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REMOTE METER

Model: MT91

INSTRUCTION MANUAL



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1. Safety Instructions

- Thank you for selecting the MT91 remote meter. Please read this manual carefully before using the product.
- Please keep this manual for future reference.
- When you receive the product, check whether there are any signs of damage. If any damage is found, contact the supplier.
- Please read this manual and the safety information carefully before installing the product.
- Keep the product away from rain, direct sunlight, dust, vibration, corrosion, and electromagnetic interference.
- Do not allow water or other liquids to come in contact with or enter the product.
- The product contains no user-serviceable components. Do not disassemble or attempt to repair the device.



Do not install this product in humid, salt-spray, corrosive, greasy, flammable, explosive, dust-accumulative, or other harsh environments.

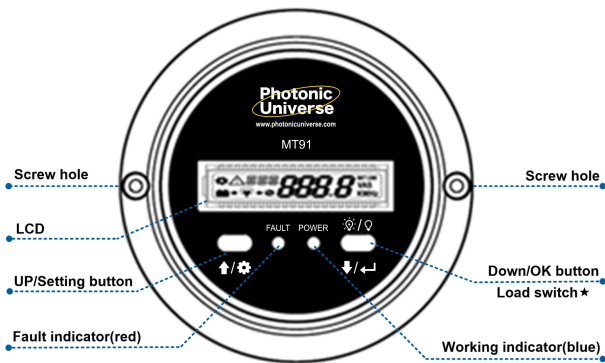
2. Overview

The MT91 connects directly to Photonic Universe IPT inverters to allow easy parameter setting. It provides convenient monitoring of the inverter, delivering precise operational data and real-time fault alerts.

Features

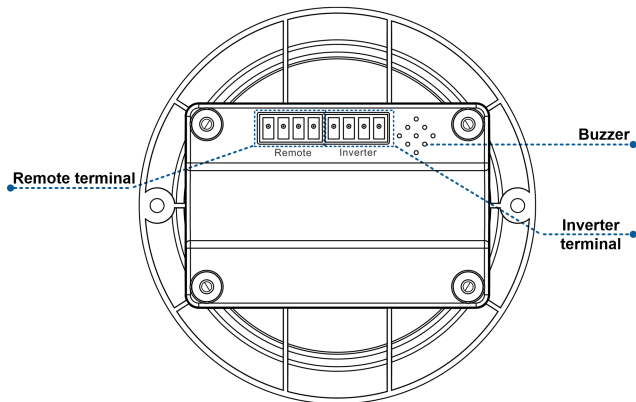
- Dual communication ports
- Real-time display of fault alarms
- Local reading of real-time parameters
- Easy to install and operate
- ON/OFF button to control the load output

3. Appearance

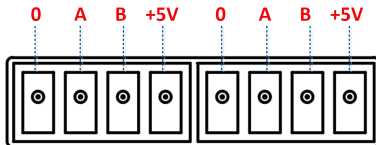


★When in the real-time interface, press and hold  for 2 seconds to turn off the load (default: ON). Press and hold  again for 2 seconds to turn on the load.

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



- PIN definition of the Inverter and Remote terminals:



- To connect the MT91 to an inverter:

Connect the "Inverter" terminals of the MT91 to the RJ45 communication port on the inverter using the supplied RS485 cable.

- To connect the MT91 to an auxiliary module:

Connect the "Remote" terminals of the MT91 to auxiliary modules such as Bluetooth or Wi-Fi modules through an adapter cable.

4. Installation Instructions

Surface mounting installation is recommended.

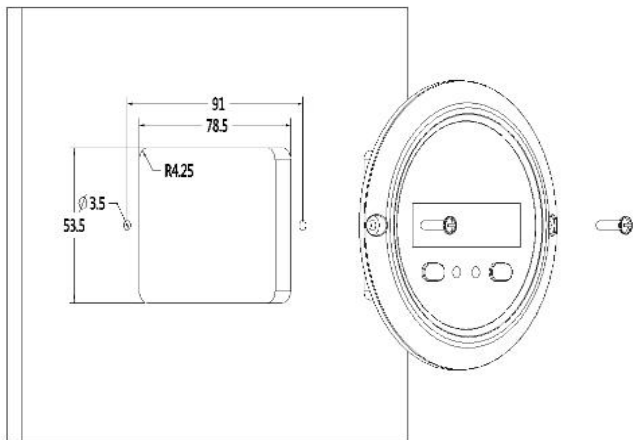
Step 1: Mark the mounting position according to the product dimensions (hole centres 91mm apart) and drill the mounting holes, ensuring that the opening is no smaller than 77 x 52mm.

