

## **SL-M800-C Micro**

### **Inverter**

## **USER MANUAL**

**V1.00**








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# 1. Important Safety Instructions

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1. The Micro Inverter is designed and tested according to international safety requirements. However, certain safety precautions must be taken during installation and operation. Installation personnel must read and follow all instructions, precautions, and warnings in this installation manual.
2. Specifications subject to change without notice - please ensure you are using the most recent update found at <https://www.slenergy.com>.

	<b>DANGER, WARNING AND CAUTION</b>		<b>CE MARKS</b>
	<b>HIGH VOLTAGE AVOID CONTACT</b>		<b>Etiquette Onduleur.</b>
	<b>HIGH TEMPERATURE AVOID CONTACT</b>		<b>USER MANUAL IN PACK</b>
			<b>DO NOT DISPOSE WITH HOUSEHOLD WASTE</b>

## 1.1 Radio interference statement

CE EMC Compliance: The equipment can comply with CE EMC, which are designed to protect against harmful interference in a residential installation. The equipment could radiate radio frequency energy and this might cause harmful interference to radio communications if not following the instructions when installing and using the equipment. But there is no guarantee that interference will not occur in a particular installation. If this equipment causes harmful interference to radio or television reception, the following measures might resolve the issues:

1. Relocate the receiving antenna and keep it well away from the equipment.

2. Place the shield between the Micro Inverter and the receiving antenna, such as metal.

3. Consult the dealer or an experienced radio/TV technical for help.

Changes or modifications not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment.

## **1.2 Safety requirements**

Only qualified personnel can install and replace inverters

Before installing or using the Micro Inverter, please read all instructions and cautionary markings in the technical documents and on the Micro Inverter system and the solar-array

Perform all electrical installations in accordance with local electrical codes

Do NOT disconnect the PV module from the Micro Inverter without disconnecting the AC power.

Be aware that the body of the Micro Inverter is the heat sink and can reach a temperature of 80°C. To reduce risk of burns, do not touch the body of the Micro Inverter.

Do NOT attempt to repair the Micro Inverter. If it fails, contact Customer Support (+86 400 6339 990) to start the replacement process. Damaging or opening the Micro Inverter will void the warranty.

Do NOT expose the connection to directed, pressurized liquid (water jets, etc.).

Do NOT expose the connection to continuous immersion.

Do NOT expose the AC connector to continuous tension (e.g., tension due to pulling or bending the cable near the connection).

Do NOT allow contamination or debris in the connectors.

Use only the connectors and cables provided.

Use the cable and connectors only when all parts are present and intact.

Use the terminator to seal the conductor end of the Engage Cable; no other method is allowed.

The external protective earthing conductor is connected to the inverter protective earthing terminal through AC connector.

When connecting, connect the AC connector first to ensure the inverter earthing

then do the DC connections.

When disconnecting, disconnect the AC by opening the branch circuit breaker first but maintain the protective earthing conductor in the branch circuit breaker connect to the inverter, then disconnect the DC inputs.

In any circumstance, do not connect DC input when AC connector is unplugged.

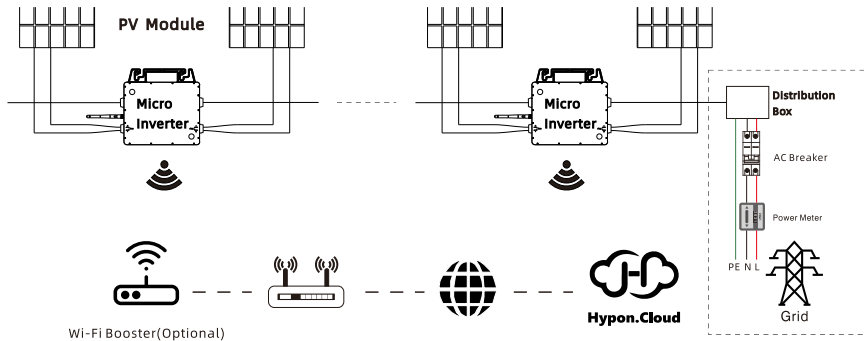
Please install isolation switching devices on the AC side of the inverter.

