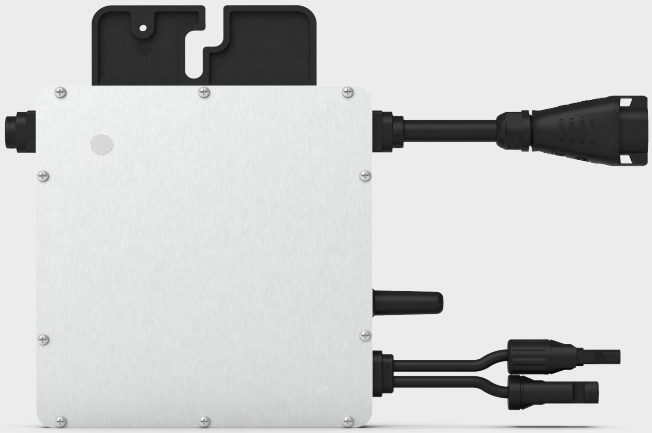
Open Energy for All



Single-phase Microinverter (Flex Solution)

USER MANUAL

HMS-400-1T

HMS-450-1T

HMS-500-1T

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.

Emission Compliance

This equipment has been tested and found to comply with the limits applied by the local regulations. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

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 Us

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

Spanish-speaking countries
service.mx@hoymiles.com

Brazil
service.br@hoymiles.com

Brazil
+55 1148585231

hoymiles.com

Using This Manual

Symbols

•	List (first level)
▷	List (second level)
Step 1, Step 2, ...	Installation steps in a defined order (first level)
A), B), C), ...	Installation steps in a defined order (second level)

Abbreviations

Abbreviation	Meaning	Abbreviation	Meaning
AC	Alternating Current	PE	Protective Earthing
DC	Direct Current	PPE	Personal Protective Equipment
DTU	Data Transfer Unit	PV	Photovoltaic
MPPT	Maximum Power Point Tracking	SN	Serial Number
O&M	Operations and Maintenance	-	-

Related Resources

The following resources can help you make the most of your microinverter:

Product documents	*Hoymiles Download Center*
Tutorial Videos	*Hoymiles YouTube Channel*
System design tools	*Hoymiles Compatibility Calculator*

Revision History

Version	Date	Description
REV1.1	2025-07-24	This issue marks the initial official release.
REV1.2	2025-10-24	• Updated product appearance–related content. • Removed the warranty limitation requiring the DC/AC ratio to be less than or equal to 1.35.

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1 About This Manual

1.1 Purpose

This manual provides information on the installation, electrical connections, operation, and maintenance of the HMS-500-1T series microinverters.

Please consider the following before installation:

- Carefully read this manual before operation.
- Keep this manual for reference.

1.2 Audience

This manual is intended for use by qualified persons only. Qualified persons must have the following skills:

- Understanding of microinverter operations and related functionalities.
- Knowledge of microinverter installation, use, and maintenance.
- Competence in handling risks occurring in microinverter installation, use, and maintenance.
- Familiarity with local electrical codes and regulations.

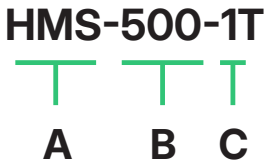
1.3 Validity

This manual is valid for:

Model	Output Power (VA)
HMS-400-1T	400
HMS-450-1T	450
HMS-500-1T	500

NOTE

Model identifier:



[A]: Series Name

[B]: Output Power Level

[C]: Number of Inputs

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2 Safety Instructions

2.1 Safety Symbols

Safety symbols are used in this manual as follows:

Symbol	Description
DANGER	This symbol indicates potential risks that, if not avoided, may lead to death or serious physical harm.
WARNING	This symbol indicates potential risks that, if not avoided, may lead to personal injury or device damage.
CAUTION	This symbol indicates potential risks that, if not avoided, may lead to device malfunctions or financial losses.
NOTICE	This symbol indicates potential risks that, if not avoided, may lead to minor injury or damage to the equipment.
NOTE	This symbol indicates an important step or tip that leads to the best results, but is not safety- or damage-related.

2.2 Additional Symbols

The product label contains the following symbols with their meanings described below:

Icon	Explanation
	Treatment Electrical equipment that has reached the end of life must be collected separately and returned to an approved recycling facility to comply with the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment and its implementation as national law. Return any devices you no longer need to an authorized dealer or an approved collection and recycling facility.
5 min	**Caution** Risk of electrical shock. Wait at least 5 minutes after the microinverter is disconnected from all external power supplies before starting maintenance.
	High Voltage Microinverters may contain high voltages, causing a risk of death.
	Hot Surface The microinverter may become hot during operation. Do not contact with metal surfaces.
	CE mark The microinverter conforms to the Low Voltage Directive of the European Union.
	FCC mark The microinverter complies with the FCC standard.
	Read the manual first Read this manual carefully before performing any installation, operation, or maintenance.

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2.3 Safety Instructions

The HMS-500-1T series microinverter has been designed and tested in compliance with international safety standards, and thus requires careful installation and operation. Installers must carefully read and strictly follow the safety instructions in this section. Failure to do so may result in:

- Injury or death to the installer or operator
- Damage to the microinverter

⚠ DANGER

General

- All installation, start-up, troubleshooting, maintenance, and all other operations must be performed by a qualified electrician and follow local wiring codes.
- Always use PPE, such as gloves and goggles, during installation.
- The microinverter should only be used when all technical parameters are observed and applied correctly. (For details, see "*8 Technical Data*".)

Installation & Operation

- Report any non-standard installation conditions to the manufacturer.
- Do not install the equipment in flammable, explosive, corrosive, extreme heat/cold, or humid environments.
- Each microinverter input should only be connected to PV modules. Do not connect batteries or other power supply sources. The unsupported devices have different output characteristics that differ from PV modules, potentially leading to improper functioning of the microinverters and posing safety hazards.
- Do not use the equipment in environments where safety devices are not working properly.
- Do not use the equipment if any unusual operations are detected.
- Check and ensure that all AC and DC wiring is properly installed and free from any snags, shorts, or damage. Additionally, ensure that all AC distribution boxes are securely sealed.
- Hoymiles shall not be liable for any damages caused by incorrect or improper operations.

Maintenance & Repair

- Ensure that the DC connectors are in perfect condition and that none of the DC conductors are exposed.
- Do not attempt to repair the product. All repairs must be done by licensed contractors or authorized Hoymiles service representatives using approved spare parts installed according to their intended use.
- Prior to any maintenance and repair operation, disconnect the power supply. Do not disconnect the AC and DC connectors under load.
- Maintain extreme caution when the microinverter is disconnected from the public grid. Hazardous voltages may still be present in some components.

⚠ WARNING

General

- Disconnect the microinverter from the electrical power supply before making or modifying any device connections.
- Restrict product access by unauthorized individuals.

Installation & Operation

- Make sure to obtain all necessary approvals from local power operators before connecting the microinverter to the power grid.
- To protect from rain, UV, and adverse weather conditions, install the microinverter beneath the PV module. Avoid exposing the AC and DC connectors to rain or moisture prior to connection.

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⚠ WARNING

- Use the *Hoymiles Compatibility Calculator* to verify the electrical compatibility of PV modules. To maintain the Hoymiles warranty, only use Hoymiles microinverters with the compatible PV modules shown on the Hoymiles Compatibility Calculator.
- Make sure that the PV module's maximum open circuit voltage falls within the maximum DC input voltage for the microinverter. (For details, see "*8 Technical Data*".)
- Improper use, incorrect installation, or unauthorized removal of necessary protections may result in damage to the equipment or serious safety and shock hazards.
- Microinverter surfaces can reach high temperatures during operation and for a short time after switching off the AC circuit breaker. Avoid direct contact with these surfaces.

Maintenance & Repair

- Avoid immersing the cable connectors or cables for a long period.
- Prevent any contaminants or deposits from entering the connector.
- Equipment repairs should only be performed by the Hoymiles Service Team, a repair team authorized by Hoymiles, or authorized personnel familiar with all warnings and operating procedures contained in this manual.
- Ensure that the installation surface and equipment are within safe temperature and voltage ranges prior to handling any part of the microinverter.

⚠ CAUTION

Installation & Operation

- Before installation, inspect for transportation damages compromising insulation integrity and safety clearances.
- Do not remove or cover any warning labels or nameplates on the microinverter.
- Lift the microinverter carefully. Take the weight of the microinverter into account.
- Follow the wiring safety instructions to ensure proper polarity and secure connections.
- Inspect the microinverter system for functionality and performance after installation. Double-check the electrical connections, communication links, and monitoring features.

Maintenance & Repair

- The microinverter packaging has been intentionally designed to be reusable. Retain the packaging for future use.
- Do not clean the equipment with corrosive or filamentary material-based rags to prevent corrosion and electrostatic charges.

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3 Product Information

3.1 Overview

Functions

Microinverters are module-level power electronics that convert direct current (DC) into alternating current (AC). The HMS-500-1T series microinverter is designed for smaller budgets and compact residential installations. The new Sub-1G wireless solution enables more stable communication under various environmental conditions.

Features

- High-powered microinverter for 1-in-1 with output power up to 500 VA
- With Reactive Power Control
- Compliant with UL 1741, ABNT NBR 16150:2013, ABNT NBR 16149:2013, etc.
- Safer for rooftop solar stations with rapid shutdown compliance and isolated transformer
- Connected to one panel, flexible for various applications
- With Flex-S3 Cable System, installation is easier and faster than ever before
- Sub-1G wireless solution allows stable communication with Hoymiles gateway DTU

Applications

The HMS-500-1T series microinverter can work in two types of systems: single-microinverter system and multi-microinverter system.

In a single-microinverter system, the whole system includes one microinverter and two PV modules.

In a multi-microinverter system, you'll have multiple microinverters, each paired with two PV modules.

These setups are usually found on rooftops.

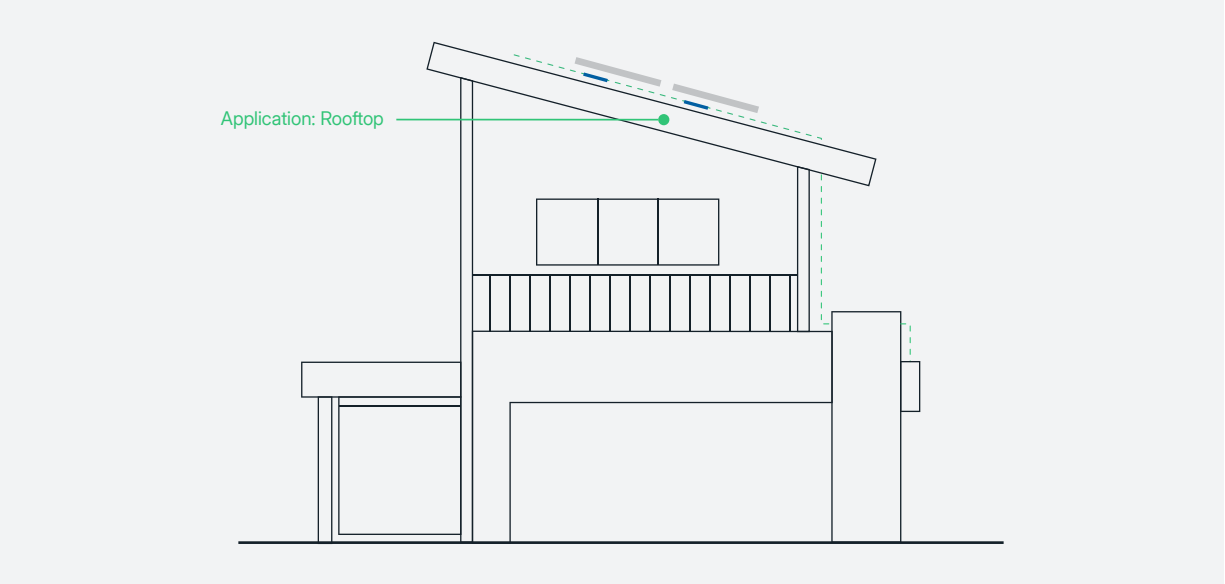

Figure 1-1 HMS-500-1T Series Microinverter System Application

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NOTE

For each type of setup, you'll need different accessories.

- Single-Microinverter System:

  You can order a Flex-S3 Field Connector and get an AC cable ready for connection.

	Flex-S3 Field Connector It provides a quick and simple electrical connection between the microinverter and the grid by serving as a joining component. To use it, you should prepare an AC cable to connect to it to form the AC End Cable.

- Multi-Microinverter System:

  You'll need to order the Flex-S3 Cable System and prepare an AC cable and a distribution box to connect the microinverters to the grid. The Flex-S3 Cable System includes these components:

	Flex-S3 Connection Cable Used to make a customized AC Trunk by using the Flex-S3 Trunk Connectors and Flex-S3 Extension Connectors.		**Flex-S3 Trunk Connector** Used to connect the microinverter's AC output to the AC Trunk, as well as to join together multiple Flex-S3 Connection Cables to create the AC Trunk.
	Flex-S3 Cable Terminal Connector Used to form the AC cable into an AC End Cable, which completes the connection between the end of the AC Trunk and the distribution box.		**Flex-S3 Extension Connector** Used to extend your cable runs when the distance between two microinverters exceeds the standard length of a Flex-S3 Connection Cable.
	Flex-S3 Sealing Cap Used to cover the unused connection port on the Flex-S3 Trunk Connector, which is typically located at the beginning of the AC Trunk.		**Flex-S3 Disconnect Tool** A versatile tool that can be used to take apart connectors, tighten nuts, and loosen nuts.

