations can be created by clicking on the "+" icon . This opens the WorkSpace configuration window below:



Start by selecting the Screen Mode (full screen or split screen) and then the type of display you want to include in your WorkSpace configuration. Note that for full screen configuration, the default name of the WorkSpace will

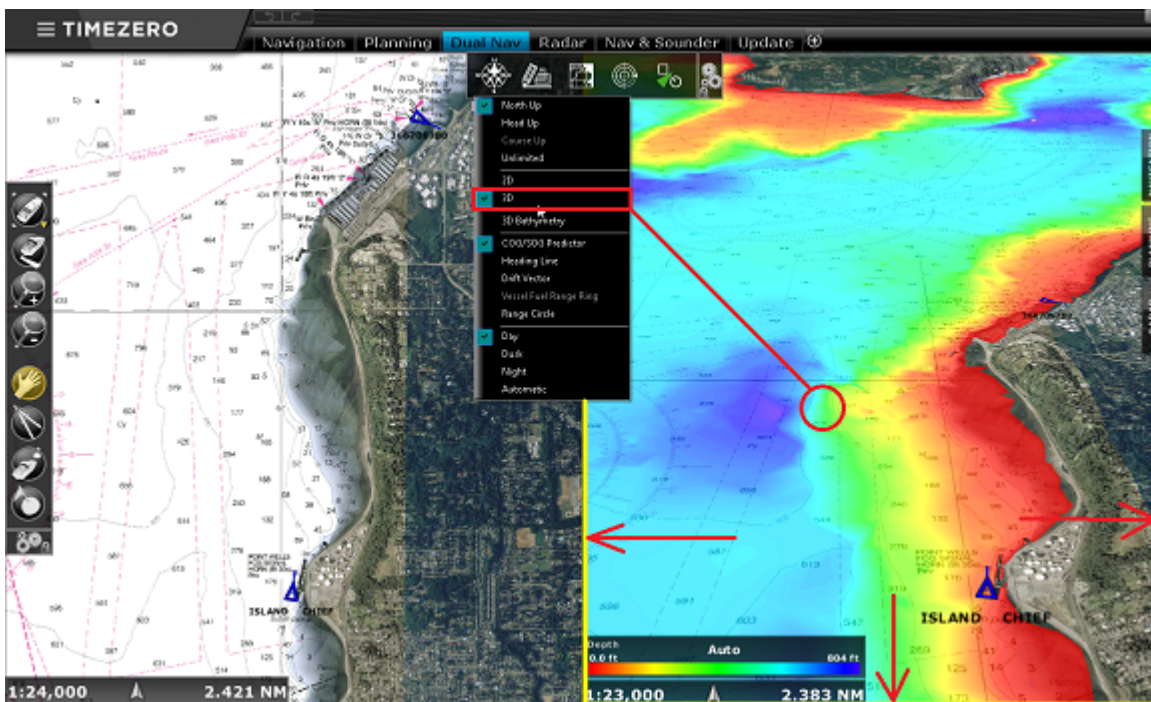
adopt the type of display selected (but you can rename it if you want). For split screen configuration, the default name will be set to "Custom" but it is highly suggested to rename it to something more meaningful to you.

Once a WorkSpace has been created, it will be displayed just below the status bar. You can re-order the WorkSpace position by clicking and dragging on a WorkSpace tab. To delete or edit an existing WorkSpace, simply right click on it:



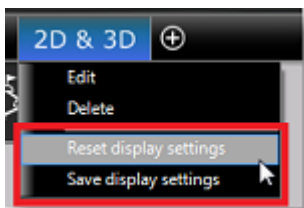
**Note:** You can only "Edit", "Reset/Save Display Setting" on the current WorkSpace (the WorkSpace that is currently selected)

When the screen is split, the Toolbar and Ribbon selection applies to the active display which is surrounded by a yellow frame. For example, if your screen is split in two and if you want to change a property of the display located on the right, make sure to click on the right side (to make it the active display), then select the corresponding action from the Toolbar or Ribbon :



### Saving and Recalling WorkSpace configuration

A WorkSpace configuration can be saved and then recalled at a later time:



The following parameters are saved:



- Toolbar configuration
- Ribbon configuration
- Undocked NavData (NavData that have been "pulled off" from the NavData bar)
- State of the display (Zoom Level, chart selection, ...)

For example, you could adjust the Navigation WorkSpace to be centered on your vessel, zoomed in on the chart without any additional layers (no depth shading, no contour lines...) with only the tools you need for Navigation (Pan, Go To,...). Once you are satisfied with your WorkSpace configuration, right click on the WorkSpace tab ("Navigation" in that case) and select "Save display settings".

If for whatever reason you (or another user) start cluttering your Navigation WorkSpace with useless layers, tools or set a zoom level not appropriate for navigation monitoring, you can always right click on the "Navigation" WorkSpace and select "Reset display settings". This will revert the WorkSpace to its previously saved state.

WorkSpace configuration can also be recalled using [Quick Access NavData](#) or [Shortcuts](#).

## Setting up Instruments

TimeZero can utilize information from many different instruments on your boat. A GPS will be the most common type of instrument used, but depth sounders, speed sensors, wind vanes, and AIS receivers can also supply information to TimeZero.

Instruments can be connected to the PC through an NMEA0183 interface (serial port), through the Network (if a Furuno NavNet MFD or Ethernet sensor is used) or through NMEA2000 (using the Actisense NGT-1 USB Gateway).

- **Serial Port:** In most cases, connecting an NMEA0183 instrument to a computer is straightforward, and is accomplished by simply connecting the serial cable supplied by the instrument manufacturer to the serial port on the PC. The serial port is a nine-pin male port on the back of the computer often identified by an IO or COM symbol.



- **Serial to USB adapter:** Newer computers – especially laptops – may not include a serial port. One can be added by using a serial-to-USB adapter, which can be obtained from any marine dealer. A serial-to-USB adapter will create a "virtual COM port" on your computer that can be viewed in the "COM and Ports" section of the Device Manager.



**IMPORTANT:** Make sure to install the USB adapter drivers **BEFORE** connecting the USB cable of the adapter to the computer!

- **Actisense NGT-1-USB:** The Actisense NGT-1-USB is a USB to NMEA2000 adapter and allows TimeZero to receive data from a NMEA2000 bus and output navigation data to an auto-pilot.



**IMPORTANT:** Make sure to install the USB adapter drivers BEFORE connecting the Actisense NGT-1-USB to the computer! Also note that TimeZero is NOT compatible with the Actisense NGT-1-ISO that uses a serial connection.

- Active USB GPS antenna is an easy way to provide the software with a vessel's position.



**IMPORTANT:** Make sure to install the GPS USB drivers BEFORE connecting the USB cable of the GPS to the computer!

- Ethernet: If the boat is equipped with a NavNet series Furuno Chart Plotter or Sensor, your computer can be connected to the NavNet network using a standard Ethernet Cable. Assign a fixed IP address to the computer connected to the NavNet network such as 172.31.3.150 with a subnet mask of 255.255.0.0.



Note that any NMEA0183 to Ethernet gateway or NMEA0183 to WIFI can also be used (by setting up a UDP or TCP connection).

**Tips:** For more information about installing Radar, Sounder and Camera please refer to the Installation chapter.

## **Automatic Instrument Configuration**

TimeZero can locate most instruments connected to the computer automatically. To use this feature, start TimeZero in "Navigation" mode to enable sensor and instrument connections. Next, launch the Automatic Configuration Wizard:

- Click on the "TimeZero" Button located on the top left of the screen
- Click on "Connection Wizard"
- Select the "Automatic Ports Configuration"; and then, click "Next"
- Follow the on-screen instructions

**Tips:** For more information about connecting instruments, please refer to the [Connection Wizard](#) Chapter.

**Note:** The Connection Wizard option will not appear when the software is started in "Home Planning" mode

## Working With Charts

### Scrolling & Zooming

TimeZero offers a new ultra-fast cartographic engine with unparalleled seamlessness and speed of zooming. TimeZero will always select the best charts as you scroll around and zoom in and out. Because scrolling and zooming are so important, TimeZero provides you with several ways of doing them using the mouse or keyboard.

#### Scrolling the Charts

##### **Panning Tool:**



The Panning Tool is the default tool of TimeZero. If it is not selected, click on the Panning tool (hand) located on the Toolbar and move the cursor over the chart to the center of the screen.

- Press and hold the left mouse button while moving the cursor to scroll or drag the chart around
- Double-click with the hand tool on a chart point to center automatically on that point

**Note:** The panning tool is automatically selected by default after every action. This feature can be disabled from the [General](#) Options if you uncheck "Enable Auto Hand Tool Selection"

##### **Using the Keyboard:**

The Arrow Keys on the keyboard can also be used to scroll the chart. Holding down an Arrow Key moves the displayed chart area in the direction of the arrow.

#### Zooming the Charts

TimeZero allows you to seamlessly zoom in or out to the exact magnification level you like without steps or limitations.

##### **Using the Mouse Scroll Wheel:**

If the mouse has a wheel, roll the wheel up and down to zoom in and out. By default, the chart will be zoomed at the location of the cursor. This can be changed to the center of the screen by enabling "Center on screen when Zooming" from the [General](#) Options.

**Note:** Using the Scroll Wheel is the best practical method to change chart scale without having to change the active tool.

##### **Using the Zoom +/- Buttons:**

By default, the Zoom In and Zoom Out buttons are available in the Toolbar in every WorkSpace. Simply click on the corresponding button to Zoom In or Zoom Out by fixed increment.

##### **Using the Zoom Tool:**

The Zoom Tool is hidden by default. Click on the "Configure" button (at the very end of the Toolbar) to add it to the Toolbar configuration. The Zoom Tool is very powerful to zoom and pan the chart at the same time (especially if your mouse has no scrolling wheel). Select the tool by clicking on it, move the cursor over the chart, then left click to Zoom In or right click to Zoom Out.

### Using the keyboard:

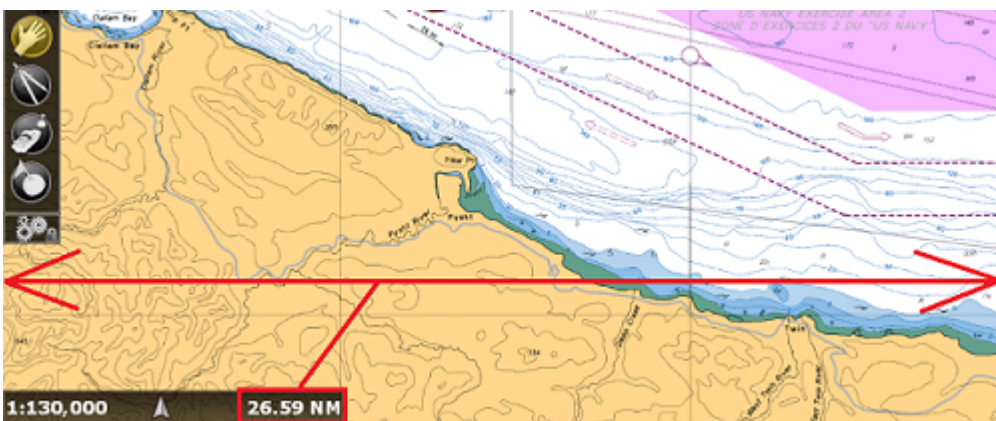
Use the Page Up / Page Down key or +/- keys to zoom in or out.

**Note:** When zooming with the Zoom +/- buttons or +/- keys, TimeZero uses predefined chart scale that can be adjusted from the [Plotter Display](#) Options menu (using the "Chart Scales Selection" button).

### Scale & Range value

The Scale and Range of the chart are displayed on the bottom left of your screen. When the chart display is Overzoomed , the scale is written in red.

The range indicates the real distance from the left side to the right side of the chart screen. On the example below the distance represented on the screen is 26.59 Nautical Miles.



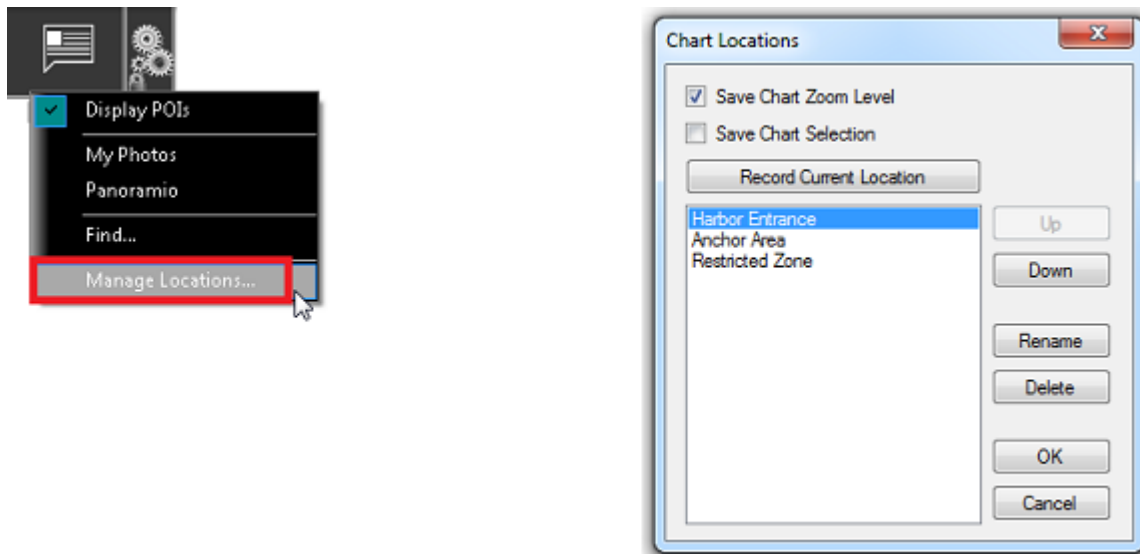
The chart scale is expressed as a ratio (1:130,000 in the example above), so the unit of measure does not matter. On a chart whose scale is 1:130,000, one inch the screen represents 130,000 inches in the real world.

The chart scale and range vary according to the zoom level but also according to the latitude (due to the Mercator projection).

### Chart Location

Chart locations can be saved and recalled in TimeZero. This can be useful to quickly set your chart screen to a specific location (for example a Harbor Entrance, Anchorage Area or any other locations that are important ). To save a chart location, pan and zoom to the correct location to adjust the chart screen as desired, click on the "POI" button located in the Ribbons and select "Manage Location...":

**Note:** If the "POI" button is not displayed in the Ribbons at the top of the screen, click on the "Configure Ribbons" button (on the right side of the Ribbons) to add it to the configuration



If you want the Zoom Level (Chart range) to be saved with the location, select "Save Chart Zoom Level". If you want to save the type of chart currently selected (Raster, C-Map, etc...) make sure to select "Save Chart Selection". This can be useful if a specific chart is better for a specific location.

Click on "Record Current Location" to name and save the location currently displayed on screen. Once the location is added to the list, you can reorder it using the "Up" and "Down" button. Make sure to click "OK" to close the Chart Locations window and save the location.

After one or multiple locations have been saved, you can quickly recall a location from the "POI" button in the Ribbons by selecting "Recall Locations". This will open a sub-menu with all your saved location.

Location can also be recalled using [Quick Access NavData](#) or [Shortcuts](#) (using the location number).

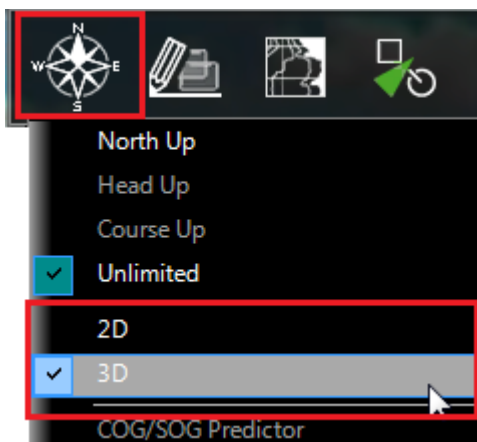
If you want to delete, rename or change the order of any location, just select "Manage Location..." from the "POI" button.

**Note:** A maximum of 12 locations can be saved.

## [2D & 3D Chart Orientation](#)

### [2D & 3D Mode](#)

TimeZero operates in a fully rendered 3D environment. You can switch from the traditional 2D view to the impressive 3D perspective by choosing the 2D or 3D option in the Mode's drop-down menu:



**Note:** If you have the "PBG Module" and want to analyze seafloor bathymetry (for fishing for example), we recommend using the "3D Cube" WorkSpace that provides greater details and a better bathymetric view of the seafloor.

## Chart Orientation

In 2D mode, the chart can be displayed in North Up, Course Up or Head Up:

- **North Up:** This mode displays the North at the top of the screen.
- **Head Up:** This mode orients the bow of the vessel to the top of the screen. The chart rotates as the vessel's bow is always pointed toward the top of the screen. In Head up mode, pay close attention to the Compass icon (on the bottom left). It provides information about the direction of North. Head Up mode is only available if a Heading sensor is connected OR if your speed is over 1Kn (GPS COG will be used in that case)
- **Course Up:** This mode is only available when a "Go To" or Route has been activated. When this mode is selected, the chart rotates and aligns vertically with the active leg. This mode provides a "stabilized" view (not moving with the own ship heading) toward your destination (or active Waypoint).

**Tips:** Click on the Compass icon (arrow) of the Chart scale (located at the bottom left) to cycle in between the various mode

In 3D, the chart can be displayed in North up, Course Up, Head Up or in "Unlimited":

- **North Up:** In this mode, the azimuth is fixed pointing toward the North. The pitch or inclination is adjusted by holding the middle click button and moving the mouse. If the mouse does not have a middle button, press and hold the Alt (Option) key of the keyboard while moving the cursor.
- **Head Up:** In this mode, the azimuth is fixed pointing along the current Heading. The pitch or inclination is adjusted by holding the middle click button and moving the mouse. If the mouse does not have a middle button, press and hold the Alt (Option) key of the keyboard while moving the cursor.
- **Course Up:** In this mode, the azimuth is fixed pointing along the current destination. The pitch or inclination is adjusted by holding the middle click button and moving the mouse. If the mouse does not have a middle button, press and hold the Alt (Option) key of the keyboard while moving the cursor. This mode is only available when a Go To or Route has been activated.
- **Unlimited:** In this mode, the azimuth and pitch can be freely adjusted by holding the middle click button and moving the mouse. If the mouse does not have a middle button, press and hold the Alt (Option) key of the keyboard while moving the cursor.

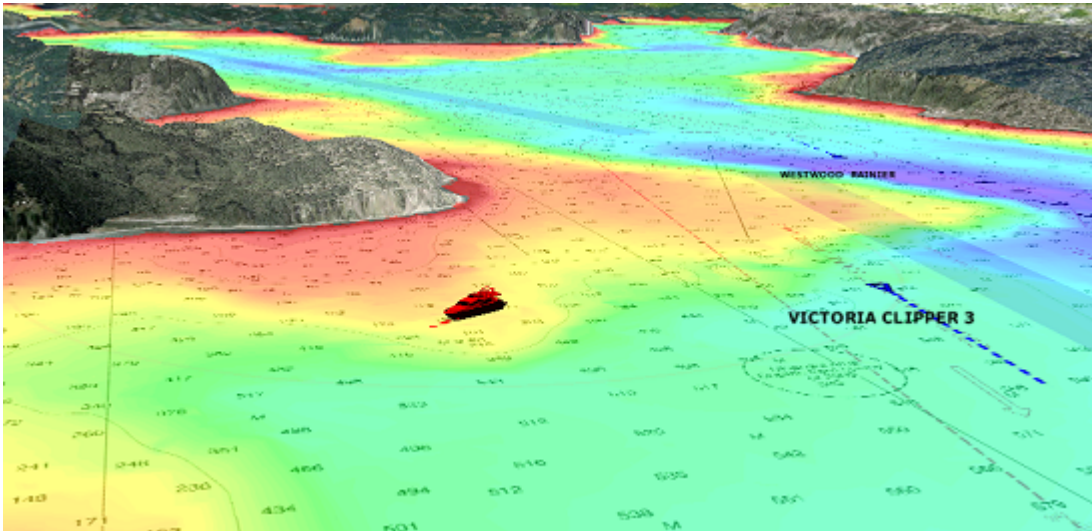
**Tips:** A "3D Orientation" tool is available (hidden by default) and allows the user to adjust the azimuth and pitch by clicking and dragging the cursor over the charts. This is very useful if your mouse does not have a middle click button and if the keyboard is not easily accessible.

## 3D View

When "3D" is selected from the "Mode" button in the Ribbon , TimeZero handles Altimetry (3D above Sea Level) and Bathymetry (3D below Sea Level) in two different ways. Altimetry (3D above water) is always activated and its exaggeration can be adjusted manually from the [Plotter Display](#) Options under the "3D Display" by adjusting the "3D Alti Exaggeration" slider.

**Note:** This setting is used to enhance the 3D image over land by over or under-exaggerating 3D data over land. Minor changes in elevation become visible in areas that might otherwise appear completely flat (or vice-versa). If you are in an area where the mountains appear too high, simply reduce the 3D Alti Exaggeration

Bathymetry (3D below water) is always turned OFF in the Navigation and Planning WorkSpaces. This means that the seafloor appears flat. This is to avoid parallax effect that can be disturbing to some users.



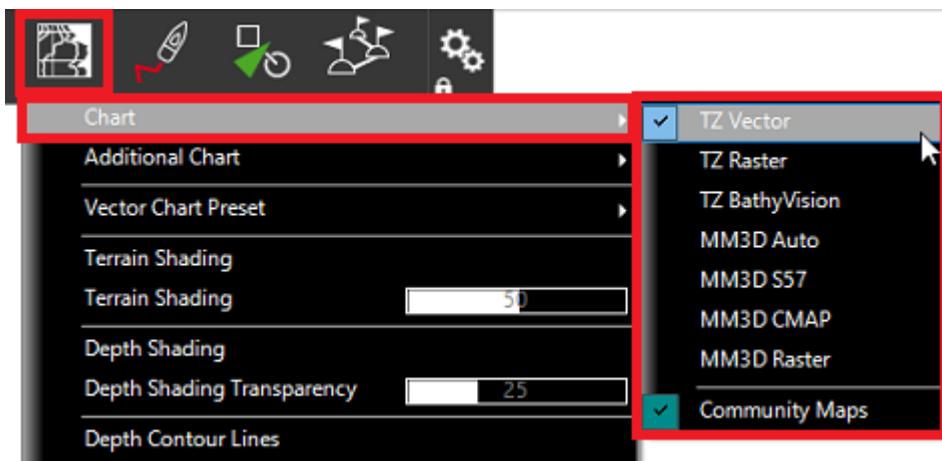
If you want to display under water bathymetry in a 3D view, the "3D Cube" WorkSpace (requiring the PBG module) can be used. In the 3D Cube WorkSpace, TimeZero adjusts the bathymetry exaggeration automatically according to the zoom level and the Slope of the terrain (this can be switched to a manual mode from the "Mode" Ribbon if needed). Please refer to the [3D Cube WorkSpace](#) for more information.

## Selecting Charts & Overlays

TimeZero's powerful graphics engine adds new chart presentation options to the conventional method of electronic chart plotting. TimeZero can display vector or raster charts and merge them with satellite pictures and depth shading. With 3D data and our Satellite PhotoFusion rendering, satellite imagery blends with critical chart data in an easy, useful way that greatly enhances situational awareness.

### Selecting Charts

Click on the Chart button in the Ribbon to display and select the various options:



Note that the various chart selection options listed below will vary according to the charts that have been installed and unlocked on your computer.

- **TZ Vector:** Select this option to display the new Mapmedia TZ Maps vector charts.
- **TZ Raster:** Select this option to display the new Mapmedia TZ Maps raster charts.
- **TZ BathyVision:** Select this option to display the new Mapmedia TZ Maps Fishing Charts.
- **MM3D Auto:** Select this option if you want TimeZero to automatically pick the best MM3D chart source according to the area

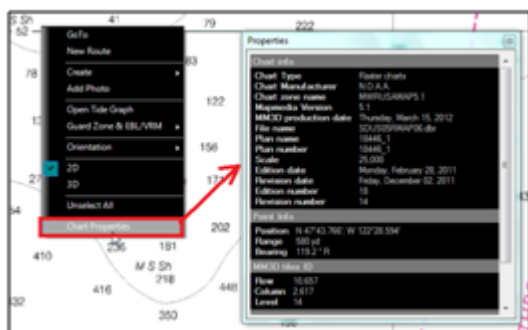
**Note:** By default, TimeZero will try to use a Vector chart in Auto mode. However, if you have installed and prefer Raster charts, you can switch the "Chart Priority in Auto Mode" to "Raster" from the [Plotter Display Options](#)

- **MM3D S-57:** Select this option to display Vector Charts from Hydrographic Offices (NOAA) compiled in MM3D format
- **MM3D C-Map:** Select this option to display Mapmedia mm3d C-Map Vector charts
- **MM3D Raster:** Select this option to display Raster Charts from Hydrographic Offices (NOAA, SHOM, UKHO,...)
- **ENC:** Select this option to display S57 (ENC) or S63 (Encrypted ENC) charts that have been imported

**Note:** If a chart type is missing from the selection, it means that you have not installed that type of chart yet.

## Chart Property

Source, issue date and other chart information can be displayed by right clicking on the chart and selecting "Chart Properties" (for MM3D0 or "Chart Object Properties" (for TZ Maps):





## Satellite Photos

Satellite pictures can be fused with raster or vector charts by a method called PhotoFusion. Land areas are completely opaque, so that these areas are displayed as high-resolution satellite photos on the chart. As the depth increases, the satellite photography becomes more transparent so that the shallows are displayed along with the chart information. As the deeper water begins, the satellite picture disappears, leaving the raster or vector chart. High-resolution satellite photography enables the user to easily identify the seabed classification as sand, rock, coral or other obstructions.

To enable the PhotoFusion overlay, select "Satellite Photo" from the Chart button.

**Note:** PhotoFusion automatically adjusts the transparency of the Satellite Photo, however, it is possible to manually offset the transparency (make it more or less transparent) using the "PhotoFusion Transparency Offset" setting available in the Plotter Display Menu.

## Depth Shading

A depth color scale can be applied to raster or any type of vector charts. This unique feature allows you to view water depths at-a-glance with vibrant colors. To enable the Depth Shading overlay, select "Depth Shading" from the Chart button. The transparency levels can be adjusted from the same location so that the chart data is visible beneath the color shading.

By default, the color scale is set automatically (TimeZero scans for the deepest and shallowest point on the screen and automatically adjusts the upper and lower boundary). You can disable the Automatic mode by clicking on "Auto".



In Manual mode, you can adjust the lower and upper boundaries by moving the cursor over one of the depth values and using the mouse wheel to change it. You can also adjust the lower and upper boundaries from the [Plotter Display](#) under Depth Shading.



**Tips:** If you put the cursor over the color scale and use the mouse wheel (in manual mode), it will change both the upper and lower boundary at the same time (span).

If you have the PBG module unlocked, the discrete depth shading can be enabled to provide total control over the color and associated depth value. Please refer to the [Fishing Workspace](#) chapter.

## Other Overlays

The Chart button in the Ribbons allows the user to display various additional overlays:

- Select "Tidal Height Stations" to display the Tidal Gauges on the Charts (refer to [Tides](#) for more information).
- Select "Tidal Currents" to display Currents Arrows on the Charts (refer to [Tidal Currents](#) for more information).
- Select "Grid" to display a Lat/Lon or TD (Ioran) grid on the Charts.

**Note:** When the Grid is set to TD or Loran, it will only appear at lower zoom level

## Adjusting Vector Charts Display

Unlike Raster charts, Vector charts can provide control over the level of information displayed. Vector charts are made up of individual objects and data layers such as navigational aids, spot soundings and land features that can be displayed or hidden. These adjustments are made from the [Vector Chart Options](#).

### Vector Chart Presets

All vector chart options can be saved into presets. By default, TimeZero is initialized with a "Custom" preset in addition to the presets below:

- "Base" shows the minimum set of objects necessary for planning
- "Standard" adds other objects (such as restricted areas or channels) that are necessary for safe navigation
- "All" display all the objects available
- "Fishing" adds objects that are useful for fishing
- "Custom" default preset used by TimeZero

Note that the "Base", "Standard", "All", and "Fishing" presets cannot be modified, and all vector chart options (except for Safety Depths) will be hidden when one of those presets is selected. The default "Custom" preset can be modified and the user can create new presets by selecting "<Add New>" from the preset selection list.

Vector chart presets can be recalled from the Chart button under "Vector Chart Preset". Note that different chart presets can be selected independently by WorkSpace. It means that you can have the "Fishing" WorkSpace using a vector charts presets adjusted for fishing operation, while having the "Navigation" WorkSpace with a different vector chart preset adjusted for navigation.

### Appearance

The appearance section of the Vector Chart options allows you to change how the charts are rendered on the screen. Various vector chart color theme can be selected. It is also possible to change the style of light and buoy icons as well as adjusting the overall object size (Depth Sounding Buoys, Wrecks, Obstructions, etc...).

### Safety Depths

The Shallow, Safety and Deep water parameters are used to color the various depth area of the vector chart. The transition between colors is based upon the depth contour lines of the vector chart. Note that if there is no contour line available on the vector chart corresponding to the exact value you selected, the color transition will occur at the next deepest (safer) contour line available.

Note that these parameters are global to all vector chart presets. Changing these values will immediately apply to all presets.

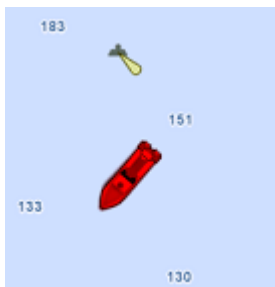
### Layers

The layers section allows you to turn ON or OFF the display of specific objects on the chart and in some case control how they are displayed.

## Ship & Track

### Ship Icon

When TimeZero is started in Navigation mode and is receiving a valid position, a ship icon is displayed on the chart:



**Note:** If you cannot locate the ship icon on the chart, click on the "Center On" button located in the Toolbar to center the chart on your ship's position.

The icon in red represents the boat and indicates its position and heading (or course over ground if heading data is not available). Note that it is possible to change the default red color to green or yellow from the [Initial Setup](#) Options.

If the position source is lost the ship icon is displayed in black and stays at the last known position value. A GPS Lost alarm is also triggered:

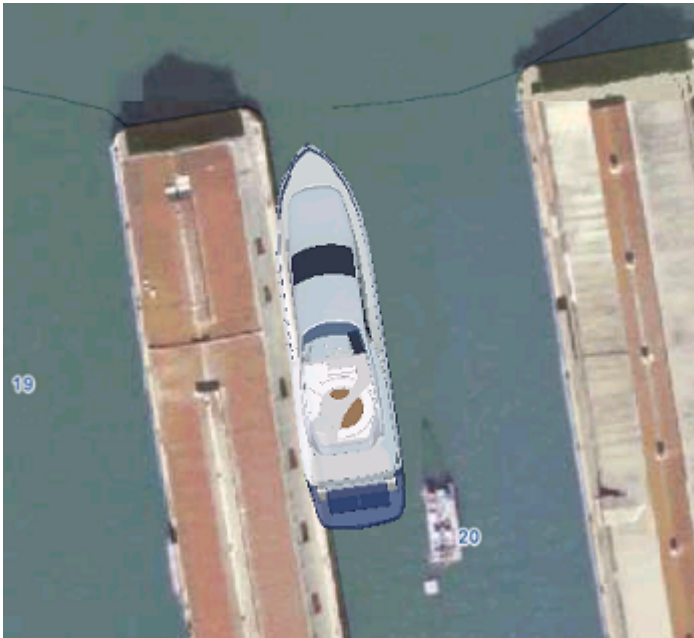


**Note:** The ship icon will turn black if no valid GPS data is received for more than 10 seconds. If you have intermittent GPS signal, it is recommended to try to relocate the GPS antenna position on your boat to improve reception. If you want to monitor the quality of GPS signal and number of satellites being used, it is recommended to use the "GPS Status" NavData.

### Icon Size

The size of the icon can be selected from the [Initial Setup](#) Options ("Size of Static Icon").

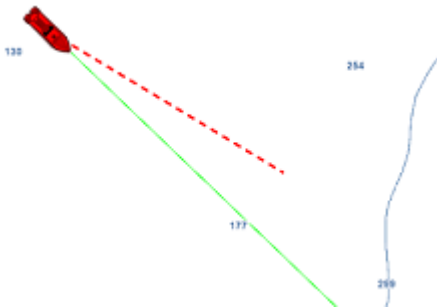
When sufficiently zoomed in on the chart, the ship icon will be displayed in real size according to the scale of the chart and the "Boat Length" parameters setup in the [Initial Setup](#) Options.



When the Plotter is displayed in 3D, a three dimensional model of the vessel icon is displayed. The model can be customized from the [Initial Setup](#) Options ("Boat Icon").

### **Course & heading Vector**

The Heading line and/or Course vector can be displayed. Right click on the Ship Icon (or select the "Mode" Ribbon Button) and enable or disable the corresponding vector.



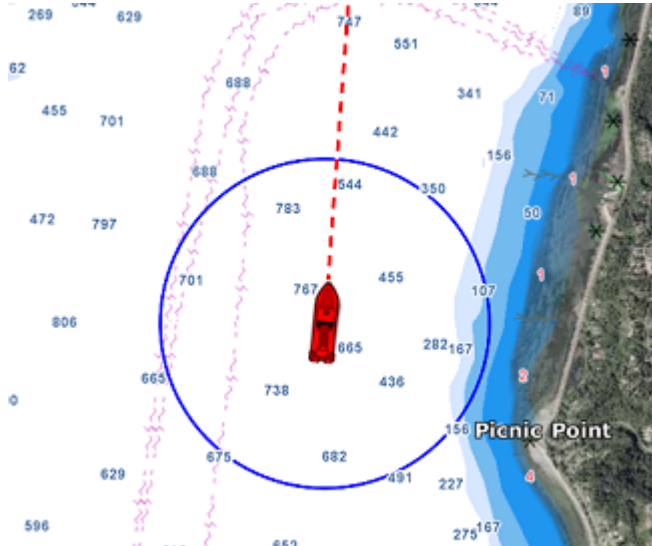
The COG vector (displayed in dashes with the same color as the boat icon) is calculated by the GPS. It indicates the direction of movement relative to a ground position. The length of the COG vector can be setup by distance or time. When it is set to "Time", the length varies according to the speed of the boat and can be configured to show the predicted position in a specified amount of time. This setting is available in the [Ship & Tracks](#) Options (under "COG/SOG Predictor").

The Heading Line (displayed as a green line by default) is sent by an Electronic Compass and shows the direction of the bow of the boat. The heading line color can be changed from the [Ship & Tracks](#) Options (under "Heading Line Color").

The Drift Vector (displayed as a blue dashed line) can be received from a sensor or computed by TimeZero when COG, SOG, STW and heading are received. This vector graphically represents the drift direction and speed. To be consistent, the drift vector shares the same parameters as the COG vector (when set to "time").

## Range Circle

A range circle can be displayed around your vessel. Right click on the Ship Icon (or select the "Mode" Ribbon Button) and enable "Range Circle":



Range circle distance, color and thickness can be adjusted from the [Ship & Tracks](#) Options.

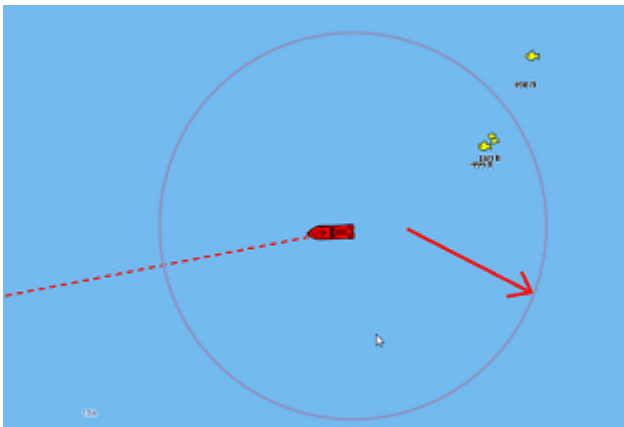
## Centering on the boat

Click on the "Center On" button in the Toolbar to center the charts on your own ship position:



## Motion Mode

When your boat is on the screen and the chart is scrolled or zoomed, a red circle appears in the middle of the screen. This is the "Relative Motion Circle", a new and intuitive way to control the Relative/True motion.



When the Ship icon is inside the Relative Motion Circle, the chart will scroll on the screen and the Ship icon will always stay at the same relative position inside the circle (Relative motion mode). When the Ship icon is outside the Relative Motion Circle, the screen will not scroll (True motion mode).

To shift the position of the relative motion mode, scroll the charts using the Panning Tool or the Keyboard arrows until the Ship icon is at the desired location on the screen, making sure to keep the Ship icon inside the Relative Motion Circle.

You can adjust the size of the Motion Circle from the [Ship & Tracks](#) Options.

**Note:** When the chart orientation is set to "Head Up", the software automatically offsets the icon location on screen to the bottom, giving more chart view in front of your boat.

### [Auto Shift mode \("Look Ahead"\)](#)

If you right click on the "Center On" button, you can select the "Auto Shift" mode:



When this mode is selected, the position of the boat will automatically be moved inside the motion circle based on your speed and your course (COG). The "Autoshift Maximum Speed" can be adjusted from the [Ship & Tracks](#) Options. This adjusts the speed at which the boat will be the most off centered on screen.

**Note:** The Autoshift function makes the most sense when the chart orientation is set to "North Up". However, the Autoshift function will also work in "Head Up" mode, and will simply off center the boat on a vertical axis based upon its speed.

Note that if you manually pan the chart or use the arrow keys on your keyboard, the Auto Shift mode will automatically be turned OFF.

**TIPS:** You can adjust the size of the Motion Circle from the [Ship & Tracks](#) Options to increase or decrease the maximum Auto shift location on the screen. Make sure also to adjust the Auto shift Maximum speed according to your boat.

## [Trail & Tracks](#)

TimeZero can keep track of your Own Ship position history using either Trail or Tracks. The trail is always and automatically recorded in the background (you have nothing to enable) and it can be either displayed or hidden on the chart. Tracks need to be manually recorded by using the track button (ON/OFF) or be recalled from a Trail portion. Tracks can then be managed from a list and exported/imported.

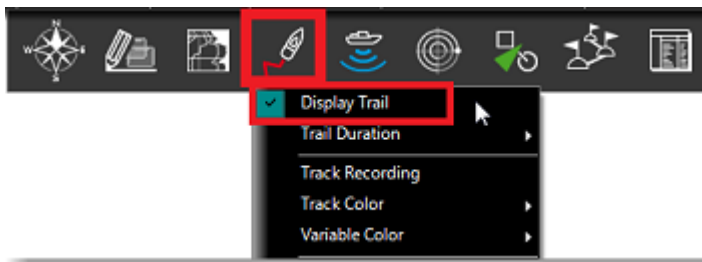
Trail and Track have each their advantages and their specific uses. Tracks are useful to permanently record specific passages or the location of fishing gear, but can quickly clutter your screen if you are not diligent about choosing when to enable or disable the track recording. The trail on the other hand is 100% automatic and you can dynamically adjust its length (using the trail duration setting).

For recreational boaters, the best practice is to primarily use the trail, and then, if you want to permanently display on your chart a specific passage, simply create a track from a trail portion (using the right click on the trail and selecting "recall track").

**Note:** Trail and Tracks are both recorded at one second interval as soon as TimeZero receives a good GPS position

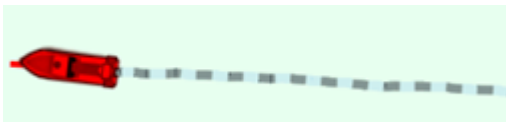
### [Trail](#)

To display the trail on your chart, select "Display Trail" under the "Own Ship" button:

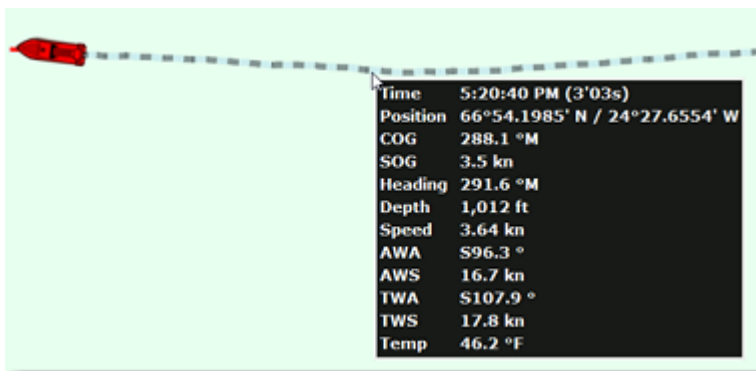


You can also right click on the boat icon and select Own SHip Trail.

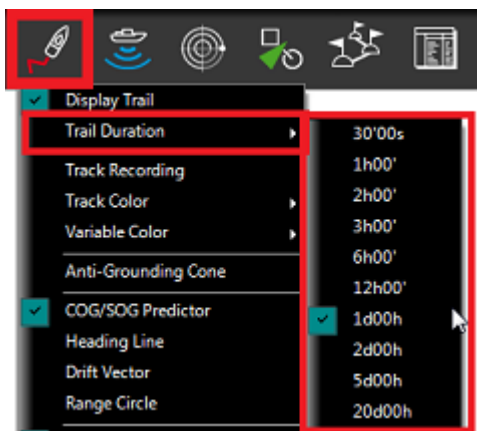
When enabled, the trail displays behind the boat icon all your contiguous position using animated white and black dots:



Hovering the cursor over any point of the trail will display a tooltip with all the data that was recorded at that time:



The trail duration can be adjusted from the [Ship & Tracks Options](#) or directly from the "Own Ship" button:



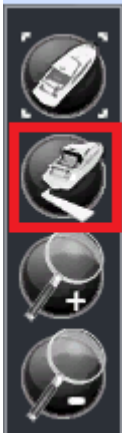
Note that the trail display is dynamic and changing its duration will immediately update its length on the chart. By default, TimeZero displays a trail duration of 1 day, but you can make it as short as 30 minutes or as long as 20 days.

**Note:** It is possible to replay a trail older than 20 days by using the [Boat Replay](#) feature of the Planning WorkSpace.

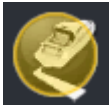
## Tracks

### Enabling / Disabling Track Recording

To enable or disable the track recording, click on the "Track" Button in the Toolbar:



When the track is being recorded, the "Track" Button turns yellow :



Click on the button again to toggle OFF the track recording.

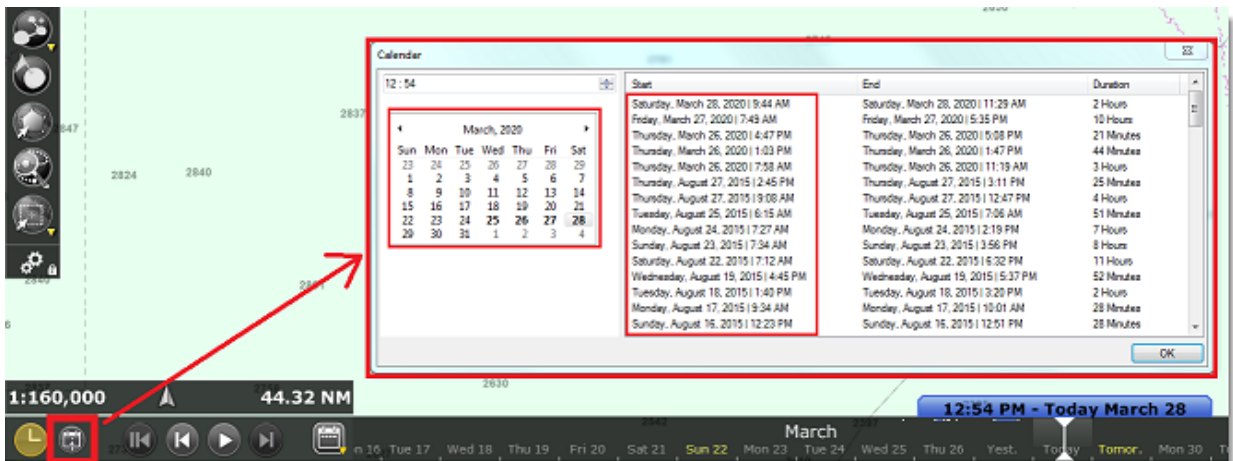
### Recalling a Track using the Trip List and the Trail

TimeZero has an innovative feature that allows you to recall any track portion from your trail (which is guaranteed to be always recorded). This is a much more practical way to create a track rather than trying to remember to press the track button ON and OFF at specific times. Although the live trail display is limited to 20 days, you can use the Planning WorkSpace and the trip list to recall any trail of any trips you have done in the past.

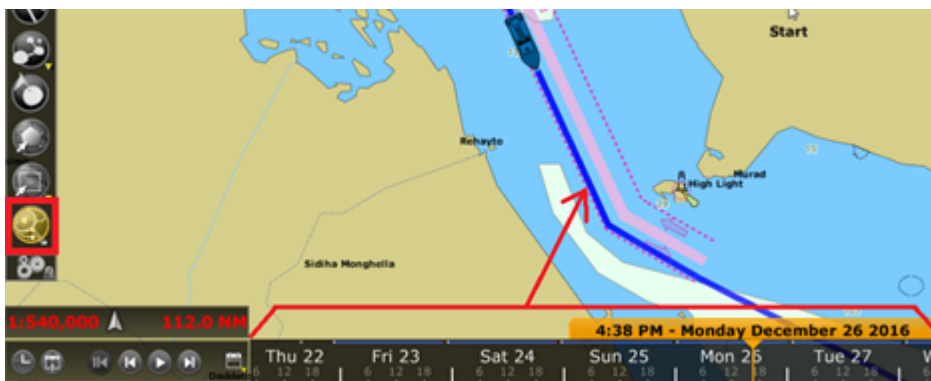
To recall a track:

- Select the "Planning" WorkSpace
- Click on the Calendar icon to open the Calendar and Trip list. Either select a date/time using the calendar or select a trip by clicking on its start date inside the list:

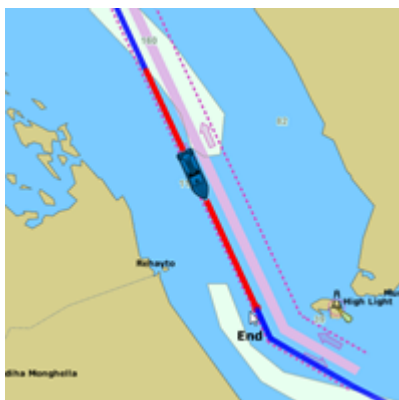




- After selecting a valid date, the chart will center automatically to the recorded location and a blue boat icon will be visible on the chart (this is the position TimeZero recorded for the selected date/time). Note that you can move the timeline at the bottom of the screen to refine the date/time until the blue boat icon is approximately at the position you wish to record the track from.
- To activate the Track Recall mode, either click on the "Track Recall" tool available in the Toolbar of the Planning WorkSpace, or right click on the blue boat icon and select "Recall Track"
- Once the Recall Track mode is enabled, TimeZero will display track points around the blue boat icon and your cursor will change into cut tool:



- Use the tool to "cut" the track portion you want to recall by clicking on a first point to set the beginning of the track and by clicking a second time to set the end. TimeZero will then create a track automatically:



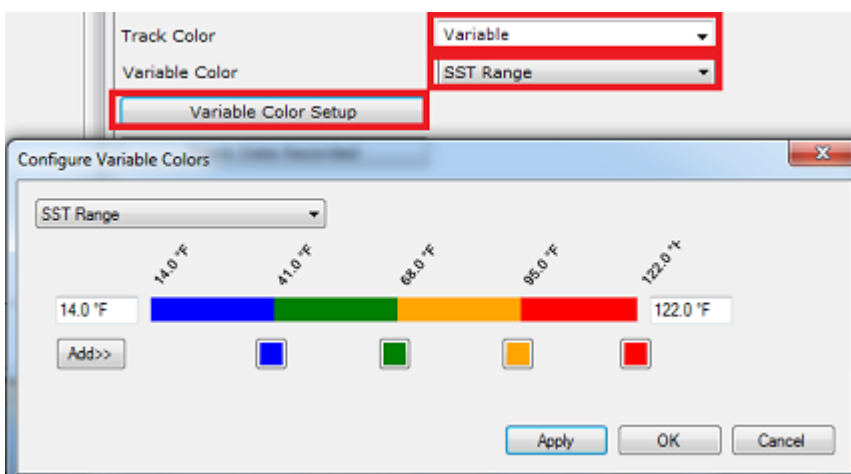
## Track Coloring

You can change the default track colors from the [Ship & Tracks](#) Options by adjusting the "Track Color" setting. After adjusting this setting, all the new tracks will use that color by default. Note that you can individually change the color of any track by right clicking on a track and selecting a new color.

The Track can also be set to change its color automatically according to some parameters received in real time by your computer (Depth, Sea Surface Temperature, Speed and Bottom Discrimination)

**Note:** Bottom Discrimination requires the Furuno Sounder Module and a Furuno Ethernet Sounder BBDS1 or DFF1-UHD with selected transducers.

To set the track color according to a parameter, open the [Ship & Tracks](#) Options, select "Variable" for "Track Color", then select the parameter you want to use to change the color such as SST (Sea Surface Temperature) for "Variable Color". Finally, click on the button "Variable Color Setup" to open the color configuration:



Start by adjusting the minimum and maximum parameter values. Outside of these boundaries, the track color will be set to the first and last color (blue and red on the example above). Once the minimum and maximum values are adjusted click on the small color square to change the color and/or parameter value.

To add a new color, simply click on the "Add>>" button. To remove a color, click and drag the color square all the way to the right side (a trash icon will appear), then release the mouse. Press "Apply" to confirm the change, then "OK" to close the window.

From now on, each time you select the track to be "Variable Color", this color scale and parameter will be used.

**Note:** The track variable color does not affect the data being recorded. It only affects the display. If you want to change the variable color of a specific track, start by adjusting the color scale (and parameter used) from the Options, then right click on the track you want to change the color and select "Variable Color" then choose the parameter. This will refresh the track color using the latest settings

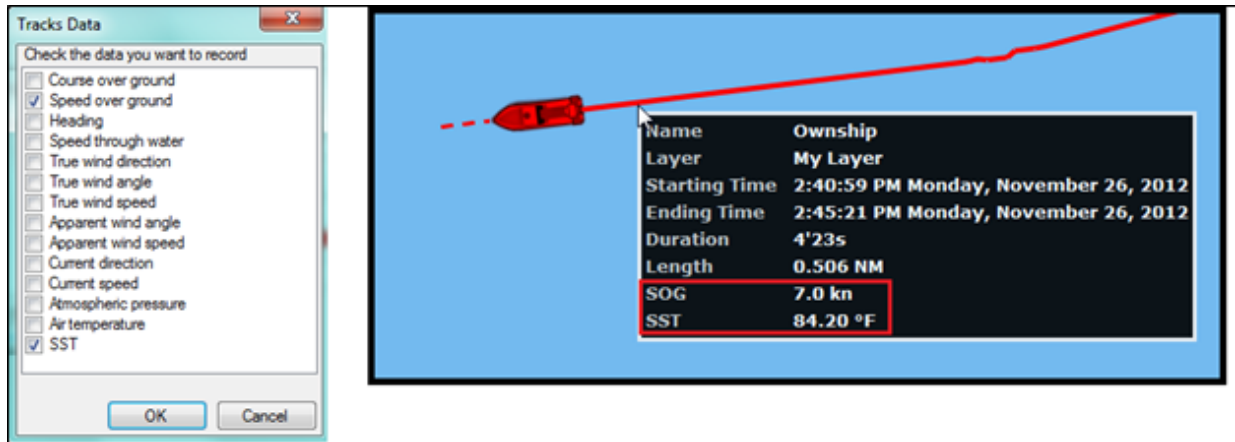
## Recording Additional Data in the Track

By default, Speed (SOG) and Depth data are always recorded inside the track (provided that the corresponding sensor are connected and configured in TimeZero). You can add other data from the [Ship & Tracks](#) Options by clicking on the "Track Data Recorded" button. The following data can be recorded inside the track:

- Course Over Ground (COG)
- Heading
- Speed Through Water
- True Wind Direction

- True Wind Angle
- True Wind Speed
- Apparent Wind Speed
- Set (Current direction)
- Drift (Current speed)
- Atmospheric Pressure
- Air Temperature
- Sea Surface Temperature (SST)

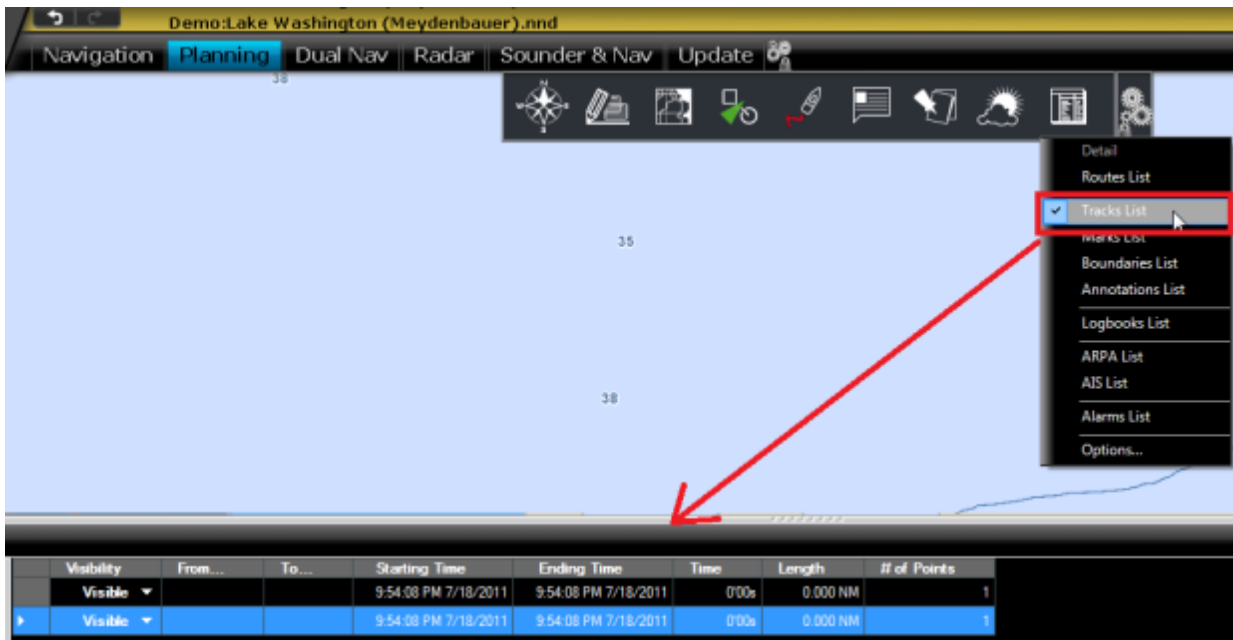
To view the additional data recorded in the track, just rollover your cursor over a track. A Tooltip will appear:



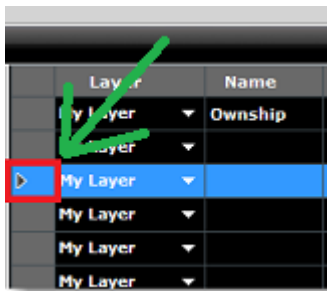
**Note:** You can only record a maximum of 10 additional pieces of data in the track. The depth and Bottom Discrimination (when connected to a BBDS1/DFF1-UHD) are always recorded and cannot be disabled.

## Displaying the Track List

To display a list of all the tracks, select the "Lists" button from the "Planning" Workspace Ribbon and click on "Track List":



To select and center on a specific track on the Chart, click on the first column corresponding to the track you want to display:



Please refer to the [Marks and Objects List](#) chapter for more information on the List.

## Converting a Track into a Route

Right Click on a track (either on the Chart or from the Track list) and select "Create Route". This will create a route that follows the track direction.

**Note:** If you right click on the track being recorded (the "active track"), select "Track Back" to convert the Track into a Route and automatically reverse it.

## Importing and Exporting Track

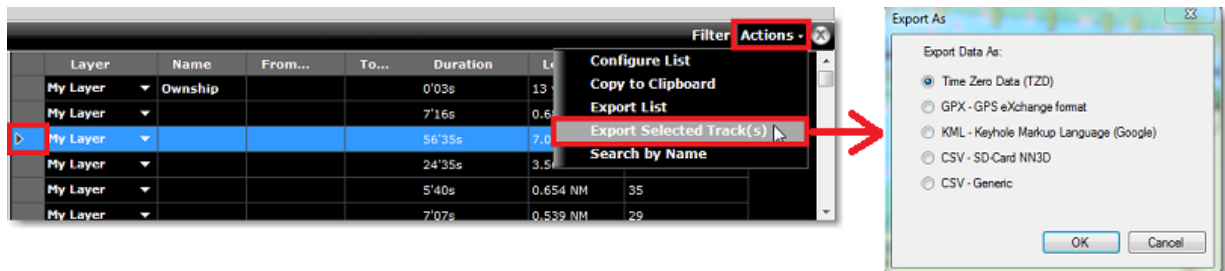
### Exporting Track

You can export all your tracks or only tracks belonging to specific layers from the "Import/Export" button available under the TimeZero button. Please refer to the [Import & Export Data](#) chapter for more information.

If you want to export only one track or a specific selection of tracks, you can use the "Action" menu of the Track List:

- Open the "Track List" by using the "List" button located in the ribbon

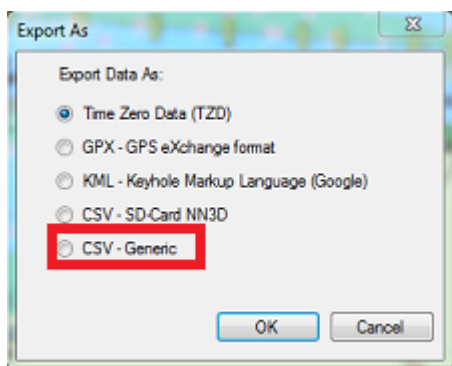
- Select one or multiple tracks. To select multiple consecutive tracks, select the first line, press and hold the SHIFT key then select the last line (this will select the range). To select individual tracks, press and hold the CTRL key and click on the lines.
- Click on the "Action" button located on the upper right side of the list panel
- Select "Export Selected track(s)"
- Select the export format
- Give a name to the file that will hold your track(s) and save it:



**Note:** If you want to export one or multiple track to exchange them with another TimeZero user, it is recommended to use the "TimeZero Exchange (TZX)" format.

### Exporting Track Details

When you select "CSV - Generic" from the format window, all the detailed track information (including additional data) will be exported as a CSV file:



This selection allows the user to generate a CSV file containing a new line for every track point with all parameters included in the track. The first line starts with # followed by the track name. The second line is a header indicating the name of each parameters contained in the column.

Example:

#Name1

*Latitude,Longitude,Year,Month,Day,Hour,Minute,Second,Depth,Course over ground,Speed over ground,Heading,Speed through water,True wind direction,True wind angle,True wind speed,Apparent wind angle,Apparent wind speed,Set (Current direction),Drift (Current speed),Atmospheric pressure,Air temperature,SST*

The resulting CSV file can be opened in Excel if needed for deeper analysis.

**Note:** If multiple tracks are selected, all the information (from multiple tracks) is combined in a single file. The #TrackName and header will allow to identify the beginning of all the tracks in the CSV file.

### Importing Track

To import tracks, select the "Import/Export" button available under the button. Please refer to the [Import & Export Data](#) chapter for more information.

**Note:** When you import track from a file, they are added to your existing database.

## Trips & Boat Replay

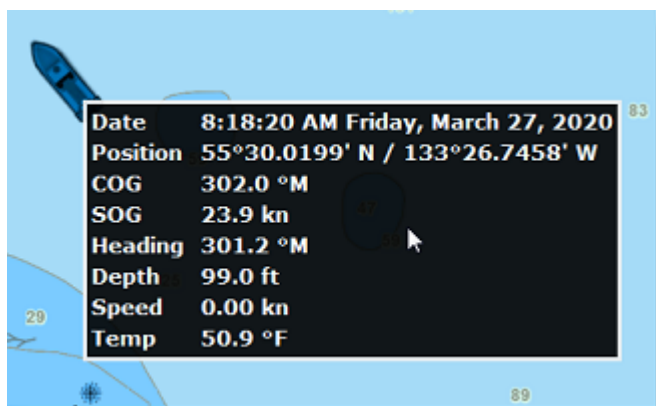
TimeZero includes a powerful logbook feature that always record your position and instruments data into a database. This data is automatically split into "trips" that can be easily selected and replayed from the Planning WorkSpace.

When you select the "Planning" WorkSpace, a timeline is displayed at the bottom of the screen. This timeline allows to simulate route planning, display weather or tides & currents, but it also allows you to go in the past and replay your trips.

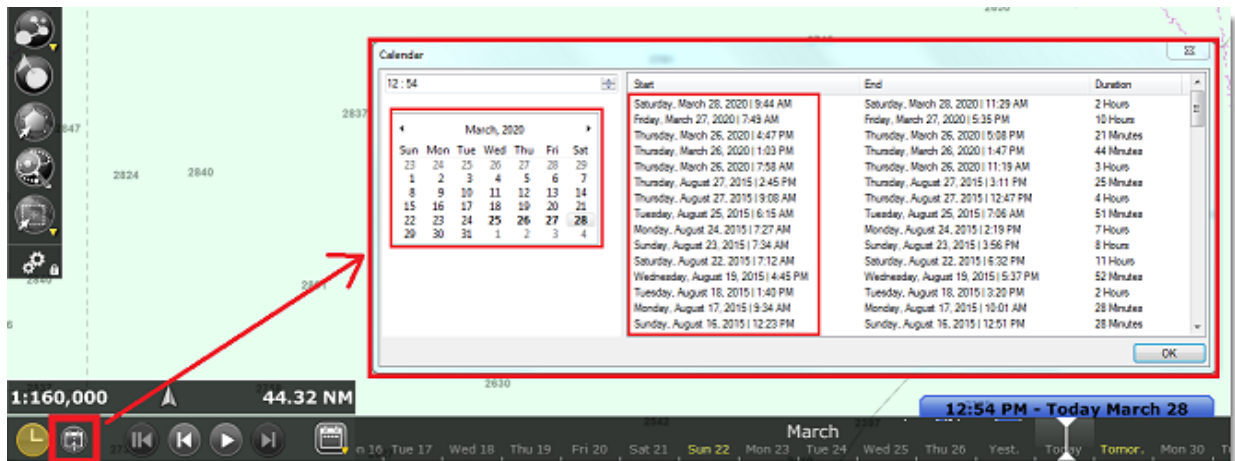
When the timeline is in Hour, Day or Week Mode, time-spans containing recorded data will be indicated with a blue bar. As you shift the play-head over these time-spans, a blue boat icon will be displayed on the chart indicating your recorded position:



You can click on the blue boat icon to display all sensor data available at that time:



To display a list of your previous trips, simply click on the Calendar icon located at the bottom left corner of the Planning WorkSpace:



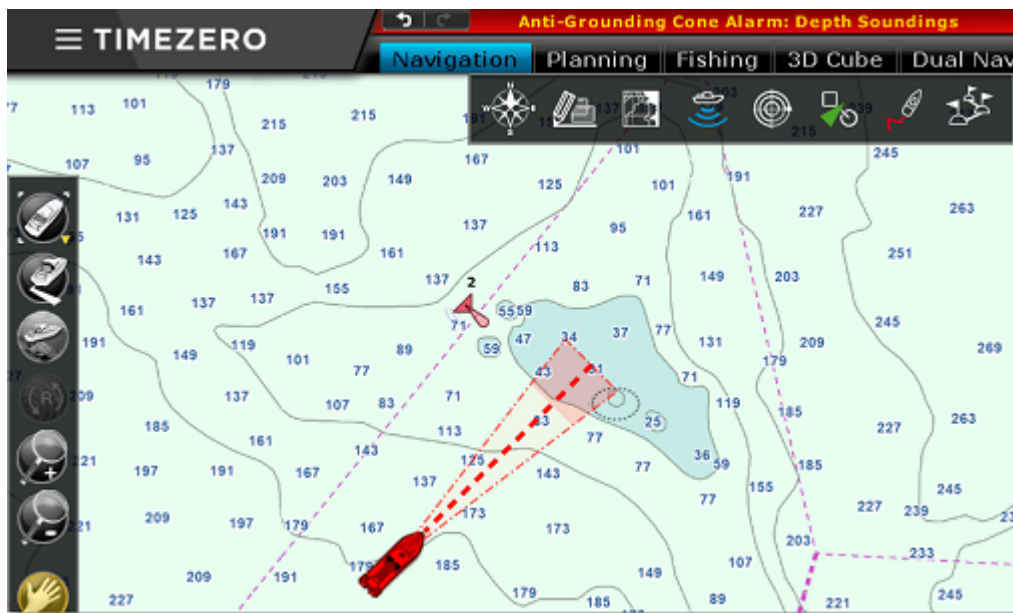
All window will appear allowing you to select a specific date (using a calendar) or view all your previous trips organized by date (most recent at the top). Note that by clicking on the start date of any trip, the timeline will adjust to this date and the chart will center on the blue boat icon making it very easy to find and replay your trips.

You can then use the Play/Pause button or manually drag the timeline to replay your trip. If you want to create a track from your past trips, read the [following chapter](#).

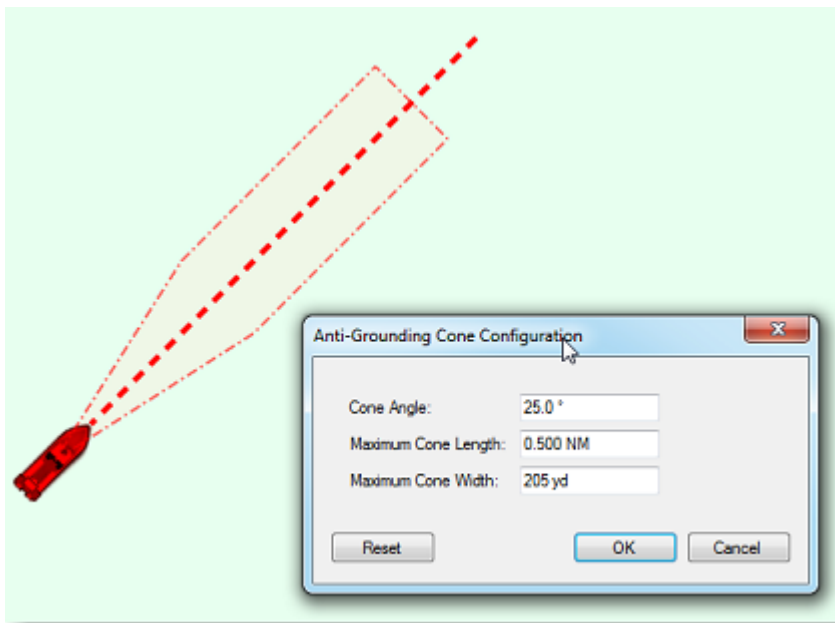
## Anti-Grounding Cone

The anti-grounding cone enables TimeZero to scan for dangerous objects and depth in front of your boat and warn you in case of possible collision or grounding. To activate the anti-grounding cone, either right click on the boat or click on the "Own Ship" button in the ribbon and select "Anti-Grounding Cone".

This will display a cone in front of the vessel that has the same length as the COG/SOG predictor. If a dangerous objects enter the cone, an alarm will appear in the status bar (a sound can also be assigned from the [Alarm Options](#) by pressing "Define Alarm Sounds"):



The shape of the cone can also be adjusted from the [Alarm Options](#) by pressing "Anti-Grounding Cone configuration". The angle of the cone and the maximum length/width can be adjusted. In the example below, the angle has been increased (making the cone cover a wider area quicker in front of the vessel), but maximum values have also been setup that modify the shape of the cone similar to a funnel:



The type of dangerous objects and depth areas that TimeZero scans inside the cone is shared with the [Route Safety](#). The list of objects can be adjusted from the [Routes Options](#) by clicking on "Route Safety Configuration".

Although the Anti-Grounding Cone is not limited to vector charts objects, a warning will be displayed if it is enabled in an area where no detailed vector chart is available.

**Note:** Vector charts don't have to be displayed on the screen, they just have to be loaded in the software. If you install both Raster and Vector charts and prefer to display Raster charts on screen, the Vector charts data will still be used by the anti-grounding cone.

## Man Over Board

The "Man Over Board" button is hidden by default. To make it available in the Toolbar, click on the "Configure" button and add it to the WorkSpace configuration.



The MOB button can be configured to act in two ways from the [Alarms Options](#) (under "MOB Behavior"): "Event Only" or "Alarm and Activate Route".

### When the MOB is set to "Event Only":

- An Event (mark with MOB icon) is dropped at the current vessel location
- The Navigation WorkSpace is automatically selected
- The chart is automatically zoomed and centered on the MOB location

### When the MOB is set to "Alarm and Activate Route":

- An instant Waypoint is created at the current ship position and the Route is activated
- The Navigation WorkSpace is automatically selected
- The chart is automatically zoomed and centered on the MOB location



- The MOB alarm is activated in the status bar

**Note:** When a MOB is triggered in "Alarm and Activate Route", the Waypoint Switching parameters are disabled and the MOB Waypoint remains active until manually cancelled.

#### To return to Normal Mode:

Cancel the MOB by selecting "Cancel Navigation" from the "Route" button located in the Ribbon (or right click on the Active Route).

## Anchor Watch Alarm

The Anchor Watch Alarm allows you to set and monitor your position relative to an anchor point. If your current position strays too far from that set point, a warning and alarm will be triggered.

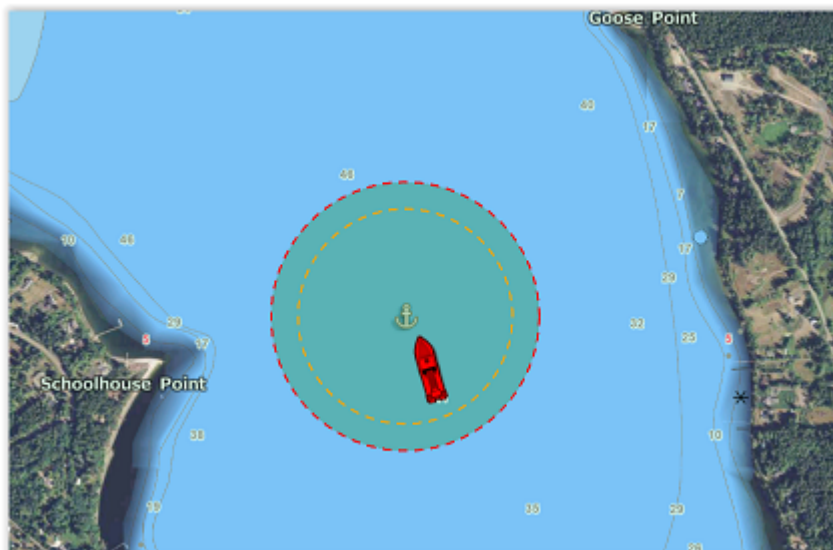
TimeZero includes an advanced Anchor Watch Alarm that is automatically synchronized on the local network among other compatible TimeZero devices (TZ iBoat on iOS and other TimeZero on PC). The Anchor Watch Alarm can also be sent to the TimeZero Cloud (Internet connection required) so that you can monitor your boat remotely from any web browser.

### Set the Anchor Watch Alarm

You can enable ("drop") the Anchor Alarm by right clicking directly on the Own Ship icon and selecting "Anchor Watch Alarm".

**TIPS:** You can also set a Custom [Shortcut](#) or a [Quick Access](#) NavData to drop the Anchor Watch Alarm.

When the alarm is enabled, an icon is dropped at the anchor point, and a red dashed circle corresponding to the anchor watch alarm radius (adjusted from the [Alarms](#) Options) is drawn on the chart:

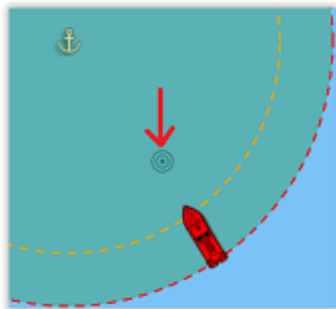


**Note:** By default the anchor point will be set at the bow of your vessel. You can adjust the Anchor Point position (relative to your vessel) from the [Initial Setup](#) Options under "CCRP". Note that for the anchor point to be properly placed, a heading sensor is recommended (so that TimeZero knows exactly which direction your vessel is facing).

When the anchor watch is enabled, the trail is automatically displayed and restricted to the time the anchor watch was dropped. This allows you to view the movements of your vessel since you started the anchor watch:



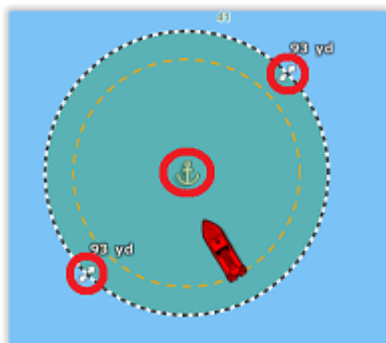
If you notice big swings in position that are due to GPS inaccuracies, it is possible to enable the Anchor Watch "Position Averaging" from the [Alarms](#) Options. When enabled, this will average your GPS position over the specified duration (from 5 seconds to 45 seconds). Note that if you enable position averaging, the averaged position will be displayed on the chart:



Enabling position averaging will delay the Anchor Watch warning, but it might avoid lots of false alarms.

### **Adjust the Anchor Watch Alarm Position and Radius**

If you need to adjust the anchor watch position and/or radius after it has been dropped, simply click on the anchor icon to select it. You will then be able to drag the anchor point with your mouse and adjust the alarm radius by using the two handles that will appear when the anchor point is selected:

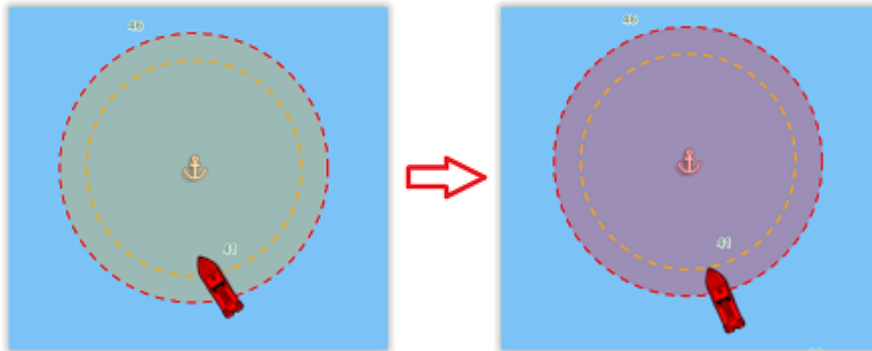


**TIPS:** when the anchor point or circle is selected, the alarm radius is displayed just above the two handles.

If you want to reset the anchor point to the bow of your vessel, you can right click on the anchor point or circle and choose "Reset Anchor Watch".

## Anchor Watch Warning and Alarm

When the vessel is at a safe distance from the anchor point (when the distance from the anchor point to your GPS position is less than 80% of the alarm radius), the circle background is green. When the distance reach 80% (but stays under 100%), you are in the "warning" area: the circle background will turn orange, a yellow warning ("Anchor Watch Warning") will appear in the status bar and a short warning sound will play through your computer speakers. If your GPS position goes outside the alarm radius, the circle background will flash in red, a red alarm ("Anchor Watch Alarm") will appear in the status bar, and an alarm sound will play through your computer speakers:



**TIPS:** It is possible to change or disable the warning and alarm sounds from the [Alarms](#) Options (click on "Define Alarm Sounds").

To stop the Anchor Watch Alarm, you can right click on the anchor point or its circle and select "Remove Anchor Watch". You can also uncheck "Anchor Watch Alarm" by right clicking directly on the Own Ship icon.

## Local Synchronization of the Anchor Watch Alarm

If multiple compatible TimeZero devices are connected on the same local network (TZ iBoat on iOS and other TimeZero on PC), the Anchor Watch will be automatically synchronized on all devices. Any modification done to the Anchor Watch after it has been set will also be synchronized on the local network. This allows you to drop the Anchor Watch from a phone running TZ iBoat and then adjust it from the PC. When the Anchor Watch is created, modified or removed through another device on the network, a notification will be displayed in the status bar.

## Remote Monitoring of the Anchor Watch Alarm

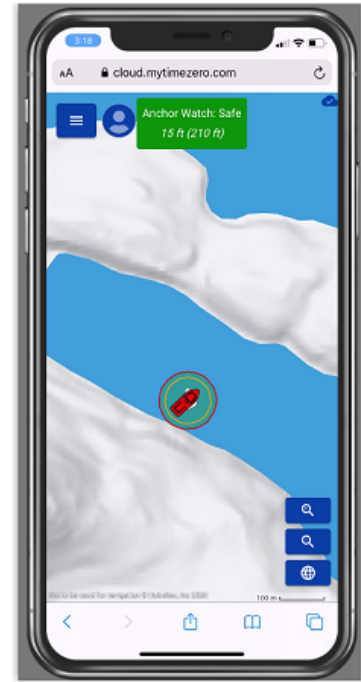
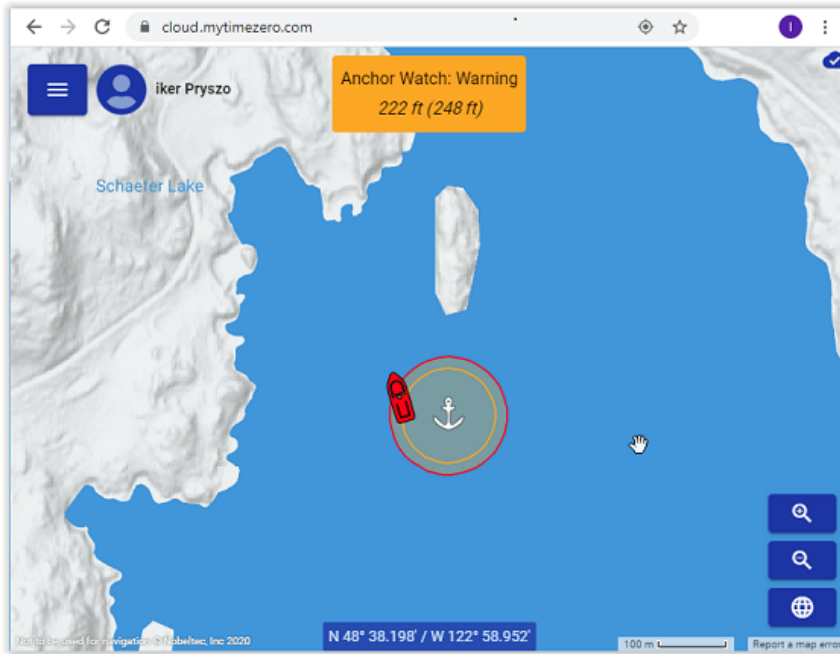
If the PC is connected to the Internet, it is possible to monitor your Anchor Watch using a Web Browser from any location. Just make sure to register TimeZero with your My TIMEZERO account and enable "Report my position automatically to My TIMEZERO" from the [My TIMEZERO](#) Options.

When this option is enabled, a connection status icon will be displayed on the top right of your screen. Green means that TimeZero has a valid Internet connection and is properly reporting your position and the anchor watch status to the server:

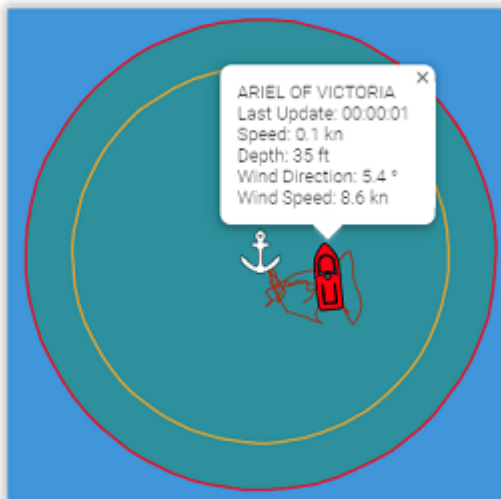


To monitor remotely your Anchor Watch and boat position, you can use any web browser (including mobile phone web browser such as Safari or Chrome) and login to your TZ Cloud account at: <https://cloud.mytimezero.com/>

Your vessel position and the anchor watch alarm will be displayed:



Note that you can click on your vessel to get real time information including speed, depth and wind if TimeZero is wired to the appropriate sensor and if "Include Wind and Depth to position report" is enabled from the [My TIMEZERO Options](#) (enabled by default):



**Note:** When the Anchor Watch alarm is enabled, the position reporting interval set in the [My TIMEZERO Options](#) is ignored and the position/anchor watch report is fixed to 5 sec (to make sure to have an Anchor Watch monitoring close to real time). As soon as the Anchor Watch is disabled, the position reporting interval will revert to your selected setting.

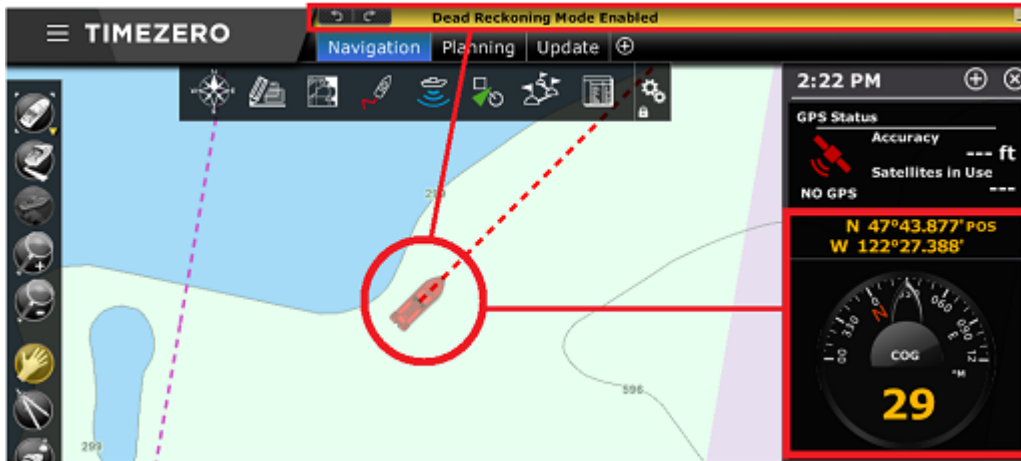
## Dead Reckoning

In case of GNSS (GPS) failure, TimeZero can use Heading (magnetic or gyro-compass sensor) and Speed Through Water (doppler sensor recommended) to estimate position using Heading as COG and Speed Through Water as SOG.

First, activate the "Allow Dead Reckoning" setting from the [Initial Setup](#) Options. Then you need to make sure to configure a heading (that does not rely on GNSS data) and speed through water sensor.

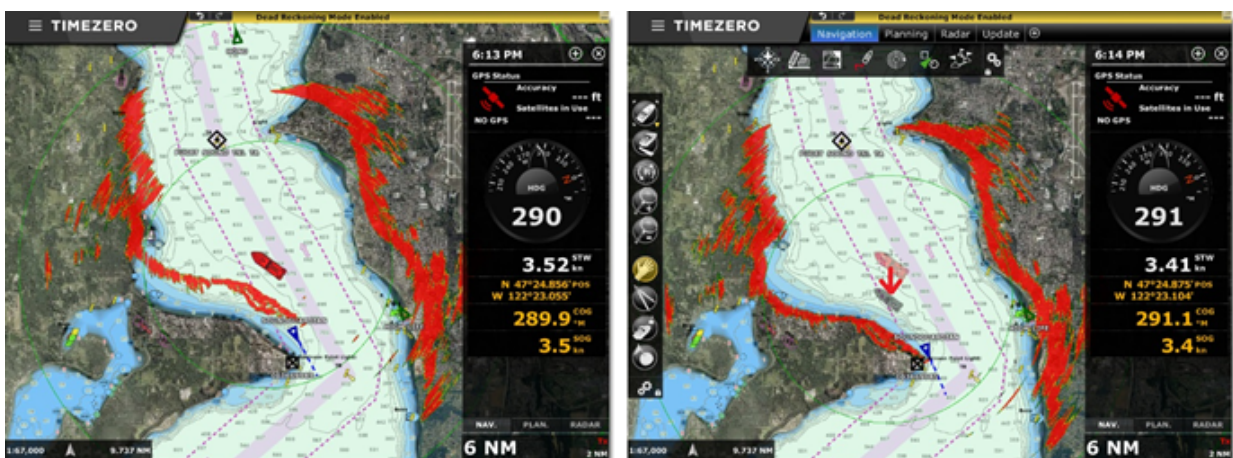
**Note:** If you are using a Satellite Compass that provides GPS, it is OK to use its heading data and configure it as a master as long as you have a backup heading sensor (magnetic compass for example) configured on a separate NMEA0183 port.

If the GPS signal is lost (resulting in a loss of position, COG and SOG data) and if TimeZero detects valid heading and speed through water data, TimeZero will automatically enable the Dead Reckoning mode after triggering a "Position Lost" alarm. When the Dead Reckoning mode is enabled, a notification will be displayed in the status bar, the boat icon will start to flash slowly and the position, COG and SOG NavData value (if configured) will be displayed in yellow to indicate the data is estimated:



TimeZero uses STW as SOG and HDG as COG to estimate new positions. If there are currents or winds, this estimated position can become false over time (because drift effect cannot be taken into account). If you have a way to manually estimate your position and have an up to date Lat/Lon, you can re-initialize and validate a new position manually by right clicking on the boat icon and selecting "Move Own Ship by Lat/Lon". This will open a window allowing you to enter a new position manually.

Alternatively, if you are connected to a compatible Furuno Radar (providing a radar picture through Ethernet), the radar overlay can be used to adjust the position by simply dragging the boat icon until the radar overlay matches the coastline or any other specific target (AIS or Buoy):



After adjusting the position thanks to the radar overlay, TZ will then continue to estimate the new refined position automatically (until further adjustments are needed because of currents or wind).

As soon as a valid position is received again by TimeZero, the Dead Reckoning mode will be disabled automatically.



## Bearing And Distance

### Divider Tool

The Divider Tool can be used to display range and bearing in between two points or in between your own position and multiple points:



### Bearing and distance between two points

To display the bearing and distance between two points, select the divider tool and move the cursor on the first location, click a first time to drop the first point on the chart, move the mouse over the second location and click a second time to drop the second point. A label with the range and bearing in between the two points will appear (near the second point):



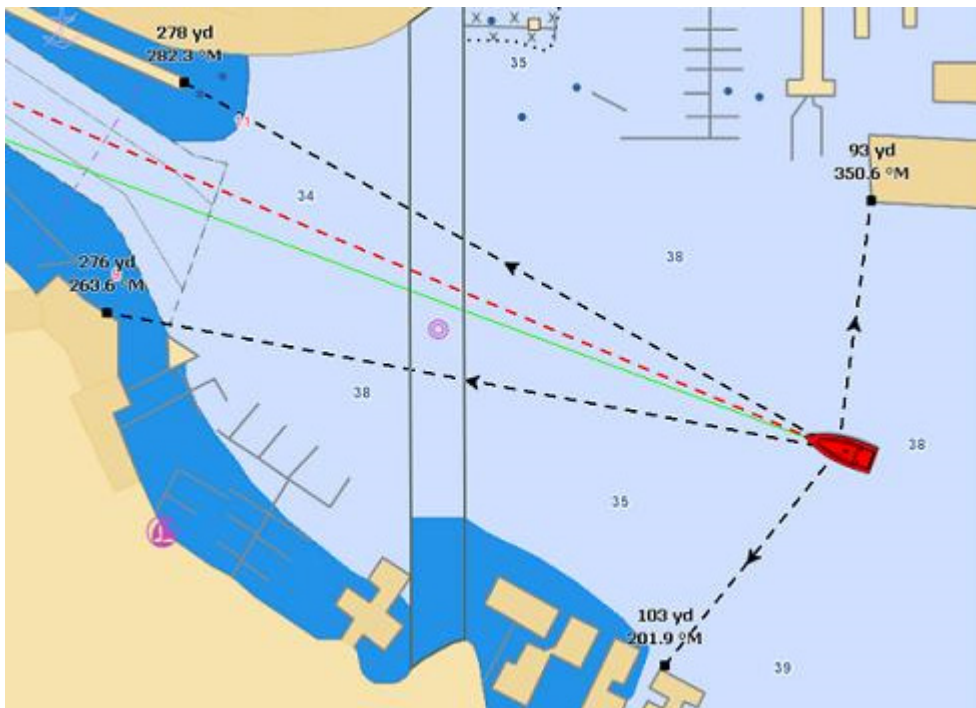
**Note:** After dropping the first point, it is possible to move the chart by clicking and dragging on the screen. You can also zoom in/out using the scroll wheel or keyboard shortcut. Please refer to the [Scrolling & Zooming](#) chapter.

### Multiple Bearing and distance from own ship position

Select the divider tool and double click on the chart. This will create a divider line between the location where you double clicked and own ship position.

You can create multiple divider lines by repeating this action (select divider tool again and then double click on other locations):





**Note:** The divider lines from own ship will update as the boat is moving

### **Bearing and distance between two targets or a target and a point**

The Divider tool can also be "attached" to targets (AIS or ARPA targets) by selecting (left click) the target with the tool. The range and bearing will automatically update on screen as the target move. You can click on a target and a fix point on the chart, or you can click in between two targets to get up to date real time bearing and distance information.

**Note:** If a target is lost or if you restart the software, the divider line(s) that were using a target as reference point will be erased.

### **Editing and Deleting Divider line**

Divider lines can be moved by clicking and dragging the point to a new position

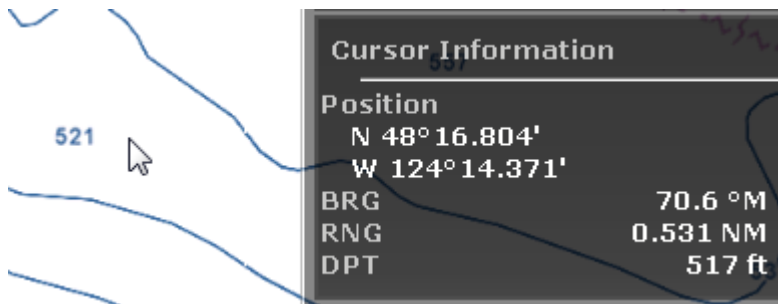
You can right click on a Divider line to delete it or delete all Divider lines.

**Tips:** If you double click on the Divider tool, it will erase all Divider lines on screen

### **Cursor NavData**

The cursor NavData is displayed by default under the "Planning" NavData Panel on the right side of the screen. If the cursor NavData is not displayed, click on the "+" button on the top of the NavData panel to add it:





The Cursor NavData is very convenient to get quickly access to cursor position and range and bearing from own ship position.

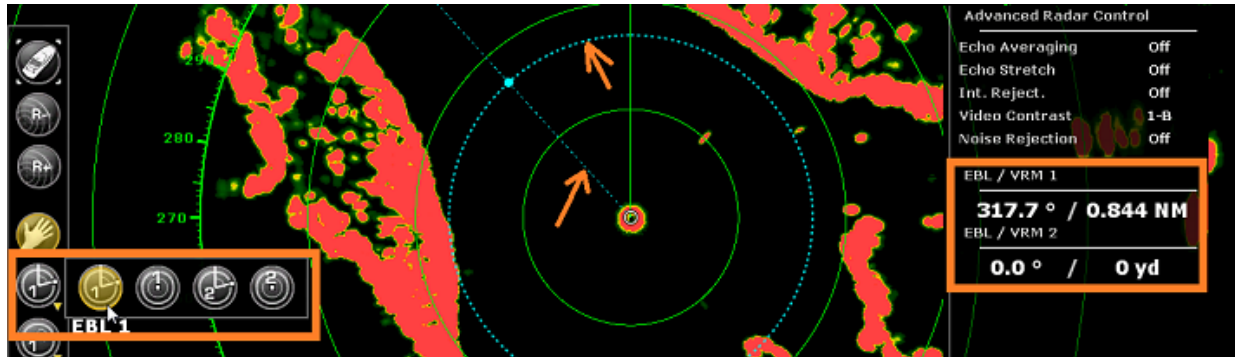
If you right click on the NavData you will see an option to add and display additional information such as "Time to Cursor" (TTC). The Time to Cursor will give you a rough estimate about the time required to reach the cursor position with your current boat speed.

**Tips:** If you set the Position Unit to Loran/TD, you can right click on the NavData to display a Lat/Lon cursor and thus display at the same time Lat/Lon and Loran/TD for cursor position.

## EBL & VRM

The "Furuno Radar Module" needs to be unlocked and radar configured to access this feature

The EBL / VRM tool is available in the Tool Bar of the Radar WorkSpace. You can right click on the tool to get access to two EBL and two VRM:



The EBL is used to display the relative bearing of a target on the radar display. After setting the EBL/VRM tool in EBL mode (either EBL1 or EBL2), a line is moved with the cursor, and the bearing is read from the EBL/VRM NavData. Note that one end is always anchored at the center of the radar.

The VRM is used to determine the distance to a particular target, such as the mouth of a river, a sea buoy marking a channel entrance or another vessel. The VRM is like a standard range ring, but can be adjusted manually by selecting the EBL/VRM tool in VRM mode (either VRM1 or VRM2). The range is read from the EBL/VRM NavData.

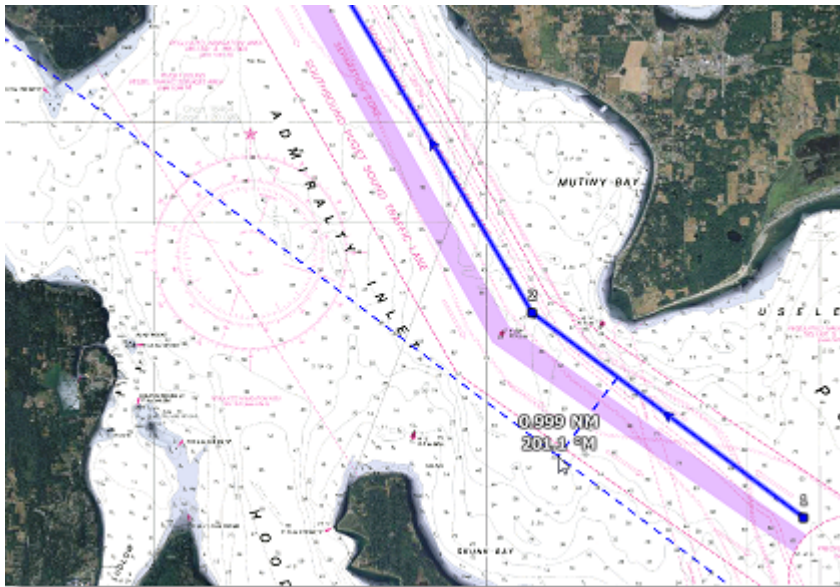
To adjust the EBL and VRM, you can click and drag them with your mouse, or put the cursor over the VRM or EBL value and use the scroll wheel. To delete an EBL or VRM, you can right click on it and select Delete. If you want to delete all EBL/VRM from the screen, just double click on the EBL/VRM tool.

**Tips:** The EBL/VRM color can be adjusted if you right click on the EBL or VRM.

## Parallel Line

A route leg parallel line is an advanced plotting tool can be setup on any leg of a route (one parallel line per leg) and used for dead reckoning (in case you lose GPS position). Simply right click on a route leg and select "Parallel

Line". A dashed line (parallel to the route leg) will be attached to your cursor with bearing and distance (in between line and route leg) displayed under the cursor:



To drop the parallel line, just left click. Once dropped, you can drag the parallel line to make adjustment and the new distance will be updated on the parallel line itself. Note that the parallel line extends beyond the leg boundary so that you can align the line with landmark or NavAid that may be located far away. If you move the leg, the parallel line will also update (to stay parallel to the route leg).

A typical use of the parallel line is to take a fix object that can be seen on your radar and use it as a reference:

- Create a route in TimeZero
- Identify a fix object that can be seen on the radar (Coast Line, NavAid, Landmark,...)
- Locate that object on the chart and create a parallel line that intersects that object. Note the distance.
- Set a parallel line on the radar at the same distance
- In case you lose GPS, simply make sure that the parallel line on the radar stays on the object radar return, and you will know that you follow the route segment for which the parallel line was drawn

It is possible to change the color of the parallel line by right clicking on it.

To delete the parallel line, simply right click and select "Delete Parallel Line".

**Note:** The Parallel Line(s) will only show on routes which are selected (planning) or Active.

## Routes

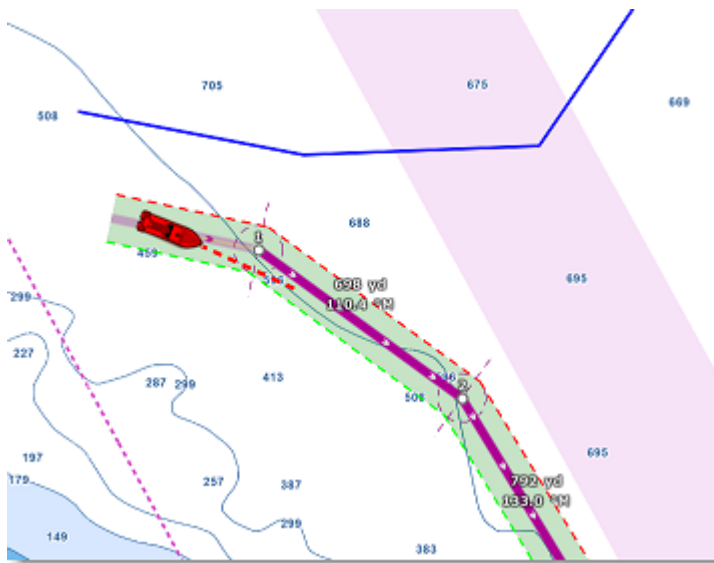
### Route Introduction

TimeZero allows for the creation of up to 200 routes of 500 waypoints each allowing you to plan multiple voyages.

**Note:** Routes can only be created on the default "TimeZero" layer. It is not possible to create or move routes to another layer. This restriction has been implemented so that routes are always and automatically synchronized with all your TimeZero devices. Layers can only be used with Tracks, Marks, Boundaries and Annotations. For more information about layers, please refer to the [Layer Introduction](#) chapter.

Route can be built using the "Route" tool by clicking directly on the chart to create multiple points of passage (called "waypoints"). TimeZero offers lots of feature to plan your routes (route safety check, tides & currents integration, ...) that are described in the following chapters. Once you are ready to navigate, you can designate the route you want to follow and "activate" it. The active route is displayed in red and has special priority in the navigation system. When a route is activated, the first waypoint becomes active (surrounded in yellow) and if a pilot is connected and configured in TimeZero, the route information (bearing and XTE) will be sent and used to automatically steer the boat.

On the picture below, the route on the bottom is activated:



When enabled, the route safety is automatically analyzed by TimeZero. Safe legs have a green background while dangerous leg will have a red background. For more information, please refer to the [Route Safety](#) chapter.

### Route Synchronization

Routes are automatically synchronized with all the compatible TimeZero Platforms (TZ Navigator, TZ Professional, TZ iBoat, and Furuno TZT2/TZT3) that are connected on the same local network. You can display a list of all the detected TimeZero platforms from the [Device List](#) Options. Note that for the synchronization to work, TZ Navigator, TZ Professional and TZ iBoat all need to be logged with the same My TIMEZERO account (for security). But note that the synchronization with Furuno TZT2/TZT3 does not require to be logged when connected directly to the NavNet network (172.31.x.x).

The route activation will also be automatically synchronized on all the platforms at the same time. Note that it is recommended to use the same [Waypoint Switching Mode](#) settings to have a common visual reference on every devices, but if the settings are different, the first platform to arrive at a waypoint will indicate all the other one to switch as well.

If you do not want a platform to synchronize automatically on the local network, you can turn OFF the LAN Synchronization from the [Device List Options](#).

Routes can also be synchronized and saved automatically to the TZ cloud (when connected to the Internet). For more information, please refer to the [TimeZero Cloud](#) chapter.

### Hiding Individual Routes

You can hide individual routes from the Route list by selecting or not the visible checkbox:

Visible	Name	From	To	Length	Comment
<input checked="" type="checkbox"/>	Alaska 01	Clam Bay	Gowlland Harbour	98.86 NM	Don't take Mudge against the ebb again
<input checked="" type="checkbox"/>	Alaska 02	Cleveland Passage	Ketchikan	57.37 NM	
<input type="checkbox"/>	Seattle	Gig Harbor	Poulsbo	19.52 NM	

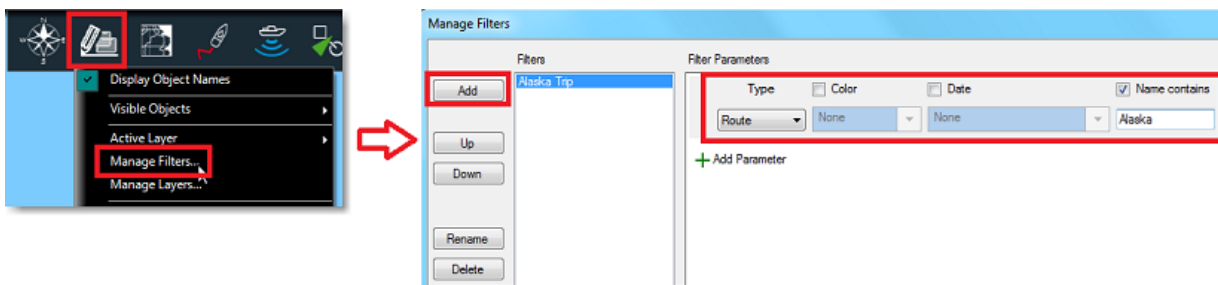
**Note:** It is not possible to hide the Selected (Planning) and Active Route. The Planning and Active Route will always be displayed on the chart even if the route has been hidden. If you want to hide the planning route, right click anywhere and select "unselect all".

Note that you can select multiple routes from the list (using the SHIFT or CTRL key) and then use the right click on the selection to change the visibility of multiple routes at the same time.

### Using Filters to Hide or Show a group of Routes

If you want to selectively hide or show multiple routes, you can create and use a Filter. For example, you could use a filter that only show routes that have been created in between two specific dates or route that contains a specific string in their name.

An easy way to group multiple routes for a specific trip is to prefix all the route name (for example "Alaska"). Then you can create a filter that only show routes whose name contains "Alaska":



For more information on filters and how to manage and use them, please refer to the [Filters](#) chapter.

### Creating a Route

When creating or editing a route, it is recommended to use the Planning WorkSpace. This WorkSpace allows you to access advanced features such as displaying a route detail list or making simulations and animations with tides, currents and weather.

#### To create a new Planning Route:

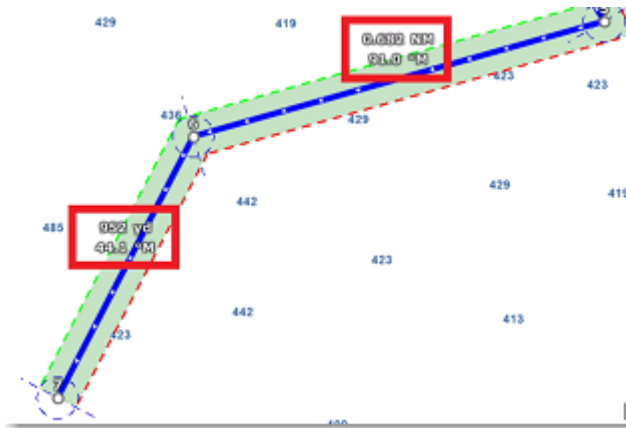
1. Click on the "Route" Tool located in the Toolbar or right click anywhere on the chart and select "New Route"
2. Place the cursor at the starting point and click on the chart; This sets the location of the first waypoint

1. Move the cursor to the next desired destination and click on the chart. Continue with this procedure to add additional waypoint
2. When all the desired waypoints are added, right click to create the last waypoint and choose "End Route" or press the Esc key on the Keyboard to end the route at the last created waypoint. Alternatively, double click at the creation of the last waypoint.

While creating a route, the chart will move automatically to follow the route. To move the chart manually, click and drag the chart with your cursor. Waypoints are only created when you left click on the same position (without dragging the cursor). The arrow keys on the keyboard can also be used to scroll the chart while building a route.

Right click on the selected route and select "FlyOver" will follow the route on the chart.

By default, TimeZero is setup to display the range and bearing of each leg directly on the chart:



This can be turned off from the [Routes](#) Options by disabling "Display leg distance and bearing".

### **Great Circle Route:**

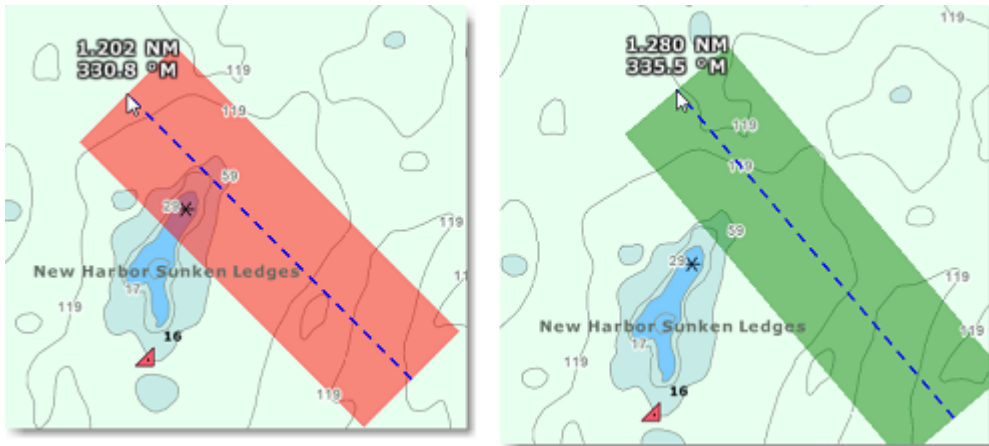
TimeZero can display great circle or rhumb line routes. The great-circle route is the shortest path between two points on a sphere, like the Earth. A rhumb line route crosses all meridians of longitude at the same angle. Since the charts displayed by TimeZero are Mercator projections, rhumb line routes appear as straight lines and great-circle routes appear as curved lines.

When the "Great Circle Navigation" option is enabled, TimeZero divides the route into shorter rhumb line segments that follow the great circle path.

### **Route Safety**

TimeZero includes a very innovative feature that allows you to check route safety while you are building it. This feature (enabled by default) can be adjusted from the [Routes](#) Options under "Check Route Safety".

When turned ON, the leg you are building will turn red or green after a brief moment letting you know if the leg is safe or not:



The width of the path checked along the route for dangerous objects and depth area corresponds to the "Default Route XTE Value" (default cross track error). This setting can be adjusted from the [Routes Options](#). Note that by default, TimeZero reduces automatically the width of the XTE to be able to fit the route in tight passage:



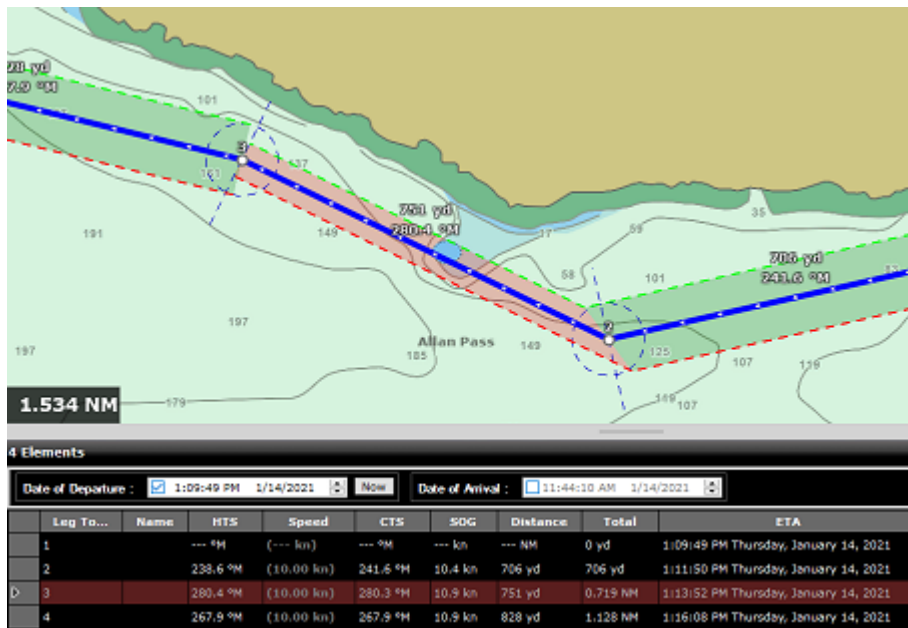
The minimum limit that TimeZero will use for automatically adjusting the XTE can be setup using the "minimum XTE value" from the [Routes Options](#). If you do not want TimeZero to automatically adjust the route XTE (and always use a fix value), simply disable "Automatic XTE" from the [Routes Options](#).

The type of dangerous objects and depth areas that TimeZero scans can be adjusted from the [Routes Options](#) by clicking on "Route Safety Configuration".

Although the Route Safety scan is not limited to vector charts objects, a warning will be displayed if it is enabled in an area where no detailed vector chart is available.

**Note:** Vector charts don't have to be displayed on the screen, they just have to be loaded in the software. If you install both Raster and Vector charts and prefer to display Raster charts on screen, the Vector charts data will still be used for the Route Safety scan.

You can also launch a Route Safety scan on any route that you have previously created or imported by simply clicking on the route (selecting the route as the planning route). Dangerous leg will be displayed in red on the chart and on the Route Detail list:



**Note:** Leg on the Route Detail list can also be displayed in red if a current is too strong.

**IMPORTANT:** Route Safety is only available on leg that are 30NM or less. If you create a leg that is longer than 30NM, the route safety background will be gray indicating that no check has been performed. It is recommended to keep your route legs smaller than 30NM by inserting more waypoints.

## Editing Routes

To move a waypoint, place the cursor on top of it and click to select it. Once the waypoint is selected, you can click and drag the waypoint to the new location. Most of the advanced route editing operations can be performed by right clicking directly on any leg of a route and selecting the appropriate option from the drop-down menu. Note that if the [Route Safety](#) is enabled, it will be checked automatically as soon as the route is edited.

**Note:** TimeZero offers a very powerful unlimited Undo/Redo function. Every editing operation can be Undone or Redone multiple times by clicking the arrows in the status bar. The corresponding keyboard shortcuts (CTRL-Z, CTRL-Y) can also be used.

### Extend a Route

To add waypoints to the end of the route, right click on any leg of the route and choose "Extend Route". TimeZero will automatically center the display on the last waypoint and enter into Route Building mode.

### Insert a Waypoint

To insert a new waypoint in the middle of a route (to avoid an obstacle, for example), right click on the leg of the route where you want to insert a waypoint and choose "Insert Waypoint". Once the new waypoint has been inserted, you can drag it to the new desired position.

### Reverse Route

To reverse the direction of a route, right click on any leg of the route and choose "Reverse Route".

### Delete Route

To delete a Route, right click on any leg of the route and choose "Delete Route".



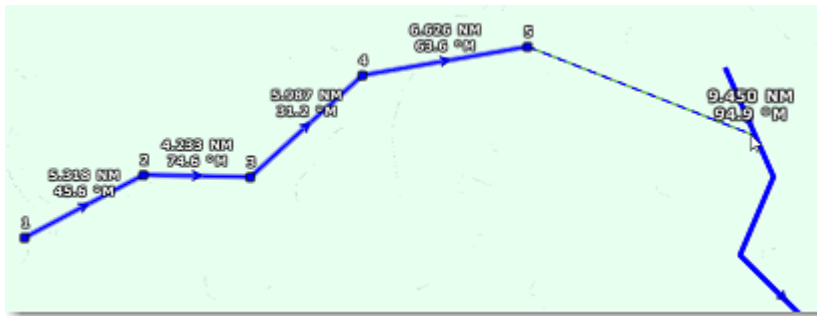
**Note:** An Active Route cannot be deleted; it must be deactivated first by selecting "Cancel navigation".

## Split Route

You can split the route at a specific waypoint or on a specific leg. When you right click on a waypoint and select "Split Route", the waypoint is duplicated and the route will stop at this waypoint and a new route starting at the same location will be created. When you right click on a route leg (segment) and select "Split Route", that leg will be removed and you will end up with two routes.

## Join two Routes

To join two routes together, right click on the first route and select "Extend Route". With the route builder selected, put the cursor over any leg of the second route and then right click on it. Select "Link Route" from the contextual menu. This will join the two routes together:



## "Fork" Route

A route can be "forked" from any waypoint. Simply right click on the waypoint you want to fork the new route from and choose "Fork Route". This will duplicate the route up to the location and allow you to go to a different direction from that point.

## Rename Route

To rename a Route, right click on any leg of the route and choose "Rename Route".

## Lock and Unlock Route

Right click anywhere on a leg or a waypoint and choose "Lock Route". When a route is locked, you will not be able to move its waypoint and a confirmation window will appear if you try to erase it. Use the same process to unlock a Route.

## Route Detail

The Route Detail displays the selected planning route in a tabular format together with information about the route as a whole. The Route Detail can also be used to calculate an ETA for each waypoint along the route and will help you select the best departure or arrival time possible. When planning a route, TimeZero computes automatically the Speed over Ground (SOG) according to the Speed through Water (that you can customize) and local currents.

## Opening and Closing the Route Detail

**Note:** Although you can display the Route Detail in the Navigation Workspace, it is highly recommended to work with the Route Detail in the Planning Workspace (that provides simulation functions with the Timeline located at the bottom of the screen).



Select the Planning WorkSpace, right click on a leg-line of the route you want to see and then select "Route Detail". Alternatively, you can also double-click on any leg-line of the route to open its Detail:

Leg To	Name	HTS	Speed	CTS	SOG	Distance	Total	ETA	Layover	TTG	Total TTG	Current D	Current S	Tidal Current Name
2		30.7 °M	2.00 kn	30.7 °M	2.0 kn	2.244 NM	2.244 NM	3:50:17 AM 04/11/2012	00h00'00s	1h07'	1h07'	343.5 °M	0.0 kn	
3		87.6 °M	2.00 kn	63.6 °M	2.1 kn	1.766 NM	4.010 NM	4:41:10 AM 04/11/2012	00h00'00s	50'52s	1h58'	351.5 °M	0.7 kn	Auto(Baker Bay entrance, E of Sand Isl
4		107.9 °M	2.00 kn	110.9 °M	0.7 kn	5.579 NM	9.589 NM	12:16:25 PM 04/11/2012	00h00'00s	7h35'	9h33'	122.5 °M	0.8 kn	Auto(Point Adams
5		107.0 °M	2.00 kn	92.0 °M	3.8 kn	2.107 NM	11.70 NM	12:49:17 PM 04/11/2012	00h00'00s	32'52s	10h06'	76.5 °M	2.2 kn	Auto(Youngs Bay
6		42.6 °M	2.00 kn	60.6 °M	2.4 kn	4.340 NM	16.04 NM	2:38:39 PM 04/11/2012	00h00'00s	1h49'	11h56'	118.5 °M	1.0 kn	Auto(Youngs B

To close the Route Detail, Click the "X" button at the top right of the route detail list.

**Note:** Line in the route detail can be displayed in red. This means that either a current is too strong on that leg or that the [Route Safety](#) detected a dangerous area or depth under the safety depth value.

## Using the Route Detail

The top part of the Route Detail displays information about time of departure and ETA (Estimated Time of Arrival). The time of departure can be selected as the present time or another selected date. When a time of departure is selected, TimeZero will calculate the ETA according to the parameters available in the table (speed, current,...).

TimeZero also allows the user to set a date of arrival rather than a date of departure. This is useful when you need to arrive at a specific time (because of tidal currents for example). In this case, TimeZero will calculate the time of departure.

The information appearing in Bold in the table (such as "Name") can be edited by double clicking on the cell to be edited. After changing the value, press the ENTER key, or click outside the value to accept the new value, or press the ESC key to cancel the change.

Values that can be changed include: the waypoint name, the waypoint position, the speed (speed through water), the XTE (cross track error) and the layover time. The other values are computed by TimeZero, and cannot be changed directly:

- **Leg To:** Each line of the list gives you information about the leg that allows to reach a specific waypoint. The "Leg To" value is the number of that Waypoint.
- **Name:** Name of the waypoint.
- **HTS:** Heading to Steer. This is the heading that you should follow to reach the next waypoint. This value is adjusted to take the currents into account. This value can be different from the CTS if currents are strong in the area.
- **Speed:** Speed through water of the boat (or surface speed). This value can be edited individually for each leg or can be set globally (for all legs) using the Action menu. If you want to revert to the default speed value, just erase the content of this cell.
- **CTS:** The "Course to Steer" is the direction (bearing) of the route leg as it would be on a paper chart.
- **SOG:** Speed over Ground being calculated based upon the surface speed and currents. The SOG will be different that the speed, because your boat can be "pushed" or "slow down" by the currents.
- **Distance:** is the distance of that leg
- **Total:** is the cumulative distance from the start of the route to that leg
- **ETA:** The Estimated Date of Arrival to that Waypoint taking account the currents (based on SOG).
- **XTE:** Cross Track Error of the leg. This value can be edited individually for each leg or can be set globally (for all legs) using the Action menu. If you want to revert to the default XTE value, just erase the content of this cell.

- Layover: allows you to enter a pause in the route for a specific leg
- TTG: "Time to Go" is the time to navigate on that leg. The SOG and Distance are used to compute that value.
- Total TTG: is the cumulative time to go from the start of the route to that leg
- Current D: is the current direction of the station closest to the middle of that leg (default) or the station that was manually assigned to that leg
- Current S: is the current speed of the station closest to the middle of that leg (default) or the station that was manually assigned to that leg
- Tidal Current Name: is the name of the tide station closest to that waypoint
- Tide Level: is the tide height of the station closest to that waypoint.
- Comment (hidden by default): Comment of the waypoint.
- Current Angle (hidden by default): is the current angle (from the bow of the vessel) in which the current goes
- Position (hidden by default): is the position of the waypoint
- Tide Name (hidden by default): is the name of the tide station closest to that waypoint

The Route Detail "Action" menu provides quick access to main functions and parameters. It can be found on the right side title bar of the list. It includes the following options:

- Activate Route: To activate the planned route and start navigating. Note that this option is not available when TimeZero is started in Home Planning mode or when no position (GPS) is available.
- Reverse Route: To reverse the direction of the planning route
- Set Speed of all legs: To adjust or reset the intended speed of all the legs
- Set XTE of all legs: To adjust or reset the Cross Track Error of all the legs
- Optimized Departure Time: To compute the best departure time according to currents (see next paragraph for details)
- Arrive at High Tide: To compute the time you need to leave to arrive at your destination during high tide (see next paragraph for details)
- Configure List: To add or remove columns of the Route Detail table
- Copy to clipboard: To copy the list information as displayed on your screen. You can paste this information in a text editor or Excel for further editing
- Export list in text file format: To export the list information as displayed on your screen. Each field is separated by a Tab
- Print: To print the route detail voyage plan

## Route Wizard & Simulation

### Route Wizard

After creating a route, the Route Wizard will automatically appear (you can also right click on an existing route and select "Open Route Wizard"):

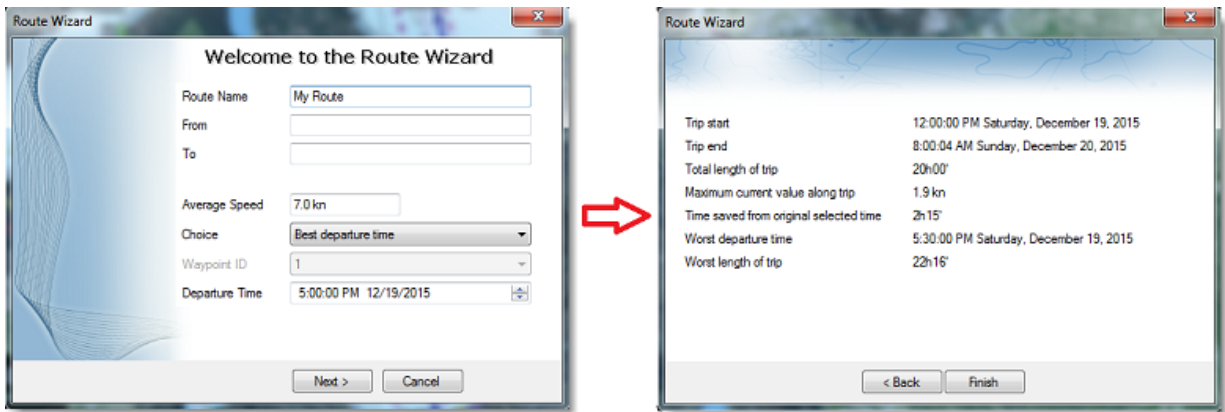
**Note:** This can be disabled by turning OFF "Display Route Wizard after creating a route" from the [Routes Options](#).

The Route Wizard allows you to enter the route information (name, origin and destination), but also helps you adjust speed and departure date according to tides and currents (when available).

Start by entering the average speed that will be used on all legs of the route for time computation. Then, select the mode you want to use:

- Depart at time: use this choice when you want to leave at a specific date and time. TimeZero will then compute your arrival time (ETA ) using the selected departure date, the average speed on all legs and the currents (when available).
- Best departure time: use this option when you want TimeZero to select the best departure time according to currents along the route (taking into account your average speed on all legs). TimeZero will look for the best departure time around the time you selected (+/- 12H).
- Arrive at time: use this choice when you want to specify the arrival time. TimeZero will then compute your departure time using the selected arrival date, the average speed on all legs and the currents (when available).
- Arrive at high tide: use this choice when you want to arrive at high tide. TimeZero will look for the departure time around the time and date you selected (+/- 12H) that will allow you to arrive at high tide at your destination (taking into account speed and currents). A tide station needs to be near the last point of the route for this function to work.
- Arrive at a waypoint at given time: use this choice when you want to pass a specific waypoint at a specific date and time (transit time) taking into account the average speed along all legs and currents (when available).

The most powerful mode of the Route Wizard is certainly the "Best Departure Time" choice. This mode can save you a lot of time (and fuel!) when transiting in areas with a lot of currents. In the example below, the original date of departure was set to 5PM on December 19 (with an average speed of 7Kn). However, after computation, TimeZero let me know that by leaving at noon, I would be able to save more than 2 hours (more than 10% of the total trip duration):



The Route Wizard result page also gives you interesting information (such as worst departure time and maximum current value along the trip).

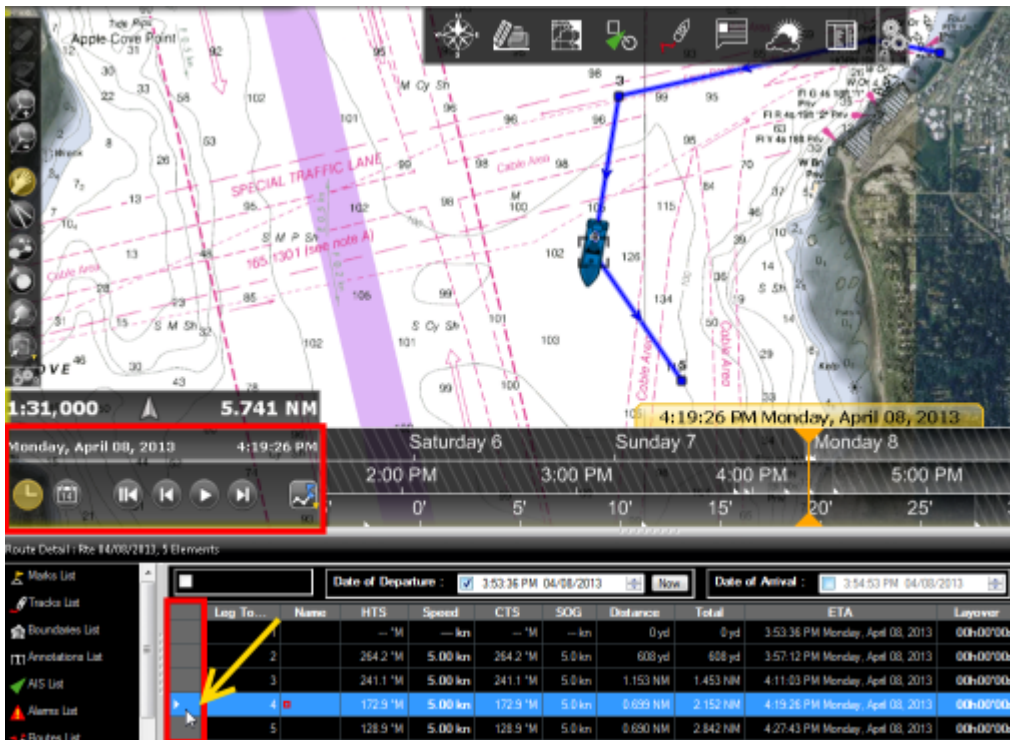
When you close the Route Wizard, the speed and date of departure is automatically set for the current planning route.

### Route Simulation

**IMPORTANT:** The Route Simulation features are only available in the Planning WorkSpace.

When a line of the Route Detail list is selected, or when you click on a waypoint, the Timeline at the bottom of the screen will switch in "Route" mode and set the Chart Time to match the ETA at the selected Waypoint. A "virtual boat" (blue ship icon) will also appear. This function is very useful when Weather Data or Tidal information is displayed because they will automatically adjust to the predicted time.

To select a specific row (or line) of the Route Detail, click inside the first grey column in front of the specific line:

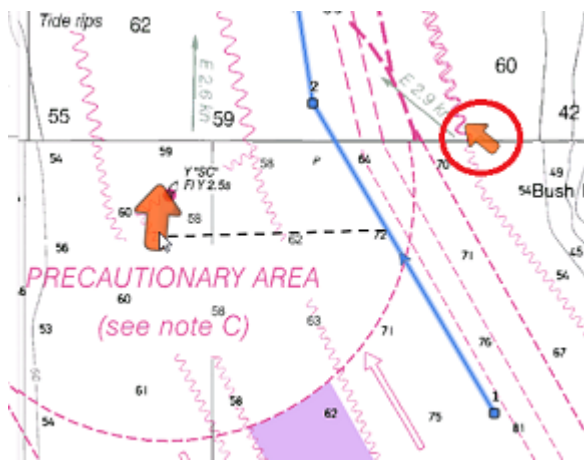


The chart will automatically center on that waypoint and the Timeline will automatically adjust the Chart Time to that ETA . The Tide Gauges, Current arrows and Weather (if displayed on the chart) will automatically refresh to display the conditions at that waypoint.

As soon as you adjust the Departure (or Arrival) date or change the speed (either the speed of all legs or the speed of each leg individually) from the Route Detail list, TimeZero will compute the simulation with the new parameters taking into account the currents (when available).

In areas where high resolution tidal currents are available (mostly Western Europe), TimeZero will automatically compute the effect of currents along the route.

In other areas where discrete current stations are available (North America), TimeZero uses the current which is closest to the middle of the leg (surrounded in red below). If you want to assign another current station for a specific leg, right click on the leg, select "Assign Tidal Current" then click on the new current stations.



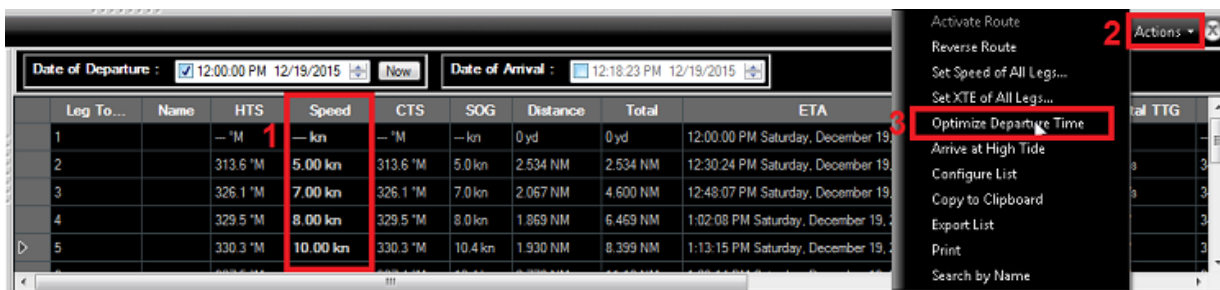
**Note:** The maximum search distance to assign automatically discrete current stations is 5NM

Discrete Currents that have been assigned manually to a leg will not display "Auto" in the Tidal Current name column:

Current D	Current S	Tidal Current Name
— °M	— kn	
163.1 °M	2.8 kn	Admiralty Inlet, Washington Current
124.1 °M	3.1 kn	Auto(Bush Point Light, 0.5 mile NW of)

### Advanced Route Optimization

The Route Wizard allows you to get a quick result by using the same average speed along all legs. However, it is possible to set independent speed on some legs from the Route Detail list. Simply enter individual speeds for some legs, and then, run the optimization from the "Action" menu. This will preserve all custom speeds that have been set on the legs:



When you manually enter a speed on a leg, the font is slightly bold indicating that you have fixed a "speed constraint" on that leg. When activating the route, all the speeds that have been manually set along the legs will be used instead of the speed given by the GPS (except for the Active Leg which is always using the real time GPS speed). If you prefer to use the real time GPS speed for all legs, simply select "Reset Speed to Default" from the "Action" menu. This will remove all the manual speed constraints and allow the dynamic GPS speed to be used instead.

**Note:** Running the Route Wizard will NOT replace the speed on the leg for which you have set a speed constraint. Select "Set Speed of All Legs" from the "Action" menu and "Reset Speed to Default" in order to remove all speed constraint to allow the Route Wizard to update the speed.

## Activating a Route

Once a route is created and checked for obstacles and other hazards, the route can be activated for navigation. This section describes the process and tools TimeZero provides to do this.

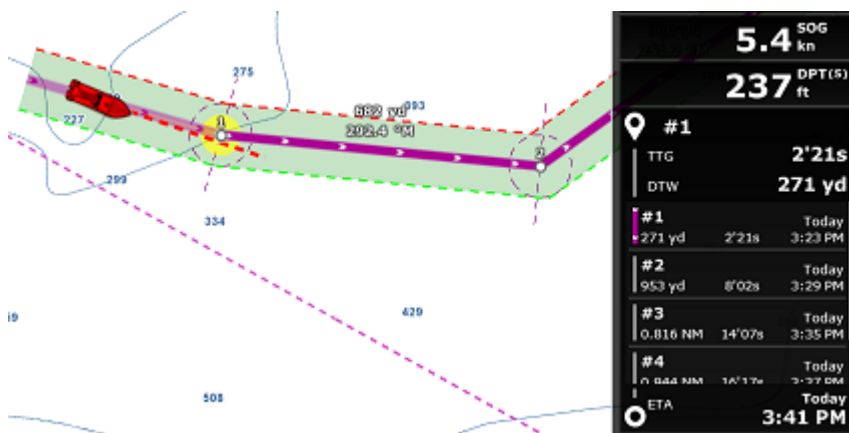
### Start the Navigation

**Note:** TimeZero needs to be started in "Navigation" mode with a valid GPS fix for the route activation to be available.

First, select the "Navigation" WorkSpace. Right Click on the desired route to navigate; then choose "Activate Route". A route can also be activated by right clicking on a waypoint or even the middle of a leg and choosing "Activate Route from this Point". This automatically skips all previous waypoints from activation.

The "Go To" tool may also be used to activate a specific route. Select this tool from the Toolbar and click on the route to activate for navigation. If a waypoint is clicked on, this will activate the route from this point and automatically skip all the previous waypoints.

#### When a Route is activated:



- The Active Route legs are displayed in red
- The active leg (leg to the active waypoint) is drawn slightly more transparent

- The active waypoint is surrounded by a glowing yellow circle
- When "Display XTE Alarm lines" is enabled from the [Routes](#) Options, the Cross Track Limit Area appears delimited with two colored dashed lines: green on the starboard of the Ship icon, red on the port of the Ship icon. This value can be adjusted globally from the [Routes](#) Options ("Default Route XTE Value") or leg by leg from the [Route Detail](#) list.
- The Active Route information are displayed in the NavData

**Note:** It is possible to add other type of information related to the Active Route in the NavData. Just click on the NavData "+" icon (top right), click on the "Route NavData" button and then select the Route Data you would like to display. You may repeat this operation multiple times to add multiple pieces of route data to the NavData sidebar. For more information, please refer to the [NavData](#) Chapter.

- The Route Detail (when the Active Route is selected) displays the active route detail (no longer the planning route detail)
- The Active Waypoint Distance, Bearing and Cross Track Error information are transmitted to the Autopilot, if configured as an output

## [Active Route Detail](#)

After activating a route (and when no other planning route has been selected after activating the route), the Route Detail list displays information about the active route (such as TTG and ETA to each waypoints). This list is very similar the the [planning route detail list](#), but the first line always displays the active leg (past legs are not displayed), and the date is fixed to the activation date (which cannot be modified).

### **Speed used in the Active Route**

When planning a route, you have the possibility to adjust the speed of each leg individually (set "speed constraints" to each leg) or simply use a default speed on every leg (adjusted using the setting "Route Planning Default Speed" located under the [Routes](#) Options). When you activate a route, if you have not set any speed constraint on a leg, then the speed will be automatically set and updated to the GPS real time speed. However, if you have set a speed constraint on a leg during the planning stage, that speed will be used to compute TTG and ETA (instead of the real time GPS speed).

**Note:** this does not apply to the active leg that always rely on the VMC for speed value.

If you have previously customized leg speeds when planning the route and would prefer to use the real time GPS speed on all legs, select "Reset Speed to Default" from the Route Detail Action menu. You can also erase the speed on a specific leg from the active route detail list (removing the constraint) to let TimeZero know that you would prefer use the real time GPS speed.

### **Currents computation along the Active Route**

By default, TimeZero will use SOG (GPS Speed) and will not take any currents (tidal or oceanic currents) into account along the active route (like it does for the planning route). This is the default behavior so that the active route ETA and TTG matches other devices that may not be able to take currents into account. However, if you want TimeZero to use currents for the active route data computation, you can enable "Use Currents in Active Route" from the [Routes](#) Options. Just note that to get an accurate computation, you need to have Speed Through Water (STW) configured in TimeZero as this is the data that TimeZero uses as a reference.

## [Restart or manually switch waypoint:](#)

If the cross-track-error ("XTE") gets large enough to start causing alerts, select the "Restart" function from the "Route" button in the Ribbon (or right click on the route or on the boat), to realign the intended course and head directly to the active Waypoint without reverting to the original course. Restarting a route is a typical action if you had to take an action to avoid another vessel or an object and just want to head directly toward the active waypoint.



In some situation, instead of restarting the route you may want to directly switch to the next Waypoint. This action can be done by selecting "Skip Waypoint" from the "Route" button in the Ribbon ( or right click on the active Waypoint).

**Create an instant "Go To" waypoint:**

If you do not want to create a route (with multiple waypoints) and just want to display information (TTG, ETA,...) to a single point, you can create a temporary Goto point using the "Go To" Tool:

- Select the "Go To" tool from the Toolbar
- Click on the intended destination within the chart or on an existing mark

Alternatively, you can use the Right Click Contextual Menu:

- Right Click on the chart on the intended destination
- Select "Go To"

This will create an Instant Goto point for navigation.

**Tips:** If you want to create Goto point using coordinates, double click on the "Go To" tool. This will display a window where you can enter the coordinate manually.

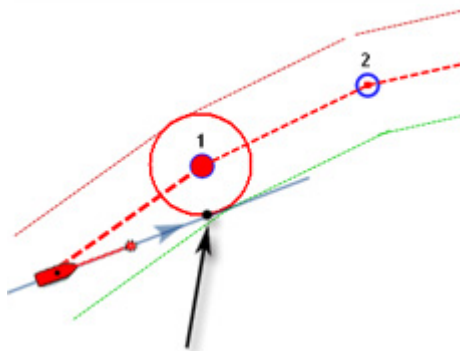
**Note:** Any Instant Goto point created with the Go To tool will be erased when the Active Route is canceled. To save the destination drop a Mark using the Mark Tool onto the Active Instant Waypoint.

**Waypoint Switching Mode**

Upon arrival at a Waypoint, the switching notification is triggered and the next Waypoint is activated automatically. Waypoint arrival parameters are determined by the "Waypoint Switching Mode" selected in the [Routes Options](#):

**Circle:**

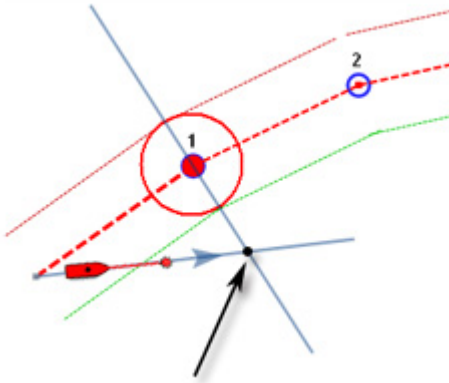
In this mode, the next Waypoint is automatically switched when your boat icon enters the active Waypoint's arrival circle. The value of the arrival circle is set from the [Routes Options](#) ("Switching Circle Radius"):



**Cross Line (also known as "Perpendicular"):**

In this mode, the next Waypoint is automatically switched when your boat crosses the line through the Waypoint that is perpendicular to the leg line.





### Circle and cross line:

This is the default selection. In this mode, the next Waypoint is automatically switched when the boat enters the active Waypoint's arrival circle or crosses the line through the Waypoint that is perpendicular to the leg line.

**Note:** Upon arrival at the last Waypoint, the route is automatically cancelled (de-activated).

**TIPS:** If you do not want TimeZero to automatically switch waypoint, or if you do not want TimeZero to automatically deactivate a "Go To", simply set the Waypoint Switching Mode to "Circle" and set the radius to 0. This will prevent TimeZero to ever reach any waypoint and switch or cancel the route automatically.

## Canceling the Active Route

To deactivate or stop the navigation, select "Cancel Navigation" from the "Route" button in the Ribbon (or right click on the Active Route)".

When a Route is deactivated, it reverts to a Planning Route.

**Note:** An Active Route is automatically cancelled when reaching the last Waypoint of the route.

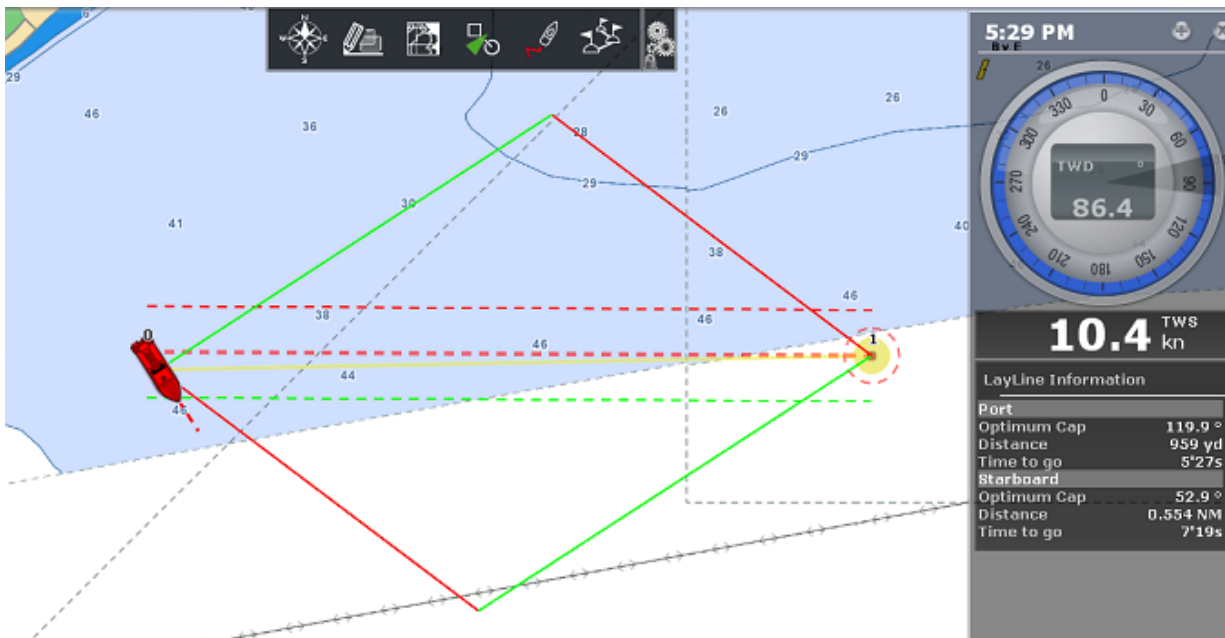
## Laylines

The "Routing Module" needs to be unlocked to access this feature

Laylines can be displayed on the chart from the "Mode" button located in the Ribbons. The Laylines will only be displayed on the chart under the following conditions:

- Laylines display is enable on the chart
- True Wind Direction (TWD) is received in TimeZero (note that TimeZero can compute TWD from True Wind Angle and Heading)
- A Go To or Route is Active and displayed on screen
- The destination (the active waypoint) is in such a way that the sail boat cannot sail directly to it (sail boat needs to tack).

In the example below, the wind direction is coming from the East (displayed using a TWD Gauge NavData). The active waypoint is straight into the wind, and it is not possible for the sail boat to reach the destination directly without tacking. In that case, the Laylines appear on the chart and show the two best tacking points (optimum course and distance):



A Layline NavData can be configured in the NavData bar. This will display the port and starboard optimum course and distance as well as Time to Go (or "Time to Tack").

Note that the laylines computation takes into account the [Polar](#) file loaded in the software, true wind direction and currents (tidal and/or oceanic currents).

## Search and Rescue Pattern

TimeZero can create routes that follow various typical search and rescue patterns. The following patterns are available:

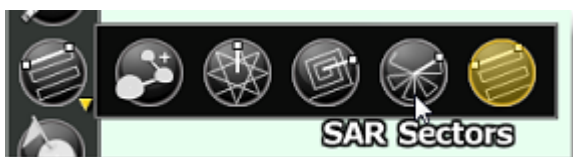
- "SAR Survey" also known as creeping line
- "SAR Snail" also known as Expanding Square
- "SAR Sector" also known as a Vector search
- "SAR Star"

SAR Pattern can be created graphically using the route tool or manually (using numerical values).

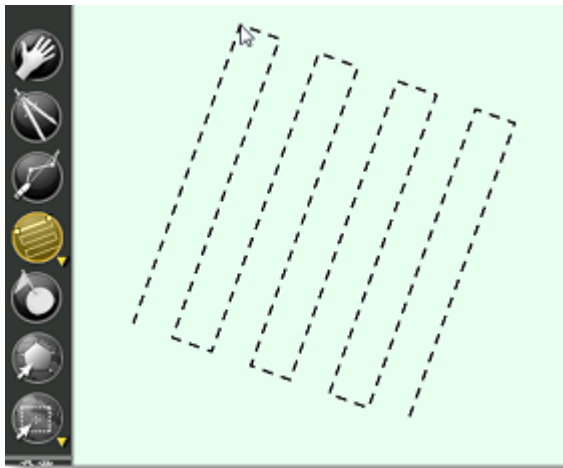
### Using the Route Tool

To create a SAR pattern graphically, you have first to manually select the SAR interval from the "Route" Options. Note that TimeZero provides a table that will select a proper SAR interval based on the type of target you are looking for and visibility. Simply click on the "SAR Interval" button located in the "Route" Options.

Once you have selected the proper SAR interval, simply right click on the Route Tool and select the appropriate SAR Pattern:



Left click once on the chart to place the center point of the search pattern and move the cursor to adjust orientation and overall covered area:



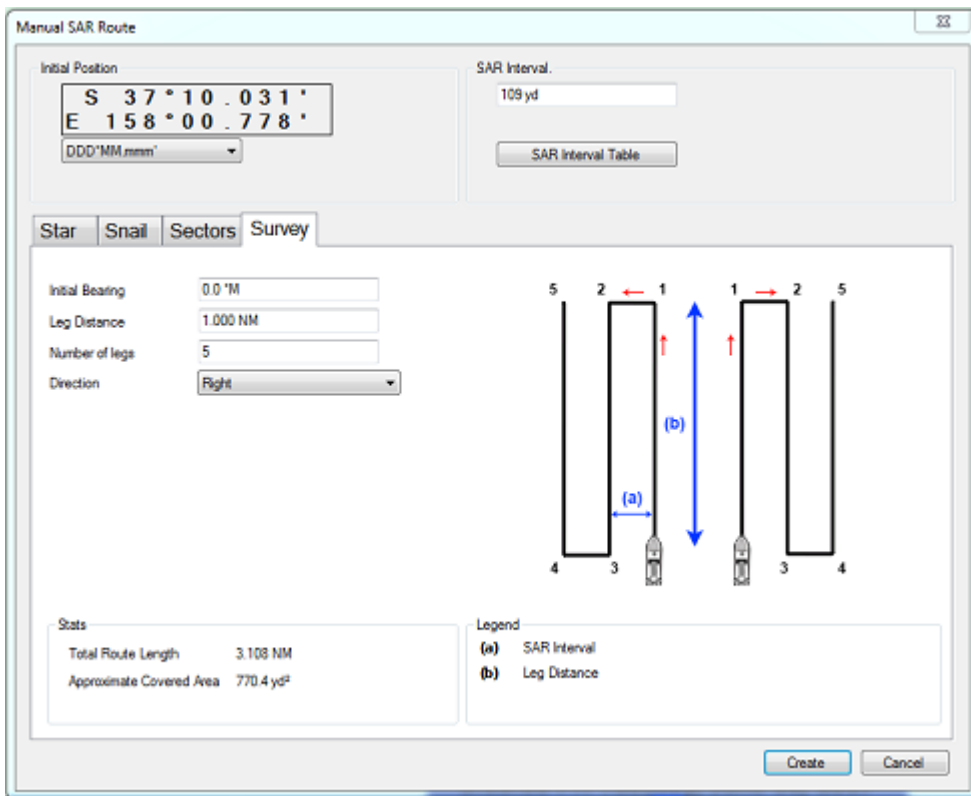
Click again to create the SAR Route.

### Using Numerical Values

It is also possible to create SAR Pattern using numerical values. Simply select "Create SAR Route by Lat/Lon" from the "User objects" button located in the Ribbons.

**Tips:** You can also right click anywhere on the chart and select "Create -> SAR Route".

The Manual SAR Pattern window will appear on screen:



The Initial Position (starting point of the SAR Pattern) will be initialized by default to the lat/lon corresponding to the center of the screen. You can edit manually the position and even change the coordinate system by using the drop down menu.

You can then enter the SAR Interval or click on the "SAR Interval Table" button to select the type of target and visibility.

Finally, select the tab corresponding to the type of SAT Pattern you would like to create and enter the various parameters. Click on "Create" to build the SAR route on the chart.

## Importing & Exporting Route

When you are logged in to your [My TIMEZERO](#) account and when "Synchronize my User Object to My TIMEZERO" is enabled, your routes will automatically be saved and synchronized on all your TimeZero devices (iPads and computers).

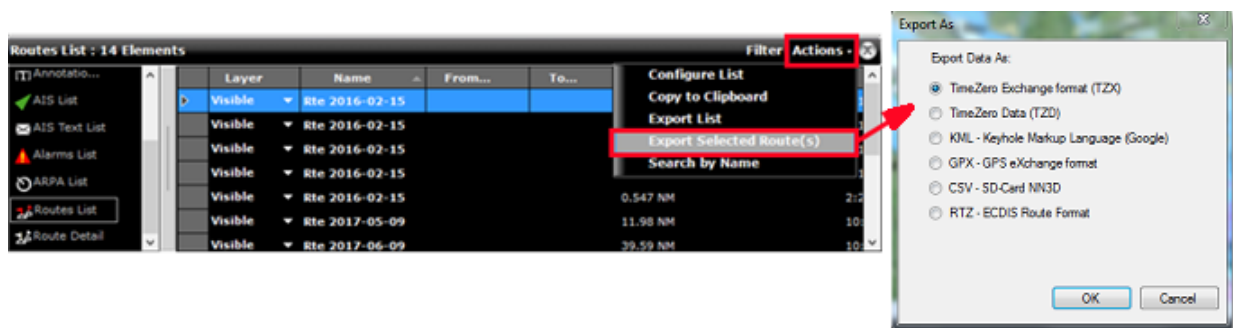
However, if you want to manually import or export one or multiple routes to a file (for example to exchange with another user or another system), you can follow the steps below:

### Exporting

You can export all your Routes or only Routes belonging to specific layers from the "Import/Export" button available under the TimeZero button. Please refer to the [Import & Export Data](#) chapter for more information.

If you want to export only one route or a specific selection of routes, you can use the "Action" menu of the Route List:

- Open the "Routes List" by using the "List" button located in the ribbon
- Select one or multiple routes. To select multiple consecutive routes, select the first line, press and hold the SHIFT key then select the last line (this will select the range). To select individual routes, press and hold the CTRL key and click on the lines.
- Click on the "Action" button located on the upper right side of the list panel
- Select "Export Selected Route(s)"
- Select the export format
- Give a name to the file that will hold your route(s) and save it



**Notes:**

- If you want to export one or multiple routes to exchange them with another TimeZero user, it is recommended to use the "TimeZero Data (TZX)" format.
- If you want to export a route in the RTZ format (to exchange the route with an ECDIS system), you must select only one route before choosing "Export Selected Route". This is because the RTZ file can only contain one route.

## **Importing**

To import routes, select the "Import/Export" button available under the TimeZero button. Please refer to the [Import & Export Data](#) chapter for more information.

**Note:** When you import routes from a file, they are added to your existing database



## Objects

### Creating & Editing Marks

TimeZero allows for the creation of up to 30,000 Marks. Marks are used to plot specific locations such as fishing spots, harbors or preferred anchorages. All Marks are displayed on the chart and in the Marks List.

**Note:** The 30,000 marks limitation only applies to the default "TimeZero" layer (which is automatically synchronized with all your TimeZero devices). You can create more than 30,000 marks if you create new layer(s). For more information about how to organize large quantity of user objects into layers, please refer to the [Layer Introduction](#) chapter.

#### Creating Marks graphically

Click on the Mark tool located in the Toolbar and click on the Chart to drop a Mark.

You can also right click anywhere on the Chart and choose "Create" -> "Mark".

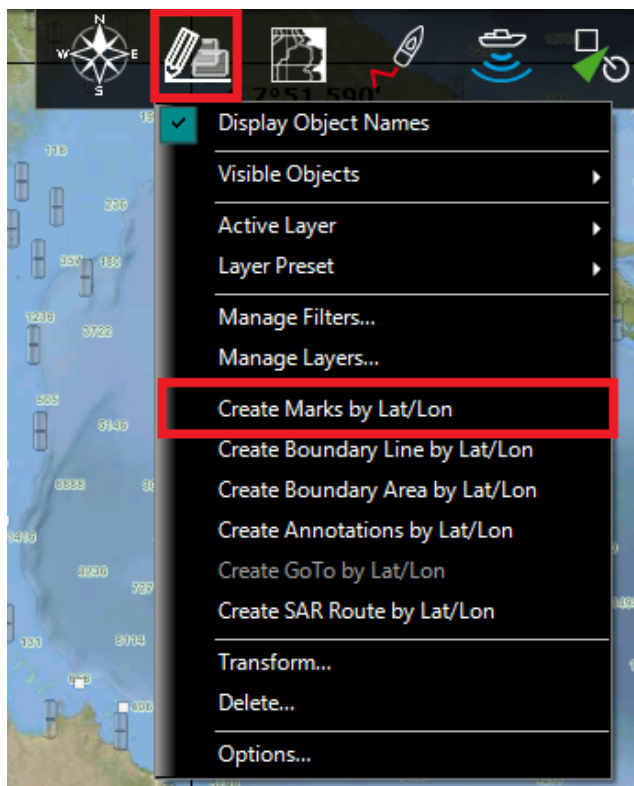
The default icon and color setup in the [Marks & Boundaries](#) options will be used.

**Tips:** You can right click on the "Mark" tool to select a color and icon before dropping a mark with the Mark tool.

**Note:** When using the Mark tool from the Toolbar, the software will automatically revert back to the Panning tool (Hand tool) after the Mark is dropped. To add several Marks without having to select the Mark Tool each time, deselect "Enable Auto Hand Tool Selection" from the "General" options. When you are finished creating Marks with the tool, the Panning Tool must then be manually selected.

#### Creating Marks Manually

To create a Mark by entering the Latitude/Longitude, double click on the Mark Tool located in the Toolbar. This will display a window to enter the Latitude/Longitude numerically. You may also click on the "Marks" Ribbon button and select "Create Mark by Lat/Long":



## Moving a Mark

To move a mark, you have to select it first by left clicking on it with your cursor. Once selected, you can drag it to the new desired location.

If you want to manually adjust the mark coordinates (using lat/lon numbers), double click on it (or right click and choose "Mark Properties") to display its Property window. Enter the new coordinates in the corresponding fields.

## Changing Marks Icon and Color

You can right click on the mark to adjust directly some of its properties such as icon and color.

You can also double click on a mark (or right click and choose "Mark Properties") to display the Property window. Change the color and/or icon from the corresponding fields.

**Tips:** If you want to assign the same color or icon to multiple marks, use the "Select" tool to select multiple marks then right click on one of the selected marks.

## Adjusting Marks Size

The Marks Size is a global setting (found under the [Marks & Boundaries](#) Options) that will affect all marks displayed on the screen.

## Delete or Rename Mark

Right click on a mark and choose the corresponding option (Rename Mark or Delete Mark) from the drop down menu.



## Lock and Unlock Mark

Right click on a Mark and choose "Lock Mark" to lock a Mark. When a Mark is locked, you will not be able to move it and a confirmation window will appear if you try to erase it. Use the same process to unlock a Mark.\

## Hiding Marks

You can hide marks that belong to specific layers by selecting "Visible Layers" from the "Layers" Ribbon Button. You can automatically hide all the marks when switching in 3D mode by deselecting "Display Marks in 3D" from the "Plotter Display" Options. This can be used to reduce clutter when switching in 3D mode.

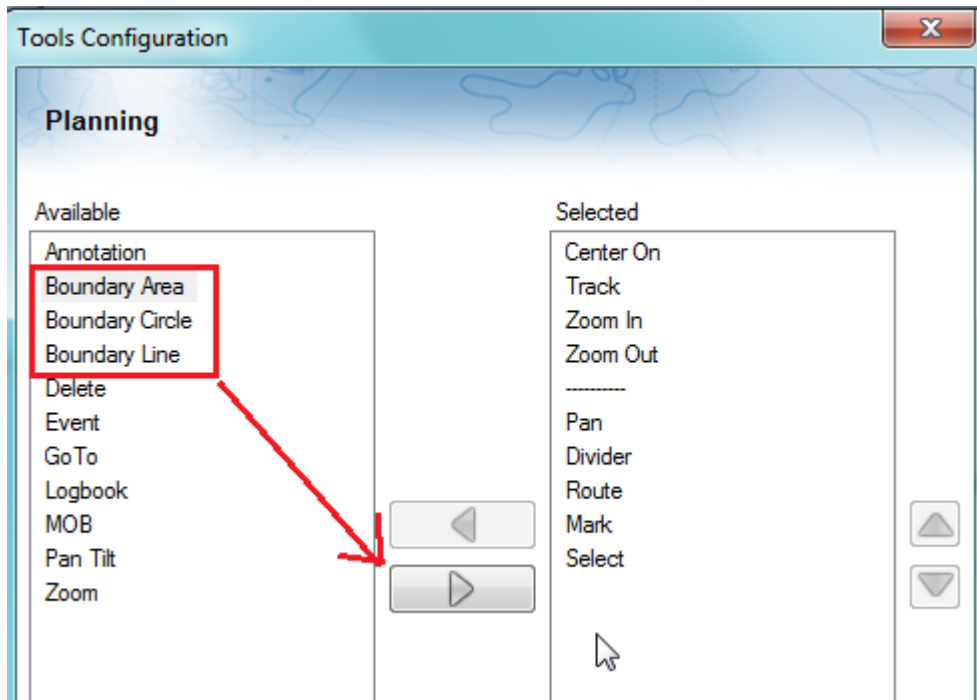
## Creating & Editing Boundaries

### Creating Boundaries graphically

TimeZero allows for the creation of up to 100 Boundaries (Areas, Lines and Circles) with up to 50 points per Area/Lines.

**Note:** The 100 boundaries limitation only applies to the default "TimeZero" layer (which is automatically synchronized with all your TimeZero devices). You can create more boundaries if you create new layer(s). For more information about how to organize large quantity of user objects into layers, please refer to the [Layer Introduction](#) chapter.

If the tools are not displayed, click on the "Configure Tools" button (at the lower end of the Toolbar) to add the tool you want to appear:



Click on the corresponding Boundary Tool (Area, Circle or Line) and click on the Chart to create the boundary. For areas and lines, double click on the last point to close the area or end the line.

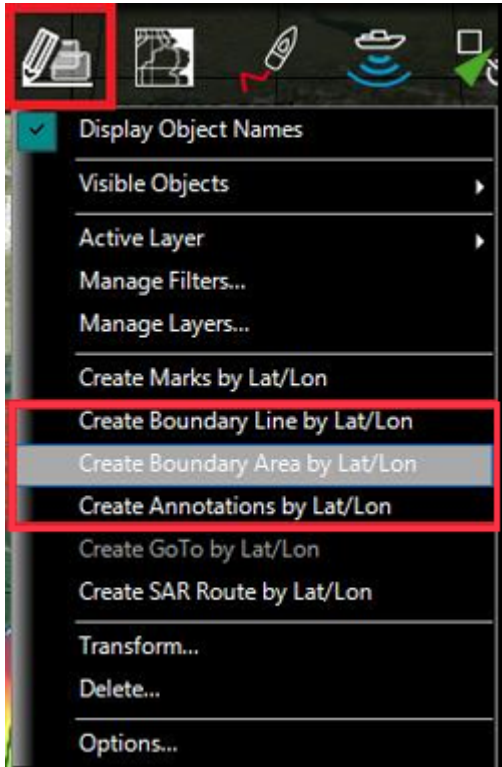
You can also right click anywhere on the Chart and choose "Create" -> "Boundary".

The default color and transparency (for areas and circles) defined in the [Marks & Boundaries](#) options will be used.

**Tips:** You can right click on the Boundary Tools to select a color before creating the boundary on the chart.

## Creating Boundaries (Areas and Lines) Manually

To create an area or a line manually by entering numbers (by Latitude/Longitude), double click on the corresponding Boundary Tool located in the Toolbar. This will display a window to enter the Latitude/Longitude numerically. You may also click on the "Marks" Ribbon button and select the corresponding option:



## Delete or Rename Boundary

You can delete or rename a boundary by right clicking on the boundary edge and choosing the corresponding option from the drop down menu.