## 2. Micro Inverter System Introduction

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The Micro Inverter is used in utility-interactive grid-tied applications, comprised of two key elements:

- Micro Inverter
- Router



*Note: Wi-Fi booster is a repeater (also known as Wi-Fi signal amplifier), mainly used to extend the range of Wi-Fi networks. When there is a large office area or a large home, Wi-Fi booster can expand your Wi-Fi system's coverage area by boosting or amplifying the wireless signal. It eliminates the dead spots to reach the signals to the destination*

This integrated system improves safety; maximizes solar energy harvest; increases system reliability, and simplifies solar system design, installation, maintenance, and management.

### Micro Inverters maximize PV energy production

The Micro Inverter ensures top performance from the array by maximizing the performance of the module within the array when PV modules in the array are affected by shading.

### More reliable than centralized or string inverters

The distributed Micro Inverter system ensures that no single point of system failure exists across the PV system. Micro Inverters are designed to operate at full power at ambient temperatures of up to +65°C (+149° F). The inverter housing is

designed for outdoor installation and complies with the IP67 environmental enclosure rating.

## 3. Working Mode

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### 3.1 Work Mode

1. Normal: Under this mode, Micro Inverter is operating normally and convert DC power into AC power to support the house loads and feed in to Public Grid.
2. Zero Export Control (optional, HM-2000D) : Under this mode Micro Inverter's generation is limit base on the current house loads, there will be no extra power feed in to the Public Grid.
3. Stand by: There are several circumstance that Micro Inverter will stay in Standby mode:
  - The current condition is contradicted with Micro Inverter operating requirement.
  - No house loads or the Export control value has been set as "0" on the HM-2000D under the Zero Export Control mode.



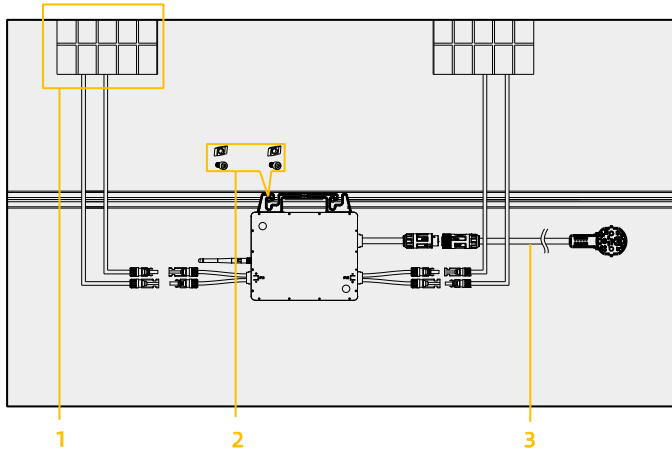
## 4. UNPACKING

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### 3.1 Product Overview

The total size of SL-M800-C is 230(width) ×190(height) ×46.5(depth) mm. It has 2 pairs of PV input terminals.

The detail description is shown below:



Mark Num.	Description
1	Solar panel
2	M8 screws(prepared by the installer-self)
3	AC to power plug cable/Female AC Plug (Optional)

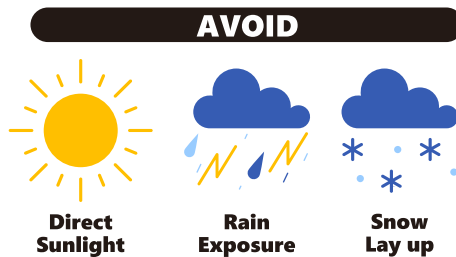
Note: None of the accessories above is included in the package and should be purchased separately.

## 5. INSTALLING

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### 5.1 Installation Requirement

1. Planning the cable length Determine whether to use an extension cable.
2. Please install the inverter(s) in places that can avoid inadvertent contact.
3. The installation must be carried out with the equipment disconnected from the grid (power disconnect switch open) and with the photovoltaic modules shaded or isolated.
4. Installation method, location and surface must be fitting for the inverter's weight and dimensions.
5. The inverter performance peaks at ambient temperature lower than 65°C.
6. Avoid electromagnetic interference that can compromise the correct operation of electronic equipment.
7. Install only on structures specifically conceived for photovoltaic modules (supplied by installation technicians).
8. Install the Micro Inverter and all DC connections under the PV module to avoid direct sunlight, rain exposure, snow buildup, UV, etc.

