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REMOTE METER

Model: MT80

INSTRUCTION MANUAL



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1. Safety Instructions

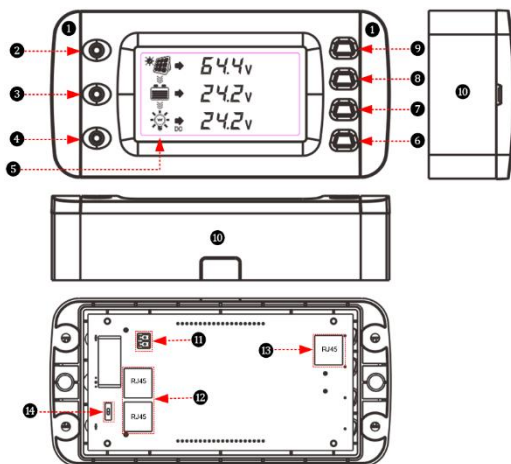
- Please keep this manual for future reference.
- Please read this manual and the safety information carefully before using the product.
- Do not install the remote meter in humid, salt-spray, corrosive, greasy, flammable, explosive, dust-accumulative, or other harsh environments.
- Keep the product away from rain, direct sunlight exposure, dust, vibration, corrosion, and electromagnetic interference.
- Do not allow water or other liquids to come into contact with or enter the product.
- The product contains no user-serviceable components. Do not disassemble or attempt to repair the device.

2. Overview

The MT80 allows users to monitor the status of combined AC/DC systems with a compatible solar charge controller and an inverter. The meter can provide precise operational data and real-time alerts to a PC or cloud server through an RS485 communication interface, allowing users to monitor the status and parameters of their controller/inverter system from a computer, tablet, or a smartphone.

Features:

- Multiple RJ45 communication ports
- Real-time display of fault alarms
- Local display of real-time parameters
- Easy to install and operate
- ON/OFF button to control the load output
- Enables remote inverter ON/OFF control via a dry contact output



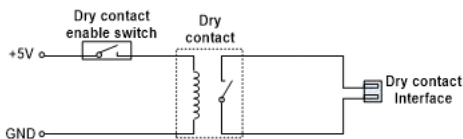
3. Appearance

①	Decorative Shell	⑧	Battery parameter button
②	PV indicator	⑨	PV parameter button
③	Battery indicator	⑩	Base (optional)
④	Load indicator	⑪	Dry contacts interface ^①
⑤	LCD display	⑫	RS485 device port (RJ45) *
⑥	Load ON/OFF button	⑬	RS485 monitor port (RJ45) *
⑦	Load parameter button	⑭	Dry contacts enable switch ^①

*The RS485 device port consists of two RJ45 ports, which are connected in parallel. This port connects to compatible Photonic Universe solar charge controllers or inverters.

*The RS485 monitor port connects to a PC or a cloud platform.

① Working Principle:



Dry contact rated value: 5A/30VDC;

Max. value: 0.5A/60VDC

Note: It is recommended to only turn ON the contact enable switch (14) when the dry contact function is in use. If it is not being used, it is best to leave it OFF to minimize contact wear, extend its service life and save energy.

4. Installation Instructions

● Before Installation

1. Check whether the communication ID of the controller is 1; if not, set it to 1.
2. Check whether the communication ID of the inverter is 3; if not, set it to 3.
3. Mount the unit following either the wall-mounting, or surface-mounting instructions below.

● Wall-mounting installation

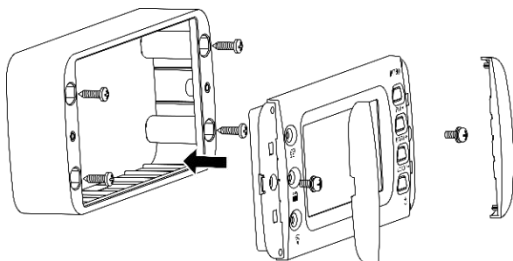
Step 1: Mark and drill mounting holes according to the frame dimensions (175 × 50 mm), then insert the plastic wall plugs.

Step 2: Secure the frame using four self-tapping screws.

Step 3: Remove the decorative shell.

Step 4: Fasten the MT80 unit to the base using two M4 pan head screws.

Step 5: Install the decorative shell.



