



# ENERGYMETER

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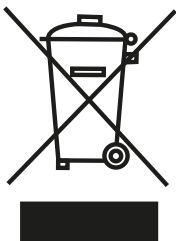
User Manual



Valid for the following models

**EM12-150**

## INSTRUCTIONS FOR THE PROPER DISPOSAL



This electronic product is subject to the European Directive 2012/19 / EU. Comply with local waste disposal regulations, do not dispose of old products with normal household waste. The proper disposal of products that can no longer be used prevents potential negative consequences for the environment and for the population.



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# 1. INTRODUCTION

With **ENERGYMETER** you can always monitor the state of charge of your batteries: LifePO<sub>4</sub>, AGM, Gel, Wet.

The system detects and displays voltage and current input and output from one or more 12V service batteries (connected in parallel). The handy touch screen display allows you to set the technology of the connected batteries and check their status of charge in a simple and immediate way.

## SAFETY INSTRUCTIONS

- Child Safety: Keep the device Out of Reach.
- Carefully check the integrity of the device and connectors.
- To avoid overheating and possible fires do not install the device in a sealed environment, Always choose a well ventilated area.
- Do not place the device on highly flammable surfaces or environments (eg: paper, cloth, etc.).
- Do not cover the cooling slits on the side and the fan on the top.
- Do not install the device near flooded batteries: they produce flammable, corrosive and explosive gas while working, and it can damage the product.
- protect the device from sunlight or direct sources of heat.
- To avoid malfunctions, DO NOT install and use the device in very humid environments, in contact with water splashes, various liquids, or exposed to rain.
- To avoid risk of electric shock and/or fire, the vehicle's fuel system must be in good condition.
- In case of damaged connecting cables or inadequate section, immediately replace them with suitable cables as specified by this manual or by a qualified electrician.

- In case of anomalies in the conformity of the product do not use it! it is strictly forbidden to open the device. Repairs may only be carried out by qualified technical personnel using original spare parts.
- Keep the instruction manual near the device for easy access to the essential safety, use and maintenance information.
- The information contained in this manual may be changed without notice. NDS Energy s.r.l. reserves the right to make changes and improvements to the product at any time without notice and without obligation to apply these changes to the devices previously distributed.
- The images of the products are purely indicative and may therefore not be fully representative of the characteristics of the product, differing in color, size or accessories.

## 2. PACKAGE CONTENTS

Check the contents of the package:

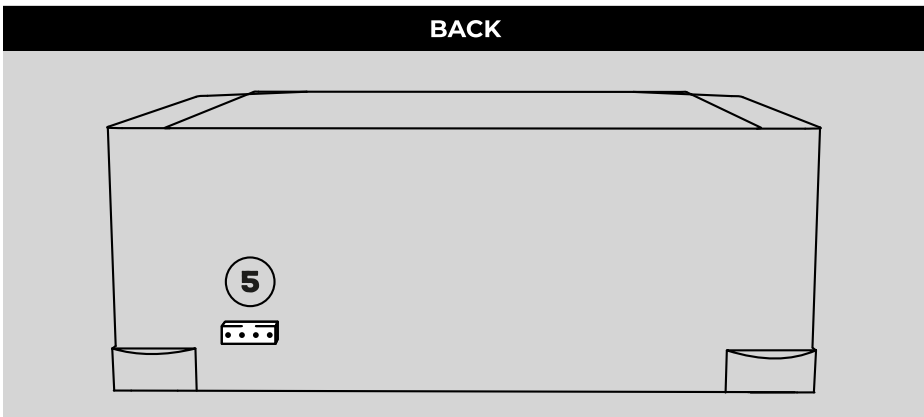
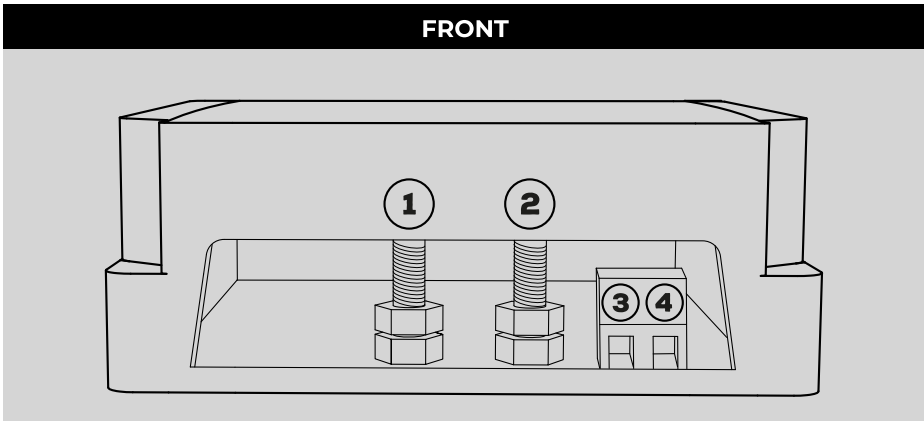
- N°1 **ENERGYMETER** Blackbox
- N°1 **ENERGYMETER** Display
- N°1 Power Cable/Data cable for display
- N°4 Wall mounting screws

