

MagNum User Manual

MN-101

MN-200

MN-300



Version 1.1
relates to Software Version 2.0.xx

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MagNum User Manual

- ... affordable
- ... feature rich
- ... ergonomically
- ... light weight
- ... up to 4 motors
- ... support for two individual hand units
- ... broadcast applicable
- ... dual band radio communication
- ... servo lens support
- ... Cine Tape display
- ... useful & intelligent accessories

System overview

The Chrosziel MagNum LCS was developed to meet a broad spectrum of needs of today's ACs & Broadcasters. It provides an outstanding value for money with an unique combination of ergonomics, reliability and precision. Low budget productions are addressed as well as highly professional applications. It complies with up-scaled requirements regarding precision and traction even in extreme environmental conditions like deep temperatures and associated stiff lenses.

The MagNum family starts with the single channel LCS MN-101 dedicated for low budget professional productions. The user is provided with a powerful precise tool for his daily work with lots of interesting features. For even more professional features (i.e. Cine Tape Display), the user may chose between the MN-150 (two motors/single channel hand unit) , the MN-200 (full two channels) and MN-300 (three channel solution). The MN-150 can be upgraded later to a MN-200, if needed. Both, motor controller and hand units can be combined with the complete MagNum family. The hand unit can be split up into two units for separate Focus and Iris control. Due to the semi hermetic design it can be used in dusty and humid environments.

MagNum is compatible with nearly all third party digital encoder motors from Preston, Heden, Betz Tools, ARRI (CLM-4), Scorpio, Element Technica or any other similar products. The internal power booster supply for the motors allows for independence from the input voltage level and therefore motors can deliver their maximum torque on 12V as well as on 24V power sources.

As an additional unique feature, MagNum provides dual band radio communication. Beside the commonly used 2.4 GHz band, MagNum can be switched to the 434 MHz band as well, if the GHz band is occupied by to many other emitters (as there are Wifi, video transmitters etc.).

Help to improve your MagNum

Chrosziel listens to their users feedback & requests regarding features and others very carefully. You are invited to take part in this process. If you feel you need to contact us in this matter write an e-mail to magnum@chrosziel.de.

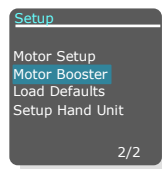
Also, we highly recommend to register your product with your e-mail address and serial numbers in order to be notified for new software releases instantly. Chrosziel is using this registration information for update information purposes only. Simply write to magnum@chrosziel.de as well. The update procedure is described in chapter "

Software update via *USB* on page 25.

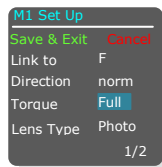
Powering the unit

The motor controller (MN-101R/ MN200R) is basically powered through the 5pin Lemo socket. The controller accepts voltage levels from 10-30V. For maximum safety, the power input is protected against application of wrong power polarity and overvoltage. It features an electronic power surge as well. Please choose a strong power supply if high torque for the motors is required. The best option is always to obtain the power from a battery directly (D-tap connection). Some cameras provide a so-called accessory power out. Those power sources are mostly not very strong. Reduce the power consumption of the receiver in such a case with following methods:

a.) Reduce the voltage boost level for the motors. Go to menu entry "Motor Booster" in the setup menu and assign a value from 0 (Booster off) .. 4 (Booster max).



b.) reduce the maximum torque of a particular motor. Go to menu entry "Motor Setup" and modify the "Torque" setting (Low = 25%, Mid = 50%, Full = 100%).



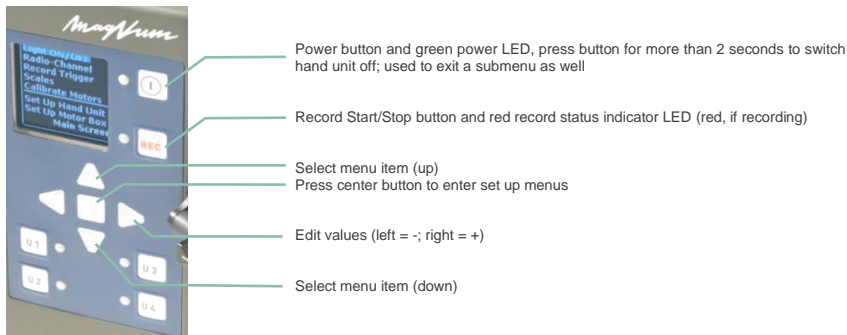
If a short power drop occurs, the info line in the hand unit's main screen showing the voltage level of the power supply of the "brain" side changes to "Brain. Pow. Drop!". The power LED on the motor controller side is flashing orange in that case additionally. Even if the supply recovers, the display does not change until reboot of the system. This is to make sure that even short power drops are recognized by the user so that the user can react to it by checking the circumstances like empty battery or weak power source.

The hand unit (MN-100T/ MN-150T/ MN-200T) is powered through a standard Li- battery (SONY NP-FM55 or compatible). Alternatively, the hand units MN-150/200T can be powered by an external power supply through the 7 pin Lemo serial connector. The battery voltage is indicated on the main screen by a battery gauge. If voltage of the battery becomes too low, the green power LED on the keypad beside the power button starts blinking. The user can still expect several minutes of operation, but the empty battery should be exchanged as soon as possible.

For all power connections, refer to section "Connector pin outs" on page 29, cables are listed in section "List of cables" on Page 30 of this document.

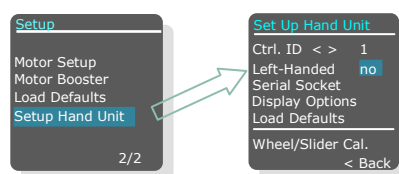
General menu navigation

Menu navigation is done by pressing the desired buttons on the foil key pad. The up/down arrow buttons mainly *select* a menu entry while the left/right arrows *modify* an entry. The centre button of the arrow cross *enters* the menu towards deeper menu levels or performs "Save" and "Exit" operations. In addition, the power button may be used to *exit* some of the submenus quickly.

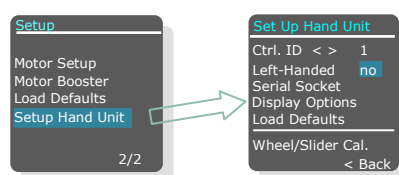


Setting up the display options and the "left-handed mode" of the hand unit

For sinistrals willing to use the Focus hand wheel with their left hand, the hand unit can be switched to the "Left-handed" mode. Enter the setup menu of the hand unit, navigate to "Set up Hand Unit" --> "Left-Handed". The mode can be changed by pressing the left/right arrow buttons. If active the display orientation is turned by 180° and the directions of the arrow buttons are adopted as well.



