Open Energy for All



Combiner Box

User Manual

HMS-C

Audience

This document is intended for use by qualified persons only.

Legal Notice

Hoymiles has made every effort to ensure the accuracy and completeness of this manual. However, this manual may be changed and revised due to product enhancements or user feedback.

Hoymiles reserves the right to modify this manual without prior notice at any given time. The latest version of this manual can be found by visiting the Hoymiles official website ***(www.hoymiles.com)*** or scanning the QR Code below.

Warranty

Follow the installation instructions in this manual to ensure warranty compliance and reliability. The current warranty conditions can be accessed at ***www.hoymiles.com***.

Contact Information

If you have technical queries or any questions concerning our products, please contact our support through the Hoymiles service portal:

Floor 6, Building 5, Housheng 99 Road, Gongshu District, Hangzhou 310015 P. R. China

hoymiles.com

USA	service.us@hoymiles.com
Canada	service.ca@hoymiles.com

Before contact, make sure the following information at hand:

- Model of the product
- Brief description of the problem

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Using This Manual

Symbols

Symbol	
•	List
-	List (second level)
Step 1 ...	Steps in a defined order
A) ...	Steps in a defined order

Revision History

Issues	
V202405	Original issue
V202406	Updated "**6.2 Establishing an Internet Connection**"

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CONTENTS

1. Important Information 01
- 1.1 Read This First 01
- 1.2 Save These Instructions 01
- 1.3 Explanation of Symbols 01
- 1.4 Safety Instructions 01

2. Hoymiles Microinverter System 02
- 2.1 Microinverter 02
- 2.2 Combiner Box 02
- 2.3 S-Miles Cloud 03

3. Product Introduction 04
- 3.1 Appearance and Dimensions 04
- 3.2 Interface Layout 04
- 3.3 System Capacity 07
- 3.4 Energy Export Management 07
- 3.5 Technical Specifications 08

4. Preparation 10
- 4.1 Downloading the S-Miles Cloud Application 10
- 4.2 Checking the Scope of Delivery 10
- 4.3 Preparing the Things You'll Need 10

5. Installation 11
- 5.1 Mounting the Combiner Box 11
- 5.2 Installing DG Breaker(s) 11
- 5.3 Connecting the Circuit Wiring to the Panel 13
- 5.4 Installing Grid CTs 15
- 5.5 Energizing the Combiner Box 16

6. Monitoring Platform Configuration 18
- 6.1 Completing the Installation Map 18
- 6.2 Establishing an Internet Connection 18
- 6.3 Creating Your Power Plant 19
- 6.4 Customer Login 19
- 6.5 Viewing Power Plant Data 20

7. Troubleshooting and Replacement 21
- 7.1 Troubleshooting Lists 21
- 7.2 Checking the Microinverter Communication Status 25
- 7.3 Using the Standby Antenna 26
- 7.4 Replacing Devices 27

8. Optional Actions and Decommission 29
- 8.1 Extending the CT Lead Wires 29
- 8.2 Powering Off / Restarting the Combiner Box 29
- 8.3 Dismantling the Combiner Box 29
- 8.4 Storaging and Transporting the Combiner Box 30
- 8.5 Disposing of the Combiner Box 30

9. Appendix 1: Installation Map 31

10. Appendix 2: Terms and Abbreviations 32

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1. Important Information

1.1 Read This First

Hoymiles Combiner Box HMS-C is only compatible with Hoymiles HMS series microinverters. Please read all the instructions and warnings in the manual carefully before installation and operation.

1.2 Save These Instructions

This manual contains important instructions for HMS-C that shall be followed during installation and maintenance of the Combiner Box.

1.3 Explanation of Symbols

Symbols on the Product Label

Symbol	Explanation
	**Caution** Risk of electrical shock.
	**Read the manual first** Read this manual carefully before performing any installation, operation, or maintenance.

Symbols in the User Manual

Symbol	Description
	This symbol indicates situational hazards that may lead to high-level electric shocks or severe physical injuries.
	This symbol signifies the importance of strictly following directions to avoid safety hazards, including damage to equipment and personal injury.
	This symbol indicates either potential risks that may lead to minor injury or damage to the equipment, or an important step or tip that leads to the best results.

1.4 Safety Instructions

Danger!

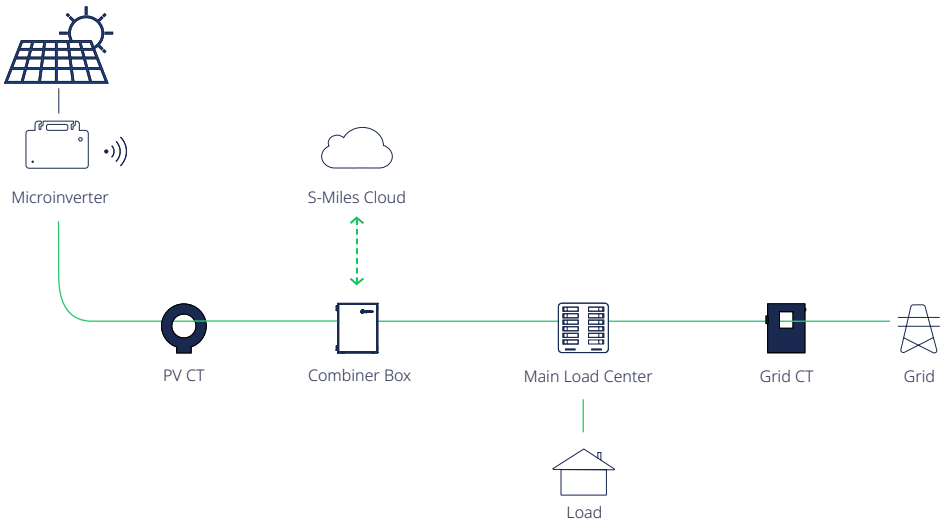
- Please read all the instructions and warnings in this manual carefully.
- Do not attempt to repair or disassemble the Combiner Box without Hoymiles' permission, otherwise it will invalidate the remaining warranty period. Please send the Combiner Box back to your installer for repair or replacement.
- Do not use Hoymiles products in a way that is not suggested by the manufacturer. Otherwise it can cause death, personal injuries, or equipment damage.

Warning!

- The installation, replacement, and repair of the Combiner Box must be carried out by qualified persons only. Hoymiles is not liable for damages resulting from improper installation and use.
- Wiring methods should be in accordance with the National Electrical Code and ANSI/NFPA 70.

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2. Hoymiles Microinverter System



A typical Hoymiles HMS microinverter system is composed of multiple HMS series microinverters, a Combiner Box (with a built-in DTU), and the Hoymiles S-Miles Cloud monitoring platform.

Conversion of direct current (DC) to alternating current (AC) is done by the microinverters.

The Combiner Box combines the AC output of the microinverters, collecting module-level data from them using its built-in DTU. Its pair of PV Current Transformers (CT) and pair of Grid CTs track the amount of electricity generated and consumed by the system. These data are sent to the S-Miles Cloud.

The S-Miles Cloud is a comprehensive monitoring and analysis platform. It provides real-time insights into the whole system performance, enabling you to keep track of your PV system's status. It also enables remote monitoring, module-level monitoring, as well as efficient operations and maintenance (O&M).

2.1 Microinverter

Hoymiles module-level HMS series microinverters track the maximum DC power point of each PV module, which is known as Maximum Power Point Tracking (MPPT).

The MPPT circuit of the microinverter is less susceptible to partial shade conditions. With multiple independent MPPTs, when one MPPT fails or is shaded, the microinverter can operate the unshaded string at the maximum efficiency point using the other MPPTs, ensuring optimal performance under various partial shading scenarios.

Module-level monitoring is another feature of Hoymiles HMS series microinverters. All the data will be collected and sent to the S-Miles Cloud via the DTU.

Furthermore, the microinverter only carries a few dozen volts of DC voltage, which significantly lowers the risk to user safety.

2.2 Combiner Box

The Hoymiles Combiner Box serves as a central hub in a solar energy system, responsible for power distribution, electricity metering, and system communication. With a Type 3R and UV-resistant enclosure, it is suitable for outdoor installation. It supports a 120/240 V Split-phase grid and accommodates the necessary AC connections for a Hoymiles microinverter system.

The Combiner Box integrates a Communication Module (meter, DTU, and power supply) that collects microinverter data via sub-1G and sends the data to the S-Miles Cloud via 4G and Ethernet. It also integrates a smart meter for revenue-grade PV production metering with accuracy at ±0.5% and grid metering with accuracy at ±1.0%.

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2.3 S-Miles Cloud

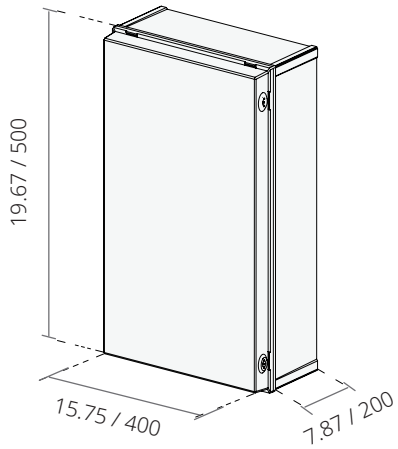
Hoymiles S-Miles Cloud monitoring platform is a real-time visualized monitoring and management system accessible through mobile devices and web browsers. Its easy-to-use procedure makes it convenient for you to set up and monitor your PV system. After power plant creation, it tracks the real-time output effectiveness of your PV installation. The performance of each solar panel is presented on the virtual array of the plant, enabling you to make clear comparisons between modules. S-Miles Cloud also provides status updates on individual modules and alerts you if any part of the installation needs attention.