**Note:** Instead of clicking on the edge of a boundary, you can also select the boundary first (left click) and then right click on it. Just make sure that the boundary is displayed entirely on the screen. If the boundary is partially displayed (because the screen is zoomed in too much), you will not be able to select it. In this case, zoom out until the boundary is displayed entirely on the screen then click on it again to select it.

## Moving a Boundary

To move a boundary, you have to select it first by left clicking on it with your cursor. Once selected, you can drag it to the new desired location. Just make sure that the boundary is displayed entirely on the screen. If the boundary is partially displayed (because the screen is zoomed in too much), you will not be able to select it. In this case, zoom out until the boundary is displayed entirely on the screen then click on it again to select it, then drag it.

If you want to manually adjust a boundary point coordinates (using lat/lon numbers), select the boundary first. The corners will appear, and you will be able to right click on them to edit their positions. Enter the new coordinates in the corresponding fields.

**Note:** if the boundary is locked, the corner will not appear. You will have to unlock the boundary first.

To move a circle by entering new coordinates, double click to display its Property window.

## Changing Boundaries Color and Contour

Double click on a boundary (or right click and choose "Boundary Properties") to display the Property window. Change the color and/or contour from the corresponding fields.

**Tips:** If you want to assign the same color to multiple boundaries, use the "Select" tool to select multiple boundaries then right click on one of the selected boundaries.

## Changing Boundary Area and Circle transparency

Double click on a circle or area (or right click and choose "Boundary Properties") to display the Property window. Change the transparency from the corresponding field.

## Adjusting Boundary Contour Thickness

The Boundary Contour Thickness is a global setting (found under the [Marks & Boundaries](#) Options) that will affect all boundaries displayed on the screen.

## Lock and Unlock Boundary

Right click on a boundary and choose "Lock Boundary" to lock a boundary. When a boundary is locked, you will not be able to move it or delete it (a dialog box will appear if you try to erase it). Use the same process to unlock a boundary.

## Hiding Boundaries

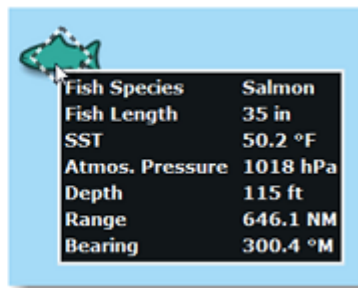
You can hide boundaries that belong to specific layers by selecting "Visible Layers" from the "Layers" Ribbon Button. You can automatically hide all the boundaries when switching in 3D mode by deselecting "Display Boundaries in 3D" from the "Plotter Display" Options. This can be used to reduce clutter when switching in 3D mode.

## Catches

TimeZero allows for the creation of up to 1000 Catches. Catches are marks with specific properties allowing to capture information about a single caught fish:

- Fish Species
- Fish Length
- Fish Weight
- Name & Comment
- Depth
- Pressure
- Sea Surface Temperature

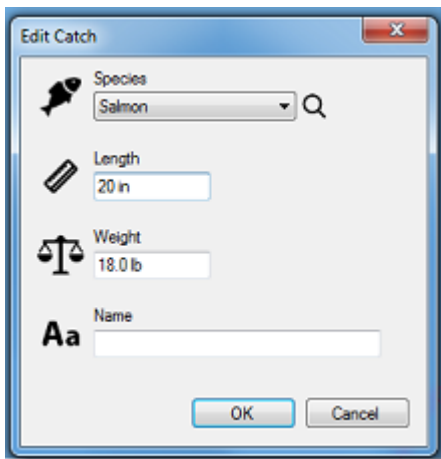
The icon is fixed and automatically selected according to the selected fish species. The color will vary automatically according to the average fish size caught by species (green for above average and red for under average among all the Catches you entered in TimeZero):



In addition to environment conditions, you can add a picture to your catch (usually a photo of the fish).

### Creating a Catch

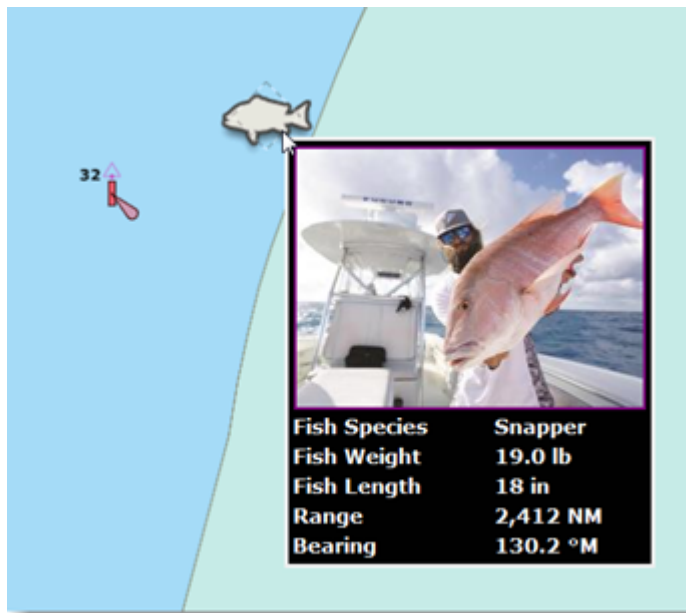
To create a Catch, right click on the chart, select "Create" and "Catch". A window will appear allowing you to enter information about your Catch:



### Adding a picture to a Catch

It is possible to add a picture to your catch. Simply right-click on the Catch and select "Add Photo".

The next time you click on the Catch, the picture will appear in the tooltip:



To display the picture in full screen, just click on it.

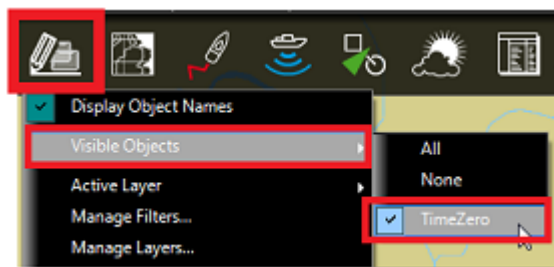
**TIPS:** To capture Catches from your phone, a free App (for iOS & Android phones) is available on the Apple App Store and Google Play Store. The name of the App is "TZ First Mate" (published by Furuno). This App was originally designed to be a "companion" of Furuno NavNet TZT2 and TZT3 Plotters, but it can also be used with TimeZero. TZ First Mate allows to quickly capture a Catch by snapping a picture using the phone camera. The position (and atmospheric pressure when available) will be automatically inserted using the phone sensors. The App will then synchronize and push the Catches to the TZ Cloud as soon as the Phone has an Internet connection and you will be able to see the objects on TimeZero via Cloud Synchronization. Note that if the computer and the phone are on the same network, the local synchronization will also work (without Internet access).

## Editing a Catch

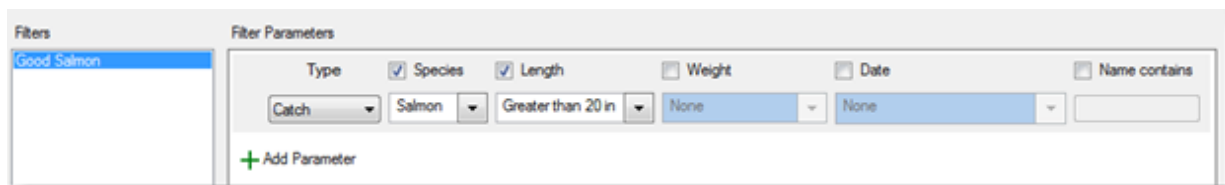
To edit a catch basic information, right-click on it and select "Edit...". If you want to edit all properties, select "Catch Properties".

## Show/Hide Catch

Catches are located on the default TimeZero layer than can be enabled or disabled from the "User Objects" button:



Filter can also be used to show specific group of fishes. Filter parameters (fish species, fish length and fish weight) are available allowing to create "common sense" filters based on fish properties. It then become very easy to only display fishes of a specific species, that are under or over a specific size or weight:



For more information, review the [Filters](#) chapter.

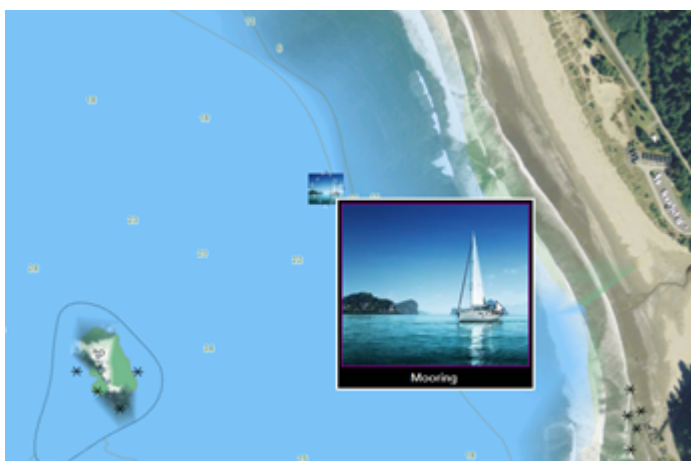
## Photos

TimeZero allows for the creation of up to 1000 Photos. Photos are a great way to highlight specific point of interest on the chart. Photos can be manually added on the chart at a specific location, or they can be imported automatically using the position embedded in their metadata (usually when the photo has been taken with a phone). When you add or import a photo in TimeZero, it is automatically compressed and if you are logged in to your [My TIMEZERO](#) account (with "Synchronize my User Object to My TIMEZERO" is enabled), your Photos will automatically be saved and synchronized on all your TimeZero devices (iPads and computers).

**Note:** Photos can only be created on the default "TimeZero" layer. It is not possible to create or move photos to another layer. This restriction is implemented so that photos are always and automatically synchronized with all your TimeZero devices (all objects put on the TimeZero layer are synchronized). Layers can only be used with Tracks, Marks, Boundaries and Annotations.

### Add a Photo Manually on the Chart

Instead of using a mark to record a nice beach or a mooring location, a photo can be used instead. Just right click on the chart and select "Add Photo". This opens a window allowing you to select a photo on your computer. Once the photo has been selected, a small pictogram will appear on the chart and the full picture will be available when you click on it:



**TIPS:** To create a Photo from your phone, a free App (for iOS & Android phones) is available on the Apple App Store and Google Play Store. The name of the App is "TZ First Mate" (published by Furuno). This App was originally designed to be a "companion" of Furuno NavNet TZT2 and TZT3 Plotters, but it can also be used with TimeZero. TZ First Mate allows to quickly create a Photo using the phone camera. The position will be automatically inserted using the phone GPS. The App will then synchronize and push the Photos to the TZ Cloud as soon as the Phone has an Internet connection and you will be able to see the objects on TimeZero via Cloud Synchronization. Note that if the computer and the phone are on the same network, the local synchronization will also work (without Internet access).

### Import Photo

Photos stored on your computer can be imported and positioned automatically on the chart.

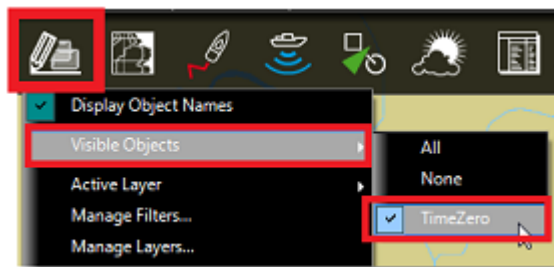
When importing photos from the Import Wizard, TimeZero will look for any GPS tag information that may be embedded in the EXIF metadata. If no GPS tag is found in the photo, TimeZero will look at the date/time tag (which is available with most digital cameras) and try to cross reference the date with trail information.

Please refer to the [Import & Export Data](#) chapter to learn how to import JPG photos.

**Note:** You can only import automatically photos that are in the JPEG format (\*.jpeg or \*.jpg extension)

## Show/Hide Photos

Photos are located on the default TimeZero layer than can be enabled or disabled from the "User Objects" button:



Filters can also be used to show/hide group of objects with various condition. For more information, review the [Filters](#) chapter.

## Selecting User Objects

### Selecting Individual Object

To select a single object (mark, route, boundary, etc...), just click on it. Note that for Boundaries (Area or Circle), the entire object needs to be visible on the screen in order to be selected by clicking on it. If the entire boundary is not visible on screen, you can click on its edge to select it.

Once an object is selected, you can right click on it to change its properties, or drag it to move it on the chart.

### Selecting Multiple Objects

The Selection tool can be used to select multiple objects at once. If you right click on the tool, you can set it in "Rectangle" mode or "Free" mode:



The rectangle mode allows to draw a rectangle on the screen (click and drag) and select all the objects inside that rectangle when the mouse is released. The free mode allows you to freely draw a selection area on the screen (click and drag) and is a very powerful tool to exclude or include specific objects to the selection.

**Note:** It is not possible to use the Selection tool when too many objects are displayed on the screen (over 100). To minimize the number of object, zoom in and try the selection tool again.

You can also press and hold the SHIFT key and drag the cursor to select multiple object (rectangle). You can also press and hold the CTRL key on your keyboard and click on multiple objects to manually select them.

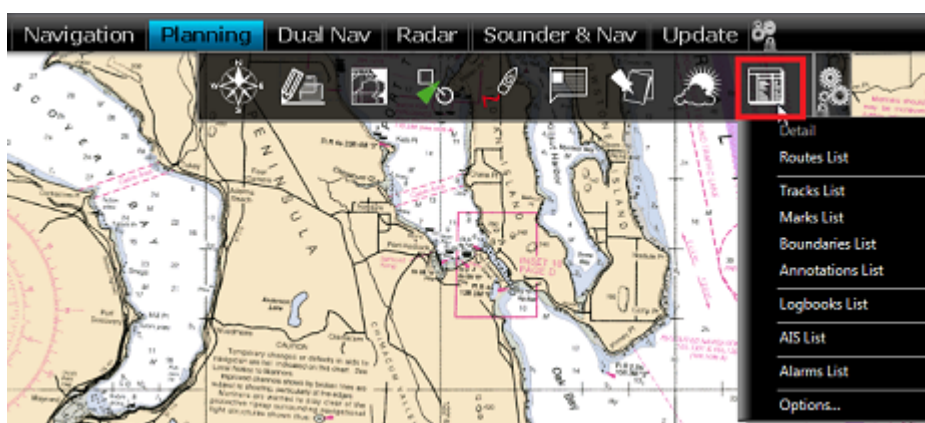
Multiple objects can also be selected from the list (CTRL or SHIFT). Since the list can be sorted by various parameters, it can be easier to select multiple objects (for example by creation date, color, icon, etc...). For more information about list, please refer to the [Objects List](#) chapter.

### Apply a modification on Multiple Objects

Once multiple objects are selected, you can right click on the selection to delete or change properties common to all the objects (color, icon, layers, etc...)

### User Object Lists

Lists are really useful to sort, filter and find specific objects. When you select a line from a list, the corresponding object gets selected on the chart and centered on the screen. To display a list of Marks, Boundaries or Annotations, click on the "List" button in the ribbon (displayed by default in the "Planning" WorkSpace).



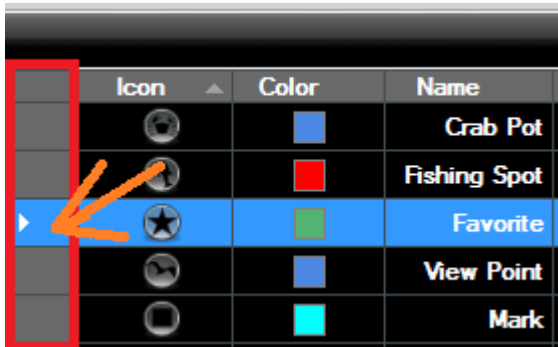
Once the list tab is open at the bottom of the screen, you can change list category from the left pane:



**Note:** The list for a corresponding object will only appear if you have created at least one object of that kind. So for example, if you have not yet created any mark, the mark list will not be available.

To select a specific row (or line), click inside the first grey column in front of the specific line:





Icon	Color	Name
		Crab Pot
		Fishing Spot
		Favorite
		View Point
		Mark

When a line is selected, the chart will be centered on the corresponding object.

The information displayed in the table (rows) can be customized by clicking on the "Action" button (available on the right side of the List header) and choosing "Configure List".

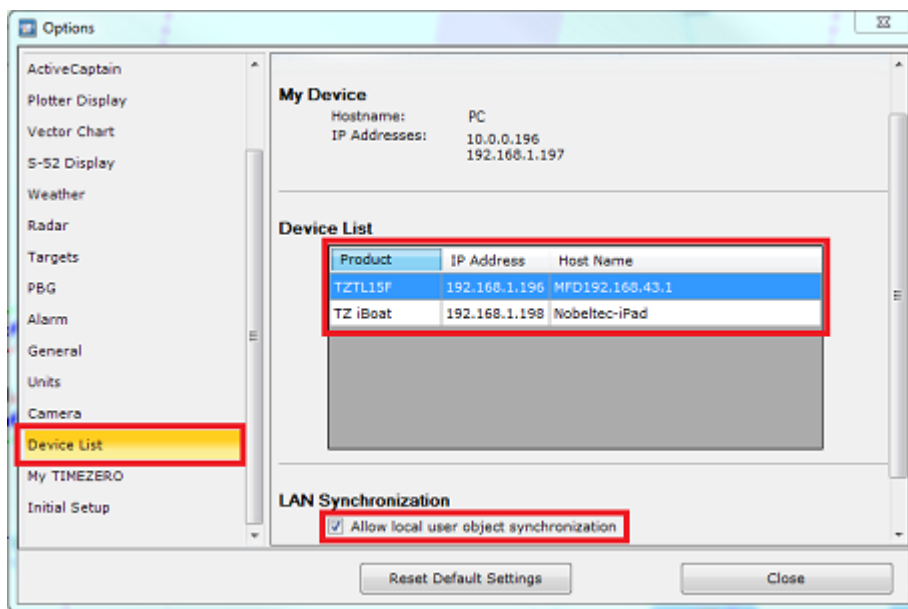
This information can be exported in a file (text format) or copied to the clipboard by clicking on the corresponding item under the "Action" menu. The fields in the text file are delimited using Tabs. We recommend using Windows Excel to open the file or paste the content of the clipboard (for proper formatting).

The "Filter" button (available on the right side of the List header) allows you to filter objects displayed in the list using various criteria. Once the list is filtered, select an object to center the chart on it (this is particularly useful to retrieve Marks created at a specific date).

**Note:** The filters do not affect what is displayed on the chart. The filters only affect what is displayed inside the list.

## User Objects Synchronization

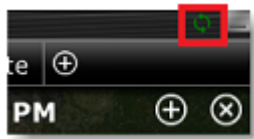
All User Objects (routes, boundaries, lines, catches, annotations, and photos) stored on the TimeZero layer are automatically synchronized with all the compatible TimeZero Platforms that are connected on the same local network (TZ Navigator, TZ Professional, TZ iBoat, and Furuno TZT2/TZT3). You can display a list of all the detected TimeZero platforms from the [Device List](#) Options:



Although the LAN synchronization does NOT require an Internet connection to work (as it operates on the local network), all the TimeZero platforms need to be logged with the same My TIMEZERO account in order for the synchronization to occur (for security).

**Note:** the synchronization with Furuno TZT2/TZT3 does not require to be logged in when connected directly to the NavNet network (172.31.x.x). Also note that the the synchronization with TZT2 only works with firmware v7 and above.

When TimeZero synchronizes its database with another device on the local network, a small green status icon will appear at the top right corner of the screen (next to the minimize button):



If you do not want a platform to synchronize automatically on the local network, you can turn OFF the LAN Synchronization from the [Device List](#) Options.

Note that by default, only the marks and objects that are stored on the default "TimeZero" layer are synchronized. If you create another layer ([Creating & Editing Layers](#)), and store user objects on that custom layer, they will not be synchronized. This is because the TimeZero layer enforces a limit on the number of user objects that can be synchronized with smaller platforms (TZ Navigator, TZ iBoat and Furuno TZT2/TZT3). Custom layers (created by the user) do not enforce any limitation. Also, smaller platforms do not have the ability to handle multiple layers. For all these reasons, only the user objects that are put on the "TimeZero" layer are synchronized. However, if you do not care about smaller platform and would like to only synchronize user objects among other TimeZero, you can enable the option "Synchronize All Layers" from the [Device List](#) Options. When this option is checked, all layers and all user objects will be synchronized, but only with other TZ Professional (you will lose the synchronization with TZ Navigator, TZ iBoat and Furuno TZT2/TZT3). This option must be checked on all the TZ Professional .

User Objects can also be synchronized using the cloud (when connected to the Internet). For more information, please refer to the [TimeZero Cloud](#) chapter.

## Importing & Exporting objects

When you are logged in to your [My TIMEZERO](#) account and when "Synchronize my User Object to My TIMEZERO" is enabled, your Marks and Boundaries will automatically be saved and synchronized on all your TimeZero devices (iPads and computers).

However, if you want to manually import or export one or multiple objects to a file (for example to exchange with another user), you can follow the steps below:

### Exporting

You can export all your objects or only objects belonging to specific layers from the "Import/Export" button available under the button. Please refer to the [Import & Export Data](#) chapter for more information.

If you want to export only one or a specific selection of objects, you can use the "Action" menu of the corresponding object list. For example to export a single or subset of Marks:

- Open the "Marks List" by using the "List" button located in the ribbon
- Select one or multiple marks. To select multiple consecutive marks, select the first line, press and hold the SHIFT key then select the last line (this will select the range). To select individual marks, press and hold the CTRL key and click on the lines.
- Click on the "Action" button located on the upper right side of the list panel
- Select "Export Selected Mark(s)"
- Select the export format
- Give a name to the file that will hold your mark(s) and save it

**Note:** If you want to export one or multiple marks to exchange them with another TimeZero user, it is recommended to use the "TimeZero Data (TZD)" format.

## **Importing**

To import objects, select the "Import/Export" button available under the button. Please refer to the [Import & Export Data](#) chapter for more information.



## Object Management

### Introduction

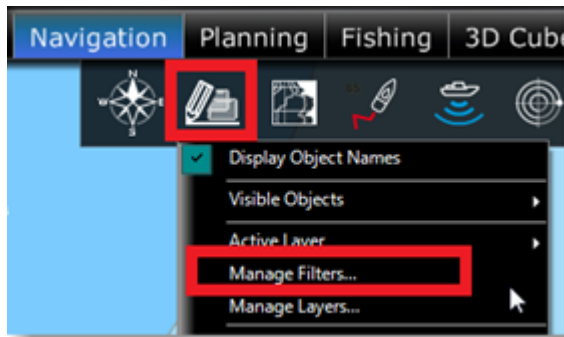
TimeZero includes various features that allow the user to manage large quantity of data (Tracks and User Objects). You can manage your data using "Filters", "Layers" or a combination of both. Filter and Layer both allow you to show or hide a specific set of User Objects on your screen so that you can focus your attention on the relevant data. For new users, we recommend looking at using "Filters" before diving into "Layers" management (which is an older feature based on legacy products).

TimeZero also includes various features that allow the user to create and log data easily. For example the [Events](#) allow you to preset marks with specific icon and color and drop them at your current location with one click (or one keystroke). You could use a crab icon to mark your pot location and the color of the mark to indicate the pot quantity (full pot = green / empty pot = red).

Finally, TimeZero allows the user to manipulate data using the [Transform Objects](#) window. This feature is especially useful when importing data from legacy or third-party software and/or when you want to re-organize your data.

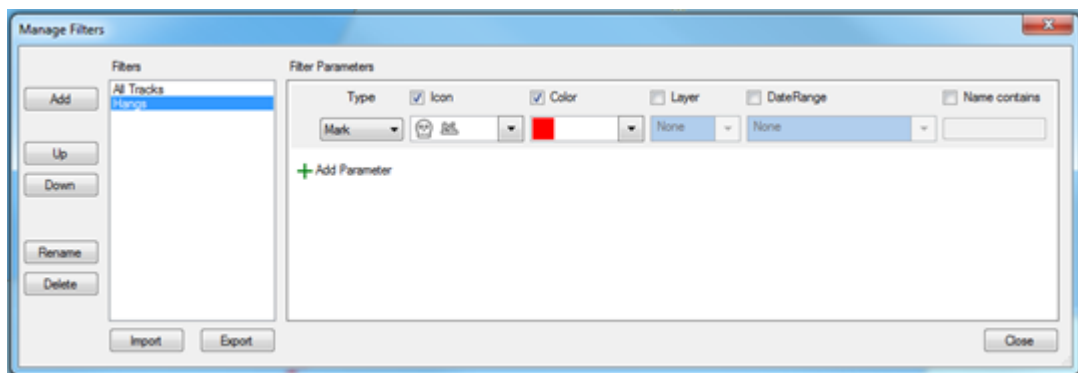
### Filters

TimeZero allows the user to create filters based on simple parameters (type of object, color, icon...) so that only the relevant information is displayed on the screen. Filters can be created by selecting "Manage Filters..." under the "User Objects" button:



### Creating Filters

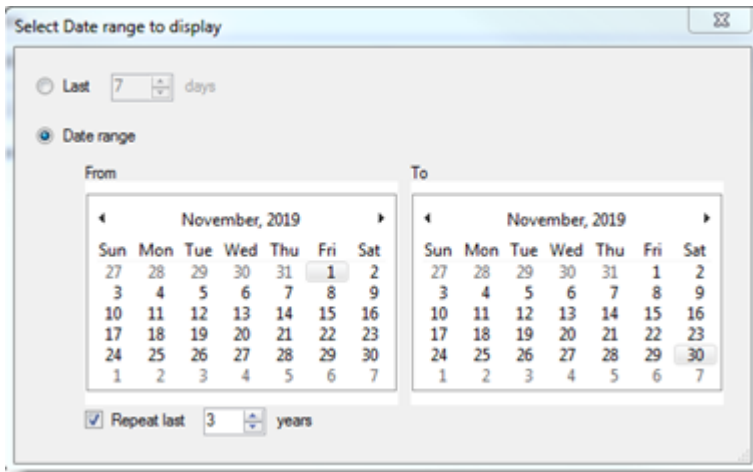
To create a new filter, click on the "Add" button. After giving a name to the filter, you can add parameters that will define the objects you will see when the filter is applied:



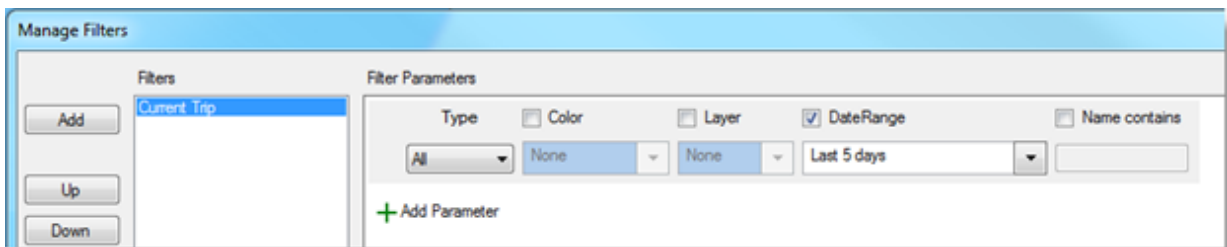
Up to 20 filters with multiple parameters can be created. Filters criteria include:

- Type of Object (Marks, Annotations, Route, Areas, Circle, Lines, Own Ship Tracks, AIS tracks, ARPA tracks, Catches and Photos)
- Icon (for marks) and pattern (for boundaries)
- Fish Size and Weight (for Catches)
- Color
- Layer
- Creation Date
- Name of Object

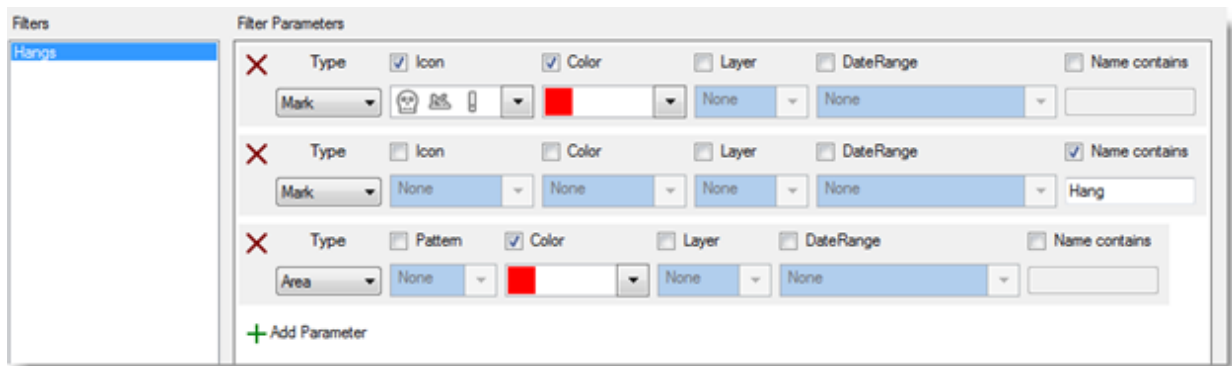
Note that the date criteria is very flexible and allows to select objects that have been created/modified during the last XX days (last week for example), or created/modified in between two specific dates, or created/modified in between two specific dates over multiple years (to select multiple fishing seasons):



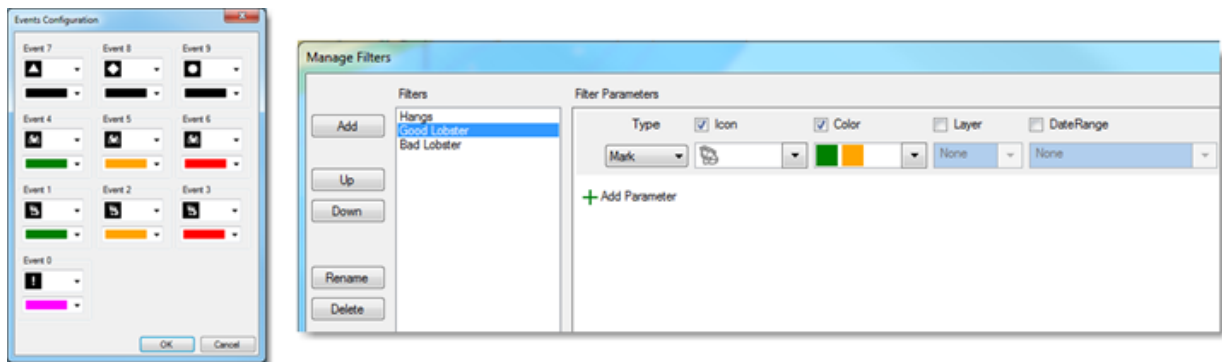
A filter can be configured to be as simple as displaying all objects that have been created/modified during the last 5 days (for example to only show the objects that have been created during the current fishing trip):



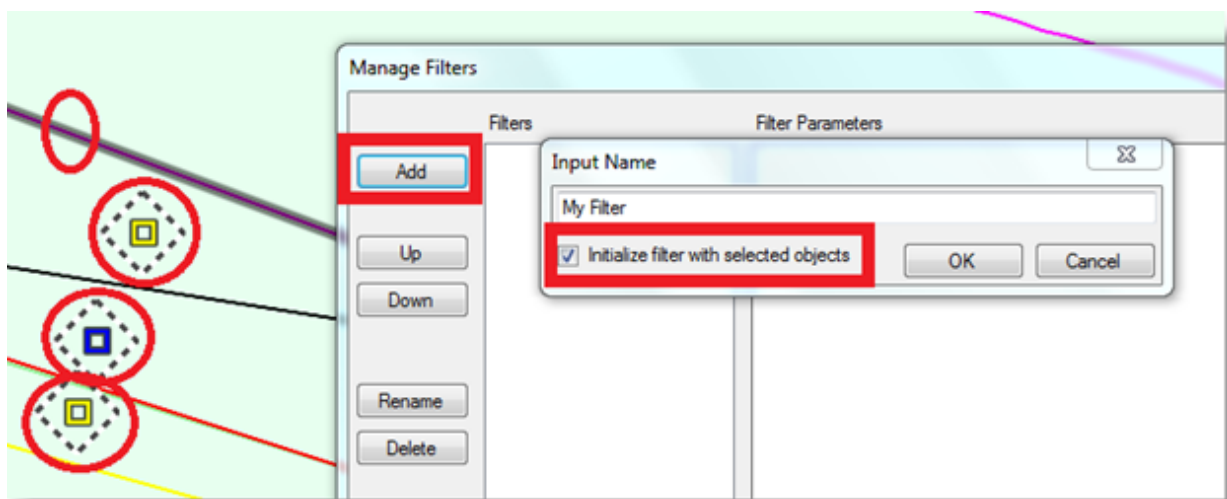
But filters can be configured to be very advanced by combining multiple parameters and multiple types of objects. For example, the filter below will display marks that are red with specific icons (3 icons), plus any marks whose name contain "Hang", plus any areas that are red:



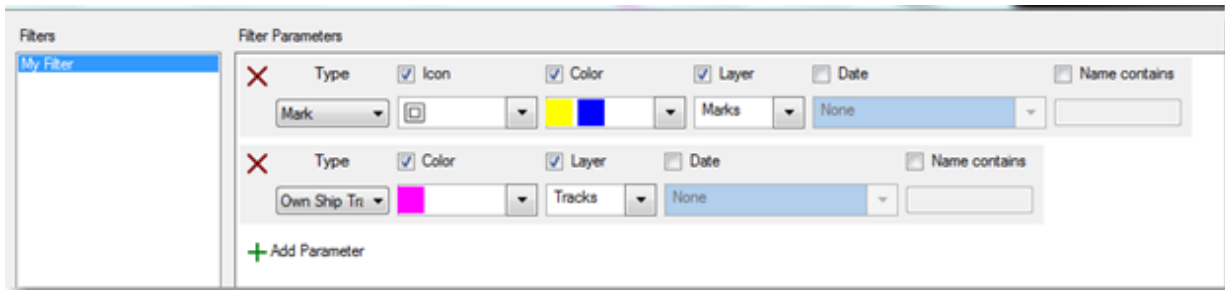
Filters are especially useful when paired with the use of [Events](#), especially the Event NavData that allows to quickly drop preset marks under the boat. In the example below, the event NavData has been configured with lobster and crab icons that use a color code to indicate the relative catch amount (green for a trap that is full, orange for an average trap and red for nearly empty). Then, corresponding filters have been configured allowing the user to highlight productive areas with one click:



Note that filters can be created directly from existing user object selection. For example, you can OPTION-Click (or Shift Drag) on multiple objects and then create a new filter with the option "Initialize filter with selected objects":

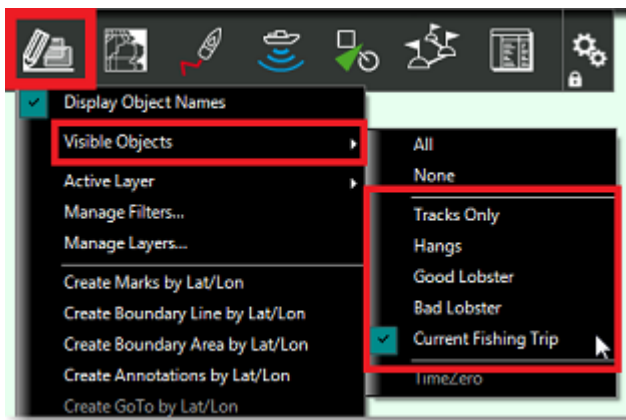


This will automatically create a filter with the selected objects in parameters:



### Applying a Filter

Filters can be selected from the "User Objects" button under "Visible Objects":



**Note:** It is not possible to select multiple filters at the same time. Only one filter can be selected at a time.

But a more convenient way to select your filters is to use the dedicated Filter NavData. To add a new NavData, click on the "+" located at the top of the NavData container (it must be opened first). Then, find the "User Object Filters" in the list and click OK to add it to your configuration:





By default, this NavData will display the first 4 filters, but right clicking on the NavData allows to limit the number of filters to 2 or expand it to 8 filters. The active filter selection (if any) will be displayed in yellow/orange in the list:



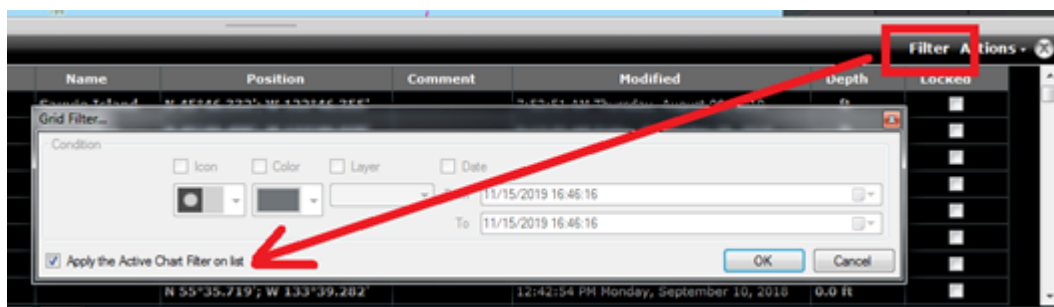
Note that you can re-order the list from the "Manage Filter" window (by clicking on the blue "i" icon), but you can also hide specific filters by right clicking on the NavData (and use "Toggle Filter Visibility"):



**TIPS:** Independent filters can be selected on each display and each WorkSpace. For example, if you split your screen in two (two plotters), the left side can be configured with one specific filter independent of the right screen.

## Using Filter in Lists

The lists (Marks List, Tracks List, Boundaries Lists) can be setup to use the active filter (so that the chart and the list are synchronized and display the same objects):



## Events

TimeZero offers various options to drop a mark at the boat position (GPS position). These special marks are called "events" in the software. The default icon and color that will be used when dropping an Event can be changed from the [Marks & Boundaries](#) Options ("Event Mark Symbol" & "Event Mark Color"). By default, the event will display a label consisting of the "Event" prefix followed by an incremental number. You can change the Prefix and the starting number from the [Marks & Boundaries](#) Options. You can also use the depth or Sea Surface

Temperature (SST) as the event label (for depth, TimeZero will always use the depth below waterline) or select no label at all. If you wish, you can also have TimeZero asking you the label of the event when you drop it (by selecting "Prompt for Event Name" from the [Marks & Boundaries](#) Options).

Events are locked by default, preventing you to move the location of the event accidentally. You can disable this behavior from the [Marks & Boundaries](#) Options. Note that you can also unlock an event by right clicking on it and unchecking "Lock Mark".

**Note:** Once created on the chart, it is possible to select multiple Events at the same time using the CTRL or Shift Key or by using the Select Tool in the Toolbar. Once selected, you can right click to perform various actions on all the events at the same time (unlock, Icon, Color, etc...)

## Using the Event Tool

The "Event" tool in the Toolbar can be used to drop an event each time you click on it. Click on the "Configure Tools" button (at the lower end of the Toolbar) to add the tools to your Toolbar configuration if it is not displayed:



You can also right click on the "Event" tool to quickly change the default icon and color parameters.

## Using the ENTER key

You can also press the ENTER key on your keyboard to drop an event. The default icon and color that will be used when dropping an Event with the ENTER key are the same as the one used when dropping an event from the "Event" tool.

## Using the numeric keys [0..9]

The numeric keys 0 through 9 can be used to drop events that have customized icon and color according to the key that is pressed. This feature can be used to quickly mark locations with specific meanings. For example, if you want to mark the location of good and bad fishing spots when getting your pots (crab, lobster, etc..) you could assign key "0" to a red color icon meaning "bad location". You could use "1" to drop an event with another color/icon and mean "average location", and so on. We realize that when fishing you may not have the time to right click and select icon and color to specific event. Pre configuring the event color and icon using the keypad allows you to quickly gather information in a split second by just pressing one key.

The numerical keys on your existing computer keyboard will work, but you could also consider an inexpensive dedicated USB keypad to drop the events:



Use the "Configure Events" window of the [Marks & Boundaries](#) Options to set up the events icons and colors that are associated with the 0 to 9 numeric keys.

## Using the Event NavData

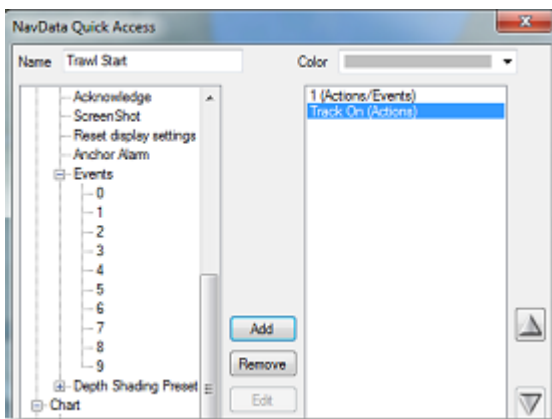
The Event NavData allows you to quickly drop a mark under your boat with a specific icon and color. You can customize the icon and color of all the 11 events by clicking on the "i" icon available on the top right corner of the NavData:



Note that events are extremely useful when fishing. You could preset specific icons and colors having a specific meaning (good pot, medium pot, bad pot) and simply use the cursor to immediately drop a mark containing the relevant information at your current position. Note that you can also use your keyboard by pressing the 0 to 9 numerical key and the Enter key (the Enter key corresponds to the bottom right event icon while the 0 key corresponds to the bottom left).

## Using the Quick Access NavData

The Quick Access button can be configured to drop any events. Because the Quick Access button can be configured with multiple actions, it is possible to drop an event and trigger another function such as Track ON for example:



## Event Label

The depth value or a customized text prefix can be used to automatically label events. You can use the prefix and auto-numbering to easily keep track of individual pots on the same line. Before laying down a new line, set a prefix that will identify that specific line ("LineA" for example) and set the auto-numbering to "1" (to start the count at 1). Press the "ENTER" key or any numerical number on your keyboard to record an event each time you drop a pot. Each event will be automatically named "LineA 001", "LineA 002", etc... When you are ready to lay another line, rename the prefix ("LineB") and reset the count to "1".

You can also use the depth or Sea Surface Temperature (SST) as the event label (for depth, TimeZero will always use the depth below waterline) or select no label at all

Refer to the [Marks & Boundaries](#) Options to set up the events label.

## Layers

TimeZero allows you to create "layers" that can be used to categorize your data. By default, TimeZero creates a "TimeZero" layer that stores all your User Objects. This layer is automatically synchronized with all compatible TimeZero Platforms (TZ Navigator, TZ Professional, TZ iBoat, and Furuno TZT2/TZT3). Because the default "TimeZero" layer is synchronized, there is a limitation about the number of User Objects it can hold:

- Marks = 30,000 maximum
- Route = 200 with up to 500 waypoints per route
- Boundary (Areas and Lines) = 100 with up to 50 vertices per object
- Circle = 100 maximum
- Annotation = 100 maximum
- Photo = 1,000 maximum
- Catch = 1,000 maximum

**Note:** There is no limit about Tracks as they are not synchronized among devices.

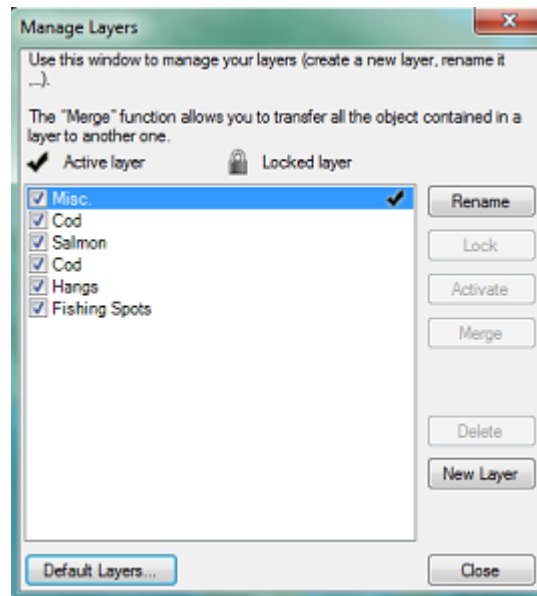
If you need to store more user objects and/or if you want to organize your data, you can create additional "custom" layers. You can create as many layers as you want and give them custom names.

Custom layers you create are not subject to any limitation, but they cannot be synchronized with small platforms (TZ Navigator, TZ iBoat and Furuno TZT2/TZT3).

**Note:** if you do not care about smaller platforms and would like to only synchronize user objects among other TimeZero, you can enable the option "Synchronize All Layers" from the [Device List](#) Options. When this option is checked, all layers and all user objects will be synchronized, but only with other TimeZero (you will lose the synchronization with TZ Navigator, TZ iBoat and Furuno TZT2/TZT3). This option must be checked on all the TimeZero.

## Managing Layers

Select "Manage Layers..." from the "User Objects" ribbon button. This opens a window that allows you to perform various actions on Layers:



- **Rename:** Click on this button to rename the layer selected in the list
- **Lock/Unlock:** Click on this button to lock or unlock the layer selected in the list. Locking a layer prevents accidental change to any objects assigned to that layer

**Note:** To prevent a user to unlock a layer, it is possible to [Lock the User Interface](#) and protect it with a password. When the User Interface is locked, various advanced options of the software cannot be changed and it is not possible to unlock a layer.

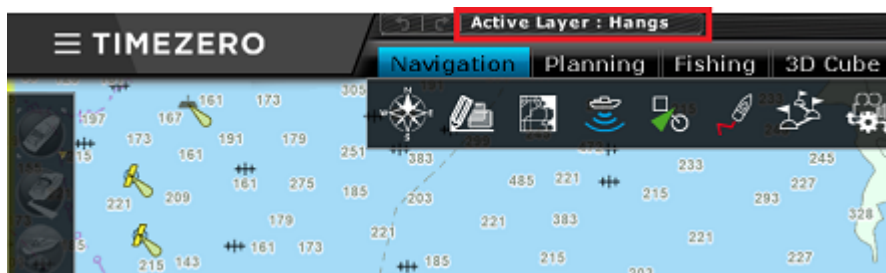
- **Activate:** Click on this button to set the layer selected in the list as the Active Layer. The "Active Layer" is the default layer on which the objects will be assigned to when they are created
- **Merge:** Click on this button to transfer all the objects assigned to the layer selected in the list over a new layer (a pop up window will appear allowing you to select the target layer)
- **Delete:** Click on this button to delete all the objects assigned to the layer selected in the list

**Note:** You cannot delete the default "TimeZero" layer. The "TimeZero" layer is used for the synchronization of User Objects.

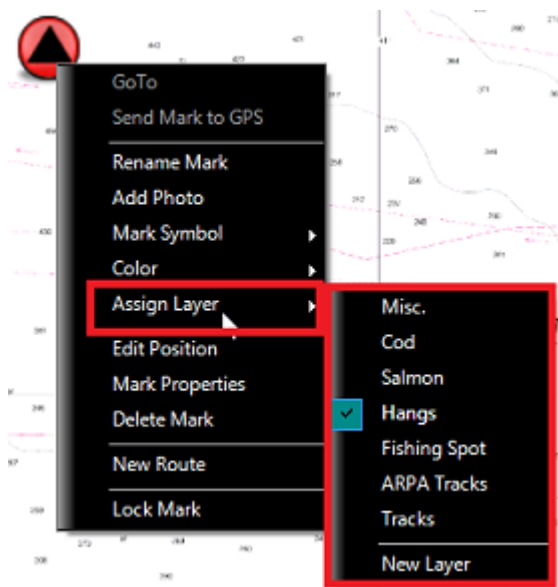
- **New Layer:** Click on this button to create a new layer

## Using Layers

When you select a tool to create an object (Mark, Route, Annotation, Boundary,...) the "Active Layer" name will be displayed on the top of the screen:

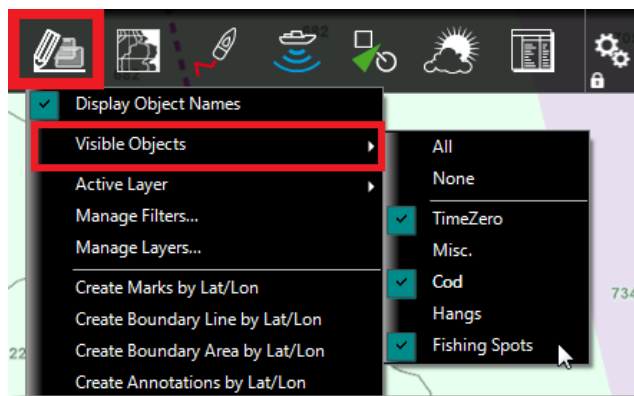


The "Active Layer" is the default layer assigned to any object created. Note that you can change the layer of a mark or object at any time after creating it by right clicking on the Mark and selecting "Assign Layer". This will display a contextual menu with the list of all the layers available:



**Note:** You can only assign one layer per object.

Once your objects are categorized with layers, you can configure your screen to only show objects that belongs to specific layer by adjusting the "Visible Objects" from the "User Object" button:



The "Visible Object" selection is independent per WorkSpace. You could have one WorkSpace display a set of layers and have another WorkSpace display another set of layers or no layer at all.

**Note:** By default, all layers are set to invisible on the Radar WorkSpace.

If you manage large quantity of objects and layers, it is also possible to use "Preset" of layer (by enabling the Advanced Mode of the Layer Management window). Layer Presets can be used to bundle a specific group of layers together and hide the one you are not using (the layers that are not part of the currently selected Layer Preset).

TIPS: You can lock specific layer(s) to prevent editing the objects it contains.

## Enabling/Disabling Layers

If you have lots of layers and decide not to use some of them temporarily, you can disable them by deselecting the check box in front of the corresponding layer(s). When you disable a layer, the objects it contains will no longer be displayed on the chart and you will not be able to activate it or use it as a default layer.

**Note:** You cannot disable the default "TimeZero" layer. The "TimeZero" layer is used for the synchronization of User Objects.

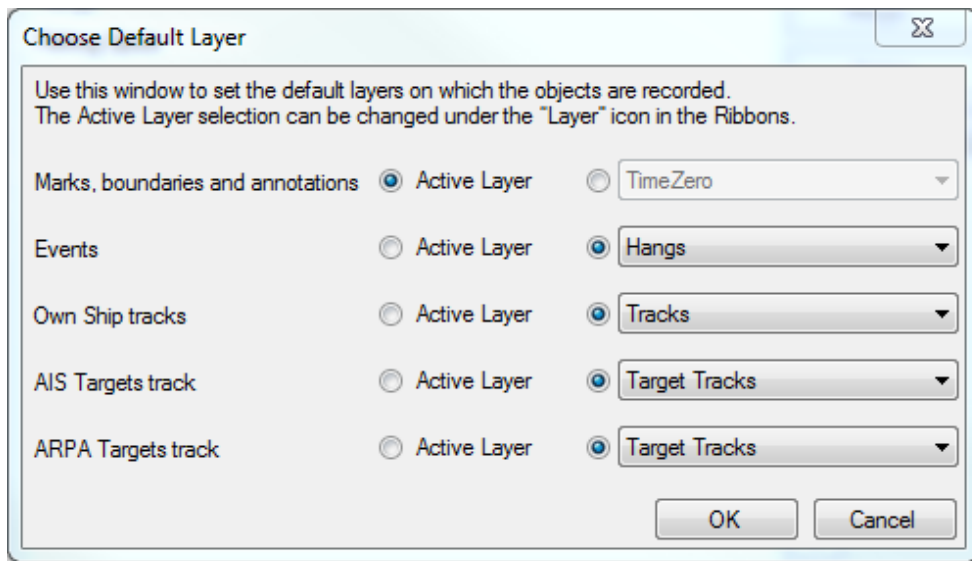
## Locking Layers

If you want to prevent accidental changes to specific objects (for example boundary areas), group them on a layer(s) and lock that layer(s) by selecting the layer(s) in the list and pressing the "Lock" button.

If the User Interface has been locked from the main menu, the user will not be able to unlock Locked Layers. In order to unlock layers, the User Interface needs to be unlocked. Refer to [Lock the User Interface](#) for more information.

## Default Layers

By default, all the Marks, Boundaries, Annotations and Tracks you create are assigned to the Active Layer. The "Default Layers" window allows you to force specific type of objects to be assigned to different default layers when they are created:



For example, you may want to create a dedicated layer for all the ARPA tracks and select it as a default layer (instead of the Active Layer). When you enable the Track Recording on an ARPA target, that track will automatically be assigned to the "Target Tracks" layer (regardless of the Active Layer selection).

## Advanced Layer Management

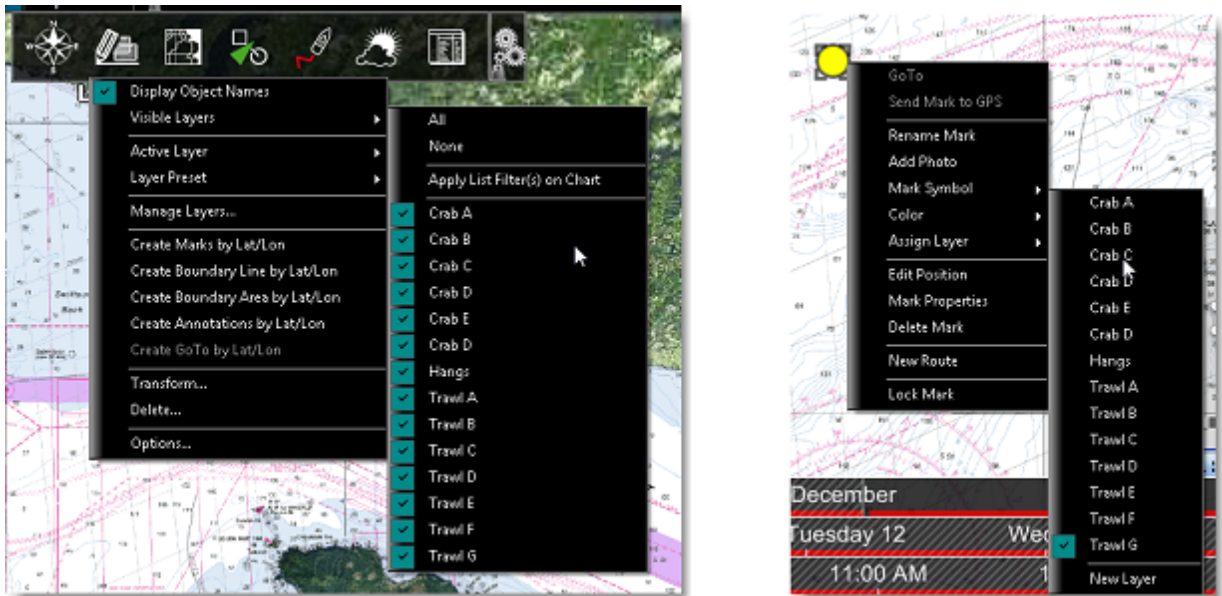
For advanced users that need to manage a large quantity of layers, TimeZero provides an advanced layer management system allowing a user to create "presets" of layers. Layer Presets can be used to bundle a specific group of layers together and hide the one you are not using (the layers that are not part of the currently selected Layer Preset). This allows you to only work and see a subset of layers at a specific time. Changing preset, will automatically unload and load a new set of layers.

This feature can be useful if you perform multiple types of fishing that do not necessarily require you to use the same layers. For example, you could have 10 layers that you only find useful when laying down pots (for crab), and 15 other layers that are only useful when trawling. In this case, instead of having 25 layers always available

in the software, you could create a preset "crab" and another "trawling" that would only activate the relevant layers in the software. Note that you may have a layer that you use to store hangs (rocks, wrecks,...) that can be shared and enabled for both "crab" and "trawling" preset.

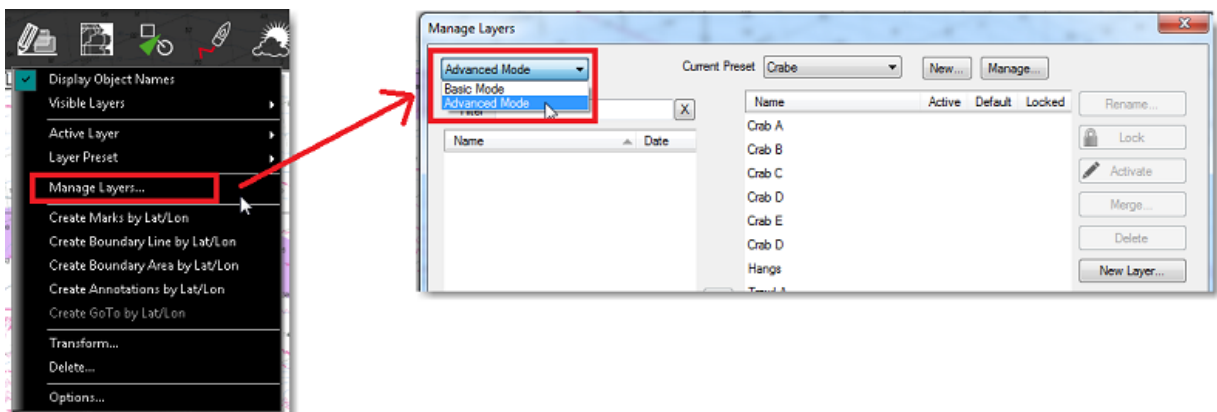
**Note:** Creating presets of layers is only useful when you have more than 10 or 20 layers. If you only work with 10 or less layers overall, it is easier to just turn them ON or OFF individually from the "Visible Layer" option under the "Layer" button in the ribbon.

In the example below, this user has too many layers in his software, making layer selection cumbersome:



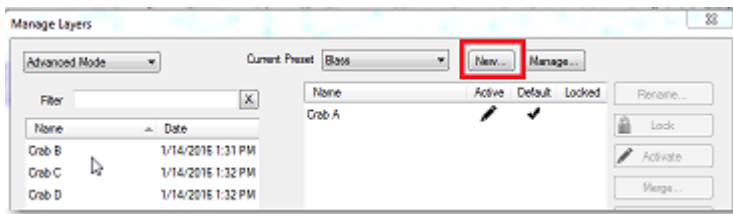
The user realizes that when trawling, he never uses any of his "Crab" layers. To solve this problem, a "Crab" and "Trawl" layer preset can be created from the Manage Layer Window.

Simply select "Manage Layer..." located under the "User Object" button in the Ribbons and then select "Advanced Mode":

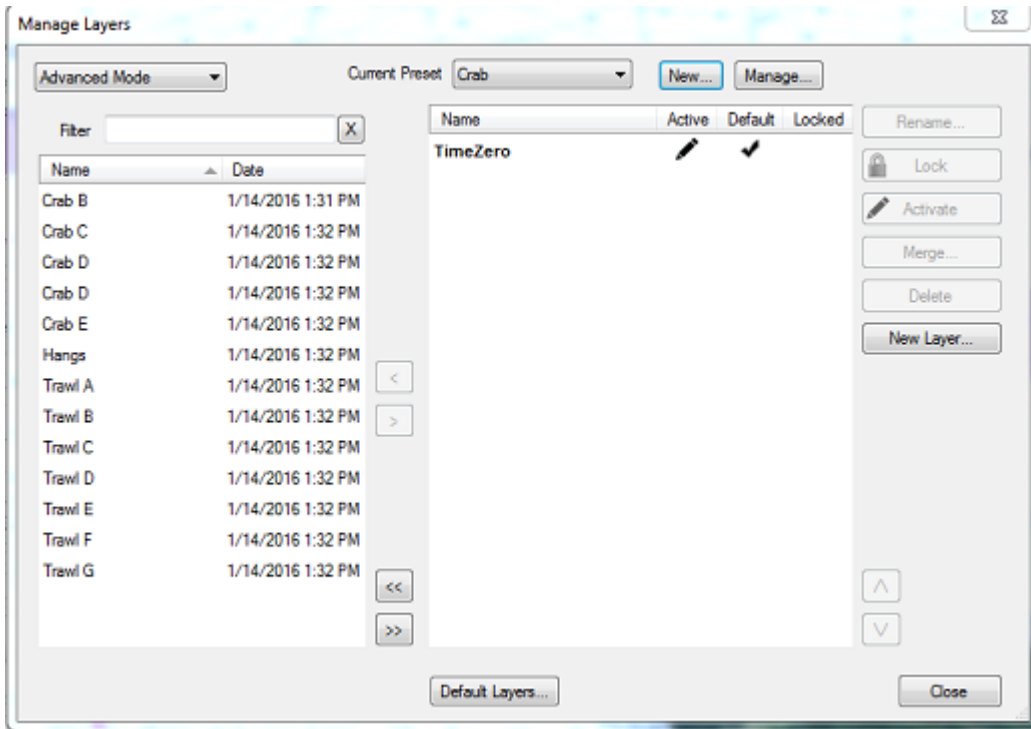


Click on "New" in front of Current Preset:



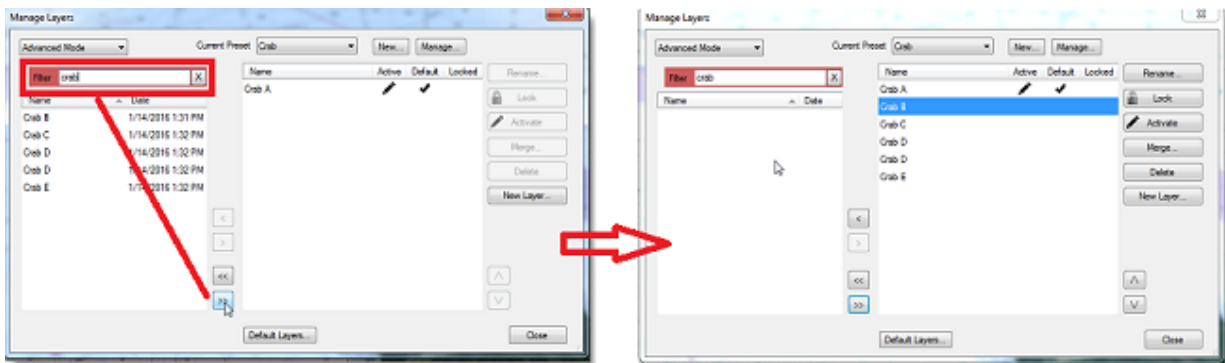


Enter a name for your preset ("Crab" for example) and press OK. TimeZero will create a preset just containing the default "TimeZero" layer:



To include a layer in the current preset, move them from the list located on the left (list of layers that are disabled for the current preset) to the right (list of layers that are enabled for the current preset).

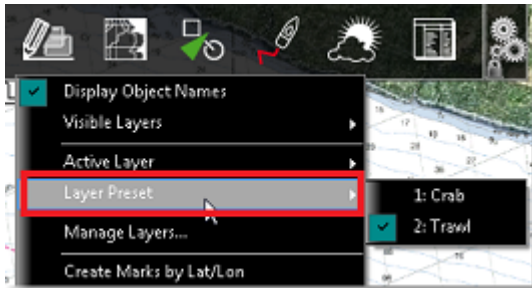
Note that if you have lots of layer, you can sort or filter the list on the left to find the layer you want to move to the right. In the example below, "Crab" is entered as a filter and thus, only the layers with containing "Crab" in their name are displayed. It is then possible to move all of them to the right by using the ">>" button:



Repeat the same process to create a "Trawl" preset.

Note that it is possible for the same layer to be in multiple presets. For example, it is possible to add the "Hangs" layer in both "Crab" and "Trawl" preset.

Once the Presets are created, it is possible to switch from one preset to another by selecting "Layer Preset" under the "User Object" button in the Ribbons:



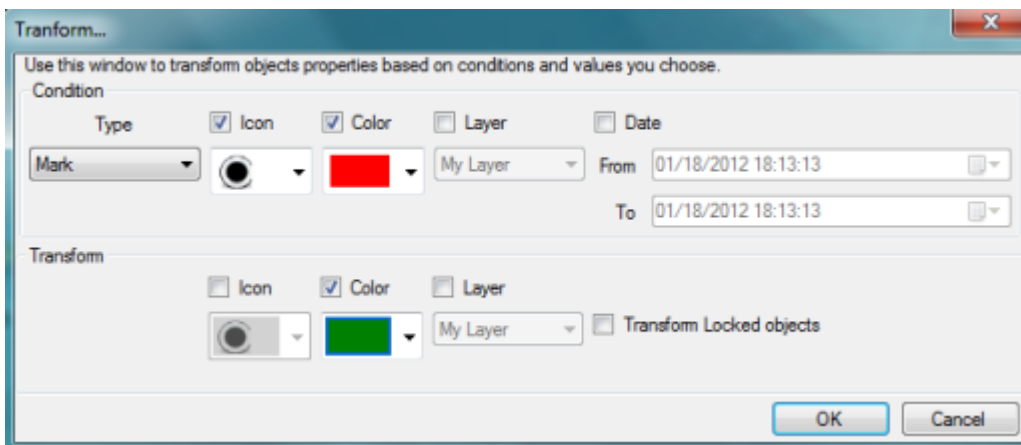
Selecting a preset will unload from the software all layers and load only the layers that are selected in the preset.

If you want to rename or delete your presets, open the "Manage Layer" window and select "Manage..." in front of current preset. Note that deleting a preset will not delete the layers it contains.

**Note:** You cannot remove the default "TimeZero" layer from a Preset. The "TimeZero" layer is used for the synchronization of User Objects and it always need to be present in the software.

## Transform Objects

The Transform window allows you to define a selection of objects matching specific conditions and apply a transformation on them with one click. To open the Transform window, select "Transform..." from the "User Objects" ribbon button:



### Select Conditions

The top part of the window is used to set the various conditions that an object needs to match in order to be transformed.

First select the type of object you want to transform from the drop down menu (marks, ...). Then select the conditions you want to apply. For example, if you want to select objects that have a specific color, check "Color" and choose the color you want the object to match. If you don't want to restrict the selection with a specific layer condition, leave it unselected. For example, if you want to select objects belonging to any layers, leave the layer condition unselected.

## Apply Transformation

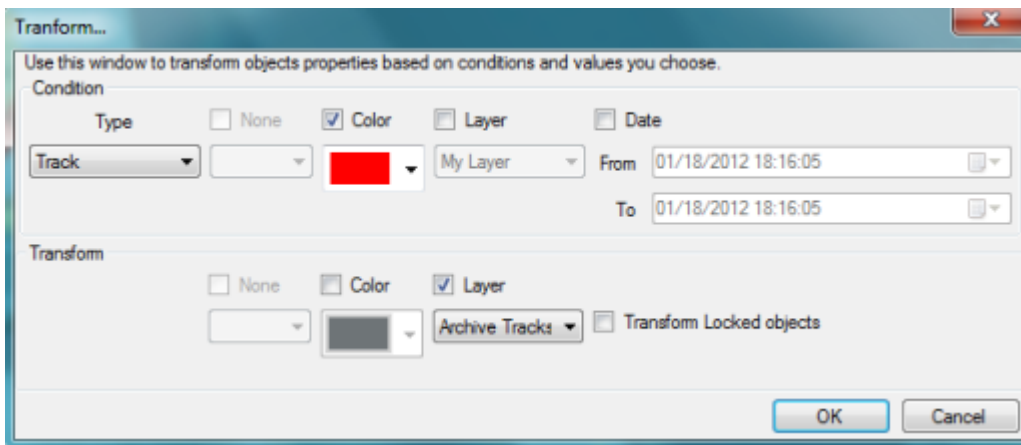
The bottom part of the window allows you to select the type of transformation you want to apply on the objects that match the selection. If you don't want to transform a specific property, leave it unselected. For example if you only want to change the color property, just check "color" and select the color you want all the objects to have after the transformation.

**Note:** Objects belonging on a locked layer will not be transformed

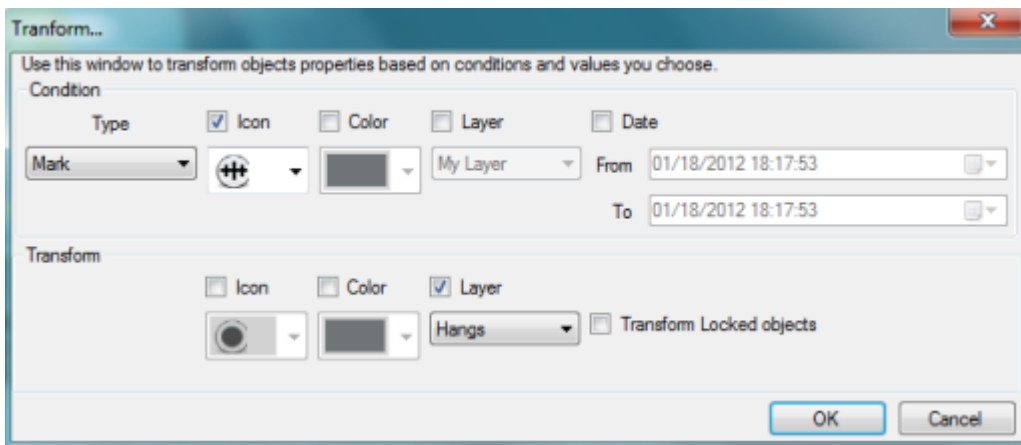
## Examples

Below are some commons transformations:

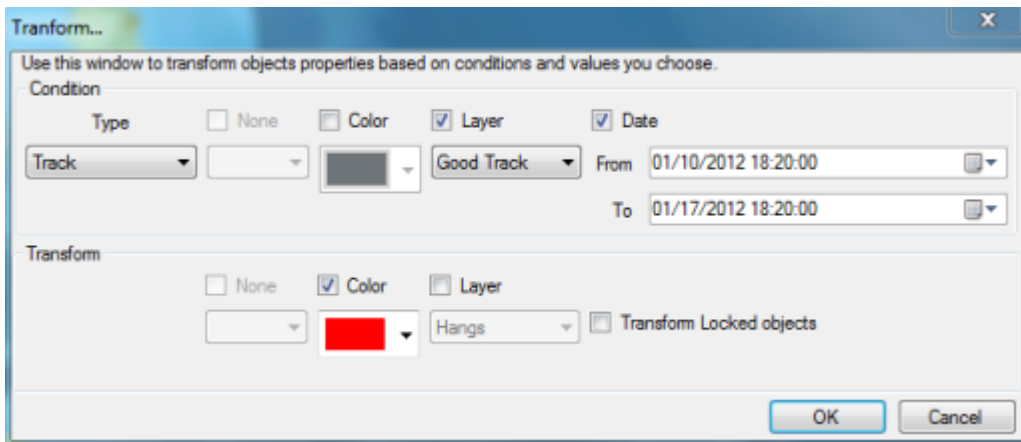
- Select all the red tracks and assign them to a specific layer ("Archived Tracks" in the example below)



- Select all the marks that have a specific icon and assign them to a specific layer ("Hangs" in the example below)

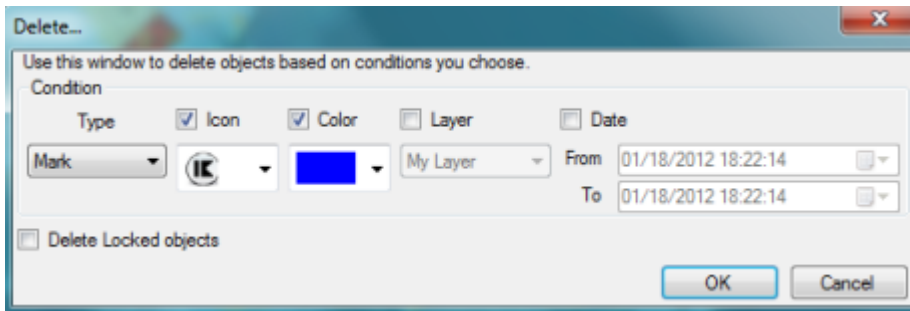


- Select all the tracks created in between a specific time interval that are assigned to the "Good Track" layer and change their color to red



## Deleting Objects

The Delete window allows you to select objects that match specific conditions (similar to the Transform window) and delete them all at once. To open the delete window, select "Delete..." from the "User Objects" ribbon button:



Select the type of object you want to delete from the drop down menu (marks, ...). Then select the conditions you want to apply. For example, if you want to select objects that have a specific color, check "Color" and choose the color you want the object to match. If you don't want to restrict the selection with a specific condition, leave it unselected. For example, if you want to delete objects belonging to any layers, leave the layer condition unselected.

**Note:** Objects individually locked from the chart (using the right click menu) will not be deleted unless you select "Delete Locked objects". Object belonging to a locked layer will never be deleted.

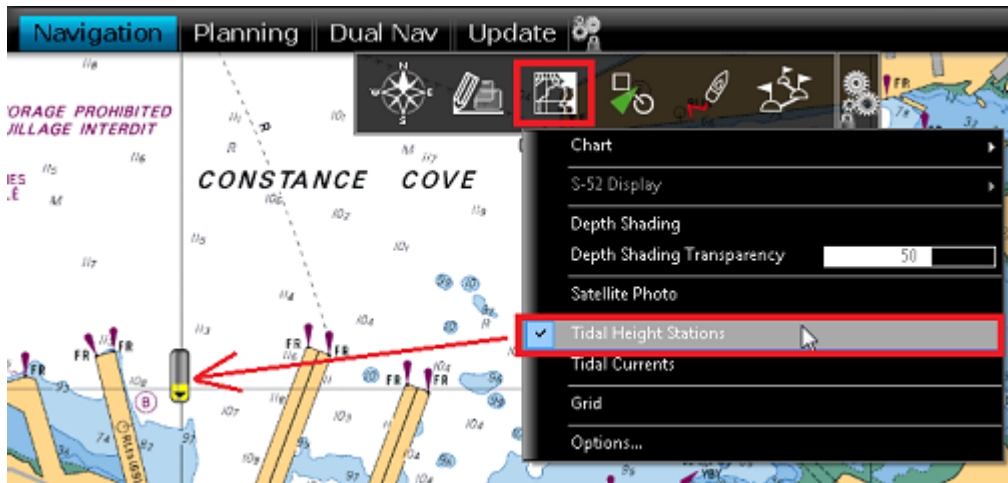
## Tidal Height & Tidal Currents

### Tides

TimeZero can predict the tide level for thousands of tide stations around the world. Tides can be displayed directly on the chart or in a graph.

#### Displaying Tides on the Chart

Click on the "Chart" button located in the Ribbon and select "Tidal Heights Stations":



The tide icons displayed on the chart are dynamic and show you a preview of the water level:



*Rising from low to high*



*Falling from high to low*



*At slack (low and high)*

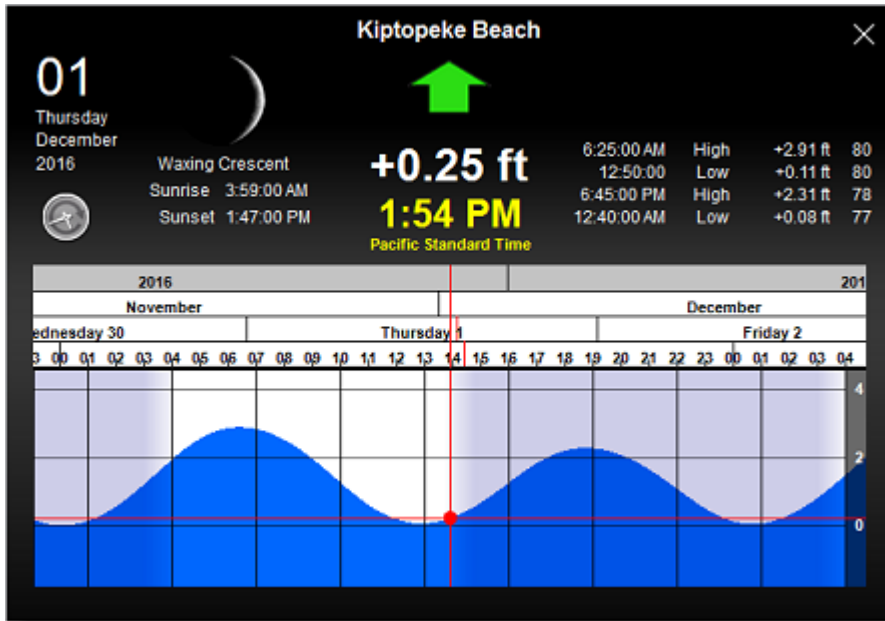
If you put your cursor over a tide icon or click on it, a tool tip indicating the Tide level will appear.

If you are in the Navigation WorkSpace, the tide level is displayed for the current time. If you are in the Planning WorkSpace, you can change the time using the timeline located at the bottom of the screen.

**IMPORTANT:** All tidal height prediction times in the Navigation WorkSpace are adjusted for the local time currently selected on your computer. Make sure that your computer is set at the correct time and that the local time zone is properly selected for your area. To change the computer's time zone or daylight savings time setting, use the "Date and Time" option in the Windows Control Panel.

### Displaying the Tide Graph

To display a Tide Graph, right click on a Tide icon and select "Open Tide Graph" (or double click on the tide icon). You can also right click anywhere on the chart (in this case it will use the nearest Tide Station from cursor position). This opens a window displaying various tides related information (tide level, low/high tide time, moon phase, sunrise/sunset time):



To change the time, you can drag the graph with your mouse, use the scroll wheel or use the right/left arrow of your keyboard.

**Tips:** To scroll the graph over a long time period, you can put your cursor over the day or month on the time bar and drag from this location. This will increase the scrolling speed.



To set the time of the graph back to the current time, click on the clock button:

**Note:** If you open the Tide Graph from the Planning WorkSpace, the time of the graph is initialized to the same time selected in the Virtual Time Control (Time Bar) of the WorkSpace.



1. Selected date
2. Moon and Sunrise/Sunset information
3. Tide level and Time (with Time Zone indication)
4. Time, Level and Coefficient for previous and next high/low

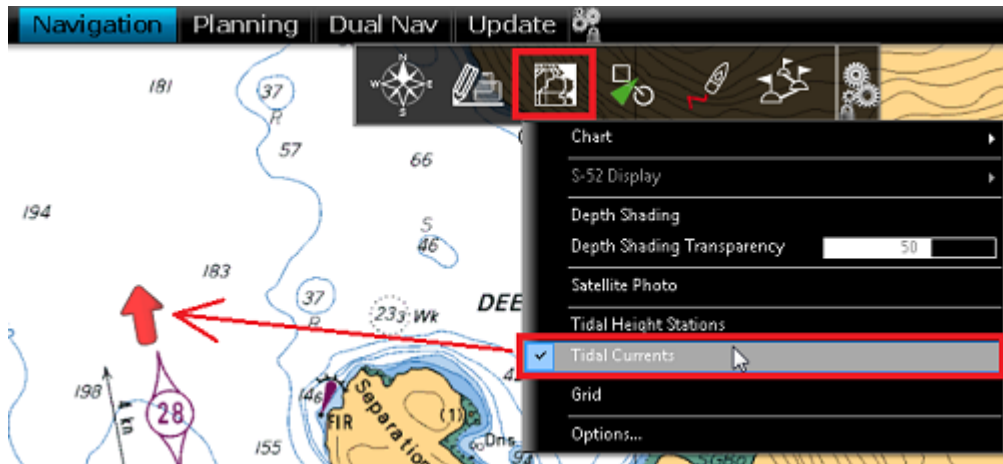
## Tidal Currents

TimeZero can predict tidal currents for thousands of current stations around North America. In Western Europe, High Resolution Tidal Currents are available for an additional fee. Please refer to the [Mapmedia Catalog](#) for coverage.

Tidal current can be displayed directly on the chart or in a graph.

### Displaying Tides on the Chart

Click on the "Chart" button located in the Ribbon and select "Tidal Currents":



This will display arrows on the chart indicating the direction and overall speed of the current. Low current speeds are indicated in yellow. Orange or red colors indicate high speed currents.

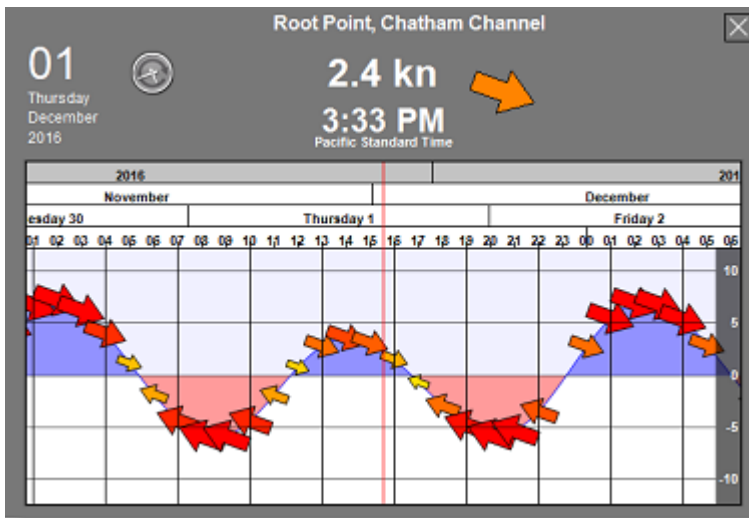
**IMPORTANT:** Oceanic Currents (that are downloaded with Weather Forecast) are displayed in blue, while Tidal Currents (integrated in the software) are displayed in yellow-red. Oceanic Currents (blue arrow) can be turned ON or OFF from the Weather button located in the Ribbon. Please refer to [Displaying Weather Data](#) for more information.

If you put your cursor over a current icon or click on it, a tooltip indicating the Speed and Direction will appear.

**IMPORTANT:** All tidal current prediction times in the Navigation WorkSpace are adjusted for the local time currently selected on your computer. Make sure that your computer is set at the correct time and that the local time zone is properly selected for your area. To change the computer's time zone or daylight savings time setting, use the "Date and Time" option in the Windows Control Panel.

### Displaying the Tidal Current Graph

To display a Tidal Current Graph, right click on a Tide icon and select "Open Current Graph" (or double click on the current icon):



To change the time, you can drag the graph with your mouse, use the scroll wheel or use the right/left arrow of your keyboard.

**Tips:** To scroll the graph over a long time period, you can put your cursor over the day or month on the time bar and drag from this location. This will increase the scrolling speed.

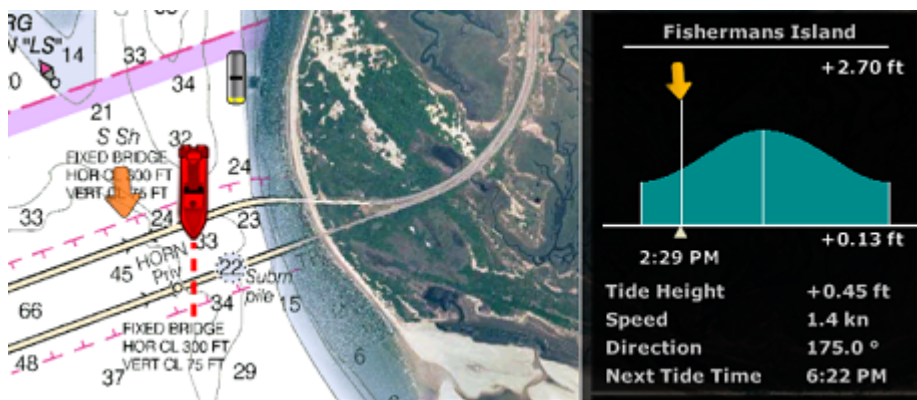


To set the time of the graph back to the current time, click on the clock button:

**Note:** If you open the Current Graph from the Planning WorkSpace, the time of the graph is initialized to the same time selected in the timeline of the WorkSpace.

## Tides & Current NavData

When you have a GPS position, a Tides & Current NavData can be added to the NavData panel by clicking on the "+" icon. This NavData displays and updates in real time the nearest Tides and Currents information from your own ship position:



The maximum search distance for tide stations is 50NM and 4NM for Tidal Current Station. If there is no tide or current station within this distance, the NavData will display no information.

Note that it is possible to choose and fix the Tide Station being display in the NavData by selecting a Tide Station as a "Reference Station". Just right click on a Tide icon on the chart and select "Use as Reference Station". To release the reference station, you can right click on the NavData and select "Set Auto".



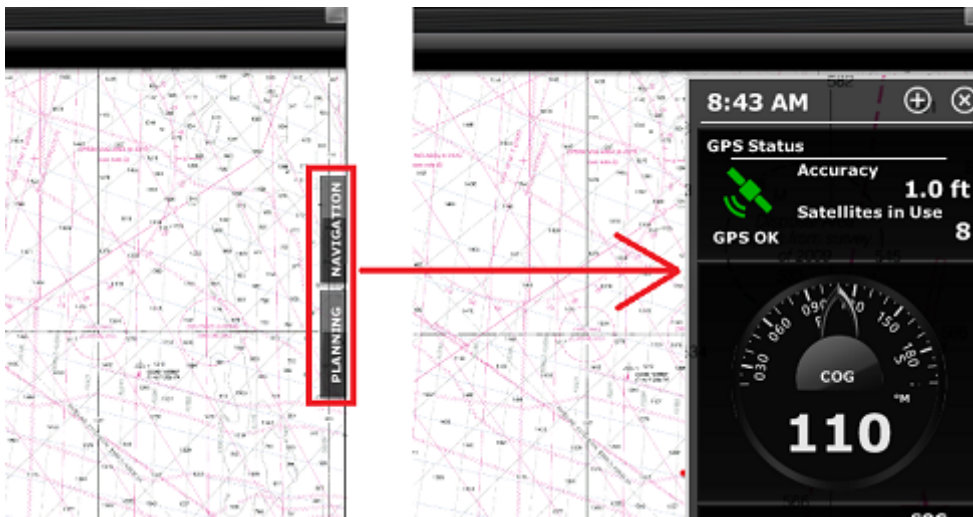
**Note:** It is not possible to fix a Tidal Current station. Currents are always automatically selected based on distance from own ship.



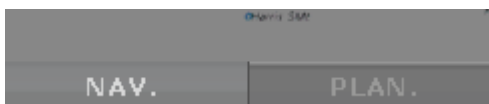
## NavData

### Introduction

The NavData panel is displayed on the right side of the screen. When the panel is closed, tabs allowing you to open the panel appear:



When the NavData panel is open, you can switch from various configurations by clicking on the tabs name located at the bottom of the panel:



TimeZero offers 2 panels by default (3 if you have a radar).

**Note:** The tabs name and configuration cannot be changed but can vary according to your modules.

The content of each panel can be fully customized. To add a NavData, click on the "+" located at the top of the panel:



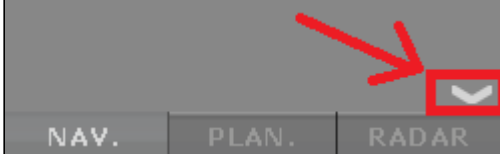
To close the entire NavData Panel, click on the "X" located next to the "+".

To remove a specific NavData, right click on it and select "Remove".

To change the position of the NavData inside the panel, just click and drag to the new location.

You can edit most of the NavData (to change the information it displays) by right clicking on a NavData.

**Note:** When you add too many NavData or when the list is displayed at bottom of the screen, the NavData may eventually "overflow" and not be visible anymore. If you see the overflow icon at the bottom of the NavData panel, it is recommended to delete some NavData to free up space:



Note that the overflow icon is just an indication (you cannot click on it to scroll the NavData).

The NavData panel overall size and transparency can be adjusted from the [General](#) Options.

**Note:** The NavData Panel configuration is global to all the WorkSpaces in the software. However, the panel can be displayed or hidden independently per Workspace.

## NavData Types

Various types of NavData can be displayed in TimeZero:

### Sensors NavData

The Sensor NavData is used to display numerical values received from sensors connected to the computer. The font color is white for data that is received directly from a sensor and yellow when the data is being computed by TimeZero from a sensor:



**Note:** In the example, above, Speed Over Ground (SOG) is displayed in white because it is directly received from the GPS. The True Wind Speed (TWS) is displayed in yellow because it is computed by TimeZero from Apparent Wind (received from the sensor) and Speed.

The following Sensor NavData are available:

- Date/Time
- Boat Position
- COG - Course Over Ground
- SOG - Speed Over Ground
- DPT - Depth

**Note:** The Depth can be configured to display the value below the keel or below sea level using the "Depth Display" from the [Initial Setup](#) Options

- SST - Sea Surface Temperature
- HDG - Boat Heading (can be computed by TimeZero from SOG when the speed is over 1kn)
- STW - Speed Through Water (also known as Speed Over Water)
- Set - Current Direction (can be computed by TimeZero from COG, STW, Heading and SOG)

- Drift - Current Speed (can be computed by TimeZero from COG, STW, Heading and SOG)
- TWD - True Wind Direction. If True Wind Direction is not sent by the wind sensor, it can be computed by TimeZero from Apparent Wind Angle with Heading/Speed through Water ("Surface" reference) or COG/SOG ("Ground" Reference). "Surface" or "Ground" can be selected from the [Initial Setup](#) Options ("True Wind and VMG Calculation")
- TWA - True Wind Angle. If True Wind Angle is not sent by the wind sensor, it can be computed by TimeZero from Apparent Wind Angle with Heading/Speed through Water ("Surface" reference) or COG/SOG ("Ground" Reference). "Surface" or "Ground" can be selected from the [Initial Setup](#) Options ("True Wind and VMG Calculation")
- TWS - True Wind Speed. If True Wind Speed is not sent by the wind sensor, it can be computed by TimeZero from Apparent Wind Speed and Speed through Water ("Surface" reference) or SOG ("Ground" Reference). "Surface" or "Ground" can be selected from the [Initial Setup](#) Options ("True Wind and VMG Calculation")
- AWA - Apparent Wind Angle
- AWS - Apparent Wind Speed
- VMG - Velocity Made Good. If VMG is not received, it can be computed by TimeZero from True Wind Direction and Speed through Water ("Surface" reference) or SOG ("Ground" Reference). "Surface" or "Ground" can be selected from the [Initial Setup](#) Options ("True Wind and VMG Calculation").
- Atmospheric Pressure
- Air Temperature
- Humidity
- HDOP
- Boat Position Lat/Lon: always displays the boat position in Lat/Lon even if another unit has been selected as coordinate system.
- % Polar: Only available with the Routing module
- Bottom Hardness %: Only available with the Bottom Hardness module
- Door Spread: Only available with the Trawl Positioning module
- Pitch
- Roll
- Heave
- Fuel Time to Empty (computed by TimeZero from Fuel Tank Level and Fuel Rate)
- Fuel Distance to Empty (computed by TimeZero from Fuel Tank Level, Fuel Rate and Speed)
- Fuel Rate

To change the data displayed in a sensor NavData, just right click and select a new data from the contextual menu. The NavData will be immediately updated and display the selected data.

It is possible to configure one NavData to cycle through multiple data. Just right click on the NavData, select "Add" and choose the data you want to add. The NavData will begin to cycle between the two data. You can repeat this operation and add more data to cycle through. To stop the cycle, uncheck all data from the "add" contextual menu.

**Note:** The cycle speed can be changed from the [General](#) Options by adjusting the "NavData Multi Data Dwell Time" setting.

## Route NavData

Route NavData are used to display various numerical values linked to the Active Route computed by TimeZero. Note that by default an "Active Route NavData" giving you basic information about the active route is configured inside the "Navigation" NavData panel. If that does not give you enough information, Route NavData can be configured manually. Note that if a route or Go To is not activated, the Route NavData will display dashes ("--"). The font color of the Route NavData is red:



The following Route NavData are available:

- BTW - Bearing to Waypoint: indicates the course to steer to reach the active Waypoint from own ship position. This value does not take into account any current and is simply the course as it would be plotted on a chart. This value corresponds to the "CTS" column in the list.
- HTS - Heading to Steer (real time): indicates the course to steer to reach the active Waypoint from own ship position taking into account the real time variations caused by wind and/or currents. The HTS (real time) is computed by TimeZero from the CTS and the drift vector.
- HTS - Heading to Steer: indicates the course to steer to reach the active Waypoint from own ship position taking into account the Tidal Currents embedded in TimeZero.

**Note:** The HTS will display the same value as CTS if there is no Tidal Currents near the Active Leg.

- NEXT - Next Course: indicates the CTS to follow after the next Waypoint. This is useful to see if a major course change is needed after passing the Active Waypoint.
- TTG - Time To Go (using VMC): indicates the time that it will take to reach the Active Waypoint. TimeZero computes this value using the DTW and the VMC.
- DTW - Distance To Waypoint: indicates the distance remaining to reach the Active Waypoint from own ship position.
- XTE - Cross Track Error: indicates the distance the vessel is to one side of the straight line between the Active Waypoint and previous Waypoint (or position where the route was Activated if the Active Waypoint is the first of a route or a Go To).
- ETA - Estimated Time Arrival: indicates the arrival date and time taking into account the Tidal Currents along the route and the real time speed.
- TTA - Time To Arrival: indicates the time remaining to reach the end of the route taking into account the Tidal Currents along the route and the real time speed.
- DTA - Distance to Arrival: indicates the distance remaining to reach the end of the route.
- VMC - Velocity Made good on Course: indicates the speed made towards the Active Waypoint. This is computed by TimeZero from the component of SOG that is in the direction of the Active Waypoint. In other words, the VMC is "the speed at which you approach the Active Waypoint".

To change the data displayed in a Route NavData, just right click and select a new data from the contextual menu. The NavData will be immediately updated and display the selected data.

It is possible to configure one NavData to cycle through multiple data. Just right click on the NavData, select "Add" and choose the data you want to add. The NavData will begin to cycle between the two data. You can

repeat this operation and add more data to cycle through. To stop the cycle, uncheck all data from the "add" contextual menu.

## Active Route NavData

When a route is activated, the Active Route NavData displays Distance, Time To Go and Estimated Time of Arrival of each waypoint:



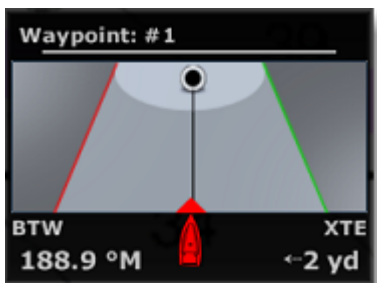
If the route contains many waypoints that do not fit inside the NavData, it is possible to scroll the content of the NavData to look at future waypoint information. Note that the last waypoint (the arrival) will always be visible at the bottom of the NavData.

Note that this NavData automatically expands and contracts to occupy the remaining space of the NavData container. If you undock the NavData, a right click on it will allow you to set the size it occupies (to display 5, 10 or 15 waypoints).

You can right click on this NavData to configure its content. You can also select to only display the waypoints that have been named. This can be useful when you want to display only a couple of important waypoints in the list. In this case, simply double click on the waypoint (on the chart) to enter a name.

## Waypoint NavData

The Waypoint NavData displays information about the Active Waypoint. It combines in one screen a "highway" display (also known as "Helmsman" Display), and the XTE (cross track error) and BTW (Bearing to Waypoint) values.



## Gauge NavData

Gauge NavData are used to display values received from sensors connected to the computer in a graphic "gauge" type display. The font color is white for data that is received directly from a sensor and yellow when the data is being computed by TimeZero from a sensor:



The following Gauge NavData are available:

- Date/Time
- Bearing To Cursor
- TWD - True Wind Direction. If True Wind Direction is not sent by the wind sensor, it can be computed by TimeZero from Apparent Wind Angle with Heading/Speed through Water ("Surface" reference) or COG/SOG ("Ground" Reference). "Surface" or "Ground" can be selected from the [Initial Setup](#) Options ("True Wind and VMG Calculation")
- TWS - True Wind Speed. If True Wind Speed is not sent by the wind sensor, it can be computed by TimeZero from Apparent Wind Speed and Speed through Water ("Surface" reference) or SOG ("Ground" Reference). "Surface" or "Ground" can be selected from the [Initial Setup](#) Options ("True Wind and VMG Calculation")
- Atmospheric Pressure
- Air Temperature
- COG - Course Over Ground
- SOG - Speed Over Ground
- DPT - Depth

**Note:** The Depth can be configured to display a value below the keel or below sea level using the "Depth Display" from the [Initial Setup](#).

- SST - Sea Surface Temperature
- HDG - Heading (can be computed by TimeZero from SOG when the speed is over 1kn)
- STW - Speed Through Water (also known as Speed Over Water)
- TWA - True Wind Angle (can be computed by TimeZero from Apparent Wind and STW or Apparent Wind and SOG)
- AWA - Apparent Wind Angle
- AWS - Apparent Wind Speed
- VMG - Velocity Made Good

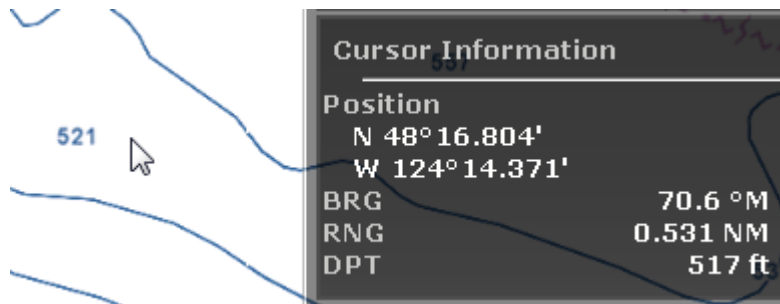


- Total Fuel Flow
- Fuel Flow #1
- Fuel Flow #2
- Fuel Flow #3
- Fuel Flow #4

Most of the Graphic NavData scale can be adjusted from the [Initial Setup](#) Options under "Graphic Instruments Setup".

## Cursor NavData

The Cursor NavData displays various information related to the cursor position on the screen:



If you right click on the Cursor NavData you can configure what information you want to display.

The following data can be displayed inside the Cursor NavData:

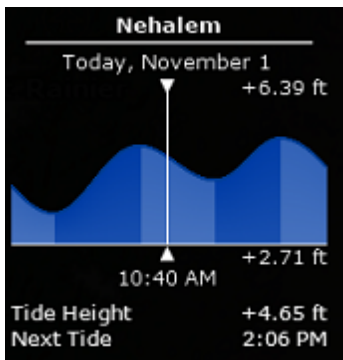
- Position: indicates the position of the cursor on the screen using the position unit selected from the [Units](#) Options.
- Position Lat/Lon (hidden by default): indicates the position of the cursor on the screen using the Lat/Lon unit.

**Tips:** If you set the Position Unit to Loran/TD, this data allows you to display at the same time Lat/Lon and Loran/TD for cursor position.

- BRG: indicates the bearing from own ship
- RNG: indicates the range from own ship
- DPT: indicates the depth below cursor.
- Hardness %: indicates the bottom hardness value (from 0 to 100%) when Bottom Hardness is displayed on the chart (requires compatible sounder and PBG module)
- Time to cursor (hidden by default): indicates the time it would take to reach the cursor position from own ship using the current speed.

## Tide NavData

This NavData displays and updates in real time the nearest Tides information from your own ship position:



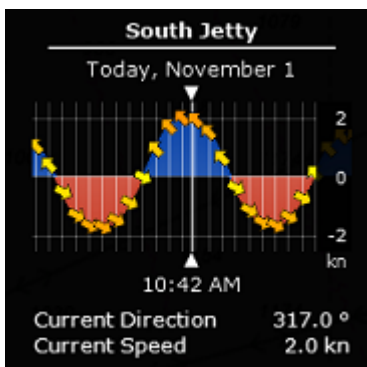
The maximum search distance for Tide Stations is 50NM. If there is no tide station within this distance, the NavData will display no information.

Note that it is possible to choose and fix the Tide Station being displayed in the NavData by selecting a Tide Station as a "Reference Station". Just right click on a Tide icon on the chart and select "Use as Reference Station". To release the reference station, you can right click on the NavData and select "Set Auto".

**Tips:** If you right click on the NavData you can select "Open Tide Graph", this will open the full Tide Graph for that station.

### Current NavData

This NavData displays and updates in real time the nearest Current station information from your own ship position:



The maximum search distance for Current Stations is 4NM. If there is no current station within this distance, the NavData will display no information.

**Note:** It is not possible to fix a Tidal Current station. Currents are always automatically selected based on distance from own ship.

**Tips:** If you right click on the NavData you can select "Open Current Graph", this will open the full Current Graph for that station.

### Weather NavData

The Weather NavData displays the weather forecast under the cursor using numerical value:

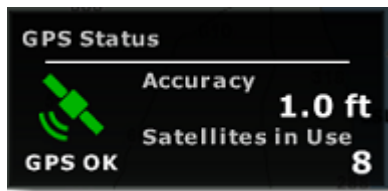
Weather Information	
Wind Dir.	301.6 °M
Wind Spd	10.7 kn
Cur. Dir.	167.3 °M
Cur. Spd.	0.5 kn
Wave Dir.	96.3 °M
Wave Height	+4.40 ft
Wave Period	0'08s
Pressure	1,021 hPa

In the "Planning" WorkSpace, the time of the forecast is set by the timeline. In the "Navigation" WorkSpace, the time of the forecast is always set by computer current time.

You can right click on the NavData to add or remove specific weather data.

### GPS Status NavData

The GPS Status NavData displays in large font "GPS OK" (in green), "Poor GPS" in yellow or "NO GPS" (flashing in red):



It also displays the GPS accuracy (based on HDOP ) and the number of satellites that are used to compute the position fix.

**Note:** In order for the accuracy to be displayed in the NavData, the HDOP must be received in TimeZero (NMEA sentence GGA or GNS or GSA or PGN129029 or PGN129539). In order for Satellites in Use to be displayed, the NMEA0183 sentence GGA or GNS must be received. The GPS Poor quality indicator is a combination of HDOP and Satellites in Use (when HDOP > 4 or Satellite in use < 4).

### Laylines NavData

The "Routing Module" needs to be unlocked to access this feature

The Laylines NavData displays the Port and Starboard layline optimum Course and Distance as well as Time To Go ("time to tack").

LayLine Information	
<b>Port</b>	
Optimum Cap	119.9 °
Distance	787 yd
Time to go	4'27s
<b>Starboard</b>	
Optimum Cap	52.9 °
Distance	828 yd
Time to go	5'30s

Please refer to the [Laylines](#) chapter for more information.

### Trip Odometer NavData

The Trip Odometer NavData allows you to keep track of various trip statistics:

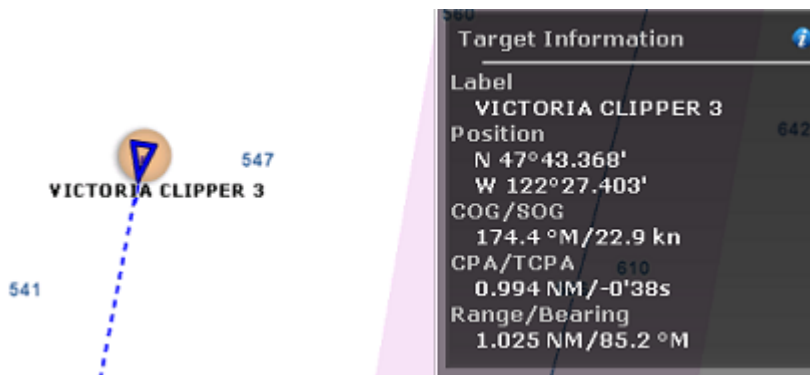
Trip Information	
Date Set	1/12/2016
Duration	3h20'
Avg. Speed	6.9 kn
Max. Speed	10.0 kn
Trip	23.05 NM
Odometer	23.05 NM

Note that all values (except Odometer) can be reset by right clicking and select "Reset". You can also enable or disable some information by right clicking on the NavData. Like in a car, the Odometer is never reset.

**Tips:** if you change computer or reset to factory default, the Odometer value will go back to 0. If you press and hold the CTRL key while right clicking on the NavData, a new item "Restore Odometer Value" will appear allowing you to enter any number.

### Target Information NavData

The Target NavData displays detailed information about the selected target (AIS, ARPA or DSC). To select a target, just click on it. The target will become surrounded in yellow and the information will be displayed in the Target Information NavData:



Note that once a target is selected (surrounded in yellow), you can select other objects (such as Marks or Boundaries) without affecting the target selection. Only selecting another target will change the target selection.

If you click on the "i" icon (blue icon on the top right), it will open the full target property window.

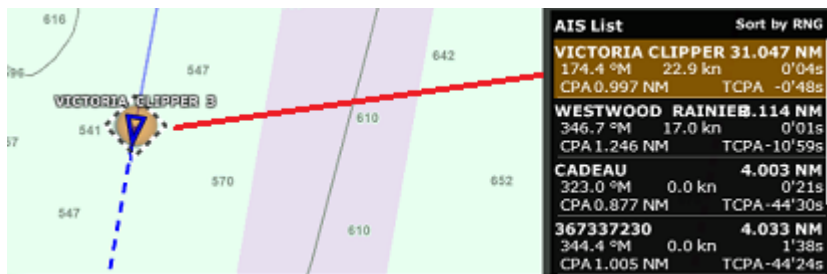
### AIS and ARPA List NavData

The AIS and ARPA NavData lists display a list of AIS or ARPA targets with basic information (to fit in the NavData):

AIS List		Sort by RNG	
<b>VICTORIA CLIPPER</b>	<b>31.042 NM</b>	174.5 °M	23.0 kn
		0'01s	CPA 0.997 NM
			TCPA -0'43s
<b>WESTWOOD RAINIEB.</b>	<b>0.888 NM</b>	349.2 °M	17.0 kn
		0'02s	CPA 1.158 NM
			TCPA -10'39s
<b>CADEAU</b>	<b>4.003 NM</b>	323.0 °M	0.0 kn
		0'16s	CPA 1.190 NM
			TCPA -43'28s
<b>367337230</b>	<b>4.033 NM</b>	344.4 °M	0.0 kn
		1'33s	CPA 1.304 NM
			TCPA -43'18s
<b>ZEEHAEN</b>	<b>4.067 NM</b>	85.4 °M	0.0 kn
		0'44s	CPA 1.321 NM
			TCPA -43'58s
<b>WALLA WALLA</b>	<b>4.154 NM</b>	247.7 °M	0.0 kn
		0'10s	CPA 3.579 NM
			TCPA 23'46s

The list can be sorted by Range, CPA , TCPA or SOG when you right click on the NavData. You can also select the type of data you want to see for each target (COG/SOG and/or CPA/TCPA). Note that this NavData automatically expands and contracts to occupy the remaining space of the NavData container. If all targets cannot be displayed in the space available (more likely with the AIS list), it is possible to scroll the content of the AIS or ARPA NavData.

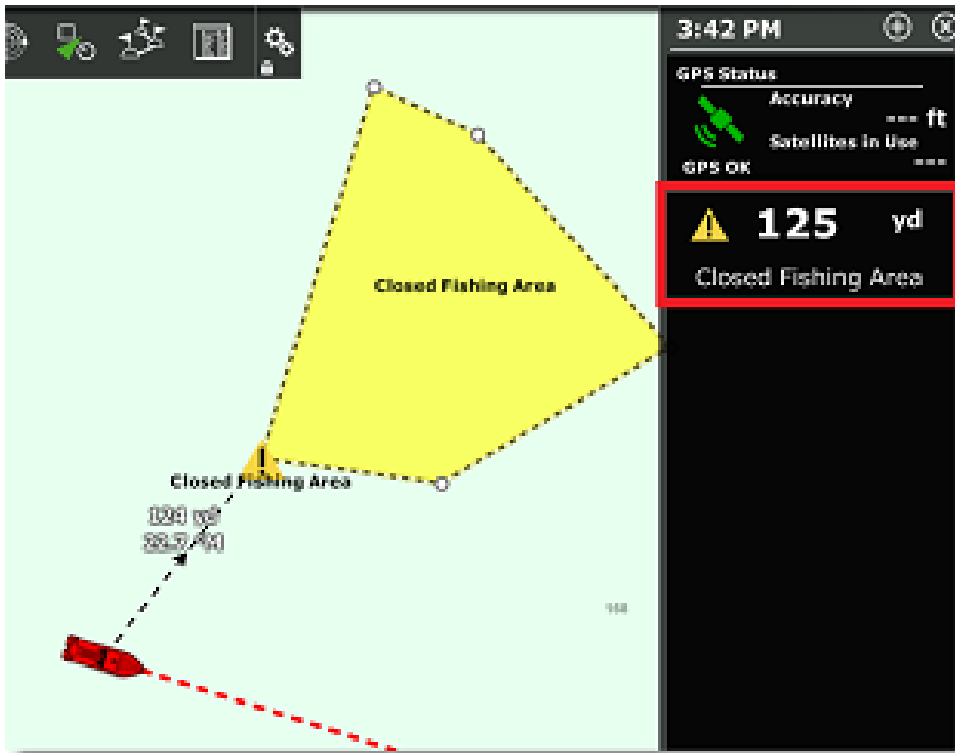
You can click on any item of the list and TimeZero will automatically center the chart on the corresponding target. Also, if you click on a target on the chart, it will highlight it inside the list and scroll if necessary:



If you undock the NavData, a right click on it will allow you to set the size it occupies (to display 5, 10, 15, or 20 targets).

## Alarm Zone NavData

Any Boundary Area can be set as an alarm zone by right clicking on the area and selecting "Own Ship Alarm". The Alarm Zone NavData is used to display the distance to the closest alarm boundary area. TimeZero will start by raising a notification when approaching the Alarm zone (you can set the distance of th "Own Ship Alarm Zone Warning" under the [Alarms](#) Options) then raise an alarm if the boat enters the alarm zone. The NavData will reflect the notification by displaying a yellow warning sign when the boat approaches the zone and red warning sign if the boat enters the alarm zone:



Note: When the distance to the alarm zone becomes smaller than the "Own Ship Alarm Zone Warning" value, a divider line is automatically displayed from the boat icon to the closest point of the alarm zone.

### Event NavData

The Event NavData allows you to quickly drop a mark under your boat with a specific icon and color. You can customize the icon and color of all the 11 events by clicking on the "i" icon available on the top right corner of the NavData:



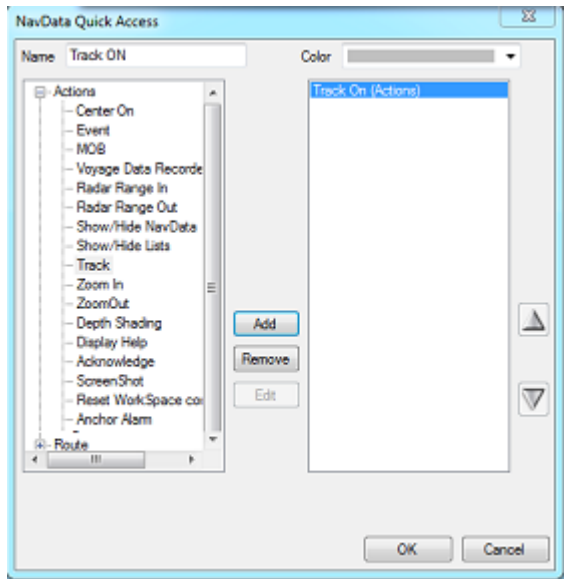
Note that events are extremely useful when fishing. You could preset specific icons and colors having a specific meaning (good pot, medium pot, bad pot) and simply use the cursor to immediately drop a mark containing the relevant information at your current position. Note that you can also use your keyboard by pressing the 0 to 9 numerical key and the Enter key (the Enter key corresponds to the bottom right event icon while the 0 key corresponds to the bottom left).

### Quick Access NavData

The Quick Access NavData allows you to assign almost any function of TimeZero to a button that can be quickly activated:

## TRACK ON

When you add a Quick Access NavData, it will be empty by default. Simply click on it to open the configuration window:



This window allows you to enter the name that will be displayed on the button, the color and the Action(s) you want to perform. You can perform virtually any action available in TimeZero. Note that you can combine (add) multiple action to the same button similar to macros! For example, you could configure a button to select 2D mode, turn OFF the Depth Shading and set the orientation mode to Head Up.

### Radar Control NavData

The Radar Control NavData gives quick access to the most used radar control: Gain, Sea (STC ) & Rain (FTC ):



**Tips:** Click on the "A" to switch from Manual to Automatic mode for the selected parameter.

The Radar Control NavData can also display the "Tune" bar (read only). Simply right click on the NavData and add "Tune" to the NavData configuration.

### Advanced Radar Control NavData

The Advanced Radar Control NavData gives quick access to the more advanced radar filters. Click on the filter value to cycle through the various mode:

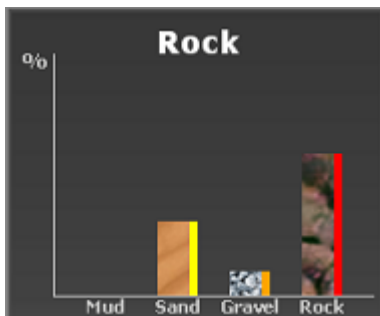
Advanced Radar Control	
Echo Averaging	1
Echo Stretch	Low
Int. Reject.	Medium
Video Contrast	1-C
Noise Rejection	On

You can customize the NavData by right clicking on it.

### Bottom Discrimination NavData

The Furuno Sounder Module and a Furuno BBDS1 or DFF1-UHD Ethernet Sounder are required to access this feature

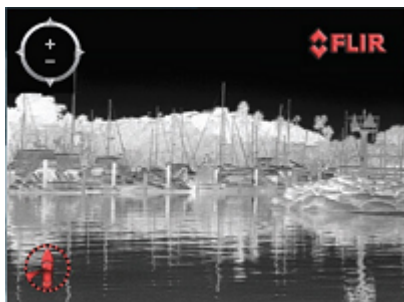
This NavData displays real time bottom discrimination information when TimeZero is connected to a Furuno BBDS1 or DFF1-UHD Ethernet Sounder:



The four "bar graph" display the real time probability value of having either Mud/Sand/Gravel/Rock below the transducer. The colors located on the right side of each bar indicate the color of the corresponding type if the track color is set to variable according to bottom classification (from the [Ship & Tracks Options](#)). At the top of this NavData, TimeZero displays the name of the highest probability bottom type.

### Camera NavData

This NavData displays a video feed. If the camera has Pan, Tilt, and Zoom (PTZ) capabilities, a virtual joystick will appear when you roll your cursor over the NavData:



You can change the video source of the NavData by right clicking on it.

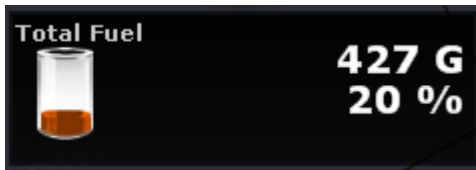
If the camera has additional features (such as the Flir M-Series), the right click contextual menu also gives access additional commands (Scan, Home, Scene, IR/Visible switch, etc...).

For more information, please refer to the [Camera NavData](#) Chapter.



## Fuel Tank Level NavData

This NavData displays the Total Fuel Level:



You can display individual tank level by right clicking on the NavData. The NickName of the Fuel Tank can be changed from the [Initial Setup](#) Options (under the "Fuel" Category).

**Note:** The Tank Level indicator can be used for other type of fluid than Fuel (for example grey water tank). If you are not using a specific tank for fuel, make sure to disable it from the Fuel computation in the [Routes](#) Options (uncheck "use fuel tank # in vessel computation")

## Multibeam NavData

The PBG module and WASSP Module are required to access this feature

The Multibeam NavData allows you transmit and standby the WASSP DRX (with WASSP Generation 3 system), enable or disable PBG and select the PBG depth source:



When selecting "Multi" the multibeam sounder (multiple points) will be used as PBG source. When selecting "Single" the regular depth (on point) will be used as PBG source. Typically, multibeam sounders are not able to track bottom in deep water. If you also have a traditional monobeam sounder connected to TimeZero, it may make sense to switch the PBG source to "Single" in deeper water.

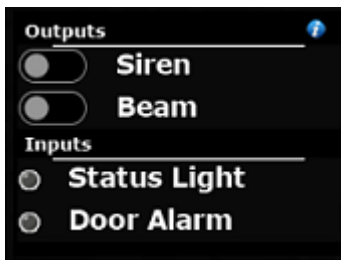
A status indicator (green/red) is displayed under the "Multi" and "Single" selection to show you which type of data is currently available.

## User Object Filters NavData

This NavData displays your user object filters using big buttons that are easy to toggle ON and OFF. For more information on how to create User Object filters, please refer to the [Filters](#) chapter.

## SeaLevel IO NavData

This NavData allows you to control and monitor relays and input status from the SeaLevel Network IO 110E and 120E.



You can right click on this NavData to select which Input and Output you want to monitor/control (up to 4 inputs and 4 outputs). You can click on the "i" icon located on the top right to configure the SeaLevel hardware and rename the inputs and outputs. For more information, please refer to the [SeaLevel Network IO](#) Chapter.

### Radio Direction Finder NavData

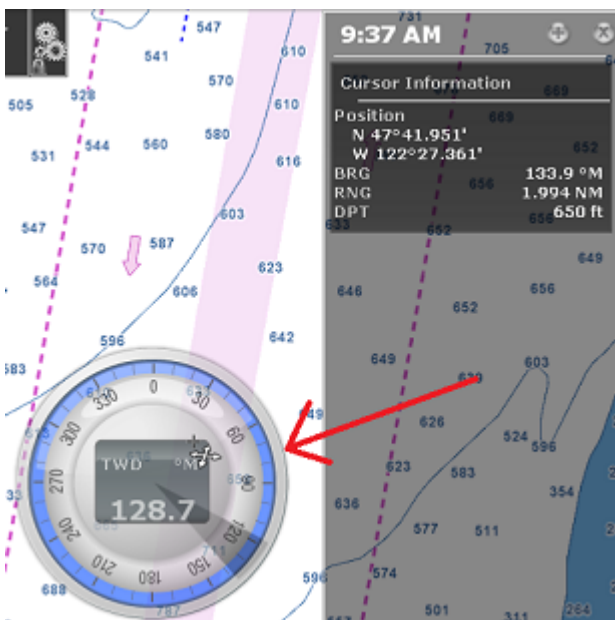
This NavData allows you to monitor the input of the RhoTheta Radio Direction Finder. It displays the information of the last bearing that was received together with channel number, frequency, and signal level:



For more information, please refer to the [Radio Direction Finder](#) Chapter.

### Undocking NavData

When you add a NavData (by clicking on the "+" icon of the NavData Panel), it appears initially inside the NavData panel. You can move the NavData outside of the panel ("undock the NavData") and placing it anywhere on the screen by clicking on it and dragging your mouse outside of the panel:



If the "Hide Undocked NavData" setting from the [General](#) Options is unchecked, the undock NavData will stay displayed on screen even if the NavData Panel is closed.

Undocked NavData can be made bigger or smaller by right clicking on them and choosing Decrease or Increase Size.

**Tips:** If you want to "lock" the undocked NavData to prevent them from being accidentally moved after placing them on the screen, you can check the "Lock Undocked NavData" setting from the [General](#) Options.

To dock a NavData back into the NavData panel, just drag it back inside the panel.

When a NavData is undocked, it become part of the configuration of the WorkSpace. This means that you can undock independent NavData in each WorkSpace.



## Weather

### Introduction

After [registering](#) TimeZero to your My TIMEZERO account, you will be able to download free weather forecast and basic oceanography data. You can receive the data from our server using a direct Internet connection, using an [Iridium Go](#) or by E-mail (with a file attachment). Weather data can then be displayed and animated from the Planning WorkSpace.

In addition to free weather forecast and basic oceanography data, you can subscribe to a [Premium Ocean-O service](#) that will provide higher resolution oceanographic data.

**Note:** TimeZero also has the capability to [open standard GRIB file](#).

### Requesting a Weather File

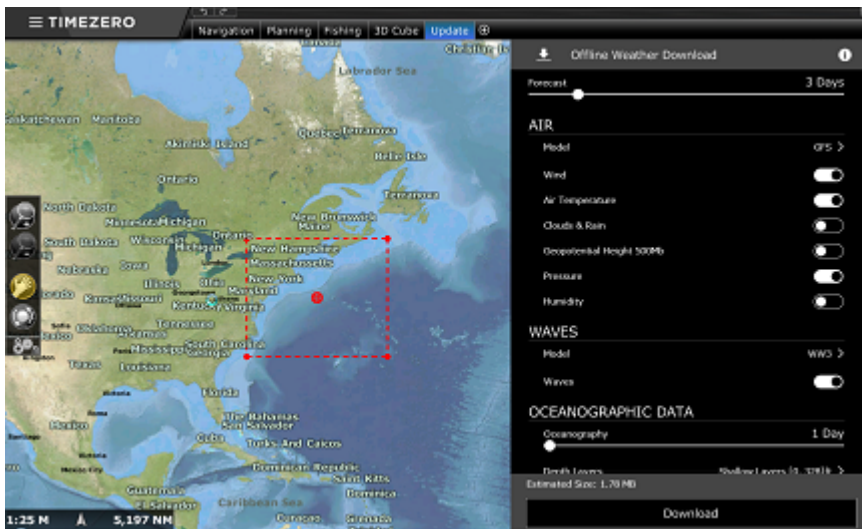
**IMPORTANT:** In order to be able to request a weather file, you have to [register](#) your copy of TimeZero.

You can update the weather data from the "Update" WorkSpace. This WorkSpace allows you to define an area, select the parameters you want, and retrieve the weather data. If you have a direct Internet connection or if you have an [Iridium Go](#), the weather file is downloaded directly within TimeZero. If you are using a Satellite Phone or low-bandwidth connection, you can choose to request the file by E-mail instead and receive it as an attachment.

By default, TimeZero will use the "High Speed Internet" download method (that takes advantage of parallel downloads). But if you are using a satellite or a low bandwidth connection, it is recommended to change the download method to "Satellite or Low Bandwidth Internet" from the [Weather](#) Options. If you use an Iridium Go make sure to refer to the [Iridium Go](#) chapter.

#### **To request a weather file:**

- Select the "Update" WorkSpace then pan and zoom the chart to display roughly the area where you want to receive a weather forecast.
- Select the "Update Area" Tool from the Toolbar.
- Click and drag the cursor on the chart to draw an area, or move the existing area
- Select the parameters you want from the menu on the right side of the screen
- Click on the "Download" / "Request by E-mail" button



**Note:** The default weather download method set in TimeZero is "direct" (download via Internet). You can change the download method to E-mail or Iridium Go from the [Weather Options](#).

When you choose to retrieve the Weather file by e-mail TimeZero will open the default e-mail client set on your computer to create a request. After sending this request, our server will reply with an e-mail containing an attached file (.twz file) that can be opened in TimeZero.

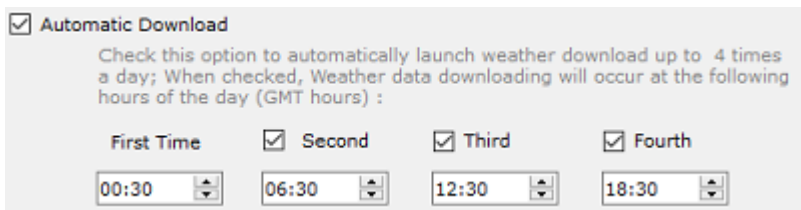
Note that the e-mail containing the **weather file will be sent to the same e-mail address that was used to request the weather file.**

**Tips:** To change the default e-mail client of the computer, open Internet Explorer, select the TOOLS menu, INTERNET OPTIONS, PROGRAMS.

If you have an Iridium Go, TimeZero will automatically trigger the connection to the satellite and establish the communication. Please refer to the [Iridium Go](#) chapter for more information.

**Setup an Automatic Weather Download Schedule:**

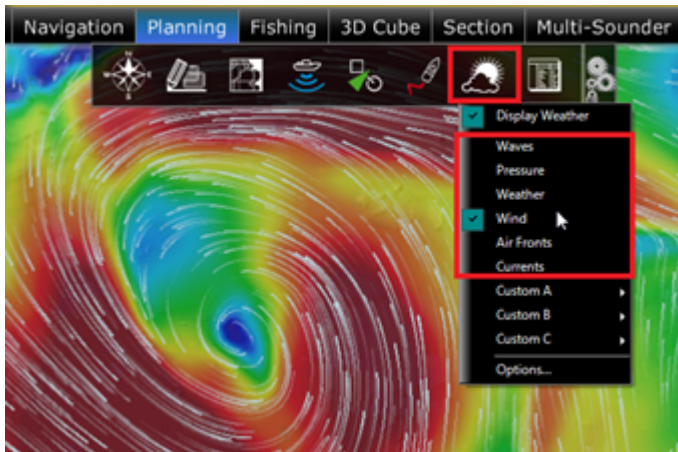
Once an initial request has been performed (after setting up a weather download area and selecting parameters from the Update WorkSpace), it is possible to automate the weather download by enabling a schedule from the [Weather Options](#). TimeZero will then automatically, and up to four times per day, initiate a download in the background:



**Displaying Weather Data**

**Displaying Graphically**

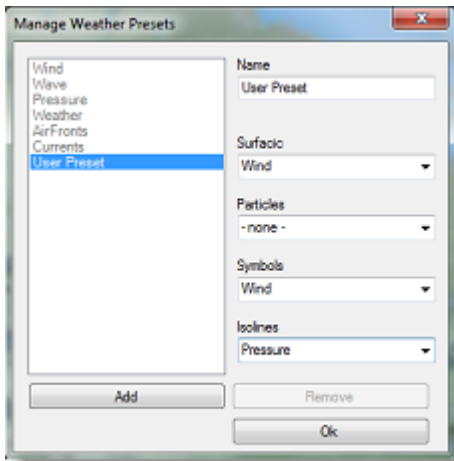
When you download a Weather File from the Update WorkSpace, TimeZero automatically loads the data for you. You just have to select the "Planning" WorkSpace, click on the "Weather" button in the Ribbons and select "Display Weather". TimeZero offers a new and innovative weather presentation using particle animation. It is now very easy to visualize the "flow" of weather and oceanographic conditions such as wind, currents and waves:







**Note:** When receiving the weather file by e-mail or from a third party provider, you first need to open the file in TimeZero. Please refer to the [Opening a Weather File](#) Chapter.

Once "Display Weather" is checked, you can choose from various display presets or select a custom display.

To create a custom display, select "Manage Weather Presets". A window will appear allowing you to create or modify existing user presets:



When the Wind is displayed using symbols (Weather Feather), the icon and color give you an estimation of the wind direction and wind speed. The size and number of feather indicates wind speed (add 5Kn for a small feather and 10Kn for a big feather):

	This icon and color are used if the wind is in between 0 and 2.5Kn
	This icon and color are used if the wind is in between 2.5 and 7.5Kn (one small feather)
	This icon and color are used if the wind is in between 7.5 and 12.5Kn (one big feather)
	This icon and color are used if the wind is in between 12.5 and 17.5Kn (one big feather and a small feather)

When a weather data is displayed in color, a scale will be displayed on the lower left.

### Displaying Numerical Value

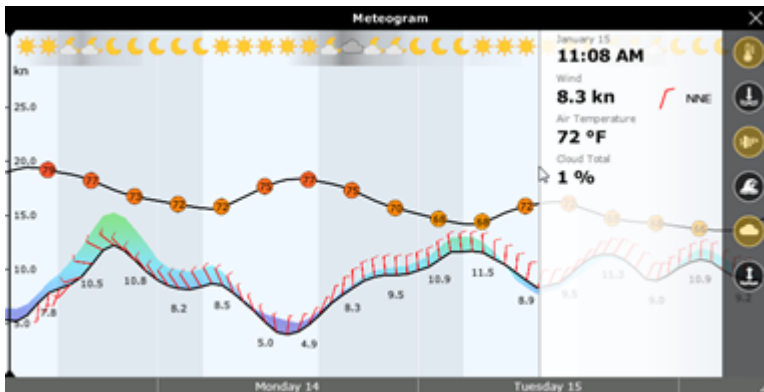
The Weather information NavData can be used to display weather data using numerical values. It is displayed by default in the "Planning" NavData panel. This NavData displays weather condition under the cursor and is updated as you move the cursor over the weather data on the chart. If the "Weather Information" NavData is not displayed, click on the "+" icon on the top of the NavData panel and select "Weather Information":

Weather Information	
Wind Dir.	301.6 °M
Wind Spd	10.7 kn
Cur. Dir.	167.3 °M
Cur. Spd.	0.5 kn
Wave Dir.	96.3 °M
Wave Height	+ 4.40 ft
Wave Period	0'08s
Pressure	1,021 hPa

You can customize the weather data displayed in the NavData by right clicking on it.

### Meteogram

A "Meteogram" window can be opened by right clicking anywhere on the chart and selecting "Show Meteogram". The Meteogram allows to see a graphical presentation of one or multiple meteorological variables with respect to time at a particular location. If you click and hold the cursor inside the Meteogram window, numerical values will be displayed at the cursor position:

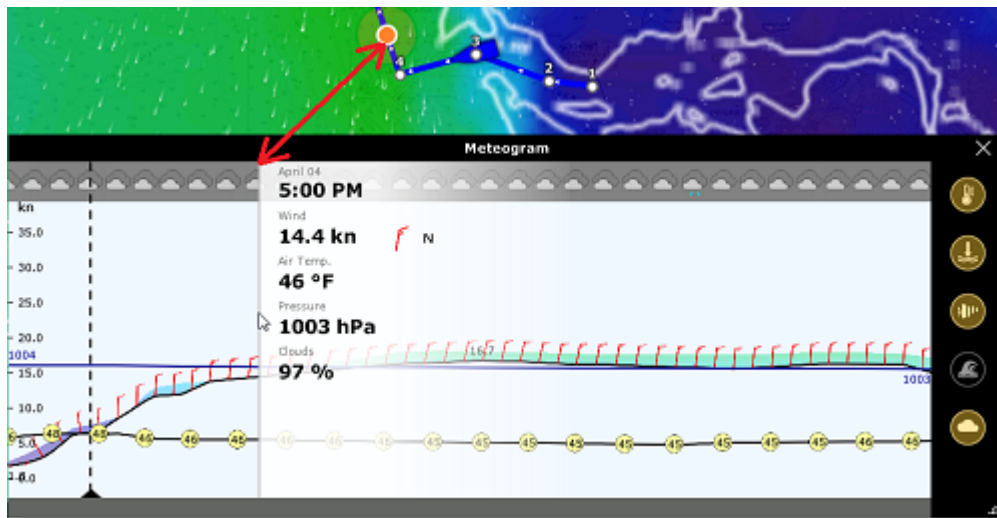


**TIPS:** You can change the scale of the Meteogram with the scroll wheel.

The Meteogram can be very useful to see the evolution of weather at a specific point (represented by the orange dot on the chart) and determining the best departure or arrival time. Note that you can drag the orange dot on the chart to change the Meteogram location and see the change applied in the window in real time.

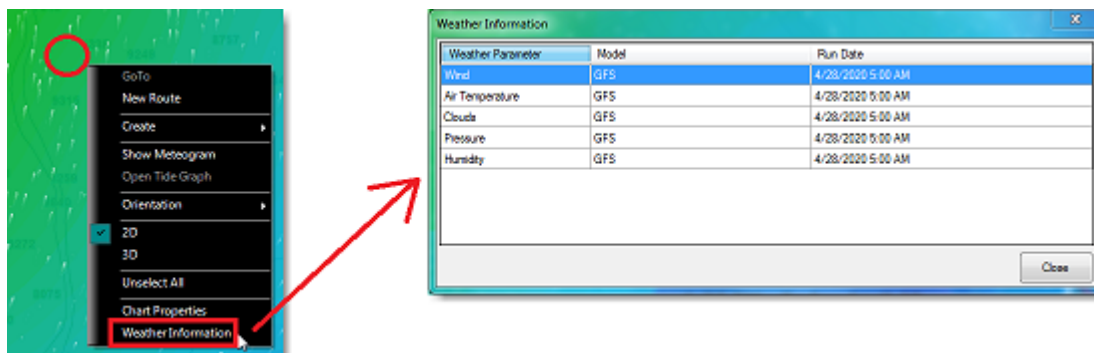
The Meteogram can also be displayed along a route by right clicking on a route. The route projected speed and ETA will be used to show the various conditions that you will encounter along the journey. As you move your cursor over the Meteogram, you will see the orange dot move along the route to indicate the location of the weather forecast:





### Weather Info (Source and Run date)

If you would like to know the weather validity (run date) or weather source, you can right click anywhere on the chart (when the weather is displayed) and select "Weather Information":



A window will appear listing all the weather parameters available at that location with their corresponding model and run date.

### Weather Type and Coverage

The following Weather Data is available from the free Weather Service:

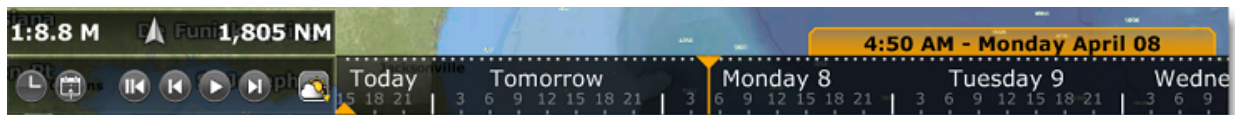
- Wind: This data contains wind speed and wind direction forecast and is available globally (90°N/90°S/0°-360°). The wind direction is given by the angle of "where the wind is coming from".
- Air Temperature: This data contains the Air Temperature forecast and is available globally (90°N/90°S/0°-360°).
- Pressure: This data contains atmospheric pressure forecast at sea level and is available globally (90°N/90°S/0°-360°).
- Clouds & Rain: This data contains the Cloud Coverage and Rain forecast and is available globally (90°N/90°S/0°-360°).
- Humidity: This data contains the humidity forecast and is available globally (90°N/90°S/0°-360°).

- Wave: This data contains Wave Height and Wave Direction forecast and is available only on open oceans (excluding Great Lakes and Mediterranean) in between 78°N and 78°S (0°- 360°). The wave direction is given by the angle of "where the wave is going to".
- Current: This data contains Oceanic Currents Speed and Direction at the time it was requested (one observation). This data has limited availability (47.04°N/78, 64°S & 0°- 360°). The current direction is given by the angle of "where the current is going to".  
Note that the [Premium Ocean-O Service](#) offers multi-layer currents (current data available at multiple depth) as well as up to 10 days forecast.
- Sea Surface Temperature: This data contains the Sea Surface Temperature at the time it was requested (one observation). This data is available in between 65°N and 60°S (0°- 360°).  
Note that the [Premium Ocean-O Service](#) offers higher resolution Sea Surface Temperature (8 times more accurate). The [Premium Ocean-O Service](#) also offers multi-layer sea water temperature (temperature data available at multiple depth) as well as up to 10 days forecast.
- Sea Surface Height: This data contains the Altimetry at the time it was requested (one observation). This data is the ocean height anomaly from average sea level. This data is available in between 60°N and 60°S (0°- 360°)
- Chlorophyll: This data contains the Chlorophyll concentration at the time it was requested (one observation). This data is available in between 52°N and 50°S (0°- 360°)

**Note:** The [Premium Ocean-O Service](#) offers additional high resolution and multi-layer data (Thermocline, Salinity, Oxygen, Ph, Sea Ice etc...)

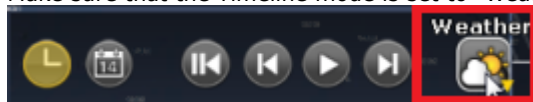
## Animate Weather Forecast




The "Planning" WorkSpace allows you to play time-lapse movies of Weather Forecast thanks to the time line located at the bottom of the screen. When you display weather, the timeline automatically switches in "Weather Mode" matches the duration of the weather forecast:



### To make an animation:

- Display weather information on the chart (select "Display Weather" from the "Weather" button located in the Ribbon)
- Make sure that the Timeline mode is set to "Weather Mode":

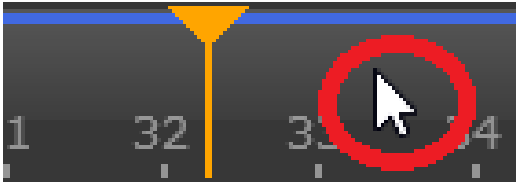


- Click on the "Rewind" ("File Start") button: 
- Click on the "Play/Pause" button to start/pause the movie: 
- To reset the virtual time back to the current time, click on the "Actual Time" button: 

- To step forward and backward using the file forecast interval, click on the "Step Back/Forward" buttons:



You can also scroll through time at various speeds by dragging your mouse in the timeline:



**TIPS:** You can adjust the replay speed from the [General](#) Options by adjusting the "Animation Replay Speed" setting.

**Note:** Whenever the Chart Time is different from the current computer local time, the Date/Time text is surrounded in yellow.

## Opening a Weather GRIB File

TimeZero is compatible with GRIB file (GRIB 1 format only) downloaded from the weather service or third party service. To open a weather GRIB file in TimeZero:

- Click on the TIMEZERO Button and select "Open Weather File"
- Browse and select the GRIB file then click on "Open"

**Tips:** When receiving a weather file by e-mail, you can directly open the attachment and load it in by double clicking on it.

If you open a GRIB file that was downloaded or generated from a third party source or software, TimeZero might not be able to display all layers of data (the GRIB format contains more than 200 type of parameters!). Below is the list of GRIB data layer that TimeZero can render:

- ugrd (33) Wind Direction & Speed
- vgrd (34) Wind Direction & Speed
- prmsl (2) Pressure
- tmp (11) Air Temperature
- tcdc (71) Cloud
- prate (59) Precip.
- swell (105) Waves
- htsgw (100) Waves
- wvhgt (102) Waves
- swper (108) Wave Period
- swdir (104) Wave Direction
- wvper (103) Wave Period

- wvdir (101) Wave Direction
- perpw (108) Wave Period
- dirpw (107) Wave Direction
- uogrd (49) Current Direction & Speed
- vogrd (50) Current Direction & Speed
- spc (48) Current Direction & Speed
- dirc (47) Current Direction
- wtmp (80) Sea Surface Temperature
- dist (8) Sea Surface Height

### **Premium Ocean-O Service**

In addition to the standard (free) weather and oceanographic data, a premium service providing higher resolution and multi-layer data can be purchased through your dealer. The high-resolution oceanographic data available with this service is a key factor in targeted fishing for the optimal performance. Subscription to this service also unlock a new WorkSpace (the "Ocean-O" WorkSpace) that was designed and optimized to visualize, filter and combine all the oceanographic data in order to find the best fishing spots.

	Included	Premium Ocean-o
Wind	25Km	1Km (selected area)
	GFS (0.25 * 0.25)	GFS (0.25 * 0.25) Arome (0.01 * 0.01) Arpege (0.1 * 0.1) NAM CONUS USA (0.03 * 0.03) ICON Europe (0.06 * 0.06) ICON Global (0.12 * 0.12)
Wind Gust	25Km	1Km (selected area)
	GFS (0.25 * 0.25)	GFS (0.25 * 0.25) Arome (0.01 * 0.01) Arpege (0.1 * 0.1) NAM CONUS USA (0.03 * 0.03) ICON Europe (0.06 * 0.06) ICON Global (0.12 * 0.12)
Pressure	50Km	50Km
	GFS (0.5 * 0.5)	GFS (0.5 * 0.5) Arome (0.5 * 0.5) Arpege (0.5 * 0.5) NAM CONUS USA (0.5 * 0.5) ICON Europe (0.5 * 0.5) ICON Global (0.5 * 0.5)
Air Temperature	25Km	1Km (selected area)

	GFS (0.25 * 0.25)	GFS (0.25 * 0.25) Arome (0.01 * 0.01) Arpege (0.1 * 0.1) NAM CONUS USA (0.03 * 0.03) ICON Europe (0.06 * 0.06) ICON Global (0.12 * 0.12)
Cloud	25Km	1Km (selected area)
	GFS (0.25 * 0.25)	GFS (0.25 * 0.25) Arome (0.01 * 0.01) Arpege (0.1 * 0.1) NAM CONUS USA (0.03 * 0.03) ICON Europe (0.06 * 0.06) ICON Global (0.12 * 0.12)
Precipitation	25Km	1Km (selected area)
	GFS (0.25 * 0.25)	GFS (0.25 * 0.25) Arome (0.01 * 0.01) Arpege (0.1 * 0.1) NAM CONUS USA (0.03 * 0.03) ICON Europe (0.06 * 0.06) ICON Global (0.12 * 0.12)
Humidity	25Km	1Km (selected area)
	GFS (0.25 * 0.25)	GFS (0.25 * 0.25) Arome (0.01 * 0.01) Arpege (0.1 * 0.1) NAM CONUS USA (0.03 * 0.03) ICON Europe (0.06 * 0.06) ICON Global (0.12 * 0.12)
Wave (Signifiant)	50Km	3Km (selected area)
	WW3 (0.5 * 0.5)	WW3 (0.5 * 0.5) Arome (0.02 * 0.02) Arpege (0.1 * 0.1) Copernicus Global (0.08 * 0.08)
Surfacic Current	8Km	8Km
	(0.08 * 0.08)	(0.08 * 0.08)
Sea Surface Temperature	16Km	1Km
	(0.16 * 0.16)	(0.01 * 0.01)
Sea Surface Height (Altimetry)	8Km	8Km
	(0.08 * 0.08)	(0.08 * 0.08)

Chlorophyl	4Km	4Km
	(0.04 * 0.04)	(0.04 * 0.04)
Water Temperature (Multi-Layer)	N/A	8Km
		(0.08 * 0.08)
Thermocline	N/A	8Km
		(0.08 * 0.08)
Dissolved Oxygen (Multi-Layer)	N/A	25Km
		(0.25 * 0.25)
Primary Production	N/A	25Km
		(0.25 * 0.25)
Phytoplankton	N/A	25Km
		(0.25 * 0.25)
Current (Multi-Layer)	N/A	8Km
		(0.08 * 0.08)
Shear	N/A	8Km
		(0.08 * 0.08)
Sea Ice	N/A	8Km
		(0.08 * 0.08)
Sea Water Ph	N/A	25Km
		(0.25 * 0.25)

## Type of Oceanographic Data

### Sea Surface Temperature (SST)

SST or "Sea Surface Temperature" has been used by fishermen for a long time and it is one of the most well-known data. SST data comes from satellite (observation). For that reason, it is very accurate (less than 1km), and is updated regularly (once per day). But as satellites cannot see through water (infrared is used to detect temperature), they cannot see through clouds, and therefore raw SST data has "holes". In TimeZero, the SST data is "corrected" to fill holes with computed data from models and various other sources such as water temperature measured by vessels.

Every fish has its "comfort" temperature zone, so fishermen use water temperature to find suitable areas to target specific species. SST will be particularly useful for fish that can be found near the surface. Fishermen also

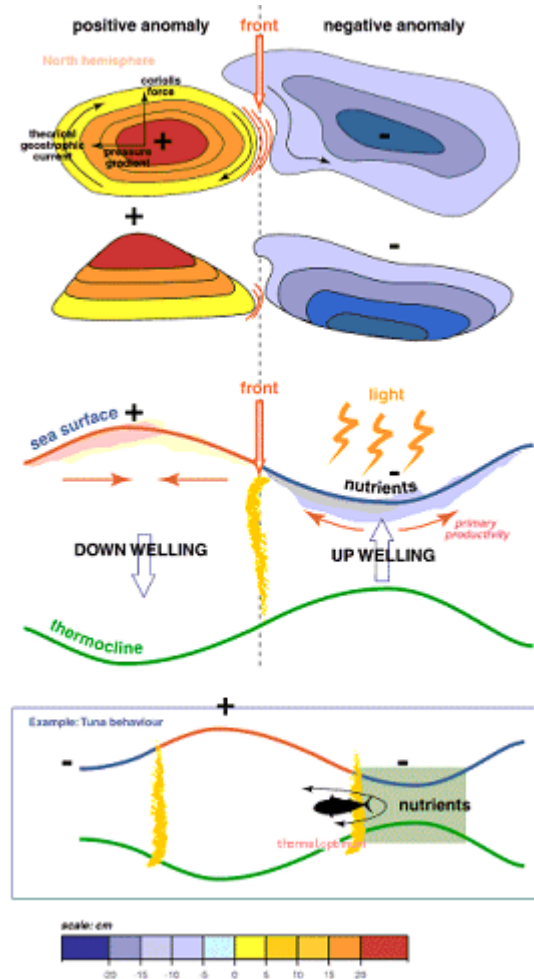
look for temperature break, i.e. areas where the temperature varies quickly. Such fronts act like natural barriers for fishes that tend to accumulate or swim along them. It is recommended to use the "Front" presentation type for SST to easily locate these areas.

### Sea Water Temperature (SWT)

SWT or "Sea Water Temperature" is very similar to SST but is not restricted to the surface. SWT has several depth layers and TimeZero makes it possible to check water temperature at any depth (using the Oceanogram, Plot Window or manually setting the Depth Layer). SWT is computed from advanced oceanic models and is not as accurate as SST which comes from satellite observations. However, the advantage of SWT is its ability to provide water temperature at multiple depths allowing TimeZero to compute thermocline (see below). Because SWT is computed from a mathematical model, it also provides up to 10 days forecast. In summary, SWT can be very useful for species that may not be always found near the surface.

### Sea Surface Height (SSH - Altimetry)

The sea surface level is not flat! The water level rises and falls according to the water column temperature and other factors. Water which is relatively colder will be heavier than warmer water. This heavier water will cause a difference in SSH or "Sea Surface Height" (also referred sometimes as "Altimetry"). High spots in the ocean surface column associated with positive values are usually nutrient-poor waters. Low spots in the ocean surface column associated by negative values are nutrient-rich areas and have everything needed to attract food for pelagic fish and other predators that are at the top of the food chain. Many times, areas found between high and low spots form "oceanic highways" where fish are most likely to be found (because fish like to hunt in low areas and rest in high areas). Finding SSH "fronts" (near SSH=0m) is important for fishermen, because fishes like Tuna often cross this border.



### Chlorophyll, Phytoplankton & Primary Production

Chlorophyll is a color pigment found in plants, algae, and phytoplankton. The chlorophyll data comes from satellite (observation), while Phytoplankton & Primary Production are computed from models (partially deduced from chlorophyll data). Chlorophyll is commonly used by fishermen because there is a well-known correlation between chlorophyll concentration and fish location. Small fishes like to stay in high concentration areas where the food (microorganisms) can be found. Larger fishes like Tuna are more likely to be found at the edge of areas that are high in chlorophyll concentration. They usually go hunt inside the high concentration areas to feed, but then retreat in low-chlorophyll concentration areas to find "comfort" (better visibility with more oxygen). It is recommended to use the Chlorophyll with the Front presentation type to locate these areas (edge).

### **Thermocline**

Water temperature usually decreases slowly according to depth, but sometimes, at a specific level, the water temperature can drop quickly. The depth where this rapid change occurs is called the thermocline. The thermocline consists of two parameters: Depth and Strength. The thermocline strength shows how quickly the water temperature changes, while the thermocline depth indicates its location in the water column. Note that the thermocline does not indicate a fish probability location, but instead gives an indication of the capturability (likelihood of capturing fishes at that location). When the thermocline is weak or well below the net, fish can escape from below and the capturability is low. However, when the thermocline is strong (sudden change of temperature) and when the net is located just above the thermocline, it acts like a natural barrier decreasing the likelihood of the fish to escape.

### **Current & Shear**

Current is a multi-layer data and it is possible to check speed and direction at the surface, but also at any depth. TimeZero uses that multi-layer data and compute the "shear" which is similar in principle to the thermocline, but for current data. The shear will indicate the depth at which currents change drastically. Nets that are positioned in high shear areas can become "distorted" by the currents variation and fishermen should avoid these areas.

### **Salinity & Dissolved Oxygen**

Salinity is the salt concentration in sea water. One unit of salinity is PSU (Practical Salinity Unit) is equal to 1 gram of salt per kilogram of water. Salinity is usually inversely proportional to dissolved oxygen (which is the O<sub>2</sub> concentration in sea water), so you can look at one or the other parameter according to your preference. Fish body tissues contain less salt than the water in which it lives. Fish regulates their own salt concentration by osmoregulation. But osmoregulation varies from one specie to the other, and they each all have their own salinity "comfort zone". Note that this data is usually not as important a factor as SST, Altimetry or Chlorophyll, but can be used as an additional filter to narrow a search area.

### **Sea Water pH**

As the amount of dissolved carbon dioxide in seawater increases, declining pH indicates increasing acidity. On average, pH level of the world's seas have already dropped—on average from 8.2 to 8.1 on the pH scale (lower numbers are more acidic). That's a 26 percent drop in the past century (because the pH scale is logarithmic). Ocean acidification is best known for its osteoporosis-like effects on shellfish, which makes building and maintaining shells difficult for these creatures such as commercially valuable oysters and clams.

### **Sea Ice**

Sea Ice includes Ice Concentration, Ice Thickness and Ice Drift Speed/Velocity. This data is very valuable in extreme North or South latitude.

## **Ocean-O Workspace**

When subscribed to the Ocean-O Premium service, a new "Ocean-O" display is unlocked after activating the service. To activate the service (once you have an active subscription), select the "Update" Workspace and click on the "Go Premium" button:



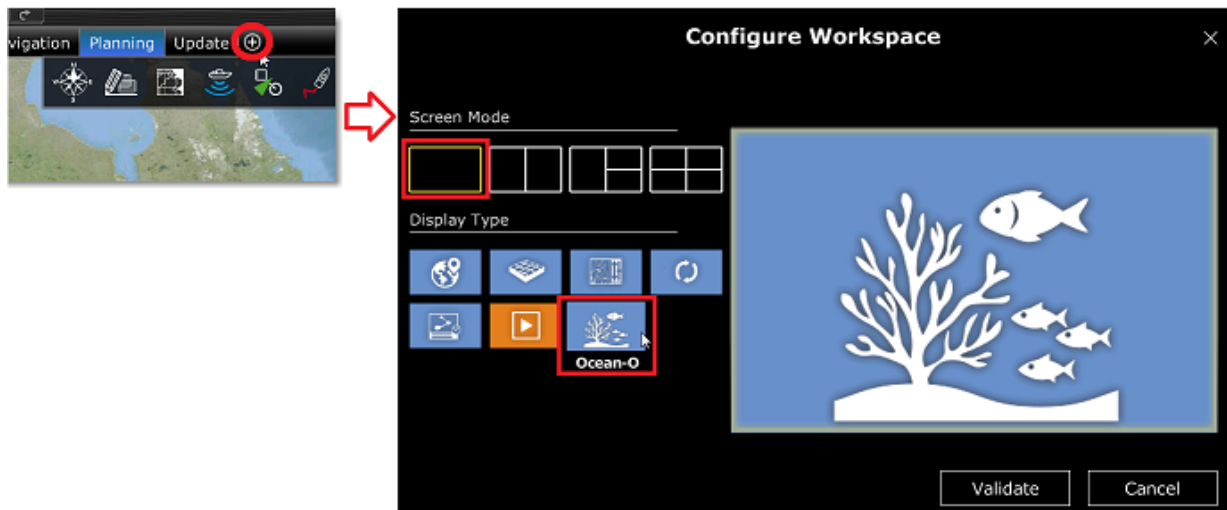


If you have an Internet connection, the activation will be automatic and you can start to download weather data right away. If you do not have an Internet connection, but are able to send/receive e-mail (using a Satellite Phone for example), you will be able to activate the service by e-mail (simply follow the on-screen instructions after clicking on "Go Premium").

Once the service is activated, you can configure the new Ocean-O display as a full or split screen WorkSpace (if you want to display two independent set of data side by side). The Ocean-O WorkSpace allows you to configure and precisely adjust the display of any type of oceanographic and weather data. For multi-layered data, it is possible to select the depth at which the data is rendered on screen. This WorkSpace also offers access to specific tools such as the Oceanogram, Auto-Filters and Plot window.

## Configuring the Ocean-O WorkSpace

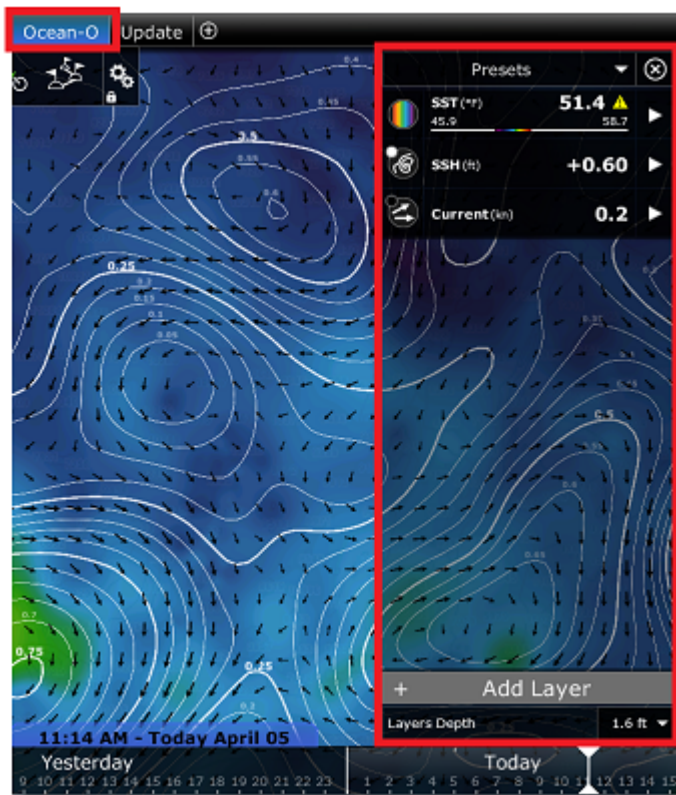
If the Ocean-O WorkSpace is not available at the top of your screen, click on the "+" button to add a new WorkSpace. Select the full screen mode or split screen mode and then select the "Ocean-O" display type:



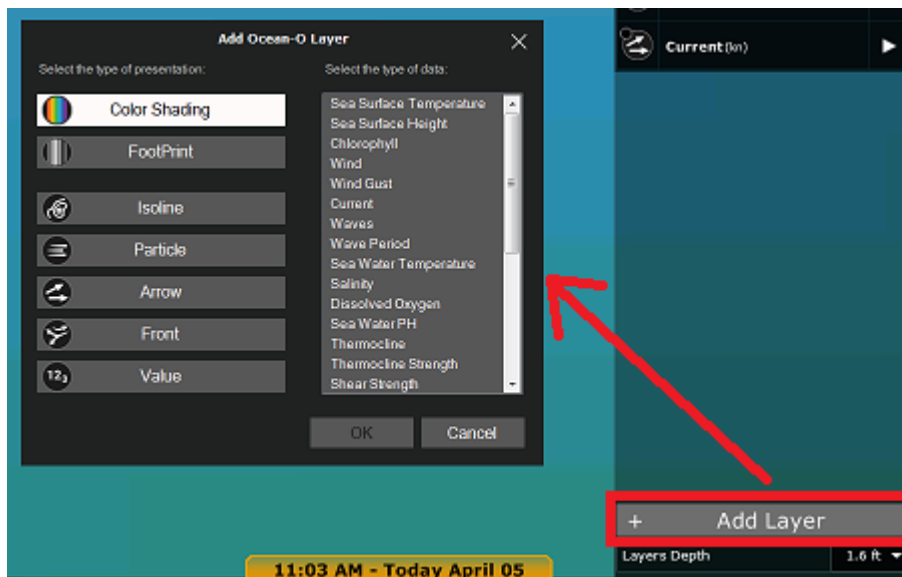
## Selecting and adjusting data display

**TIPS:** Before configuring the Ocean-O WorkSpace, it is recommended to [download](#) a weather file using the Update WorkSpace so that you are able to select and configure the data you want.