Step 2: Use two screws to fix the remote meter in place.

- **Product dimensions**

Distance between the centres of mounting holes: 91mm

Recommended recess size: 78.5 x 53.5mm



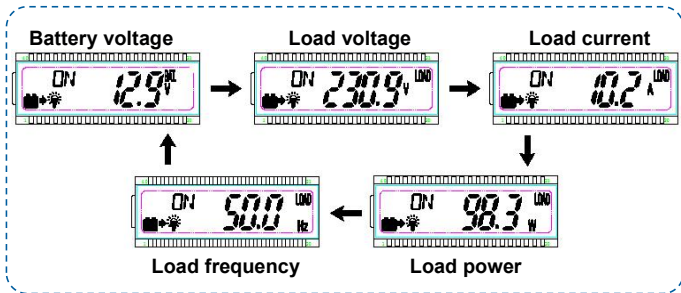
5. Button Instructions

Button	Operation	Instruction
	Press	Scroll up
		Increase the setting value
	Press and hold for 2 seconds	Enter the parameter setting interface
		Return to real-time interface (default)
	Press	Scroll down
		Decrease the setting value
	Press and hold for 2 seconds	In the real-time interface, toggle the load output ON/OFF (default: ON).
		In the setting interface, confirm the parameter configuration.
 + 	Press	In the setting interface, exit the parameter configuration interface.
	Press and hold for 2 seconds	In the real-time interface, clear all faults.

The remote meter will sound a long beep when confirming parameter settings and will sound a short beep for all other actions.

6. Real-time Interface

In the real-time interface please press  or  and cycle through the parameters shown below.



Note:



indicates that the load is ON.



indicates that the load is OFF.

7. Setting Interface

- Parameter configuration

Step1: When in the real-time interface, press and hold  for 2s to enter the parameter setting interface.

Step2: Press  or  to select the parameter to be configured.

Step3: Press and hold  for 2s to enter the configuration interface of the specified parameter. The parameter value will flash.

Step4: Press  or  to select the desired parameter value.

Step5: Press and hold  for 2s to confirm the desired value.

Step6: Press  and  together to exit the current interface.

- **Power Saving Mode**

Users can enable the power saving mode and set the PSI (the power threshold for entering the power saving mode), and the PSO (the power threshold for exiting the power saving mode), in the parameter setting interface.

When the inverter load power is lower than the PSI value, the system will automatically switch to power saving mode. In this mode, the inverter output is turned on for 1s and turned off for 5s to conserve power.

When the inverter load power exceeds the PSO value, the inverter will automatically exit power saving mode and resume normal operation.

1) Enable power saving mode (PSE)

Step 1: When in the real-time interface of the remote meter, press and hold



button to enter the parameters setting interface.

Step 2: Press



or



button to select the PSE parameter.

Step 3: Press and hold



button until the PSE parameter (default: OFF) flashes.

Step 4: Press  or  button to toggle the PSE status.

- Select ON to enable power saving mode.
- Select OFF to disable power saving mode.

Step 5: Press and hold  button to confirm the desired value.

2) Set the power to enter the power saving mode (PSI)

Step 6: When in the parameter setting interface, press  or  button to select the PSI parameter.

Step 7: Press and hold  button until the PSI value flashes.

Step 8: Press  or  button to set the desired value.

- Press  button to increase the PSI value by 1.
- Press  button to decrease the PSI value by 1.
- Press and hold  button to increase the PSI value by 10. After ten operations, the PSI value will increase by 100 each time.

Step 9: Press and hold



button to confirm.

3) Set the power to exit the power saving mode (PSO)

Step 10: When in the parameter setting interface, press



or



button

to select the PSO parameter.

Step 11: Press and hold



button until the PSO value flashes.

Step 12: Press



or



button to set the desired value.

- Press  button to increase the PSO value by 1.
- Press  button to decrease the PSO value by 1.
- Press and hold  button to increase the PSO value by 10.

After ten operations, the PSO value will increase by 100 each time.

Step 13: Press and hold



button to confirm.