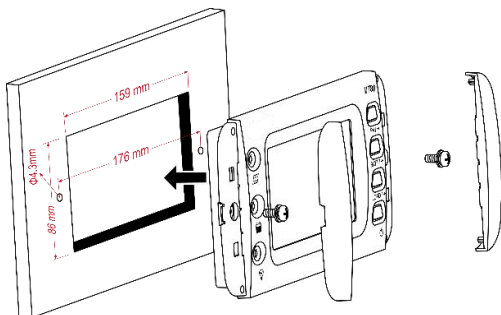
- **Surface-mounting installation**

Step 1: Mark the surface according to the distance between the hole centres (176 mm), drill the mounting holes and cut the opening, ensuring that it is not smaller than 158.2 x 85.2 mm.

Step 2: Remove the decorative shell.

Step 3: Secure the MT80 unit using two screws.

Step 4: Install the decorative shell.



5. Indicator Instruction

Indicator	Color	Status	Instruction
	Green	ON solid	PV is charging
	Green	OFF	No PV charging
	Green	Fast flashing	PV overvoltage
	Green	ON solid	Battery voltage is normal
	Green	Fast flashing	Battery overvoltage
	Orange	ON solid	Battery undervoltage
	Red	ON solid	Battery overdischarge
	Red	Slow flashing	Battery overtemperature Battery undertemperature Controller overtemperature
	Green	ON solid	Load switch ON
	Green	OFF	Load switch OFF
	Green	Fast flashing	System voltage error
	Orange	Fast flashing	

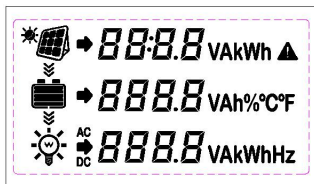
6. Button Instruction

Button	Operation	Instruction
 PV / →	Press	Scroll through PV parameters
 BATT / →	Press	Scroll through battery parameters
 LOAD / →	Press	Scroll through load parameters
		Exit the fault page
	Press and hold for 5s	Check error code information
	Press	Toggle the controller and inverter load output ON/OFF state simultaneously ^①
	Press and hold for 5s	Clear the total accumulated PV generated power, DC load usage, and AC load usage

- ① If the solar controller and inverter outputs are out of sync, press to turn off all the load outputs simultaneously, then press again to turn on all the load outputs.

7. LCD Display

- LCD Display



Note: The display screen can be viewed clearly when the angle between the end-user's horizontal line of sight and the display is within 90°. If the angle exceeds 90°, the information on the display screen may not be clearly visible.

Symbol	Definition	Symbol	Definition
	PV charging		No PV charging
	Load ON		Load OFF

- LCD Display Interface

Item	LCD Display	Definition
PV	64.4v	PV voltage
	3.3 A	PV current
	0.2 kW	PV power
	0.6 kWh	Total PV generated power ^①

Battery	 → 24.0 V	Battery voltage
	 → 11.1 A	Battery current
	 → 35.0 %	Battery capacity
	 → 25.0 °C	Battery temperature
DC Load	 → 25.3 V	DC load voltage
	 → 4.9 A	DC load current
	 → 0.1 kW	DC load power
	 → 0.1 kWh	Total DC load usage ^①
AC Load	 → 219.9 V	AC load voltage
	 → 1.7 A	AC load current
	 → 0.3 kW	AC load power
	 → 0.3 kWh	Total AC load usage ^②
	 → 50.0 Hz	AC load frequency

① The "Total PV generated power" and "Total DC load usage" are real-time parameters from the solar charge controller, which can be directly read and displayed by the MT80.

② The "Total AC load usage" is calculated based on the inverter's AC load power and displayed on the MT80.

8. Error Codes

• Solar Controller Error Codes

Indicator	Colour	Status	LCD	Code
	Green	Fast flashing	<i>Err</i> ▲ 1001	Battery overvoltage
	Orange	On solid	—	Battery undervoltage
	Red	On solid	<i>Err</i> ▲ 1002	Battery overdischarge
	Red	Slow flashing	<i>Err</i> ▲ 1003	Battery overtemperature
			<i>Err</i> ▲ 1004	Battery under temperature
			<i>Err</i> ▲ 1005	Controller overtemperature
	Orange	Fast flashing	<i>Err</i> ▲ 1006	System voltage error
	Green	Fast flashing		
	Green	Fast flashing	<i>Err</i> ▲ 1007	PV overvoltage
	Green	Slow flashing	<i>Err</i> ▲ 1008	Load short circuit
	Green	Slow flashing	<i>Err</i> ▲ 1009	Overload

Note: When the battery voltage drops below the low voltage disconnect voltage (LVD) point of the controller, the controller and inverter outputs will turn off.