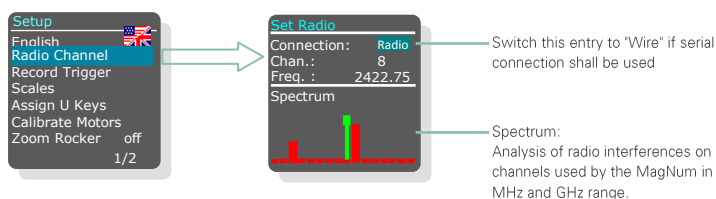
Select whether several displays shall appear on the main screens info area as there are the Cine Tape reader value (in metric or imperial representation) & voltage level of the motor controller supply. The Cine Tape measure is displayed as selected regardless which setting was done on the Cine Tape itself. As an example the Cine Tape can be setup for imperial display while the Magnum hand unit displays the measure in metric.



Selecting the radio channel, determining interferences from other radio equipment

As already mentioned in the section "System overview", the MagNum MN-150/200 supports two frequency bands (434 MHz and 2.4 GHz). The MN-101 has the same frequencies and channels (channels for MHz (0..4) are not supported). The band is selected automatically when the radio channel is set. Please refer to following table:

Channel	Center Frequency
0	433.10 MHz (use external Antenna; MN150/200 only!) (10mW)
1	433.20 MHz (use external Antenna; MN150/200 only!)
2	433.40 MHz (use external Antenna; MN150/200 only!)
3	433.80 MHz (use external Antenna; MN150/200 only!)
4	434.40 MHz (use external Antenna; MN150/200 only!)
5	2.400.75 GHz (30mW)
6	2.40375 GHz
7	2.40975 GHz
8	2.42275 GHz
9	2.44075 GHz
A	2.44375 GHz
B	2.44975 GHz
C	2.46275 GHz
D	2.47075 GHz
E	2.47375 GHz
F	2.48175 GHz



Please note: When this screen is visible, the MagNum wireless connection is temporarily disconnected as the hand unit scans through all available RF channels in order to find possible frequencies and display other emitters. Use external antenna on BNC connector if MHz range is used (Channels 0-4). For GHz range (Channels 5 - F) internal antennas are used.

LED signals on motor controller



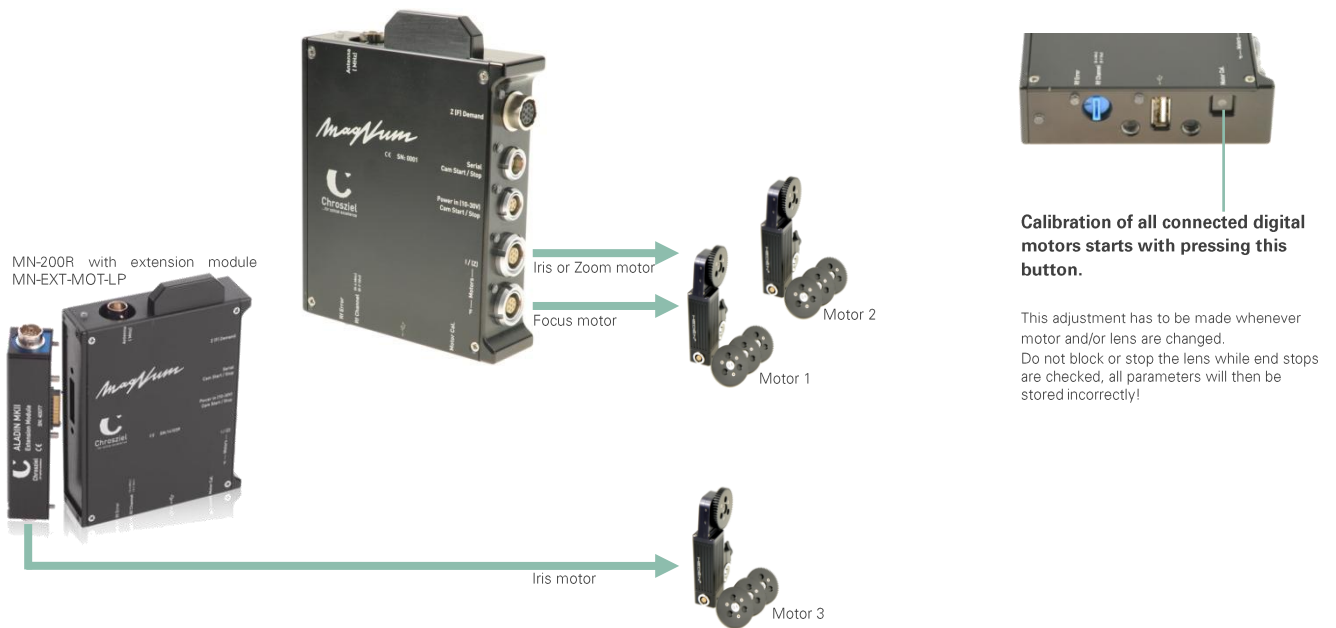
Setup and calibration of digital encoder motors

Connecting:

The Magnum system supports digital encoder motors of nearly every known manufacturer as there are Heden, Betz Tools, ARRI (CLM4), Preston, RED, Indiecarn and compatible products.

On the MN-101 motor controller, there is one motor socket which responds to the focus wheel of hand unit (with hand unit ID set to 1).

The MN-200R motor controller has two motor sockets. Per default the motor 1 (labelled with "F") is assigned to the wheel of the hand unit with ID1. Motor 2 (labelled with "I/(Z)") is linked to the slider of the hand unit with ID1 or the wheel of hand unit with ID2. As soon as a Zoom control is used (either with a local zoom demand connected or wireless Zoom control from hand unit), this motor switches automatically to the Zoom function. One or two further motors can be used if the Magnum MN-200R is extended by an extension module like MN-EXT-MOT-LP or AL2-EXT-MOT. Default function of the motors can be overwritten within the motor set up menu.



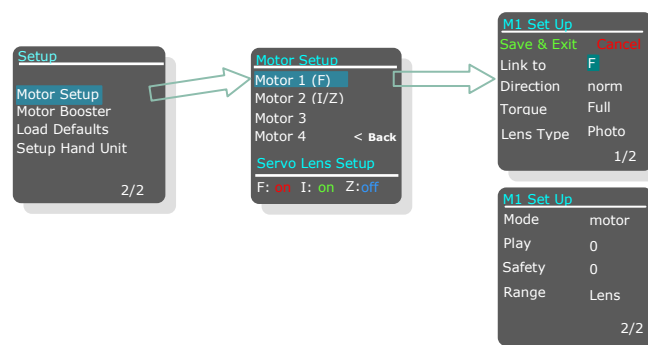
When (re)mounting the system to the camera it is recommended to power the motor controller first and connect the motors afterwards. This is because the MagNum controller monitors the motors all the time and is notified through these procedure that motors have been connected. So the end stops will be cancelled and motor can not hit the lens end stops accidentally. If motors are calibrated correctly power can be disconnected and reconnected from the motor controller every time without losing the calibration information.