## 3. CHARACTERISTICS

**ENERGYMETER** provides information on the status of charge of the service batteries connected to it for LiFePO<sub>4</sub>, AGM, Gel, Wet technologies:

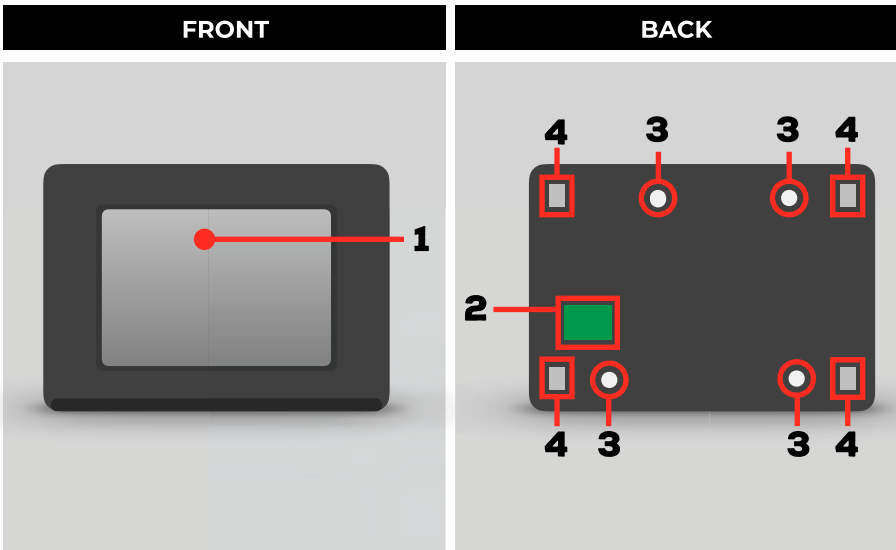
- Batteries voltage (V).
- Instant current monitor(A): what you charge minus what you use (appliances).
- Batteries State of Charge (SoC).

# 4. BLACKBOX STRUCTURE



N°	FUNCTION
1	Appliances Positive Pole: Lights, Inverter, Battery chargers, Solar regulator, etc...
2	Leisure Battery Positive Pole
3	Non used connection
4	Leisure Battery Negative Pole
5	Display Touch Screen connector

# 5. DISPLAY STRUCTURE



N°	FUNCTION
1	Touch screen Display
2	Communication cable hole
3	Four wall mounting holes
4	Display-wall mount attachment system

## **CAUTION**

Do not force the connector into the slot: the insertion direction is unambiguous!



## 6. DISPLAY INSTALLATION

1. Disassemble the wall bracket from the **ENERGYMETER** display



- a. Slide downward the wall Mount and upward the display.