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3. Product Introduction

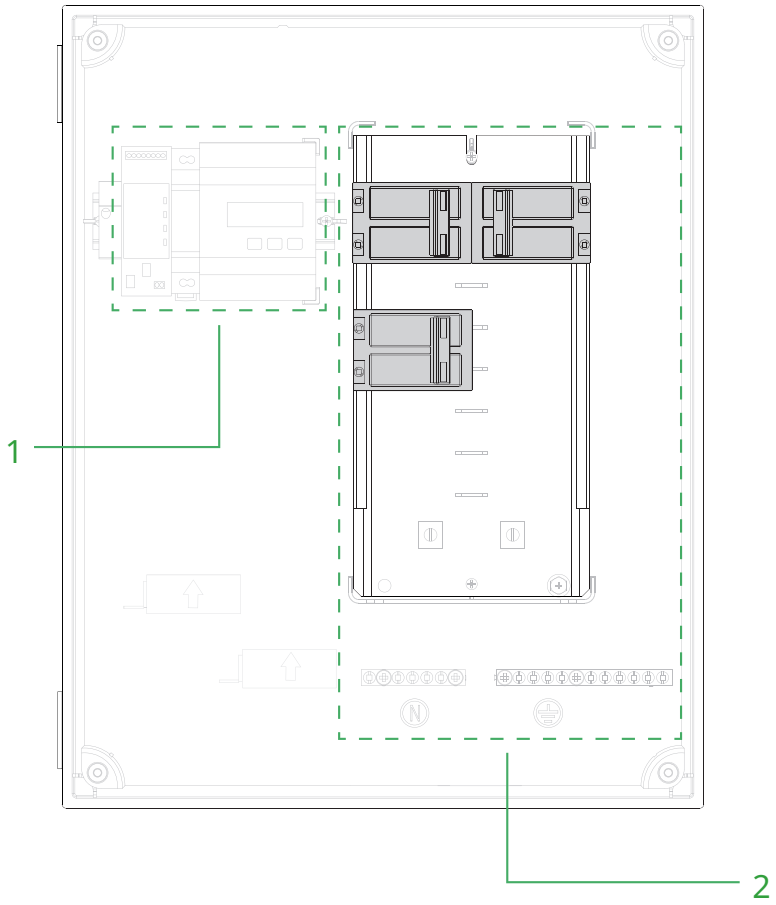
3.1 Appearance and Dimensions

Unit: inch / mm



3.2 Interface Layout

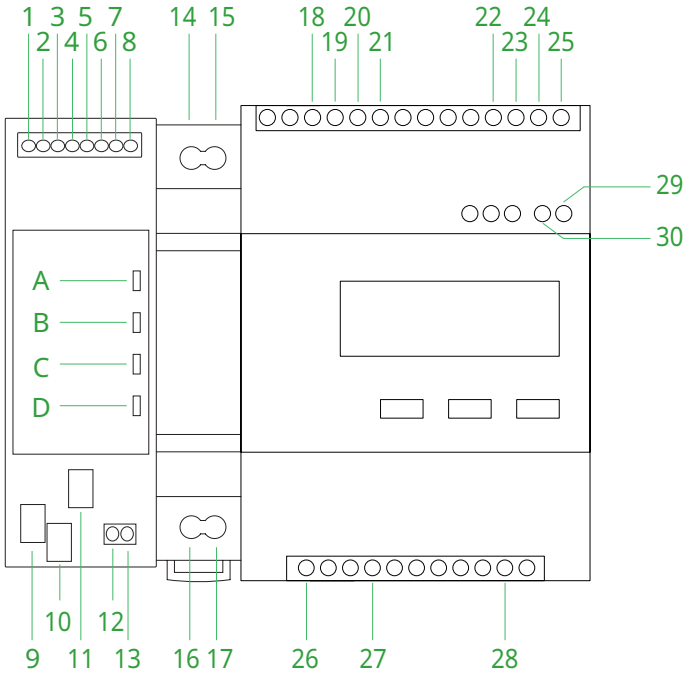
General



No.	Description
1	Communication Module
2	PV Load Center

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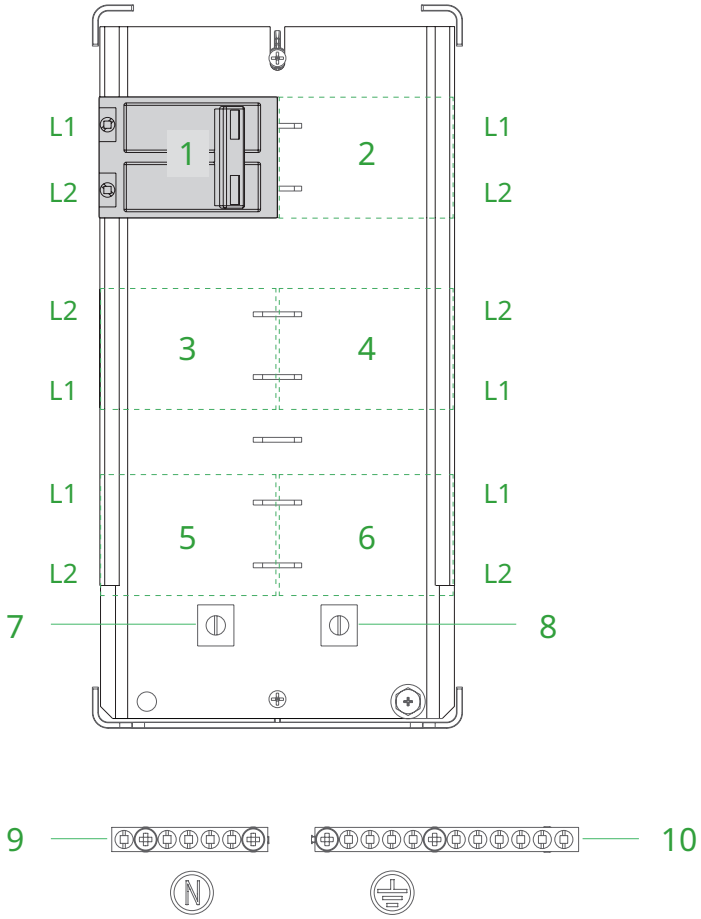
Communication Module



No.	Description	No.	Description
A	Power Indicator	14	Power Output (+5 V)
B	Communication Indicator (with Server)	15	Power Output (GND)
C	Communication Indicator (with Microinverter)	16	Power Input L1
D	Alarm Indicator	17	Power Input N
1	RS485A	18	Grid CT2-2 I2
2	RS485B	19	Grid CT2-2 I2*
3	RS485A	20	Grid CT2-1 I1
4	RS485B	21	Grid CT2-1 I1*
5	Reserved Port	22	PV CT1-2 I2
6	Reserved Port	23	PV CT1-2 I2*
7	Power Input (+5 V)	24	PV CT1-1 I1
8	Power Input (GND)	25	PV CT1-1 I1*
9	Sub-1G Antenna	26	Power Input L1
10	Ethernet Port	27	Power Input L2
11	4G Antenna	28	Power Input N
12	485A Port	29	485A Port
13	485B Port	30	485B Port

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PV Load Center



No.	Description
1	Communication Module Breaker
2-6	Installation Positions for distributed generation (DG) Breakers
7	Main Lug Output L1
8	Main Lug Output L2
9	Neutral Bar
10	Ground Bar

NOTICE

The polarity markings for L1 and L2 at Position 3 and 4 are in reverse order compared to other positions.

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3.3 System Capacity

When choosing DG breakers, make sure to meet the following requirements.

- The Combiner Box accommodates Eaton BR-style DG breakers of 10 A, 15 A, 20 A, and 30 A. The total breaker rating (including the 10 A pre-installed Communication Module Breaker) should not exceed 125 A.
- DG Breaker rating selected for each circuit branch ⩾ 125% × actual current of the circuit branch

  If the calculated result does not match the standard Eaton rating, choose the next higher standard rating DG Breaker.

Example 1

A branch connects one HMS-2000-4T microinverter, of which the actual current is 8 A. Thus, the branch requires an 8 A×125%=10 A DG Breaker, which matches Eaton BR-style standard rating.

Example 2

A branch connects one HMS-2000-4T and one HMS-500-1T microinverters. The actual current is 8 A+2 A=10 A, which means that the DG Breaker rating needed is 10 A×125%=12.5 A. Since 12.5 A is not a standard rating of Eaton BR-style DG breakers, users should choose a 15 A DG Breaker, which is the next higher standard rating.

Example 3

A branch connects three HMS-2000-4T microinverters, of which the actual current is 8 A×3=24 A. Thus, the branch requires a 24 A×125%=30 A DG Breaker, which matches Eaton BR-style DG Breaker standard rating.

Example 4

There are four branches, each of which connects three HMS-2000-4T microinverters, which is the same as the branch in Example 3. Therefore, we can conclude that each branch needs a 30 A DG Breaker. However, the total breaker rating would be 30 A×4+10 A=130 A, which exceed 125 A. Such option is not permittted.

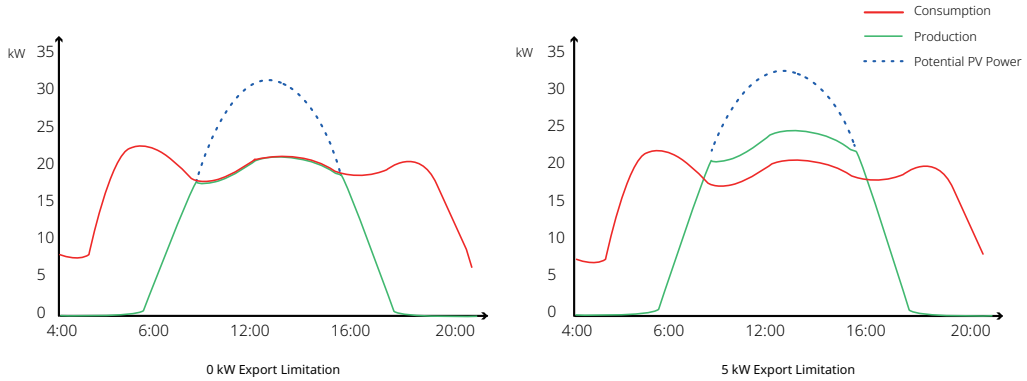
3.4 Energy Export Management

The Smart Power Export Management of the Combiner Box intelligently controls the output power of the PV system, maximizing power generation without violating grid export regulations.

The meter, CTs, and DTU are indispensable for Hoymiles Export Management solution. The meter measures PV output and load consumption, and uploads the data to the S-Miles Cloud, allowing users to track electricity online accordingly.

To accurately measure PV production, the pre-installed PV CTs are located at the output of the PV system, and the Grid CTs should be installed by users at the output of the Main Load Center to the grid.

Based on the data collected by the meter, the DTU adjusts power production to ensure the export power stays within the set limit.