- Inverter Error Codes**

Indicator	Colour	Status	LCD	Code
	Green	Slow flashing	<i>Err</i> ▲ <i>3001</i>	Output short circuit
			<i>Err</i> ▲ <i>3002</i>	Output overload
			<i>Err</i> ▲ <i>3003</i>	Output voltage abnormal
			<i>Err</i> ▲ <i>3004</i>	Busbar overvoltage
			<i>Err</i> ▲ <i>3005</i>	Input overvoltage
			<i>Err</i> ▲ <i>3006</i>	Input undervoltage
			<i>Err</i> ▲ <i>3007</i>	Input overcurrent
			<i>Err</i> ▲ <i>3008</i>	Inverter overtemperature

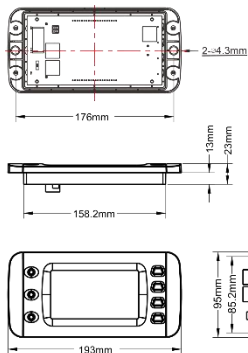
9. Specifications

Model	MT80	
Compatible products	Controller	XTR-N, PTR-AN, TR-AN and TR-BN series
	Inverter	IPT Series
RS485 power supply	5VDC (Power supplied from the connected controller or inverter)	
RS485 output to the monitor port	5V/100mA (If using the RTU, a separate power supply is needed)	
LCD visual angle	90° (head-on)	
LCD backlight	Yes	
Installation methods	Wall installation Surface mounting installation	
Self-consumption	16mA/5V (backlight OFF) 27mA/5V (backlight ON)	
Max. power consumption	100mA/5V (Backlight ON and dry contact enabled)	

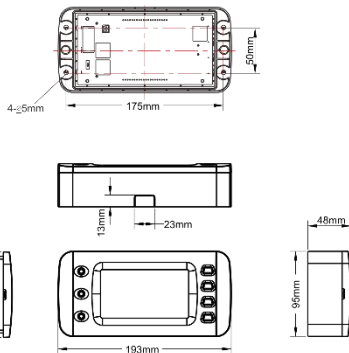
Working temperature	-20°C ~ +65°C
Storage temperature	-20°C ~ +80°C
Dimensions	193mm×95mm×48mm (base) 193mm×95mm×23mm (no base)
Mounting size	175mm×50mm (base) 176mm (no base)
Mounting hole size	φ 5mm (base) φ 4.3mm (no base)
Net weight	0.29kg (base) 0.22kg (no base)

10. Dimensions

Dimensions without base



Dimensions with base



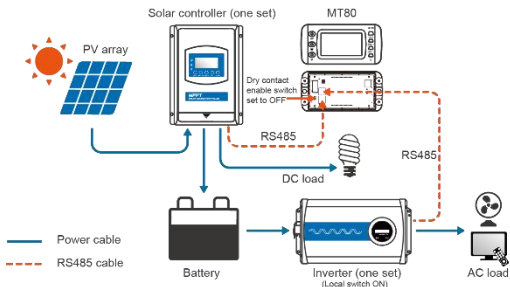
11. Recommended Applications

11.1 Standard Application

1) Advantages

The MT80 monitors the operational status and error codes of the solar charge controller and inverter while allowing the AC and DC load outputs to be controlled with a single button.

2) Connection Diagram



No.	Item	Number
1	Solar charge controller	1 pc
2	Inverter	1 pc
3	MT80	1 pc
4	RS485 cable (included)	2 pcs
5	PV, battery, AC load, DC load	As required

3) Operations

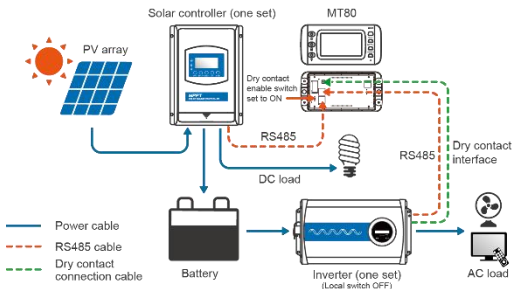
1. Connect the RS485 device ports of the MT80 to the corresponding communication ports on the solar controller and inverter.
2. Set the MT80 dry contact enable switch to the OFF state.
3. Set the inverter power switch to the ON state.
4. The MT80 load ON/OFF button will directly control the AC and DC load output.

11.2 Upgraded Application

1) Advantages

The MT80 monitors the operational status and error codes of the solar controller and inverter at the same time. The load ON/OFF button controls the inverter ON/OFF state, reducing the inverter's energy losses and improving the system efficiency.