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How the Hoymiles Microinverters System Works

In a typical microinverter system, a few parts team up to turn sunlight into power you can use.

- **PV modules**

  The PV modules capture sunlight and change it into direct current (DC) electricity.

- **Microinverters**

  Microinverters are small inverters installed directly on PV modules or nearby. They convert DC electricity from the PV modules into alternating current (AC) electricity, which can power homes or be fed back into the grid.

  Microinverters use a sophisticated maximum power point tracking (MPPT) algorithm to optimize the performance of each PV module. This ensures that even if one PV module under performs, it will not drag down the overall performance of the other PV modules in the row.

- **DTU**

  The Data Transfer Unit (DTU) is Hoymiles communication gateway. It bridges the communication between microinverters and S-Miles Cloud Platform. It collects and delivers microinverter production data and energy consumption data to the S-Miles Cloud platform for monitoring and remote operations and maintenance (O&M).

- **S-Miles Cloud**

  The S-Miles Cloud is a comprehensive monitoring and analysis platform. It watches over the microinverter system from afar, providing real-time insights into the whole system's performance and enabling you to keep track of your microinverter system's status. The S-Miles Cloud also enables module-level monitoring, and remote management.

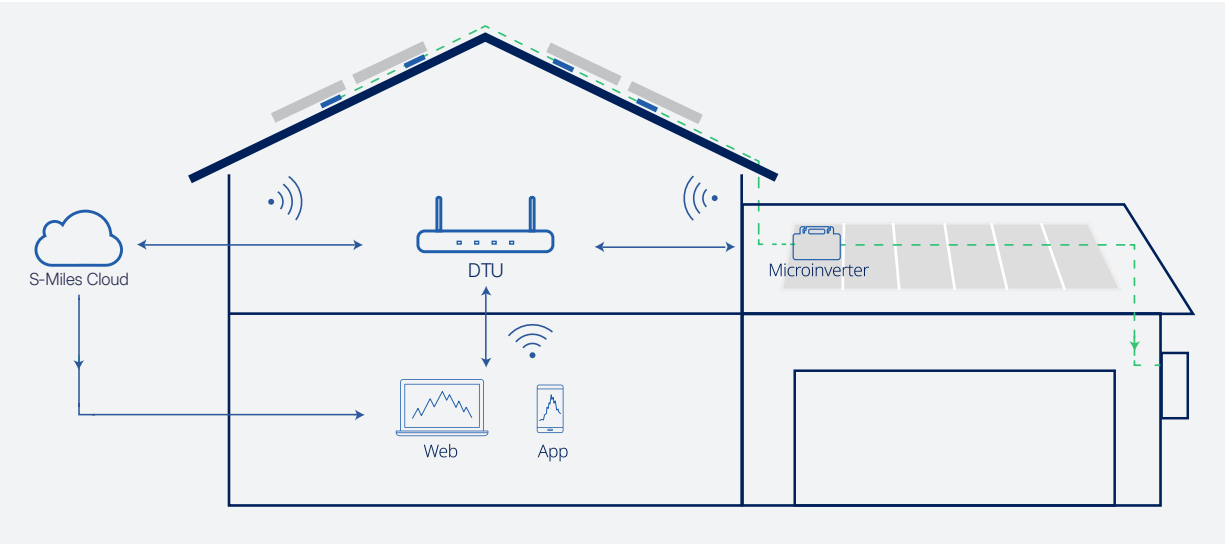

Figure 1-2 HMS-500-1T Series Microinverter System Diagram

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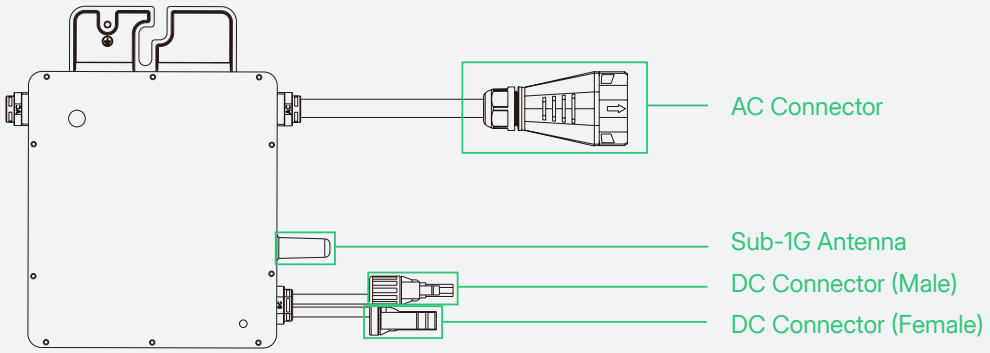
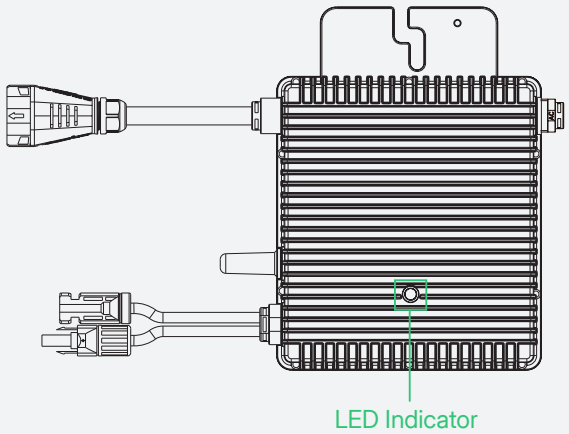
3.2 Appearance and Dimensions

NOTE

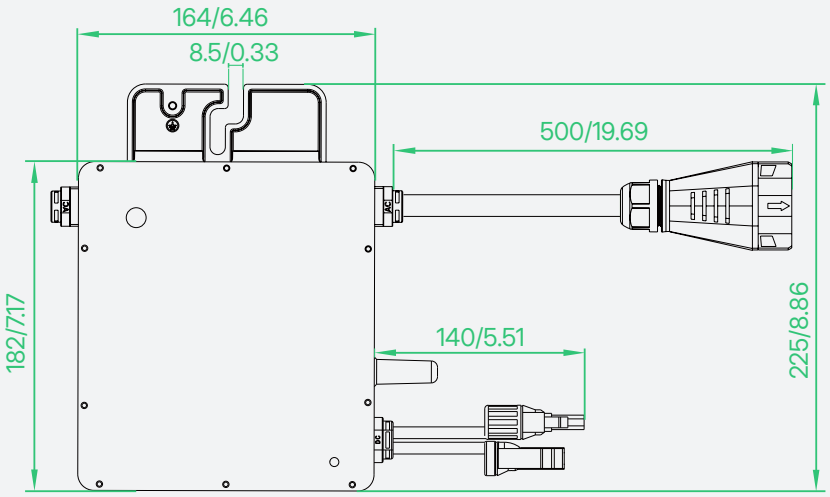
The appearance and dimensions shown here are for reference only. The actual product you receive may differ.

Appearance





Dimensions (mm/inches)



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4 Installation Steps

4.1 Preparation

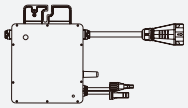
Unpacking the Box

The microinverter has been thoroughly tested and was subject to a strict inspection before delivery. However, damage may still occur during shipping.

Conduct a detailed inspection after unpacking the microinverter:

- Check for any external damage
- Check and confirm that all items have been included

❶ Microinverter



❷ Quick Installation Guide

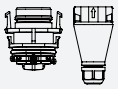
NOTICE

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

Checking the Parts

- **Single-Microinverter System**

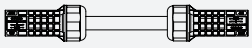
❶ Flex-S3 Field Connector



❷ AC Cable

- **Multi-Microinverter System**

❶ Flex-S3 Connection Cable



❷ Flex-S3 Trunk Connector

❸ Flex-S3 Cable Terminal Connector

❹ Flex-S3 Sealing Cap

❺ Flex-S3 Extension Connector

❻ AC cable

NOTE

Hoymiles doesn't offer the AC cable and mounting bracket for sale. You need to buy them separately. When purchasing, ensure compliance with local regulations and consider the following guidelines:

AC cable: ensure it meets the necessary requirements.

Type	Wire Type	Size	Cross-section Diameter
Single-Microinverter System	Outdoor Use, Copper Wire	1.5/1.0 mm² (16/18 AWG)	8 to 9.5 mm (0.31 to 0.37 inches)
Multi-Microinverter System	Outdoor Use, Copper Wire	2.5/4/6 mm² (10/12 AWG)	≤ 16.5 mm (0.65 inches)

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Checking the Tools

Installation tools include but are not limited to the following recommended ones. If necessary, use other auxiliary tools on site.

- **Single-Microinverter System**

Marker	Cable Cutter	Wire Stripper	M8 Screws
Cable Ties	Disconnect Tool	PPE	-
Crimping Tool 1.5 mm² (16 AWG)	Torque Wrench 1.5 to 3 N·m (13 to 27 in-lb)	Crimp Ferrules 1.5 mm² (16 AWG)	Electric Screwdriver 2 to 9 N·m (18 to 80 in-lb)

- **Multi-Microinverter System**

Marker	Steel Tape	Cable Cutter	Wire Stripper
M8 Screws	Cable Ties	Disconnect Tool	PPE
Crimping Tool 2/4/6 mm² (10/12 AWG)	Torque Wrench 1.5 to 3 N·m (13 to 27 in-lb)	Electric Screwdriver 2 to 9 N·m (18 to 80 in-lb)	Hex Key

Downloading the Application

Download the S-Miles Installer application. To download,

- Scan the QR code located on the right side, or,
- Search for "S-Miles Installer" on the App Store or Google Play Store

S-Miles Installer

Planning the Microinverters

You should specify the number of microinverters per AC output line based on the AC cables' capacity.

Maximum Microinverter Number per Line			
Model	**HMS-400-1T**	**HMS-450-1T**	**HMS-500-1T**
10 AWG	16@208 V 17@220 V 18@230 V 19@240 V	14@208 V 15@220 V 16@230 V 17@240 V	13@208 V 14@220 V 14@230 V 15@240 V
12 AWG	10@208 V 11@220 V 11@230 V 12@240 V	9@208 V 9@220 V 10@230 V 10@240 V	8@208 V 8@220 V 9@230 V 9@240 V

NOTE

- Limits are determined based on AC cable ampacity, which can vary. Check local codes to determine the exact restrictions.
- Multiple 1-in-1, 2-in-1, and 4-in-1 microinverters can be connected to the same AC output line, as long as the total current doesn't exceed the local regulations' ampacity limits.

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Determining the Installation Position

Consider the following to ensure the optimal location for the microinverter:

IP67	• The microinverter meets the IP67 (NEMA 6) rating for environmental protection and can be installed indoors or outdoors.
	• Shield the microinverter and DC connections from sunlight, UV, rain, snow, and other elements by installing them beneath the PV module. • Install the microinverter beneath the PV modules to prevent power derating caused by temperature rise.
	• Provide a minimum clearance of 2 cm (0.79 inches) around the microinverter enclosure to ensure proper ventilation and heat dissipation.
-40°C to 65°C	• Align environmental conditions with microinverter requirements specified in "*8 Technical Data*", including protection level, temperature, humidity, altitude, and more.
	• Do not install the microinverter in: Areas near corrosive, flammable, or explosive materials Areas accessible to children or pets
	• To avoid communication interference, steer clear of metal obstacles or large obstructions near the installation site of the microinverter.

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4.2 Single-Microinverter System

DANGER

- Make sure there is no electrical connection before proceeding with the installation.
- During installation, secure the whole microinverter system to prevent it from falling.

WARNING

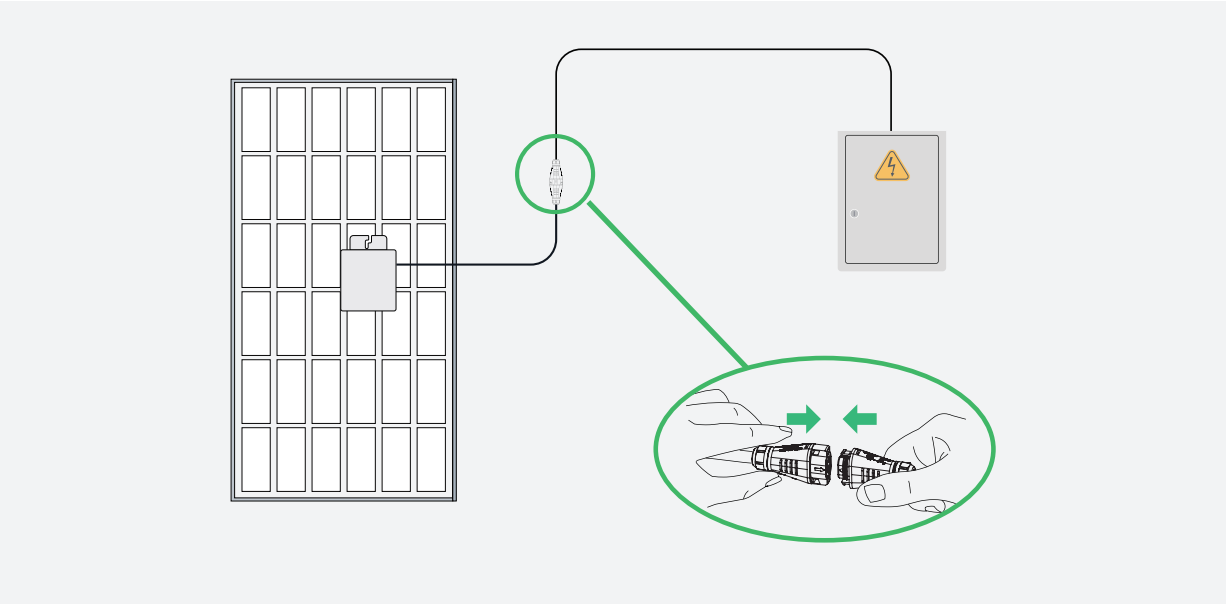
Ensure that your installation adheres to the required environmental and safety standards. Seek professional advice if necessary.