The Ocean-O WorkSpace includes additional controls on the right side of the screen (named the "Ocean-O panel") that allow to add, configure and display weather and oceanographic data:



By default TimeZero is configured with three "layers" (SST displayed in color, SSH displayed with isolines, and Currents displayed with arrows). To add a new layer, click on the "Add Layer" button located at the bottom of the Ocean-O panel. This opens a window that allows you to select the presentation and type of data you want to add:

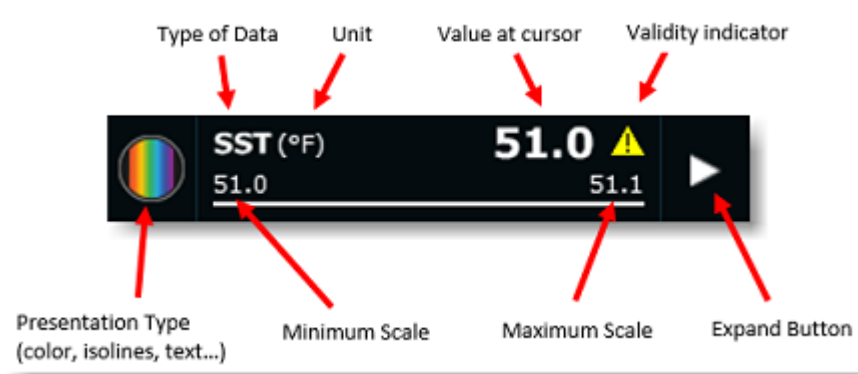


TimeZero offers various type of presentations:

- Color Shading: displays the data using a traditional color palette
- FootPrint: displays the data with a uniform shade that is useful when you want to combine and highlight areas that match multiple parameters (areas with overlapping footprint coverage will be displayed with a darker shade)

- Isoline: display the data with contour line and is useful when combined with another data type displayed in color (for example Sea Surface Temperature displayed in color together with Altimetry displayed with isoline)
- Arrow: shows the direction of a specific data (current, wind...)
- Front: highlights areas with a sudden change such as areas with big temperature change
- Value: displays text label on a fix grid

Once you selected the type of presentation, you can select the data type among what is available in TimeZero (what you have downloaded). After clicking on "OK" the layer will be added to the Ocean-O panel:



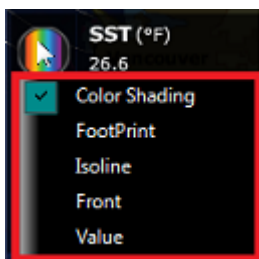
When the presentation type is set to isoline, footprint, label, value or arrow, a small dot will indicate the color used to display the corresponding data data:



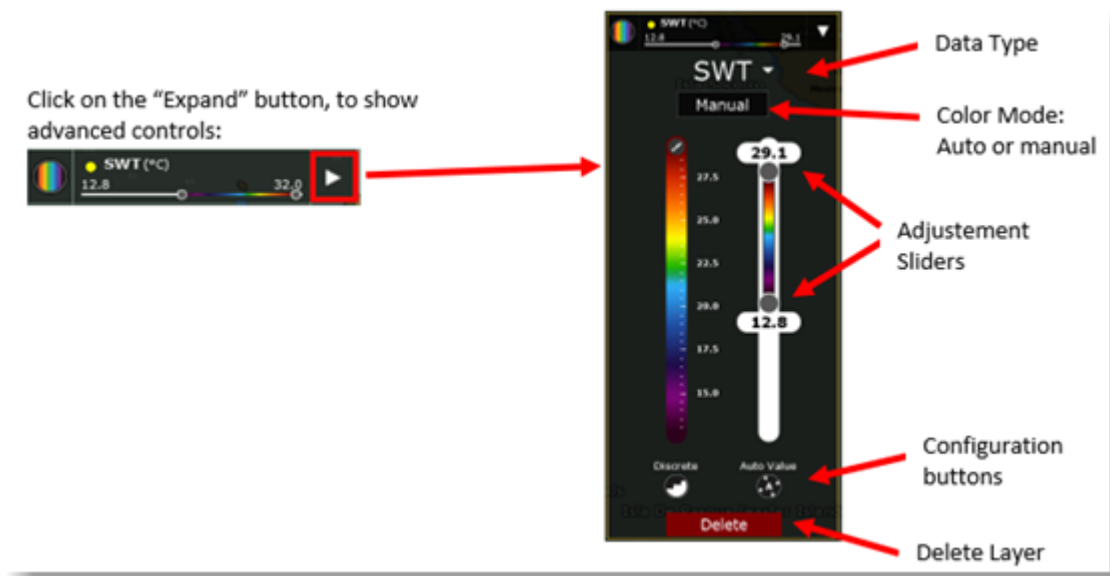
You can quickly toggle the display of the layer ON or OFF by clicking on the presentation type icon:



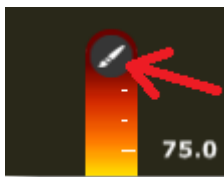
You can also change the presentation type of a layer that is already configured by right clicking on the presentation type icon:



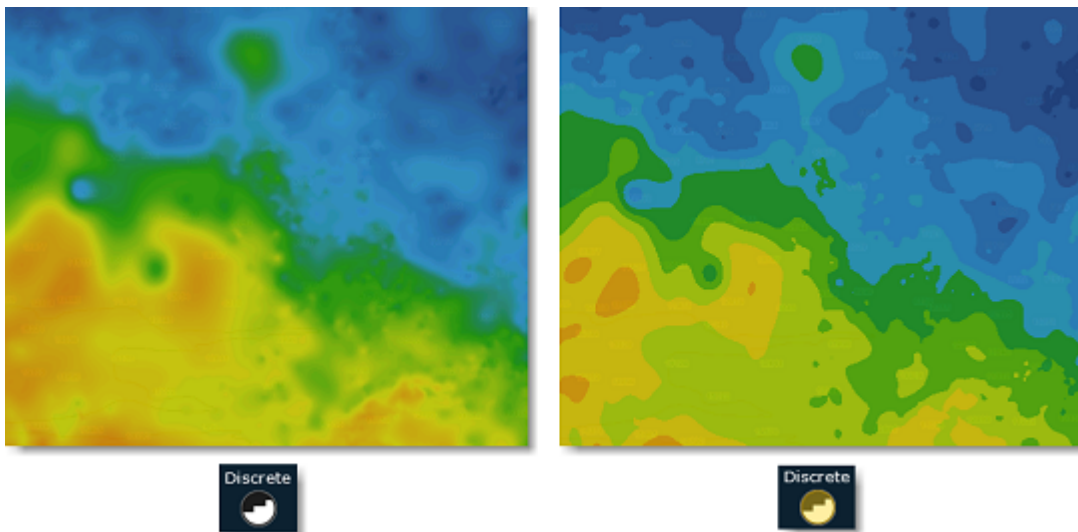
Note that the layer can be expanded or collapsed. When expanded, you can adjust many parameters that will affect how this data will be displayed on the chart:



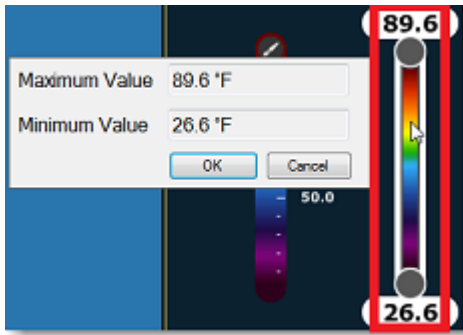
When the presentation type is set to Color Shading, you can change the color palette used by clicking on the pencil icon:



Note that you can choose to use "continuous" colors (default), or "discrete" colors if you press the corresponding button located at the bottom of the color scale:



The Color Shading presentation type has two operating modes: "Auto" or "Manual". In "Auto" mode, the maximum/minimum values applied to the color scale sliders are set automatically according to what is currently displayed on your screen (the screen coverage). This mode is very useful to highlights the variation of the data at any scale or location. However, if you prefer to set yourself the minimum/maximum scale sliders (to highlight specific areas matching these conditions), you can change the mode to "Manual". Note that in "Manual" mode, you can double click anywhere on the sliders to open a window that will let you enter the minimum and maximum value using your keyboard:

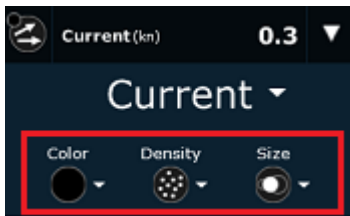


**TIPS:** When you are in "Manual" mode, you can press the "Auto Value" button. This will do a "one shot" automatic configuration of the maximum/minimum value according to what is currently displayed on your

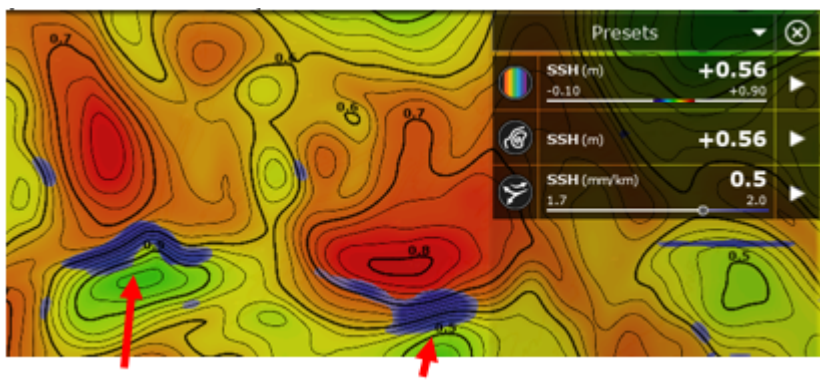


screen:

For other type of presentation (isolines, label, ...) expanding the layer will reveal various settings such as color, density or size:



Finally, user can select "Front" to highlight areas with a big gradient. Traditionally, quick changes in data value (big gradient) could be located by analyzing isolines (looking for areas with shorter distance in between lines) or by looking at the quick variation in color scale. But to save time, the "front" presentation type can be used instead. For example, in the picture below, the blue color highlights areas with sudden changes in Altimetry:



Note that with the Front presentation type, you can adjust a slider that will simply raise or lower the gradient intensity threshold.

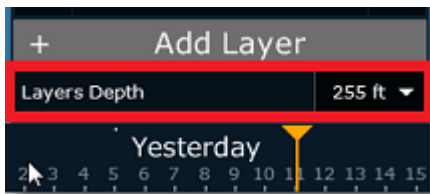
## Multi-layered data

Some data such as Sea Water Temperature, Currents, Salinity, Dissolved Oxygen and pH are available at multiple depth. When you select the data you want to download from the Update WorkSpace, you can also select the range of depth layers you want to include:





From the Ocean-O WorkSpace, a drop down menu will appear allowing you to select the depth you want to use for all the data that are multi-layered:

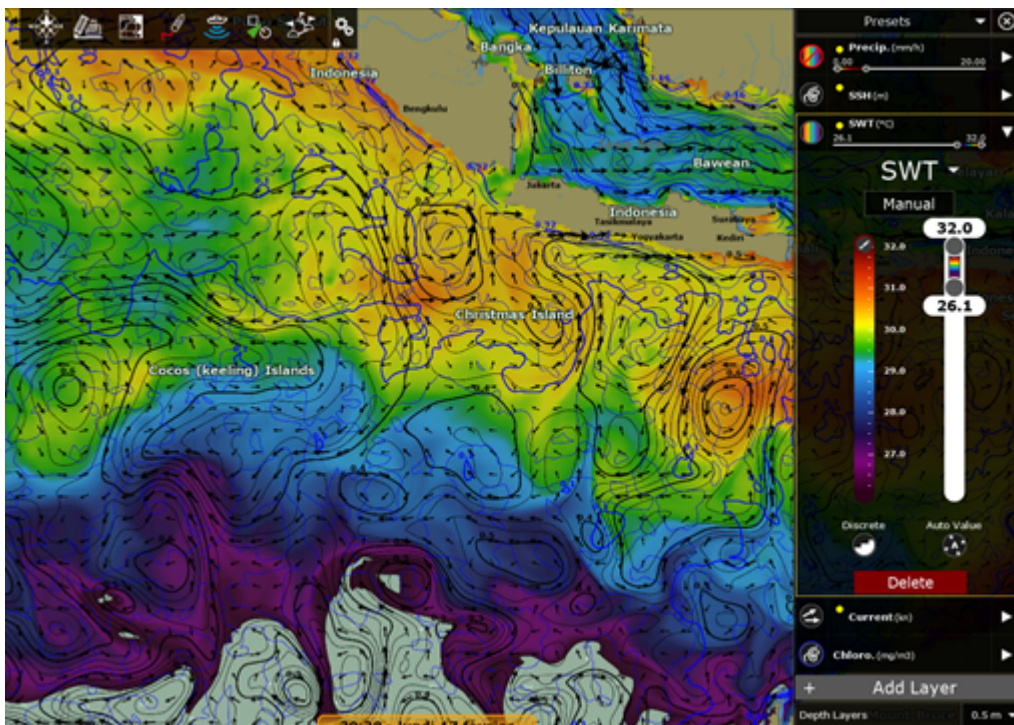


Note that additional tools (such as the Oceanogram and the Plot window) allows you to see and analyze multi-layered data according to depth. Please refer to the "Oceanogram" and "Plot Window" paragraphs below.

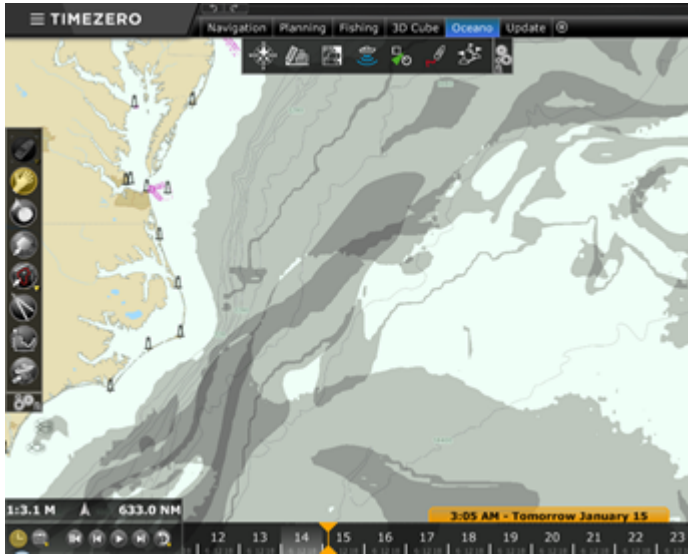
### Combining multiple type of data

A core strength of the Ocean-O WorkSpace is to be able to combine multiple type of data on your screen. You can add as many layers as you want and combine several types of data using different types of presentation. For example, in the picture below:

- Altimetry is displayed with black isolines
- Water Temperature is displayed in color shading, with colors varying from 26.1°C to 32°C
- Currents are displayed using black arrows
- Chlorophyll is displayed using blue isolines.



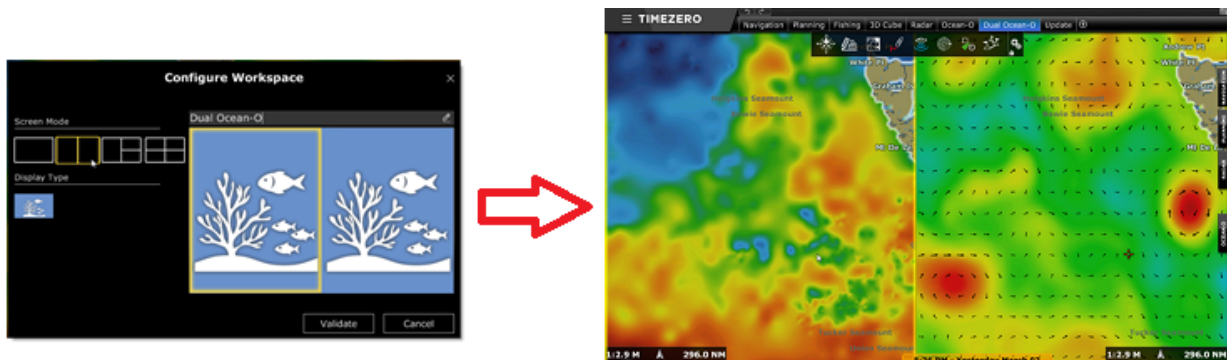
But if you want to highlight areas that match multiple parameters, you can use the "FootPrint" presentation type. FootPrint uses a uniform color showing on the chart the areas that contain data in between the minimum and maximum slider. By adding multiple "FootPrint" for various type of data you will see darker shade corresponding to areas that match multiple parameters:



Note that you can also use different color for each FootPrint. This might help you identify which parameters overlap or to highlight "no go" areas (for example area with big waves that would render fishing operation impracticable):



Another way to display multiple data at once is to configure a split screen with two Ocean-O display side by side. Simply create a new WorkSpace, divide the screen in two and select two Ocean-O display:



When you configure a WorkSpace with two Ocean-O display, the charts will be interlocked by default so that the same area is always displayed on the two sides as you pan and zoom the screen.

**Note:** You can disable the interlock by unchecking "Link Displays" from the "Mode" button in the Ribbon.

You also have access to another Ocean-O panel for the left side that you can configure completely independently.

**TIPS:** When you have two Ocean-O displayed side by side, the two panels will take lots of screen space. We recommend to close the Ocean-O panel once you are done with the initial configuration by clicking on the close button available on the top of the right panel next to the "Preset" selection (this will close both panels)

## Auto-Filter

Auto-Filter is a powerful feature that allows to automatically adjust the scale of all the layers that are visible from a specific data point selected on the chart. For example, if you have made a good fishing campaign and you are satisfied with your catches at a specific location, you may want to highlight on the chart other locations that matches the same characteristics (same SST, same Altimetry, same Chlorophyll Concentration...).

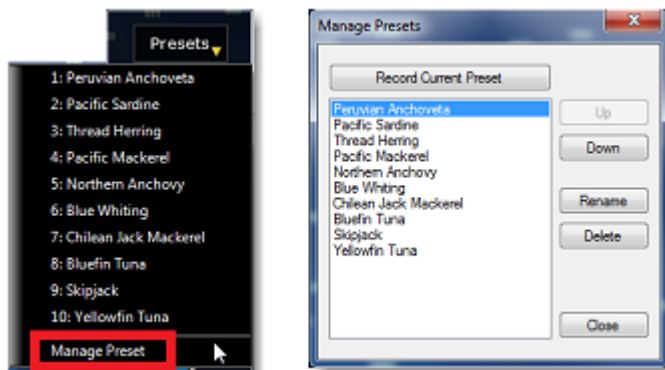
Simply right click on the location and select "Auto Filters". All visible layers that are setup with the Color Shading or Footprint presentation will automatically be adjusted so that other areas with the same criteria are highlighted on the chart. You can then save this state as a Preset (see below) so that you may compare multiple presets at a later time (and see if there is any correlation).

## Presets

TimeZero comes pre-loaded with a couple of presets that can be used as a starting point. To select a preset simply click on the "Presets" drop down menu at the top:



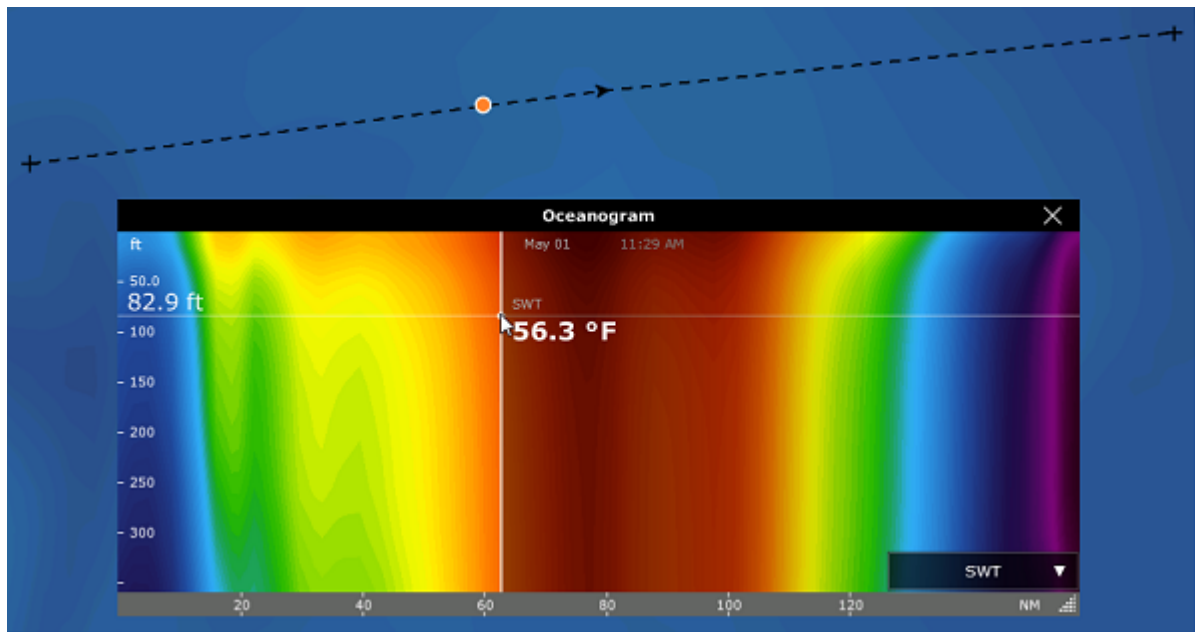
You can create (save) your own presets from the same drop down menu by selecting "Manage Presets":



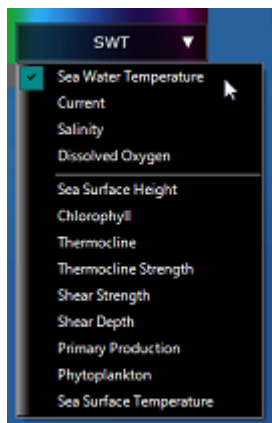
## Oceanogram

The Oceanogram is an advanced feature that allows you to study the profile of a water column parameter along a line:



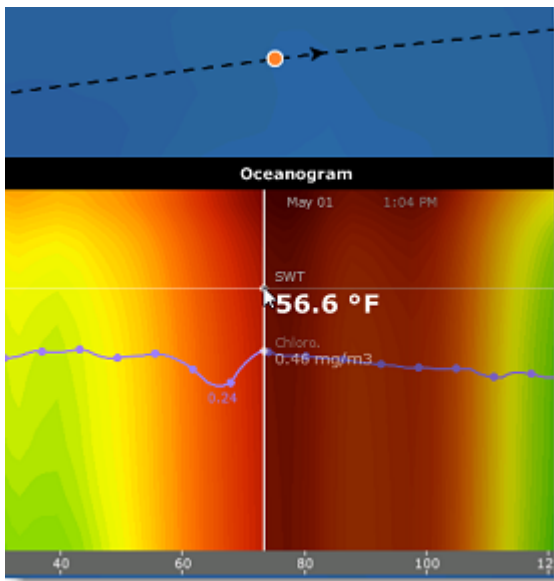


You can select the data you want to analyze using the drop down menu located at the bottom right of the window:



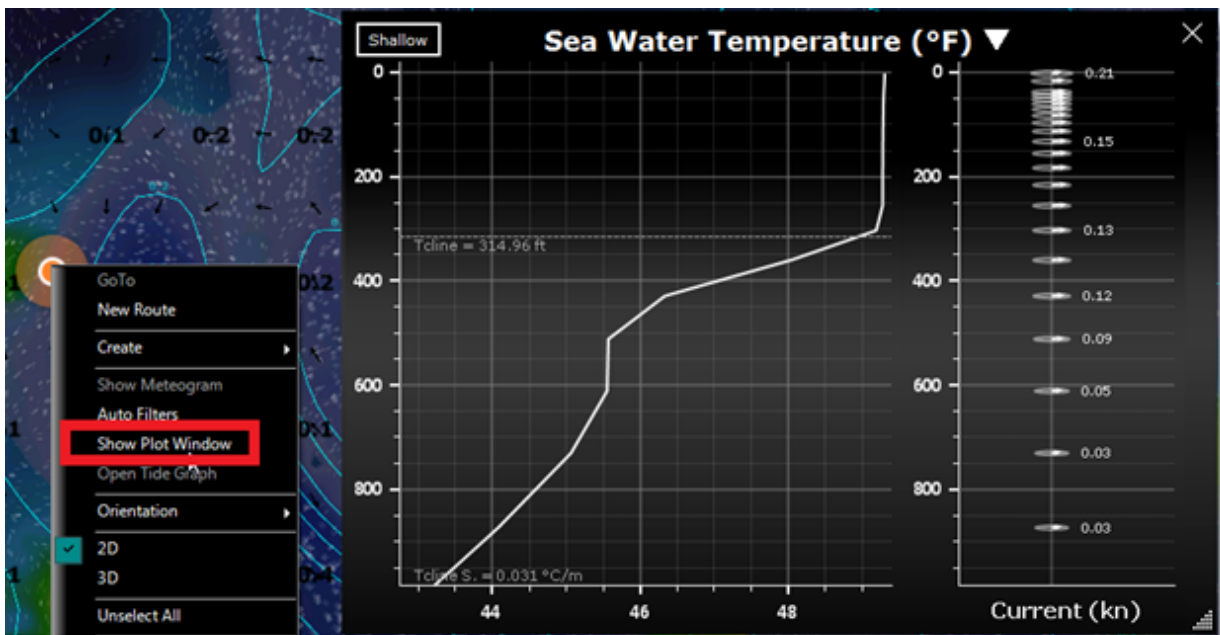
Note that the top selection allows you to select the multi-layered data you want to display in color, while the bottom selection allows you to superpose other type of "surfacic" parameter(s).

In the example below, the Sea Water Temperature is displayed in color (multi depth layer along the line) with the Chlorophyll curve (corresponding to chlorophyll data at the surface). It is interesting to note at the cursor position (marked by an orange dot on the chart) the rise of the chlorophyll on top of a warmer water column:



### Plot Window

The Plot window allows you to drill down into any multi-layered data (water temperature, currents, salinity, oxygen and PH). Simply right click anywhere and select "Show Plot Window". A graph showing the variation of the selected data according to the depth will be displayed. In the example below, the Sea Water temperature is being displayed at a location (indicated by the orange dot on the chart) revealing the thermocline depth:

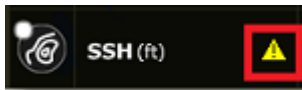


Note that the currents direction and intensity (according to depth) are also displayed on the right side.

### Forecast

Just like for weather data, some oceanographic data (data based on models and not observation) can include forecast data. Although Oceanographic data are not as "dynamic" as weather (they are much slower), forecasts will allow show you trend. When you select the data you want to download from the Update WorkSpace you can select a forecast range for both Weather data (at the very top) and Oceanographic Data. You can then use the timeline of the Ocean-O WorkSpace to adjust the time and display forecasts.

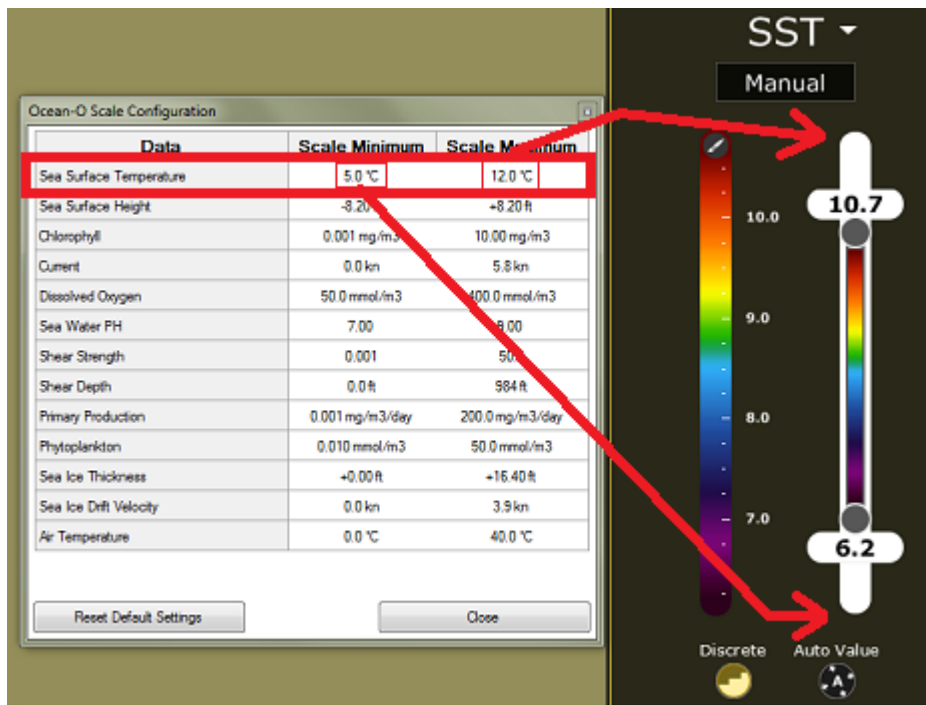
Note that if the timeline is set to a date that is farther than 48H apart from the last observation or forecast of a particular data, a warning will be displayed:



Note that it will be typically the case when adjusting the timeline in the future for data that cannot be forecasted (such as SST which is an "observation" only).

## Advanced Settings

To support a wide array of customers, TimeZero uses default minimum and maximum scale values that are very wide. For example, by default, the SST sliders can go down from -3C to +32C. But you will certainly not need such a wide range for your application. So, in order to make the sliders easier to adjust, you can change every minimum and maximum scale values from the [Weather](#) Options by clicking on the "Ocean-O Scale Configuration" button:



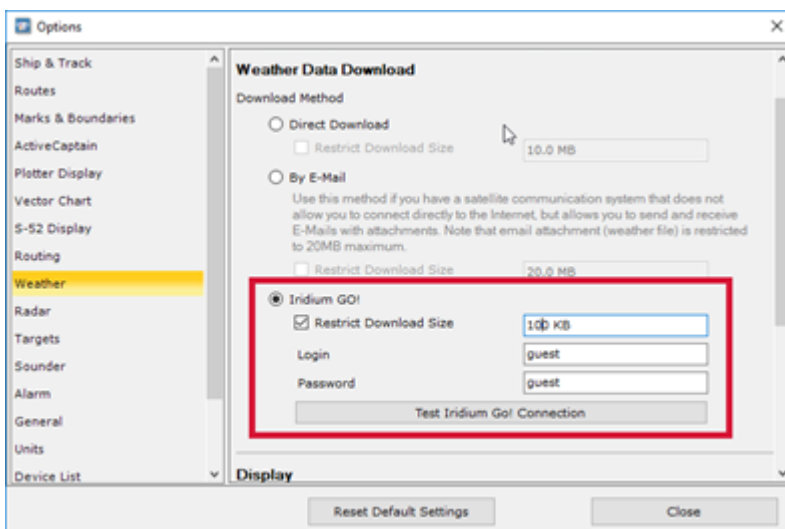
By default, when you download new data, the previous data is erased (to only keep the latest data). With the Ocean-O Premium service, you have the option to keep a record of the old data in your database. Simply enable "Keep History when downloading weather data" from the [Weather](#) Options.

## Iridium Go

TimeZero can use an "Iridium Go" to download weather data at sea, where Wi-Fi or Cellular connection is not possible. The Iridium Go is a satellite communicator that creates a Wi-Fi HotSpot for your computer:

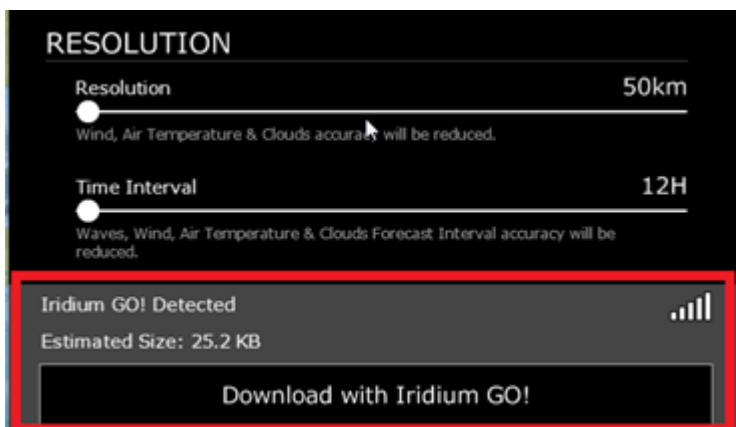


Although very slow (2Kbps), the Iridium Go offers an unlimited data plan for about \$150 per month that can be a very good solution to download weather anywhere. To setup the Iridium Go in TimeZero, open the [Weather](#) Options and set the weather download method to "Iridium Go". You will then be able to enter your Iridium Go login and password and test the connection:



**IMPORTANT:** Make sure to connect your computer to the Wi-Fi HotSpot created by the Iridium Go before testing the connection or attempting to download weather data.

Once setup, the "Update" WorkSpace download button will change to display the current status of the Iridium Go (satellite connection status):



When pressing the "Download" button, TimeZero will automatically establish the Iridium Go satellite connection (dial up), data download, and finally close the connection (to save power). In case of interruption during the

download, the progress bar will turn orange. Do NOT press on "Cancel" to try to relaunch the process manually, TimeZero will automatically attempt to reconnect and resume the download at the point where it left off. Note that for data download to start, the satellite status needs to have at least 3 bars.

**Note:** The real world speed of the Iridium Go is about 10KB/minute. A weather download of 80KB will take a little less than 10 minutes in average. The default maximum size is set to 100kB (from the [Weather Options](#)), but you can increase it to up to 1MB (but it might take as long as 2 hours to retrieve 1MB).



## Weather Routing

### Introduction

The "Routing Module" needs to be unlocked to access this feature

Like all sailors know, the most direct route isn't always the best one. TimeZero Routing Module allows to calculate the optimal sailing route based on weather forecasts, currents, performance of your sailboat ("polars") and your own navigation style. The Routing algorithm uses the isochrons method to compute the best route. A specific isochron represents all the points that your sailboat can reach in a fixed amount of time, dependent upon the weather forecast (wind, current, wave) and the boat characteristics (as defined in the polars).

Excerpts from comments on "weather routing" by Brice Pryszo, founder of MaxSea International:

*In 1984, when I designed the "isochrones" routing algorithm method, the only existing routing solutions required the use of powerful shore-based computers which basically tested millions of routes to choose the best one. This required power and time then not available on board sail boats. The MaxSea routing algorithm was designed to be executed on a personal computer.*

*The very first time that I tested the MaxSea weather routing algorithm was during the trans-Atlantic race "La Route de la Decouverte" with Philippe Jeantot onboard Credit Agricole. Philippe was late arriving at the Canary Islands due to equipment failure. The fleet leaders, 24 hours ahead, were sailing WSW in nice 10-15 Kt trade winds, south of a low pressure system (as any smart sailor would do). Meanwhile, the MaxSea weather routing algorithm sent Credit Agricole NW, straight into unsettled weather and unstable wind, up to the cold front of a deep low pressure system. The first hours were not welcoming but behind the cold front, a 20 Kt North wind pushed the large catamaran at twice the speed of the remaining fleet. Two days later, Credit Agricole was leading the race by several hundred miles. At that time no experienced navigator would have chosen such a solution!*

*Another astonishing example of the power of routing occurred when we tried to optimize an Atlantic passage West to East with regular high pressure mid Atlantic. As any good sailor knows, routing should begin by passing around the high pressure using a northerly course. Instead of following the quiet sailing to the east, the weather routing plunged the course to the south, straight into the low pressure center. Before reaching ineffective wind, the MaxSea routing jibbed the boat port into an increasing breeze perfect for reaching, making her route much faster than if she had taken the northern route with a downwind slog.*

*These two incidents had a major effect on sail boat racing results. Today, using routing is absolutely necessary to be competitive in ocean and long distance races. Routing has also proven to be great tool for cruisers because it greatly enhances safety and comfort. Routing can exploit user-defined characteristics and create what we call "cruising" or "safety" polar curves. Utilizing such polar curves the routing will do all it can to find a path which avoids strong wind. This is beneficial because strong wind is generally surrounded by medium wind in which the boat is faster allowing her to "escape".*

Brice Pryszo

### Creating a Routing

The "Routing Module" needs to be unlocked to access this feature

Before creating a routing, it is recommended to update the weather for the corresponding area. Please refer to [Requesting a Weather File](#) for more information. Make also sure to load the corresponding Polar file in TimeZero. Please refer to the [Polar](#) chapter for more information.

Select the "Planning" WorkSpace and display the weather data on the chart (to make sure that the weather file covers the area). Please refer to [Displaying Weather Data](#) for more information.

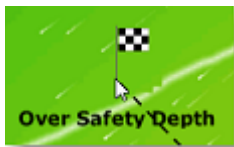


Select the "Launch Routing" tool available in the Toolbar:

- Move the cursor over the charts (at the departure location) and click once to set the starting point
- Move the cursor over the charts (a rubber line will appear) and click a second time to set the arrival point

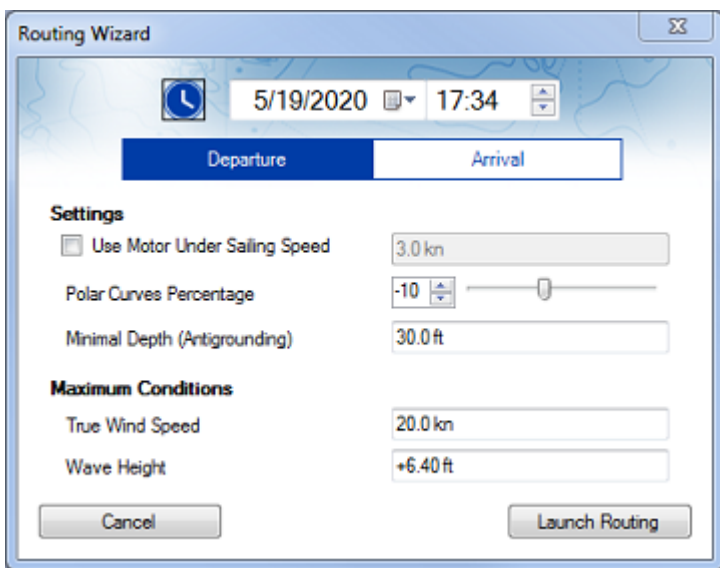
**Note:** If you are connected to a GPS and receive a live position, you can double click with the "Launch Routing" tool on your destination. This will launch a routing in between your current location and the destination.

In some cases, when moving the cursor to set the departure and arrival points, you might see a text tooltip appearing warning you of specific conditions:

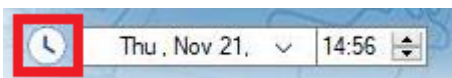


- "Outside Weather Coverage": the cursor position is outside the area covered by the weather forecast.
- "No Bathymetric Data": there is no detailed bathymetric data available under the cursor position. Note that it is normal to have this warning in open water, where detailed bathymetric data is not available. However, if you see this warning near the coastline, this is an indication that you should install 3D data (files ending with ".dbt").
- "Over Safety Depth": the cursor position is over land or above the minimal depth defined in the [Routing Options](#).
- "Strong Winds" / "Big Waves": the weather maximum criteria (maximum wind, maximum wave) defined in the [Routing Options](#) are exceeded at the cursor position

As soon as the departure and arrival points are defined, TimeZero will open the Routing Wizard window:



First, select if you prefer to set a departure time or arrival time (by clicking on "Departure" or "Arrival"), then, select a date and time. Note that you can click on the clock icon to use the current time:



**Tips:** Make sure the selected date & time fall within the weather forecast range. If the weather forecast is not "long" enough for the trip (for example a 5 days trip with only a 3 days forecast), TimeZero will use the last forecast available for the remainder of the trip (fixed value).

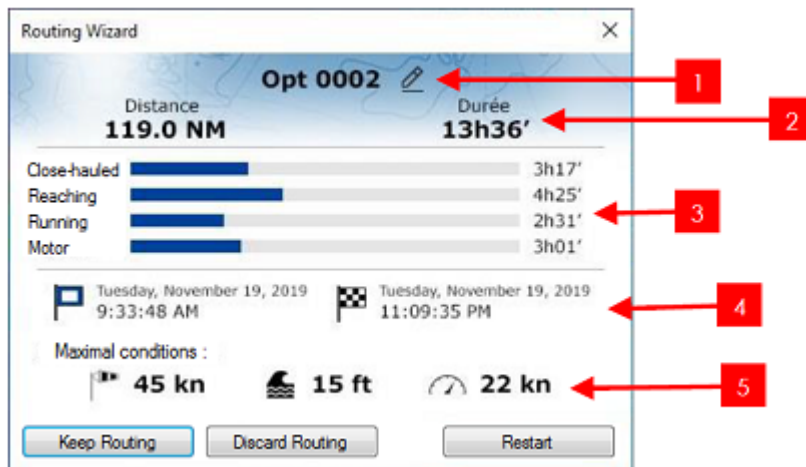
Before launching the Routing, the Wizard allows you to adjust some parameters:



- **Use Motor Under Sailing Speed:** This parameter allows you to specify a minimum speed for which you will decide to start your engine. Note that the speed you achieve under power can be adjusted from the [Routing Options](#).
- **Polar Curves Percentage:** This setting allows you to apply an overall factor on your polars. For example, if you want to see what would be the route if you only achieve 90% efficiency, you can set the slider to -10%.
- **Minimal Depth:** Set the minimum depth allowed for the routing. You would usually use a value corresponding to the draft of your vessel plus a margin. When computing the optimum route, TimeZero will avoid areas that are shallower than this value.
- **Maximum True Wind Speed:** Set a maximum wind speed constraint. When computing the optimum route, TimeZero will avoid areas that have wind speed over this value.
- **Maximum Wave Height:** Set a maximum wave height constraint. When computing the optimum route, TimeZero will avoid areas that have wave height over this value.

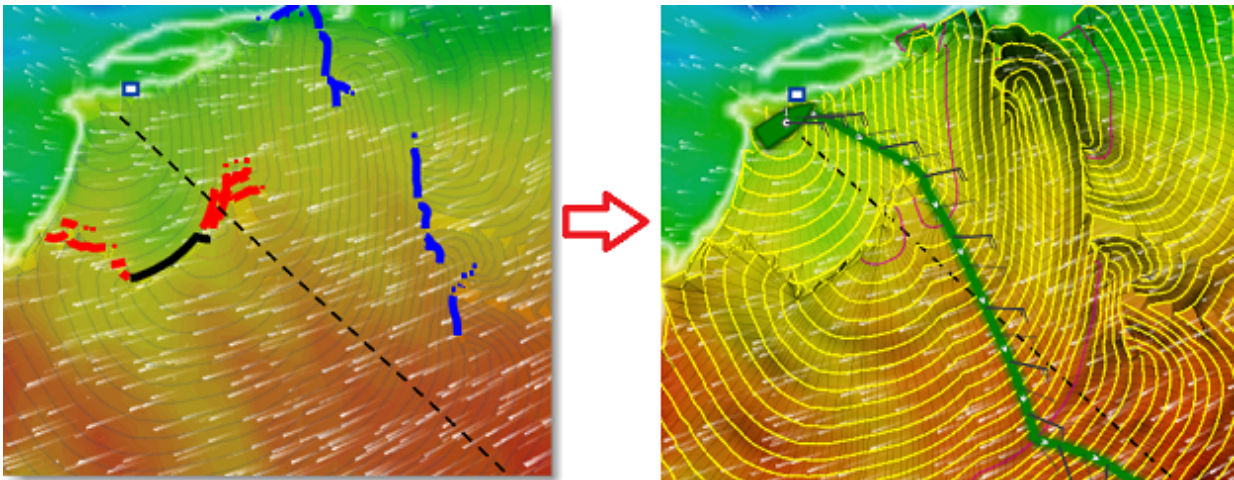
**Note:** Other (more advanced) parameters can be setup from the [Routing Options](#). For example, you can set a minimum wind speed or shift/alter the weather data.

After reviewing and/or adjusting the routing parameters, you can click on "Launch Routing". TimeZero will launch the routing computation and display a route summary window:



- 1: Click here to change the name of the route
- 2: Total Distance and total Duration of the route
- 3: Total time under specific sail or motor configuration
- 4: Departure and arrival date / time
- 5: Maximal conditions reached along the route

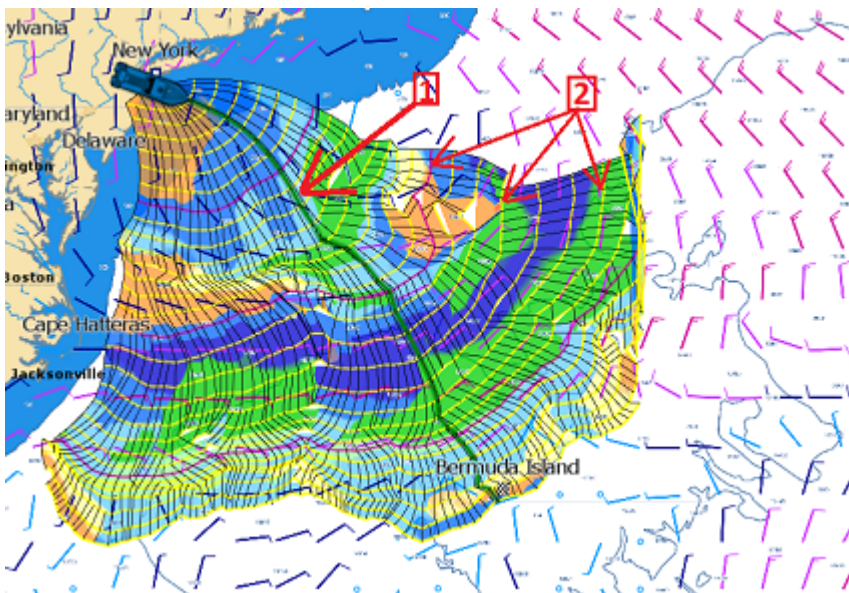
Note that when TimeZero computes the optimum route, you may see black, red or blue lines. Those lines represent areas where a constraint has been reached (preventing the optimum route to cross this path). Red highlights areas where a maximum wind constraint has been reached. Black highlights maximum wave height and blue highlights minimum wind constraint. In the example below, you can see that the resulting computation has avoided those areas:



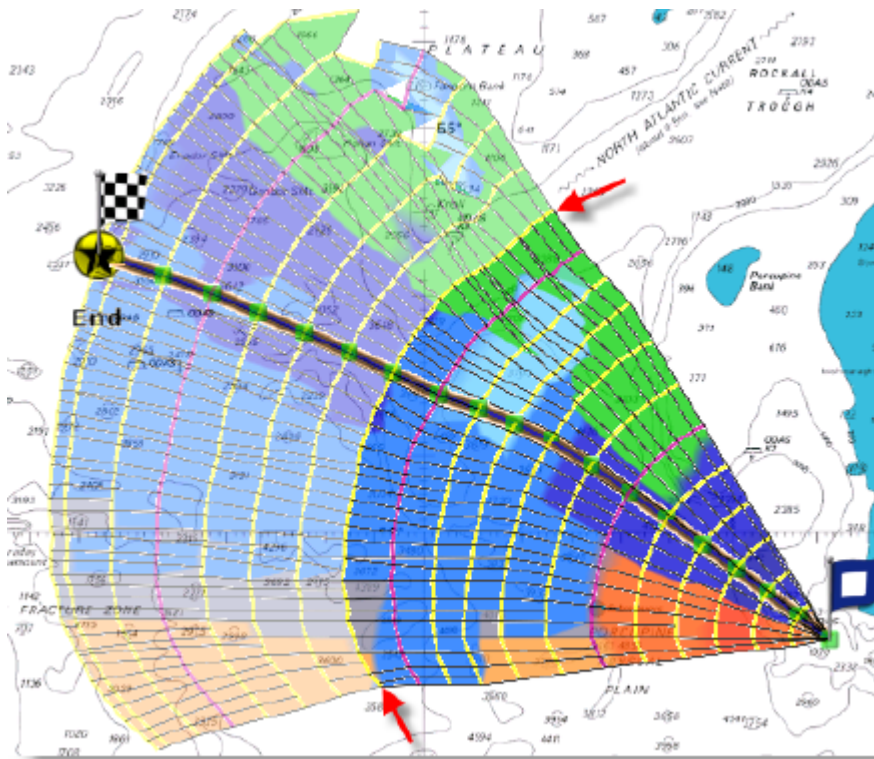
To close the Routing Wizard, you can choose to discard the routing, restart a new computation (for example if you want to change the date of departure), or keep the routing.

**Tips:** By default TimeZero will automatically erase previous routings to only keep the last one. If you prefer to keep all routings (if you want to compare multiple scenarios), you can uncheck "Only Keep the Last Routing" from the [Routing Options](#).

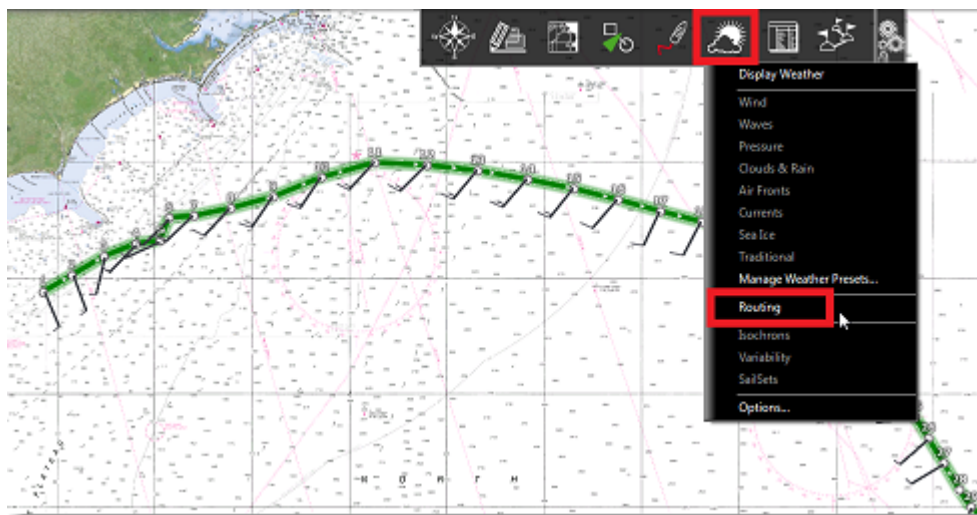
After closing the Wizard (when "Keep Routing" has been selected), the optimized route (1) will be displayed in green, the "isochrons" (2) in yellow/purple lines, and the SailSets in various colors:



Note that the length of weather forecast should cover the entire time required for the trip. If this is not possible (for a very long cruise), TimeZero will use the latest forecast available as an estimation, and display the isochrons in semi-transparent color. In the following example, TimeZero is using the same fixed weather forecast (latest available) from the location pointed by the red arrow:



If you would like to focus on the route generated by the routing, you can uncheck "Routing" from the Weather button located in the ribbon:



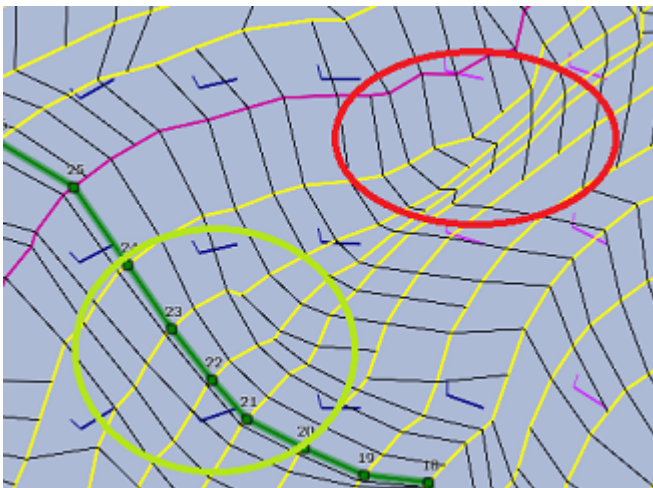
This will reveal the route (displayed in green by default) which will include a wind feather icon on each waypoint showing the wind direction and strength that is forecasted at the location for the date/time predicted by the routing algorithm.

**Note:** Once the optimum route (routing) has been generated, it cannot be edited. You cannot move waypoints nor adjust the departure time or speed after it has been computed. If you would like to edit the routing like a route, you can right click on it and select "Convert to route".

### How to interpret isochrons

Each isochron represents a group of points that the sailboat can reach in a fixed amount of time. For example, if the isochron interval is 3 hours, then the first isochron represents the point the boat can reach in 3 hours, the second isochron is the point the boat can reach in 6 hours, the third one is the point the boat can reach in 9 hours, and so on. The isochrons are drawn as yellow curves on the chart. Every 24 hours, a purple color is used for the isochron (to quickly visualize a day worth of sailing on the chart).

The shape of the isochrons indicates global tendencies. For example, if a group of isochrons is "compacted" in the North (red circle below), and other group is "expanded" in the South (green circle), this indicates that the South holds the better options for travel:



Isochrons that are farther apart means faster speed (because a longer distance can be achieved in the same amount of time).

TimeZero automatically analyzes these patterns, computes the best route possible and displays it in green on the chart.

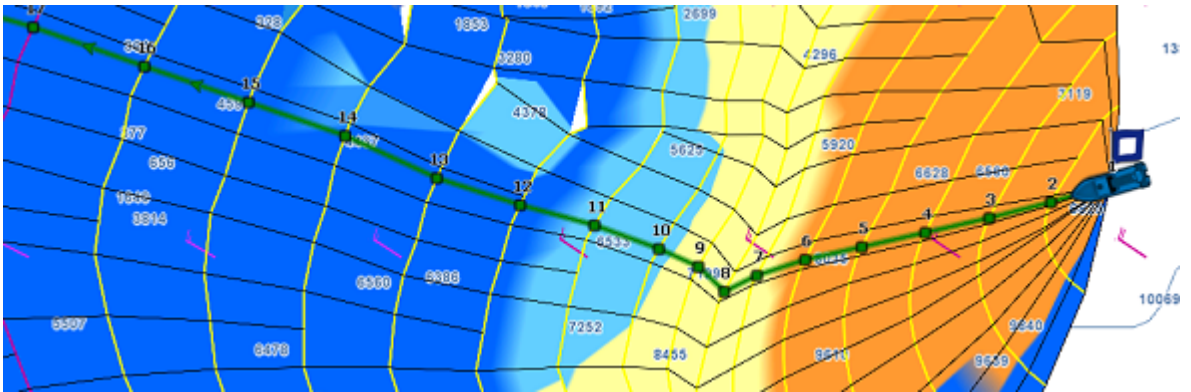
### How to Interpret SailSets

SailSets display the Sail configuration to be used in color on the chart. The color scale is defined in the [SailSets table](#) of the [Polar Workspace](#).

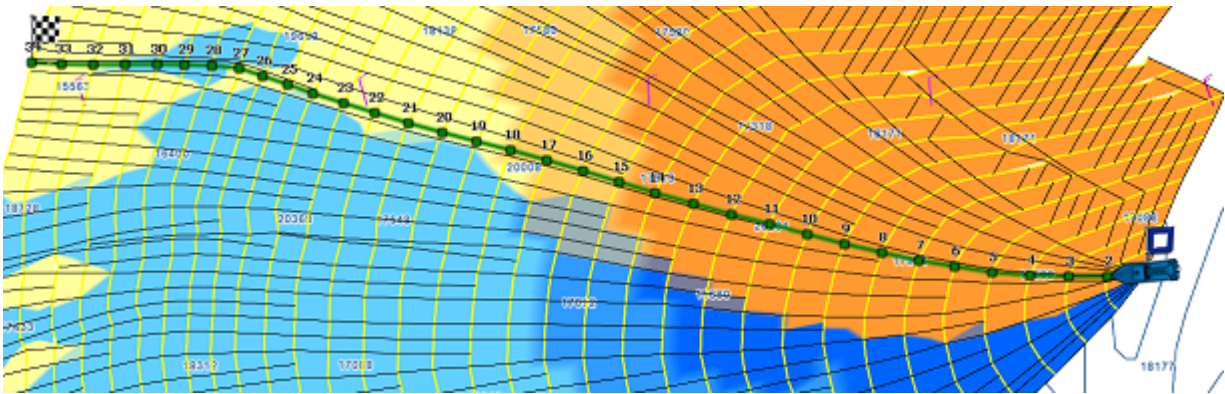
Note that the default color scale pre loaded in TimeZero allows you to graphically visualize quickly on the chart the "type of navigation" that you can expect for various areas. Red colors are used for Close Hauled navigation or Downwind, green for Broad Reach and blue for Close and Beam Reach. The darker the color, the stronger the wind.

In the example below, the navigation will start Close-Hauled with medium wind speed (orange), then the wind speed will drop around waypoint #6 (pale orange), then the configuration will change to reaching with low wind around waypoint #10 (pale blue), then the wind speed will increase around waypoint #12 (darker blue):



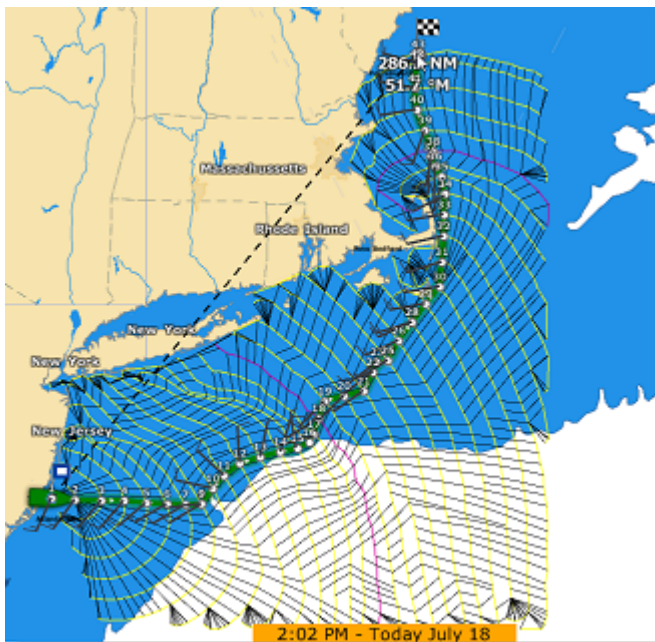


SailSets are great to identify alternate route that may offer easier navigation (if reaching your destination in the shortest time is not your primary goal). In the example below, the fastest route forces you to sail in an area with lots of Close Hauled at the beginning (orange color). You could define an alternate route (south) which would adopt a much easier navigation (in the blue area).



### **Avoid Land and Shallow Water**

By default the Routing will avoid land (minimum depth is set to 0), but you can adjust the safety depth from the [Routing Options](#) using the "minimal depth" setting:



Please make sure to install the detailed 3D database files (files ending with ".dbt") that came with your charts. If no detailed 3D data is available, the routing will use the lower resolution worldwide 3D database that can lead to unexpected results.

**Note:** In some extreme circumstances, the routing module will not be able to find a "path". In these cases, you can try to split the routing in multiple steps by creating a route first. Please refer to the [Manual Constraints](#) chapter.

### Minimum Speed ("motoring")

You may enable the "Use Motor Under Speed" setting from the [Routing](#) Options if you would like to indicate to the routing algorithm that you are willing to use your engine in areas where you speed (under wind power) would fall below a threshold. Note that you can setup the threshold and the speed that you will reach under engine power independently. For example, you may setup the threshold at 5Kn (meaning that if your speed goes under 5kn you will start your engine), and use a different value for your speed while "motoring" (for example 8kn).

If you enable this option, TimeZero will highlight the legs where you need to start your engine with a black outline:

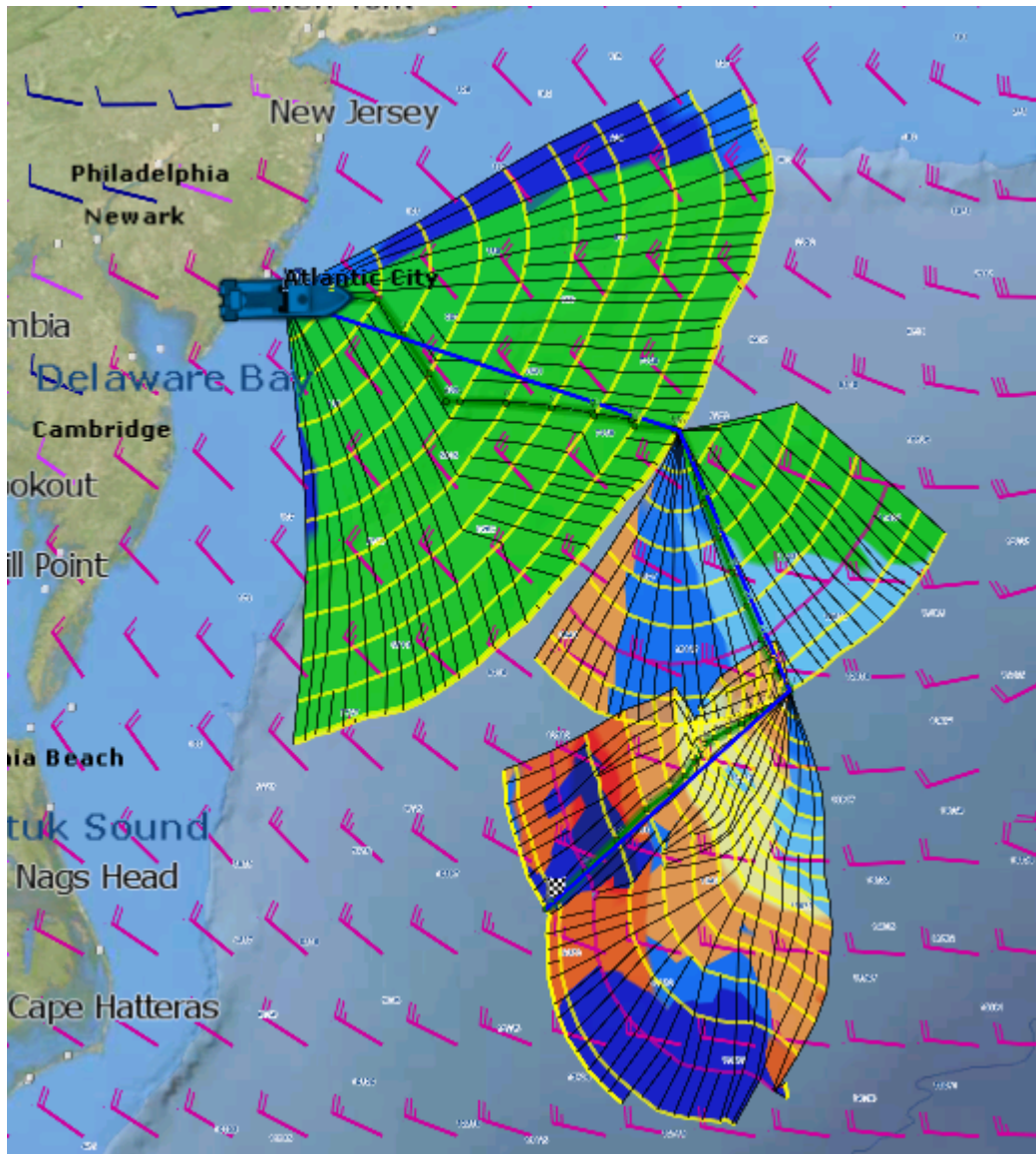


## Routing with Manual Constraints (Advanced)

The "Routing Module" needs to be unlocked to access this feature

### Routing from several waypoints

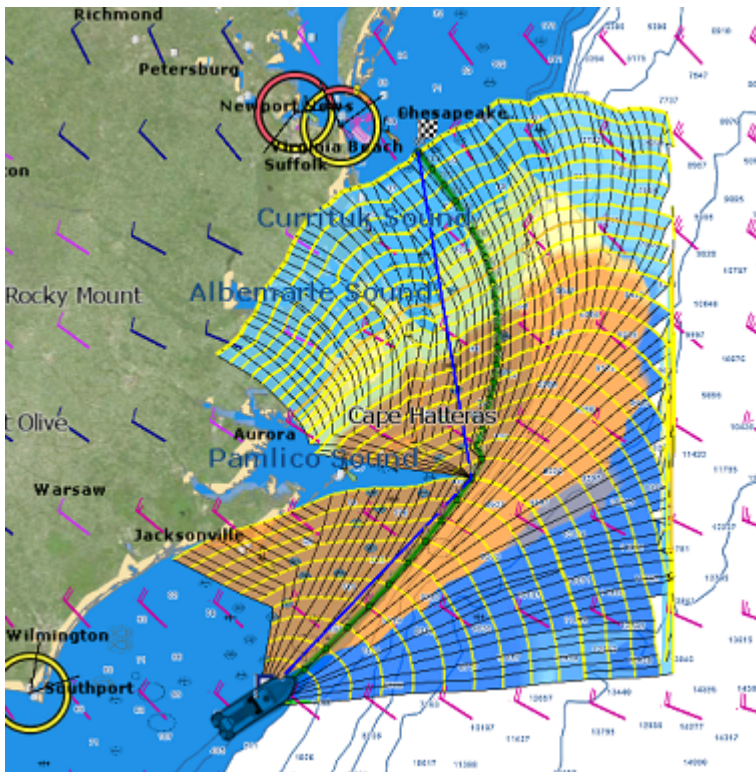
It is possible to define a routing that go over specific locations. This can be useful in intricate passages where the routing cannot find a way due to land or shallow water. To perform a "multi-leg" routing, start by creating a route with the Route tool. The various waypoints of the route will define the various locations that must be reached by the routing. Once the route is created, select the departure date from the Time Bar, select the "Launch Routing" tool and click once on the route. This will automatically create a routing that goes over all the Waypoints:



### Routing with constraints

Instead of defining "hard constraints" (routing going over a specific location), you can perform a routing with "loose" constraints. This can be useful to avoid specific areas. The steps are very similar to creating a routing from several waypoints. But, before clicking on the Route with the Routing Tool, simply right click on the Waypoints and select "Leave Port" or "Leave Starboard". This will allow the Routing algorithm to "explore" more

options while leaving specific waypoints to the Starboard or Port side. In the example below, a route consisting of 3 Waypoints was created. Then Waypoint #2 was set to "leave port":



## Routing Detail

The "Routing Module" needs to be unlocked to access this feature

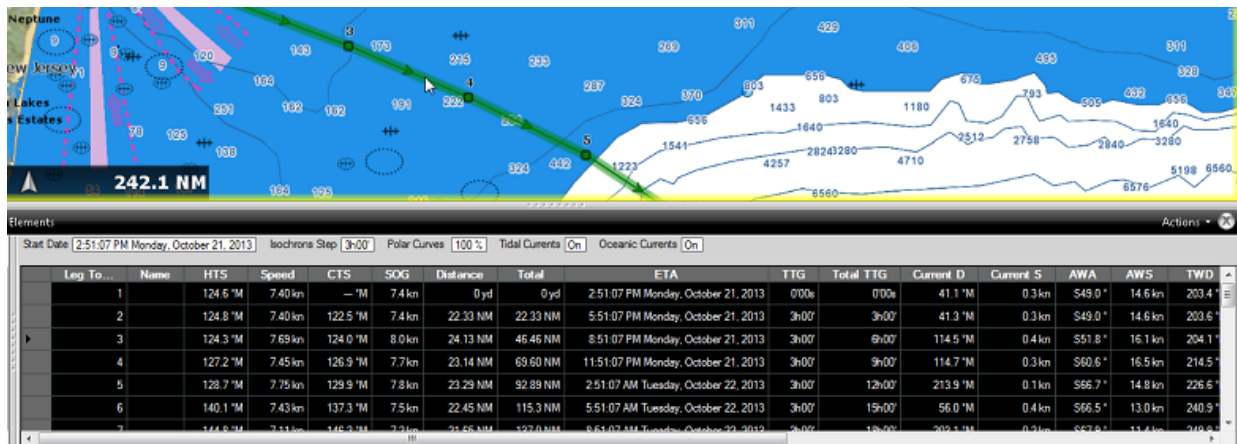
The Routing Detail is very similar to the Route Detail. It displays information about the selected routing in a tabular format together with information about the routing as a whole (date of departure, weather file used for computation, etc...). Unlike the Route Detail, the Routing Detail cannot be modified. If you want to modify a parameter (date of departure for example), a new routing must be launched.

### Opening and Closing the Routing Detail

**Note:** Although you can display the Routing Detail in the Navigation WorkSpace, it is highly recommended to work in the Planning WorkSpace (that provides the Time Bar).

Select the Planning WorkSpace, zoom in on the optimized route and double click on it (double click on one of the green leg).





To close the Route Detail, Click the "X" button at the top right of the route detail list.

## Using the Route Detail

The top part of the Routing Detail displays information about the routing itself:

- **Start Date:** The Routing date of departure
- **Isochrons Steps:** The step in between two isochrons displayed on the chart. In most cases (if there is no tack in between two isochrons), this will also be the step in between two legs.
- **Polar Curves %:** Indicates the polar percentage factor that was used for the computation of this routing.
- **Tide Current, Oceanic Current, and Waves:** Indicates if these parameters are taking into account for this routing (can be adjusted from the [Routing Options](#)).

The table display for each leg various useful information that can be displayed, hide or reorder from the "Action" menu:

- **Leg To:** Each line of the list gives you information about the leg that allows to reach a specific Waypoint. The "Leg To" value is the number of that Waypoint.
- **ETA:** The Estimated Date of Arrival to that Waypoint taking account the currents (based on SOG).
- **Speed:** speed through water of the boat (or surface speed). This value can be edited individually for each leg or can be set globally (for all legs) using the Action menu.
- **HTS:** Heading to Steer. This is the heading that you should follow to reach the next waypoint. This value is adjusted to take the currents into account. This value can be different from the CTS if currents are strong in the area.
- **SailSet:** is the SailSet used for this leg according to Wind Angle, Speed and the SailSet table defined in the Polar Workspace.
- **SOG:** Speed over Ground being calculated based upon the surface speed and currents. The SOG will be different that the speed, because your boat can be "pushed" or "slow down" by the currents.
- **CTS:** The "Course to Steer" is the direction (bearing) of the route leg as it would be on a paper chart.
- **TWS:** is the True wind Speed
- **TWA:** is the True Wind Angle
- **TWD:** is the True Wind Direction

- Waves H: is the Wave Height
- Distance: is the distance of that leg
- Total TTG: is the cumulative time to go from the start of the route to that leg
- AWA: is the Apparent Wind Angle
- AWS: is the Apparent Wind Speed
- Current D: is the current direction
- Current S: is the current speed
- Name: an optional name you can set on a specific waypoint
- Position: is the position of the waypoint
- Total: is the cumulative distance from the start of the route to that leg
- TTG: "Time to Go" is the time to navigate on that leg. The SOG and Distance are used to compute that value.
- Variability: is the variability on that leg
- Waves D: is the Wave Direction
- Waves P: is the Wave Period

**Note:** Current, AWA, AWS, TWD, TWS, Waves are values coming from the Weather File.

The Route Detail "Action" menu provides quick access to main functions and parameters. It can be found on the right side title bar of the list. It includes the following options:

- Convert to Route: To convert a routing (which has fixed constraint and cannot be edited) to a route that can be freely edited.
- Activate Route: To activate the planned route and start navigating. Note that this option is not available when TimeZero is started in Home Planning mode or when no position (GPS) is available.
- Configure List: To add or remove columns of the Route Detail table
- Copy to clipboard: To copy the list information as displayed on your screen. You can paste this information in a text editor or Excel for further editing
- Export list: To export the list information as displayed on your screen in a text file. Each field is separated by a Tab
- Print: To print the list as displayed on your screen.
- Search by name: To locate in the list a waypoint with a specific name.

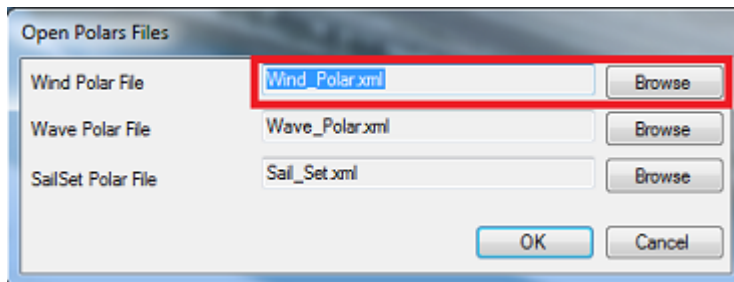
## Polar

The "Routing Module" needs to be unlocked to access this feature

### Opening a Polar file

Boat speed used by the Routing algorithm and Laylines is entered into TimeZero from a polar curve diagram which relates boat speed to wind speed at a given wind angle. To open a polar file, click on the TIMEZERO button

located on the top left of the screen and select "Open Polar File". Click on the "Browse" button in front of "Wind Polar File":



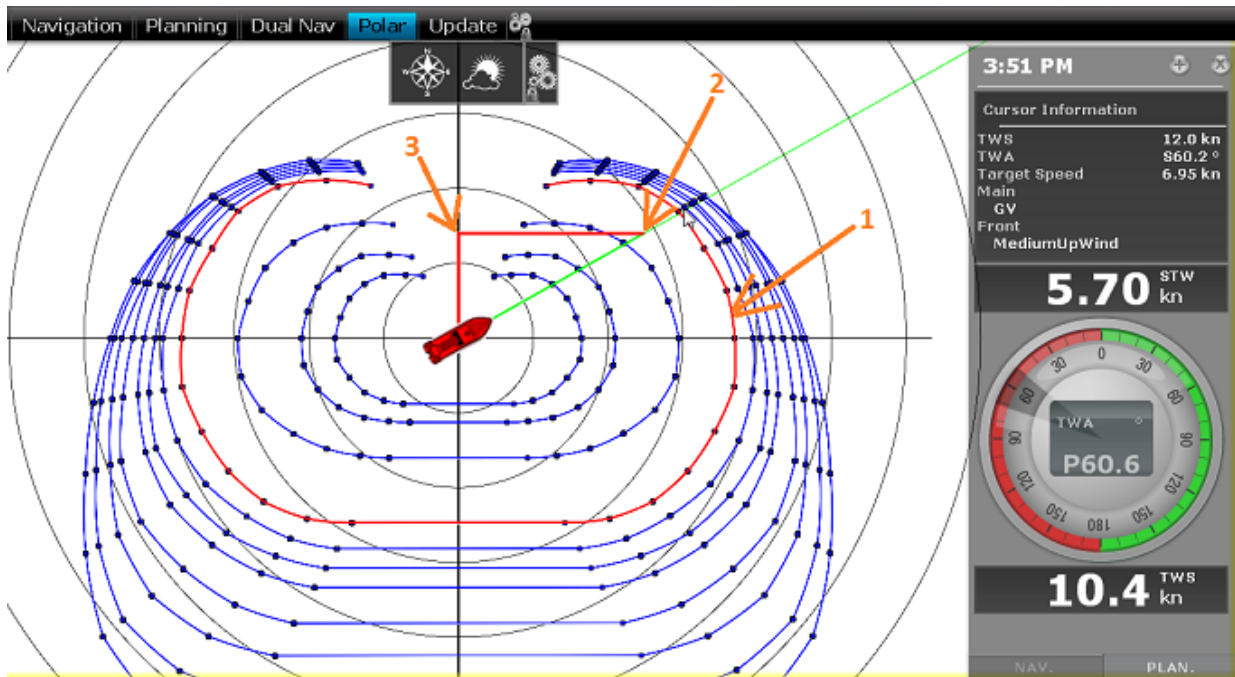
Select the polar file and click on "Open".

Note that various Wind Polar files for multiple sailing boats can be downloaded from [www.mytimezero.com](http://www.mytimezero.com). Just click on "My TIMEZERO". sign in, click on "My PC Software" and then "Polars".

**Note:** You should not have to open any Wave\_Polar file. The default Wave Polar file loaded in TimeZero should work for every user (as it applies an automatic relative offset to the Wind Polar).

## The polar Graph

The polar file loaded in the software can be viewed and modified from the "Polar" WorkSpace:



The various polar curves (in blue) represent the boat theoretical speeds according to True Wind Angle (TWA) and True Wind Speed (TWS). The theoretical boat speed value is given by the distance in between the point on the polar curve and the center of the graph (the farther away the greater the speed). There is one polar curve per True Wind Speed value. If TimeZero is connected to a sensor that output True Wind Speed, the polar curve corresponding to the real time wind speed ("Live Polar") will be highlighted in red (1).

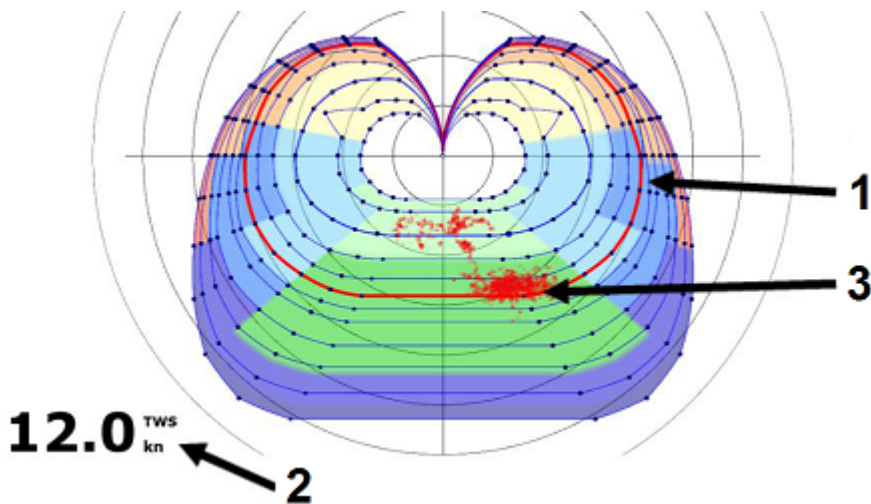
**Note:** The graph can be either displayed in "Wind Up" (default) or "Head Up" from the "Weather" button located in the Ribbon. The traditional "Wind Up" display places the wind axis vertically on the graph.

If TimeZero is connected to a speed sensor (Speed Through Water), the real time boat speed will be displayed (2) with its projection on the wind axis (3) (aka: VMG).

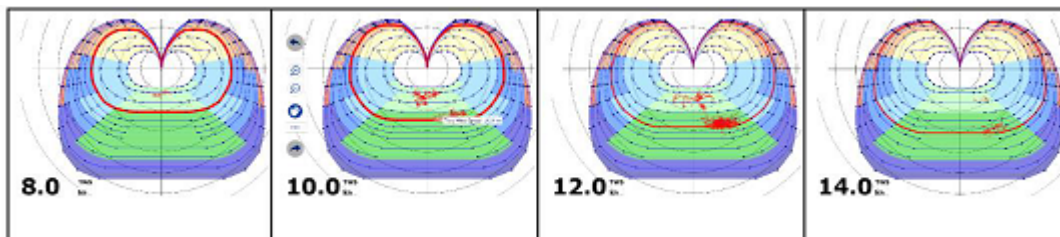
In the Polar WorkSpace, the Cursor Information NavData gives various information related to the polar. In the example above, the cursor has been placed over the real time polar curve (displayed in red) in the boat direction (aligned with the heading line). We can learn that the Target Speed (theoretical boat speed) is 6.95Kn. The real time boat speed (STW) is only 5.70Kn . So, in this case, the boat is not reaching maximum performance (90% performance). This is either because the polar data over estimates the boat performances or because the sail configuration needs to be adjusted by the crew to meet the real boat performance.

### Polar Performance analysis

TimeZero continuously records wind and boat speed data at a rate of one sample per second. These samples can be displayed in the Polar WorkSpace as individual dots which, when accumulated, form a cloud o points called the Performance Plots. Performance Plots are automatically sorted by wind speed. In live mode, the wind speed sensor connected to TimeZero is used to select the appropriate points. When live mode is turned OFF, you can select the wind speed to show by clicking on one of the polar curves directly on the graph or by selecting a column in the polar table. In the screenshot below, the selected wind speed is 12Kn as displayed on the lower left corner (2). The theoretical performance of the boat at this speed is indicated by the polar curve displayed in red (1). TimeZero displays all the points that have been logged at this selected wind speed showing your real performance on the graph:



In the examples below, showing the point cloud for various wind speeds, it can be seen that the user mainly sailed in 12 kt of wind, since this is where the cloud is the most pronounced:



When "Live Polar" is selected, you can select how much history you want to display on the polar graph. When "Live Polar" is unchecked, you can select a previous trip, a duration and a starting date:

## Modifying the Polar data

It is possible to adjust the polar data by using the table at the bottom of your screen. Just make sure to select "Wind Polar" on the left. Value can be modified (like in a spreadsheet) and column and row can be added or deleted. Just right click on the column or row header you wish to add or delete:

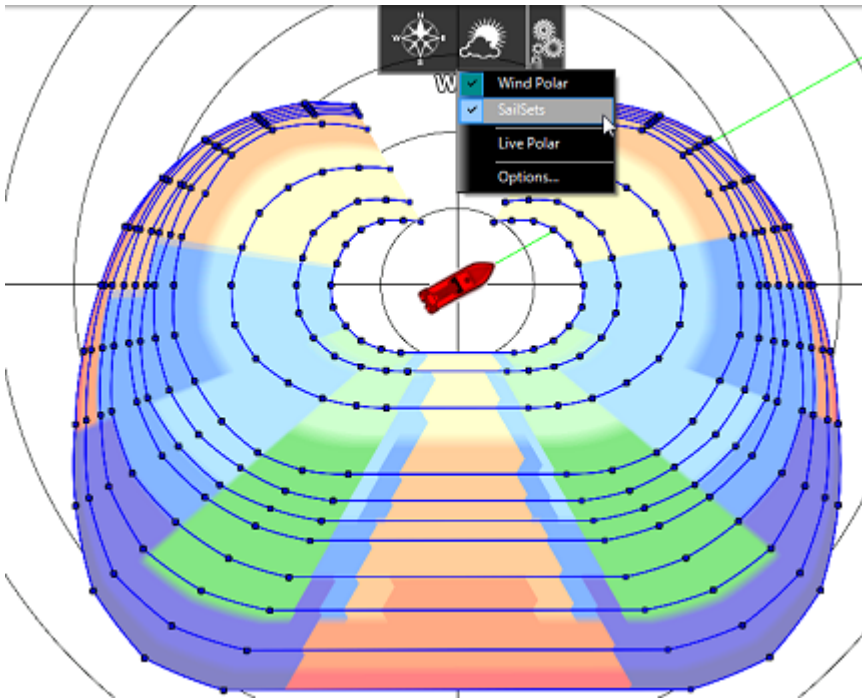
	3.0 kn	4.0 kn	6.0 kn	10.0 kn	12.0 kn	14.0 kn	16.0 kn	20.0 kn	24.0 kn	28.0 kn	32.0 kn
30.0 °	1.90 kn	2.50 kn	3.50 kn	4.70 kn	5.10 kn	5.20 kn	5.30 kn	5.40 kn	5.40 kn	5.40 kn	5.40 kn
40.0 °	2.20 kn	2.90 kn	4.00 kn	5.50 kn	5.80 kn	5.90 kn	6.00 kn	6.10 kn	6.20 kn	6.20 kn	6.20 kn
50.0 °	2.60 kn	3.40 kn	4.60 kn	6.30 kn	6.50 kn	6.60 kn	6.70 kn	6.80 kn	6.90 kn	6.90 kn	6.90 kn
60.0 °	3.00 kn	4.00 kn	5.10 kn	6.80 kn	7.00 kn	7.20 kn	7.30 kn	7.50 kn	7.60 kn	7.60 kn	7.60 kn
70.0 °	3.50 kn	4.80 kn	6.00 kn	8.00 kn	8.20 kn	8.40 kn	8.50 kn	8.70 kn	8.80 kn	8.80 kn	8.80 kn
80.0 °	4.00 kn	5.50 kn	7.00 kn	9.00 kn	9.20 kn	9.40 kn	9.50 kn	9.70 kn	9.80 kn	9.80 kn	9.80 kn
90.0 °	4.50 kn	6.20 kn	8.00 kn	10.00 kn	10.20 kn	10.40 kn	10.50 kn	10.70 kn	10.80 kn	10.80 kn	10.80 kn
100.0 °	5.00 kn	7.00 kn	9.00 kn	11.00 kn	11.20 kn	11.40 kn	11.50 kn	11.70 kn	11.80 kn	11.80 kn	11.80 kn

The rows represent the angle in between the wind and the boat (where is the wind coming from relative to the bow of the boat). The columns represent the Wind Speed. So, in the table above, if the True Wind Speed is 20Kn and if the True Wind Angle is 60 degree, the target speed (theoretical boat speed) is 7.5Kn. You can edit this value by selecting the cell and entering the new value.

As soon as you make a change in the table, the graph above will update. If you want to store permanently the modification, make sure to click on the "Save" button at the top of the table. This will write the modification to the polar file on your Hard Drive.

## SailSets

The SailSets color can be displayed on the Polar graph from the "Weather" button in the ribbon:



If you select "SailSets" in the list on the bottom left, the Sail Set color table will be displayed. Each cell can be assign new sail configuration using a drop down menu. If you want to change a sail configuration, click on the "SailSets Configuration" button at the top of the table.

**Note:** For the average user, the default SailSets configuration does not need to be changed. In this case, the color will simply highlight on the chart the type of navigation (Close Hauled, Reaching, etc...)

## Advanced Routing

The "Routing Module" needs to be unlocked to access this feature

### Polar Modification (Percentage)

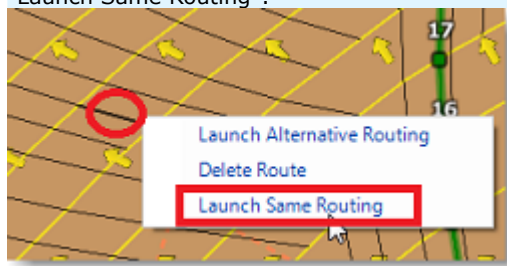
It is possible to adjust the Polar Curves percentage from the "Routing" Options. You can increase or decrease the overall polar performance without having to load multiple polar files. If you uncheck the "Only Keep The Last Routing" option, you can launch multiple routings (same origin and destination) with different Polar percentages. This will show you multiple scenarios on screen illustrating what would happen if you underperform (lower percentage) or over perform the Polar speed during your cruise.

The example below shows two routings that have the same origin, arrival and start date. One routing was made without any polar modification (0) and the second one was made with a 10% reduction:



You can see that if you under perform by 10%, the two optimum routes are totally different.

**TIPS:** To launch the same routing (same start point, end point and date) right click on a black line and select "Launch Same Routing":



To help you adjust the polar in real time, you can display the real time "% Polar" computation in the NavData. TimeZero will compare the theoretical data from the Polar file with the real time speed and wind data from your sensors. The "% Polar" will tell you in real time if you over or under perform the polar data.

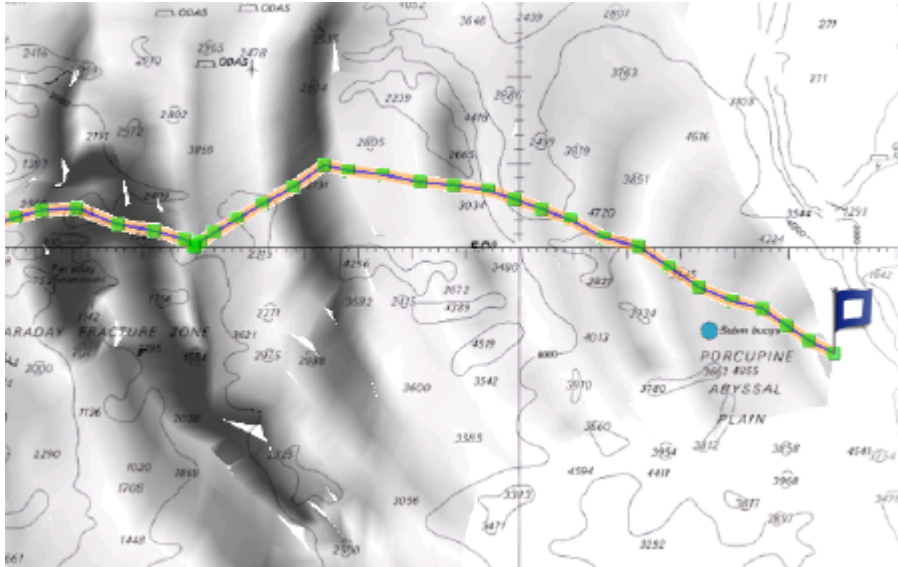
### Routing Variability

The Variability (OFF by default) allows to identify important variation of wind direction and speed directly on the chart. Dark areas indicates passage that would require extra attention (weather transition, important pressure gradient,...)



The variability uses an inverse factor: it is equal to 100% if wind direction and speed are stable and decrease when the routing shows important variations.

To display the variability on the chart, select "Variability" located in the "Weather" button in the Ribbon of the Planning WorkSpace:



The variability can also be displayed leg by leg in the Routing Detail list.

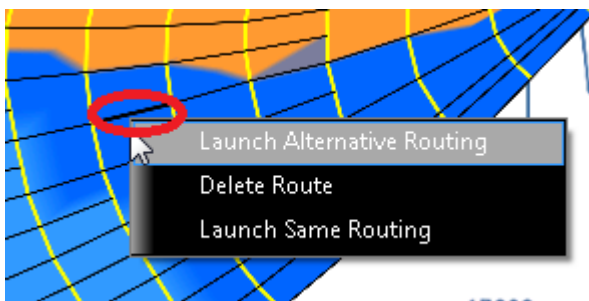
## Weather Modification

With experience, you may learn how to adjust the weather prediction based on real time observations from you or other competitors. It is possible to adjust the Weather File using multiple criteria.

You can adjust the overall wind speed (either by percentage or constant value), wind direction, waves height, current strength and time shift of the weather file. All these parameters can be adjusted from the "Weather" Options.

## Alternate Routing

The alternate routing allows you to compute a new routing that will pass over a specific location. Sometimes, it can be better to adopt an alternative strategy (as explained above) or if the initial routing result is going over land or crossing any type of obstacle. All route plans drawn in black in between each isochrons are optimal routes (they allow to reach the corresponding location in the minimum amount of time). Simply right click on any Route Plan (black leg) and choose "Launch Alternative Routing".



**Note:** It is sometimes easier to zoom in on the chart in order to be able to right click on a specific Route Plan



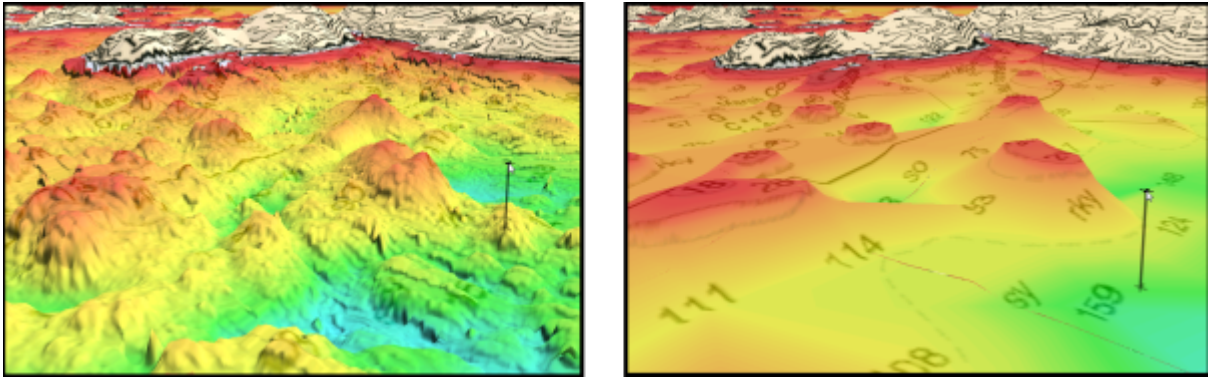


## Bathy Recorder (PBG)

### PBG Introduction

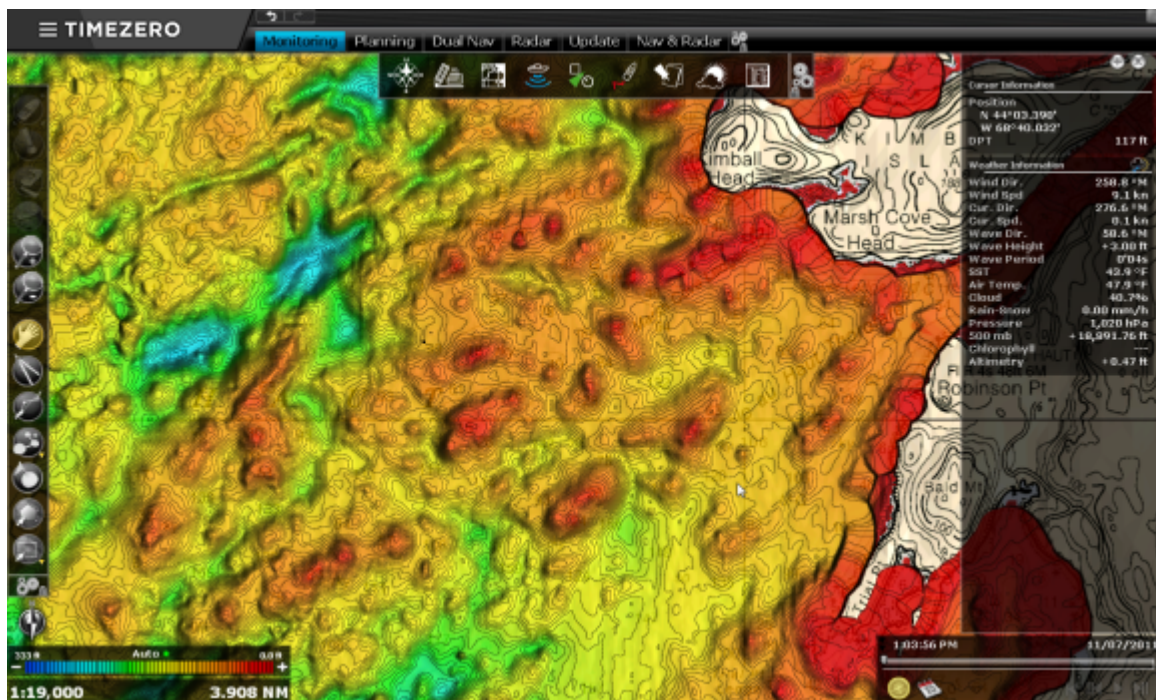
The "PBG Module" needs to be unlocked to access this feature

The Bathy Recorder (also known as "Personal Bathymetric Generator" or "PBG") enables you to record sea floor topographic information using your Sounder to incorporate that data into your personal 3D PBG database. When you use PBG, the 3D data will constantly improve with repeat trips over the same areas, enabling you to have a perfect picture of important sea floor terrain, as well as your favorite fishing spots.



On the left: 3D data with PBG enabled (after multiple passes). On the right: Regular 3D data without PBG

In addition to rendering your data in 3D, TimeZero with PBG module allows you to display depth shading (color according to depth), custom contour lines with complete control over the density and a depth profile window.



If you have a Sounder that can provide Bottom Classification, Backscatter or Bottom Hardness, TimeZero will also record this information at the same time as the depth and be able to display bottom hardness in color over the chart.

PBG can be done with any single beam sounder (TimeZero just needs to receive a depth value) or with a multi-beam sounder such as the Furuno DFF-3D or WASSP system. The advantage of using a multi-beam sounder such as the DFF-3D or WASSP is that you will be able to cover a much wider area and collect many more points more quickly.

## Configuring PBG (Single Beam Sounder)

The "PBG Module" needs to be unlocked to access this feature.

**Note:** This chapter only applies to the configuration of regular sounder (Single Beam Sounder) that simply provide a depth value. Please refer to the [DFF-3D Multibeam Sounder](#) installation chapter if you need to configure a Furuno DFF-3D multibeam sounder.

### Adjusting the Draft Offset

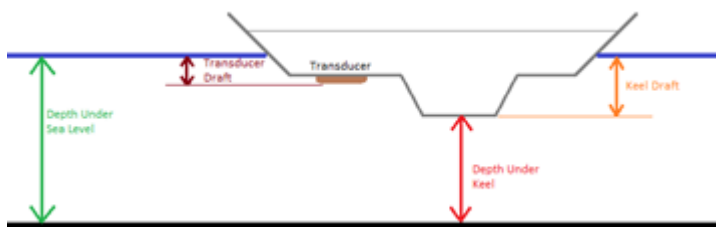
When using PBG with a regular sounder (single beam sounder), the Transducer Offset settings must be configured before any recordings can be made:

- Click on the Button and select "Options"
- Select "Initial Setup" and enter your transducer draft

Depth Display	Depth Below Waterline
Keel Draft	0.0 ft
Transducer Draft	6.0 ft

The value for "Transducer Draft" is always a positive value (enter the distance in between the water line and the position of the transducer).

The value for "Keel Draft" is also a positive value (enter the distance in between the water line and the bottom of the Keel).



**Note:** The "Keel Draft" parameter is not used by PBG. It is only used when you select to display depth below keel in the NavData. PBG will always record depth data in relation to the Water Line.

**IMPORTANT:** By default, the Transducer Draft Source is set to "Automatic". If you already have setup the draft offset in your sounder and if that information is sent to the software (using the \$DPT sentence), TimeZero will use this value and ignore the one setup in the options (the draft offset sent by the sounder has priority over the one you setup in the software when the Draft Source is set to "Automatic"). However, if you set the Transducer Draft Source to "Manual", TimeZero will use the value setup in the Options instead.

**IMPORTANT:** If you use a Furuno Ethernet Sounder (such as the DFF1 or DFF3), and if you want to setup the draft value inside the sounder (so that the same value is distributed on the network), you need to adjust the Transducer Offset from the [Sounder](#) Options (under the "Initial Setup" category of the sounder).

## Adjusting the Depth Filters

This paragraph only applies to single beam sounder (it does not apply to multibeam sounder such as WASSP or DFF-3D).

TimeZero allows you to adjust filters that will prevent erroneous data to be recorded in the 3D database when the sounder loses the bottom or detects a false bottom (a fish school for example). For the best result, we highly recommend to adjust at minimum the "Depth Filter" and the "Speed Filter" (those are the most effective filters) from the [PBG Options](#). Adjust the minimum and maximum depth filter according to your fishing location. For example, if you are fishing in between 50 and 200 feet, set the maximum depth filter to 250 feet. If you are usually fishing at 6Kn, adjust the speed filter to 10Kn (usually sounder performance and capability to detect a good bottom will drop at higher speed).

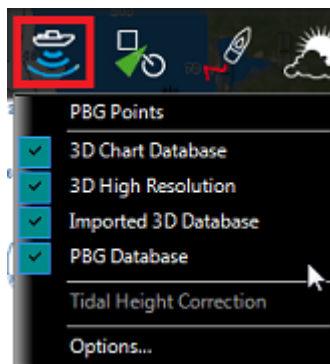
To open the PBG filters configuration, click on the "TimeZero" Button and select "Options" then "PBG". Refer to the [PBG \(Bathy Recorder\)](#) options for an explanation of the various filters.

**Note:** The Depth Filters are not available when connected to a multibeam [WASSP](#) system. To adjust filters on a WASSP system (such as Tide Offset), adjust these parameters directly in the WASSP Processor. In case of the [DFF-3D](#) multibeam sounder, only a quality filter is available.

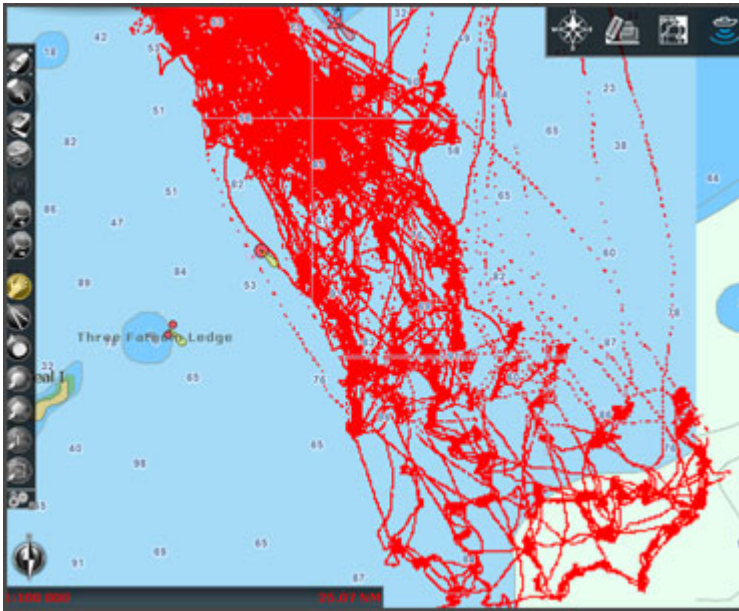
Although adjusting properly the depth filters is a key point in order to record good data, it is not uncommon for TimeZero to record bad depth points (caused by a school of fishes or sounder bottom detection loss). In this case, bad points can be deleted automatically or manually after they have been recorded. Please refer to the [Delete Bad PBG Data](#) chapter for more information.

## Displaying the bathymetry data on the charts

You can either display the bathymetry data in 2D using contour lines and depth shading or render it in 3D. The type of data used for the bathymetry is defined from the "PBG" ribbon button:



- PBG Points:** When this item is selected, the depth points that have been recorded or imported appear on the chart as a light red dot. This option is useful to spot areas where you have been recording data or to make sure that you are recording depth points (the software should drop a red dot behind the boat every second when PBG is enabled)



**Note:** PBG Points are not displayed with [WASSP](#) sounders.

- **3D Chart Database:** When this item is selected from the PBG ribbon, the 3D data from the charts will be displayed on the screen.
- **3D High Resolution:** When a High Resolution 3D database has been installed and this item is selected from the PBG ribbon, the High Resolution 3D data will be displayed on the screen (only available on selected areas).
- **Imported 3D Database:** When this item is selected from the PBG ribbon, the 3D data from files that have been imported will be displayed on the screen. Please refer to the [Import & Export Data](#) chapter for a list of supported 3D data that can be imported in TimeZero.
- **User 3D Database:** When this item is selected from the PBG ribbon, the 3D data that you have recorded in the software will be displayed on the screen.

Each of these 3D databases can be enabled or disabled independently. TimeZero merges the 3D databases that are selected and renders them on the screen in real time. Note that your depth soundings are recorded in a dedicated database (inside the "PBG Database"). At the beginning, when you have not recorded lots of data, it is recommended to enable the "3D Chart Database" (and "Imported Database" if you have imported 3D data) in addition to your PBG data. That way, TimeZero will automatically "fill the holes". After logging lots of data, it might be interesting to disable the "3D Chart Database" (and the "Imported Database") to only display your 3D data (that is the most up to date data).

- **Tidal Height Correction:** Check this option to have TimeZero correct in real time the depth recorded in the 3D database. By default, the nearest Tide Station (from GPS position) will be used as a reference. You can manually set a specific tide station by clicking on "Set Reference Station" from the "PBG" options.

**Note:** Tidal Height Correction is not available with [WASSP](#) sounders. Tide offset can be adjusted from the [WASSP](#) processor directly.

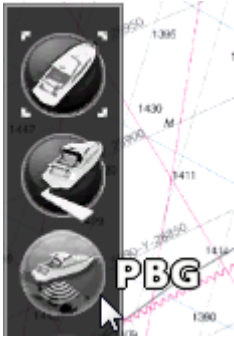
- **PBG Filters:** This option allows you to enable or disable all the Depth Filters that are set up in the "PBG" Options
- **Reset consistency filter:** This option is only available when the "Consistency with previous Data" is configured and enabled (in the "PBG" options"). Use this option to force the filter to take the current data as a new point of comparison. This is useful when the filter "gets stuck" when the terrain slope changes a lot. Refer to the [PBG \(Bathy Recorder\)](#) chapter for more information on the consistency depth filter.

**Note:** PBG filters are not available with [WASSP](#) sounders.

## Using PBG

The "PBG Module" needs to be unlocked to access these features

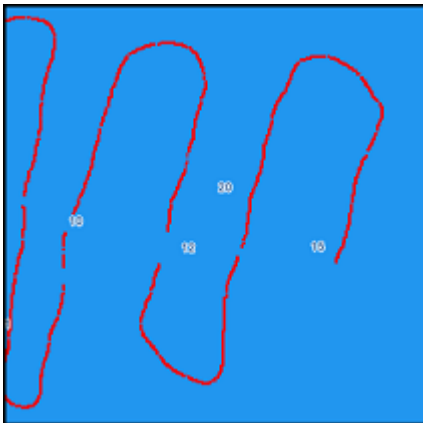
To enable or disable PBG (enable or disable the depth logging), click on the "PBG" button in the ToolBar:



When the depth data is being recorded, the "PBG" Button turns yellow:



To verify that depth points are being recorded, you can turn ON the "PBG Points" from the "PBG" button located in the ribbon at the top of your screen. When the boat is moving and when depth is being received from your depth sounder, you should see small red points that are dropped every second behind your boat. Note that in order to see the PBG points, you may have to zoom in on the chart:



**Note:** PBG points are displayed on the User 3D Database and Imported 3D Database only.

**Note:** If PBG does not seem to work, make sure that the software receives a good position and depth. Double check also that the Status Bar does not display any message in yellow (at the very top of your screen) regarding a depth filter that could prevent the data from being recorded.

## Depth Shading

The Depth Shading allows to display color according to depth. Three modes can be selected:

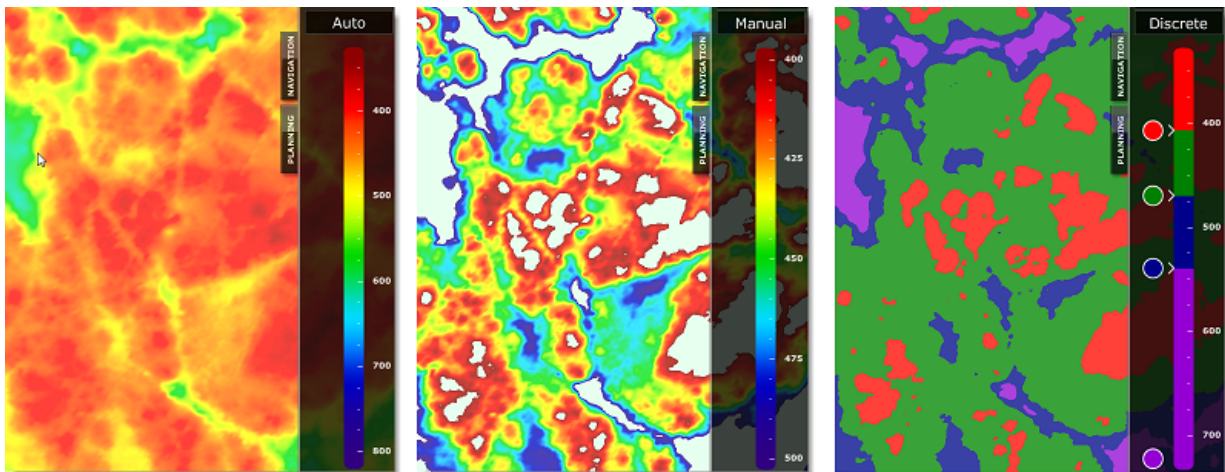
- **Auto:** In this mode, TimeZero scans for the deepest and shallowest point on the screen and automatically adjusts the upper and lower boundary so that your entire screen is always filled with color. This mode is useful to have a relative idea of where the shallow and deep areas are located. However, since the scale



continuously changes as you scroll the chart, this mode is not good if you want to focus on absolute depth value.

- **Manual:** In this mode, the minimum (red) and maximum (blue) depth values is adjusted manually. If an area containing depth points falls outside the range (defined by the minimum and maximum values), it will not be colored. This mode is useful if you want to highlight on the chart a specific depth range (for example when you are interested seeing all areas in between 100 and 150 meters). In between the minimum and maximum value a continuous gradient is used. The gradient that TimeZero uses can be selected by right clicking on the color scale.
- **Discrete:** In this mode, you also select the minimum and maximum depth values, but you also select the color that will be used in between. This mode is very useful when you want to use specific color for specific depth range (for example, use red for areas unsafe for navigation, then orange for areas safe for navigation but not interesting for fishing, then green for areas that are good for fishing and finally blue for area that are too deep). In "Discrete" mode, color can be added by double clicking on the color scale and edited or removed by right clicking on a color circle.

The example below shows the same areas in Auto mode, Manual mode, and Discrete mode:



To display and adjust the depth shading mode, it is recommended to use the [Fishing WorkSpace](#).

## Depth Contour Lines

Depth Contour Lines generated using the 3D database can be displayed in TimeZero from the "Chart" button located in the Ribbon. An innovative GPU algorithm allows a large number of contour lines to be drawn on the screen while maintaining the "TimeZero" performance (fast chart redrawing in 2D or 3D).

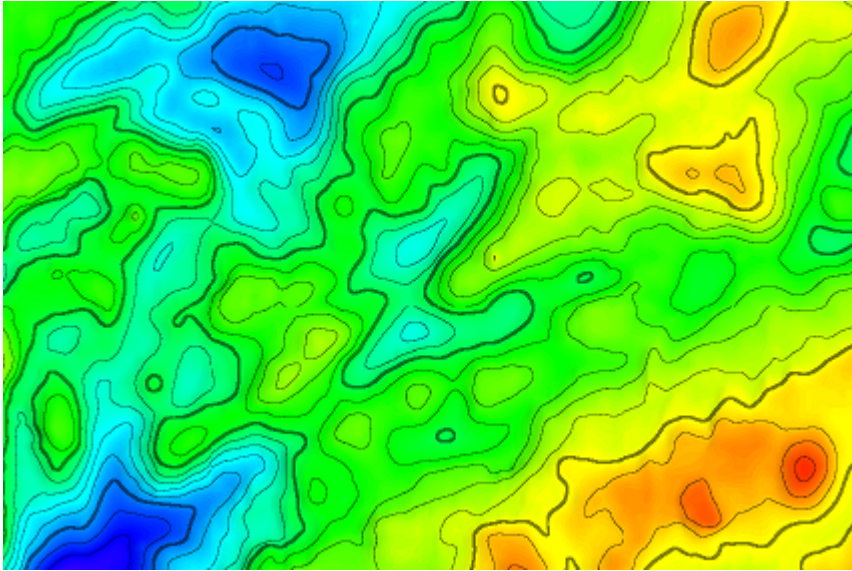
The contour lines can be set in "Automatic" or "Manual" mode:

### Automatic Mode

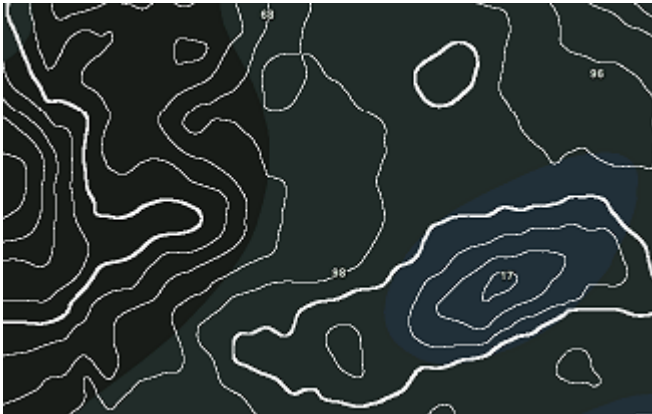
In automatic mode, TimeZero automatically adjusts the contour line interval based upon your density selection, slope and chart scale. As you zoom in/out or pan the chart, TimeZero will automatically adjust the contour line interval so that an appropriate amount of contour line is displayed on screen. This mode is perfect if you just want to have an idea of the relative slope for the area displayed on screen. However, if you prefer TimeZero to display a contour line based on a fixed interval, the manual mode should be used.

### Manual Mode

In manual mode, the contour line interval is manually fixed. In addition a "highlight" can be setup to display a bold contour line at a fixed frequency. In the example below, the interval has been manually set to 15 feet with a highlight frequency of 5 lines. There are 4 thin contour lines in between two bold contour lines:

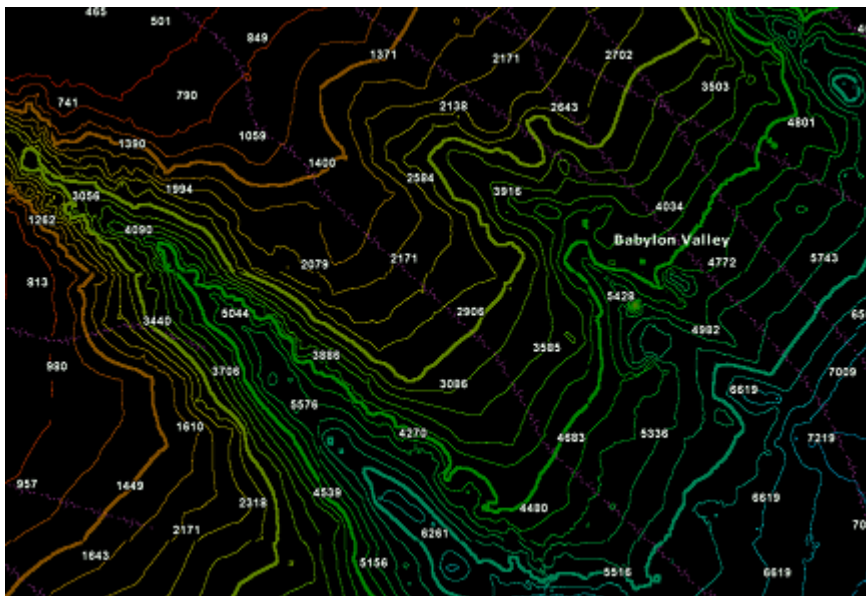


**TIPS:** You can select "Inverse Chart Palette in Day mode" to invert the chart color scale. In that case, the contour lines will be displayed in white on the screen:



### Contour Lines Color

When the depth shading is not displayed, the contour lines will be automatically displayed in color using the same scale and mode as the depth shading:.



**Note:** The contour lines will automatically revert to black when the depth shading is displayed, even if the option is checked. This prevents the contour lines from "disappearing" when using the same color as its background.

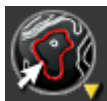
### Contour Lines Coverage

By default, contour lines are only displayed on the same depth range (min/max) as the depth shading. If you want to display the contour lines everywhere, it is possible to uncheck "Restrict Contour Line to Depth Shading Range" from the [Plotter Display Options](#) or by right clicking on the Contour Lines button of the [Fishing Workspace](#).

### Contour Line Tool

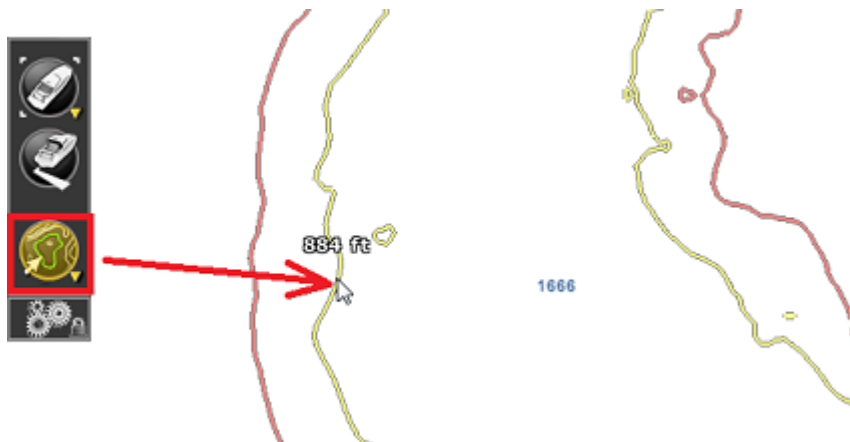
TimeZero allows you to create two custom contour lines (a red and a green contour line) by using the cursor with the "Contour Line" tool selected. This can be useful to highlight on the chart shallow water or to mark a boundary in between two depth values.

Click on the "Configure Tools" button at the bottom of the ToolBar on the left side of the screen and make sure that the "Contour Line" tool is added to the Toolbar configuration:



When this tool is selected, a temporary yellow contour line is drawn under the cursor with a depth label. This allows you to move the cursor over the chart and position the contour line to the desired depth. Left click on the chart to drop the contour line:





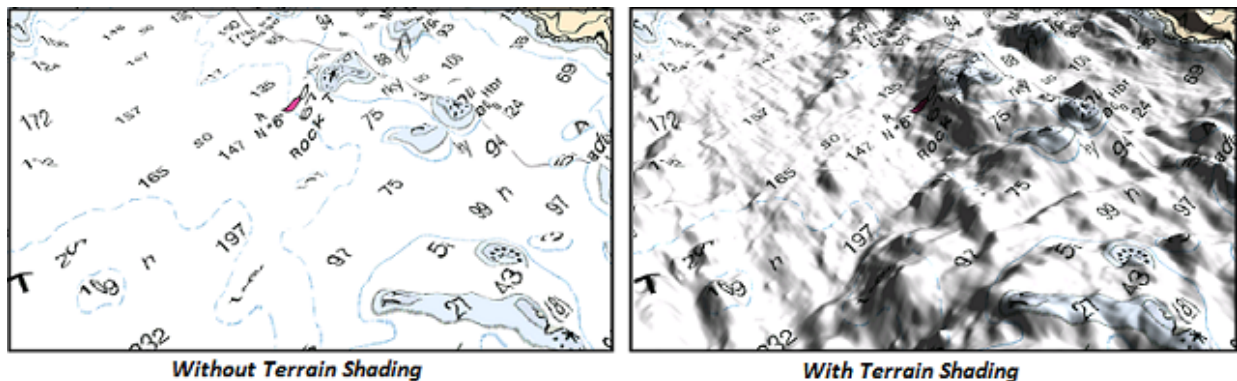
The contour line will be either drawn in green or in red according to the tool that has been selected. To change the tool from the red contour line to the green contour line, right click on the tool and select the corresponding color. Note that only two contour lines can be created with this tool. If you drop a second contour line of the same color, it will replace the previous one.

To delete the red and green contour line, just double left click on the Contour Line tool icon in the ToolBar.

**Note:** The red and green contour lines that have been drawn with the Contour Line tool appear on the chart even if "Depth Contour Lines" is not selected from the "Chart" Ribbon.

## Terrain Shading

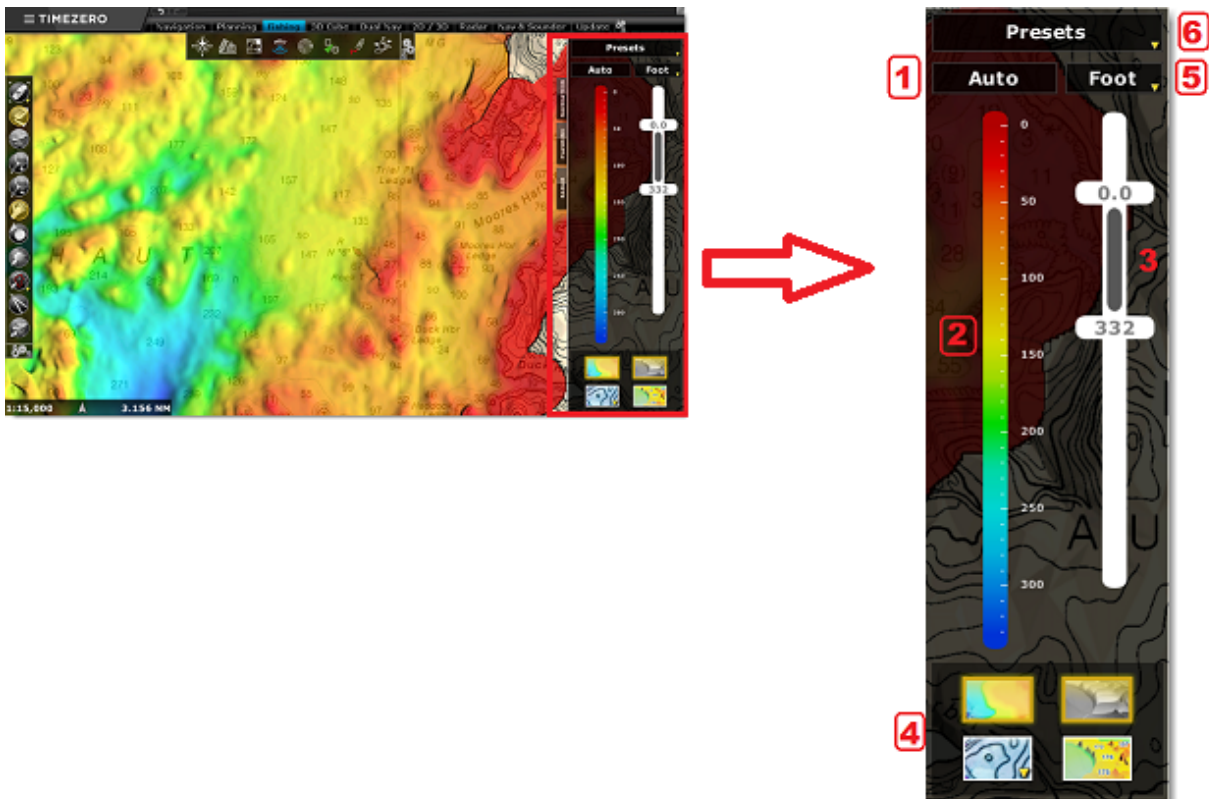
The Terrain shading highlight the relief on the chart and is available under the "chart" button located on the Ribbon or from the [Fishing WorkSpace](#). The shading level can be adjusted from the same location. This feature is especially useful in 3D mode when the charts are uniform (same color), making the 3D relief more visible:



## Fishing WorkSpace

The "PBG Module" needs to be unlocked to access this feature

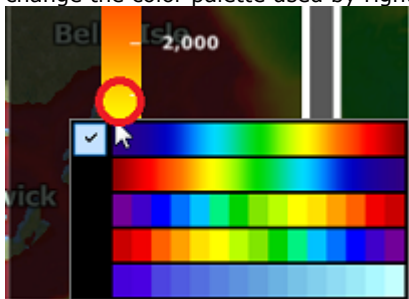
The Fishing WorkSpace is similar to the Navigation WorkSpace, but includes additional controls on the right side of the screen that allow the user to quickly adjust Depth (and Hardness) Shading, Terrain Shading and Contour lines parameters:



### 1: Depth Shading Mode

This button located at the top of the color scale allows you to switch in between 3 modes of Depth (or Hardness) Shading:

- **Auto:** In this mode, the color palette is fixed (color gradient) and the minimum and maximum scale is adjusted automatically according to the area (using the shallowest and the deepest point currently displayed on screen). In this mode, the Min/Max sliders control (3) cannot be adjusted as the minimum and maximum are adjusted by the software. Although you cannot change the scale values, you can change the color palette used by right clicking on it:



- **Manual:** In this mode, the color palette is fixed (color gradient), however the user can adjust manually the minimum and maximum scale using Min/Max sliders control (3). It is possible to click and drag on the slider handles, but also double click to enter a value manually using the Keyboard. If you use the wheel while the cursor is over a slider handle, it will automatically "snap" to the nearest rounded depth value.

**Tips:** The color palette is fixed using a color gradient in Auto and Manual mode, it is possible to change the overall color by right clicking on the color gradient (2).

- **Discrete:** In this mode, you can adjust the minimum and maximum scale value (to set your working depth area), and then adjust precisely which color you want to use for specific depth range. You can add a color by double clicking on the color scale (2) or right click and select "Add Color". The color can be moved

along the scale by clicking and dragging or by double clicking and entering a value. Color can be changed or removed by double clicking or right clicking on a color and select "Edit".

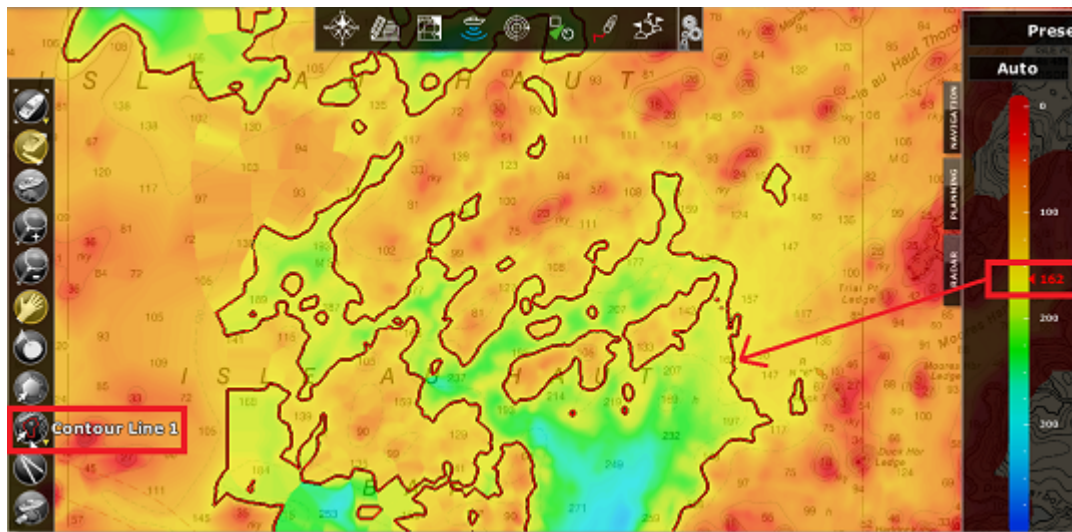
**Tips:** In Manual and Discret Mode, a button appears just underneath the scale slider (3). This button allows to automatically adjust the Minimum and Maximum scale just once (just when pressed). This is specifically useful to

initially set the overall range of depth in Discrete Mode:

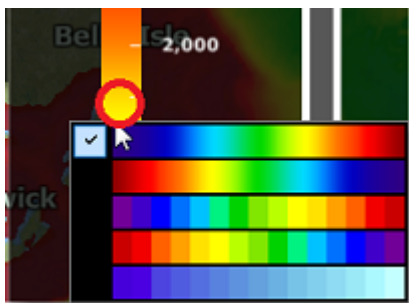


## 2: Color Scale

The color scale allows you to give a reference in between the colors displayed on the chart and corresponding depth. In Discrete mode, it is possible to specify the color and move them along the sliders. The color scale also displays the depth location of the contour lines drawn with the contour line tool. You can also drag it or double click on it to adjust its value:



Note that you can change the default scale color palette (when the mode is set to "Auto" or "Manual") by right clicking on it:



## 3: Range Scale

The range scale defines the minimum and maximum value where color will be shown. In Discrete Mode, it is important to adjust this slider first before adjusting the individual color. If "Restrict Contour Lines to Depth Shading Range" is selected in the Contour Line options, this slider will also affect where contour lines are drawn on the chart.

## 4: Display Buttons

These buttons located at the bottom allow to turn ON or OFF specific overlays on the chart:



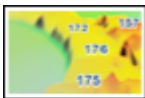
This button turns ON and OFF the Depth or Hardness Shading display. If you have hardness or backscatter data recorded in your database, you can right click on this button to switch the color shading according to hardness or backscatter (instead of depth).



This button turns ON and OFF the Terrain Shading display. Terrain shading allows to better see the relief even in 2D.



This button turns ON and OFF the Contour Lines display. Right Click on this button to quickly access the Contour Lines parameters.



This button turns ON and OFF the PBG Depth Soundings display. These depth soundings are displayed in black and comes from the user or imported 3D PBG database (in contrast to light blue soundings that are coming from the vector charts)

### 5: Unit Selection

This button located just above the range scale allows you to quickly change the depth unit of the software.

### 6: Preset Selection

At the very top, the "Presets" button allows you to manage or switch in between presets. A Preset captures all settings included in the panel: depth shading mode (Auto or Manual or Discrete), range scale minimum and maximum values, color scale, button states and contour lines parameters. You can create up to 12 presets.

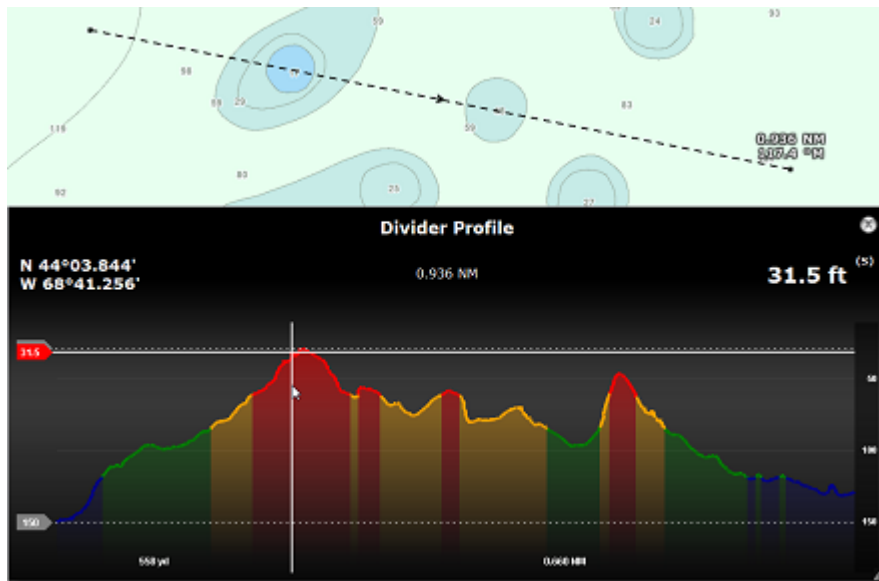
Presets are very useful especially when using the Discrete Depth Shading. They allow you to record various color palette settings for various application and allow to swap very easily from one to another.

**Tips:** Even if the button allowing you to switch preset is not available in the other WorkSpace (Navigation, Planning,...), it is possible to set a shortcut or add a Quick Access NavData to switch preset from anywhere in the software.

## Profile Window

The "PBG Module" needs to be unlocked to access this feature

The Profile Window allows you to analyze the bottom profile along a divider line or a track that has been previously recorded:



To display the profile window along a line, create a Divider Line using the "Divider" tool located in the ToolBar and then, double click on it or right click and select "Display Profile Window".

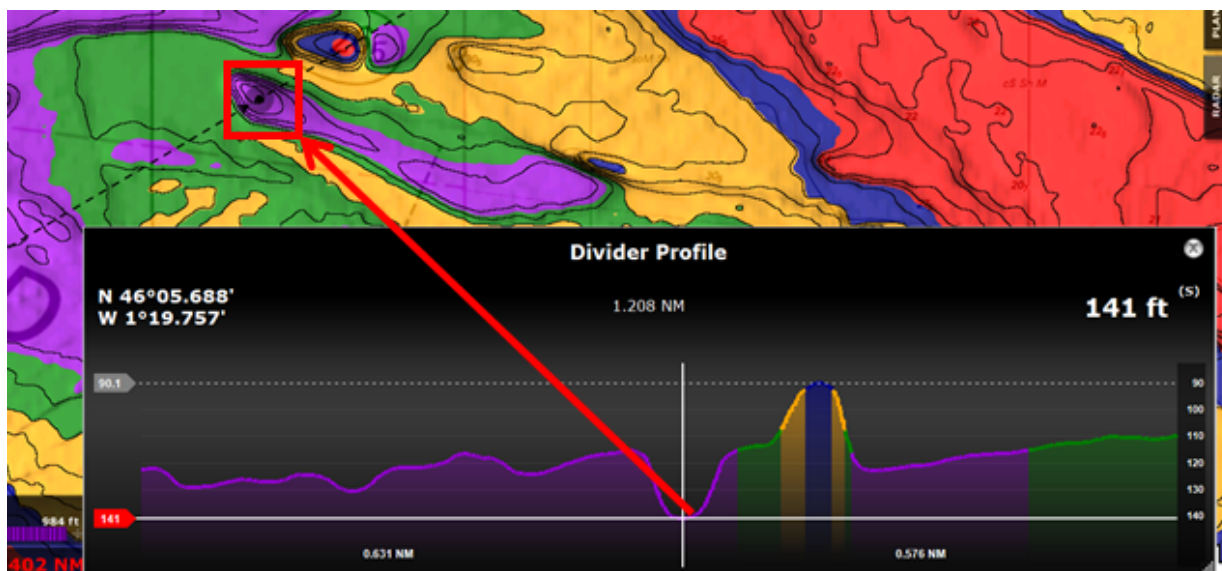
Once the profile window is open, it is possible to adjust the divider line on the chart by moving its extremities. The profile window will automatically adjust its content. Note that TimeZero will use the 3D database that are currently selected on screen to draw the profile window.

**Note:** It is not possible to display the profile window on a divider which is "linked" to the boat (a divider line that has been created by double clicking on the chart).

To display the profile window along a track line, right click on the corresponding track on screen and select "Display Profile Window". TimeZero will use the depth information embedded in the track to draw the profile window (the 3D database is not used in this case).

**Note:** It is not possible to display the profile window on a track which is currently being recorded by TimeZero

When you move the cursor over the profile window, the corresponding location is displayed on the chart:



It is possible to create a mark by double clicking directly on the profile window.



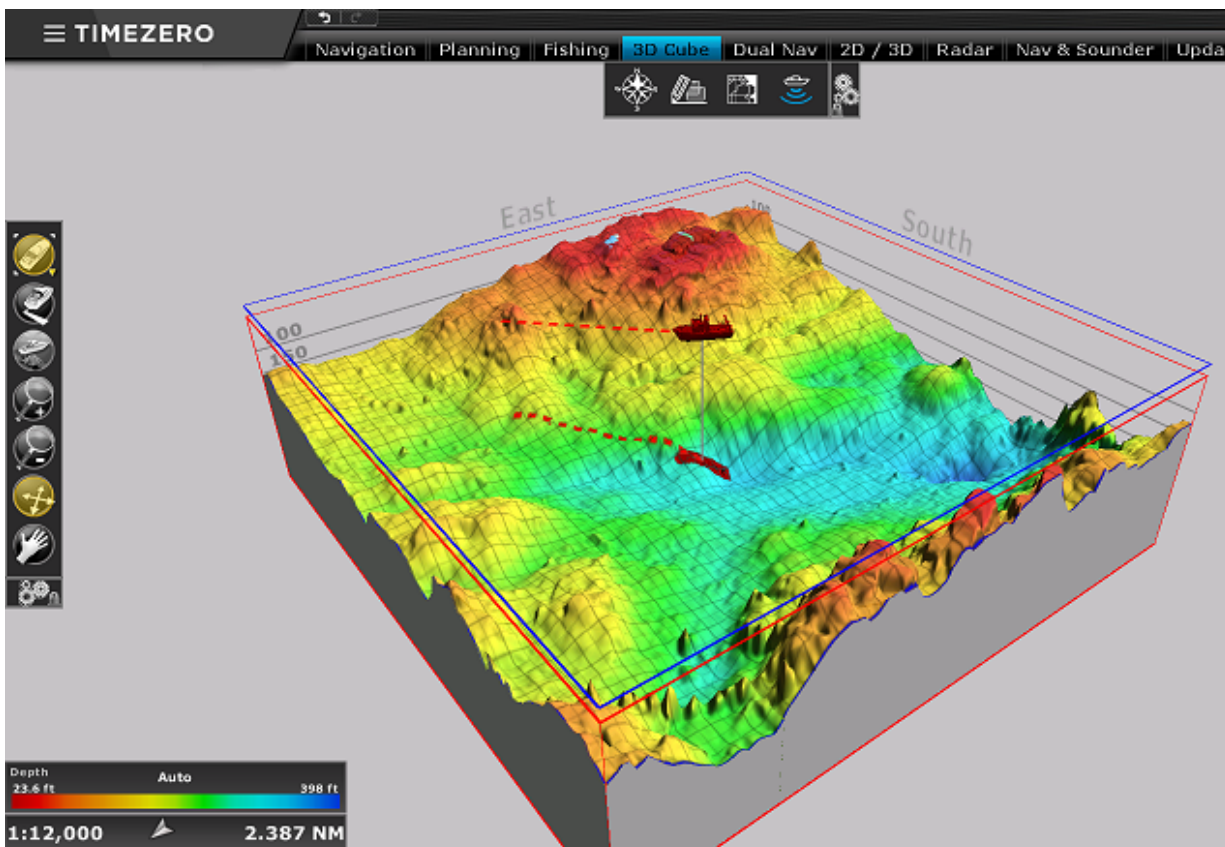
**Tips:** The profile window can be resized by clicking and dragging on its lower right corner.

**Note:** The profile window will use the same colors as the "depth shading" color configuration.

### 3D Cube WorkSpace

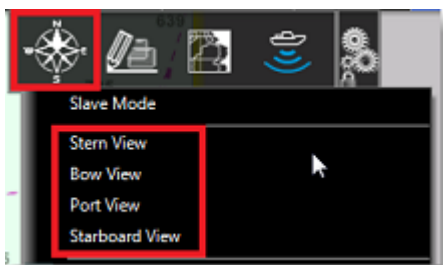
The "PBG Module" needs to be unlocked to access this feature

The 3D Cube WorkSpace offers a 3D view that is solely focused on bottom structure. In this WorkSpace, the bathymetry is always turned ON and is automatically adjusted to provide the best view possible:



It is possible to rotate the view around the boat by left clicking and dragging the mouse over the screen. As the boat moves and changes heading, the view stays locked providing the same camera angle relative to the bow of your vessel. The mouse wheel allows you to adjust the distance in between the boat and the view point (camera).

The "Mode" button of the 3D WorkSpace offers features that allow you to set the camera angle to specific presets and also display or hide a depth scale and 3D cone:



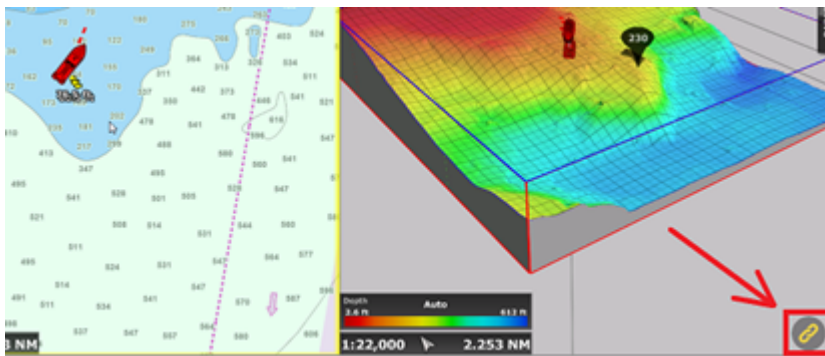
**Note:** Position and zoom presets can also be adjusted by right clicking on the chart

By default, the 3D Cube WorkSpace is center on the boat, but it is possible to move the view and explore various areas by selecting the "Pan" (hand) tool from the Toolbar. Once selected, left clicking and dragging the mouse will allow you to move the location of the 3D Cube view. To go back to the own ship position, click on the "Center On" button located at the top of the Toolbar.

Pressing the ESC key, will select the Orientation tool, which is the default tool of the 3D Cube WorkSpace.

**Tips:** While the Orientation tool is selected, it is possible to temporary switch to the Pan tool by pressing and holding the SHIFT Key.

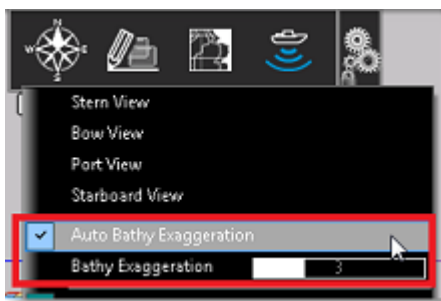
The 3D Cube also offers a "Slave Mode" (under the "Mode" button in the Ribbon). This mode is only available when a WorkSpace contains a 3D Cube display and a Navigation display (ex: when the screen is divided in between Navigation and 3D Cube) or when using multiple screens. When the Slave Mode is available, an icon will appear on the lower right corner of the 3D Cube display allowing to link the 3D Cube center point and zoom level to the Navigation display:



The user is able zoom and pan on the Navigation chart and the 3D Cube will automatically match the zoom and location. Note that if you manually pan the 3D Cube, then the Slave mode will be disabled automatically.

**Note:** Adjusting the Orientation of the 3D Cube will not disable the Slave Mode.

By default, the 3D exaggeration is automatic and is automatically adapted for the terrain displayed on the cube. However, it is possible to adjust a factor of Auto Exaggeration by adjusting the "Bathy Exaggeration" slider when "Auto Bathy Exaggeration" is selected:



It is also possible to fix a manual exaggeration by unchecking "Auto Bathy Exaggeration". In this case, the user will more likely have to re-adjust the manual exaggeration when changing areas.

By default, a Depth Cursor is displayed when moving the mouse over the 3D Cube View. It can be disabled from the "PBG" button in the ribbon:



**Note:** For positive depth value (altitude), the cursor will turn red.

In the "3D Cube" WorkSpace, all objects (marks, tracks, ...) are displayed projected on the bottom and cannot be edited (the "Navigation" or "Planning" WorkSpace must be used to create or edit objects). When using vector charts, only the chart background is displayed (buoys and other navigational objects are not represented). Additionally, a grid is displayed by default (that can be disabled from the "Chart" button in the ribbon). All of these contribute to display a simple and uncluttered 3D view for the user.

## **Bottom Hardness**

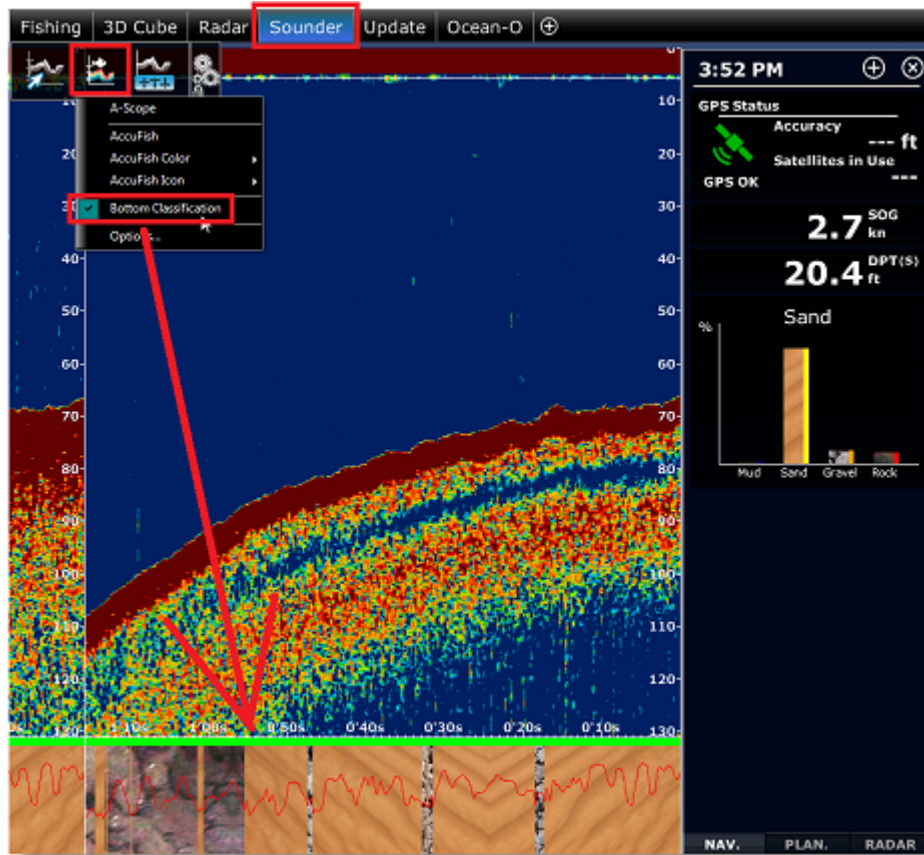
This feature requires the "Furuno Sounder" module (for NavNet sounders that support the bottom classification feature) or the "WASSP" module (for WASSP Gen1, Gen2 or Gen 3) or the "Bottom Hardness" module (for selected third party single-beam sounders). Contact your dealer for more information about sounder and transducer compatibility.

TimeZero can record bottom hardness (when PBG recording is enabled) together with depth when a compatible sounder (or WASSP) is connected and configured. There are three type of systems that can be used to provide hardness to TimeZero.

## **Furuno Network Sounders (Bottom Classification)**

The Furuno network sounders BBDS1, DFF1-UHD and the internal sounder of the TZT2 and TZT3 MFD have the capability of displaying bottom classification. These sounders determine the bottom structure and separates them into the following categories: mud, sand, gravel, and rock. This is achieved by analyzing echo characteristics of the High and Low frequencies from the bottom components such as particle size and hardness. Note that for the sounder to compute and send this data to TimeZero, "Bottom Classification" needs to be enabled from the Sounder WorkSpace under the "Sounder Display" button:





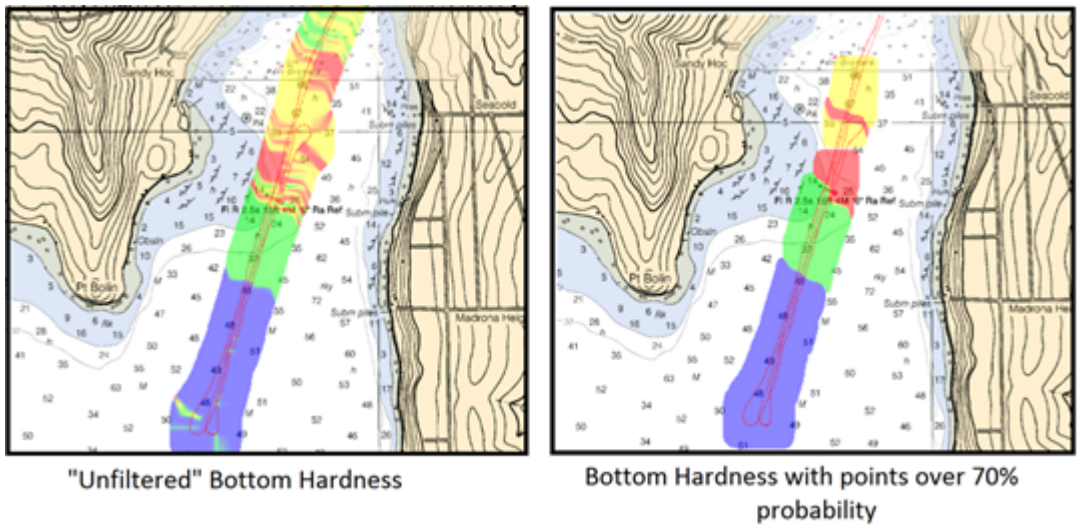
When "Bottom Classification" is enabled, the sounder switch in "Auto" mode (user cannot change the sounder range or its gain) and the dual frequency is enabled (this will slow down a little the ping rate). The bottom classification characteristics are displayed at the bottom of the sounder screen with a red curve indicating the "confidence" of detection.

**IMPORTANT:** The Bottom Classification only works in water deeper than 5 meters when the transducer has been configured properly. Please refer to the [BBDS1](#) or [DFF1-UHD](#) installation chapter for more information.

A bottom classification NavData showing the detection probability of each category (mud, sand, gravel, and rock) can also be displayed.

When the Bottom Classification feature of the sounder is enabled and PBG is recording, TimeZero will convert each category to a hardness percentage (0% mud, 25% for sand, 50% gravel and 100% rock) and record it in a database. The bottom hardness can then be displayed from the Fishing Workspace (see below).

A unique feature of the Furuno Sounders with Bottom Classification is that they also send the probability of discrimination, allowing you to know how reliable the data is for particular areas. This probability can be used in conjunction with the Bottom Hardness color scale to show data only in areas where the probability is high (filtering out uncertain data):



To enable the filter, select the "Minimum Probability" and adjust the slider under the PBG Options (just under "Bottom Classification Settings"). Increase the filter value if you want to display on the chart only the points that have a very high probability.

**Note:** The Bottom Discrimination Probability filter does not affect the recorded data. You can always remove the filter to display the full data on your chart.

**Third Party Sounder with hardness output capability**

Bottom Hardness can be recorded via NMEA0183 using the following sounders:

- Simrad ES70 and ES80 (\$PSIMDHB sentence)
- Koden CVS-FX series (\$PKODS sentence)
- Hondex HDX-121, HE-1500Di, and HE-7300Di (\$PHDX sentence)
- JRC JFC-130 series (\$PJ RCS sentence)
- Seascan (\$PSAP sentence)

**Note:** Bottom Roughness is not supported, only hardness.

Please note that the Bottom Hardness module is required for TimeZero to accept these NMEA0183 sentences.

**Note:** this module is not required for Bottom Discrimination data generated over the network by the BBDS1, DFF1-UHD or TZT2 Internal Sounder (feature included with the Sounder module).

Just like with Furuno Ethernet sounder, the hardness output of these various manufacturers is converted to a 0%-100% scale and can then be displayed from the Fishing WorkSpace (see below)

**WASSP with Backscatter**

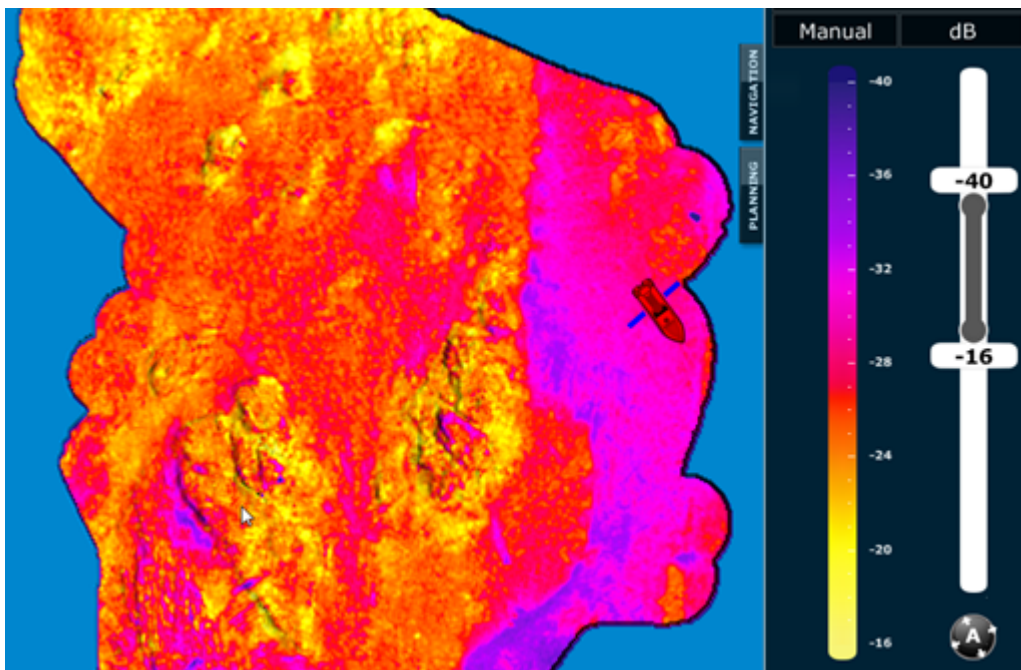
The multibeam sounder WASSP is able to send Backscatter data to TimeZero. Backscatter is very similar to bottom hardness. The backscatter can then be displayed from the Fishing WorkSpace (see below).

## Bottom Hardness display

When you have either Backscatter or Hardness recorded in your database, it is possible to right click on the depth shading color icon to switch the color scale mode to Hardness or Backscatter:



A new color palette is displayed from dark blue (soft) to bright yellow (hard) to render the hardness or backscatter on the chart:



Just like with Depth Shading, Auto, Manual and Discrete mode is available. The only major difference with depth shading is that hardness or BackScatter values that fall outside the min/max range (Manual or Discrete mode) will still be displayed in color on the chart (either using dark blue for value below the minimum, or bright yellow for value above the maximum).

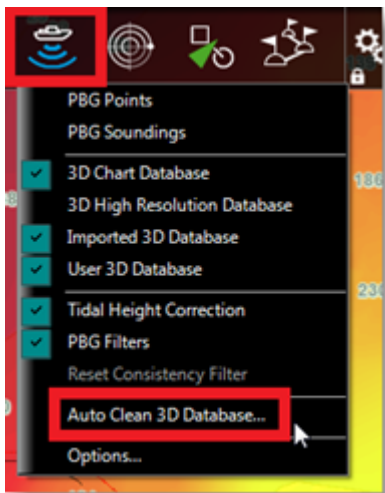
## Delete Bad PBG Data

The "PBG Module" needs to be unlocked to access this feature

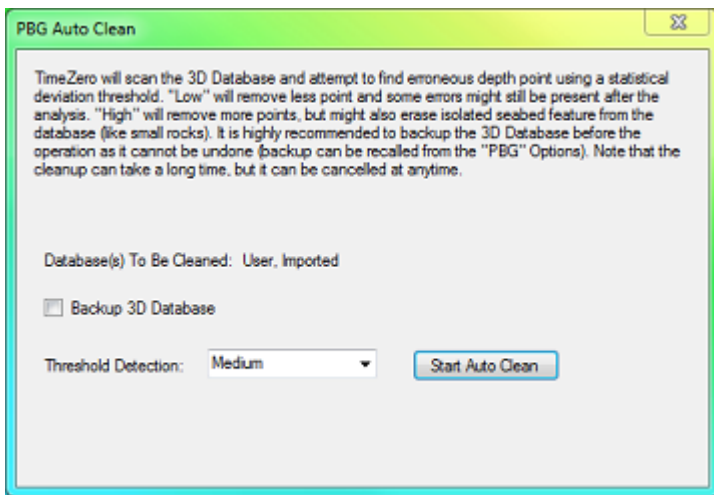
Sometimes, your sounder will send erroneous depth value to TimeZero. If the depth filters are not able to reject the erroneous points (or if they are disabled), you can manually delete bad PBG points after they have been recorded. Note that to delete PBG points, **you have to stop recording PBG data by turning OFF the "PBG" button in the Toolbar.**

## Full database "Auto Clean":

An "Auto Clean 3D Database" feature is available under the "PBG" button for single-beam and DFF3D depth data:



When selected, a window appears allowing you to launch a process that will detect and erase suspicious depth points (based on statistical analysis) using three thresholds on your entire database(s):



Note that the cleanup process will operate on the User 3D database, Imported 3D database or both according to which databases are currently enabled under the "PBG" button.

When set to "High", more depth points will be removed with a slight chance of removing isolated seabed features. When set to "low" some bad depth points might be missed and still be present in your database after the process is over. The default "Medium" threshold should get rid of all major erroneous depth values while keeping isolated seabed feature intact.

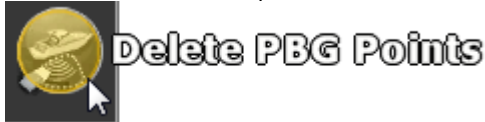
**IMPORTANT:** Note that it is not possible to use the "Undo" button while or after the clean up process has started. For this reason, it is possible to back up the PBG database **before** the process starts in case you want to revert back to your original database. If you are not satisfied with the clean up process and want to revert back, you will be able to click on the "Recall Single Beam & DFF3D databases" button available in the [PBG Options](#).

While the cleaning process is ongoing, TimeZero will move the chart and display the changes for immediate feedback. According to the size of the PBG database, the process could be long, but it can be interrupted at any time.

## Deleting erroneous depth points manually

To delete erroneous depth value:

- Select the "Fishing" WorkSpace
- Make sure that the Depth Shading is turned ON. This will help you locate the points with wrong depth value
- Zoom in on the chart to clearly see the bad points on your screen
- Select the "Delete PBG points" from the Toolbar



**Note:** If you don't see the "Delete PBG Points" in the Toolbar, add it to your configuration by clicking on the "Configure Tools" Button:



**IMPORTANT:** In order to be able to select the "Delete PBG Points", you must first disable the recording of the depth point (you must disable PBG)

- Click and drag with your cursor a closed area around the points you want to erase
- The points will be erased when you release your cursor

**Note:** If you made a mistake, you can always "Undo" by pressing the "Undo" button at the very top of the user interface

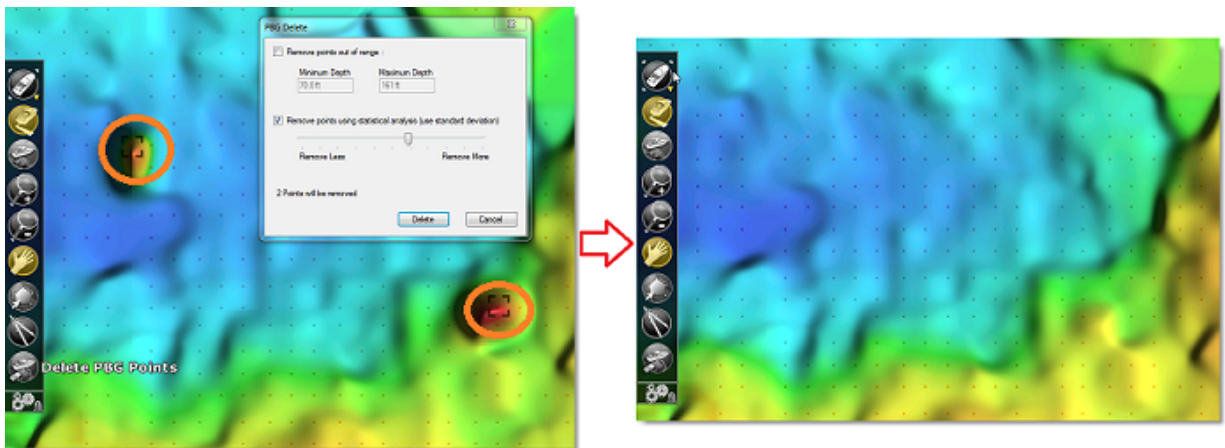
**Tips:** If you are zoomed in enough and can see only one bad point, you can left click on the bad point instead of dragging an area around it.

## **Deleting erroneous depth points in a local area (screen)**

TimeZero can attempt to detect automatically erroneous depth points by performing a statistical analysis over a small area (the screen location). It is also possible to delete multiple points at once that are outside a specific range of acceptable depth values.

- Select the "Fishing" WorkSpace
- Make sure that the Depth Shading is turned ON. This will help you locate the points with wrong depth value
- Zoom in on the chart to clearly see the bad points on your screen
- Double click on the "Delete PBG Tool"
- Select if you prefer to delete point using the automatic analysis (default) or by selecting a depth range.

If you choose to delete the points automatically, a slider allows you to adjust the tolerance for the erroneous points detection. Increase or decrease this slider until all the bad depth points are selected on screen and then press "Delete":



If you choose to delete the points by depth range, simply enter the range where all good depth value should fall under. For example, to delete invalid depth points that create a sharp peak on the screen, simply enter the range of depth that should contain all the good depth on screen. TimeZero will then select all the points that fall outside this range.

**Tips:** When opening the PBG delete window, the range of depth is initialized with the depth shading scale min/max values. So if you adjust the depth shading to only show color where the good points are, it will automatically select all the points outside the range when opening the window.

**Note:** You can "Undo" by pressing the "Undo" button at the very top of the user interface.



## Targets

### Target Overview

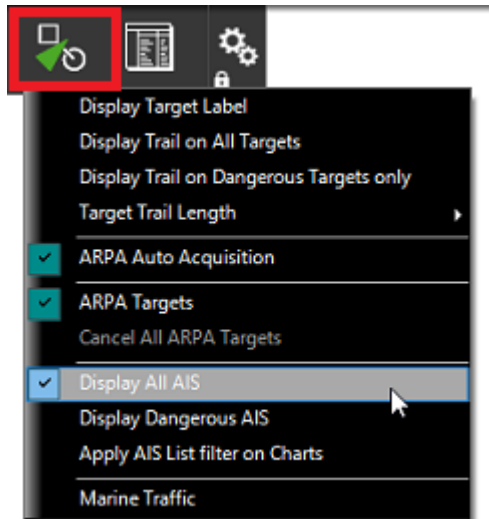
TimeZero can track multiple types of targets:

- ARPA targets (Radar Targets)

**Note:** A Heading Sensor is required to display ARPA targets in TimeZero

- AIS targets transmitted by an AIS receiver
- AIS targets received through the Internet from the [Marine Traffic](#) service ("Marine Traffic")
- DSC targets transmitted by a VHF with DSC functionality
- [Fleet targets](#) received through the Internet (using the My TIMEZERO Fleet Service) or via a Text file (POSREPORT Format).

Targets can be displayed on the chart or on the radar screen by selecting the "Target" button in the Ribbon and selecting the corresponding target category:



### AIS Target

AIS target symbols are small triangles colored by default in blue for AIS Class A and green for AIS Class B:



**Note:** AIS downloaded from the Internet through the Marine Traffic Web Site are colored in yellow. Please refer to the [Marine Traffic](#) chapter for more information:

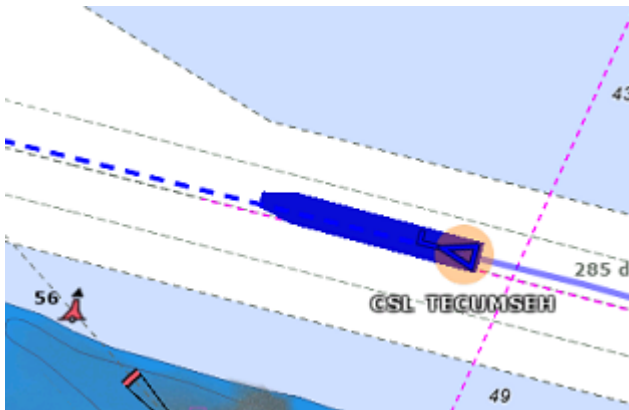


When Heading and Course Over Ground (COG) is sent by the AIS transponder, TimeZero Professional will use the heading information to align the AIS icon and will display a COG Vector in dashed line:



**Note:** The AIS COG vector length (predictor time) uses the same time parameter as your own ship setup in the [Ship & Tracks Options](#)

If the AIS target contains the vessel size information, TimeZero Professional will represent the shape of the vessel on the chart (in real size) when the chart is on a small range:



### AIS Target Icon

	AIS icon with Rate of Turn indicator. In this example, the AIS target is turning to port
	AIS Lost icon. An AIS gets lost if no information updating the target location is received after a period of time. The time that causes an AIS to get lost varies with the class of AIS (A or B), its speed, and its navigation status (moored, in navigation, etc...). A lost AIS icon will disappear from the screen after 30 seconds
	AIS Icon with one (or multiple) important data missing preventing CPA and TCPA computation (missing COG and/or SOG of target or Own Ship)
	Dangerous AIS icon breaking an alarm condition (either CPA/TCPA or proximity alarm)
	AIS Base Station icon
	AIS Search and Rescue Aircraft icon
	AIS SART (Personal Man Over Board transponder) icon
	AIS AtoN (physical or virtual Aid to Navigation) icon





AIS Weather (AtoN with environmental sensors) icon

## AIS Color

The default color of AIS targets can be changed from the [Targets](#) Options. You can choose a different color for AIS Class A or AIS Class B. You can also set the color to "variable". In this case, the target type (Cargo, Fishing, Blue Force, etc...) will be used to select the default color of the AIS icon:



You can also change the color of any AIS target individually by right clicking on its icon and selecting a color, or by adding an entry in the AIS favorite and specifying a color.

