

REMOTE METER

Model: MT11

INSTRUCTION MANUAL



For use with DM series dual battery MPPT solar charge controllers

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1. Important Safety Instructions

SAVE THESE INSTRUCTIONS:

This manual contains important safety, installation and operating instruction for the remote meter.

General safety information

- Please inspect the MT11 thoroughly after it is delivered. If there is any damage, document this with photos and contact the shipping company or seller for assistance.
- Please read this manual carefully before installing the product and pay close attention to the safety information.
- Keep the MT11 away from rain, dust, vibrations, corrosive gas and intense electromagnetic interference.
- Do not allow water to enter the remote meter.
- There are no user serviceable parts inside the remote meter. Do not disassemble or attempt to repair it.
- The MT11 is only compatible with DM series charge controllers. Please confirm before purchase and installation.

2. Overview

The MT11 remote meter is an accessory which is compatible with the DuoRacer (DM series) MPPT solar controller. It can monitor the running data and working status of the controller, set the battery type and temperature units, and reset the generated energy counter.

Features:

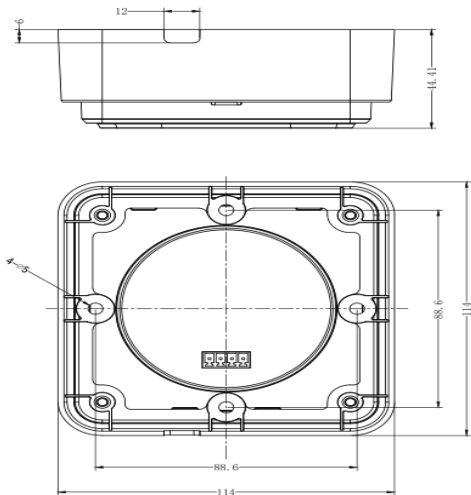
- Automatically identify and display the type, model and relevant parameter data of compatible controllers.
- Real-time display of the operational data and working status of the connected device in digital, graphical and textual forms by a large-screen multifunctional LCD.
- Three touch buttons are quick and easy to operate.
- No need for external power supply. The connected charge controller supplies the power for MT11.
- The meter can browse the controller's parameters, set the battery type and temperature unit, and reset the generated energy counter.
- Real-time display of fault information of the connected devices.
- Long communication distance via RS485.

3. Product Components

- ✦ Remote meter MT11
- ✦ 5m communication cable
(Model: CC-RS485-RS485-3.81-4P-500)
- ✦ Optional Mounting Frame

4. Installation

4.1 Mounting Frame (optional accessory, included)



Mechanical parameter	Measurement
Overall dimensions	114 x 114 x 44.41mm
Mounting dimensions	88.6 x 88.6mm
Terminal	Φ5

4.2 Wall installation steps

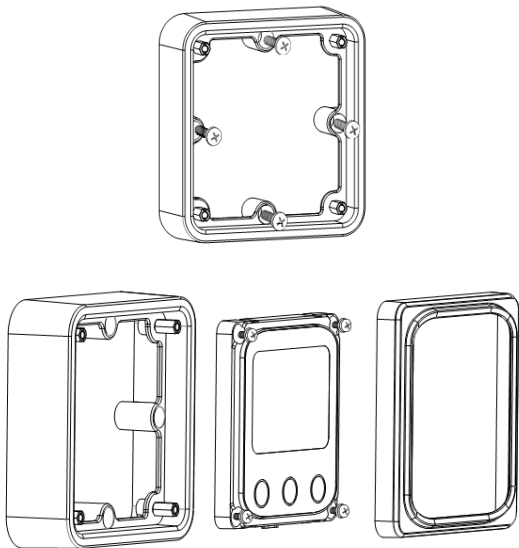
Step 1: Mark and drill screw holes to match the mounting dimensions of the base, and insert the plastic expansion bolts.

Step 2: Use four PA4.2×32 self-tapping screws to fix the frame to the wall.

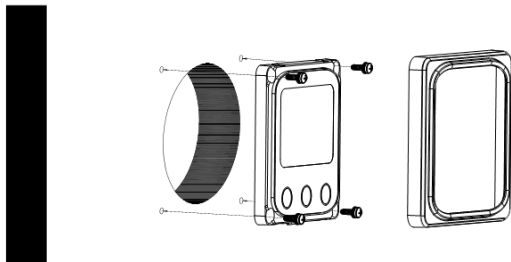
Step 3: Remove the decorative shell.

