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MastMinder MM-48100, 200, 250, V2 Modular Solar System Installation Manual

For following systems

- **0.5KW 12 PV, 2 solar modules with 3 x 200 AH 15-cell Lithium batteries**
- **1KW 24 PV, 4 solar modules with 24 x 2volt 1500AH Lead / Acid batteries**
- **1KW 30 PV, 5 solar modules with 6 x 200AH 15-cell Lithium batteries**

Contents

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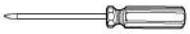
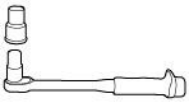
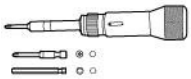
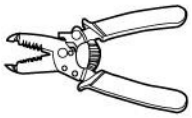
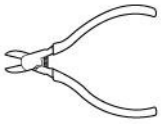
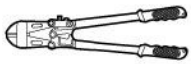
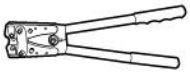
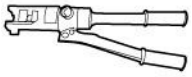
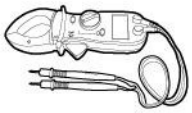
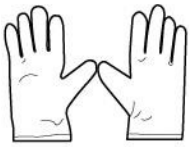
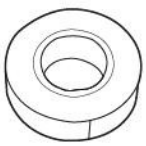
1 Installation Preparations

Tools

Use tools with insulated handles. The following table is for reference only.
Table 1-1 Installation tools and instruments

 Utility knife	 Marker	 Phillips screwdriver	 Flat-head screwdriver	 Torque wrench
 Combination wrench	 Adjustable wrench	 Socket wrench	 Torque screwdriver	 Wire stripper
 Diagonal pliers	 Wire clippers	 Power cable crimping tool	 Hydraulic pliers	 Heat gun
 Clamp meter	 ESD wrist strap	 ESD gloves	 Protective gloves	 Steel measuring tape
 Heat shrink tubing	 PVC insulation tape			

1.1 Unpacking and Acceptance

- Check whether the packing cases are intact. If a packing case is severely damaged or wet, identify the cause and report the issue to the supplier.
- Unpack the cases.
- Check the quantity of components against the packing lists attached to the packing cases. If the quantity differs from that specified on the packing lists, identify the cause and report the issue to the supplier.

1.2 Installing a Protective Ground Cable

Figure 1-2 Installing a protective ground cable

1.3 Installing a Solar Module

- Remove the filler panel from the solar module slot.
- If the solar module is damaged, report the issue to the supplier.
- The solar module slot presents a risk of electric shock. Do not touch the slot with your hands.
- High temperature is generated around the air exhaust vent when the solar module is running. Do not touch the vent with your hands or cover the vent with cables or other objects.
- Loosen the screw towards the left.
- Draw the buckle downwards.
- Gently push the solar module into its slot along the guide rails.
- Push the buckle upwards.
- Tighten the screw towards the right to secure the buckle.

Figure 1-1 Installing a solar module

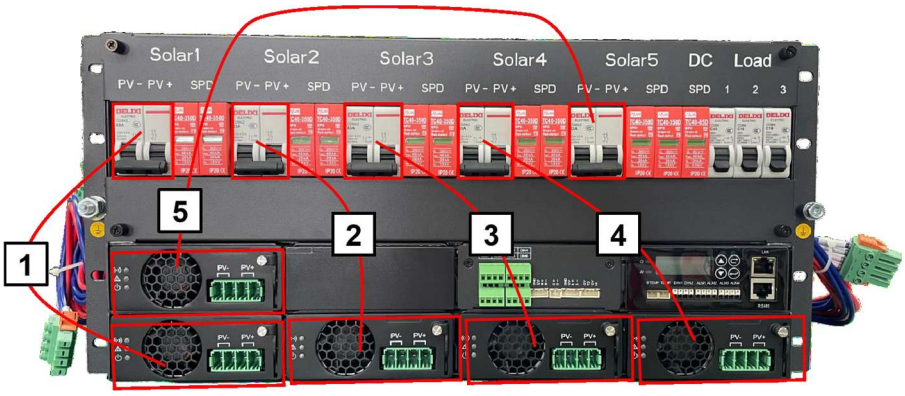
This is a V2 Low Voltage type with the characteristics below.

Input Voltage	58～150VDC
Rated Input Voltage	125VDC
Maximum Input Voltage	150VDC
Maximum Input Current	50A

1.4 Installing Photovoltaic Input Power Cables

The solar module corresponds one-to-one with the photovoltaic input circuit breaker, as shown in Figure 1-12.