**Note:** When you manually change the color of a specific AIS target, TimeZero will remember this setting and will continue to represent that AIS target with the custom color even if the target is lost and required or if the software is restarted. Any color that has been setup manually or defined in the AIS favorite has priority over the default color.

## AIS Label

The target label can be set to display the name of the target (name of the vessel or MMSI number), the speed of the target, or a combination of both. You can select which data you want to use as target label from the [Targets](#) Options (by adjusting "Target Label"). Note that by default, TimeZero will only display a label on the selected AIS target, but if you prefer, you can display a label on all targets by selecting "Display Target Label" from the "Targets" button located on the Ribbons:



## AIS Favorite

It is possible to give a Nickname and set a fixed color to one or multiple AIS from the "AIS Favorite" list located under the [Targets](#) Options. Simply open the list by clicking on the "AIS Favorite" button, click on the "Add" button, enter the MMSI number of the target, select a Nickname and color. The list can be saved (exported) for backup or to be imported on another TimeZero Professional .

TIPS: You can also right click on an AIS icon directly on the chart and select "Favorite" to add it to the list (without having to enter its MMSI manually).

## AIS Filtering

AIS targets can be filtered (automatically hidden) on the chart from the "Targets" button located on the Ribbons. You can choose to:

- "Display all AIS": All AIS targets are displayed on the chart without any filtering
- "Display Dangerous AIS": Only the AIS targets that are considered dangerous are displayed on the chart. AIS are considered dangerous when they fall below both CPA and TCPA values (defined in the [Alarms Options](#)), or if they are inside a radar guard zone or inside the AIS proximity alarm radius,.
- "Apply AIS List filter on Chart": When selected, this option allows to match any filter that may be applied to the AIS list onto the chart. For example, if you select this option and decide to filter the AIS list to only display targets that are set as your favorite, only those AIS would be displayed on the chart (to match the list filter). Please refer to the [Target List & Information](#) chapter for more information on how to enable the AIS List filter.

## AIS SART

Personal Search And Rescue Transponders (SART) use AIS messages to broadcast their position and trigger an alarm automatically in TimeZero Professional . AIS SART can be a device on a vessel, in a life raft or a personal Man Over Board (MOB) device. In an emergency situation an alarm will be triggered and a message will appear in TimeZero asking to either center your display on the SART location or create a Go To point. The position of the AIS SART on the chart will be marked with the following icon:



TimeZero Professional can also receive AIS SART Test messages. In this case a simple notification will be displayed in the status bar and the icon will be displayed on your chart in green instead of red.

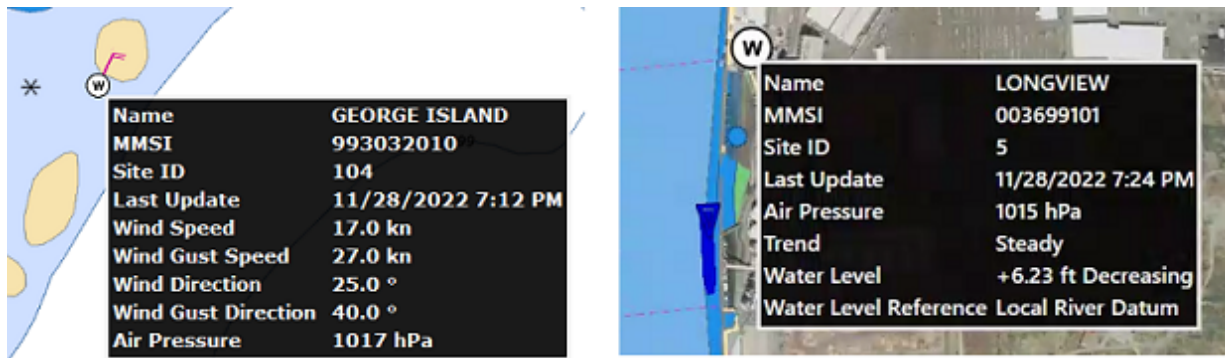
## AIS Weather

When TimeZero detects an AIS Base Station or AIS AtoN which sends environmental data, a special weather icon is used instead of the regular Base Station or AtoN AIS icon. If the environmental data includes Wind Speed and Wind Direction, TimeZero will add a wind feather directly over the weather icon:



**Note:** TimeZero is compatible with the AIS Message 8 (ASM) "IMO Meteorological and Hydrographic data" DAC1 FI31, "USCG/USACE Environmental Message" DAC 367 FI 33, and "IMO Environmental Message" DAC1 FI26.


When clicking on an AIS Weather icon, a tooltip will appear with all the environmental data which is broadcasted by the station:



## ARPA Target

This feature requires your computer to be connected to a Heading Sensor and a Radar

### Introduction

ARPA (automatic radar plotting aid) symbols are small circles colored by default in green: . The ARPA symbols are created and tracked by analyzing the radar picture. ARPA targets can be either computed by the Radar directly or by TimeZero when connected to an Ethernet Radar (when TimeZero receives the radar picture). In this case, TimeZero uses a powerful process to detect, filter and track up to 200 ARPA targets.

**Note:** When connected to a Furuno FAR or DRS radar via the network, it is possible to choose if the ARPA targets are computed inside the radar antenna (default) or by TimeZero by adjusting the setting "ARPA Processing" available in the [Radar Options](#).

### Acquiring ARPA targets

**Note:** It is only possible to acquire ARPA target from TimeZero when connected to a compatible Ethernet Radar (with corresponding Module unlocked). If your radar is connected to TimeZero via NMEA0183 (using TTM sentence), control from the PC is not possible.


ARPA targets can be manually acquired by:




- Double clicking on a radar echo
- Right Clicking and selecting "Acquire Target"
- Using the "Acquire Target" tool (hidden by default) and left clicking on a radar echo

Note that properly tuning and adjusting your radar for changing conditions (weather, sea state,...) is critical for proper ARPA target tracking. If there is too much noise on the radar picture, this can cause false targets detection. On the other hand, if the radar is not adjusted properly (not enough gain for example), you could miss some targets.

When TimeZero is processing the targets (only available with Ethernet Radar), ARPA targets can also be acquired automatically by analyzing Radar Echo inside one or multiple areas. Please refer to the [Guard Zones](#) chapter.

### ARPA Target Icon

 Just after acquiring a target, TimeZero will process radar data for a few revolutions and display the target using a dashed circle.

	Once the target is fully acquired, TimeZero displays the target using a plain circle with a speed vector (over 1kn).
	Lost ARPA target. This happens if the target becomes out of radar range or if the target cannot be tracked by the radar anymore.
	ARPA Icon (flashing) breaking an alarm condition (either CPA/TCPA or proximity alarm)

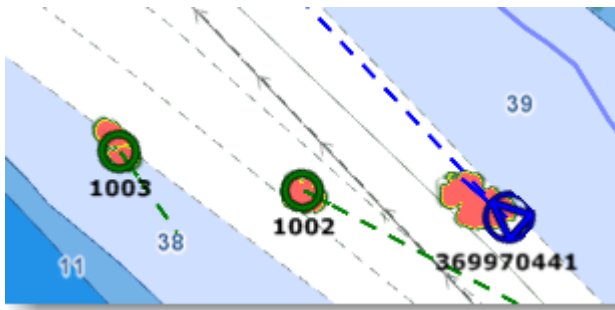
**Note:** When TimeZero is processing the targets (only available with Ethernet Radar), the ARPA target icon size and transparency varies according to its tracking quality. If the radar has difficulties seeing the target, its icon will slowly decrease and its transparency increase until the radar can get a strong echo of the target.

### ARPA Color

The default color of all ARPA targets can be changed from the [Targets](#) Options. You can also change the color of any ARPA target individually by right clicking on an ARPA target and selecting a color.

### Target Association

When Radar and AIS are connected to TimeZero, the same vessel can be picked up by both the Radar (as an ARPA target) and by the AIS Receiver (as an AIS target). To avoid displaying two targets on the chart, the AIS and ARPA targets are "fuse" into a single target with a specific icon (triangle inside a circle):





It is possible to fuse ARPA into AIS or AIS into ARPA. According to this selection, the position and the ToolTip of the target displayed on screen will reflect the one of the type selected. Target Association parameters are setup from the [Targets](#) Options.

### DSC Targets

DSC equipped marine radios provide vessel tracking for both DSC polling and distress calls. When you poll another boater who is also equipped with DSC VHF for their position, TimeZero will display their returned position. TimeZero can be connected to a VHF using NMEA0183 through the Connection Wizard.

When DSC is configured, DSC targets can be displayed from the "Target" button located in the ribbon:

 369258147	DSC target icon
 111111112	DSC target under distress icon

**Note:** DSC will not appear under the "Target" button until it has been configured in the Connection Wizard.

By default, DSC targets will display their MMSI number on screen. You can replace that number by a Nickname from the DSC Favorite list located in the [Targets](#) Options.

When a DSC distress call is received by TimeZero, an alarm will be triggered and the DSC target icon will be displayed in red.

## Target Information

TimeZero can display target information in various ways:

### Using the Target Tooltip:

Simply over or click on any target to display a tooltip:

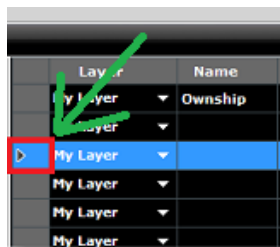


### Using the ARPA or AIS List:

Select ARPA or AIS List from the "List" ribbon button to display the list of targets at the bottom of the screen.

#### Sorting the list:

The list can be sorted by clicking on any column title. For example, you can click on the "Range" column title to put the closest AIS targets at the top of the list (click again on the title if the sorting is reversed). To select and center a target on the screen, click on the first column corresponding to the target you want to display:



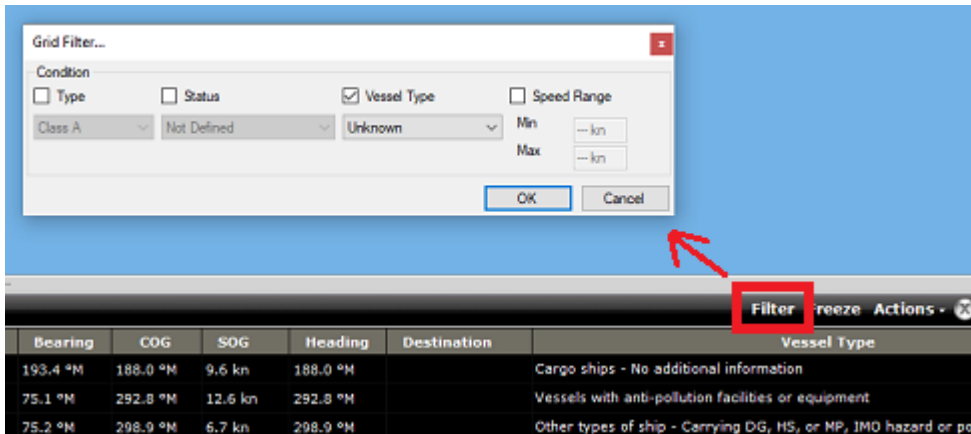
Note that the selected target might be bouncing up and down according to the sorting that you have selected. It is possible to "Freeze" the list (to prevent the selected line to be moved by the sorting process) by clicking on the "Freeze" button located in the list header:

A screenshot of the target list table. The table has columns for Range, Bearing, COG, SOG, Heading, Destination, Vessel Type, and Velocity. A red box highlights the 'Filter Freeze Actions' header in the top right corner.

Range	Bearing	COG	SOG	Heading	Destination	Vessel Type	Velocity
749 yd	266.7 °	178.0 °	0.0 kn	-- °		--	15: Not Defined
757 yd	267.7 °	15.0 °	0.0 kn	-- °		--	15: Not Defined
791 yd	268.0 °	283.0 °	0.0 kn	-- °		--	15: Not Defined
0.544 NM	265.1 °	286.0 °	0.8 kn	-- °		--	15: Not Defined
0.686 NM	152.5 °	167.0 °	0.0 kn	-- °		--	15: Not Defined

**Filtering the List:**

The AIS list can be filtered by clicking on the "Filter" button located on the AIS list header:



After pressing this button a window will appear allowing you to specify the filter you want to use. Pressing the "OK" button will validate the filter and a green checkmark indicating that a filter has been applied will be visible next to the filter button. To remove the filter and display all AIS targets again in the list, click a second time on the Filter button.

Note that by default, the filter only operates on the list, but if you select "Apply AIS List filter on Chart" from the Target ribbons, the filter will also be applied on the AIS targets displayed on the chart. For example, you may want to only display the AIS targets that you have set as favorite in the list and on the chart. Simply make sure to enable "Apply AIS List filter on Chart" and then set a filter by Vessel Type and select "Favorite".

**Using the AIS and ARPA NavData list**

If you do not want to display the full AIS or ARPA list (to save space at the bottom of the screen), you can use the AIS or ARPA NavData list.

An "AIS List" and "ARPA List" NavData can be added to the NavData bar configuration. Simply click on the "+" icon to add the corresponding NavData to the NavData bar.

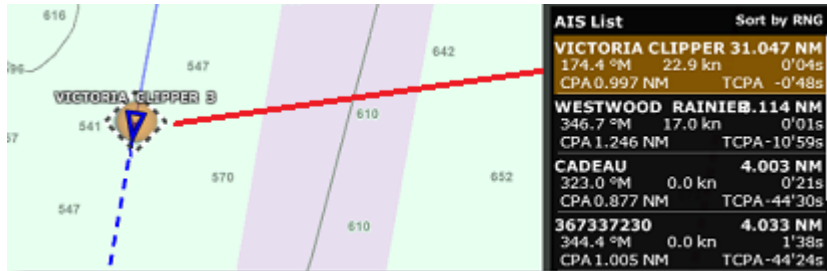
The image shows a screenshot of the 'AIS List' NavData window. The window title is 'AIS List' and it has a 'Sort by RNG' option. The list contains several vessels with their respective data:

<b>VICTORIA CLIPPER</b>	<b>31.042 NM</b>
174.5 °M	23.0 kn
0'01s	
CPA 0.997 NM	TCPA -0'43s
<b>WESTWOOD RAINIER</b>	<b>0.088 NM</b>
349.2 °M	17.0 kn
0'02s	
CPA 1.158 NM	TCPA -10'39s
<b>CADEAU</b>	<b>4.003 NM</b>
323.0 °M	0.0 kn
0'16s	
CPA 1.190 NM	TCPA -43'28s
<b>367337230</b>	<b>4.033 NM</b>
344.4 °M	0.0 kn
1'33s	
CPA 1.304 NM	TCPA -43'18s
<b>ZEEHAEN</b>	<b>4.067 NM</b>
85.4 °M	0.0 kn
0'44s	
CPA 1.321 NM	TCPA -43'58s
<b>WALLA WALLA</b>	<b>4.154 NM</b>
247.7 °M	0.0 kn
0'10s	
CPA 3.579 NM	TCPA 23'46s

The list can be sorted by Range, CPA , TCPA or SOG when you right click on the NavData. You can also select the type of data you want to see for each target (COG/SOG and/or CPA/TCPA). Note that this NavData automatically expands and contracts to occupy the remaining space of the NavData container. If all targets cannot be displayed

in the space available (more likely with the AIS list), it is possible to scroll the content of the AIS or ARPA NavData.

You can click on any item of the list and TimeZero will automatically center the chart on the corresponding target. Also, if you click on a target on the chart, it will highlight it inside the list and scroll if necessary:

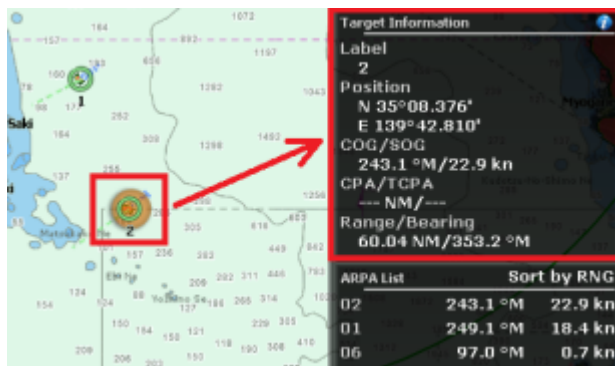


## Using the Target Information NavData:

If you do not want to use any list, and just want to keep an eye on a single target, you can use the Target Information NavData that will display basic info about the selected target.

The "Target Information" NavData can be added to the NavData bar configuration. Simply click on the "+" icon to add the corresponding NavData to the NavData bar.

The target information always displays the information of the last selected target (surrounded with an orange circle on the chart):



To display the full information of the target, click on the blue "i" icon located on the top right corner of the NavData.

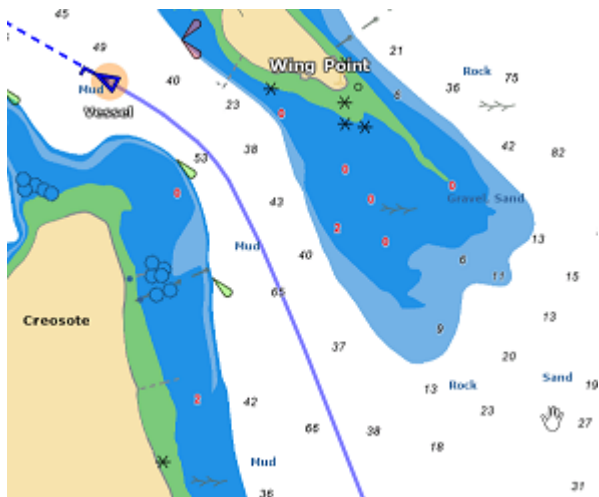
**Tips:** If you don't want to leave the NavData bar opened all the time but still want to see the target information, you can undock the Target NavData by dragging it outside of the NavData bar, then close the NavData bar and position the NavData in a corner. To "lock" the NavData and prevent to move it accidentally when dragging the charts, you can select "Lock Undocked NavData" from the [General](#) options.

## Target Trail

### Target Trail

TimeZero automatically keeps track of all the AIS and ARPA target history (for up to 12H). In order to display the target position history (called a "trail"), simply click on a target to select it, and its trail will be automatically displayed:





**Note:** The trail color always matches the target color.

The trail offers a very convenient and quick way of displaying the target overall movements without having to manually enable track recording and without cluttering the display with hundreds of tracks. You can adjust the trail length from the [Targets](#) Options or from the Target button located in the ribbons with the "Target Trail Length" setting (set to 6 minutes by default).

Note that it is possible to display the trails on all targets by selecting the corresponding option from the Target Ribbon button. It is also possible to automatically display the trail on "dangerous" targets (targets that break the CPA alarm).

If you have the VDR Module, you can display a trail on a replay target (thus extending the 12H limitation) by simply clicking on a replay target. Note that the trail representation on a replay target is slightly different:



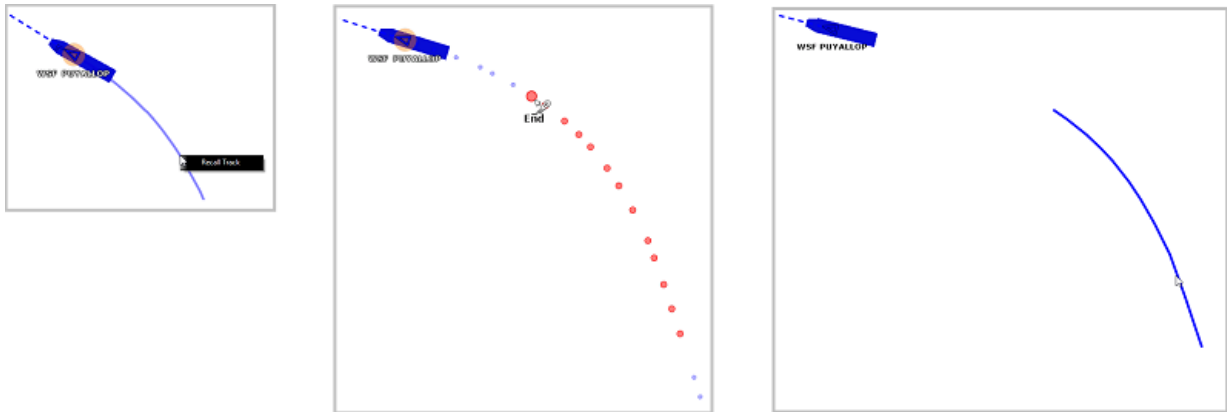
### Target Track

If you prefer to record permanently a track, Target Tracking can be enabled on AIS and ARPA targets by right clicking on a target and selecting "Target Tracking". From that moment, TimeZero will stop displaying the trail and start recording a track. Just like trail, the track line has the same color as the target (this can be changed by right clicking on the target or the track at a later time).

When the target disappears from the screen (when the target is lost), the track remains on the screen until manually deleted by the user (by right clicking on the Track line). In case of AIS target, tracking can be automatically enabled as soon as the target re-appears if "Remember AIS tracking status" is set checked from the [Targets](#) Options.

## Target Track Recall

It is possible to create a target track after the fact from a target trail. This is useful if you do not want to enable Target Tracking systematically (to avoid creating lots of tracks), but decide at a later time to create a track from a trail. Simply right click on the target trail and select "Recall Track". All the trail points will be displayed and the cursor will change allowing you to set a starting position by clicking a first time, and then set an ending location by clicking a second time:



After setting the end point, the track will be recalled and saved permanently in the track database (until manually deleted).

**Note:** The track might be displayed initially behind the trail. You can right click anywhere and choose "unselect all" to de-select the target and hide the trail from the screen. This should reveal the track behind it.

## Target CPA & TCPA

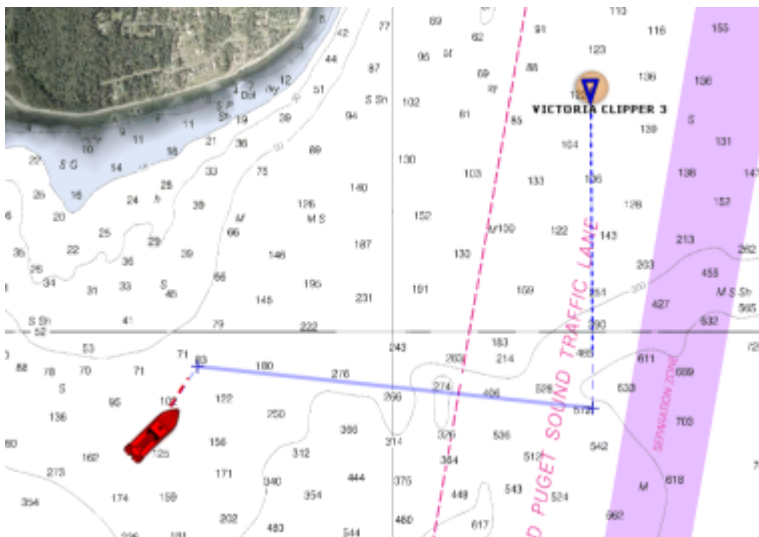
### CPA & TCPA values

TimeZero always compute and update on any target type the Closest Point of Approach (CPA) and the Time to Closest Point of Approach (TCPA). You can display those values from the target tooltip or the target list, but you can also set thresholds that will categorize a target as dangerous and change the way the icon will be displayed on the chart and/or trigger a specific alarm. Those thresholds can be adjusted from the [Alarms](#) Options under "CPA Alarm/Display Value" and "TCPA Alarm/Display" value. Note that both thresholds need to be met for the target to be considered dangerous.

If the "CPA/TCPA alarm" is checked from the [Alarms](#) Options, the status bar will turn red and an audio sound will play (if a sound has been selected under "Define Alarm Sounds") as soon as a target break both CPA and TCPA thresholds.

### Graphic CPA

Graphic representation of the target Closest Point of Approach (Graphic CPA) can be displayed on the screen when the "Display CPA/TCPA vector" is enabled from the [Targets](#) Options. This information is continuously updated and warns you about potential collisions by locating on the chart the location where you will meet a specific target.

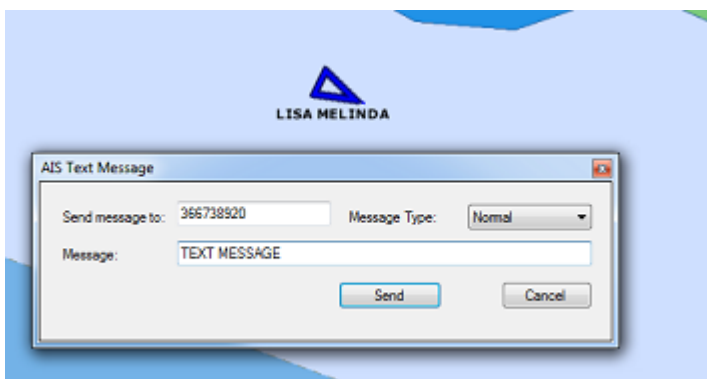


## AIS Text Message

### Sending AIS Text Message

When TimeZero Professional is connected to an AIS Class A **bidirectionally**, it is possible to send an addressed text message to another vessel that has an AIS receiver (Class A).

To send a message manually, right click on an AIS target and select "Send Text Message". Select the Message Type (Normal or Safety), type the message and click on "send":



AIS Text Messages can also be sent by clicking on the Target button located in the Ribbons, and by selecting "Send AIS text Message...". By default, the destination of the message will be filled with the MMSI of the selected target, but you can change and edit the MMSI number if you want.

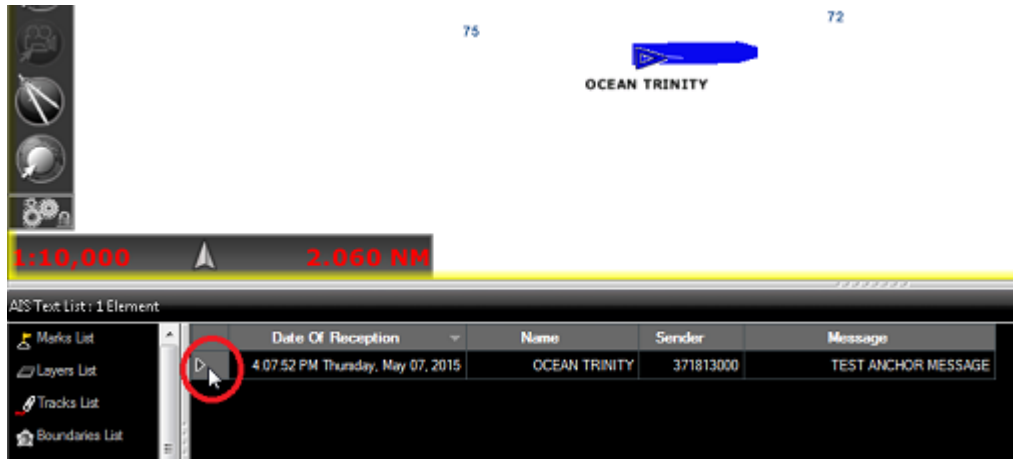
**IMPORTANT:** If you use a Furuno FA170 connected to the computer via Ethernet (NavNet network), the configuration is automatic. However, with any other AIS that are connected through a serial COM port (NMEA0183), a bidirectional serial communication must be used in between the computer and the AIS transmitter. Use the [Data Output](#) of the Connection Wizard and select the "ABM" sentence on the port connected to the AIS transmitter. The option to send an AIS Text message will not appear if the "ABM" sentence is not configured as an output in the Connection Wizard.

If the AIS transmitter sends an acknowledgment (through the NMEA "ABK" sentence), TimeZero Professional will display the notification "AIS Text Message Sent" in the status bar (no need to configure the "ABK" sentence as an input)

**Note:** Instead of using a serial cable, it is also possible to use the Furuno FA150 with the LAN adapter card (LAN Kit) and send/receive AIS text message (and AIS targets) through the network. The LAN adapter card needs to be set in "PC" mode and the UDP port 10000 needs to be configured as an "AIS" for input type and "ABK" for output.

## Receiving AIS Text Message

When the AIS receives a text message, it is automatically displayed in TimeZero Professional. A notification will appear in the Status Bar ("AIS Text Message received from: xxxxx" (where xxxx is the MMSI of the target that sent the message), and the message will be added to the "AIS Text" list. You can click on the AIS List (left side of the list) to retrieve on the chart the target that sent the message:



Message can be erased individually by right clicking on the message from the AIS Text List or globally from the AIS Text List "Actions" menu. Up to 100 messages can be stored in the AIS Text List.

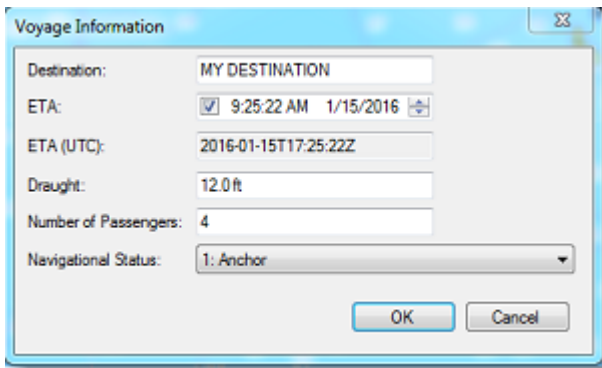
TimeZero Professional will display "Normal" or "Safety" messages that are addressed or broadcasted.

## AIS MKD

AIS Class A are required by legislation to have a Minimal Keyboard Device ("MKD") to enter voyage related data that will be used in their broadcast information (so that other vessels can know their status). Usually, entering the required information on an AIS MKD is cumbersome and difficult. TimeZero allows you to program your AIS Class A directly from the PC using a clearly organized user interface.

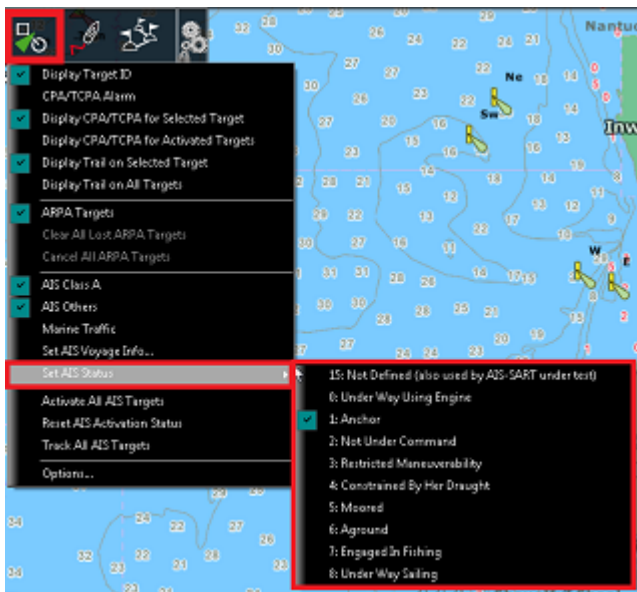
**IMPORTANT:** If you use a Furuno FA170 connected to the computer via Ethernet (NavNet network), the configuration is automatic. However, with any other AIS that are connected through a serial COM port (NMEA0183), bidirectional serial communication must be used in between the computer and the AIS Class A. Use the [Data Output](#) of the Connection Wizard and select the "VSD" sentence on the port connected to the AIS Class A. The option to set the AIS Voyage Info and Status will not appear if the "VSD" sentence is not configured as an output in the Connection Wizard.

Once TimeZero is properly configured to output the "VSD" sentence to your AIS Class A, you can program your AIS with your Voyage Information. Select "Set AIS Voyage Info..." from the "Targets" button located in the Ribbons. The following window will appear:



Enter the various information and press OK to send the configuration to your AIS.

If you only need to change your status (Anchor, Under Way, Moored,...) you can also select directly "Set AIS Status" from the same menu:



**Tips:** You can also set shortcuts on your keyboard to change AIS Status directly (or even create a [QuickAccess NavData](#)). This is specifically useful if you are required to change your status often (like a ferry).

## Fleet Tracking

In addition to AIS and ARPA targets, TimeZero can display Fleet Targets which are "private" targets that are generated from other compatible TimeZero platforms. It is possible to send/receive TimeZero Fleet targets using two methods which both have their advantages and limitations:

### Fleet Targets send & receive via TZ Cloud

Transmission of the fleet target data is done via an Internet connection using TimeZero's own servers ("TZ Cloud") and is compatible with TZ Professional, Furuno NavNet TZT2/TZT3 and TZ Coastal Monitoring. It requires each vessel to use either TZ Professional or a Furuno NavNet TZT2/TZT3, and it requires the operating center (that would display the fleet target data) to either use TZ Coastal Monitoring Single/Dual Radar or TZ Coastal Monitoring Remote. Vessel's position and optionally wind/depth data can be transmitted at up to 5 seconds interval (default is 30 seconds). The TZ Cloud Fleet Tracking solution also allows to send text messages, user objects (routes, marks, areas...) and Radio Direction Finder bearings (MOB detection) among the fleet participants (RDF not available on NavNet T22/TZT3). The TZ Cloud Fleet Tracking solution has been optimized for slow and intermittent Internet connection. It supports "store & forward" for up to 7 days / 10,000 positions per vessel. This means that if a vessel loses its Internet connection (even for a couple of days), its past positions

will be uploaded to the TZ Cloud as soon as an Internet connection is recovered (allowing all other participants to display a full trail without any "holes").

The Fleet Target via TZ Cloud is the perfect solution for customers that just need to upload basic data (position, wind, depth), or need to exchange user objects (route or boundary areas), or customers that do not want to setup their own infrastructure (no server setup needed, just a basic Internet connection). Typical customers would be a Search & Rescue operation that needs to send SAR routes from a command center to one or multiple vessels, or a Fishing Fleet that would need to keep track of its vessels and send boundary areas (prohibited areas).

Note that the Fleet Target solution via TZ Cloud requires an annual subscription (price varies according to the amount of vessel in the fleet). Fleet targets can be viewed and interacted with by any participant in the fleet.

#### Fleet Targets send & receive via TZ Host

Transmission of the fleet data is done via the self-managed TZ Host (Remote Architecture) and is only compatible with TZ Professional and TZ Coastal Monitoring. It requires each vessel to use TZ Professional with the TZ Host output module (not compatible with NavNet TZT2/TZT3), and it requires the operating center (that would display the fleet target data) to use TZ Coastal Monitoring Remote. This solution allows to send not only the vessel position (including wind and depth) but also the vessel AIS and ARPA targets together with Radar echo and Camera picture (including remote control ability for Radar and Camera). The trade-off is that a permanent connection must be established in between TZ Professional / TZ Coastal Monitoring Remote and the TZ Host (no "store & forward" capability due to the amount of data). Note that this connection does not need to be an Internet connection. The TZ Host can operate on a private LAN or private WAN. Another limitation is that sending user objects or text message is not supported via the TZ Host solution.

The Fleet Target via TZ Host is the perfect solution for customers that want to monitor (and control) radar or camera remotely. Typical customers would be one or multiple autonomous / semi-autonomous vessels (loaded with TZ Professional and the TZ Host output module) which require monitoring from the office (using TZ Coastal Monitoring Remote), or a customer with a land-based TZ Coastal Monitoring solution that needs some vessels to be part of the surveillance operation (mixing land-based station with mobile assets).

Fleet Target via TZ Host is self-managed and does not require a subscription.

**Note:** It is not possible to combine both solution (Fleet Tracking via TZ Host and Fleet Tracking via TZ Cloud).

## Setup of Fleet Tracking via TZ Cloud

It is possible to subscribe to the My TIMEZERO Fleet Tracking service through your dealer. When this service is activated, you can configure multiple vessels under a "fleet" account (your private group of vessels). Each vessel will be able to report their own position and receive the position of all other vessels in the fleet using an Internet connection. The secure communication with the TimeZero server was optimized to take as little bandwidth as possible (so that the service can be used with Satellite connection). In addition to be able to send and receive position, members inside the fleet can also exchange User Objects (Marks, Routes, Boundaries, and Photos) very easily.

### **Setup Vessels with TZ Professional:**

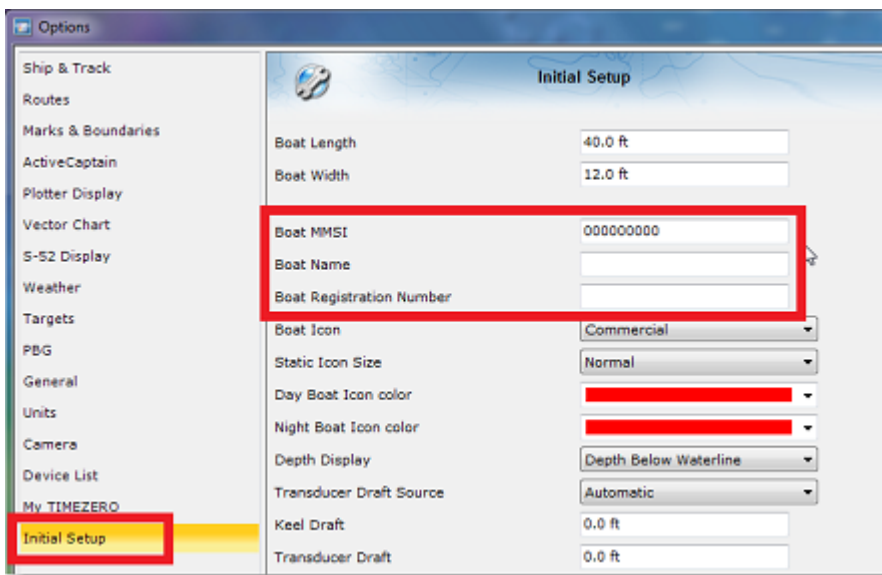
Each vessel must have an Internet connection and be setup and logged in with a different My TIMEZERO account. Once setup, contact your dealer to activate the service with the list of vessels (the list of My TIMEZERO accounts) to include in your fleet. Then, enable the "Report my position automatically to My TIMEZERO" from the [My TIMEZERO Options](#). Enabling this option will allow TimeZero to send your position, but also retrieve the positions of all other vessels in the fleet. The reporting frequency can be adjusted (as often as every 5 seconds to once every hour). You can choose to only send your Position (+ COG/SOG) or also include Depth and Wind data (speed/direction).

**Note:** The size of one message is less than 450 bytes for position (+ COG/SOG) and about 500 bytes (0.5KB) when it includes the additional Depth and Wind data. With the default option (set to report every 30 seconds), the upload bandwidth will be approximately 1.5MB/day and the download bandwidth will be the same number multiplied by the number of vessels in the fleet (so about 7.5 MB/day for 5 vessels). The bandwidth can be dramatically reduced by setting slower reporting interval (down to 12KB/day!).

When the position report is enabled, a status icon will appear in the top right corner (next to the minimize button) to indicate when TimeZero has a proper connection to the Fleet Tracking server. Green means that the connection is working and red signify that TimeZero is not connected (usually when the Internet connection is lost):



Note that it is highly recommended to setup the "Boat MMSI", "Boat Name", and optionally "Boat Registration Number" from the [Initial Setup](#) Options:



The boat MMSI is especially important if the same My TIMEZERO account is used on multiple vessels. In that case, make sure to use different MMSI numbers so that the position reporting does not "jump" in between two vessels that are logged with the same account. You should also setup the boat name because it will be displayed on all the other TimeZero that are in the same fleet as you. The boat registration number and boat size are optional and for information only (they would be displayed in the vessel properties).

**TIPS:** If you are connected to an AIS transmitter (Class A or B), the boat MMSI and boat name will be automatically setup from the AIS feed through the VDO sentence.

**Setup the Supervision Center with TZ Coastal Monitoring:**

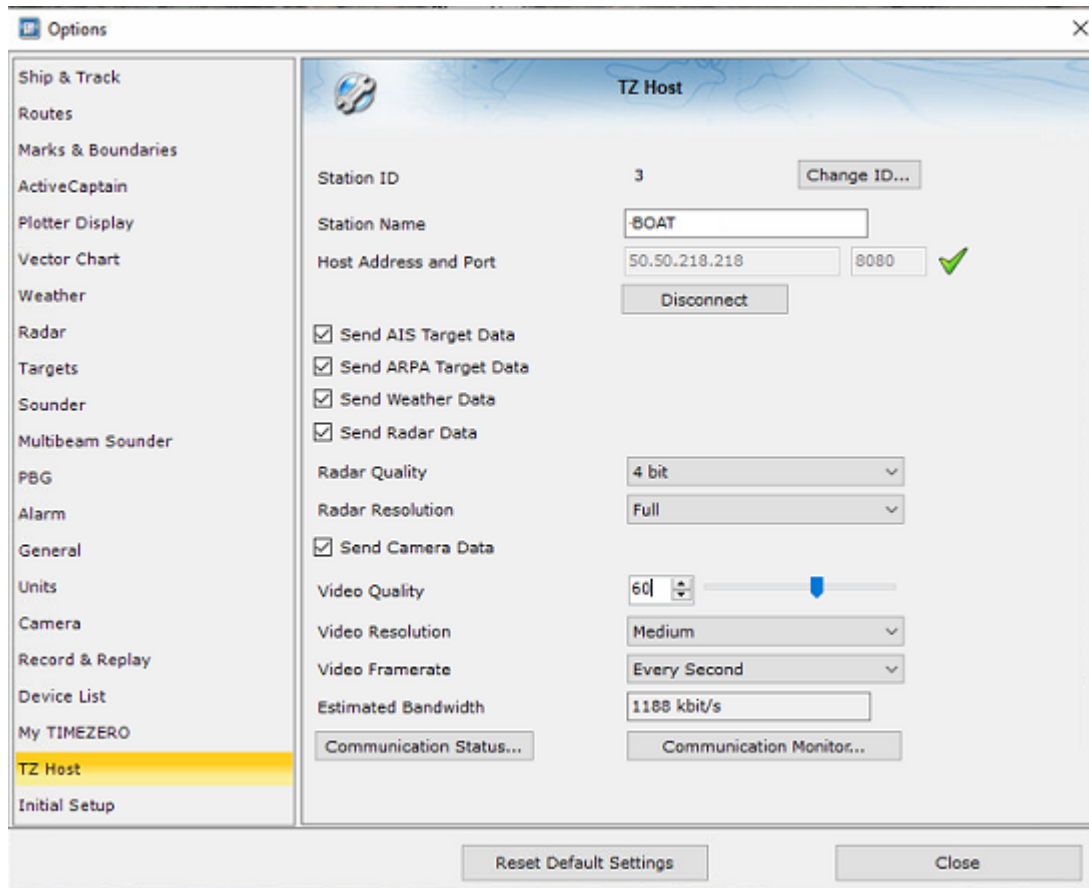
The supervision center must have an Internet connection and be setup and logged in with a different My TIMEZERO account. Once setup, contact your dealer to activate the service with the list of My TIMEZERO accounts to include in your fleet. Then, enable the "Get Fleet Targets from TZ Cloud" from the [My TIMEZERO](#) Options. Enabling this option will allow TimeZero to retrieve the positions of all other vessels in the fleet.



## Setup of Fleet Tracking via TZ Host

### Setup Vessels with TZ Professional:

Each vessel you want to track and get data from (AIS, ARPA, Radar, Camera) must be loaded with TZ Professional V5 (or superior) and have the TZ Host Output module unlocked. You will need to setup a TZ Host and a way for each vessel to communicate with the TZ Host (internet connection or private LAN/WAN). For more information about the network setup, please refer to the TZ Host Architecture Network Setup. Once the network and the TZ Host have been setup, choose a unique Station Name and Station ID (used to identify the vessel on the TZ Host network), enter the IP address of the computer running the TZ Host, select which type of data you would like to send (and their quality) and click on "Connect":



**TIPS:** You can also enter additional vessel information (like Vessel Name, Size, MMSI, and Registration Number) from the [Initial Setup](#) Options

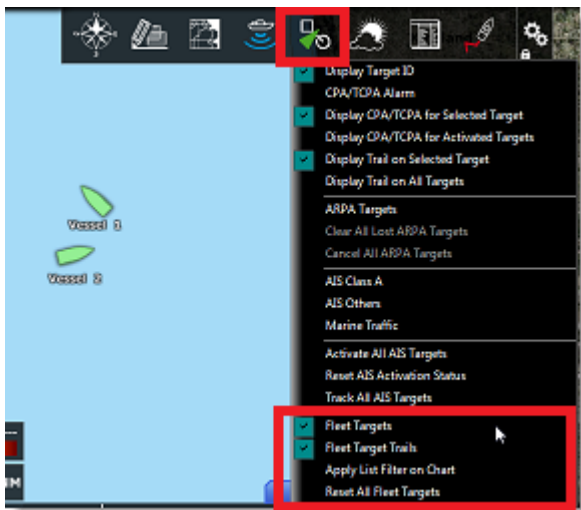
### Setup the Supervision Center with TZ Coastal Monitoring:

In order to monitor the vessel(s), you will need to use TZ Coastal Monitoring Remote which will connect to the TZ Host to get all the data (vessel position, AIS, ARPA, radar and camera).

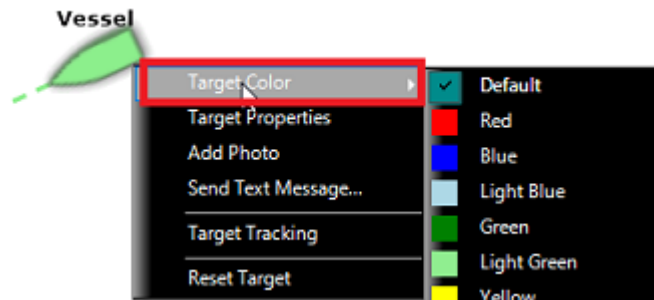
Note that with the TZ Host solution, the fleet targets will only be visible on TZ Coastal Monitoring Remote.

## Show and Hide Fleet Targets

To display the fleet targets on your screen, select "Fleet Targets" from the "Targets" button located in the Ribbon:



By default, all Fleet targets are displayed in green, but you can change the default color from the [Targets](#) Options (by changing the "Fleet Color" setting). Note that you can also individually customize the color of each target by right clicking on the target and selecting "Target Color":



Changing the color of specific target can be useful to highlight specific vessel in your fleet.

By default, the text label displayed below the target icon will be the vessel name (as received by the Fleet Tracking server). But if you prefer, you can set a custom Nickname (either from the list or from the target properties) that will be used instead.

**Note:** If you customize the color and the nickname on specific target(s), TimeZero will remember these settings, even after restarting. You can revert to the default color by selecting "Default" (under target color) and revert to the name transmitted by the vessel by erasing the nickname.

Because the Fleet reception is not always real-time (especially with the TZ Cloud solution when the sender and/or receiver lose their Internet connection or when they setup a longer position update interval to save bandwidth), Fleet targets have a much longer timeout than AIS or ARPA targets. A Fleet target will no longer be displayed on the screen (and inside the Fleet list) if its last update is older than the "Fleet Timeout" setting available in the [Targets](#) Options (12 hours by default). Note that, if you would like to remove a fleet target before waiting for this timeout, you can right click on a fleet target and select "Reset Target". This will get rid of the fleet target until a new position report is received again.

If you want to reset and erase all Fleet Targets at once, select "Reset all Fleet Target" from the "Targets" button located in the ribbon.

## [Fleet Target Trails](#)

### Fleet Target Trail

The Fleet Target trails are always and automatically recorded in TimeZero. The Fleet target trails behavior is slightly different than AIS or ARPA target trail. If you have selected to display the trail on all targets (from the Target Ribbon button), then the fleet target trail length will match the AIS or ARPA trail length (which is setup using the "Target Trail Length" setting from the [Targets Options](#)). However, when selecting (clicking on) a Fleet target, a longer trail is loaded and displayed on the chart. This longer trail (that is only displayed on the selected target matches the "Fleet Timeout" setting of the [Targets Options](#)).

**Note:** The trail is automatically cut (split) if there is a gap of more than 50Km or if a position report was not received for more than 2 hours.

### Fleet Target Track

Target Tracking can be enabled on Fleet targets by right clicking on a target and selecting "Target Tracking". From that moment, TimeZero will stop displaying the trail and start recording a track. Just like trail, the track line has the same color as the target (this can be changed by right clicking on the target or the track at a later time).

### Target Track Recall

It is possible to create a target track after the fact from a target trail. This is useful if you do not want to enable Target Tracking systematically (to avoid creating lots of tracks), but decide at a later time to create a track from a trail. Simply right click on the target or on the trail itself and select "Recall Track". All the trail points will be displayed and the cursor will change allowing you to click once to set a start position and click a second time to set the end point.

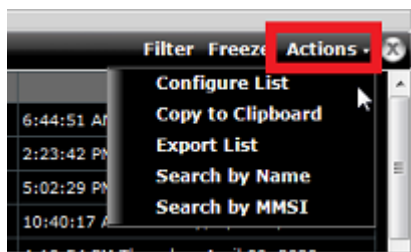
## Fleet Target List

To display a list of all the vessels in your fleet, select "Fleet Target List" from the "Lists" button located on the ribbon. If the list window is already open at the bottom of your screen, you can also select "Fleet List" from the list category:



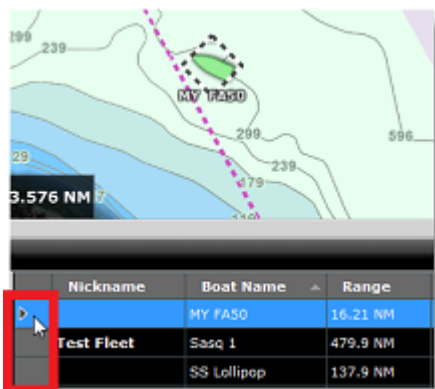
Nickname	Boat Name	Range	Bearing	COG	SOG	Color	MMSI	Last	Date
	MY FASO	16.15 NM	159.1 °M	279.4 °M	5.7 kn	Default	999999999	2d04h	6:44:51 AM Thursday, April 09, 2020
Test Fleet	Test 5	479.9 NM	226.3 °M	218.4 °M	6.0 kn	Default	123123123	20h13'	2:23:42 PM Friday, April 10, 2020
	SS Test	137.9 NM	215.7 °M	41.9 °M	15.5 kn	Default	008675309	1d10h	5:02:29 PM Thursday, April 09, 2020
	Test	805.7 NM	158.9 °M	183.2 °M	7.1 kn	Default	123456788	0'27s	10:36:15 AM Saturday, April 11, 2020
	The Endeavor	4.110 NM	309.1 °M	101.4 °M	5.2 kn	Default	000256819	1d10h	4:10:54 PM Thursday, April 09, 2020
		5,088 NM	92.5 °M	341.2 °M	2.1 kn	Default	000000000	1d01h	9:39:26 AM Friday, April 10, 2020
		7,672 NM	72.4 °M	319.5 °M	4.9 kn	Default	000000000	17h07'	5:29:33 PM Friday, April 10, 2020

Note that you can customize the columns that are displayed in the list by clicking on the "Actions" menu and selecting "Configure List":



**TIPS:** This list can be sorted by double clicking on any column header. So for example, you can sort by "Last" date (to see the most up to date fleet target at the top), by speed or by color (if you have assigned specific color to specific targets).

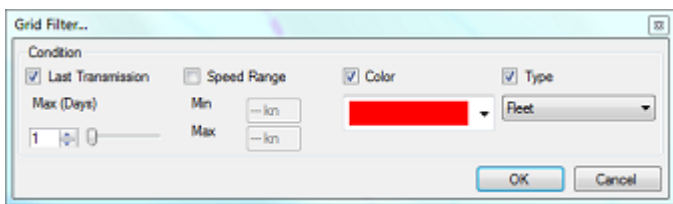
The action menu can also be used to search a specific Fleet Target by Name or by MMSI. Once you have located a target in the list, TimeZero can center on it if you just click on the row header:



**TIPS:** If you have sorted the list by a parameter that is often updated and can vary a lot (speed for example), individual items in the list might jump around and be difficult to select. To temporary stop the list from refreshing, you can click on the "Freeze" button.

### Fleet Target Filter

It is possible to filter items in the list by clicking on the "Filter" button displayed at the top right corner of the list. When you click on this button, a window opens allowing you to select your filter parameters:



By default, the filter only operates on the list, but you can apply the same filter on the chart if you select "Apply List Filter on Chart" from the "Targets" button located in the ribbon.

### Send and Receive User Objects and Text Message (TZ Cloud only)

#### Send User Objects:

It is possible to send and receive user objects (marks, boundaries, routes, and photos) in between any member of the fleet. To send a user object, simply right click on a user object and select "Send To". You will have the option to select a specific vessel inside the fleet or send the user object to the entire fleet at once.

**Note:** Sending a Route or a Boundary area containing about 20 points will only take 2kB. Sending user objects with the Fleet service is much more efficient and practical than sending user object by e-mail (using TZX file format).

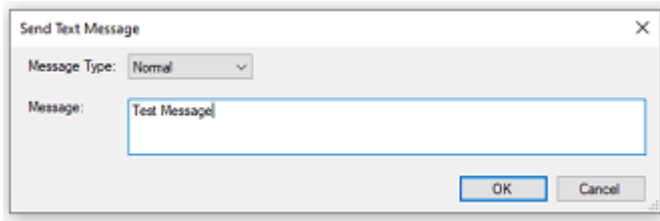
Note that if you lock the object or set it as an "Own Ship Alarm" area (in case of boundaries) before you send the object, these settings will be transferred as well with the user object.

If you modify the same user object (for example change its color, or add a waypoint to a route,...) and send it again, it will NOT create a duplicate on the receiver (it will update the same User Object as well).

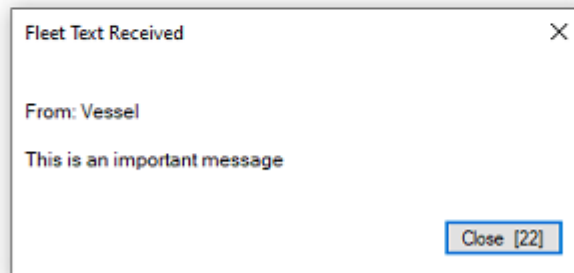
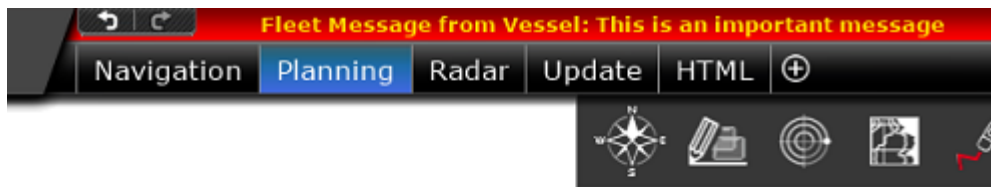
**TIPS:** Its is possible to send the Planning Route directly to a Fleet Target by right clicking on it and selecting "Send Planning Route".

#### Send Text Message:

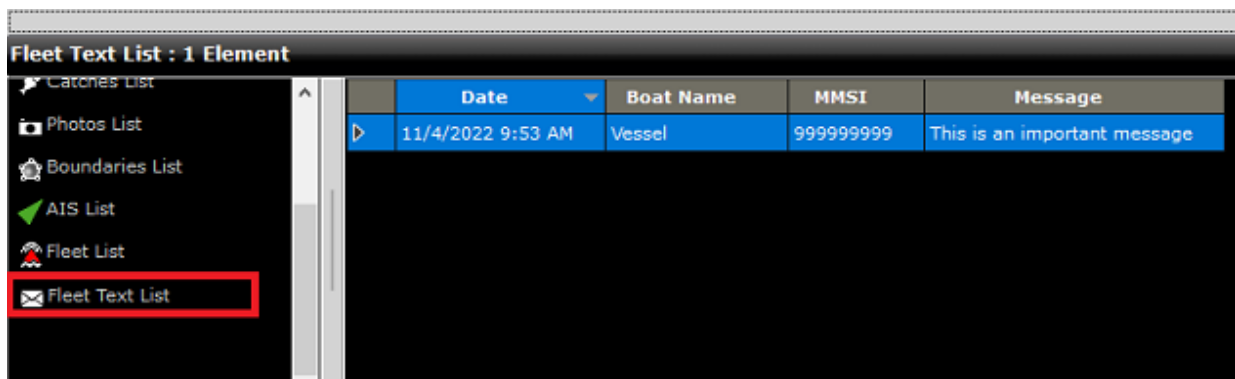
To send a message to a specific vessel, simply click on the fleet target you would like to send a message to and select "Send Text Message...". A window will appear allowing you to type a text message (maximum 150 characters):



Note that you can set the message type to "Normal" or "Important". When a message is sent with the "Normal" priority, the receiver will get a notification (yellow) with the message displayed in the status bar. When a message is sent with the "Important" priority, the receiver will get an alarm (red) with the message displayed in the status bar, and a window will automatically pop-up displaying the message to draw attention:



All the text messages you receive are kept and can be read at any time from the "Fleet Text List":



#### Notification and Acknowledgment:

Just after sending a user object or a text message, a mail icon will appear at the top of the target(s) you sent the object/message to. The icon will be yellow to indicate that the object/message was properly sent to the server, but not yet delivered to the vessel. Once the object/message is actually delivered to the vessel, the icon will turn green and a notification will be displayed in the status bar (and logged in the Alarm list):



When you see the delivery notification, you are guaranteed that the user object or message was delivered to the vessel. This acknowledgment is especially important in case the Internet connection is not reliable on the vessel you want to send the object or message to.

**Note:** If an Internet connection is not available on the vessel you want to send the user object to, the information will be kept and stored on the Fleet Tracking server until a valid Internet connection can be established with the vessel.

### Receive & Control Radar & Camera (TZ Host Only)

All Fleet target data that is sent to the TZ Host can be viewed and controlled from TZ Coastal Monitoring Remote. The target will appear on the chart and the camera and radar data can be viewed/controlled from the Camera and Radar WorkSpace respectively. If the camera installed on the vessel has Pan/Tilt/Zoom ability, you will be able to control the camera directly from TZ Coastal Monitoring Remote. Target Watch Alarm and Zone Monitoring Rule can be set on TZ Coastal Monitoring Remote to trigger specific behavior.

### Boundary Area Alarm

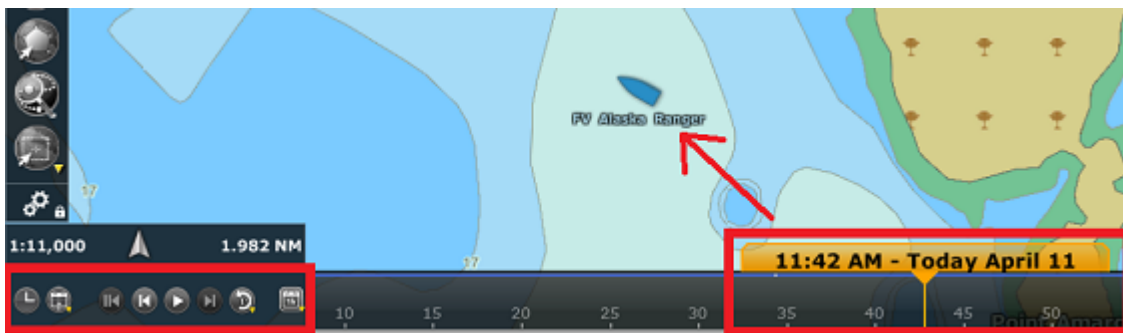
#### **Boundary Area Alarm**

Just like with AIS and ARPA targets, it is possible for TimeZero to raise an alarm if a Fleet Target enters an area. Simply right click on any boundary area and enable "Target Alarm". You will then be notified when a target enters this area.

Note that the Alarm list will keep a log of the event. If you click on the alarm itself from the Alarm list, TimeZero will automatically center the chart on the location where the alarm occurred.

### Fleet Target Record and Replay

If you have the VDR module, the Planning WorkSpace allows to replay target position history by using the timeline:



Fleet Targets that are replayed are displayed in blue and are slightly more transparent than "real time" targets. Note that you can also display a trail on replayed Fleet Targets (the trail for replayed targets is fixed to one day).

**Note:** Even if a target has been reset, although it will not be displayed anymore in the "Navigation" WorkSpace or when the date is set to "Now" in the Planning WorkSpace, it will be possible to see the old target data by going in the past.

## Legacy Fleet Target Format (PosReport file)

TimeZero can also display and update fleet targets by using the [POSREPORT format](#). The [POSREPORT format](#) consists of one or multiple text files located in a specific folder (selected from the [Targets](#) Options under "Vessel Tracking Data Location"). The text files contain information about other vessels (ID, Position, Date,...). The text files can be created manually, or sent by email and then saved in the Vessel Tracking Data folder, or created automatically by third party software compatible with the [POSREPORT format](#). As soon as a new text file is saved in the folder, TimeZero detects it, and displays the updated targets on screen. After TimeZero processed the file (to extract all targets information), TimeZero automatically deletes the file from the folder.

**IMPORTANT:** Only basic features are available when you use the POSREPORT format. For example, there is no automated way to report your position or send/receive user objects (with acknowledgment) like it is possible with the TZ Cloud Fleet service. The POSREPORT format was designed to offer basic Fleet Tracking capabilities with third party software that can generate a text file.

## Fishing Buoys

TimeZero is compatible with satellite buoys from various manufacturers (Satlink, Marine Instruments, Zunibal, Ryokusei) and AIS transmitter installed on fishing gear. After proper configuration, TimeZero will display and record Fishing Buoys with specific icon, enable a dedicated list and offer various features (trail, drift alarm, ...).

### Fishing Buoys Setup

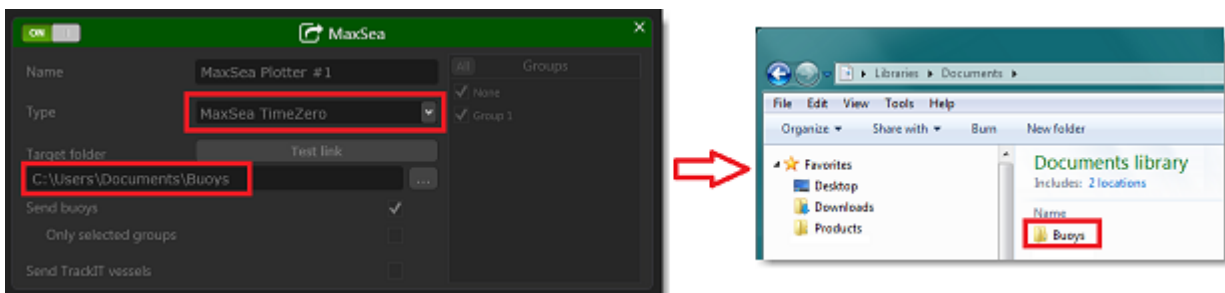
TimeZero can import and process Fishing Buoys data in three different ways:

- reading the content of a text file inside a folder
- receiving information on a Serial COM Port
- processing AIS target with a specific MMSI

### Text File (Satlink, Marine Instruments and Zunibal buoys)

TimeZero can be setup to check continuously the content of a directory and look for a text file (with a name following the pattern \*\_PosReport\*.\*.) containing satellite Buoys information. To be analyzed properly, the text file should contains data in a specific format that looks similar to NMEA sentences (please refer to the [NMEA Sentence](#) chapter for more information). Satellite buoys manufacturers such as Satlink, Marine Instruments and Zunibal have software that can generate text file in that format.

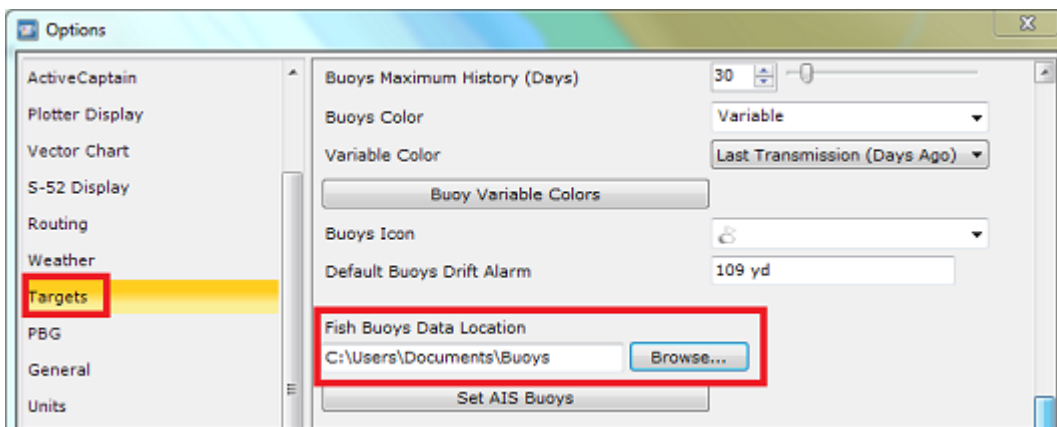
The first step is to create a dedicated folder somewhere on your computer (a "Buoys" folder located in "Documents" for example) and setup the satellite buoys software to write inside it. Below is an example with the Satlink software:



**Note:** Please refer to the documentation of your Satellite Buoys software for exact configuration steps. If the software can output in multiple formats, make sure to choose either "TimeZero" or "MaxSea" format.

Next, select the same folder in TimeZero from the [Targets](#) Options under "Fish Buoys Data Location":

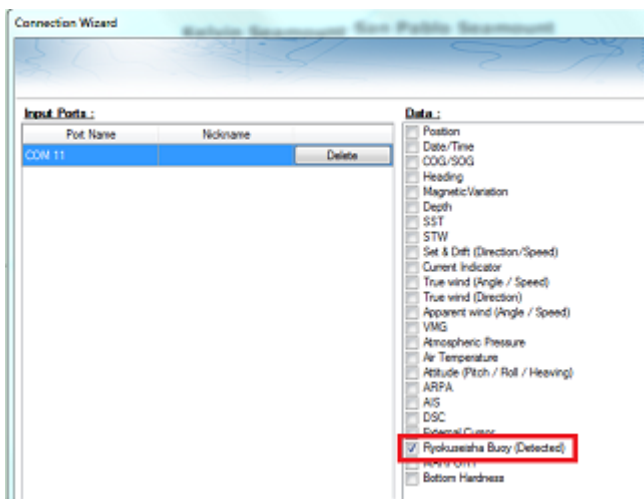




From now on, every time the satellite buoys software writes a new file into the folder, TimeZero automatically detects it, processes the data contained inside the file, and then deletes the file.

### Serial COM Port (Ryokusei buoys)

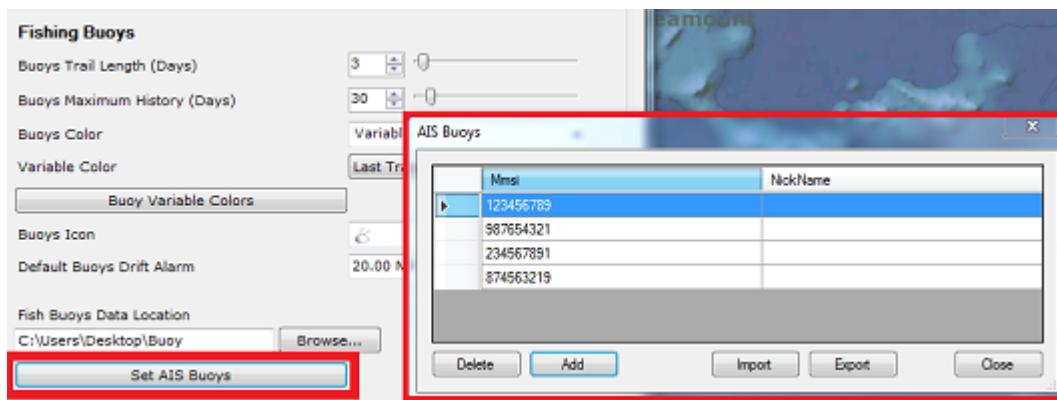
TimeZero can be setup to look for proprietary sentences on a Serial COM port (RBY or BLV sentence) that is used by the Japanese buoys manufacturer Ryokusei (or Ryokuseisha). Simply configure in the connection wizard (on a serial port) the "Ryokuseisha Buoy" data category:



You can also configure the "RBY\_RBC" sentence as an output on the same port (it will allow you to request a position update directly from TimeZero by right clicking on the buoy).

### AIS Buoy

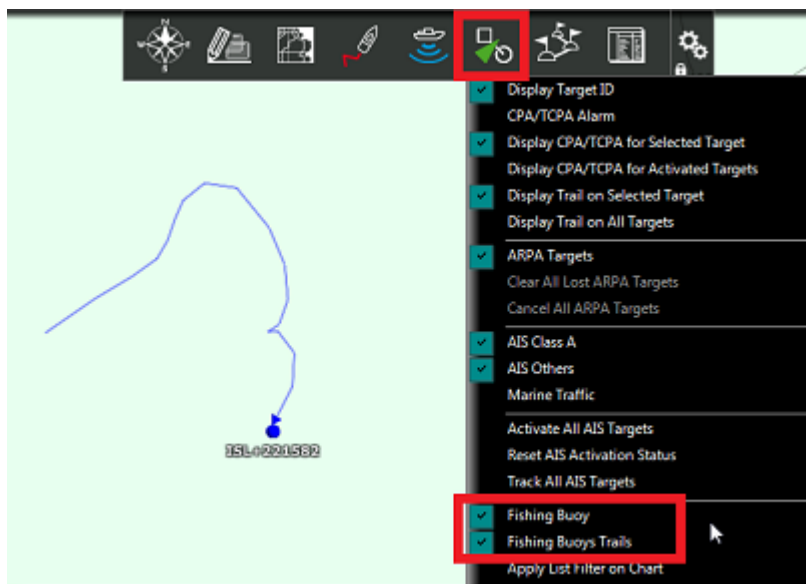
In some countries, it is allowed to attach an AIS transmitter to your fishing gear so that it can be easily located. To avoid displaying the AIS target as a vessel on the chart, it is possible to preset a list of MMSI from the [Targets](#) Options. Simply click on "Set AIS Buoys" and enter all the MMSI corresponding to all AIS transmitters that are attached to your fishing gear:



From now on, when TimeZero receives an AIS position report matching a MMSI in the list, TimeZero will convert that AIS into a Fishing Buoy.

## Show and Hide Buoys

To display the fishing buoys on your screen, select "Fishing Buoys" from the "Targets" button located in the Ribbon:



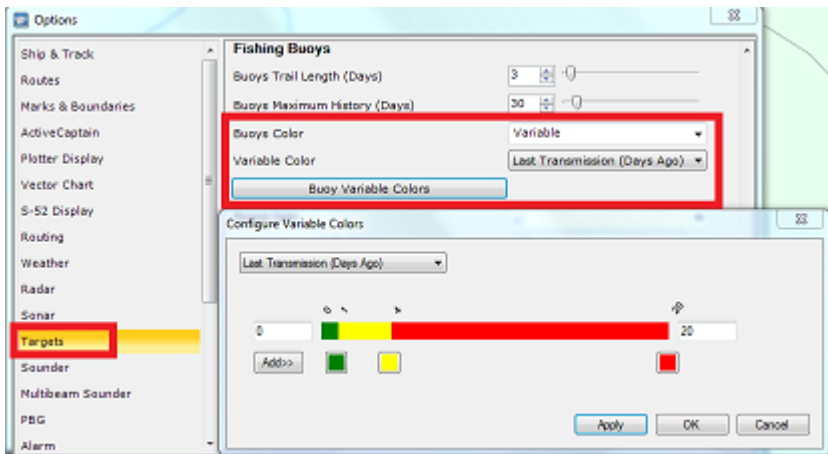
By default, all fishing buoys are displayed using a small buoy icon, but you can change the default icon from the [Targets](#) Options (by changing the "Buoy Icon" setting).

Note that you can also individually customize the icon of each buoy by right clicking on the buoy and selecting "Icon".

## Buoys Color

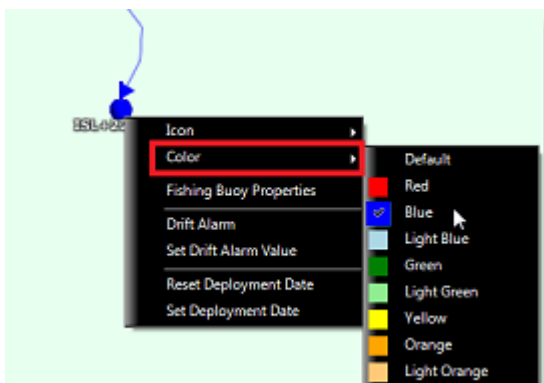
By default, all fishing buoys are displayed in variable color: green for buoys that were updated in the last 24H, yellow for buoys that were updated in the last 4 days, red for buoys that were updated in the last 5 to 20 days and black for buoys that are older than 20 days.

It is possible to change this default color from the [Targets](#) Options by clicking on the "Buoy Variable Colors" button:



Note that you can change, add, or remove colors, but you can also change the parameter used. For example, you can change the buoys color according to their speed or according to the sea surface temperature value.

If you prefer, you can also make all buoys the same color by choosing a color under the "Buoy Color" setting instead of "Variable". You can also individually customize the color of each buoy by right clicking on the buoy and selecting "Color":



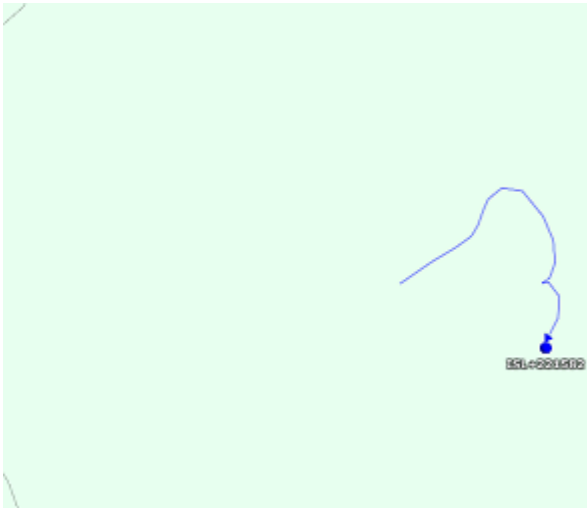
**TIPS:** You can select multiple buoys from the chart or from the list using the SHIFT key on your keyboard and then change the color of all the selected buoys simultaneously.

## Buoys Trail and History

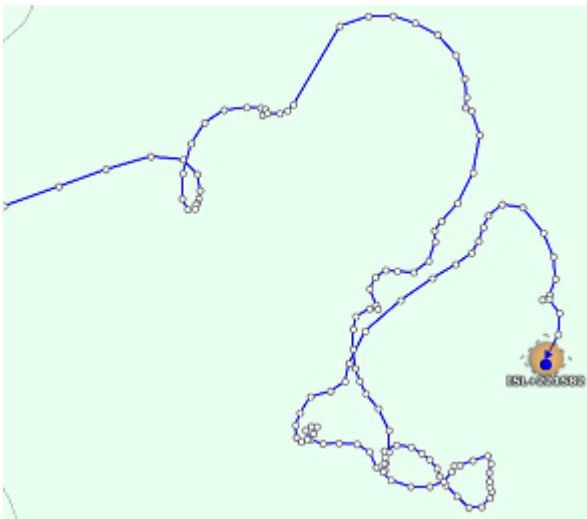
The fishing buoys history is always and automatically recorded in TimeZero. You can display a short trail behind all fishing buoys by enabling "Fishing Buoys Trails" from the "Targets" button located in the Ribbon. The trail length can be adjusted from the [Targets](#) Options ("Buoy Trail Length (days)"). However, when clicking on a buoy, a longer trail (called "history") is loaded and displayed on the chart. By default, this longer trail (that is only displayed on the selected buoy) is set to 30 days, but it can be adjusted using the "Buoy Maximum History (days)" to up to 360 days (one year):



Below is an example of a trail:



Below is the history displayed on the same buoy after clicking on it:



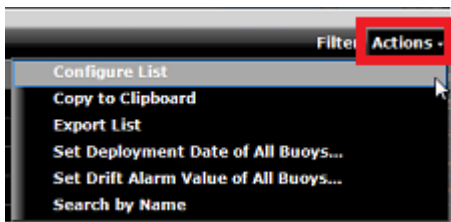
**Note:** When a buoy is selected, all its position report received by TimeZero are displayed with small dots. You can click on each dot to see a tooltip showing the buoy information for that report.

## Buoys List

To display a list of all the buoys, select "Fishing Buoys List" from the "Lists" button located on the ribbon:

Fishing Buoys List : 7 Elements											Filter	Actions
Nickname	ID	Icon	Color	Range	Bearing	COG	SOG	SST	Battery	Date	Position	
SLX+251444	LX251444	Default	Default	--- NM	--- °M	331.4 °M	0.0 kn	32.00 °F	63.00 V	11:31:38 AM Sunday, April 12, 2020	N 33°55.884'; W 67°1...	
ISL+221547	SL221547	Default	Default	--- NM	--- °M	102.3 °M	0.7 kn	32.00 °F	98.00 V	5:09:23 AM Sunday, April 12, 2020	S 3°08.682'; E 73°50...	
ISL+221816	SL221816	Default	Default	--- NM	--- °M	313.8 °M	0.3 kn	32.00 °F	100.0 V	5:45:43 AM Sunday, April 12, 2020	S 19°58.734'; E 61°51...	
ISL+244728	SL244728	Default	Default	--- NM	--- °M	270.0 °M	0.3 kn	32.00 °F	78.00 V	5:54:07 PM Saturday, April 11, 2020	S 5°29.850'; E 49°23...	
ISL+225501	SL225501	Default	Default	--- NM	--- °M	2.6 °M	0.0 kn	32.00 °F	0 mV	8:54:40 AM Sunday, March 15, 2020	N 5°17.802'; E 73°03...	
ISL+226168	SL226168	Default	Default	--- NM	--- °M	131.6 °M	0.1 kn	32.00 °F	100.0 V	6:55:51 PM Saturday, April 11, 2020	S 9°05.664'; W 136°0...	
ISL+221502	SL221502	Default	Default	--- NM	--- °M	222.8 °M	1.2 kn	32.00 °F	100.0 V	9:40:50 AM Sunday, April 12, 2020	N 34°53.586'; W 60°0...	

Note that you can customize the columns that are displayed in the list by clicking on the "Actions" menu and selecting "Configure List":

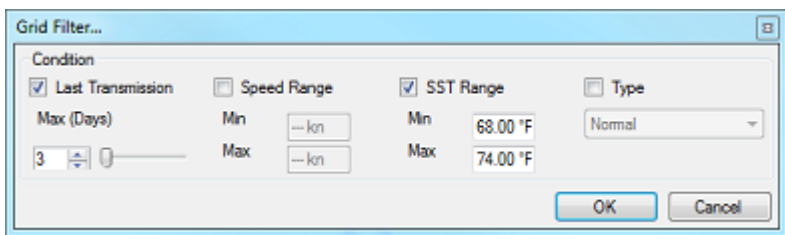


**TIPS:** This list can be sorted by double clicking on any column header. So for example, you can sort by "Date" (to see the most up to date buoy at the top), by speed or by color (if you have assigned specific color to specific buoys).

You can also display a "Fishing Buoys Detail" list that will show all the position reports of the selected buoy.

### Buoys Filter

It is possible to filter items in the list by clicking on the "Filter" button displayed at the top right corner of the list. When you click on this button, a window opens allowing you to select your filter parameters:



By default, the filter only operates on the list, but you can apply the same filter on the chart if you select "Apply List Filter on Chart" from the "Targets" button located in the ribbon.

### Buoys Deployment Date

By default, the trail duration and the history (when you click on a buoy) are common to all buoys according to the setting in the [Targets](#) Options. However, sometimes, you may want specific buoy(s) to display their trail or history only up to a very specific date (for example, when the buoy is deployed to a new location). In order to "clamp" the trail and history to a specific date, it is possible to adjust on one or multiple buoys a "deployment date". Setting properly your deployment date will prevent TimeZero to draw a long line in between multiple locations (when you transport the buoy on your boat to a new location). After setting a deployment date, the trail and the history will stop at the deployment date or maximum trail/history duration (whichever comes first).

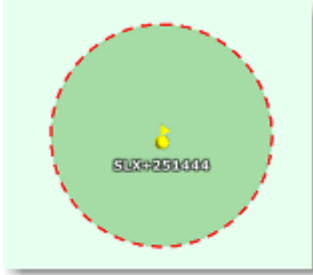
The deployment can be set individually by right clicking on a single buoy or it can be set on multiple buoys at the same time by using the multi-selection (from the list or chart). If you want to change the deployment date of all your buoys, you can use the "Actions" menu of the Buoys list:



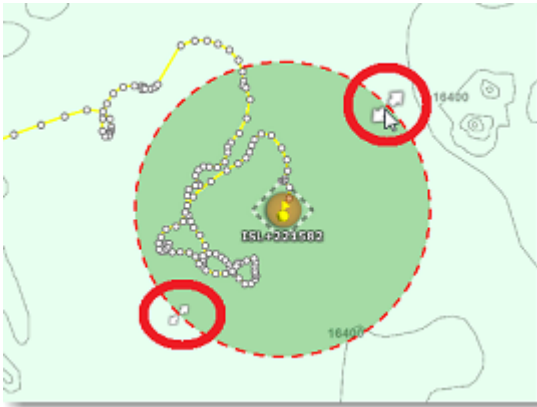
**Note:** TimeZero never erases anything, it is just "filtering" the display with the deployment date information (so if you make a mistake, you could always change the deployment date to an earlier date and you will retrieve the trail or track up to that new date).

## Buoys Drift Alarm

It is possible to set a Drift Alarm on any buoy by right clicking on a buoy and selecting "Drift Alarm". A circle (representing the drift alarm radius) will be displayed on screen:



By default, the radius is set to 20NM, but you can change this default value from the [Targets](#) Options (by setting "Default Buoys Drift Alarm"). But note that you can set individual values to each buoy by right clicking on the buoy (and selecting "Set Drift Alarm Value"). You can also set the radius directly with your cursor on the chart. Simply click on the buoy and resize the radius using the modify icon:



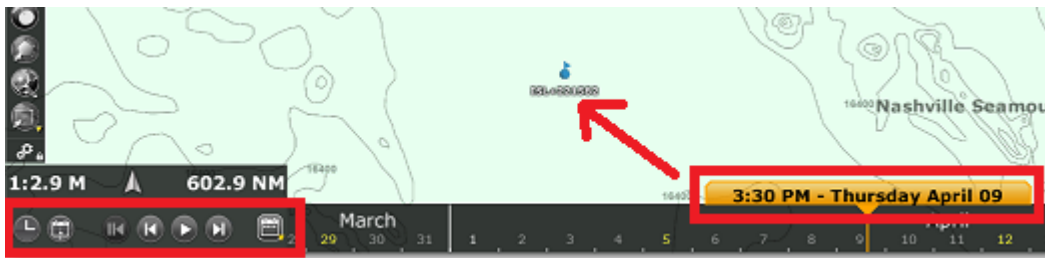
If the buoy goes outside the Drift Alarm distance, an alarm will be triggered and logged in the Alarm list. Note that when an alarm is raised, it is easy to find the buoy that raised the alarm from the alarm list (it will indicate the buoys ID, and when you click on the alarm from the list, it will move the screen to that location):

Alarms List : 3 Elements				
Annotations List	Category	Date	Title	Acknowledge
<ul style="list-style-type: none"> <li> <input checked="" type="checkbox"/> AIS List           </li> </ul>	User	11:18:34 AM Friday, November 15, 2019	Fishing Buoy Drifting: BUOY0031	<input type="checkbox"/>

To disable the Drift Alarm, right click on the buoy and uncheck "Drift Alarm".

## Buoys Record and Replay

Buoys are always and automatically recorded in a database. This data is used to display the trail (and longer history when a buoy is selected), but it can also be used in the Planning WorkSpace to replay buoy position history by using the timeline:



Buoys that are replayed are displayed in blue and are slightly more transparent than "real time" buoys. Note that you can also display a trail on replayed Fleet Targets (the trail for replayed targets is fixed to one day).

**Note:** It is not possible to display a trail or history on a replay buoy.

## Radar

### Radar Introduction

The "Furuno Radar Module" needs to be unlocked and radar configured to access this feature

Radar is an acronym meaning RAdio Detecting And Ranging. It is a device which measures not only the time it takes for a pulsed signal to be reflected back from an object but also its bearing relative to your position. Radar mainly functions as an anti-collision aid. It also provides information about the whereabouts of neighboring vessels, coastal outlines, etc.

The Radar Scanner (or antenna) rotates 360 degrees on its vertical axis, using a special gear that allows the radar to know at any time in which direction it is pointing at with extreme accuracy. Radio pulses are emitted from the scanner in a certain direction. When the pulse strikes an object such as a ship or island some of the energy returns to the scanner ("radar echo"). The direction in which the scanner is pointing when the reflection is received is the direction of the target causing the reflection. Since radio waves travel at a near-constant speed, the time required for the reflected echo to return to the scanner is a measure of the range (distance) to the target.

TimeZero is compatible with two types of Furuno radar:

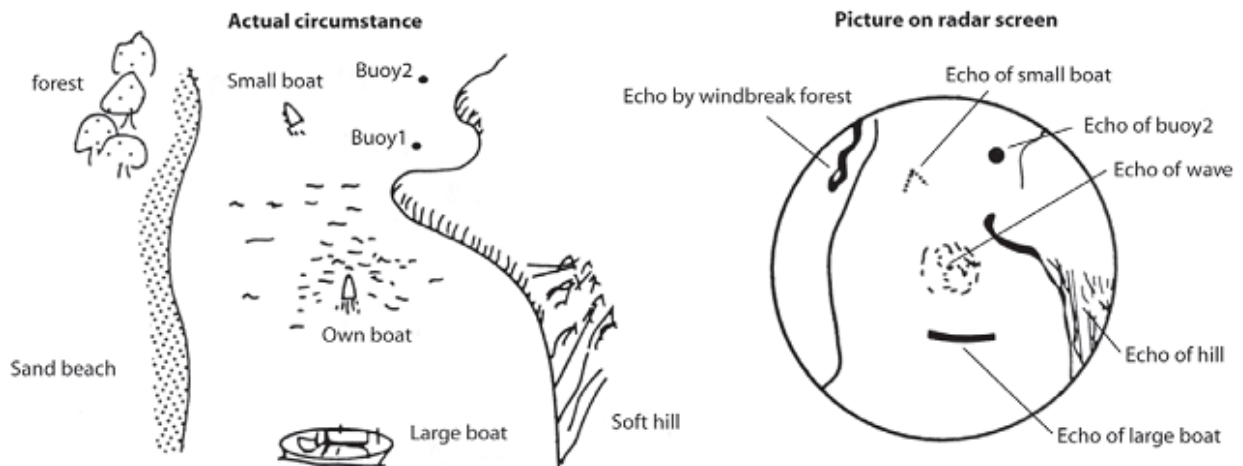
- **Furuno NavNet DRS Series Radar:** TimeZero can be connected to a Furuno "DRS" (Digital Radar Sensor) through an Ethernet connection.

**Note:** DRS radar can be directly connected to TimeZero (without a NavNet MFD).

- **Furuno FAR Series Radar:** TimeZero is compatible with most of the Furuno FAR commercial series radars that have an Ethernet interface: FAR2xx7, FAR15x3/15x8, FAR 2xx8 and FAR3xxx.

To interpret the radar picture, an operator should be familiar with the radar video presentation caused by the wanted and unwanted effects. For instance, radar images (radar echo) produced by bridges, sand beaches, waves and even a boat's wake may all be represented differently than expected based on their visual appearance. For correct interpretation of the radar picture, it is highly recommended that you practice using the radar in good weather conditions.

The picture below shows an example of a typical radar picture compared against a sample real-world scenario. There are a number of things to learn from this image regarding how a radar works:



Here is a list of some important ones:

- Buoy #1 is being blocked by the cape or hill and is not visible in the radar display



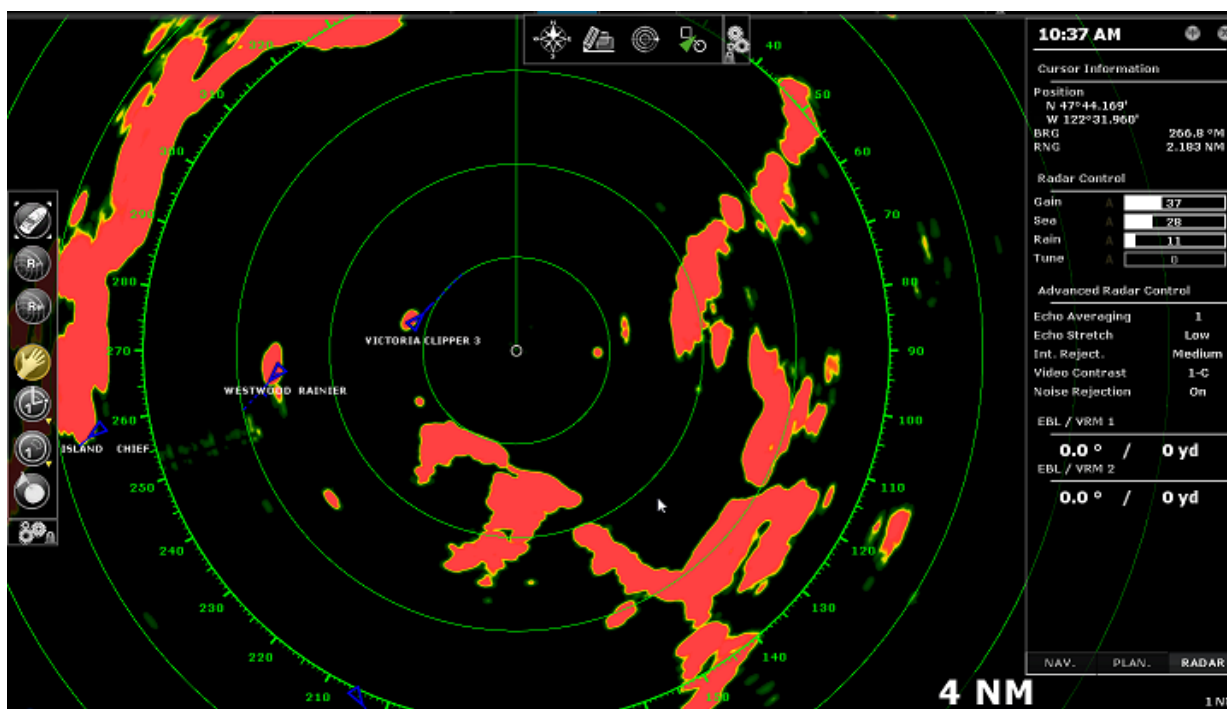
- Due to its proximity and size, the large boat returns a strong radar return that is similar to its actual profile. On the other hand, the small boat is painted as a small dot, because its reflection area is smaller. Also notice that the smaller boat's wake returns a large reflection.
- The hill on the starboard side of the vessel, because of its dense forest and hilly nature, returns large echoes, while the sandy beach to the port returns a weak radar image. The exception to the port side return is the windbreak forest which returns strong echoes because of its profile differences.
- The waves around your boat are displayed on the radar by little "speckle" of noise (that can be suppressed by increasing the "Sea" control of the Radar)

## Radar WorkSpace

The "Furuno Radar Module" needs to be unlocked and radar configured to access this feature

### Radar Overview

The Radar WorkSpace displays a traditional dedicated radar display:



The Radar can be displayed full screen or split screen with another display (such as Plotter).

When using a DRS radar that is capable of dual range, the Radar WorkSpace will always display the first range of the DRS. In order to display the two Radar Ranges of the DRS, a [Dual Radar WorkSpace](#) must be selected.

### Transmit /Standby

When the Radar is powered on and warmed up, you can view the radar image on screen by putting the Radar in Transmit mode. You can transmit the radar by:

- selecting the "Transmit" options from the "Radar" Ribbon button
- by clicking on the "Stand-By" text located at the center of the radar screen
- by clicking on the Radar Range Scale on the lower right of the screen (on the "StdBy" status)

To stop the Radar, you can:

- uncheck "Transmit" from the "Radar" Ribbon
- click on the "TX" located on the Radar Range Scale on the lower right of the screen.

Note that in Standby mode, the Radar is still ON but does not rotate and does not send magnetic pulses. Usually a Radar is never turned completely off in navigation because it takes a while to warm-up (1 to 2 minutes).

## Radar Range

Press the radar "Range +" or "Range -" buttons located in the Toolbar to increase or lower the radar range respectively:



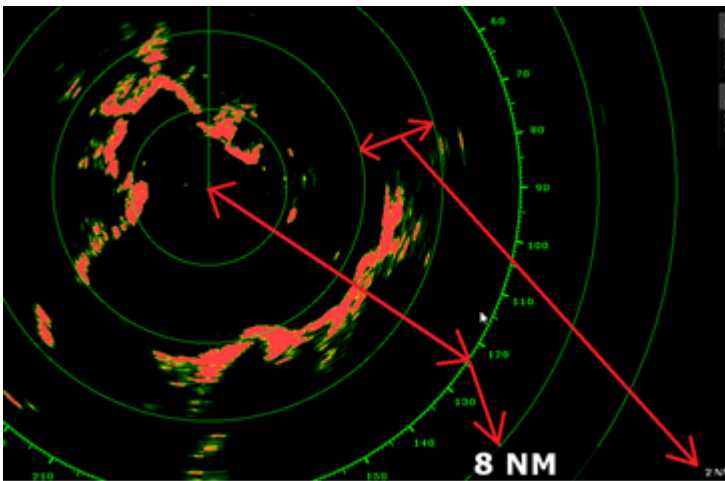
Click this button to reduce the Range of the radar. A smaller range provides greater detail of the radar echoes close to your position (by using shorter pulse length), and should be used as you approach coastlines, harbors or if you want to monitor other vessels in your close proximity.



Click this button to increase the Range of the radar. A bigger range provides greater distance of detection, but decreases the resolution (because a longer pulse length is used by the radar).

You can also use the scroll wheel of your mouse on the Radar WorkSpace to change the range (similar to zooming in or out on the chart) when the "Change Radar Range with Scroll Wheel" is checked from the [Radar Options](#).

When you change the radar range, the range rings are updated on the display. The range of the Radar and the range of Ring interval are displayed on the lower right of the screen:



The range ring and interval rings can be shown or hidden from the "Radar" Ribbon button by selecting or deselecting the "Radar Rings" option. You can setup the number of interval rings displayed on the radar from the [Radar Options](#).

**Note:** When you set the radar to a specific range (3NM for example), the Radar will actually transmit and detects targets farther than this value. This is done to allow the user to offset the radar (shift the display) by panning the radar screen down.

## Radar Orientation

- North Up: This mode displays the North at the top of the screen. In order to display the Radar in North Up mode on the Radar WorkSpace, a heading sensor is required.
- Head Up: This mode orients the bow of the vessel to the top of the screen. This is the default and traditional radar orientation display.
- Course Up: This mode is only available when a "Go To" or Route has been activated and when a heading sensor is connected to the computer. When this mode is selected, the radar screen rotates and aligns vertically with the active leg.

## Bearing Scale

The Bearing Scale is displayed on the Range Ring and indicates bearing using graduations. The bearing scale can be setup in "True" or "Relative" from the [Radar Options](#).

When set to "Relative", the bearing origin (0) is from the bow of the vessel. This means that in "Head Up" orientation mode, the bearing "0" is always at the top of the screen.

When set to "True" the bearing origin (0) is toward True North. This means that in "North Up" orientation mode, the bearing "0" is always at the top of the screen.

**Note:** When set to True, the bearing scale does not take into account the Magnetic Variation. It is always referenced to true North.

## Range and Bearing to target

The range and bearing to a target can be measured inside TimeZero by using the Cursor NavData displayed by default in the NavData panel.

Variable Range Marker and Electronic Bearing line can also be used. Please refer to the [EBL & VRM](#) chapter for more information.

## Radar Display

The Radar background and Radar echo color can be adjusted from the [Radar Options](#).

The Radar display can be configured to not only show the radar picture but also other information such as AIS targets, Marks, Boundaries, Routes, etc...

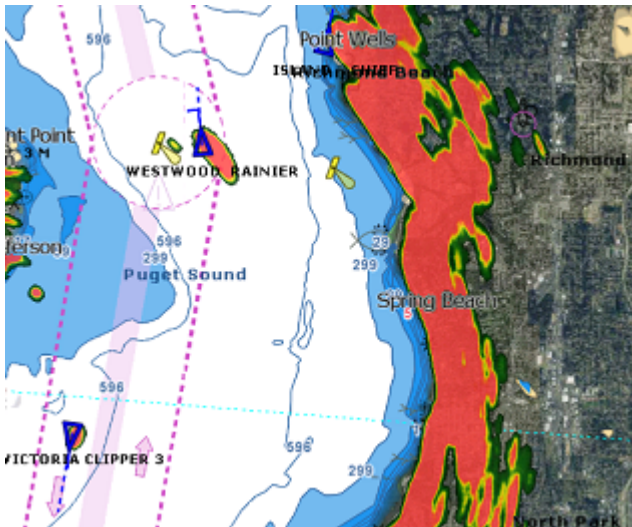
To configure the Radar display, simply use the corresponding Ribbon buttons (Targets, Routes, Marks, etc) to enable or disable corresponding features.

**Tips:** If you want to temporarily and quickly remove all objects from the Radar display to only focus on the radar picture, you can press and hold the CTRL key and the Space Bar.

## Radar Overlay

The "Furuno Radar Module" needs to be unlocked and the radar configured to access this feature

The Radar Picture can be displayed over the charts if the computer is connected to a Heading sensor. The radar overlay helps you navigate the chart better and the chart brings context to what can often be a confusing display of radar blobs. To enable the radar overlay, select the "Navigation" WorkSpace, click on the "Radar" button located in the Ribbon and then select "Radar Overlay". This will display the radar echo over the charts:



Note that the Radar can be adjusted from the "Navigation" WorkSpace by using the Radar NavData Panel and/or the Radar Ribbon button.

**Tips:** If you want to only display the radar picture temporarily, press and hold the CTRL key and the spacebar. This will get rid of everything except for the radar picture and ARPA targets.

The Radar Overlay transparency can be adjusted from the [Radar Options](#).

If you are using a Furuno DRS radar (capable of "Dual Range"), you can select which range is displayed on the chart. Please, refer to the [DRS Dual Range](#) chapter.

## Radar Controls

The "Furuno Radar Module" needs to be unlocked and the radar configured to access this feature

Most of the Radar Controls can be found under the "Radar" Ribbon button or from one of the Radar NavData.

### Radar Source

When having two radars on the network, the "Radar Host" selection from the [Radar Options](#) allows to select which Radar is being selected, displayed and controlled in TimeZero.

**IMPORTANT:** When changing Radar Source, it takes approximately 10 seconds before the selected radar becomes fully operational.

### Transmit /Standby

When the Radar is powered ON and warmed up, you can view the radar image on screen by putting the Radar in Transmit mode. You can transmit the radar by:

- selecting the "Transmit" options from the "Radar" Ribbon button
- by clicking on the "Stand-By" text located at the center of the radar screen
- by clicking on the Radar Range Scale on the lower right of the screen (on the "StdBy" status)

To stop the Radar, you can:

- uncheck "Transmit" from the "Radar" Ribbon

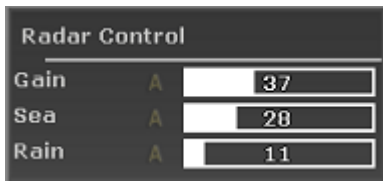
- click on the "TX" located on the Radar Range Scale on the lower right of the screen.

Note that in Standby mode, the Radar is still ON but does not rotate and does not send magnetic pulses. Usually a Radar is never turned completely off in navigation because it takes a while to warm-up (1 to 2 minutes).

**Note:** If the Transmit button is greyed out, make sure that the radar is powered and that a correct Radar Hostname is selected from the [Radar Options](#).

### Gain / Sea (STC) / Rain (FTC)

The Gain, Sea and Rain controls can be adjusted from the Radar Ribbon button or directly from the Radar Control NavData (displayed by default in the Radar NavData Panel):



**TIPS:** If you have a scroll wheel, you can rollover the bar graph or setup shortcut that temporary allow you to use the wheel to adjust Gain/Sea/Rain

**Gain:** This control adjusts the receiver sensitivity. Increase the gain to increase sensitivity and display radar echoes on the screen. Reduce the gain if you see too much noise on the screen and if the picture gets overly cluttered with random "speckles". The Gain can also be setup in "Auto" mode on some radar models by selecting the corresponding option in the Radar Ribbon button or by clicking on the "A" in the Radar Control NavData.

**Sea:** Sea control, also called STC (Sensitivity Time Constant), suppresses reflections from waves near your own ship, especially at short range. In rough seas the reflected echoes from wave crests are very strong, producing a mass of echoes which cover the central part of the display. This is called sea clutter. Any echoes within the clutter will be partially or totally obscured. Increase this control to reduce the clutter and distinguish echoes. The proper setting should be such that the clutter is suppressed and echoes become distinguishable. If the control is set too high, both sea clutter and echoes will disappear from the display. When there is no sea clutter visible on the display, decrease the value. The Sea can also be setup in "Auto" mode on some radar model by selecting the corresponding option in the Radar Ribbon button or by clicking on the "A" in the Radar Control NavData.

**Rain:** The Rain control, also called FTC (Fast Time Constant), suppresses the reflected echoes from rain, hail and snow to clear the display. The echoes from legitimate contacts can become lost in the echoes from precipitation, called rain clutter. When rain clutter masks the display, increase this control to break up the clutter and distinguish echoes. Adjust the control so that the clutter just disappears; too much Rain action may shrink or erase the echoes from legitimate targets. If there is no precipitation, leave that setting to 0 (minimum). The Rain can also be setup in "Auto" mode on some radar models by selecting the corresponding option in the Radar Ribbon button or by clicking on the "A" in the Radar Control NavData.

#### **How to adjust manually the Gain, Sea and Rain controls:**

The Gain, Sea and Rain can be adjusted from the Radar Control NavData or from the Radar Ribbon button. If your Radar model is capable of "Auto" mode (from the Radar Ribbon), the auto features will work well for most situations. If you want to adjust the Radar manually try the following:

- Transmit the Radar to a medium range (around 3NM)
- Set the Sea and Rain control to the minimum (0)

**Note:** While initially adjusting the Gain/Sea/Rain, it is recommended to turn OFF all the radar filters (Echo Averaging, Echo Stretch etc...)

- Set the Gain control to maximum (the screen should show mostly Radar noise)

- Now decrease the gain control until the radar picture show a very small amount of noise (only a few noise spots on the screen) from 1.5NM to 3NM (it is alright to have noise near the center of the screen in between 0 and 1.5NM)
- Without disturbing the gain control select the appropriate working range (1.5NM for example)
- Increase the Sea control as desired until the noise that is present near the center on the screen disappears
- Only increase the Rain control if there is precipitation.

### **Automatic Clutter Elimination - ACE (FAR3xx0, FAR2xx8 & FAR15x7/x8 only)**

This setting is available from the "Radar" Ribbon button or from the "Advanced Radar Control" NavData.

ACE is an automatic filter that reduces noise caused by sea and rain clutter. When ACE is activated, the Sea and Rain adjustments are disabled (because automatically adjusted by the ACE algorithm). When ACE is enabled, the operator can only adjust the gain.

### **Pulse Length**

Pulse Length is the length of time of each transmission of radar waves by the transceiver. Typically a longer pulse length produces better long range target detection and a shorter pulse length is for better target range discrimination. The pulse lengths are pre-set for each range so you are not typically required to change this setting. However, if you are not satisfied with the current pulse length setting, it is possible to toggle between a shorter or longer pulse length from the "Radar" Ribbon button.

**Note:** The Pulse Length is not available on MDS1/8-R Radars

### **Echo Trail**

This feature requires the computer to be connected to a Heading sensor.

This feature available from the "Radar Ribbon" "button continuously shows the movements of other ships in afterglow. It is useful for assessing overall target movement. Echo trails show the movements of radar echo overtime relative or true to your vessel. The trails disappear overtime (according to the "Trail Length" parameter). When set to "True" mode, only objects that are moving in reference to the water (such as another ship) will show a trail on the screen. Fixed objects on the water (such as buoys or a rock) will not show a trail even if your own ship is moving. When set to "relative" mode, any objects that move relative to your boat will leave a trail on the screen. So if your own ship is moving toward a stationary target (buoys for example), the target will leave a trail (smearing):



(a) True target trails  
(No smearing of  
stationary targets)



(b) Relative target trails  
Targets moving relative  
to own ship

The following Trail options are available from the "Radar" Ribbon button or from the [Radar](#) Options:

- Trail Shade: "Single" displays the trail with one color intensity. "Multi" decreases (fades) the trail color intensity over time
- Trail Level: Adjusts the way the trail picture is merged with real time radar echo. The higher the number, the more emphasis there will be on the trail.
- Trail Length: Adjust the trail length.

To clear (reset) the trail, use the "Clear Trail" option of the "Radar" Ribbon button.

It is possible to change the color of the trail from the [Radar](#) Options.

**Note:** If you want more precise information for a specific radar echo, you can right click on it and acquire it as an ARPA target. The radar will precisely look at the echo and extract Course and Speed.

### **Interference Rejection**

This setting is available from the "Radar" Ribbon button or from the "Advanced Radar Control" NavData.

If intermittent "Streaks" or "spiral lines" show up on your Radar display, it is most likely Radar interference received from another Radar. The Interference Rejection reduces or eliminates interference received from another ship's Radar. Turn it off when no Radar interference exists.

### **Echo Stretch**

This setting is available from the "Radar" Ribbon button or from the "Advanced Radar Control" NavData.

This function 'stretches' small echoes to make them easier to see. It stretches not only small echoes but also returns from sea, rain clutter and Radar interference. For this reason, make sure clutter and interference are sufficiently suppressed before using echo stretch.

### **Echo Averaging**

This setting is available from the "Radar" Ribbon button or from the "Advanced Radar Control" NavData. Echo averaging requires the computer to be connected to a Heading sensor.

The echo averaging uses multiple consecutive radar pictures to create an "average picture". This filter is very effective at removing noise (that has a tendency to have random position in between two pictures). Note that a side effect of the echo averaging is that it makes target that are moving quickly weaker on screen.

### **Noise Rejection**

This setting is available from the "Radar" Ribbon button or from the "Advanced Radar Control" NavData.

This function removes the "white noise" (random "speckles") that can sometimes spread over the entire radar picture.

### **Target Analyzer (DRS-NXT only)**

This setting is available from the "Radar" Ribbon button or from the "Advanced Radar Control" NavData.

DRS-NXT radar uses the new Furuno exclusive Target Analyzer function, where targets that are approaching your vessel automatically change color. Green targets are targets that stay stationary, or are moving away from you, while red targets are moving towards your vessel. Target Analyzer works independent of vessel speed, both your own vessels and target vessels, with minor limitations. Echoes dynamically change colors as targets approach, or get farther away from your vessel. Target Analyzer can increase safety, as well as improve situational awareness.

## **Bird Mode (DRS-NXT & DRSAX only)**

This setting is available from the "Radar" Ribbon button or from the "Advanced Radar Control" NavData (hidden by default).

The DRS-NXT and DRSAX (DRS "X-Class") feature a new bird mode that helps you identify birds gathering around schools of fish at the sea surface. Bird mode adjusts the gain and sea settings automatically for optimal visibility.

## **RezBoost (DRS-NXT & DRSAX only)**

This setting is available from the "Radar" Ribbon button or from the "Advanced Radar Control" NavData (hidden by default).

RezBoost allows to improve the azimuth resolution of the radar echoes. When set to "High" the horizontal beamwidth resolution is improved by a factor of 2. Note that using RezBoost can make target "smaller" on screen.

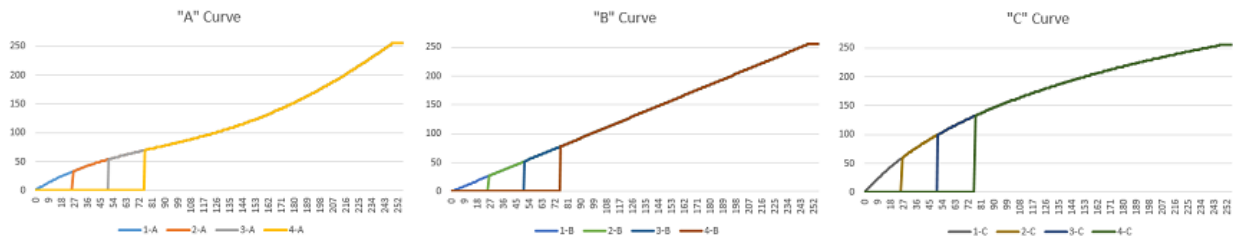
## **Video Contrast**

This setting is available from the "Radar" Ribbon button or from the "Advanced Radar Control" NavData (hidden by default).

This advanced functions slightly alters the way the radar echoes are drawn on the screen. The settings from 1 to 4 adjusts a "gate" (1 = no gate, 4 = maximum gate).

The setting from A to C adjusts the dynamic curve. When set to "A", the mid-level in the curve is low, so this setting is suitable for reducing rain clutter. When set to "C" the mid-level in the curve is high, so this setting is suitable for detecting distant targets.

The graphics below plots the video intensity received by the radar on the X coordinate and the resulting echo intensity as seen on screen on the Y coordinate:



## **Radar User Preset**

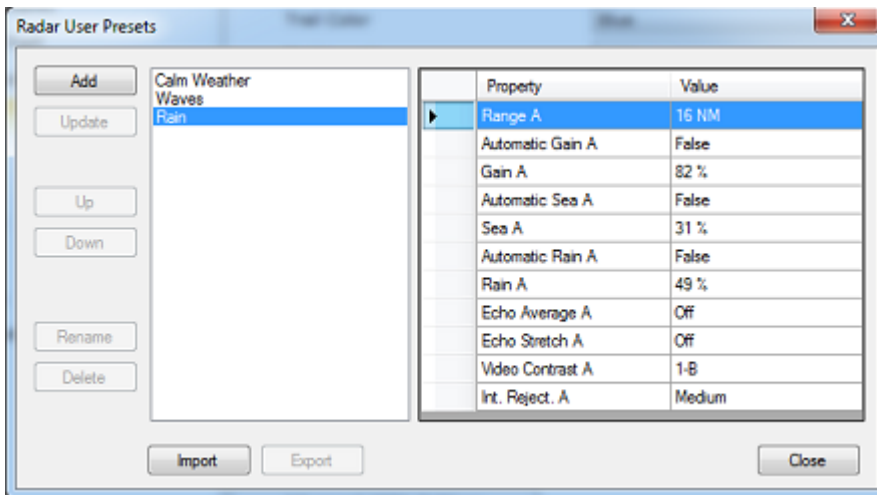
The "Furuno Radar Module" needs to be unlocked and radar configured to access this feature

Radar User Presets can be created to save and recall all the radar parameters (Radar Range, Gain, Sea, Rain, Interference Rejection, Echo Averaging, Echo Stretch and Video Contrast). This is useful to adjust the radar to specific conditions without having to change all the parameters one by one. For example, you could create various presets according to weather and sea state or according to the type of Navigation (Coastal, Open Sea,...).

To store a Radar Preset:

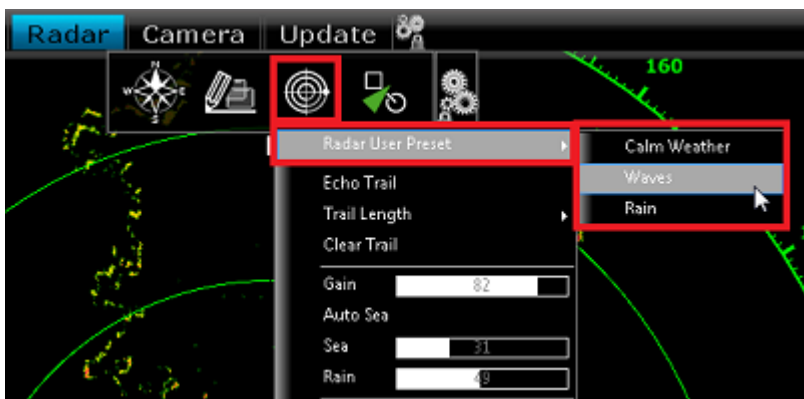
- Adjust the Radar to match a specific condition or type of use
- Open the [Radar](#) Options and click on the "Radar User Presets" button
- Click on "Add" and enter a name for the preset. At this time, TimeZero will capture all the settings and stores them with the preset name:





- Repeat this process for creating other presets

To recall a Preset, click on the "Radar" button in the Ribbon and select "Radar User Preset":

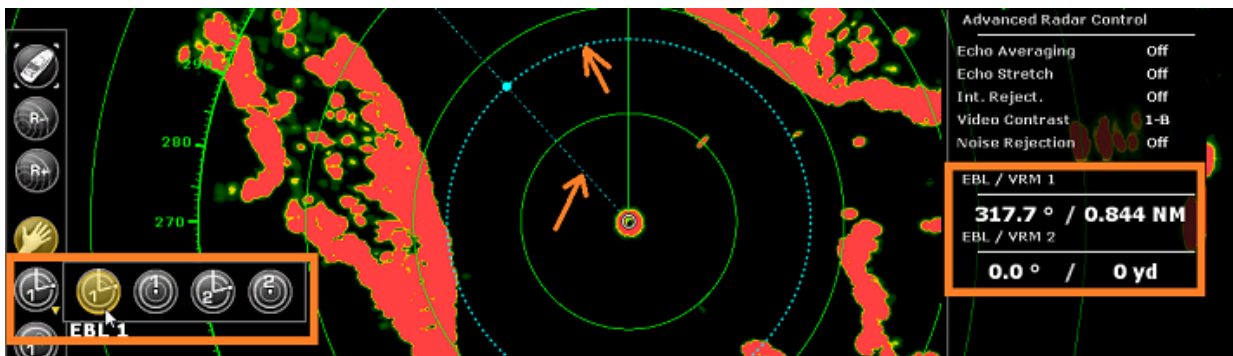


Radar Presets can also be recalled using Custom Shortcuts that can be setup from the [General](#) Options by clicking on "Customize Functions Keys..."

## EBL & VRM

The "Furuno Radar Module" needs to be unlocked and radar configured to access this feature

The EBL / VRM tool is available in the Tool Bar of the Radar WorkSpace. You can right click on the tool to get access to two EBL and two VRM:



The EBL is used to display the relative bearing of a target on the radar display. After setting the EBL/VRM tool in EBL mode (either EBL1 or EBL2), a line is moved with the cursor, and the bearing is read from the EBL/VRM NavData. Note that one end is always anchored at the center of the radar.

The VRM is used to determine the distance to a particular target, such as the mouth of a river, a sea buoy marking a channel entrance or another vessel. The VRM is like a standard range ring, but can be adjusted manually by selecting the EBL/VRM tool in VRM mode (either VRM1 or VRM2). The range is read from the EBL/VRM NavData.

To adjust the EBL and VRM, you can click and drag them with your mouse, or put the cursor over the VRM or EBL value and use the scroll wheel. To delete an EBL or VRM, you can right click on it and select Delete. If you want to delete all EBL/VRM from the screen, just double click on the EBL/VRM tool.

**Tips:** The EBL/VRM color can be adjusted if you right click on the EBL or VRM.

## Guard Zones

The "Furuno Radar Module" needs to be unlocked and radar configured to access this feature

Guard Zones can be setup in TimeZero from the Radar WorkSpace using the Guard Zone tool located in the Toolbar. Guard Zones are used to detect and warn you about radar echo that enters or exits a specific area. When a target (AIS or ARPA) or Radar Echo (picture) triggers the Guard Zone, a "Target Alarm" is raised and displayed in the Status Bar. When the ARPA targets are computed by TimeZero ("Enable Local TimeZero ARPA Processing" selected from the [Radar](#) Options), Guard Zone can also be used as Automatic ARPA Acquisition Area.

If you right click on the tool, you can select which Guard Zone to draw (either Guard Zone 1 or Guard Zone 2).

With the tool selected, click and drag on the screen to draw the Guard Zone. Note that the Guard Zone are always "fan" shaped and relative to the bow of your vessel (they move with vessel orientation). That way, a Guard Zone displayed at the top of the screen in Head Up mode will always stay in front of your vessel.

Once the Guard Zone has been drawn, you can right click on it to adjust its parameters:

- **Hide:** If you hide a Guard Zone, it is not active anymore and disappears from the screen. The only way to make it appear again is to select "Guard Zone -> Show" from the Radar Ribbon button or to create a new Guard Zone with the tool
- **Sleep:** When you sleep a guard zone, it remains displayed on the screen but the alarm is inactive. Note that if "ARPA Auto Acquisition" is selected, the ARPA acquisition will still be operating (even when the Guard Zone is set to sleep)
- **Work:** After putting a guard zone to sleep, you can re-activate it by selecting "Work". This will activate the Alarm again.
- **Guard Zone Alarm Level:** this adjusts the sensitivity of the Alarm. If you want the alarm to only be triggered with strong echo, set it to "Low"
- **Guard Zone Alarm In/Out:** adjust if the guard zone is triggered when target enter or exit the zone.

**Note:** if a Guard Zone is working and displayed, you will get a notification if the Radar Range becomes smaller than the Guard Zone range. This is because the Radar will not be able to "see far enough" to monitor the Guard Zone area. To correct this problem, increase the Radar Range until the Guard Zone is covered by the radar range or sleep the Guard Zone to stop using it.

## DRS Dual Range

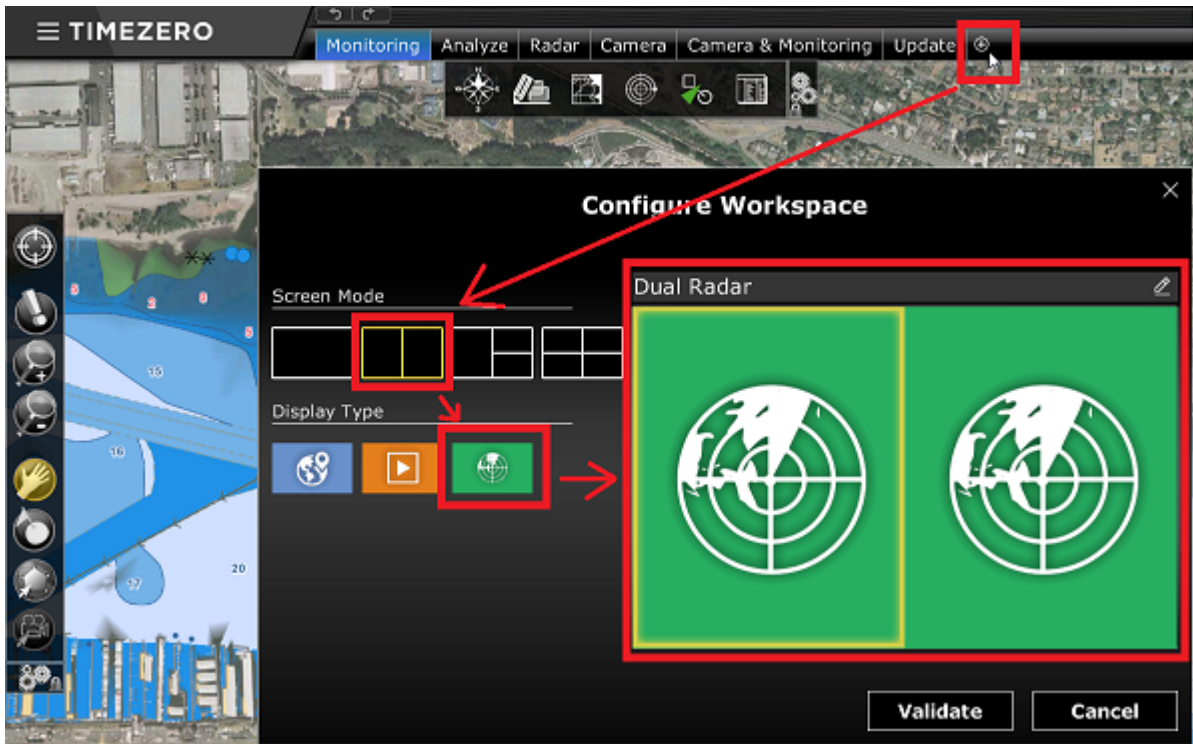
The "Furuno Radar Module" needs to be unlocked and a Furuno **DRS** radar needs to be configured to access this feature.

## Dual Radar WorkSpace

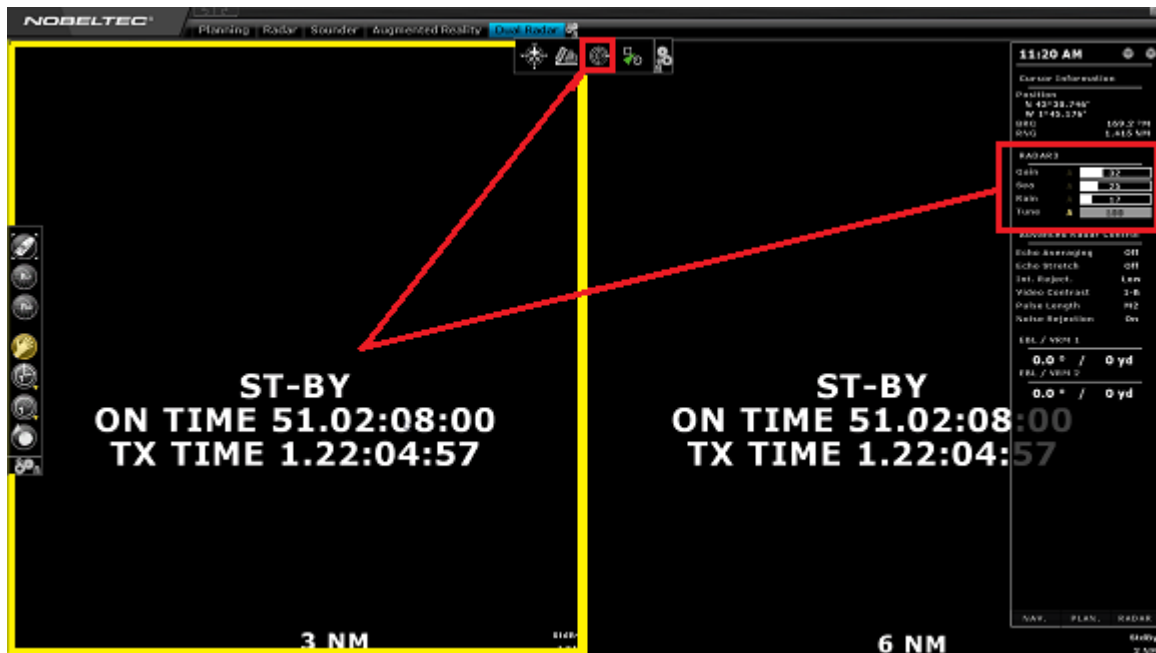
All Furuno DRSxD, DRSxA, DRSxAXClass antennas, have "True" Dual Range radar capability which provides "simultaneous" transmission of both short and long pulse. This allows complete independent control of range, gain, sea clutter and rain clutter for two separate ranges. The DRS-xNXT has also Dual Range capability, but the control of gain, sea clutter and rain clutter will be interlocked.

**Note:** The DRS4DL and FAR Series radars do **NOT** have Dual Range capability

When TimeZero is connected to a Furuno DRS Radar capable of Dual Range, it is possible to configure a WorkSpace that displays two Radar pictures:



The Dual Radar Range WorkSpace allows you to visualize and control the two ranges of the DRS. The range displayed on the left side is referred to as "Range A". The range displayed on the right side is referred to as "Range B". To control a specific range, click on the corresponding side of the window to select "Range A" (left side) or "Range B" (right side). A yellow border will highlight the range that is currently selected and controlled from the "Radar" button located in the Ribbon and from the Radar NavData:



Range A of the DRS can be transmitted with or without Range B. When only Range A of the DRS is transmitting, this allows the antenna to turn at high speed (up to 48RPM at small range). If both Range A and Range B are transmitting (when the DRS operates in Dual Range), the DRS can only turn at 24RPM.

**Note:** For technical reasons, when Range B is set to transmit, it will also automatically transmit Range A. If you only want one range to be transmitting (to operate at high speed) make sure to transmit Range A. Note also that when you click on Standby from either range, it will automatically standby all range (to stop the antenna).

All single Radar WorkSpace are always using "Range A". When transmitting from a single Radar WorkSpace, you only transmit "Range A". Only the "Dual Radar" WorkSpace allows you to access directly "Range B".

### Dual Radar Range on Chart Overlay

When using the Radar Overlay on the chart, you can either use "Range A" or "Range B" as a source of the Radar Overlay.

Use "Range A" if you want the DRS to run at high speed and/or if you want the Radar WorkSpace to display and share the same settings as the Radar Overlay. Use "Range B" if you want independent picture and control in between the single Radar WorkSpace (that always uses Range A) and the Radar Overlay. In this mode, the "Range B" can be adjusted from the Radar Overlay using the Radar Control in the NavData panel or from the "Dual Radar" WorkSpace (using the radar picture located on the right side).



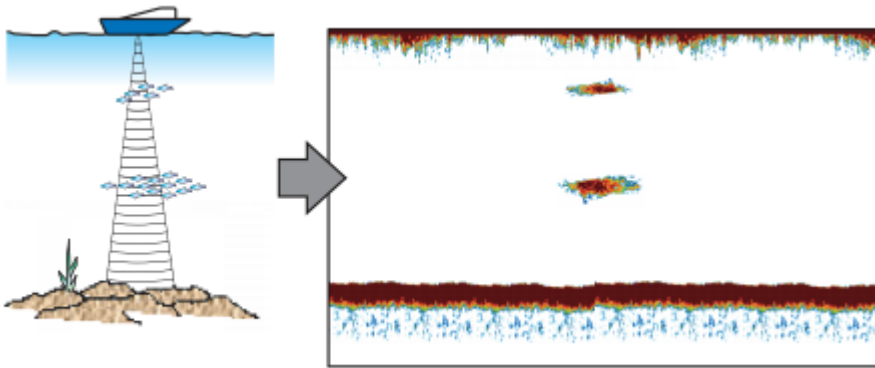
## Sounder

### Sounder Introduction

The "Furuno Sounder Module" needs to be unlocked to access the sounder/fish finder features.

**Note:** No Module is necessary to display the digital depth from a NMEA0183 or NMEA2000 sounder. Please refer to the [Sensor NavData](#) chapter for more information.

Echo sounders or "fish finder" determine the distance between its transducer and underwater objects such as fish or seabed and show the results on the screen. An ultrasonic wave transmitted through water travels at a nearly constant speed of 4800 feet (1500 meters) per second. When a sound wave strikes an underwater object such as fish or sea bottom, part of the sound is reflected back toward the source. The depth to the object can be determined by calculating the time difference between the transmission of a sound wave and the reception of the reflected sound. The sounder will then display this return ("ping") as one of up to 64 different colors depending on the strength of the returned signal. Sounder pings are represented over time, in a running display moving from right to left as the bottom appears beneath the transducer.



Most of the sounders on the market can operate at multiple frequencies (usually "Low" and "High"). The frequency of the sound waves created by the transducer impacts the type of reflected returns. Higher frequency sound waves, such as 200 kHz, do not penetrate the water deeply, but they return greater detail from the items they contact. For this reason, the Sounder in 200 kHz frequency is great for fish detection. However, transducers are rarely able to penetrate deeper than 600 feet in 200 kHz mode. Lower frequency sound waves behave in the opposite way. They offer much deeper depth penetration, but provide less detail from objects they contact.

TimeZero is compatible with the following Furuno Ethernet sounder:

- **DFF1:** Black Box 600W/1kW Dual-frequency 50/200 kHz
- **DFF3:** Black Box 1kW/3kW Dual frequencies between 28 and 200 kHz
- **BBDS1:** Black Box 600W/1kW Dual-frequency 50/200 kHz with bottom discrimination (\*)
- **DFF1-UHD:** Black Box 1kW Broadband "CHIRP" Dual frequencies (50 kHz +/- 20 kHz, 200 kHz +/- 25 kHz) with bottom discrimination (\*)
- **TZtouch2 & TZtouch3 Internal Sounder:** 600W/1kW Dual-frequency 50/200 kHz sounder integrated to the NavNet TZtouch2 & TZtouch3 MFD with bottom discrimination (\*)
- **FCV-1150:** Standalone 1kW/3kW Dual-frequency 28/200 kHz

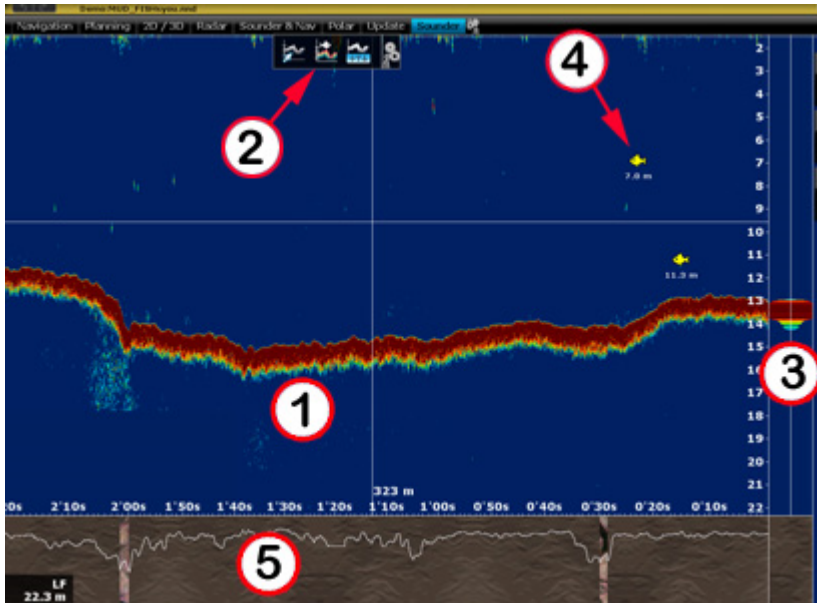
(\*) The Bottom Discrimination is only available with selected transducer models. Make sure to contact your Furuno dealer for transducer compatibility.

## Sounder WorkSpace

The "Furuno Sounder Module" needs to be unlocked to access the sounder/fish finder features.

### Sounder Overview

The Sounder WorkSpace displays a traditional dedicated sounder display:



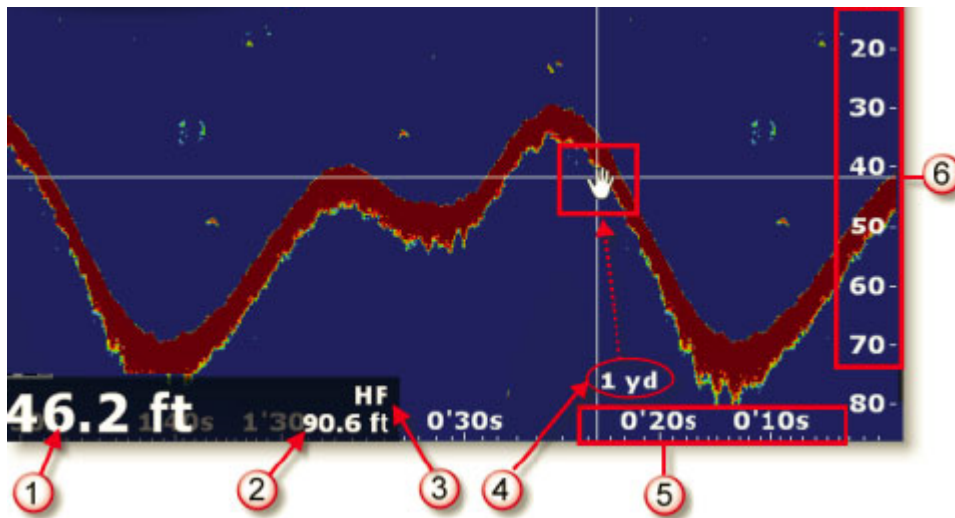
1: Sounder Echogram: The sounder picture moves from right to left. Echo on the far right represent "real time" return (what is picked up by the transducer under your boat).

2: Sounder Ribbon Buttons: Use these buttons to adjust the various mode of the sounder and adjust what is displayed on screen.

3: A-Scope Display: The A-Scope displays the enlarged, newest sounder echo returns. These magnified returns are also drawn in proportional scale, where strongest returns are also the widest.

4: ACCU-Fish Icon: The ACCU-Fish feature of the Sounder can be utilized to display individual fish icon when fish echoes are detected. It helps beginners to identify the fish targets on the display for a more fun fishing experience. Note that this feature is not available with the FCV1150.

5: Bottom Discrimination Display: Display the type of bottom when the Bottom Discrimination feature of the BBDS1 or DFF1-UHD is enabled.



1: Depth Indication: Depth sent by the sounder

2: Range: Sounder Range Scale (maximum depth detection of the sounder). Can be adjusted by using the "Range +/-" buttons on the Toolbar.

3: Frequency: Operating frequency of the sounder. "HF" for High Frequency, "LF" for Low Frequency, "HF/LF" for Dual Frequency.

4: Distance Indicator: Distance of the echo under the cursor from own ship position.

5: Horizontal Scale: Time Scale of past echoes.

6: Vertical Scale: Depth Scale

## **Sounder History**

TimeZero is able to record sounder history. To display sounder history, click and hold your mouse then drag the sounder picture to the right. You can also use the left/right key of your keyboard. The range of the sounder history will automatically scale to what is displayed on your screen.

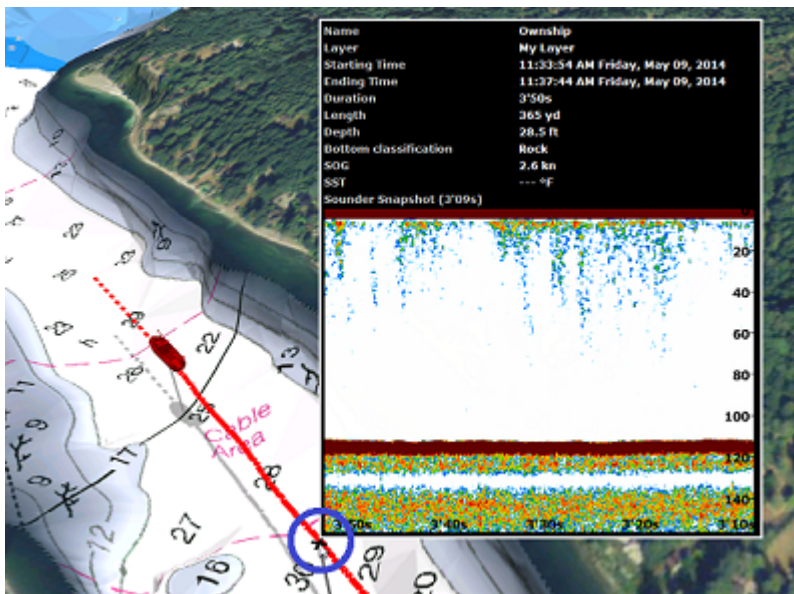
**Note:** The sounder history length recorded by TimeZero varies according to depth. In shallow water, TimeZero can record approximately 1 hour. In deeper water, the sounder history can be up to 5 hours.

Note that, when displaying the sounder history, the sounder picture is not scrolling anymore. To go back to the real time sounder display (and have the picture scrolling again), drag the sounder picture all the way to the left or click on the "Center On" button located in the Toolbar.

**Note:** After 5 minutes, the Sounder will go back automatically to the real time view.

The sounder history can also be displayed by rolling the cursor over the **active** track:

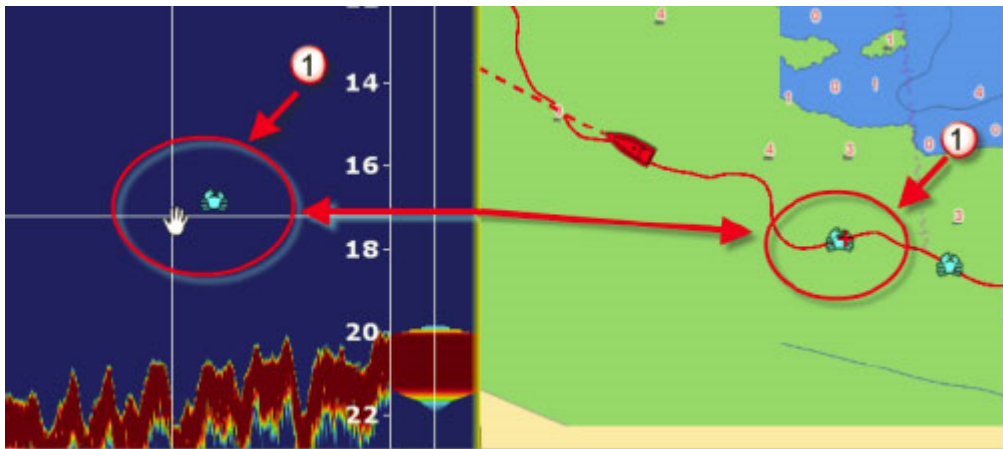




Note that the sounder history will only appear in the track tooltip for the track being actively recorded (the active track). If you stop tracking, it will lose the sounder reference.

### Sounder Geolocation

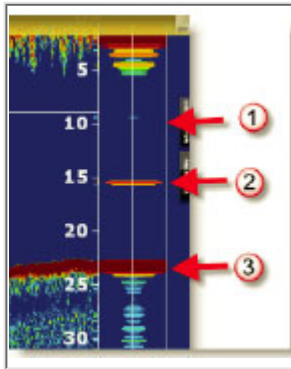
TimeZero is able to associate each sounder ping with a specific Lat/Lon. This feature allows you to pinpoint exactly where a specific sounder ping was acquired by rolling the mouse over the Sounder Display. A "ghost" (or duplicate) image of the cursor will appear on the chart plotter if your screen is split in between the Sounder and Navigation, indicating where the sounder ping was taken. You can also double click anywhere on the sounder picture to drop a mark:



The mark will appear on the chart at that location and will contain the depth at which it was created.

### A-Scope

The A-scope appears at the right of the screen when selected from the Ribbon. The A-Scope displays the enlarged, newest sounder echo returns. These magnified returns are also drawn in proportional scale, where strongest returns are also the widest:



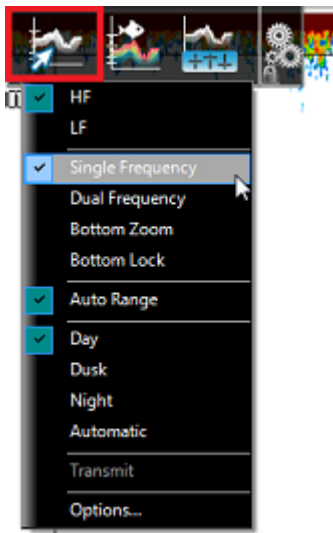
- 1: Weak reflection (Fish or noise)
- 2: Strong reflection (Fish)
- 3: Strong reflection (bottom)

**Note:** The "A-Scope Peak Hold" setting available in the [Sounder](#) Options allows to keep the peak of the A-Scope displayed for longer period of time.

## Sounder Display Mode

The "Furuno Sounder Module" needs to be unlocked to access the sounder/fish finder features.

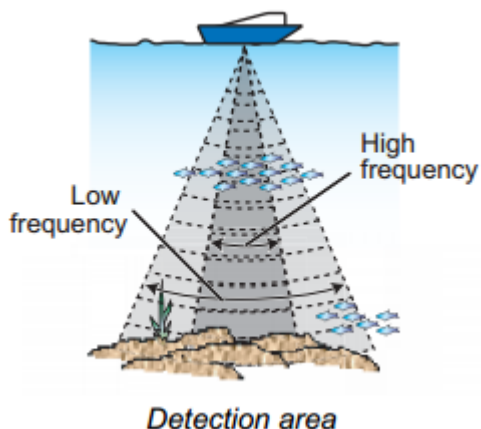
The various sounder display modes can be selected from the "Sounder Mode" or "Sounder Display" buttons located in the Ribbon :



### Single Frequency

The single frequency mode shows either the low-frequency or high-frequency picture on all the screen.

A low frequency gives a wide detection area and can reach deeper. Use the low frequency for general search and to find bottom conditions. A high frequency gives better resolution but cannot reach as far as low frequency. Use the high frequency to inspect a school of fish:



**Tips:** You can switch from Low to High frequency by clicking on the Sounder frequency indicator on the lower left of the screen:



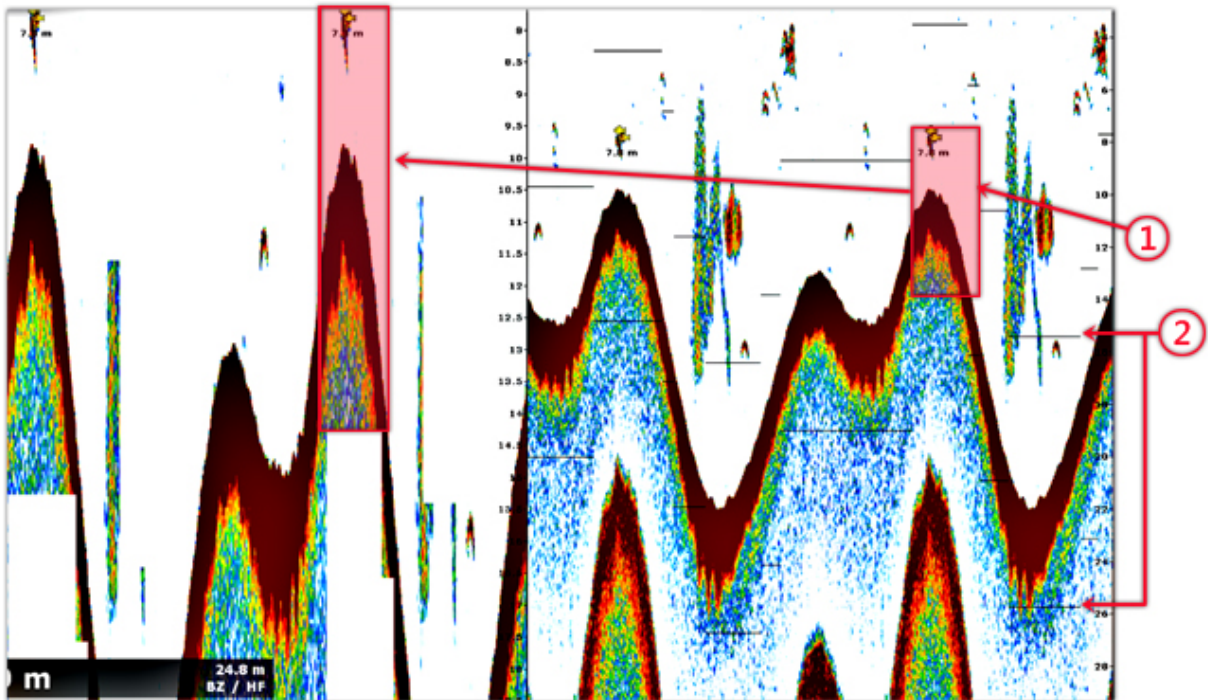
### **Dual Frequency**

The dual frequency mode splits the sounder screen in two and provides both low and high frequency pictures at the same time. Use the dual frequency display to compare the same picture with two different sounding frequencies.

You can reverse the High and Low frequency side by inverting the frequency selection or by clicking on the Sounder Frequency indicator on the lower left.

### **Bottom Zoom**

With the Bottom Zoom selected, the Sounder Display is divided in half. The left side contains a Bottom Zoom display, while the right side continues to display the regular sounder data. Bottom Zoom causes the bottom, when it is found, to be drawn larger (1). Zoom reference lines are displayed on the right screen (2), allowing you to view the area of the echo that gets expanded:



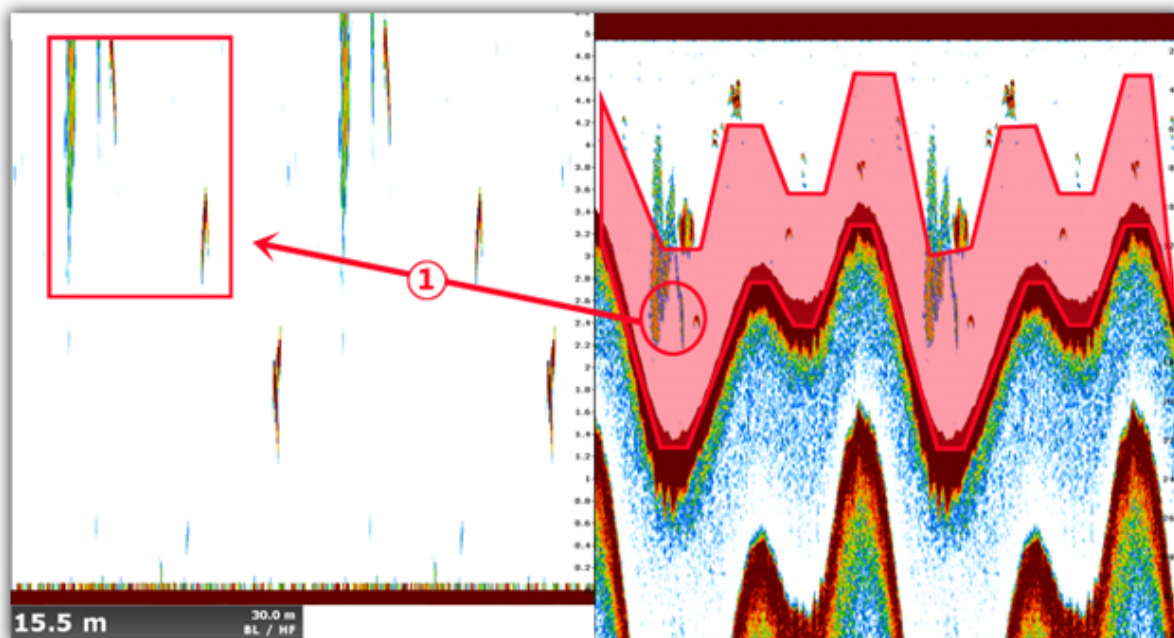
The zoom "window" size can be adjusted by using the "Zoom Range Span" setting available in the [Sounder Options](#). The center of the "window" can be shifted around the bottom (depth) by using the "Bottom Range Shift Area" setting available in the [Sounder Options](#).

The zoom can operate on the High or Low frequency picture.

This display mode is useful to focus on bottom fishing.

### **Bottom Lock**

The Bottom Lock mode presents an interesting view of the sounder returns. The sea floor is flattened in this view, allowing easy comprehension of how far a fish or other return is above the sea floor:



The zoom "window" size can be adjusted by using the "Bottom Lock Range Span" setting available in the [Sounder Options](#).

### **Bottom Classification**

This feature is only available with the BBDS1, DFF1-UHD and TZT2/3 Internal sounder when paired with selected transducers. Contact your Furuno dealer for more information about transducer compatibility.

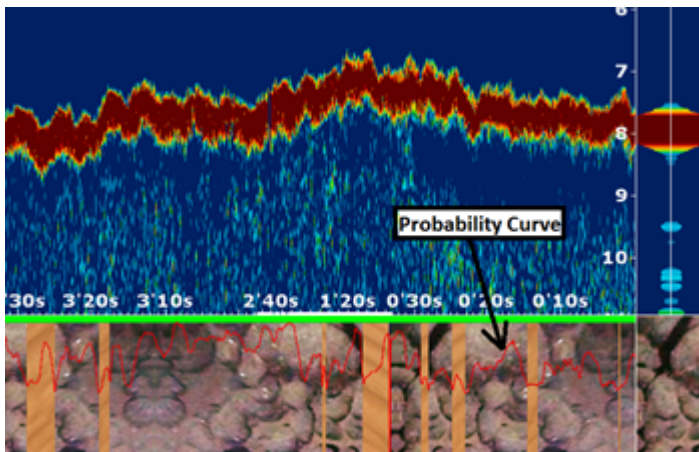
Some Furuno Ethernet sounders have a bottom classification feature that determines the bottom structure and separates them into the following categories: mud, sand, gravel, and rock. This is achieved automatically by analyzing echo characteristics from the bottom components such as particle size and hardness.

To enable the bottom discrimination, select "Bottom Classification" under the "Sounder Display" button located in the Ribbon. The sounder will start analyzing the bottom and return its structures with probability of detection. TimeZero can display this information in various ways.

**Note:** Enabling the Bottom Classification locks the sounder in Auto Range and Automatic Mode (you can no longer adjust the range or the gain manually). The sounder also goes into Dual Frequency (Low and High frequencies) to get more information about the bottom.

#### **"Aquarium" Mode:**

The "Aquarium" mode is automatically displayed at the bottom of the Sounder Echogram when the "Bottom Classification" is enabled from the "Sounder Display" button. A red line is also displayed indicating the probability of corresponding data (the higher the more confident the result is):

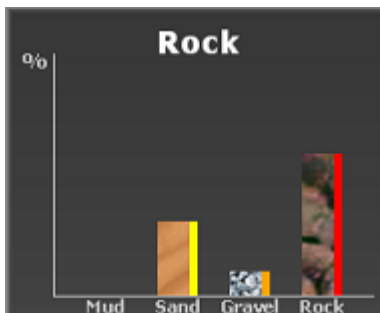


The various textures of the Aquarium mode are:

MUD	SAND	GRAVEL	ROCK
			

**Bottom Classification NavData:**

A real time Bottom Classification NavData can be displayed on the NavData Panel. This NavData displays in real time the probability of the four components and is very useful if the Sounder is not displayed on screen:



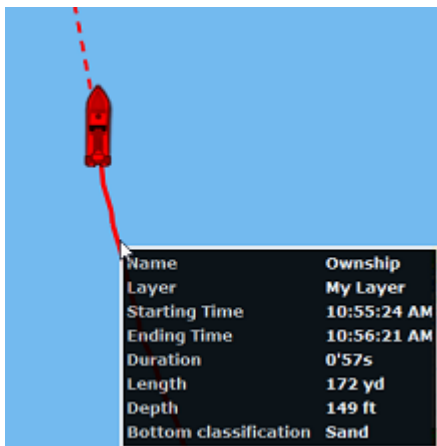
Please refer to the [Bottom\\_Discrimination](#) NavData Chapter for more information.

**Track Color and Track Tooltip:**

The track color can be adjusted to display the Bottom Classification from the [Ship & Tracks](#) Options. The color used for each bottom type can be customized and is displayed on the right side of each bar graph of the Bottom Classification NavData. Please refer to the [Track\\_Coloring](#) Chapter for more information.

Note that you can also access the bottom type on every track Tooltip by rollover your cursor over a track:









**Bottom Hardness on the chart:**

When enabling PBG (Bathy Recording), TimeZero will record the depth data but also the bottom hardness. Bottom Hardness is computed from the Bottom Classification value sent by the sounder. Please refer to the [PBG chapter](#) for more information.

**ACCU-Fish**

The ACCU-Fish feature estimates the length of each fish and shows a fish symbol and depth value or fish length. This feature requires appropriate transducer and either the BBDS1 or DFF series sounder. ACCU-Fish helps beginners to identify the fish targets on the display for a more fun fishing experience.

When the ACCU-Fish function of the Sounder is enabled from the "Sounder Display" button located in the Ribbon, fish icons will be displayed on the Sounder Echogram and on the chart. You can change the fish icons (dot, solid or striped) and label (depth or size of the fish) from the [Sounder Options](#).

Fish size	Solid	Striped
Large fish symbol (more than 51 cm (20.08 inch))		
Small fish symbol (10 to 50 cm (3.9. to 19.69 inch))		

You can change the fish icons color from the "Sounder Display" button in the Ribbon.

Note that the ACCU-Fish icons are only temporary and disappear on the chart and sounder after two minutes. If you want to create a permanent mark, simply double click on the sounder echogram over the fish icon, or right click on the chart on a fish icon and select "Create Mark".

**Note:** Enabling the ACCU-Fish function force the sounder into Dual Frequency (Low and High frequencies).

**Auto Range**

When "Auto Range" is selected, the sounder range will automatically adjust according to the depth. Note that, if the sounder lose bottom, the range will automatically cycle through all the values until a good bottom (depth) is found again. In certain cases, (when the bottom disappear due to the boat moving at high speed), it is recommended to de-activate "Auto Range" to prevent the sounder from cycling through the various ranges.

## Sounder Controls

The "Furuno Sounder Module" needs to be unlocked to access the sounder/fish finder features.

### Automatic Mode:

There are two types of automatic fish finder modes: "Auto Fishing" and "Auto Cruising". These settings can be adjusted from the "Sounder Adjustments" button located in the Sounder Ribbon. "Auto Fishing" optimizes the sounder to display schools of fish, and "Auto Cruising" optimize the sounder to detect the bottom. "Auto Cruising" uses a higher clutter removal setting than "Auto Fishing". Do not use "Auto Cruising" when your purpose is to find fish, because the clutter removal circuit can erase weak echoes. The automatic fish finder function automatically adjusts the gain, clutter, TVG and echo offset:

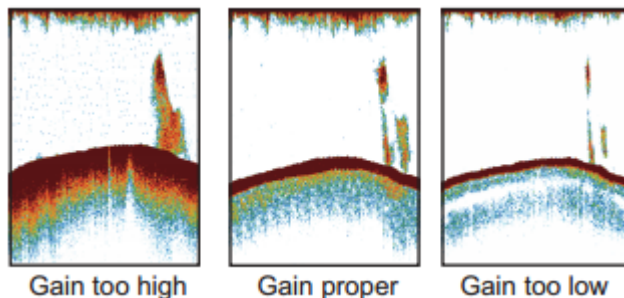
- The sensitivity of the receiver (Gain) is adjusted to show the bottom echo in reddish-brown
- The Clutter Adjustment is set to automatically reduce low-level noise like plankton.
- The TVG function is automatically adjusted.
- The echo offset balances the gain on high and low frequencies.

There is an independent "Auto-Range" control (available from the "Sounder Display" button located in the Ribbon) that adjusts the range of the sounder automatically to track the bottom. Note that, if the sounder loses bottom, the range will automatically cycle through all the values until a good bottom (depth) is found again. In certain cases, (when the bottom disappear due to the boat moving at high speed), it is recommended to deactivate "Auto Range" to prevent the sounder from cycling through the various ranges.

### Manual Mode:

When you select "Manual", you can manually adjust the Low and High frequency Gain of the sounder.

**Gain:** The gain controls how echoes of different strengths are displayed on the screen. Set the gain to show a slight amount of noise on the screen. Increase the gain for greater depths and lower the gain for shallow waters:

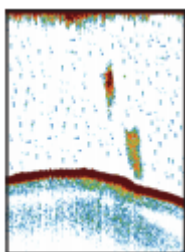


**Range:** When "Auto Range" is turned OFF from the "Sounder Mode" button in the Ribbon, you can manually adjust the range by clicking on the "Range +" or "Range -" buttons located on the Toolbar. You can enable or disable specific ranges value from the [Sounder](#) by clicking on "Sounder Ranges Selection". This allows you to only cycle through and limit the depth ranges that are useful for your application. You can also use the wheel of your mouse to change the range to any value (not restricted by the Sounder Range Selection).

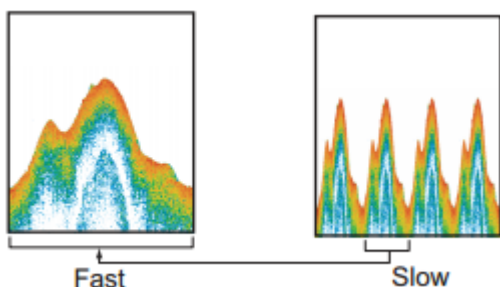
**Range Shift:** You can "offset" or shift the range from the [Sounder](#) Options by entering a value in the "Range Shift" setting or by dragging the sounder picture downward.

**Clutter:** If low intensity "spots" of noise appear over most of the screen like in the illustration shown below (caused by sediment in the water or noise) you can increase the "Clutter" slider available in the [Sounder](#) Options.



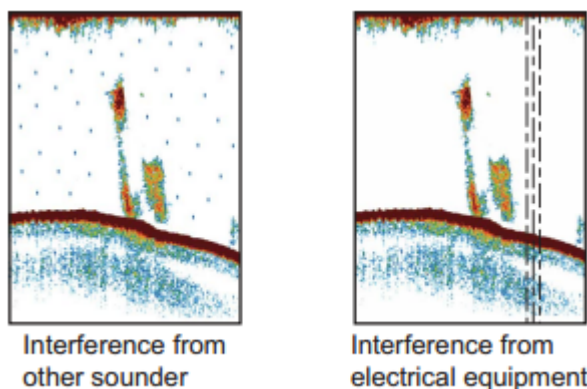


**Picture Advanced:** The "picture advance" setting available in the [Sounder](#) Options controls how quickly the vertical scan lines (pings) of the sounder move across the screen. A fast advance speed expands the size of a school of fish horizontally on the screen. A slow advance speed shortens the school of fish. Use a fast advance speed to see the hard bottom. Use a slow advance speed to see the smooth bottom.

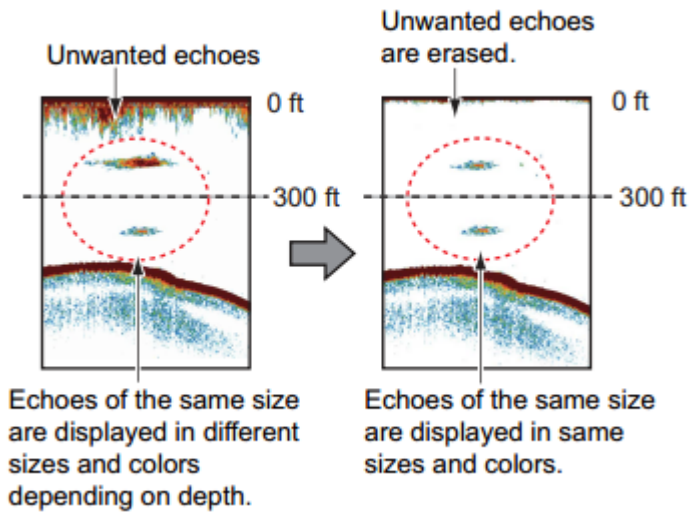


For most application, it is recommended to leave the picture advance to "1".

**Interference Rejection:** This setting available from the "Sounder Adjustments" button located in the Ribbon . Only use the Interference Rejection when noise appears on the screen due to other sounder around you or if you have interference from electrical equipment:



**TVG:** The TVG settings (HF and LF) available in the [Sounder](#) Options can be used to balance the echo strength along the water column. A school of fish at a depth deeper than a school of equal strength in shallow water appears in weaker colors. This condition is caused by the attenuation of the ultrasonic wave. To display the schools of fish in the same colors, use the TVG. The TVG automatically increases the gain with depth so that echoes of the same strength and different depths are shown in the same colors. In the illustration shown below, for example, the TVG is set for 300 ft and the TVG level is adjusted. Unnecessary echoes at a distance less than 300 ft are deleted and echoes at depths greater than 300 ft are not adjusted





## Multibeam Sounder

### WASSP

The "PBG Module" and "WASSP Module" need to be unlocked to access these features.

WASSP is a multibeam sounder capable of transmitting 112 beams (224 for WASSP generation 3) on a wide 120° port-starboard swath of the seafloor in one ping. TimeZero can take all these depth points and perform seabed profiling at up to 100 times the speed of conventional single-beam sounders with high accuracy. The WASSP system can also transmit "BackScatter" data (hardness) that can be displayed in TimeZero using a Color Scale similar to the Depth Shading.