0 kW Export Limitation

5 kW Export Limitation

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3.5 Technical Specifications

Accessories	
Communication Module	Includes a Power Supply, a DTU-Plus, and a meter, collectively gathering and transmitting data, enabling users to monitor system performance via PC, Smartphone, or Tablet and making remote O&M possible
Load Center	Eaton load center, 125 A capacity, with one circuit breaker assigned for powering the communication module, and the other five circuit breakers (not included), designated for branch circuits
Communication Module Breaker	Circuit breaker, 2-Pole, 10 A
Neutral Bar	Eaton GBK5
Ground Bar	Eaton GBK10
Production CT	Pre-wired revenue-grade solid core CT, accurate up to 0.5%
Grid CT	Two consumption metering clamp CTs, shipped with the box, accurate up to 1.0%
Electrical Specifications	
Rating	110 A
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Maximum continuous current rating (input from PV)	88 A
Branch circuits (solar)	Supports up to five 2-Pole Eaton BR series DG Breakers (not included), such as BR210, BR215, BR220, and BR230
Maximum total branch circuit breaker rating (input)	110 A
Communication module breaker	10 A (Eaton BR series)
Wire size	20 A to 50 A breaker inputs: 14 to 4 AWG conductors
	Main lug combined output: 10 to 2/0 AWG conductors
	Neutral and Ground: 14 to 6 AWG conductors
	Always follow local code requirements for conductor sizing
Mechanical Data	
Dimensions (W × H × D)	19.67" × 15.75" × 7.87" (500 × 400 × 200 mm)
Weight	21.2 lbs. (9.6 kg)
Ambient temperature range	-13°F to 122°F (-25°C to 50°C)
Cooling	Natural convection
Enclosure rating	Outdoor, IP65/NEMA type 3R, Polycarbonate Construction
Altitude	Up to 6,562 feet (2,000 meters)
Internet Connection Options	
Ethernet	802.3, 10 M / 100 M Adaptive Ethernet, Cat 5E (or Cat 6) UTP Ethernet cable (not included), for connecting to the S-Miles Cloud via the internet
Mobile connect	4G LTE, for connecting to the S-Miles Cloud via the internet
RS485	Support for data transmission using Modbus protocol

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Access point	For connection between the DTU and a mobile device running the S-Miles Cloud App
Metering ports	Up to two Grid CTs, and two Production CTs
Compliance	
Combiner Box	UL 1741, CAN/CSA C22.2 No. 107.1, FCC CFR 47 part 15 B, ICES-003 Issue 7
Power Supply	UL 508, UL 62368-1
Meter	UL 61010-1, UL61010-2-030, FCC CFR 47 part 15 B, CSA-C22.2 NO. 61010-1, CSA-C22.2 # 61010-2-030, ICES-003 Issue 7
Compatibility	
Microinverter	HMS Series Microinverters

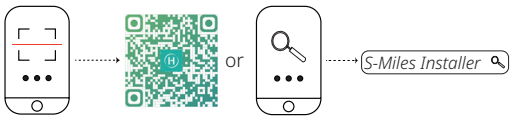
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4. Preparation

4.1 Downloading the S-Miles Cloud Application

Download the S-Miles Installer app and open it to log in to your account. There are two ways to download,

- Scan the QR code on the right
- Type in "S-Miles Installer" in your app marketplace.



4.2 Checking the Scope of Delivery

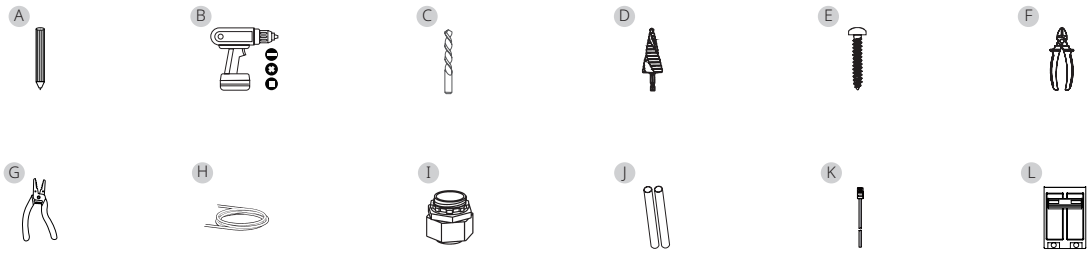
NOTICE

Immediately contact your supplier or distributor upon noticing any damaged or missing parts.



Combiner Box ×1 | Grid CT (split-core) ×2 | Mounting Set ×1 | Enclosure Key ×1 | Installation Guide ×1 | Installation Map ×1

4.3 Preparing the Things You'll Need



No.	Item	No.	Item	No.	Item
A	Marker	B	Electrical Screwdriver	C	Small Drill Bit
D	Step Drill Bit	E	Mounting Hardware [1]	F	Diagonal Cutter
G	Wire Stripper	H	Copper Cable [2]	I	Conduit Hub Fitting (Rain-tight, UL-listed)
J	Conduit (UL-listed)	K	Ethernet Cable (if needed) [3]	L	DG Breaker [4]

NOTICE

[1] Suitable mounting hardware: Utilize #8 screws (or larger) or expansion screws with sufficient length to securely mount the Combiner Box to the vertical surface.

[2] Use copper conductors, ensuring they are sized in accordance with local code requirements and considerations for voltage drop/rise. Refer to the unit's door for wire sizes and torque values.

[3] The DTU provides two options for internet connectivity: cellular or Ethernet. If you opt for cellular, ensure that the pre-installed SIM card is inserted in the DTU's SIM card slot. If you choose Ethernet, make sure to have an Ethernet cable ready for the connection.

[4] The Combiner Box accommodates up to FIVE DG Breakers (one for each PV branch circuit). Only Eaton BR-style breakers are compatible. Approved options include Eaton BR210, Eaton BR215, Eaton BR220, and Eaton BR230 circuit breakers.

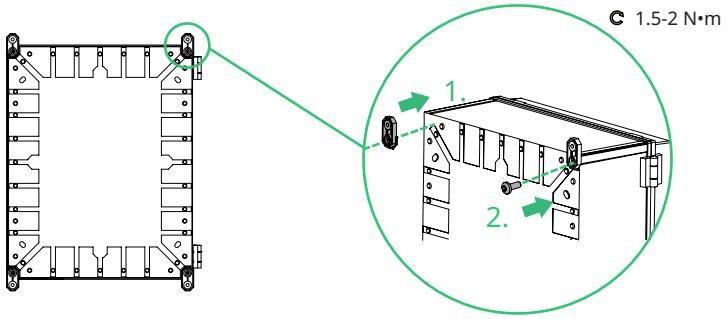
** Note the DTU serial number (SN) on the installation map. Later, you will need to enter the S-Miles Installer App. You can type it in manually or scan the label on the inside of the combiner box's door. Always keep a copy of the installation map for your records.*

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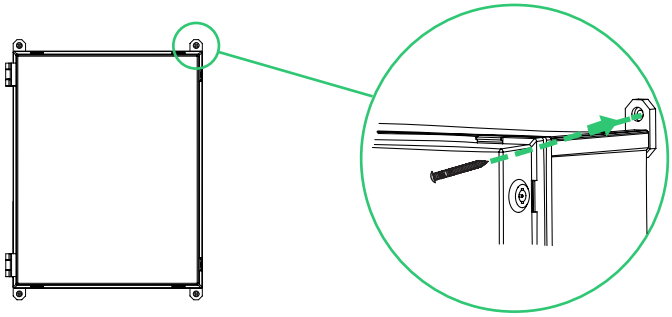
5. Installation

5.1 Mounting the Combiner Box

A) Install the mounting brackets into the Combiner Box and secure them using the provided screws. (Torque: 1.5-2 N•m)



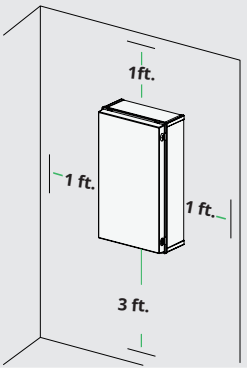
B) **Vertically** mount the Combiner Box onto the installation surface, securing it with #8 screws (or expansion screws) as illustrated below.



NOTICE

For safe operation and to avoid damage to the Combiner Box, observe the following requirements when selecting the installation site.

- **Basic Requirements:** The installation site must be convenient for electrical connection, operation, and maintenance. Additionally, it must be shielded from direct rainfall.
- **Mounting Structure Requirements:** The installation surface must be suitable for the weight (21.2 lbs.), dimensions (19.67" × 15.75" × 7.87"), and cable length of the Combiner Box.
- **Installation Space Requirements:** To ensure air circulation, the installation site must have sufficient air clearances around the Combiner Box. Clearances may vary depending on specific installations, and we suggest a general minimum guideline: maintain 1 foot (30 cm) clearance to the nearest adjacent sidewall on the up, left, and right sides, and maintain 3 feet (90 cm) clearance to the bottom side.



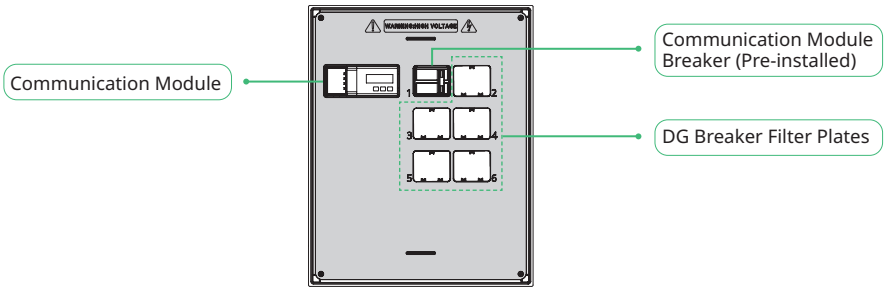
5.2 Installing DG Breaker(s)

WARNING

- Before installing the DG Breaker, ensure that its handle is positioned toward the OFF position.
- The Communication Module (meter, DTU, and power supply) has been pre-installed in the Combiner Box; do not take any action regarding them to prevent potential damage.

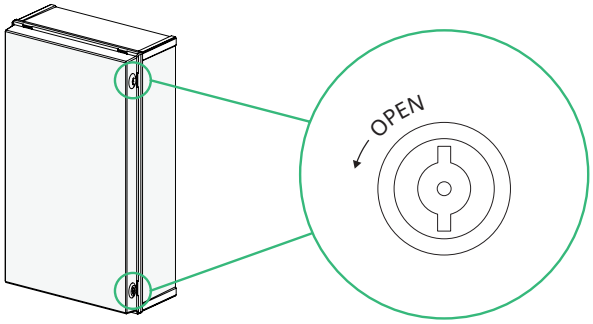
The Combiner Box comes with a pre-installed Communication Module Breaker (2P, 10 A) for connecting the Communication Module. Given the Combiner Box's capacity to accommodate a total of 110 A (sum of DG Breaker ratings, excluding the pre-installed Communication Module Breaker), if you intend to install additional DG Breakers, you can install up to FIVE DG Breakers. Make sure to follow all NEC and local electrical codes during installation.