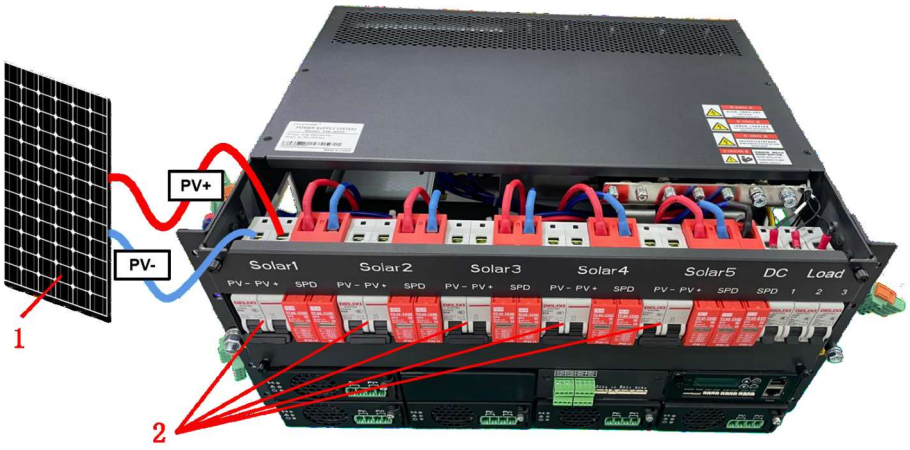
Figure 1-12 Photovoltaic module and photovoltaic input circuit breaker correspondence



Procedure

- Remove the front panel, route the photovoltaic input power cable, threading the photovoltaic input power cable through the top of the sub-rack.
- Fasten the photovoltaic input power cables to the photovoltaic input circuit breaker.

Figure 1-13 Installing photovoltaic input power cables



（1）Photovoltaic panel （2）Photovoltaic input circuit breakers

1.5 Connecting Battery Cables

Before installing, operating, and maintaining batteries, read the battery manufacturer's instructions and comply with their requirements. The safety precautions specified in this document are highly important and require special attention. For more safety precautions, see the instructions provided by the battery manufacturer.

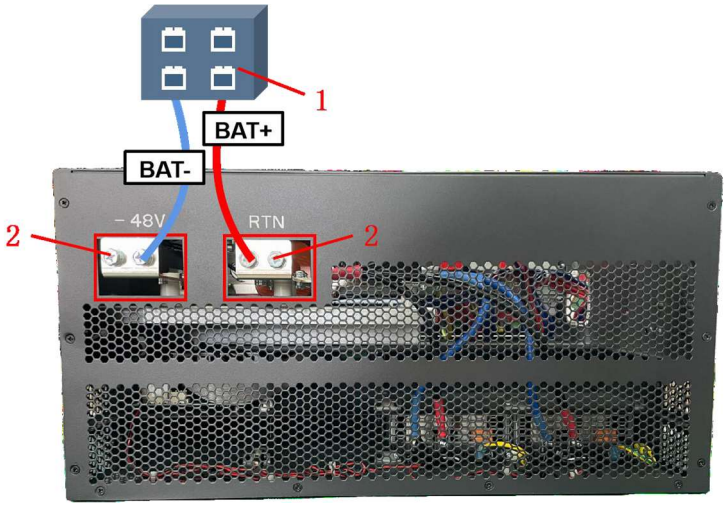
DANGER

- Smoking and sparks are prohibited near batteries.
- Switch off battery circuit breakers before installing batteries.
- Comply with regulations and warnings of the battery manufacturer.
- Use tools with insulated handles, otherwise, batteries may be burnt out and personal injury may occur.
- During battery operations, wear goggles, rubber gloves, and protective clothes.
- Remove conductive articles such as watches, bracelets, and rings.
- If battery acid gets in the eyes, rinse with cold water for more than 15 minutes and seek media advice immediately. If battery acid contacts skin or clothing, wash with soap and water immediately.
- Secure battery cables to a torque specified in battery documentation. Loose connections will result in excessive voltage drop or cause batteries to burn out when the current is large.