Before calibration is done, the following set-up steps must be followed in the set up menu:

- 1) Booster setting (decision for general motor torque for all motors) refer to section "Powering the unit" on Page 8.
- 2) Torque setting for each single motor
- 3) Lens type (Cine or Photo lens)

Do NOT change settings 1 & 2 after calibration or repeat calibration if changed.

Setup: Navigate to the desired motor port to be set up as follows:

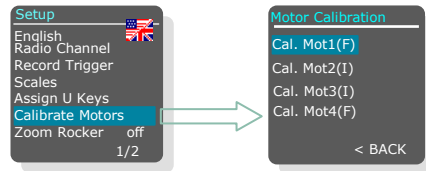


Check for correct setting of "Torque", "Lens Type", "Mode" & "Range". If motor rotating direction shall be reversed, modify the "Direction" entry. Leave the menu by either using the "Save & Exit" or the "Cancel" entry.

Calibration :

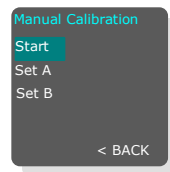
Calibration can be started either by pressing the button labelled "Motor Cal." on motor controller or remotely by choosing a single motor intended to be calibrated. If the local hardware button on the motor controller is used ALL motors are forced to enter the calibration procedure.

For remote calibration navigate to the motor calibration menu entry:



If motor is in "Cine" mode, the lens is expected to have mechanical end stops. So the calibration can be done automatically by the motor without intervention from the user. Calibration of the motor will start immediately after operating the entries "Cal. Mot. ...".

If motor is in "Photo" mode, the mechanical end stops on the lens gear do not exist and need to be assigned by the user manually. Therefore a sub menu appears after operating the entries "Cal. Mot. ...".



In manual mode, three steps must be done:

"Start" sets the motor in calibration mode, the current position of the hand wheel or slider is set as a starting point. It is a good practise to set the hand wheel/ slider to a around 50% position before starting the process. Now drive the motor carefully to first dedicated limit by using either the hand wheel for motor 1 or the slider or Zoom demand respective for motor 2. Then Press "Set A", the first limit is stored. Then, drive the motor as before to the second limit and press "Set B". The second limit is stored and the motor starts moving on its own to measure the lens parameter (mainly strength) to finalize the calibration procedure. Repeat procedure above for any other motor.

Instead of using the menu, the hardware calibration button can be used as well for calibrating motors set to "Photo" mode. The button then needs to be pressed successively 3 times while performing the above-described steps for every motor in parallel at the same time.

Note: Motor channels on the extension module do currently NOT support the "Photo" mode, but may do so in the future.

For information about cables refer to section "List of cables" beginning at page 30 of this document.

Setup connections to servo lenses

The so-called Servo lenses have their own motors in the servo unit which is mounted directly on the lens. External encoder motors can be disclaimed.

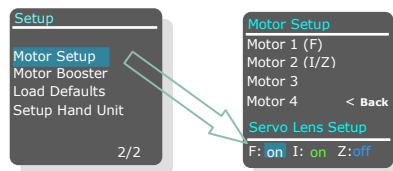
Control over those motors is made by a digital serial link from the MagNum Motor controller to the lens servo unit.

The MN-200R features one serial digital port which is used for this purpose. The MN-200R can either be powered through the connection cable from the lens directly or powers the lens vice versa. For information about cables refer to section "List of cables" beginning at page 30 of this document.



The user is able to configure the use of the servo motors to be controlled by the MagNum in the set up menu.

Navigate to the motor set up menu and then to the "Servo Lens Setup" section. While highlighting the entries for F/I/Z, the user can decide which function shall be done by the MagNum controller ("on") and which shall be performed by the servo unit's controller again ("off").

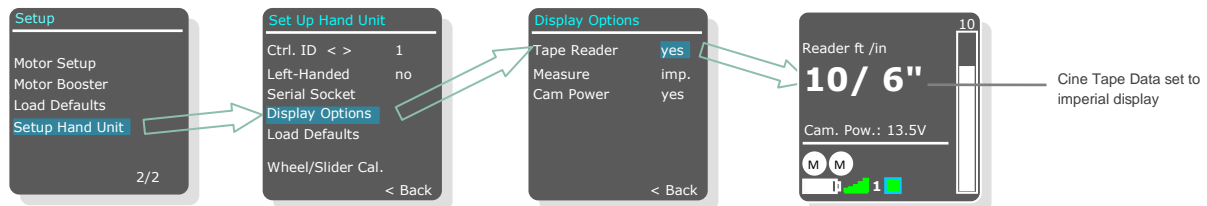


For information about cables, refer to section "List of cables" beginning at page 30 of this document.

Connecting a CINE TAPE MEASURE (CTM) System

For comfortable use, the data of the CTM can be displayed on the MagNum hand unit. The CTM has to be connected by wire to the MagNum motor controller.

Data are received automatically as soon as the CTM is in operation. The user can change the data display from metric to imperial and vice versa. This setting is independent from the setting in the CTM it self. So i.e. the CTM might display the distance in meter while MagNum hand unit displays the same distance as feet.



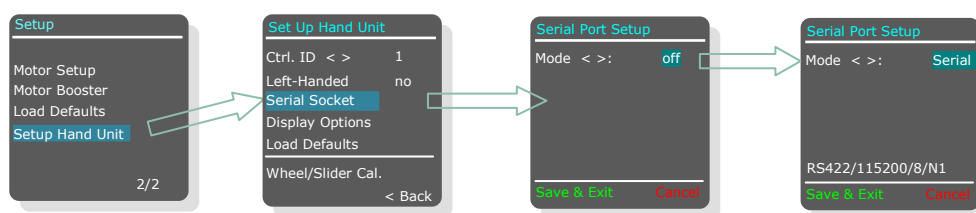
This feature is available with the MN-200R brain version only. For information about cables refer to section "List of cables" beginning at page 30 of this document.

Wired connection between hand unit and motor controller

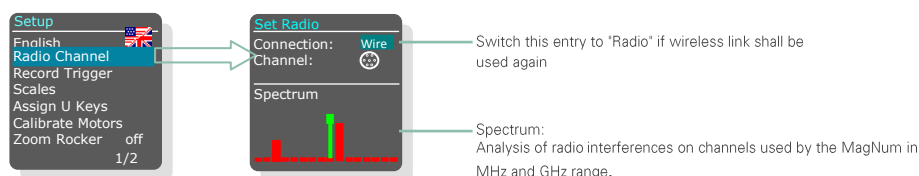
In some special cases, a wired serial connection from hand unit to motor controller is preferred against a wireless connection. Such scenarios can occur when radio communication is not allowed in the respective situation, when radio communication is intentionally suppressed by strong interferences or when a remote device shall be controlled over a glass fibre line or a similar infrastructure.

The connection is established via the two serial sockets (9 pin on motor controller and 7 pin on hand unit). In order to activate the serial connection for the hand unit, go to menu entry "Serial Socket" and set the mode to "Serial". Radio communication is now disabled. The serial socket can be activated/deactivated from the radio channel setup menu as well.