- B. Rise the bottom part of the display



- C. Slide downward the display and disassemble the wall bracket from the display

2. Place the wall bracket on the selected wall and take the hole sign to make a proper hole for the mounting screws (diameter 3mm) and the communication cable pass (minimum diameter 7,2mm).
3. Make holes and screw the wall bracket to the wall using the provided screws. Be sure to have a flat surface, without any screw projections.
4. Let the Communication cable (white connector) pass through the hole previously realized and gently connect the joint to the board.

5. Fix the display on the wall bracket.



- a. Insert the display mounting flaps in the wall mount press and slide upward



- B. Down the bottom part of the display and join the wall mount



- C. Slide downward the display to tighten the bottom flaps

6. Connect the **ENERGYMETER** display to the blackbox using the Power / Data cable with white, flat, four pole connector.

**NOTE**

The **ENERGYMETER** Display is not compatible with other NDS Devices.

# 7. SETUP

Follow the instruction for a proper touch screen usage:

- Touch the display with fingers or soft surfaces, avoid sharp objects
- Avoid excessive pressure on the display surface
- Avoid any Contact with other electronic devices: static discharge can damage the device.
- Avoid any contact with liquids, water, humidity: the touch screen could not work properly

## STEP 1

Connect the Power / Data cable to the Display, and wait for the home-screen startup.



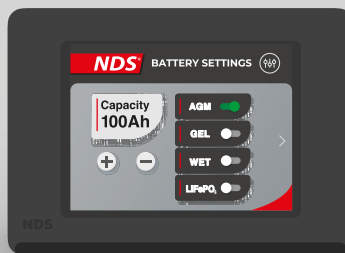
Power up

## STEP 2

Set the connected Leisure battery capacity by touching repeatedly the “+” and “-” icons.

Then select the battery technology on the right side list.

Touch the right side of the screen to move to the next screen.

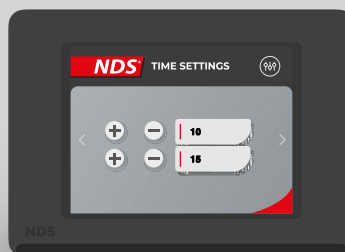


Battery technology and capacity settings

## STEP 3

Set the time by touching repeatedly the “+” and “-” icons. From the top down hours and minutes

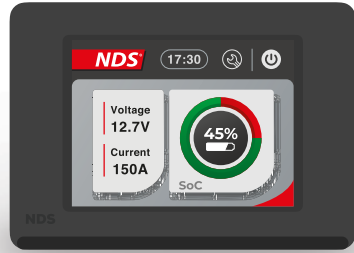
Touch the right side of the screen to move to the next screen, or touch the right side to go back.



Time setup

## HOME SCREEN

The Home Screen shows the battery voltage and the instant current (charging-usage) on the left side, and the SoC on the right side.



## 8. CALIBRATION

After setting the correct values of capacity and technology of the connected batteries it is necessary to perform the Calibration: this operation is fundamental for the correct calculation of the SoC of the leisure batteries.

Calibration must be performed whenever **ENERGYMETER** is disconnected from the power supply.

To calibrate the device, simply leave the batteries on charge without connecting any load and without using them, up to 100% SoC.

Once the 100% charge is completed, you will be able to use the batteries and see a correct SoC value.

### NOTE

The **ENERGYMETER** SoC calculation only occurs on the loads and batteries connected to it.



If a load or a charging source is connected directly to the battery or to another point, the SoC value is considered unreliable.

# 9. FUNCTIONING

It is possible to connect one or more service batteries (in parallel with each other) to **ENERGYMETER** up to a total capacity of 600Ah and view their status of charge and related currents. Energy Meter supports the most common Leisure battery technologies: LiFePO<sub>4</sub>, AGM, Gel, Wet.

The Home Screen of the **ENERGYMETER** display shows information on:

- Service batteries status
- Date and time


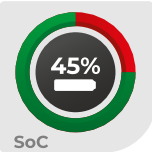
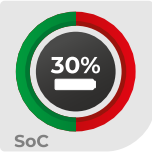
ICON	MEANING AND FUNCTION
	Setup icon: if touched let access to the setup menu starting from "Battery Setup" screen
	Turn off icon: if touched turns off the display. To turn back on the display touch again the screen (everywhere)

# 10. STATE OF CHARGE (SOC)

In the Home Screen there is a circle colored in green or red, with a percentage within, both these data represent the SoC.