2) Connection Diagram



No.	Item	Number
1	Solar charge controller	1 pc
2	Inverter	1 pc
3	MT80	1 pc
4	RS485 cable (included)	2 pcs
5	Dry contact connection cable (optional)	1 pc
6	PV, battery, AC load, DC load	As required

3) Operations

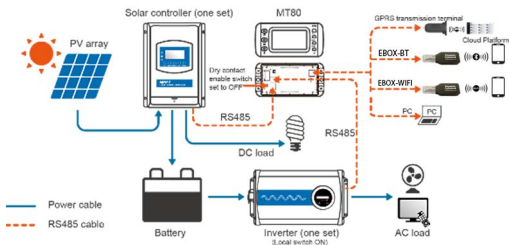
1. Connect the RS485 device ports of the MT80 to the corresponding communication ports on the solar controller and inverter.
2. Connect the dry contact interface of the MT80 to the external switch port of the inverter.
3. Set the MT80 dry contact enable switch to the ON state.
4. Set the inverter power switch to the OFF state.
5. The MT80 load ON/OFF button controls the inverter ON/OFF state remotely.

11.3 Advanced Application

1) Advantages

Connect the MT80 RS485 external communication port to a Wi-Fi module, Bluetooth module, PC or RTU. The mobile application or PC software enables parameter configuration and real-time operational monitoring. Through the same interface, the MT80 can also perform one-touch control of AC and DC load outputs.

2) Connection Diagram



No.	Item	Number
1	Solar charge controller	1 pc
2	Inverter	1 pc
3	MT80	1 pc
4	Wi-Fi module, Bluetooth module, RS485-USB cable, or RTU	1 pc
5	Mobile phone or PC	1 pc
6	RS485 cable (included)	3 pcs (2 pcs included, 1 pc optional)
7	PV, battery, AC load, DC load	As required

3) Operations

1. Connect the RS485 device port of the MT80 to the corresponding communication ports on the solar controller and inverter.
2. Connect the RS485 monitor port of the MT80 to the Wi-Fi module, Bluetooth module, RS485-USB cable, or RTU.
3. Set the MT80 dry contact enable switch to the OFF state.
4. Set the inverter power switch to the ON state.

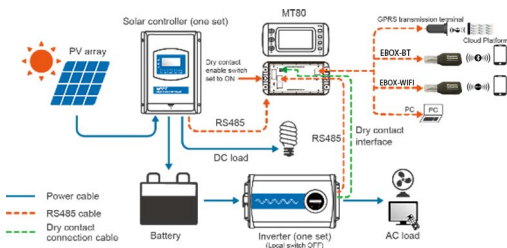
- Set the parameters or monitor the operational status of the solar controller and inverter using the phone app, PC software, or cloud platform.
- The MT80 load ON/OFF button will directly control the AC and DC load output.

11.4 Professional Application

1) Advantages

Connect the MT80 RS485 external communication port to a Wi-Fi module, Bluetooth module, PC or RTU. The mobile application or PC software enables parameter configuration and real-time operational monitoring. The load ON/OFF button on the MT80 controls the inverter ON/OFF state, reducing the inverter's energy losses and improving the system efficiency.

2) Connection Diagram



No.	Item	Number
1	Solar charge controller	1 pc
2	Inverter	1 pc
3	MT80	1 pc

4	Wi-Fi module, Bluetooth module, RS485-USB cable, or RTU	1 pc
5	Mobile phone or PC	1 pc
6	RS485 cable (included)	3 pcs (2 pcs included, 1 pc optional)
7	Dry contact connection cable (optional)	1 pc
8	PV, battery, AC load, DC load	As required

3) Operations

1. Connect the RS485 device port of the MT80 to the corresponding communication ports of the solar controller and inverter.
2. Connect the RS485 monitor port of MT80 to the Wi-Fi module, Bluetooth module or RS485-USB cable, or RTU.
3. Connect the dry contact interface of MT80 to the external switch port of the inverter.
4. Set the MT80 dry contact enable switch to the ON state.
5. Set the inverter power switch to the OFF state.
6. Set the parameters or monitor the operational status of the solar controller and inverter using the phone app, PC software, or cloud platform.
7. The MT80 load ON/OFF button controls the inverter ON/OFF state remotely.

Please note that changes may be made to the user manual without prior notice.

User manual version number: v3.0

Photonic Universe Ltd

E-mail: info@photonicuniverse.com

Web: www.photonicuniverse.com

Tel.: +44 (0) 203 150 11 11

Fax: +44 (0) 203 150 12 12