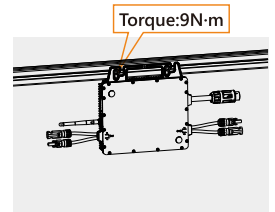
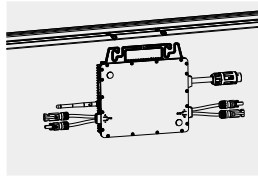
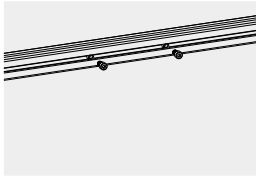


9. Install Micro Inverter underneath of the PV modules to make sure it works in the shadow. If this condition cannot be met, might trigger the inverter production de-rating.

## 5.2 Mounting

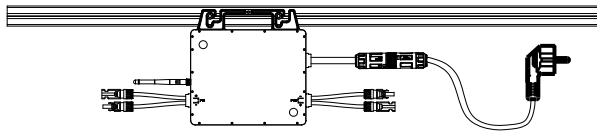
### 5.2.1 Micro Inverter Installation

1. Mark the position of each Micro Inverter on the rail, according to the PV module layout.
2. Fix the screw on the rail.
3. Mount Micro Inverter at each of these locations and tighten the screws.

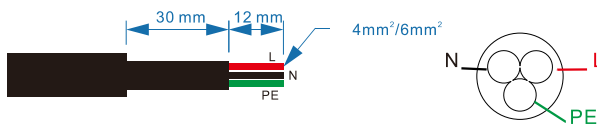


### 5.2.2 AC Connection

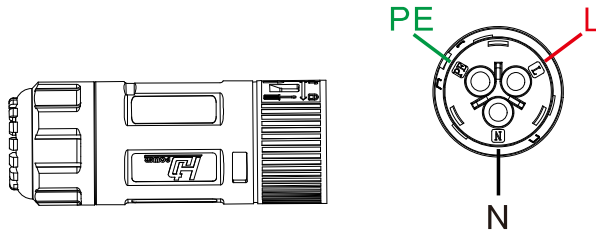
- 1.a) Insert the AC to power plug cable into the AC connector of the micro inverter until it clicks.
- 1.b) Connect the AC end cable to the distribution box, and wire it to the local grid network.



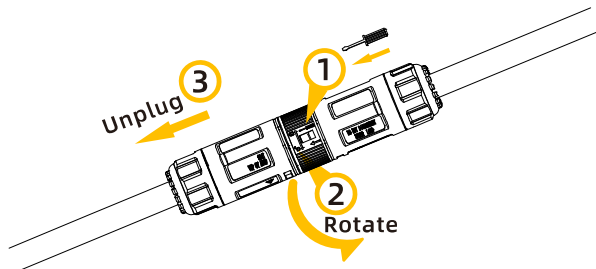
- 1.A) Insert the conductor( $4\text{mm}^2/6\text{mm}^2$ ) into a suitable ferrule acc. to DIN 46228 and crimp



- 1.B) Insert the crimped conductors L, N and PE into corresponding terminals and tighten the screws (torque 1.4N·m)



2. Please plug the AC end Cap to make last connection water and dust-proof. End Cap's ingress protection is IP65 and cannot be soaked in water.
3. Push the buckle open with the tool as shown, rotate the latch as shown, unplug the male and female ends to unlock the cables.



Check all the wires of the installation before connecting to the grid to be sure they match. Wrong cable polarity can damage the Micro Inverters, such an issue is not covered by the warranty.