Starting from 100% charge, with a completely green circle, when the batteries are discharged, the circle will turn red following a clockwise direction of progression.

The table shows some examples of SoC:

ICON	STATE OF CHARGE
 <p>SoC</p>	SoC = 100%
 <p>SoC</p>	SoC = 45%
 <p>SoC</p>	SoC = 30%

# 11. TECHNICAL FEATURES

<b>ENERGY METER BLACKBOX</b>	
Nominal Voltage	12V
Maximum supported capacity	600Ah
Maximum supported current	150A
Current range	-150A/+150A ±10%
Size	125x123x47mm
Weight	480g
Working temperature	-20°C/+65°C
Average consumption device on	3mA@12V
Average consumption device stand-by	1mA@12V
<b>ENERGY METER DISPLAY</b>	
Display Technology	TFT 2,83" 262k colors with Touch Screen
Average consumption device on	73mA @ maximum brightness 33mA @ Display OFF 8mA light time
Connection type	RS232 with 8m cable
Working temperature	-10°C / +70°C
Size	100x80x11mm
Weight	55g



## EU DECLARATION OF CONFORMITY - Display Energy Meter

**Commercial Name:** Energy Meter

**Models:** EM 12-150

Declares under its own responsibility that the product:

Company NDS Energy s.r.l.

Address: via Giovanni Pascoli  
65010 - Cappelle sul Tavo (PE)  
Italy

to which this declaration refers, complies with the provisions of the Council Directive of the European Union on Electromagnetic Compatibility (EMC) **Directive 2014/30/EU**,

demonstrated by compliance with the following standards:

- **EN 61000-6-2: 2005**
- **EN 61000-6-3: 2007+A1 :2011**

Compliance for the restriction of the use of hazardous substances is demonstrated by compliance with **Directive 2011/65/EU (RoHS 2)**, according to the regulations:

- **EN 50581**

Cappelle sul Tavo, 07/01/2017

Timbro e firma

A handwritten signature in black ink is written over a rectangular stamp. The stamp contains the text "NDS ENERGY s.r.l." in a bold, sans-serif font.