On the motor controller side, the serial link is established automatically, so no further steps have to be done for a serial link set up.



alternative:



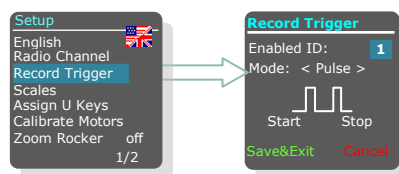
If user wants to go back to radio communication, the serial port of the hand unit needs to be switched to "off" again.

For information about cables refer to section "List of cables" beginning at page 30 of this document.

Camera record start/stop setup & control

The remote Run/Stop function of cameras is mainly controlled with a GPI input on a special socket on the camera where the MagNum has to be connected to. For the different types of connectors, a wide range of camera Run/Stop cables is available for the MagNum. As there are two modes (Pulse & Static) of how to control this pin, the Magnum supports both of these modes and needs to be set up in "Record Trigger" set up menu entry.

The user can decide for the mode of the record trigger signal **and** from which hand unit ID the camera can be started. If "Enabled ID" is set to "1" the camera reacts to the record command from hand unit 1 and to hand unit with ID 2 if set to "2" vice versa.

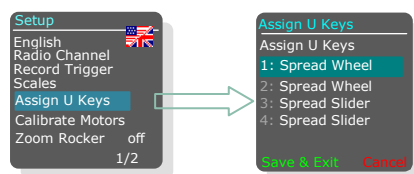


For information about cables, refer to section "List of cables" beginning at page 30 of this document.

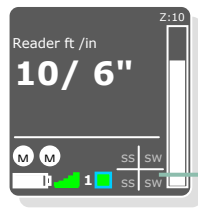
Keypad adoption, assigning U keys

The foil keypad on the hand unit features 4 user keys labelled with U1..U4. Those keys are assignable to several function short cuts. These are as follows:

- "Off" = No function assigned
- "Spread wheel" = spreading function for hand wheel and assigned LED is enabled
- "Spread slider" = spreading function for slider and assigned LED is enabled
- "Cal. Motor1..4" = a push on this button allows direct remote calibration of the motors
- "REC" = duplicates the record switch for more comfort
- "Light On/Off" = power cycling for the goose neck LED light, connected to the two pin Lemo socket on the upper side of the hand unit
- Depending on Software-Version: "Set Zoom Limits", "Zoom Zap"



The active U key assignment is shown with a diagram on the main screen.



Keypad assignment diagram

Short cuts:

blank : off
 sw: spread wheel
 ss: spread slider
 sz: set zoom limits
 c1..c4: cal motor 1..4
 rs: record run/stop
 lo: light on/off
 zz: zoom zap

Features of the advanced "VariLock" Hand Wheel and Slider

The Hand Wheel:

The Hand Wheel is the part of the Magnum that is most used on a long shooting day and therefore has to provide best possible comfort and ease of operation to the AC. The Chrosziel "VariLock" LCS hand wheel meets these requirements with the following features:

✓ easy to set
mechanically
adjustable end stops

✓ precise mechanical
scale pointer

✓ rubber surface of the wheel
for best grip



✓ three different types of
easily attachable scales:
 ○ big ring
 ○ small ring
 ○ flat disk

✓ easy to adjust fluid drag to
optimize the fluid damping for
the operator individually

✓ separate mechanical break
prevents from unintended
movements of the hand wheel

Procedure of friction (fluid drag) adjustment:

Increasing the friction:

- Turn the hand wheel counter clockwise up to the end stop.
- Push the adjustment pin and keep it pressed.
- Turn the hand wheel clockwise. After some degrees of turning the pin should snap into the under laying adjustment ring.
- Increase the friction depending on your needs.

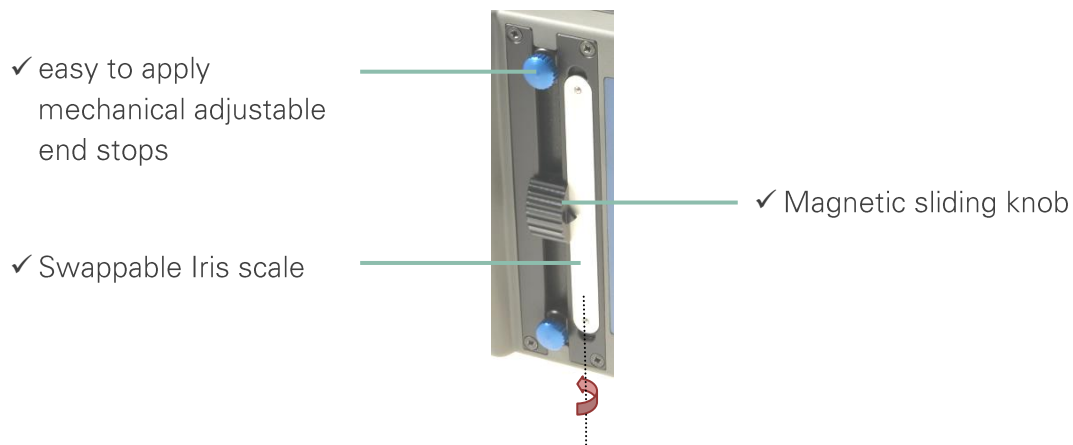
Decreasing the friction:

- Do the same steps as above, but in the opposite direction.
- Turn the hand wheel clockwise up to the end stop.
- Push the adjustment pin and keep it pressed.
- Turn the hand wheel counter clockwise. After some degrees of turning the pin should snap into the under laying adjustment ring.
- Decrease the friction depending on your needs

The Slider:

The slider of a LCS is the second important tool for controlling the lens of a camera. The challenge on sliders is the normally existing slot the slider knob is pulled along. This gap allows dust and moisture to enter the hand unit. Chrosziel has introduced a new slider technology based on magnetic coupling which allows a hermetic design of the slider and therefore of the whole hand unit.

Another special feature of the MagNum slider are the adjustable mechanical end stops similar to the hand wheel allowing a fast and easy way to set some inner limits for the Iris pull. Also to mention is that the aluminium stripe of the Iris scale can be removed and reassembled the other way round giving a second facility for writing a alternative Iris scale.



Spreading the hand wheel/ slider

Before the procedure is described, one needs to understand the meaning of spreading and how it works.

In **normal mode** (Spreading is off) the full rotation/movement of the hand wheel/slider corresponds to 100% of the lens scale range between the two mechanical end stops. In **spread mode** only a part of the lens scale corresponds to the full range of the hand wheel/slider. This mode is useful if a highly accurate pull shall be performed in a specific range of the lens scale. For example: the scale of the lens ranges from 0,3 m to infinity, but the next shoot shall be done from 20m to 30m only and needs to be very precise in this range, it will be spread to the full scale of the hand controller. The one end stop then corresponds to 20m and the other to 30m.