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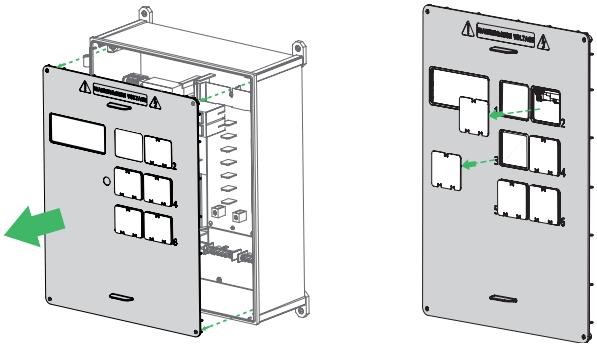
Step 1 Unlocking the Door

Put the enclosure key into the keyholes at the right side of the door and turn it counter-clockwise. The door is unlocked when both keyholes present the figure shown below.



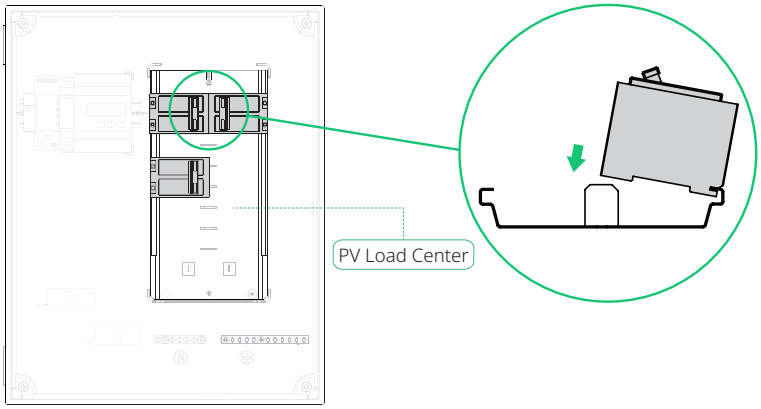
Step 2 Removing the Dead Front

A) Use an electric screwdriver to loosen the four screws supporting the dead front. It is not necessary to completely remove the screws.
B) Pull the dead front away from the Combiner Box.
C) Remove the filter plate on the dead front for each DG Breaker position to be used.



Step 3 Mounting the DG Breaker(s)

In the position where you removed the filter plate, snap the DG Breaker onto the PV Load Center.



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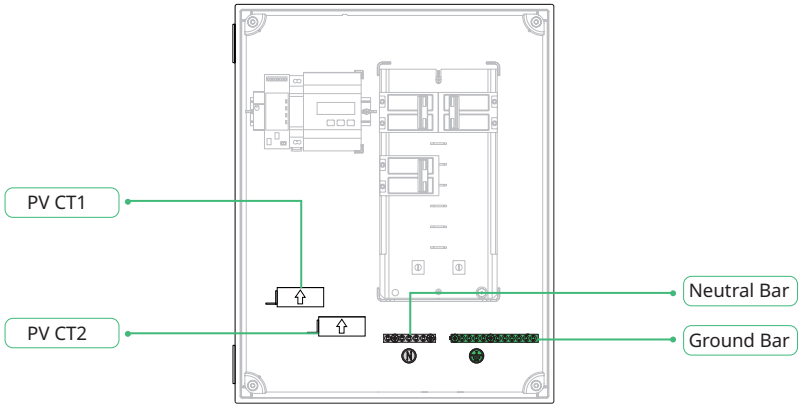
5.3 Connecting the Circuit Wiring to the Panel

WARNING

- Wear safe clothing and eye protection.
- You can only create openings on the bottom side of the enclosure. Do not drill conduit holes on the top of the Combiner Box or any locations that may permit moisture ingress. When drilling, consider the internal parts of the Combiner Box.
- Each DG Breaker can only manage one branch circuit.
- Use copper conductors sized in accordance with local code requirements and considerations for voltage drop/rise.

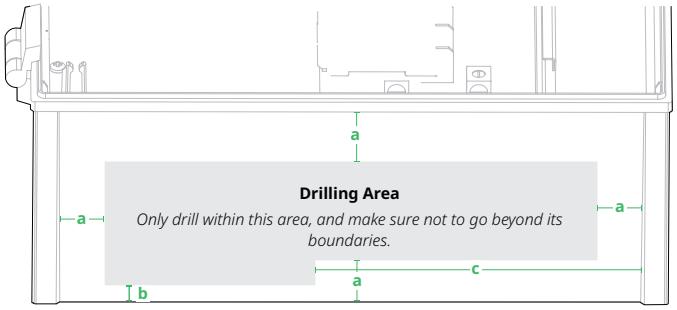
NOTICE

In this document, when we mention 'PV CT1' and 'PV CT2,' we are specifically referring to the 'CT1-1' and 'CT1-2' designations on the label affixed to the Combiner Box's door.



Step 1 Drilling Conduit Holes

A) Use a marker to outline the drilling area.

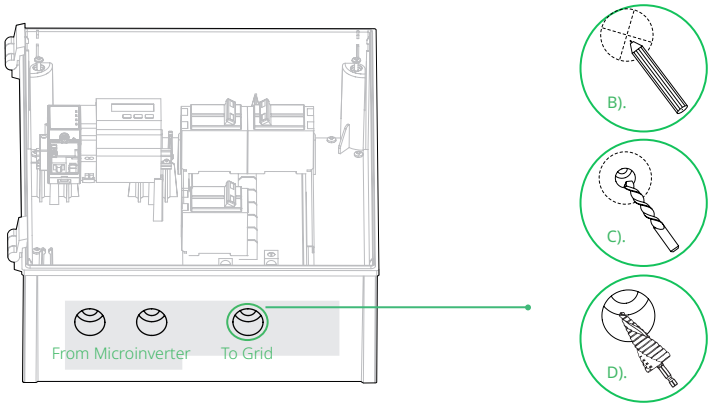


a=1.97'' (50 mm)
b= 0.79'' (20mm)
c=8.67'' (220 mm)

B) Mark drilling spots on the bottom of the enclosure.

C) Use a small drill bit to create shallow pilot holes where marked.

D) Use a step drill bit to drill holes for conduit hub fittings.



NOTICE

The number of holes to drill in the enclosure depends on the specific requirements of your system setup. In the example shown, three holes are drilled: two on the left for PV input branch circuit wiring and one on the right for grid output wiring. This example is just a reference; you should follow local electrical codes and configure the specific number of holes based on your system's needs.

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Step 2 Installing Conduits

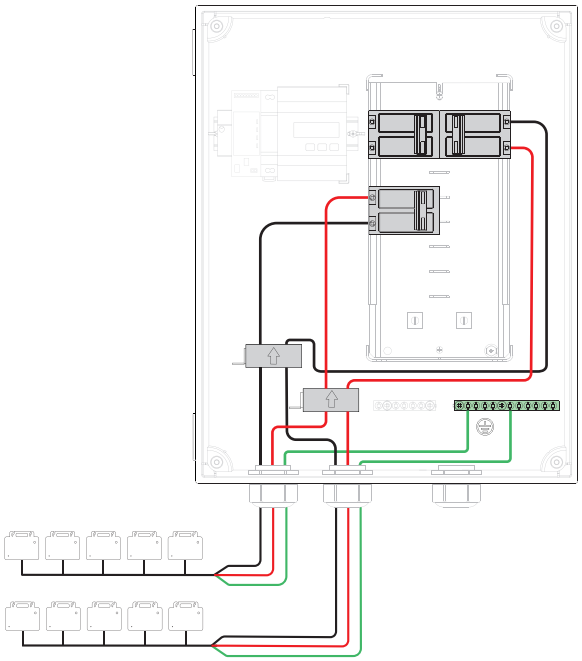
A) Insert conduit hub fittings into each corresponding hole and fully tighten the fittings.
B) Slide the conduits into the fittings as required by local regulations.

Step 3 Wiring Input From the PV

A) Connect the green (or green and yellow) ground wires to the Ground Bar.
B) Pass the L1 conductors from each PV branch circuit through the PV CT1 in the same direction as the arrow printed on the side of the CT.
C) Pass the L2 conductors from each PV branch circuit through the PV CT2 in the same direction as the arrow printed on the side of the CT.
D) Plug the L1 and L2 conductors into each DG Breaker's terminal slots.

NOTICE

- Each wire is color-coded, with the L1 and L2 conductors typically using black and red colors. The wiring code scheme may vary depending on your location. If uncertain, use a multimeter for verification. Always adhere to the local electrical code for proper wiring.
- Observe the L1 and L2 polarity marking at each breaker position.



E) Torque all connections as indicated in the table below.

Connection	Wire sizes	Torque
DG Breaker	14-10 AWG	2.2 Nm (20 lb-in)
	8 AWG	2.8 Nm (25 lb-in)
	6-4 AWG	3.0 Nm (27 lb-in)
Neutral and Ground	14-10 AWG	2.2 Nm (20 lb-in)
	8 AWG	2.8 Nm (25 lb-in)
	6 AWG	3.9 Nm (35 lb-in)
Main Lug	10-4 AWG	5.0 Nm (45 lb-in)
	3-2/0 AWG	5.6 Nm (50 lb-in)
Copper conductors only, rated min. 75°C. Follow NFPA 70(NEC), or CSA C22.1 part 1, and all local codes.		

Table 1 - Recommended Wire Size and Toeque Specifications

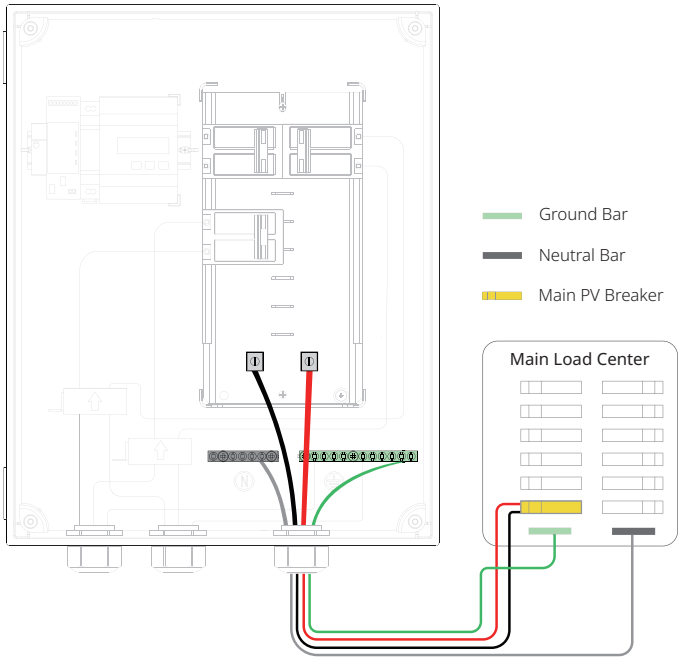
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Step 4 Wiring the Output Connections

- Use copper conductors sized in accordance with local code requirements, while considering aspects such as voltage drop/rise and the capacity of the Main PV Breaker.