NOTICE

- Due to the on-site conditions and the placement of the microinverter, you may need additional DC Extension Cables. You can purchase them from Hoymiles by emailing *sales@hoymiles.com*.
- The microinverter can connect to up to two PV modules, but the exact number of connections depends on the maximum power required by local regulations.

Assembly Diagram

Connect one end of the AC cable to the Flex-S3 Field Connector, then attach the Flex-S3 Field Connector to the microinverter. Finally, connect the other end of the AC cable to the distribution box.



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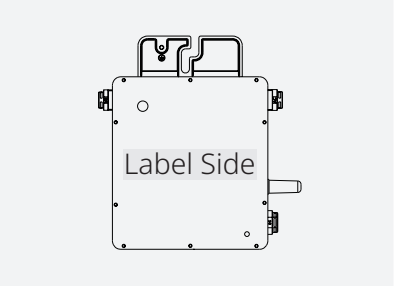
Procedure

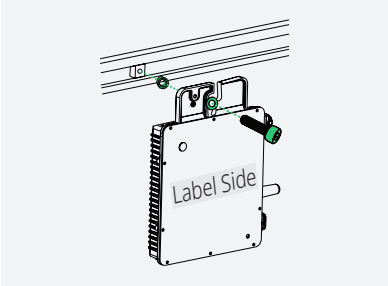
Step 1 Attach the microinverter to the PV racking

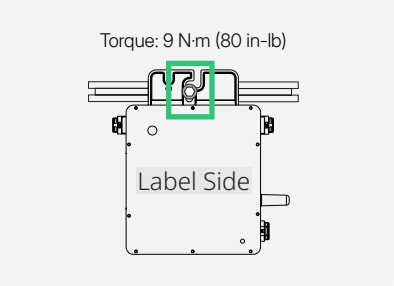
A) Plan and mark the position of the microinverter on the PV racking.

B) Place the microinverter (label side up) onto the racking.

C) Secure the microinverter to the racking (torque: 9 N·m / 80 in-lb).



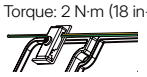




⚠ WARNING

- Leave as much space between the microinverter and any nearby surface as you can for reliable communication.
- Allow at least 2 cm (0.79 inches) of space around the microinverter for ventilation and heat dissipation.
- The AC cable already includes earth wires for direct grounding. If external grounding is required at your installation site, you can order the grounding accessory by emailing *sales@hoymiles.com*.

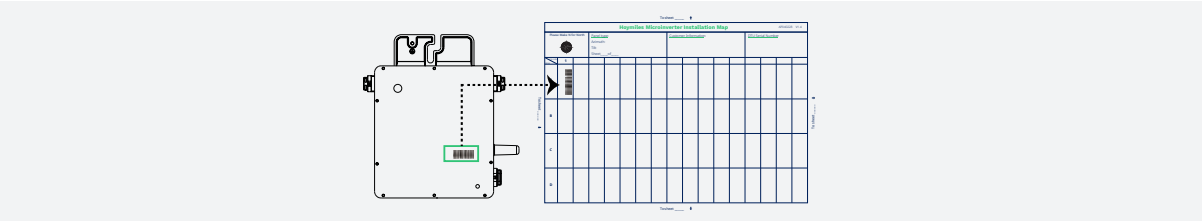
Torque: 2 N·m (18 in-lb)



Step 2 Complete the installation map

A) Peel off the microinverter's removable SN label.

B) Take out the installation map from the DTU's package, and affix the label to the respective location on the installation map.



Step 3 Connect the PV modules

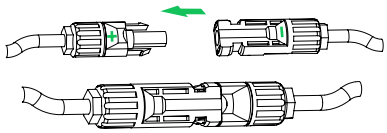
A) Connect the female connectors of PV modules to the DC male connectors of the microinverter.

B) Connect the male connectors of PV modules to the DC female connectors of the microinverter.

C) Mount the PV modules above the microinverter.

⚠ CAUTION

Please note that the microinverter's DC male connector is marked with a "+" sign, while the DC female connector is marked with a "-" sign. These symbols simply indicate the gender of the connector and do not imply the positive or negative current.



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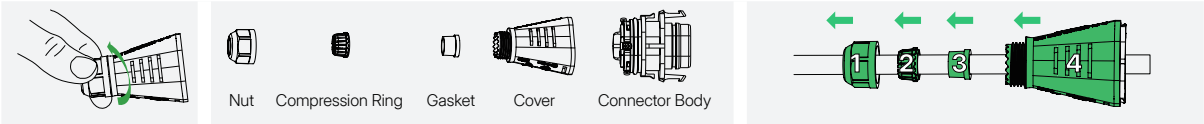
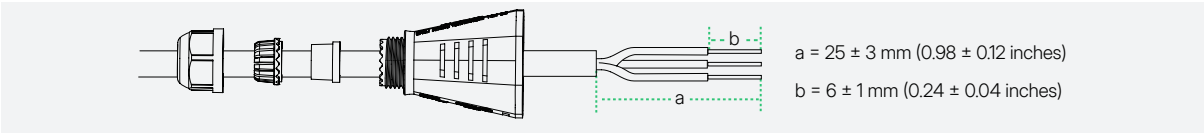
Step 4 Power on the microinverter system

A) Separate the Flex-S3 Field Connector into five parts and slide them over an AC cable.



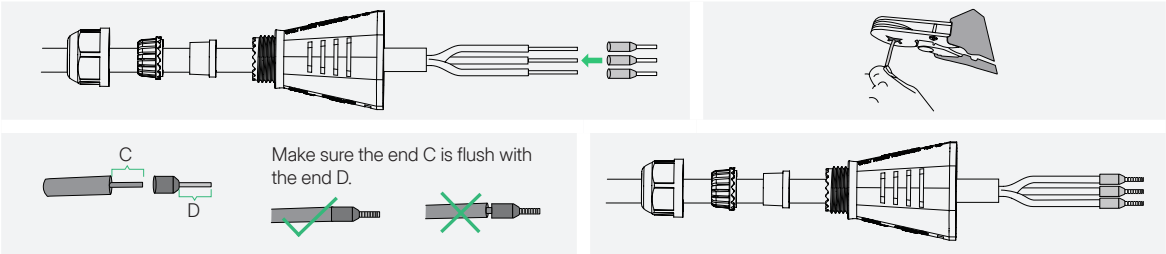
B) Strip off 25 ± 3 mm (0.98 ± 0.12 inches) of the outer jacket with a cable cutter. Then use a wire stripper to strip the insulation to expose 6 ± 1 mm (0.24 ± 0.04 inches) of the conductor.



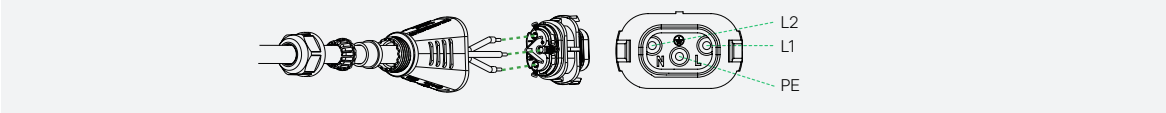
C) Secure the conductors to the connector body.

- **Stranded Wire**

a. Insert the conductors into the crimp ferrules, and crimp them securely using a crimping tool.



b. Insert the crimped cable into the connector body. (Wiring color codes may vary. Always adhere to national and site-specific regulations for wiring.)

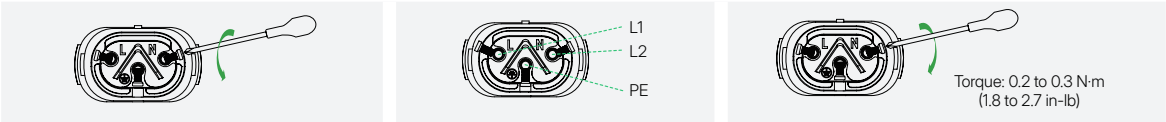


- **Solid Wire**

a. Loosen the screws in the connector body with a Phillips screwdriver.

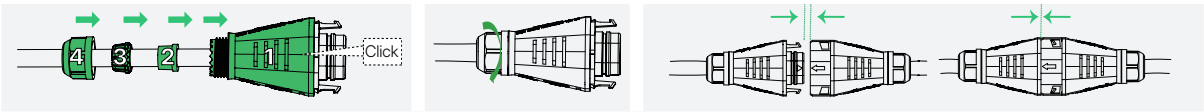
b. Insert the L1, L2, and PE wires into the connector body in accordance with the labeling. (Wiring color codes may vary. Always adhere to national and site-specific regulations for wiring.)

c. Tighten the screws (torque: 0.2 to 0.3 N·m / 1.8 to 2.7 in-lb).



D) Slide the cover, gasket, compression ring, and nut over the cable, then firmly tighten the nut with a torque wrench (torque: 2 ± 0.5 N·m / 18 ± 4.4 in-lb).

E) Connect the Flex-S3 Field Connector to the microinverter's output connector until it clicks into place.



F) Connect the other end of the AC cable into the distribution box.

G) Wait five minutes for the system to start producing power.

H) Check the LED indicator. If the microinverter is operating as expected, the LED indicator will flash green. If the LED indicator remains off or lights solid red, see "*6.2 LED Indicator Status*".

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4.3 Multi-Microinverter System

DANGER

- Disconnect AC circuit breakers and ensure they are not inadvertently reconnected before making any electrical connections.
- Confirm all cables are not powered before performing cable connections.

WARNING

- All electrical connections must adhere to local and national standards.
- Ensure all cables are in good condition, properly insulated, not damaged, securely attached, and of an appropriate size.
- Ensure all microinverters and inter-wiring connections are properly set up before installing the PV modules.

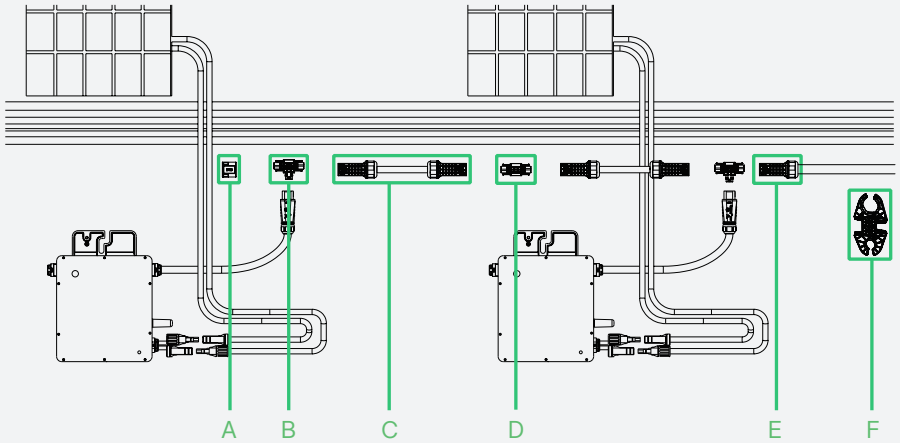
CAUTION

- When moving the microinverter, do not pull or carry it by the AC cable. Always grasp the handle.
- Securely mount the microinverters using the correct amount of torque. The mounting torque of the M8 screw is 9 N·m (80 in-lb). Do not over-torque.

NOTICE

Due to the on-site conditions of the roof and the placement of the microinverter, you may need additional DC Extension Cables. You can purchase them from Hoymiles by emailing *sales@hoymiles.com*.

Assembly Diagram



[A]: Flex-S3 Sealing Cap
[B]: Flex-S3 Trunk Connector
[C]: Flex-S3 Connection Cable
[D]: Flex-S3 Extension Connector
[E]: Flex-S3 Cable Terminal Connector
[F]: Flex-S3 Disconnect Tool

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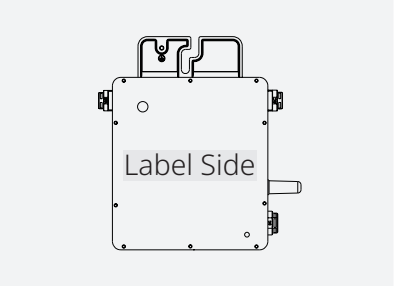
Procedure

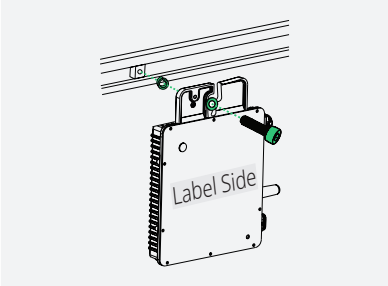
Step 1 Attach the microinverter to the PV racking

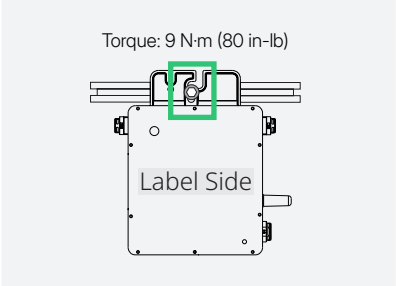
A) Plan and mark the position of the microinverter on the PV racking.