- User defined parameters

Display	Parameter	Default	Range
 VPT	Output voltage class ^①	220VAC	220VAC/230VAC/240VAC
 FRE	Output frequency class ^①	50Hz	50Hz/60Hz
 BLT	LCD backlight time	30s	30s/ 60s/100s(ON solid)
 PSE	Power Saving Enable	OFF	ON/OFF
 PSI	Power to enter power saving mode	20VA	20VA - (20%*rated power of the inverter)
 PSO	Power to exit power saving mode	40VA	(20VA + PSI) - (50%*rated power of the inverter)
 BRS	Baud Rate Select	115200	9600/115200

 LVD	Low voltage disconnect voltage ^②	12V: 10.8V 24V: 21.6V 48V: 43.2V	12V: 10.5V~14.2V; step size 0.1V 24V: 21V~30.2V; step size 0.1V 48V: 42V~62.4V; step size 0.1V
 LVR	Low voltage reconnect voltage ^②	12V: 12.5V 24V: 25V 48V: 50V	12V: 11.5V~15.2V; step size 0.1V 24V: 22V~31.2V; step size 0.1V 48V: 43V~63.4V; step size 0.1V
 OVR	Over voltage reconnect voltage ^②	12V: 14.5V 24V: 29V 48V: 58V	12V: 11.5V~15.2V; step size 0.1V 24V: 22V~31.2V; step size 0.1V 48V: 43V~63.4V; step size 0.1V
 OVD	Over voltage disconnect voltage ^②	12V: 16V 24V: 32V 48V: 64V	12V: 12.5V~16.2V; step size 0.1V 24V: 23V~32.2V; step size 0.1V

			0.1V 48V: 44V-64.4V; step size 0.1V
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① After configuring the parameters marked with ①, the inverter will restart automatically. The new setting will take effect after the inverter has restarted.

② Please refer to the following rules for the modification of these parameters:

- **Rules for battery protection voltage**

A. Over voltage limit voltage (16.2/32.2/64.4V) $\geq$ Over voltage disconnect voltage $\geq$ Over voltage reconnect voltage +1V.

B. Over voltage reconnect voltage $\geq$ Low voltage reconnect voltage.

C. Low voltage reconnect voltage $\geq$ Low voltage disconnect voltage +1V.

D. Low voltage disconnect voltage $\geq$ Low voltage limit voltage (10.5/21/42V).

- When the input voltage reaches a protection threshold, the system displays the following status indications:

Input voltage protection	Status
Over voltage protection	The output is switched OFF. The blue indicator flashes rapidly. Buzzer beeps. LCD displays ΔIOV .
Over voltage reconnect	The blue indicator is solid ON. The output voltage is normal.
Low voltage protection	The output is switched OFF. The blue indicator flashes slowly. Buzzer beeps. LCD displays ΔILV .
Low voltage reconnect	The blue indicator is solid ON. The output voltage is normal.

Note: Although the inverter is designed with overvoltage protection, the surge voltage must not exceed 20V for the 12V system, 40V for the 24V system, and 80V for the 48V system; otherwise, the inverter may be damaged.

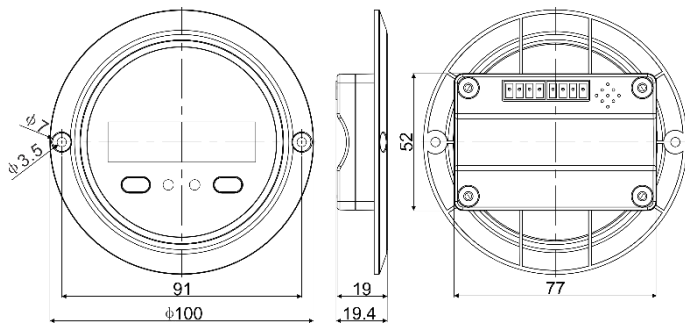
8. Error Codes

Error code	Faults	Buzzer	Working indicator	Fault indicator
ΔOTP	Inverter over temperature Heat sink over temperature	5 beeps	OFF	ON solid
ΔIOV	Input over voltage	5 beeps	Fast flashing (once/1s)	OFF
ΔILV	Input low voltage	5 beeps	Slowly flashing (once/4s)	OFF
ΔOSC	Output short circuit	5 beeps	OFF	Fast flashing (once/1s)
ΔOOL	Output overload	5 beeps	ON solid	Slowly flashing (once/4s)
ΔOVA	Output voltage abnormal	5 beeps	OFF	OFF

9. Specifications

Model	MT91
Compatible products	IPT inverters
Power supply	5VDC
Power supply method	Inverter communication port
LCD visual angle	Straight from the front
LCD backlight	Yes
Installation method	Surface mounting installation
Self-consumption	14mA/5V(no backlight) 23mA/5V(backlight)
Work temperature range	-20°C ~ +60°C
Storage temperature range	-35°C ~ +70°C
Dimensions	100 x 19.4mm
Mounting size	100 x 50mm
Mounting hole size	Φ3.5mm
Net Weight	65g

10. Dimensions



***Specifications and other details in this manual
may be subject to change without prior notice.***

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