With the latest WASSP Generation 3 (WASSP S3 or WASSP F3), echo and water column data can be displayed in TimeZero (using the Section, Multi-Sounder, Side Scan, and Water Column display).

**Note:** WASSP Generation 3 may require additional modules (that need to be unlocked inside the WASSP DRX) to access some type of data. Please contact your WASSP dealer for more information.

### Echo Adjustments

This section only applies to WASSP Generation 3

#### **Range vs. Zoom**

The range of the multibeam sounder can be set to Automatic or Manual from the "Mode" button located in the Ribbons. When the mode is set to "Manual", the range can be increased or decreased using the "Range In" and "Range Out" buttons available in the Toolbar.

Note that it is also possible to Zoom on the echo by using the scroll wheel of the mouse or by adjusting the "Zoom" slider under the "Display" button located in the Ribbons. Adjusting the zoom, will not change the range at which the multibeam sounder operates. Instead the zoom function performs a "digital zoom" by expanding or contracting the picture sent by the sounder.

**TIPS:** It is highly recommended to leave the range to "Automatic" and use the Zoom if you want to adjust the picture. Using the range in manual mode can cause the multibeam sounder to lose track of the bottom and operate at a range that is not optimal.

#### **Gain, Clutter and Dynamic Range**

WASSP S3/F3 has a total dynamic range of over 150 dB. This means that the sounder can receive both very strong and very weak targets without saturating and losing valuable information. In order to represent this massive range of echo returns on the display, the display dynamic range limits this range and can both be adjusted in the range of target types that can be viewed (Display Dynamic Range) and the strength of targets being displayed (Gain Control). Targets stronger than the display range on the screen will appear at max color strength and targets weaker than the display range on screen will disappear.

The Gain can be adjusted from the "Adjustment" button located in the Ribbons. You can also put your cursor over the color scale displayed on the bottom left and use the mouse wheel to increase or decrease the gain value:

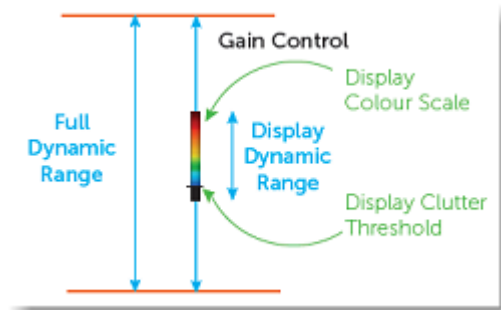


Turn the gain higher to make weak echo appears stronger.

The Clutter can be adjusted from the "Adjustment" button located in the Ribbons, just below the Gain. Low level noise and clutter from sediments, system noise etc can appear on the screen as dots. These can be suppressed

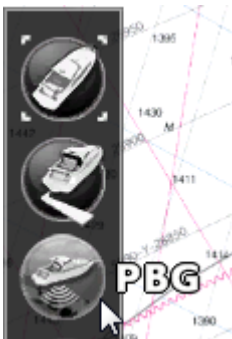
using the clutter control. Clutter control will blank out any returns below the specified return strength on the slider.

The "Dynamic Range" is used to adjust the span at which the color scale (used to render echoes) will operate. A large dynamic range will render on screen echo strength from weak to strong (dark blue to bright red). If you want to "focus" and restraint the color to a smaller interval, you can decrease the dynamic range:

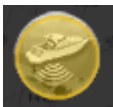


**PBG with WASSP**

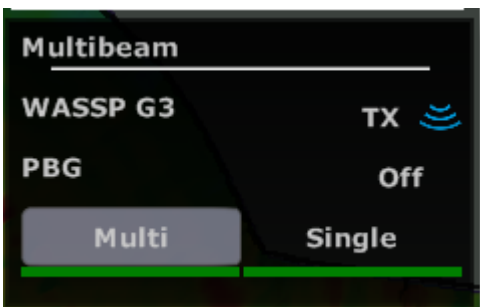
Once the WASSP has been configured in the Connection Wizard, click on the "PBG" button in the Toolbar to enable depth recording:



When depth (and backscatter) data are being recorded, the "PBG" Button turns yellow:



Note that the "Multibeam" NavData allows you to Transmit/Standby the WASSP DRX (WASSP Generation 3 only), enable or disable PBG recording, and select the depth data source. By clicking on either "Multi" or "Single" you can select the type of data that will be recorded (PBG):



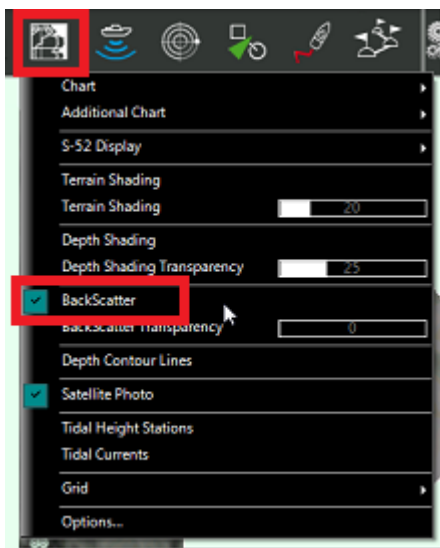
When set to "Multi", the bathymetric data from WASSP will be recorded. When set to "Single", the depth data setup in the Connection Wizard (single beam) will be recorded. It can be useful to switch to "Single" in deep area where the WASSP might not be able to detect bottom but where a traditional single beam sounder would.

Once you have collected data, you can view depth information in 3D by using the [3D Cube WorkSpace](#), or in 2D by using Depth Shading or Contour lines from the [Fishing WorkSpace](#).

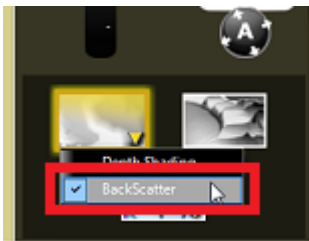
## BackScatter with WASSP

BackScatter data (hardness) can be displayed on the chart similar to the [depth shading](#). The seafloor backscatter is defined as the amount of acoustic energy being received by the multibeam sounder after a complex interaction with the seafloor. This information can be used to determine bottom type, because different bottom types "scatter" sound energy differently. For example, a softer bottom such as mud will return a weaker signal (lower dB value) than a harder bottom, like rock (higher dB) value. By default a harder bottom is displayed in black while a softer bottom is displayed in white.

To display the BackScatter on the chart, click on the "Chart" button located in the Ribbon and select "BackScatter":



You can also right click on the "Depth Shading" button available on the lower right corner of the Fishing WorkSpace and change the color mode to "BackScatter":



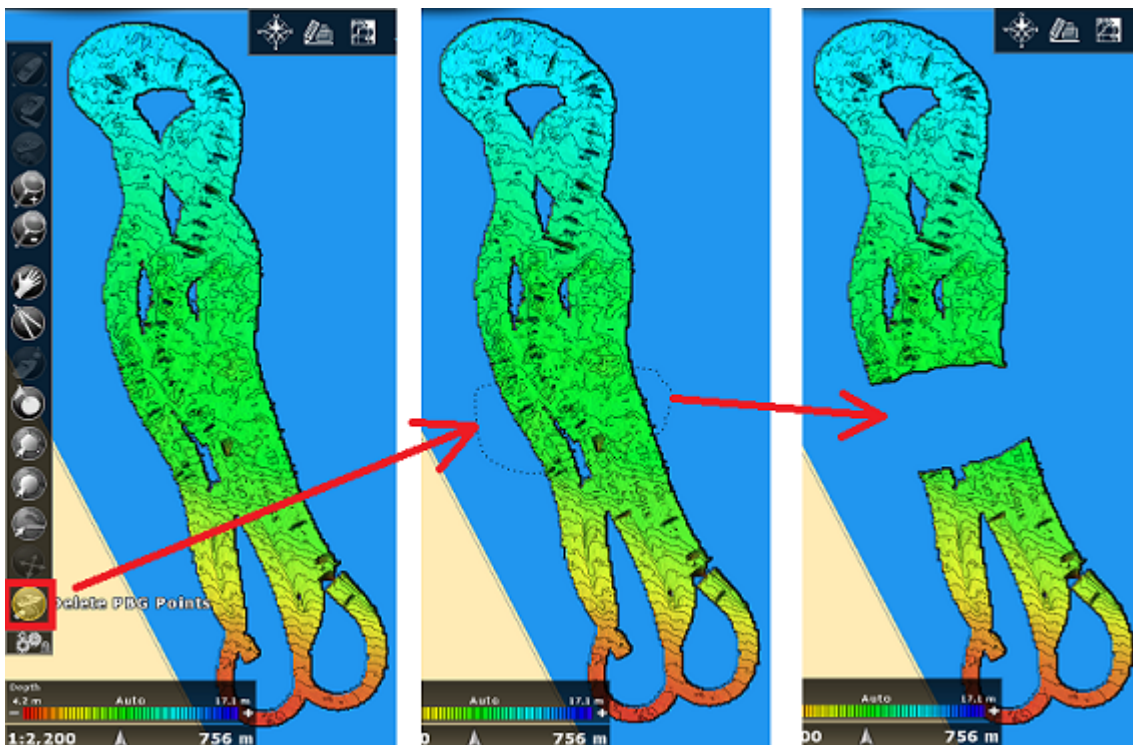
The BackScatter color scale can be adjusted and set to "Automatic", "Manual" or "Discrete". You can change the mode from the [Fishing WorkSpace](#).

**TIPS:** When the backscatter is displayed, it is possible to show depth contour lines on top of the backscatter. By default the contour lines will be displayed in color. The color of the contour line will use the same color palette as depth shading. Please refer to the [Fishing WorkSpace](#) for more information on how to adjust color and contour lines.

### Deleting WASSP Data

To delete WASSP recorded data, make sure that only the "PBG Database" is enabled from the PBG button in the ribbon. This will allow you to focus on the recorded data (not the 3D data from the chart, or the one that was imported).

Turn OFF the PBG recording, select the "Delete PBG Points" from the Toolbar, draw around the area you want to delete and then release the mouse:



### DFF-3D

The "PBG Module" and "DFF3D Module" need to be unlocked to access these features.

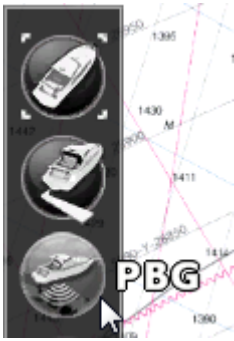
The DFF-3D is a multibeam sounder that can see 120-degrees port to starboard, allowing you to see the depth and direction fish schools are moving, while displaying the seabed condition in real time. The DFF-3D gives you real-time 120 port-starboard view of the water column and seabed up to 650 feet. The DFF-3D allows you to explore fishing spots and find fish in deep water far faster than conventional single beam sounders. When using PBG with the DFF-3D, TimeZero will record up to 50 depth points in one "ping" (instead of just one depth point with a conventional sounder).

### DFF-3D Configuration

Before using the DFF-3D in TimeZero, make sure it has been properly configured. Follow with attention the [DFF-3D Multibeam Sounder](#) chapter. If you are using an SC30 for stabilization, make sure to properly enter all the offsets (critical).

### PBG with DFF-3D

Click on the "PBG" button in the Toolbar to enable depth recording:



When depth data is being recorded, the "PBG" Button turns yellow:



Note that the ["Multibeam" NavData](#) allows you to Transmit/Standby the DFF-3D, enable or disable PBG recording, and select the depth data source. By clicking on either "Multi" or "Single" you can select the type of data that will be recorded (PBG):



When set to "Multi", the bathymetric data from the DFF-3D will be recorded. When set to "Single", the depth data setup in the Connection Wizard (single beam) will be recorded. It can be useful to switch to "Single" in deep area where the DFF-3D might not be able to detect seabed but where a traditional single beam sounder would.

Points recorded with the DFF-3D are recorded in a similar way as with a regular single beam sounder. The only difference is that the DFF-3D provides many points every second (up to 50) over a larger area. However, TimeZero uses the same extrapolation ("brush" parameter) as with a regular sounder. If you are collecting depth data points with the DFF-3D in areas in between 10 to 30 meters, it is recommended to decrease the "Brush Size" from the [PBG](#) Options in order to increase the resolution.

In areas deeper than 30 meters, the default brush size (19) is recommended. This is because the distance in between depth points increases with depth, and TimeZero needs a larger brush size to "fill the gap" and smooth all the depth points.

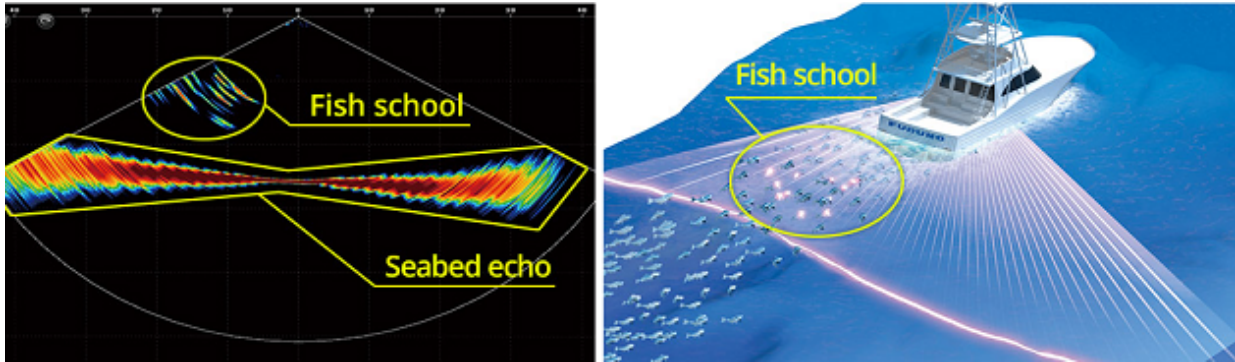
**Note:** Feel free to adjust the Brush size as you wish. The extrapolation is applied in real time and do not affect the way points are recorded (it only affects the way they are rendered on the screen).

Once you have collected data, you can view depth information in 3D by using the [3D Cube Workspace](#), or in 2D by using Depth Shading or Contour lines from the [Fishing Workspace](#).



## Section Display

The Section displays real-time conditions under the boat in a wide 120 degrees swath port to starboard. This mode allows you to see exactly where fish are detected and helps visualize the seafloor shape under your boat.



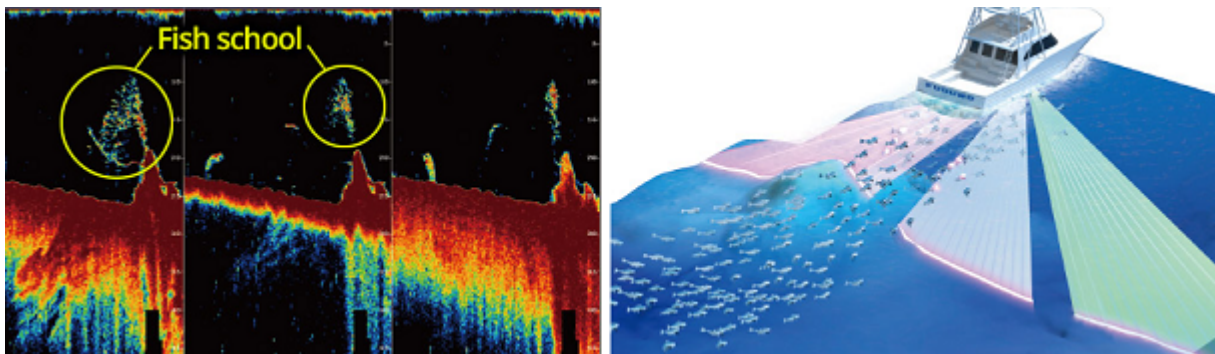
**Note:** The width of the seafloor returns will appear much larger at the edges of the swath due to the larger seafloor coverage in range (angle of incidence).

From this view, it is possible to double click on the echo to create a mark at that location (you can also select the "Mark" tool in the Toolbar). Note that the mark will disappear from this view shortly after being created. The mark will be available permanently on the chart (until you delete it) and will contain the depth at which it was created.

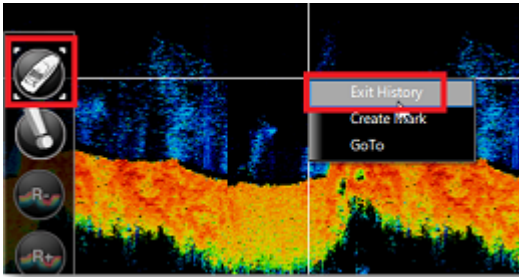
**Note:** It is only possible to have one Section screen in the software

## Multi-Sounder Display

The Multi-Sounder operates like a traditional Sounder, but instead of having only one beam (under your boat), two additional beams (port and starboard) are displayed on the screen. The Triple Beam display helps to understand the depth of fish targets and the seabed condition in each direction, as well as the direction the target fish are moving. Each beam angle and beam width are selectable:

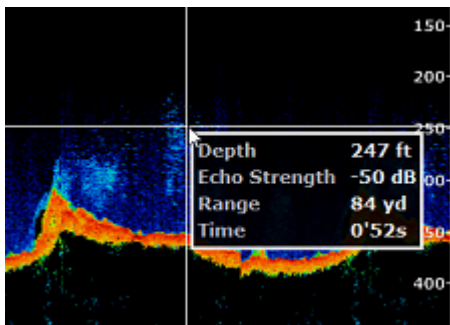


The multi-sounder operates much like a traditional sounder display scrolling from left to right. It is possible to scroll back to view past echo by clicking and dragging on the sounder picture. To go back to real time display, you can either click on the "Center On" button located in the Toolbar or right click anywhere on the sounder picture and select "Exit History":



**Note:** The Multi-Sounder will also automatically go back to real time view after 5 minutes of inactivity or after changing WorkSpace.

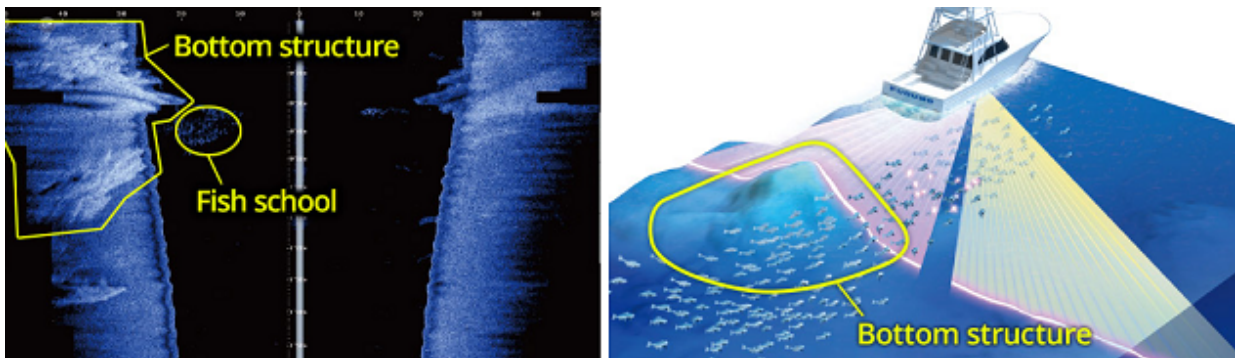
If you left click anywhere on the sounder picture, a tooltip indicating the depth, echo strength, range (distance in between your vessel and cursor on sounder) and time since that echo was detected will appear on screen:



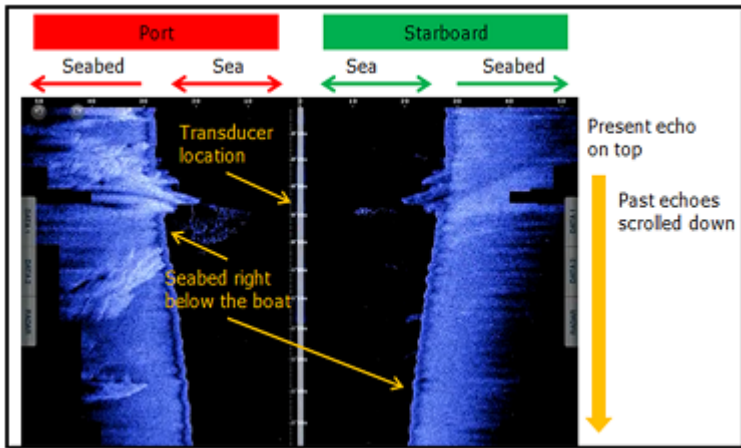
It is also possible to double click on the echo to create a mark at that location (you can also select the "Mark" tool in the Toolbar). The mark will be available permanently on the chart (until you delete it) and will contain the depth at which it was created.

## Side Scan Display

The Side Scan display shows a raw picture generated from the data received by the sonar. The display is drawn on the screen as a waterfall – the newest information appears at the top of the screen, while the oldest falls off the bottom of the screen. This is similar to the way sounder displays operate, except that in this case the new data appears on the top of the screen and the old data disappears at the bottom. The left side of the side scan view shows the signals received from the port side while the right shows signals received from the starboard side:



By default, the side scan view starts at the center of the vessel and works its way out to port and starboard. As the side scan image moves further out along the sea-floor, the picture shows features on the sea-floor. Objects, such as rocks, appear as bright white marks followed by a shadow. Harder ground gives strong returns (lighter color on the scale), while a patch of mud or kelp causes a dark patch/shadow to appear.

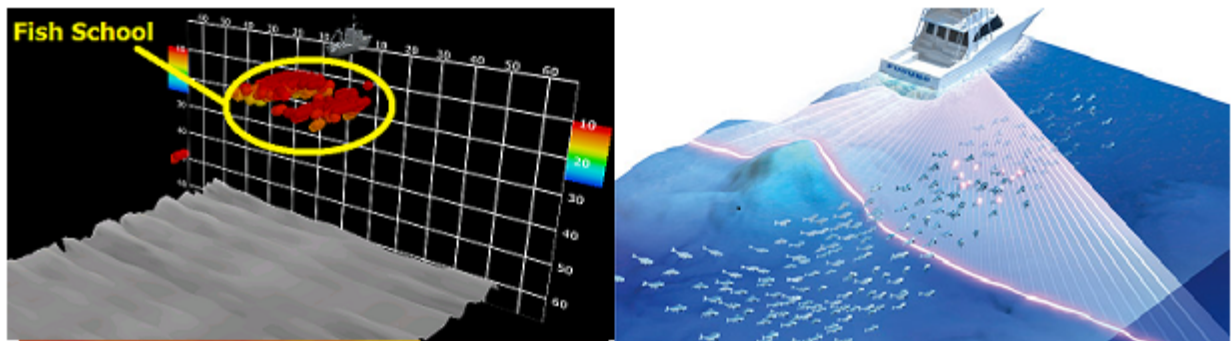


Note that it is possible to create a mark by double clicking on the side scan picture (or by using the Mark tool located in the Toolbar), however, the mark location on the chart will be an estimate only (as it is not possible to exactly geo-reference the side scan picture).

## Water Column Display

The Water Column provides an easy and intuitive time-based image of the seafloor, along with fish target icons. This mode displays a historical view of the section under your boat. Note that even if the boat does not move, the picture will continue to scroll to show the evolution of the water column (fish that may move) under your boat.

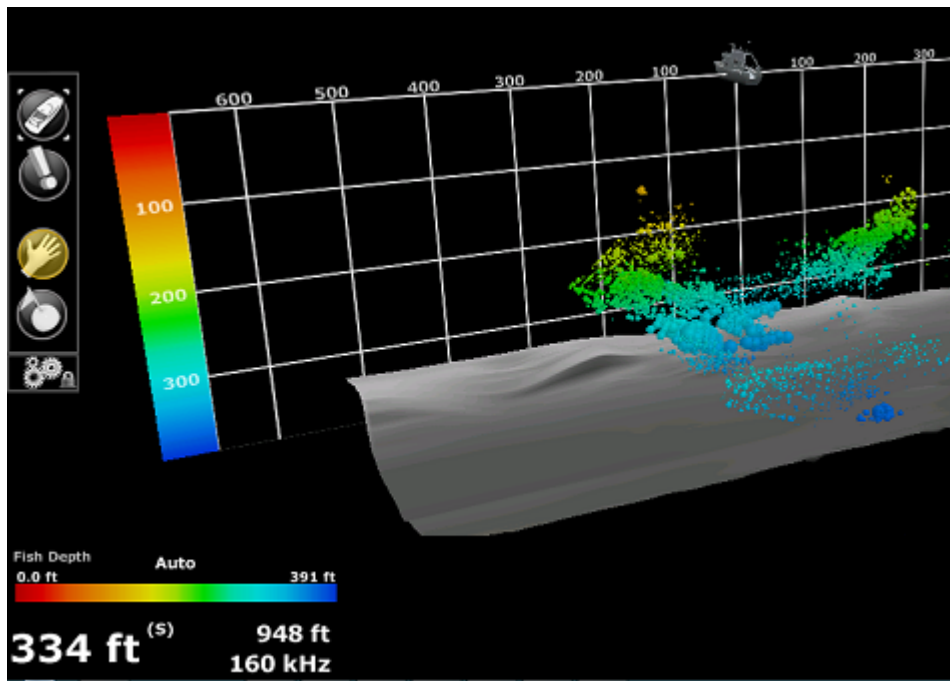
Fish targets are displayed on screen using small sphere ("bubbles") colored according to depth (or target intensity in case of WASSP):



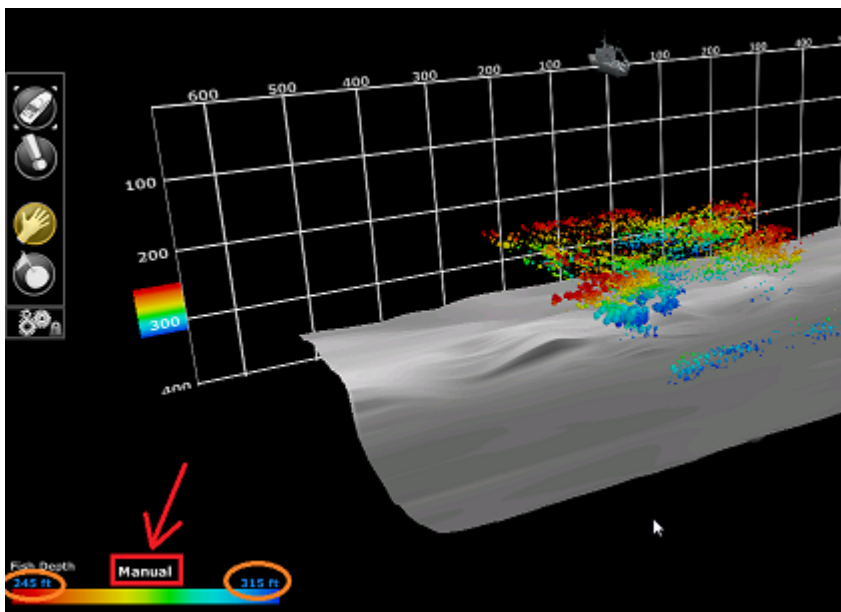
**IMPORTANT:** although the Water Column seems to render a basic 3D map of the seafloor, it is actually not! To have an accurate spatial rendering of the bottom, the "3D Cube" WorkSpace should be used. The Water Column behave more like a traditional Sounder view where time is used to move the picture forward (and not distance or speed). For example, if you stand still, the rendering of the Water Column will continue to advance. This allows you to view a time history of what happens under your boat even if you are standing still or trawling at low speed.

With WASSP generation 3, Fish Targets can be colored according to depth or intensity by selecting "Fish Strength Shading" or "Fish Depth Shading" from the "Display" button located in the Ribbon. With the DFF-3D, Fish Target can only be colored according to depth (only the "Fish Depth Shading" mode is available).

When Fish Depth Shading is selected, a color scale will be indicating on the right and left side of the grid (scale). By default the Color Scale will be in "Auto" mode using red for the surface and dark blue for the deepest point on the screen:



You can switch the Fish Depth Shading in manual mode by clicking on the color scale "Auto/Manual" located at the bottom left of your screen:



In Manual mode, you can put your cursor over the minimum and maximum value and use the scroll wheel to adjust the value. Note that fish targets that are outside of the boundary will not be displayed on screen. This can be useful if you only want to display fish target in between specific depth values.

When Fish Strength Shading is selected (WASSP only), the color of the fish targets varies according to target echo strength. Fish with stronger return will be displayed in red while small fish or plankton will be displayed in blue. By default, the Fish Strength Shading is in Manual mode and set up to display all types of fish return. Just like adjusting the Depth Shading, you can adjust the minimum and maximum strength. Please note that this will not only adjust the color, but also alter the fish target size if "Dynamic Size" is selected from the "Display" button located in the ribbon.



## Advanced Fishing Sensor

### Trawl Positioning

The "Trawl Positioning" Module needs to be unlocked to access this feature

TimeZero can be connected to a Marport system and display the door positions (received from the Marport system) and an estimation of the net position (after the user enters some parameters):

**Trawl Display**

Display Net

Sweep Length (Bridle)

Wing End Spread

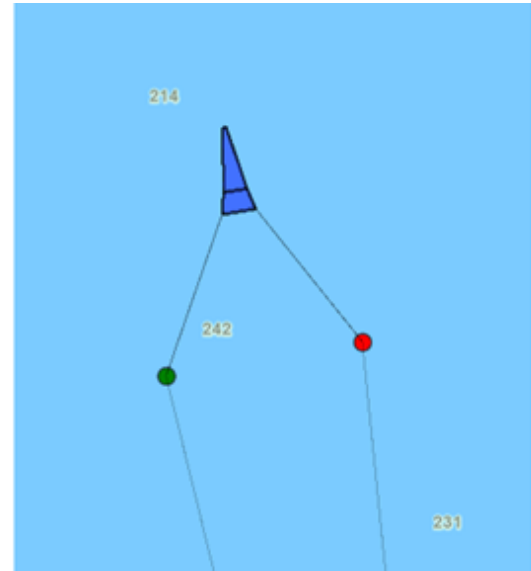
Net Opening (vertical)

Net Length (Ribline)

Trawl COG/SOG predictor

Trawl cables

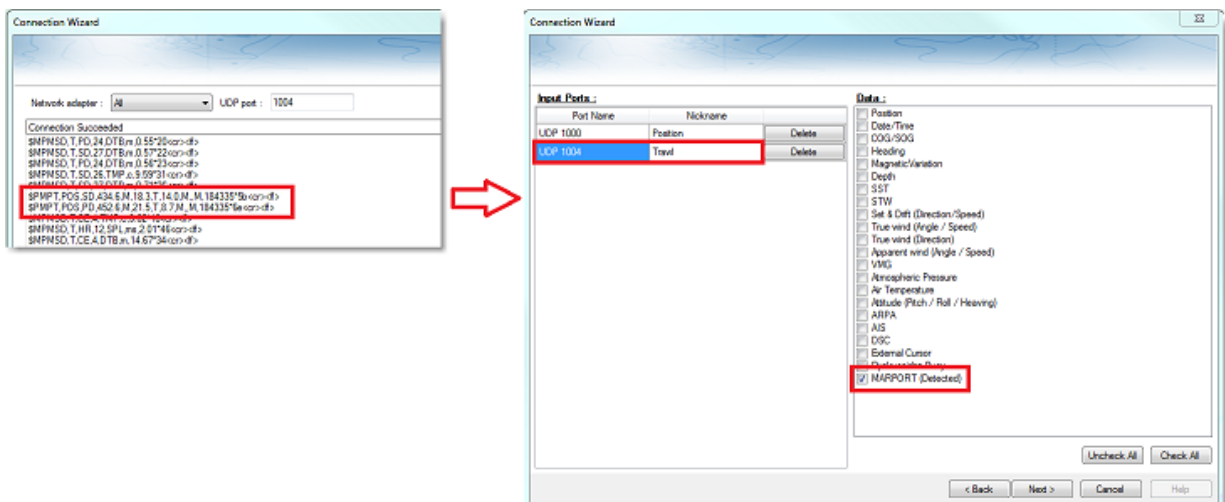
Trawl Trail



**Note:** At this time, TimeZero is only compatible with single net sensor (with two door positions only)

### Initial Configuration

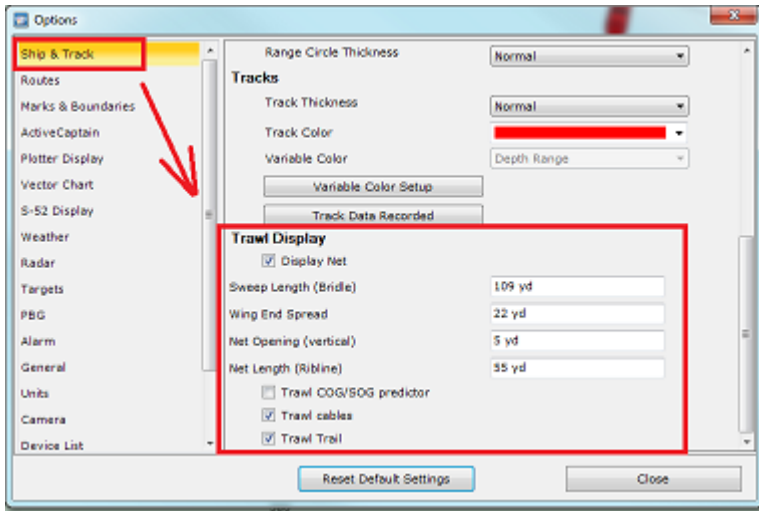
The Marport system needs to be configured to output the \$PMPT sentence (carrying the two door position information) on either a Serial or UDP port. Then, the corresponding port needs to be configured in the Connection Wizard:



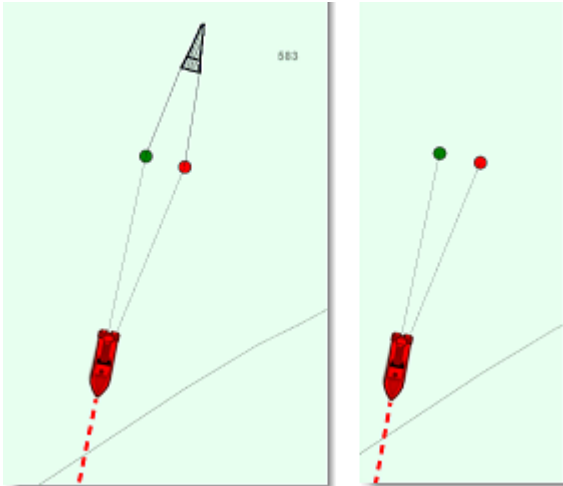


**Note:** The \$PMPT sentences is only outputted by the Marport system every 5-10 seconds while other sentences (such as \$MPMSD) might be outputted on the same port at a higher frequency. It is possible for TimeZero to not automatically detect the \$PMPT sentence and you may have to manually check "MARPORT" in the connection wizard.

Once the input port has been configured, close the wizard, open the Options (located under the TimeZero button) and select **Ship & Tracks**. Scroll down until you find the "Trawl Display" category:

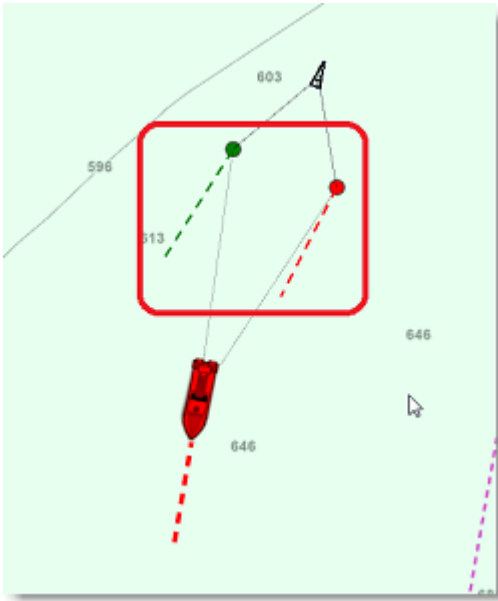


"Display Net" allows you to select if you want to display an (approximate) net representation on the chart or if you just want to display the door positions:



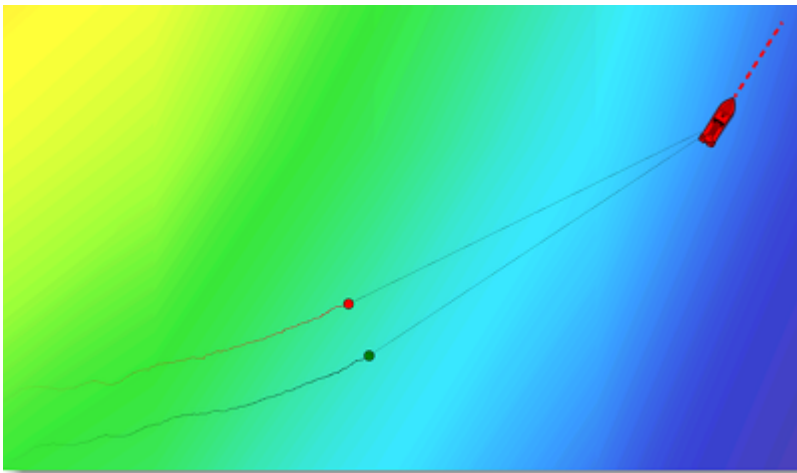
If you choose to display the net, you will have to enter various parameters that will allow TimeZero to make a rough estimate of the net position (based on the doors position sent by the Marport system and the fixed parameters that have been setup).

You can then choose to display or not the Trawl Cables, Door COG/SOG predictor and Door Trail. The COG/SOG predictor allows to visualize the direction and speed of the Door (using the same length parameter as the vessel):



**Note:** The Own Ship COG/SOG predictor parameters (that are shared with the door predictor) can be found at the top of the [Ship & Tracks](#) Options.

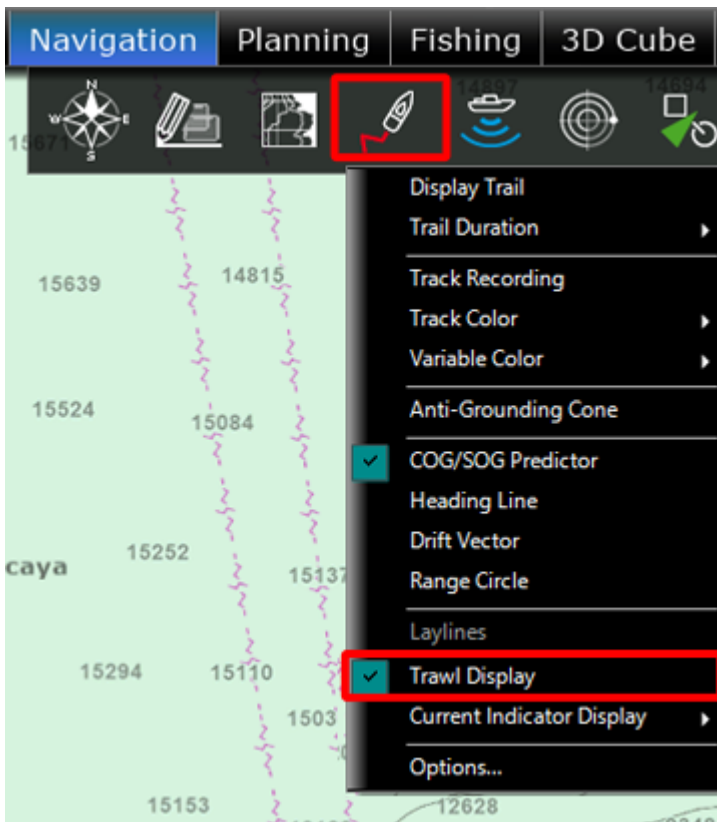
The trail records the last 100 door positions and display them using a small line on the chart. It is very useful to see the door position overtime:



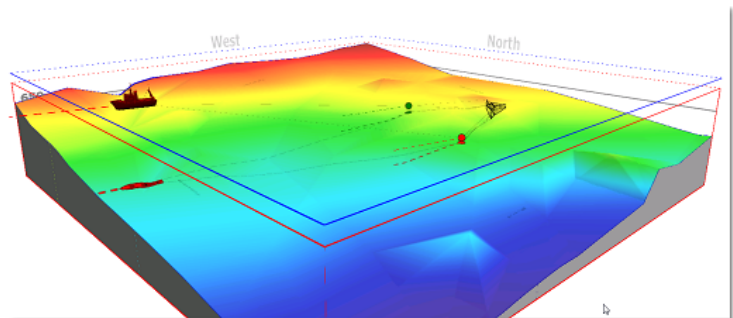
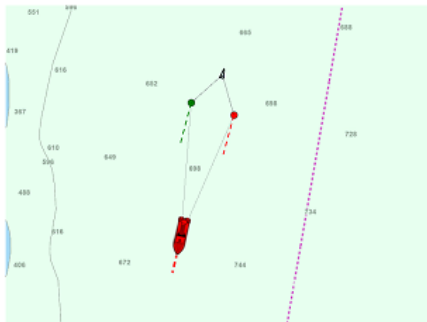
### **Trawl display**

The trawl can be displayed on the chart by selecting "Trawl Display" located under the "Own Ship" button:



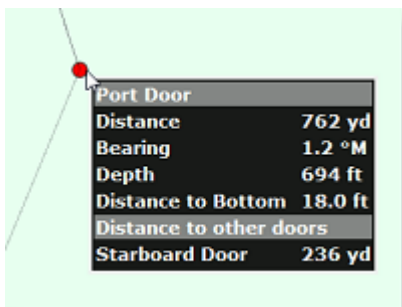


Note that the trawl can be displayed in 2D (on the Navigation WorkSpace) or in 3D if you have the PBG module (on the 3D Cube WorkSpace):



**Note:** when displayed in 3D, the door and the net will be positioned at their real depth

If you put your cursor over a door, a tooltip with various information will appear:



A "Door Spread" NavData can also be added if you want to keep the distance in between the doors displayed on your screen:

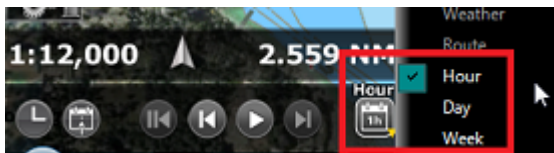


For more information on how to display and configure the NavData, please refer to the [NavData Introduction](#) chapter.

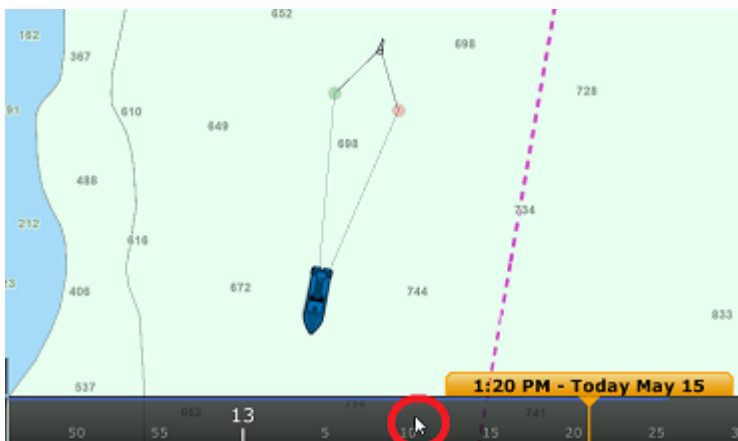
## Trawl Replay

It is possible to replay the trawl position overtime using the time bar control of the Planning WorkSpace:

- Select the Planning WorkSpace
- Make sure to enable the "Trawl Display" from the Mode button located in the ribbon
- For short term analysis, it is recommended to switch the time bar scale to "1 Hour" by clicking on the button below:



- Drag the time line back in time to replay the own ship position (blue icon) and trawl position. You can use the Play/Pause button if you want to make an animation:



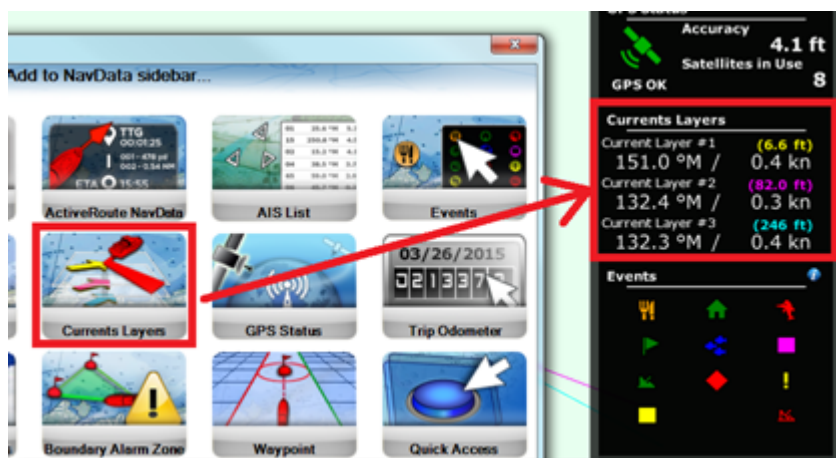
Note that the replay trawl is display with greater transparency.

You can click on the blue replay boat icon or replay door icon to display the information that was recorded at that time (boat speed, door depth,...). This can be a very valuable tool to analyze the net behavior under previous conditions.

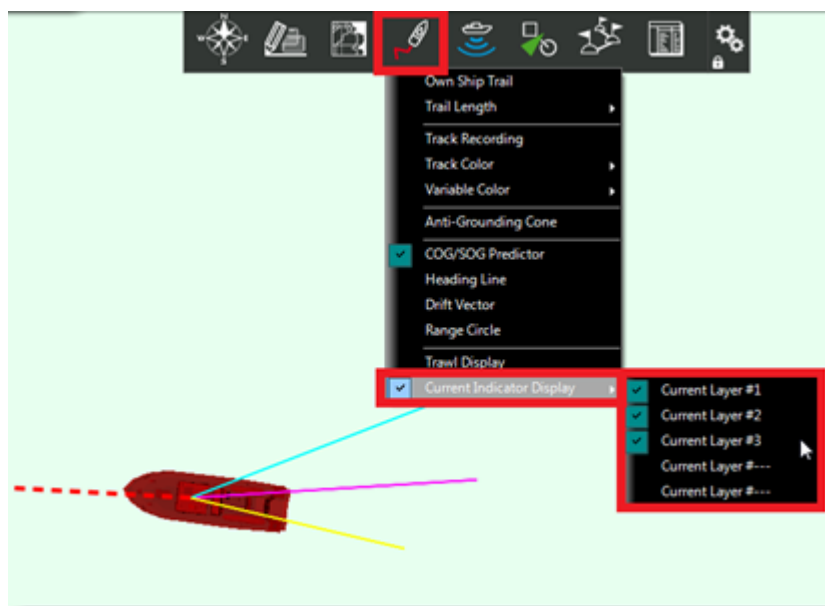
## Current Indicator

TimeZero can be connected to current indicators that output the \$xxCUR NMEA sentence (tested with Furuno CI-68 and CI-88). Current indicators output the current speed and direction under the vessel at multiple depth (usually 3 or 5 depth "layers").

After configuring the Current Indicator input in the Connection Wizard (via COM, UDP or TCP port), a "Current Layers" NavData can be configured to display up to 5 real-time currents under the boat at various depth (as setup on the current indicator hardware):



Currents vector can be displayed on the chart from the "Own Ship" button:

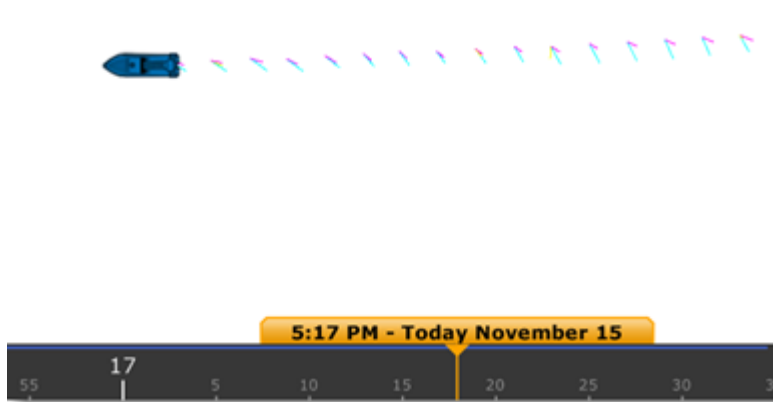


Current vectors are displayed using color coded lines (that match the color displayed in the NavData).

A Current Trail can also be enabled from the [Ship & Tracks](#) Options allowing current data to be displayed on the chart up to two days in the past:



To display current data older than two days, the Planning WorkSpace (with the timeline) can be used. It is possible to set any date/time in the past (or select a trip from the calendar window) and the current trail will also be displayed behind the blue boat icon (replay boat):



**Note:** when replaying data, the trail behind the blue boat is fixed to one day.

## SeaLevel Network IO

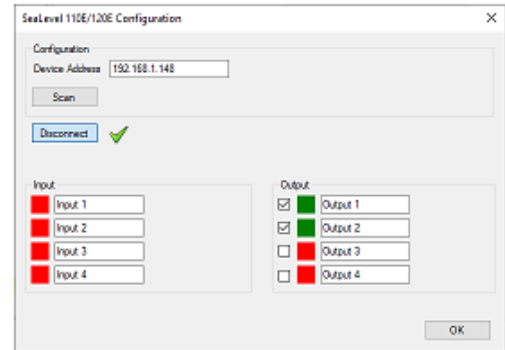
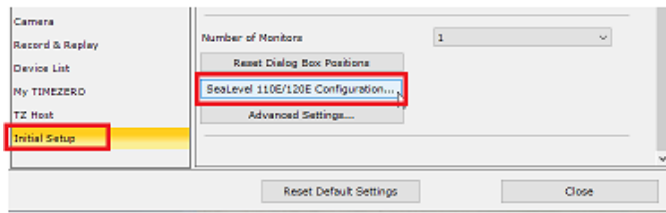
TimeZero can be connected to a SeaLevel 110 or SeaLevel 120 Ethernet (4 Inputs / 4 Relay Outputs Digital Interface Adapter). This allows TimeZero to control external devices and/or allows TimeZero to react to external inputs:



## Configuration

The first step is to assign an IP address to the SeaLevel Network IO by following SeaLevel's instructions. Make sure to fix an IP address that is on the same subnet as the computer. After setting the IP address, it is [recommended to ping the SeaLevel IP address](#) to make sure the network is properly setup and that there is a good connection in between the computer and the SeaLevel Network IO.

To configure the SeaLevel Network IO in TimeZero, open the [Initial Setup](#) Options and click on the "SeaLevel 110E/120E Configuration" button:



You can either manually enter the IP address of the SeaLevel Network IO, or press the "Scan" button. Then, press on the "Connect" button to connect TimeZero to the SeaLevel Network IO. Once the connection has been established, you will be able to monitor the relay and digital input status (red or green squares), but also test the relay output from the configuration window by using the check-boxes. You can also setup nicknames to both the inputs and outputs (nicknames will be displayed in the NavData).

## Output

### NavData

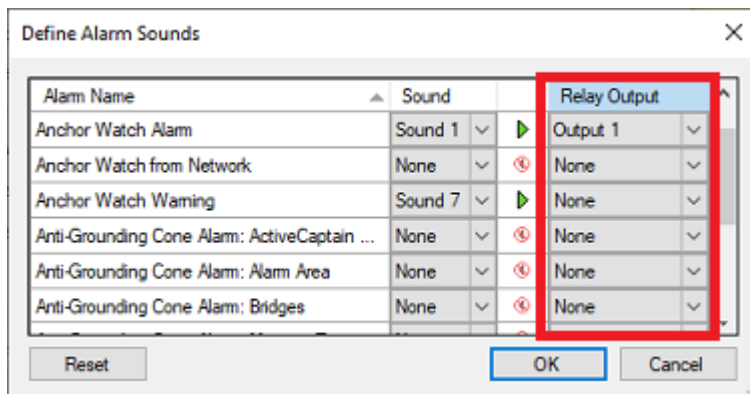
It is possible to control the output (turn the relays ON or OFF) directly from the SeaLevel IO NavData:



You can right click on this NavData to select which Output(s) you want to display and control.

### Alarm

It is possible to turn ON a specific relay when an alarm is triggered in TimeZero. This can be done from the same configuration window that allows you to select the alarms sound. Open the [Alarms](#) Options and click on the "Define Alarm Sounds" button:

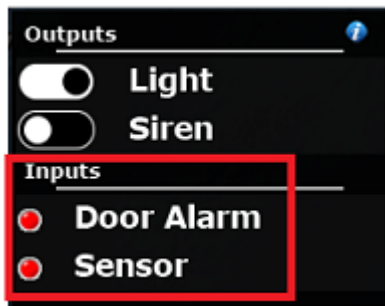


Once an output has been selected for a specific alarm, the relay will turn ON when the corresponding alarm is raised until it has been acknowledged by the user (at which point the relay will turn OFF).

## Input

### NavData

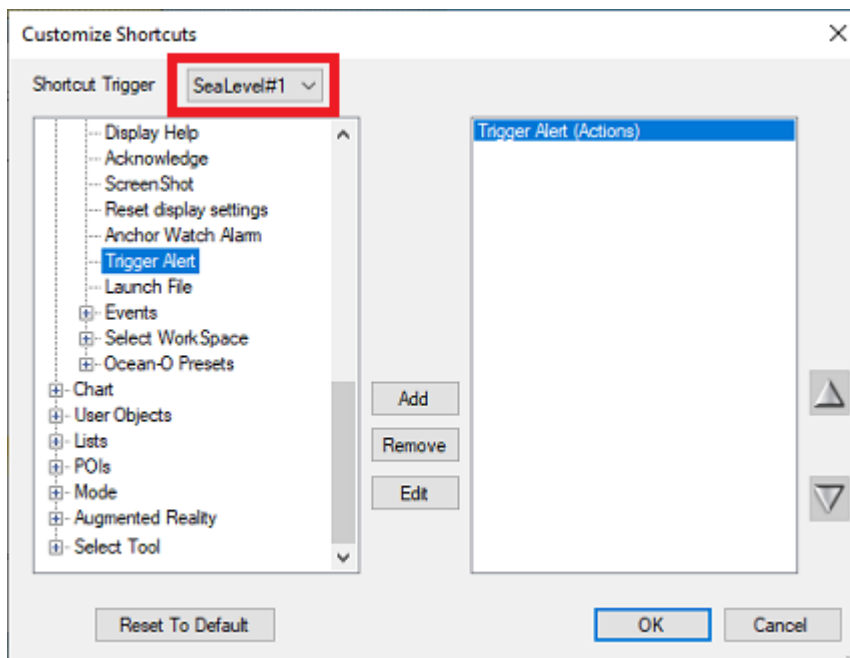
It is possible to monitor the input status directly from the SeaLevel IO NavData:



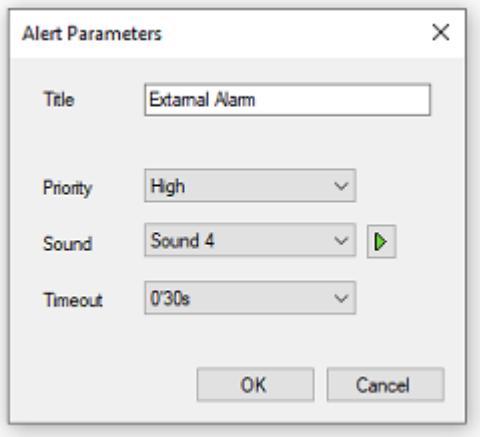
You can right click on this NavData to select which Input(s) you want to display.

### Shortcuts

Each SeaLevel input can be configured to trigger one or multiple actions in TimeZero using the powerful shortcuts framework. This can be setup from the [General](#) Options by clicking on "Customize Functions Keys...". First, select the corresponding SeaLevel Input as the trigger (instead of a function key), and then, add one or multiple actions you would like this input to trigger:



If you would like a SeaLevel input to trigger an Alarm in TimeZero, simply select the "Trigger Alert" action. You will be able to setup a text (the title of the alarm), a priority (High for Red, Medium for Yellow, and Low for green), a sound, and a Timeout:



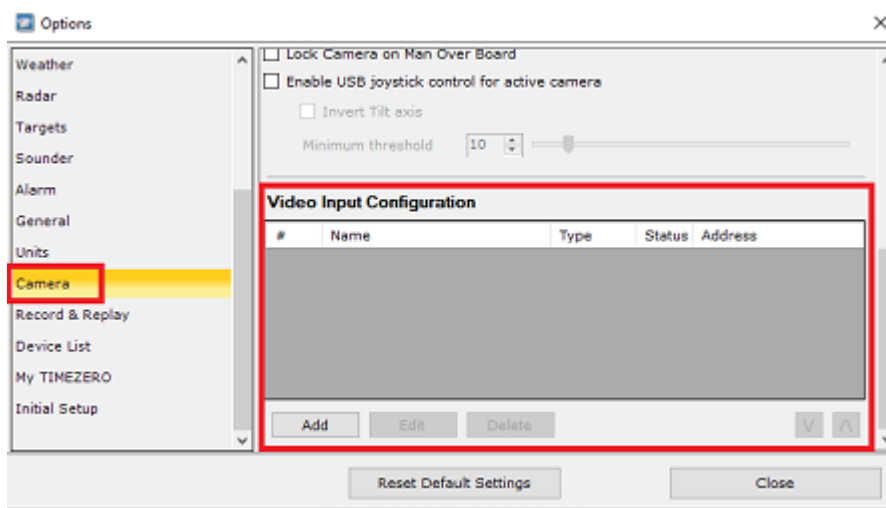
You can configure many actions and combine them (by simply adding multiple in the list) opening many integration possibilities.

## Video Input

The Video Input can be used to bring external display inside TimeZero as a full or quarter screen display. You can use an H264 to DVI (or VGA) encoder or a USB converter (compatible with DirectShow). This can be useful to show in TimeZero instruments that are not directly compatible with TimeZero but have a video output (such as a Sonar or Third Party standalone Sounder with a DVI or VGA output):



To configure a Video Input simply open the [Camera](#) Options and scroll down to the Video Input section:

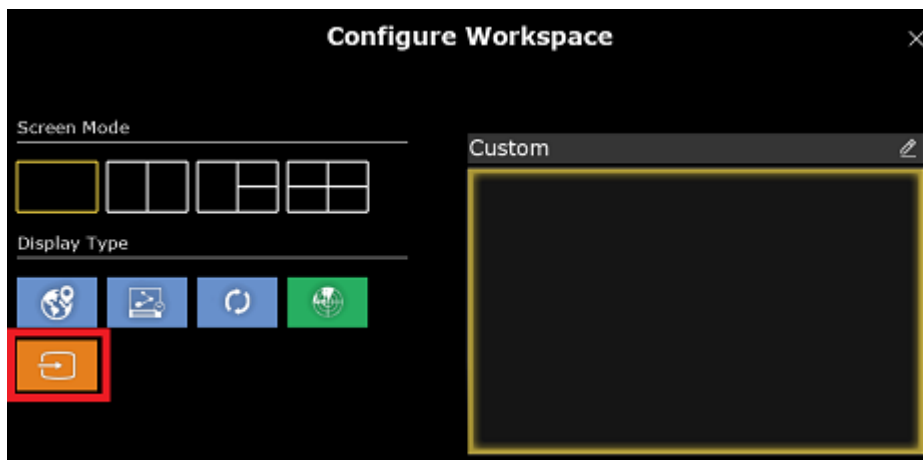


Click on "Add". If you are using a network video encoder, click on "H264 Network Encoder", make sure it has been set with a fix IP address, and that it can convert the video input into a H264 video stream. You will need to enter the RTSP path in TimeZero. Here is an example of RTSP path without login/password: "rtsp://192.168.1.210:554/Streaming/Channels/101". Here is an example with login/password "rtsp://admin:12345@192.168.1.210:554/Streaming/Channels/101".

**Note:** You may find the RTSP path in the network encoder documentation or online if you search for your network encoder model number followed by "RTSP Path" or "TSP URL".

If you are using a USB Video encoder click on "Direct Show Device". TimeZero will list all the Direct Show Compatible video encoder for you to choose.

Once at least one video input has been configured, you will be able to create a WorkSpace with a full screen or quarter screen display:



## Radio Direction Finder

TimeZero is compatible with the Radio Direction Finder Rhotheta RT-300, and RT-500M:





A radio direction finder (RDF) will be able to detect the bearing of any VHF signal and send it to TimeZero so that it can be displayed on the chart. In addition, if the signal originates from a PLB or Cospas-Sarsat beacon (MOB device), an alarm will be triggered in TimeZero.

## Configuration

The first step is to connect the Radio Direction Finder to TimeZero. This can be achieved through a Serial COM port or via a UDP or TCP port. Once you have connected the RDF to TimeZero, open the Connection Wizard and manually add an input port (select serial, UDP or TCP according to your physical connection). If the RDF is transmitting a signal while TimeZero is analyzing the port, the "Rhotheta RDF" checkbox will be automatically checked (check it manually otherwise).

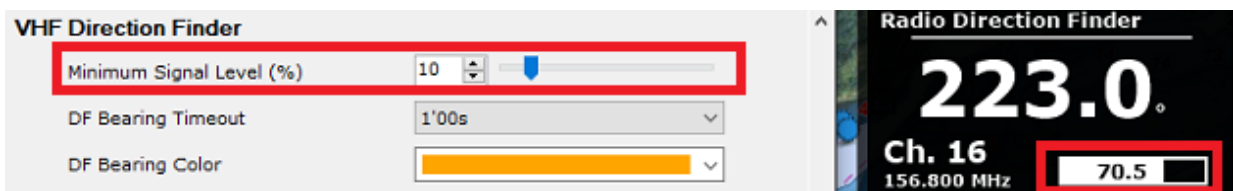
**Note:** TimeZero is compatible with the \$PRHO,xx,DFSTD sentence.

TimeZero only reads the relative bearing from the RDF, so make sure to configure a heading sensor in TimeZero so that the bearing is properly geo-referenced on the chart.

Once the Connection Wizard has been configured, you can add the Radio Direction Finder to the NavData. It should be displaying the real time data sent by the RDF hardware (Bearing, Channel Number, Frequency and Signal Level in %):



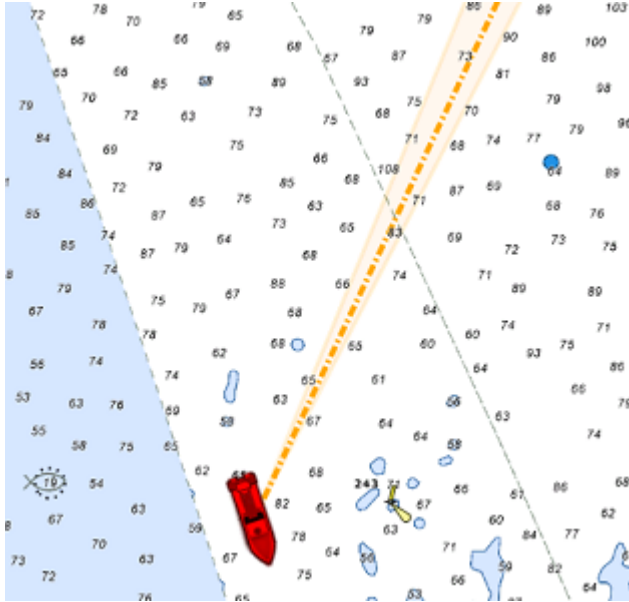
By default the DF bearings are displayed in orange on the chart, however, this color can be adjusted from the [Initial Setup](#) Options under the VHF Direction Finder section ("DF Bearing Color setting"). Note that, in order for a bearing to be displayed on the chart, it must be above the Minimum Signal Threshold which can be adjusted from the same options (set to 10% by default):



A DF bearing timeout can also be adjusted. It sets the time after which a bearing will disappear from the chart if no matching bearing is sent by the RDF to TimeZero.

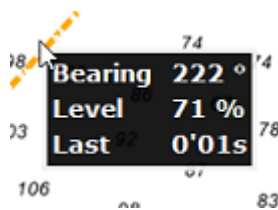
## DF Bearing

When "VHF DF Bearing" is selected from the Own Ship button located in the Ribbon, the DF bearing(s) will be displayed on the chart:



All DF Bearing lines are originating from the CCRPP which can be adjusted from the [Initial Setup](#) Options. An existing DF bearing line is updated if a new bearing is received within 30 degrees of a previous bearing last value. If not, a new bearing line is created on the chart. This allows TimeZero to display multiple DF bearings that originate from multiple VHF or Beacon (if they are at least 30 degrees apart). If the bearing Min/Max values are available, a cone is displayed on the active bearing. The cone is slightly transparent and "flashes" (fade out over 1 sec) to indicate a new reception.

If you click on a DF Bearing line, a tooltip will appear with the Bearing value, the Signal Level and the time the bearing line was last updated:

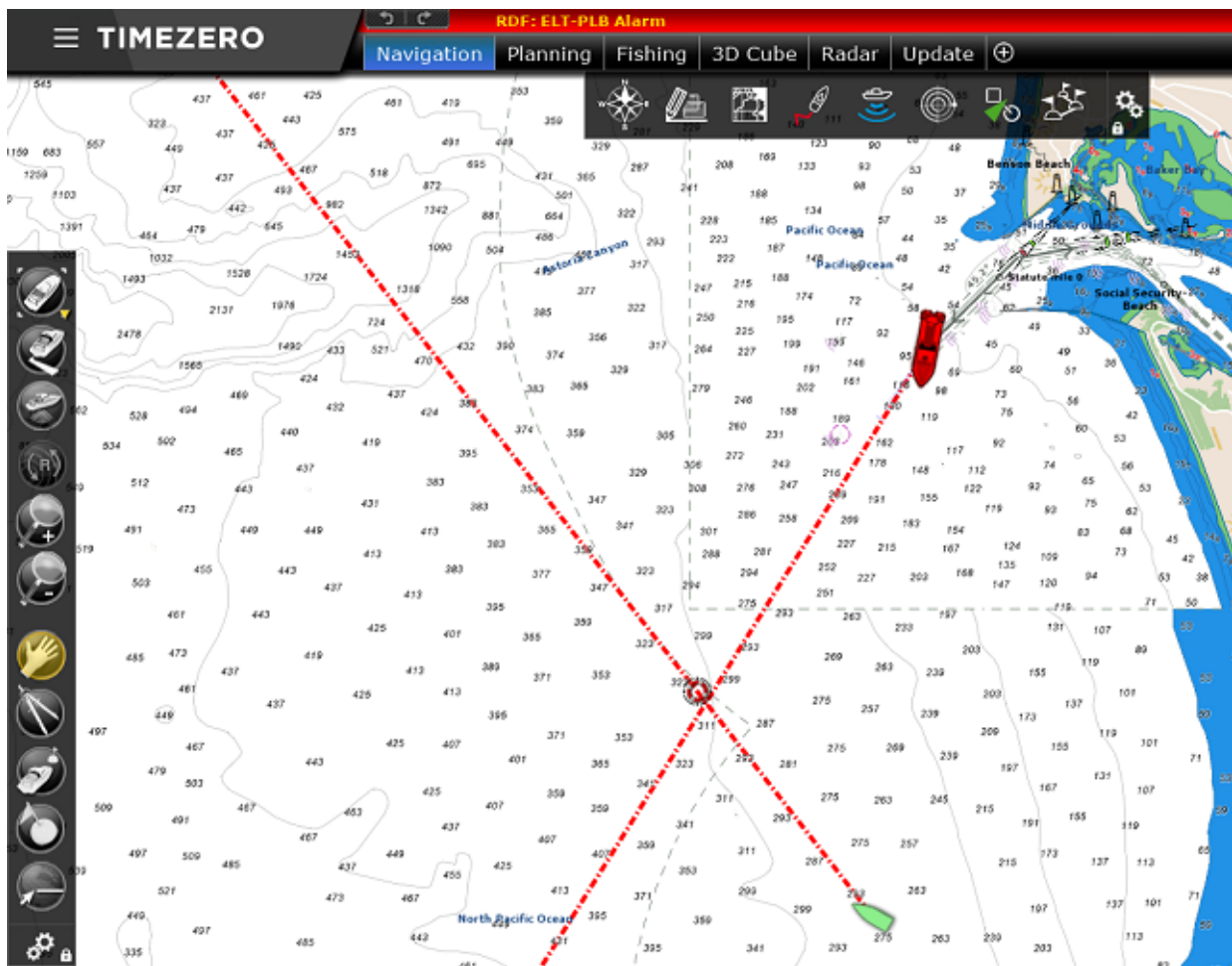


When a PLB or Cospas-Sarsat signal is received, the DF bearing will be displayed in red, and an alarm will be raised in TimeZero:



**Triangulating multiple DF Bearings**

If you are using the TZ Cloud [Fleet Tracking](#) tracking services, any DF alarm bearing (PLB or Cospas-Sarsat) will automatically be transmitted among other fleet members. This means that if your vessel and other vessels which are member of your fleet have all a RDF installed, you will be able to share the bearing allowing you to triangulate the MOB position and create a mark at the intersection:



**Note:** Only alarm bearings are transmitted via the TZ Cloud Fleet Tracking service. Regular DF Bearing are not transmitted in order to save bandwidth.

The MOB mark position will be automatically updated as the bearing intersection moves around. When the bearing(s) timeout (disappear from the chart), the marks will stay on the chart until manually deleted.



## Camera

### Camera Introduction

Up to 4 cameras can be configured in TimeZero. TimeZero is compatible with AXIS IP Cameras (fixed or PTZ), AXIS IP converters (single or quad converters), FLIR Cameras (M-Series), fixed H264 Cameras, and ONVIF Cameras.

**IMPORTANT NOTE:** Please contact us for ONVIF cameras support. We cannot guarantee that any ONVIF cameras would work out of the box with TimeZero (especially PTZ cameras). The camera manufacturer may not have implemented all commands that TimeZero needs to control the camera. The only cameras that we can fully support are FLIR and AXIS cameras.

A Pan, Tilt and Zoom camera ("PTZ Camera") can be controlled directly from TimeZero using the AXIS protocol, FLIR CGI Nexus protocol, and ONVIF Protocol. PTZ cameras that are able to pan 360 degrees and send feedback to TimeZero can be displayed on the chart (field of view) and used for tracking. A camera that is selected to be "Use for Tracking" from the Camera settings page can:

- Display a cone on the chart representing the field of view (FOV) of the camera
- Be [controlled directly from the chart](#) using the right click menu to move or lock the camera to a position, object or target
- Be controlled using a standard USB Joystick connected to the computer (USB joystick needs to be activated from the [Camera Options](#) and [Calibrated](#))
- Be configured to automatically lock on a Man Over Board mark from the [Camera Options](#)
- Be configured to always lock on the Active Waypoint (when a Route is activated) from the "Mode" button located in the Ribbon or by right clicking on the Boat icon.

**Note:** In order for a camera to be displayed on the chart (and used for tracking), it needs to be able to pan 360 degrees and send feedback to TimeZero. Tracking cannot be set on a PTZ "fish-eye" camera such as the AXIS 212PTZ that only relies on digital zooming.

If a camera has PTZ functionality but is not configured for tracking, it will only be possible to control it from the NavData or from the Camera WorkSpace (the field of view, joystick control and right click control from the chart are not available).

The following chapters will describe how to display and control a camera. Please refer to the [Camera Installation](#) Chapter for setup instructions.

**Note:** If you would like to bring an external display in TimeZero using an HDMI to Ethernet encoder or a USB Video Encoder (DirectShow compatible), do not configure it as a camera source. Rather, configure the external display as a [Video Input](#).

### Camera WorkSpace

The Camera WorkSpace is used to display the video feed from a compatible camera. This WorkSpace contains a "Camera", "Camera Control" and "Augmented Reality" buttons located on the Ribbon and can be configured as a full screen or quarter screen.

The "Camera" button allows you to select the video source displayed in the WorkSpace.

The "Camera Control" button allows you to control specific features of the camera (Home Position, Color Palette, etc...) and to unlock the camera if it has been locked on a target or object. Note that the features available under this button vary with the type of Camera.

**Note:** You can also right click on the video screen to change video source and directly access features of the camera.

The "Augmented Reality" button allows you to enable and configure the various Augmented Reality features. Note that in order to be available, the camera setting "Enable Augmented Reality" must be enabled from the Camera option page.

If the camera has Pan/Tilt/Zoom function, it is possible to move the camera by:

- using the virtual joystick available on the lower right corner of the camera WorkSpace
- left clicking on any point on the screen to center the camera on that point
- clicking and dragging the mouse to move the camera (see below)
- using the arrow keys on the keyboard

The camera Zoom can be adjusted by:

- clicking on the "-" / "+" buttons available in the virtual joystick
- using the mouse scroll wheel
- using the "Page Up" and "Page Down" buttons on the keyboard

## Joystick Mode

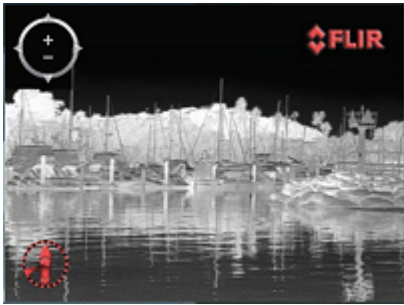
Clicking and holding the left mouse button on the camera screen will display a red arrow originating from the center of the screen to your cursor. You can move the cursor around the screen to change the direction of the arrow and its length. The farther from the center of the screen your cursor is, the quicker the camera will move in that direction:



## Camera NavData

The camera image can be displayed in the NavData. This is useful when you don't want to dedicate a full or half screen to camera display. Multiple Cameras can be added to the NavData panel allowing you to keep an eye on multiple cameras at the same time.

To add a camera to the NavData configuration, click on the "+" button (at the top) and select "Camera":



By default, the NavData will use the first video source configured in the software. If you have configured multiple cameras, right click on the NavData to change the video source.

If the selected camera has Pan Tilt Zoom capabilities, a virtual joystick will appear when you roll the cursor over the NavData. This allows you to adjust the camera position and zoom level.

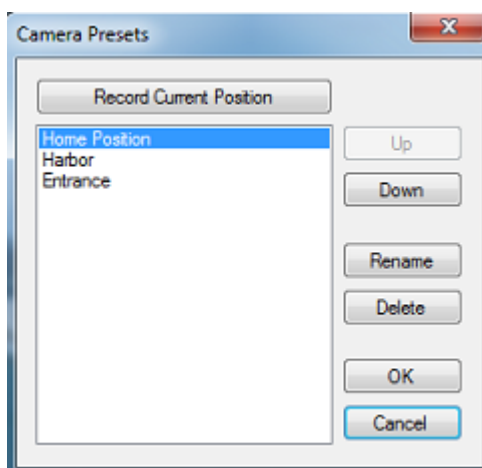
If the camera offers additional controls (such as the FLIR M-Series), right click on the NavData to access them (Scan, Home, Scene, IR/Visible switch, etc...).

When **undocking** the camera (dragging the camera image out of the NavData bar), you can resize the camera by right clicking on it and select "Increase" or "decrease".

## Camera Presets

Camera Presets can be created to save and recall camera position (Pan/Tilt and Zoom). To store a Camera Preset:

- Select the Camera WorkSpace
- Select the camera you want to adjust from the "Camera" button located in the Ribbon
- Adjust the Camera to the specific position and zoom level you want to save using the mouse or virtual joystick
- Select "Manage Presets..." from the "Camera Control" button located in the Ribbon
- Click on "Add" and enter a name for the preset. At this time, TimeZero will capture all the settings and stores them with the preset name:



To recall a Preset, click on the "Camera Control" button in the Ribbon and select "Presets":

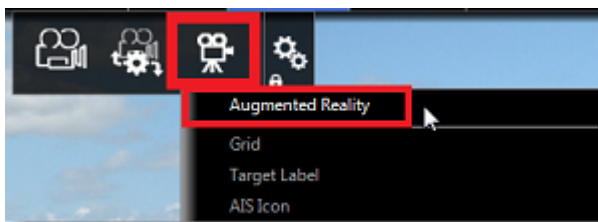




Camera Presets can also be recalled using Custom Shortcuts that can be setup from the [General](#) Options by clicking on "Customize Functions Keys..." or using a [Quick Access NavData](#).

## Augmented Reality

Various Augmented Reality features can be enabled from the "Augmented Reality" button located in the ribbon (when the camera has been setup for Augmented Reality):



**Note:** Augmented Reality is available with a fixed or PTZ camera. Although it will work with just position and heading data, it is highly recommended to connect a Furuno Satellite Compass (such as SC30, SC33 or SCX20) so that compensation can be applied with Pitch and Roll data. Please refer to the [setup instructions](#) below.

### Augmented Reality Layers

#### Grid

A thin blue grid can be displayed over the video:



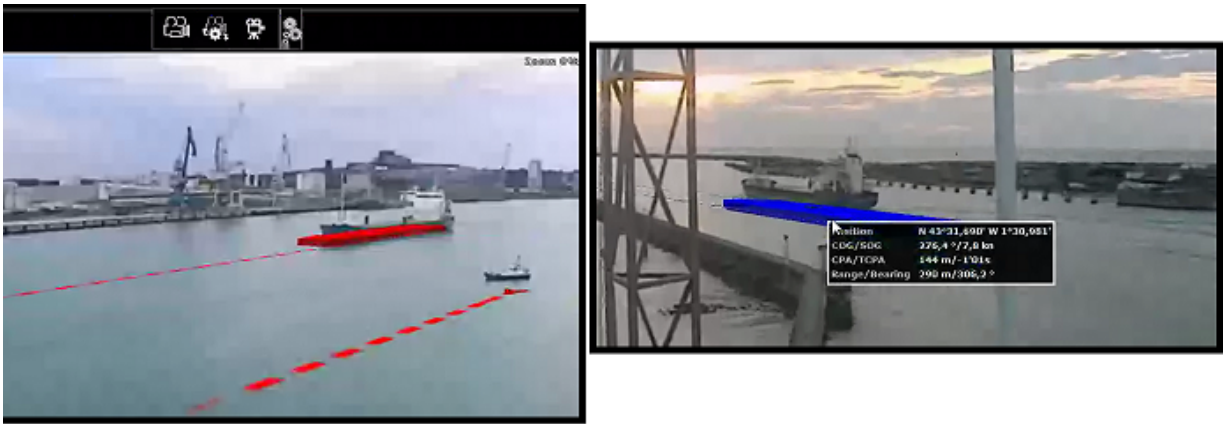
#### Target Label

A target label can be enabled to display information of ARPA or AIS targets directly into the camera feed. It displays the relative direction of the target, its ID (in case of ARPA) or Name (in case of AIS) and its speed:



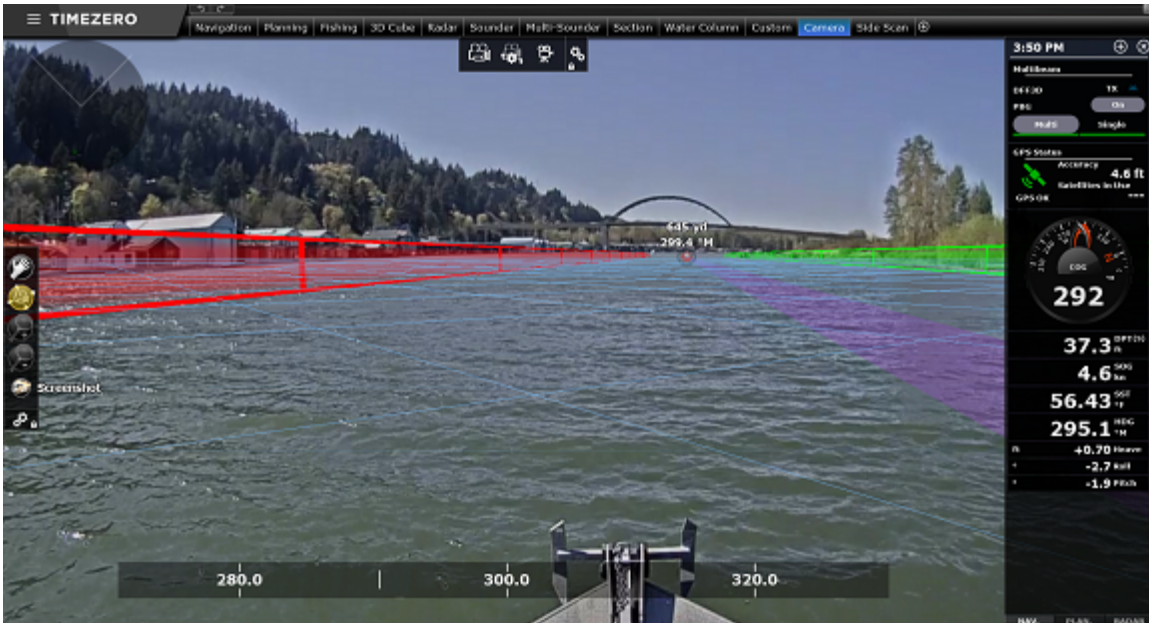
**AIS Icon**

For AIS targets, TimeZero can display the icon and "shape" (if the AIS target transmits its size) directly over the video:



**Active Route and XTE Alarm line**

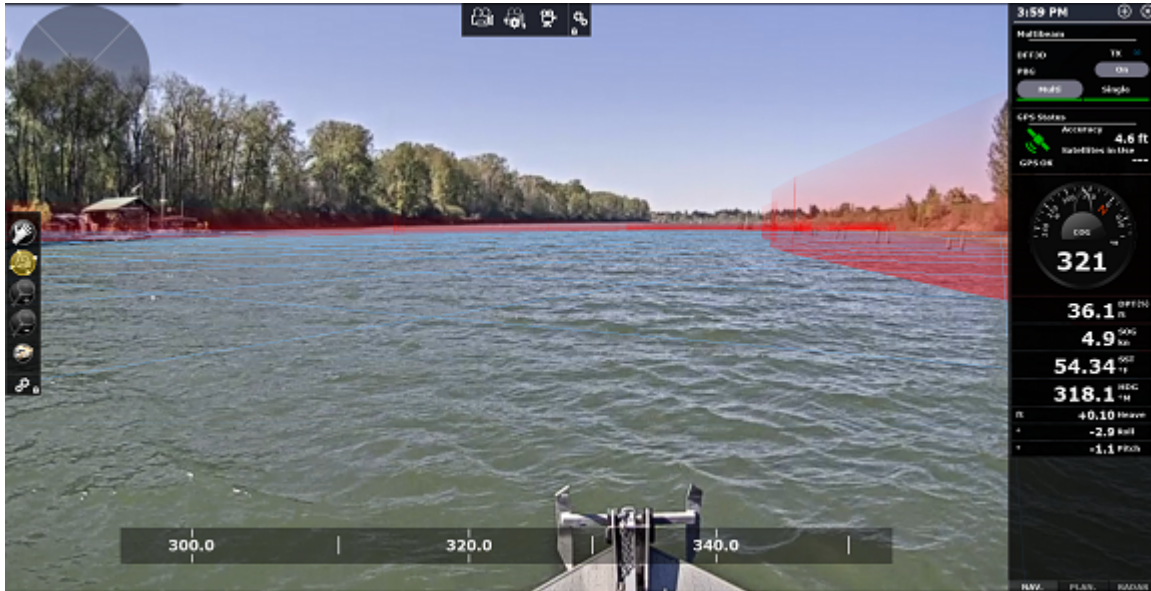
If you activate a route, TimeZero can display the route (in purple), the active waypoint (with distance and bearing information) and the cross track error alarm line:



TIPS: The XTE alarm line height can be setup under "Advanced Settings and Calibration" (last selection of the "Augmented Reality" button)

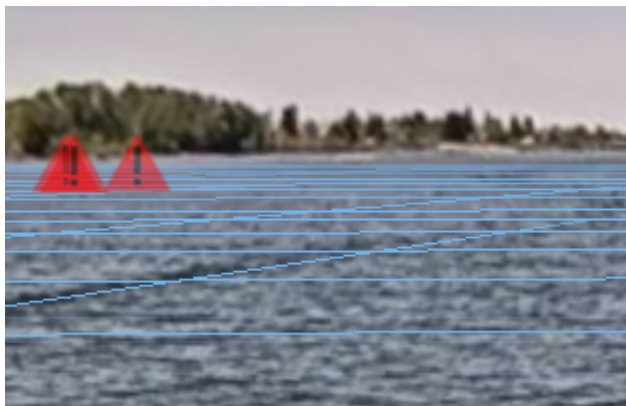
### Depth Area Under Safety Depth

The vector chart depth area information can be used and displayed in the camera feed as virtual wall:



### Anti-Grounding Danger

When the Anti-Grounding cone is activated (refer to the [Anti-Grounding Cone](#) chapter for more information), isolated danger can also be displayed on the camera feed



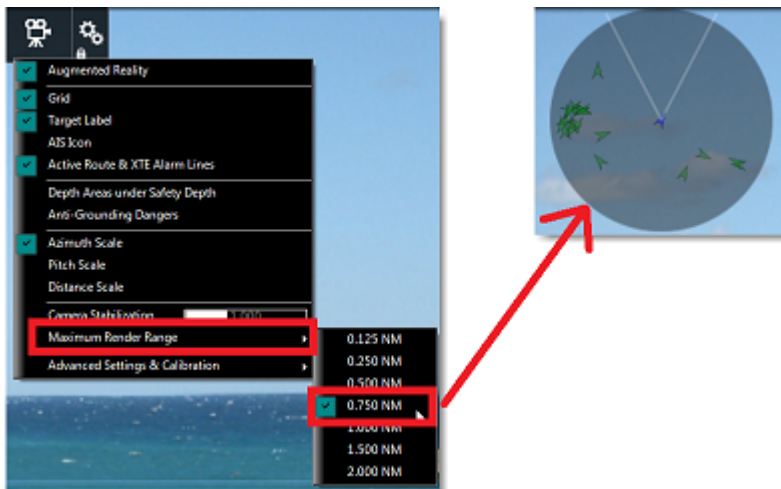
### Azimuth, Pitch and Distance Scale

Various scales can be enabled or disabled at the bottom (azimuth) and right side (Pitch or Distance) of your screen. Note that it is not possible to display at the same time the Pitch and Distance scale.

### Render Range

Objects that are displayed in the Camera WorkSpace are filtered by range. You can set how far TimeZero should render objects by adjusting the setting "Maximum Render Range". Note that this range is also used by the field of view preview panel located on the upper left corner of the screen:

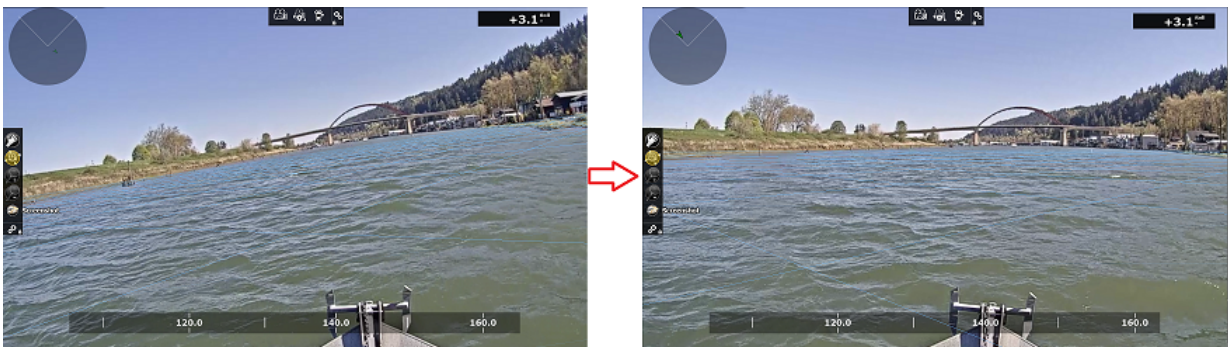




## Stabilization

When a Pitch & Roll sensor such as the Furuno SC30, SC33 or SCX20 is connected to the computer and configured inside the Connection Wizard, TimeZero uses that information to stabilize objects (grid, target label, ...) inside the Camera WorkSpace.

TimeZero will also display the horizon perfectly flat on your screen (using the roll data to rotate the picture of the camera). This setting is turned ON by default (located under the "Augmented Reality" button, "Advanced Settings and Calibration", "Flat Horizon"):



Finally TimeZero can perform a digital stabilization of the entire camera picture and "smooth" abrupt changes. You can adjust the stabilization factor using the "Camera Stabilization" slider located under the "Augmented Reality" button.

## Augmented Reality Setup

At minimum GPS and Heading need to be configured, but it is highly recommended to connect a Furuno Satellite compass via NMEA2000 (using the Actisense NGT-1 USB). A Furuno Satellite Compass will not only provide very accurate position and heading, but it will also send to TimeZero Pitch and Roll data. When Pitch and Roll data are configured in the Connection Wizard, TimeZero will automatically use them for stabilization.

### Camera Configuration

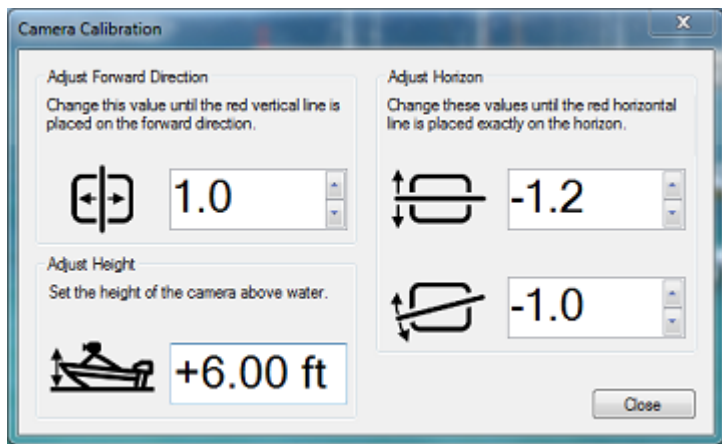
Make sure to select "Enable Augmented Reality" when configuring the camera. With a generic H264 camera or an Axis camera, it is very important to enter the horizontal Field of View of the camera into the "FOV" field of the camera setting. When configuring a PTZ Camera, you have to enter the maximum FOV (when zoomed all the way out) and minimum FOV (when zoomed all the way in). This information can be found in the camera documentation.

**Note:** There is no need to enter a FOV for FLIR Camera as it is configured automatically.

**Initial Adjustments (calibration)**

Good calibration is very important to display properly and accurately the various augmented reality layers. To calibrate the camera, select the Camera WorkSpace, click on the "Augmented Reality" button, then select "Advanced Settings and Calibration", and then "Calibrate Camera...".

When calibrating the camera, a heading and horizon reference lines are displayed and the following window appears:



**Note:** If you are calibrating a PTZ camera, the camera automatically moves into the forward direction when the window is open so that you can align it with the bow of the vessel. Do NOT manually Pan/Tilt the camera when performing the calibration.

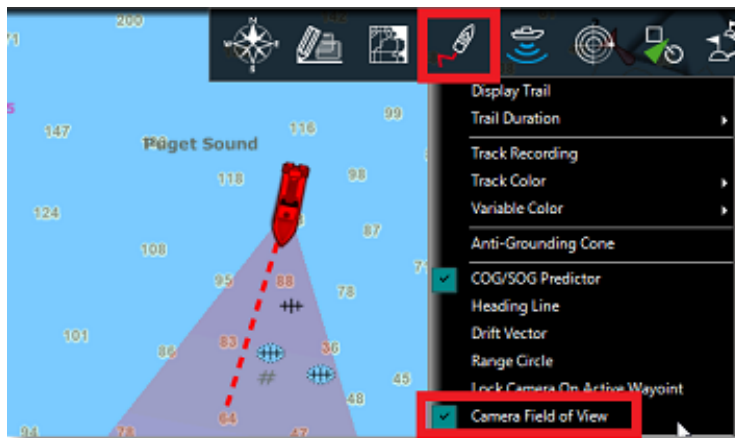
First, setup the height of the camera (its height above water) and then use the heading line (forward direction), Horizon and Rotation offset controls to calibrate the camera. To adjust the forward direction, the best is to align the vertical reference line with the bow of your vessel (if it is visible). If it is not visible, you can use an AIS target and make sure that the target label is aligned vertically with the vessel you see through the camera. To adjust the horizontal and rotational offset, the best is to have the horizon visible on screen. Then, use the two controls so that the horizon reference line matches the horizon as seen through the camera.

**Sensor Delay**

Some cameras may take longer than other processing data (encoding and transferring the video over the network). Also, according to your computer CPU, decoding the camera video feed might also add some lag to the overall process. In order to better "synchronize" the sensor data (heading / pitch / roll) with the video feed, it is possible to introduce a lag to the Heading and Pitch/Roll data by adjusting "Heading Delay" and "Pitch & Roll Delay" available under "Advanced Settings and Calibration".

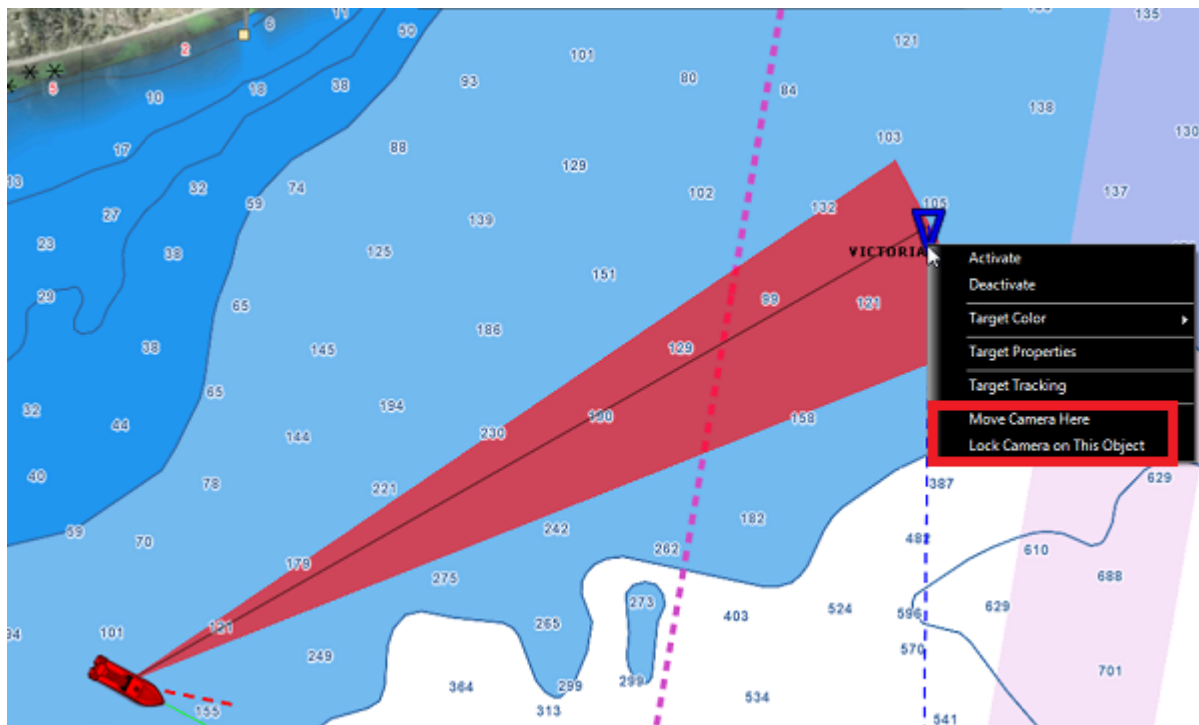
**Controlling & Tracking from the Chart**

A camera that has been configured to be used for tracking in the Camera Options can be controlled from the chart and used for tracking (if it is a PTZ Camera). A cone representing the field of view of the camera is displayed when "Camera Field of View" is selected from the "Own Ship" button located in the ribbon:



**Note:** The FOV color can be changed from the [Camera Options](#)

To control the camera, just right click on the chart, an object or a target and select "Move Camera Here". When using the "Move Camera" command, the camera will move in that direction one time, but TimeZero will not update the camera position as the target moves or as the boat changes direction. If you want TimeZero to continue tracking the position, object or target, right click and select "Lock Camera":



When a camera is locked, the cone (FOV) appears with a brighter color and a black line is displayed in between the boat and the object to track. To unlock a camera you can:

- Move the camera manually (by initiating a new "Move Camera Here" right click or using the Joystick)
- Use the "Camera Control" button and select "Unlock Camera"
- Right click on the boat and select "Unlock"

**Important:** The tracking is automatically disengaged as soon as you manually take control of the camera.

The camera can also be moved using the "Move Camera Here" tool (hidden by default):



When clicking on the chart, this tool will initiate a "Move Here" command. However, if you click on a target, this tool will initiate a "Lock Camera" command automatically.

## Record & Replay

### Introduction

The "Voyage Data Recorder" module needs to be configured to access this feature.

In addition to record Own Ship position and instruments (refer to the [Boat Replay](#) chapter for more information), the user can set TimeZero to record Targets (AIS and ARPA), Radar Echo. The data can then be replayed from any WorkSpace that has been configured with a time line. Various [Record & Replay](#) Options allow the user to select which data to record, and in the case of Radar, the frame rate and quality can be adjusted to save space.

TimeZero can store and playback up to 30 days of data that can be replayed immediately. When the recording limit is reached inside TimeZero, the data is deleted

**IMPORTANT:** A solid state hard drive is required to support recording and replaying data in TimeZero

### Enabling Recording

By default, TimeZero is set to record Targets and Events. Radar recording can be enabled from the [Record & Replay](#) Options.

Recording automatically starts when the software is opened.

Recording can be enabled or disabled by clicking on the "Voyage Data Recorder" tool (hidden by default). TimeZero will remember the state of the recording tool when restarting the software. If the recording is disabled, a notification will be displayed at startup.

### **Recording Space (average):**

- Events Recording: events recording is approximately 1MB per day (when TimeZero generates lots of events).
- Target Recording: approximately 200MB per day (200 AIS targets and 30 ARPA targets at all times).
- Radar Recording at maximum frequency (every radar turn) in high quality: approximately 1GB per day for a properly tuned radar picture. Decreasing the resolution to "normal" or "low" would reduce the size by a factor of 3 or 9 respectively. Decreasing the recording frequency would divide the size of the recording by the same amount. Lowering the Radar Quality (from 8 to 2 bits) would save 30% space. If space is an issue, we recommend lowering first the quality (4 bits for example), then the recording frequency and then the resolution. A good compromise in between quality and size would be recording in High Resolution at 4 bits every 2 antenna turn. This would result in 500MB per day.

A 500GB Solid State Hard Drive should be enough space to hold the operating system, software, charts and one month of active recording. If the remaining disk space falls below 20GB, a first alarm will be triggered in TimeZero ("Disk Low Space Alarm"). It is recommended to adjust the archiving process by decreasing the amount of day recorded if you see this alarm. If nothing is done and if the hard drive falls below 5GB, a "Disk Full Alarm" will be triggered and the recording of data will stop to avoid overfilling the disk.

**TIPS:** If a rule is set to move and activate a camera when a target enters an area, it can be a good idea to set that rule to also trigger an event. That way, it will be very easy to locate at which time a target entered an area, and when to look at the camera replay.

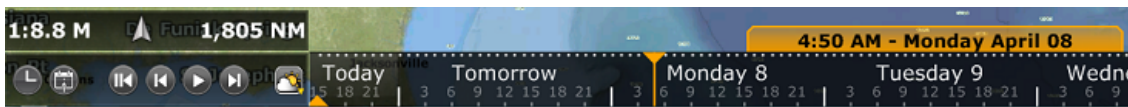
### Replay Data

The "Voyage Data Recorder" module needs to be unlocked to access this feature.

The Planning WorkSpace contains a Time Line or "Virtual Time Control" at the bottom of the screen. It is used to [Animate Weather Forecast](#) when shifting the time in the future, but it can also be used to replay data that has




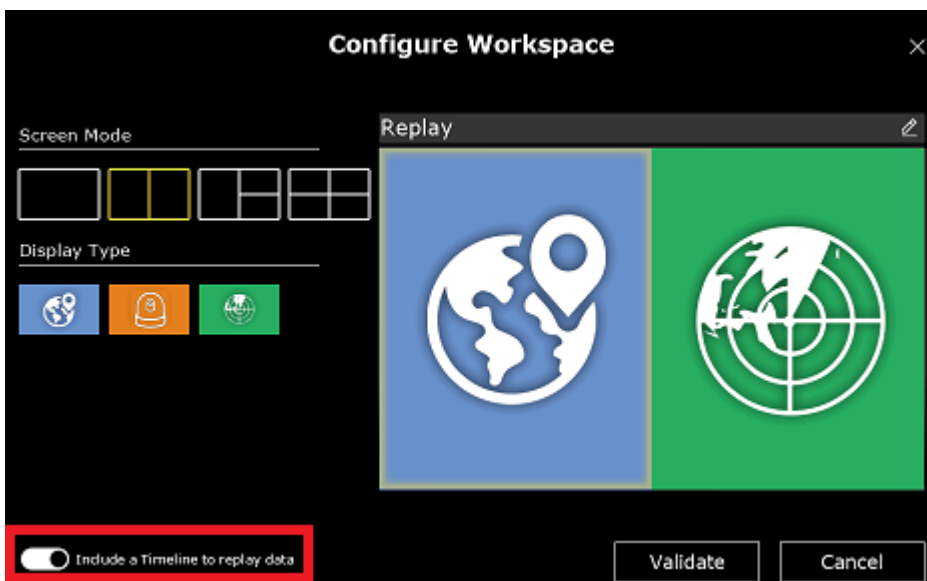
been previously recorded with the "Voyage Data Recorder" module(up to 30 days) when shifting the time in the past.



### Create a WorkSpace with a Time Line

By default, TimeZero configures the Planning WorkSpace with a Time Line so that it can be used to replay data out of the box. However, you can create and name your own WorkSpace (with a Time Line) that may contain one or multiple displays (such as a split screen in between chart and radar). To create a new WorkSpace, click on

the "+" icon  located at the top right of the screen. This opens the WorkSpace configuration window. Select your screen configuration (full screen or split-screen), the type of display you would like to replay, and turn ON "Include a Timeline to replay data". Make sure to only select displays that can be replayed (for example, the video input, sounder or update displays cannot be configured in a WorkSpace with a Time Line):



### Use the Time Line to replay data

#### Time Line Operation Mode:

The Time Line has two modes of operation:

- In "Live" mode, the WorkSpace displays real time data. The date and time marker are displayed in blue (updated continuously with the current date/time) and the "Actual Time" button is displayed in yellow:



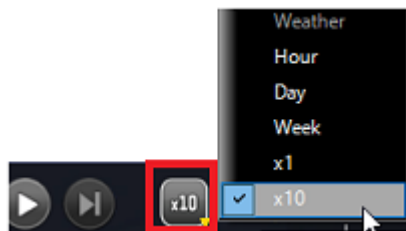
- In "Virtual" mode, when the time is shifted **in the past**, the WorkSpace displays recorded data. The date and time marker are displayed in yellow:



**Note:** Before replaying data, make sure that the appropriate information is displayed on screen. For example, if you want to replay radar echo on the chart, you will have to enable "Radar Overlay" from the "Radar" button in the ribbons.

### Time Line Scale:

The Time Line offers various time scale that can be selected to replay data at various speed. Simply left click on the button below to select your time scale:







After selecting the scale, you can scroll through time by dragging your mouse over the Time Line:



**TIPS:** You can also use the mouse wheel to change the time: put your cursor over the time line and use the scroll wheel.

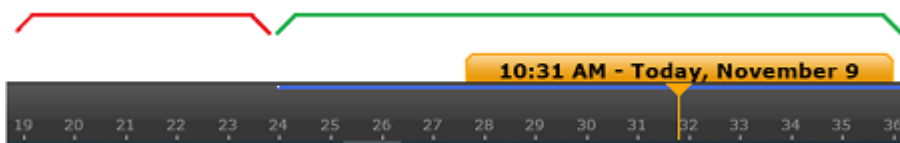
### Time Line Control:

The Time Line includes various controls to replay recorded data:

- If you want to replay a specific amount of time from the current play head position, click on the "Replay Last" button: . You can change the amount of time (default 1 min.) by right clicking on the "Replay Last" button (1, 2, 5, 10, or 15 minutes). Note that when clicking on this button, the TimeLine scale will change to either X1 (when replay last is setup for 1 minute) or X10 (for all other values).
- To reset the virtual time to current time, click on the "Now" button: . This will set the Time Line to real time and live data will be displayed.
- To step forward and backward through the various Events, click on the "Step Back/Forward" buttons: 
- To set the play head to a specific date, click on the "Calendar" button: 

### Time Line Recording indication:

A blue line on the Time Line indicates the presence of recorded data:

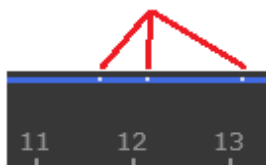


## Retrieve Specific Events

### Using Events

Events are used to "bookmark" important moments so that they can be easily retrieved from the Event List or from the Time Line. Some events are automatically created by TimeZero and are categorized as "System Event" (for example whenever the software is started or stopped or whenever an alarm is triggered). Events can also be created by Rules and are categorized as "Rule Events" (for example, each time an AIS enter a forbidden area). Events can also be created manually by the user by pressing the "Manual Event Log" button that can be configured in the toolbar. Those events are categorized as "User Events" and can be useful to record all kind of external events (for example whenever a VHF distress call is received). Finally "Audio Events" can be created whenever TimeZero detects activity in the audio channel(s). Note that "Audio Events" are dynamic: you can enable, disable them, or even choose the threshold (audio activity duration) at which they will be listed in the Event list from the [Record & Replay](#) Options.

Events are displayed on the Time Line with small white dots:



User can "jump" from event to event by using the "Step Forward" and "Step Backward" button available in the Time Line.

### Event List

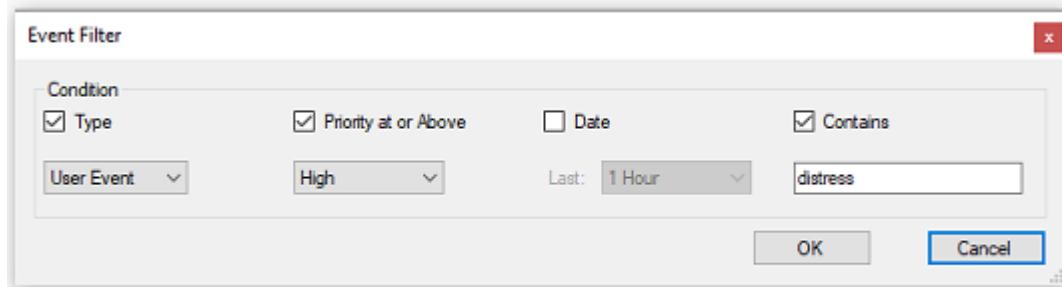
The Event List can be open from the "Lists" button in the Ribbon:

Event Type	Date	Title	Description	Position	Source ID	Source Name	Priority
User Event	1:44:42 PM Wednesday, November 9, 2022	VHF Call	Distress call receive via VHF	N 45°54.065'; W 123°58.206'			High
Rule Event	1:44:12 PM Wednesday, November 9, 2022	AIS in dangerous area	This is a description	N 45°53.411'; W 124°10.396'	36706690	FAITH II	High
System Event	10:23:56 AM Wednesday, November 9, 2022	Software Started		---			Medium
System Event	2:39:38 PM Tuesday, November 8, 2022	Software Stopped		---			Medium

By default, Events are sorted by date with the newest events at the top of the list, but you can sort using any column (by clicking on the column header). The rows displayed in the list can be customized by clicking on the "Action" button (available on the right side of the List header) and choosing "Configure List".

**Note:** The Event List can be exported in a file (text format) or copied to the clipboard by selecting "Export List" or "Copy to clipboard" under the "Action" menu. The fields in the text file are delimited using Tabs. We recommend using Windows Excel to open the file or paste the content of the clipboard (for proper formatting).

The "Filter" button (available on the right side of the List header) allows you to filter the events that are displayed in the list using various criterias:

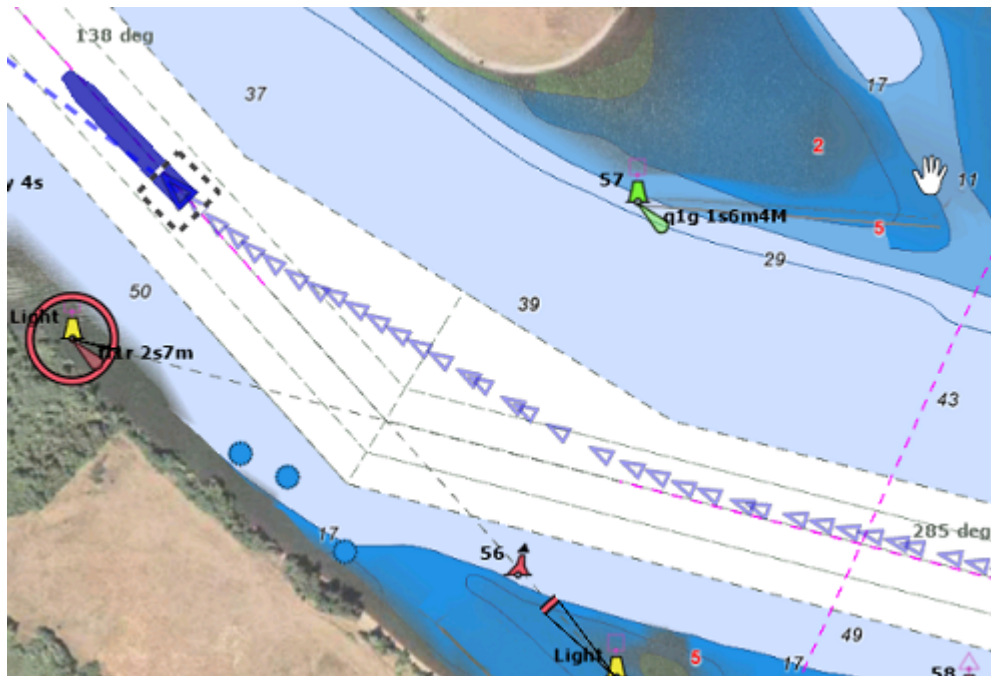


When the list is filtered, a green check-mark will be displayed in front of the Filter button. Simply click again on the same button to remove the filter.

Once you have found the event you are looking for, you can click on it from the list and TimeZero will automatically adjust the date of the Time Line to match that event.

### Using Trail and Track

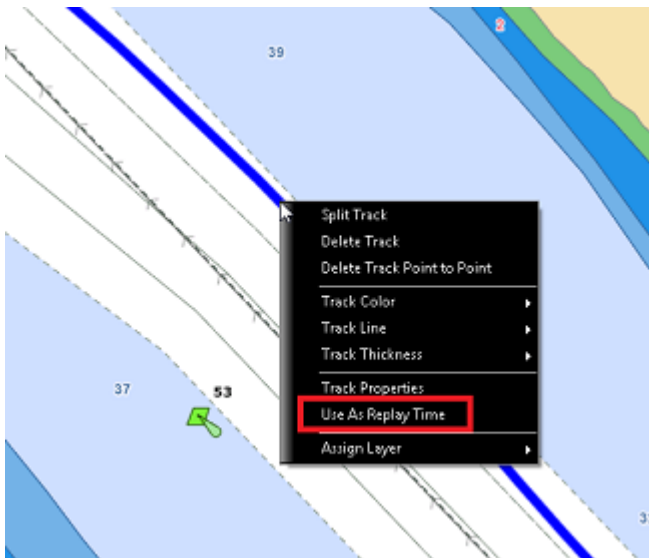
When the play back is paused in the past, it is possible to click on any recorded target to show its trail. This will automatically display on the chart all the past positions recorded in the database:



If you click on one of the trail icons, TimeZero will automatically adjust the time line to that date.

**Note:** The trail length is using the same settings as real time target trail from the [Targets](#) Options

Note that if you have a track displayed on the chart (that might have been recorded manually or automatically), it is possible to set the time line to the date at which this specific track was created (time embedded in the track under the cursor):



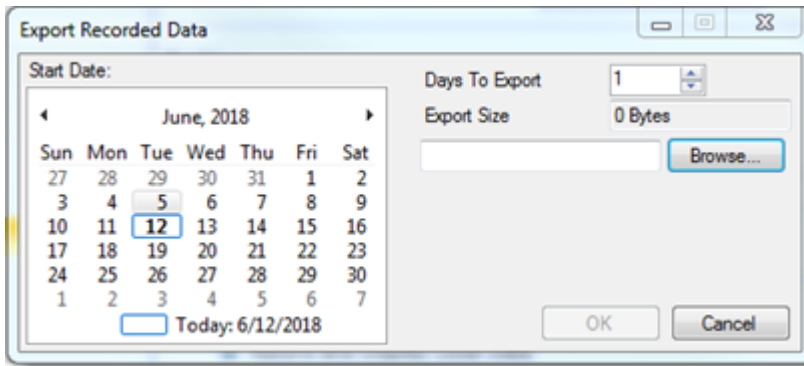
This is very useful to find and see the target that created the track originally for post analysis.

## Extracting Recorded Data

The "Voyage Data Recorder" module needs to be configured to access this feature.

## Using the Record & Replay Options

Data that has been recorded in TimeZero can be extracted from the Record & Replay Options by pressing the "Export Recorded Data..." button and selecting a starting date and a duration:



Choose the starting date using the calendar and the number of day(s) you wish to export.

**TIPS:** The days with available recorded data will appear in bold.

Once your time span has been defined, click on "Browse" to select a destination (for example a USB Drive) and click on "OK". TimeZero will create a folder named "TZ Backup yyy-mm-dd" containing the recorded data for that starting date and duration.

## Online Services

### TimeZero Cloud

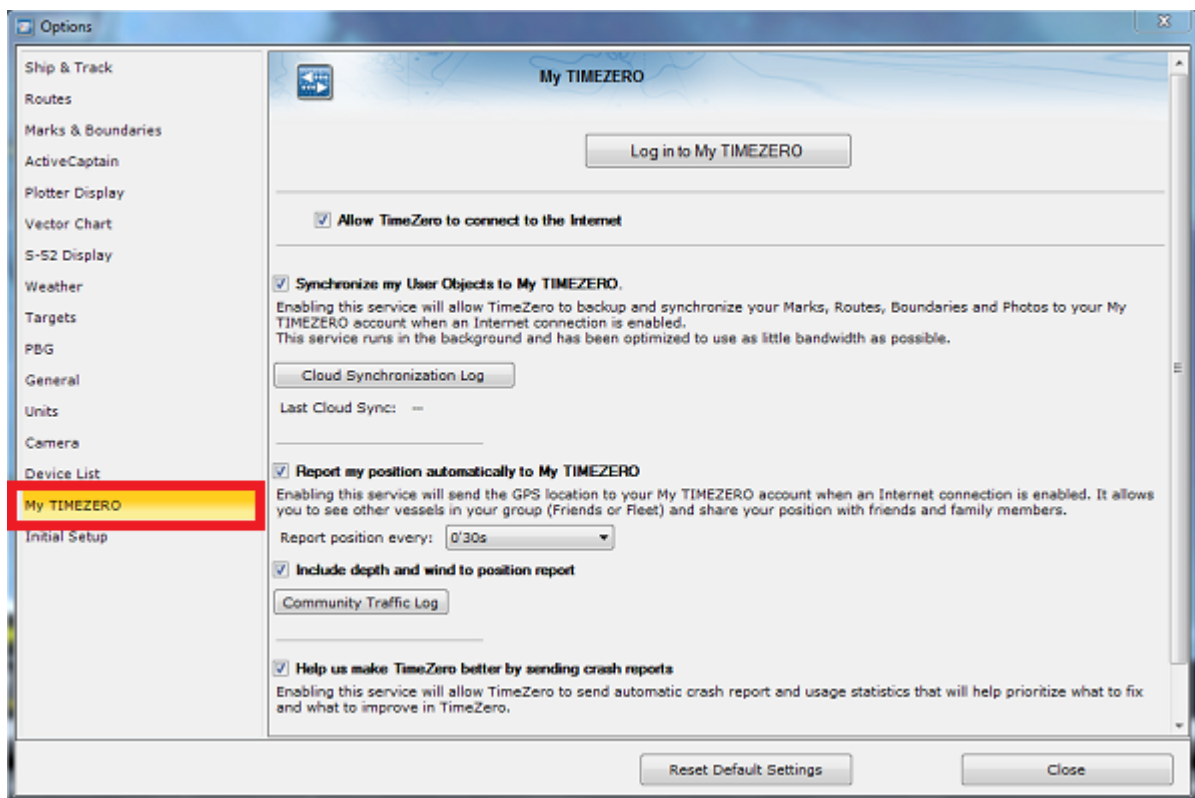
You can access your personal TZ Cloud from any web browser (Edge, Safari, Chrome) by tapping the URL: [cloud.mytimezero.com](http://cloud.mytimezero.com). Simply log in with the same My TimeZero account credential you use in TimeZero.

### User Objects Cloud Synchronization

When you are logged to your My TIMEZERO account, your user objects (routes, marks, catches, boundaries, lines, annotations, and photos) can be automatically saved and synchronized to the TZ Cloud. If you own any other TimeZero products (such as the TZ iBoat iPad App, a Furuno TZT2/TZT3 MFD, or another PC loaded with TimeZero), they can all be synchronized (even remotely) as long as they are connected to the Internet and logged to the same My TIMEZERO account.

**Note:** Please refer to the [Registering TimeZero](#) chapter for more information about the My TIMEZERO account.

Note that your data is kept secured and it is NOT shared with any other users, but if you would like to disable the automatic backup/synchronization, you can do so from the [My TIMEZERO Options](#):



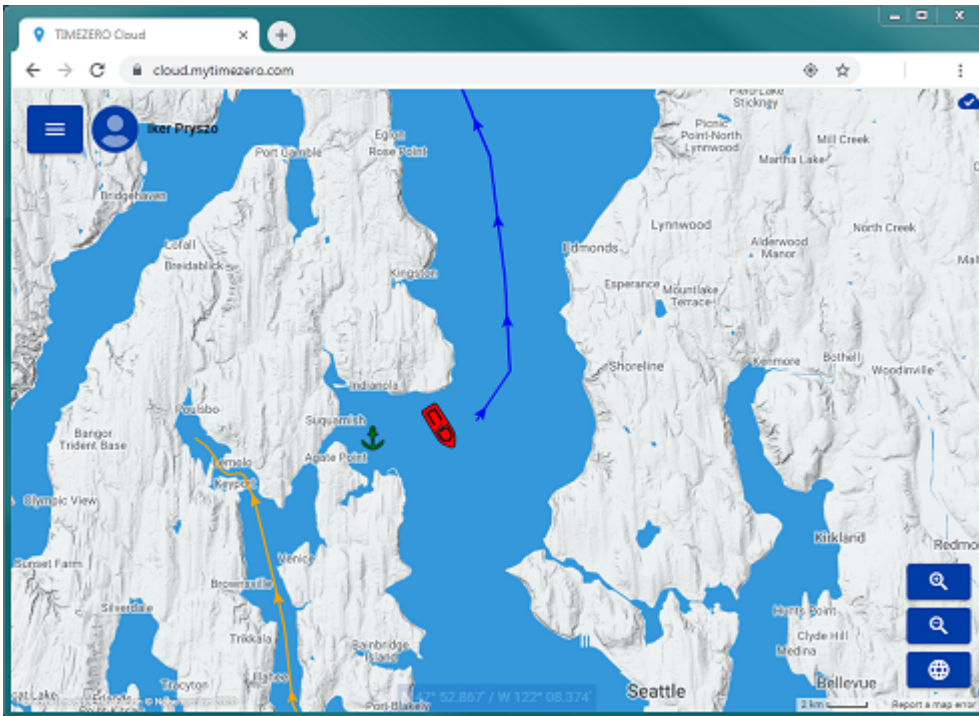
When the cloud synchronization is enabled, you will see a small green status icon (cloud) appearing at the top right corner of the screen (next to the minimize button) each time TimeZero is exchanging data with the TZ Cloud:



## **Position & Anchor Watch Cloud Monitoring**

### **My Position**

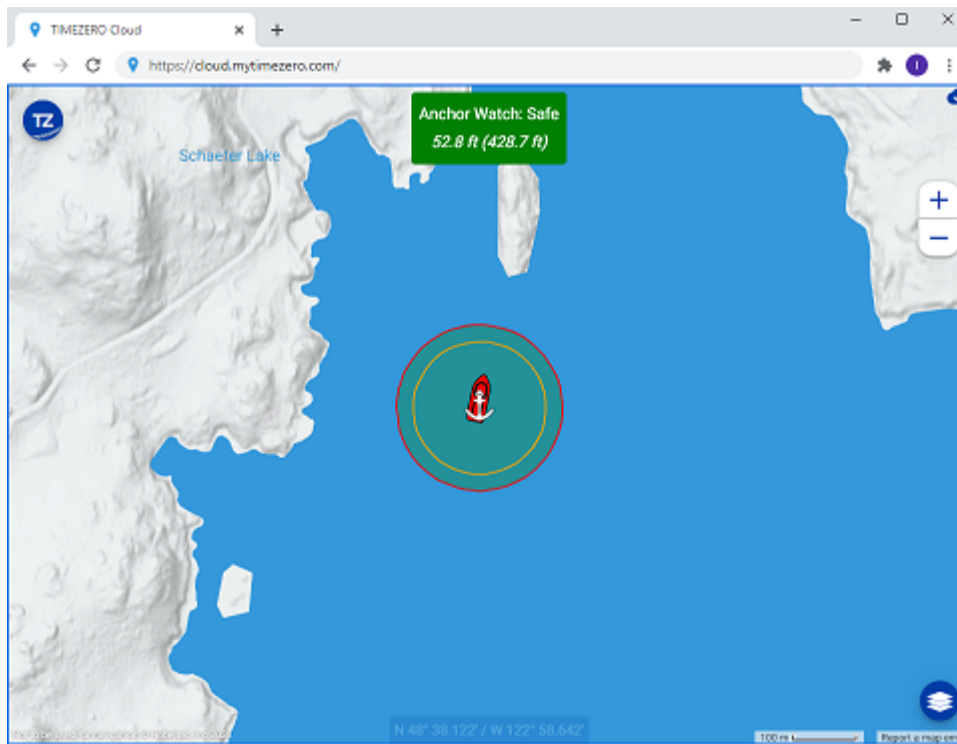
If you have an Internet connection on-board, you can enable the "Report my position automatically to My TIMEZERO" setting from the [My TIMEZERO Options](#). Once this settings is enabled and once you have a connection to the Internet, your position will automatically be sent securely and privately to the TZ Cloud allowing a family member (that has your My TimeZero credential) to see your live position on any Web Browser:



### **Anchor Watch Cloud Monitoring**

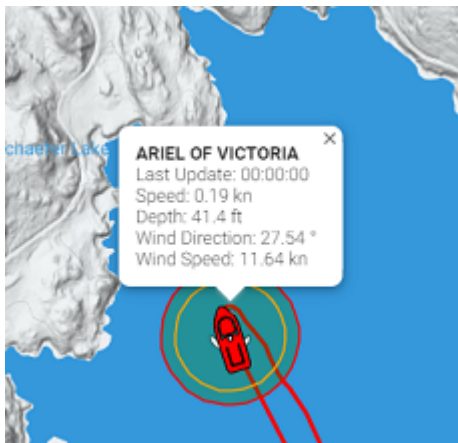
If you report your position to the TZ Cloud, the Anchor Watch alarm (when enabled) can also be monitored from any web browser:





**Note:** Make sure to review the [Anchor Alarm](#) chapter to learn how to configure it and trigger it in TimeZero.

As long as your computer is powered ON (with TimeZero running) and has an Internet connection, you will be able to monitor your anchor watch alarm from shore (from a mobile phone for example). If you click on the vessel icon you will even be able to see the current depth and wind (if TimeZero is connected to a sounder and/or wind sensor) and the vessel track:

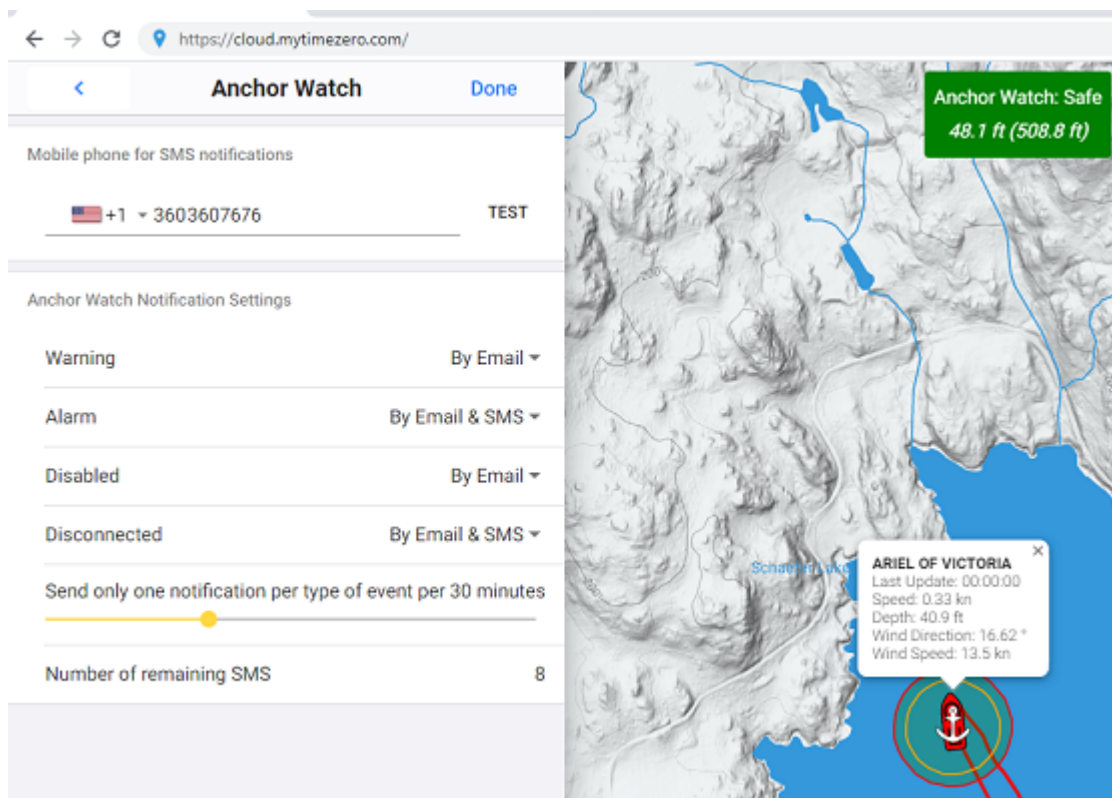


**TIPS:** As soon as the position report setting is enabled from the [My TIMEZERO](#) Options, a status icon will appear on the top right corner of your screen (next to the minimize button). When the status icon is displayed in red, it means that TimeZero is not able to communicate with the server and the position reporting cannot occur. When the status icon is green, it means that TimeZero can access the server and can update your position and your anchor watch status:





The TZ Cloud also has the ability to notify you automatically by E-Mail and/or SMS, so that you do not need to keep the web page open. Simply click on the "TZ" button located on the top left of the Web Page and select "Anchor Watch":



For each event related to the Anchor Watch Monitoring (Warning, Alarm, Disabled or Disconnected), you can decide if you want an email and/or SMS notification.

**Note:** At this time, you are allowed to receive a maximum of 10 SMS per month (test SMS not included). At the beginning of every month, the counter is reset to 10. So you should keep the SMS notification only for important event. Note that there is no limit on the number of e-mail notification that can be sent.

### Fleet Tracking Service

The Fleet Tracking service is geared toward governmental agencies (Coast Guard, Search and Rescue...) and Fishing Fleets customers that want to monitor a list of vessels and be able to exchange objects (Route, Search and Rescue Pattern, Areas, or Picture) seamlessly and automatically.

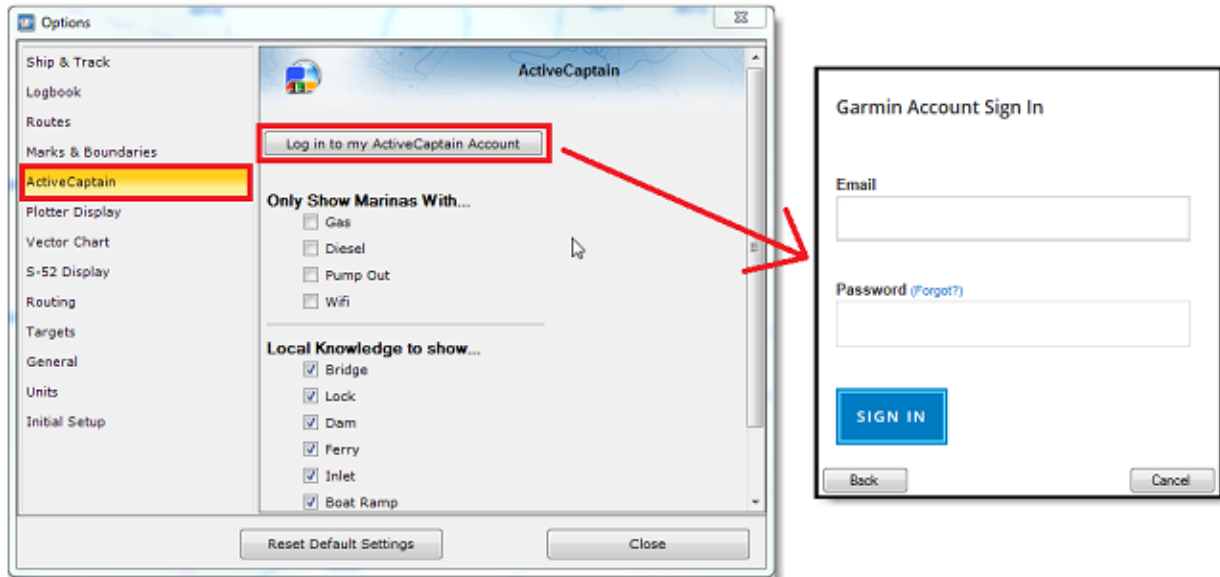
Please refer to the [Fleet Tracking](#) chapter to learn all the features of this service.

### ActiveCaptain

ActiveCaptain is what is called a "crowd sourced" Point of Interest (POI) data service whereby hundreds of thousands of users participate in building and consuming the data. The ActiveCaptain database is stored, maintained and synchronized inside TimeZero directly. An Internet connection is not necessary to access any of the marina, anchorage, local knowledge, or hazard markers data. However, an Internet connection is required to update the data. In addition, a Garmin account with an ActiveCaptain profile is necessary if you want to post a review or a comment.

## Register to be an "ActiveCaptain":

To register and for more information about the ActiveCaptain POI database and its features, make sure to visit <http://www.activecaptain.com>. You will have to create a Garmin account and then create an ActiveCaptain profile. Once your account is created, enter your Garmin login/password information under the [ActiveCaptain](#) Options by clicking on "Log in to my ActiveCaptain Account" (Internet connection required):



**Note:** Registration is mandatory to be able to post reviews or comments. However, registration is not mandatory to view or update ActiveCaptain data.

## Displaying ActiveCaptain Markers on the chart

To display the ActiveCaptain markers on the chart, click on the "POI" button and select the corresponding ActiveCaptain data layer ("AC Marina", "AC Anchorages", "AC Local Knowledge", "AC Hazards").

**Note:** If the "POI" button is not available in the Ribbon, click on the "Configure Ribbons" icon to add it to the Workspace configuration

**Tips:** It is possible to setup advanced filters for some markers (Marinas and Local Knowledge) from the [ActiveCaptain](#) Options.

To display basic marker information, rollover or click on any marker. To access the full marker information, double click on any marker. This will open the Marker Property window that contains multiple tabs (sorted by category).

## Updating ActiveCaptain data

To update the ActiveCaptain database, click on the "POI" button and select "Update ActiveCaptain". This will open the ActiveCaptain Update Wizard.

## Post a Review or Comment

When the PC is connected to the Internet, you can post a review directly from TimeZero. Just open the marker properties (double click on it), select the "Review" tab and click on "Rate it...".

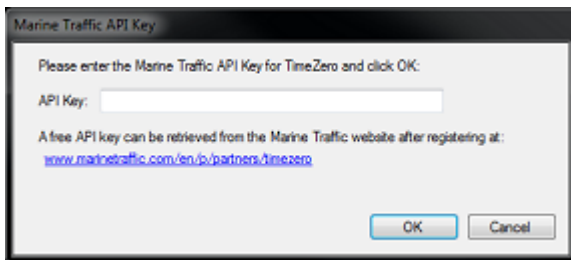
You can also Vote on existing reviews or comments by clicking on the Thumb Up icon.

## Marine Traffic

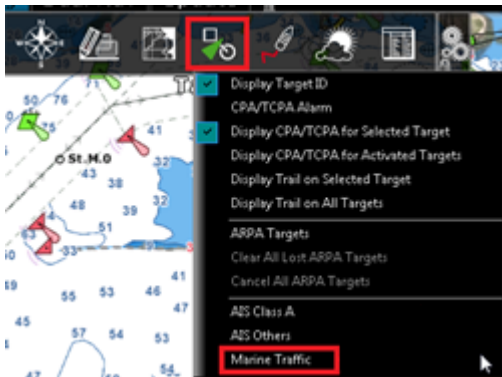
**IMPORTANT: THE MARINE TRAFFIC FEATURE SHOULD NOT BE USED FOR NAVIGATION. THERE CAN BE A SIGNIFICANT DELAY (5 MINUTES TO ONE HOUR) IN BETWEEN THE ONLINE REPORTS AND REAL TARGETS POSITION. THE MARINE TRAFFIC SERVICE IS SUBJECT TO SERVICE INTERRUPTIONS AND IS PROVIDED 'AS IS'.**

If the PC is connected to the Internet, TimeZero can display AIS target from the Marine Traffic Web Site. This service provides free near real-time information, about ship movements and ports, mainly across the coast-lines of Europe, Asia and North America. In order to display the target from the Marine Traffic service, you have to register and create an account on the Marine Traffic Web Site and get an Activation Key for TimeZero: <http://www.marinetraffic.com/en/p/partners/timezero>

To enter the activation key, open the [Targets](#) Options and click on "Marine Traffic API Key":



Once you have entered the activation key in TimeZero, select "Marine Traffic" from the "Targets" button in the Ribbon.



**Note:** After enabling Marine Traffic, it might take a couple of minutes for the information to appear on the screen

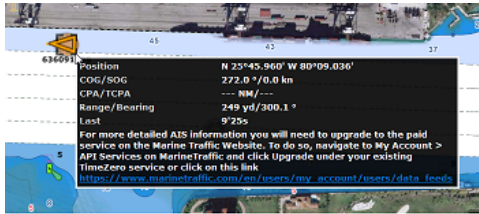
AIS received through the Internet from Marine Traffic appears in orange ("real" AIS targets from an AIS receiver connected to TimeZero appear in blue for Class A and green for Class B):



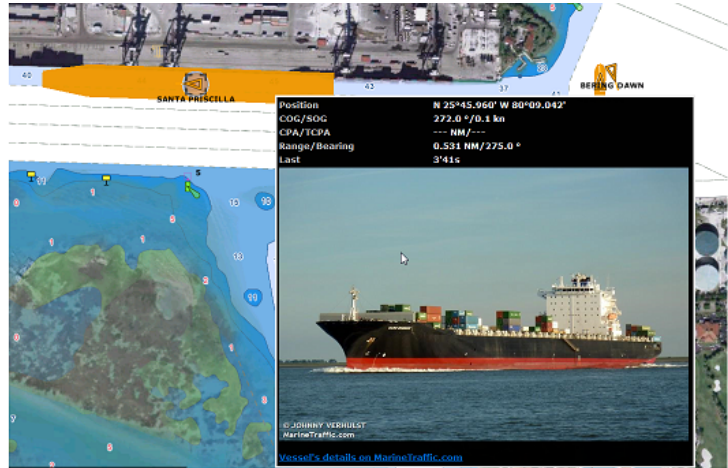
Note that the Marine Traffic targets only appear when the chart is zoomed in at a range of 200NM and below (to avoid loading too much data from the server). Targets are refreshed automatically every one minute or as soon as the chart is scrolled to a new location. It is possible to adjust the maximum "age" of a target that will be displayed on the chart from the [Targets](#) Options using the "Do not display Marine Traffic AIS older than..." setting.

This is useful if you don't want to display targets that have not been updated on the Marine Traffic website for a long time (out of a receiver range).

To access the target information, rollover the AIS icon with your cursor or click on it. The free Activation Key will allow you to display AIS Position, MMSI, COG, SOG and the time of the last received position (last update). TimeZero users are able to subscribe to an "advanced" service (for a monthly fee) directly on the Marine Traffic website to receive even more detailed information about the target (Name, Size, Destination, ETA, Picture,...):



**Basic Service (free)**



**Advanced Service (monthly fee)**



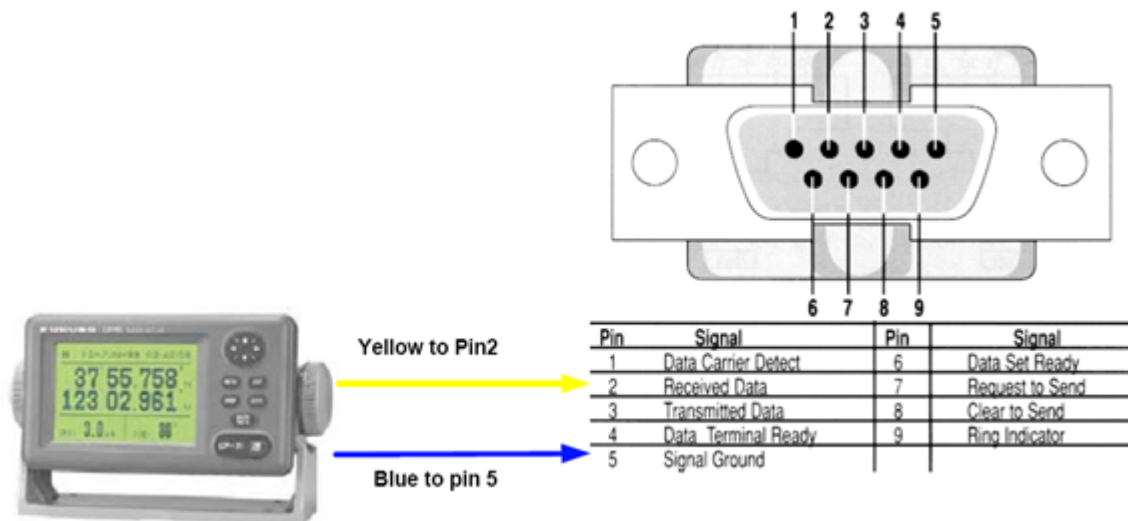
## Installation

### NMEA0183 Serial Connection

Instruments (GPS, Heading sensor, Sounder, AIS...) are usually connected to the computer using a serial connection. The data being transferred on that serial connection needs to be in NMEA0183 format for the instrument(s) and computer to understand each other. Be aware that physical serial connections may be achieved using two different protocols: RS-232 or RS-422.

#### RS-232 (regular PC "COM port")

The default standard for serial ports on computers is RS-232. It uses 3-wires consisting of a transmit signal "TD" (pin 3 of the DB9 connector from the computer perspective), a receive signal "RD" (pin 2 of the DB9 connector), and a signal ground "SG" (pin 5 of the DB9 connector). Some GPS (like the Furuno GP32) have a dedicated PC port (RS-232) that can be connected directly to the serial input of the PC.



**Note:** In the above diagram, only 2 wires of the GPS are used: the transmit signal and ground (or "Signal Ground"). In this example the PC is just a "listener" and doesn't send any information back to the GPS.

#### RS-422 (or "NMEA port")

RS-422 uses a "balanced" (or differential) signal that does not use a common ground. RS-422 uses 4 wires: TD-A (Transmit Positive), TD-B (Transmit Negative), RD-A (Receive Positive) and RD-B (Receive Negative).

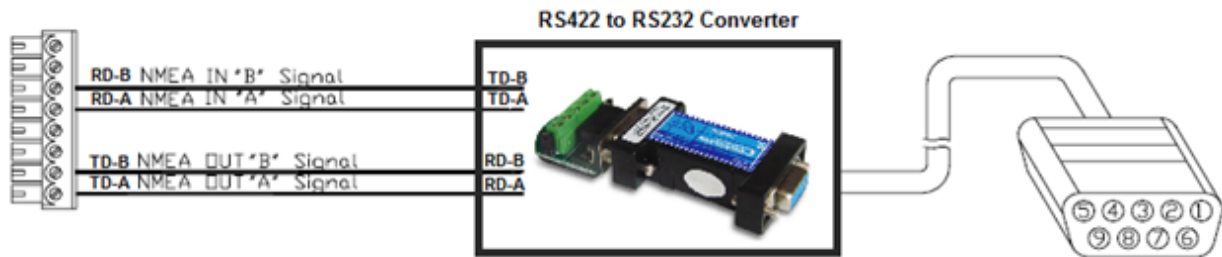
**Note:** "TD-A" / "TD-B" can also be noted "TD-H" / "TD-C" (Hot/Cold)

RS-422 has been selected as a preferred interface to transmit NMEA0183 data on a boat. RS-422 uses a differential signal instead of a single ended signal used by RS232. Where a single-ended system will start to become unreliable after a couple dozen feet, a differential system can be reliable for several hundreds of feet. In an electrically noisy environment like a boat, this can make a big difference. With RS-422 (differential signal), 4 wires are used (two to transmit and two to receive). Note that there is no common ground with RS-422 (no "signal ground"). The transmit and receive lines use their own "point of comparison".

All Furuno depth sounders (such as FCV1100) only output NMEA0183 using the RS-422 protocol. If you want to connect the FCV1100 to a serial COM port (RS232), you will have to use a RS-422 to RS-232 adapter.

Connect the white wire to the RD-A and the black wire to the RD-B of the converter. In this example we do not want to talk back to the sounder (so we will not use TD-A and TD-B of the converter).

If you want to talk and listen to the NMEA0183 device, you will have to wire both TD and RD lines:

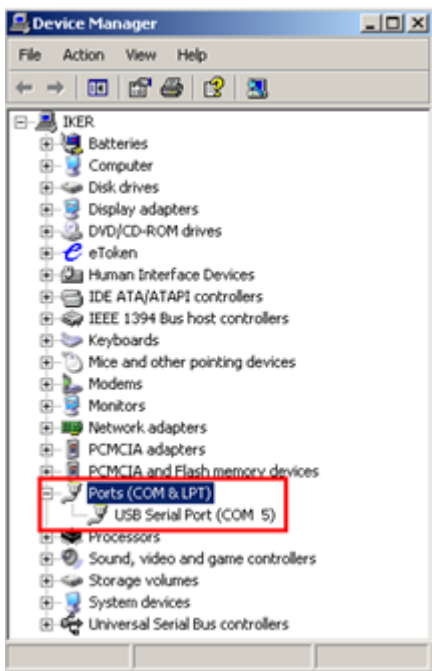


### Using a Serial to USB Adapter

On most computers, the USB interface has replaced the old COM port (serial) interface. Most laptop manufacturers got rid of serial ports years ago. Some desktop computers still have a serial port, but these serial interfaces are less common and it is unlikely that modern computers will have a serial port. So, if you need to connect an instrument serially to your computer, you will have to purchase a Serial to USB Adapter.

Before connecting the Serial to USB Adapter, you will have to install the "driver" provided by the hardware manufacturer. Usually, the driver is provided on a CD, but it is always a good idea to download it from Internet (to make sure that you install the latest version). When connecting the Serial to USB Adapter to your computer, the driver will create a "virtual COM port" (also known as "VCO"). This means that for any software installed on the computer, the adapter will be seen and detected as a regular COM port (just like if the PC had a Serial COM port). Note that if the appropriate driver has not been correctly installed in Windows, the Serial to USB Adapter will not function properly and will not appear as a Virtual COM Port for the software.

To make sure the drivers are correctly loaded, open the "Device Manager" and look for a COM port under "Ports (COM & LPT)":



To open the Device Manager under Windows 7, search for "device Manager" from the Start menu. Under Windows 8, right click on the "Start" button (on the lower left of the Desktop) and select "Device Manager".



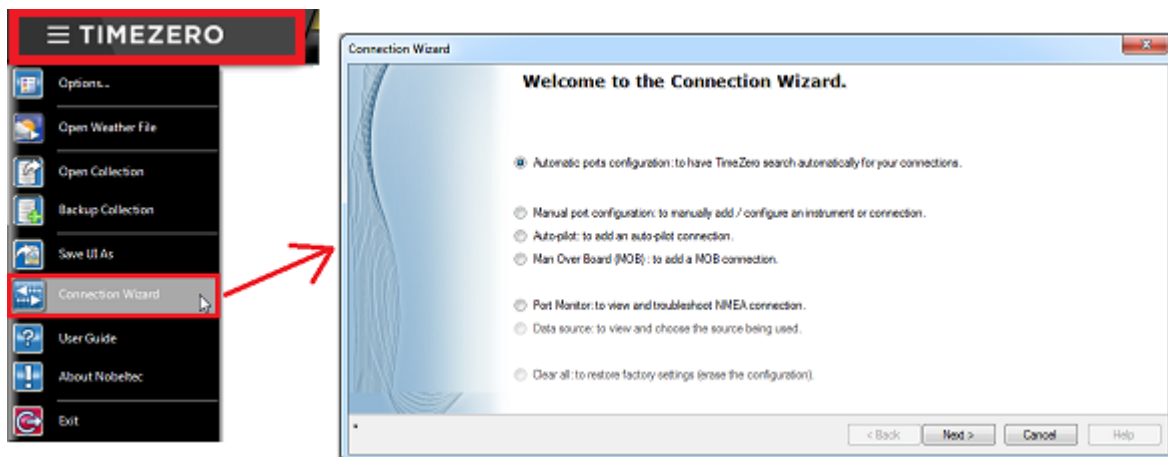
## Connection Wizard Introduction

The Connection Wizard is used to configure instruments such as GPS, AIS, Heading and Wind Sensor. The Wizard is designed to intuitively recognize your hardware devices and connect them to the software correctly. However, you must already have the devices wired and transmitting data.

**Note:** The Connection Wizard is not used to configure Camera, Radar or Sounder. It is only used to configure NMEA0183, NMEA2000 and NavNet NMEA sensors.

The Connection Wizard is also used to output data (NMEA0183) to a pilot or external display.

To open the Connection Wizard, make sure to start the software in "Navigation" mode, click on the "TimeZero" button and select "Connection Wizard":



## Automatic Port Configuration

The Automatic Port Configuration option of the wizard will scan your system automatically for the various sensors:

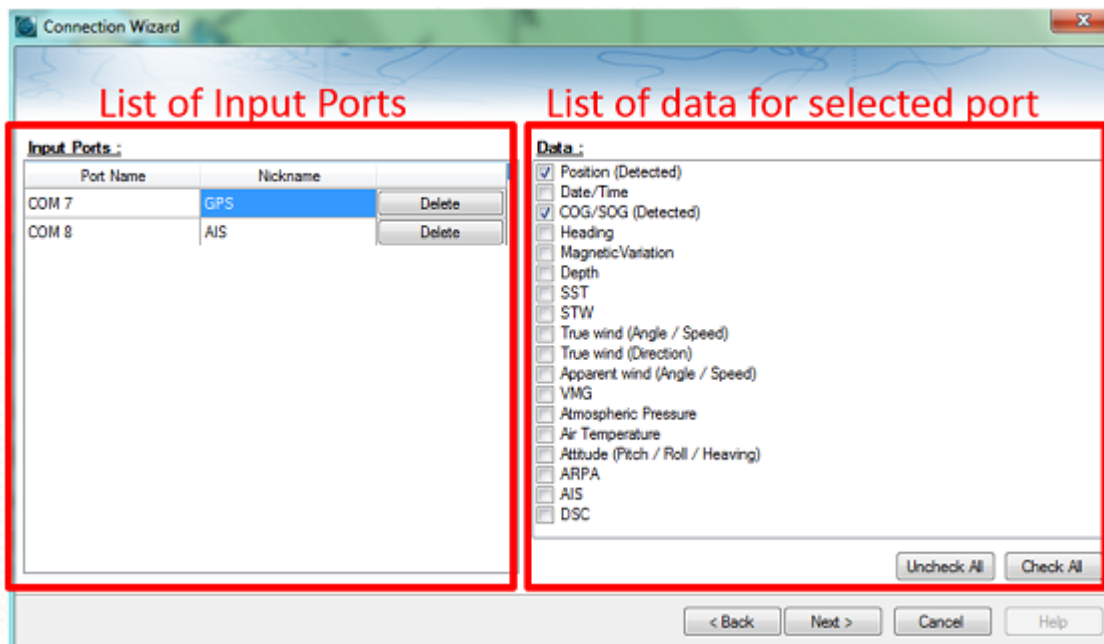
- NMEA0183 sensors (GPS, AIS, Heading, Wind Sensor, etc...) connected through a Serial port or USB to Serial Adapter (at 4800 and 38400 baud rate).
- NMEA2000 sensors (GPS, AIS, Heading, Wind Sensor, Fuel Instruments, etc...) connected through the Actisense NGT1-USB.
- NavNet Data (FA30, MFDs, etc...) connected through an Ethernet cable

Before launching the detection, make sure to connect and power all the sensors.

**IMPORTANT:** When you perform an Automatic Detection, it erases the previous input configuration.

**Note:** It is not possible for TimeZero to automatically configure the outputs (to a pilot or external display for example). The Automatic Port Configuration only configures the inputs. You will have to manually configure the output by selecting "Data Output and Pilot".

After the detection, the wizard will display a page with the list of the ports that are receiving data on the left and the detail of the selected port on the right:



Every data type detected is automatically checked (on the right). Note that you can uncheck data type on specific port(s) if you don't want to use them. For example, it is not recommended to use position or heading from a port connected to an AIS sensor.

Note that you can enter an optional Nickname for each port configured (on the left) such as "GPS", "Heading" or "AIS".

If you do not want to use a specific port that was automatically discovered, you can press the "Delete" button available on the left panel.

Click on "Next". This will display the [Data Source](#) page.

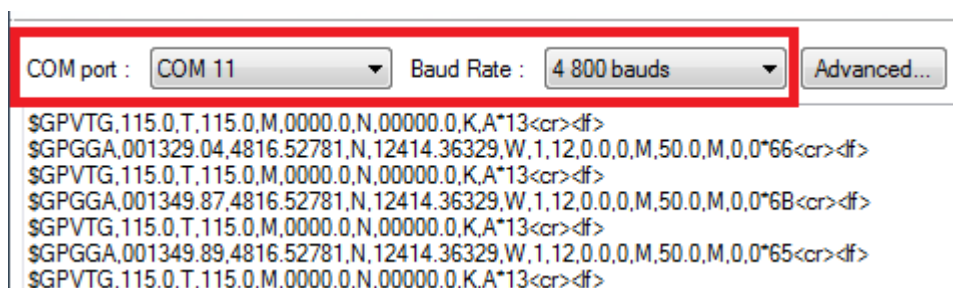
**Note:** If you feel you are missing a port or data type, check the wiring and use the port monitor to check that data is correctly flowing.

## Manual Port Configuration

Choose "Manual Port Configuration" when you know what to configure or to edit an existing port configuration.

### Add/Configure Serial Port (NMEA0183):

Select this option to manually configure a new or modify an existing COM Port (Serial or USB to Serial Adapter). The first screen will allow you to select a COM port and a Baudrate (default 4800 bauds):



**Note:** The "Advanced" button is only reserved for Technical Support. Do not adjust any advanced settings yourself.

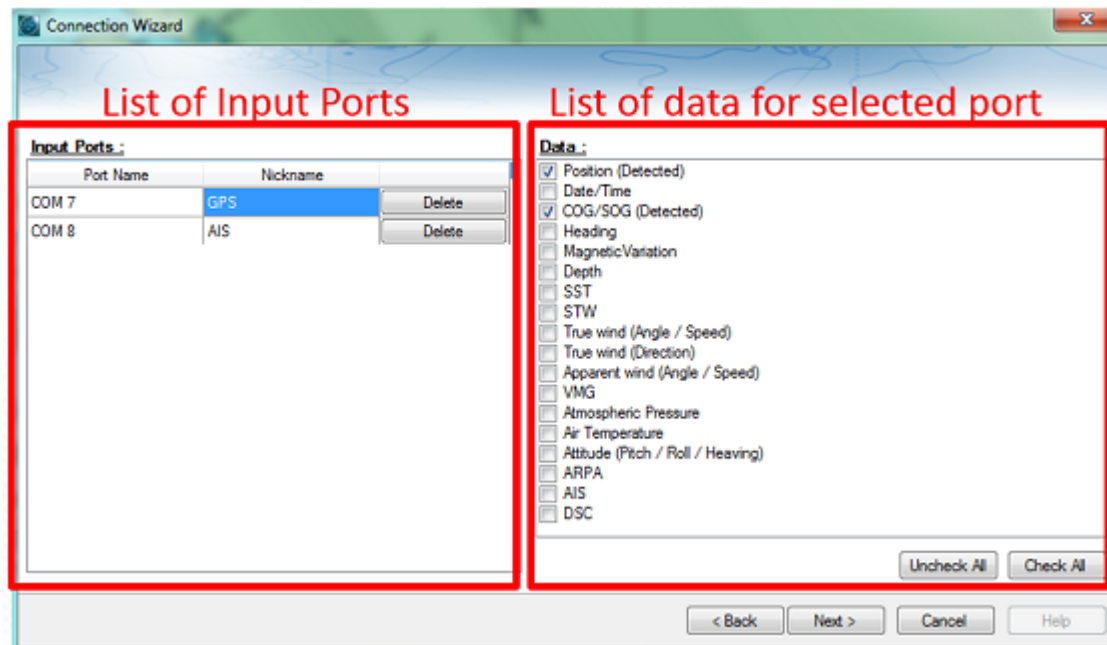
After selecting a COM port, you should see NMEA0183 sentences flowing in the window below. Valid NMEA sentences should:

- Start with "\$" or "!"
- Followed by 5 characters:
  - The first 2 characters indicating the type of sensor sending the data (such as "GP" for GPS, "AI" for AIS, "EC" for Electronic Compass, "II" for multi-sensor, etc...)
  - The 3 remaining characters indicating the type of NMEA sentence (such as "GGA", "GLL" or "RMC" for position information; "VTG" for speed information; "DPT" or "DBT" for depth information, etc...)
- Followed by a series of data separated by ","

If you don't see any data, try another COM port or double check the wiring. If you see "garbage" data (random letters and characters), try another baud rate speed (such as 4800, 9600 or 38400) and make sure the wires are not inverted.

**Tips:** If the COM port does not appear in the list, make sure the USB to Serial adapter drivers are correctly installed from the Windows "Device Manager" control panel. If you feel that TimeZero is not listing an existing COM port, press and hold the CTRL key and click on the COM port selection. This will display a window where you can manually enter a COM port.

The next page of the Wizard will display a list of the ports previously configured on the left with the port you just added/modified:



On the right, every data type detected is automatically checked. Note that you can uncheck data type on specific port(s) if you don't want to use them. For example, it is not recommended to use position or heading from a port connected to an AIS sensor.

**Note:** In some case, TimeZero cannot automatically detect (and thus check) specific data types. This can happen with AIS receivers that may not send target data while TimeZero is analyzing the data feed. If you are sure that the data should be present on that port (for example of you saw on the previous window NMEA "!AI" sentences corresponding to AIS), you can manually check a data type (AIS in that case).

Click on "Next". This will display the [Data Source](#) page.

### Add/Configure NavNet Connection:

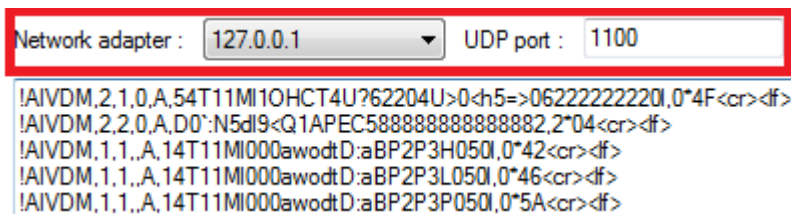
Select this option to configure or modify a NavNet connection when the computer is connected to the Furuno NavNet network through the Ethernet port.

- "NMEA" is used when the computer is connected to a Furuno NavNet MFD (Multi Function Display such as "NavNet 1", "NavNet Vx2", "NavNet 3D" or "NavNet TZtouch"), Furuno AIS (FA30, FA50) or Sounder (to get the depth, temperature and speed information from the transducer).
- "Fast Heading" is used when the NavNet network contains a DRS radar. In that case, a better faster heading is available from the DRS radar.
- "ARPA" is used when the NavNet network contains a DRS radar to get the ARPA data from the radar.

After checking the corresponding options, click on "Next" and follow the [same steps as when configuring a Serial COM port](#).

### Add/Configure UDP (or TCP) connection (NMEA0183):

Select this option to configure a network UDP (or TCP) connection. This can be used with Serial to Ethernet converters that can broadcast the serial information (NMEA0183) on the Network using "UDP" (or "TCP"). Select the IP address of your computer connected to the corresponding Ethernet card and enter the port number programmed inside the Serial to Ethernet converter:



Confirm that NMEA0183 data is flowing and press on "Next". Follow the [same steps as when configuring a Serial COM port](#).

**Note:** UDP or TCP connection can be useful to send data in between two TimeZero computers

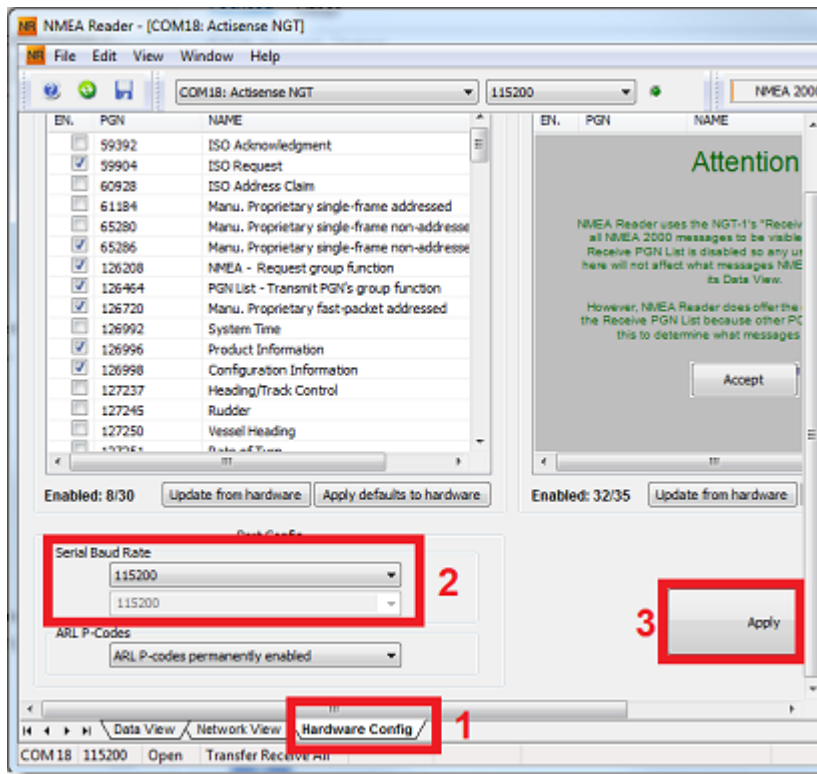
### Add/Configure NMEA2000 connection:

This option is used when the Actisense NGT1-USB is connected to the computer. The NGT1-USB gives TimeZero direct access (input and output) to the NMEA2000 data (PGN).