B) Place the microinverter (label side up) onto the racking.

C) Secure the microinverter to the racking (torque: 9 N·m / 80 in-lb).







⚠ WARNING

- Leave as much space between the microinverter and any nearby surface as you can for reliable communication.
- Allow at least 2 cm (0.79 inches) of space around the microinverter for ventilation and heat dissipation.
- The AC cable already includes earth wires for direct grounding. If external grounding is required at your installation site, you can order the grounding accessory by emailing *sales@hoymiles.com*.

Torque: 2 N·m (18 in-lb)

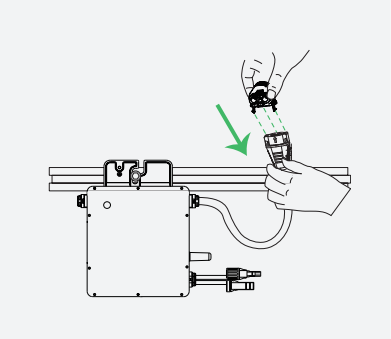
Step 2 Connect the AC Trunk Connector

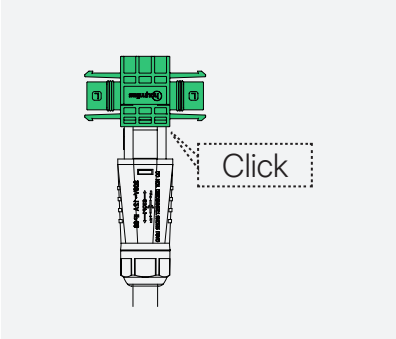
A) Connect the Flex-S3 Trunk Connector to the microinverter.

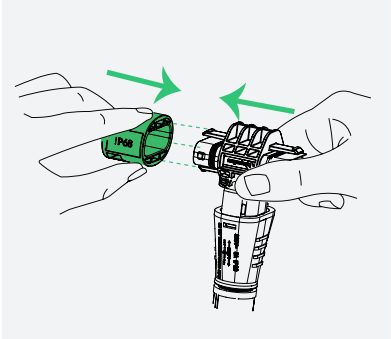
B) Cover the unused port on the Flex-S3 Trunk Connector (located at the beginning of the AC Trunk) with a Flex-S3 Sealing Cap. Listen for a click as the sealing cap engages.

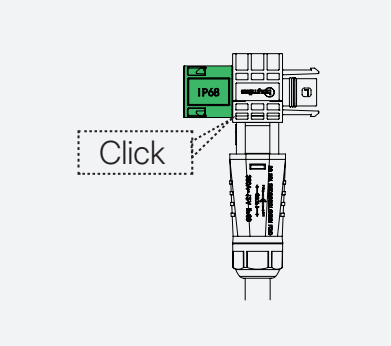
per microinverter

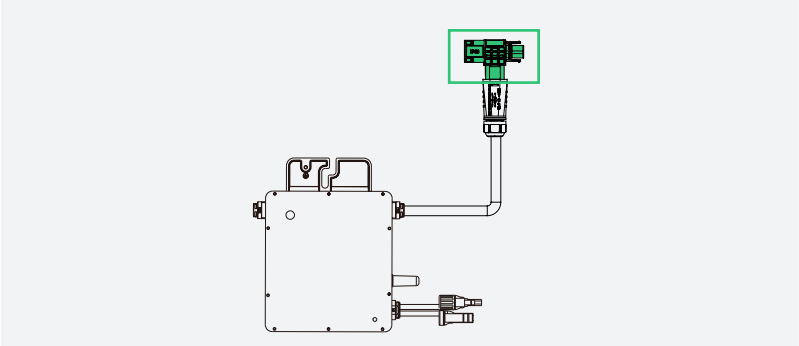
per AC output line











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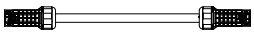
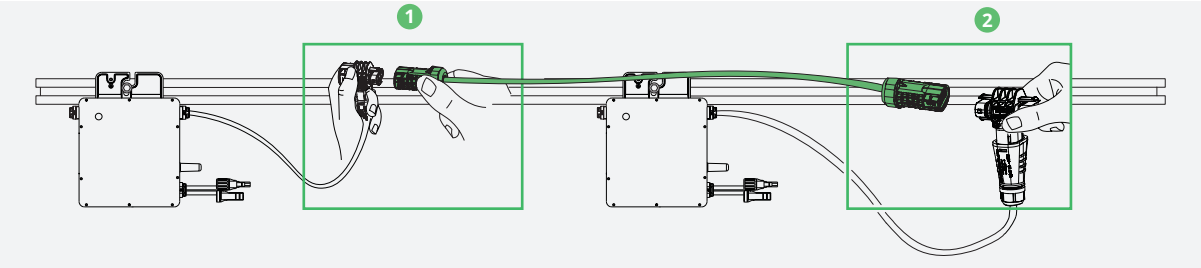
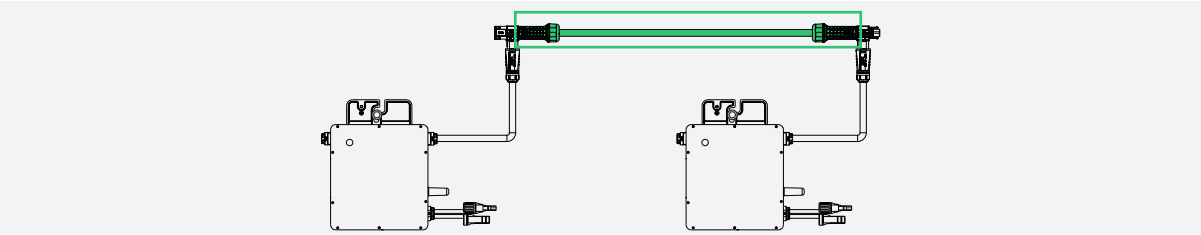
Step 3 Connect adjacent microinverters

Use the Flex-S3 Connection Cables to connect all microinverters on the AC Trunk one by one. Listen for a click as they engage.



The quantity depends on the on-site situation.

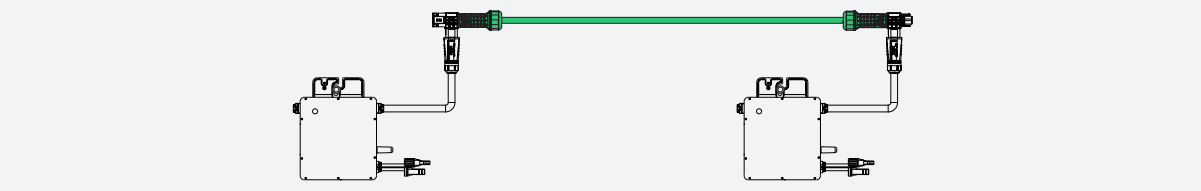




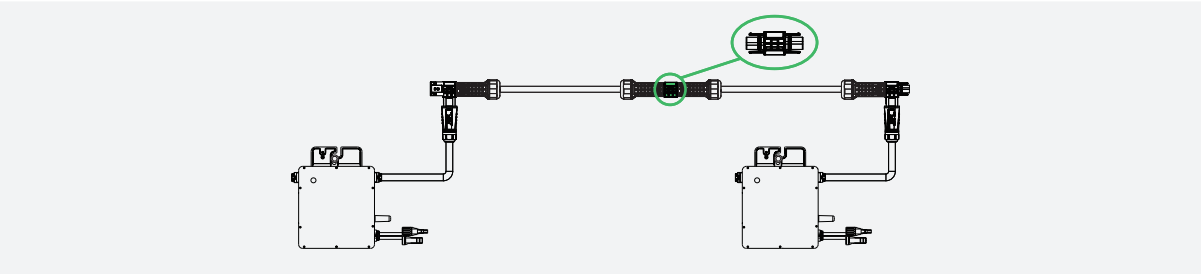
Obstacle Scenario

If you need to space microinverters farther apart, Hoymiles offers two solutions:

- **Using a longer Flex-S3 Connection Cable:** Hoymiles offers cable lengths including 1.1 m (3.6 feet), 2.0 m (6.6 feet), 2.3 m (7.5 feet), 3.0 m (9.8 feet), and 4.6 m (15.1 feet). If you require a different length, contact our sales team by emailing *sales@hoymiles.com*.



- **Using a Flex-S3 Extension Connector** to connect two Flex-S3 Connection Cables into a longer one.



** To disconnect the Flex-S3 Extension Connector from the AC Trunk, you must use a Flex-S3 Disconnect Tool. (See "7.1 Removing the Microinverter".)*

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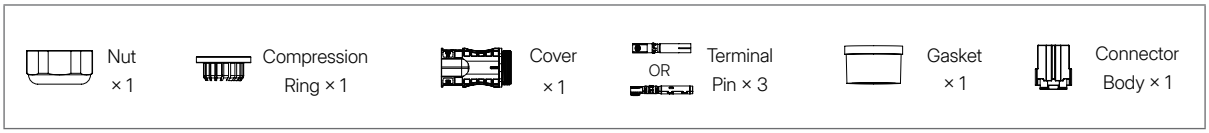
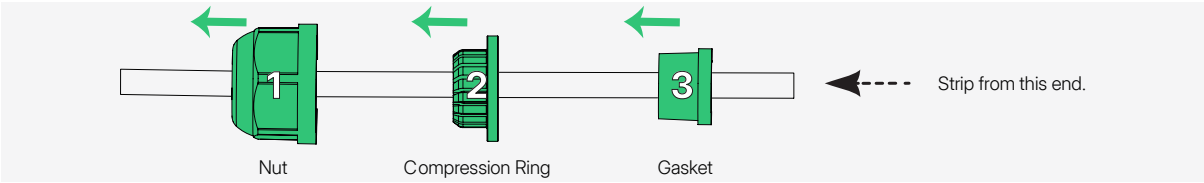
Step 4 Make the AC End Cable

A) Separate the Flex-S3 Cable Terminal Connector into six parts, and then slide the nut, compression ring, and gasket over the AC cable in the correct order.

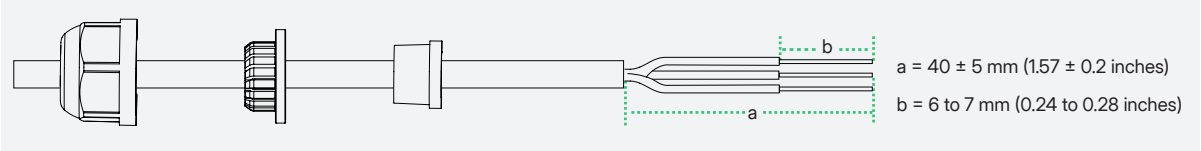




NOTICE

Two terminal pin sizes are available: one for 10 AWG cables and the other for 12 AWG cables. Choose the correct terminal pin size matching the cable size to ensure a reliable and secure connection. Using the wrong size may result in potential issues or connection failures.

B) Strip off 40 ± 5 mm (1.57 ± 0.2 inches) of the outer jacket with a cable cutter. Then use a wire stripper to strip the insulation to expose 6 mm to 7 mm (0.24 to 0.28 inches) of the conductor.



NOTE

Take care not to cut individual conductor strands.

C) Secure the conductors to the terminal pins.

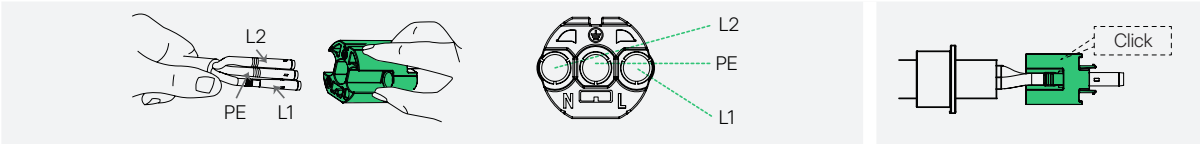
- **Stranded Wire**

  Insert the conductors into the terminal pins, and crimp them securely using a crimping tool.

- **Solid Wire**

  Insert the conductors into the terminal pins, and tighten the screws clockwise using the hex key provided (torque: 0.3 to 0.4 N·m / 2.7 to 3.5 in-lb).

D) Insert the crimped cable into the connector body.



NOTICE

Wiring color codes may vary. Always adhere to national and site-specific regulations for wiring.