Step 4: Use four M4×8 pan head screws to mount the MT11 screen onto the frame.

Step 5: Install the decorative shell over the screen.



4.3 Surface mounting steps



Step 1: Mark and cut an appropriately-sized hole in the surface for the cable and rear of the screen.

Step 2: Mark and drill screw holes based on the mounting dimensions.

Step 3: Remove the decorative shell.

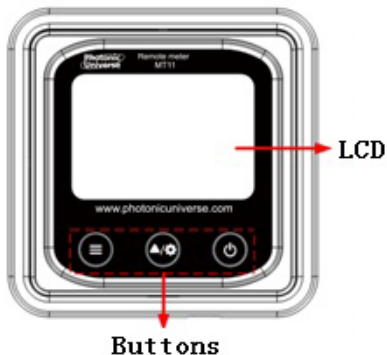
Step 4: Use four M4×8 cross recessed pan head screws with M4 nuts to mount the MT11 screen onto the surface.

Step 5: Install the decorative shell.

NOTE: Consider the plugging/unplugging space and the length of the cable during installation to ensure the cable will fit.

5. Product Features

5.1 Front View






LCD display screen

Remote meter operation interface. Refer to chapter 6 for details of display and operation.

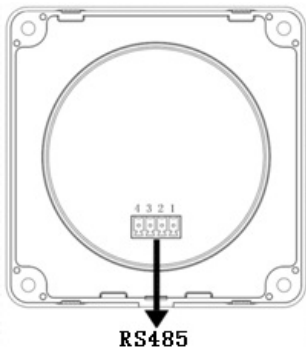
Buttons

The meter buttons include two function buttons and one switch button.

	Press the button	<ol style="list-style-type: none">1. PV array parameters2. Storage battery parameters
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		3. Browse the starter battery parameters automatically (<i>Auto</i>)
	Press the button	1. Browse the PV array parameters 2. Browse the storage battery parameters 3. Browse the starter battery parameters
	Press the button and hold for 5s	Temperature units/Battery type
	Press the button	Turn the meter ON
	Press the button and hold for 5s	Turn the meter OFF

5.2 Rear View



✦ **RS485 communication port**

Used to connect to the solar controller which, provides power and data to the MT11.

✦ **Communication cable models**

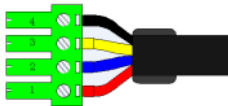
CC-RS485-RS485-3.81-4P-500 (Included, 5m length)

CC-RS485-RS485-3.81-4P-1000 (Optional, 10m length)

CC-RS485-RS485-3.81-4P-2000 (Optional, 20m length)

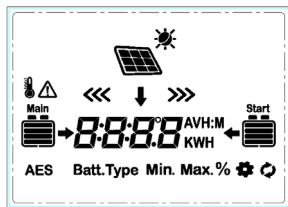
✦ **Pins definition**

PIN	Definition
1	DC5V
2	RS-485-B
3	RS-485-A
4	GND

















6. Display and Operation

6.1 LCD display



Icon	Instruction	Icon	Instruction
	BATT1 battery capacity level [Ⓞ] 0~12%		BATT2 battery capacity level [Ⓞ] 0~12%
	BATT1 battery capacity level [Ⓞ] 13%~35%		BATT2 battery capacity level [Ⓞ] 13%~35%
	BATT1 battery capacity level [Ⓞ] 36%~61%		BATT2 battery capacity level [Ⓞ] 36%~61%
	BATT1 battery capacity level [Ⓞ] 62%~86%		BATT2 battery capacity level [Ⓞ] 62%~86%



	BATT1 battery capacity level ^① 87%~100%		BATT2 battery capacity level ^① 87%~100%
	Day		PV array
	Night		BATT1 charging icon
	Display the parameters of the PV array		BATT2 charging icon
	Display the parameters of BATT1		BATT1 temperature parameters
	Display the parameters of BATT2	AES	AES signal icon
	Setting icon	Batt.Type	Battery type icon
	Auto global view sign	Min.	Minimum voltage icon
	Fault icon	Max.	Maximum voltage icon

