

April 2025

MastMinder MM-48250, 52 + 12 PV V2 Modular Solar System Installation Manual

For following system

- **1KW 52+12 PV, 5 solar modules with 200AH 15-cell Lithium batteries**

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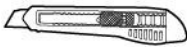
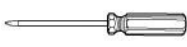
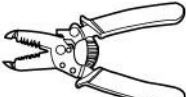
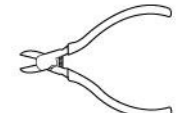
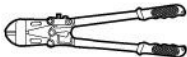
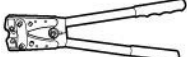
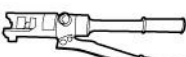
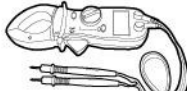
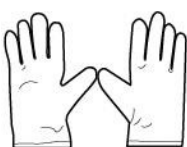
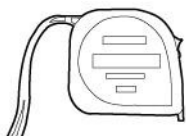
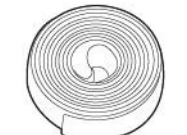
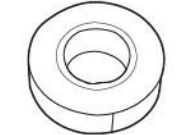
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1 Installation Preparations

Tools

Use tools with insulated handles. The following table is for reference only.

Table 1-1 Installation tools and instruments

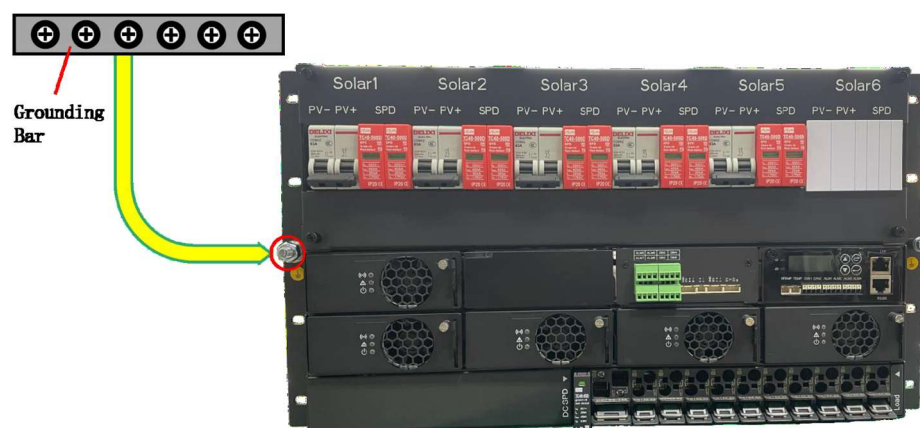
				
Utility knife	Marker	Phillips screwdriver	Flat-head screwdriver	Torque wrench
				
Combination wrench	Adjustable wrench	Socket wrench	Torque screwdriver	Wire stripper
				
Diagonal pliers	Wire clippers	Power cable crimping tool	Hydraulic pliers	Heat gun
				
Clamp meter	ESD wrist strap	ESD gloves	Protective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



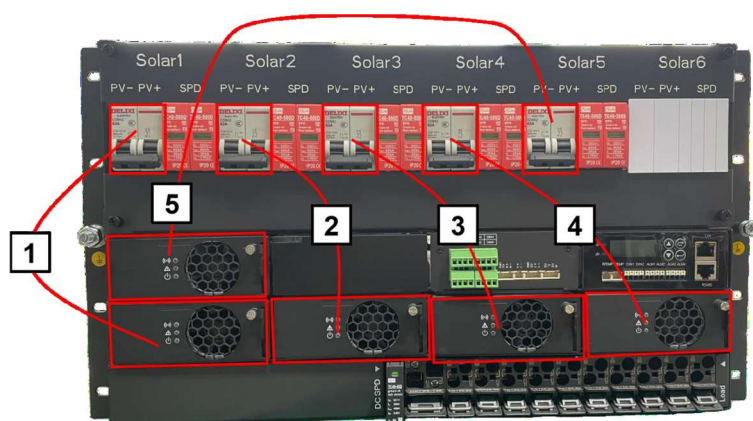
This is a V2 **High Voltage** type with the characteristics below.

Input Voltage	200~400VDC full load 100~200VDC De-rating
Rated Input Voltage	240/336VDC
Maximum Input Voltage	400VDC
Maximum Input Current	19A

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.