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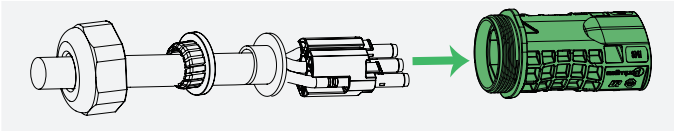
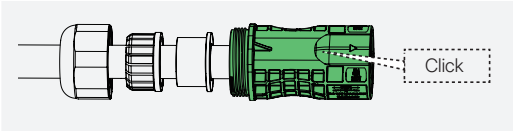
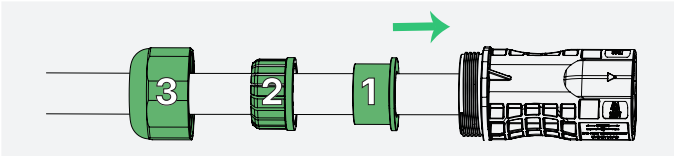
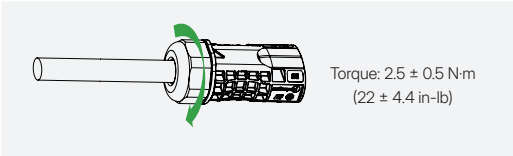
E) Insert the connector body into the cover.





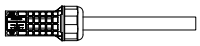
F) Slide the gasket, compression ring, and nut over the cable assembly.
Tighten the nut to 2.5 ± 0.5 N·m (22 ± 4.4 in-lb).

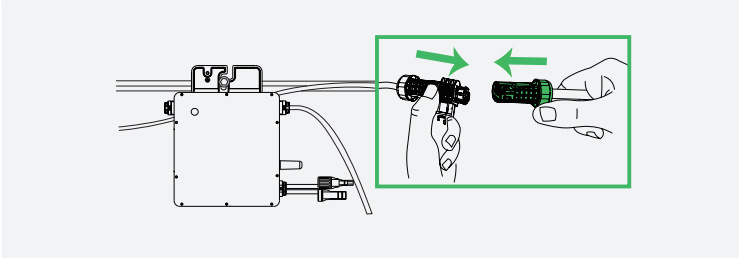


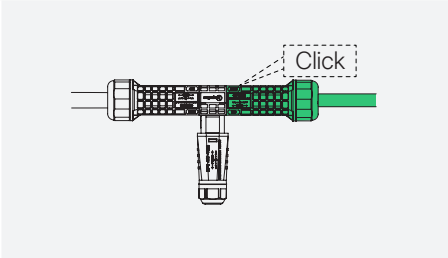


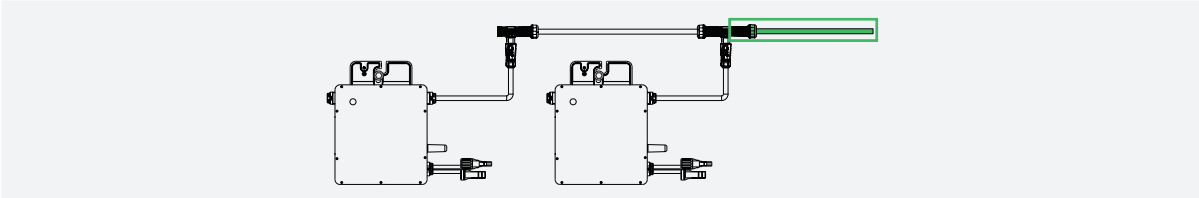
Step 5 Connect the AC End Cable

Connect the AC End Cable to the last Flex-S3 Trunk Connector in the AC Trunk. Listen for a click as they engage.


per AC output line

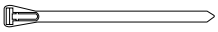


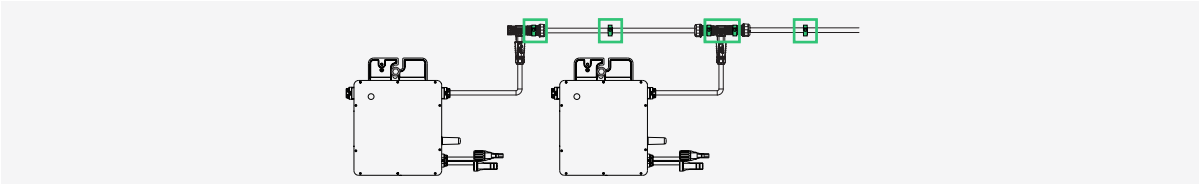




Step 6 Manage the AC Trunk

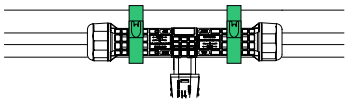
Secure all cables and connectors to the racking with metal cable ties, following local wiring regulations for tie spacing.

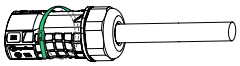

The quantity depends on the on-site situation.



NOTE

The cable ties should be fastened around the central portion of all connectors.





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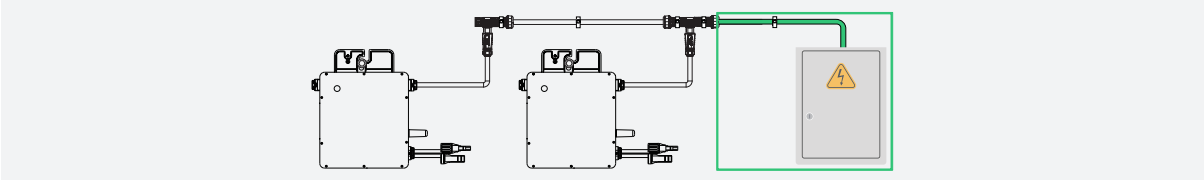
Step 7 Connect to the distribution box

Connect the other end of the AC End Cable to the distribution box.



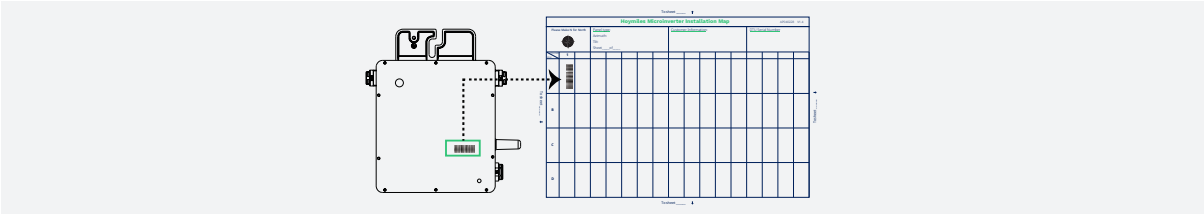
⚠ WARNING

Please adhere to local wiring codes for wiring safety.

Step 8 Complete the installation map

A) Peel off the microinverter's removable SN label.

B) Take out the installation map from the DTU's package, and affix the label to the respective location on the installation map.



Step 9 Connect the PV Modules

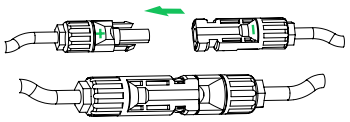
A) Connect the female connectors of PV modules to the DC male connectors of the microinverter.

B) Connect the male connectors of PV modules to the DC female connectors of the microinverter.

C) Mount the PV modules above the microinverters.

⚠ CAUTION

The microinverter's DC male connector is marked with a "+" sign, while the DC female connector is marked with a "-" sign. These symbols simply indicate the gender of the connector and do not imply the positive or negative current.



Step 10 Start-up

A) Check the following before powering on the system:

Check Item	Acceptance Criteria
Microinverter	The microinverters are installed correctly and securely.
Cables routing	Cables are routed properly as required.
Cable ties	Cable ties are evenly distributed and no burr exists.
Cable connection	The AC output power cable and DC input power cable are connected correctly, securely, and reliably.

B) Power on the Microinverter System.

C) Turn **ON** the AC disconnect switch or circuit breaker for each AC output line.

D) Turn **ON** the main utility-grid AC circuit breaker.

E) Allow five minutes for the system to start generating power.

F) Check the LED status. If the microinverter is operating as expected, the LED indicator will flash green. If the LED indicator remains off or lights solid red, see "*6.2 LED Indicator Status*".

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5 Setting Up and Activating Monitoring

NOTE

- A DTU is required to monitor the performance of the microinverters. For details, refer to the ***DTU's user manual***.
- The screenshots provided here are for reference only. The actual screens may vary.
- The DTU's network name includes "DTU/DTUP/DTUL" followed by the last eight digits of the product SN, and is password-free by default.
- The router's Wi-Fi name can only contain English letters and Arabic numerals and the router should support a 2.4 GHz band.
- Refer to the ***S-Miles Installer App Operating Guide*** for additional details on power system implementation.
- Consult the DTU Manual, and S-Miles Cloud Guide for comprehensive instructions on configuring your monitoring platform.

This section will guide you through connecting to the S-Miles Cloud, setting up the power system, adding devices, and configuring your power system.

Step 1 Establish an internet connection

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

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

C) Tap the picture of the DTU.

A) B) C)

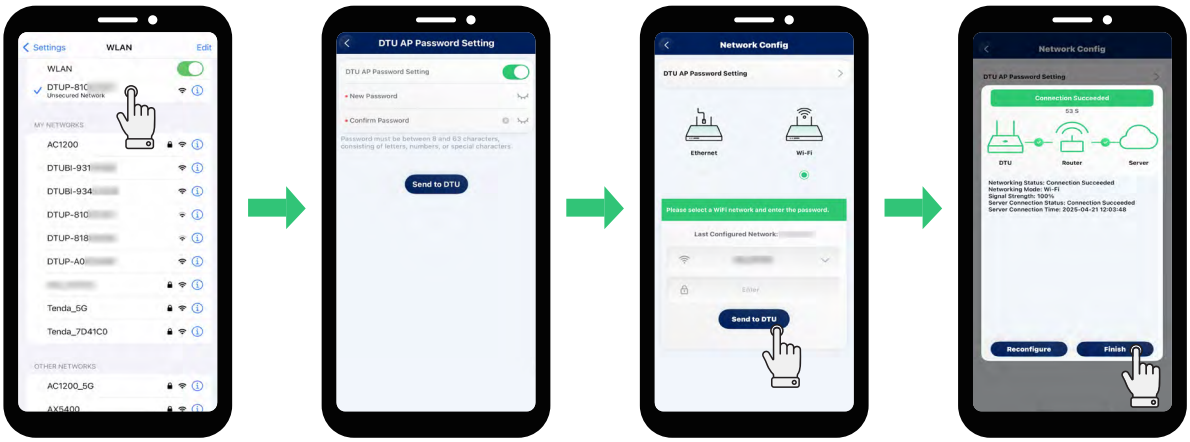
D) Select the DTU's network.

E) Return to the App, and set the new DTU AP password.

F) Wait for about 30 s, and connect to the DTU's network again using the new password.

G) Return to the App, and tap **Network Config** . Select or enter the router's Wi-Fi name, and enter the password. Then tap **Send to DTU**.

H) When the connection succeeds, tap **Finish**.



D) E) G) H)

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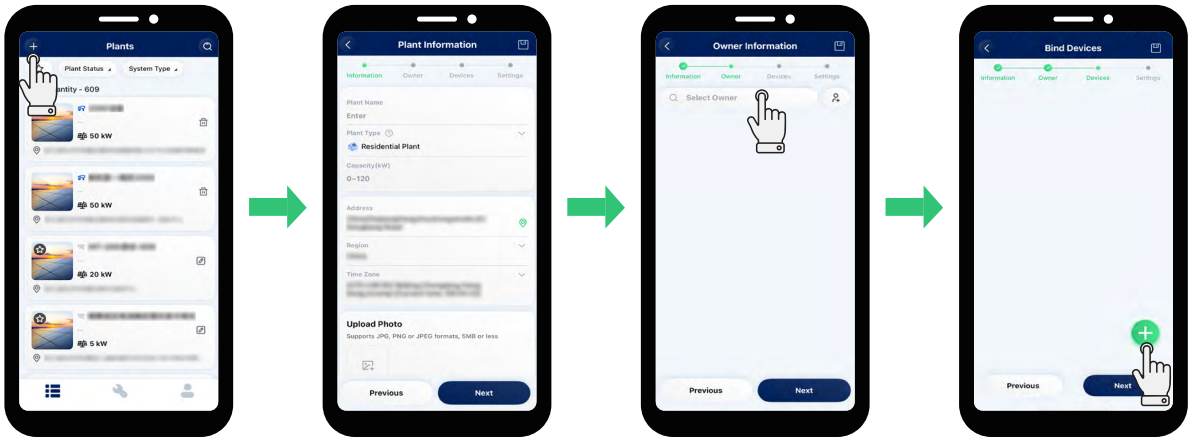
Step 2 Create your power plant

NOTE

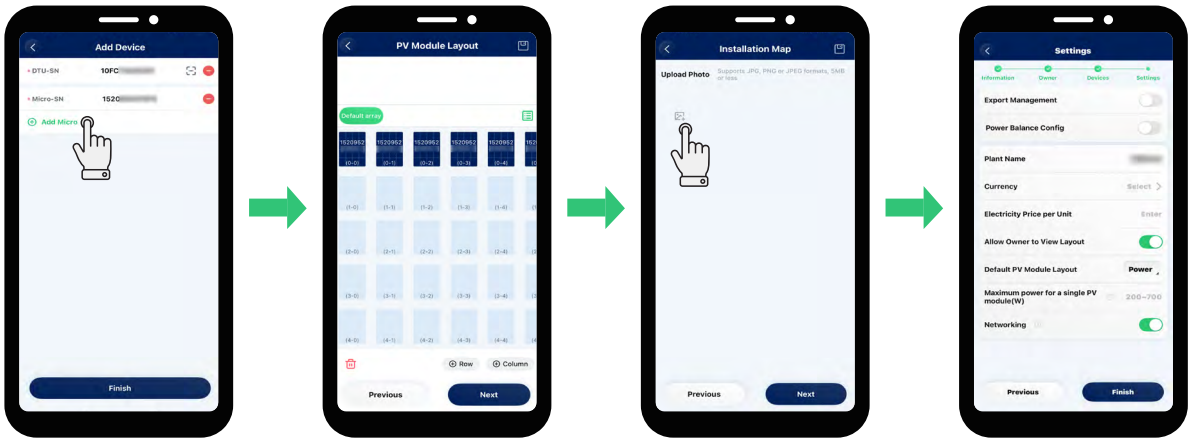
- Ensure the correct time zone is selected to avoid incorrect daily power generation display.
- Enter the PV module's input power. If left blank, the system defaults to 240 W, which may affect performance tracking.
- Export Management and Power Balance Config cannot be enabled at the same time.