MagNum allows the storing of **up to four independent** spread settings which can be switched off if not needed and recalled later on by simply pressing a button. Before spreading can be used, at least one of the user keys U1-4 needs to be set up for a spreading function either for slider or for the hand wheel.

Store a spreading:

- Move hand wheel/slider to the first limit of the scale portion to be spread
- Press the desired U-key and wait until the associated LED is blinking- this will happen after 1 second. The first limit of the spread range is memorized.
- Keep the U-key pressed and move the hand wheel/ slider to the second limit and release the key. Second limit of the spread range is memorized. The LED for that user key will light permanently indicating that spreading on that button is active now.
- In order to switch off that spreading, simply press the U-key for less than one second. No LED is on.
- In order to recall the previously programmed spreading press the same user key again for less than one second - the LED switches on again.
- Repeat procedure above for any other user key if required.

Hint:

When applying a “zero” spreading (the hand wheel was not moved during the spreading procedure), the recall of this spreading setup can be used as a kind of preset control for a desired position or lock the motor electronically to a desired position.

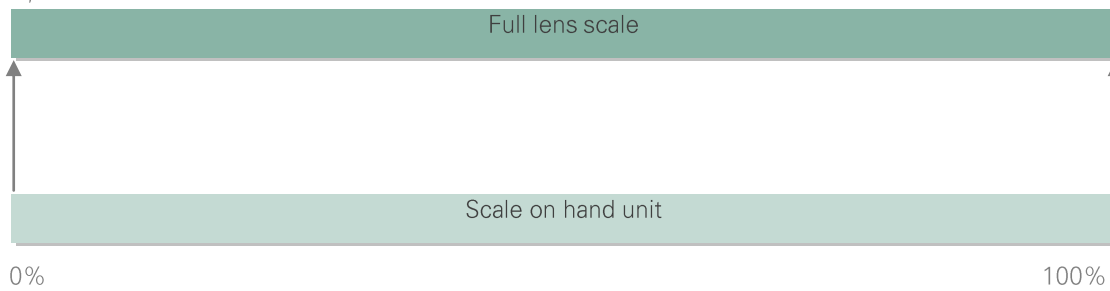
Example: Drive lens ring to 30m and press U1 key for more than one second. Release U1. Drive the lens ring to 20 m and hold down U2 for more than one second. Release U2. Do not turn the hand wheel in both steps.

Now the scale values 30m and 20m can be recalled instantly by pressing on U1 or U2 once.

Normal (1:1) Mode

0,3m

Infinite



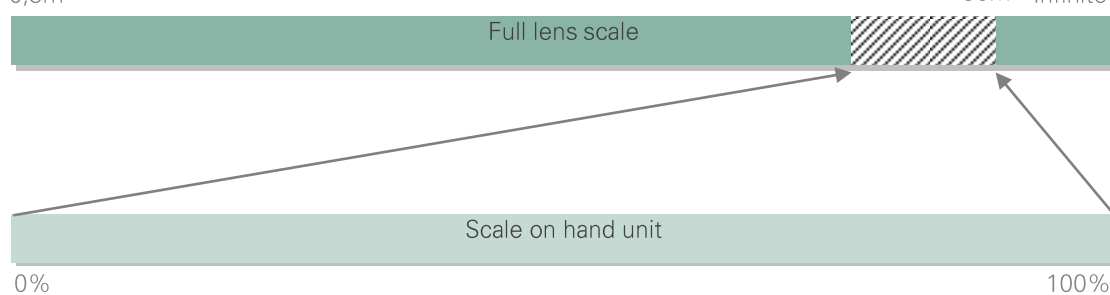
Spread Mode:

0,3m

20m

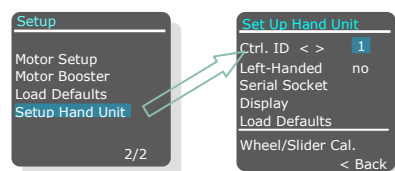
30m

Infinite



Two hand units for controlling Focus and Iris separately

The MagNum family provides the possibility to split up the control functions of e.g. Focus and Iris into two hand units. This is very useful if two operators (1.AC for Focus and DIT for Iris) want to share the work on the lens. The MagNum system distinguishes the two hand units by the ID they are set to. The first hand unit (ID 1, this is the general default as well) controls the Focus motor while hand unit with ID 2 automatically is linked to the Iris function. In order to set up the ID of a hand unit navigate to setup page 2/2 and hit the "Set Up Hand Unit" entry. Modify the entry "Contr. ID" from 1 to 2 or back to 1 if required. Two hand units with same ID must not exist on same radio channel. This will lead to unintended jumps of the motor(s).



If two hand units are going to be used, the operator has to decide from which of the two units the camera run trigger shall be operated. The assignment of the hand unit enabled for the RUN control is done in the menu "Record Trigger". Please refer to section "Camera record start/stop setup & control" on page 17 of this document. The default setting is "1".

Wired and wireless Zoom control, changing the Zoom speed ratio

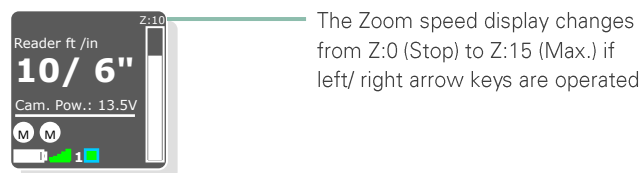
The Magnum has two ways of operating the Zoom (focal length) of a lens. It allows three different ways to control the Zoom either wired or wireless.

For wireless Zoom control, mount the Chrosziel Zoom Rocker to the hand unit and set the menu entry "Zoom Rocker" to "on". Alternatively the up/down buttons of the foil keypad may be used as a simple Zoom controller. In any case, if the "Zoom Rocker" is switched to "on", the main screen shows an additional vertical bar graph indicating the current relative position of the Zoom motor. The Zoom speed can be set with the left/ right arrow keys. Please note: If Chrosziel Zoom Rocker shall be used, the software feature needs to be enabled in the Section "Set Up Hand Unit".



For wired Zoom control connect a third party zoom rocker directly into the 12 pin Hirose on-board demand socket of the motor controller (MN-200-R only). This helps the DOP to control the Zoom on his own locally behind the camera. The Zoom rocker is detected automatically and the motor No. 2 (labeled with I/(Z)) turns into a Zoom motor with speed control for highly precise and smooth zooming. The LED near the socket lights up (refer to section "LED signals on motor controller" on page 12. **When connecting a Zoom demand to the socket or repowering the motor controller, the zero position of the Zoom controller is determined by the controller automatically. The rocker must not be operated at this time, otherwise a wrong zero calibration is performed and the Zoom motor will move on its own when releasing the rocker.**

Please note: As motor 2 (I/(Z)) reacts to the Zoom demands in both cases it will not react to changes of the hand units slider because it is automatically switched to the Z-function.