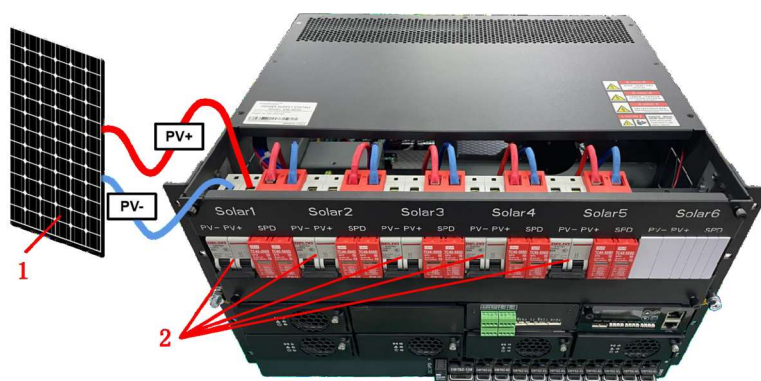
Figure 1-12 Photovoltaic module and photovoltaic input circuit breaker correspondence



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.

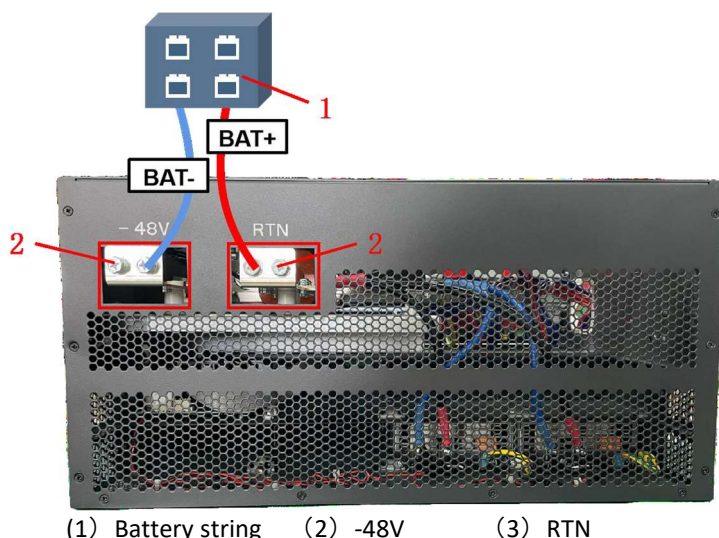
DANGER

- 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.

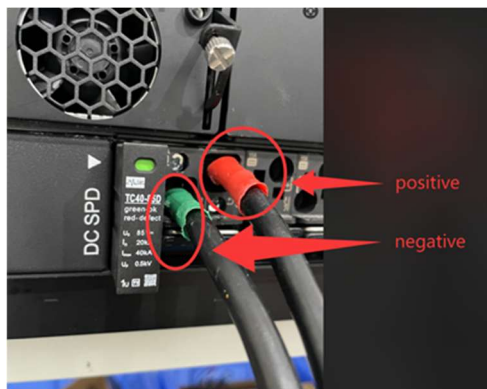
Procedure

- 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

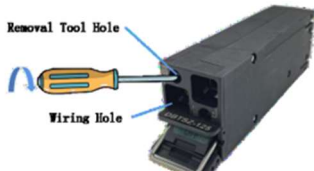
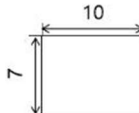


1.6 Connecting the Load cables

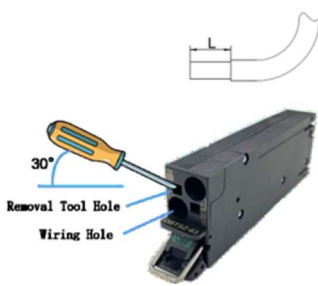
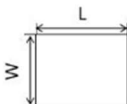


There are both High Capacity & Low Capacity Load outputs as per below.

High Capacity Load Connection below.

DBTSZ-125			
Connection Area	Bare wire	25~35mm ²	Cabling Diagram:
	Cold-pressed terminal with pre-insulated	10~25mm ²	
	Cold-pressed terminal with not pre-insulated	35mm ²	 
	Cross-sectional area of cold-pressed terminal:		
			
	1. Cross-sectional area of cold-pressed terminal: L≤10mm, W≤7mm. 2. When the cold-pressed terminal is inserted to a depth of 26mm, the diameter of the insulation tube or heat shrink tube must be no more than 12.5mm.		
Insertion Depth	23~25mm		
Stripping Depth	18mm		

Low Capacity Load Connection below.