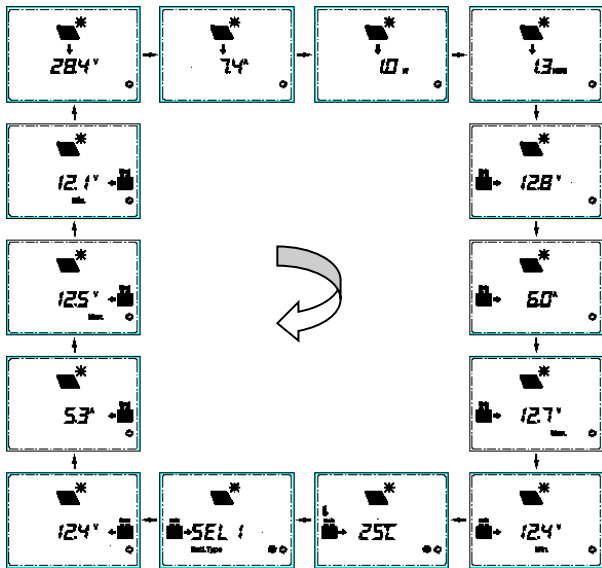
① Battery power capacity is calculated by a linear relationship between the disconnect voltage and float charging voltage.

6.2 Auto global view mode

Operation:

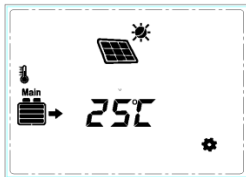
Step 1: Press the  button, *Auto* will appear.

Step 2: Press the  button, select the . The display will now automatically loop through all parameters.





Display Loop: PV voltage → PV current → PV power → Battery power → BATT1 voltage → BATT1 current → Max. BATT1 voltage → Min. BATT1 voltage → BATT1 temperature → BATT1 battery type → BATT2 voltage → BATT2 current → Max. BATT2 voltage → Min. BATT2 voltage → PV voltage

6.3 Temperature units



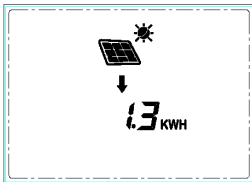
Operation:



Step 1: Press the  button under the battery temperature interface.

Step 2: Press the  button to select the temperature unit.

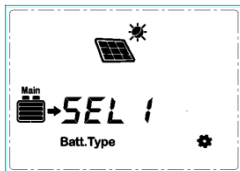
Step 3: Press the  button to set successfully.

6.4 Clear the generated energy





Press the  and  button and hold for 5s to clear the generated energy.

6.5 Battery type



1) Operation:

Step 1: Press the  button and hold for 5s under the battery type interface.

Step 2: Press the  button when the battery type interface is flashing.

Step 3: Press the  button to confirm the battery type.

2) Battery type

SEL 1	BATT1 12V Sealed	SEL 2	BATT1 24V Sealed
GEL 1	BATT1 12V Gel	GEL 2	BATT1 24V Gel
FLd 1	BATT1 12V Flooded	FLd 2	BATT1 24V Flooded
LIF4	LiFePO ₄ (4S)	LIF8	LiFePO ₄ (8S)
LIC3	Li-NiCoMn (3S)	LIC6	Li-NiCoMn (6S)
USE	User		

NOTE: The battery voltage is set as default and not changeable when selecting the default battery type. Please change to “User” battery type before adjusting the battery voltage. Set the voltage of the “User” battery type via PC software only.

1) Lead-acid Battery Control Voltage Parameters

The parameters below are for a 12V system at 25 °C. Please double the values in a 24V system.

Battery type Voltage parameter	Sealed	Gel	Flooded	User
Over Voltage Disconnect Voltage	16.0V	16.0V	16.0V	9~17V
Charging Limit Voltage	15.0V	15.0V	15.0V	9~17V
Over Voltage Reconnect Voltage	15.0V	15.0V	15.0V	9~17V
Equalize Charging Voltage	14.6V	→	14.8V	9~17V
Boost Charging Voltage	14.4V	14.2V	14.6V	9~17V
Float Charging Voltage	13.8V	13.8V	13.8V	9~17V
Boost Reconnect Charging Voltage	13.2V	13.2V	13.2V	9~17V
Low Voltage Reconnect Voltage	12.6V	12.6V	12.6V	9~17V
Under Voltage Warning Reconnect Voltage	12.2V	12.2V	12.2V	9~17V
Under Volt. Warning Voltage	12.0V	12.0V	12.0V	9~17V
Low Volt. Disconnect Voltage	11.1V	11.1V	11.1V	9~17V
Discharging Limit Voltage	10.6V	10.6V	10.6V	9~17V
Equalize Duration (min.)	120	→	120	0~180
Boost Duration (min.)	120	120	120	10~180