Refer to the diagram on the door of the Combiner Box and do the following:

A) Connect the L1 and L2 outputs from the main lug on the Combiner Box to the Main PV Breaker (located in the Main Load Center).
B) Plug the white neutral wire into the Neutral Bar's terminal slot.
C) Plug the green (or green and yellow) ground wire into the Ground Bar's terminal slot.
D) Torque all connections as indicated in Table 1.

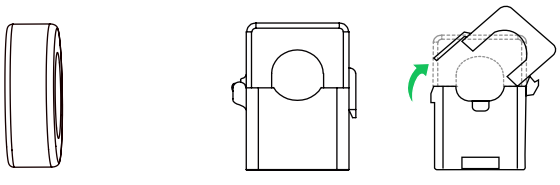


5.4 Installing Grid CTs

- To prevent electric shock or other injuries, always de-energize the Main Load Center before starting the wiring process.
- There is a risk of electrocution and equipment damage. Do not install CTs when current is flowing in the sensed circuit. Always install CT lead wires in the terminal blocks before energizing the sensed circuit.
- Due to variances in load center design, there may not always be enough space to install Grid CTs. Please check and ensure there are adequate spaces in the Main Load Center to install the Grid CTs.
- Ensure consistent matching of CT and load current. The provided Grid CTs are rated at 250 A, and the load current must not exceed 250 A.
- It is crucial to match CT and sense voltage phases. To properly measure power and energy, CT inputs must align with the respective voltage inputs. Ensure the polarity between the Main Load Center and the two main AC lines is consistent.

On the meter's label, you'll find designations like CT1-1, CT1-2, CT2-1, and CT2-2, which match with the PV CT1, PV CT2, Grid CT1, and Grid CT2 as mentioned in this document.

Two PV CTs (solid-core) for PV metering are already pre-installed and pre-wired in the Combiner Box upon delivery. The package also includes two Grid CTs (split-core) for grid metering. To install the Grid CTs, create a protected route using conduit for the CT lead wires, running them from the Main Load Center to the Combiner Box.



PV CTs Grid CTs

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Procedure

A) Position two Grid CTs on the Main Load Center.

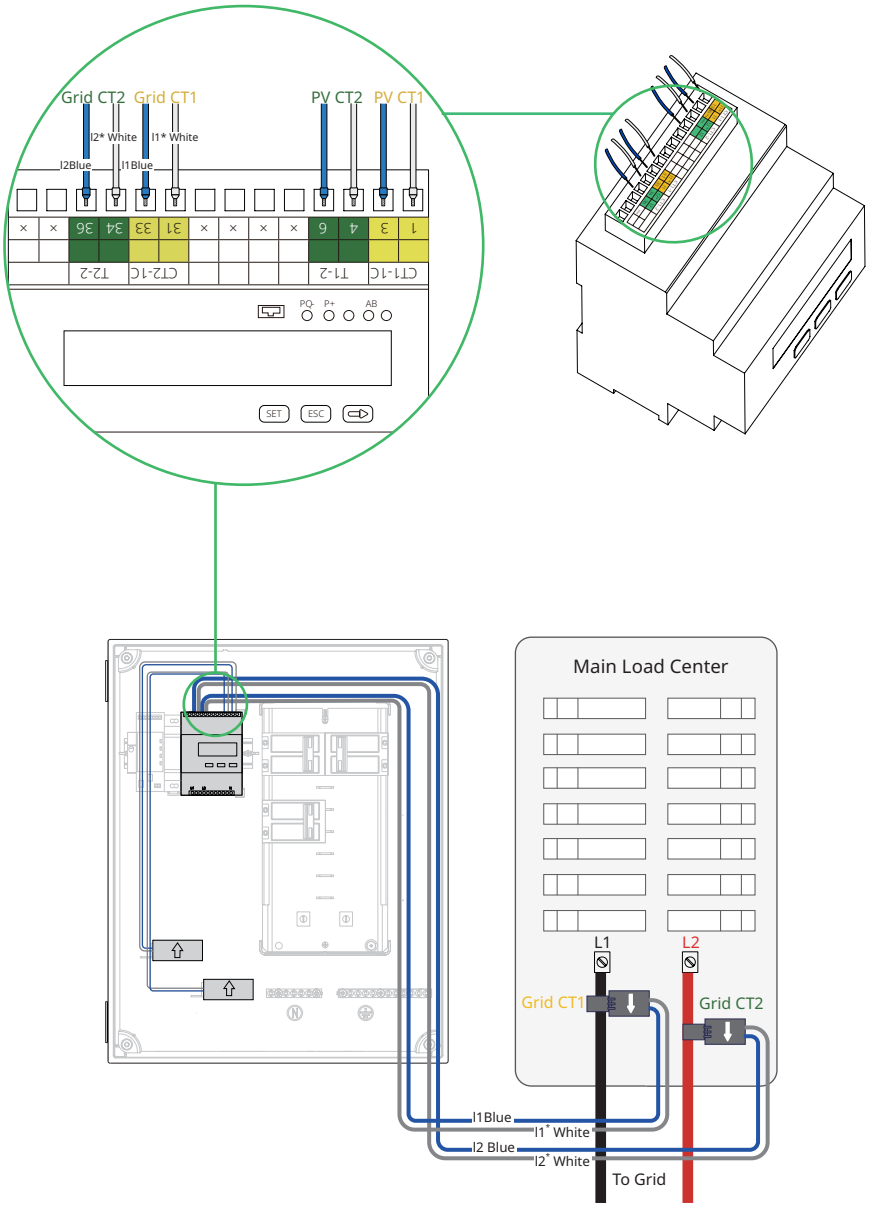
> **DANGER**
>
> - It is not permitted to open the Grid CT openings or to jam the Grid CTs on the cable at this time!

B) Guide the Grid CT lead wires from the mounting position through the conduit to the Combiner Box.

> **NOTICE**
>
> The CT lead wires are 5 m. If the length is too short for your needs, consult 8.1 for guidance.

C) Connect the Grid CT lead wires to the meter as shown below.

E) Clamp the Grid CTs in place, making sure the arrows marked on the CTs are aligned with the current flow to the grid.



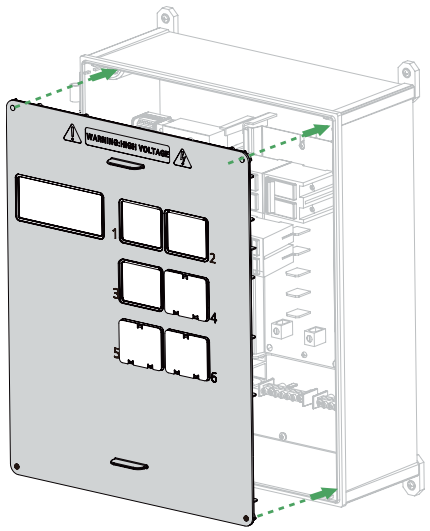
5.5 Energizing the Combiner Box

Step 1 Installing the Dead Front

A) Verify all connections are correct and securely tightened.

B) Re-install the dead front. (Torque: 1 N•m)

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Step 2 Affixing the Warning Label

Take out the warning label in the packaging and affix it to a conspicuous location on the surface of the enclosure.



Step 3 Energizing the Combiner Box

A) Make sure all breakers are in the OFF position.
B) Turn on the Main PV Breaker.
C) Turn on the Communication Module Breaker.

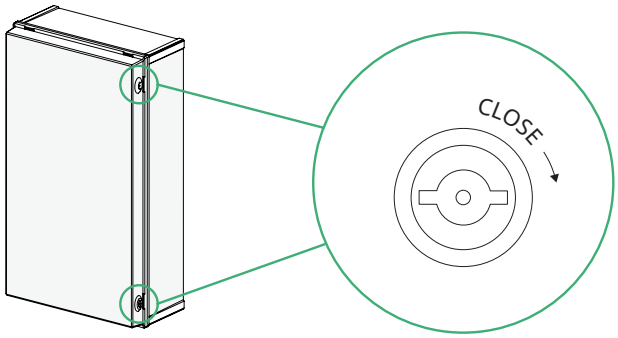
NOTICE

If all connections are correct, the meter will display the voltage, the DTU will start up, and the LED indicator will be solid green. (Refer to the label on the door for LED indicator meanings.)

D) Turn on the other DG Breaker(s).
E) Wait briefly for the microinverters to boot up. Once the boot-up is complete, the meter will show the current and power.

Step 4 Locking the Door

Put the enclosure key into the door keyholes and turn it clockwise. The door is locked when both keyholes present the figure shown below.



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6. Monitoring Platform Configuration

Before activating the monitoring platform, make sure to:

- Confirm proper installation and wiring of the microinverter and Combiner Box. A green LED flash indicates proper functioning.
- Affix the DTU's SN label on the installation map and take note of the DTU's SN.

NOTICE

- The screenshots provided in this manual are for reference only.
- The DTU's network name includes "DTUP" followed by the **last eight digits** of the product SN, and is password-free by default.
- Refer to the ***S-Miles Installer App Operating Guide*** for additional details on power system implementation.

6.1 Completing the Installation Map

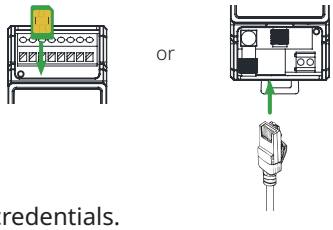
A) Peel off the removable SN label of the Combiner Box.

B) Affix the label to the respective location on the installation map.

6.2 Establishing an Internet Connection

A) Decide the connection mode of your DTU.

- **4G connection**: Check whether the pre-installed Micro SIM card is inserted correctly.
- **Ethernet connection**: Use a LAN cable to connect your router and the DTU.