Connection Area	Bare wire	0.75~16mm ²	Cabling Diagram: 
	Cold-pressed terminal with pre-	0.75~10mm ²	
	Cold-pressed terminal with not pre-	16mm ²	
	Cross-sectional area of cold-pressed terminal:		
	 1. Cross-sectional area of cold-pressed terminal: 1.3mm≤L≤6mm, 1.3mm≤W≤6mm. 2. When the cold-pressed terminal is inserted to a depth of 25mm, the diameter of the insulation tube or heat shrink tube must be no more than 9.5mm.		
Insertion Depth	23~25mm		
Stripping Depth	0.75~6mm ² : 12-18		
	10~16mm ² : 18mm		

1.7 Attach a LAN Communication Cable

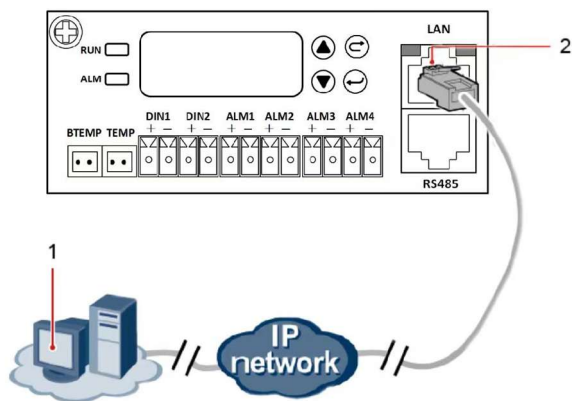
SMU48B provides communication interfaces, as shown in Table 1-2.

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

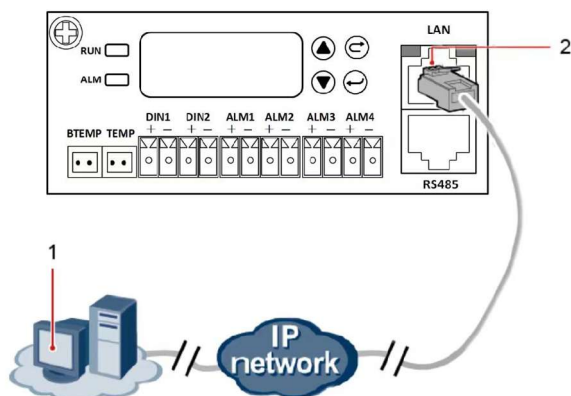


(1) Ethernet terminal equipment (2) LAN port

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.

Power System -> Parameter Settings

Information
Battery Info
Active Alarm
History Datas
Parameter Settings
Alarm Settings
System Settings

AC Settings
Input Voltage High: 280 V
Input Voltage Low: 180 V
AC Phase: PH-3

DC Settings
System Voltage High: 58.0 V
System Voltage Low: 45.0 V
Ambient Temp. High: 55 degC
Ambient Temp. Low: -10 degC
Ambient Humidity High: 90 %
Ambient Humidity Low: 5 %

Battery Settings
Float Charge Voltage: 53.0 V
Boost Charge Voltage: 53.0 V
Battery Temp. High: 50 degC
Battery Temp. Low: 0 degC
Charge Current Limit: 0.10 C10
Battery Number: 1
Single Battery Capacity: 100 Ah
Boost Charge Period: 30 day
Boost Charge Time: 9 hour
Boost To Float Current: 0.05 C
Boost To Float Current: 0.02 C
Temper. Offset: 80 mV/degC
Offset Center: 25 degC
TimingTestEnable: Disable
TimingTestCycle: 60 day

LVD Settings
BLVD Voltage: 48.0 V
BLVD Reconnect Voltage: 50.0 V
LLVD1 Reconnect Voltage: 50.0 V
LLVD2 Reconnect Voltage: 48.5 V
LLVD3 Reconnect Voltage: 48.5 V
LLVD4 Reconnect Voltage: 48.5 V
LLVD1 Time: 480 min
LLVD2 Time: 480 min
LLVD3 Time: 480 min
LLVD4 Time: 480 min

- 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.

System Voltage: 50.0 V
System Current: 46 A
Battery Current: 13 A
Battery: Equal Charge
Alarm State:

AC Input Information
A Phase Voltage: 0 V
B Phase Voltage: 0 V
C Phase Voltage: 0 V
AC Frequency: 50 Hz

DC Information
System Voltage: 50.0 V
System Current: 46 A
Battery Current: 13 A
Battery SOC: 100.0 %
Ambient Humidity: 0 %
Load1 Current: 46 A
Load1 Energy: 0 kWh
Bat.1 Mid.Volts: 0 V
Battery Temp.1: 25 degC
Total Load Power: 2.35 kW
Load2 Current: 0 A
Load2 Energy: 0 kWh
Bat.2 Mid.Volts: 0 V
Ambient Temp.2: 25 degC
Total Load Energy: 0 kWh
Load3 Current: 0 A
Load3 Energy: 0 kWh
Bat.3 Mid.Volts: 0 V
Ambient Temp.3: 25 degC
Total Load Energy: 0 kWh
Load4 Current: 0 A
Load4 Energy: 0 kWh
Bat.4 Mid.Volts: 0 V