Procedure

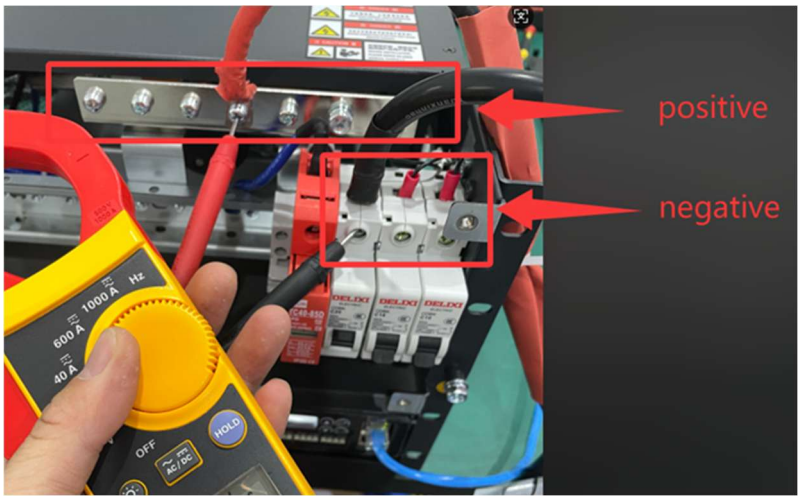
- Connect negative battery cables to the -48V port on the back of the sub-rack.
- Connect positive battery cables to the RTN port on the back of the sub-rack.
- Ensure that the positive and negative battery cables are correspondingly connected to the positive and negative pole of the port.
- The positive and negative battery cables must be correctly connected, otherwise it will cause damage to the power system.

Figure 1-11 Installing battery cables



(1) Battery string (2) -48V (3) RTN

1.6 Connecting the Load cables



1.7 Attach a LAN Communication Cable

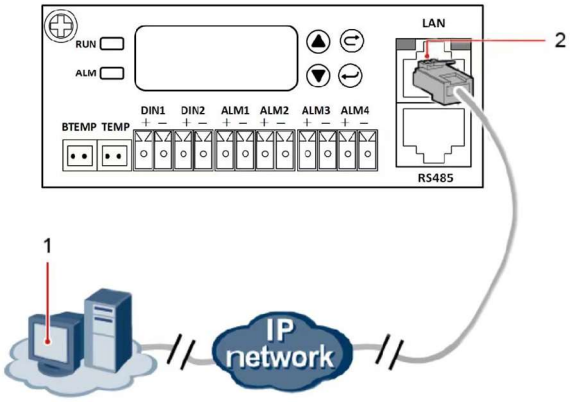
SMU48B provides communication interfaces, as shown in Table 1-2.

Table 1-2 LAN Communication port

Communications Port	Communications Parameter	Communication Protocol
LAN	10M / 100M is adaptive	HTTPS, SNMP

Connect the LAN interface to the monitoring panel, as shown in Figure 1-8.

Figure 1-8 LAN interface connection

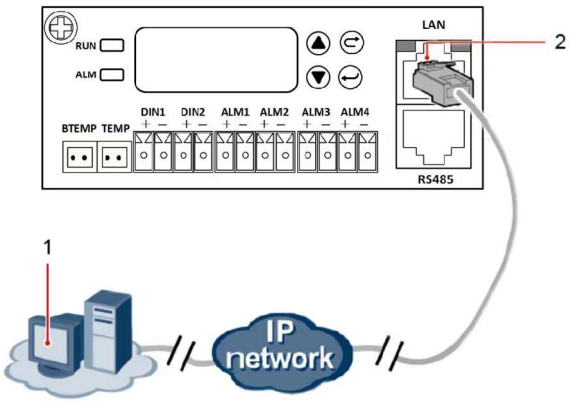


(1) Ethernet terminal equipment (2) LAN port

1.8 Third-party Network Management (over HTTPS, SNMP)

Connect the LAN port to the monitoring panel, as shown in Figure 1-10.