Before configuring the NMEA2000 connection in TimeZero, make sure that the NGT1-USB drivers have been installed (the Actisense NGT1-USB should appear as a Virtual COM Port in the Device Manager). Note that because only one gateway needs to be connected to the computer to provide all NMEA2000 data, there is no need to select a COM port in the Connection Wizard when configuring a NMEA2000 connection (TimeZero will automatically find the first NGT1-USB it detects). Simply press on "Next" to automatically detect the gateway and follow the [same steps as when configuring a Serial COM port](#).

Note that all the NMEA2000 data is coming inside TimeZero through one port, and it is not possible to adjust the NMEA2000 devices priority directly from the Connection Wizard interface. However, TimeZero will look at the NMEA2000 device instance number to affect priority to specific devices. For example if you have multiple GPS, you can assign priority by changing their instances number (the lowest the instance number, the highest the priority). For more information about NMEA2000 device priority, please make sure to read the [How to adjust priority on NMEA2000](#) chapter.

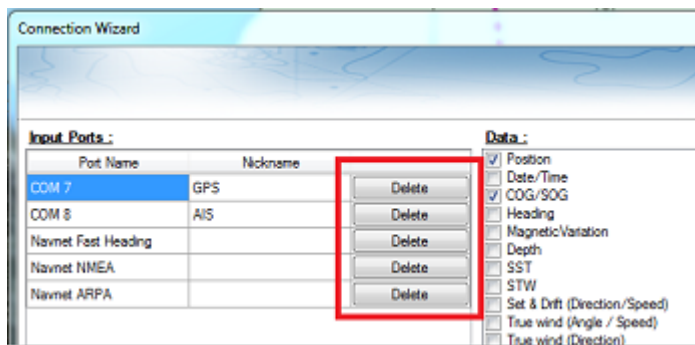
**IMPORTANT:** Note that TimeZero requires the NGT1-USB firmware to be v2.690 (or above) and also require the NGT1-USB to operate at a baud-rate speed of 115200bps (which should be the default operating speed of the NGT1-USB). If you need to upgrade the firmware of your NGT1-USB, you can download the latest version from the [Actisense website](#). If the baudrate speed of the NGT1-USB is not set to 115200bps, you can adjust it using the Actisense NMEA Reader tool that can be downloaded from the [Actisense website](#):



### To remove a connection:

If you want to remove a specific port from TimeZero:

- Open the Connection Wizard
- Select "Data Source" and press "Next"
- On the Input Ports configuration page, press the "Delete" button in front of the port you want to delete



- Press "Next" and review the "Master" setup (especially if you have deleted a Port that was previously used as a Master for a specific data type)
- Press "Next" and "Finish" to close the Connection Wizard

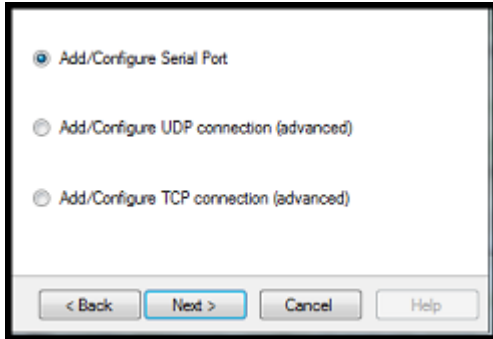
### Autopilot And External Output (NMEA0183)

Choose "Data Output" when you want to output NMEA0183 data from TimeZero to an Autopilot or any External Display.

Each autopilot requires that certain, specific information be provided by TimeZero. Most autopilots follow the same basic principles of course to steer and cross track error. Autopilot tries to maintain a heading to a mark while maintaining a minimum Cross Track Error. TimeZero contains a number of specific settings that have been created because not all autopilots work the same way. Consult your autopilot manual to verify what information the device needs.

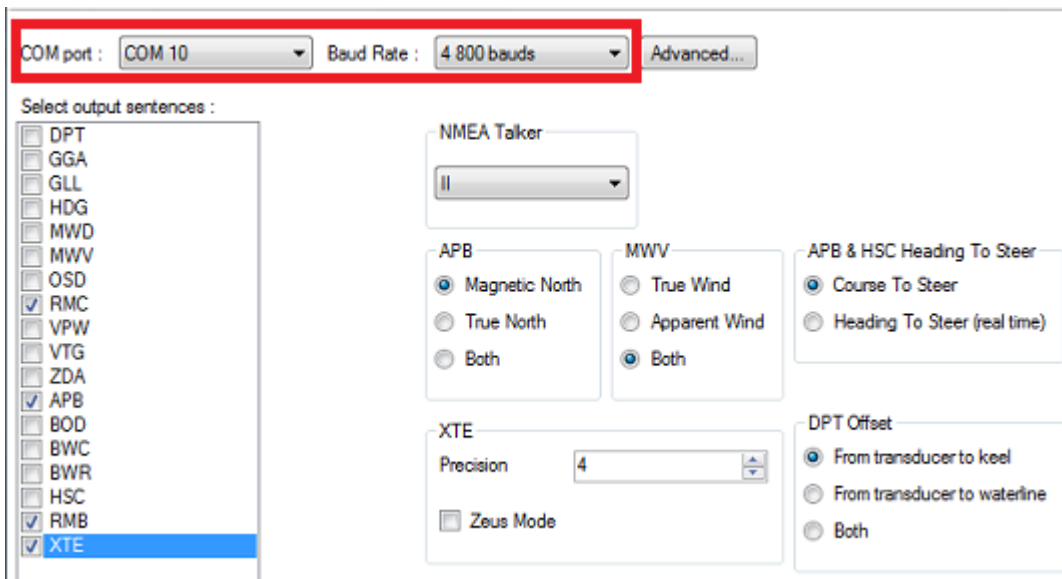
## Output Configuration (NMEA0183)

TimeZero can output NMEA0183 data over a COM port (Serial or USB to Serial Adapter) or over an Ethernet network (using UDP or TCP). Select the appropriate option and click on Next:



**Note:** UDP is useful when you want to broadcast NMEA data to one or multiple computers located on the same local network (same broadcast domain). Use TCP if you need to route NMEA0183 data through the Internet or if the device or computer you are sending the data only accepts TCP connection. Note that when TimeZero is set to output NMEA data using a TCP port that was not previously configured as an input, it will create and open a TCP port and listen to incoming connection from a remote client (TimeZero becomes a TCP server). Just configure the client to connect to the server (TimeZero in this case) using its IP address and to the port that is configured on the next page. If you would like to receive and send data on the same port over TCP (for example to receive and send data to a NMEA Multiplexer), first, start by configuring the TCP port as an input in TimeZero. Then, when configuring an output TCP port, you will be able to select the input port you previously configured, allowing TimeZero to send and receive data on the same TCP port.

The top of the output configuration window will automatically adjust according to the output mode (COM, UDP or TCP). In the example below, the serial (COM) output has been selected, allowing you to select a COM port and a baudrate (in case of UDP or TCP, you have to select a network adapter and a TCP/UDP port):



**Note:** If using a COM port and if the selected Port is already configured as an Input, you cannot select the Baudrate (it will be locked to the same baudrate as the input).

**Note:** The "Advanced" button is only reserved for Technical Support. Do not adjust any advanced settings yourself.

Once the port has been configured from the top of the page, select the NMEA0183 sentences you want to output from TimeZero to an External Device (including another TimeZero) or an Autopilot.

Most Autopilots only require "APB" and "XTE". If your pilot also needs position and speed information, add "RMC" to the list. It is recommended to read your Autopilot documentation to know what sentence you should select from the list.

**IMPORTANT:** Never send back position (RMC, GGA, GLL) to a device that already receives or outputs position. This can create a "data loop" and cause erratic behavior.

**Note:** When switching a Waypoint, TimeZero will always send an AAM (Waypoint Arrival Alarm) sentence to the Pilot. This allows the pilot to properly detect a switching Waypoint condition and notify you. If you want to trigger a notification inside TimeZero, make sure to check "Waypoint Switching Notification" and/or "End of Route Notification" from the [Alarms Options](#).

Press "Next" to validate the settings then "Finish" to close the Wizard.

In order to confirm a good connection in between TimeZero and your Autopilot

- Activate a route in TimeZero (or create an Active Waypoint using the "Go To" tool)
- Add three Route NavData to the NavData panel in TimeZero: "CST", "DTW" and "XTE" (Please refer to the [NavData](#) chapter for more information)
- Make sure that the Autopilot and TimeZero are using the same North reference (either "True" or "Magnetic"). You can adjust the North reference in TimeZero by adjusting the "Bearing Display" setting in the [Units Options](#)
- Configure your pilot to show a "Steering Page" displaying at minimum the corresponding information:
  - Distance to Waypoint (usually labeled as "DTW" or "RNG" or "DIST")
  - Bearing to Waypoint (usually labeled "CST" or "BRG" or "Bearing")
  - Cross Track Error (usually labeled "XTE")



- Confirm that the information displayed in TimeZero and on the pilot matches

If no information appears on the Autopilot ("--" for example), or if the pilot is not steering properly, check the [Autopilot Troubleshooting](#) chapter.



## Advanced Output Settings:

### NMEA Talker:

This setting changes the NMEA talker used in the NMEA sentence generated by TimeZero. The default is set to "II" ("integrated instruments"). Some older pilots or external displays might not recognize the "II" talker. In this case, try to change it to "GP".

### APB:

This setting defines the North Reference that will be used inside the APB sentence for the Bearing to Waypoint (or CTS). Usually, if the Autopilot is connected to a Magnetic Heading sensor, you will use "Magnetic North". If the Autopilot is connected to a True Heading Sensor (such as a Satellite Compass), you will use "True North". If set to "Both", the APB sentences will alternatively use Magnetic and True North. If you choose either Magnetic or True North, it is usually recommended to set TimeZero with the same reference. You can adjust the North reference in TimeZero by adjusting the "Bearing Display" setting in the [Units Options](#)

### MWV:

This setting defines the Wind Reference that will be used inside the MWV sentence. If set to "Both" the MWV sentence will alternatively use Apparent Wind and True Wind (angle & speed).

### APB & HSC Heading to Steer:

The APB NMEA0183 sentence contains two bearing references: Course to Steer and Heading to Steer. When "Course to Steer" is selected in TimeZero, the Heading to Steer field inside the APB and HSC NMEA sentences will use the same value as the Course To Steer field (copy). If "Heading to Steer (real time)" is selected, TimeZero will apply the drift vector to the Course to Steer value to compute the proper Heading to Steer that takes into account the real time currents and use that value in the Heading to Steer field of the APB and HSC sentences. Note that for the Heading to Steer (real time) value to be correct, you need a high precision heading source (such as a Satellite Compass). For most application, it is recommended to leave this setting to "Course to Steer".

### XTE:

The "Precision" settings indicate the number of digits used for the Cross Track field used in the NMEA sentences. Only decrease the precision if you have an old Autopilot that has trouble adjusting to high precision XTE.

The "ZEUS" mode is only to be used with ZEUS Mercury Autopilot. This setting alters the "end of route" behavior of TimeZero. When the ZEUS mode is selected, all the XTE fields are set to a NULL value (,,) when reaching the end of a route. For any other Autopilots, leave that setting unchecked.

### DPT (Depth) Offset:



Indicates the type of transducer offset used in the NMEA Depth output. Make sure that the "Transducer Draft" and "Keel Draft" settings are properly setup in TimeZero from the [Initial Setup](#) Options.

### TTM Bearing and Course:

Used to output the TTM bearing relative to own ship heading (relative) or relative to North.

## To delete an output port:

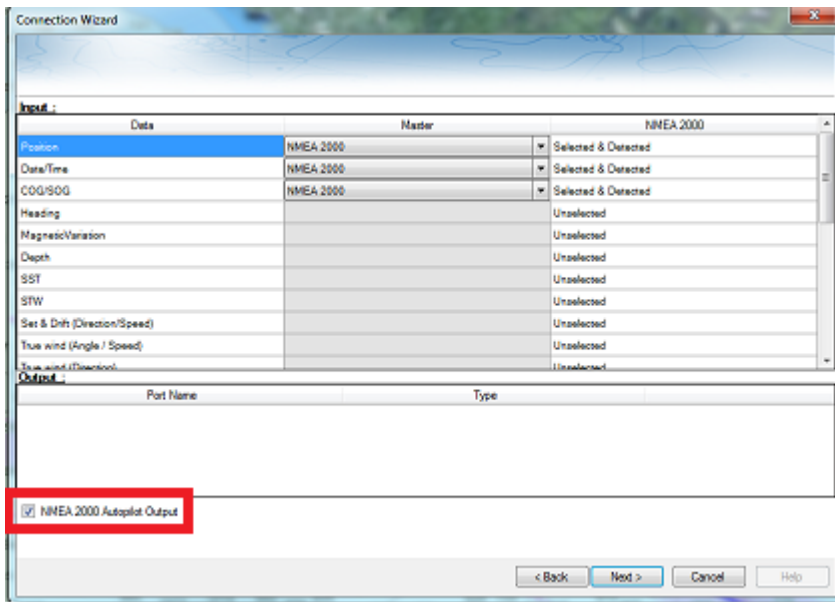
- Open the Connection Wizard
- Select "Data Source" and press "Next"
- Press "Next"
- On the Master selection page, press the "Delete" button in front of the output port you want to delete

Input :						
Data	Master	GPS	AIS	Navnet Fast Heading	Navnet NMEA	Navnet ARPA
Position	GPS	Selected & Not Date...	Unselected	Unselected	Unselected	Unselected
Date/Time		Unselected	Unselected	Unselected	Unselected	Unselected
COG/SOG	GPS	Selected & Not Date...	Unselected	Unselected	Unselected	Unselected
Heading	AIS	Unselected	Selected & Not Date...	Unselected	Unselected	Unselected
Magnetic Variation		Unselected	Unselected	Unselected	Unselected	Unselected
Depth		Unselected	Unselected	Unselected	Unselected	Unselected
SST		Unselected	Unselected	Unselected	Unselected	Unselected
STW		Unselected	Unselected	Unselected	Unselected	Unselected
Scr & Drift (Direction...		Unselected	Unselected	Unselected	Unselected	Unselected
True wind (Angle / S...		Unselected	Unselected	Unselected	Unselected	Unselected
True wind (Direction)		Unselected	Unselected	Unselected	Unselected	Unselected
Output :						
Port Name			Type			
COM 9			NMEA 0183			
						Delete

- Press "Next" and "Finish" to close the Connection Wizard

## Autopilot Output (NMEA2000)

When an Actisense NGT1-USB is connected to your computer and already setup as an input (NMEA2000 input), the last page of the Connection Wizard allows you to enable or disable the "NMEA2000 Pilot Output" (checked by default):



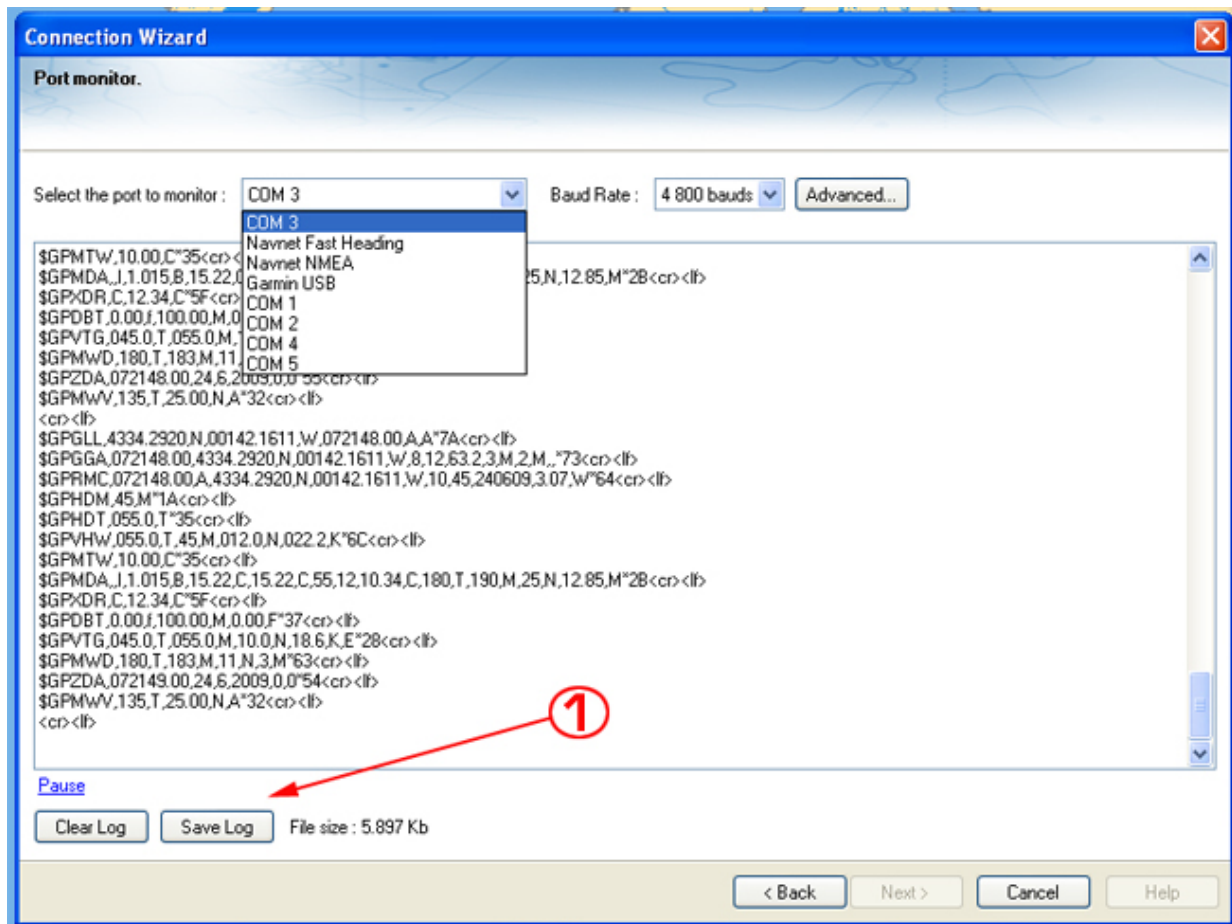
When "NMEA2000 Pilot Output" is checked, the following PGNs are automatically sent while a route is activated:

- PGN 129283 - Cross Track Error
- PGN 129284 - Navigation Data
- PGN 129285 - Navigation Route/WPT Information (used to transmit the name of the destination waypoint)

## Port Monitor

The Port Monitor is used to troubleshoot and look at the data flowing into a specific port (if any). The port monitor can analyze:

- Any Serial COM Port available on your computer
- Any UDP Port already configured in TimeZero
- The NavNet NMEA ports



The "Save Log" button allows you to create a text file containing the log of the NMEA data. This is very useful to send this file to Tech Support for analysis, in case TimeZero does not seem to decode the sentence properly.

## Data Source

The Data Source displays a "matrix" view of all the inputs and outputs and allows you to setup port priorities when more than one sensor provide the same data. All data types supported by TimeZero are listed in the first column (position, heading, etc...). Before this window is displayed, TimeZero analyzes all the inputs. For each data type and configured ports, the data source window display if it is "unselected" (unavailable), "Selected & Detected" (configured and correctly detected), or just "Selected" (configured by not detected).

If the same data type has been selected on more than one port, a drop down menu (in the "Master") column allows you to select which port to use as a primary sensor (which will be the port used for that specific data in TimeZero):

Input :				
Data	Master	COM 11	COM 5	
Position	COM 11	Selected & Detected	Selected & Detected	
Date/Time	COM 11	Unselected	Unselected	
COG/SOG	COM 11	Selected & Detected	Selected & Detected	
Heading		Unselected	Unselected	
MagneticVariation		Unselected	Unselected	
Depth		Unselected	Unselected	
SST		Unselected	Unselected	
STW		Unselected	Unselected	
Drift		Unselected	Unselected	
Current		Unselected	Unselected	
True wind (Angle / Speed)	COM 11	Selected & Detected	Unselected	
True wind (Direction)	COM 11	Selected & Detected	Unselected	

Output :			
Data	COM 11	COM 5	
MOB	Unselected	Unselected	
Auto-pilot	Unselected	Unselected	

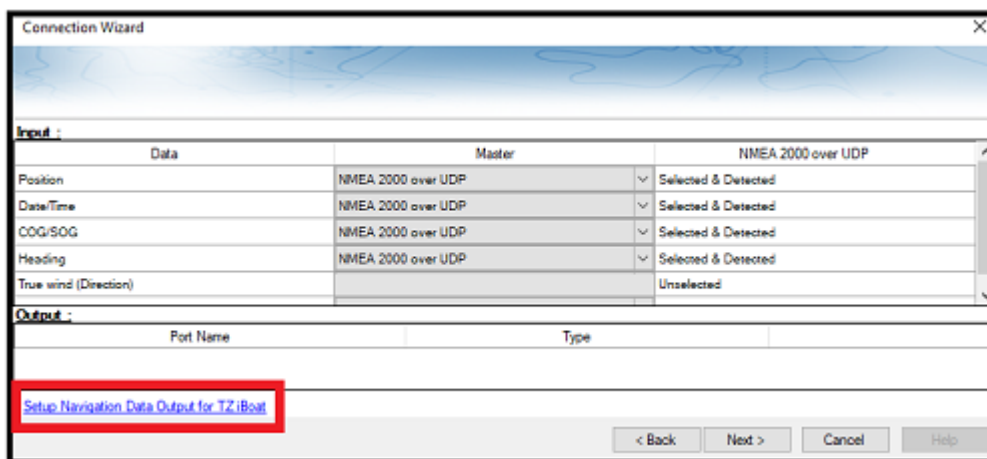
If the Master Sensor becomes unavailable, TimeZero will automatically select another for you. If the Master Sensor becomes available again, TimeZero will revert back to it automatically without user interaction.

This allows you to design a system with total redundancy (as long as you have multiple GPS sources).

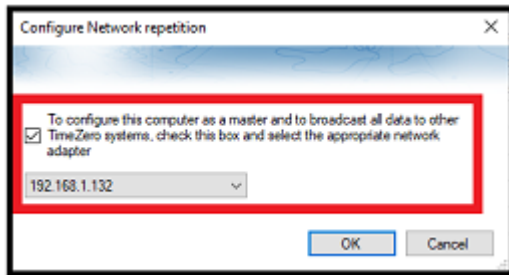
## Network Repeater

TimeZero can be setup to output navigation data on the network (Position, COG/SOG, Heading, Depth, Speed, Wind, Water Temperature and AIS) for other TimeZero devices. This feature is especially useful when [TZ iBoat](#) is connected on the same Wi-Fi network as the computer (TZ iBoat will be able to receive and display all navigation data available in TimeZero).

To enable the Navigation Data output on the network, select "Data Source" from the Connection Wizard and click on "Setup Navigation Data Output for TZ iBoat" (available from the second page):



Select the Network Adapter connected to the Wireless Network and press OK:



TZ iBoat will automatically pick up the data sent by the computer running TimeZero (no configuration needed on TZ iBoat) as long as it is connected on the same network. Note that TimeZero will output the navigation data it currently uses. For example, if two GPS are configured, whichever GPS is set as master and is currently used by TimeZero is the one that will be repeated on the network.

Although not recommended (for redundancy concerns), it is possible to configure a second (or multiple) computers running TimeZero to receive the data being sent on the network. Simply open the Connection Wizard and select the Automatic Configuration (while the TimeZero sending the data is up and running) or manually configure a UDP port on port 31000.

Note: It is not recommended to use the Network Repeater function to feed data to a second computer because if the primary computer sending the data is turned OFF, you would also lose data on the second computer. It is best practice to connect both computers directly to the navigation instruments (via NMEA0183 or NMEA2000) to have redundancy.

## Clear All

This option will erase all the Input and Output configuration of TimeZero Professional. Only use this option if you want to configure all the Inputs and Outputs of TimeZero Professional from scratch.

**Be careful as this cannot be undone.**

## Garmin GPS Gate Connection

Some Garmin GPS units do not output Position in neither NMEA0183 nor NMEA2000 data. Instead those Garmin units output in a Garmin proprietary format. TimeZero is not compatible with the Garmin proprietary data. In order for TimeZero to receive position information, a third-party software called GPS Gate Splitter (also known as Franson GPS Gate) must be installed on the computer.

GPS Gate can be setup to connect to the Garmin GPS and output standard NMEA0183 sentences using a virtual COM port. Follow the instructions below to install GPS Gate, configure it and setup TimeZero..

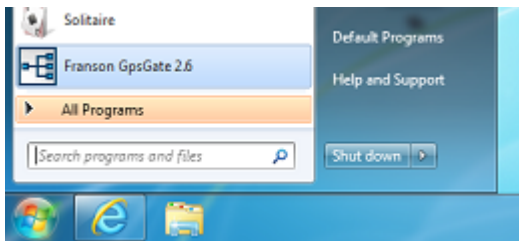
### Install GPS Gate

Open a web browser and Google "GPS Gate Client" or "GPS Gate Splitter"

**Note:** You may want to try to access the following URL directly: [http://gpsgate.com/products/gpsgate\\_client](http://gpsgate.com/products/gpsgate_client)

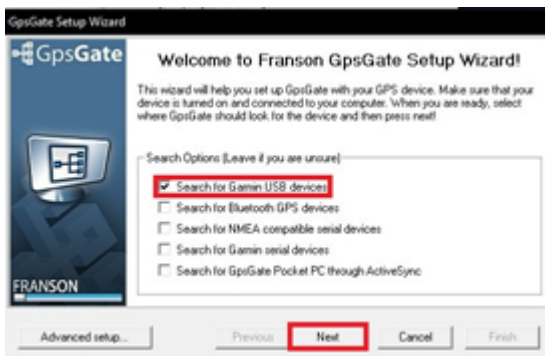
Download and install GPS Gate Splitter Express (free edition)

At the end of the installation, you should have "Franson GPSGate" available in your Windows Start menu:



## Configure GPS Gate

The first time you open GPS Gate, a wizard will appear. Select "Search for Garmin USB devices" and un-check any other selection:



Once it finds your GPS, click "Yes":

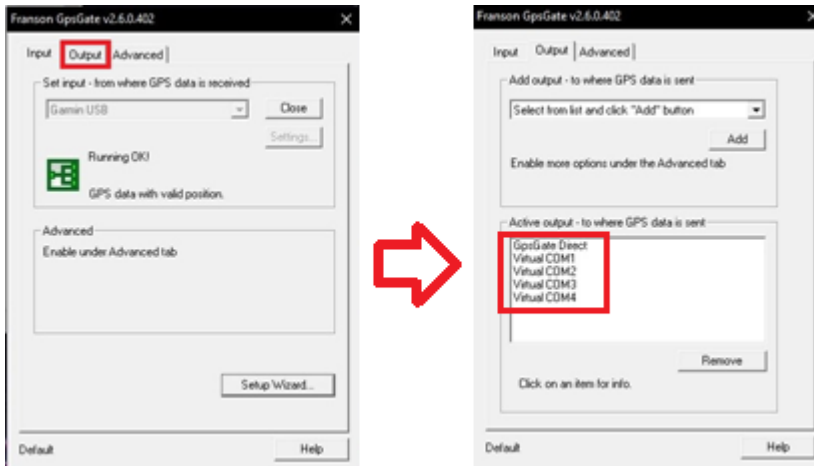


On the Select Output screen, select only "I want to share my GPS between several applications" and click next:



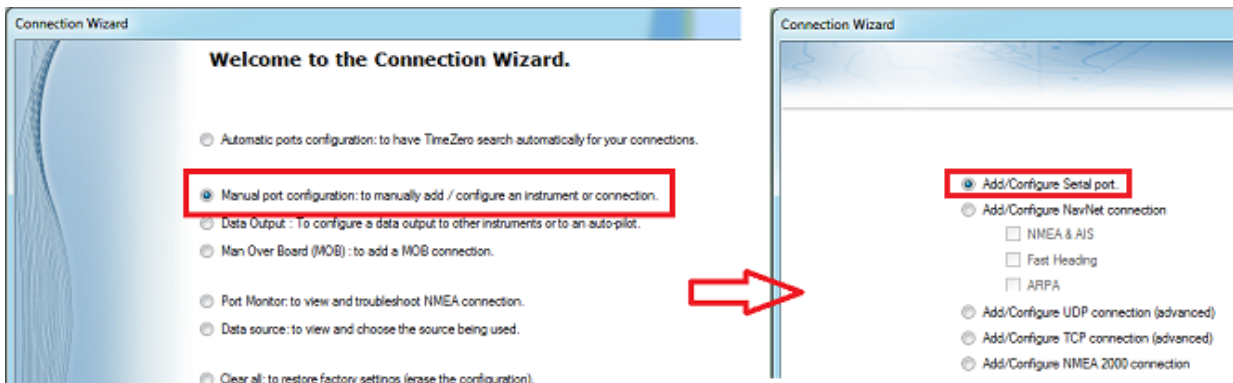
On the Summary page, click "Finish".

GpsGate is now configured and should look like the image below. Select the output tab to configure the output port. From this screen you can add or remove Virtual Com Ports:

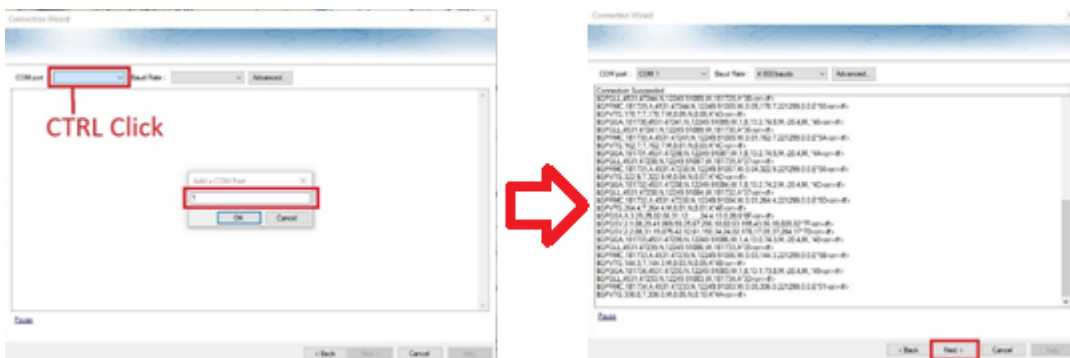


### Configure TimeZero

Open TimeZero and open the Connection Wizard. Select "Manual Port configuration" and then "Add/Configure Serial Port":



Hold the Ctrl key and Click on the COM port selection box and enter the COM port number that was configured in GpsGate and click "OK". Once you see NMEA data scrolling, click Next:



Make sure that "Detected" sentences are selected and then click Next and continue through the Connection Wizard as if it was with a regular NMEA0183 source.



## NavNet MFD & DRS Connection

The "Furuno Radar Module" needs to be unlocked prior to configure NavNet3D, NavNet TZtouch or NavNet TZtouch2 in TimeZero.

**IMPORTANT:** this chapter assume that you have a compatible NavNet MFD (NavNet3D, TZtouch or TZtouch2) connected to the network. If the DRS radar is directly connected to the PC (no MFD on the network), please refer to the [Direct DRS Connection Chapter](#).

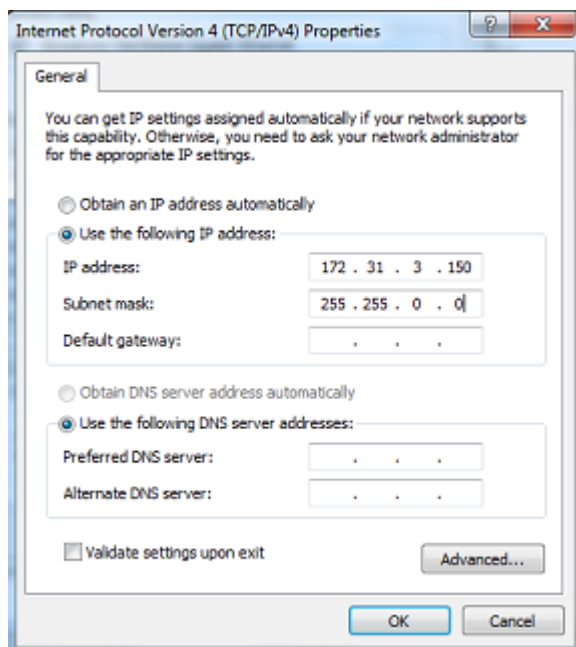
TimeZero connects to a Furuno NavNet3D, TZtouch, or TZtouch2 "MFD" (Multi Function Display) and "DRS" (Digital Radar Sensor) through an Ethernet connection (100Base-T). The computer needs to have an IP address that "matches" the Furuno Network (172.31.x.x/255.255.0.0) in order to exchange information with the MFD and DRS. We highly recommended using 172.31.3.150 as a fixed IP address for the computer with a subnet mask of 255.255.0.0.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the NavNet network (usually "Local Area Connection").

**Note:** If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the radar, you can temporary disconnect the Ethernet Cable connected to the NavNet HUB or MFD from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 172.31.3.150 with a subnet mask of 255.255.0.0:



Once the computer's IP address has been assigned, launch TimeZero in Navigation Mode. Open the "Options" by clicking on the "TimeZero" logo (located at the top left corner) and select "NavNet". Make sure that the MFD and the Radar are detected. Do not proceed to the next step until all Furuno Ethernet sensors are properly listed.

Select the Connection Wizard and perform an "Automatic Detection". TimeZero will automatically detect the Navigation Data available on the NavNet network (GPS, Heading, AIS, Wind,...).

If the NavNet instrument is not automatically detected, you can manually add a NavNet Port:

- Select "Manual Port Configuration" from the Connection Wizard and click on "Next"
- Select "Add/Configure NavNet Connection" and click on "NMEA & AIS", "Fast Heading" and "ARPA". Click on "Next"
- Make sure that the type of data you want to receive from the NavNet network are checked for the various NavNet ports

**Note:** Make sure that the MFD setup as a Master is turned on **before** starting TimeZero. TimeZero will not recognize the DRS if the NavNet MFD is turned OFF or not present on the network.

### Important Note About DHCP Server And Router On A NavNet3D Network:

Using a Router (with a DHCP server) is **absolutely forbidden** on a NavNet3D Network. The NavNet3D MFD "Master" is already a DHCP server (and would conflict with any other third party DHCP server). You may setup the computer to acquire an automatic IP address, but in that case, the NavNet3D MFD set as a Master needs to be turned ON before the computer. If the computer is connected to the network or turned ON prior to the NavNet3D MFD set as Master, the computer will not acquire a valid IP address and the Ethernet connection must be repaired manually. That is why it is recommended to setup a fixed IP address (172.31.3.150 / 255.255.0.0).

**Note:** Some PC Network Interface (under Windows7) cannot acquire an IP address from the NavNet3D DHCP server (from the Master). In these rare cases, there is no other way but to fix the IP address of the PC or use the Windows "Alternate IP Configuration"

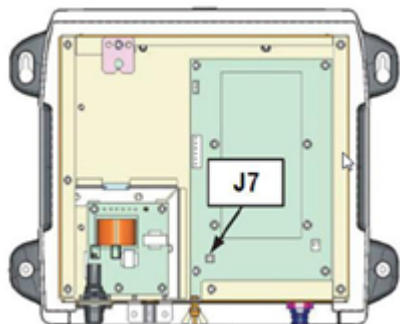
## Direct DRS Connection

**IMPORTANT:** Follow this chapter when the DRS radar is directly connected to the PC without MFD.

### Power Supply Unit Connection (optional on some models)

Some newer DRS (such as the DRS4D-NXT) do not need any Power Supply Unit and can be connected directly to the main 12v or 24v battery (refer to the Furuno DRS installation guide for more information).

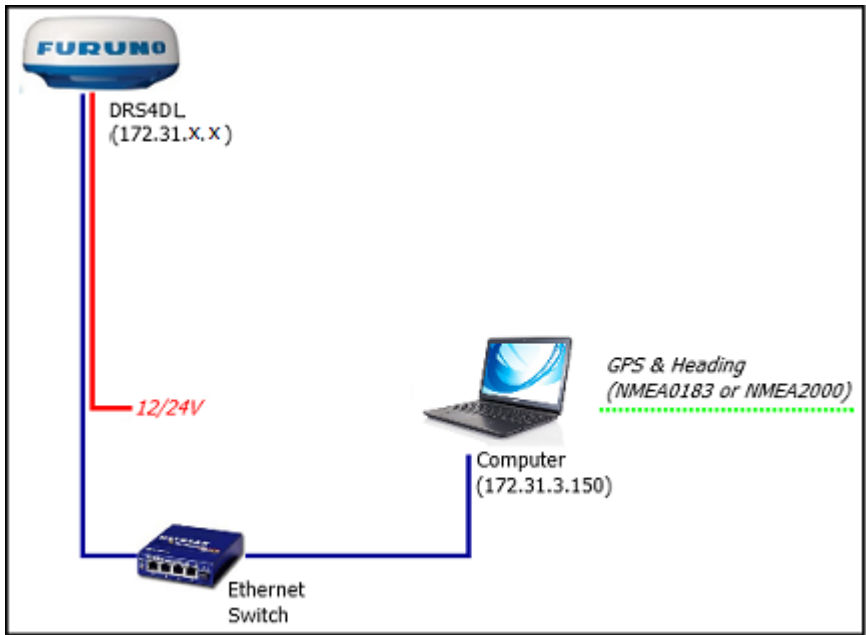
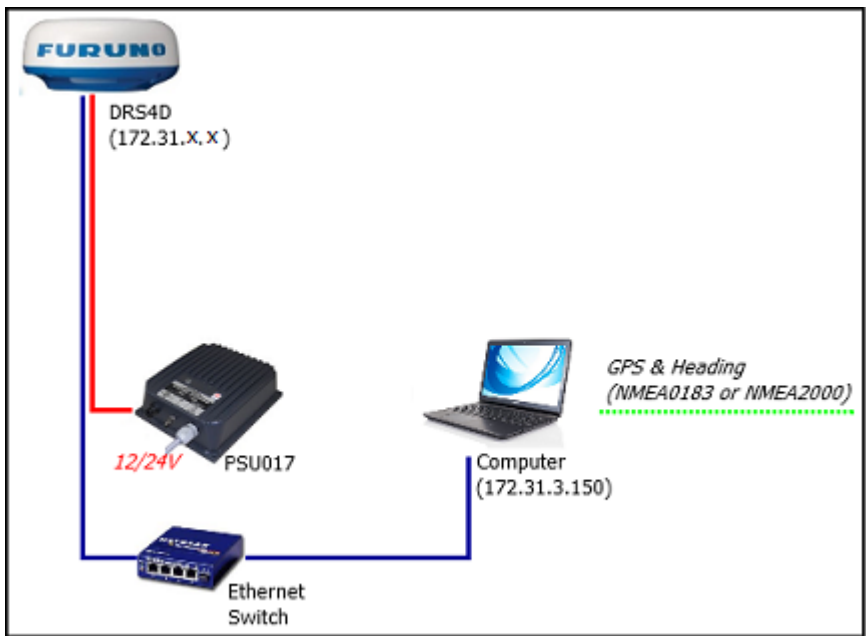
If the DRS model you use requires the PSU012 or PSU013 (Power Supply Unit) to power the antenna (48v), make sure to insert the "J7" jumper inside the PSU (under its cover). If the jumper is not inserted, the PSU will not power ON (the LED will remain OFF) even when 12 or 24v is provided



**Note:** If the PSU017 is used (for DRS dome antenna), there is no need to open the cover or insert any jumper.

## Network Connection

To connect the DRS Ethernet port to the computer, we highly recommend installing a HUB/Switch in order to be able to add additional Ethernet sensors easily (FA30, DFF1, etc...) and to be able to monitor and troubleshoot network traffic (by looking at the activity LED of the HUB):



Connect GPS, Heading and optional additional instruments to the computer using one or multiple COM ports (through a USB to Serial adapter if needed) or through NMEA2000 via the Actisense NGT1 Gateway.

**Important information regarding heading:** If you want to overlay radar on the chart, acquire ARPA targets or use the North-Up Orientation of the Radar WorkSpace, you have to provide Heading to TimeZero. For reliable ARPA, the heading refresh rate must be 10Hz or more (the heading sentences must be received 10 times per second or more). If TimeZero only receives heading once per second, ARPA reliability is not guaranteed.

**Note:** If you connect the Heading Sensor using NMEA2000 the refresh rate is always 10Hz.

**Set the IP of the Computer**

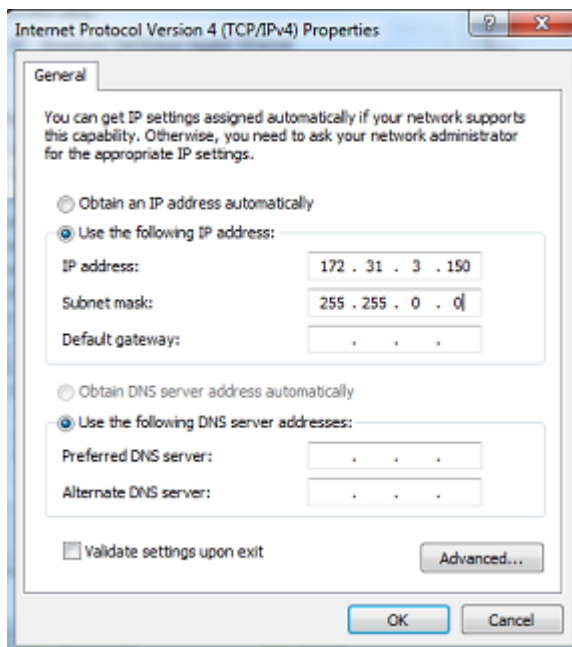
The computer needs to have an IP address that “matches” the Furuno Network (172.31.x.x/255.255.0.0) in order to exchange information with the DRS. We highly recommended using 172.31.3.150 as a fixed IP address for the computer with a subnet mask of 255.255.0.0.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the radar (usually "Local Area Connection").

**Note:** If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the radar, you can temporary disconnect the Ethernet Cable from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fixed IP address 172.31.3.150 with a subnet mask of 255.255.0.0:



Once the computer's IP address has been assigned, launch TimeZero in Navigation Mode. Open the "Options" by clicking on the "TimeZero" logo (located at the top left corner) and select "NavNet". Make sure that the Radar is detected. Do not proceed to the next step until all Furuno Ethernet sensors are properly listed.

**Note:** Make sure the DRS is turned ON **before** starting TimeZero. TimeZero will not display the Radar features if the DRS is turned OFF or not present on the network.

## Configuration

Open the [Radar](#) Options in TimeZero. Under "Radar Initial Setup", select the DRS Hostname and adjust the DRS initial settings just like you would from a NavNet3D or TZtouch MFD.

**Note:** There is no feedback when pushing the "Radar Optimization" button. This is normal!


## FAR 2XX7 Connection

### Configure the Radar

#### Check and Assign Radar Hostname(s)

When multiple radars are networked or inter-switched together, a unique "Radar Number" (and IP address) must be assigned to each radar processor. Note that for TimeZero to correctly detect the radar, at least one Radar Processor must be assigned to 172.31.3.6.

**IMPORTANT:** The FAR2xx7 IP address must be set up to 172.31.3.6. TimeZero will not be able to connect to the radar if the FAR2xx7 is set to another type of IP address. If the FAR is set with an IP address of 192.168.31.x (for ECDIS), make sure to revert DIP#4 to the OFF position on S1, then perform a factory reset. This will switch the FAR back to the Class B 172.31.x.x IP address:



S1	Monitor SXGA for FAR-2117, 2127 (Default)	Monitor UXGA for FAR2817, 2827 (MU-231CR S. No. 0269 or later*)	FAR-2117-BB FAR-2127-BB
1	OFF	ON	OFF
2	OFF	OFF	ON
3	OFF		
4	OFF = 172.31.x.x / ON = 192.168.31.x		

To assign the radar number, hold "HL OFF" and press the "MENU" key 5 times on the FAR 2XX7. The "Initialize" menu will appear. Select "Installation" (4), then Radar NO (4). Once the radar number is changed, the radar must be restarted to store the new setting. If applicable, follow the same procedure for each radar on the network, and then confirm that each radar number is unique. You cannot have two radars on the same network with the same name or number.

**Note:** Whenever a network change is made, it is recommended that all radars are powered down and restarted.

To confirm the network settings and communications between multiple radars, power up all of the radars in the network, then right click on the Radar Antenna box (top left corner). The antenna information for all of the available radars in a network will appear on the right in the menu panel. Be sure that all the radars on the network are listed in this panel. If not, check the cables and the network settings.

#### IMO Mode

When TimeZero is interconnected to the FAR2xx7 via the network, the radar should be set to IMO Mode B, C or W. To set the IMO type, hold "HL OFF" and press the "MENU" key 5 times on the FAR 2XX7. The "Initialize" menu will appear. Select "Installation" (4), then "Type" (7). Set to "B", "C" or "W" ("W" is recommended).

#### SIO LAN Output

The FAR2xx7 SIO LAN Output has to be turned OFF (which is the default setting on the FAR). To make sure this setting is OFF, right click on the "Own Ship Position" box on the FAR and select OFF for the "SIO Data LAN Output" (3).

### Configure the computer

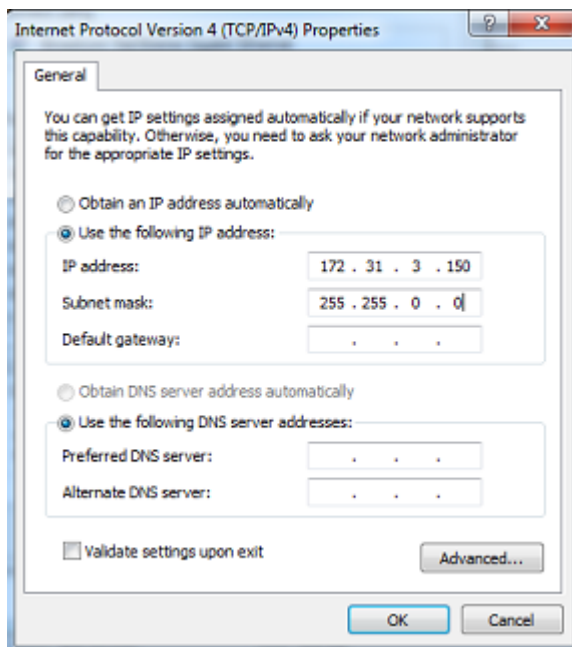
TimeZero connects to a Furuno FAR 2xx7 radar through an Ethernet connection (100Base-T). The computer needs to have an IP address that "matches" the Furuno Network (172.31.x.x / 255.255.0.0). We recommended using 172.31.3.150 as a fix IP address for the computer with a subnet mask of 255.255.0.0.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the radar (usually "Local Area Connection").

**Note:** If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the radar, you can temporary disconnect the Ethernet Cable connected to the radar from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 172.31.3.150 with a subnet mask of 255.255.0.0:

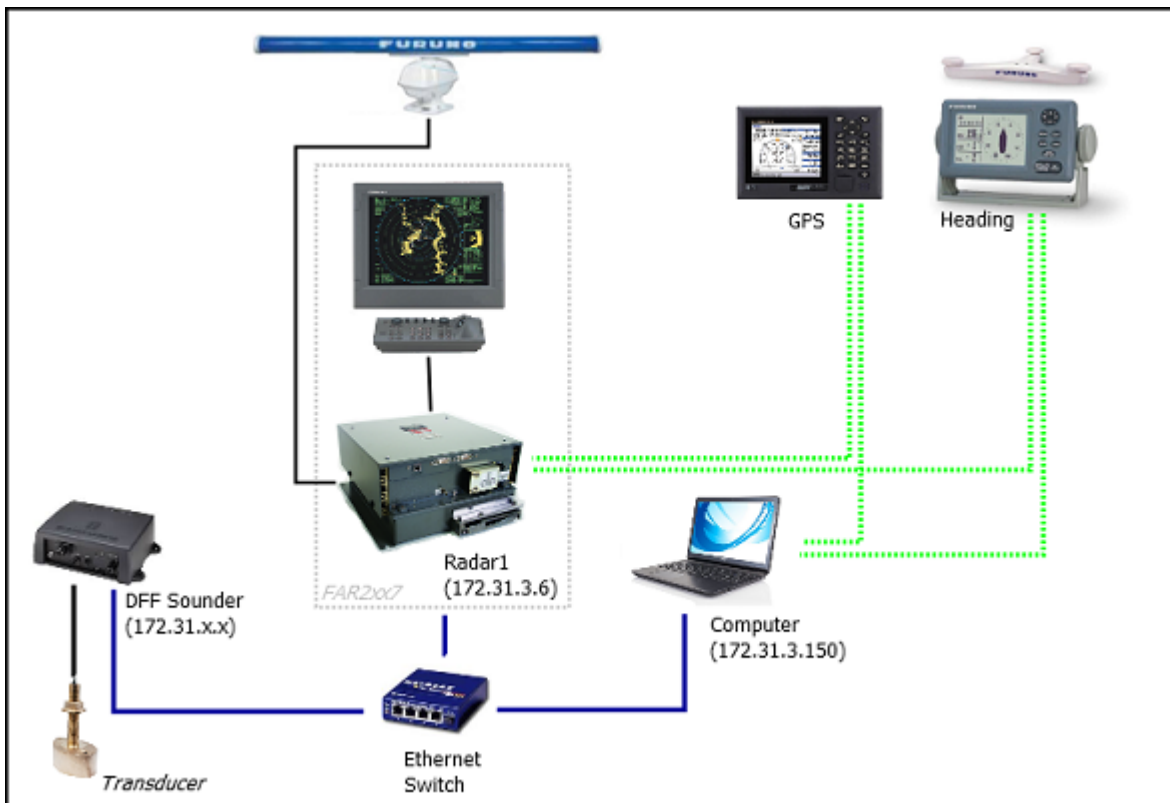


Once the IP address of the computer has been assigned, launch TimeZero in Navigation Mode.

## Configure Instruments

Instruments (GPS, Heading, AIS, ...) need to be connected directly to the computer via NMEA0183 or NMEA2000. When connecting instruments to TimeZero, it is very important to make sure that the same GPS and Heading sources connected to the FAR radar are also used and connected to TimeZero. Connecting a different GPS and/or Heading source will result in radar overlay issue.

Note that it is possible to connect NavNet sensors (such as a DFF1-UHD sounder) to the same network so that TimeZero can display Radar and Sounder Echo:



**Note:** The FAR "SIO LAN Output" can interfere with other NavNet sensors (such as Ethernet Sounders) that may be present on the network, and thus, it should be turned OFF.

## ARPA Configuration

TimeZero can operate in two modes for ARPA processing. It can either use the ARPA data processed by the Radar (default), or use its own local ARPA processing. This setting is adjusted from the Radar Options using the "ARPA Processing" option. If you want TimeZero and the FAR to share the same ARPA data, make sure to leave this option to "Radar Antenna" and configure the FAR radar and TimeZero with the instructions below.

### 2XX7 Configuration:

The ARPA target output must be setup through the LAN from one FAR2xx7. Hold "HL OFF" and press the "MENU" key 5 times. The "Initialize" menu appears. First, select "TT Preset" (6). Select "True" for "TTM Output" (2). Select "Back" to return to the "Initialize" menu and select "Other" (8). Set "INS" (5) to "LAN".

### TimeZero Configuration:

In order for the ARPA target to be received over the network, you need to configure it manually in the software:

- Open the Connection Wizard
- Select "Manual Port Configuration" and click on "Next"
- Select "Add/Configure UDP Connection" and click on "Next"
- Select the IP address that begins with 172.31.x.x from the "Network Adapter" drop down menu and type "10028" for the "UDP Port". Click on "Next"
- When TimeZero is done analyzing the port, select "UDP 10028" in the list on the left and make sure that "ARPA" is checked in the list on the right. Click "Next" then "Finish".

**Note:** You can only use the ARPA data from one FAR radar on the network.

## FAR15x3 & FAR15x8 Connection

### Configure the Radar

#### **Check and Assign Radar Hostname(s)**

When multiple radars are networked or inter-switched together, a unique "Radar Number" (and IP address) must be assigned to each radar processor. Note that for TimeZero to correctly detect the radar, the IP address must match the NavNet IP address 172.31.x.x (172.31.3.17 by default).

The Radar number can be adjusted from the Radar Installation Menu. To access the Installation menu on a FAR15xx, press and hold the "HL OFF" button while pushing 5 times the "MENU" button. This should bring the "Radar Installation" menu on screen. Select "Installation" and adjust the "RADAR NO" (4).

**Note:** Whenever a network change is made, it is recommended that all radars are powered down and restarted.

#### **IMO Mode**

When TimeZero is interconnected to the FAR15xx via the network, the radar should be set to the "non-IMO" mode. From the same "Installation" menu, set "Type" (7) to "non-IMO".

#### **SIO LAN Output**

The FAR15xx SIO LAN Output has to be turned OFF (which is the default setting on the FAR). To make sure this setting is OFF, right click on the "[OS POSN]" box on the FAR and select OFF for the "SIO Data LAN Output" (3).

### Configure the computer

TimeZero connects to a Furuno FAR15xx radar through an Ethernet connection (100Base-T). The computer needs to have an IP address that "matches" the Radar Network (172.31.x.x / 255.255.0.0) in order to exchange information with the radar. We highly recommended using 172.31.3.150 as a fix IP address for the computer with a subnet mask of 255.255.0.0.

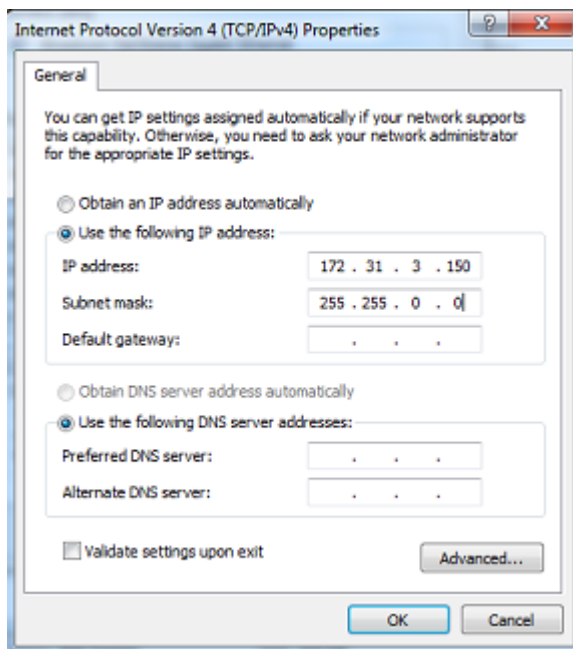
Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the radar (usually "Local Area Connection").

**Note:** If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the radar, you can temporary disconnect the Ethernet Cable connected to the radar from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 172.31.3.150 with a subnet mask of 255.255.0.0:



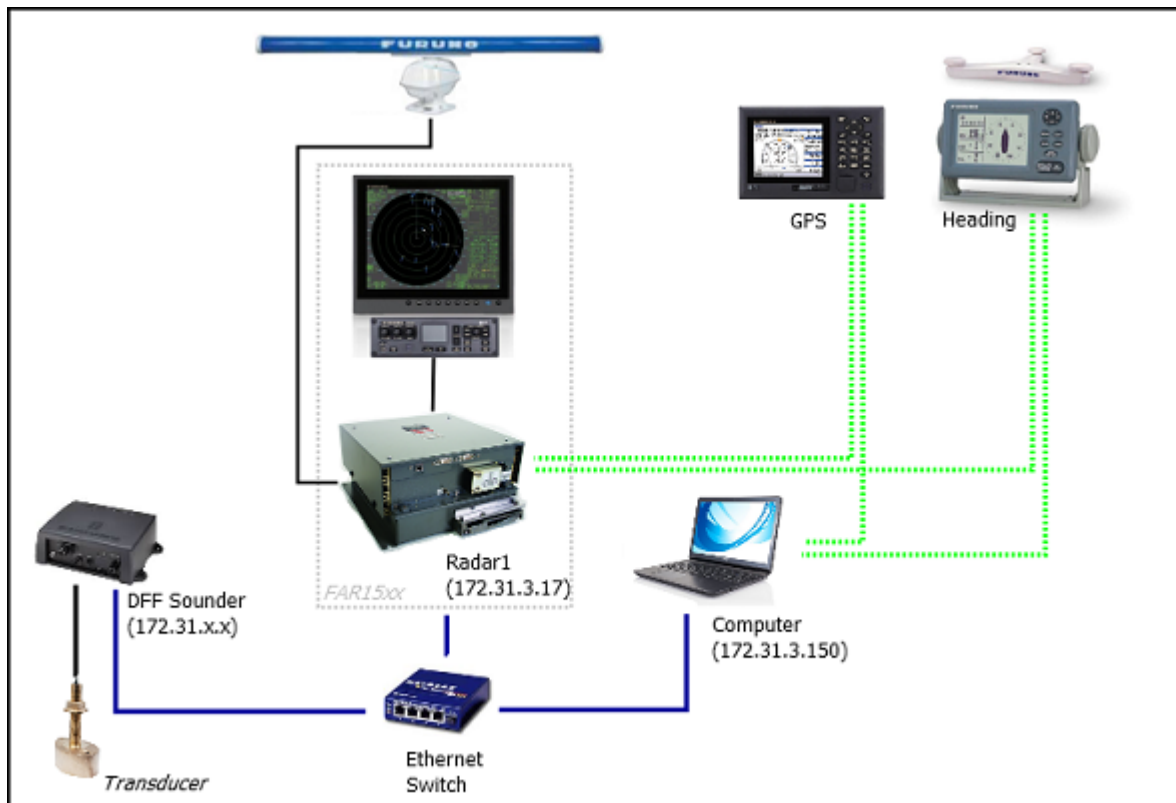


Once the IP address of the computer has been assigned, launch TimeZero in Navigation Mode.

## **Configure Instruments**

Instruments (GPS, Heading, AIS, ...) need to be connected directly to the computer via NMEA0183 or NMEA2000. When connecting instruments to TimeZero, it is very important to make sure that the same GPS and Heading sources connected to the FAR radar are also used and connected to TimeZero. Connecting a different GPS and/or Heading source will result in radar overlay issue.

Note that it is possible to connect NavNet sensors (such as a DFF1-UHD sounder) to the same network so that TimeZero can display Radar and Sounder Echo:



**Note:** The FAR "SIO LAN Output" can interfere with other NavNet sensors (such as Ethernet Sounders) that may be present on the network, and thus, it should be turned OFF.

## ARPA Configuration

TimeZero can operate in two modes for ARPA processing. It can either use the ARPA data processed by the Radar (default), or use its own local ARPA processing. This setting is adjusted from the [Radar](#) Options using the "ARPA Processing" option. If you want TimeZero and the FAR to share the same ARPA data, make sure to leave this option to "Radar Antenna" and configure the FAR radar and TimeZero with the instructions below.

### FAR15xx Configuration:

The ARPA target output must be setup through the LAN from one Radar. Hold "HL OFF" and press the "OFF CENTER" key 5 times to display the "Factory" menu. Select "Back", select "Other" and set "INS" to "LAN". Select "Back" two times to display the "Radar Installation" menu. Select "TT PRESET", select "TT DATA OUTPUT" and set "Select Sentence" to "TTM" and "TTM Reference" to "True".

### TimeZero Configuration:

In order for the ARPA target to be received over the network, you need to configure it manually in the software:

- Open the Connection Wizard
- Select "Manual Port Configuration" and click on "Next"
- Select "Add/Configure UDP Connection" and click on "Next"
- Select the IP address that begins with 172.31.x.x from the "Network Adapter" drop down menu and type "10028" for the "UDP Port". Click on "Next"
- When TimeZero is done analyzing the port, select "UDP 10028" in the list on the left and make sure that "ARPA" is checked in the list on the right. Click "Next" then "Finish".

**Note:** You can only use the ARPA data from one FAR radar on the network.

## FAR2xx8 Connection

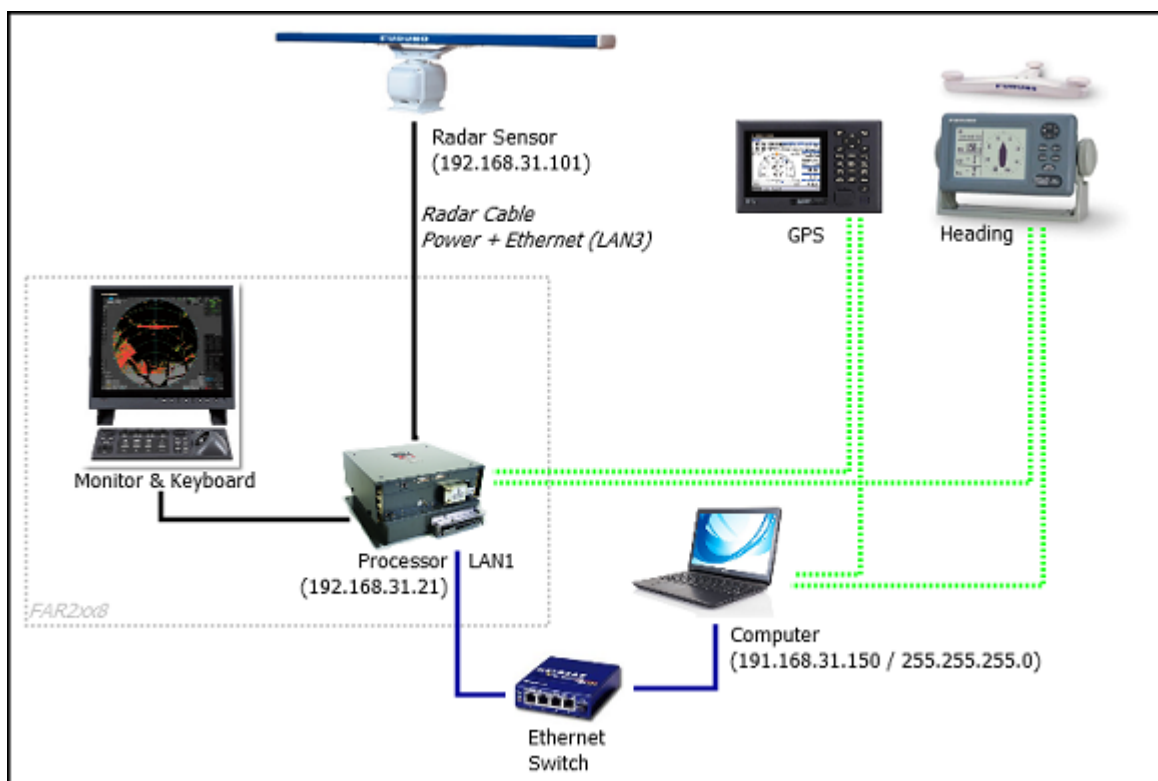
### Configure the Radar

#### Set the FAR2xx8 IP Address

The PC communicates directly with the FAR2xx8 radar via its LAN1 port. The FAR2xx8 was designed to operate on either a CLASS C or CLASS B network.

#### CLASS C ("ECDIS") IP

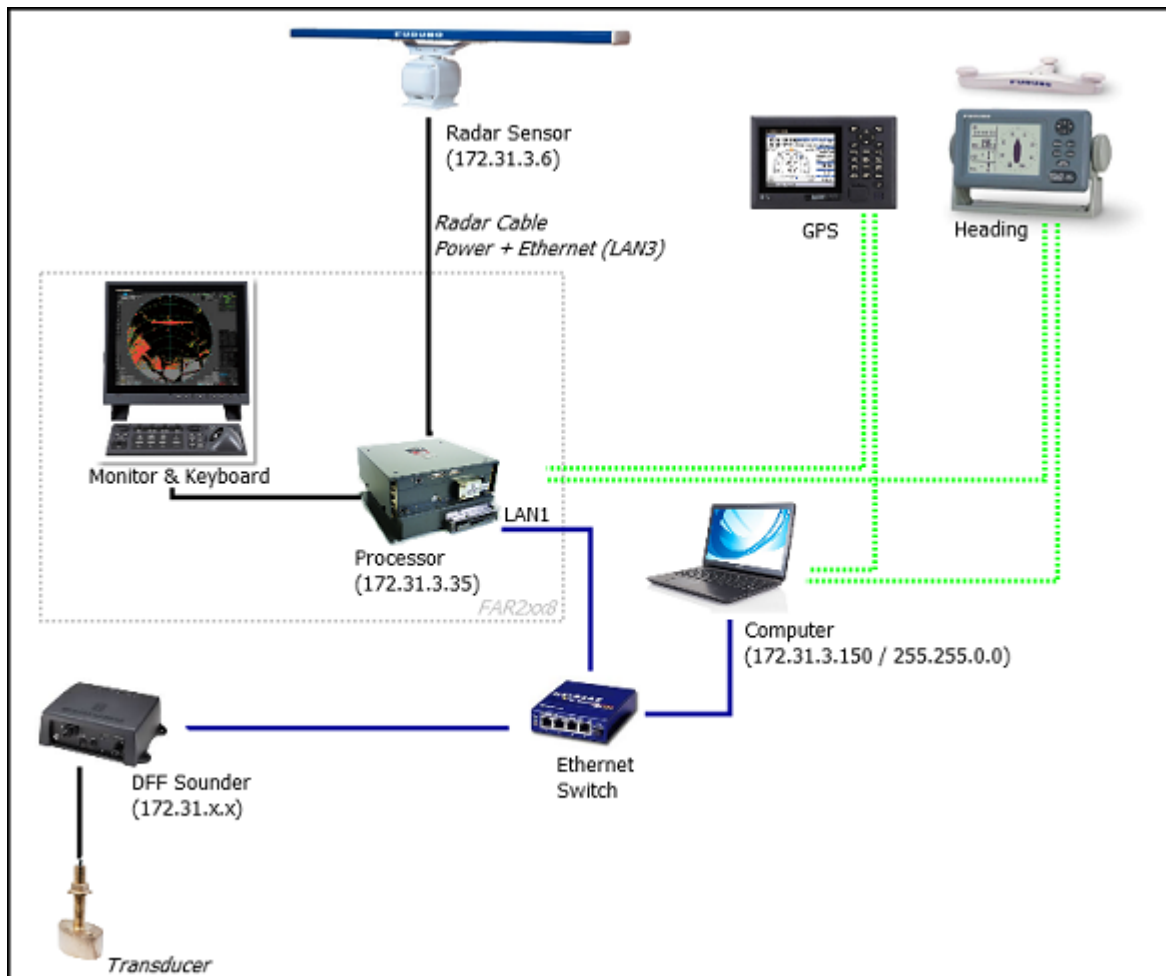
By default, the FAR2xx8 operates on a Class C network 192.168.31.x / 255.255.255.0 ("ECDIS network"). For most application, it is recommended to leave the radar with its default IP address (LAN1: 192.168.31.21 / SCAN: 192.168.31.101) and configure the computer IP address accordingly:



**IMPORTANT:** With this Class C IP address, you cannot mix and connect any NavNet Sounder (DFF1-UHD for example) with the FAR2xx8. This is because the NavNet sounders were designed to only operate on the "NavNet" network (172.31.x.x). Note that it is NOT possible to use a second Ethernet card on the computer to connect the sounder. This is because TimeZero can only use one Ethernet Card at a time for Furuno Sensor communication (Radar and Sounder). If you want to integrate TimeZero to a FAR2xx8 and a NavNet Sounder, you will have to change the IP address of the FAR2xx8 to a CLASS B network (see below).

#### CLASS B ("NavNet") IP

If you want to connect a FAR2xx8 radar and a network sounder, it is possible to switch the FAR2xx8 to the CLASS B network (172.31.x.x):



To change the CLASS and IP address of the FAR2xx8, hold "HL OFF" and press the "MENU" key 5 times. The Radar Installation menu will appear. Select "Next" (0), then "Network Settings" (2). Under "LAN 1.3 IP Address", set the Class to "B", then set the "LAN1 IP address" to "172.31.3.35" and "SCAN" to "172.31.3.6".

Once the radar IP is changed, the radar must be restarted to store the new setting.

**IMPORTANT:** Because TimeZero cannot output any Navigation data on the network (Position, COG/SOG, Heading, Pitch & Roll, Heave) in presence of a FAR2xx8, only basic single beam sounder integration is supported. It is NOT possible to mix a DFF3D and FAR2xx8 on the same network. It is also NOT possible to mix a FAR2xx8 and a DRS radar on the same network. Also, please note that sounder heave compensation is not supported.

**Note:** If multiple radars are networked or inter-switched together, a unique Radar Number must be assigned to each radar processor and radar sensor. This can be done from the first page of the FAR2xx8 "Installation" menu.

## IMO Mode

When TimeZero is interconnected to the FAR2xx8 via the network, the radar should be set to IMO Mode B or W. To set the IMO type, hold "HL OFF" and press the "MENU" key 5 times on the FAR2XX8. The "Radar Installation" menu will appear. Select "Installation" (5), then "Type" (6). Set to "B" or "W" ("W" is recommended).

## SIO LAN Output

The FAR2xx8 SIO LAN Output should be turned OFF (which is the default setting on the FAR). To make sure this setting is OFF, right click on the [POSN] box located at the top right of the FAR2xx8 screen:



Select OFF for the "SIO Data LAN Output" (4).

Instruments (GPS, Heading, AIS, ...) need to be connected directly to the FAR2xx8 and to the computer. When connecting instruments to TimeZero (via NMEA0183 or NMEA2000), it is very important to make sure that the same GPS and Heading sources connected to the FAR radar are also used and connected to TimeZero. Connecting a different GPS and/or Heading source will result in radar overlay issue.

### Configure the computer

TimeZero connects to the FAR2xx8 radar through an Ethernet connection (100Base-T) via the LAN1 port of the radar processor. The computer needs to have an IP address that "matches" the Radar Network (192.168.31.x / 255.255.255.0 or 172.31.x.x / 255.255.0.0 according to the CLASS selected on the FAR2xx8). We highly recommended using the following IP for the computer:

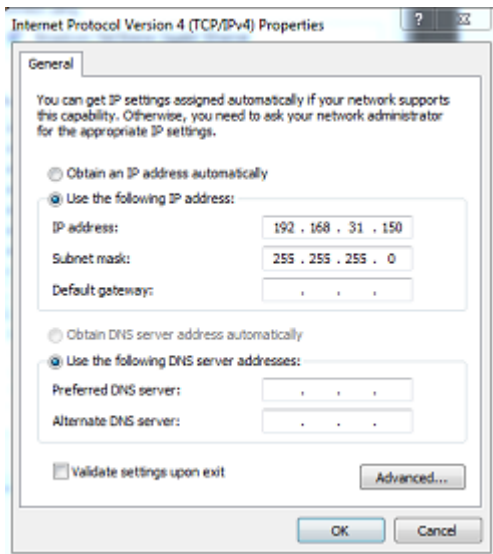
- 192.168.31.150 with a subnet mask of 255.255.255.0 when the FAR2xx8 is set for CLASS C (Default "ECDIS" network)
- 172.31.3.150 with a subnet mask of 255.255.0.0 when the FAR2xx8 is set for CLASS B ("NavNet" Network)

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the radar (usually "Local Area Connection").

**Note:** If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the radar, you can temporary disconnect the Ethernet Cable connected to the radar from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 192.168.31.150 with a subnet mask of 255.255.255.0 (or 172.31.3.150 with a subnet mask of 255.255.0.0 if CLASS B was selected):



Once the computer's IP address has been assigned, it is recommended to Ping the IP address of the Radar Processor Unit (192.168.31.21 by default) and the Scanner unit (192.168.31.101 by default) to make sure the network is correctly set up. For more information on how to ping an Ethernet device, refer to the [How To Ping](#) chapter. Once connectivity has been confirmed, launch TimeZero.

## **ARPA Configuration**

TimeZero can operate in two modes for ARPA processing. It can either use the ARPA data processed by the Radar (default), or use its own local ARPA processing. This setting is adjusted from the [Radar](#) Options using the "ARPA Processing" option. If you want TimeZero and the FAR to share the same ARPA data, make sure to leave this option to "Radar Antenna" and configure the FAR radar and TimeZero with the instructions below.

### **2XX8 Configuration:**

The ARPA target output must be setup through the LAN from one FAR2xx8. Hold "HL OFF" and press the "MENU" key 5 times. The Radar Installation menu will appear. Select "Next" (0), then "Other Settings" (3). Set "ECDIS" (4) to "LAN". Go back to the initial Radar Installation menu (first page), then select "TT Preset" (6), then "TT Data Output" (2). Set "Select Sentence" (2) to "TTM" and "TTM/TTD Reference" (3) to "TRUE".

### **TimeZero Configuration:**

In order for the ARPA target to be received over the network, you need to configure it manually in the software:

- Open the Connection Wizard
- Select "Manual Port Configuration" and click on "Next"
- Select "Add/Configure UDP Connection" and click on "Next"
- Select the IP address that begins with 192.168.31.x from the "Network Adapter" drop down menu (or 172.31.x.x if the CLASS was changed) and type "10028" for the "UDP Port". Click on "Next"
- When TimeZero is done analyzing the port, select "UDP 10028" in the list on the left and make sure that "ARPA" is checked in the list on the right.
- Click "Next" then "Finish" to close the connection Wizard

**Note:** You can only use the ARPA data from one FAR radar on the network.

## **FAR 3xx0 Connection**

The FAR3xxx communicates directly with TimeZero via LAN1 of the processor unit.

**IMPORTANT:** You cannot mix and connect any NavNet sensors (DFF sounders or DRS radars) and FAR3xxx at the same time to TimeZero. NavNet sensors were designed to only operate on the "NavNet" network (172.31.x.x) which is incompatible with the FAR3xxx network (192.168.31.x). Note that it is NOT possible to use a second Ethernet card on the computer to connect NavNet sensors. This is because TimeZero can only use one Ethernet Card at a time for Furuno Sensor communication (Radar and Sounder).

## **Configure the Radar**

### **Check and Assign Radar Hostname(s)**

When multiple radars are networked or inter-switched together, a unique "Equipment ID" (and IP address) must be assigned to each processor and radar sensor. Note that for TimeZero to correctly detect the radar, at least one Radar Sensor Unit must be assigned to 192.168.31.101. Please refer to the Furuno Radar Installation Manual to properly setup Equipment ID (and IP address):

Processor Unit		
Equipment ID	CRA001	
Equipment Name	No.1 Chart Radar	
Equipment Type No.	FAR-3xx0	
Subsystem	*****	
IP Address	Sensor Network	172 . 31 . 16 . 21
	Gateway Network	192 . 168 . 31 . 31
Serial No.	4395-2953	

Radar Sensor Unit	
Equipment ID	RAS001
Equipment Name	No.1 Radar Sensor
Equipment Type No.	FAR-3xx0 SSD
Antenna Position	*****
IP Address	192 . 168 . 31 . 101
Serial No.	

### IMO Mode

When TimeZero is interconnected to the FAR3xxx via the network, the radar should be set to IMO Mode B. To set the IMO type, hold "HL OFF" and press the "MENU" key 5 times on the FAR3xxx. The "Radar Installation" (9) menu will appear. Select "Installation" (3), then "Type" (3). Set to "B".

### Configure the computer

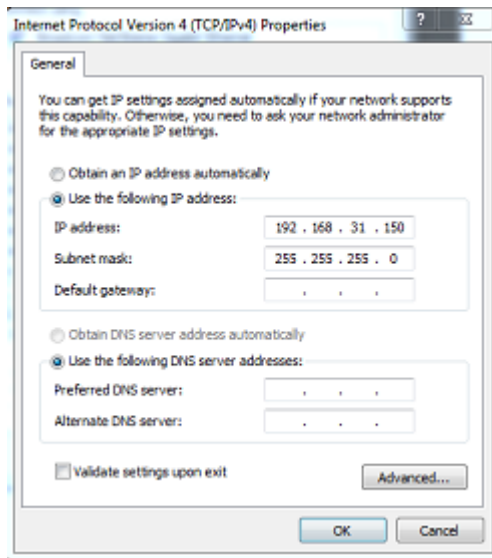
TimeZero connects to a Furuno FAR3xxx radar through an Ethernet connection (100Base-T). The computer needs to have an IP address that "matches" the Radar Network (192.168.31.x / 255.255.255.0) in order to exchange information with the radar. We highly recommended using 192.168.31.150 as a fix IP address for the computer with a subnet mask of 255.255.255.0.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the radar (usually "Local Area Connection").

**Note:** If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the radar, you can temporary disconnect the Ethernet Cable connected to the radar from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

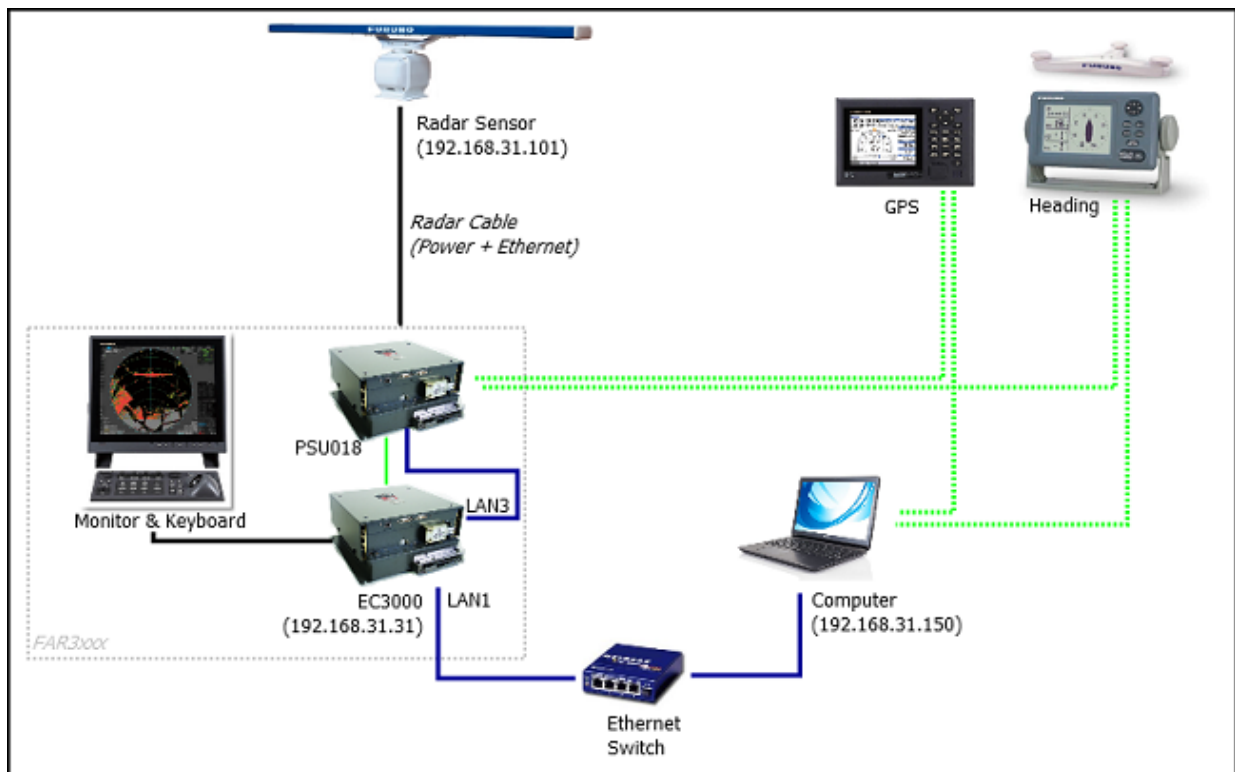
Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 192.168.31.150 with a subnet mask of 255.255.255.0:



Once the computer's IP address has been assigned, it is recommended to Ping the IP address of the Radar Sensor Unit (192.168.31.101) to make sure the network is correctly set up. For more information on how to ping an Ethernet device, refer to the [How To Ping](#) chapter. Once connectivity has been confirmed, launch TimeZero

## Configure Instruments

Instruments (GPS, Heading, AIS, ...) need to be connected directly to the computer via NMEA0183 or NMEA2000. When connecting instruments to TimeZero, it is very important to make sure that the same GPS and Heading sources connected to the FAR radar are also used and connected to TimeZero. Connecting a different GPS and/or Heading source will result in radar overlay issue.





## ARPA Configuration

At this time, TimeZero cannot "share" the same ARPA target with the FAR3xxx (unless a TTM serial output is configured). It is recommended to use TimeZero own local ARPA processing. This setting is adjusted from the TimeZero [Radar Options](#) by setting "ARPA Processing" to "TimeZero".

## DFF1 & BBDS1 Sounder

The "Furuno Sounder Module" needs to be unlocked prior to configure a Furuno Ethernet Sounder in TimeZero.

### Introduction

TimeZero can be connected to a NavNet network that includes an MFD (TZtouch/TZtouch2/TZtouch3) and a DFF1/BBDS1 or TimeZero can be connected directly to a DFF1/BBDS1 (without any MFD on the network). When there is no MFD on the network, and if you want to use the Heave Compensation feature of the sounder, TimeZero will need to be connected to a Furuno Satellite Compass (in order to provide Heave, Pitch and Roll information to the sounder). If there is an MFD on the network, connect the Furuno Satellite Compass to the MFD (which will be in charge of sending Heave, Pitch and Roll information to the sounder).

### Computer Setup

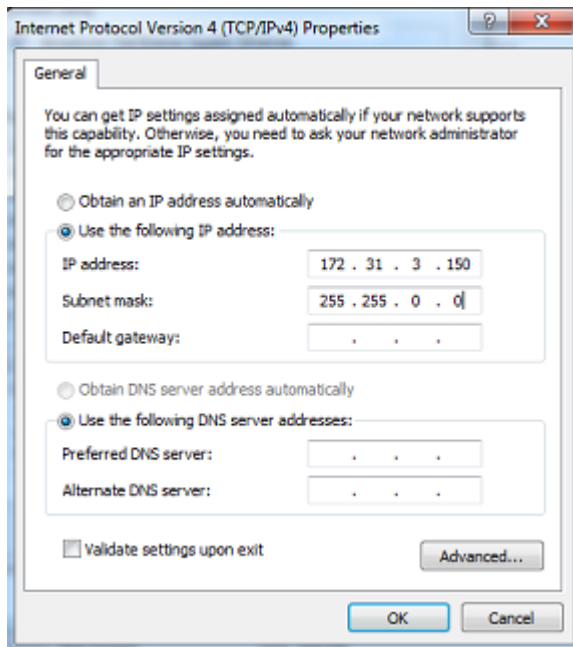
The DFF1 or BBDS1 connects to the PC through an Ethernet connection (100Base-T). All the Furuno Ethernet sensors (including Ethernet sounders) only operate on the 172.31.x.x / 255.255.0.0 class B network. You will have to setup your computer IP address to match that network. We highly recommended using 172.31.3.150 as a fixed IP address for the computer with a subnet mask of 255.255.0.0.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the sounder (usually "Local Area Connection").

**Note:** If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the sounder, you can temporary disconnect the Ethernet Cable connected to the sounder from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 172.31.3.150 with a subnet mask of 255.255.0.0:



## Sounder Setup

Make sure that the DFF1 or BBDS1 is set for the fix IP address mode. Remove the "MODE SW" rubber cap on the DFF1/BBDS1 side panel and make sure that DIP Switches are in the configuration "Down-Up-Up-Down":



Connect the DFF1/BBDS1 to the computer (directly or via a HUB/Switch).

**Note:** You can "Ping" the DFF1 or BBDS1 from the computer to make sure that the network connection in between the computer and the sounder is OK. The address of the DFF1 and BBDS1 to ping is: 172.31.92.1. For more information on how to ping an Ethernet device, refer to the [How To Ping](#) chapter.

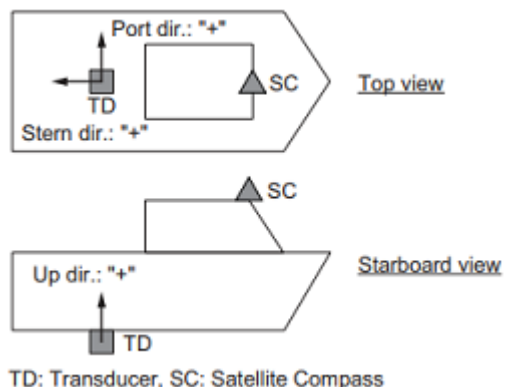
## TimeZero Settings

Open TimeZero in Navigation mode, select the **Sounder** Options and make sure that the "DFF1" or "BBDS1" is set as a Fish Finder Source.

Click on the "Transducer Setup" button. Select "TD-ID" if your transducer has this capability. If not, select "Model" to pick a model number or "Manual" to adjust the settings manually (frequency and power).

**IMPORTANT:** If you are setting up a BBDS1, "Manual" or "TD-ID" CANNOT be used. If you want the Bottom Discrimination to work properly, the transducer needs to be set to "Model" with a valid transducer model selected. If you have trouble with the Bottom Discrimination not appearing in TimeZero, please refer to the "Bottom Discrimination Troubleshooting" section below.

If you want to use the Heave Compensation, make sure to select the corresponding Satellite Compass which is connected to TimeZero (or to the MFD) and enter the various offsets using the coordinate system below (origin is the transducer):



Enter the distance between the transducer(s) and the Satellite Compass antenna. For the Bow-Stern direction, enter a negative value if the transducer is located on the aft side of the Satellite Compass (like in the picture above). For the Port/Starboard direction, enter a positive value if the transducer is located on the starboard side of the Satellite Compass.

**Note:** If you are using a SCx20 Furuno Satellite compass, select "SC30".

Once you are done with the transducer settings, click on "Close" to validate the setting and close the transducer setup window.

Close TimeZero, restart the DFF1 or BBDS1 and restart TimeZero.

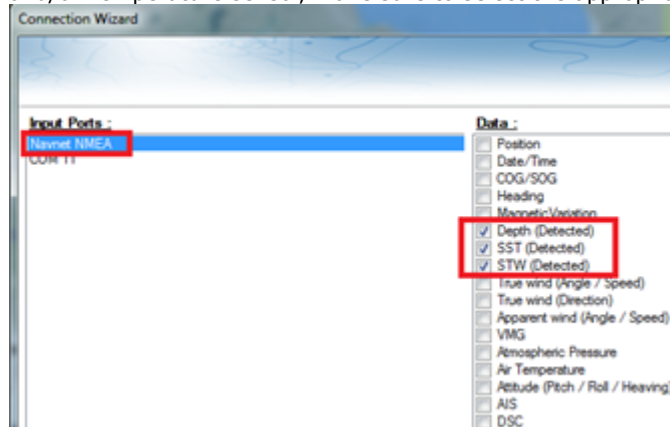
Select the [Sounder](#) Options again and make sure to adjust the "Transducer Draft" under the "Sounder Initial Setup".

Close the TimeZero Options and select the Sounder WorkSpace: you should see the sounder picture scrolling on the screen. Adjust the Sounder Range to get a good view of the bottom (it is recommended to set the mode to Auto Fishing).

Note that the depth, temperature and speed data is sent to TimeZero via the Ethernet connection on the NavNet NMEA port. Follow the instructions below to configure the NavNet port:

- Select "Connection Wizard" that can be found under the "TimeZero" button
- Select "Manual Port Configuration" from the Connection Wizard
- Select "Add/Configure NavNet Connection" and click on "NMEA & AIS"

- Make sure that at minimum "Depth" is checked for the "NavNet NMEA" port. If the transducer has a Speed and/or Temperature sensor, make sure to select the appropriate data:



**Note:** In some instances, when the DFF1/BBDS1 is connected to a transducer **without** speed sensor, it will still send a wrong "STW" value (that will always be set to 0). In that case, make sure to **uncheck** "STW" from the Connection Wizard.

- Click on "Next" and "Finish" to close the Connection Wizard

If you want to use the Heave Compensation feature, make sure TimeZero has been configured to receive Heave, Pitch and Roll from the Connection Wizard (you can display these values in a NavData to confirm proper configuration).

## Advanced Troubleshooting

### "Power OFF" Message

If TimeZero displays "Power OFF" on the Sounder WorkSpace or you see no echo at all, it means that the sounder is not recognized on the network. Check the IP address of the computer (make sure the subnet mask is set to 255.255.0.0) and check the cable(s). You can "Ping" the DFF1/BBDS1 from the computer to make sure that the connection between the computer and the sounder is OK. The address of the DFF1/BBDS1 to ping is: 172.31.92.1. For more information on how to ping an Ethernet device, refer to the [How To Ping](#) chapter.

### Bottom Discrimination not working (BBDS1 only)

If you use a BBDS1 and cannot see the Bottom Discrimination data (after enabling the feature from the "Sounder" button located in the Ribbon), check the following points:

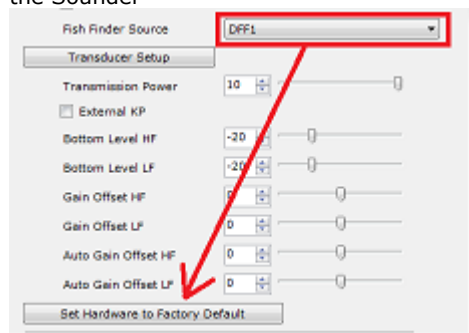
- The BBDS1 will ONLY send Bottom Discrimination data when the depth below transducer is over 5 Meters (17 Feet). If you are configuring the sounder at the dock with less than 5 meters of water, the bottom discrimination data will NOT appear. You will have to perform a sea trial. It is recommended to restart the BBDS1 (cycle the power) at least once in depth over 5 meters.
- Bottom Discrimination data will ONLY work with selected Transducers. Please contact your Furuno dealer for compatible transducer.
- Bottom Discrimination data will ONLY work if the Transducer Setup has been set up to "Model Number". If the transducer was previously set to "Manual" or "TD-ID" and switching it to "Model Number" does not seem to enable Bottom Discrimination, it is recommended to perform a Master Reset of the Sounder (see below).

### How to perform a Master Reset of the sounder:

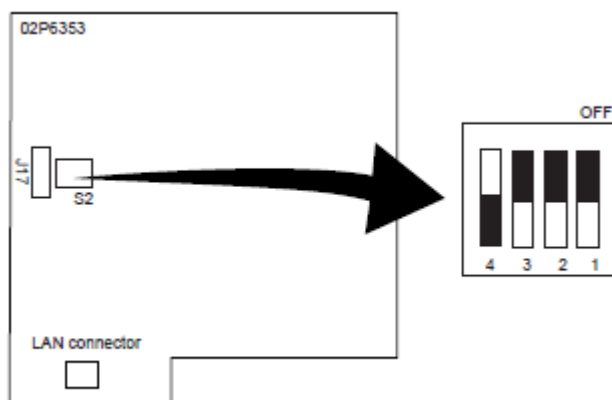
If TimeZero displays a white screen even after adjusting the Transducer Setup, it is recommended to perform a Master Reset of the DFF1/BBDS1 and try the configuration again. To perform a Master Reset of the sounder:

- Start TimeZero open the "Sounder" Options, select the DFF1 or BBDS1 under "Fish Finder Source" and click on "Set Hardware to factory" default. Close the Options but leave TimeZero open and connected to

the Sounder



- Remove the DFF1/BBDS1 cover (leave the Sounder ON)
- Set the DIP 4 inside the DFF1/BBDS1 to ON (while the sounder is ON), then press on the red button (located on the top near the middle) and release it



S2

		OFF	ON
1	Power select	600W	1kW
2	Not Use	-	-
3	clear	OFF	ON
4	All clear	OFF	ON

- Wait for approximately 20 seconds (until the LED flash ON and OFF on the Sounder board)
- Set the DIP switch 4 back to the OFF position
- Go back to TimeZero and configure the Sounder Transducer settings from the "Sounder" Options.

**IMPORTANT:** It is important to perform the Sounder Reset (turning the DIP switch ON then OFF) while the Sounder is powered ON and if possible with TimeZero open. There is no need to turn OFF the sounder during that procedure

## DFF1-UHD Sounder

The "Furuno Sounder Module" needs to be unlocked prior to configure a Furuno Ethernet Sounder in TimeZero.

## Introduction

TimeZero can be connected to a NavNet network that includes an MFD (TZtouch/TZtouch2/TZtouch3) and a DFF1-UHD or TimeZero can be connected directly to a DFF1-UHD (without any MFD on the network). When there is no MFD on the network, and if you want to use the Heave Compensation feature of the sounder, TimeZero will need to be connected to a Furuno Satellite Compass (in order to provide Heave, Pitch and Roll information to the sounder). If there is an MFD on the network, connect the Furuno Satellite Compass to the MFD (which will be in charge of sending Heave, Pitch and Roll information to the sounder).

## Computer Setup

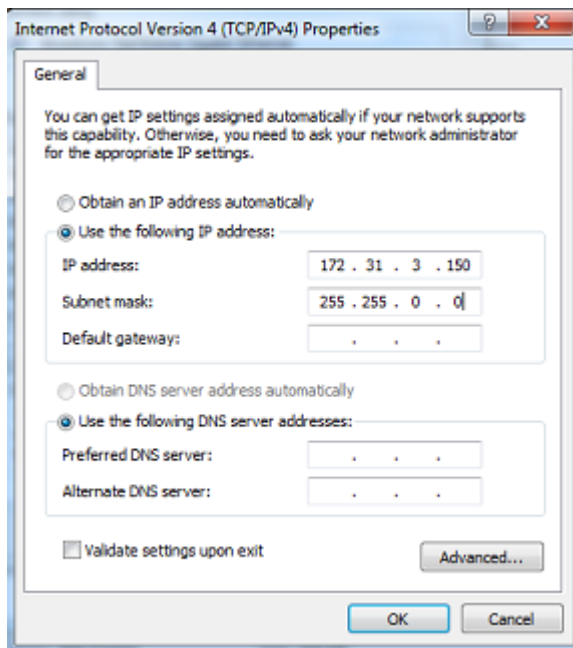
The DFF1-UHD connects to the PC through an Ethernet connection (100Base-T). All the Furuno Ethernet sensors (including Ethernet sounders) only operate on the 172.31.x.x / 255.255.0.0 network. You will have to setup your computer IP address to match that network. We highly recommended using 172.31.3.150 as a fixed IP address for the computer with a subnet mask of 255.255.0.0.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

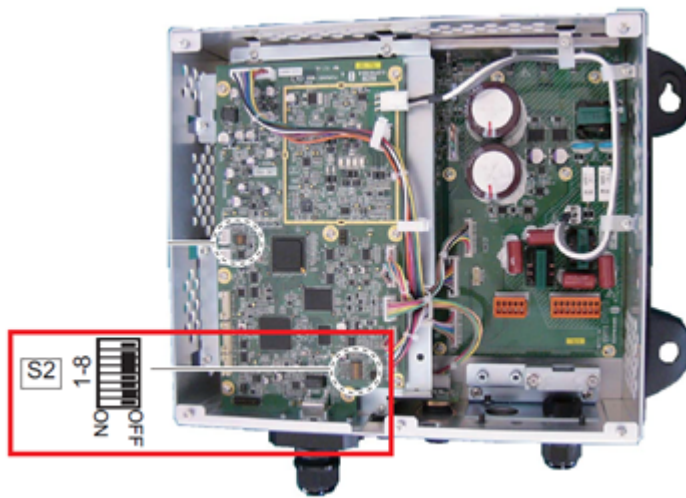
Double click on the Network Adapter connected to the sounder (usually "Local Area Connection").

**Note:** If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the sounder, you can temporary disconnect the Ethernet Cable connected to the sounder from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 172.31.3.150 with a subnet mask of 255.255.0.0:



If the DFF1-UHD is directly connected to the computer, make sure that the DFF1-UHD is set for the fix IP address mode. Open the DFF1-UHD cover and make sure that the "S2" DIP Switches 1 and 2 are set to the OFF position (all DIP Switches should be in the OFF position):



Connect the DFF1-UHD to the computer (directly or via a HUB/Switch).

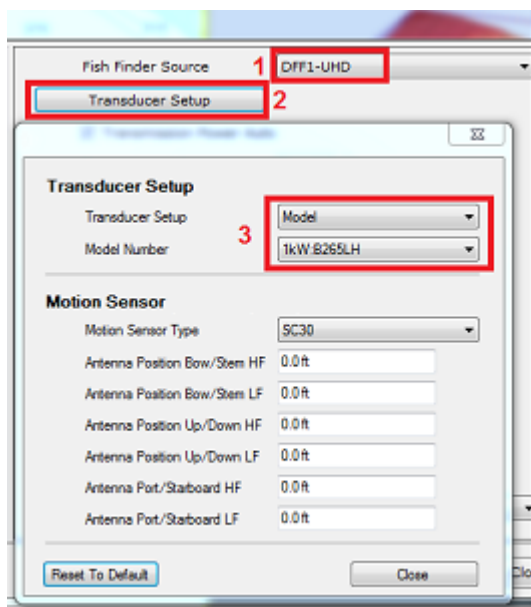
**Note:** You can "Ping" the DFF1-UHD from the computer to make sure that the connection in between the computer and the sounder is OK. The address of the DFF1-UHD to ping is: 172.31.92.2. For more information on how to ping an Ethernet device, refer to the [How To Ping](#) chapter.

**IMPORTANT TD-ID (XID) INFORMATION:** In some instance the TD-ID (XID) wire (orange wire connected to PIN 3 of TB4 connector) can cause problem. It is recommended to disconnect the orange wire and proceed to a Master Reset of the Sounder (see at the end of this chapter). After performing the master reset, follow the instructions below to manually set the transduce settings.

## TimeZero Settings

Open TimeZero in Navigation mode, select the [Sounder](#) Options and make sure that the "DFF1-UHD" is set as a Fish Finder Source.

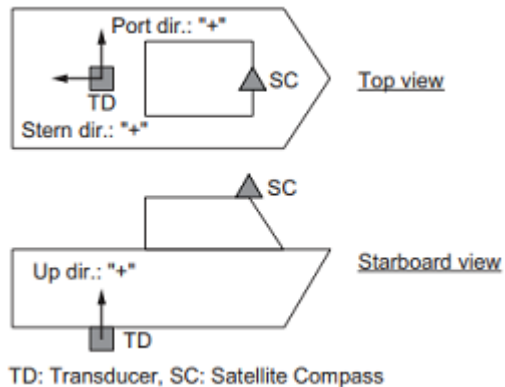
Click on the "Transducer Setup" button. Select "Model" and select the corresponding transducer model:



**IMPORTANT TRANSDUCER INFORMATION:** We recommend using the Airmar transducer B265 or CM265 with the DFF1-UHD. Other "Low High" CHIRP transducers such as the 175LH, 109LH or 509LH may be used, however

the accuracy of both ACCU-FISH and Bottom Discrimination modes will not be guaranteed. In this case, put the transducer settings to "Model Number" and select "B265LH". Please refer to a Furuno dealer for more information on the DFF1-UHD sounder and compatible transducers.

If you want to use the Heave Compensation, make sure to select the corresponding Satellite Compass which is connected to TimeZero (or to the MFD) and enter the various offsets using the coordinate system below (origin is the transducer):



Enter the distance between the transducer(s) and the Satellite Compass antenna. For the Bow-Stern direction, enter a negative value if the transducer is located on the aft side of the Satellite Compass (like in the picture above). For the Port/Starboard direction, enter a positive value if the transducer is located on the starboard side of the Satellite Compass.

**Note:** If you are using a SCx20 Furuno Satellite compass, select "SC30".

Once you are done with the transducer settings, click on "Close" to validate the setting and close the transducer setup window.

After doing any change to the Transducer Setup window, the DFF1-UHD **needs to be restarted** (to lock the settings in the DFF1-UHD memory). Exit TimeZero then unplug and plug back the DFF1-UHD power cable. Restart TimeZero.

Select the [Sounder](#) Options again and make sure to adjust the "Transducer Draft" under "Sounder Initial Setup". Make sure to also adjust the proper "Temperature Port". Most transducers have a built in temperature sensor and the information is sent through the transducer cable. In that case, select "Low Frequency" for "Temperature Port" selection. If you have an independent temperature sensor connected to the "MJ" port, select "MJ".

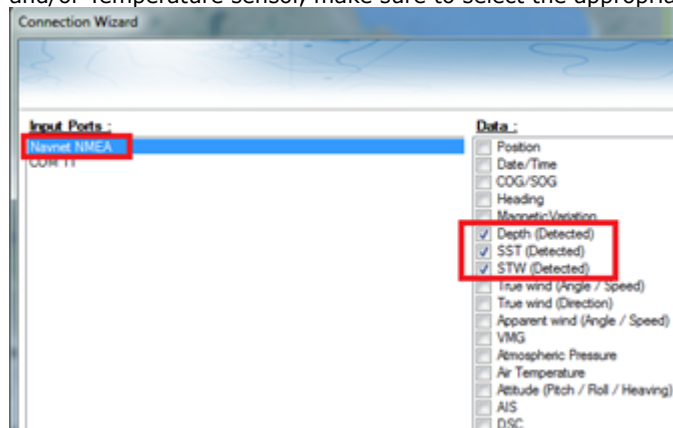
Close the TimeZero Options and select the Sounder WorkSpace: you should see the sounder picture scrolling on the screen. Adjust the Sounder Range to get a good view of the bottom (it is recommended to set the mode to Auto Fishing).

Note that the depth, temperature and speed data is sent to TimeZero via the Ethernet connection on the NavNet NMEA port. Follow the instructions below to configure the NavNet port:

- Select "Connection Wizard" that can be found under the "TimeZero" button
- Select "Manual Port Configuration" from the Connection Wizard
- Select "Add/Configure NavNet Connection" and click on "NMEA & AIS"



- Make sure that at minimum "Depth" is checked for the "NavNet NMEA" port. If the transducer has a Speed and/or Temperature sensor, make sure to select the appropriate data:



**Note:** In some instance, when the DFF1-UHD is connected to a transducer **without** speed sensor, it will still send a wrong "STW" value (that will always be set to 0). In that case, make sure to **uncheck** "STW" from the Connection Wizard.

- Click on "Next" and "Finish" to close the Connection Wizard

If you want to use the Heave Compensation feature, make sure TimeZero has been configured to receive Heave, Pitch and Roll from the Connection Wizard (you can display these values in a NavData to confirm proper configuration).

## Advanced Troubleshooting

### "Power OFF" Message

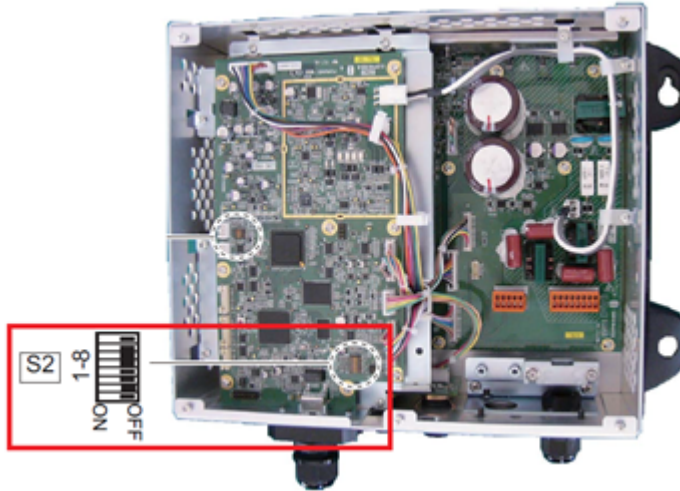
If TimeZero display "Power OFF" on the Sounder WorkSpace or you see no echo at all, it means that the sounder is not recognized on the network. Check the IP address of the computer (make sure the subnet mask is set to 255.255.0.0) and check the cable(s). You can "Ping" the DFF1-UHD from the computer to make sure that the connection in between the computer and the sounder is OK. The address of the DFF1-UHD to ping is: 172.31.92.2. For more information on how to ping an Ethernet device, refer to the [How To Ping](#) chapter.

### "Blank" Screen (no echo even when gain is set to maximum):

If TimeZero displays a "blank" (empty) screen even after changing the Transducer Setup and restarting the DFF1-UHD, it is recommended to remove the orange wire (XID wire), perform a Master Reset of the DFF1-UHD and try the configuration again. To perform a Master Reset of the sounder:

- Disconnect the DFF1-UHD from the network and power it OFF (remove power)
- Remove the DFF1-UHD cover (leave the Sounder OFF)

- Set the "S2" DIP switch No. 4 to ON (while the sounder is OFF)



- Power ON (connect power) the Sounder and wait 1 minute or two minutes
- Power OFF the sounder, set DIP switch number 4 back to the OFF position
- Connect the DFF1-UHD back to the network
- Power ON the Sounder and confirm that the LED blink fast (twice per second) after 1 minute of boot up
- Start TimeZero and configure the Sounder Transducer settings from the "Sounder" Options
- Close the Options window and exit TimeZero
- Restart the DFF1-UHD (disconnect and reconnect power)
- After 1 minute, confirm that the DFF1-UHD led blink slowly (once every 2 seconds)
- Start TimeZero

#### **Bottom Discrimination not working:**

If you cannot see the Bottom Discrimination data (after enabling the feature from the "Sounder" button located in the Ribbon), check the following points:

- The DFF1-UHD will ONLY send Bottom Discrimination data when the depth below transducer is over 5 Meters (17 Feet). If you are configuring the sounder at the dock with less than 5 meters of water, the bottom discrimination data will NOT appear. You will have to perform a sea trial. It is recommended to restart the DFF1-UHD (cycle the power) at least once in depth over 5 meters.
- Bottom Discrimination data will ONLY work with selected Transducers. For example, the bottom discrimination will NOT work with the B275LH-W. Please contact your Furuno dealer for compatible transducer.
- Bottom Discrimination data will ONLY work if the Transducer Setup has been set to "Model Number". "TD-ID" is NOT recommended. In some instance, it appears that the TD-ID configuration is not sending proper transducer information to the DFF1-UHD. In these cases, the TD-ID wire of the transducer needs to be disconnected to allow the transducer to be manually selected to the specific model. Remove the TD-ID orange wire which is connected to PIN3 of the TB4 connector. Once the orange wire has been removed, restart the DFF1-UHD and TimeZero, then set the Transducer Setup by Model Number and pick the corresponding Transducer Model.

## DFF3 Sounder

The "Furuno Sounder Module" needs to be unlocked prior to configure a Furuno Ethernet Sounder in TimeZero.

### Introduction

TimeZero can be connected to a NavNet network that includes an MFD (TZtouch/TZtouch2/TZtouch3) and a DFF3 or TimeZero can be connected directly to a DFF3 (without any MFD on the network). When there is no MFD on the network, and if you want to use the Heave Compensation feature of the sounder, TimeZero will need to be connected to a Furuno Satellite Compass (in order to provide Heave, Pitch and Roll information to the sounder). If there is an MFD on the network, connect the Furuno Satellite Compass to the MFD (which will be in charge of sending Heave, Pitch and Roll information to the sounder).

### Computer Setup

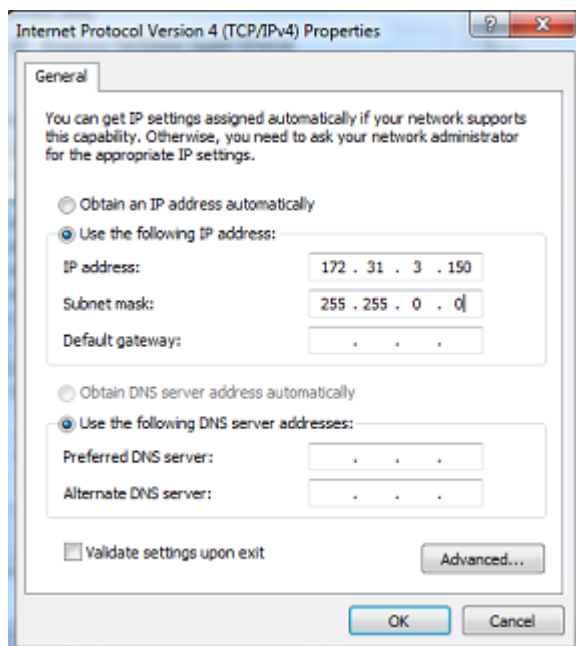
The DFF3 connects to the PC through an Ethernet connection (100Base-T). All the Furuno Ethernet sensors (including Ethernet sounders) only operate on the 172.31.x.x / 255.255.0.0 network. You will have to setup your computer IP address to match that network. We highly recommended using 172.31.3.150 as a fixed IP address for the computer with a subnet mask of 255.255.0.0.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the sounder (usually "Local Area Connection").

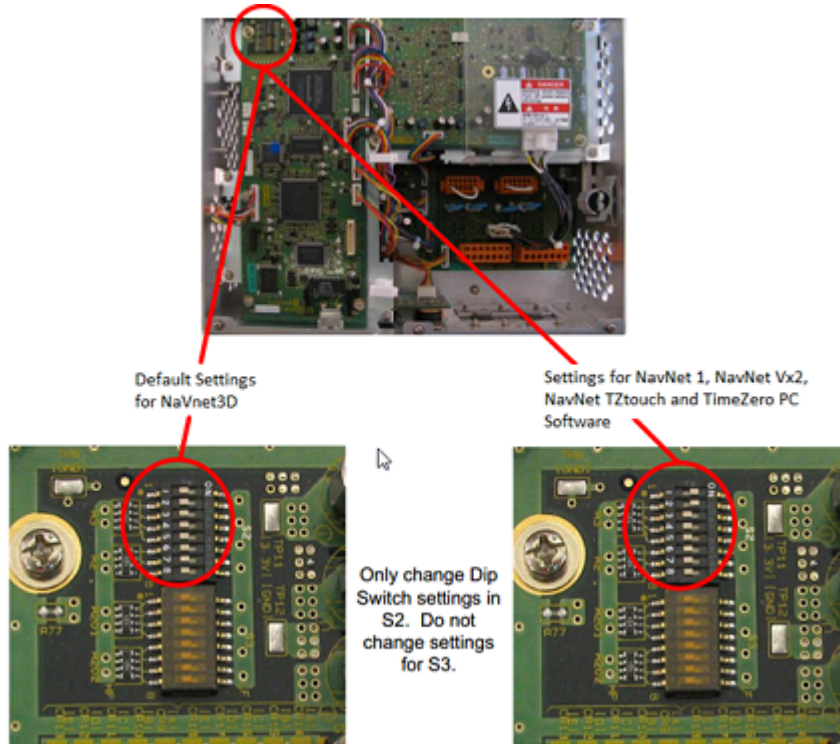
**Note:** If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the sounder, you can temporary disconnect the Ethernet Cable connected to the sounder from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 172.31.3.150 with a subnet mask of 255.255.0.0:



## Sounder Setup

Make sure that the DFF3 is set for the fix IP address mode. Open the DFF3 cover and make sure that "S2" DIP Switches 1 and 2 are set to the ON position (all other DIP Switches to OFF):



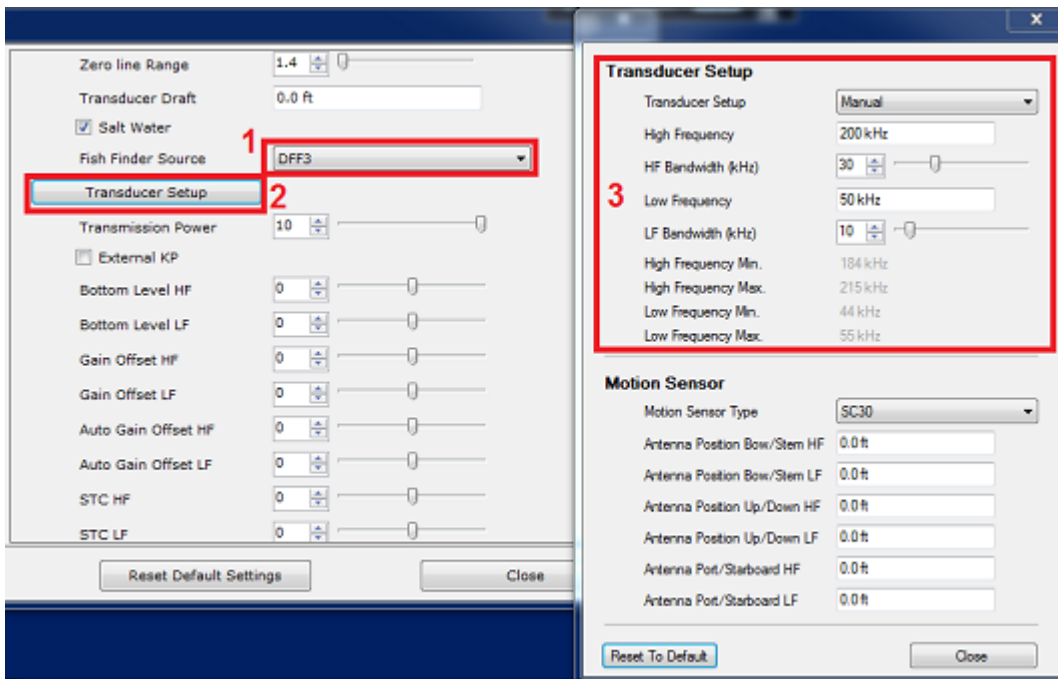
Connect the DFF3 to the computer (directly or via a HUB/Switch).

**Note:** You can "Ping" the DFF3 from the computer to make sure that the connection in between the computer and the sounder is OK. The address of the DFF3 to ping is: 172.31.92.1. For more information on how to ping an Ethernet device, refer to the [How To Ping](#) chapter.

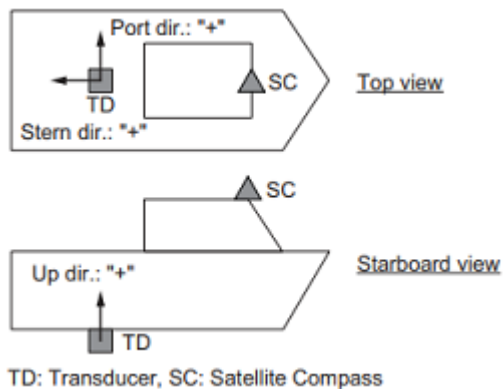
## TimeZero Settings

Open TimeZero in Navigation mode, select the [Sounder](#) Options and make sure that the "DFF3" is set as a Fish Finder Source.

Click on the "Transducer Setup" button. Select "TD-ID" if your transducer has this capability. If not, select "Model" to pick a model number or "Manual" to adjust the settings manually (frequency and power):



If you want to use the Heave Compensation, make sure to select the corresponding Satellite Compass which is connected to TimeZero (or to the MFD) and enter the various offsets using the coordinate system below (origin is the transducer):



Enter the distance between the transducer(s) and the Satellite Compass antenna. For the Bow-Stern direction, enter a negative value if the transducer is located on the aft side of the Satellite Compass (like in the picture above). For the Port/Starboard direction, enter a positive value if the transducer is located on the starboard side of the Satellite Compass.

**Note:** If you are using a SCx20 Furuno Satellite compass, select "SC30".

Once you are done with the transducer settings, click on "Close" to validate the setting and close the transducer setup window.

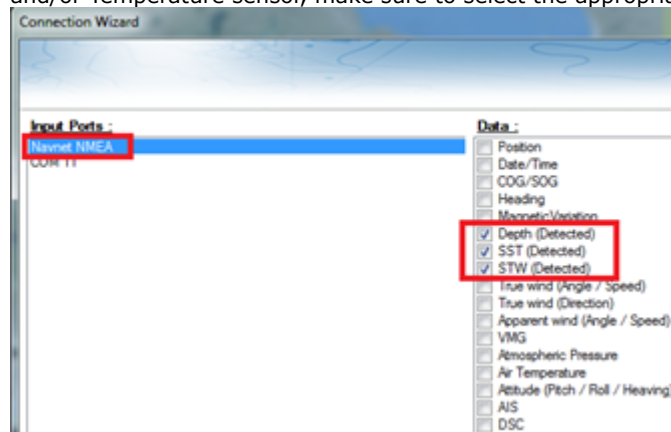
After doing any change to the Transducer Setup window, **the DFF3 needs to be restarted** (to lock the settings in the DFF3 memory). Exit TimeZero, and unplug and plug back the DFF3 power cable. Restart TimeZero.

Select the **Sounder** Options again and make sure to adjust the "Transducer Draft" under "Sounder Initial Setup". Make sure to also select the proper "Temperature Port". Select either "Low Frequency", "High Frequency" or "MJ Port" according to where the temperature sensor is connected.

Close the TimeZero Options and select the Sounder WorkSpace: you should see the sounder picture scrolling on the screen. Adjust the Sounder Range to get a good view of the bottom (it is recommended to set the mode to Auto Fishing).

Note that the depth, temperature and speed data is sent to TimeZero via the Ethernet connection on the NavNet NMEA port. Follow the instructions below to configure the NavNet port:

- Select "Connection Wizard" that can be found under the "TimeZero" button
- Select "Manual Port Configuration" from the Connection Wizard
- Select "Add/Configure NavNet Connection" and click on "NMEA & AIS"
- Make sure that at minimum "Depth" is checked for the "NavNet NMEA" port. If the transducer has a Speed and/or Temperature sensor, make sure to select the appropriate data:



**Note:** In some instance, when the DFF3 is connected to a transducer **without** speed sensor, it will still send a wrong "STW" value (that will always be set to 0). In that case, make sure to **uncheck** "STW" from the Connection Wizard.

- Click on "Next" and "Finish" to close the Connection Wizard

If you want to use the Heave Compensation feature, make sure TimeZero has been configured to receive Heave, Pitch and Roll from the Connection Wizard (you can display these values in a NavData to confirm proper configuration).

## Advanced Troubleshooting

### "Power OFF" Message

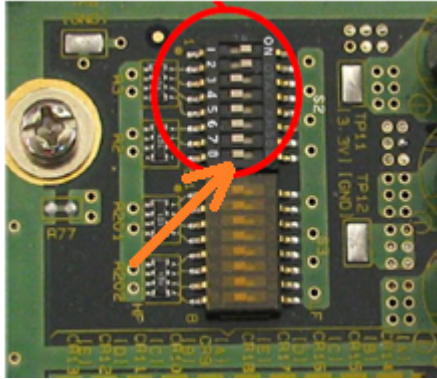
If TimeZero display "Power OFF" on the Sounder WorkSpace, it means that the sounder is not recognized on the network. Check the IP address of the computer (make sure the subnet mask is set to 255.255.0.0) and check the cable(s). You can "Ping" the DFF3 from the computer to make sure that the connection in between the computer and the sounder is OK. The address if the DFF3 to ping is: 172.31.92.1. For more information on how to ping an Ethernet device, refer to the [How To Ping](#) chapter.

### How to perform a Master Reset of the sounder:

If TimeZero displays a blank" (empty) screen even after changing the Transducer Setup and restarting the DFF3, it is recommended to perform a Master Reset of the DFF3 and try the configuration again.

- Disconnect the DFF3 from the network and power it OFF (remove power)
- Remove the DFF3 cover (leave the Sounder OFF)

- Set the "S2" DIP switch 8 to ON (while the sounder is OFF)



- Power ON (connect power) the Sounder and wait 1 or 2 minutes
- Power OFF the sounder, set DIP switch 8 back to the OFF position
- Connect the DFF3 back to the network
- Power ON the Sounder and confirm that the LED blink fast (every 0.5 sec) after 1 minute
- Start TimeZero and configure the Sounder Transducer settings from the "Sounder" Options
- Close the Options window and exit TimeZero
- Restart the DFF3 (disconnect and reconnect power)
- After 1 minute, confirm that the DFF3 led blink slowly (once every 2 seconds)
- Start TimeZero

## **FCV1150 Sounder**

The "Furuno Sounder Module" needs to be unlocked prior to configure a Furuno Ethernet Sounder in TimeZero.

### **Computer Setup**

The FCV1150 connects to the PC through an Ethernet connection (100Base-T). All the Furuno Ethernet sensors (including Ethernet sounders) only operate on the 172.31.x.x / 255.255.0.0 network. You will have to setup your computer IP address to match that network. We highly recommended using 172.31.3.150 as a fixed IP address for the computer with a subnet mask of 255.255.0.0.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the sounder (usually "Local Area Connection").

**Note:** If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the sounder, you can temporary disconnect the Ethernet Cable connected to the sounder from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.



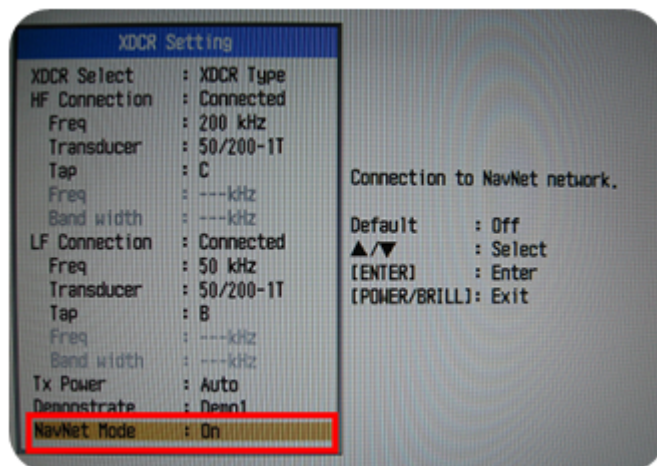
Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 172.31.3.150 with a subnet mask of 255.255.0.0:



## Sounder Setup

**IMPORTANT:** In order to connect properly to TimeZero, the FCV1150 internal software must be v3.02 or above

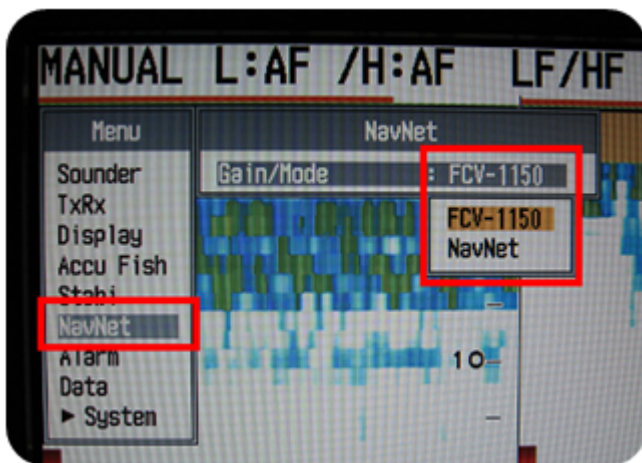
Make sure that the FCV1150 is in "NavNet" mode (in order to enable the network connection of the FCV1150). To access the setup menu, power ON the FCV1150 while pressing the [MENU] key:



Once the NavNet mode has been enabled restart the FCV1150.

The FCV1150 can be used in "FCV1150" or "NavNet" control mode. This setting can be adjusted from the "NavNet" menu:





When the FCV1150 is setup in "NavNet" mode, the hardware knobs located on the FCV1150 will be disabled and TimeZero will have full control over the various settings (Gain, Mode, Range, etc...). When the Sounder is setup in "FCV1150" mode, TimeZero will only be able to control the Range and Shift of the FCV1150 (all the other controls such as gain and mode will have to be adjusted using the hardware knobs on the FCV1150 itself). Most users will want to setup the sounder in "FCV1150" mode in order to be able to use the knob of the sounder.

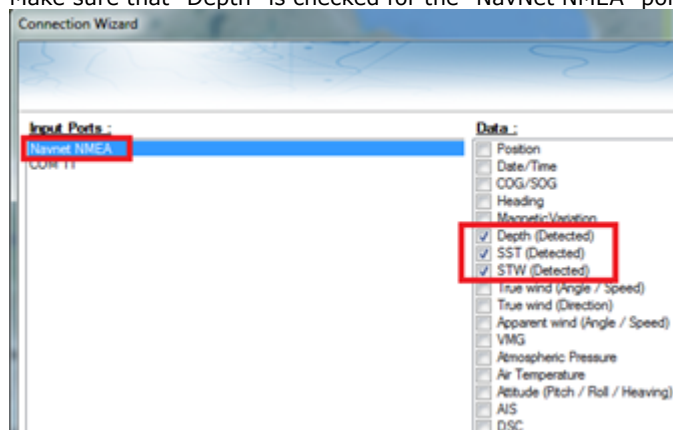
Configure all the initial Sounder settings directly from the FCV1150 (please refer to the FCV1150 installation guide).

### TimeZero Setup

Launch TimeZero in Navigation Mode. Select the Connection Wizard and perform an "Automatic Detection". TimeZero will automatically detect the depth available on the network (sent by the Ethernet Sounder on the "NavNet NMEA" port).

If the sounder is not sending depth information while performing the Automatic Detection, you will have to manually add a NavNet Port:

- Select "Manual Port Configuration" from the Connection Wizard
- Select "Add/Configure NavNet Connection" and click on "NMEA & AIS"
- Make sure that "Depth" is checked for the "NavNet NMEA" port



**Note:** If the transducer has a temperature and speed sensor, you will also receive Speed Through Water (STW) and Sea Surface Temperature (SST) through the network.

**IMPORTANT:** The resolution of the Sounder might be greatly degraded in TimeZero if you start the software while the FCV1150 Display Mode is set on "User 1" or "User 2" (knob on the front). It is recommended to set the FCV1150 to a regular display mode (such as Single or Dual Frequency display) when starting TimeZero.

## Bottom Hardness Setup (NMEA0183)

The "Bottom Hardness Module" needs to be unlocked prior to configure Bottom Hardness in TimeZero.

### How to connect

Bottom Hardness information is sent over NMEA0183 through a RS-422 (opto-isolated) cable. Bottom hardness data is not sent over Ethernet with the FCV1150. It is important to select the appropriate com port in TimeZero for both depth and hardness in the event there are multiple sounders on-board.

**Note:** Bottom Hardness requires firmware v4.03. You can see what firmware version is on the sounder at startup. To upgrade the sounder firmware please contact your Furuno Dealer

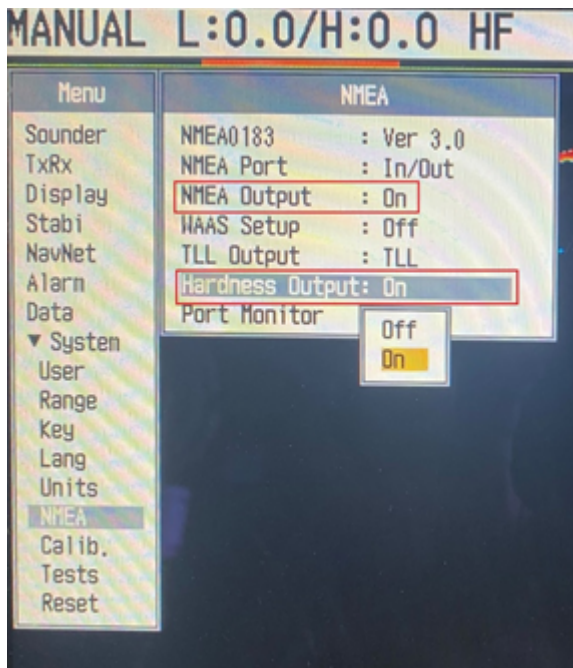
### Transducer Requirements

The bottom hardness output has been officially tested with the CA 1T 50k/200k transducer. Although it will output some information with other transducers it is necessary to select a named transducer. Hardness output will not operate with a manual frequency input.

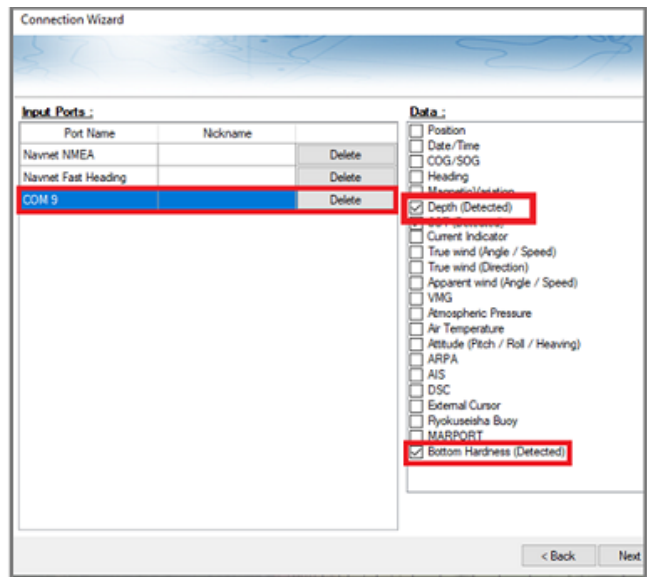
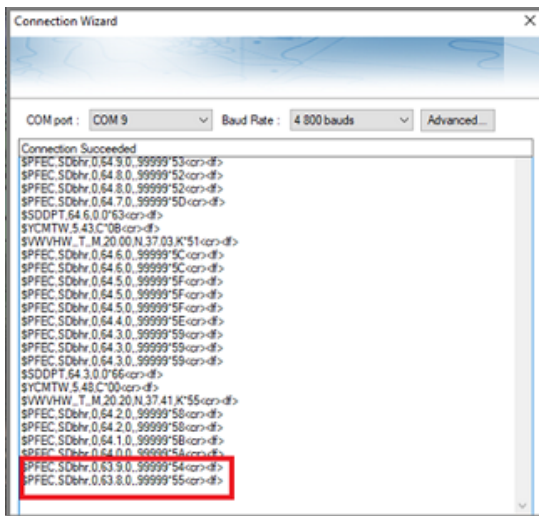
To adjust the transducer settings on the FCV1150, hold down [POWER] and [Menu] buttons, then, release [POWER] button while continuing to hold [Menu] to enter the XDR setup mode. Make sure that the proper named transducers are selected. Restart the sounder to store the settings.

### Initial Setup

Make sure that the bottom hardness sentence is turned on from the menu:



Connect the sounder to TimeZero via serial COM port (RS232) and open the Connection Wizard. Add a new input and double check that you can see the \$PFEC,SDbhr sentence (bottom hardness data):



It is recommended to select both "Bottom Hardness" and "Depth" from the COM port and set this depth source as master (on the next page of the connection wizard). After closing the Connection Wizard, you should see Bottom Hardness in TimeZero (please refer to the [Bottom Hardness](#) chapter for more information).

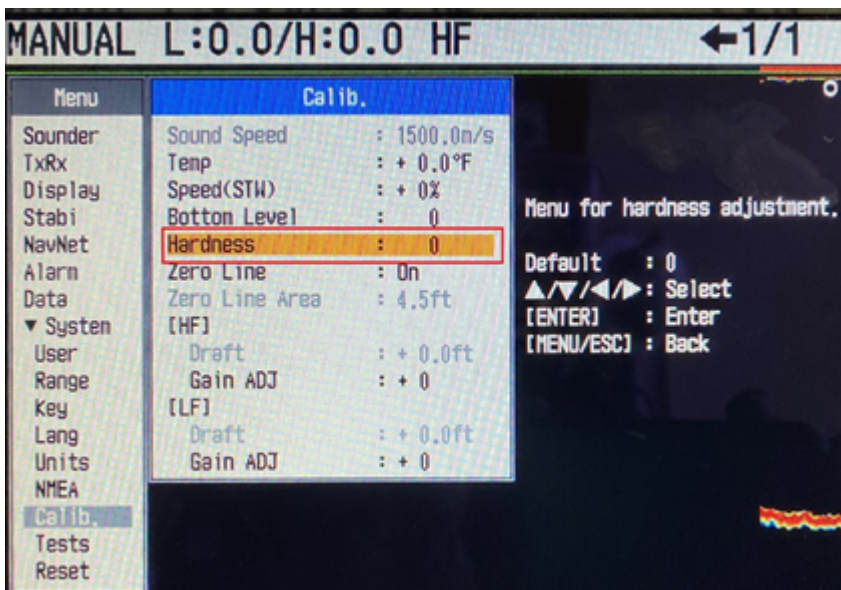
### Recommendations

It is recommended to pick one frequency per depth area:

- In HF mode the sounder uses the HF for bottom hardness
- In LF mode the sounder uses the LF for Bottom Hardness
- In Dual Frequency mode the sounder uses the LF for bottom hardness.

It is recommended to disable "Auto-Power" (Auto power will change by depth and thus change Hardness values). It is also recommended to fix the transmit rate. For initial setup start out with the Power at 10 and the TX rate at 20.

The hardness offset allows you to raise or lower the minimum or maximum value sent by the sounder. This is useful if the sounder is reporting numbers close to 0 or 100 as any hardness reading above or below those numbers will be clipped:



Note that after adjusting the Hardness Offset, it is recommended to erase previously recorded data.

## DFF-3D Multibeam Sounder

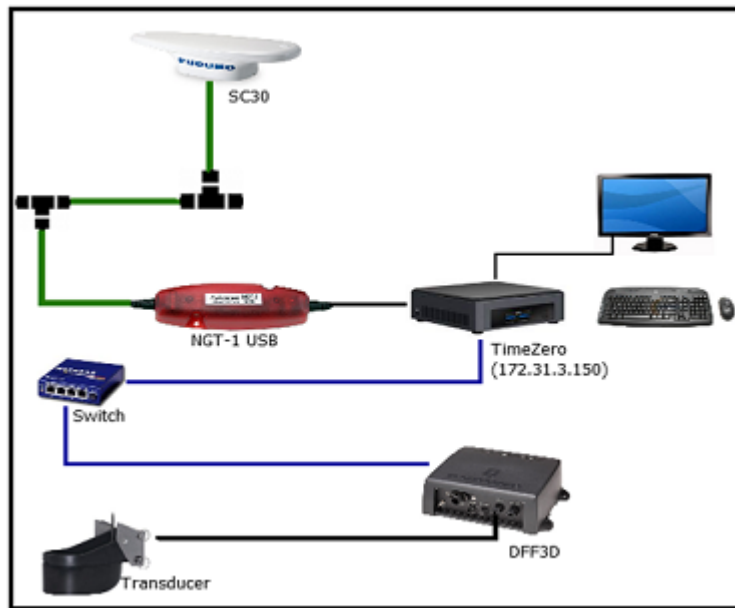
The "DFF3D Module" needs to be unlocked prior to configure the Furuno DFF-3D in TimeZero

### Introduction

TimeZero can be connected to a NavNet network that includes an MFD (TZtouch/TZtouch2/TZtouch3) and a DFF-3D or TimeZero can be connected directly to a DFF-3D (without any MFD on the network).

When there is an MFD on the network, all DFF-3D initial adjustments should be done from the MFD following Furuno instructions. Once setup has been done on the MFD, start TimeZero and you only need to configure the NavNet input from the Connection Wizard (to receive position, heading, depth,...) either manually or automatically.

When there is no MFD on the network, at minimum position and high speed heading (10 times per second) must be configured in TimeZero in order to geo-referenced the DFF-3D information. The DFF-3D transducer internal motion sensor can be used for motion compensation, but it is highly recommended to use a Furuno satellite compass (SC30, SC33, SC70 or SCX20) connected to the computer via NMEA2000 (using the Actisense NGT-1 USB adapter). The satellite compass will be able to provide GPS, accurate high speed heading and better motion information than the internal transducer sensor. To connect the DFF-3D to the computer, we highly recommend installing a switch (even if the DFF-3D is the only ethernet sensor):



**Note:** When there is an MFD (TZtouch/TZtouch2/TZtouch3) on the network, the position and heading sensors are connected to the MFD (Furuno satellite compass still recommended). In that case, there is no need to connect the Furuno satellite compass directly to TimeZero.

### Computer Setup

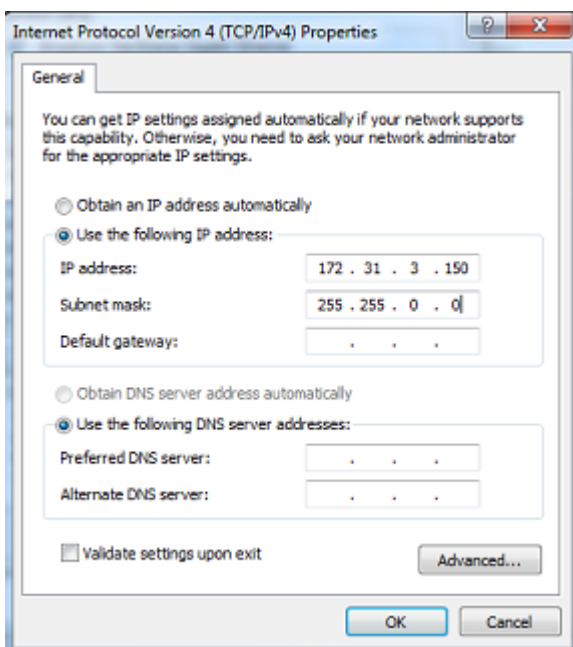
The DFF-3D (and MFD if present) connect(s) to the PC through an Ethernet connection (100 Base-T). All the Furuno NavNet components operate on the 172.31.x.x / 255.255.0.0 network. You will have to setup your computer IP address to match that network. We highly recommended using 172.31.3.150 as a fixed IP address for the computer with a subnet mask of 255.255.0.0.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and directly select the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

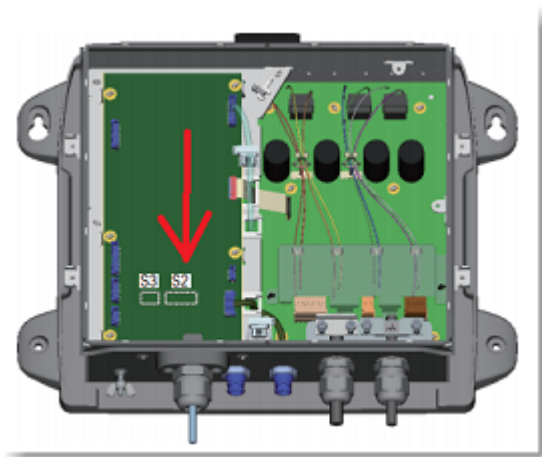
Double click on the Network Adapter connected to the DFF-3D (usually "Local Area Connection").

**Note:** If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the DFF-3D, you can temporary disconnect the Ethernet Cable connected to the DFF-3D from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 172.31.3.150 with a subnet mask of 255.255.0.0:



Make sure that the DFF-3D is set for the fix IP address mode. Open the DFF-3D cover and make sure that all the "S2" and "S3" DIP Switches are set to the OFF position:



Connect the DFF-3D to the computer directly or better, via a HUB/Switch.

**Note:** You can "Ping" the DFF-3D from the computer to make sure that the connection in between the computer and the DFF-3D is OK. The address of the DFF3D to ping is: 172.31.92.21. For more information on how to ping an Ethernet device, refer to the [How To Ping](#) chapter.

## TimeZero Settings (DFF-3D directly connected to TimeZero)

Open TimeZero in Navigation mode, and open the "Multibeam Sounder" Options.

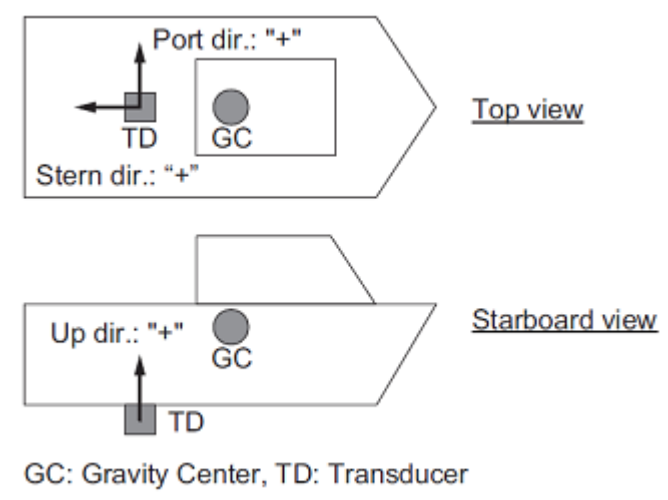
### DFF-3D Transducer Setup

Scroll down inside the "Multibeam Sounder" Options page to the "Setup" category.

1) Adjust the "Transducer Draft" (distance in between the water line and the transducer location). This should always be a positive number.

2) Select "Salt Water" if you are operating in Salt Water (this adjusts the speed of sound used for distance measurement).

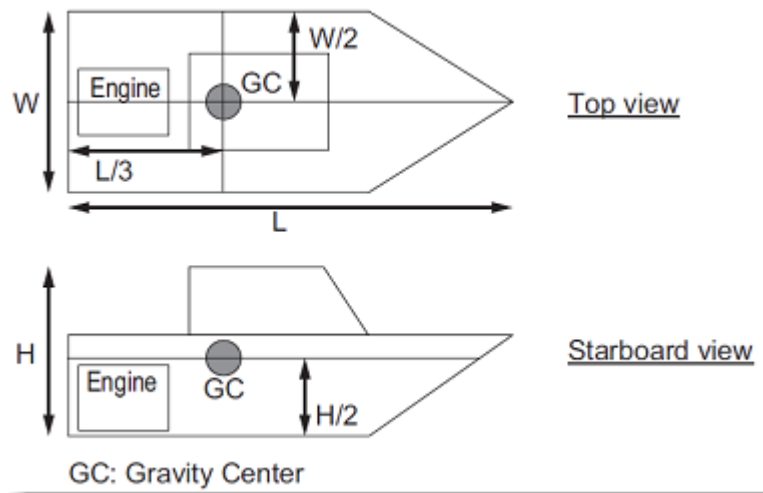
3) Click on the "Transducer Setup" button to adjust the position of the Center of Gravity ("GC"), GPS, Heading and Motion Sensor (Pitch/Roll/Heave) **relative to the transducer** using the coordinate system below:



- Select "Transducer Mis-mount Correction" if the DFF-3D transducer has been installed the wrong way (reversed).
- Enter the distance (on the bow / stern axis) in between the transducer and the ship's center of gravity in the "Transducer Position Bow/Stern" field. If the Center of Gravity is "in front" of the transducer (like the picture above), enter a negative value.
- Enter the distance (on the down / up axis) in between the transducer and the ship's center of gravity in the "Transducer Position Up/Down" field. For upward location of center of gravity (like the picture above), enter a positive value.
- Enter the distance (on the starboard / port axis) in between the transducer and the ship's center of gravity in the "Transducer Position Port/Starboard" field. For port location of the center of gravity, enter a positive value.



**TIPS:** If the location of the Center of Gravity is unknown, use the following approximation for its location:



Enter the GPS Sensor position using the same rules as the Transducer to Center of Gravity location.

Select "Internal" or "SC" for the Motion Sensor Source ("Off" is not recommended). When set to "Internal", the motion sensor built inside the DFF-3D transducer will be used. In that case, there is no need to enter the Motion Sensor position (because it is the same location as the transducer). Select "SC" when a Furuno Satellite compass is directly connected to TimeZero (preferably using an Actisense NGT-1 via the NMEA2000 bus) or if the Furuno satellite compass is connected to the MFD. In that case, enter the satellite compass position (enter the relative position from transducer to Satellite Compass location) using the same rules as the Transducer to GPS location.

**Note:** If you use a Furuno Satellite compass for both position and motion compensation, simply enter the same offsets for the GPS and Motion Sensor.

**IMPORTANT:** For the best motion compensation performance, we highly recommend using a SC33, SC30 or SCX20 connected to TimeZero via NMEA2000 (using the Actisense NGT1 USB to NMEA2000 adapter).

Below is an example illustrating proper offset (Furuno satellite compass is used for both GPS and motion sensor):

4) If there is no MFD on the network, adjust the Sensor Time lag (inside the "Transducer Setup" window) according to the following cases (if there is an MFD on the network, please refer to the MFD installation guide for the proper Sensor Time Lag values).

**IMPORTANT:** If the sensors are connected to the MFD, please refer to the MFD instructions to apply the proper time lag values. Apply the values below ONLY if there is no MFD on the network and if the sensors are directly connected to TimeZero

Motion Sensor (when using a Furuno Satellite Compass directly connected to TimeZero):

Only adjust these parameters if "Motion Sensor Source" is set to "SC" (not "Internal")

- 250ms if the SC is connected via NMEA2000 using the Actisense NGT1 USB to NMEA2000 adapter
- 280ms if the SC is connected via NMEA0183 (COM Port) at 38400 bps with a repeat interval of 10Hz minimum
- 380ms if the SC is connected via NMEA0183 (COM Port) at 4800 bps with a repeat interval of 10Hz minimum

Heading Sensor (when heading sensor is directly connected to TimeZero):

When using a Furuno satellite compass directly connected to TimeZero as a heading source:

- 250ms if the SC is connected via NMEA2000 using the Actisense NGT1 USB to NMEA2000 adapter
- 280ms if the SC is connected via NMEA0183 (COM Port) at 38400 bps with a repeat interval of 10Hz minimum
- 380ms if the SC is connected via NMEA0183 (COM Port) at 4800 bps with a repeat interval of 10Hz minimum

When using a PG700 or third party Heading Sensor directly connected to TimeZero:

- 290ms if the Heading Sensor is connected via NMEA2000 using the Actisense NGT1 USB to NMEA2000 adapter
- 320ms if the Heading Sensor is connected via NMEA0183 (COM Port) at 38400 bps with a repeat interval of 10Hz minimum
- 420ms if the Heading Sensor is connected via NMEA0183 (COM Port) at 4800 bps with a repeat interval of 10Hz minimum

Position Sensor (when position sensor is directly connected to TimeZero):

When using a Furuno satellite compass directly connected to TimeZero as a position source:

- 250ms if the SC is connected via NMEA2000 using the Actisense NGT1 USB to NMEA2000 adapter
- 280ms if the SC is connected via NMEA0183 (COM Port) at 38400 bps with a repeat interval of 10Hz minimum
- 380ms if the SC is connected via NMEA0183 (COM Port) at 4800 bps with a repeat interval of 10Hz minimum

When using a GP330B or third party GPS directly connected to TimeZero:

- 290ms if the GPS is connected via NMEA2000 using the Actisense NGT1 USB to NMEA2000 adapter
- 320ms if the GPS is connected via NMEA0183 (COM Port) at 38400 bps with a repeat interval of 10Hz minimum
- 420ms if the GPS is connected via NMEA0183 (COM Port) at 4800 bps with a repeat interval of 10Hz minimum



5) Transmission Power: It is recommended to leave the Transmission Power to Auto. If you are operating the DFF-3D over 100 meters, it is recommended to set it to Maximum (10).

## Connection Wizard

First, make sure that TimeZero is properly configured to receive position, heading and optionally, motion data (when a Furuno Satellite Compass is used) using the Connection Wizard. It is recommended to display Position, Heading, Pitch, Roll and Heave numerical NavData to make sure TimeZero is properly receiving all the data.

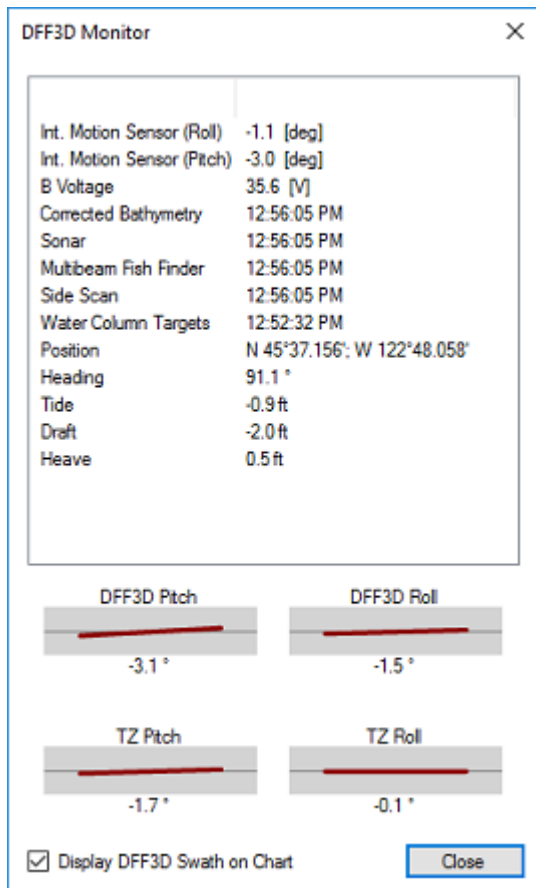
**IMPORTANT:** The Heading value should not be displayed in yellow in the NavData (it should be displayed in white). If it is displayed in yellow, it means that COG is used as "fake heading" which is not acceptable for the DFF3D.

Note that the depth data from the DFF3D is sent to TimeZero via the Ethernet connection on the NavNet NMEA port. So, after connecting the DFF3D, make sure to re-run the Connection Wizard and follow the instructions below to configure properly the NavNet port:

- Select the "Connection Wizard" that can be found under the "TimeZero" button
- Select "Manual Port Configuration" from the Connection Wizard
- Select "Add/Configure NavNet Connection" and click on "NMEA & AIS"
- Make sure that "Depth" is checked for the "NavNet NMEA" port
- Click on "Next" then "Finish" to close the Connection Wizard

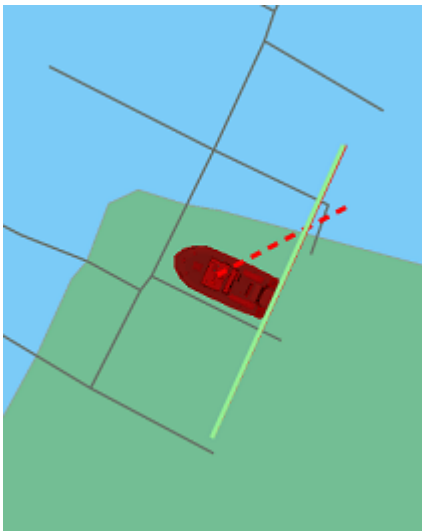
## DFF-3D Monitor

The DFF-3D monitor allows you to make sure the DFF-3D receives all the data on the network it needs to generate good bathy data. After configuring the DFF-3D and TimeZero, it is recommended to look at the DFF-3D Monitor that can be opened from the [Multibeam Sounder](#) Options:



Make sure that a valid Position, Heading, Tide and Heave values are displayed. If you are using a Satellite Compass connected to TimeZero as the Motion Sensor for the DFF3D (with no MFD on the network), the DFF3D Pitch/Roll indicators should match the TZ Pitch/Roll indicators (because the DFF3D should use the pitch and roll values sent by TZ over the network). If they do not match, it indicates that the Motion Source was not properly setup to "SC" (under the transducer setting window) or that there is a technical issue (the DFF3D is not receiving pitch/roll data from the network).

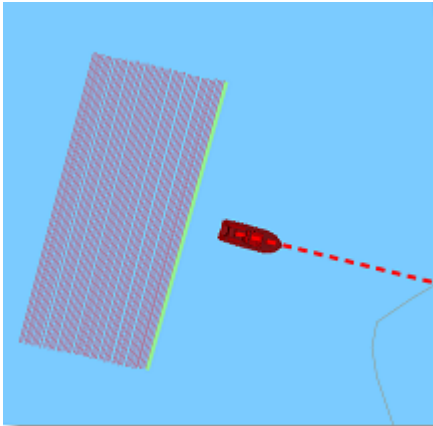
It is also recommended to check "Display DFF3D Swath on Chart" temporary while at the dock to make sure that offset have been configured properly. Selecting this option will display a green line showing the DFF3D swath:



If you are stationary, the swath should be displayed at the transducer location.

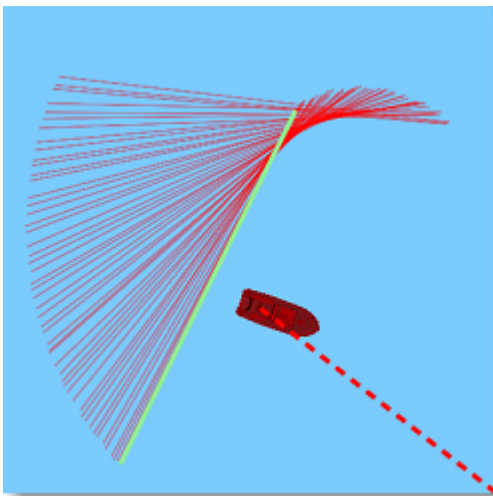
**IMPORTANT:** In order for the boat icon to scale properly, make sure to enter the Boat Length, Boat Width, and GPS location from the [Initial Setup](#) Options. Note that the coordinate system used by TimeZero is different than the one used to enter the DFF-3D offset in the Transducer Setup.

When the boat is moving, you should see the green line (displaying the current swath) and trail of red line showing the previous 50 swath. When the boat is running a straight line on a calm day (no pitch) at a constant speed, the red line should almost equally spaced like the picture below:



Note that it is normal to have the green line "lagging" behind the boat (due to sensor lag and processing time of DFF-3D).

When making a turn, the red line should look like below:



If the red lines are not evenly spaced, this might indicate that heading refresh rate is below 10Hz.

## **Bathymetric Data Calibration**

### **Roll Offset**

Use the chart or local knowledge to identify a spot for the roll patch test – ideally a flat area between 20-40m (shallower than 10m will make it hard to get an accurate reading). Enable PBG recording, display the PBG points (that will help you see where the DFF-3D is actually generating depth points), and run the ship along a straight line in one direction. Turn the ship in the port direction and make a return journey next to the first pass (in the exact opposite direction). If the PBG points generated from the two swath side by side indicate the same depth

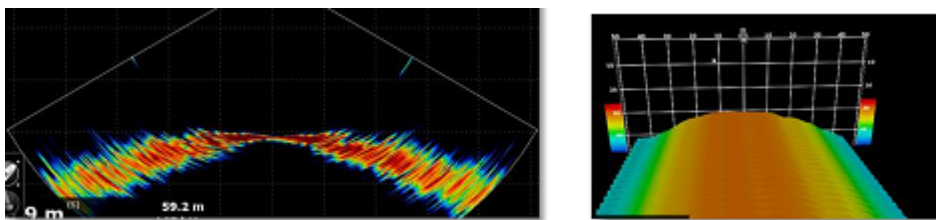
(flat), you have no roll offset. However, if the two swath side by side create a bump or a hole, you should introduce a roll offset.

If you are using the internal motion sensor of the DFF-3D transducer, you can adjust the roll offset from the transducer setup window. HOWEVER, if you are using a Satellite Compass (recommended), then, you need to adjust the Satellite Compass directly. This can be done from the [Initial Setup](#) Options by clicking on the "Calibration" button (displayed under "Furuno Satellite Compass").

**Note:** TimeZero needs to be connected to the Satellite Compass using the Actisense NGT1-USB (via NMEA2000).

### Sound Speed Correction

The speed of sound in water is altered by both salinity and water temperature. The DFF-3D relies on the speed of sound to compute depth. An improper value will cause a flat bottom to appear with a "bump" or a "Hole" across the swath. Below is an example where the DFF-3D is mapping a "hump" because of an improper sound speed calibration:



Because there is a greater distance at the edge of the swath (compared to directly below the vessel), a wrong assumption regarding the speed of sound in water has a greater impact on the edge causing this "hump". Note that the opposite might also happen (a "hole" near the center instead of a "hump"). Although the DFF3D transducer has a temperature sensor that allows it to compute the speed of sound, sometimes, it is required to introduce an offset.

If you experience a "hump" or a "hole" in the swath over a flat area, you may need to adjust the "Sound Speed Correction" from the [Multibeam Sounder](#) Options.

To decrease the "hump", the slider should be adjusted to the right (positive value). Also, the setting just below "Temperature based correction" should be enable (allowing the DFF3D to change the sound speed according to the transducer temperature sensor). Finally make sure to select "Salt Water" from the DFF-3D Transducer Setup if you operate in Salt Water.

### PBG Brush Size Setting

Points recorded with the DFF-3D are recorded in a similar way as with a regular single beam sounder. The only difference is that the DFF-3D provides many points every second (up to 50) over a larger area. However, TimeZero uses the same extrapolation ("brush" parameter) as with a regular sounder. If you are collecting depth data points with the DFF-3D in areas in between 10 to 30 meters, it is recommended to decrease the "Brush Size" from the [PBG](#) Options in order to increase the resolution.

In areas deeper than 30 meters, the default brush size (19) is recommended. This is because the distance in between depth points increases with depth, and TimeZero needs a larger brush size to "fill the gap" and smooth all the depth points.

**Note:** Feel free to adjust the Brush size as you wish. The extrapolation is applied in real time and do not affect the way points are recorded (it only affects the way they are rendered on the screen).

## Advanced Troubleshooting

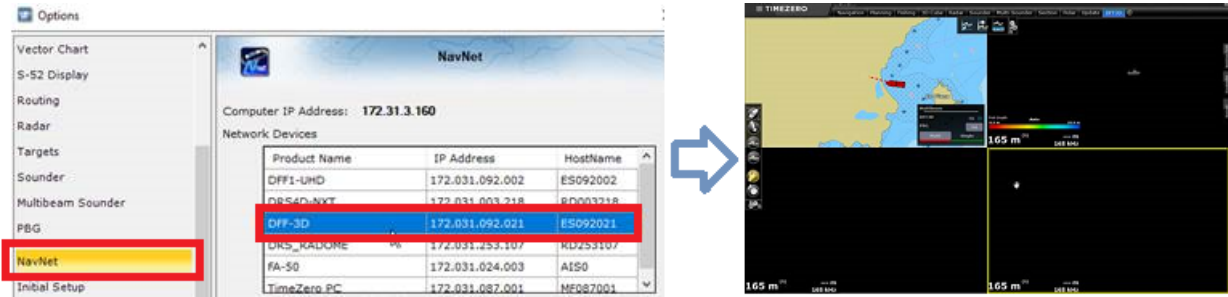
### "Power OFF" or "No Connection" Message

If TimeZero display "Power OFF" or "No Connection" on the DFF-3D WorkSpaces (Section, Water Column, Side Scan) it usually means that the sounder is not recognized on the network. Check the IP address of the computer (make sure the subnet mask is set to 255.255.0.0) and check the cable(s). You can "Ping" the DFF-3D from the computer to make sure that the connection in between the computer and the sounder is OK. The address of the

DFF-3D to ping is: 172.31.92.21. For more information on how to ping an Ethernet device, refer to the [How To Ping](#) chapter.