A) Tap **Plants** > **Add Plant**.

B) Follow the prompts to fill in the required information, and tap **Finish** to complete the plant creation.



A) B)-1 B)-2 B)-3



B)-4 B)-5 B)-6 B)-7

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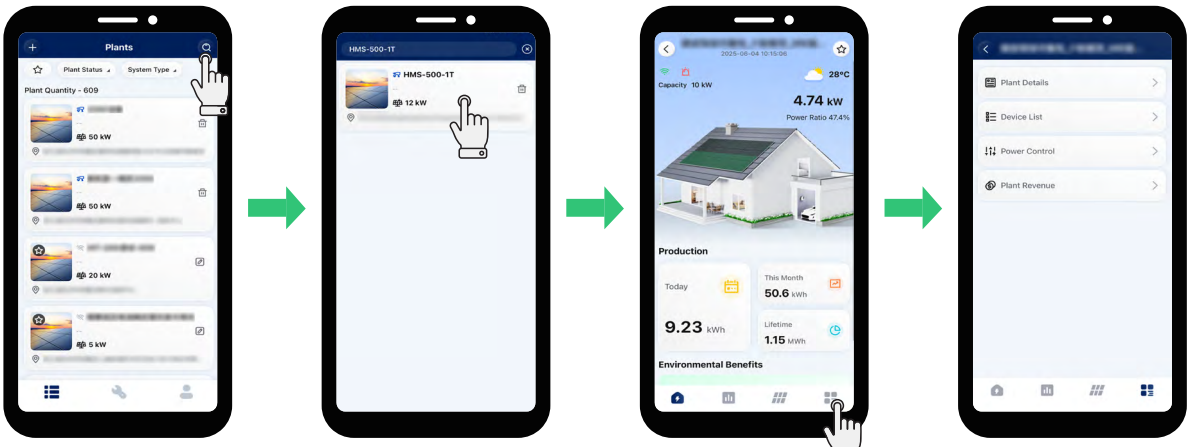
Step 3 Set your power plant

A) Tap **Plants** > **Search**.

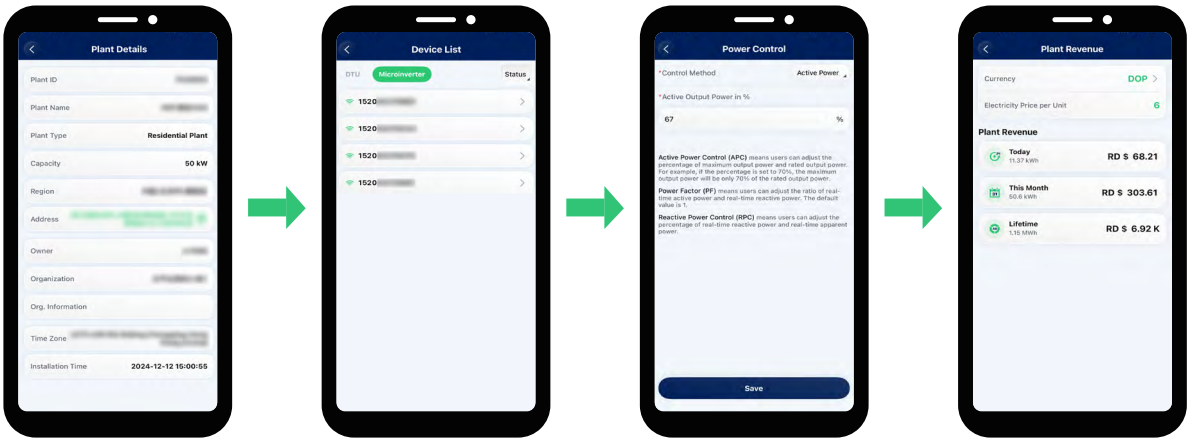
B) Enter the desired plant name for your search, and tap the plant name to move to the plant homepage.

C) On the plant homepage, tap **Setting**.



A) B)-1 B)-2 B)-3

Item	Description
Plant Details	It provides access to geographical location, system capacity, and owner information about your power plant.
Device List	It provides an SN list of devices installed in your power plant.
Power Control	It provides access to adjust the Active Power, Power Factor, and Reactive Power.
Plant Revenue	It provides revenue data over the electricity price, real-time power production data, and historical power production data.



Plant Details Device List Power Control Plant Revenue

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6 Troubleshooting

6.1 Troubleshooting List

Code	Alarm range	Alarm status	Resolutions
121	CU	Over temperature protection	1. Ensure the microinverter installation site is properly ventilated and at a suitable ambient temperature. 2. Improve airflow and heat dissipation if necessary. 3. Please contact your dealer or *Hoymiles technical support team* if airflow and ambient temperature meet the requirements.
125	CU	Grid configuration parameter error	1. Ensure grid configuration parameters are correct and attempt the upgrade again. 2. Please contact your dealer or *Hoymiles technical support team* if the issue persists.
126	CU	Software error code 126	1. No further action is necessary if the alarm is accidentally triggered but the microinverter continues to function normally. 2. Please contact your dealer or *Hoymiles technical support team* if the alarm recurs frequently and does not reset.
127	CU	Firmware error	1. Check for the correct firmware and re-attempt the upgrade. 2. Check and ensure the DTU, Hoymiles monitoring system, and microinverter are all connected and communicating with each other. Retry if needed. 3. Please contact your dealer or *Hoymiles technical support team* if the issue persists.
128	CU	Hardware configuration error	1. No special action is required if the alarm is accidental and the microinverter continues to function correctly. 2. Please contact your dealer or *Hoymiles technical support team* if the alarm recurs frequently and does not reset.
129	CU	Abnormal bias	1. No further action is necessary if the alarm is accidentally triggered but the microinverter continues to function normally. 2. Please contact your dealer or *Hoymiles technical support team* if the alarm recurs frequently and does not reset.
130	CU	Offline	1. Please ensure the microinverter is functioning correctly. 2. Check the communication status between the DTU and Hoymiles monitoring system, or between the DTU and microinverter, and make the necessary improvements if the communication appears poor. 3. Please contact your dealer or *Hoymiles technical support team* if the alarm recurs frequently and does not reset.
141	Grid	Grid overvoltage	1. Sudden, accidental activation of the alarm might be the result of a temporary irregularity in grid voltage. The microinverter will recover automatically once the grid voltage stabilizes. 2. Check whether the grid voltage is in the acceptable range in the event of recurring alarm activation. 3. Contact your local power operator or adjust the grid overvoltage protection limit through the *S-Miles Cloud Platform* with consent from the local power operator if the grid voltage is not within acceptable limits.
142	Grid	10 min value grid overvoltage	
143	Grid	Grid undervoltage	
144	Grid	Grid over-frequency	
145	Grid	Grid under-frequency	

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146	Grid	Rapid grid frequency change rate	1. Sudden, accidental activation of the alarm might be the result of a temporary irregularity in grid voltage. The microinverter will recover automatically once the grid voltage stabilizes. 2. Check whether grid voltage is in the acceptable range in the event of recurring alarm activation. 3. Contact your local power operator or adjust the grid overvoltage protection limit through the ***S-Miles Cloud Platform*** with consent from the local power operator if the grid voltage is not within acceptable limits.
147	Grid	Power grid outage	Check whether a power grid outage occurred.
148	Grid	Grid disconnection	Check the condition of the AC switch or AC wiring for issues.
149	Grid	Island detected	1. Sudden, accidental activation of the alarm might be the result of a temporary irregularity in grid voltage. The microinverter will recover automatically once the grid voltage stabilizes. 2. If all the microinverters in your station frequently trigger alarms, reach out to the local power operator to investigate potential grid islands. 3. If the alarms do not stop, please contact your dealer or ***Hoymiles technical support team***.
209	PV-1	PV-1 No input	1. Confirm that the port is connected to the PV module. 2. If the PV module is indeed connected, examine the DC cable connection between this port and the PV module.
215	PV-1	PV-1 Input Overvoltage	1. Ensure the PV module's open-circuit voltage is less than or equal to the maximum input voltage. 2. If it is within the normal range, contact your dealer or ***Hoymiles technical support team***.
216	PV-1	PV-1 Input Undervoltage	
301 - 311	-	Hardware Error Code	1. No further action is necessary if the alarm is accidentally triggered but the microinverter continues to function normally. 2. Please contact your dealer or ***Hoymiles technical support team*** if the alarm recurs frequently and does not reset.

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6.2 LED Indicator Status

The LED indicator on the microinverter indicates various statuses. The following table details the possible LED statuses and what they mean.

Start-up

LED	Time Gap	Pattern	Indication
Flashing green	0.3 s, 5 times		Start-up success
Flashing red	0.3 s, 5 times		Start-up failure or microinverter failure
Alternating red and green flashing	1 s		Firmware failure

Operation

LED	Time Gap	Pattern	Indication
Flashing green	1 s		Normal power production
Flashing red	0.5 s		Control unit failure
Flashing red	1 s		AC grid fault
Solid red	-		Hardware failure

NOTE

- The microinverter is powered by the DC side. If the LED indicator is not illuminated, check the DC side connection. If the connection and input voltage are normal, contact your dealer or Hoymiles technical support team for further assistance. (For details, see "***Contact Us***".)
- All faults on microinverters are reported to S-Miles Cloud via the DTU. Refer to the S-Miles Installer/End-user Application or S-Miles Cloud interface for more information.
- Ensure the grid connection is normal.

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6.3 On-Site Inspection and Maintenance Instructions (Only for Qualified Technicians)

⚠ DANGER

- Always wear personal protective equipment while performing inspection and maintenance.
- Shut down the microinverter and disconnect it from all power sources before beginning maintenance.
- The microinverter still contains lethal voltages after disconnecting from the power sources. Wait at least five minutes before proceeding with maintenance.

⚠ WARNING

Maintenance operations are strictly limited to authorized personnel, who are then responsible for reporting any discrepancies.

On-Site Inspection

Most microinverter faults can be diagnosed and resolved using the following troubleshooting steps.

Check Item	Method
Ambient Temperature	Check the temperature of the microinverter for overheating (see "*8 Technical Data*").
Electrical Parameters	Verify the PV modules' DC voltage, the grid voltage, and the grid frequency are within the allowable range (see "*8 Technical Data*").
Electrical Connection	Ensure every AC breaker is operational and locked in the closed position.
DC Connections	Check and make sure the DC connection between the PV module and the microinverter is tight and secure. **Check steps:** A) Disconnect the AC power first to de-energize the microinverter. B) Disconnect the DC connections. C) Re-connect the PV module and microinverter. D) If the DC connection is normal, the LED indicator will flash red (see "*6.2 LED Indicator Status*").
AC Connections	Check and make sure the AC connection between the grid and the microinverter is tight and secure. If DC connections and AC connections are functioning properly, the LED indicator will flash green. **Check steps:** A) Disconnect the AC power first to de-energize the microinverter. B) Disconnect the DC connections. C) Re-connect the PV module and microinverter. D) If the DC connection is normal, the LED indicator will flash red (see "*6.2 LED Indicator Status*"). E) Reconnect the AC power. F) If DC and AC connections are normal, the LED indicator will flash green five times (see "*6.2 LED Indicator Status*"). G) If the problem persists, contact *Hoymiles technical support team*.

Maintenance

Regular inverter maintenance is essential for ensuring longevity and optimal performance assets. The checklist provides specific tasks for the maintenance process.

Check Item	Acceptance Criteria
Ventilation	• Verify the installation location has sufficient free space for ventilation and heat dissipation. • Keep all components free and clear of debris, especially around the heat sink. Clean the microinverter regularly using a soft brush or vacuum cleaner.
Electrical Connection	Check the wiring connections for any loose or damaged wires. If needed, tighten any loose connections.
Microinverter Status	• Check the microinverter for any sign of corrosion or physical damage. Broken parts should be addressed immediately. • Regularly updating the firmware and software of the microinverters.
Environment	Check and ensure the environmental conditions remain within the specified operating range (see "*8 Technical Data*").

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7 Decommission

This section introduces how to safely remove, replace, store, and recycle microinverters at the end of their lifespan.