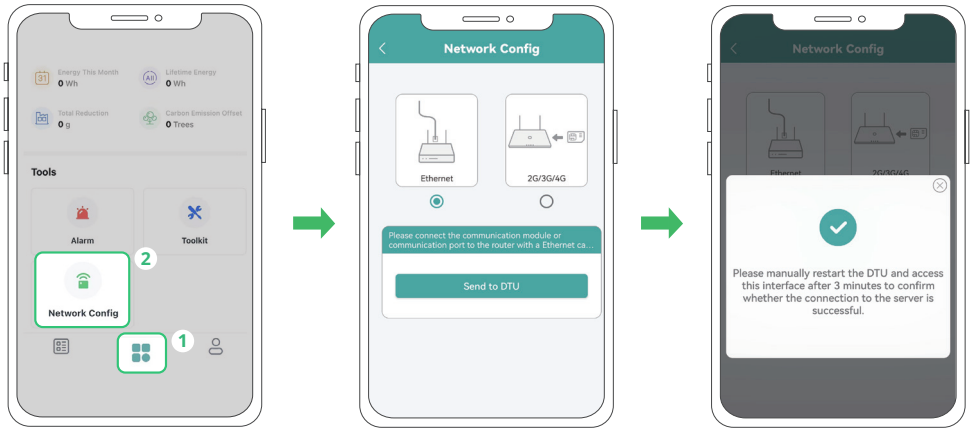
B) Open and log in to the S-Miles Installer application using your credentials.

C) Tap **O&M** > **Network Config** .

D) Follow the prompts to configure the network connection.



B) C) D)-1



D)-2 D)-3 D)-4

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E) Wait patiently for about ONE minute for the network configuration to complete. If the network connection fails, follow the on-screen instructions to fix the problem.

NOTICE

In the case of a 4G connection failure, return to **O&M Screen**. Tap **Toolkit** > **Cloud Communication** > **Network Config**, enter the APN information, and tap **Send to DTU**. If you do not have the APN information, please contact the Hoymiles technical support team.

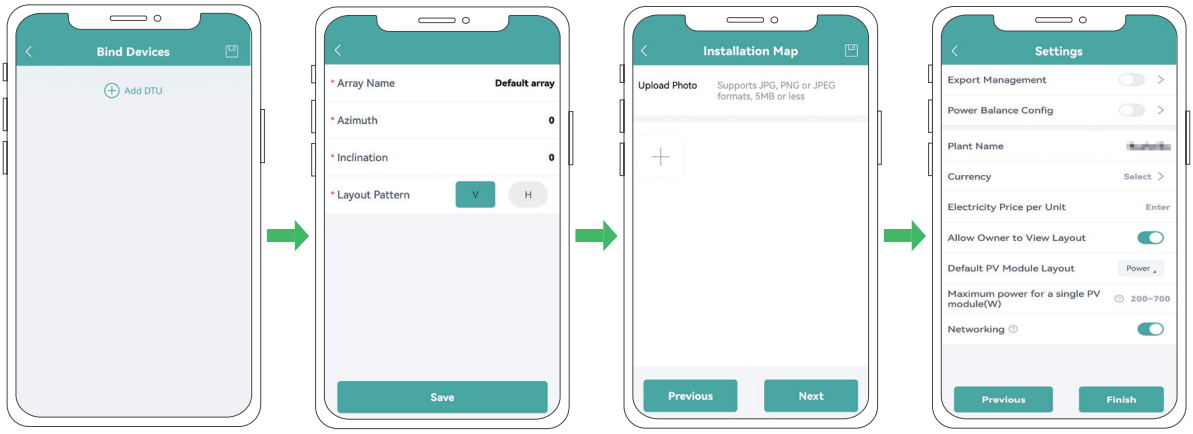
6.3 Creating Your Power Plant

A) On **Plants Screen**, tap **Add Plant** .

B) Follow the prompts to fill in the required information.



A) B)-1 B)-2



B)-3 B)-4 B)-5 B)-6

6.4 Customer Login

A) Download the S-Miles Installer application. To download,

- Scan the QR code located on the right
- Search for “S-Miles Installer” on the App Store or Google Play Store

S-Miles Installer

B) Launch and log in to the app using the credentials set by the installer.

C) All the plant details will be available once the data is uploaded. (The data of the newly created power plant will be uploaded about five minutes after the plant creation.)

NOTICE

Plant power generation is also available on the S-Miles Cloud website *global.hoymiles.com*.

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6.5 Viewing Power Plant Data

You can view the power plant data in the application or on the website.

Application viewing:

A) Launch and log in to S-Miles Installer.

B) Tap **Search** .

C) Enter the desired plant name for your search, then tap the plant name to move to the plant thomepage.



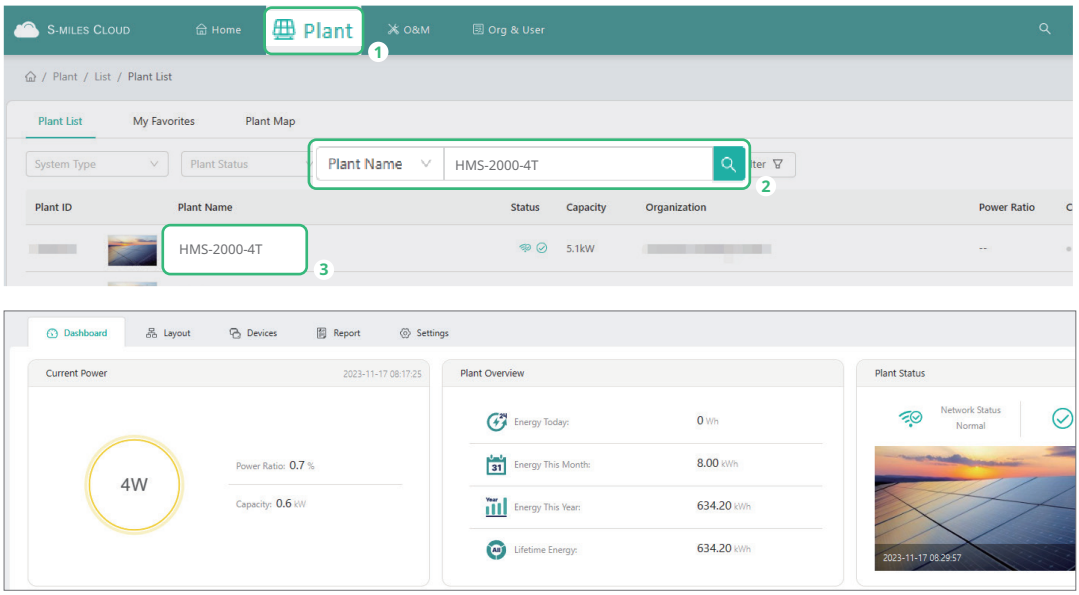
B) C) C)-1

Website viewing:

A) Log in to the S-Miles Cloud at ***https://global.hoymiles.com***.

B) Go to **Plant Page**, and click **Search** .

C) Enter the desired plant name for your search, then click the plant name to move to the plant dashboard.



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7. Troubleshooting and Replacement

7.1 Troubleshooting Lists

Troubleshooting of the Combiner Box and Microinverter(s)

Fault	Possible Cause	Solution
Combiner Box not powered on	• The Main PV Breaker in the Main Load Center is not turned on. • The Main PV Breaker in the Main Load Center is not securely wired or installed, or is damaged. • The Main Load Center malfunctions.	A) Check whether the Main PV Breaker is in the ON position. B) Use a multimeter to measure whether the terminal voltage of the Main PV Breaker reads 240 V. • If there is no voltage, check whether: - the Main PV Breaker is correctly installed. - the Main Load Center is correctly connected to the grid. If both are normal, replace the probably damaged Main PV Breaker with a new one. • If the voltage is 240 V, check whether: - the Main Load Center and the Combiner Box are correctly connected. - the main lug are correctly wired.
Microinverter(s) in one or more branches not powered on	• The DG Breaker is not turned on. • The DG Breaker is not securely wired or installed, or is damaged. • The PV Load Center malfunctions.	A) Use a multimeter to measure the voltage of the main lug. If there is no voltage, follow the **instructions** in the first row to troubleshoot the issue. B) Check whether the DG Breaker is in the ON position. C) Use a multimeter to measure whether the terminal voltage of the DG Breaker reads 240 V. • If no voltage is measured, replace the probably damaged DG Breaker with a new one. • If there is a voltage of 240 V, check the microinverter's AC End Cable connection at both ends.

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Troubleshooting of the DTU

Users can learn the system status by checking the DTU indicator lights.

Symbol	Color	Indicates
⏻	Green	Power on/off
☁	Green	Communication with the internet
⇄	Green	Communication with the microinverter
⚠	Red	Fault

Table 2 - Meanings of DTU Indicator Light Colors

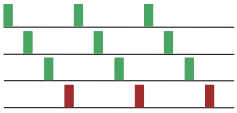
Indicator Light	Status	Description	Indicates
All		On for 0.2s one by one three times	The firmware is upgrading.
		On for 0.6s one by one once	The DTU is starting.
⏻		On	The DTU is powered on.
		Off	The DTU is powered off.
☁		On	The DTU is communicating with the S-Miles Cloud.
		Flashing (0.2s gap)	The internet is disconnected.
		Flashing (0.6s gap)	The internet is connected, but the server disconnected.
		Flashing (2s gap)	The S-Miles Installer app is connected.
⇄		On	The DTU is connecting with the microinverter.
		Flashing (0.2s gap)	No microinverter ID is available. (Please **create a power plant** on the S-Miles Cloud.)
		Flashing (0.6s gap)	The microinverter ID is incomplete.
⚠		Off	The DTU functions normally.
		Flashing (0.2s gap)	DTU warning occurs.
		Flashing (0.6s gap)	Microinverter warning occurs.
		Flashing (2s gap)	Meter warning occurs.

Table 3 - Meanings of DTU Indicator Light Status

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Please refer to the following table to troubleshoot problems.