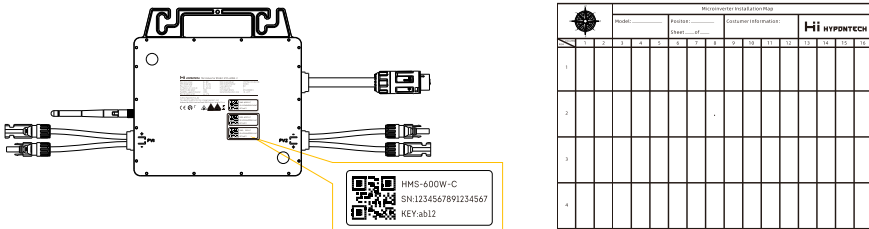
### 5.2.3 AC Switch Types

Please install an individual 2-stage miniature circuit breaker according to the following specifications.

Model	Maximum output current (A)	AC Breaker Rated current (A)
HMS-800W-C	3.6	10
HMS-600W-C	2.7	10

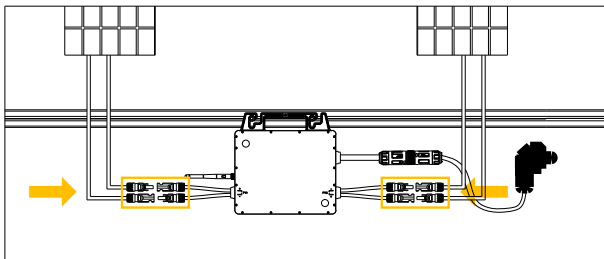
### 5.2.4 Installation Map

1. Peel the removable serial number label from each Micro Inverter.
2. Affix one serial number label to the respective location on the installation map and affix another to the PV module frame which is easy to see. The warranty cards can be obtained from the appendix of this manual or Hypontech website: <https://www.hypon.com/>.



### 5.2.5 PV Connection

1. Mount the Micro Inverter under the PV modules.
2. Connect the PV modules' DC cables to the DC input side of the Micro Inverter.



### 5.2.5 Place a Warning Notice

A warning notice shall be placed in such a position that any person gaining access to live parts will be warned in advance of the need to isolate those live parts from all points of supply.

Special attention should be paid that the power supply, measuring circuits (sense lines) and other parts may not be isolated from the network when the switch of the interface protection is open.

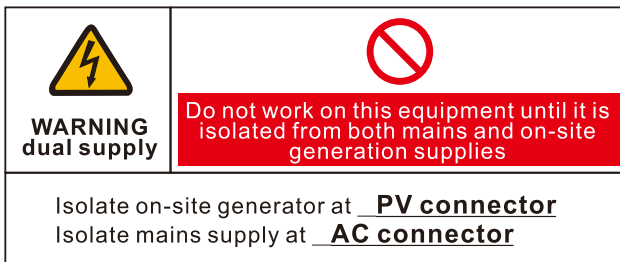
As a minimum, warning labels shall be placed:

On the switchboard (DNO panel and consumer unit) that has the micro-generator connected to it;

On all switchboards in between the consumer unit and the micro-generator itself;

On, or in the micro-generator itself;

At all points of isolation for the micro-generator.



## 6. START UP AND OPERATION

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### 6.1 Safety Check Before Start Up




Please check before switching on any voltage resources connected to the inverter:

1. Grid Voltage: Check the grid voltage at point of connection at the inverter complies with permitted range of the inverter.
2. Mounting of the inverter: Check if the inverter is properly mounted and attached to the rail.
3. DC Connectors: Check if the DC connectors are installed correctly on terminals.
4. AC Connectors and Wire Assembly: Check if wires are assembled correctly on the AC side and if the AC connector is properly and securely installed. Check if the AC connector is firmly plugged into AC terminal.
5. Cables: Check if all cables are reliably connected. Check if the connections are effective, while the insulations are undamaged.
6. Groundings: Check all groundings using multi-meter and if all exposed metal parts of the inverter are properly grounded.
7. DC Voltage: Check if the largest open-circuit voltage of PV arrays complies with the permitted range.
8. DC Polarity: Check if the wires from DC voltage resource are connected to terminals with correct polarity.
9. Grounding Resistance: Check if the grounding resistance of PV strings  $>1\text{M}\Omega$  using a multi-meter.