⚠ DANGER

- Never disconnect a DC connector when PV modules are in the sun. Cover the PV modules before disconnecting.
- Potentially dangerous voltage may still be present inside disconnected microinverters.
- Disposal of the microinverter must comply with the related local regulations to avoid pollution. The microinverter must not be disposed of with normal waste.
- Do not make repairs yourself. Hoymiles microinverter does not have any user-serviceable parts inside.

7.1 Removing the Microinverter

Step 1: Switch **OFF** all AC circuit breakers.

Step 2: Use an electric meter or current clamp to ensure there is no voltage and current.

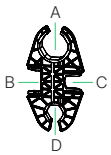
Step 3: Use the Flex-S3 Disconnect Tool to disconnect all AC connections and wait about five minutes.

Step 4: Use the Flex-S3 Disconnect Tool to disconnect all DC cable connections.

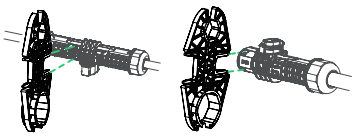
ⓘ NOTE

To use the Flex-S3 Disconnect Tool,

A) Align the Flex-S3 Disconnect Tool's notches with the released tabs on the connectors.
B) Squeeze the tool firmly to apply pressure to the release tabs.
C) Gently pull the connectors apart to disconnect them.



[A]: Tightens or loosens the Flex-S3 Connector nut when making an AC End Cable.
[B]: Disconnects the microinverter AC output connector from the Flex-S3 Trunk connector or Flex-S3 Field Connector.
[C]: Disconnects the Flex-S3 Sealing Cap from the Flex-S3 Trunk Connector or the Flex-S3 Trunk Connector from the Flex-S3 Connection Cable.
[D]: Tightens or loosens Flex-S3 Field Connector nuts.



Step 5: Remove the PV modules from their mounts and cover them.

Step 6: Remove protective earthing connections (if needed).

Step 7: Unscrew the fixing screws on the top of the microinverter and remove the microinverter from the mounting racking.

7.2 Replacing the Microinverter

Step 1: Record the new microinverter's SN.

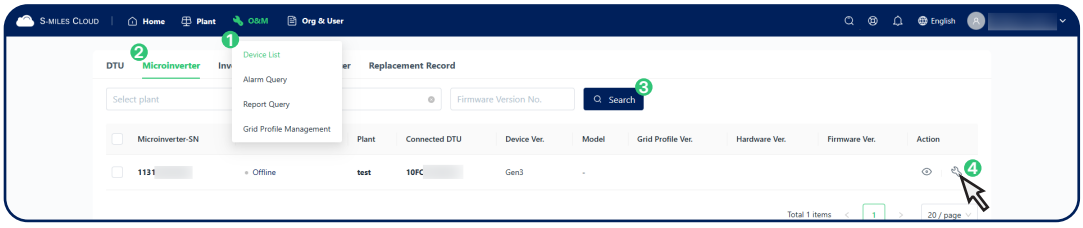
Step 2: Switch OFF all AC circuit breakers and wait about five minutes.

Step 3: Install the new microinverter. (For details, see "*Installation Steps*".)

Step 4: Replace the microinverter on the monitoring platform.

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

B) Go to **O&M** > **Microinverter** > **Search**, locate the device you wish to replace, and click **Device Maintenance** 🔧.



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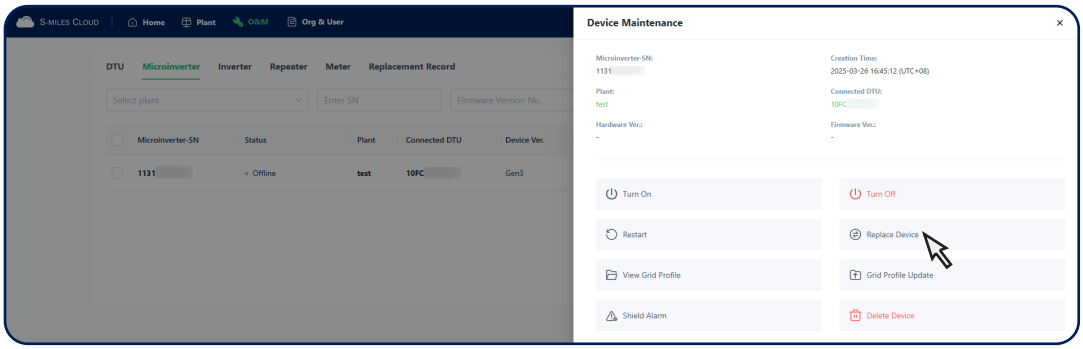
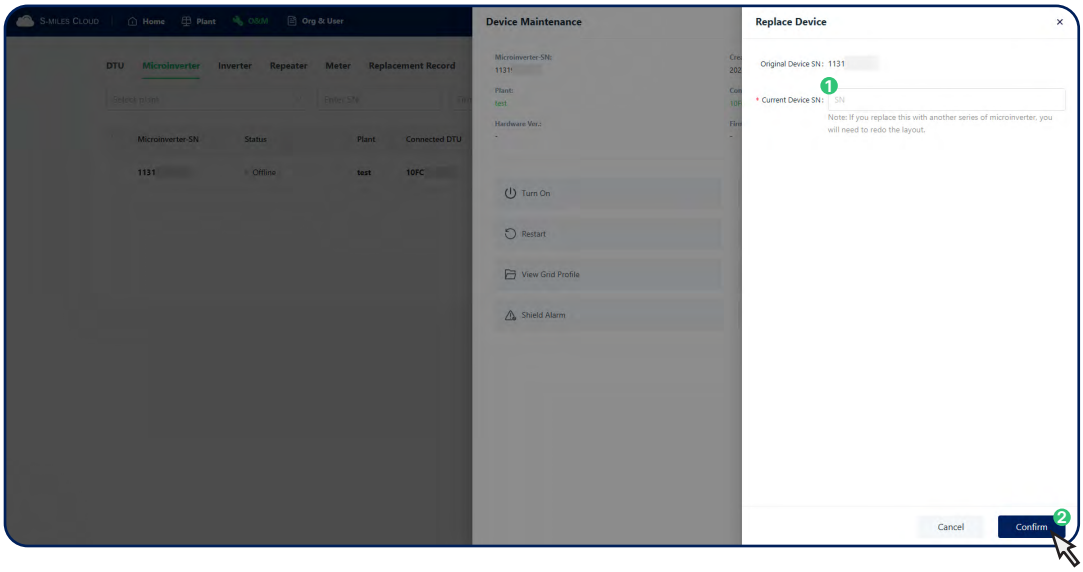
C) Click **Replace Device**.



D) Enter the new microinverter's SN, and click **Confirm** to replace the microinverter.



7.3 Storing and Transporting the Microinverter

The following requirements should be met if the microinverter is not put into use directly.

- Pack the microinverter in the original packaging. If the original packaging is unavailable, use the packaging that is suitable for the weight and dimensions of the microinverter.
- Maintain a storage temperature of -40°C to 85°C (-40 °F to 185 °F), and a relative humidity between 0% to 95%.
- Store the equipment indoors in a well-ventilated area.
- Protect the microinverter from physical shocks or vibrations during transportation and storage.
- Prevent sudden impacts or movements during transportation.
- Follow general transportation regulations for the mode of transport and ensure compliance with all local regulations.
- Conduct a thorough inspection before restarting the equipment after prolonged non-operation.
- Do not exceed the stacking limit marked on the outer side of the packaging.

7.4 Disposing of the Microinverter

Step 1: Pack the microinverter in the original packaging. If the original packaging is unavailable, use the packaging that is suitable for the weight and dimensions of the microinverter.

Step 2: Properly seal the package using adhesive tape.

Step 3: Discard the packaging in accordance with local regulations.

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8 Technical Data

⚠ WARNING

Make sure that the maximum open circuit voltage of the PV module is within the microinverter's operating voltage range.

Model	HMS-400-1T				HMS-450-1T				HMS-500-1T			
Input Data (DC)												
Commonly used module power (W)	320 to 540+				360 to 600+				400 to 670+			
Maximum input voltage (V)	65											
MPPT voltage range (V)	16 to 60											
Start-up voltage (V)	22											
Maximum input current (A)	14				15				16			
Maximum input short circuit current (A)	25											
Number of MPPTs	1											
Number of inputs per MPPT	1											
Output Data (AC)												
Maximum continuous output power (VA)	400				450				500			
Maximum continuous output current (A)	1.92	1.82	1.74	1.67	2.16	2.05	1.96	1.88	2.40	2.27	2.17	2.08
Nominal output voltage	208	220	230	240	208	220	230	240	208	220	230	240
Nominal output range (V)*	180-275											
Nominal frequency/range (Hz)*	50/45–55 or 60/55–65											
Adjustable power factor (@ nominal power)	>0.99 default 0.8 leading ... 0.8 lagging											
Total harmonic distortion (@ nominal power)	<3%											
Maximum units per 10 AWG branch**	16	17	18	19	14	15	16	17	13	14	14	15
Maximum units per 12 AWG branch**	10	11	11	12	9	9	10	10	8	8	9	9
Efficiency												
Peak efficiency	96.7%				96.5%				96.5%			
Nominal MPPT efficiency	99.8%											
Night power consumption (mW)	<50											
Mechanical Data												
Ambient temperature range (°F)	-40 to 149 (-40°C to +65°C)											
Dimensions (W × H × D [inches])	7.17 × 6.46 × 1.18 (182 × 164 × 30 mm)											
Weight (lbs)	3.86 (1.75 kg)											
Enclosure rating	Outdoor-IP67 (NEMA 6)											
Cooling	Natural convection-No fans											
Features												
Communication	Sub-1G											
Type of isolation	Galvanically Isolated HF Transformer											
Monitoring	S-Miles Cloud (Hoymiles Monitoring Platform)											
Compliance	UL 1741, ABNT NBR 16150:2013, ABNT NBR 16149:2013											

* : Nominal voltage/frequency range can vary depending on local requirements.
**: Refer to local requirements for the exact number of microinverters per AC output line.

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9 Installation Map

To sheet _____

hoymiles

Hoymiles Microinverter Installation Map

AP040228 V1.3

Please Make N for North

Panel type:

Azimuth:

Tilt:

Sheet___of___

Customer Information:

DTU Serial Number

COLUMN / ROW	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
A																
B																
C																
D																

To sheet _____

To sheet _____

To sheet _____

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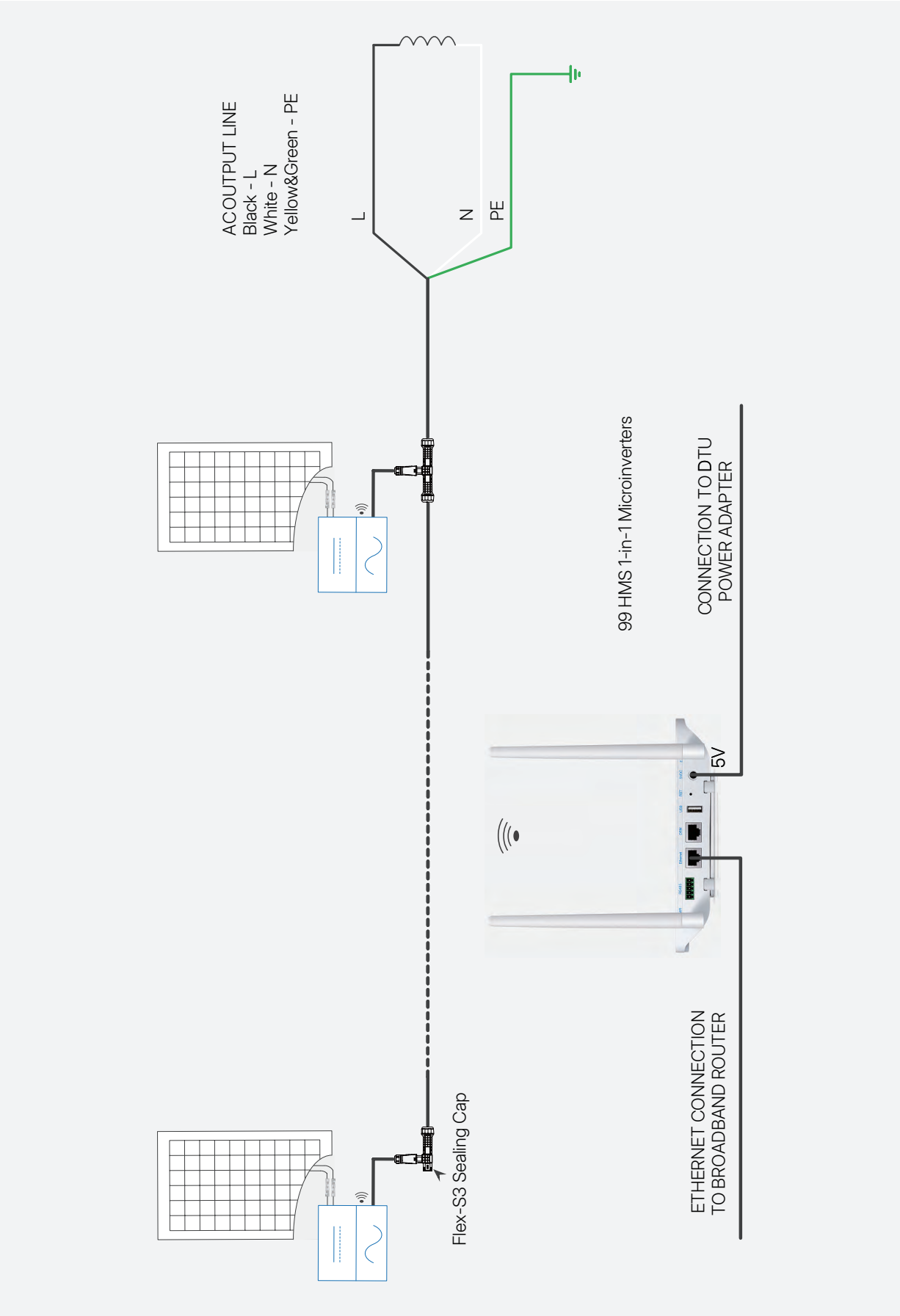
10 Appendix 1: WIRING DIAGRAM