Fault	Possible Cause	Solution
DTU not on, Power Indicator off	The power supply isn't energized.	Check the input and output voltage of the power supply to ensure it is in normal operation.
	The DTU isn't energized.	Check whether cables between the power supply and the DTU are connected correctly and securely.
Communication Indicator suggesting communication failure with the S-Miles Cloud	The Ethernet cable or Micro SIM card isn't plugged or inserted correctly.	Check to ensure the Ethernet cable or SIM card is plugged or inserted correctly.
	The DTU's network connection mode is wrongly selected.	Select the actual network connection mode at the installation site.
	The Micro SIM card cannot connect to the internet.	Check whether the SIM card can access the internet and the APN setting is correct.
Communication Indicator suggesting communication failure with some or all of the microinverters	Networking isn't performed or has failed.	Re-network the microinverter and ensure the networking succeed.
	The amount of microinverters at the installation site may have changed.	
	The microinverter is off.	Check to ensure the microinverter is in normal operation.
	The signal quality between these microinverters and the DTU is poor.	• Replace the pre-installed antenna with the standby one. (See 7.3) • If the standby antenna has been installed, move it to a place where the signal quality is the best.
Alarm Indicator flashing	Faults occur in the DTU, microinverter, or meter.	Refer to Table 3 to find the faulty device and troubleshoot the issue according to the device's user manual.
DTU's Wi-Fi network not found	The DTU isn't energized.	A) Follow the instructions in the second row to ensure the DTU is powered on. B) Restart the DTU.

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Troubleshooting of the Meter

Fault	Possible Cause	Solution
No display when powered on	The voltage is abnormal.	• Choose the specified voltage. • If the voltage is normal, contact your distributor.
RS485 communication fault	The RS485 cable is open-circuited, short-circuited, or reversely connected.	Change a new RS485 cable.
	The meter's address, baud rate, data bit, and check bit are not the same as those of the DTU.	Set the the same address, baud rate, data bit, and check bit as those of the DTU.
	The meter does not match with the DTU's communication protocol.	Set the meter's baud rate to 9600.
Inaccurate grid-side metering	The Grid CTs are not clamped on cables to the grid.	Check to ensure the Grid CTs are clamped on cables to the grid.
	The arrows on the Grid CTs does not point toward the grid.	Check to ensure the arrows on the Grid CTs point toward the grid.
Inaccurate PV-side metering	The L1 and L2 conductors are plugged into the DG Breaker’s terminal slots in a wrong order.	Based on the interface layout of **PV Load Center**, check whether the L1 and L2 conductors are correctly plugged into each DG Breakers. (Please pay attention to DG Breakers in Position 3 and 4.)
Abnormal electrical parameter (voltage, current, power, etc.) data read through RS485 communication	The data is secondary side data without a transformation ratio.	Multiply the data by the voltage and current ratios.
	The data frame analysis is wrong.	Analyze the data frame based on the communication protocol format. Please pay attention to the endianness (big or small).

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7.2 Checking the Microinverter Communication Status

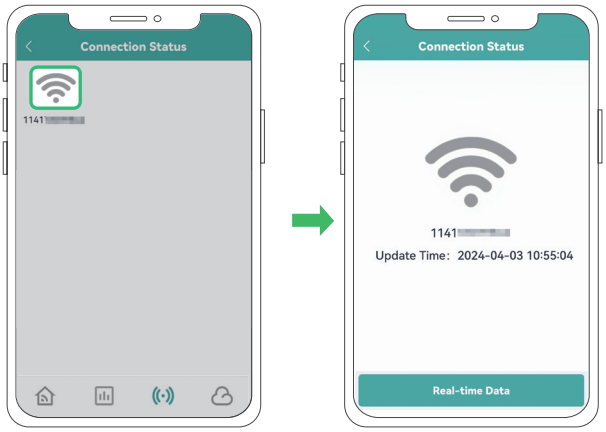
A) Launch and log in to the S-Miles Installer app using your credentials.

B) Tap **O&M** > **Toolkit** > **Connection Status**.



A) B)-1 B)-2

C) The **Connection Status Screen** shows the signal strength between the DTU and the microinverter. Tap **Wi-Fi** to check the detail of the microinverter. (The signal quality is refreshing constantly.)



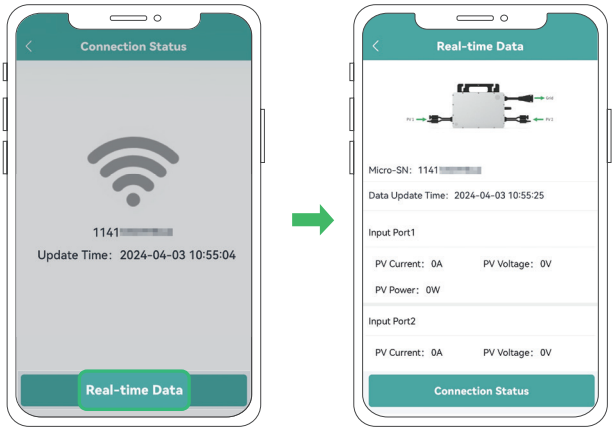
E)-1 E)-2

NOTICE

If there is no signal, check whether the microinverter is powered on, or refer to the troubleshooting chapter in the microinverter user manual.

D) If the signal strength stays weak, use the standby magnetic-mount antenna to enhance the signal. (See 7.3)

E) Tap **Real-time Data** to check the input and output data of the microinverter.

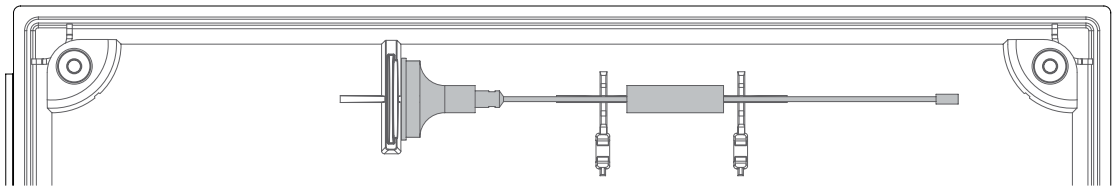


E)-1 E)-2

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7.3 Using the Standby Antenna

A standby antenna is placed inside the Combiner Box. Users can use it to replace the pre-installed one to improve the communication between the Combiner Box and the microinverter.



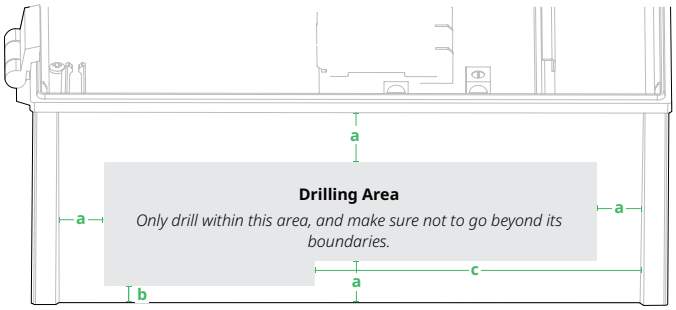
Procedure

Step 1 Drilling a Hole

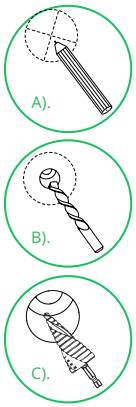
A) Mark a drilling spot on the bottom of the enclosure within the drilling area. The specific position and size should be determined based on the actual situation.
B) Use a small drill bit to create a shallow pilot hole where marked.
C) Use a step drill bit to drill a hole for the antenna cable.

WARNING

- Wear safe clothing and eye protection.
- You can only create openings on the bottom side of the enclosure. Do not drill holes on the top of the Combiner Box or any locations that may permit moisture ingress. When drilling, consider the internal parts of the Combiner Box.

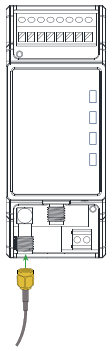


a=1.97'' (50 mm)
b= 0.79'' (20mm)
c=8.67'' (220 mm)



Step 2 Installing the Standby Antenna

A) Unscrew the antenna cable from the DTU's Sub-1G Antenna Port.
B) Take the standby antenna out of the Combiner Box and pass the cable through the drilled hole.
C) Connect the antenna to the port and securely screw it in place.



Step 3 Checking the Signal

Follow the instructions in 7.2 to check the microinverter communication status. Adjust the antenna position until the signal quality becomes good.

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7.4 Replacing Devices



- The replacement of the Combiner Box and devices in it must be carried out by qualified persons only. Hoymiles is not liable for damages resulting from improper installation and use.

7.4.1 Replacing the Combiner Box

A) Unlock the door and turn off the DG Breaker(s) and the Communication Module Breaker.
B) Turn off the Main PV Breaker of the Main Load Center.
C) Open the buckle of the Grid CTs to remove them from the Main Load Center.
D) Remove the dead front. (See 5.2 for instructions.)
E) Disconnect the Grid CTs from the meter.
F) Disconnect wires from the main lug, Neutral Bar, and Ground Bar.
G) Disconnect wires from and remove the DG Breaker(s).
H) Disconnect the standby antenna from the DTU if the antenna is used.
I) Remove the conduits at the bottom of the enclosure.
J) Install the dead front and close the Combiner Box's door.
K) Unscrew the screws to remove the Combiner Box from the installation surface.
L) Record the SN of the DTU in a new Combiner Box.
M) Follow the instructions in Chapter 5 to install the new Combiner Box.
N) Change the DTU SN on the S-Miles Cloud. (Refer to 7.4.4 for details.)

7.4.2 Replacing the DTU

A) Unlock the door and turn off the DG Breaker(s) and the Communication Module Breaker.
B) Turn off the Main PV Breaker of the Main Load Center.
C) Open the buckle of the Grid CTs to remove them from the Main Load Center.
D) Remove the dead front. (See 5.2 for instructions.)
E) Disconnect all the wires from the DTU. (Disconnect the AC cable from the DTU first.)
F) Replace the DTU with a new one and record the new SN.
G) Connect all the wires to the newly-installed DTU in place. (Connect the AC cable to the DTU last.)
H) Install the dead front.
I) Clamp the Grid CTs in place, making sure the arrows marked on the CTs are aligned with the current flow to the grid.
J) Turn on the Main PV Breaker of the Main Load Center.
K) Turn on the DG Breaker(s) and the Communication Module Breaker.
L) Lock the Combiner Box's door.
M) Change the DTU SN on the S-Miles Cloud. (Refer to 7.4.4 for details.)

7.4.3 Replacing the Meter

A) Unlock the door and turn off the DG Breaker(s) and the Communication Module Breaker.
B) Turn off the Main PV Breaker of the Main Load Center.
C) Open the buckle of the Grid CTs to remove them from the Main Load Center.
D) Remove the dead front. (See 5.2 for instructions.)
E) Disconnect all the wires from the meter. (Disconnect the AC cable from the meter first.)
F) Replace the meter with a new one.

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G) Connect all the wires to the newly-installed meter in place. (Connect the AC cable to the meter last.)

H) Install the dead front.