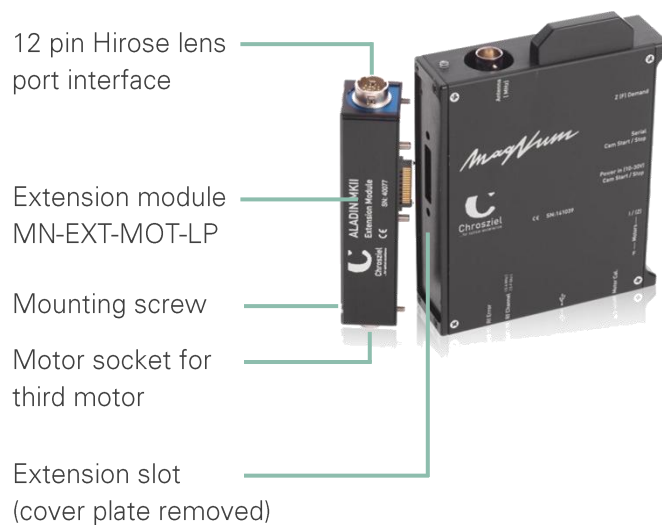


Extending the MN-200

If a third motor shall be involved at this stage, the MagNum motor controller needs to be extended by the extension module MN-EXT-MOT-LP. This module introduces a third motor channel assigned to Iris function by default. On the other side a lens port interface for broadcast video cameras is supplied. The lens port interface allows a full integration of the so called "broadcast workflow". It accepts analogue iris control signals for remote operation of the Iris motor as well as feeding back the F/I/Z motor positions and states of the two switches RET and VTR.

In order to mount the extension module to the receiver go through following steps:

- DISCONNECT receiver from power
- Remove the cover plate on the rear (open the two inner screws)
- Plug in the extension module in the correct direction
- Fix position by screwing the two long screws of the module into the receiver housing
- Reconnect power



Using the MagNum in a typical broadcast environment

In conjunction with the extension module MN-EXT-MOT-LP, Magnum motor controller/brain brings back the full broadcast workflow with lenses not having a broadcast motor servo drive unit.

For behind-the-camera control, the Magnum accepts common broadcast demand units for Zoom and Focus with analogue control signal. Either one Zoom demand can be connected directly into the demand socket of the brain or a F & a Z demand are connected through a Y-adaptor to the demand socket at the same time.

The extension module extends the 2- channel base system to a three motor system on the one hand and allows to interface to a standard 12-pin Hirose lens port connector of the camera on the other.

The currently supported functions of the lens port are:

- Iris control from the control room / OB-van via the camera with a standard analogue Iris control signal
- VTR/RET switch feedback to the camera
- analogue motor position feedback of the Focus/Iris/Zoom motor

Camera head light control via DMX

If dimmer cable shall be used for controlling a dedicated LED light, configure the mode of desired motor channel from "motor" to "dimmer". On hand unit, navigate to "Setup hand unit"/ "Serial Socket" menu and modify the mode of the on-board serial socket to "DMX". Apply a DMX address, the lighting console will talk to and leave the menu with "Save & Exit". Connect the hand unit to the lighting console with a dedicated DMX cable (refer to list of cables at the end of this document). If a DMX signal is present, the DMX level is shown on the main screen.

Note: The DMX signal takes over control of the hand wheel. If motor 2 (normally used for Iris) is connected for light control switch the ID of the hand unit from 1 to 2.

If hand unit with ID 2 controls the I-motor, a second hand unit with ID1 can be used in parallel for controlling the F-motor (motor 1).

Software update via USB

Chrosziel is continuously improving the software of the system based on the demands of the industry including customer-requested improvements. The user can easily install an update to the latest software. The only requested items are the software files supplied by Chrosziel and a standard USB- Stick. Files can be downloaded from the Chrosziel website. To register for update notifications, please write an e-mail to MagNum@chrosziel.de.

Always update both, motor controller and hand unit- with the same software version!

Unzip and copy the provided software files into the root of an USB stick (FAT/FAT32 formatted).

Update procedure for hand unit:

- Power down the hand unit
- Plug USB stick into socket
- Press and hold down "REC" button and power on the hand unit.
- Unit will perform the update indicating the progress by different LED flashing patterns on the front. After update, the unit restarts automatically

Update procedure for motor controller (brain):

- Power down the controller
- Plug USB stick into socket
- Press and hold down "Motor Cal" button and repower the motor controller
- Unit will perform the update indicating the progress by different LED flashing patterns on the front. After update, the Unit restarts automatically

After a software update establish a link between the hand unit and the motor controller and perform a factory default as described in section "Loading the factory default setup".

Loading the factory default setup

Loading the factory default setup brings the unit back to a known state. This is useful in trouble shooting situations or if formerly applied changes to the configuration shall be reverted to a standard set up for the next shoot.

Navigate to the set up page 2/2, chose the "Load Defaults" menu entry and hit "Execute". If motor controller shall be reset as well (which the case most of the time), take care to establish a connection between hand unit and the controller/brain by selecting the same radio channel before loading the defaults.

The settings that are set to default are as follows:

Motor channels:

Motor 1 = F

Motor 2 = I(Z)

Motor 3 = I

All motors set back to:

mode = cine lens, play= 0 , safety = 0, mode = motor, torque = full, direction = norm

Motor booster:

Level = 4 (max.)

Wheel/Slider spreading:

All spreadings are reset, the user keys are reassigned to U1/2 spread slider, U3/4 spread wheel, "Zoom Rocker" set to off

Serial port on hand unit:

Mode = off

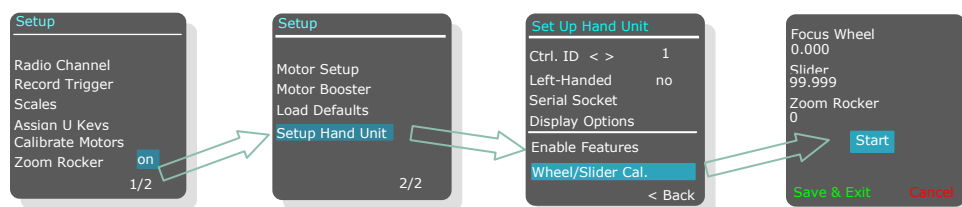
Zoom Rocker:

Mode = off

Basic calibration of hand wheel and slider

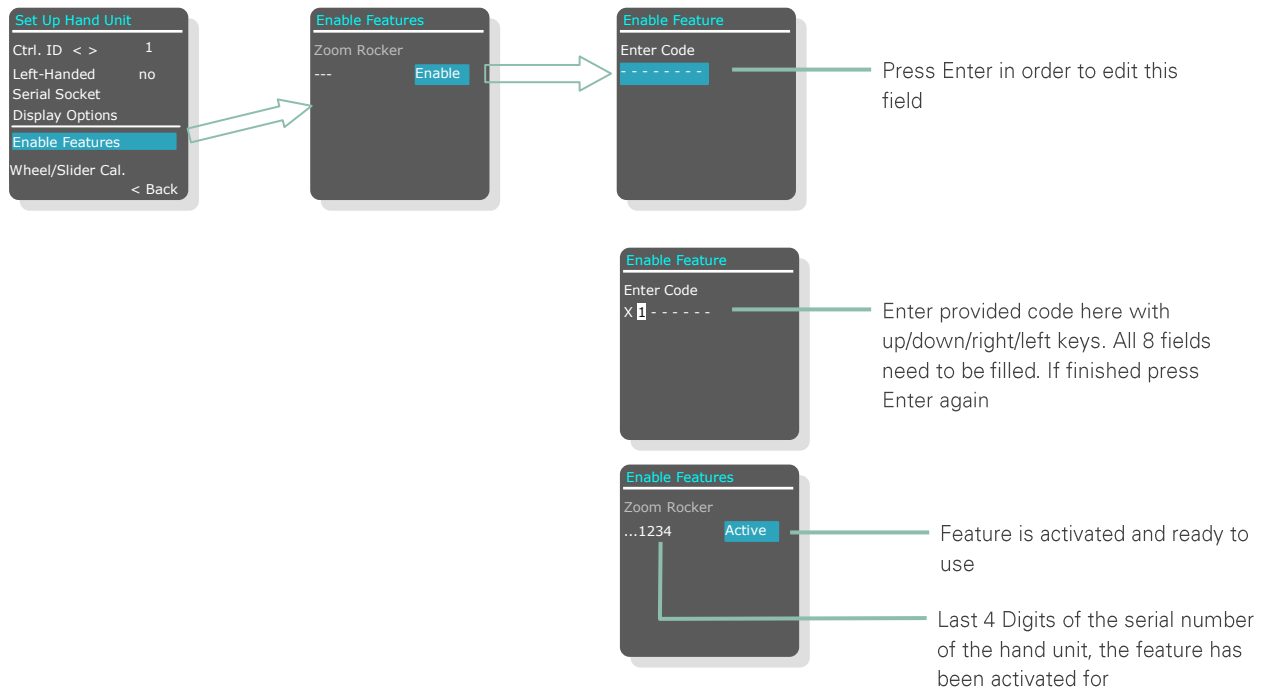
In order to check the proper basic calibration of the hand wheel and slider, navigate to the setup entry "Wheel/Slider Cal.". When turning/sliding from one end stop to the other the dedicated numbers shall change between 0.0xx and 99.9xx. If not, like after software updates or if just 0.000 is shown, it might be necessary to recalibrate the mechanical limits of the hand wheel and the slider against a 100% ratio.

Simply press the "Start" button and turn/slide both devices to each of their mechanical limits. Take care that no inner mechanical end stops are applied (refer to section "Features of the advanced "VariLock" Hand Wheel and Slider" on Page 18). Press "Save & Exit" after the procedure is finished.



Enabling a software feature

Several optional software features can extend and customize the MagNum for even more functionality. Features are enabled by entering a dedicated unlock-code in the menu entry "Enable Features".



MagNum feature comparison chart

	MN-101	MN-150	MN-200
User-optimized ergonomically hand unit	✓	✓	✓
Left-handed mode through a symmetrical case	✓	✓	✓
Compact dimensions for both hand unit and receiver	✓	✓	✓
Light weight (262 g two-channel receiver and 577 g)	✓	✓	✓
Transmits via the worldwide shared 2.4 GHz-frequency band	✓	✓	✓
Menu-driven, intuitive operation via touch keys and colour OLED display	✓	✓	✓
Multilingual display	✓	✓	✓
4 user-defined hotkeys	✓	✓	✓
Spectrum analyzer visualizes interfering frequencies to select the best transmission channel	✓	✓	✓
Remote Motor calibration from hand unit, also possible locally from receiver	✓	✓	✓
Motor performance reinforced by internal booster to 30 V and adjustable	✓	✓	✓
A fluid damped hand wheel	✓	✓	✓
Socket for connecting a gooseneck lamp to the hand unit	✓	✓	✓
Motor position and end stops stay in place following change of battery	✓	✓	✓
Spread a variable adjustment range of the lens by rotating the hand wheel	✓	✓	✓
Scale disc or scale ring (optional)	✓	✓	✓
Recording start / stop signal for the camera (optional cables required)	✓	✓	✓
USB-interface for updates	✓	✓	✓
Battery level indicator in the hand unit display	✓	✓	✓
Voltage supply indicator of the receiver on hand unit display	✓	✓	✓
5x ¼" screw thread on the hand unit	✓	✓	✓
Widely available Sony FM50 / 55 Li-Ion rechargeable battery in the hand unit	✓	✓	✓
Hand strap and padded neck strap	✓	✓	✓
Dual-band system, sends in 430 MHz (5 channels) or in 2.4 GHz frequency band (11 channels)		✓	✓
Combined socket for simultaneous connection of analogue focus and zoom rear camera operations (Demands)		✓	✓
VariFluid, adjustable fluid damping in the hand wheel		✓	✓
VariLock II function, two freely adjustable mechanical end stops on the hand wheel		✓	✓
Mechanical brake within the hand wheel		✓	✓
Direct cable connection between the hand unit and the receiver via serial port makes hassle-free long distance operation possible		✓	✓
Direct control of servo lenses (e.g. Cabrio- or ENG lenses)		✓	✓
CINE-TAPE Support		✓	✓
Antenna socket for the MHz range		✓	✓
Extension interface for extension modules like the third and fourth motor channel and camera Hirose 12-pin interface		✓	✓
DMX input to the hand unit e.g. for remotely controlling a head light on the receiver		✓	✓
Hermetically sealed slider for adjusting the aperture			✓
Removable iris-scale made of aluminium, can be written upon on both sides			✓
Two adjustable, mechanical end stops for the slide on the slide control			✓

Technical specifications

Serial link from MagNum hand unit to MagNum receiver	RS422 @ 38400 Baud
Power supply for motor controller	10- 30V / 0.3 - 5A (peak current might be higher)
Motor Booster (up-converter) - voltages to motors	0 = off (motor supply voltage = input voltage), 1 = 15V, 2 = 20 V, 3 = 25V, 4 = 30V, if input voltage is higher then booster level, motor supply voltage = input voltage
Rf power 400MHz Band	10mW
Rf power 2.4 GHz band	30 mW

Connector pin outs

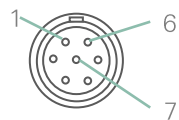
Motor-Controller - Power in / Camera Run start/Stop



Front view to Socket
Type: Lemo 0B. 305

Pin 1: + Power in
Pin 2: CAM Relay 1
Pin 3: CAM Relay 2
Pin 4: - Power /GND
Pin 5: "CINE TAPE" in