# 12. WARRANTY

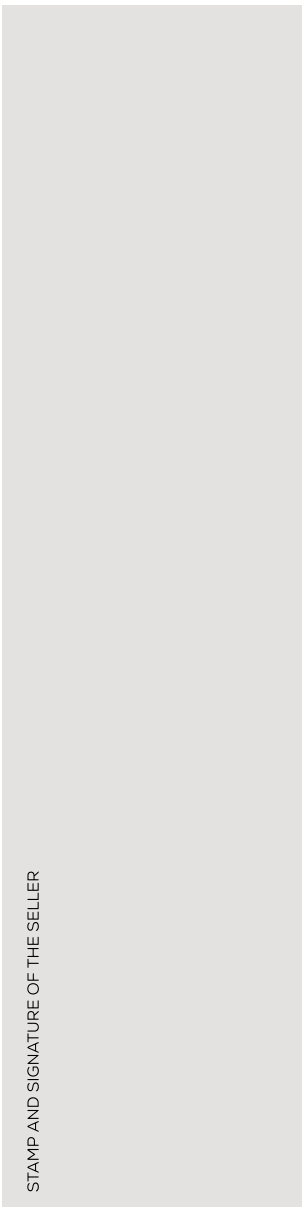


## WARRANTY COUPON

MODEL CODE\_\_\_\_\_

SERIAL NUMBER (S/N)\_\_\_\_\_

PURCHASE DATE\_\_\_\_\_



STAMP AND SIGNATURE OF THE SELLER

### **NDS ENERGY S.R.L.**

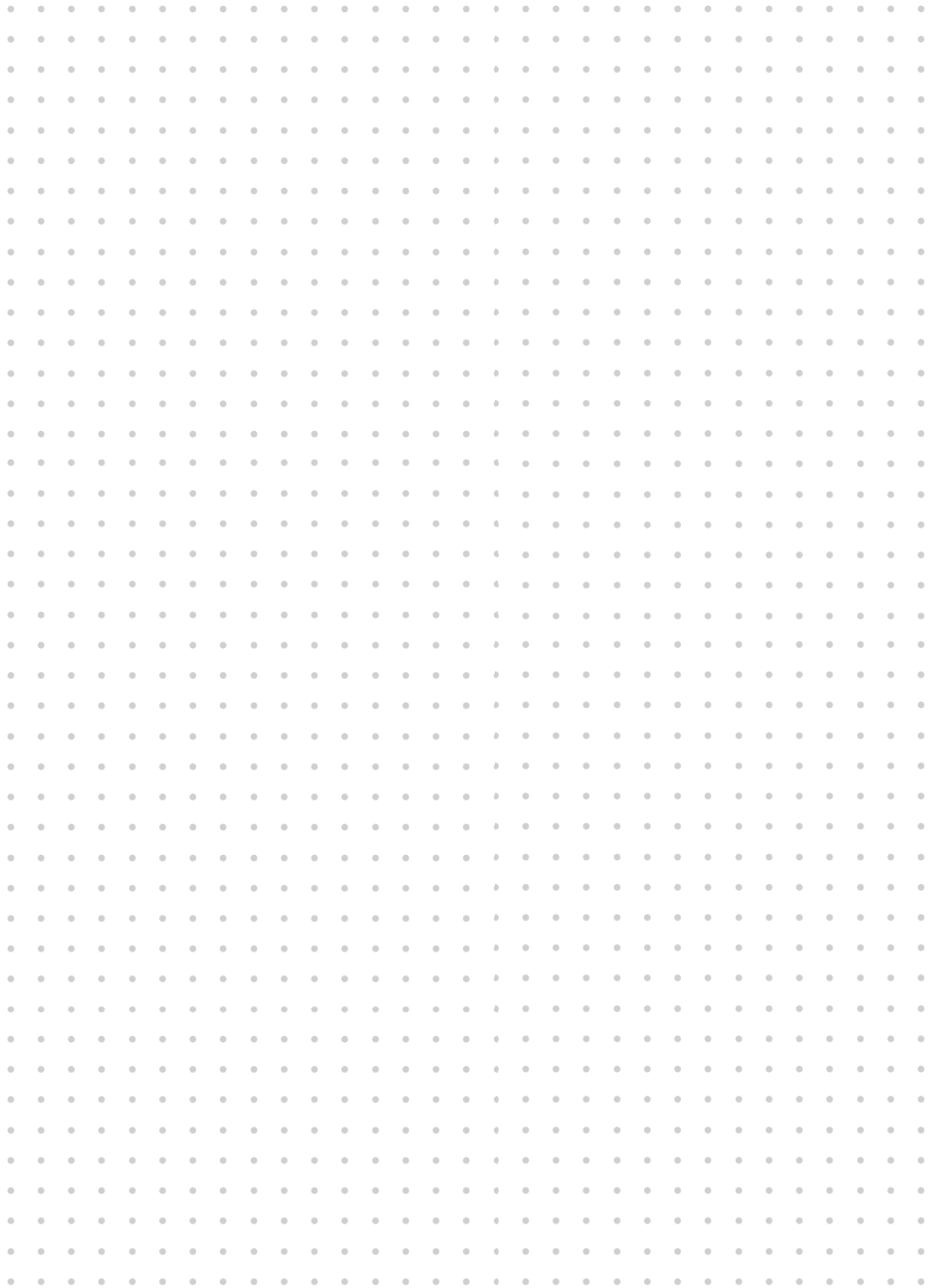
VIA G. PASCOLI, 169  
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ITALY

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# NOTES





**ALL THE ENERGY YOU NEED**

TUTTA L'ENERGIA CHE TI SERVE



0071\_MANS\_EnMet\_GB00

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