NOTE:

- 1) When the battery type is sealed, gel, or flooded, the adjustable range of equalize duration is 0 to 180min, and boost duration is 10 to 180min.
- 2) The following rules must be observed when modifying the value of the parameters in User battery type (factory default value is the same as sealed type):

- A. Over Voltage Disconnect Voltage > Charging Limit Voltage \geq Equalize Charging Voltage \geq Boost Charging Voltage \geq Float Charging Voltage > Boost Reconnect Charging Voltage.
- B. Over Voltage Disconnect Voltage > Over Voltage Reconnect Voltage
- C. Low Voltage Reconnect Voltage > Low Voltage Disconnect Voltage \geq Discharging Limit Voltage.
- D. Under Voltage Warning Reconnect Voltage > Under Voltage Warning Voltage \geq Discharging Limit Voltage.
Boost Reconnect Charging voltage > Low Voltage Disconnect Voltage.

2) Lithium Battery Control Voltage Parameters

The parameters below are for a 12V system at 25 °C; please double the values in a 24V system.

Battery type Voltage parameter	LiFePO ₄ (4S)	Li-NiCoMn (3S)	User
Over Voltage Disconnect Voltage	15.6V	13.5V	9~17V
Charging Limit Voltage	14.6V	12.6V	9~17V
Over Voltage Reconnect Voltage	14.5V	12.5V	9~17V
Equalize Charging Voltage	14.5V	12.5V	9~17V
Boost Charging Voltage	14.5V	12.5V	9~17V
Float Charging Voltage	13.8V	12.2V	9~17V
Boost Reconnect Charging Voltage	13.2V	12.1V	9~17V
Low Voltage Reconnect Voltage	12.4V	10.5V	9~17V
Under Voltage Warning Reconnect Voltage	12.5V	11.0V	9~17V

Under Volt. Warning Voltage	12.0V	10.5V	9~17V
Low Volt. Disconnect Voltage	11.0V	9.3V	9~17V
Discharging Limit Voltage	10.8V	9.3V	9~17V

The following rules must be observed when modifying the parameter values in User battery type for a lithium battery.

- A. Over Voltage Disconnect Voltage > Over charging protection voltage (Protection Circuit Modules (BMS))+0.2V;
- B. Over Voltage Disconnect Voltage > Over Voltage Reconnect Voltage = Charging Limit Voltage \geq Equalize Charging Voltage = Boost Charging Voltage \geq Float Charging Voltage > Boost Reconnect Charging Voltage;
- C. Low Voltage Reconnect Voltage > Low Voltage Disconnect Voltage \geq Discharging Limit Voltage;
- D. Under Voltage Warning Reconnect Voltage > Under Voltage Warning Voltage \geq Discharging Limit Voltage;
- E. Boost Reconnect Charging voltage > Low Voltage Reconnect Voltage;
- F. Low Voltage Disconnect Voltage \geq Over-discharging protection voltage (BMS)+0.2V.







WARNING: Please refer to the voltage parameters of the BMS when adjusting the lithium battery voltage parameters.



WARNING: The accuracy of BMS must be at least 0.2V. If the deviation is higher than 0.2V, the manufacturer will assume no liability for any system malfunction caused by this.

6.6 Fault indication

Fault	LCD	Instruction
BATT1 overvoltage		Battery level shows full, battery frame blink, fault icon blink.
BATT1 over-discharged		Battery level shows empty, battery frame blink, fault icon blink.
BATT1 over temperature		Battery level shows current capacity, battery frame blink, fault icon blink, the temperature icon blink, the temperature value blink, the temperature unit blink.
BATT1 system voltage error ^①		Battery level shows empty, battery frame blink.

① No alarm for system voltage fault when using Lithium batteries.

7. Technical Specifications

Compatible models	DM series (DM1024/DM2024/DM3024)
Self-consumption (Power on)	13mA/5Vdc
Self-consumption (Power off)	4mA/5Vdc
Communication protocol	RS485
Communication port	3.81-4P
RS485 cable	CC-RS485-RS485-3.81-4P-500 (5m)
Environmental temperature	-20°C~+70°C
Storage temperature range	-20°C~+70°C
Enclosure	IP20
Screen unit dimensions	98.4×98.4mm
Frame dimensions	114×114mm
Weight	0.11kg

Manual is subject to change without prior notice.

Version number: 2.7

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