Motor-Controller - Motor sockets



Front view to Socket
Type: Lemo xxG.1B. 307

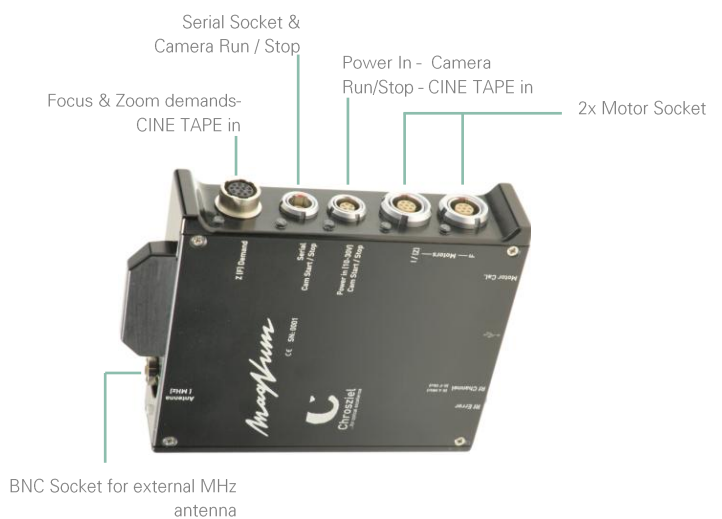
Pin 1: Motor -
Pin 2: Motor +
Pin 3: Encoder Channel A
Pin 4: +5V
Pin 5: Ground
Pin 6: Encoder Channel B
Pin 7: ID

Motor Controller - Serial socket & camera Run/Stop



Front view to Socket
Type: Lemo xxB.1B. 309

Pin 1: GND
Pin 2: Uin 10V - 15V
Pin 3: RS 232 TX/ 422 TX-
Pin 4: RS422 RX+
Pin 5: RS232 RX/ RS422 RX-
Pin 6: RS422 TX+
Pin 7: +10V /200mA/fused
Pin 8: CAM Relay 1
Pin 9: CAM Relay 2



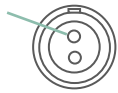
Motor Controller - Demands and CINE TAPE in



Front view to Socket
Type: Hirose HR10A-10R-12

Pin 1: Ucam 12-15V
Pin 2: GND
Pin 3: Uref 7.5V
Pin 4: Uref 5V
Pin 5: Uref 2.5V
Pin 6: U Focus Control
Pin 7: U Zoom Control
Pin 8: Cine Tape Serial In
Pin 9: VTR
Pin 10: GND
Pin 11: RET
Pin 12: GND

Hand Unit - LED Light

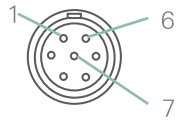


Front view to Socket
Type: Lemo xxG.0B.302

Pin 1: LED + out
Pin 2: LED - out



Hand Unit - Serial Socket



Front view to Socket
Type: Lemo xxG.0B.307

Pin 1: GND
Pin 2: Ubat in 7.5-9V
Pin 3: RS422 TX-
Pin 4: RS422 RX+
Pin 5: RX/ RS422 RX-
Pin 6: RS422 TX+
Pin 7: n.a.

List of cables

Power cables

Anton-Bauer D-Tap	MN-AB
XLR 4-Pin	MN-XLR4
Hirose 4-Pin (Low Power, Reduce Motor Performance)	MN-H4
ARRI Cameras 12V Fischer 11-Pin	MN-ARRI12
MK-V Lemo 3-Pin	MN-MKV
Pro / Artemis Lemo 4-Pin	MN-PRO
RED AUX Lemo 0B 4-Pin	MN-REDAUX
Betz RIG Lemo 3-Pin	MN-RIG
SteadyCam Master Lemo 12V Lemo 2-Pin	MN-STM
SteadyCam Ultra / Archer / Clipper 12V Lemo 3-Pin	MN-STU12
SteadyCam Ultra 24V Lemo 3-Pin	MN-STU24
Open End	MN-POW-O

Camera Run (Record Start/Stop) cables

Aaton Cameras Lemo 2-Pin	MN-COFAA2
Aaton Cameras Lemo 6-Pin	MN-COFAA6
Arri Cameras Fischer 11-Pin	MN-COFA
Arri Alexa / MovieCam / Sony / Pro35 Adapter / SI-2K Fischer RS 3-Pin	MN-COFA-M
Canon EOS xD Remote Connector 3-Pin	MN-COFEOS
LANC TM 2,5mm Jack	MN-COFL
Moviecam Compact Fischer 2-Pin	MN-COFMOV
Panavision Cameras Lemo 10-Pin	MN-COFPAN
RED EPIC / Scarlett Lemo 00B 4-Pin at Sync Socket	MN-COFE00B
RED EPIC / Scarlett BNC for 3x Splitcable	MN-COFEBNC
RED One Lemo 0B 4-Pin at top AUX-Out Socket in Default-Configuration	MN-COFR1
Sony F5 / F55 Hirose 4-Pin	MN-COF55
Video Camera (for Film Style or Prime Lenses) Hirose 12-Pin	MN-COFV-V
Fujinon Video Lens 12-Pin	MN-COFV-F
Canon Video Lens 8-Pin	MN-COFV-C

Combined Power with Camera Record Start/Stop cables

Aaton Cameras Lemo 6-Pin	AA-A2-P-CAM
ARRI Alexa / Moviecam SL / Sony 24V Fischer RS 3-Pin	RS-A2-P/CAM
ARRI Cameras 12 Volt 11-Pin Fischer	ARRI-A2-P/CAM
Panavision / Millenium 24V Lemo 10-Pin	PAN-A2-P/CAM
Sony F5 / F55 12V Hirose 4-Pin (Low Power, Reduce Motor Performance)	F55-A2-P/CAM

Motor cables

60cm Standard cable	MOTD60
100cm Standard cable	MOTD100
60cm ARRI CLM4	MOTD-CLM4
Fujinon Digital Drive Hirose 20-Pin	MN-FJNHR20
Fujinon older Lenses Hirose 10-Pin	MN-FJN
Canon Hirose 20-Pin (combined power, motor and run/stop control)	MN-PMCD
Angenieux Digital Drive Hirose 20-Pin	MN-ANG

Special cables

Adaptor for simultaneous operation of a Fujinon Focus and Zoom Demand (12pin Hirose Plug to 2x 12pin Hirose socket)	MN-FZ-FA
Adaptor for simultaneous operation of a Canon Focus and Zoom Demand (with analogue output signal (20pin Hirose Plug to 2x 20pin Hirose socket)	MN-FZ-CA
CineTape input cable (on 12 Hirose socket)	MN-CTHR12
Combined CineTape input and power in (on 5 pin Lemo socket)	MN-CT
Control Cable for LitePanel LED lights	AL-LP
DMX input cable with 5 pin male XLR plug	MN-DMX
Direct serial connection from one hand unit to motor control box	MN-SER-TX
Connection of the lens port socket of the module MN-EXT-MOT-LP (Hirose 12pin) to a Camera Lens Port (Hirose 12pin) for Iris control and RET/VTR feedback	AL2-INTF-LP

Further cables on request ...