Rectifier Module

No.	Vin(V)	Vin(V)	Vout(V)	Iout(A)	Temp(degC)	On/Off
1	0.0	0.0	0.00	0.0	0	ON
2	0.0	0.0	0.00	0.0	0	ON
3	0.0	0.0	0.00	0.0	0	ON
4	0.0	0.0	0.00	0.0	0	ON
5	0.0	0.0	0.00	0.0	0	ON
6	0.0	0.0	0.00	0.0	0	ON
7	0.0	0.0	0.00	0.0	0	ON
8	0.0	0.0	0.00	0.0	0	ON
9	0.0	0.0	0.00	0.0	0	ON
10	0.0	0.0	0.00	0.0	0	ON
11	0.0	0.0	0.00	0.0	0	ON
12	0.0	0.0	0.00	0.0	0	ON

Solar Module

No.	Vin(V)	Vin(A)	Vout(V)	Iout(A)	Temp(degC)	On/Off
1	387.5	8.3	50.77	59.9	26	ON

- 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.

Power System -> Active Alarm

Information
Battery Info
Active Alarm
History Datas
Parameter Settings
Alarm Settings
System Settings

Active Alarm

Alarm No.	Alarm Name	Alarm No.	Alarm Name	Alarm No.	Alarm Name
1	AC POWER FAULT	11	-	21	-
2	-	12	-	22	-
3	-	13	-	23	-
4	-	14	-	24	-
5	-	15	-	25	-
6	-	16	-	26	-
7	-	17	-	27	-
8	-	18	-	28	-
9	-	19	-	29	-
10	-	20	-	30	-

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.



AC Settings

Input Voltage High: 280 V Set Input Voltage Low: 180 V Set AC Phase: PH-3 PH-1 Set

DC Settings

System Voltage High: 58.0 V Set System Voltage Low: 45.0 V Set Ambient Temp. High: 55 degC Set Ambient Temp. Low: -10 degC Set Ambient Humidity High: 90 % Set Ambient Humidity Low: 5 % Set

Battery Settings

Float Charge Voltage: 53.0 V Set Boost Charge Voltage: 53.0 V Set Battery Temp. High: 50 degC Set Battery Temp. Low: 0 degC Set Charge Current Limit: 0.10 C10 Set Battery Number: 1 Set Single Battery Capacity: 100 Ah Set Period Boost Charge: Disable Enable Set Boost To Float Current: 0.02 C Set Boost Charge Period: 30 day Set Boost Charge Time: 9 hour Set Float to Boost Current: 0.02 C Set Boost To Float Current: 0.02 C Set TimingTestEnable: Disable Set TimingTestCycle: 60 day Set

LVD Settings

BLVD Voltage: 48.0 V Set BLVD Reconnect Voltage: 50.0 V Set LLVD Mode: Voltage Set LLVD3 Voltage: 44.0 V Set LLVD4 Voltage: 44.0 V Set LLVD1 Reconnect Voltage: 50.0 V Set LLVD2 Reconnect Voltage: 48.5 V Set LLVD3 Reconnect Voltage: 48.5 V Set LLVD4 Reconnect Voltage: 48.5 V Set LLVD1 Time: 480 min Set LLVD2 Time: 480 min Set LLVD3 Time: 480 min Set LLVD4 Time: 480 min Set

Lithium battery.

AC Settings

Input Voltage High: 280 V

Set

Input Voltage Low: 180 V

Set

DC Settings

System Voltage High: 58.0 V

Set

System Voltage Low: 45.0 V

Set

Ambient Temper. High: 55 degC

Set

Ambient Humidity High: 90 %

Set

Ambient Humidity Low: 5 %

Set

Battery Settings

Float Charge Voltage: 53.0 V

53

Set

Boost Charge Voltage: 53.0 V

53

Set

Battery Temper. High: 50 degC

Set

Charge Current Limit: 0.10 C10

0.2

Set

Battery Number: 1

3 or 6 or 9

Set

Single Battery Capacity: 100 Ah

200Ah

Set

Boost Charge Period: 30 day

Set

Boost Charge Time: 8 hour

Set

Float to Boost Current: 0.05 C

Set

Temper. Offset: 80 mV/degC

Set

Offset Center: 25 degC

Set

TimingTestEnable: Disable

Enable

Set

LVD Settings

BLVD Voltage: 48.0 V

43.2

Set

BLVD Reconnect Voltage: 50.0 V

48.5

Set

LLVD Mode: Voltage

Voltage

Set

LLVD1 Voltage: 44.0 V

Set

LLVD1 Reconnect Voltage: 50.0 V

Set

LLVD2 Reconnect Voltage: 48.5 V

Set

LLVD3 Reconnect Voltage: 48.5 V

Set

LLVD1 Time: 480 min

Set

LLVD2 Time: 480 min

Set

LLVD3 Time: 480 min

Set

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