Figure 1-10 Third-party Network Management (over HTTPS, SNMP)



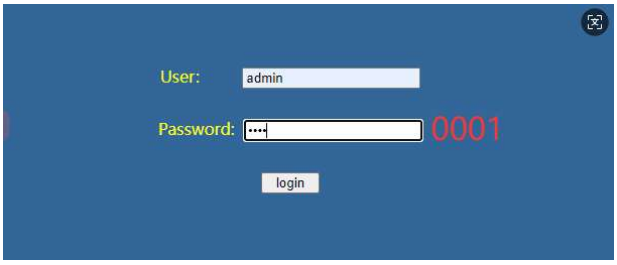
(1) User HTTPS / SNMP terminal (2) LAN port

1.9 Preparing the LAN communications

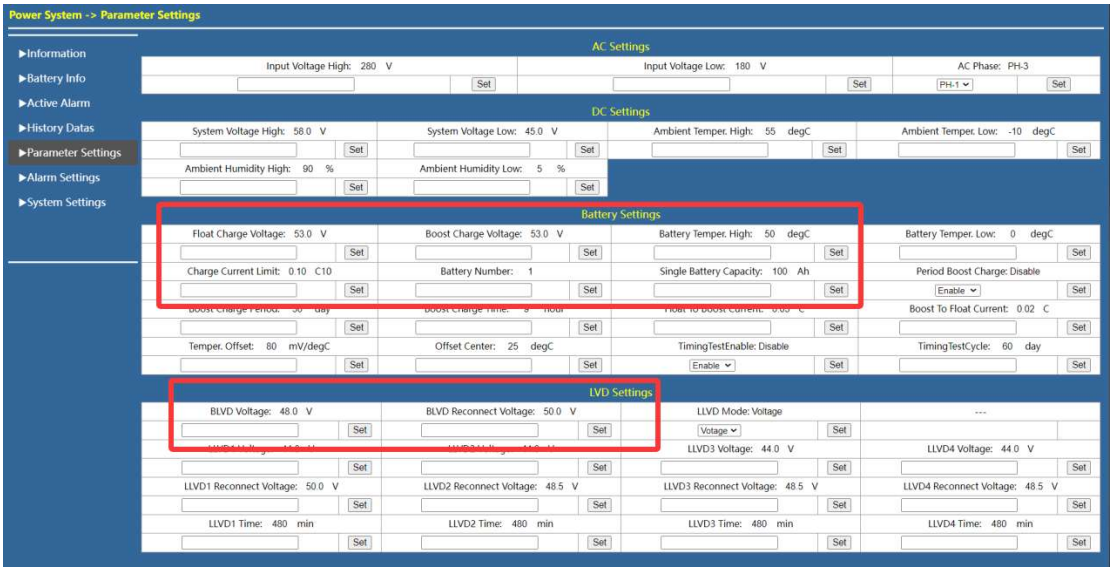
Connect a laptop to the LAN port above using a standard straight through network cable.

- Set the computer IP.
  (Open the computer's Network and Internet settings - Change adapter options - Ethernet properties - Internet Protocol Version 4 properties - Modify IP address)
  The monitoring unit default IP is 192.168.124.100, so the computer IP needs to be set to 192.168.124.120 for example.
  The laptop IP needs to be in the same network segment as the monitoring unit.

- Enter the monitoring IP (192.168.124.100) on any webpage, and complete the login (login account: admin, password: 0001).



- Check the monitoring interface - parameter setting interface - battery charging parameters are correct.
- The charging parameters can be changed according to the characteristics of the battery.
- Please see example settings in Appendix.



- Turn on the photovoltaic circuit breaker and check the battery charging, to see if the charging voltage/current is normal.
  You can check it through the PC or SNMP.

- Turn on the load output circuit breaker to supply power to the load, and check whether the load voltage/current is normal.
  This can also be checked via SNMP.
- Check if there are any real-time alerts on the monitoring interface.
  If there are alerts, please view the real-time alert information and check it.
  If necessary, please contact our after-sales technicians.

2 Verifying the Installation

2.1 Checking Hardware Installation

- Check that all screws, especially those used for electrical connections, are secured. Check that flat washers and spring washers are installed properly.
- Check that solar modules are completely inserted into their respective slots and properly locked.

2.2 Checking Electrical Connections

- Check that all circuit breakers are OFF or all fuses are disconnected.
- Check that flat washers and spring washers are securely installed for all OT terminals and that all the OT terminals are intact and properly connected.
- Check that batteries are correctly installed and that battery cables are correctly connected, and not short circuits exist.
- Check that input and output power cables and ground cables are correctly connected, and not short circuits exist.

2.3 Checking Cable Installation

- Check that all cables are securely connected.
- Check that all cables are arranged neatly and bound properly to their nearest cable ties, and are not twisted or overly bent.
- Check that cable labels are properly and securely attached in the same direction.

3 Appendix – Battery charge settings

Lead acid battery.

Lithium battery.