**No Picture (no echo) displayed on screen**

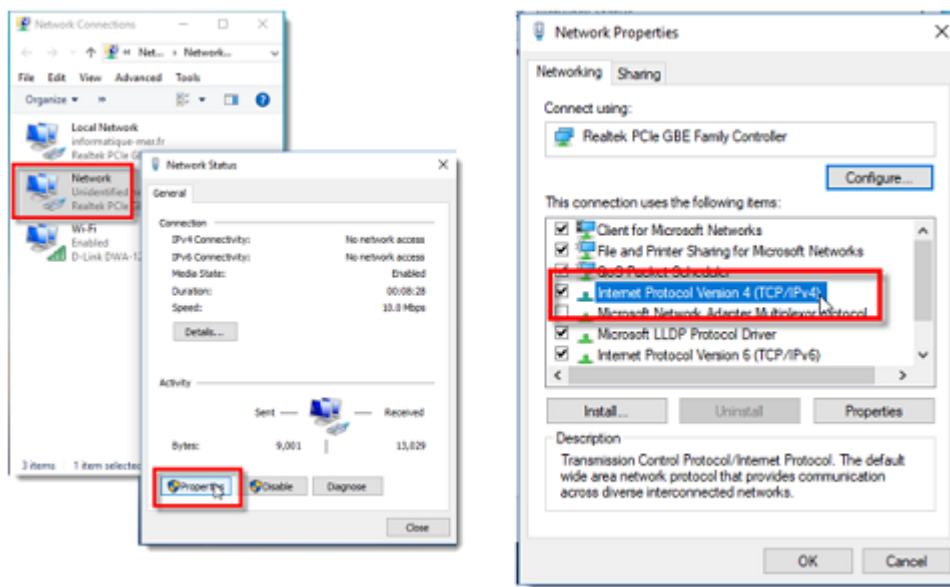
If the DFF-3D replies to "Ping" commands and is listed under the "Device List" Options, but no echo is displayed on screen, it can be caused by either a firewall or by the computer having multiple Ethernet cards:



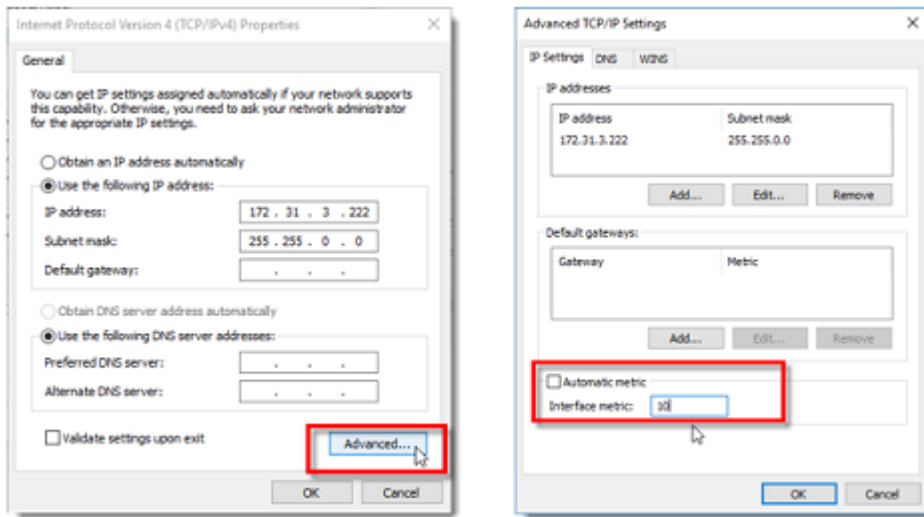
First, try to disable the Firewall (either the Windows Firewall or any other third party firewall that may be installed on the computer) and then, restart the DFF3D and TimeZero.

If that does not solve the issue, the problem may come from your computer having multiple network adapters (multiple Ethernet Cards and/or Wifi adapters). To confirm that you are facing this issue, you can temporarily disable all the Ethernet cards (and Wifi adapters) that are not used to establish the connection to the DFF-3D. If that solves the issue and you do not use the other adapters, it is recommended to leave them disabled. However, if you need the other adapters (to connect to the Internet for example) and have to reactivate them, it is possible to manually modify the "metric" of all the Network Adapters to define a priority so that TimeZero uses the proper Ethernet card.

We suggest you to start with metric value of 10 for the Ethernet card connected to the Furuno network, and to set all the other cards to 50, 60, etc (the lower the number the higher the priority). Open the TCP/IP V4 properties:



Click on the "Advanced" button, uncheck "Automatic metric" and enter the value manually:



After adjusting the metric of all the network adapters, restart your computer.

## WASSP Multibeam Sounder

The "PBG Module" and "WASSP Module" needs to be unlocked to access these features.

### Introduction

TimeZero is compatible with the following WASSP Multibeam sounders:

#### **Generation 1 and Generation 2:**

<b><u>WASSP Models</u></b> <b><u>Gen 1 and Gen 2</u></b>	<b><u>WMB-160F</u></b>	<b><u>WMB-80F</u></b>	<b><u>WMB-3230</u></b>	<b><u>WMB-5230</u></b>	<b><u>WMB-3250</u></b>
<b>Minimum WASSP Software</b>	v1.52.6.587	v1.52.6.587	v4.1.4.574	v4.1.4.574	v2.4.3.179
<b>Type</b>	Fishing	Fishing	Fishing	Fishing	Survey
<b>Frequency</b>	160 kHz	80 kHz	160 kHz	80 kHz	160 kHz
<b>Beam Width</b>	112 beams over 120°				224 beams over 120°
<b>Maximum Depth</b>	200m	500m	200m	500m	200m
<b>Output Format</b>	v1.1	v1.1	MaxSea (v2.2)	MaxSea (v2.2)	MaxSea (v2.2)
<b>Multibeam Depth</b>	Yes	Yes	Yes	Yes	Yes
<b>BackScatter</b>	Yes	Yes	Yes	Yes	Yes

<b>Section</b>	No	No	No	No	No
<b>Multi-Beam Sounder</b>	No	No	No	No	No
<b>Fish Target</b>	No	No	No	No	No
<b>Sidescan</b>	No	No	No	No	No
<b>Navigation Data</b>	No (*)	No (*)	Yes	Yes	Yes

(\*) GPS, Heading and other instruments need to be connected using dedicated serial COM port or NMEA2000 in TimeZero

**Generation 3:**

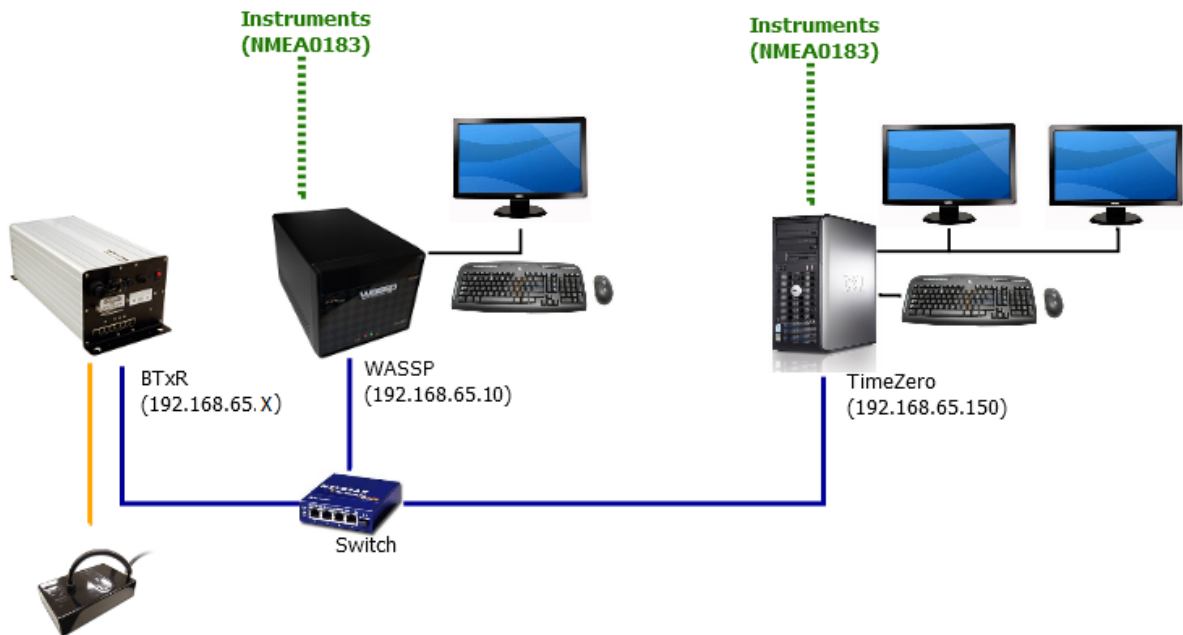
<b><u>WASSP Models Gen 3</u></b>	<b><u>S3</u></b>	<b><u>F3</u></b>	<b><u>F3 L</u></b>
<b>Minimum WASSP DRX Software</b>	v3.1	v3.1	v3.1
<b>Type</b>	Survey	Fishing	Fishing
<b>Frequency</b>	160 kHz	160 kHz	80 kHz
<b>Beam Width</b>	224 beams over 120°		
<b>Maximum Depth</b>	200m	200m	450m
<b>Multibeam Depth</b>	Yes	Yes	Yes
<b>Section</b>	Yes	Yes	Yes
<b>BackScatter</b>	No	Option	Option
<b>Multi-Beam Sounder</b>	No	Yes	Yes
<b>Fish Target</b>	No	Option	Option
<b>Sidescan</b>	No	Option	Option
<b>Navigation Data</b>	Yes	Yes	Yes

## Network Configuration

The WASSP Computer/Processor needs to be networked to the TimeZero Computer using an Ethernet cable. WASSP Generation 1 (WMB-160F/80F) and WASSP Generation 2 (WMB-32x0/5230) require a dedicated WASSP computer for post-processing and an additional computer to run TimeZero. With WASSP Generation 3 (S3, F3 and F3L) you do not need any computer for post processing and the TimeZero computer can be directly connected to the WASSP Black Box (DRX).

### Generation 1: WMB-160F/80F

The first generation of WASSP processor (WMB-160F and WMB-80F) has only one Ethernet card. In order to connect to the TimeZero computer, a switch must be used:



Set the TimeZero computer IP address on the same network as the WASSP Processor and BTxR (for example 192.168.65.150).

**IMPORTANT:** Make sure to disable the firewall on the WASSP computer and on the TimeZero computer.

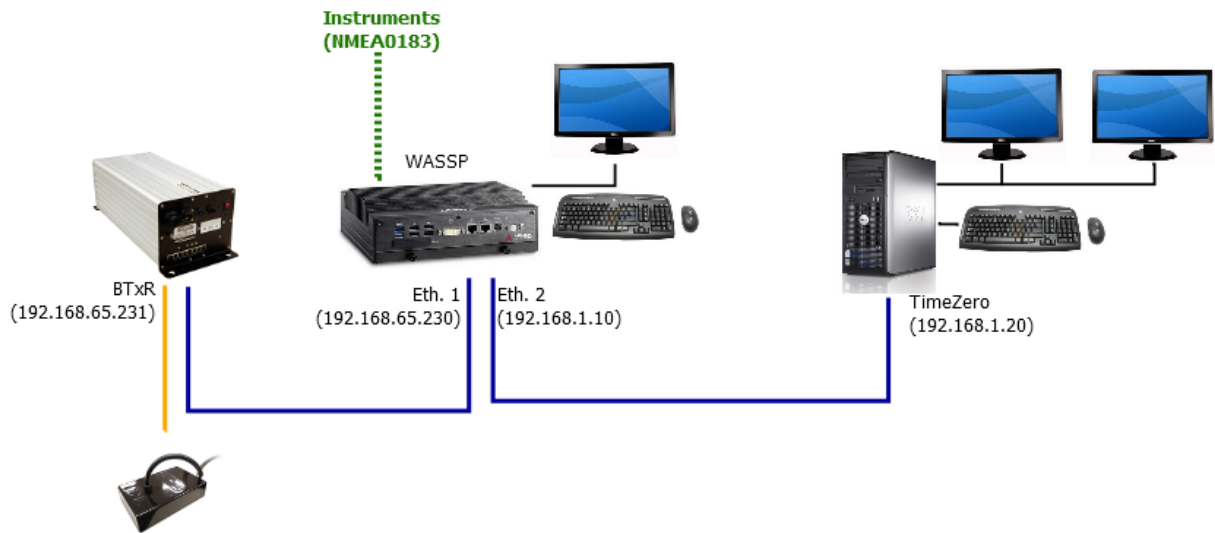
It is recommended to "ping" the WASSP processor (192.168.65.10 in the example above) from the TimeZero computer to make sure the network is correctly setup. Please refer to the [How To Ping](#) chapter.

With WASSP generation 1 models (WMB-160F and WMB-80F), dedicated Serial COM port or NMEA2000 connection that are configured through the Connection Wizard must be used to receive Navigation Data (GPS, Heading, etc..).

### Generation 2: WMB-3230/5230/3250

The second generation of WASSP processor (WMB-XX30 and WMB-XX50) has two Ethernet cards. The second Ethernet card can be used to link the WASSP processor (PC) to the TimeZero PC directly:





Make sure to assign a fix IP address to the second Ethernet Card of the WASSP processor. Assign a similar (but different IP address) on the same subnet for the TimeZero computer.

Example:

- 192.168.1.10 /255.255.255.0 for the WASSP processor (second Ethernet Card)
- 192.168.1.20 / 255.25.255.0 for the TimeZero computer

**IMPORTANT:** Make sure to disable the firewall on the WASSP computer and on the TimeZero computer.

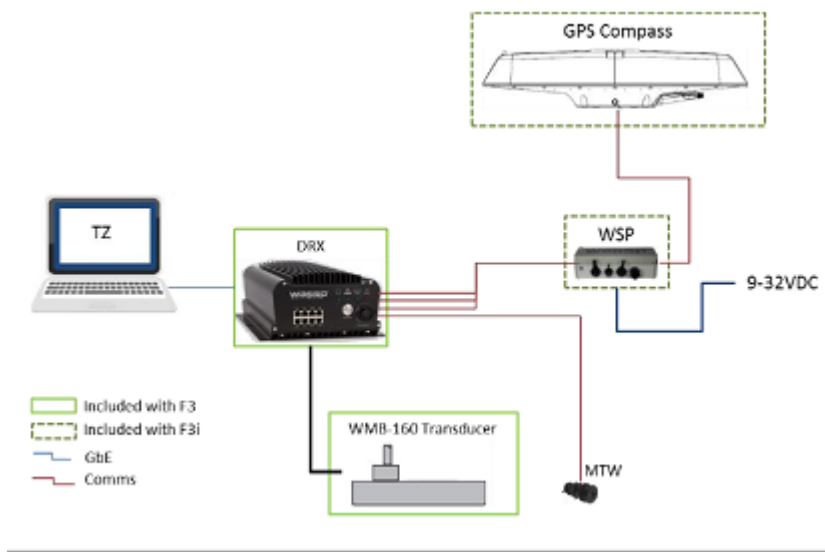
It is recommended to "ping" the WASSP processor from the TimeZero computer to make sure the network is correctly setup. Please refer to the [How To Ping](#) chapter.

With Generation 2, the navigation data (GPS and Heading) is also received from the WASSP processor through the Ethernet network. You don't need to connect the instruments directly to TimeZero. All data can be received from the Network.

**Note:** You can still connect instruments directly to TimeZero using Serial COM port or NMEA2000 for additional data (AIS) or when the WASSP Processor is not powered ON.

### Generation 3: WASSP S3, F3 and F3L

The third generation of WASSP uses a black box concept (similar to a regular Furuno Ethernet sounder) that does not need any extra computer to process the data. You can connect the "DRX" (WASSP Black Box) to the TimeZero computer directly or via a switch:



TimeZero gets Bathy and BackScatter information (just like with WASSP Gen1/2) but also can render Multibeam echo (Section, Multibeam Sounder, Sidescan) as well as Fish Targets (Water column data).

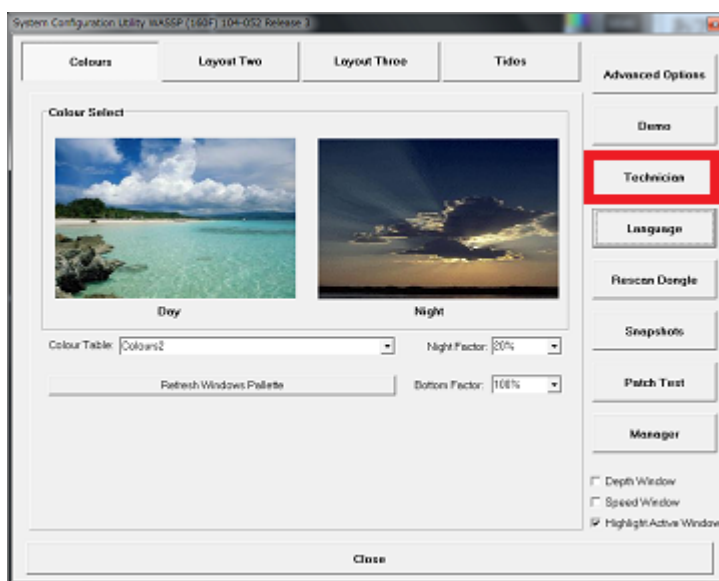
With WASSP Generation 3, the navigation data (GPS and Heading) is also received from the DRX through the Ethernet network. You don't need to connect the GPS or Heading via Serial COM Port to the TimeZero computer.

**Note:** You can still connect instruments directly to TimeZero using Serial COM port or NMEA2000 for additional data (AIS) or when the WASSP Processor is not powered ON.

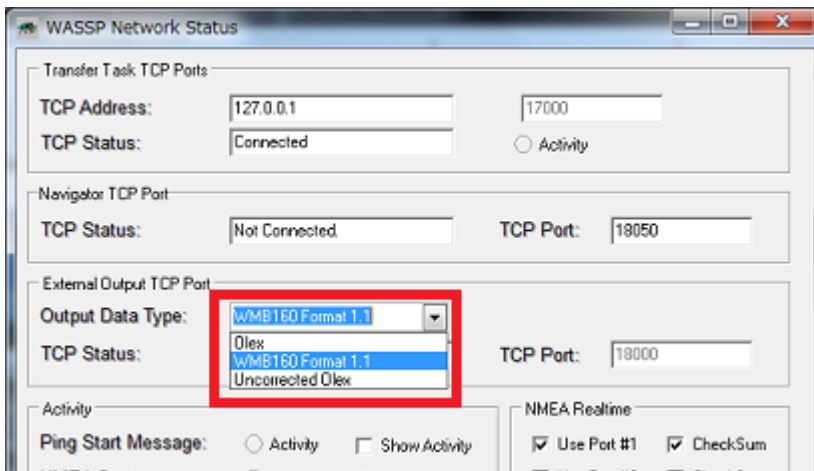
## WASSP Processor Configuration

### Generation 1: WMB-160F/80F

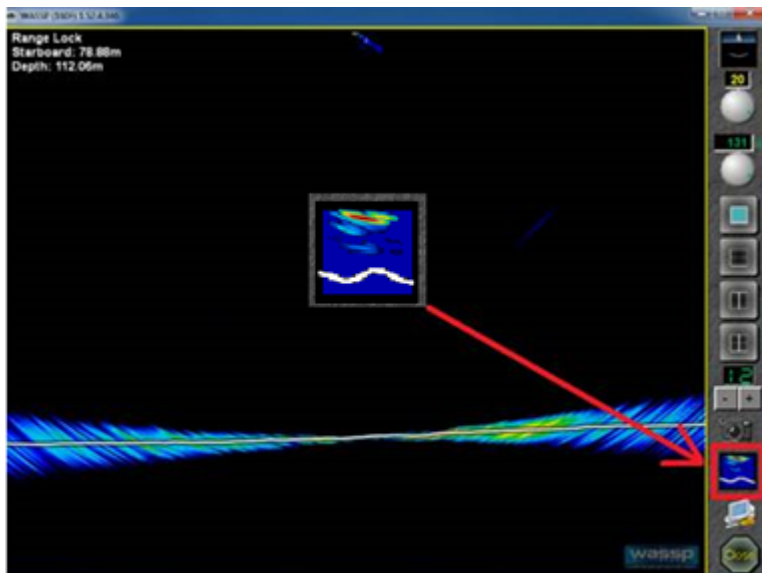
Open the WASSP Processor "System Configuration" utility and select "Technician"



Select "Network" and make sure that "WMB Format 1.1" is selected as "External Output TCP Port":

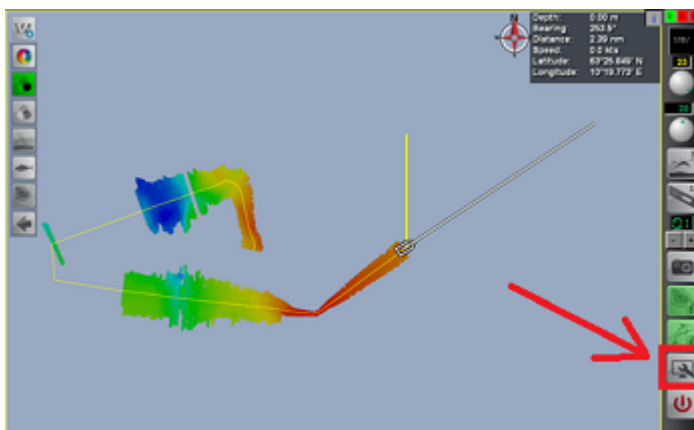


Close the window and make sure that the WASSP sees the bottom and is set to output data by clicking on the corresponding icon:



### Generation 2: WMB-3230/5230

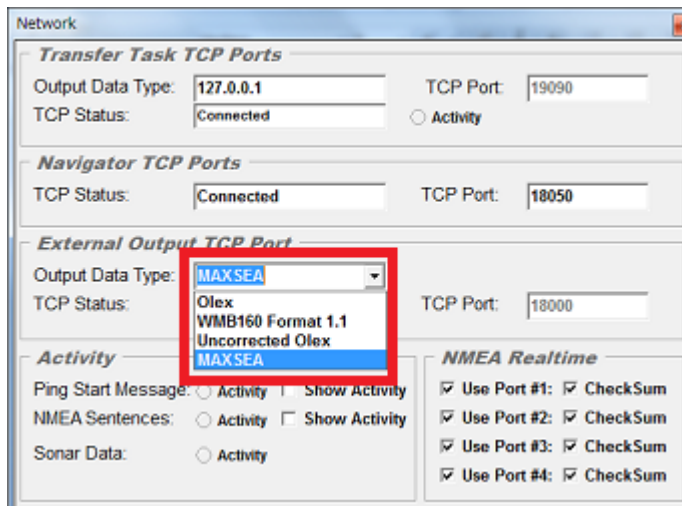
Click on the "Utility" button located on the WASSP Toolbar:



Click on the "Network Utility" button from the Utility Panel:

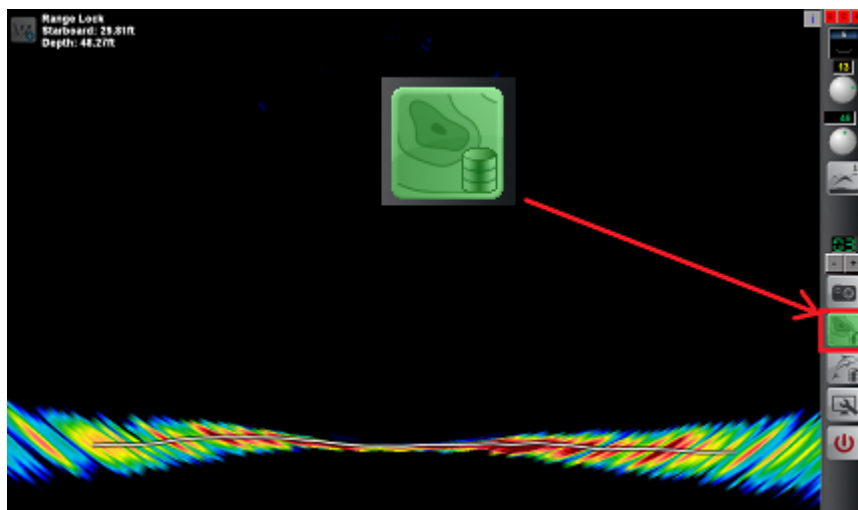


Select "MaxSea" as "External Output TCP Port":



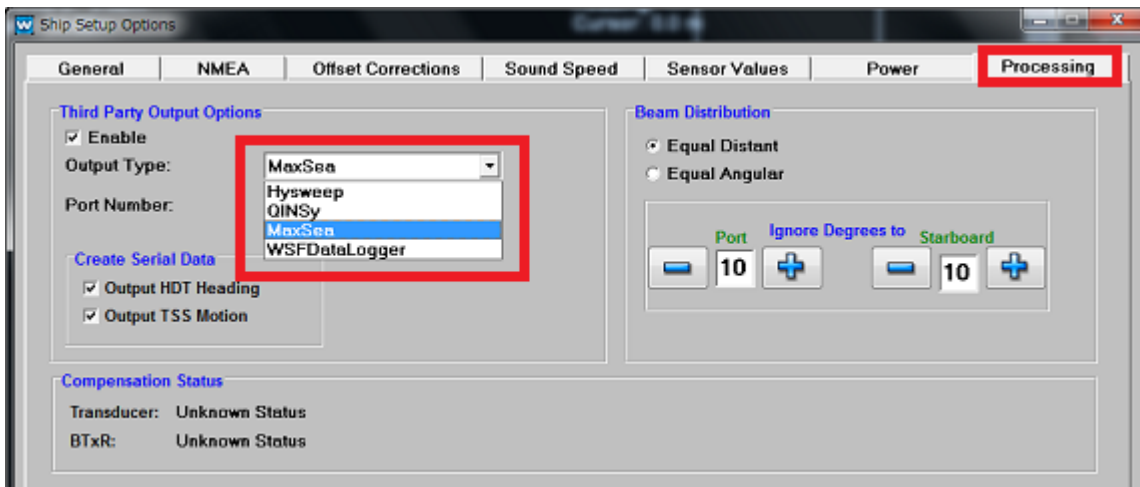
**IMPORTANT:** If you cannot select "MaxSea" as an Output Port, the WASSP dongle must be updated with the correct license file. Please contact your WASSP dealer to get the appropriate license file.

Close the window and make sure that the WASSP sees the bottom and is set to output data by clicking on the corresponding icon:



## Generation 2 Survey: WMB-3250

Open the "Processing" tab from the Ship Setup Options and select "MaxSea" for the Third Party Output Options:



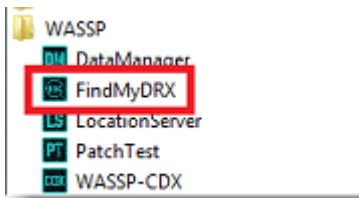
IMPORTANT: If you cannot select "MaxSea" as an Output Port, the WASSP dongle must be updated with the correct license file. Please contact your WASSP dealer to get the appropriate license file.

### Generation 3: S3, F3 and F3L

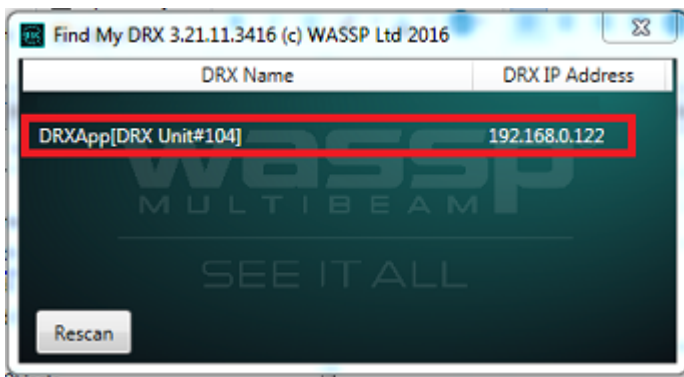
To connect the WASSP Processor (DRX) to TimeZero, you will have to fix the IP address of the DRX. This is done through the DRX Web interface. In order to access the Web Interface of the DRX, you will have to connect the computer to the DRX (directly or via a switch). If there is no router on the network, the WASSP DRX and the PC will use a default IP address of 169.254.x.x. In order to find the IP address of the DRX, you can use the "Find My DRX" tool that is package with the WASSP software.

Install the WASSP Software on the TimeZero computer. This will install the WASSP "CDX" (WASSP Viewer) as well as some other tools that you will need to perform the WASSP initial adjustments and initially find the DRX on the network.

After installing the WASSP Software, you should find in the Windows Start menu "Find My DRX" under "WASSP":



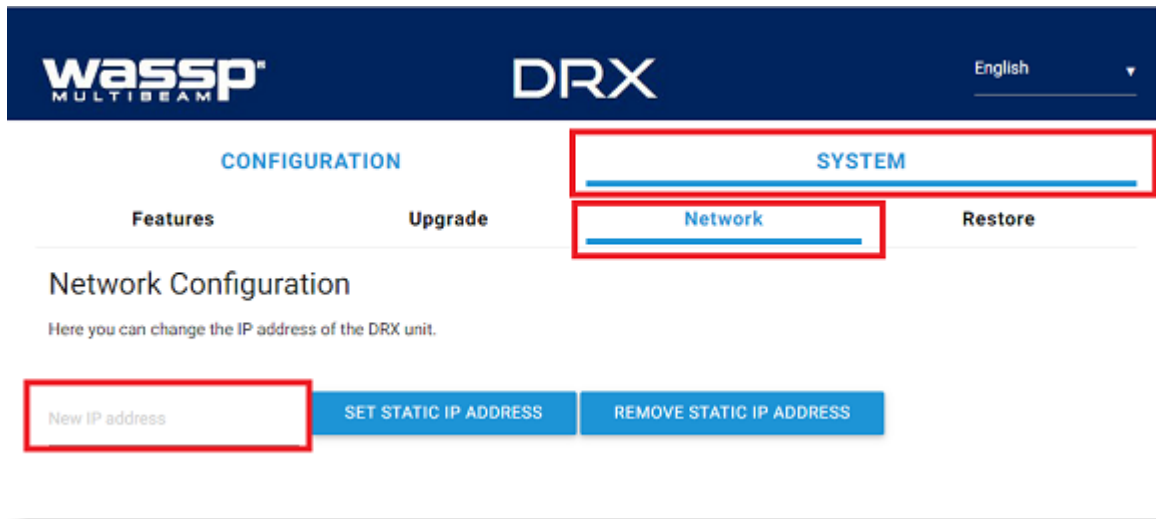
Open "Find My DRX". If the computer is on the same network as the DRX, it should be listed in the list with its IP address:



You can click on it to open a Web Browser

**IMPORTANT:** It is highly recommended to use Chrome to perform the initial adjustments of the DRX.

Once the DRX configuration page opens, select "System" and then "Network":



**IMPORTANT:** If you do not see a "Network" menu under "System", this usually means that the DRX firmware needs to be upgraded. The minimum DRX firmware that can be used with TimeZero is 3.1.109

Enter a fix IP address and press "Set Static IP Address". Note that you can use any IP address as long as you set the DRX and TimeZero computer on the same network.

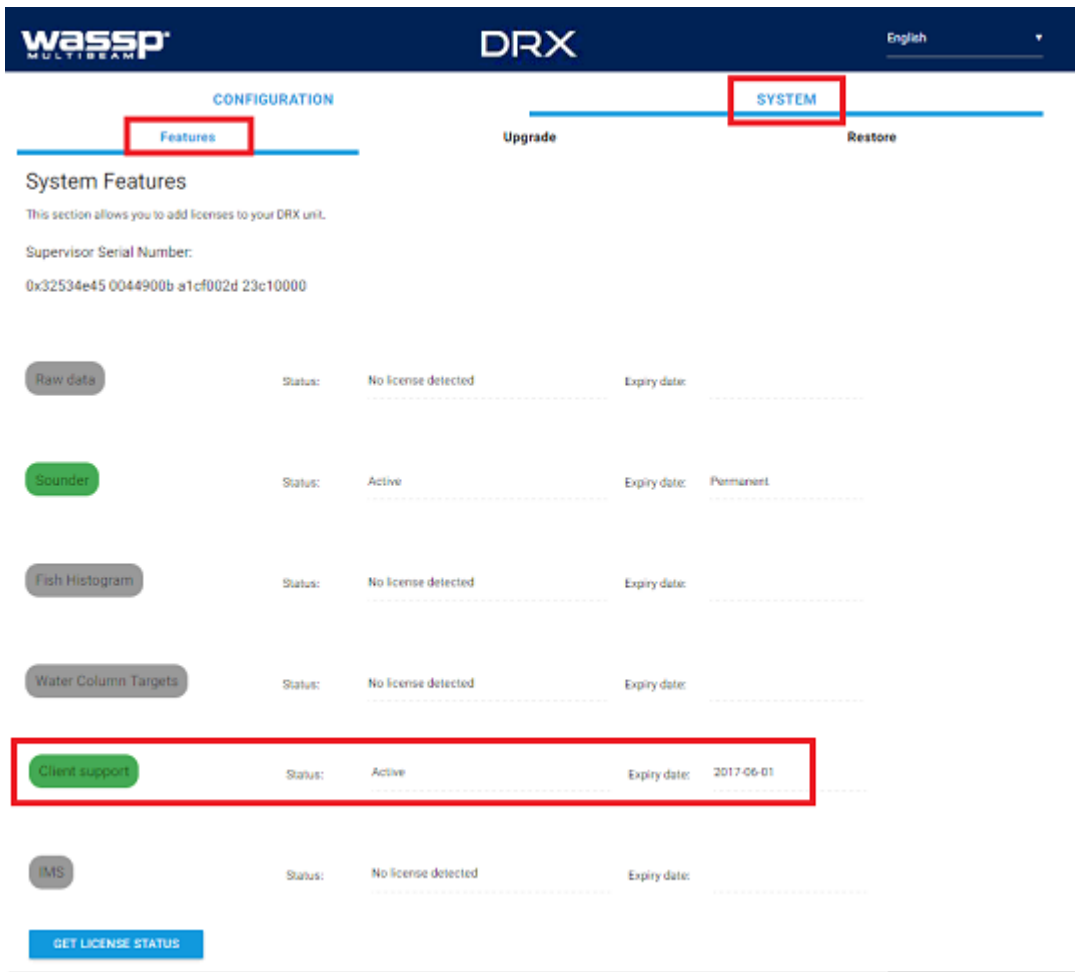
Example:

- 192.168.1.10 /255.255.255.0 for the DRX

- 192.168.1.20 /255.255.255.0 for the Computer

Note that after changing the IP address of the DRX, you will have to change the IP address of the computer in order to access the DRX Web Configuration page again.

In order for TimeZero to be able to connect to the DRX, the "Client Support" module needs to be unlocked inside the DRX (this is independent from the TimeZero PBG and WASSP modules). The DRX "Client Support" module needs to be purchase through your WASSP Dealer. To make sure that you have the DRX "Client Support" module unlocked, you can select the "Feature" page under "System" and make sure that "Client Support" is active (displayed in green):



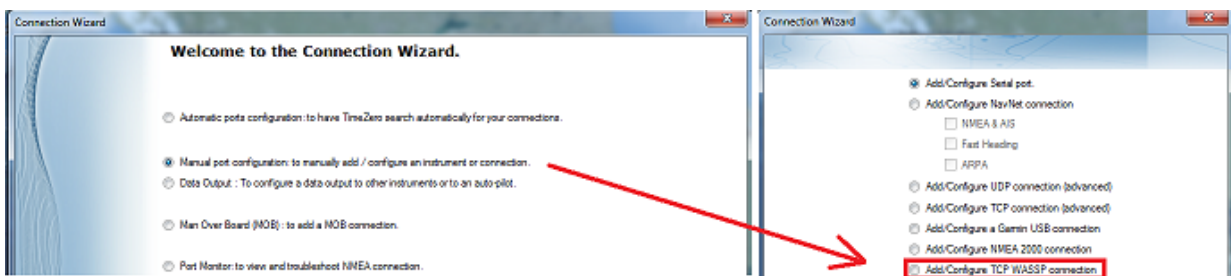
Continue performing the WASSP initial configuration as per WASSP installation guide. It is recommended to use CDX (WASSP viewer) to make sure all settings are properly configured.

### TimeZero Configuration

**Note:** Before configuring WASSP into TimeZero, it is recommended to "ping" the WASSP Processor IP address to make sure that the network configuration is setup properly. Please refer to [How To Ping](#) for more information. It is also recommended to disable the Windows Firewall on the TimeZero (and WASSP computers for Generation 1 and Generation 2). Finally, make sure that the WASSP is correctly connected to the instruments (GPS, Heading, etc...) and can detect a good bottom.

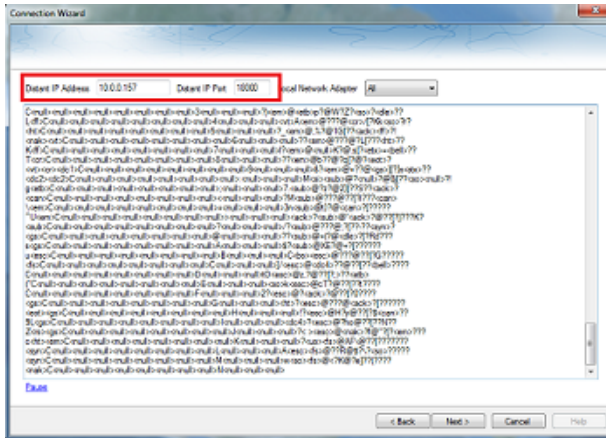
Open the Connection Wizard by clicking on the button on the upper left of your screen.

Select "Manual port configuration" then "TCP WASSP Connection"

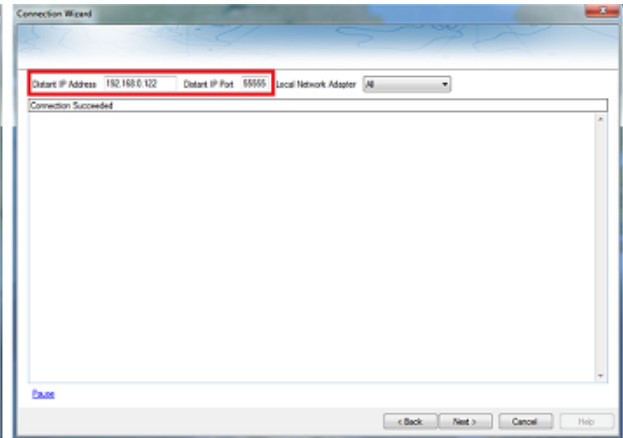


**Note:** If don't see WASSP Connection from the Connection Wizard, ensure that the WASSP module is configured in TimeZero.

Enter the WASSP Processor IP address and the Port number ("18000" for WMB-160F/80F/3230/5230, "18007" for WMB-3250 and "55555" for S3/F3/F3L):



**Generation 1/2**

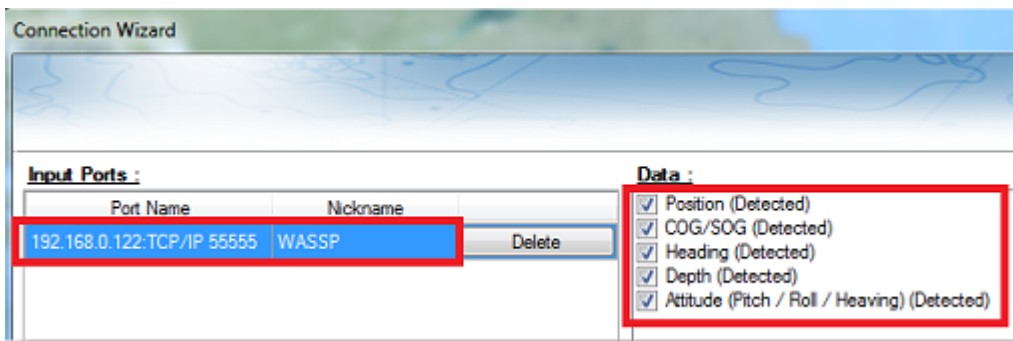


**Generation 3**

Confirm that data is received from the WASSP processor. Note that the data sent over Ethernet is not NMEA, so it is normal to see "scramble data" as illustrated in the screenshot above with Generation 1 and Generation 2. With Generation 3, you will not see any "scramble data", it will simply say "Connection Succeeded".

Click on "Next" and wait for the Connection Wizard to analyze the Port.

If you have a Generation 2 or Generation 3, make sure that the Navigation data is also detected and selected:



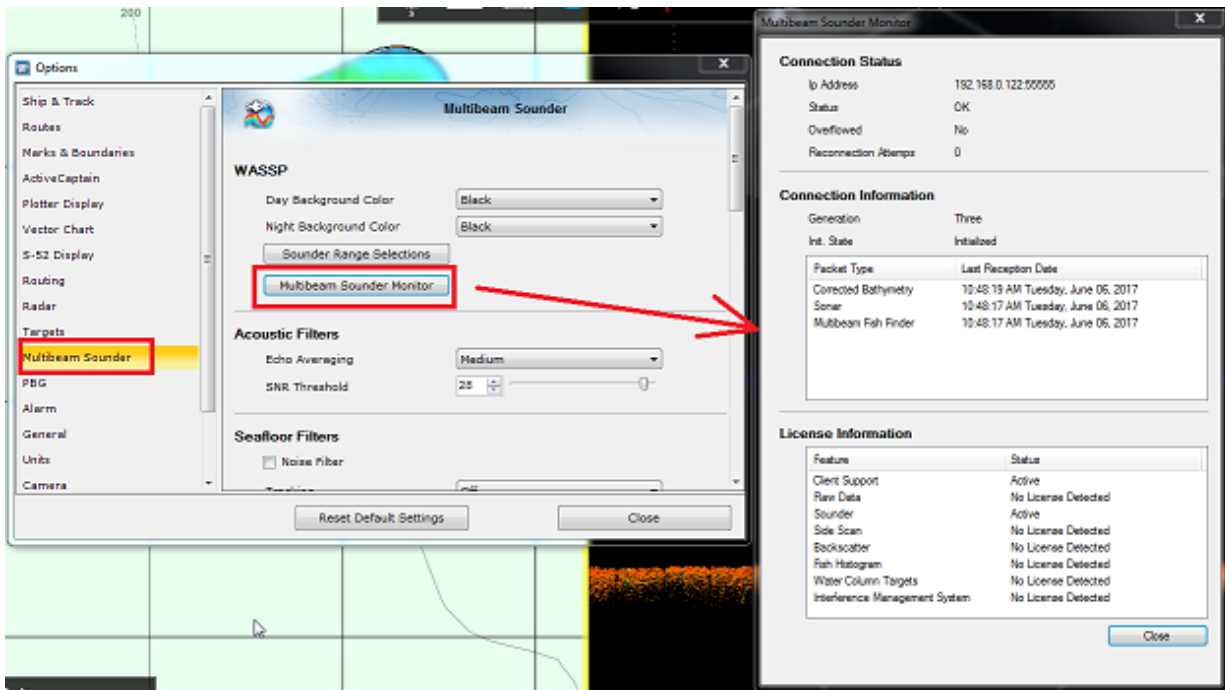
**IMPORTANT:** If the WASSP is not transmitting during the analysis of data, it is normal for TimeZero to not automatically detect some data. Simply manually check the data in that case.

**Note:** With Generation 1, it is normal to have nothing selected under "Data". This is because Generation 1 does not transmit Navigation data to TimeZero. As long as the WASSP Port is configured, it will receive depth and backscatter data. Also note that the "Depth" check box will be automatically checked (even if no data is received). It is recommended to uncheck "Depth" from the Connection Wizard under the WASSP port with Generation 1.

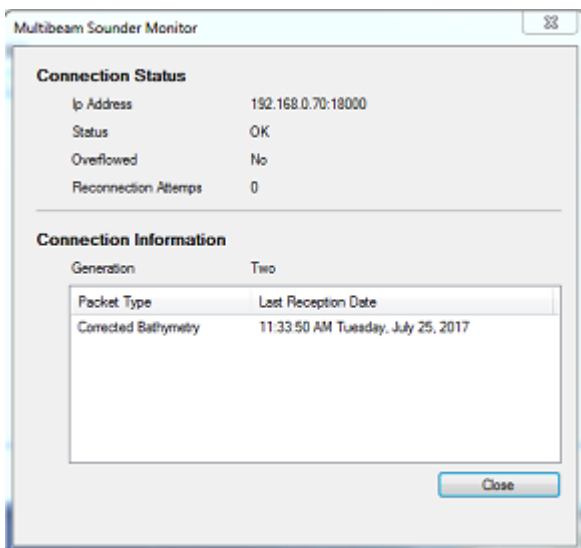
Click on "Next". Select the "Master" Data Source (in case TimeZero is connected to multiple sensors) then click on "Next" then "Finish" to close the Connection Wizard.

Select "Options" by clicking on the button on the upper left of your screen. Click on "Multibeam Sounder" and "Multibeam Sounder Monitor":



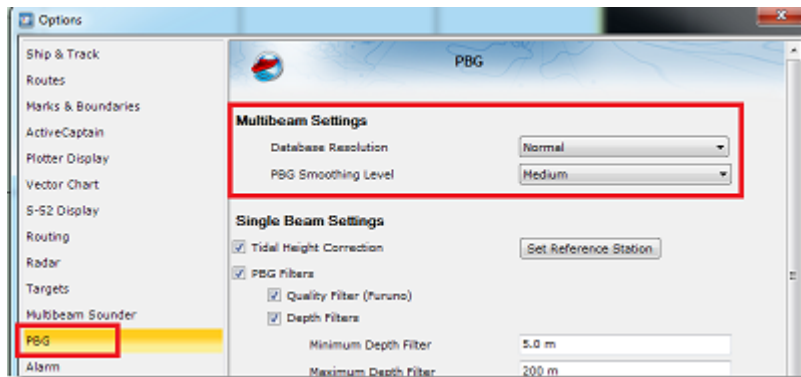


A window will open displaying various information regarding the WASSP DRX (Generation 3 only). With WASSP Generation 1 or Generation 2, this window will only display minimal information:



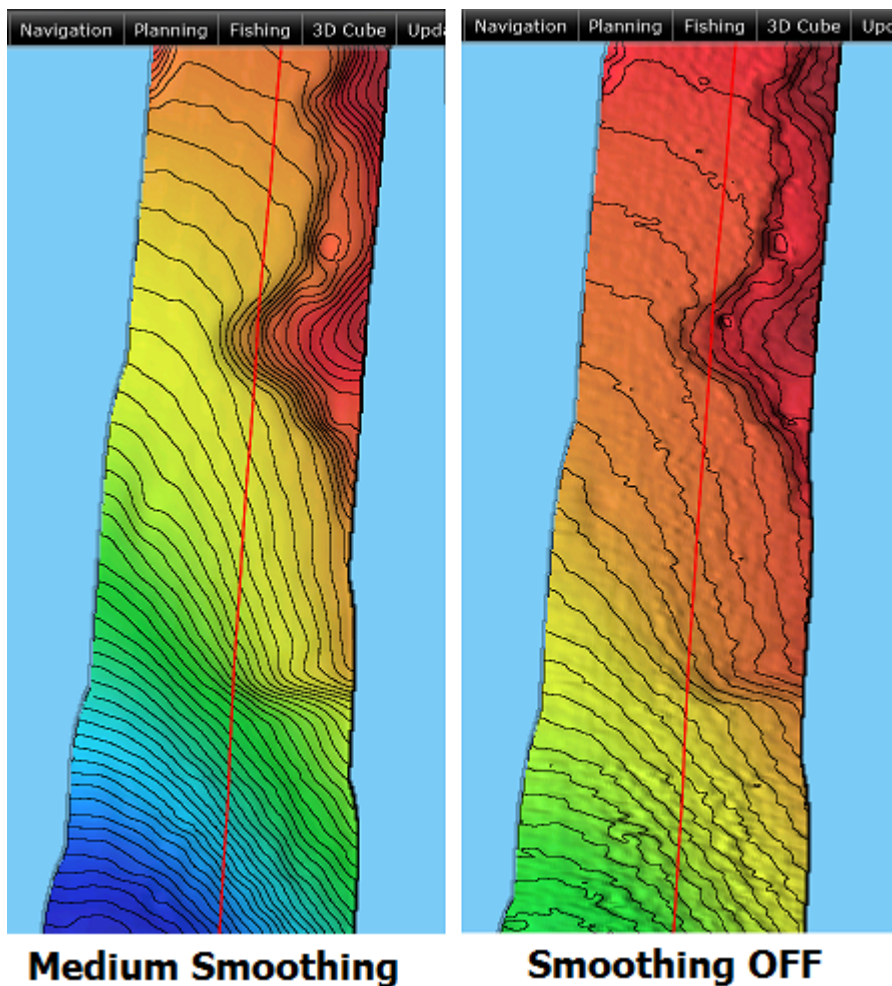
**TIPS:** When connecting a WASSP Generation 3, the "Multibeam Sounder" Options will allow to adjust most of the DRX settings directly from TimeZero. However, some initial adjustments (offset, sensor configuration, patch test and backscatter calibration) will need to be performed either from the DRX Web configuration page or from CDX or tools provided with CDX. A good practice is to adjust WASSP using the WASSP installation guide and CDX and then use TimeZero.

Click on the "PBG" Option. You will be able to setup the Database Resolution and the Smoothing Level:

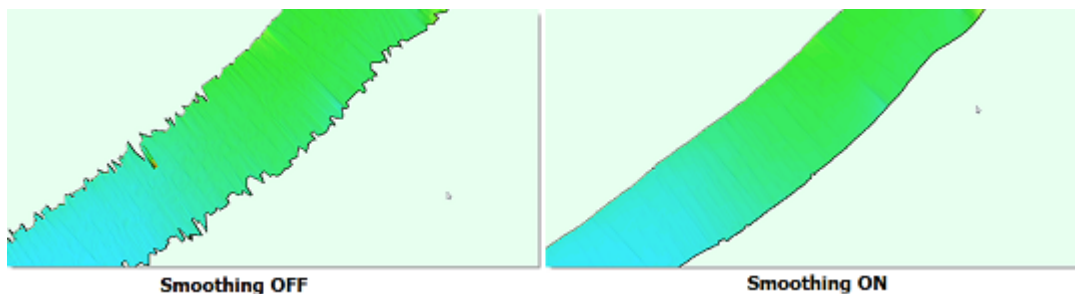


The database resolution is automatically adjusted by TimeZero according to depth. At greater depth the "space" in between depth points increase and TimeZero automatically select a bigger grid to save disk space. The database resolution setting (Normal or High Resolution) allows to select the maximum resolution that will be used for shallow water. When set to "Normal", the maximum resolution is set to 30cm. When "High Resolution" is selected, the maximum resolution is set to 8cm.

The PBG Smoothing level adjusts the TimeZero post processing of the WASSP Bathy and Backscatter data. Smoothing will help damp inaccuracies (small error) and will improve the contour line rendering:



When the smoothing is enabled, a special postprocessing is also enabled to smooth the edge of the swath:



Finally, click on the "Initial Setup" Options and enter the same "Transducer Draft" as the WASSP Processor. Please note that the value for "Transducer Draft" is always a positive value (enter the distance in between the water line and the position of the transducer).

Click on "Close" to close the "Options".

You should now receive navigation data and be able to record Multibeam depth data and BackScatter data by clicking on the "PBG" button in the Toolbar.

**Note:** In order to confirm that data is being recorded, you might have to perform a sea trial in order for the boat position to move. In some case (if the GPS is very stable), you will not be able to see depth being recorded until you vessel move.

## AXIS IP Camera & Converter

### Introduction

TimeZero is compatible with any AXIS IP Cameras and any AXIS IP Converters. If the Camera has Pan/Tilt/Zoom (PTZ) abilities, TimeZero can control the camera from the Camera WorkSpace, the Camera NavData virtual joystick, and from the chart (if the camera is set to be used for tracking).

### **Installation Overview**

In order to view (and control) an AXIS IP camera or converter from TimeZero, it is necessary to:

- Assign a fixed IP Address to the camera or converter using the AXIS IP Utility Program
- Setup the camera or converter with credentials (it is recommended to use the default "pass" password for the "root" account)
- Adjust some settings such as maximum frame-rate and resolution (according to how many cameras you have on the network and the CPU of computer)
- Add and configure the Camera in TimeZero from the [Camera](#) Options

**Note:** Video feed decoding (H264) can take lots of CPU and requires a powerful computer if you connect multiple HD cameras. In some situation, you might have to reduce the frame-rate (FPS) and/or resolution of the camera for "smooth" operation in TimeZero.

### Setting the IP of the computer

You can select any IP address you want for the AXIS IP Camera or Converter as long as the computer is on the same network. In the following example, we will configure the Cameras and computer addresses to use the IP network 172.31.x.x / 255.255.0.0 (same Network as Furuno sensors):

- Open the "Control Panel" from the Windows "Start" menu (under Windows 8 or Windows 10, right click on the "Start" button, then select "Settings" and "Network & internet")

- Select "Change Adapters"
- Right click on the Local Area Connection corresponding to the Ethernet card where the network is connected and choose "Properties"
- Select "Internet Protocol version 4 (TCP/IP v4)" then click on "Properties"
- Select "Use the following IP address" then enter the appropriate IP address and Subnet Mask for the computer

In this example, we will use the NavNet IP network, so we will set the IP address of the computer to 172.31.3.150 with a subnet mask of 255.255.0.0

### Setting the IP of the camera(s)

In this example, we will set up 3 IP cameras:

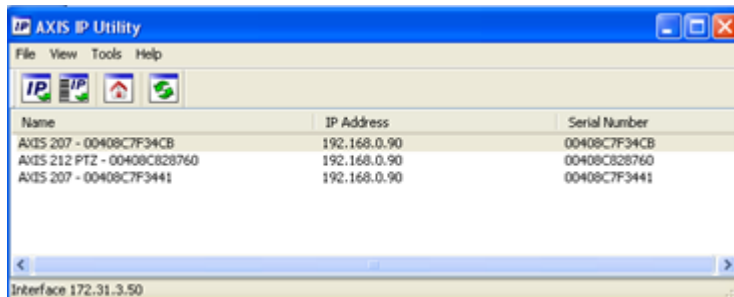
- One Pan/Tilt/Zoom IP camera (AXIS 212PTZ)
- One fixed (non PTZ) IP Camera (AXIS 207)
- One fixed (non PTZ) IP Camera (AXIS 207)

Download the AXIS IP Utility from AXIS website:

<https://www.axis.com/en-us/support/downloads/axis-ip-utility>

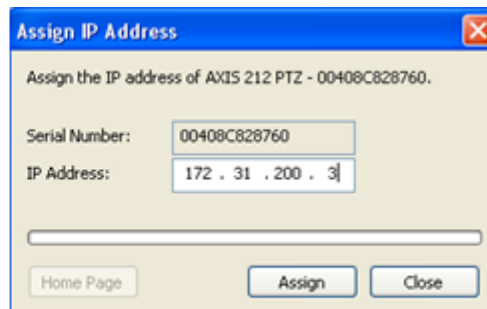
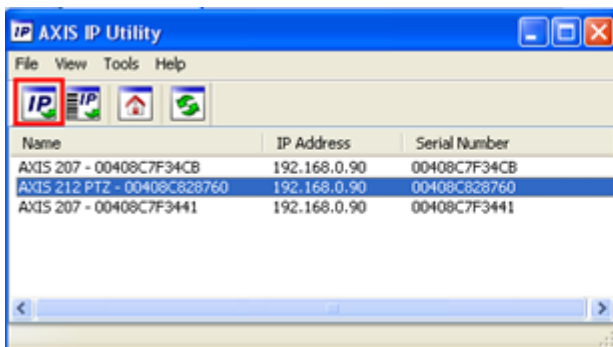
Right click on the "AXIS IPUtility" software and choose "Run as Administrator". If the Windows Firewall appears when opening the tool, make sure to click on "Unblock" to allow the software to detect and configure correctly the IP Camera(s).

The AXIS IP utility will detect all the IP cameras connected on the network:



**Note:** If you use the same camera models in multiple locations, be sure to write down the Camera serial number (which can be found on the back of the camera) with the intended location to help assign the correct camera.

To change the IP address of the Camera, select the camera in the list and click on the button "assign new IP address to selected device". Enter the correct IP address and click on "Assign":



Wait 30 seconds. If you don't get a confirmation message within 30 seconds, you will need to restart (power OFF and ON) the camera while leaving the tool running. After restarting the camera, wait for 3 minutes. You may have another Windows Firewall warning during the process. Simply accept it.

**Note:** If you do not get a confirmation message after 3 minutes, close the AXIS IP Utility tool and repeat the entire process.

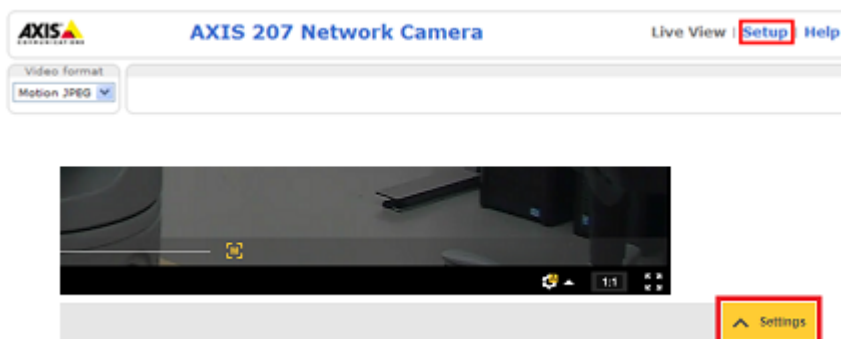
If applicable, repeat the process with other cameras (to assign the IP of the other cameras).

### Configuring the camera

The cameras need to be initially configured using a Web browser. When you connect to the camera the first time, it will ask you to create the Root account. It is recommended to set the password of the IP camera to "pass" and click "OK".

**Note:** If the camera is also used by a Furuno NavNet MFD, the Root account password MUST be setup to "pass"

Once the page of the camera appears, open the settings page. Click on the "Setup" button located on the top right corner (on older AXIS Cameras) or click on the "Setting" button located on the bottom right corner (for newer AXIS IP Cameras):



**RECOMMENDATION:** To achieve better performance and optimize network bandwidth, it is recommended to limit the camera resolution to a maximum of 720p and the camera frame rate (fps) to 15 fps. On older AXIS IP Cameras, select "Video ->Video Stream" and adjust the "Resolution" and "Maximum Frame Rate" settings found under the "Image" tab. On newer AXIS IP Camera, those settings can be found directly under the "Stream" tab.

**Note:** If you have a PTZ camera with the "Control Queue" option (under "PTZ Configuration-> Control Queue"), make sure to leave the Control Queue setting OFF as it is not supported by TimeZero (or NavNet MFD).

### Configuring TimeZero

Open TimeZero, select the Camera Options, click on the "Add" button and select AXIS. TimeZero will scan for any AXIS IP cameras that are connected on the local network.

**Note:** If the camera is not automatically detected (which can happen if the computer is connected to multiple networks), click on the button "My camera is not in the list" in order to manually enter its IP address.

After selecting the camera from the list (or after manually entering its IP address), TimeZero will ask you to enter the camera's credential (login/password). After validating the login and password, TimeZero will display the configuration window. The parameters you can edit will vary according to the camera capabilities (fixed vs. PTZ) and features you want to enable (Tracking and/or Augmented Reality):

Enter a user friendly name for the camera, then select the Image Aspect:

- "Full" will zoom the picture to fill the screen without changing the aspect ratio of the camera
- "Fit" will display the entire picture while keeping the aspect ratio of the camera and add a black border to fill the screen if needed

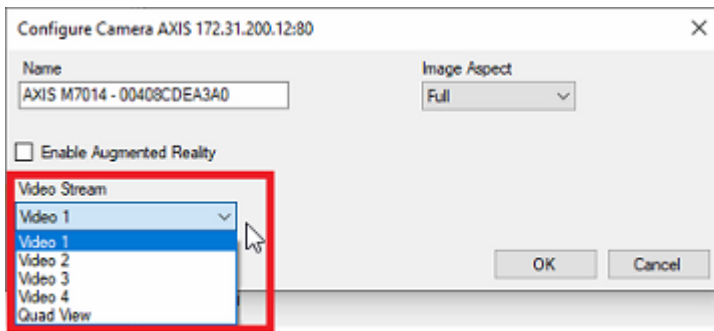
If you enable "Use for Tracking" (only available with AXIS PTZ Cameras) or "Augmented Reality", you will need to enter the camera position on the vessel.

The position is defined as a longitudinal and lateral distance measured from the center bow of the vessel. When entering these settings, remember that the longitudinal positions are always positive (from Bow to Stern) while the lateral position is negative for Port and positive for Starboard (0 is the middle of the vessel).

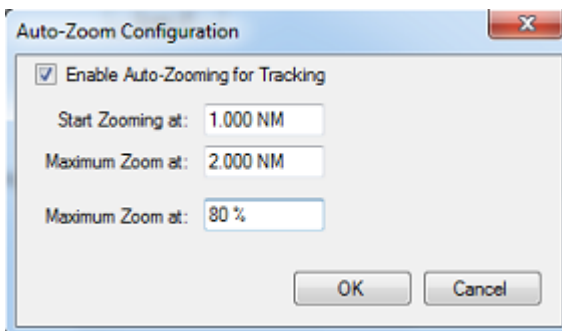
For the Horizontal, Vertical and Roll offset (mainly used for Augmented Reality), it is easier to adjust those settings from the Camera WorkSpace directly. Please refer to the "Augmented Reality Setup" paragraph of the [Augmented Reality](#) chapter for more information.

You will also have to enter the horizontal Field of View of the camera. If the camera has Zoom capability, you will have to enter two values: the Maximum FOV (when the camera is zoomed out) and the minimum FOV (when the camera is zoomed in). Note that TimeZero will attempt to extract those values from the camera. However, some AXIS cameras do not support this feature and you should double check those values using the camera specification.

If you are using an AXIS IP Converter with multiple inputs, you can select a specific input or a view that will mix the 4 inputs as one camera. If you want to add another channel from the same converter, repeat the process by adding another converter with the same credential and IP address but with another channel selected (each channel is seen as an independent camera in TimeZero).

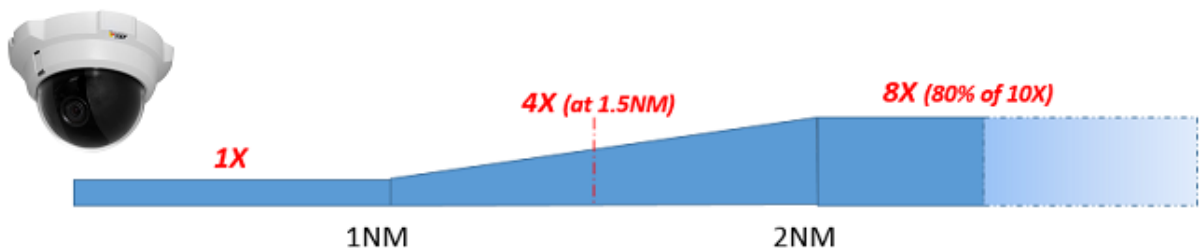


If the camera is PTZ and if you enabled the Tracking feature, you can configure the "Auto-Zoom" if you want the camera to adjust its zoom automatically when tracking an object. In the example below, the camera will start to zoom when the point or object to track reaches 1NM. The adjusted maximum zoom (80% of camera zoom maximum capacity) will be reached at 2NM. In between 1NM and 2NM, the zoom will be adjusted linearly (in between 1X and adjusted maximum zoom):



**Note:** Limiting the maximum zoom (in %) is useful if you don't want the camera to zoom at its full value (because it becomes "too blurry").

The diagram below illustrates the zoom value according to distance with a 10X zoom camera that has been restricted to 8X (80% of maximum zoom value):

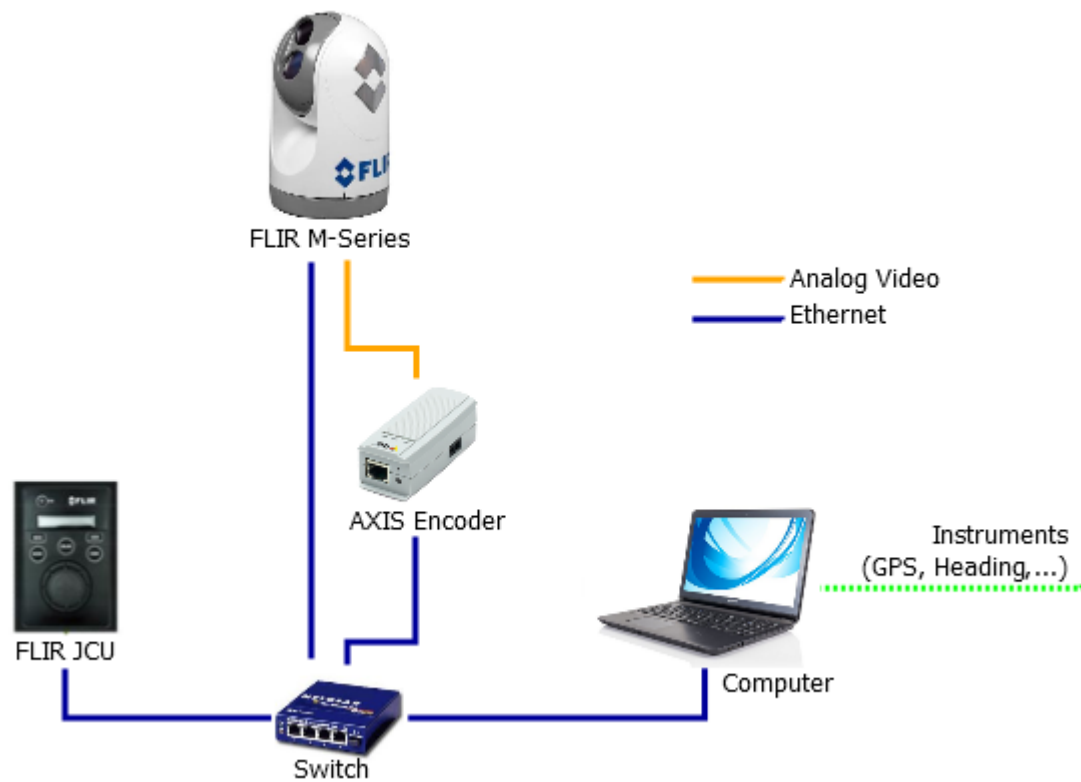


Click on "OK" to validate the settings and add the camera to the configuration.

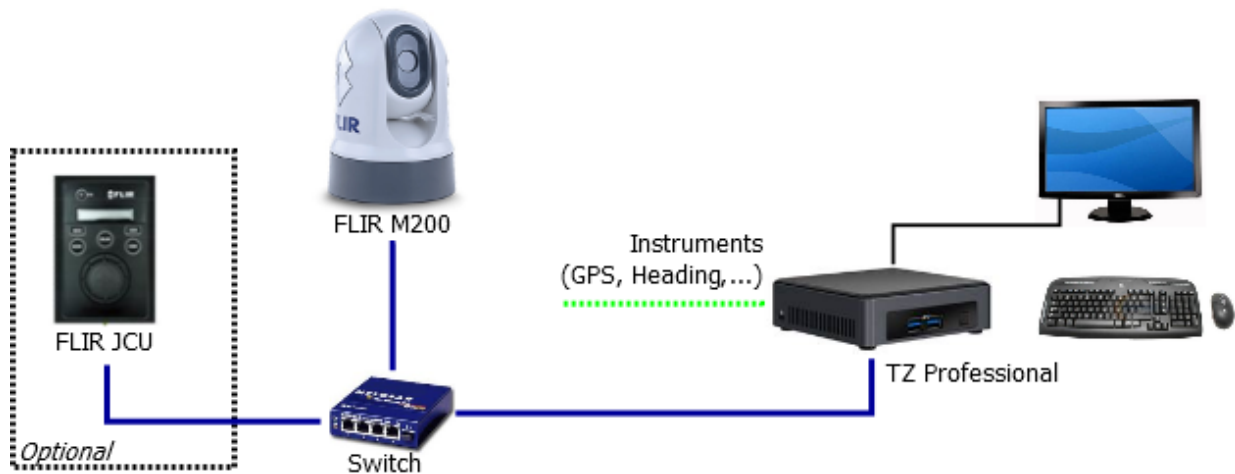
## FLIR Configuration

TimeZero is compatible with all FLIR M-Series cameras. Note that the legacy FLIR M-Series camera requires an AXIS video encoder if you want to view the video inside TimeZero. Below is an example showing a typical legacy FLIR M-Series connection diagram with an AXIS IP Video encoder to bring video inside TimeZero:





However, newer FLIR cameras have an internal IP video encoder and you don't have to use any external AXIS IP Encoder (a single Ethernet cable will provide Control and Video). The below example illustrates a typical connection diagram with a M200 (also applicable to M300/400/500):



The FLIR Joystick ("JCU") uses one Ethernet cable for data and power. To provide power to the JCU, you can use a regular switch with a "Power over Ethernet" (POE) injector or use a POE switch that can provide power directly from its POE connectors.

## Camera Configuration

You have to assign a fixed IP address to the Camera, the JCU Controller (Optional) and the computer. In this example, we will use a traditional Class C network configuration (192.168.1.X / 255.255.255.0), but you could also use the Furuno network configuration (172.31.x.x / 255.255.0.0) if you want to integrate TimeZero, NavNet Sensors and the FLIR Camera onto the same network.



**Note:** When manually assigning the IP addresses, make sure to not use the same IP address twice!

Example:

- Computer = 192.168.0.50 / 255.255.255.0
- FLIR Camera = 192.168.0.100 / 255.255.255.0
- JCU (FLIR Joystick) = 192.168.0.101 / 255.255.255.0
- Optional AXIS Converter (for older M-Series) = 192.168.0.102 / 255.255.255.0

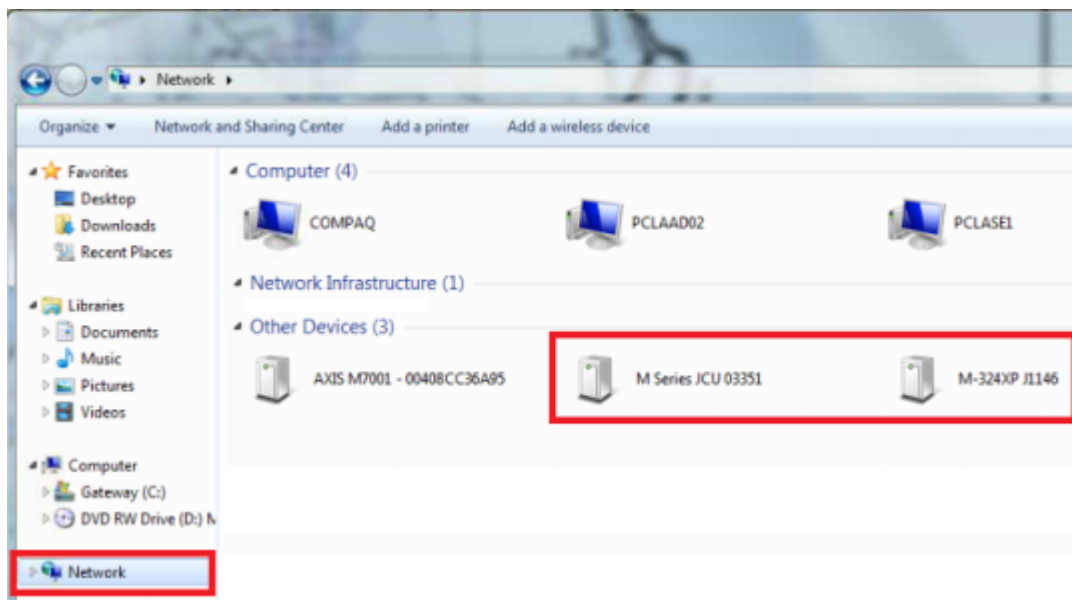
The FLIR Camera and the JCU controller are UPnP-enabled devices. You can see the list of UPnP-enabled device from your computer by opening "Network" in Windows. Note that the devices (Camera, JCU, and AXIS Converter) will only appear on your PC if they are on the same network domain.

When the computer is directly connected to the FLIR Camera or JCU via an Ethernet cable or via a Hub/Switch (without router or DHCP server on the network), the Camera and JCU automatically assign themselves an IP address of 169.254.x.x / 255.255.0.0. In order to access the configuration page of the Camera and JCU, you need to setup your PC on that network (ex: 169.254.1.2 / 255.255.0.0)

**Note:** If your computer is set to "obtain an address IP automatically", it should automatically set an IP address of 169.254.x.x after two minutes. However, it is sometimes easier to manually fix the IP address 169.254.1.2 / 255.255.0.0.

**Note:** If the JCU and the Camera, where previously assigned another IP address, you can display the JCU IP address by pressing the COLOR button while pushing the puck. You can then assign an IP address to your PC accordingly, and thus be able to access the Camera and JCU configuration page.

Once the computer is on the same network as the FLIR Camera and JCU, with UPnP enabled, you should see the Camera and JCU icon under "Network":



**Note:** If the devices don't appear, check to make sure that your computer is setup to display UPnP notifications:

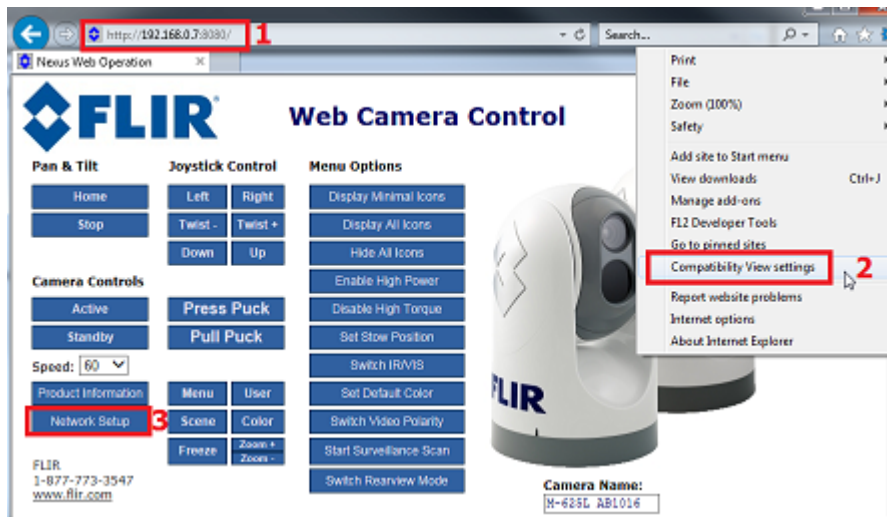
- Start the Control Panel and go to Add/Remove programs
- On the left-hand side, select the Add/Remove Windows components
- From the Windows Component Wizard, scroll down to Networking Services, then highlight and select the "Details" button
- Check the box to enable the UPnP User Interface and select OK
- Select Next when returning to the Windows Component Wizard
- Select Finish

Double click on the Camera icon to open its configuration web page.

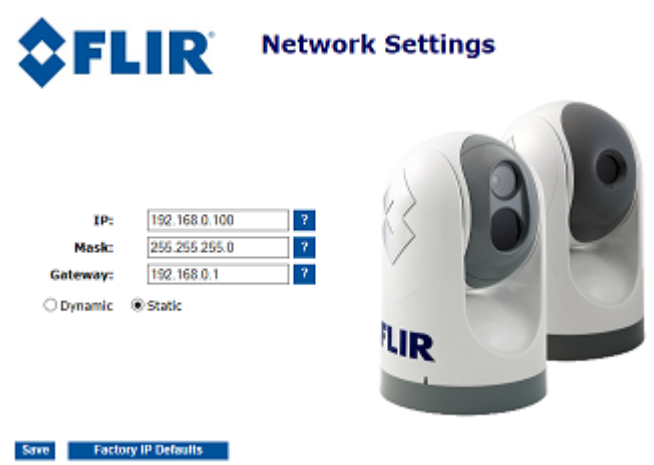
**FLIR M-Series (Legacy):**

**IMPORTANT:** If you are configuring a first generation M-Series, make sure to use Internet Explorer in compatibility mode. Other browser (such as Chrome) might not allow you to edit properties.

To configure a fixed IP address for the FLIR M-Series first generation, click on "Network Setup":



Select the Static option rather than Dynamic. The screen will refresh, and the IP, Mask, and Gateway fields will change from grey to white, indicating that they can accept user entries:



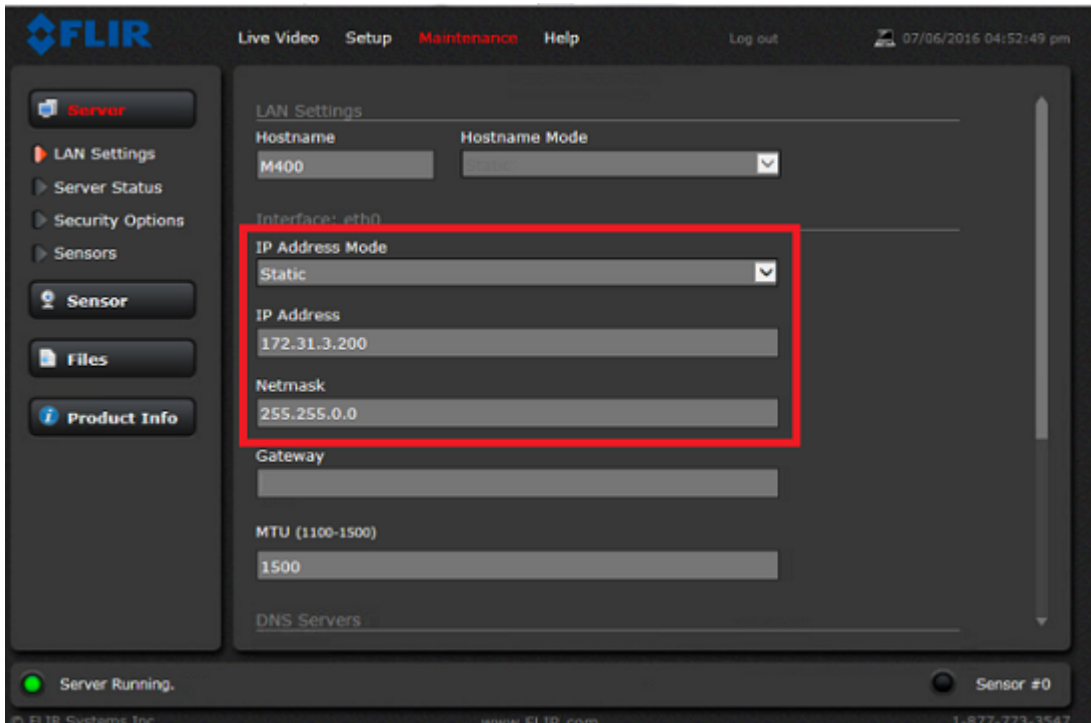
Once you have entered the appropriate IP address and subnet mask (192.168.0.100 / 255.255.255.0 in this example), click on the "Save" link. The camera should reboot and adopt the new IP address.

**Note:** You will not be able to access anymore the Camera configuration page after changing its IP address (until you change the IP address of your computer later in this process)

Wait one minute then restart the Camera (cycle the power).

**FLIR M200, M400 and M500:**

To configure a fixed IP address, select "Maintenance" at the top of the screen, then "Server" (on the left) and click on "LAN Settings". Set the IP Address Mode to "Static" and enter the proper IP address and subnet mask:

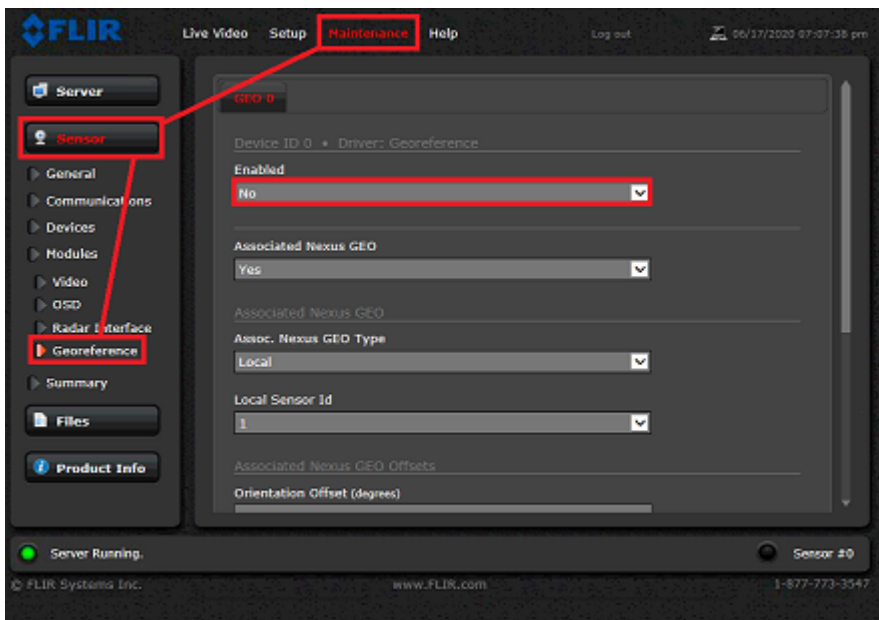


Once the parameters have been setup, scroll down and select "Save" and then "Restart Network".

**Note:** You will not be able to access anymore the Camera configuration page after changing its IP address (until you change the IP address of your computer later in this process)

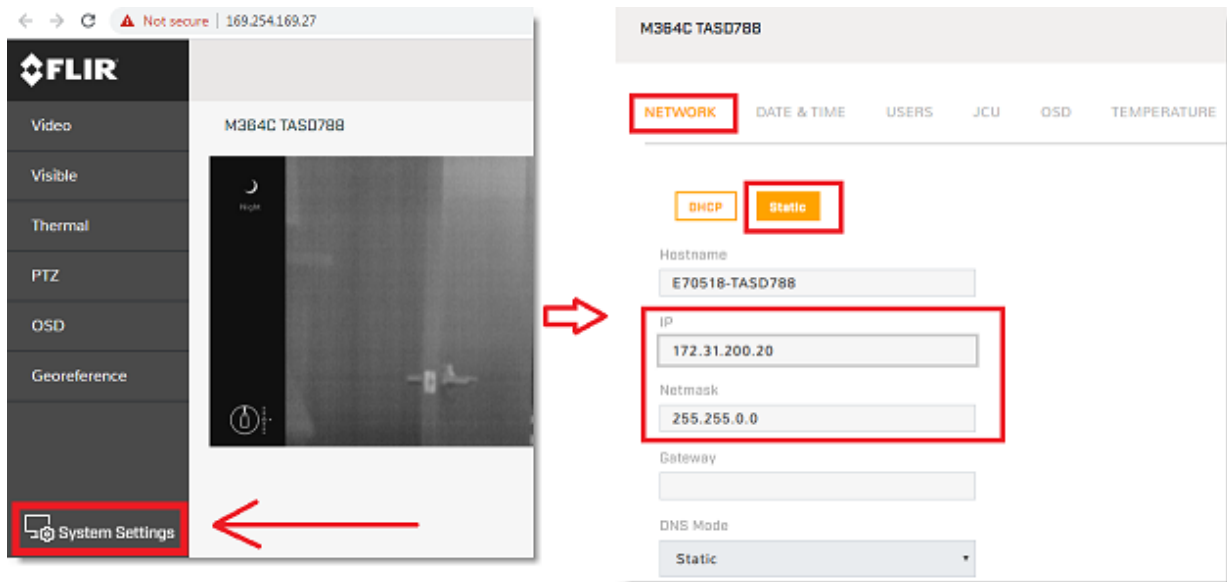
Wait one minute then restart the Camera (cycle the power).

Note that with M200, M400 and M500 the "Georeferencing" should be disabled if you have connected a GPS and Heading sensors to the camera:



**FLIR M300:**

To configure a fixed IP address, click on "System Settings" and then "Network". Set the IP Address Mode to "Static" and enter the proper IP address and subnet mask:



Once the parameters have been setup, scroll down and select "Save" and then "Restart Network".

**Note:** You will not be able to access anymore the Camera configuration page after changing its IP address (until you change the IP address of your computer later in this process)

Wait one minute then restart the Camera (cycle the power).

### **JCU (FLIR Joystick) Configuration**

Go back to "My Network Places" and double click on the JCU to open its web page and set the IP address in the same way.

**IMPORTANT:** If you are configuring an older JCU, make sure to use Internet Explorer in compatibility mode. Other browser (such as Chrome) might not allow you to edit properties.



### M-Series JCU Web Interface

**Firmware Update**

Please specify a .bin file:

**Network Addressing**

Dynamic

Static

IP:  ?

Mask:  ?

Enter the appropriate IP address and subnet mask (192.168.0.101 / 255.255.255.0 in this example), click on the "Save" link.

After changing the IP address of the Camera and JCU, you need to setup the final IP address of the PC on the new domain (192.168.0.50 / 255.255.255.0 in this example).

Once the IP addresses have been fixed on the same domain for all devices (PC, Camera & JCU), you should be able to see their icons in "My Network Place" (XP) or "Network" (Vista/Window 7).

### **AXIS Converter Configuration (legacy M-Series):**

If you use an AXIS converter (with a legacy FLIR M-Series), use the "AXIS IP Utility" to fix the IP address of the converter. Note that the AXIS IP Utility is able to discover any AXIS device even if the computer is not on the same network domain. Leave the IP address of the PC to its final IP configuration (192.168.0.50 / 255.255.255.0 in this example) and open the AXIS IP Utility. Change the IP and the settings of the AXIS converter according to the documentation (please refer to the [AXIS IP Camera & Converter](#) chapter for more information).

### **TimeZero Configuration:**

Open TimeZero, select the [Camera](#) Options, click on the "Add" button and select FLIR. TimeZero will scan for any FLIR cameras that are connected on the local network.

**Note:** If the camera is not automatically detected (which can happen if the computer is connected to multiple networks), click on the button "My camera is not in the list" in order to manually enter its IP address.

After selecting the camera from the list (or after manually entering its IP address), TimeZero will display the configuration window. The parameters you can edit will vary according to the camera capabilities (Single vs. Dual Head) and features you want to enable (Tracking and/or Augmented Reality):

Enter a user friendly name for the camera, then select the Image Aspect:

- "Full" will zoom the picture to fill the screen without changing the aspect ratio of the camera
- "Fit" will display the entire picture while keeping the aspect ratio of the camera and add a black border to fill the screen if needed

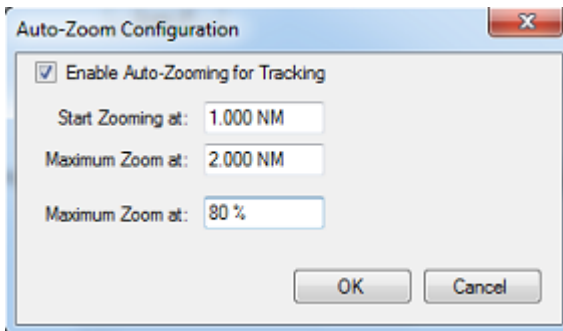
If you enable "Use for Tracking" or "Augmented Reality", you will need to enter the camera position on the vessel.

The position is defined as a longitudinal and lateral distance measured from the center bow of the vessel. When entering these settings, remember that the longitudinal positions are always positive (from Bow to Stern) while the lateral position is negative for Port and positive for Starboard (0 is the middle of the vessel).

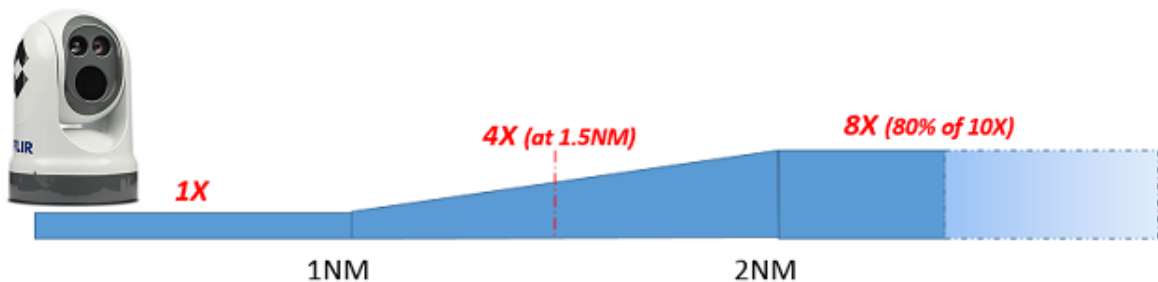
For the Horizontal, Vertical and Roll offset (mainly used for Augmented Reality), it is easier to adjust those settings from the Camera WorkSpace directly. Please refer to the "Augmented Reality Setup" paragraph of the [Augmented Reality](#) chapter for more information.

**Note:** If you use an AXIS video encoder with an old FLIR M-Series (legacy model which does not support Video over IP), you will need to enter manually the RTSP path of the AXIS IP Encoder connected to the analog video output of the FLIR Camera. Example: `rtsp://root:pass@172.31.200.12:554/axis-media/media.amp`. Make sure to use the IP address of the AXIS IP Encoder in the RTSP path.

if you enabled the Tracking feature, you can configure the "Auto-Zoom" if you want the camera to adjust its zoom automatically when tracking an object. In the example below, the camera will start to zoom when the point or object to track reaches 1NM. The adjusted maximum zoom (80% of camera zoom maximum capacity) will be reached at 2NM. In between 1 and 2NM, the zoom will be adjusted linearly (in between 1X and adjusted maximum zoom):



The diagram below illustrates the zoom value according to distance with a 10X camera that has been restricted to 8X (80% of maximum zoom value):



If you have a Dual-Head FLIR Camera (VIS and IR Lens), you will be able to adjust independently the Visual and IR Auto-Zoom.

## ONVIF Camera

### Introduction

TimeZero can control a camera that supports the ONVIF Profile S protocol. ONVIF is a popular control protocol used in the CCTV industry. In order for TimeZero to successfully control the camera, specific ONVIF capabilities must be supported. Please refer to the [ONVIF Protocol Requirement](#) chapter to make sure the camera is compatible.

### Setting the IP of the computer

You can select any IP address you want for the ONVIF Camera as long as the computer is on the same network. In the following example, we will configure the camera and computer addresses to use the IP network 172.31.x.x / 255.255.0.0 (same Network as Furuno sensors):

- Open the "Control Panel" from the Windows "Start" menu (under Windows 8 or Windows 10, right click on the "Start" button, then select "Settings" and "Network & internet")
- Select "Change Adapters"
- Right click on the Local Area Connection corresponding to the Ethernet card where the network is connected and choose "Properties"
- Select "Internet Protocol version 4 (TCP/IP v4)" then click on "Properties"
- Select "Use the following IP address" then enter the appropriate IP address and Subnet Mask for the computer

In this example, we will use the NavNet IP network, so we will set the IP address of the computer to 172.31.3.150 with a subnet mask of 255.255.0.0

## Setting the IP of the camera(s)

Please follow the manufacturer's instructions to fix the IP address of the ONVIF Camera. In this example, we will use an IP address of 172.31.200.1 for the camera. Make sure that "HTTP" is enable on the camera (TimeZero is not compatible with ONVIF over HTTPS).

## Configuring TimeZero

Open TimeZero, select the [Camera](#) Options, click on the "Add" button and select ONVIF. TimeZero will scan for any ONVIF IP cameras that are connected on the local network.

**Note:** If the camera is not automatically detected (which can happen if the computer is connected to multiple networks), click on the button "My camera is not in the list" in order to manually enter its IP address (172.31.200.1 in this example) and the ONVIF port number (usually 80).

After selecting the camera from the list (or after manually entering its IP address), TimeZero will ask you to enter the camera's credential (login/password) if applicable. After validating the login and password, TimeZero will display the configuration window. The parameters you can edit will vary according to the camera capabilities (fixed vs. PTZ) and features you want to enable (Tracking and/or Augmented Reality):

Enter a user friendly name for the camera, then select the Image Aspect:

- "Full" will zoom the picture to fill the screen without changing the aspect ratio of the camera
- "Fit" will display the entire picture while keeping the aspect ratio of the camera and add a black border to fill the screen if needed

If you enable "Use for Tracking" (only available with PTZ Cameras) or "Augmented Reality", you will need to enter the camera position on the vessel.

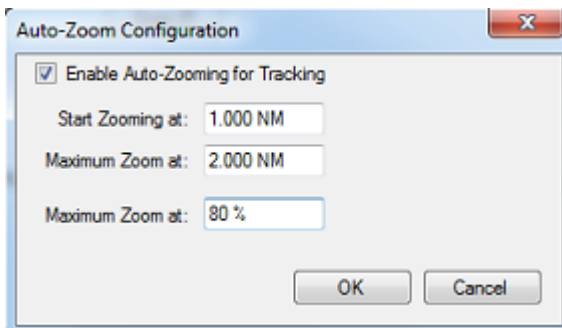


The position is defined as a longitudinal and lateral distance measured from the center bow of the vessel. When entering these settings, remember that the longitudinal positions are always positive (from Bow to Stern) while the lateral position is negative for Port and positive for Starboard (0 is the middle of the vessel).

For the Horizontal, Vertical and Roll offset (mainly used for Augmented Reality), it is easier to adjust those settings from the Camera WorkSpace directly. Please refer to the "Augmented Reality Setup" paragraph of the [Augmented Reality](#) chapter for more information.

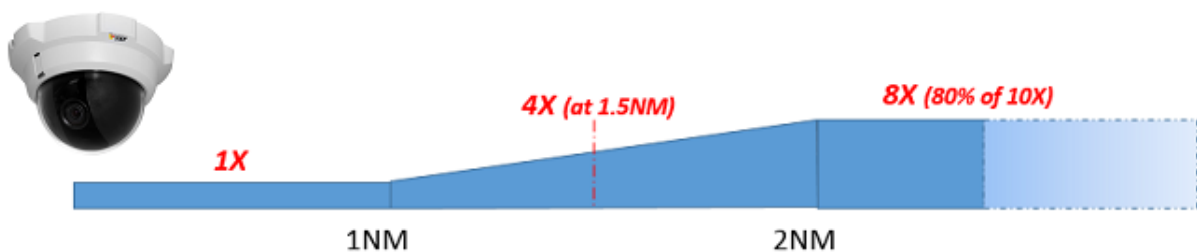
You will also have to enter the horizontal Field of View of the camera. If the camera has Zoom capability, you will have to enter two values: the Maximum FOV (when the camera is zoomed out) and the minimum FOV (when the camera is zoomed in). Check the manufacturer's specification for the maximum and minimum FOV values.

If the camera is PTZ and if you enabled the Tracking feature, you can configure the "Auto-Zoom" if you want the camera to adjust its zoom automatically when tracking an object. In the example below, the camera will start to zoom when the point or object to track reaches 1NM. The adjusted maximum zoom (80% of camera zoom maximum capacity) will be reached at 2NM. In between 1NM and 2NM, the zoom will be adjusted linearly (in between 1X and adjusted maximum zoom):



**Note:** Limiting the maximum zoom (in %) is useful if you don't want the camera to zoom at its full value (because it becomes "too blurry").

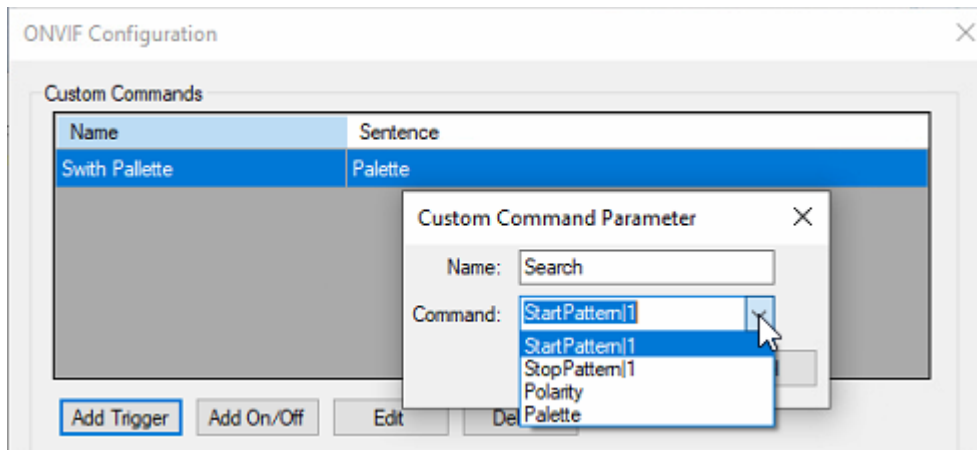
The diagram below illustrates the zoom value according to distance with a 10X zoom camera that has been restricted to 8X (80% of maximum zoom value):



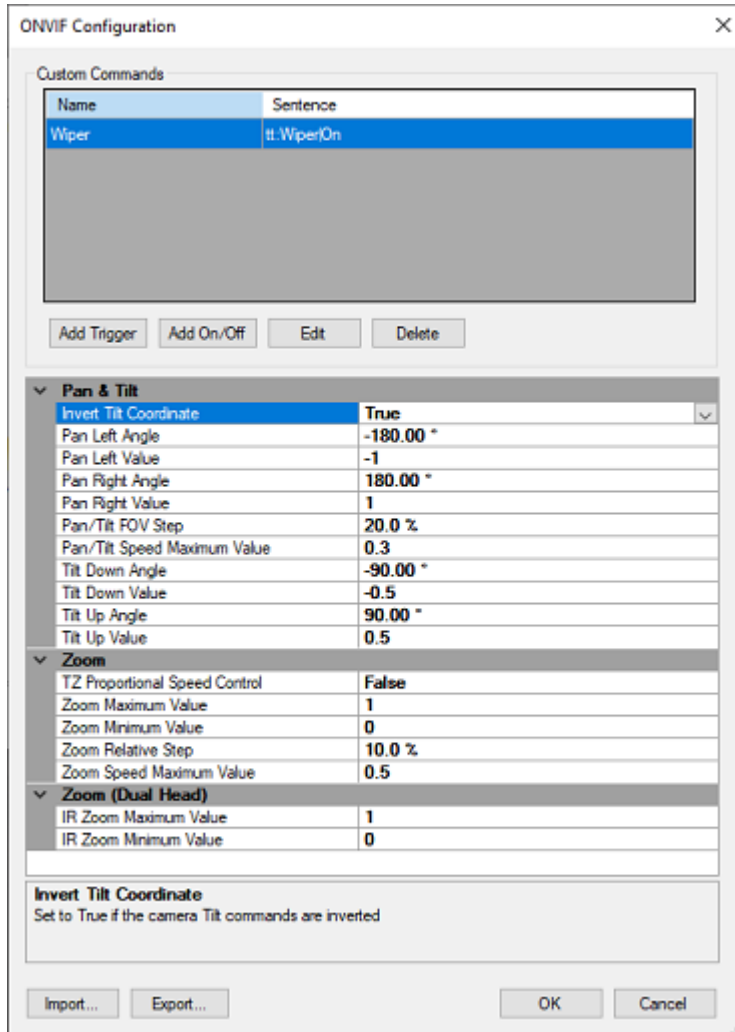
TimeZero will automatically detect the streaming profile that are advertised by ONVIF. You can select the streaming profile you would like to use from the drop-down menu.

### **ONVIF Advanced Configuration**

Click on the "ONVIF Configuration" button to adjust the ONVIF protocol settings. The top part of the window allows you to configure custom actions that can be performed by the camera. Any action(s) configured on this page become available under the "Camera Control" button in the ribbon (when the corresponding camera is active) or when right clicking on the video of the camera. "Trigger" and "On/Off" actions can be configured. A trigger will only send one command and will not remember its state. Triggers are usually used for "one shot" actions that do not require any status to be displayed in TimeZero. "On/Off" requires two ONVIF actions and it is displayed as checkbox (one for the "ON" state and another one for the "OFF" state). TimeZero remember the ON/OFF state (checkbox) and this can be used to control Auxiliary sensor (Wiper, Spotlight...).



The bottom part of the window allows to configure advanced ONVIF parameters and can be usefull if the camera does not behave properly with the default ONVIF configuration:



Please refer to the [ONVIF Protocol Requirement](#) chapter for an explanation of these parameters and guidelines on how to test the camera in TimeZero.

## TimeZero Hardware Compatibility

HARDWARE	TZ Professional	TZ Navigator	TZ Coastal Monitoring
NavNet NMEA Data (Vx2 / NN3D / TZT / TZT2/TZT3)	✓	✓	N/A
NavNet TZT2 (2nd Gen.) Routes & Waypoints synchronization (Furuno Firmware V7 and above)	✓	✓	✓
NavNet TZT3 (3rd Gen.) Routes & Waypoints synchronization	✓	✓	N/A
DRS2D / DRS4D / DRS4A / DRS6A / DRS12A / DRS25A	✓	✓	✓
DRS4DL	✓	✓	✓
DRS4D-NXT	✓	✓	✓
DRS6A-NXT	✓	✓	✓
DRS6-XCLASS	✓	✓	✓
DRS12/25A-XCLASS	✓	✓	✓
DRS2D-NXT	✓	✓	✓
DRS12/25A-NXT	✓	✓	✓
FAR15x3/15x8 (★)	✓	✓	✓
FAR2xx7	✓	✓	✓
FAR3xxx	✓	✓	✓
FAR2xx8	✓	✓	✓
FAR228NXTBB	✓	✓	✓
Overlay DRS4W	✓	✓	✓
NavNet Black Box Sounder (DFF1, DFF1-UHD, DFF3, BBDS1)	✓	✓	N/A
Internal TZT2 Sounder	✓	✓	N/A
FCV1900	✓	✓	N/A

FCV1150 (★★)	✓	✓	N/A
Internal TZT3 Sounder (including DI-FFAMP)	✓	✓	N/A
Multibeam Sounder DFF3D	✓	N/A	N/A
Simrad ES70 and ES80 (\$PSIMDHB sentence)	✓	N/A	N/A
Koden CVS-FX series (\$PKODS sentence)	✓	N/A	N/A
JRC JFC-130 series (\$PJRCs sentence)	✓	N/A	N/A
Hondex HDX-121, HE-1500Di, and HE-7300Di (\$PHDX)	✓	N/A	N/A
Seascan (\$PSAP sentence)	✓	N/A	N/A
Camera FLIR M Series	✓	N/A	✓
Camera FLIR M 200	✓	N/A	✓
Camera FLIR M 300	✓	N/A	N/A
Camera FLIR M 300C	✓	N/A	✓
Camera FLIR M 400	✓	N/A	✓
Camera FLIR M 500	✓	N/A	✓
AXIS Camera & Converter (Single LENS only)	✓	N/A	✓
Generic Fixed Camera	✓	N/A	✓
Multibeam WASSP (★★★)	✓	N/A	N/A
FCV25 (module required)	✓	N/A	N/A
SC30/SC33	✓	✓	N/A
SC50/SC70	✓	✓	N/A
SC130	✓	✓	N/A
SCX20/SCX21	✓	✓	N/A

CI-68, CI-88	✓	✓	N/A
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★ The FAR 15x3 Target Analyzer is not supported by TIMEZERO

★★ Custom mode of FCV1150 is not supported by TIMEZERO

★★★ Bathymetry and Backscatter data only with G1/G2. Full Sounder/Side-Scan/Section/Water Column views with G3

## Reference

### Import & Export Data

#### Backing-up and Restoring Data:

When you want to backup your data or when you want to "clone" your data on another computer, it is recommended to use the "Collection". A collection conveniently groups all objects (routes, marks, objects, tracks, ...), 3D data and layers configuration in one file.

To backup all your data, select "Backup Collection" from the menu.

To restore all your data, select "Open Collection" from the menu.

Note that the charts or settings are not backed up inside a collection. You will have to re-install the charts. The settings are not saved into the collection, however, it is possible to save the user settings by using [Save the User Interface](#) from the menu.

**IMPORTANT - MERGING DATA:** When importing a collection, your current data will be overwritten with the data contained in the Collection. If you want to exchange data with another user (and merge the data) you have to use the TZX format from the "Import/Export" Wizard (see below).

**IMPORTANT - SYNCHRONIZATION:** Note that if you are using the [local synchronization](#) or the [TZ Cloud synchronization](#) (to backup data), you should not use collections. Importing an old collection (an old "state" of the user object database) will be overwritten as soon as you connect to the TZ Cloud or to another TimeZero device that may have a newer "state" of the same user objects database. In other words, after importing an old collection, you may see your user objects revert to the previous state automatically when connected to the Internet.

#### Importing Data

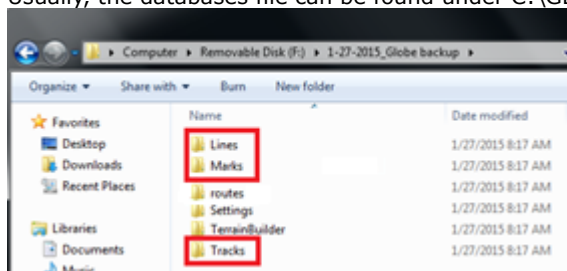
Select "Import/Export" from the menu to import data from the following format:

**Note:** Imported data is merged with your existing data

#### **Data:**

- **TimeZero Exchange (TZX files):** this format is used to exchange all type of user objects (including tracks) in between TimeZero users. This format guaranties the full integrity of the data (it supports Routes, Marks, layers, Tracks & Objects).
- **Legacy TimeZero User Data (TZD files):** this format is used to exchange data with older version of TimeZero software.
- **GPS Exchange (GPX files):** this "open source" format is often used by third party software or converter. It is primary used to exchange Routes and Marks, but you can also import tracks. Note that when importing GPX file from third party application, custom icon and color will be lost.
- **Google Map (KML & KMZ files):** this format is primary used to exchange data with Google Earth. Marks, Boundaries (lines / areas), and Tracks are supported.
- **Furuno NavNet 3D (CSV files):** this format is used to import Routes and Waypoints from Furuno NavNet3D Multi Function Display. Only Marks and Routes are supported.
- **Nobeltec ONF (TXT files):** this format is used to import marks, lines, boundaries, routes and tracks from the legacy software Nobeltec VNS & Nobeltec Admiral.
- **Rosepoint Navigation Object (NOB files):** this format is used to import all navigation objects from RosePoint Coastal Explorer.

- **ECDIS Route Format (RTZ files):** this format is used to import a single route (one route per RTZ file) from ECDIS systems.
- **MaxSea Layers (PTF files):** this format is used to import the marks and tracks from MaxSea "Classic" (v12 and below) that are stored in PTF file(s). Usually PTF files are stored in "My Documents->My MaxSea". Look for any files whose extensions are "\*. ptf". Note that the customer might have saved his PTF files to another location. In that case, search for any files having the PTF extension.
- **Olex Plot (GZ files):** this format is used to import marks, layers, lines, boundaries and tracks from Olex.
- **P-Sea WindPlot:** this format is used to import Marks and Tracks from WinPlot. TimeZero is able to import Marks and Tracks saved in Text format; Marks, Tracks, Routes and Boundaries saved in native Windplot format or backup file.
- **SeaPlot PRO (SPP & ECR files):** this format is used to import Marks and Tracks from SeaPlot PRO.
- **ECC Globe:** this format is used to import Marks, Lines and Tracks database files (MDB) from ECC Globe. Usually, the databases file can be found under C:\GLOBE\:



Note that TimeZero 64bits can only import ECC Globe MDB files that were generated with "newer" version of ECC Globe (using Access database 2000 or newer). If you have very old ECC Globe files (that are using Access database 97 or earlier), they will not import in TimeZero 64bits (they might in TimeZero V4 which is 32bits).

- **Sodena Turbowin (MDG files):** this format is used to import data file from TurboWin 8. TimeZero will import Navigational object data from Turbowin on a folder by folder basis. Simply specify the folder(s) that contain the TurboWin data, and the type of data that you are interested in and the program will locate the correct data files and import it
- **TMQ C-Plot (USR, MRK and TRK files):** this format is used to import marks, events boundaries and tracks from C-Plot.

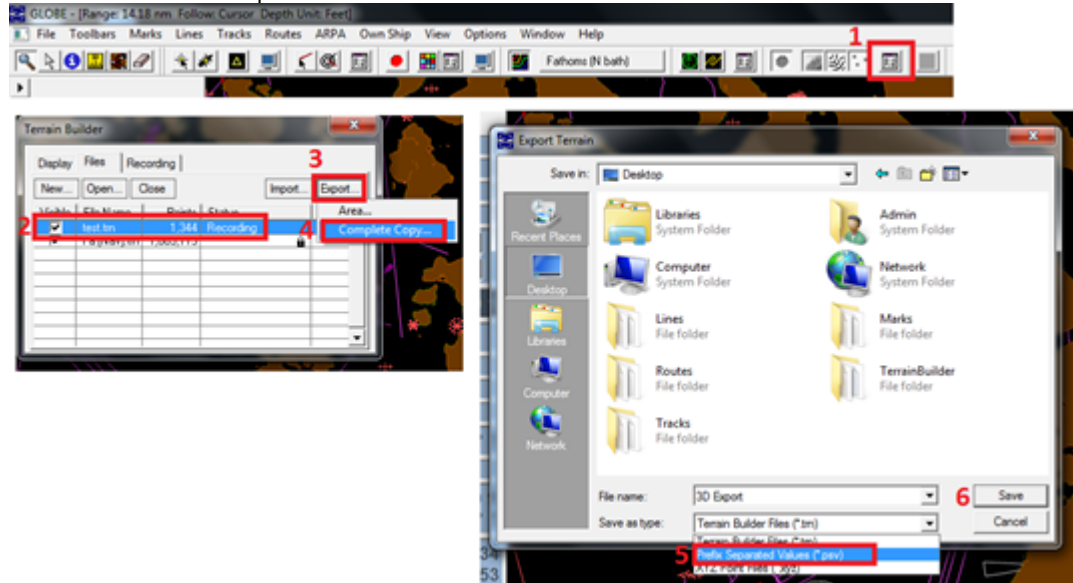
### 3D Data

This feature is only available with the PBG module

- **TimeZero PBG Data (TZPBG files):** this format is used to import 3D depth data, BackScatter and Hardness from another TimeZero user. Note that when importing the data, you will be able to choose which type of data you want to import.
- **Depth Data (XYZ files):** this format is used to import generic XYZ depth data or XYZ file(s) generated from MaxSea v12 and below. The generic XYZ format consists of Longitude, Latitude, Altitude. The altitude is in Meters with negative values representing depth:  
Ex: -136.0004000 56.9942500 -107.9  
Value can be separated by spaces, tabs or commas.  
TimeZero also supports the XYZ file from NOAA that have the following header:  
"survey\_id,lat,long,depth,quality\_code,active"  
Ex: H11371,48.3276139,-122.8239623,42.06,1,1
- **MaxSea Classic PBG (PTZ files):** this format is used to import MaxSea 3D user data (.ptz files). Usually the PTZ file is located in "My Documents->My MaxSea". Look for a file named "3DDB.PTZ".

**Note:** The 3DDB.GRZ file only contains basic 3D data and cannot be imported in TimeZero. All the PBG user data is stored in a single file (the "3DDB.PTZ" file).

- Olex Depth Data (GZ & OL3 files): this format is used to import Olex 3D user data
- ECC Globe: this format is used to import ECC Globe Terrain Builder 3D user data. Please note that TimeZero can only import 3D data from ECC Globe that has been exported as ".PSV" files. Refer to the screenshot below to export the 3D data from Globe in the correct format:



- **Nobeltec Bathy Recorder (BTH files):** this format is used to import "Bathy Recorder" user files recorded with Nobeltec VNS or Admiral.
- **Sodena Turbowin Depth Data:** this format is used to import 3D user file from TurboWin 8. By default, TurboWin places its user generated bathy files in a sub folder named UDB\_UserBathy in the Database folder located under the program's main installation folder. TimeZero will import the bathy data from TurboWin on a folder by folder basis. Simply specify the folder(s) that contain the turboWin bathy data and the program will locate the correct data files and import them.
- **Legacy TimeZero v2.0 (PTZ2 files):** This format is used to import 3D data that has been previously imported in MaxSea or Nobeltec TimeZero v1 (with v2 and above, TZPBG files are used instead).

When importing 3D data, you can restrict the points that get imported by entering a depth range (minimum and maximum). Entering a tight range corresponding to your fishing area is the best way to filter out bad points that may be inside the 3D file you are importing. You can also select "Remove points using statistical analysis", but this is only efficient in areas with moderate slope. Do not use this options in area that have lots of changes in the terrain as this might filter out good depth points.

## Images

- **JPEG:** this format is used to import and geo-referenced photos (pictures are automatically placed on the charts). In order to be imported, the photo must either embed the lat/lon or a time/date that can be correlated by TimeZero with a GPS position.

## Exporting Data:

Select "Import/Export" from the menu to export data in the following format:

## Data

- **TimeZero Exchange (TZX files):** this format is used to exchange all type of user objects (including tracks) in between TimeZero users. This format guaranties the full integrity of the data (it supports Route, Marks, layers, Tracks & Objects).



- **Legacy TimeZero User Data (TZD files):** this format is used to exchange data with older version of TimeZero software.
- **GPS Exchange (GPX files):** this "open source" format is often used by third party software or converter. It is primary used to exchange Routes and Marks, but you can also export tracks.
- **Google Map (KML & KMZ files):** this format is primary used to exchange data with Google Earth. Marks, Boundaries (lines / areas), and Tracks are supported. Note that routes will be exported as lines.
- **Furuno NavNet 3D (CSV files):** this format is used to export Routes and Waypoints to Furuno NavNet3D Multi Function Display. Only Marks and Routes are supported.

If you want to only export a couple of Routes or Marks, use the "Actions" menu of the Route List or Mark List:

1. Open the "Route List" or "Mark List" from the "Lists" button in the Ribbon
2. Select one line on the list by clicking inside the first grey column in front of the specific line (or select multiple lines using the CTRL or SHIFT key)
3. Click on the "Action" menu and select "Export Selected Route/Marks"
4. Select the export format
5. Select the location, give a name to the file and then validate.

### 3D Data

This feature is only available with the PBG module

- **TimeZero PBG Data (TZPBG files):** this format is used to export 3D depth data, BackScatter and Hardness to another TimeZero. Note that when exporting the data, you will be able to choose which type of data you want to import.
- **Depth Data (XYZ files):** this option allows to export your 3D PBG data (Mono Beam only) in a standard XYZ format. This is useful if you want to export your 3D data to another GIS. Please note that this **DOES NOT** export the 3D data may have been imported. This only exports the 3D data that has been generated inside TimeZero. The format is lat, lon, elevation with depths represented by negative values in meters:  
*Ex: -124.272242954799, 46.7432681482846, -8.1*

**Note:** It is NOT possible to export XYZ depth data created from WASSP.

## Save the User Interface (UI)

TimeZero can be highly customized to fit your needs. You can customize the Ribbons and ToolBar of each WorkSpaces, configure the NavData, adjust Options, etc...

All these settings can be saved in a file by selecting "Save UI as" from the menu.

When you want to load all the TimeZero settings, make sure that TimeZero is closed, then double click on the file to open the software and load the corresponding settings.

Note that multiple files containing multiple setting profiles can be created (one per captain for example). Instead of opening the software using the TimeZero shortcut located on the desktop, open the file setting instead. This will ensure that your default settings are re-apply each time you start the software.

**Note:** The User Objects (Routes, Marks, etc..) and the Instruments Configuration (GPS, AIS, etc...) are not stored inside the setting files (they are global to the software and will stay the same when you open a file setting)

Note that there is also a way to just save a specific WorkSpace configuration. So that if you are a single user and just want to save one initial configuration, it might be easier to use this feature instead. Please refer to the [Saving and Recalling WorkSpace configuration](#) chapter for more information on how to save a WorkSpace configuration.

**Note:** Unlike the User Interface file (that requires TimeZero to be restarted), recalling a WorkSpace configuration can be done while the software is running.

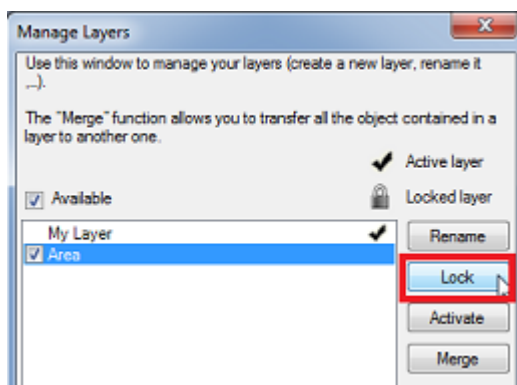
## Lock the User Interface

To prevent users to modify the software configuration and installation setup, it is possible to lock the user interface.

Select "Lock User Interface" from the menu. A window prompting for a password will appear. After validating the password, the following feature will NOT be available anymore to the user:

- The Options (including installation setup) will not appear anymore under the menu
- The Connection Wizard will not appear anymore under the menu
- It will not be possible to recall a backup (Open a collection)
- It will not be possible to change the configuration of the Toolbar, Ribbon, WorkSpace and NavData
- The layers that were previously locked from the "Manage Layers" window cannot be unlocked (see below)

To prevent users to modify layers, simply lock the layer(s) containing the boundary from the "Manage Layer" window under the "Mark" ribbon button:



Note that you cannot lock the Active layer. Make sure to activate another layer before locking it.

**Note:** It is NOT possible to lock all the layers in TimeZero Professional. At minimum one layer must be unlocked and set as the Active layer. This will be the layer used in case the user wants to create new objects. Create and activate a "user" layer that will be used as the default Active layer.

Once the layer(s) you want to protect are locked, finish by locking the User Interface (after configuring all the Options, instruments, Toolbar, NavData). The protection is independent per Windows User Account. So if the computer has two user accounts ("Admin" and "User" account), and if you only lock the user interface on the "User" account, you will be able to access all the setup and Options by logging on the computer as the "Admin".

To unlock, select "Unlock User Interface" from the menu and enter your password

**Tips:** If you lose the password, click on "Hint" and send the generated code to Tech Support. We will be able to retrieve your password from to the Hint code.

## Shortcuts

### Default Shortcuts

The default Shortcuts of TimeZero are:

- **Ctrl**: Maintain the Ctrl key down while selecting several objects together by clicking them one after one using the hand tool.
- **Shift**: Maintain the Shift key down to select the alternate tool (which varies with WorkSpace). The alternate tool is fixed to the:
  - Hand Tool for any Chart WorkSpace: hold the shift key while dragging to select multiple objects.
  - Pan Tool for the 3D Cube WorkSpace: hold the shift key while dragging to pan the chart.
  - Acquire Target Tool for the Radar WorkSpace: hold the shift key and click to acquire a target.
- **Ctrl + F**: Find Marks, Marina (from ActiveCaptain), Routes and Tides Station.
- **Ctrl + Z**: Undo the last command or action
- **Ctrl + Y**: Redo the last command or action
- **Del**: Delete selected object
- **Page Up**: Zoom in
- **Page Down**: Zoom out
- **CTRL + Page Up**: Activate next step of the animation
- **CTRL + Page Down**: Activate previous step of the animation
- **F1**: Call up the Help Guide
- **F2**: Zoom in step by step
- **F3**: Zoom out step by step
- **F4**: Center on boat
- **F5**: Track on /off
- **F6**: Show / Hide NavData
- **F7**: Show/Hide Lists
- **F8**: Man Over Board (MOB)
- **F9**: Create an Event (same as ENTER key)
- **F10**: Radar Range Out
- **F11**: Radar Range In
- **SHIFT + F2**: Switch between Day, Dusk and Night display
- **SHIFT + F3**: Enable/Disable the "TrackBall" mode (to pan the chart by just moving the mouse)

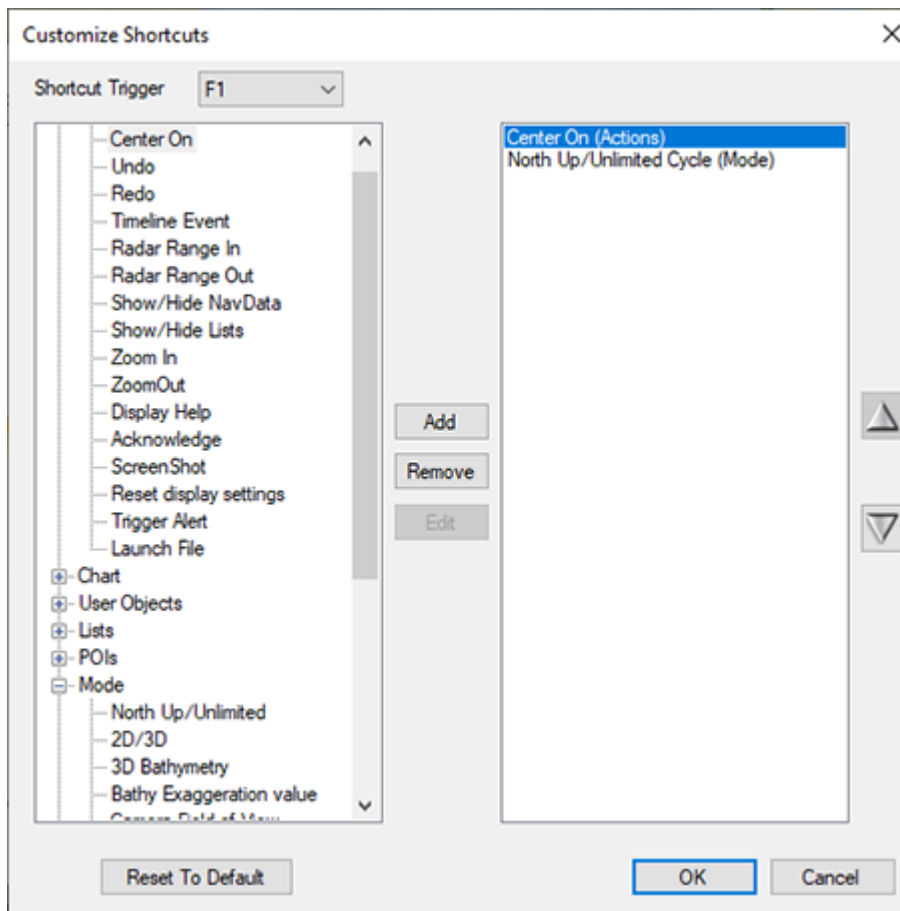
- **SHIFT + F5**: PBG (Bathy Recorder) on /off
- **SHIFT + F10**: Show / Hide Depth shading
- **SHIFT + F11**: Switch from 2D to 3D view
- **"g" + wheel (up/down)**: Adjust the Radar Gain manually (slider)
- **"s" + wheel (up/down)**: Adjust the Radar Sea manually (slider)
- **"r" + wheel (up/down)**: Adjust the Radar Rain manually (slider)
- **ALT + g**: Toggle Radar Auto Gain ON/OFF
- **ALT + s**: Toggle Radar Auto Sea ON/OFF
- **ALT + r**: Toggle Radar Auto Rain ON/OFF

Keys 0 through 9 create a custom event (defined in [Marks & Boundaries](#) Options under "Configure Events")

### **Custom Shortcuts & Macro**

Shortcuts can be customized by the user from the [General](#) Options by clicking on the "Customize Function Key" button. Keys that can be setup by the user are F1 to F12 and the combination Shift + F1 to Shift + F12.

Multiple actions ("Macro") can be triggered by one shortcut. Simply configure multiple actions for the same function key. For example, in the example below, pressing the F1 key would Center the chart on the boat and set the chart mode to North Up.




The actions are triggered in the order they are listed in the window.


Note that Custom Function can also be assigned to Quick Access NavData. Please refer to the [QuickAccess NavData](#) chapter for more information.


## Toolbar


### Tools


Some tools may only be available in specific WorkSpaces or when specific Modules are unlocked:


- 


"Center On": Click on this button to center on Own Ship position
- 


"AutoShift": Right Click on the "Center On" button to access the "AutoShift" mode. Click on the "AutoShift" button to enable or disable Auto Shift. Auto Shift is enabled when this button is surrounded in yellow.
- 

"Track": Click on this button to enable or disable Track Recording. Track recording is enabled when this button is surrounded in yellow .
- 

"PBG": Click on this button to enable or disable the Bathy Recording ("PBG"). Data is being recorded when this button is surrounded in yellow.
- 

"Zoom In/Out": Click on these buttons to zoom in or zoom on the chart. You can adjust the scale selection from the [Plotter Display](#) Options (by clicking on the button "Chart Scales Selection")
- 

"Zoom": This tool is very useful if you don't have a scroll wheel to zoom continuously on the chart. When this tool is selected, left click to zoom in and right click to zoom out.
- 

"Pan": This is the tool which is selected by default. It allows you to pan the chart with the mouse. If you have another tool selected, pressing the ESC key on your keyboard revert to the Pan tool.
- 

"Divider": This tool allows you to make bearing and range measurement in between two points. If you select this tool and double click on the chart, it will create a divider line in between own ship position and the point where you double clicked. You can double click on the tool itself to erase all

dividers. If you have the PBG module, you can double click on a Divider Line to open the Profile Window. For more information, please refer to the [Divider Tool](#) Chapter.



- "Go To": This tool allows to create a quick "Go To" point by creating an Active Route. You can double click on this tool to create a Go To using lat/lon.



- "Mark": This tool allows to create marks. You can right click on this tool to select the mark icon and color. You can double click on this tool to create a mark using lat/lon.



- "Route": This tool allows to create route. You can right click on this tool to create various Search and Rescue ("SAR") route pattern. The Search and Rescue parameters (distance) are set up from the [Routes](#) Options (under "SAR Interval").



- "3D Orientation": This tool is used to adjust the 3D view when the chart mode is set to "3D" from the [Mode](#) Ribbon.



- "Boundary Area": This tool is used to create areas. Select this tool, click on the chart to create boundary points and double click to close the area. You can double click on this tool to create an area by using lat/lon.



- "Boundary Circle": This tool is used to create circles.



- "Boundary Line": This tool is used to create lines. Click on the chart to create boundary points and double click to end the line. You can double click on this tool to create a line by using lat/lon.



- "Annotation": This tool is used to create annotation. You can double click on this tool to create an annotation by using lat/lon.



- "Recall Track": This tool (available in the Planning WorkSpace) is used to recall a Track portion from a Trail.



- "Event": This tool is used to drop a mark under the boat position.



- "MOB": This tool is used to drop a "Man Over Board" (MOB) mark under the boat position. When you activate the MOB, it drops a mark, selects the "Navigation" WorkSpace and zooms at a navigation scale automatically. If you would like for the MOB to also create an Active Route (to the MOB location) and raise an alarm, you can change the "MOB Behavior" from the [Alarms](#) Options.



- "Selection": This tool is used to select multiple objects. If you right click you can select the "Free Selection" tool that allows to draw a free selection on the screen. When multiple objects are selected, you can delete them, change icon and color.



- "Delete": This tool is used to delete objects. You can either click on an object or draw an area around multiple objects.



- "Delete PBG Points" (This tool allows to delete depth data that has been recorded in TimeZero. Note that this tool is only active when PBG is turned OFF and when the "PBG Points" are selected from the [PBG](#) button in the Ribbon.



- "Synchronize Radar Range" (requires the Radar Module): Press this button to adjust the radar range to the closest matching chart scale.



- "Range In/Out" (requires the Radar Module): These buttons are used to increase or decrease the radar range.




- "EBL VRM 1/2" (requires the Radar Module): Right click on this tool to select either "EBL " or "VRM " mode (two set each). Click on the chart or radar screen and drag the cursor to create the EBL or VRM. Double click on this tool to erase all EBL and VRM.





- "Guard Zone 1/2" (requires the Radar Module): Click on this tool to create a Guard Zone (relative to the boat) by clicking and dragging the cursor on the chart or radar screen. Once the guard zone has been created, right click to adjust its parameters. You can create up to two guard zones by right clicking on the tool. Double click on this tool to erase all guard zones.





- "Acquire Target" (requires the Radar Module): This tool allows to acquire a Radar ARPA target. Select this tool, then left click over a radar echo to acquire a target.


- 


"Contour Line 1/2" (requires the "PBG Module"): Right Click on this tool to either select the red or green contour line tool. When this tool is selected, a yellow contour line is drawn under the cursor. Click once to drop the corresponding contour line (red or green). If you drop a second red or green contour line, it will replace the previous one. Double click on this tool to erase the red and green contour line.
- 


"Range In/Out" (requires the "Sounder Module"): These buttons are used to increase or decrease the sounder range. You can adjust the scale selection from the [Sounder Options](#) (by clicking on the button "Sounder Range Selections")
- 

"Update Area": This tool is only available in the "Update" WorkSpace and is used to define the weather update area. Once the area is defined, select "Download".
- 

"Launch Routing": This tool requires the "Routing" Module. It is used to create routing in between two points. If you double click on the chart and have a valid GPS position, it will create a routing in between own ship position and the point.
- 

Camera "Joystick" mode: this tool allows to control the camera (in the Camera WorkSpace). Please refer to the [Camera](#) chapter for more information.
- 

"Move Camera Here": This tool allows to control the camera from the chart or radar screen. Select this tool and click on the location where you want to camera to point at.
- 

"Screenshot": This tool takes a screenshot of the screen and stores it in the location define under the [General Options](#) ("Screenshot Recording Location").
- 

"Voyage Data Recorder" (requires "Voyage Data Recorder Module"): This tool enable or disable the recording of all the data. Please refer to the [Record & Replay](#) chapter for more information.

## Ribbons

### Mode





This button gives access to various chart orientation in 2D or 3D, exaggeration in 3D mode and various objects linked to the own ship (COG vector, camera Field of View, etc...)

- **North Up:** This mode displays the North at the top of the screen.
- **Head Up:** This mode orients the bow of the vessel to the top of the screen. The chart rotates as the vessel's bow is always pointed toward the top of the screen. In Head up mode, pay close attention to the Compass icon (on the bottom left). It provides information about the direction of North. Head Up mode is only available if a Heading sensor is connected OR if your speed is over 1Kn (GPS COG will be used in that case).
- **Course Up:** This mode is only available when a "Go To" or Route has been activated and when the boat is moving over 1Kn. When this mode is selected, the chart rotates and aligns vertically with the active leg. This mode provides a "stabilized" view (not moving with the own ship heading) toward your destination (or active Waypoint).
- **Unlimited (3D only):** In this mode, the azimuth and pitch can be freely adjusted by holding the middle click button and moving the mouse. If the mouse does not have a middle button, press and hold the Alt (Option) key of the keyboard while moving the cursor.
- **2D:** Selects 2D mode.
- **3D:** Selects 3D mode.
- **3D Bathymetry:** Enable the 3D bathymetry view under water. This option is only available when the 3D mode is selected.
- **Bathy Exaggeration:** Allows to increase or decrease the automatic bathymetry exaggeration factor in the Navigation and Planning WorkSpace only. Please refer to the [2D & 3D Chart Orientation](#) chapter for more information
- **Day/Dusk/Night/Automatic:** Adjusts the screen's brightness and vector chart color palette (for night or day). When set to Automatic, TimeZero will automatically switch modes according to your local sunset and sunrise time.
- **Luminosity Variation:** Adjusts the brightness intensity of the Day/Dusk/Night mode.

## User Objects



This button allows to show or hide marks and objects on the chart using the layers. It also gives you the option to create objects using coordinate:

- **Display Object Names:** Turns ON or OFF the object label on the screen.
- **Visible Objects:** Selects which objects will be displayed on the screen according to the Filter or Layer selection. Please refer to the [Object Management Introduction](#) chapter for more information.
- **Active Layer:** Selects the layer that is used by default when creating object. Please refer to the [Layer Introduction](#) chapter for more information.
- **Manage Filters:** Opens a window that allows you to manage filters. Please refer to the [Filters](#) chapter for more information.
- **Manage Layer:** Opens a window that allows you to manage the layers.

- **Create Marks/Boundary/Annotation/GoTo:** Creates objects using coordinate manually entered by the user.
- **Transform:** Opens a window that allows to select and transform objects using various criteria.
- **Delete:** Opens a window that allows to select and delete objects using various criteria.

## Chart



This button allows you to select the chart used on the screen, adjust some of its property (vector chart only) and show/hide various layers of information on top of the chart:

- **Chart:** Selects the type of chart used. Select "Auto" if you want TimeZero to pick automatically the best chart source according to the area.
- **Vector Chart Preset** Provides quick access to five default presets (offering different levels of detail for vector charts) as well as any custom preset the customer may have created. Please refer to the [Adjusting Vector Charts Display](#) chapter for more information.
- **Terrain Shading:** Displays and adjusts the intensity of the relief shading (in 2D or 3D). This adjusts the chart contrast according to the slope and improve the perception of terrain.
- **Depth Shading:** Displays and adjusts the intensity of the depth shading. Please refer to [Depth Shading](#) for more information.
- **Bottom Hardness:** Displays and adjusts the intensity of the Bottom Hardness (available only with selected sounders). Please refer to [Bottom Hardness](#) for more information.
- **Depth Contour Lines:** Displays contour lines on the chart that are generated from the 3D database. These contour lines can be displayed over any type of chart and the density can be configured.
- **Fish Targets:** Displays fish targets on the chart from a multibeam sounder such as DFF-3D or WASSP.
- **MM3D Satellite Picture:** Displays the Satellite Pictures over the chart.
- **Tidal Height Stations:** Displays the Tidal Stations over the chart.
- **Tidal Currents:** Displays the Tidal Currents over the chart.
- **Grid:** Displays a grid over the chart

## Own Ship



- **Display Trail:** Displays or hides the trail on the chart. For more information about the Trail, please review the [Trail and Track](#) chapter.
- **Trail Duration:** Adjusts the trail duration.
- **Track Recording:** Enables or disables the track recording. Unlike trail (which are always recorded), track recording needs to be manually turned ON or OFF.

- **Track Color:** Selects the track color of the current and future tracks that are recorded in TimeZero Professional.
- **Variable Color:** When track color is set to "Variable", this adjusts the type of data used or track coloring. The color scale is adjusted from the [Ship & Tracks](#) Options.
- **Anti-Grounding Cone:** The anti-grounding cone enables TimeZero to scan for dangerous objects and depth in front of your boat and warn you in case of possible collision or grounding.
- **COG/SOG Predictor:** Displays the COG vector (displayed in red dashes). COG ("Course Over Ground") is calculated by the GPS. It indicates the direction of movement relative to a ground position. The length of the COG vector can be setup by distance or time. When it is set to "Time", the length varies according to the speed of the boat and can be configured to show the predicted position in a specified amount of time. This setting is available in the [Ship & Tracks](#) Options ("COG/SOG Predictor").
- **Heading Line:** The Heading Line (displayed as a green line) is sent by an Electronic Compass and shows the direction of the bow of boat.
- **Drift Vector:** The Drift Vector (displayed as a blue dashed line) can be received from a sensor or computed by TimeZero when COG, SOG, STW and heading are received. This vector represents graphically the drift direction and speed.
- **Vessel Fuel Range Ring:** Displays a circle on the chart around the boat representing the maximum range according to current fuel consumption, remaining fuel and speed. The Color of this circle can be changed from the [Routes](#) Options.
- **Range Circle:** Displays the Range circle around the boat. The Color and Size of this circle can be changed from the [Ship & Track](#) Options
- **External Cursor:** Displays the location on the TimeZero screen of an external Radar cursor using a NMEA0183 connection (when receiving the NMEA0183 "RSD" sentence from a Radar or a proprietary NMEA Sentence)
- **Current Indicator Display:** Displays current lines on the chart from a current indicator such as Furuno CI-68 or CI-88. You can choose multiple depth in the sub-menu.
- **Camera Field of View:** Display or Hide the Camera field of view (cone) on the chart. Please refer to [Controlling & Tracking from the Chart](#) for more information.

## PBG ("Personal Bathymetry Generator")

This feature is only available with the PBG module



This buttons gives access to the type of 3D data used. When multiple type of 3D data are selected, TimeZero merge them on the screen. It also offers a quick access to some of the PBG filters:

- **PBG Points:** Displays red dots where depth data has been recorded or imported by the user according to the type of 3D database(s) selected.
- **PBG Soundings:** Displays depth soundings (in black) where depth data has been recorded or imported by the user according to the type of 3D database(s) selected.

**Note:** The PBG points and PBG Depth Soundings do not appear for data that has been recorded or imported from a WASSP multibeam sounder.

- **3D Chart Database:** Enables the 3D from the chart (.dbt files that are installed with the chart).

- **3D High Resolution Database:** When a high resolution 3D file has been installed (.dbh files only available for selected areas), this items enable its display. Note that it is recommended to turn OFF the 3D chart Database when this item is turned ON.
- **Imported 3D Database:** Enables the 3D imported from other format or other users.
- **User 3D Database:** Enables the 3D data recorded by the user ("PBG Database").
- **Tidal Height Correction:** Enable the tide correction when depth soundings are recorded from the sounder.
- **PBG Filters:** Enable the various PBG filters configured under the [PBG \(Bathy Recorder\)](#) Options.
- **Reset Consistency Filter:** When the consistency filter using the previous data has been enable from the [PBG](#) Options, this allows to force the current data to be used for the next depth point comparison. This is useful when the filter get "stuck" (when the filter thinks that a big slope is abnormal).

**Note:** The PBG tide and Filters are not available when connected to a WASSP system. All the filter are done from the WASSP processor.

- **Auto Clean 3D Database...:** Opens the Auto-Clean 3D database window. You can refer to the [Delete PBG Data](#) chapter for more information.

## Target



This button allows to show/hides targets on screen as well as adjusting parameter related to targets:

- **Display Target Label:** Shows or hides the target labels (ID or Speed) on the screen. You can select if you want to display the target ID or the target Speed (or both) from the [Targets](#) Options. When set to ID (default) and for AIS targets, the label displayed on the screen is the name of the ship or the MMSI in case the name is not available.
- **Display Trail on All Target:** Displays a trail on all targets.
- **Display Trail on Dangerous Target:** Only display a trail on targets that are categorized as dangerous (targets that break the CPA/TCPA Values).
- **ARPA Targets:** Displays the ARPA target from the radar. Please refer to [ARPA Target](#) for more information. Heading information is required.
- **Cancel all ARPA targets:** Erases all the ARPA targets that are currently tracked by the radar.
- **Display All AIS:** Displays all AIS targets.
- **Display Dangerous AIS:** Only display the AIS targets that are categorized as dangerous (targets that break the CPA/TCPA Values).
- **Apply AIS List Filter on Chart:** Causes the AIS list filter to also be applied on the chart when enabled.
- **Marine Traffic:** Displays AIS targets received through the Internet from the Marine Traffic website. This does not require TimeZero to be connected to a live AIS receiver. However, AIS targets received from the Internet can be subject to high latency and is not intended for navigation. Please refer to [Marine Traffic](#) for more information.
- **Track All AIS Target:** Enables the Track recording on all AIS targets. This feature should be used with caution as it can create lots of tracks.

- **DSC:** Displays DSC targets. Please refer to [DSC Targets](#) for more information. This option only appears when DSC has been configured as an input in the Connection Wizard.
- **DSC Tracks:** Displays DSC target tracks. This option only appears when DSC has been configured as an input in the Connection Wizard.
- **Clear all DSC:** Erase all the DSC targets and their tracks. This option only appears when DSC has been configured as an input in the Connection Wizard.
- **Fleet Targets:** Displays Fleet targets. This option only appears when Fleet Tracking has been configured. Please refer to [Fleet Tracking](#) for more information.
- **Apply List Filter on Chart:** Causes the Fleet Target list filter (that can be accessed at the top right of the list to also be applied on the chart.
- **Reset all Fleet Targets:** Reset all the fleet targets. This will cause all fleet targets to disappear from the screen until a new position is received.
- **Send AIS Text Message...:** Open a window that allows to send a Text Message to a specific class A AIS target. Note that the "ABM" sentence must be selected as an output (on the port where the AIS transmitter is connected) for this option to appear.

## Route



This buttons allows you to perform various actions on the Active Route:

- **Display Routes:** Displays or hides the routes on the screen. Note that the Active Routes is always displayed on the chart even if this button is deselected. However, the Active Route in the Radar WorkSpace will be displayed or hidden according to the status of this button.

**Note:** This button will only display the routes that are set to "Visible". For more information on object, please refer to the [Route Introduction Chapter](#).

- **Restart Route:** Restarts the Active Route. This set your current position as the new origin and restart the Cross Track Error (XTE). Please refer to [Activating a Route](#) for more information.
- **Skip Waypoint:** Manually Skip the active Waypoint. Note that this also set your current position as the new origin and restart the Cross Track Error (XTE). Please refer to [Activating a Route](#) for more information.
- **Previous Waypoint:** Manually set the Previous Waypoint as the new active Waypoint. Note that this also set your current position as the new origin and restart the Cross Track Error (XTE). Please refer to [Activating a Route](#) for more information.
- **Cancel Navigation:** Cancels the Active Route and stop the navigation.
- **Activate Route:** Activates the selected Route.
- **Reverse Route:** Reverses the selected route.
- **Routes List :** Opens the Route list.

## Lists



This buttons allows you to open the various lists at the bottom of the screen. Once the lists are opened, you can switch list by using this button again or by directly selecting the corresponding list on the left pane:

Marks List : 8 Elements				
Icon	Color	Name	Position	
	Blue	Crab Pot	N 47°43.973'; W 122°31.643'	
	Red	Fishing Spot	N 47°43.908'; W 122°31.508'	
	Green	Favorite	N 47°57.817'; W 122°39.622'	
	Blue	View Point	N 47°57.916'; W 122°48.073'	
	Cyan	Mark	N 47°54.941'; W 122°42.659'	
	White	Mark 2	N 47°59.930'; W 122°44.488'	
	Red	Danger	N 47°54.277'; W 122°55.023'	
	Yellow	Mark 3	N 47°56.048'; W 122°53.194'	

**Note:** The lists are "dynamic" and will only be displayed if you have at least created on corresponding object.

## Radar



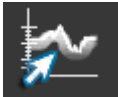
This button gives access to various radar adjustments and radar related features:

- **Radar Overlay** (Chart Only): Enables the Radar Overlay on the chart. Heading sensor is required.
- **Radar Preset:** Display the list of Radar User Presets that have been configured (if any). Please refer to [Radar User Preset](#) for more information.
- **Echo Trail:** Enables the Radar Echo Trail. Please refer to [Radar Controls](#) for more information.
- **Trail Mode:** Adjusts the trail mode. Please refer to [Radar Controls](#) for more information.
- **Trail Length:** Adjusts the trail length. Please refer to [Radar Controls](#) for more information.
- **Clear Trail:** Clear and reset the Trail.
- **Gain/Sea/Rain:** Adjusts the Gain/Sea/Rain parameters of the radar.
- **Interference Rejection:** Adjusts the Interference Rejection. Please refer to [Radar Controls](#) for more information.
- **Echo Averaging:** Adjusts the Echo Averaging. Please refer to [Radar Controls](#) for more information.
- **Echo Stretch:** Adjusts the Echo Stretch. Please refer to [Radar Controls](#) for more information.
- **Pulse Length:** Adjusts the Pulse Length. Please refer to [Radar Controls](#) for more information.

- **Noise Rejection:** Adjusts the Noise Rejection. Please refer to [Radar Controls](#) for more information.
- **Video Contrast:** Adjusts the Video Contrast. Please refer to [Radar Controls](#) for more information.
- **Guard Zone 1/2:** Adjusts the working mode of the Guard Zones. Please refer to [Guard Zones](#) for more information.
- **Radar Rings:** Displays the Radar Ring on the Radar (only visible when "Radar Overlay" is turned ON).
- **Transmit:** Sets the Radar in Transmit or Standby mode.

## Sounder Mode

This feature is only available with the Sounder module



This buttons adjusts the operating mode of the Sounder such as frequency, Zoom Mode, etc...

- **HF / LF :** Selects the operating frequency of the sounder. If the sounder is in Dual Frequency mode (both HF and LF displayed on screen), clicking on this button will inverse the side of the operating frequency.
- **Single Frequency:** Set the Sounder in Single Frequency mode. This will only display one sounder echogram on the screen. Select either HF or LF from the menu above.

**Note:** If AccuFish or Bottom Discrimination is selected, the sounder will transmit HF and LF even if the mode appears to be set to Single Frequency only. This is because AccuFish and Bottom Discrimination need both frequencies in order to work. If you want the sounder to only operate in one frequency, make sure to disable AccuFish and Bottom Discrimination.

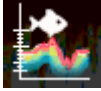
- **Dual Frequency:** Set the Sounder in Dual Frequency mode. This will display two sounder echogram on the screen (one for the Low Frequency and the other for High Frequency). When operating in Dual Frequency, the range of both frequencies is synchronized. To inverse the side of the HF and LF, select the "HF" or "LF" button above.
- **Bottom Zoom:** Set the Sounder in Bottom Zoom. Please refer to [Sounder Display Mode](#) for more information.
- **Bottom Lock:** Set the Sounder in Bottom Lock. Please refer to [Sounder Display Mode](#) for more information.
- **Auto Range:** Enables the Sounder Auto-Range. When set, the sounder will attempt to track the bottom and adjust its range automatically.

**Note:** If Bottom Discrimination is selected (BBDS1 or DFF1-UHD), the sounder automatically goes into Auto Range even if the Auto Range appears to be deactivated from the menu above.

- **Day/Dusk/Night/Automatic:** Adjusts the screen's brightness and vector chart color palette (for night or day). When set to Automatic, TimeZero will automatically switch modes according to your local sunset and sunrise time.
- **Transmit:** Set the Sounder in Transmit or Standby.

## Sounder Display

This feature is only available with the Sounder module

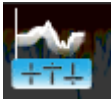


This button enables various display feature of the sounder:

- **A-Scope:** Enables the A-Scope display of the Sounder.
- **AccuFish:** Enables the AccuFish feature of the sounder. This only applies to DFF1/BBDS1/DFF1-UHD sounders with compatible transducer.
- **AccuFish Color/Icons:** Allows to select the AccuFish icon and color.
- **Bottom Classification:** Enables the Bottom Classification of the Sounder. This only applies to the BBDS1 and DFF1-UHD. Please Refer to [Bottom Discrimination](#) for more information.

## Sounder Adjustments

This feature is only available with the Sounder module



This button allows to adjust the main settings of the sounder (Gain, Auto Mode,...):

- **Auto-Fishing / Auto-Cruising:** Enables the Automatic Mode of the sounder. Please refer to [Sounder Controls](#) for more information.
- **Manual:** Sets the sounder in manual mode, allowing you to manually adjust the gain for HF and LF frequency below.
- **Manual Gain HF/LF:** Adjusts the HF and LF gain when the sounder is set in manual mode.
- **Interference Rejection:** Enables the Interference Rejection of the sounder. Please refer to [Sounder Controls](#) for more information.

## POIs



This button allows you to display various POI ("Point of Interest") on the chart and find places:

- **Display POIs:** Shows or Hides all the POIs that are selected at once.
- **AC Marina/Anchorage/Local Knowledge/Hazards:** Displays the corresponding ActiveCaptain markers in the chart. Please refer to [ActiveCaptain](#) for more information.
- **Find:** Opens a window that allows to search for place. TimeZero Professional can search in the Marina ActiveCaptain database, Tide database and in the online geoname database (when connected to the Internet).



- **Manage Locations...:** Allows to capture and manage chart location.
- **Locations:** Used to recall a chart location (only available when one or multiple chart locations have been saved)

## Weather



This button allows to display weather on the chart by selecting various presets:

- **Display Weather:** Shows or Hides the selected Weather Presets.
- **[Weather Preset List]:** Click on one of these buttons to activate the corresponding weather preset. To define a preset, just select "Manage Weather Presets". Please refer to [Displaying Weather Data](#) for more information.
- **Routing** (when Routing Module is enabled): Show/Hide the selected Routing information below
- **Isochrons** (when Routing Module is enabled): Show/Hide the Isochrons on the chart. Please refer to [Creating a Routing](#) for more information.
- **SailSets** (when Routing Module is enabled): Show/Hide the SailSets on the chart. Please refer to [Creating a Routing](#) for more information.

## Camera



This button (only available in the Camera WorkSpace) allows to select the Camera Source:

- **<List of Camera Name>:** Select the Camera to be displayed on the screen.

## Camera Control



This button allows to access features of the camera (according to the type of camera) and allows to unlock the camera (stop the tracking):

- **Unlock Camera:** Stop the camera tracking
- **<Camera Features>:** According to the type of Camera (FLIR for example), various features can be selected from this menu ("Home", "Scene", etc...)
- **Reconnect Camera:** Attempt to reconnect to the camera when the connection is lost.
- **Camera Info:** Display camera information (for troubleshooting) such as Pan/Tilt and Zoom raw value.

## Augmented Reality



This button allows to display various layer of information on top of the camera video feed in the Camera WorkSpace:

- **Augmented Reality:** Enables or disables all the Augmented Reality features. Please refer to the [Augmented Reality](#) chapter for more information.
- **Grid:** displays a blue grid on top of the camera feed.

**Note:** The grid can be used to confirm that the camera is properly adjusted.

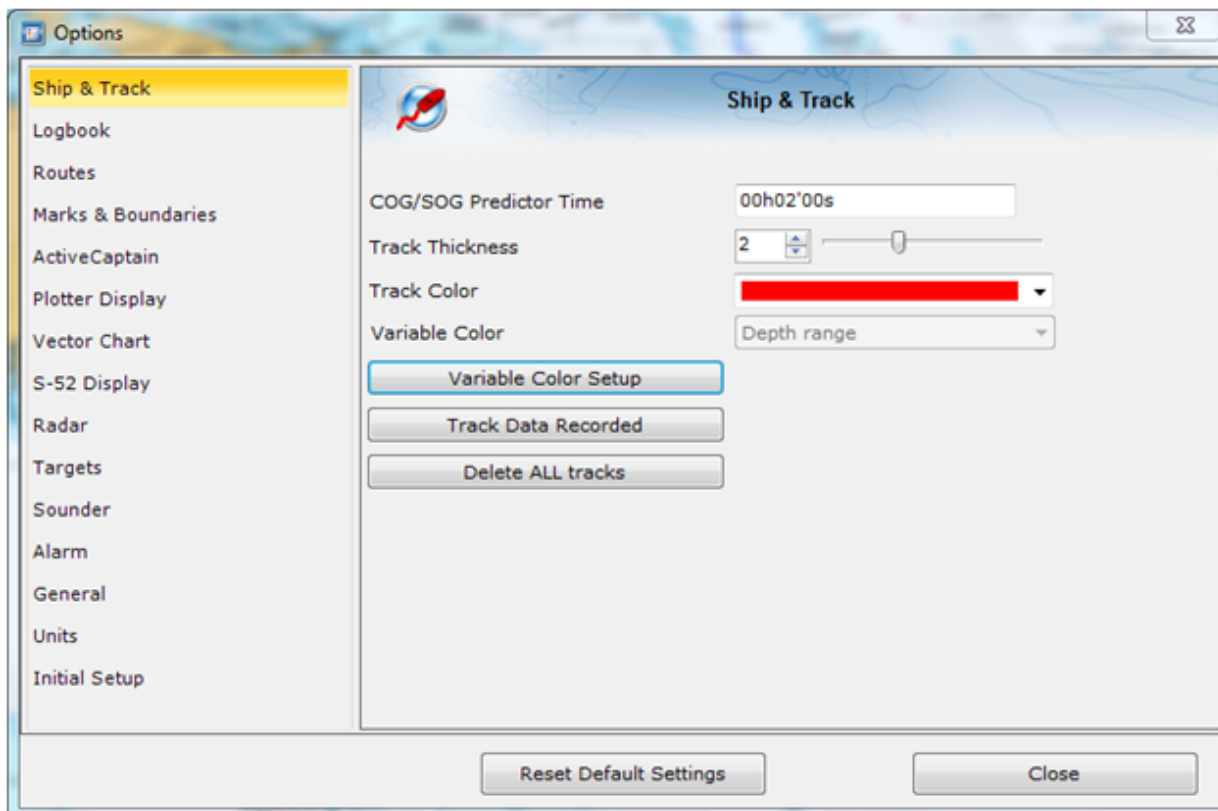
- **Target Label:** displays a label containing the target ID and its Speed over the target
- **AIS Icon:** displays the AIS icons in real size over the video. It is possible to click on these icons to get AIS information directly from the Camera WorkSpace
- **Active Route & XTE Alarm Lines:** displays the active route and cross track error alarm line.
- **Depth Area Under Safety Depth:** enables the display of dangerous areas (that are set under the safety depth).
- **Anti-Grounding Dangers:** displays any danger that are enabled for the Anti-Grounding. Note that the dangers will be displayed around the vessel even if they are not inside the Anti-Grounding cone.
- **Azimuth Scale:** displays the horizontal orientation of the camera (angle from North) at the bottom of the screen.
- **Distance Scale:** displays a distance scale (only available under the horizon line).
- **Pitch Scale:** displays the vertical orientation of the camera.
- **Camera stabilization:** adjusts the camera stabilization factor (requires Pitch & Roll data).
- **Maximum Render Range:** sets the distance at which objects will be displayed in the Camera WorkSpace.

## Options Overview

### Introduction

All preferences and settings within TimeZero are set using the Options window found under the "TimeZero" button. The Options window is comprised of a categorized list of options to the left, and the main display area to the right which contains all of the controls that the user can customize. At the bottom of the Options window a "Reset Default Settings" button allows you to reset the settings of the current page to the factory default.

**Note:** The "Reset Default Settings" button only affects the selected page (or category)



Note that some categories and features (such as Radar and Sounder) may not be available in your software (specific Modules may be required). Other categories (such as "NN3D Chart Server") will only appear when a specific sensor (a NavNet3D MFD in this example) has been detected.

## Ship & Tracks

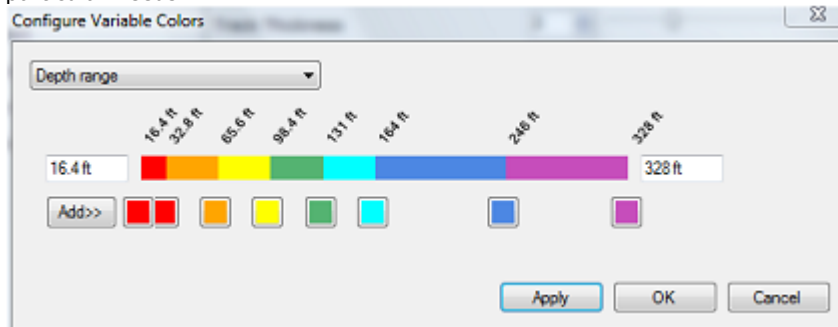
The Ship & Track options are used to configure the vessel's COG & SOG predictor line and various track recording and display options.

- **Own Ship Trail Length:** Adjusts the length of the trail (in time) displayed on the chart. Make sure to review the [Trail & Tracks](#) chapter for more information.
- **Trail Thickness:** Adjusts the thickness of the trail.
- **Own Ship COG/SOG Predictor:** Selects if the Course Over Ground (COG) predictor varies in length according to speed or fixed by a distance value.
- **COG/SOG Predictor Length:** Adjusts the Course Over Ground (COG) predictor length when set for distance.
- **COG/SOG Predictor Time:** Increases the time value to make the Course Over Ground (COG) & Speed Over Ground (SOG) predictor line longer. Decreases the time value to make the predictor lines smaller.

**Note:** The COG/SOG Predictor Time setting also affects the ARPA and AIS target predictor. The SOG Predictor Time value is also used for the Drift vector (same setting).

- **COG/SOG Predictor Thickness:** Adjusts the thickness of the Course Over Ground (COG) predictor line.
- **Heading Line Color:** Adjusts the color of the Heading Line.
- **Heading Line Thickness:** Adjusts the thickness of the Heading Line.

- **Autoshift Maximum Speed:** When the Autoshift mode is selected (look ahead), this value is used to determine the off center position of the boat based on its speed. For example, if this value is set to 10Kn, the boat will be off centered to the edge of the motion circle at speed of 10kn and above.
- **Motion Circle:** Increases or decreases the size of the Relative Motion Circle (used for Relative and True Motion). Refer to the [Centering on the boat](#) chapter for more information on the Relative Motion Circle.
- **Current Indicator Trail:** Adjusts the current indicator trail. Please refer to [Current Indicator](#) for more information.
- **Range Circle Size:** Adjusts the range circle size (that can be displayed around the boat icon by enabling it from the "Mode" button located in the Ribbon or by right clicking on the boat icon).
- **Range Circle Color:** Adjusts the range circle color
- **Range Circle Thickness:** Adjusts the range circle thickness
- **Track Thickness:** Increases or decreases the thickness of all the track lines that are set to use the "Default" thickness. Track thickness can be customize independently for each track by right clicking on the track and selecting a thickness size other than the "default" size.
- **Track Color:** Changes the default Track line color to one of 8 fixed set colors, or Variable colors according to real time parameters received by TimeZero.
- **Variable Color:** This option can be set to Depth, Bottom Discrimination, Sea Surface Temperature or Speed, but only if the Track Color option is set to Variable.
- **Variable Color Setup:** Press the Variable Color Setup button to access the control where you can alter the Track line coloring based on Depth range, Sea Surface Temperature (SST) range, or Speed. Users can adjust the minimum maximum values of the ranges as well as adding and customizing color to satisfy particular needs.



**Tips:** To remove a color, click and drag it all the way to the right (until a trash icon appear) then release the mouse

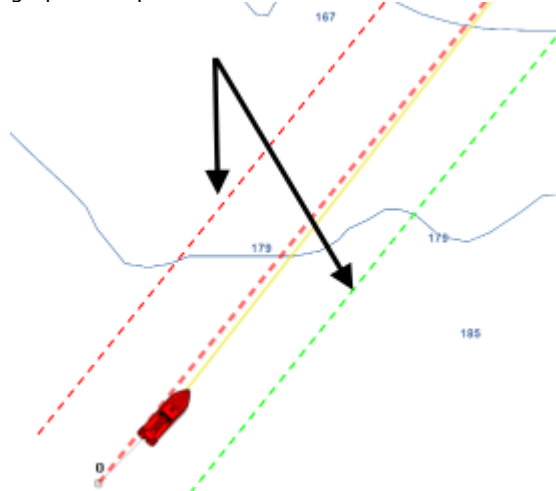
- **Track Data Recorded:** By default, Date, Depth, Sea Surface Temperature and Speed over Ground are recorded within the track. It is possible to record more data (up to 10) by checking the appropriate box. This data can then be displayed in a Tooltip when the cursor is placed over the track line. This only applied to own ship track (target tracks only record date and speed).
- **Trawl Display** (Trawl Positioning module required): These options adjust the properties of the net when connected to a trawl positioning system. for more information, please refer to the [Trawl Positioning](#) chapter.

## Routes

The Route options allow users to configure settings related to routes behavior and appearance.

- **Route Color:** changes the default Route color.

- **Route Thickness:** changes the thickness of all routes. This is a global setting that will affect all the routes displayed on the screen.
- **Display Route Wizard after creating a route:** check this option to have the software display the Route Wizard when a route is created. The Route Wizard can also be displayed by right clicking on a Route and select "Open Route Wizard".
- **Great Circle Navigation:** when this option is checked, the software will compute and display distance (with the divider tool) using the Great Circle distance (shortest distance between points on the surface of the Earth). The software will also chop long routes in smaller segments along the great circle path. These shorter resulting legs can be considered as straight ("rhumb line") segments that follow the shortest path on a Mercator projection using fixed bearing (on each segment).
- **Route Auto Zoom:** when this option is checked, the software will automatically adjust the zoom level when a new Waypoint is activated along a route. The software will either zoom in or zoom out in order to show the current position and the next Waypoint.  
*Note: The Route Auto Zoom will only work if the boat is displayed on the screen (the software will not attempt to adjust the zoom level if you are panning on another area)*
- **Route Animation:** when this option is checked, an animation is displayed on the active and planning route indicating its direction. If you find the animation distracting, you can turn OFF this option.
- **Display XTE Alarm Lines:** when this option is checked, a red and green dash line (respectively port and starboard) will appear on each side of the active leg (when a route is activated). These lines are a graphical representation of the Cross Track Alarm value.