After all installation and checks, close the AC circuit-breaker. The inverter will start to operate when DC input voltage and grid conditions meet the requirements of inverter startup.

### 6.2 Inverter LED Indicators

When the inverter operates, LED symbols on display have the following meanings:

GREEN	 ON Inverter Power ON and Feeding Power to Grid or Backup
	 Blink Inverter Power ON. Not Feeding Power to Grid
RED	 ON Inverter is Faulty

## 7. DISCONNECTING FROM VOLTAGE SOURCES

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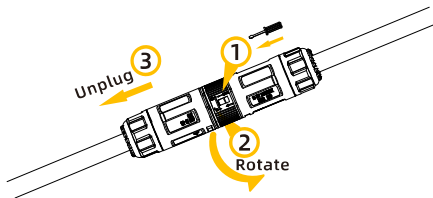
Before proceeding any operations on inverter, please disconnect the inverter from all voltage resources as described in this manual.

Following these steps in described sequence are mandatory.

1. Disconnect miniature circuit-breaker and prevent from unintentional reconnections.
2. Use clamps to ensure there is no electrical current in DC wires.
3. Disconnect all DC connections and resources. Unplug the DC connectors, and DO NOT pull the cables.



4. Use multi-meter to ensure the voltage on DC terminals of inverter is 0.
5. Push the buckle open with the tool as shown, Rotate the latch as shown, unplug the male and female ends to unlock the cables.



### **Danger to life due to high voltages.**

When an error occurs, DO NOT remove the cover of the inverter onsite.

Improper operations and attempts may induce electric shock.



## 8. TECHNICAL PARAMETERS

Module	SL-M600-C	SL-M800-C
<b>INPUT/DC</b>		
Max. PV Power (Wp)	320-450(2 Piece)	360-550(2 Piece)
Max. Input Voltage (V)	60	
Start up voltage (V)	16	
MPP Voltage Range (V)	25-55	
Max. Input Current (A)	15/15	15/15
Max. short DC current (A)	20/20	20/20
<b>OUTPUT/AC</b>		
Rated Power (W)	600	800
Max./Rated apparent AC power (VA)	600	800
Rated grid voltage (Vac)	220/230/240	
Rated grid frequency (Hz)	50/60	
Max.AC output current (A)	2.7	3.6
Power factor	>99.9%	
THDi at rated power	<3%	
Grid connection	L/N/PE	
Note: "*" The inrush current and Max. output fault current are really test values.		
<b>EFFICIENCY</b>		
Max. Efficiency	96.5%	
MPPT Efficiency	>99.9%	
<b>PROTECTION</b>		
Anti-islanding Protection	Integrated	
PV string input reverse polarity protection	Integrated	
Output Over Current Protection	Integrated	
Output Short Protection	Integrated	

Output Over Voltage Protection	DC:II / AC:III
<b>GENERAL DATA</b>	
Dimensions(W*H*D) mm	230*190*46.5
Weight (kg)	3.5
Noise emission(typical) dB(A)	20
User Interface	LED
DC connection type	MC4
AC connection type	Plug-in Connector
Communication	Wi-Fi
Cooling method	Natural Cooling
Operating ambient temperature range	-40°C.....+65°C
Allowable relative humidity range	0%~100%
Max. operating altitude(m)	3000(>3000 derating)
Degree of protection(IEC 60529)	IP67
Climatic category (IEC 60721-3-4)	4K4H
Topology	High frequency isolated
Power loss in night mode	<50mW

## 9. TROUBLE SHOOTING

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### Full Error Code and Corrective Measures

When the PV system does not operate normally, we recommend the following solutions for quick troubleshooting. If an error occurs, the Error code will be displayed on the inverter's screen or on the Hypontech's monitoring App/Web, the red LED will light up. The corresponding corrective measures are as follows:

Error Code	Fault Name	Description	Corrective Measures
1	Functional fault in Micro-Controller Unit (MCU)	MCU abnormal self-check in start process	Disconnect the inverter from the utility grid and the PV array, and reconnect it after LED turns off. If this fault is still being displayed, please contact service.
2	A faulty current sensor detected	AC current sensor detect current abnormal in the start process	Disconnect the inverter from the utility grid and the PV array, and reconnect it after LED turns off. If this fault is still being displayed, please contact service.
4	A faulty grid relay detected	The difference between INV voltage and output voltage exceeds limit.	<ol style="list-style-type: none"><li>1. Disconnect the inverter from the utility grid and the PV array, and reconnect it after LED turns off.</li><li>2. If the fault persists, measure the phase to phase voltage and phase to zero and zero to ground voltage with a multimeter to ensure that the voltage is normal and the zero to ground voltage value should not be greater than 10V.</li><li>3. Disconnect the inverter from the utility grid and the PV array, and reconnect it after LED turns off.</li></ol> If this fault is still being displayed, please contact service.
5	PV voltage too high	When the PV voltage of any circuit is greater than 60V, it is determined as the PV voltage is too high.	Check the open-circuit voltages of the strings and make sure it is below the maximum DC input voltage of the inverter. If the input voltage lies within the permissible range while the fault occurs, please contact the service.

8	Inverter temperature too high	Heat sink and internal environment temperature higher than 85 degree	<p>Please confirm:</p> <ol style="list-style-type: none"> <li>Whether the airflow to the heat sink is obstructed.</li> <li>Whether the installation site is in direct sunlight and ambient temperature around the inverter is too high.</li> </ol> <p>If all above is normal, contact the service.</p>
9	Utility grid disconnected	inverter detected grid voltage failed	<ol style="list-style-type: none"> <li>If it happens occasionally, it belongs to the short-time abnormality of the power grid, the inverter will return to normal operation after detecting that the power grid is normal, and there is no need to deal with it.</li> <li>If it cannot be recovered for a long time, please confirm: <ol style="list-style-type: none"> <li>whether the AC circuit breaker is disconnected</li> <li>whether the AC terminal or fuse is in good contact</li> <li>whether the power supply line is normal</li> </ol> </li> </ol> <p>If this fault is still being shown, contact the service.</p>
10	Grid voltage exceeds the permissible range	grid voltage exceeds the Safety regulations	<ol style="list-style-type: none"> <li>If it happens occasionally, it belongs to the short-time abnormality of the power grid, the inverter will return to normal operation after detecting the normal power grid, and there is no need to deal with it.</li> <li>In case of frequent occurrence but automatic recovery, please confirm if the grid voltage is outside the permissible range due to local grid conditions, try to modify the values of the monitored operational limits after informing the electric utility company first.</li> <li>If it cannot be recovered for a long time, please confirm: <ol style="list-style-type: none"> <li>whether the AC circuit breaker is disconnected</li> <li>whether the AC terminal is in good connection</li> <li>whether the power supply line is normal</li> <li>whether the AC cable wiring (such as wire length and wire diameter) complies with the user manual guidance</li> <li>whether the safety regulation settings are normal</li> </ol> </li> </ol>
11	Grid frequency exceeds the permissible range	grid frequency exceeds the Safety regulations	<ol style="list-style-type: none"> <li>If it happens occasionally, it belongs to the short-time abnormality of the power grid, the inverter will return to normal operation after detecting the normal power grid, and there is no</li> </ol>

			<p>need to deal with it.</p> <p>2. In case of frequent occurrence but automatic recovery, please confirm if the grid voltage is outside the permissible range due to local grid conditions, try to modify the values of the monitored operational limits after informing the electric utility company first.</p> <p>3.If it cannot be recovered for a long time, please confirm:</p> <p>①whether the AC circuit breaker is disconnected</p> <p>②whether the AC terminal is in good connection</p> <p>③whether the power supply line is normal</p> <p>④ whether the safety regulation settings are normal</p>
13	EEPROM Error, e.g. transition disturbance	Micro CPU read EEPROM failed	Disconnect the inverter from the utility grid and the PV array, and reconnect it after LED turns off. If this fault is still being displayed, please contact the service.
14	Internal communication fault	Master CPU communicate with slave CPU abnormal	Disconnect the inverter from the utility grid and the PV array, and reconnect it after LED turns off. If this fault is still being displayed, please contact the service.