I) Clamp the Grid CTs in place, making sure the arrows marked on the CTs are aligned with the current flow to the grid.

J) Turn on the Main PV Breaker of the Main Load Center.

K) Turn on the DG Breaker(s) and the Communication Module Breaker.

L) Lock the Combiner Box's door.

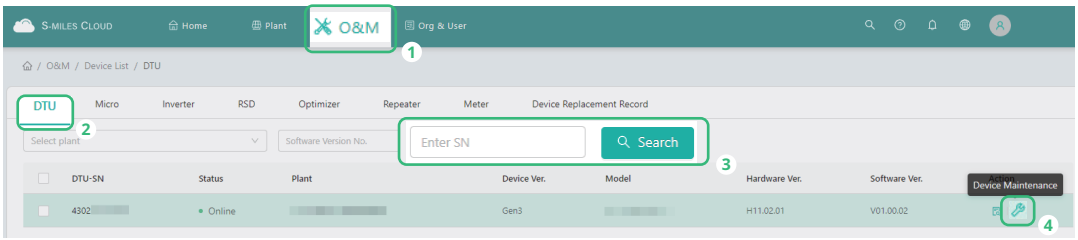
M) Viewing data on the S-Miles Cloud. (Refer to 6.5 for details.)

7.4.4 Replacing the DTU on the S-Miles Cloud

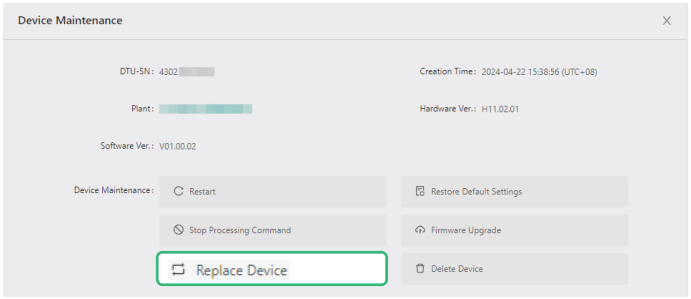
Please follow the instructions below, otherwise the data on the S-Miles Cloud can be lost.

A) Log in to the S-Miles Cloud at *https://global.hoymiles.com*.

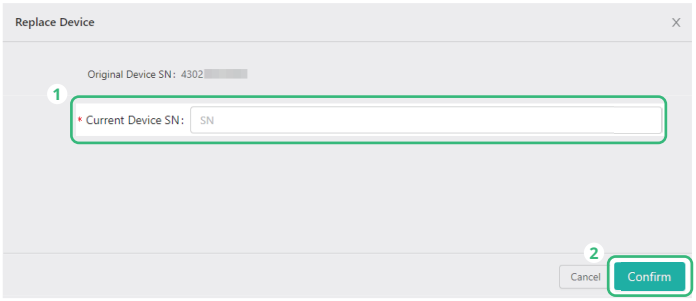
B) Go to **O&M** > **DTU** > **Search**, locate the device to be replaced, and click **Device Maintenance**.



C) On **Device Maintenance** Dialogue, click **Replace Device**.



D) Enter the SN of the new DTU, then click **Confirm**.



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8. Optional Actions and Decommission

8.1 Extending the CT Lead Wires

The following requirements should be met if the CT lead wires need extension.

- The PV CT lead wires cannot be extended.
- The Grid CT lead wires can be extended, but the accuracy would drop to less than 1% after the extension.
- The original Grid CT wires are UL2468 and 24 AWG. It is recommended extension cables be UL2468 with a minimum size of 24 AWG.
- The choice and installation of extension cables should be in accordance with all local electrical codes and standards.

8.2 Powering Off / Restarting the Combiner Box

8.2.1 Powering Off the Combiner Box

A) Unlock the door and turn off the DG Breaker(s) and the Communication Module Breaker.

B) Lock the door to protect the inside of the Combiner Box from water.

C) Turn off the Main PV Breaker in the Main Load Center.

8.2.2 Restarting the Combiner Box

NOTICE Conduct a thorough inspection before restarting the equipment after prolonged non-operation.

A) Turn on the Main PV Breaker in the Main Load Center.

B) Unlock the door and turn on the DG Breaker(s) and the Communication Module Breaker.

C) Lock the door to protect the inside of the Combiner Box from water.

D) Launch and log in to the S-Miles Installer app using your credentials.

E) Follow the instructions in 6.5.

8.3 Dismantling the Combiner Box

A) Unlock the door and turn off the DG Breaker(s) and the Communication Module Breaker.

B) Turn off the Main PV Breaker in the Main Load Center.

C) Disconnect wires from the Main PV Breaker.

D) Open the buckle of the Grid CTs to remove them from the Main Load Center.

E) Remove the dead front. (See 5.2 for instructions.)

F) Disconnect the Grid CTs from the meter and save it for later use.

G) Disconnect wires from the main lug, Neutral Bar, and Ground Bar.

H) Disconnect wires from the DG Breaker(s).

I) Remove the conduits at the bottom of the enclosure.

J) Remove the DG Breaker(s).

K) Install the dead front and lock the Combiner Box's door.

L) Unscrew the screws to remove the Combiner Box from the installation surface.

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8.4 Storaging and Transporting the Combiner Box

The following requirements should be met if the Combiner Box is not put into use.

- Pack the Combiner Box in the original packaging. If the original packaging is unavailable, use one that is suitable for the weight (21.2 lbs. /9.6 kg) and dimensions (19.67'' × 15.75'' × 7.87'' /500 × 400 × 200 mm) of the product.
- Maintain a storage temperature of -13ºF to 158ºF (-25°C to 70°C).
- Store the equipment indoors in a well-ventilated area.
- Protect the Combiner Box from physical shocks or vibrations.
- Prevent sudden impacts or movements.
- Follow general transportation regulations for the mode of transport and ensure compliance with all local regulations.
- Do not exceed the stacking limit marked on the outer side of the packaging.

8.5 Disposing of the Combiner Box

A) Follow the instructions in **8.3** to remove the Combiner Box from the installation surface.

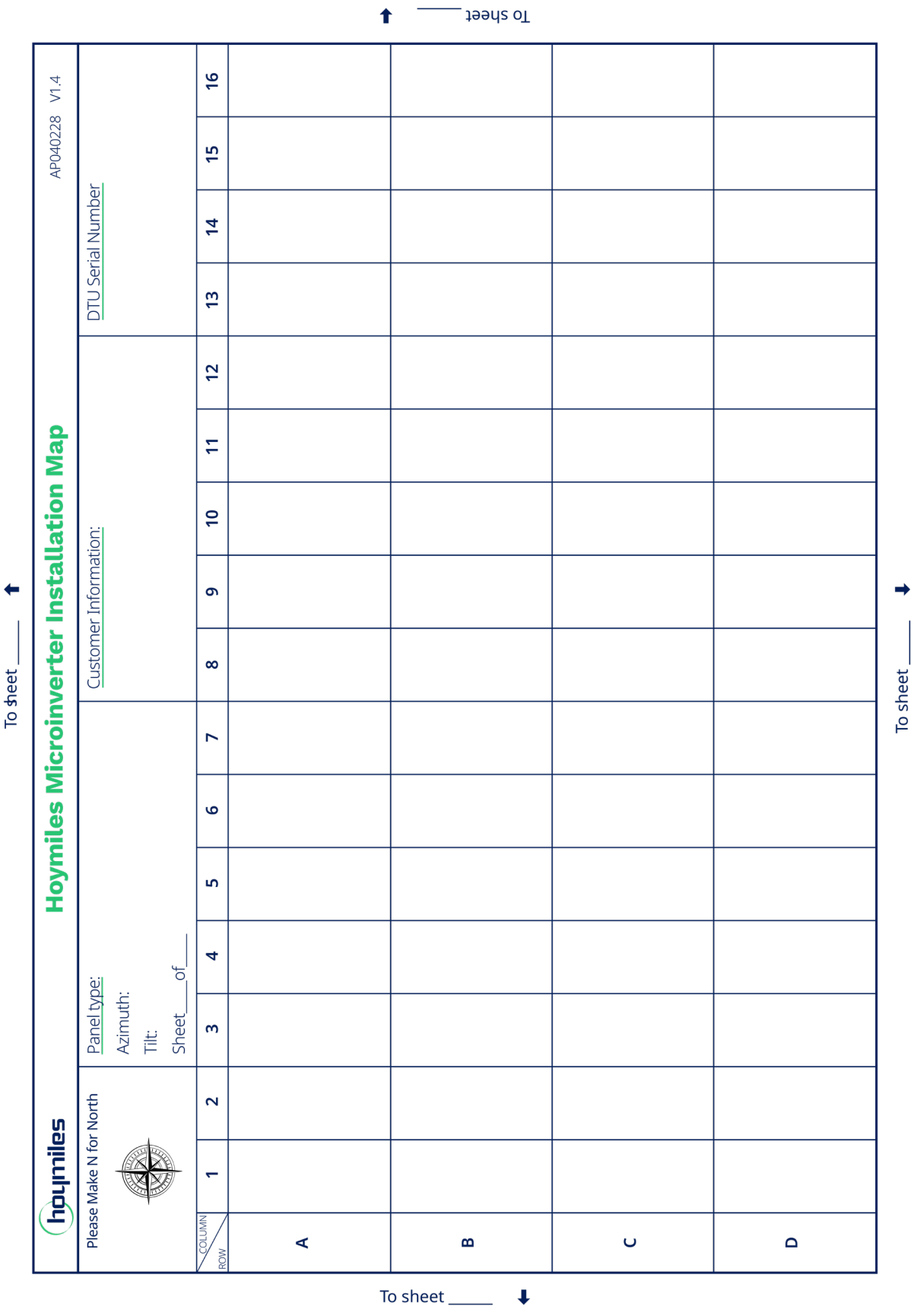
B) Pack the Combiner Box in the original packaging. If the original packaging is unavailable, use one that is suitable for the weight (21.2 lbs. /9.6 kg) and dimensions (19.67” × 15.75” × 7.87” /500 × 400 × 200 mm) of the product.

C) Properly seal the package using adhesive tape.

D) Discard the package in accordance with local regulations.

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9. Appendix 1: Installation Map



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10. Appendix 2: Terms and Abbreviations

A	
AC	alternating current
C	
CT	current transformer
D	
DC	direct current
DG	distributed generation
DTU	data transfer unit
M	
MPPT	maximum power point tracking
O	
O&M	operations and maintenance
P	
PV	photovoltaic
S	
SN	serial number

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