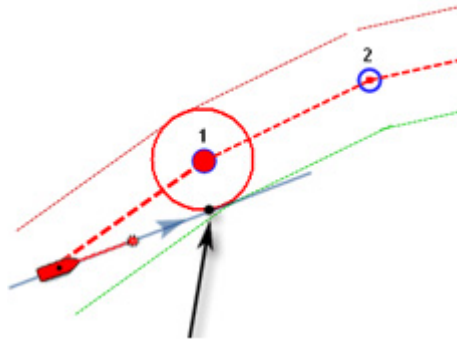


*Note: In order to see the XTE Alarm Lines on the chart, you may have to zoom in at a closer range*

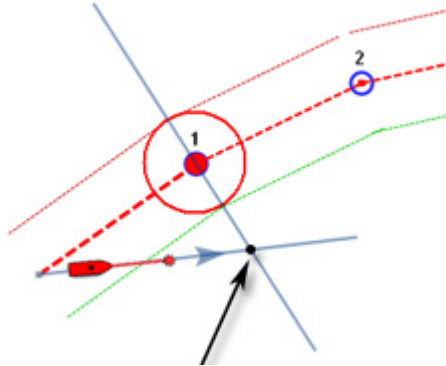
- **Default Route XTE Value:** this setting sets the default value of the route cross track error (used for displaying the XTE Alarm lines). Note that if the "Automatic XTE" setting is turned ON, the value used on a route leg might be inferior according to the Route Safety check.
- **Check Route Safety:** this setting enables TimeZero to scan for dangerous objects and depth area along any route that has been created. Please refer to [Route Safety](#) for more information.
- **Automatic XTE:** When this setting is enable, TimeZero is allowed to reduce the XTE value of each leg to avoid obstacle (related to [Route Safety](#)). The minimum acceptable value is set by adjusting the Minimum XTE Value setting below
- **Minimum XTE Value:** When Automatic XTE is enabled, TimeZero can reduce the XTE value down to this minimum value. Set this setting to the absolute minimum XTE value you are comfortable with.
- **Prevent Creating Route when Leg is unsafe:** When this setting is enabled, you will not be able to drop a waypoint until the leg of the route your are building has been analyzed and considered safe (using the Route Safety parameters).

- **Route Safety Configuration:** Click this button to adjust the type of objects that will be checked for the Route Safety and Anti-Grounding Cone. You can also enter your safety depth (for depth sounding and depth area) and safety height (for bridge clearance).
- **Waypoint Switching Mode:** this setting determines how the software switches to the next Waypoint automatically in a route

- *Circle:* in this mode, the next Waypoint is automatically switched when your boat icon enters the active Waypoint's switching circle

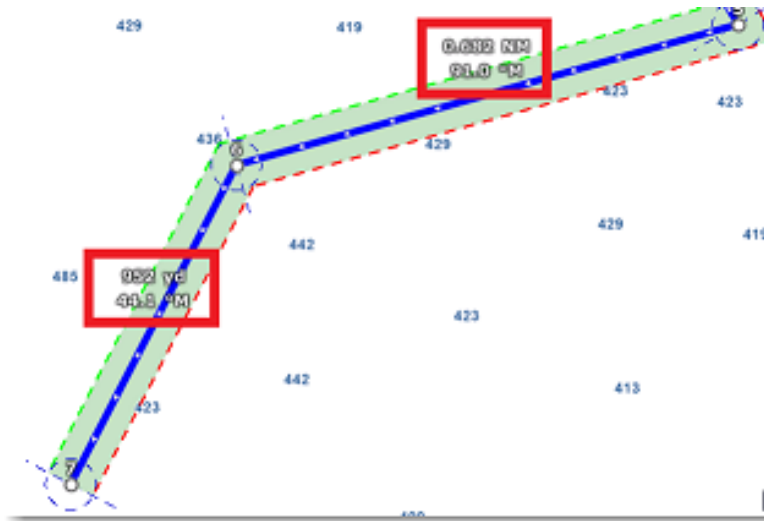


- *Cross Line (also known as "perpendicular"):* in this mode, the next Waypoint is automatically switched when your boat crosses the line through the Waypoint that is perpendicular to the active leg line



- *Circle and Cross line:* in this mode, the next Waypoint is automatically switched if it enters the switching circle or crosses the line.

- **Switching Circle Radius:** this option sets the radius of the switching circle and arrival alarm. This is a global setting that affects all Waypoints in a route.
- **Intelligent Waypoint Centering:** when this option is checked, the chart will automatically pan when a route is being built.
- **Display Leg Distance and Bearing:** when this option is checked, the distance and bearing (course to steer) will be displayed on the route leg:



*Note: the distance and bearing are not displayed on the active leg. This information can be displayed in the NavData using the "Route NavData"*

- **Route Planning Default Speed:** Set the default speed that will be used when creating a route.
- **Use Currents in Active Route:** when this option is checked, TimeZero enables current computation on the Active Route. Note that you may want to leave this option disabled if you do not have an accurate speed through water sensor connected to the computer, or if you want the route computation (ETA, TTG,...) to match other devices on your vessel that are not able to take currents into account.

**Note:** This option may slow down the software on older computer.

- **Fuel:** Fuel options are used to configure the display of estimated maximum fuel range calculations within the TimeZero software. Fuel tank levels and fuel flow information come from NMEA2000 sensors (or J1939 sensors that are converted to NMEA2000 data streams)
  - *Show Max Range on Route:* this option turns on or off the display of the estimated maximum fuel range overlay on a Route line.
  - *Max Range On Route Color:* allows the user to change the color of the maximum fuel range overlay on a Route line.
  - *Show Vessel Fuel Range Ring:* this option turns on or off the display of the estimated maximum fuel range ring (a range ring centered around the vessel)
  - *Vessel Fuel Range Color:* allows the user to change the color of the maximum fuel range ring.
  - *Use First (Second, Third or Fourth) Fuel Tank In Vessel Calculations:* allows the user to decide to use the First, Second, Third or Fourth fuel tanks on their vessel for the purposes of calculating estimated maximum fuel range
- **SAR Interval:** Search and Rescue (SAR) Interval value for auto routing density. Values can be manually entered, or if the user uses the SAR Interval Table, the value will be automatically populated with a distance appropriate for the search conditions.
- **SAR Interval Table:** Open a window that allows to automatically set the optimum distance in between SAR path according to visibility and the type of object to look for.

## Marks & Boundaries

The Marks & Boundaries options allow users to configure settings related to marks, events and boundaries (line, area and circle)

- **Display Objects Names:** this option displays object names next to the object. This is a global setting that affects all the marks, routes and boundaries displayed on the screen.
- **Mark Symbol:** changes the default Mark icon.
- **Mark Color:** changes the default Mark color.
- **Mark Size:** changes the size of all marks (ranges from 50-200). This is a global setting that affects all marks displayed on the screen.
- **Event Mark Symbol:** changes the default mark icon used when an event is triggered (when the "Event" tool or ENTER key is used).
- **Event Mark Color:** changes the default mark color used when an event is triggered.
- **Configure Events:** opens a window that allows you to customize events icons and colors when you press the 0 to 9 numeric keys on your keyboard.
- **Event Label:** changes the type of label that is used when saving events. Select "Prefix" when you want to use a user defined text prefix or select "Depth" when you want to name events with the current depth received from your sounder (depth below waterline). Select "None" if you do not want any label attached to the Event
- **Event Label Prefix:** enter the text that will be assigned to the events when "Event Label" is set to "Prefix"
- **Event Auto-numbering:** enter a numeric value that will be used after the prefix. This numeric value will be automatically incremented each time you drop an event. Erase that field if you don't want any number to appear after the prefix.
- **Lock Event:** select this option if you want the event to be locked by default.
- **Prompt for Event Name:** when this option is checked, a window allowing you to rename the event will appear each time you drop an event.
- **Automatic Event Recording:** when you check this option, an event will be automatically dropped periodically. The time is defined under the "Record every..." option. The minimum time interval is one minute.
- **Boundaries Color:** changes the default Boundary color.
- **Boundaries Transparency:** This option determines the default intensity of boundary transparency (ranges from 0-80).
- **Boundaries Contour:** changes the default Boundary contour style.
- **Boundaries Contour Thickness:** changes the contour thickness for all boundaries. This is a global setting that affects all boundaries displayed on the screen.
- **Annotation Color:** changes default Annotation color.
- **Annotation Size:** changes default Annotation size (ranges from 5-50).
- **Icon Set:** Allows the user to choose between a modern or classic icon set. "MaxSea v12" allows to use smaller icons on screen.

## **ActiveCaptain**

The ActiveCaptain options allow users to enter their ActiveCaptain credentials and set advanced marker filters

- **Only Show Marinas with:** this allows the user to show only Marinas that have information regarding specific features. Leave all the options un-check to show all marinas.



- **Local Knowledge to show:** this allows the user to show only specific "local knowledge" marker type. Leave all the options checked to show all "local knowledge" markers.

## Plotter Display

The Plotter Display options allow users to configure settings related to the Navigation and Planning Work Spaces:

- **Day/Night Mode:** adjusts the screen's brightness and vector chart color palette (for night or day). When set to Automatic, TimeZero will automatically switch modes according to your local sunset and sunrise time.
- **Luminosity Variation:** allows to adjust precisely the screen's brightness. Note that this setting use independant values per mode (Night/Dusk/Day).
- **Red Filter in Night Mode:** enables a red hue when the night mode is selected. Note that the red filter only operates on the Chart, NavData, Toolbar and Ribbon. It does not apply to windows or contextual menu.
- **Inverse Chart Palette in Day Mode:** force the night chart color palette at all times.
- **Plotter Background Color:** in "Automatic" mode, the background color when no chart is displayed (when no chart is selected from the [Chart Ribbon](#)) will be dark grey in day mode and black in night mode or when "Inverse Chart Palette in Day mode" is enabled. Select "Manual" and press the "Background Color Selection" to select a custom color.
- **Chart Priority in Auto Mode:** If you have both MM3D Raster charts and MM3D Vector charts installed for the same area, this option allows you to select which type of charts (raster or vector) will be prioritize when the chart selection is set to "Auto". If you have multiple MM3D Vector charts for the same area, the following internal priority will be used: MM3D C-Map then MM3D S-57.  
*Note: "ENC" chart (when installed) are not part of the "Auto" mode. They must be selected manually.*
- **Chart Boundaries:** selecting this option displays all chart areas boundaries:
  - The areas having detailed Nautical Charts (either Raster, C-Map, S57 or Fishing charts according to the current selection) are surrounded in purple
  - The areas having detailed Satellite Pictures are surrounded in green
- **Cross Screen Cursor:** this options display lines and cursor position information on the screen to make the cursor location more visible.
- **Chart Scales Selection:** click on this button to select the chart scale that will be used when clicking on the Zoom In/Out buttons. By default, clicking on the Zoom In/Out button step by step will go through all the chart scales. If you want to "jump" directly from one scale to another or limit the Zoom In/Out, you can deselect the scales you want to skip.
- **Allow Vector Chart Overzoom:** this option prevents the "overzoom" chart tiles to appear even if no detail is available for a specific area at a high zoom level. Disable this option if you do not want TimeZero to overzoom the charts (and display an "Overzoom" indication on screen).
- **Display Raster Chart Unit Legend:** this option displays a raster chart depth unit legend in the lower left hand corner of the screen.
- **Grid Interval:** indicates the grid interval (ranges from very low to very high) that can be turned ON and OFF from the "Chart" button located in the Ribbon .
- **Transparencies:** The following objects' transparency can be adjusted:
  - *Tide Range for PhotoFusion:* Offset the depth at which the PhotoFusion will start. This setting is useful in area with important tides.

- *PhotoFusion Transparency*: Manipulates the overall intensity of PhotoFusion transparency on water (ranges from 0-80)
- *Tidal Currents Transparency*: Manipulates the intensity of tidal Currents transparency (ranges from 0-80)
- *Depth Shading Transparency*: Manipulates the intensity of depth shading transparency (ranges from 0-80)
- *Bottom Hardness Transparency*: Manipulates the intensity of the bottom hardness transparency (ranges from 0-80). This feature requires a Furuno Sounder with Bottom Discrimination feature or a third party sounder able to send bottom hardness information (requires the bottom hardness module)
- *BackScatter Transparency*: Manipulates the intensity of the BackScatter transparency (ranges from 0-80). This feature requires a WASSP multi-beam sounder (Backscatter)
- *Weather Color Transparency*: Manipulates the intensity of weather color transparency (ranges from 0-80)
- **3D Display**: While in 3D mode, the following options control the exaggeration of depth and altitude displayed:
  - *Terrain Shading Value*: Determines the strength of the terrain shading (relief shading).
  - *3D Alti Exaggeration*: Determines the exaggeration of land altitudes displayed while in 3D mode (all WorkSpace).
  - *Bathy Exaggeration*: Determines the exaggeration of the seabed in the "3D Cube" WorkSpace and in the Navigation and Planning WorkSpaces when "Display Bathymetry in 3D" is selected.
  - *Display Bathymetry in 3D*: Determines if the bathymetry is displayed or not in the Navigation and Planning WorkSpaces. When this setting is OFF (default), only perspective is used over the sea to avoid parrallax effect. If you wish to represent sea floor with actual 3D, make sure to check this option. This setting does not apply to the "3D Cube" WorkSpace which always displays bathymetry.
- **Depth Shading**: When the depth shading is turned on (from the "Chart" button located in the Ribbon), the range and hue of the depth color scale can be controlled using the following options:
  - *Depth Shading Mode*: When set to "Auto", TimeZero automates the range of water depths to be shaded according to the area displayed on the screen. TimeZero looks for the shallowest and deepest points and automatically adjusts the range accordingly. In this mode, the color scale range is continuously updated as you pan or zoom the charts. When set to "Manual", the color scale uses the Minimum and Maximum values defined below. When set to "Discrete", use the button "Discrete color Palette" below to adjust exactly which color to use for specific depth.
  - *Minimum Value*: Fixes the minimum water depth value to be shaded when the "Manual" mode is selected.
  - *Maximum Value*: Fixes the maximum water depth value to be shaded when the "Manual" mode is selected.
  - *Depth Color Palette*: Determines the color palette used for the depth shading in Auto and Manual mode.
  - Discrete Color Palette (PBG module required): Press that button to display a window that allows you to customize exactly which color to use at specific depth.
- **Depth Contour Line (PBG Module Required)**: When the depth contour line is turned on (from the "Chart" button located in the Ribbon), the contour line mode can be adjusted using the following options:
  - *Contour Line Mode*: When set to "Auto" the contour line interval is automatically adjusted by TimeZero according to the "Automatic Contour Line Density" parameter and the chart zoom level. When set to Manual, the user specify an interval using the options below. "Auto" mode is useful to

have a quick overview of the slope without having to dial-in any parameter. "Manual" mode is useful when a specific contour line interval needs to be used.

- *Automatic Contour Line Density:* Set the overall density of the contour lines when "Auto" mode is selected. Note that the interval will automatically change according to the slope and the chart zoom level.
- *Contour Line Interval:* Set the interval in between two consecutive contour lines when "Manual" is selected.
- *Contour Highlight Frequency:* Adjusts the frequency of the bold contour lines. For example, if you set the contour line interval to 15 ft with a Contour Highlight Frequency of 10, a bold contour line will appear every 150 ft.
- *Use Depth Shading Color Palette:* Displays the contour lines in color using the same color palette as the Depth Shading. Note that this setting only applies when the depth shading is turned OFF. If the depth shading is displayed on screen, the contour lines will always be black.
- *Restrict Contour Line to Depth Shading Range:* When this setting is selected, the contour lines will only be displayed on areas covered by the depth shading range (the minimum and maximum value). If you want to see depth contour line everywhere, uncheck this option.
- **BackScatter (PBG and WASSP Modules Required):** When backscatter is turned on (from the "Chart" button located in the Ribbon or from the Fishing WorkSpace), the following settings allows you to adjust how it is displayed on the chart :
  - *Backscatter Shading Mode:* When set to "Auto", TimeZero automates the dB scale (min and max) according to the area displayed on the screen. In this mode, the color scale range is continuously updated as you pan or zoom the charts. When set to "Manual", the color scale uses the Minimum and Maximum values defined below. When set to "Discrete", use the button "Discrete Color Palette" below to adjust exactly which color to use for specific backscatter value.
  - *Minimum Value:* Fixes the minimum dB value to be shaded when the "Manual" mode is selected. Note that areas on the map that have a backscatter value under this setting will still be shaded using the minimum scale color.
  - *Maximum Value:* Fixes the maximum dB value to be shaded when the "Manual" mode is selected. Note that areas on the map that have a backscatter value above this setting will still be shaded using the maximum scale color.
  - *BackScatter Palette:* Determines the color palette used for the backscatter in Auto and Manual mode.
  - *Discrete Color Palette:* Press that button to display a window that allows you to customize exactly which color to use at specific depth.
- **Bottom Hardness (PBG and Bottom Hardness Module Required with selected sounder):** When bottom hardness is turned on (from the "Chart" button located in the Ribbon or from the Fishing WorkSpace), the following settings allows you to adjust how it is displayed on the chart :
  - *Bottom Hardness Shading Mode:* When set to "Auto", TimeZero automates the % scale (min and max) according to the area displayed on the screen. In this mode, the color scale range is continuously updated as you pan or zoom the charts. When set to "Manual", the color scale uses the Minimum and Maximum values defined below. When set to "Discrete", use the button "Discrete Color Palette" below to adjust exactly which color to use for Bottom Hardness value.
  - *Minimum Value:* Fixes the minimum % value to be shaded when the "Manual" mode is selected. Note that areas on the map that have a Bottom Hardness value under this setting will still be shaded using the minimum scale color.
  - *Maximum Value:* Fixes the maximum % value to be shaded when the "Manual" mode is selected. Note that areas on the map that have a Bottom Hardness value above this setting will still be shaded using the maximum scale color.

- *Bottom Hardness Palette:* Determines the color palette used for the Bottom Hardness in Auto and Manual mode.
- Discrete Color Palette: Press that button to display a window that allows you to customize exactly which color to use at specific depth.

## Vector Charts

The Vector Charts options allow users to configure common settings related to the Vector Chart display.

- **Preset:** Allows the user to manage vector chart presets that captures all the settings of this page. Various presets (with independent vector chart settings) can be created and recalled from any plotter. Just note that the Safety Depths will be shared across all the presets for safety reason.

### Appearance

- **Color Theme:** Determines the color palette (or "theme") used to render the Vector Charts.
- **Style:** Selects the symbol representation (for buoys) to either use the simplified style (common on ECDIS) or the paper chart style.
- **Land Features:** Selects to turn ON or OFF the land features of the Vector charts.
- **Chart Object Size:** Adjusts the size of the vector charts object icons (buoys, wrecks,...) and text displayed on the screen.

### Safety Depths

- **Shallow/Safety/Deep Water:** These parameters are used to color the various depth area of the Vector Chart. The transition between colors is based upon the depth contour lines of the vector chart. Note that if there is no contour line available on the vector chart corresponding to the exact value you selected, the color transition will occur at the next deepest (safer) contour line available.

### Layers

In addition to these screen rendering parameters, the Vector Chart Menu allows you to turn ON or OFF the display of specific object (such as Buoy Numbers or Light Description).

## Routing

The "Routing Module" needs to be unlocked to access this feature

The Routing options allow users to configure settings that will change the Routing computation:

- **Only Keep The Last Routing:** by default, TimeZero only keep the latest routing. This means that when creating a new Routing, the previous one is discarded. If you want TimeZero to keep all routings on the screen (to test multiple scenarios for example), uncheck this option.
- **Routing Transparency:** adjust the isochrons and sailset transparency on the chart.
- **Isochron Interval:** adjust the time interval in between two isochrons. By default, TimeZero adjust automatically the isochron interval according to the routing distance. You can manually select a smaller isochron interval (to increase accuracy), but keep in mind that this will increase the computation time.
- **Use Motor Under Sailing Speed:** set the minimum speed that will be used underway. When predicted speed (from Wind Power) fall under this value, TimeZero will assume you will start your engine and use the speed below to predict the rest of the voyage (until the speed under wind power goes above this threshold again)
- **Motor Sailing Speed:** set the speed under engine power

- **Polar Curve Percentages:** Allow to adjust the overall polar speeds. This settings is especially useful to decrease the overall polar values when feeling that you cannot reach 100% efficiency.
- **Avoid Land and Shallow Waters:** when this option is enabled, TimeZero will try to avoid land and shallow water areas under whose depth fall under the setting below
- **Minimal Depth:** set the minimum depth
- **Waves:** Check this option of you want the routing computation to take into account wave height and direction.
- **High Resolution Tidal Currents:** Check this option of you want the routing computation to take into account the high resolution tidal current (the routing will not use discrete tidal current stations).
- **Oceanic Currents:** Check this option of you want the routing computation to take into account the oceanic current (from weather file).
- **Maximum Acceptable Wind Speed:** Enter the maximum wind value acceptable along the optimized route. Use this field if you want to avoid area with strong wind. Leave the default value (125!) if you don't want to put any restriction on the routing computation.
- **Minimum Acceptable Wind Speed:** Enter the minimum wind value acceptable along the optimized route. Use 0 if you don't want to put any restriction on the routing computation.
- **Maximum Acceptable Wave Height:** Same as above, but for wave height.
- **Routing Label Prefix:** Prefix used for the default name of every routing. Since routing will also appear in the route list, it is common to give a specific prefix for optimized (routing) routes.
- **Routing Auto Numbering:** Used with the prefix to assign a default name.

## Weather

The Weather options allow users to configure how to retrieve weather data, how to display it on the chart and even apply offsets.

### Weather Data Download:

- **Download Method:** Allow the user to select how to retrieve weather files. TimeZero offers 4 download methods:
  - **High Speed Internet:** select this method when you are using a high speed Internet connection (at home or when using a 3G/LTE connection). TimeZero will directly connect to the weather server to retrieve the weather data and use up to 16 downloads in parallel.
  - **Satellite or Low Bandwidth Internet:** parallel downloads can cause issues with high latency and slow Internet connection. Use this method especially when using a Satellite connection to connect to the Internet. With this method, TimeZero will download the data from the weather server using a single "stream" (file) that is optimized for slow Internet. Note that the server will initially take some times to create and compress the file. TimeZero will also take some times at the end of the download to decompress the file and process the data before it can be used. You may notice that the estimated file size may be larger than the actual downloaded file size. This is normal and due to the compression algorithm that the server uses. Note that the maximum file size that can be downloaded with this method is 50Mb.
  - **By E-Mail:** use this method when the computer cannot be connected directly to the Internet but can still send and receive e-mails. TimeZero will create an email that can be send to the server. After a couple of minutes, the server will reply back with an e-mail containing the weather file in attachment. Note that the maximum file size that can be retrieved with this method is 20Mb.
  - **Iridium GO!:** Use this method when you connect your computer to the Iridium Go Wi-Fi network to connect to the Internet. Note that the maximum file size that can be downloaded with this method is 1Mb. Please refer to the [Iridium Go](#) for more information.

- **Automatic Download:** Allow the user to set a schedule at which the weather will be automatically downloaded.
- **Keep History when downloading weather data:** This setting only appears when the [Premium Ocean-O Service](#) is activated. When this option is selected, TimeZero does not erase old weather and oceanographic data when new data is downloaded. This is useful if you want to analyze trend over long period of time.

#### Display:

- **Wind Particles Trail:** Allow to adjust how long the particles animation are.
- **Color Shading Palette:** Allow to select how continuous or discrete the color palette for weather will be. If you select fewer color, it will be easier to see "steps" in the weather data.
- **Ocean-O Scale Configuration:** This setting only appears when the [Premium Ocean-O Service](#) is activated. It allows to adjust the minimum and maximum scale for the oceanographic data.

#### Wind and Wave Data Offsets:

- **Increase/Decrease Wind Speed (value and %):** Allow to offset the overall wind speed. Useful if the weather forecasts have overestimated or underestimated wind speeds (based on your own observation).
- **Change Weather File in time:** Introduce a time offset to the weather forecast. For example, if you notice that a change in forecast appears sooner, you can adjust this offset globally, so that future forecast match with your observation.
- **Increase/Decrease Waves (%):** Allow to offset the overall wave height (power). Useful if the weather forecasts have overestimated or underestimated waves (based on your own observation).
- **Increase/Decrease Currents (%):** Allow to offset the overall oceanic currents speed (power). Useful if the weather forecasts have overestimated or underestimated currents (based on your own observation).
- **Change in Wind direction:** Allow to offset the overall wind direction.

#### Ocean-O:

- **chlorophyll data source:** Allows to select the data source used for chlorophyll. The Copernicus Marine L4 is recommended for most application as it is the most accurate observation from satellite. However, during winter and at high altitudes, this source does not provide any data (remote sensing from satellite requires short-wave radiation from the sun to reach the ocean surface, which is not available during the polar night). For this particular case, it is possible to switch to the alternate model Copernicus BIO.

## **Radar**

The "Furuno Radar module" needs to be unlocked and radar configured to access this feature

The Radar options allow you to configure various advanced Radar Setup and displays preferences.

- **Day Background Color:** Determines the background color of the radar display that is used during the day.
- **Night Background Color:** Determines the background color of the radar display that is used during the night.

**Note:** The Day/Night setting can be found under the [Plotter Display](#) options.

- **Echo Color:** Determines the radar echo color:
  - **Multicolor 1:** Red for strong Echo / Yellow for medium Echo / Dark Green for weak Echo

- **Multicolor 2:** Red for strong Echo / Green for medium Echo / Dark Blue for weak Echo
- **Red:** Monochromatic Red with variable transparency according to echo level
- **Green:** Monochromatic Green with variable transparency according to echo level
- **Yellow:** Monochromatic Yellow with variable transparency according to echo level
- **Echo Transparency for Overlay:** Adjusts the overall intensity of echo transparency on the chart (this does not affect the Radar Work Space)
- **Radar Source for Overlay (Furuno DRS only):** When using a DRS with TimeZero, it is possible to use the Dual Range feature of the DRS for the chart overlay:
  - *Range A (Default):* Only the one range of the DRS (left side picture of the Dual Radar WorkSpace) will be used for the overlay. By limited the DRS to only one range, it allows the DRS to rotate at high speed (up to 48RPM).
  - *Range B:* The second range of the DRS (right side picture of the Dual Radar WorkSpace) will be used for the overlay. This allows to have individual Radar Range and settings in between the Radar Overlay and the Radar WorkSpace. This is because the regular Radar WorkSpace (not the Dual Radar) is only using the first range of the DRS (left side).
- **Sweep Fade:** The sweep fade displays a "traditional" radar animation. This feature automatically reduces the brilliance of weak signals (noise, sea clutter, rain clutter, etc.) and unnecessary echoes like radar interference.
- **Rings Interval:** You can manually adjust the number of Radar Range rings you want to display in the Radar Work Space. Leave the option set to "Automatic" if you want TimeZero to automatically adjust the number of rings according to the Radar Range and size of your screen (or window).
- **Auto Sea Mode (DRS Only):** This setting adjusts the DRS auto Sea Mode. "Advanced" should be used for most application. Use "Coastal" when in an area with lots of return from a landmass.
- **Bearing Scale Mode:** When set to "True", the Bearing Scale (numbers displayed on the outer circle of the Radar Work Space) is referenced to the true North. When set to relative, the Bearing Scale is referenced to the bow of your vessel.

**Note:** When set to True, the bearing scale does not take into account the Magnetic Variation. It is always referenced to true North.

- **Own Ship Icon:** Check this option if you want to display a real sized ship icon in the Radar Work Space. Note that the ship icon will only appear at small range (according to your own ship beam and width).
- **Trail:** Echo trails show the movements of radar echoes relative or true to your vessel. The trails disappear over time (according to the "Trail Length" parameter). When set to "True" mode, only objects that are moving in reference to the water (such as another ship) will show a trail on the screen. Fixed objects on the water (such as buoys or a rock) will not show a trail even if your own ship is moving. When set to "relative" mode, any objects that move relative to your boat will leave a trail on the screen. So if your own

ship is moving toward a stationary target (buoys for example), the target will leave a trail (smearing):



(a) True target trails  
(No smearing of  
stationary targets)



(b) Relative target trails  
Targets moving relative  
to own ship

- **Radar Initial Setup:** These settings are used to adjust the initial setup of the Radar. Note that this section will be limited if you are using a Furuno FAR radar (such as FAR2xx8) as these initial settings are performed from the Radar Processor directly. These settings are always linked to a specific Radar antenna. Make sure to select the correct Radar Hostname (from the drop down menu) before adjusting these settings.
  - *Radar Host:* Select the Radar detected on the network
  - *Nickname:* Enter the Radar Nickname that will be used in TimeZero
  - *Antenna Position:* Enter the Radar Antenna position
  - *Antenna Height (Furuno DRS Radar only):* Select the Radar Antenna height. This setting is used to automatically adjust the STC calibration.
  - *TX Channel (Furuno DRS-NXT Radar only):* Select the transmit frequency of the solid state transceiver.
  - *Target Analyzer (Furuno DRS-NXT Radar only):* This setting allows to display or hide echo caused by rain in Target Analyzer mode. Set to "Rain" when you want to see rain and "target" when you want to hide rain and focus on target only.
  - *Auto Acquire by Doppler (Furuno DRS-NXT Radar only):* When this setting is enabled, the DRS-NXT will automatically acquire ARPA target based upon Doppler information (it will attempt to acquire any target that are moving at a closing velocity of 2 or more knot).
  - *Antenna Heading Align:* It is not always possible to install a radar so that the front of the radar is exactly parallel with the boat's keel or center line. The Antenna Heading Align adjustment can compensate for this discrepancy. This process allows you to align the radar transceiver with the center line of the boat and only needs to be set once. Note that this is a different function than aligning your heading sensor. To adjust the Radar Antenna Alignment, it is best to display the Radar Work Space in "Head Up" mode and aim the bow of your vessel (during calm weather) at a buoy while underway. The buoy target should appear straight up on the Radar Screen.
  - *Sector Blanking:* This feature is used to indicate a zone where the radar does not transmit a pulse. This is necessary if:
    - Two or more radars are mounted within each other's beam;
    - There is a significant structure near the radar that causes strong returns, overwhelming the circuitry of the radar;
    - You wish to prevent radiating a particular zone of the radar (for example, your radar is mounted low on the fly bridge).



- *Antenna Rotation (Furuno DRS Radar only):* When set to "Auto" the DRS antenna rotation will increase automatically in specific conditions (at lower range). Select "24RPM" if you want the DRS radar to spin at a constant regular rate.
- *Main Bang Suppression:* Increase this setting to reduce the "main bang" (circle that appears at the center of the radar screen).
- **Radar Optimization (Furuno DRS only, not available for DRS-NXT):** Press that button while underway when commissioning the radar (note that it is not recommended to perform a Radar Optimization in the harbor because of the strong echo return). Pressing that button will calibrate the radar. You only need to press that button once after installing the radar. Note that there will be no feedback (no confirmation window) when you press that button.
- **Set Hardware to Factory Default (Furuno DRS only):** Click on this button to reset the DRS radar to its factory settings.
- **Radar User Presets:** Click on this button to open the Radar Preset window that allows to store radar configuration. Please refer to [Radar User Preset](#) for more information.
- **ARPA Processing (Furuno Radar only):** By default, the ARPA processing is performed inside the Furuno Radar Antenna. You can change this option to "TimeZero" to use the internal TimeZero ARPA algorithm instead.
- **Advanced ARPA Settings:** These advanced ARPA settings affect how the internal TimeZero ARPA algorithm detects and tracks the target.
  - *Maximum blob size in square meters:* A radar echo ("blob") that is bigger than the value of this setting will not be accepted as a valid ARPA target candidate ("Plot"). This setting is useful to reject landmass.
  - *Minimum blob size in pixel:* A radar echo ("blob") that has a smaller surface in pixel than the values specified will not be accepted as a valid ARPA target candidate ("Plot"). This setting is very useful to filter out noise or interferences that may create very small echoes on screen.

**Note:** To adjust the Maximum and Minimum blob size, it is recommended to enable "Display Plots" at the bottom of the Advanced ARPA Settings window. This will display the "plots" using blue circles on top of the radar overlay. Once the plots are displayed on screen, it is easy to adjust the filter size until you don't see any blue circles around the echoes caused by noise, but still see blue circles around real targets.

- *Minimum echo strength:* This setting adjusts a pre-processing filter that removes weak echos from the picture used by the ARPA algorithm (blob detection algorithm). This setting is useful to remove noise (weak echo) but adjusting this value too high may create false "blob" (by breaking apart a strong large echo in multiple distinct smaller echoes).

**Note:** To adjust the minimum echo strength, it is recommended to enable "Quantized Radar Display" at the bottom of the page. This will display the radar picture as seen by the ARPA algorithm. Adjust this filter until weak echoes caused by noise disappear.

- *Target Max Speed:* This setting specifies the maximum speed of a target (50Kn by default). Decrease this value if you only want to track slower target (this will decrease the false detection rate).
- *Tracking Reactivity:* TimeZero uses an advanced Kalman filter to smooth past target positions and predict the next target location. This setting adjusts the filter "responsiveness". The smaller the value, the longer the filter will take to react to sudden changes in target course. This means that targets turning fast or accelerating/stopping fast may be lost. But the advantages of a slower reactivity filter is that the COG/SOG of the target will be very stable (averaged) and its track will be very smooth. If the reactivity is increased, the filter will be quicker to react, but will cause the tracking to be "choppy" and COG and SOG to be less stable (varies quickly).
- *Target Min Acquire Scans:* A target that is being acquired (displayed with dash contour) will be considered as a valid target (displayed with solid contour) when the corresponding underlying plot is present during the specified amount of **consecutive** antenna turn. If the echo (plot) disappears

for one (or multiple) antenna turn before reaching the Target Min Acquire scans value, the counter is restarted (the target must be validated again during x consecutive antenna turn).

- *Target Max Acquire Scans:* A target that is being acquired (displayed with dash contour) for too long (because the blob appears and disappears before reaching the minimum consecutive antenna turn) will automatically be dropped after reaching this value.
- *Target Min Lost Scans:* A target that is already acquired (displayed with solid contour) will be considered as "Lost" if the underlying echo ("plot") disappears during the specified amount of **consecutive** antenna turn.
- *Display Plots:* Displays the Radar Plots on screen. Plots are represented by blue circle and identify all the echoes whose shape could match a target. Pixel size and surface are also displayed next to the plots. This can help adjusting the ARPA filter.
- *Display Gate Distance:* Displays the search gate (circle) on the chart around each target. The search gate is used to link new observations to a specific target. If an observation (plot) is outside of the search gate, it will not be used.
- *Quantized Radar Display:* When this setting is enabled, the Radar Overlay will display the radar picture as seen by the ARPA processing algorithm. All echo will have the same value and will be "gated". This can be useful to temporary enable this mode when adjusting the "Minimum Echo Strength" parameter. Make sure to turn OFF this parameter when you are done.
- **Radar Status (Furuno DRS only):** This button opens a window displaying the DRS antenna status.

## Targets

The Targets options allow users to configure settings related to the Targets display.

- **COG/SOG Predictor Time:** Increase the time value to make the Course Over Ground (COG) & Speed Over Ground (SOG) predictor line longer. Decrease the time value to make the predictor lines smaller.

**Note:** The COG/SOG Predictor Time setting also affects the Own Ship predictor (shared setting).

- **Target Trail Length:** This option adjusts the length of target trails. The target trails can be enabled or disabled on specific targets from the Target Ribbon button. This setting is also used by the Record and Replay module when right clicking on a replay target to display its trail.
- **Target Label:** By default TimeZero displays the target ID when "Display Target Label" is checked, but this can be changed to display the target speed or a combination of both. When ID is selected (default), TimeZero will always try to display the name first (either available inside the AIS information or inside the AIS Favorite List). If a name is not available, TimeZero will display the MMSI number instead.
- **Default ARPA Color:** Select the default color used for ARPA target. Note that the target color can be individually changed when right clicking on the target.
- **Default AIS Class A Color:** Select the default color used for AIS Class A target. The color can be set to a fixed value or variable (according to AIS target Type). Note that the target color can also be individually changed when right clicking on the target (this takes priority over the default color).
- **Default AIS Class B Color:** Select the default color used for AIS Class B target. The color can be set to a fixed value or variable (according to AIS target Type). Note that the target color can be individually changed when right clicking on the target (this takes priority over the default color).
- **AIS Variable Color:** Press that button to automatically assign default color according to AIS target type. The default AIS color must be set to "variable" to activate this button. Note that if a color has been setup manually (by right clicking on the target or from the Directory), the manual setup will take priority over the variable color.
- **Default DSC Color:** Select the default color used for DSC target.
- **Target Size:** Adjust the overall target size displayed in TimeZero.

- **Display CPA/TCPA Vector:** Display graphically on the chart the location of the closest point of approach for the selected target (surrounded in yellow). Please refer to [Target Graphic CPA](#) for more information.
- **Display Target Label:** Check this option to display a target label on the chart below or above the target icons (according to target orientation).
- **Remember Target Tracking Status:** When this setting is enabled, TimeZero will remember the tracking status (Track ON or OFF) of targets (Fleet and AIS) based upon their MMSI. For example, if you enable the track recording on a specific AIS target, TimeZero will remember and continue to track this target in the future even if the AIS disappears (out of range) and reappears, or if the software is restarted.
- **Reset Target Tracking Status:** When this button is pressed, TimeZero turns OFF the tracking for all targets (Track OFF on all targets) and forget their recording status. Note that this will not erase any tracks that have been recorded up to this point.
- **Favorite (AIS & DSC):** Press this button to show a window that allows you to pre configure AIS and DSC targets properties (nickname, color) from their MMSI number.
- **AIS/ARPA Association:** Press this button to display the AIS/ARPA association window. When set to "None", ARPA and AIS will always remain two distinct objects. If you set to "AIS" or "ARPA", the targets that match the criteria will be "fused" into a unique object (AIS or ARPA according to the setting). All of the criteria need to match for the fusion to occur.
- **Marine Traffic API Key:** Press this button to enter your Marine Traffic API Key (allowing you to display AIS from the Marine Traffic Web Site using an Internet connection).
- **Marine Traffic Log:** Press this button to display a window with the Marine Traffic log information
- **Do not display Marine Traffic AIS Older than:** This setting does not display the AIS target data sent by the Marine Traffic service (over the Internet) that are older than the specific set time. Please refer to [Marine Traffic](#) for more information.

#### Fishing Buoys:

- **Buoys Trail Length:** Adjusts the trail length displayed on all buoys. Please refer to [Fishing Buoys](#) for more information.
- **Buoys Maximum History:** Adjusts the trail length displayed on the selected buoy (when clicking on a specific buoy). This duration is also used by TimeZero to decide to display or not the buoy on the chart (and in the list). If a buoy was not updated since the maximum history, it will no longer be displayed in TimeZero.
- **Buoys Color:** Set the default buoy color on the chart. Buoys can use a fixed color, or a variable color according to one parameter.
- **Variable Color:** When the Buoys Color is set to "Variable", this setting specify which parameter is used (last transmission, speed or sea surface temperature)
- **Buoys Variable Color:** Pressing this button will allow to adjust the color palette used when the color is set to Variable.
- **Buoys Icon:** Set the default buoy icon on the chart. Note that individual icon can be selected by right clicking on the buoys directly.
- **Default Buoys Drift Alarm:** Adjusts the default Drift alarm radius used on buoys. Note that individual distance can be set by right clicking on the buoys directly.
- **Fish Buoys Data Location:** Set the folder monitored by TimeZero to get buoys data
- **Set AIS Buoy:** If you use AIS transponders on your fishing gear and would rather convert these AIS targets into buoys, simply click on this button and enter all the MMSI numbers of your AIS transponders.

#### Fleet:

- **Fleet Timeout:** This timeout is used by TimeZero to decide to display or not a fleet target on the chart (and in the list). If a fleet target was not updated since the timeout duration, it will no longer be displayed in TimeZero. This duration is also used on Fleet Target to display an extended trail when a Fleet target is selected. Please refer to [Fleet Tracking](#) for more information.

**Note:** Fleet Targets can also have a shorter trail displayed on all targets (not restricted to the selected fleet target). This setting is shared with the AIS & ARPA trail and can be adjusted at the top of this page using "Target Trail Length".

- **Fleet Color:** Adjusts the color of the fleet target icon.
- **PosReport Data Location:** If you are not using the TimeZero Fleet Tracking service, you can also update fleet targets using a [proprietary file exchange format](#). This setting sets the folder monitored by TimeZero to get fleet target information using the PosReport format.

## Sounder

The "Furuno Sounder Module" needs to be unlocked to access the sounder/fish finder features.

The Sounder options allow you to configure various advanced Sounder Setup and Displays preferences.

- **Fish Finder Source:** Select the Furuno Ethernet Sounder detected on the network
- **Day Background Color:** Determines the sounder screen background color in day mode.
- **Night Background Color:** Determines the sounder screen background color in night mode.

**Note:** The Day/Night setting can be found under the [Plotter Display](#) options.

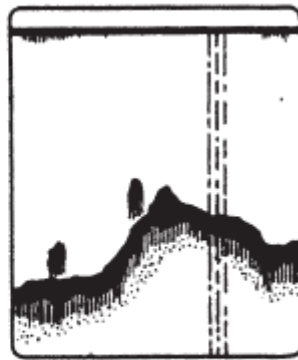
- **Echo Color Levels:** Displays fish finder returns in 8, 16 or 64 colors.
- **A-Scope Peak Hold:** This option allows you to hold the echo return in the A-Scope for a couple of seconds.
- **A-Scope 3D Cone Threshold:** Adjust the A-Scope echo strength that will be displayed in the 3D WorkSpace when the "A-Scope" is displayed on the 3D Cone. This can be used to only show strong fish finder echoes in the 3D A-Scope.
- **Zoom Reference Lines:** Shows or hides the zoom marker that appears in the bottom zoom and marker zoom modes (not implemented yet)
- **High Resolution:** This option is only relevant when TimeZero is used in conjunction with a Furuno NavNet MFD. Turn on this feature to "smooth" sounder echoes if they take a "jagged" appearance on the MFD.
- **Picture Advance:** Adjusts the speed at which the sounder view scrolls across the page.
- **Range Shift:** Adjust the Sounder Range "offset". When the sea-floor depth exceeds a practical, maximum setting, expanding Range causes Sounder returns to become too small to view clearly. The Shift function narrows return to only a portion of Sounder data.
- **Bottom Range Shift Area:** Select the position where you want the bottom of the echo to be located on the screen (when the Sounder is set to Auto Range from the Sounder Ribbon button). For example, setting 75% would place the bottom echo at a position equivalent to 75% from the top of the display.
- **Zoom Range Span:** Set the size of the zoom window displayed on the left side when Bottom Zoom mode is selected.
- **Bottom Lock Range Span:** Set the size of the zoom window displayed on the left side when Bottom Lock mode is selected.
- **Sounder Range Selections:** Allows to select the various ranges that will be used when using the Sounder Range In/Out buttons.

- ACCU-Fish:** Check this option to automatically mark any return that the sounder identifies as fish. Note that when ACCU\_FISH is enabled, the sounder will work in dual frequency mode (as both frequencies are needed to detect fish automatically). Running your sounder in dual frequency lower the refresh speed.

  - ACCU-Fish Info:* Fish information is displayed in either depth or size of detected fish.
  - ACCU-Fish Symbols:* This option determines the fish symbol used to mark detected fish.
  - ACCU-Fish Size Correction:* Adjusts the size of fish information (percentage offset)
- Display ACCU-Fish Icon on Plotter:** Allows to display or hide the ACCU-fish icons on the charts. Note that disabling this setting will not disable the ACCU-Fish function inside the sounder (ACCU-Fish icon will still be displayed on the sounder screen). The ACCU-Fish function can be disabled in the Sounder from the "Sounder Display" button located in the Sounder Workspace.
- Heaving Correction:** Check this option when a Furuno Satellite compass is connected (providing Pitch/Roll/Heave data) to compensate the sounder echo from heave. You can adjust the various parameters under "Transducer Setup".
- Interference Rejection:** Interferences from other fish finders and electrical equipment can introduce artifacts (or noise) on the sounder screen:



Interference from other sounder



Interference from electrical equipment

When this type of interference appears on the screen, use the lowest interference rejection setting possible that removes the noise on the screen. Three or four levels are available

- Clutter:** Increase this setting to remove low intensity "spots" of noise that can appear all over the screen when sediment in the water or noise are picked up by the sounder.



- Color Erase:** Increase this setting to remove weak sounder return from the screen (remove the colors that are used to display weak echo)
- White Marker:** Allows the user to change one color of the sounder color palette to white. This can be helpful in making certain returns stand out.

- **TVG HF/LF:** (Time Varying Gain) Increase this setting to reduce gain near the surface in either High or Low frequency while maintaining the gain for deeper water.
- **Transmit Rate Auto:** Automatically set the transmit rate according to ship's speed, and is inoperative when there is no speed data. The transmit rate auto is only working when one or multiple NavNet MFD are on the network. For most application, leave this setting to OFF (manual).
- **Transmit Rate Manual:** In normal use, leave this setting to the maximum value. If you are in shallow waters, set it to a lower value to prevent second reflection echoes that appear between the surface and the bottom echo.
- **Sounder Transmit:** Uncheck to put the Sounder in Standby.

## **Fish Alarm**

Use these settings to configure a fish alarm that will trigger when an echo appears in between the configured ranges. "Fish Alarm" is used in regular mode. "Fish Alarm for Bottom Lock" is only used when the sounder is in "Bottom Lock" mode.

Use "Fish Alarm Level" to setup the sensitivity of the alarm. If the setting is set to "High" a stronger echo is required to trigger an alarm.

## **Sounder Initial Setup**

- **Zero Line Rejection:** Check this option to "mask" the echoes near the top of the screen (that are caused by surface noise).
- **Zero Line Range:** Use this setting to increase or decrease the height of the Zero Line Rejection "mask".
- **Transducer Draft:** Use this option to calibrate the digital depth output of the sounder. This offset is directly stored and applied inside the Ethernet Sounder Black Box.

**Note:** The Transducer Offset set in the sounder using the above setting may be overwritten by the Keel Draft and Transducer Draft settings of the [Initial Setup](#) Options (when set to "Manual")

- **Salt Water:** Adjust the sound speed for fresh or salt water.
- **Fish Finder Source:** Select the Furuno Ethernet Sounder detected on the network
- **Transducer Setup:** When using an Airmar TD-ID transducer, the power and frequency will be automatically selected. When using another type of transducer, you will have to either select a model number or set the frequency and power manually.
- **Transmission Power:** Interference can appear on the screen when the fish finder on your ship and another ship have the same TX frequency. To prevent this interference, lower your TX power and ask the other ship to lower their TX power. The setting range is 0 to 10 (For DFF1-UHD, 0 to 2). 0 is off and 10 provides the highest TX power
- **External KP:** Turn on to sync with external keying pulse.
- **Bottom Level HF/LF:** Lower this setting to increase bottom detection sensitivity. If the sounder has difficulties displaying a good digital depth value, you may want to lower this setting. The default bottom level setting (0) determines that two strong echoes received in sequence are bottom echoes. If vertical lines appear from the bottom echo in the bottom lock display, lower the bottom level to erase the vertical lines. If you can not identify the fish near the bottom from the bottom echo, increase the bottom level.
- **Gain Offset HF/LF:** If the manual gain setting seems to "weak" or if there is a difference in between the low and high frequencies picture set as the same gain, use the gain offset to balance the gain for the two frequencies here.

- **Auto Gain Offset HF/LF:** If the Gain seems to weak or strong when the sounder is in Auto Mode, use this setting to adjust the picture
- **STC HF/LF (DFF3 only):** Delete unnecessary echoes (plankton, air bubbles, etc.) near the surface that hide the fish near the surface. The setting range is 0 to 10, and 0 is off. 10 deletes unnecessary echoes from the surface to approximately 16 ft. Make sure you do not use more STC than necessary, because you can erase the small echoes near the surface.
- **Frequency Adjust HF/LF (DFF3 only):** You can adjust the TX frequency of both the low- and high-frequency transducers. Use this feature when your fish finder and another fish finder operate on the same frequency, causing interference. Change the frequency of your transducer by enough percentage points to remove the interference
- **TX Pulse HF/LF (DFF3 only):** The pulse length is automatically set according to range and shift. Use a short pulse for better resolution and a long pulse when detection range is important. To improve resolution on zoom displays, use "Short 1" or "Short 2". "Short 1" improves the detection resolution, but the detection range is shorter than with "standard". "Short 2" raises the detection resolution, however detection range is shorter. "Std" is the standard pulse length, and is suitable for general use. "Long" increases the detection range but lowers the resolution (about 1/2 compared to the "Std" pulse length).
- **RX Band HF/LF (DFF3 only):** The RX bandwidth is automatically set according to pulse length. To decrease noise, select "Narrow". For better resolution, select "Wide".
- **Temperature Port (DFF3 and DFF1-UHD only):** Select the data source for water temperature.
- **Set Hardware to Factory Default:** Perform a Master Reset of the Sounder. After pressing this button the sounder will restart (wait a couple of minutes). Note that you will have to adjust the transducer setup after performing a Master Reset.

## Multibeam Sounder

The "DFF3D Module" or "WASSP Module" (Generation 3) needs to be unlocked to access the Multibeam Sounder features.

### DFF-3D

- **Day Background Color:** Determines the Multi-Sounder, Water Column and Section screens background color in day mode.
- **Night Background Color:** Determines the Multi-Sounder, Water Column and Section screens background color in night mode.

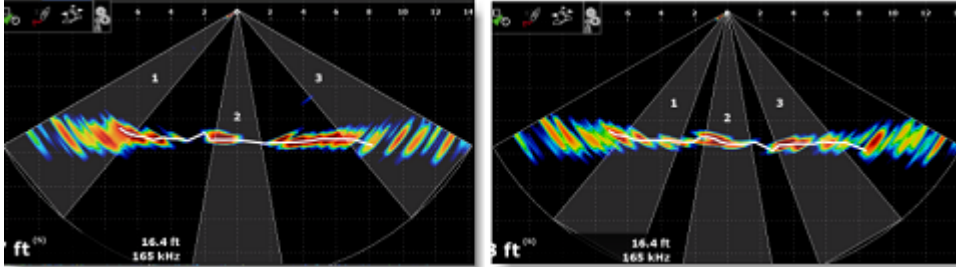
**Note:** The Side Scan background color is fixed to black and is not affected by the day or night Background Color.

- **Bottom Range Shift Area:** Select the position where you want the bottom of the echo to be located on the screen (when the DFF-3D is set to Auto Range from the "Mode" button). For example, setting 75% would place the bottom echo at a position equivalent to 75% from the top of the display.
- **Transmit Rate Auto:** Automatically set the transmit rate according to ship's speed. For most application, leave this setting to OFF (manual).
- **Transmit Rate Manual:** In normal use, leave this setting to the maximum value (20). If you are in shallow waters, you may want to use a lower value to prevent second reflection echoes that appear between the surface and the bottom echo.
- **Sounder Transmit:** Uncheck this option to put the DFF-3D in Standby.
- **Sounder Range Selections:** Allows to select the various ranges that will be used when using the Sounder manual Range In/Out buttons or Scroll Wheel (when Auto-Range is set to OFF).



## Multi-Sounder (with DFF3D)

- Triple Beam Angle:** Set the angle in between the three beams. A lower value will concentrate the beams under your boat, while a bigger value will spread them more to cover a larger area. The picture on the left illustrates a triple beam angle of 50 degree vs 30 degree on the right:



- Beam Width:** Set the angle of each beams (cannot be adjusted individually). This allows you to set a narrow or wide beam angle.
- A-Scope Peak-Hold:** When the Multi-Sounder WorkSpace is set to only display one beam (by selecting "Single Echo" from the "Display" button) and when the A-Scope is enabled (under the same button), this option allows you to hold the echo return in the A-Scope for a couple of seconds.
- High Resolution:** This option is only relevant when TimeZero is used in conjunction with a Furuno NavNet MFD. Turn on this feature to "smooth" sounder echoes if they have a "jagged" appearance on the MFD LCD screen.
- Picture Advance:** Adjusts the speed at which the sounder view scrolls across the page.
- Clutter:** Increase this setting to remove low intensity "spots" of noise that can appear all over the screen when sediment in the water or noise are picked up by the sounder.



- TVG:** (Time Varying Gain) Increase this setting to reduce gain near the surface while maintaining the gain for deeper water.
- TVG Distance:** This settings act as a gate and prevents the TVG to be applied above the TVG distance.
- Bottom Lock Range Span:** Set the size of the zoom window that tracks the bottom when "Bottom Lock" is selected from the "Mode" button.
- Bottom Zoom Range Span:** Set the size of the zoom window around the bottom when "Bottom Zoom" is selected from the "Mode" button.
- Zero Line Rejection:** Check this option to "mask" the echoes near the top of the screen (that are caused by surface noise).

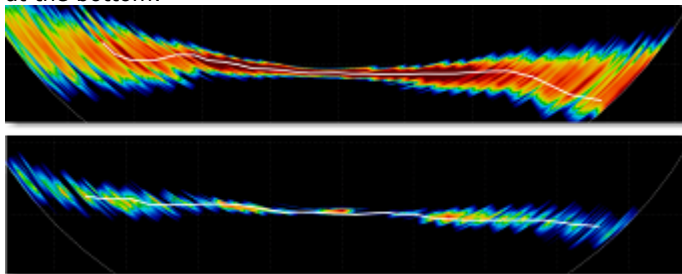


### Side Scan (with DFF3D)

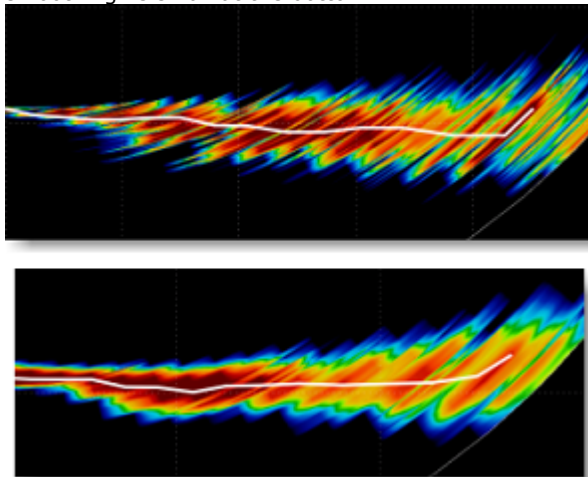
- **Echo Color:** Set the echo color used by the Side Scan screen. Note that the background color is always black and cannot be changed (the Day and Night Background color do not apply to the Side Scan screen)
- **Picture Advance:** Adjusts the speed at which the side scan view scrolls vertically across the page.
- **Clutter:** Increase this setting to remove low intensity "spots" of noise that can appear all over the screen when sediment in the water or noise are picked up by the sounder.
- **TVG:** (Time Varying Gain) Increase this setting to reduce gain near the surface while maintaining the gain for deeper water.
- **Zero Line Rejection:** Check this option to "mask" the echoes near the top of the screen (that are caused by surface noise).

### Section (with DFF3D)

- **Clutter:** Increase this setting to remove low intensity "spots" of noise that can appear all over the screen when sediment in the water or noise are picked up by the sounder.
- **TVG:** (Time Varying Gain) Increase this setting to reduce gain near the surface while maintaining the gain for deeper water.
- **Echo Width:** Set the section echo "thickness". The picture at the top illustrate a large echo size vs small at the bottom:



- **Echo Smoothing (Distance):** Smooth the echo appearance. The picture at the top illustrate a large echo smoothing vs small at the bottom:



- **Echo Smoothing (Time):** Smooth the echo over multiple pings. Increasing the value will minimized "jagged" point detection by averaging the detection over multiple ping. Increasing this setting will result in a "smoother" bottom detection.

- **Sound Speed Correction:** If the section and bottom detection appears curved on the edge (up or down) on flat bottom, the sound speed should be adjusted by moving this slider. Decrease this setting to bring the edges down.
- **Temperature Based Correction:** Enable this option to allow the DFF-3D to automatically adjust the speed of sound according to water temperature (sensor included in the DFF-3D transducer).

### Water Column (with DFF3D)

- **Fish Detection Level:** Adjust the sensitivity of the Fish Target ("bubbles") displayed on the Water Column display. If you have too many fish targets that clutter the screen, you can decrease the sensitivity by selecting "Low". If you feel you do not have enough fish target displayed on screen and would like to increase the sensitivity, adjust this settings to "high".
- **Seabed Echo Calibration:** If school of fish located at the bottom are not detected as Fish Target (Bubbles) and are instead inaccurately detected as bottom and create bump (fake rock) in the depth recording (PBG), you can increase this setting. On the opposite, if rocks at the bottom are detected as fishes, decrease this settings to remove fake fish target detection at the bottom.
- **Picture Advance:** Adjusts the speed at which the Water Column view scrolls. When set as "1" the view scroll as soon as a ping is received by the DFF-3D.
- **Hide Fish Target older than:** Adjusts the duration of the Fish Target ("bubbles") that can be displayed on screen (by enabling "Fish Targets" from the "Charts" button located in the ribbon). When set to unlimited, all fish targets that are recorded in the database will be displayed on screen. In some areas this can clutter the screen, so it is possible to automatically hide fish targets that are older than a specified duration.
- **Color Scale Mode:** Adjusts if the seabed or if the fish targets ("bubbles") are rendered on screen using a color palette. When set to "Seabed", the bottom colors change according to depth (like the traditional depth shading mode in other plotter screens) and the fish targets are using a monochromatic orange color (the hue of the fish targets varies slightly with depth). When set to "Fish Depth" (or "Fish Strength" when using a WASSP), the fish targets color change according to depth (or strength).
- **Seabed Color:** When the color scale mode is set to "seabed", this parameter selects the color palette to adopt to render the bottom (while the fish targets are displayed in monochromatic hue).
- **Seabed Monochrome Color:** When the color scale mode is set to "Fish Depth" (or "Fish Strength" with WASSP), this parameter selects the monochromatic color to adopt to render the bottom (while the fish targets are displayed in colors).
- **Fish Color:** When the color scale mode is set to "Fish Depth" (or "Fish Strength" with WASSP), this parameter selects the color palette to adopt to render the fish target (while the seabed is displayed in monochromatic color).
- **Auto Seabed Shading:** When this option is selected and when the color scale mode is set to seabed, the depth shading will be automatically set. You can disable this option and enter manual values to only color a specific depth range.
- **Auto Fish Depth Shading:** When this option is selected and when the color scale mode is set to fish target, the fish target color palette will span automatically across the entire water column and all fish targets will be displayed. You can disable this option and enter manual values to only color and display fish that are in between specific depth. Note that fish targets that fall outside the min/max values will not be displayed on screen (this acts like a filter).

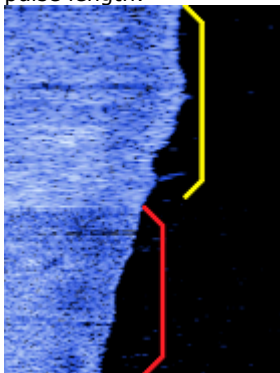
### Alarm (with DFF3D)

- **Fish Alarm:** Turns ON and OFF the Fish Alarm. When turning ON the fish alarm, you can select if the fish detection only applies to the single beam (directly under the boat) or across the 3 beams (including the side of the boat)
- **Range Min/Max Value:** Set the depth range at which the fish alarm will look for fish, allowing to target specific species.

- **Fish Alarm Level:** Set the sensitivity of the Fish Alarm

### Setup (with DFF3D)

- **Transducer Draft:** Adjust the distance in between the transducer and the water line.
- **Salt Water:** Check this option when operating in Salt Water (this adjust the sound speed for distance measurement)
- **Transducer Setup:** Adjust the transducer location, various sensor offset and time lag. Make sure to review carefully the [DFF-3D Multibeam Sounder](#) installation chapter for more information and proper setup.
- **Transmission Power Auto:** Select this setting to automatically adjust the transmission power to display the seabed echo properly
- **Transmission Power:** When Transmission Power Auto is unchecked, the transmission power can be manually adjusted using this setting
- **External KP:** Select this setting to enable synchronization using an external sounder's keying pulse (that needs to be physically wired to the DFF-3D)
- **Bottom Level:** Lower this setting to increase bottom detection sensitivity. If the sounder has difficulties displaying a good digital depth value, you may want to lower this setting. The default bottom level setting (0) determines that two strong echoes received in sequence are bottom echoes. If vertical lines appear from the bottom echo in the bottom lock display, lower the bottom level to erase the vertical lines. If you can not identify the fish near the bottom from the bottom echo, increase the bottom level.
- **Auto Gain Offset (Fish Finder / Side Scan / Section):** If the auto gain setting seems to "weak" or to "strong", use this setting to lower or raise the overall gain as necessary
- **STC (Fish Finder / Side Scan):** STC reduces surface layer noise. Increase this setting to remove noise at the surface.
- **TX Pulse:** The pulse length is automatically adjusted according to range. Use a shorter pulse for better resolution of the picture. However, a shorter pulse will not be able to penetrate as deep as a longer pulse. When bottom detection in deep water is more important, set this setting to long. If you want to have a crisper display on the Multi-Sounder and Side Scan display, select a shorter pulse length. The area in yellow below has been recorded with a long pulse length, while the area in red uses a short pulse length:



- **Tidal Correction:** Select this option to automatically apply a tide offset (based on the nearest tide station) to the bathymetry data sent by the DFF-3D. The offset value will be the same as the one displayed in the Tides NavData.
- **DFF-3D Monitor:** Press this button to display a window that will allow you to troubleshoot the DFF-3D. Refer to the [DFF-3D\\_Monitor](#) chapter for more information

- **Set Hardware Factory Default:** Perform a Master Reset of the DFF-3D. After pressing this button the sounder will restart (wait a couple of minutes). Note that you will have to readjust all the initial and transducer setup after performing a Master Reset.

## PBG (Bathy Recorder)

The "PBG Module" needs to be unlocked to access this Option page

The PBG Options allow to setup the various parameters that will be used when recording depth and when rendering the 3D Bathy Data on your screen.

### Multibeam Settings

This feature is only available when a Multibeam sounder has been configured in TimeZero (WASSP or DFF-3D).

- **Database Resolution (WASSP Only):** The database resolution setting allows to select the maximum resolution that will be used to record WASSP data. When set to "Normal", the maximum resolution is set to 30cm. When "High Resolution" is selected, the maximum resolution is set to 8cm.
- **Smoothing Level:** The PBG Smoothing level adjusts the TimeZero post processing of the Multibeam data. Smoothing will help damp inaccuracies (small errors) and will improve the contour line rendering, especially with WASSP systems.

**Note:** With DFF-3D the Brush Size can be used instead. You can increase the brush size to have smoother contour lines or decrease it to have a better accuracy.

- **Quality Filter (DFF-3D Only):** When enabled, only the depth points with high certainty will be used and recorded in the PBG database. It is highly recommended to leave that filter enabled.
- **Display Multibeam Swath:** When enabled, the swath of the multibeam will be displayed under the boat using a blue line when PBG is enabled. This allows you to see where points are being recorded.
- **Imported Backscatter Database Offset (WASSP Only):** This slider allows you to offset all backscatter values that are stored inside your "Imported Backscatter Database" (when backscatter is displayed and when "Imported 3D Database" is checked from the PBG button). This is useful if you decide to change your WASSP hardware (for example upgrading to latest generation hardware) and to transfer your "old" backscatter data from the user database to the imported database (to keep it separated from new backscatter data). This slider will allow you to offset the old data and make it match the new data after recording some backscatter data with the new hardware. Please contact our Tech Support to transfer the old backscatter data (that was generated with the old version of WASSP) into the Imported database to keep it separated from the new data (and to be able to introduce an offset).

### Single Beam Settings:

**Note:** The following settings do not apply to WASSP or DFF-3D processing. To adjust filters on a WASSP system (such as Tide Offset), use the parameters of the WASSP Processor.

- **Tidal Height Correction:** Check this option to have TimeZero correct in real time the depth recorded in the 3D database. By default, the nearest Tide Station (from GPS position) will be used as a reference. You can manually set a specific tide station by clicking on "Set Reference Station".
- **PBG Filters:** Turn ON and OFF all the PBG filters setup below
- **Quality Filter:** This filter is only used when a Furuno Ethernet Sounder (DFF1, DFF3, DFF1-UHD, BBDS1 or FCV1150) provides depth to the software. A special protocol has been developed with the Furuno Ethernet Sounders to automatically stop the PBG recording when the sounder detects that the depth is not reliable. It is recommended to leave that filter checked.
- **Depth Filter:** Adjust the minimum and maximum depth parameters according to your fishing grounds. Having that filter has "tight" as possible will ensure that the maximum number of erroneous data will be rejected.

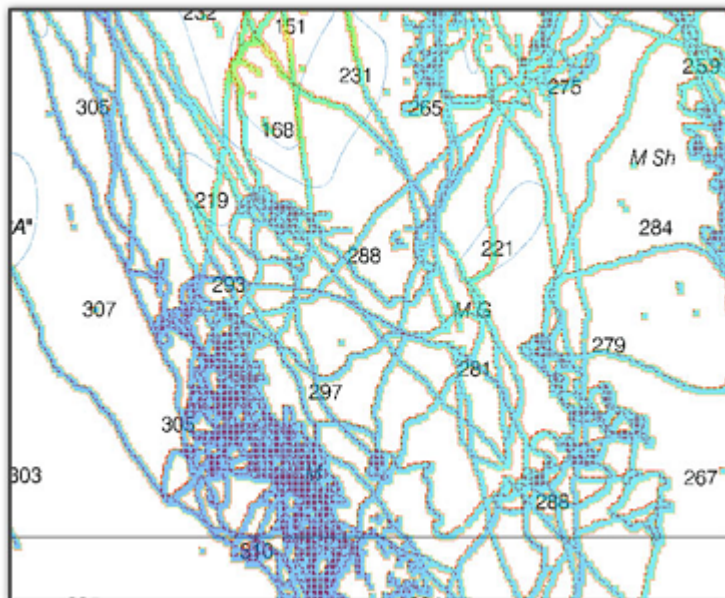
- **Speed Filter:** The sounder performance (capability of returning a good depth value) decrease with speed. The speed at which the sounder begin to lose bottom varies with the type of transducer and its location on your boat. Adjust this filters in order to stop recording 3D data at speed where the sounder starts to send unreliable data.
- **Consistency with previous recorded data:** When this filter is engaged (by selecting a % value), the software compares the last recorded value with the current depth value sent by the sounder. If they differ by more than the selected percentage, the depth value is rejected and not recorded in the 3D database. For example, when this filter is set to 20%, if the last depth value recorded was 100ft, the current depth will only be recorded if falls in between 80ft (100 - 20) and 120ft (100 + 20).
- **Consistency with 3D Chart database:** This filter works similarly to the "Consistency with previous recorded data" filter, but uses the 3D Chart data available in TimeZero to make the comparison (instead of using the last value recorded).
- **Fixed data rejection:** When this filter is engaged, the software will start rejecting data when receiving the exact same depth value multiple times (consecutively). This filter is very useful if you have a sounder that repeat over and over the same depth value when it loses bottom.

**PBG Brush Settings:**

TimeZero records single beam sounder and DFF-3D depth data point on a fixed grid that has a resolution of 1.5m\*1.5m (at latitude 45). However, displaying a swath of only 1.5 meter on the chart would not be practical for most zoom level (it would be too small). The brush setting allows to expand the coverage by extrapolating depth data. This makes depth points appearing bigger on the screen where data has not been recorded yet.

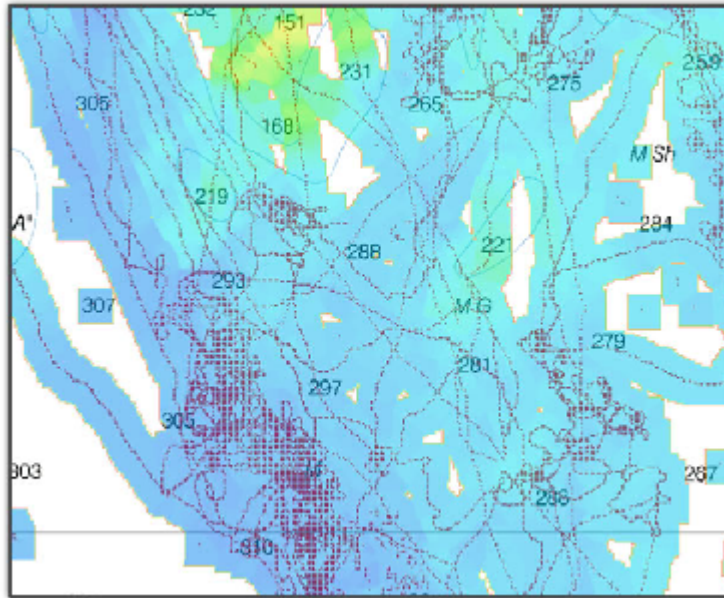
**Note:** The brush settings do not apply to the WASSP multibeam sounder. The WASSP system provide very accurate depth points that do not need any extrapolation.

Example of Small brush size:

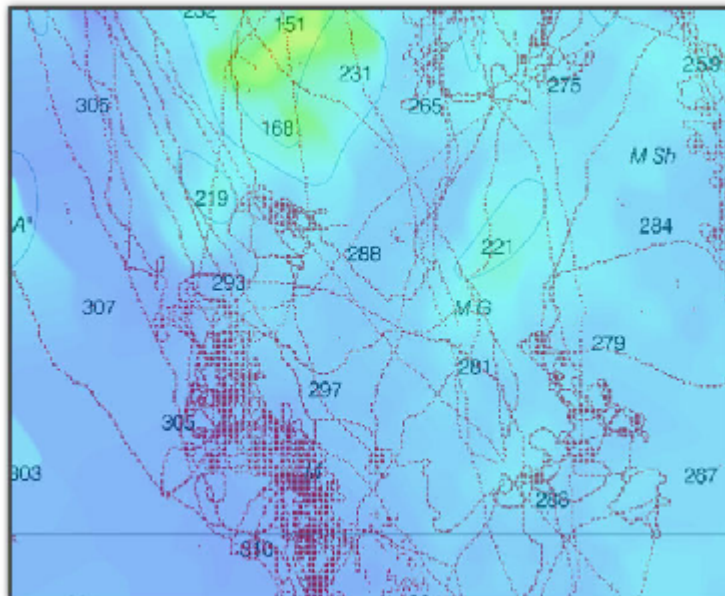


Example of Medium brush size:





Example of Large brush size:



- **Mode:** When set to "Dynamic" the brush size will vary according to the scale of the chart. This is the default setting as it will automatically "fill the hole" when unzooming the chart. As you zoom in, the brush size will reduce allowing for more and more accuracy. If you do not want for the brush size to change dynamically, this setting can be set to "fixed".
- **Size:** this sliders adjust the overall brush size (even when set to dynamic).

### **Bottom Classification Settings:**

This feature requires the Furuno Sounder Module and is only available with the BBDS1 and DFF1-UHD when paired with selected transducers. Contact your Furuno dealer for more information about transducer compatibility.

When TimeZero records the Bottom Hardness, it also record a confidence index for each points. A filter can be enabled to only show the bottom discrimination on points above a specific probability index (between 0 and 100).

Select "Minimum Probability" to enable the filter and adjust the minimum probability setting using the slider. Increase the filter value if you want to display on the chart only the points that have a very high probability.

### **Backup and Rebuild PBG databases:**

- **Backup Single Beam & DFF3D Databases:** Pressing this button allows to backup the single-beam and DFF-3D databases (user and imported). You can only backup one set of databases (creating a new backup will erase the previous one automatically).
- **Recall Single Beam & DFF3D Databases:** Pressing this button will replace the single-beam and DFF-3D databases (user and imported) by the backup files. Note that the date of last backup will be indicated just below this button.

**IMPORTANT:** The backup and recall does not operate on WASSP data.

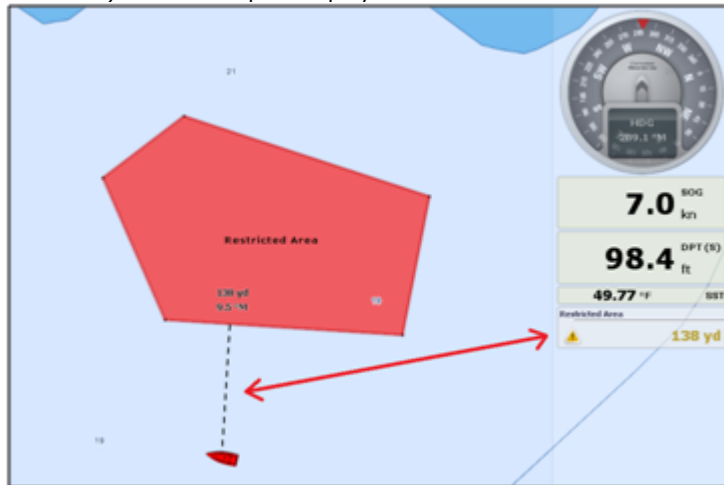
- **Rebuild All PBG databases:** This button should only be used when instructed by Technical Support. Pressing this button recompile the entire user and imported 3D database. This can be useful when tiles of data appear to be missing on screen at some zoom level.

## **Alarms**

The Alarm options allow you to configure all of the various alarms and warnings that can be trigger by the software. Alarms are displayed at the very top of the screen. An individual sound can be selected for each alarm by clicking on the "Define Alarm Sounds" button (at the end of the page). By default, all the Alarm sounds are turned off.

- **Route XTE Alarm** (Cross Track Error): An alarm is triggered when the vessel has strayed a designated distance ("XTE Alarm Value") from the active route. Note that you can display a graphical representation of the Cross Track Error limit on the chart by enabling the "Display XTE Alarm Lines" available in the [Routes](#) options.
- **Waypoint Switching Notification:** when this option is checked, a notification will appear in the status bar (on top of the screen) whenever the active Waypoint is automatically switched. A sound will also be triggered if a sound is selected under "Define Alarm Sounds" of the [Alarms](#) options.
- **End of Route Notification:** when this option is checked, a notification will appear in the status bar (on top of the screen) whenever the last Waypoint of a Route is reached. A sound will also be triggered if a sound is selected under "Define Alarm Sounds" of the [Alarms](#) options.
- **Own Ship Alarm Zone Warning:** User can create Boundary Area or Lines on the chart (using the "Boundary Area" tool or by right clicking on the chart and select "Create -> Boundary Area") and then set them as Alarm Zones by right clicking on them and selecting "Alarm". Once Boundary Alarms are created, this setting adjust the early warning notification. When the boat reach the distance set by this setting from any Alarm Zone, a notification will be displayed (to warn the user from the proximity). When the boat enters any Alarm Zone, an alarm is triggered. Note that a dedicated NavData ("Alarm Zone

NavData") can be setup to display the distance from the nearest Alarm Zone at any time.



- **Depth Alarm:** An alarm is triggered when the vessel passes over water shallower than a designated depth value.
- **Sea Surface Temperature Alarm:** An alarm is triggered when a specific condition regarding Sea Surface Temperature value is met.
- **Speed Alarm:** An alarm is triggered when a specific condition regarding the speed value of your vessel is met.
- **CPA /TCPA Alarm/Display Value:** Defines the CPA and TCPA values for which a target is considered dangerous and displayed in red on the chart. These values are also used to trigger the CPA/TCPA Alarm, when enabled.

**Note:** Even if the CPA/TCPA Alarm is not enable (not checked), the targets that break the CPA and TCPA minimum values will be displayed in red on the chart (considered as "dangerous")

- **CPA/TCPA Alarm:** An alarm is triggered when a target becomes dangerous.
- **Proximity AIS Target Alarm:** An alarm is triggered when the vessel passes within a designated distance from an AIS target..
- **Ignore for target slower than...:** Use this setting to prevent targets that are not moving from triggering the proximity or CPA/TCPA alarm. This setting is very useful in harbor to prevent safe target (moored or docked boat) to raise unwanted alarms.
- **GuardZone Alarm Sensitivity:** Set the sensitivity of the Radar Guard Alarm Zone
- **GuardZone Alarm In/Out:** Sets if the Radar Guard Alarm Zone responds to echos entering or leaving the Guard Zone
- **Anchor Watch Alarm:** An alarm is triggered when the vessel strays a designated distance from where the user set anchor. Note that you can enable/disable the Anchor Alarm by right clicking directly on the Own Ship icon. If you enable "Position Averaging", this will average your GPS position over the specified duration (from 5 seconds to 45 seconds). Please refer to the [Anchor Alarm](#) for more information.
- **Anti-Grounding Cone Alarm:** Display and enable the Anti-Grounding Cone in front of the Boat.
- **Anti-Grounding Cone Configuration:** Press this button to adjust the shape of the cone. Note that the cone length is tied to the COG/SOG predictor length.
- **MOB Behavior:** This settings is used to adjust the MOB ("Man Over Board") behavior in TimeZero. When "Event Only" is selected, TimeZero will only select the Navigation screen (if another WorkSpace is selected), Zoom In on the chart and Drop an Event (with "Man Over Board" label). When "Alarm and



Activate Route" is selected, TimeZero will perform the same actions as "Event Only", but in addition, it will also trigger an alarm and activate a route (to the "Man Over Board" event).

- **Lost Sensor Alarm:** Allows to enable or disable various alarms when losing specific type of sensors (GPS, Depth, Wind,...)
- **Define Alarm Sounds:** This option allows the user to assign a sound to various alarms. 10 predefined sounds are installed with the software, but it is possible to replace the default sounds by overwriting the sound files located under "C:\Program Files\TimeZero\...\Sounds".
- **Sound Alarm Until Acknowledged:** When this setting is checked, the Alarm Sound will repeat over and over until the user acknowledge the alarm (by clicking on the status bar, checking "Acknowledge" from the Alarm List, or pressing a function key that has been set to Acknowledge all alarm)

## General

The General options allow you to configure various TimeZero settings:

- **Animation Replay Speed:** Sets the speed of animation when the "Play" button is pressed on the Virtual Time Control (Time Bar) of the Planning WorkSpace. If you find that the weather animation moves too quickly, lower this setting.
- **NavData Transparency:** This option manipulates the intensity of NavData transparency (ranges from 0-90)
- **NavData Multi Data Dwell Time:** When multiple numeric data are assigned to the same NavData panel, the "Multi Data Dwell Time" adjusts the time (from 2 to 10 seconds) that each piece of data will be displayed before switching to the next one. To add multiple data to the same NavData panel, right click on a numerical NavData (NavData displaying Number), select "Add" and click on the Data you want to add.
- **Hide Undocked NavData:** Check this option to hide undocked NavData when the NavData tab is closed
- **Lock Undocked NavData:** Check this option if you want to "freeze" the NavData that you have dragged outside of the NavData Bar. This prevent undocked NavData to be accidentally moved when dragging the chart. Make sure to undock and set up the NavData on the screen before enabling this option.
- **NavData Size:** Determines the size of the NavData bar on the right side of the screen (ranges from 50-150).
- **Toolbar Size:** Determines the size of the Toolbar on the left side of the screen (ranges from 25-100).
- **Ribbons Size:** Determines the size of the Ribbons at the top of the screen.
- **Auto Hide Interface:** This option automatically hides some interface components when the cursor stops moving after a designated period of time ("Auto Hide Delay"). This allows to maximize the chart display.
- **Display Tooltip Over Object:** Determines how quickly the Tooltip appears when hovering over an object. If you don't like the Tooltips to appear when the mouse is over an object, set this option to OFF. You can always display the Tooltip by left clicking on any objects.
- **Center on Screen when Zooming with Scroll Wheel:** Check this option if you want the plotter to zoom in on the center of the screen when using the mouse wheel (instead of zooming on the cursor location).
- **Enable Auto Hand Tool Selection:** Leave this option checked if you want TimeZero to automatically select the panning tool (Hand Tool) after creating a route or object. Un-check this option if you want to create multiple objects in a row.
- **Inertial Scrolling:** Allows TimeZero to continue to move the chart even after releasing the mouse. This option is specifically useful with Touch Screen.
- **Customize Function Keys:** The user can create shortcut keys to control various system settings. Please refer to [Shortcuts](#) for more information.

- **Screenshot Recording Location:** Set the default screenshot recording location
- **Power Consumption Optimization:** This option adjusts software power consumption in order to aid either performance or battery conservation. If you want TimeZero to take full advantage of the video card computing power and achieve the fastest refresh time (regardless of power optimization), set this parameter to "performance".

## Units

The Units options allow you to setup the units that you want to use for various data displayed on screen.

Simply select the corresponding unit you would like to use for each data:

Parameter	Unit
Position Format	DDD°MM.mmm'
Geodetic Datum	WGS 1984
Range (Long)	Nautical Mile
Range (Short)	Yard
Short/Long Change Over	0.5 NM
Depth	Foot
Height/Length	Foot
Temperature	Fahrenheit Degree
Wind Speed	Knot
Air Pressure	HectoPascal

## Camera

The Camera options allows you to configure camera(s) and video input (to bring external screen) in TimeZero. Up to 4 cameras can be configured, allowing the user to switch source from the Camera WorkSpace or Camera Navdata. TimeZero Professional is compatible with AXIS network camera and converter, ONVIF Camera, and FLIR camera (M-Series). For video input, TimeZero is compatible with DirectShow device (USB) or H264 feed.

- **Camera Configuration List:** This window allows to Add, Edit and Remove camera. The status column indicates if the camera is working properly (green) or not (red). In case of problem (red status), you can rollover the mouse to get more information. In case of IP camera or converter, the IP address will be available under the Address column.
- **Active Camera Cone Color:** Selects the color of the Cone that will be representing the Field of View (FOV) of the Active Camera on the chart and radar screen.
- **Lock Active Camera in Man Over Board:** When this option is checked, the camera will automatically track the Man Over Board position.
- **Enable USB joystick control for active camera:** Select this option when a USB joystick is connected to the computer

- **Invert Tilt axis:** Select this option if the movement of the camera seems inverted when pushing or pulling the Joystick.
- **Minimum Threshold:** This slider adjusts the Joystick "dead band". The higher the setting the greater the Joystick has to move (initially) before sending a command to the Active Camera.

**IMPORTANT:** Make sure to calibrate the USB joystick in Windows. Please refer to the [Calibrate Joystick](#) Chapter

- **Video Input Configuration List:** This window allows to Add, Edit and Remove Video Input. The status column indicates if the external video encoder is working properly (green) or not (red). In case of problem (red status), you can rollover the mouse to get more information. In case of a network encoder (H264), the IP address will be available under the Address column.

## Record & Replay

The "Voyage Data Recorder" Module needs to be configured to access this feature.

The Record and Replay Options allows you to enable or disable the data that is recorded and adjust compression options (note that Own Ship, Targets and Events are always recorded).

- **Enable Radar Recording:** Enable or Disable the Radar recording. User can set the radar recording frequency, Quality and Resolution:
- **Radar Recording Frequency:** Adjust how often the radar picture gets recorded. You can decrease the recording frequency to save space. The Radar picture gets compressed and takes in average 1MB/minute at maximum recording speed (every antenna turn). Note that this number can increase or decrease according to how much radar echoes are present on the radar screen.
- **Radar Quality:** Adjust the number of "level" used to store radar echo information. For example, if you set the quality to 4 bits, the echo level will be converted from 128 possible levels to 16 levels. Since the Radar Recording is only use for visualization (not for target processing), you can safely reduce the quality.
- **Radar Resolution:** Adjust the resolution of the radar picture from 1024\*1024 down to 256\*256. Only reduce the Radar resolution when you need to save lots of space. Decreasing the resolution will noticeably decrease the radar echo "readability".
- **Archive/Delete Data Older Than:** Set the number of day you want TimeZero to keep recorded data on the local hard-drive. This defines how much day you can replay from the recording computer (live).
- **Export Recorded Data...:** Select this option when you want to export a chunk of data by date and duration. Note that this option only allows you to extract data that has not been yet archived.

## Device List

This page displays information about your computer (its Hostname and IP address) as well as a list of network components consisting of other compatible TimeZero platforms (TZ Navigator, TZ Professional, TZ iBoat, Furuno TZT2/TZT3) and NavNet sensors that have been detected on the network.

Network Devices

Product Name	IP Address	HostName
DRS_RADOME	172.031.003.018	RADAR2
DFF1	172.031.092.001	SOUNDER
MCU001	172.031.254.001	CU000002
FA-30	172.031.024.002	AIS0
NavNet3D MFD8B	172.031.100.254	MF100254
NavNet3D MFD12	172.031.254.002	MF000001

Note that this list will only display other TimeZero platforms that are logged with the same My TIMEZERO account.

This page also allows you to setup the local synchronization of User Objects (Marks, Routes, Boundaries and Photos):

- **Allow local user object synchronization:** When this option is checked, your computer will synchronize your marks, routes, boundaries and photos with any other TimeZero platforms that are on the same local network and logged in with the same My TIMEZERO account. For example, it allows you to synchronize your user objects with an iPad!
- **Synchronize all layers:** by default, only the marks and objects that are stored on the default "TimeZero" layer are synchronized. If you create another layer (refer to the [Layer Introduction](#) chapter), and store user objects on that custom layer, they will not be synchronized. This is because the TimeZero layer enforces a limit on the number of user objects that can be synchronized with smaller platforms (TZ Navigator, TZ iBoat and Furuno TZT2/TZT3). Custom layers (created by the user) do not enforce any limitation. Also, smaller platforms do not have the ability to handle multiple layers. For all these reasons, only the user objects that are put on the "TimeZero" layer are synchronized. However, if you do not care about smaller platform and would like to only synchronize user objects among other TimeZero, you can enable this option. When this option is checked, all layers and all user objects will be synchronized, but only with other TimeZero (you will lose the synchronization with TZ Navigator, TZ iBoat and Furuno TZT2/TZT3). This option must be checked on all the TimeZero.
- **Synchronization Log:** Press this button to open a window that will display all TimeZero platforms detected on the network, even if they are not logged with the same account (in that case, they will be displayed in red). This window also allows you to open the firewall if it failed during the installation of the software.

## My TIMEZERO

This page allows you to login to your My TIMEZERO account (if you are already logged in, this page will display your account information) and adjust how TimeZero connects to the Internet.

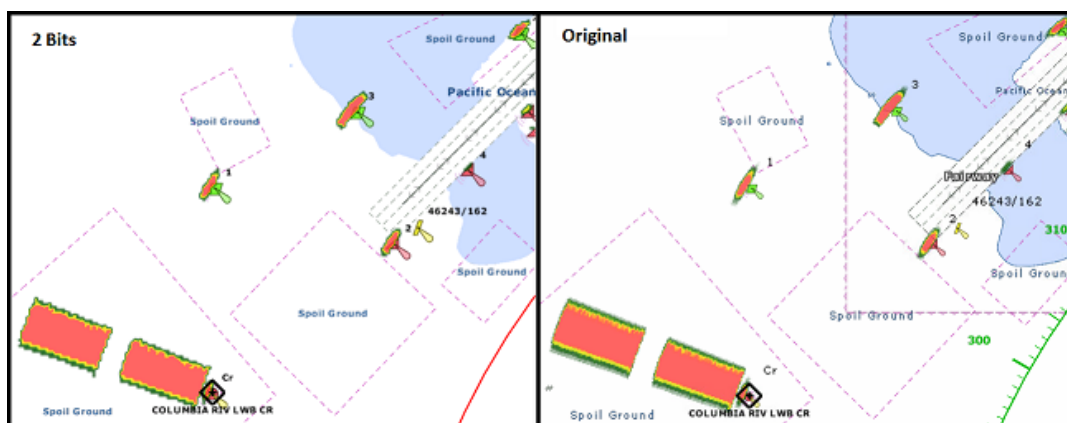
- **Allow TimeZero to connect to the Internet:** If you turn OFF this option, TimeZero will no longer access the Internet for any service.
- **Synchronize my User Objects to My TIMEZERO:** When this option is checked, your user objects (routes, marks, boundaries, lines, annotations, and photos) will be automatically saved and synchronized to the cloud as soon as your computer is connected to the Internet. Please refer to the [TimeZero Cloud](#) chapter for more information.
- **Cloud Synchronization Log:** Opens a window indicating the last time your user object database was synchronized when you have an Internet connection.
- **Report my position automatically to My TimeZero:** When this option is checked, and when you have a valid Internet connection, your position will be reported to your TZ Cloud. This option is also used for remote Anchor Watch monitoring and by the Fleet Tracking service.
- **Position Report Log:** Opens a window indicating all the position upload.
- **Help us make TimeZero better by sending crash reports:** Allows TimeZero to send crash reports at startup when the computer is connected to the Internet.
- **Automatically check and download new version:** Allows TimeZero to check for new version of the software automatically and notify the user when a new version is available.

## TZ Host

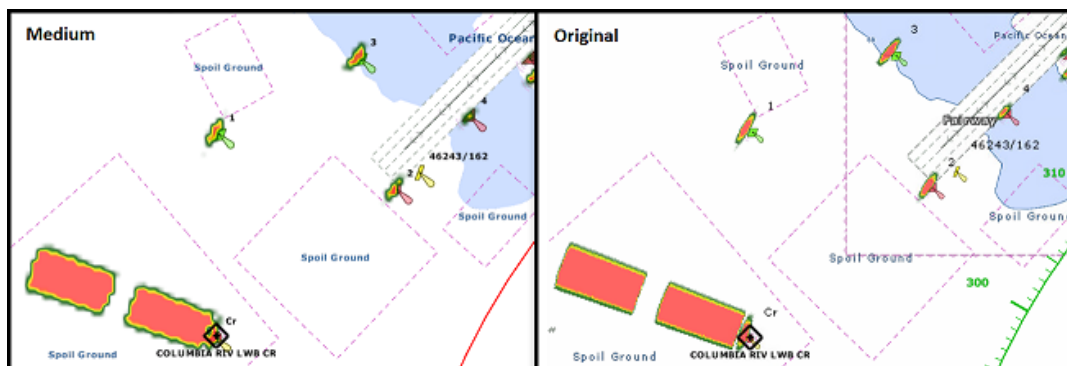
The "TZ Host Output" Module needs to be configured to access this feature.

- **Station ID:** Used to set a unique ID and Name to the computer sending its data to the TZ Host. When outputting data from multiple stations to a central station loaded with TimeZero Remote, each station MUST have a unique ID (an error will be displayed if this is not the case). Note that changing the ID or Name will require a restart of the software.

- Host Address and Port:** Enter the IP address or domain name of the computer where the TimeZero Host is running. The port is 8080 by default (but it can be changed on the TimeZero Host). When connected, TimeZero will display the status of the connection either "Encrypted" or "Unencrypted" (if HTTPS was disable manually on the Stations and on the TZ Host). When the connection is Encrypted, it will be either "Self Signed" or "Trusted". Self Signed means that the default Self Signed certificate (installed by default with the TimeZero Host) is used. While this guarantees the encryption of the data, it does not guarantee authentication (anybody could "spoof" the IP address and use the default certificate). When the Status is "Encrypted (trusted)", it means that a trusted certificate is used for the domain name, providing encryption and authentication.
- Send AIS Target Data:** Enable AIS output
- Send ARPA Target Data:** Enable ARPA output
- Send Weather Data:** Enable Real Time Weather Data output (Wind Direction, Wind Speed, Pressure, Air Temperature, Humidity and Visibility). Real Time weather must be configured on the Station using either NMEA0183 or NMEA2000 (via Connection Wizard).
- Send Radar Data:** Enable Radar Echo output
- Radar Quality (8bit / 4bit / 2bit / Quantized):** This setting adjusts the number of color "levels" that will be used when sending radar picture over the network. For example, when selecting "2 Bit", 4 colors will be used to represent all the intensities of the radar echo. When set to "Quantized", only one bit is used (one color) and the echo is gated like the Quantized Display of the ARPA processing (when set to "Quantized", the picture as seen by the ARPA algorithm is sent).



- Radar Resolution (High/Medium/Low):** This setting adjusts the resolution that will be used when sending radar picture over the network (from 1024\*1024 down to 256\*256):



**TIPS:** To save bandwidth, it is recommended to decrease the Radar Quality first, then the Radar Resolution. A radar quality of 2 Bit with high resolution will offer better overall definition than a radar quality of 4 bit with medium resolution. Decreasing the quality from 8Bits to 4 Bits will not be noticeable for the operator eye and is recommended.

- Send Camera Data:** Enable Camera output.

- **Video Quality:** This slider adjusts the amount of compression.
- **Video Resolution (Full/Medium/Low):** This setting adjusts the resolution that will be used when sending the camera picture over the network. When set to "Full" the native resolution of the camera will be used. When set to "Medium" the resolution will be divided by 2 and when set to "Low" divided by 4.
- **Video Framerate:** Adjusts the video refresh rate. By default, the camera picture will be sent every second. It is possible to increase the refresh rate or decrease it.
- **Estimated Bandwidth:** Provides an average of the bandwidth usage with the settings currently selected. This estimate supposes that the Radar picture is properly tuned and that a Radar Mask has been applied on land (to remove land echo).

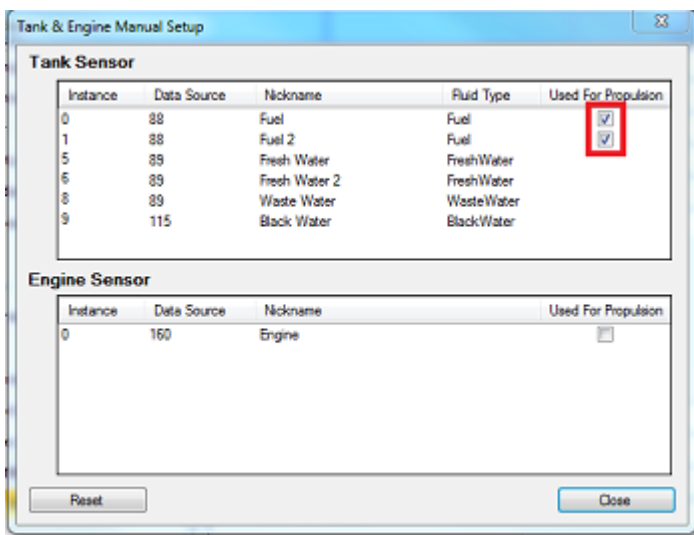
**Note:** An improperly tuned radar picture (with noise all over the screen), will increase dramatically the bandwidth used to transmit the radar picture (up to 10 times!).

- **Communication Status...:** Open a window with all the connection and transmission logs
- **Communication Monitor...:** Open a window with real time upload time statistics per type of data.

## Initial Setup

- **Boat Length:** Enter the vessel length
- **Boat Width:** Enter the vessel width
- **Boat MMSI:** Enter the vessel MMSI (identification). This field is automatically populated when connected to an AIS transmitter.
- **Boat Name:** Enter the vessel name. This field is automatically populated when connected to an AIS transmitter.
- **Boat Registration Number:** Enter the vessel registration number.
- **Boat Icon:** Users can choose the shape of the boat icon when the plotter is used in 3D (the shape of the 2D icon is fixed and cannot be changed)
- **Static Icon Size:** Users can choose the size of the 2D boat icon. Note that if you zoom to a very small range, the vessel icon size (in either 2D or 3D) will be displayed at its real scale (size) on the chart according to the "Boat Length" parameter.
- **Day Boat Icon Color:** Allows to select the color of the boat icon and COG vector during the day
- **Night Boat Icon Color:** Allows to select the color of the boat icon and COG vector during the night
- **Depth Display:** Users can choose to display the depth below the waterline or below keel. This requires the user to enter proper values for "Keel Draft" and "Transducer Draft"
- **Transducer Draft Source:** When set to "automatic", TimeZero will try to use the offset sent by the instruments and revert to the offset set below if they are missing. When set to "hardware", will only use the offset received by the instruments (causing lack of data if the instruments are not sending the proper offset). When set to "manual", will only use the offset set below:
  - **Transducer Draft:** The value for "Transducer Draft" is always a positive value (enter the distance in between the water line and the position of the transducer).
  - **Keel Draft:** The value for "Keel Draft" is also a positive value (enter the distance in between the water line and the bottom of the Keel).
- **Radar Cursor Reference:** When the Radar Cursor information is received from the NMEA0183 RSD sentence, this setting allows to adjust if the angle received from the radar is from North Up ("True") or Head Up ("Relative").

- **True Wind and VMG Calculation:** When set to "Surface", Heading and Speed through Water will be used to compute True Wind and VMG if they are not received. When set to "Ground", Course Over Ground (COG) and Speed Over Ground (SOG) will be used instead. Make sure to adjust this selection to "Ground" if you only receive Apparent Wind and don't have a Heading Sensor and Speed sensor.
- **Allow Dead Reckoning:** Allows TimeZero to activate the Dead Reckoning mode in case of GPS failure. Please refer to [Dead Reckoning](#) for more information.
- **CCRP:** The CCRP (Consistent Common Reference Point) settings allows you to define offsets for GPS and Transducers (the Radar offset is setup from the [Radar Options](#)). As set by IMO regulations, the CCRP is the location at the ship icon, to which all horizontal measurements, such as target range, bearing, relative course/speed, closest point of approach, or time to closest point of approach are referenced. Usually this is the Wheelhouse position on the boat. When entering all the settings (for CCRP, GPS, Transducer,...) remember that the longitudinal positions are always positive (from Bow to Stern) while the lateral position is negative for Port and positive for Starboard (0 is the middle of the vessel)
- **Tank & Engine Manual Setup:** Click on this button to setup your Tank NickNames and if they are used for fuel computation. TimeZero can decode up to four tank levels. Each tank sensor must have a different instance number. The Software will sort all of the tank sensors by ascending instance number. For tank that report a "Fuel" fluid type, you can select if they are used for fuel computation in TimeZero:



**Note:** This option only appears when a NMEA 2000 port (with Actisense NGT-1 gateway) has been configured.

- **Furuno Satellite Compass Calibration:** Press this button to open a window that will allow you to calibrate the Furuno Satellite Compass SC30, SC33 and SCX20. You can view and setup the Heading, Pitch and Roll offset. Note that the calibration only works when the compass is connected via the Actisense NGT1-USB (NMEA2000) and when the NMEA2000 output has been configured on the last page of the connection wizard.
- **Graphic Instruments Setup:** Allows to enter the various Min/Max used for the Gauge NavData.
- **COG and SOG Damping:** This setting can be useful when the GPS sends unreliable COG value (a COG that "jumps all over the place") to smooth the value in TimeZero. Increasing this value will raise the COG & SOG averaging time (but will decrease the response time).
- **Wind Speed/Direction Damping:** This setting smooths the wind data. Increasing this value will raise the Wind averaging time (but will decrease the response time).
- **Boat Speed Damping:** This setting smooth the speed data. Increasing this value will raise the speed averaging time (but will decrease the response time). Increasing this setting usually result in stable ETA time.



- **Wind Speed / Direction Offset:** Allows to offset the Wind Direction by adding or subtracting an angle value and by increasing or decreasing the speed by a percentage.
- **VHF Direction Finder**
  - **Minimal Signal Level (%):** Adjust the threshold that is required for the DF Bearings to be displayed on the chart.
  - **DF Bearing Timeout:** Adjust the duration after which the DF Bearings will disappear from the chart if not continuously updated.
  - **DF Bearing Color:** Set the DF Bearing color on the chart (note that the alarm bearings will always be displayed in red).
- **Number of Monitors:** Enables the user to use two or three monitors with TimeZero. This option will only be available when (at least) two monitors in extended mode are detected. When enable, TimeZero will put the second and third display to the right side of the primary monitor. If there is no monitor available to the right of the primary monitor (or not enough when selecting 3 monitors), TimeZero will use the monitor to the left side of the primary monitor. It is usually recommended to make the primary monitor of Windows the left most monitor.
- **Reset Dialog Box Position:** Press this button to reset all dialog boxes (windows) position to their default location. This can be useful if a dialog box (such as the property window) has been dragged on a monitor that has been disconnected.
- **SeaLevel 110E/120E configuration:** Press this button to configure the IP address of the SeaLevel Network IO. Please refer to the [SeaLevel Network IO](#) for more information.
- **Advanced Settings:** These settings should not be adjusted unless instructed by Technical Support.

## NMEA Sentence

### NMEA0183 Input

Below is the list of NMEA0183 sentences supported by TimeZero as input. There are sorted by the type of data they provide. In case multiple sentences provide the same data, there are listed by priority (higher priority first).

- Air Temperature: MDA, XDR ("C" parameter)
- AIS Target: VDM
- AIS Own Ship Information: VDO
- Apparent Wind Angle: MWV; VWR
- Apparent Wind Speed: MWV; VWR
- Atmospheric Pressure: MDA, XDR ("P" parameter)
- ARPA Target: TTM, TLL (containing an ID), WPL (containing an ID and having the "CD" talker)
- Course Over Ground: RMC; VTG; RMA; VDO
- Current Direction (Set): VDR
- Current Speed (Drift): VDR
- Depth Below Transducer: DPT; DBT
- Distance From Transducer To Keel: DPT



- Distance From Transducer To Water Line: DPT
- DSC Target: DSC & DSE
- Event: TLL (without ID)
- External Cursor (& Radar Cursor): RSD
- GPS Quality Indicator: GGA
- Heading: FEC\_GPatt; HDG; HDT; HDM; VHW; OSD; VDO
- Heave: FEC\_GPhve (Furuno Proprietary)
- Horizontal Dilution Of Precision (Accuracy): GGA; GSA; GNS
- Humidity (relative %): MDA; XDR ("H" parameter)
- Local Time Zone: ZDA
- Magnetic Deviation: HDG
- Magnetic variation: HDG; RMC; RMA
- Number Of Satellites in Use: GGA; GNS
- Position: RMC; GGA; GLL; RMA; GNS; VDO
- Rate Of Turn: ROT; VDO
- Pitch & Roll: FEC\_GPatt (Furuno Proprietary)
- Sea Surface Temperature: MTW; MDA
- Speed Over Ground: RMC; VTG; RMA; VDO
- Speed Through Water: VBW, VHW
- Rudder Sensor Angle: RSA
- Ryokuseisha Buoy: RBY, BLV
- Trawl Positioning: MPT (Proprietary Marport sentence)
- True Wind Angle: MWV
- True Wind Direction: MWD; MDA
- True Wind Speed: MWD; MWV; MDA
- UTC Of Position: RMC; GGA; GLL; GNS
- Velocity Made Good: VPW

### **NMEA0183 Output:**

Below is the list of NMEA0183 sentences supported by TimeZero as output:

- AAM

- ABM
- APB
- BOD
- BWC
- BWR
- DPT
- GGA
- GLL
- HDG
- HDT
- HSC
- MTW
- MWD
- MWV
- OSD
- PCG (proprietary Sentence)
- RBY\_RBC (Ryokuseisha Buoy)
- RMC
- RMB
- VHW
- TTM
- VPW
- VSD
- VTG
- XTE
- ZDA

### **NMEA2000 Input**

Below is the list of NMEA2000 sentences supported by TimeZero as input. There are sorted by the type of data they provide. In case multiple sentences provide the same data, there are listed by priority (higher priority first).

- Air Temperature: PGN\_130310; PGN\_130311\_PressureAndAirTemperature; PGN\_130312\_AirTemperature
- AIS Class A Position Report: PGN\_ 129038

- AIS Class A Static and Voyage Related Data: PGN\_ 129794
- AIS Class B Position Report: PGN\_129039
- AIS Class B Extended Position Report: PGN\_129040
- AIS Class B "CS" Static Data Report: PGN\_129809 ; PGN\_129810
- Apparent Wind Angle: PGN\_130306\_ApparentWindSpeedAndAngle
- Apparent Wind Speed: PGN\_130306\_ApparentWindSpeedAndAngle
- Atmospheric Pressure: PGN\_130314; PGN\_130311; PGN\_130310; PGN\_130311\_PressureAndAirTemperature; PGN\_130311\_PressureAndSST
- Depth Below Transducer: PGN\_128267
- Distance From Transducer To Keel: PGN\_128267
- Distance From Transducer To Water Line: PGN\_128267
- Drift Direction: PGN\_129291\_DriftAndMagneticSet; PGN\_129291\_DriftAndTrueSet
- Drift Speed: PGN\_129291; PGN\_129291\_DriftAndMagneticSet; PGN\_129291\_DriftAndTrueSet
- Fuel Level: PGN\_127505 (only tanks level that are of type "fuel")
- Fuel Flow Economy: PGN\_127497
- GPS Quality Indicator: PGN\_129029
- Heave: PGN\_065280 (Furuno Proprietary)
- Horizontal Dilution Of Precision: PGN\_129539; PGN\_129029
- Magnetic Course Over Ground: PGN\_129026\_Sog\_GeoCog; PGN\_129026\_Sog\_MagCog
- Magnetic Deviation: PGN\_127250
- Magnetic Heading: PGN\_127250
- Magnetic Sensor Heading: PGN\_127250
- Magnetic Variation: PGN\_127250
- Number Of Satellites In Use: N/A
- Pitch & Roll: PGN\_127257
- Position: PGN\_129025; PGN\_129029
- Sea Surface Temperature: PGN\_130310; PGN\_130311\_PressureAndSST; PGN\_130312\_SST
- Speed Over Ground: PGN\_129026; PGN\_128259; PGN\_129026\_Sog\_GeoCog; PGN\_129026\_Sog\_MagCog
- Speed Through Water: PGN\_128259
- Tracked Target Data : PGN\_ 128520
- True Course Over Ground: PGN\_129026\_Sog\_GeoCog; PGN\_129026\_Sog\_MagCog

- True Heading: PGN\_127250
- True Wind Angle: PGN\_130306\_TheoreticalWindSpeedAndAngle
- True Wind Magnetic Direction: PGN\_130306\_TheoreticalWindSpeedAndGeographicDirection;  
PGN\_130306\_TheoreticalWindSpeedAndMagneticDirection
- True Wind Speed: PGN\_130306\_TheoreticalWindSpeedAndAngle;  
PGN\_130306\_TheoreticalWindSpeedAndGeographicDirection;  
PGN\_130306\_TheoreticalWindSpeedAndMagneticDirection
- True Wind True Direction: PGN\_130306\_TheoreticalWindSpeedAndGeographicDirection;  
PGN\_130306\_TheoreticalWindSpeedAndMagneticDirection
- UTC Date Time: PGN\_126992
- UTC Of Position: PGN\_129029

## **NMEA2000 Output**

When "NMEA2000 Pilot Output" is checked from the last page of the Connection Wizard, the following PGNs are automatically sent while a route is activated:

- PGN 129283 - Cross Track Error
- PGN 129284 - Navigation Data
- PGN 129285 - Navigation Route/WPT Information (used to transmit the name of the destination waypoint)

## **Proprietary Sentence & File Format**

Proprietary sentences provide a means for manufacturers to use the sentence structure definitions of NMEA 0183 standard to transfer data which does not fall within the scope of approved sentences. Below are the proprietary sentences recognized and used by TimeZero.

### **"\$PMXS, CURSOR" NMEA Sentence**

This sentence can be used to display in TimeZero the location of an external cursor (or generic external position such as second GPS or ROV). The position will be displayed with a green square and can be show/hidden from the "Own Ship" button located in the ribbons.

```
$PMXS,CURSOR,IIII.II,a,yyyyy.yy,a*hh
```

**Note:** An external tool converting a regular GPS sentence into \$PMXS, CURSOR is available. This can be useful to position a second GPS or ROV (sending regular position sentence) into TimeZero.

### **POSREPORT file format**

TimeZero can scan a folder (defined in the [Targets](#) Options under "Vessel Tracking Data Location") for new or updated text file(s) containing position report information. Once TimeZero detects a new file in that folder, it analyzes it and displays the location of the target(s) on screen.

TimeZero supports two formats: the traditional "POSREPORT" format and the "simplified" format.

### **POSREPORT Format**

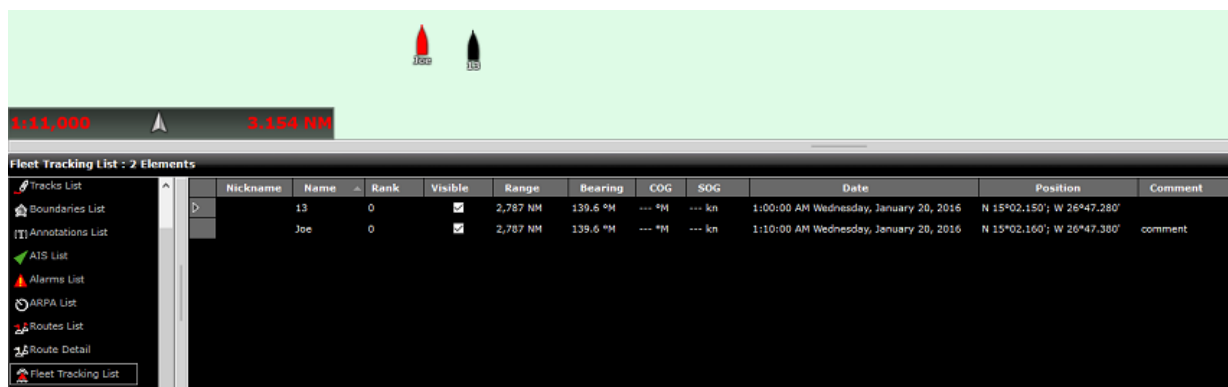
The POSREPORT text file always start with "POSREPORT", then one line per target with the fields separated by ";".

#### **Fields Definition:**

- Rank (int)
- Name or ID (string)
- Latitude (string, degrees.minutes(2 fixed digits)decimal)  
ex: N 44°54.074' = 44.54074N
- Longitude (string, degrees.minutes(2 fixed digits)decimal)  
ex: W 034°42.018' = 34.42018W
- Date (UTC, format MM/DD/YY hh:mm(:ss optional) )
- Comment (string)

**Example:**

```
POSREPORT
0;13;15.0215N;26.4728W;01/20/16 09:00:00;
0;Joe;15.0216N;26.4738W;01/20/16 09:10;comment
```



**Simplified POSREPORT Format**

The text file contains one line per target with each line starting with "//TM/POS". Then, the following parameters (key value/pair) are used (the order is not important).

- //OP/xxxxxx is used for the target name or ID (string)
- //LT/xx.xxxx is used for the latitude of the target (string: degree.decimal N = + / S = -)
- //LG/xx.xxxx is used for the longitude of the target (string: degree.decimal E = + / W = -)
- //DA/xxxxxx is used for the date of the position (string: YYYYMMDD)
- //TI/xxxxxx is used for the time of the position (string: HHMMSS)

**Example:**

```
//TM/POS//OP/My Name//LT/-16.4056//LG/-73.2195//DA/20120526//TI/141530
```

**Note:** TimeZero deletes the file after reading it.

**Fishing Buoys file format**

TimeZero will check periodically the content of a directory, specified in the [Targets](#) Options under "Fish Buoys Data Location". If a file with a name following the pattern \*\_PosReport\*.\* is present, TimeZero analyzes it and display the Buoys on screen.

The text file contains data that looks similar to NMEA sentences. Each line starts with \$MXMIT with all the fields separated by commas.

#### Fields Definition:

ID- string(8) - Identifier

ALIAS - string(20) - Name

Date Utc - 220709 - DDMMYY

Time Utc - 125632 - HHMMSS

Latitude - 003.8955 (like NMEA sentence)

Hemisphere - [N,S]

Longitude - 122.9486 (like NMEA sentence)

Meridian - [E,W]

Vcc - 00.0 - Battery voltage

Temp - [-]00.0 - Temperature

Flash - [0,1]

Battery alarm - [0,1]

Speed alarm - [0,1]

Remote command active - [0,1]

#### Example:

```
$MXMIT,M2I51041,Buoy,060710,125851,042.1363,N,008.8022,W,11.7,37.7,0,0,0,0
```

**Note:** For each buoy, TimeZero accepts only new positions dated after last position. TimeZero deletes the file after reading it.

### "\$PRBY" Fishing Buoy NMEA Sentence

TimeZero is compatible with the proprietary NMEA sentence "\$PRBY" that is used to receive [Fishing Buoy](#) information. This sentence is used by the Japanese buoys manufacturer "Ryokusei":

```
$PRBY,xxx,hmmss,1111.11,a,yyyy.yy,a,YYMMDD,tt.t,a0b0c0d0e0f0g0h0i0,BB.B<CR><LF>
|      |      |      |      |      |      |      |      |      |      |
|      |      |      |      |      |      |      |      |      |      |
|      |      |      |      |      |      |      |      |      |      |
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|      |      |      |      |      |      |      |      |      |      |
|      |      |      |      |      |      |      |      |      |      |
+--- Marker code
+--- Buoy Number
+--- Hours, Minutes, Seconds
+--- Latitude - N/S
+--- Longitude - E/W
+--- Year, Month, Day
+--- water Temp.
+--- Sonar sounder data (not used)
```

### "\$GBBLV" Fishing Buoy NMEA Sentence

TimeZero is compatible with the proprietary NMEA sentence "\$GBBLV" that is used to receive [Fishing Buoy](#) information. This sentence is used by the Japanese buoys manufacturer "Ryokusei":

\$GBBLV,,3554.330,N,14009.660,E,,,,,,,,,232210,,15.0,\*5B<cr><lf>

Field1: blank

Field2: Latitude

Field3: N/S

Field4: Longitude

Field5: E/W

Field6-15: blank

Field16: Buoy ID in six order

Field17: blank

Field18: SST

Field19: Checksum

## **ONVIF Protocol Requirements**

### **Summary of Requirements:**

In order for an ONVIF camera to be compatible with TimeZero, it needs to follow the below requirements:

- The camera must support the mandatory features of the ONVIF Profile S protocol (see [ONVIF Profile S specification](#)) over HTTP (HTTPS not supported)
- The camera must support video streaming in H264 (TimeZero is not compatible with MJPEG, MPEG4, or H265)

In addition, for a PTZ Camera:

- The camera must support continuous Move and Stop PTZ operations (pan/tilt/zoom command by speed with stop command)
- The camera must support absolute positioning (used by TimeZero when controlling the camera from the chart to move or lock on targets)
- The camera must support relative positioning (used by TimeZero when using the virtual joystick button)
- The camera must be able to provide position feedback (Pan Position, Tilt Position, Zoom Position)
- Optional: The camera can support Auxiliary Commands
- For Dual Head Cameras that have a daylight lens (Visible) and a nighttime lens (IR), the video stream linked to the Visible and IR lens must implement a PTZ Configuration with independent "token". These tokens should be link to two independent PTZ nodes that would allow TimeZero to control independently the visible and IR zoom lens and get their proper zoom position (to be able to compute the Field of View for both the visible and IR lens).

### **ONVIF Camera Validation in TimeZero:**

Although the ONVIF Profile S specification is very detailed, some manufacturers may not follow the specification closely causing unexpected behavior in TimeZero. The steps below will help you making sure that the camera is properly setup in TimeZero and conforms to the ONVIF specification.

## Pan & Tilt Coordinate Space

The default ONVIF Pan and Tilt coordinate space is normalized to the range -1/+1. For Pan position, "0" is the front of the camera, "+1" is +180 degrees (right side), and "-1" is -180 degrees (left side). For Tilt position, "0" is the horizon, "+1" tilt up the camera to its maximum angle, and "-1" tilt down the camera to its minimum angle. A camera that does not use the normalized coordinate space should automatically provide its custom coordinate space to TimeZero (during the initial detection), but sometimes, this fails. That is why it is recommended to manually pan and tilt the camera to its maximum PTZ positions and write down the raw ONVIF values that get returned by the camera. Follow the instructions below:

- Select the Camera WorkSpace in TimeZero

- Click on the "Camera Control" button located in the Ribbon, enable "Camera Info" and look for the Raw Pan, Tilt, and Zoom values:



- Manually Pan the camera around 360 degrees and make sure the raw pan position value goes from -1 to +1, performing a full rotation (with 0 being the front of the camera)

- Manually Tilt the camera all the way up and make sure that the raw Tilt position is +1. If the sign is reversed, or if the maximum tilt value is different (0.5 for example), make sure to write down this information. Also write down the maximum physical angle in degrees by observing the camera or by looking at its datasheet (for example 90 degrees).

- Repeat the same procedure by Tilting down the camera to its minimum value.

- Open the Camera Options, double click on the camera in the list, and click on the "ONVIF Configuration" button. Make sure the values below match what you have written down:



Pan & Tilt	
Pan Left Angle	-180.00 °
Pan Left Value	-1
Pan Right Angle	180.00 °
Pan Right Value	1
Pan/Tilt FOV Step	20.0 %
Pan/Tilt Speed Maximum Value	0.3
Tilt Down Angle	-90.00 °
Tilt Down Value	-0.5
Tilt Up Angle	90.00 °
Tilt Up Value	0.5
Zoom	
TZ Proportional Speed Control	False
Zoom Maximum Value	1
Zoom Minimum Value	0
Zoom Relative Step	10.0 %
Zoom Speed Maximum Value	0.5
Zoom (Dual Head)	
IR Zoom Maximum Value	1
IR Zoom Minimum Value	0

### Field of View and Zoom Coordinate Space

TimeZero needs to know the maximum (wide) and minimum (tele) horizontal field of view of the camera. This information can be found in the camera datasheet and should be setup in the Camera Options under Horizontal Field of View:

Configure Camera ONVIF 23.90.88.82.80

Name: ONVIF Image Aspect: Full

Dual Head

Use for Tracking (PTZ camera only)

Enable Augmented Reality

Position: N 46° 13' 89.7" W 124° 04' 73.4" Orientation: 0.0° Elevation: 9.8ft

Offsets (degrees): Horizontal (+Right): +0.0° Vertical (+Up): +0.0° Roll (+Starboard): +0.0°

Pan and TR Speed Offset: 100%

Horizontal Field of View: Maximum: 66.3° Minimum: 1.9°

Auto-Zoom

Video Stream: default/Primary

ONVIF Configuration

OK Cancel

The default ONVIF zoom coordinate space is normalized from 0 (wide) to +1 (tele). It is recommended to zoom the camera to its minimum and maximum and write down the raw ONVIF values using the same procedure as for the Pan & Tilt Coordinate space. Then, make sure that the minimum and maximum values match what you have written down:

Zoom	
TZ Proportional Speed Control	False
Zoom Maximum Value	1
Zoom Minimum Value	0
Zoom Relative Step	10.0 %
Zoom Speed Maximum Value	0.5
Zoom (Dual Head)	
IR Zoom Maximum Value	1
IR Zoom Minimum Value	0

## Relative PTZ Step Interval

When using the virtual joystick buttons (quick press on the up/down/right/left arrows located at the bottom right corner of the camera screen), TimeZero will move the camera in the corresponding direction using a relative command. The relative step angle sent to the camera is set by default to half the current field of view of the camera (50%). You can change this default value by adjusting the "Pan/Tilt FOV Step" setting.

**IMPORTANT:** If you notice that the camera Tilt commands are reversed when pressing the up/down arrow, set the "Invert Tilt Axis" to True.

## PTZ Continuous Move Speed

When using a physical joystick with TimeZero, or when clicking and dragging on the camera display with the cursor, TimeZero will control the camera using speed commands. If you feel that the control speed is too fast, you can reduce the "Pan/Tilt Maximum Value".

## Proportional Speed Control

When the camera is zoomed in, you want the Pan/Tilt speed to be slower than when the camera is zoomed out. Most cameras should adapt the Pan/Tilt speed according to the zoom factor. If you feel that the camera does not implement this feature (and if the pan/tilt zoom is too fast when the camera is zoomed in), you may enable the "TZ Proportional Speed Control" setting in TimeZero. When this setting is enabled, the more you are zoomed in, the slower the Pan/Tilt speed will be.

## Dual Head Configuration

When TimeZero detects multiple video stream, a "Dual Head" checkbox will appear in the main camera configuration window. In order for TimeZero to independently control the Visible and Infra-Red lens (zoom), the camera must implement two ONVIF PTZ nodes that must be linked to the Video Stream via a "token". When TimeZero detects two PTZ Nodes, new settings for the IR Field of View will be available in the main configuration window:

Configure Camera ONVIF 172.31.200.20:80

Name: ONVIF Image Aspect: Full

Dual Head

Use for Tracking (PTZ camera only)

Enable Augmented Reality

Position

N 46° 15' 734'

W 124° 05' 636'

Orientation: 0.0° Elevation: 9.8 ft

Offsets (degrees)

Horizontal (+Right): +0.0° Vertical (+Up): +0.0° Roll (+Starboard): +0.0°

Pan and Tilt Speed Offset: 100%

Horizontal Field of View

Maximum: 55.0° Minimum: 2.0°

Infrared Horizontal Field of View

Maximum: 35.0° Minimum: 15.0°

Auto-Zoom Infrared Auto-Zoom

Video Stream: Media Profile 2 Infrared Video Stream: Media Profile 1

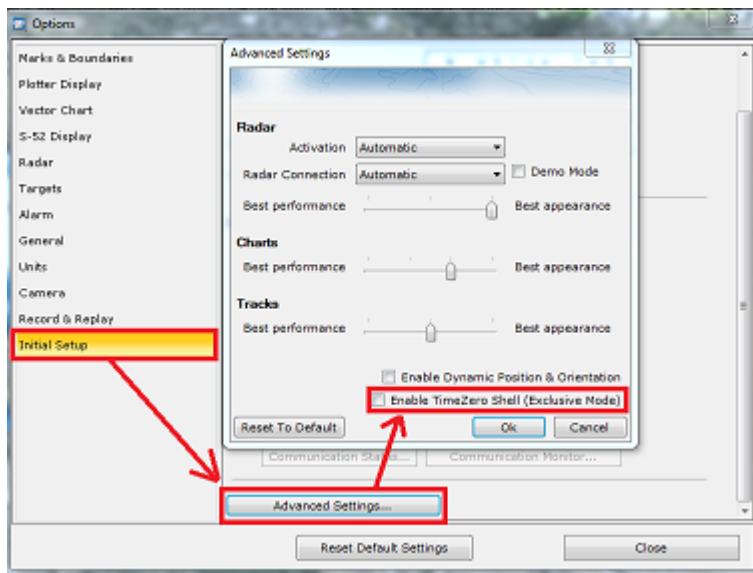
ONVIF Configuration

OK Cancel

## Shell (Exclusive Mode)

When you want to commit a computer to the sole use of TimeZero, it is possible to enable a "Shell". When this feature is enabled, it automatically launches TimeZero as soon as the user logs in on the computer. This prevents the user to access the computer Windows Explorer (files and folder).

To enable the TimeZero Shell for the current user, open TimeZero, select the "Initial Setup" Options, click on "Advanced Settings" and select "Enable TimeZero Shell (exclusive mode)":



After enabling the Shell, the next time the computer is restarted, TimeZero will start automatically and the access to the computer will be prevented. If the user exit TimeZero, it will automatically power off the computer. To restore access to the computer, the TimeZero Shell must be disabled by deselecting the same option.

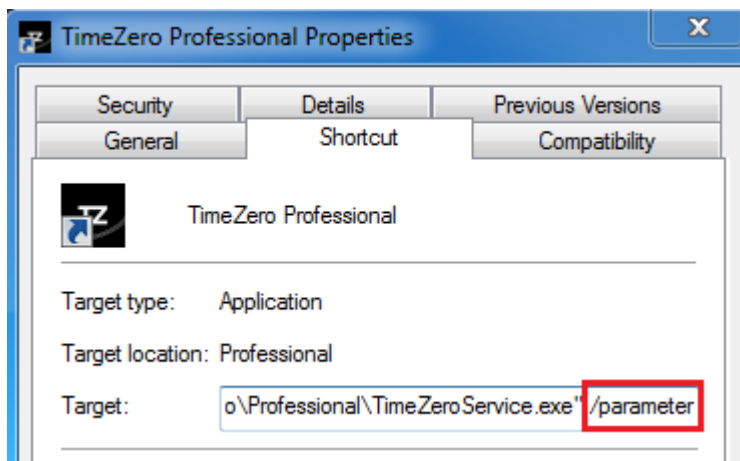
**Tips:** it is possible to prevent the user to disable the TimeZero Shell by locking the user interface in TimeZero (with a password). Please refer to [Lock the User Interface](#) for more information.

Note that the TimeZero Shell activation is independent per Windows User Account. For example, if the computer has two user accounts (an "Admin" and a "User" account), and if you only select the TimeZero Shell option on the "User" account, you will be able to use the computer normally by logging on the computer as the "Admin".

Also, when the Shell is enabled, it will automatically recall any WorkSpace configuration that have been created. This means that any WorkSpace for which the configuration has been saved will start in the same state every time you start the computer. Note that if a WorkSpace configuration has not been saved, TimeZero will not reset that WorkSpace. Please refer to the [Saving and Recalling WorkSpace configuration](#) chapter for more information on how to save a WorkSpace configuration.

## Startup Mode

Some parameters can be added to the TimeZero shortcut path. To add a parameter, right click on the TimeZero shortcut (usually located on the Desktop) and select "Properties". Under the "Shortcut" tab, simply add a space after the quote and type the parameter at the very end of the target path (just after the "):



You can replace "/parameter" in the screenshot above by:

- /navigation = used to automatically start TimeZero in Navigation mode (bypass the agreement)
- /reset = used to reset all WorkSpaces that have a display configuration saved. If a Display Configuration was not saved (right click on WorkSpace tab), the WorkSpace will not be reset.
- /simulation = used to enable the simulation mode of TimeZero.
- /secondmonitor = used to shift the monitor used by TimeZero on the second screen. Note that if multiple screens are used by TimeZero, this startup parameters will try to shift all screens to the right of the primary monitor. If unsuccessful, TimeZero will shift to the left.
- /windowtop:100 /windowleft:100 /windowwidth:800 /windowheight:600 = used to set the window size occupied by TimeZero. By default, TimeZero is always in full screen mode, but these parameters can be used to define in pixel the position and size of the space occupied by TimeZero on the screen. In this example, the top left corner of the window will be located at 100 pixels down (from the top of the screen) and 100 pixel right. The size of window will be 800 by 600.

**Note:** The window position parameter is a beta feature



## Troubleshooting

### Serial Connection

Open the Device Manager and make sure that the Virtual COM port(s) appear under the "Ports (COM & LPT)" category. If they don't appear (or if a warning appears next to it), disconnect the USB converter, make sure that the latest drivers are installed and reconnect the USB converter. If the driver is still not recognized please refer to the [USB Drivers](#) troubleshooting chapter.

Write down the Virtual COM port number (you will need that information for the next step)

Open the navigation software and use the "Port Monitor" on each of the virtual COM port. Look at the NMEA sentence (ex: "\$GPGGA") to determine what type of sensor is connected (GPS, Sounder, etc...). If you see "garbage data" (random text characters), try a different Baud Rate speed (usually 4800 is used for GPS, Sounder, Heading and 38400 is used for AIS but you can occasionally have a device using something else such as 9600). Also try to invert the wire polarity if you continue to see garbage at all Baud Rate. If you don't see any data, check the wiring.

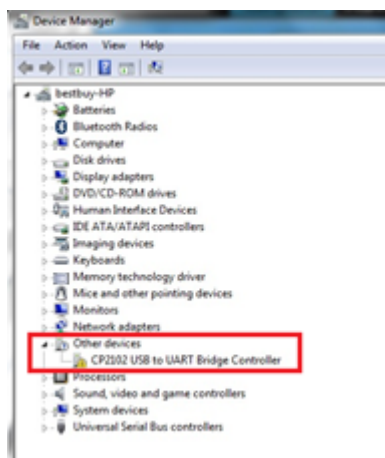
Use the Connection Wizard Auto Detection first to see if the software will detect the instruments automatically. Use the Manual Configuration (pointing at the Virtual COM port) if you have trouble.

**Note:** If you have multiple software on the PC accessing multiple COM ports at the same time, do NOT perform an Automatic Configuration in TimeZero Professional . If you do an Automatic Detection, TimeZero Professional will open and use all the active COM ports, preventing the other software to use them at the same time. In this case, configure manually the COM Port in TimeZero Professional one by one (configure ONLY the one you want TimeZero Professional to use).

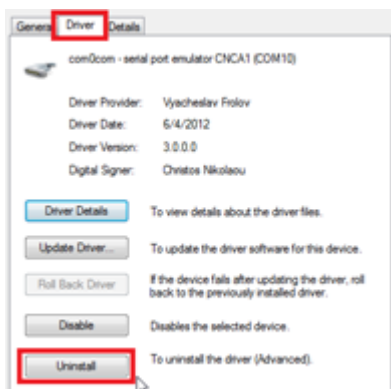
If an AIS instrument is connected to the PC, make sure that the GPS/COG/SOG/Heading Master sources are not set to the AIS Port (too slow). Use the Port Priority of Data Source selection and select the real COM port connected to the GPS, Heading... Or uncheck "Position" and "Heading" coming from the AIS port.

### USB Drivers

Sometimes, a USB to Serial adapter will not be able to find the proper drivers to use. This can happen if the adapter was plugged before installing the computer or if the wrong drivers were previously loaded. An adapter loaded without the drivers will look like that on the Device Manager:



To solve the problem, double click on the adapter, select the "Driver" tab and then click on "Uninstall":



Once the device is uninstalled, unplug the adapter from the computer.

Make sure that the drivers are correctly installed. Remember that it is always better to download the latest version of the drivers on line. Be careful as not all drivers come with an installer. Sometimes, the driver is just a ZIP file that you have to unzip and put somewhere (on your desktop for example).

Plug the USB Adapter on your computer. If the drivers didn't come with an installer (just a ZIP file), select "Browse my computer for driver software" and select to the location of the unzipped folder:



If the drivers came with an installer, just select "Search Automatically for driver software".

## Autopilot Troubleshooting

### Connection and Configuration (NMEA0183)

TimeZero can send NMEA0183 Navigation information to the autopilot via a COM port or via a USB to Serial adapter. The first step is to know where to send the pilot information (on which COM port).

**Note:** If the location of the pilot is not known, you can use the Port Monitor function of TZ to detect what port the heading is coming in on; usually this is the same port as the pilot (most pilots have a bi-directional communication with the PC to listen for pilot sentence from the PC and send Heading information to the PC).

Most Autopilots use the APB sentence to get course to steer, cross track error and Waypoint ID. TimeZero is set to output this sentence by default along with the XTE sentence. Other data to output is dependent on what the pilot will accept or need. For example, some pilots need to receive speed from the computer, in that case the VTG or RMC sentence will need to be turned ON. The user can find this information in the owner's manual for their autopilot.

Once you know which sentences to send to the pilot, open the Connection Wizard (under the TimeZero button) and select [Data Output and Pilot](#). Click on "Serial Port" and select the COM port where the pilot is connected to and select the appropriate Baudrate (usually 4800). Select the sentences to output to the pilot. If you don't know which sentences to select, you can try APB, XTE and RMC.

Note that the APB sentence has two modes: "Magnetic North" and "True North". This setting defines the North Reference that will be used inside the APB sentence for the Bearing to Waypoint (or CTS) information. If the Autopilot is connected to a Magnetic Heading sensor, you should use "Magnetic North". If the Autopilot is connected to a True Heading Sensor (such as a Satellite Compass or Gyrocompass), you should use "True North". Note that most installations are using a Magnetic Compass, so the APB default setting ("Magnetic North") should be used.

**Note:** Also be sure that TimeZero and the autopilot are set to display the same North reference. You can adjust the North reference in TimeZero by adjusting the "Bearing Display" setting in the [Units Options](#).

Once the settings have been adjusted in the Connection Wizard, click on "Next" and "Finish"

## Connection and Configuration (NMEA2000)

TimeZero can also send Pilot information using NMEA2000. Unlike with NMEA0183, there is no sentence selection (called "PGN") as the NMEA2000 is much more standardized for pilot information. In TimeZero, you just need to make sure that "NMEA2000 Pilot Output" is checked from the last page of the Connection Wizard.

Note: This option will only be available when an Actisense NGT1-USB has been configured as a NMEA2000 input.

Checking this option will automatically output the following PGNs when a route is activated:

- PGN 129283 - Cross Track Error
- PGN 129284 - Navigation Data
- PGN 129285 - Navigation Route/WPT Information (used to transmit the name of the destination waypoint)

## Test the Connection

On the NavData panel in TimeZero, configure to display CTS (Course to Steer), XTE (Cross Track Error), and DTW (distance to waypoint). Configure the pilot to display a "steering page" or a service page with the same information. Note that "CTS" may be referenced on the pilot as "Bearing", "BPW" (bearing position to waypoint) or "BRG". The "DTW" may be referenced on the pilot as "RNG", "Range" or "DIST".



Once you have configured the NavData panel in TimeZero and can also display that information on the pilot, simply activate a route/waypoint in TimeZero. Look at the pilot screen and make sure that the data matches what the software displays.

If the data does not match (course to steer for example), make sure that the Pilot and TimeZero are using the same North reference (Magnetic or True). If the course to steer is off by 1 or 2 degree, this might be due to the difference in the magnetic variation table built in the Pilot (or Heading Sensor) and the magnetic variation used by TimeZero. To avoid the pilot (or heading sensor) from making any variation calculations (going from True North to Magnetic North or the opposite), make sure that TimeZero is sending Magnetic bearing if the heading sensor used by the pilot is a magnetic sensor and True bearing if the heading sensor used by the pilot is a true heading sensor (Satellite Compass or Gyrocompass).



**Note:** With NMEA0183 connection, only the APB sentence allows you to select Magnetic or True bearing. If you use the RMB sentence, it will always send True Bearing (as per the NMEA0183 specification). For that reason, if you have a magnetic compass, it is better to use the APB sentence and make sure that it is set up in TimeZero for "Magnetic North".

If no information appears at all on the Autopilot ("--" for example), check the following if you use a NMEA0183 connection:

- Wiring: are the wires reversed? Or going into the improper input on the pilot?
- COM port number: is TZ outputting on the correct port?
- Some (older) pilots don't recognize the "II" NMEA Talker. Try to change the NMEA talker to "GP" (on the output setup page of the connection wizard)
- Check the Navigation source on your Autopilot. Some pilot have two or more inputs that can be switched. The "Navigation Source" port must match the input port of the pilot connected to the computer
- Check the input baud rate of the pilot. Most of the time it is set to the regular 4800bps, but it may be changed sometimes (38.4Kbps)
- Check if the pilot is using RS232 or RS422 and if the COM port used by TimeZero uses the same protocol

When you have confirmed that the data matches in TimeZero and on the pilot (at minimum XTE and CTS), you can perform a sea trial

### **Pilot not steering properly during a sea trial**

If the data is correctly sent by TimeZero to the pilot (with matching values), but if the pilot is not steering properly (not following a straight line or not steering in the correct direction), check the following points:

**Note:** At this point, we are not troubleshooting TimeZero itself but the pilot. TimeZero's "responsibility" is only to send a good value to the pilot. If the pilot is not steering properly at this point, then something needs to be adjusted on the pilot itself (or the compass needs to be calibrated)

#### **Check Pilot behavior in "Auto Mode"**

Every pilot has an "Auto" mode which does not rely on any external Navigation information (unlike the "Nav" or "Navigation" mode which relies on XTE and/or CTS sent by a "Navigator" such as TimeZero). Testing the pilot in "Auto" mode allows to validate its correct behavior in standalone mode. When engaging the "Auto" mode, the pilot simply takes a snapshot of the heading at the time the user presses the "Auto" button and it simply holds that course. If the pilot is unable to navigate a straight course in Auto mode, it will not be able to navigate a straight course in "Nav" mode either. In that case, adjust the pilot parameters until having a satisfactory "Auto" mode behavior.

**Note:** Some pilots allow to change course while in auto mode by turning the rotary knob. It is a good idea to change the course in Auto mode to see how the pilot react to change of course order.

#### **Check the Heading Sensor**

If the Pilot behaves correctly in "Auto" mode, but has problems following a route in "Nav" mode, then the problem is likely coming from the heading sensor. Understand that when TimeZero is sending an order to the pilot, via the Course to Steer sentence (ex: "go to 273 degree"), the pilot can only rely on its heading sensor to know where 273 degree is. If the heading sensor sends a wrong value, then TimeZero and the Pilot will not agree on where 273 degree is, resulting in an erratic behavior (pilot seems to follow an alternate course).

First, make sure that TimeZero and the Pilot are receiving the heading value from the same heading sensor. This will help when troubleshooting the heading sensor value. Then make sure that the heading value displayed on the pilot matches the value displayed in TimeZero (configure heading in the NavData panel to compare the value). If the values don't match, make sure that the pilot and TimeZero are using the same North Reference (Magnetic or True).

Once you checked that the heading is the same on the pilot and TimeZero, add a Course Over Ground ("COG") data box in TimeZero. On a calm day (low wind, no current, low wave), steer your boat on a straight line at 6-10Kn. In these conditions, the direction you are going (COG) should match the heading of the boat. In other words, the Heading and COG values displayed in TimeZero should be the same (+/- 1 degree). Repeat this process in various directions (heading North, heading South, heading East and heading West). If the heading and COG values don't match (offset more than 2-3 degrees), then the heading sensor needs to be calibrated if you want the "Nav" mode to steer in the correct direction.

### **Pilot not handling correctly the change of Waypoint**

If the Pilot "overshoots" a Waypoint, make sure that you have setup a Waypoint Switching Radius large enough in TimeZero to allow the pilot to start the turn before it actually reaches the Waypoint. The Waypoint Switching Radius can be adjusted from the [Routes](#) Options.

Also, make sure that the counter rudder gain (parameter of the pilot) is set up properly for your boat. This parameter varies with the "inertia" of your boat. Some pilots (like the Furuno Pilots) learn this parameter dynamically and gets better after a couple of turns. This information will be found in the pilot manufacturer's documentation.

## **Summary**

Here what to keep in mind when configuring a pilot with TimeZero:

- Make sure that the pilot is correctly connected to TimeZero (NMEA0183 or NMEA2000, Port COM, Baudrate, Wiring)
- Select the correct NMEA0183 output sentence (in most of the cases, APB, XTE and RMC will work) or check "NMEA2000 Pilot Output" from the last page of the Connection Wizard (when using NMEA2000)
- Make sure to match the bearing readout in TimeZero and on the Pilot (Magnetic or True) and make sure to send a bearing that has the same reference as the heading sensor (magnetic in most cases)
- Activate a route and make sure that XTE and CTS match on TimeZero and on the Pilot (display these two information on the pilot)
- Make sure that the heading sensor used by TimeZero is the same heading sensor used by the Pilot and make sure it is properly calibrated. Remember that a heading sensor that is offset by 3 or more degrees will cause the pilot to steer the boat by the same error!

## **How to adjust priority on NMEA2000**

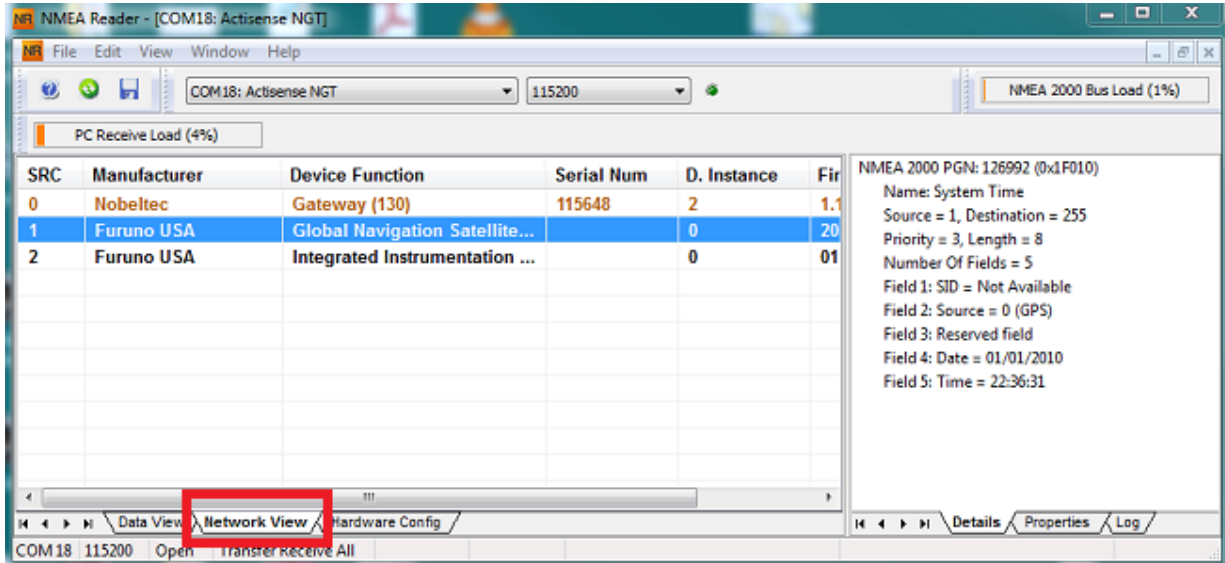
It is possible to have multiple devices providing the same information on a NMEA2000 bus. For example, you could connect on the same NMEA2000 backbone a GPS and a weather station. Some weather stations have an embedded GPS and they can provide wind but also GPS information resulting on two GPS information on the bus (one coming from the GPS and another one coming from the weather station). In TimeZero, when you configure a NMEA2000 connection, you cannot see individual sensors. So, to adjust priority (select the "Master" sensor) you have to adjust the sensor instance number. A device with a lower instance number has higher priority than a device with a higher instance number. So, if you want to make the GPS higher priority over the Weather Station, you need to set the GPS device instance to "0" and the weather station to "1".

TimeZero will be able to switch automatically from one device (with higher priority) to another device (with lower priority) in case of failure of the "Master".

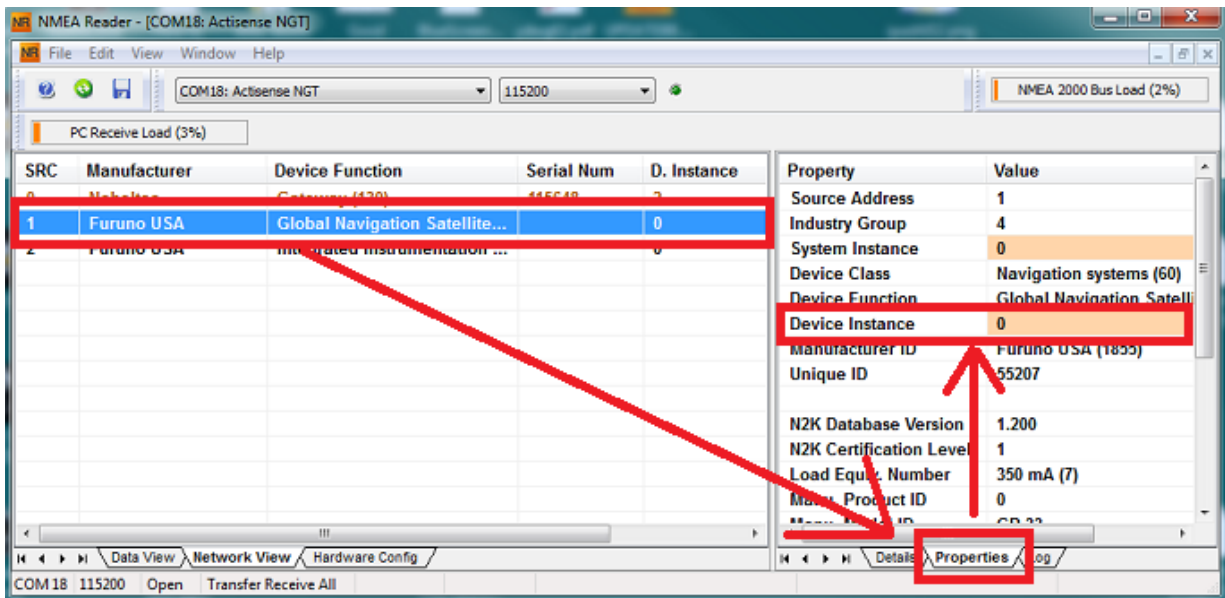
Note that the instance number is actually a property of the sensor (it is stored inside the sensor and not in TimeZero) and to change it, you need to use the Actisense "NMEA Reader" tool (available for free on the Actisense Software). The "NMEA Reader" software is a very valuable tool that allows you to see the list of sensors connected on the NMEA2000 bus (and the data they output), but also allows you to change the device instance number.

**Note:** It is not possible to use the NMEA Reader and TimeZero at the same time. Make sure to exit TimeZero before opening the Actisense NMEA Reader.

Open the Actisense NMEA Reader and select the "network view" (tab selection is at the bottom left):



Select the product whose device instance you want to change and select the properties tab at the bottom right:



Click on the device Instance field, set the number you would like to use and press the ENTER key on your Keyboard.

**IMPORTANT:** With some devices, you may not see any change until restarting the device.

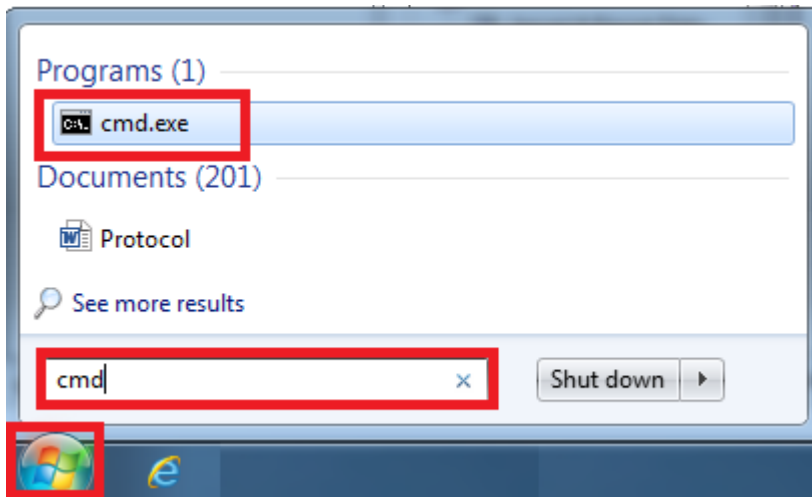
## How To Ping

### Ping a Network Device

To check the connection between the computer and any Ethernet device (Sounder, Radar, etc...), you can ping the device using its IP address.

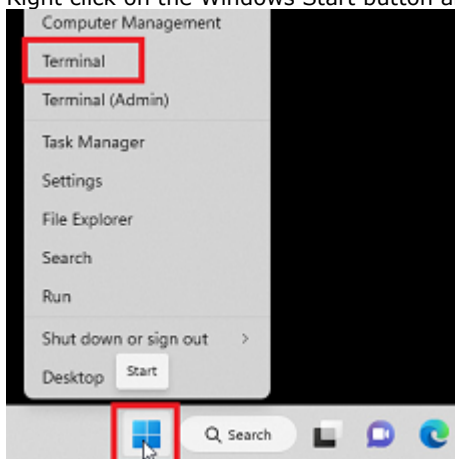
Under Windows 7 or Windows 10:

Click on the Windows Start button and search for "cmd". Select "cmd" or "command prompt" under "Programs" or "App":

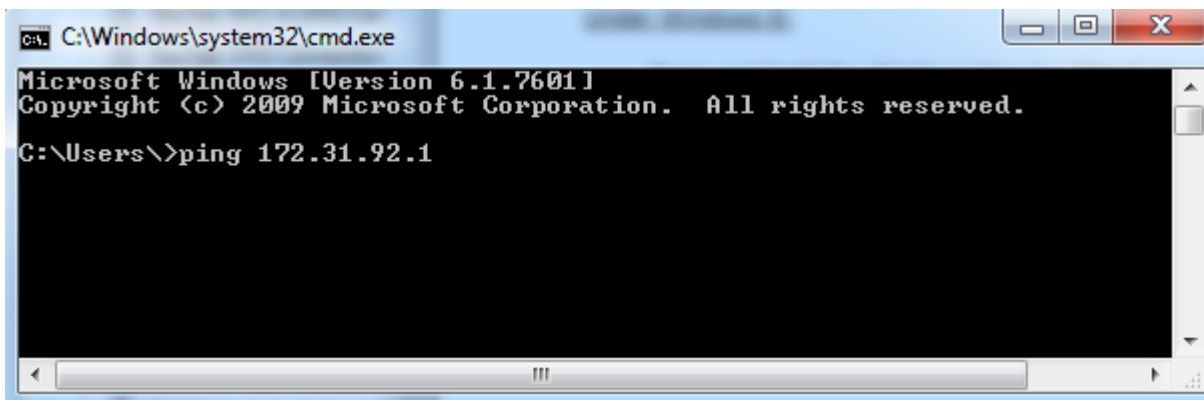


Under Windows 11:

Right click on the Windows Start button and select "Terminal":



Once the Command prompt appear, type "ping 172.31.92.1" (replace "172.31.92.1" with the IP address of the device you would like to ping):



**Note:** Do not enter leading 0 in the command. For example do NOT type "ping 172.031.092.001"

If the result is Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), the communication with the Ethernet device is OK.

If the result is Packets: Sent = 4, Received = 0, Lost = 4 (100% loss) or if any error is returned, there is a problem with either the IP configuration of the computer or the cable. Ensure the IP address is correctly set-up and the correct cable is plugged into the network interface. If the computer is connected to a Hub, ensure that the "green light" is on and blinking on the corresponding Ethernet cable. If you still have problems, try alternate Ethernet cables.

**Common IP addresses:**

**Furuno Static IP Addresses:**

- AIS FA30 = 172.31.24.2
- AIS FA50 = 172.31.24.3
- Weather BBWX1/ BBWX2 = 172.31.200.2
- Sounder DFF1 or BBDS1 (when the switch are "Down - Up - Up - Down") = 172.31.92.1
- Sounder DFF1-UHD (when DIP switches 1 and 2 are set to OFF) = 172.31.92.2
- Sounder DFF3 (when DIP switch 1 and 2 are set to ON) = 172.31.92.1
- Sounder FCV1150 = 172.31.92.20
- Multibeam Sounder DFF3D (when DIP switch 1 and 2 are set to OFF) = 172.31.92.21
- Master NavNet3D MFD = 172.31.100.254
- First NavNet TZtouch MFD (TZT, TZT2, TZT3) on the network = 172.31.252.1
- Radar Processor FAR2xx7 (set to radar 1 with S1 switch #4 set to the OFF for Class B network) = 172.31.3.6
- Radar Processor FAR2xx7 (set to radar 2 with S1 switch #4 set to the OFF for Class B network) = 172.31.3.7
- Radar Antenna FAR2xx8 (default Class C network) = 192.168.31.101
- Radar Antenna FAR3xxx (default Class C network) = 192.168.31.101

**Furuno Auto IP Addresses:**

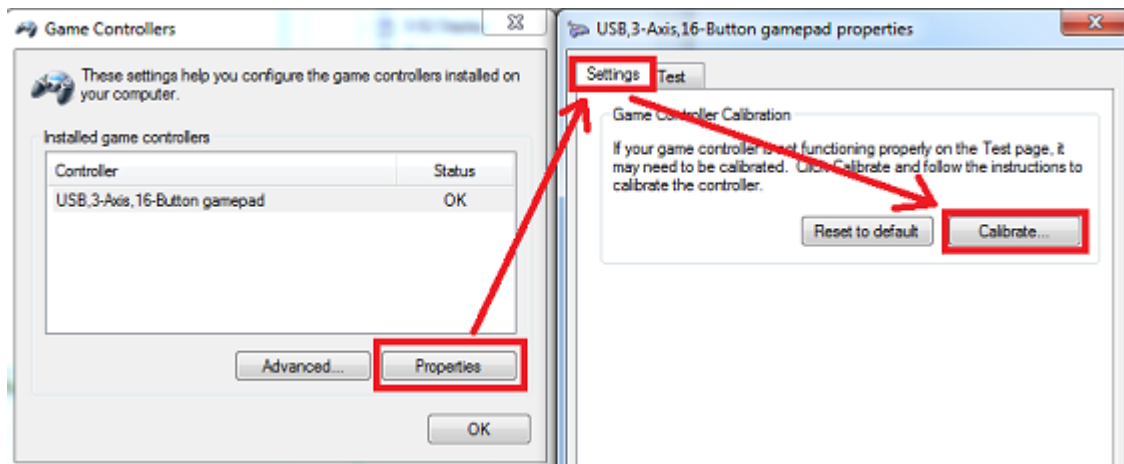
Furuno MFDs and DRS radars adopt an "Auto-IP" mechanism that automatically assigns an IP address to the device in a specific range. Unfortunately, it is not possible to predict the exact IP address of those devices without analyzing the network with a tool such as Wireshark. Below is the range of IP address those devices are using:

- NavNet TZtouch (TZT, TZT2, TZT3) = 172.31.252.x (first MFD on the network should always be 172.31.252.1)
- DRS with firmware v1.16 and above = 172.31.253.x
- DRS-NXT = 172.31.3.x

## Calibrate Joystick

Before using a USB joystick to control a PTZ Camera, it is highly recommended to calibrate it. Joystick that are not properly calibrated can move and zoom the camera on its own resulting into abnormal movements and tracking that is not working.

To calibrate the Joystick, open the "Start" menu of Windows and search for "Joystick". Under settings or control panel, select "Setup USB Game Controller". The Game Controllers control panel opens. Select the Joystick that appear in the list and click on "Properties". Select the "Settings" tab and click on "Calibrate"

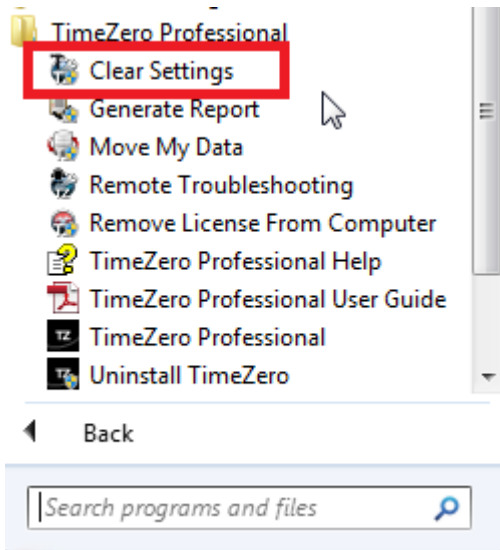


Follow the on-screen assistant to calibrate the Joystick.

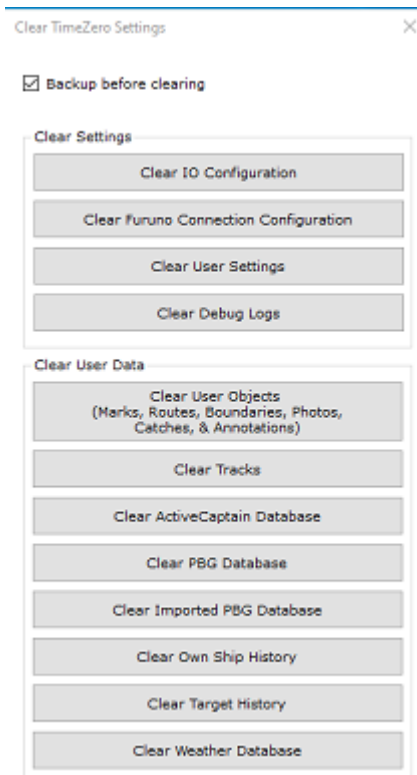
## Factory Default

To reset TimeZero Professional to Factory Default (Master Reset), exit TimeZero Professional .

Open the Windows "Start" menu, locate " TimeZero" and click on "Clear Settings"



The following window will appear:



**Clear IO Configuration:** Erase the Input and Output configuration.

**Clear Furuno Connection Configuration:** Erase various Furuno Connection and Synchronization settings. These settings are restored automatically the next time you connect to a Furuno Sensor.

**Clear User Settings:** Set to default all the Options, NavData Configuration, Toolbar, Ribbon and WorkSpaces.

**Clear Debug Log:** Erase all troubleshooting log files, message and user login information (My TimeZero)

**Clear User Objects:** Erase all the user created objects (Marks, Routes, Boundaries, Photos, Catches, ...)

**Clear Tracks:** Erase all the tracks

**Clear Active Captain Database:** Erase the Active Captain database (the default database will be reloaded after starting TimeZero)

**Clear PBG Database:** Erase the user PBG datatabase (depth & hardness)

**Clear Imported PBG Database:** Erase the imported PBG database (depth & hardness)

**Clear Own Ship History:** Erase the database that keeps the history of your boat position (track recall and boat replay will no longer be available)

**Clear Target History:** Erase the database that stores Fleet and Buoys data (Fishing Buoys)

**Clear Weather Database:** Erase the weather database

If you check "Backup before clearing", the various settings and databases will be moved instead of being erased. Contact Tech Support to recover the files if necessary.

To perform a Factory Default or Master Reset, press on all the buttons.





## **How to Contact Us**

If you have a question about TimeZero, please first review this User's Guide. If you cannot find the answer you are looking for, please contact us through our support portal available at <http://support.mytimezero.com>

TimeZero is supported by Nobeltec in North and South America and by MaxSea everywhere else:

**MaxSea International**

Technopole Izarbel  
Allée Théodore Monod  
64210 Bidart (FRANCE)

International Support Line:

+34 932 20 45 00

France Support Line:

0 899 700 264

Available from Monday to Thursday 9h00 - 12h00 and 14h00 - 17h30 / Friday 9h00 - 12h30 and 14h00 -17h00 ( UTC)

Fax: +33 (0)559 43 81 01

Sales email: [info@maxsea.fr](mailto:info@maxsea.fr)

Web site: <http://www.mytimezero.com>

**Nobeltec, Inc.**

16100 NW Cornell Rd., Suite 200,  
Beaverton, OR 97006 USA

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Sales email: [sales@nobeltec.com](mailto:sales@nobeltec.com)

Web site: <http://www.mytimezero.com>



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The Services may create automatic backups of Your navigation data (route, marks, etc.), when the Application is launched and connected to the Internet. The Application will store your last backups on Your My TIMEZERO dedicated private cloud storage account; however, if a device has not backed up to My TIMEZERO for a period of one hundred and eighty (180) days, Nobeltec reserves the right to delete the backups associated with that device. Nobeltec shall use reasonable skill and due care in providing the Services, but, to the greatest extent permissible by applicable law, Nobeltec does not guarantee or warrant that any content You may store or access through the Services will not be subject to inadvertent damage, corruption, loss, or removal in accordance with the terms of this Agreement, and Nobeltec shall not be responsible should such damage, corruption, loss, or removal occur. It is Your responsibility to maintain appropriate alternate backup of Your information and data.

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