220/230 VAC SINGLE PHASE:



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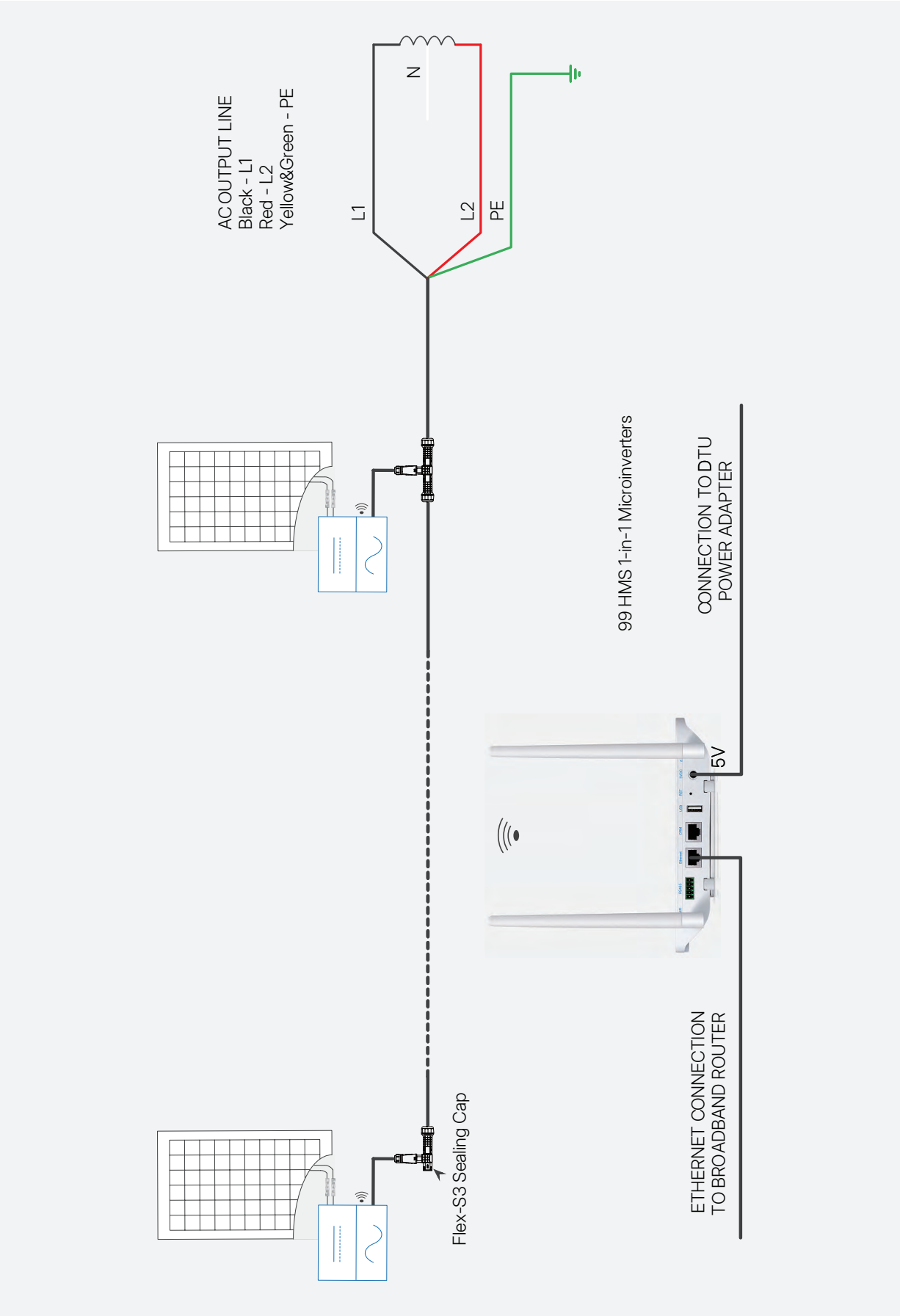
120/240 VAC SINGLE PHASE:



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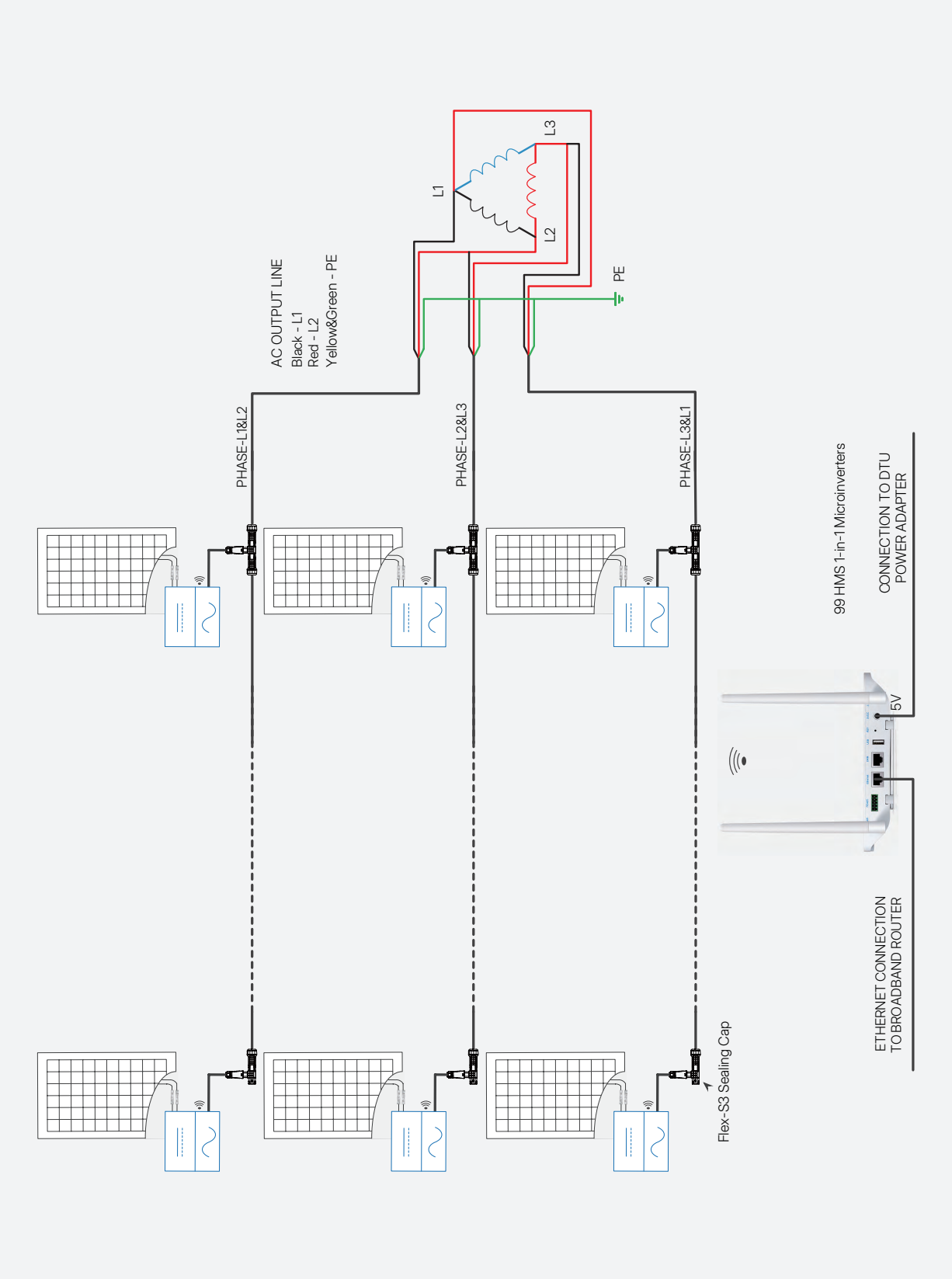
208 VAC THREE PHASE:



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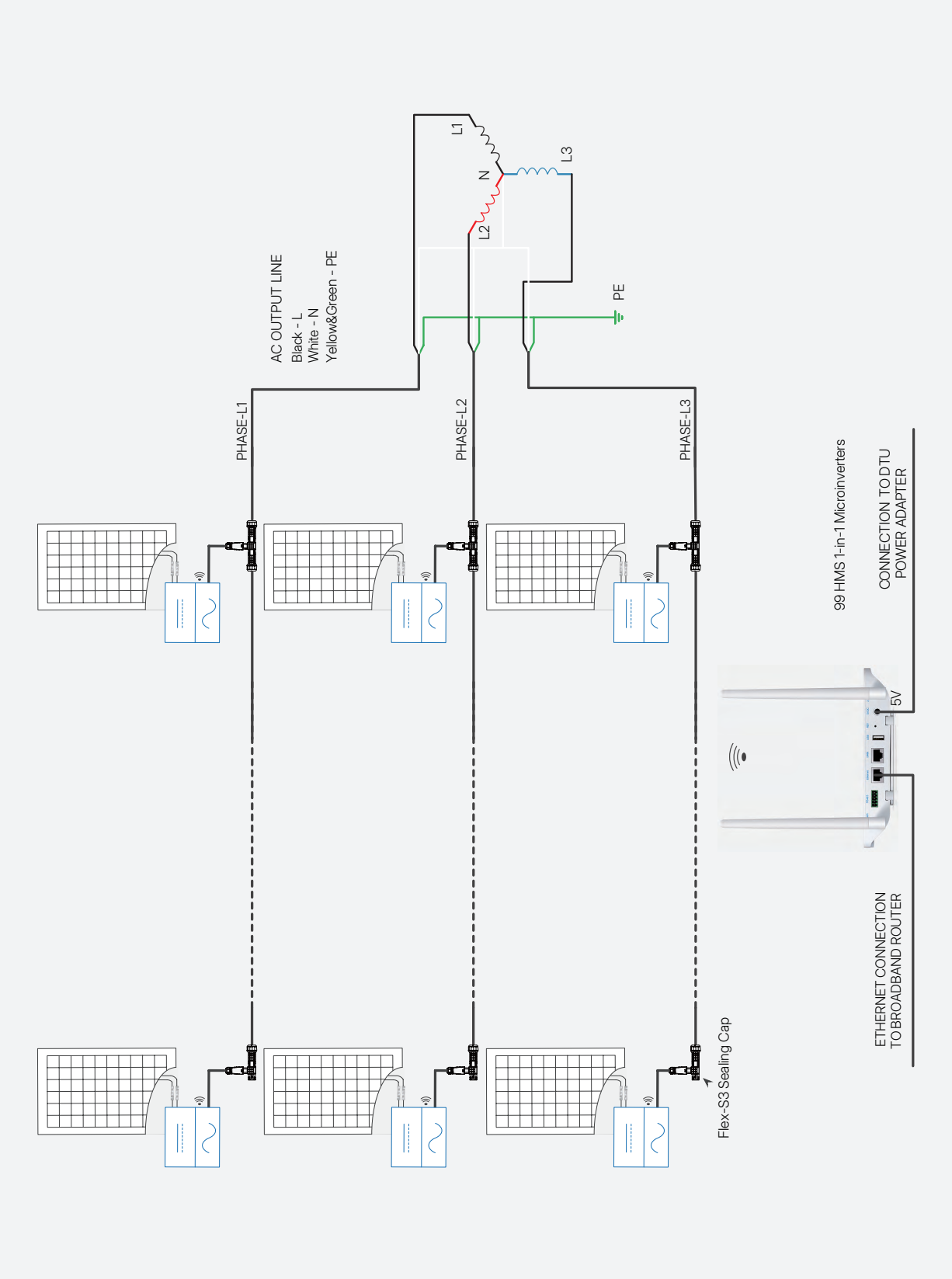
230/400 VAC THREE PHASE:



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11 Appendix 2: Regulatory Compliance Statement

Hoymiles Microinverter (model: HMS-400/450/500-1T) is a class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures. OPERATING FREQUENCY (the maximum transmitted power): 863 to 870 MHz, ERP<14 dBm.

EU Declaration of Conformity

Hoymiles Microinverter (model: HMS-400/450/500-1T) is in compliance with the essential requirements and other relevant provisions of directives 2014/53/EU, 2009/125/EC, 2011/65/EU and (EU)2015/863.

The original EU Declaration of Conformity may be found at ***https://www.hoymiles.com/***.

RF Exposure Information

- This device meets the EU requirements (2014/53/EU Article 3.1a) on the limitation of exposure of the general public to electromagnetic fields by way of health protection.
- The device complies with RF specifications when it is used 20 cm from your body.

FCC compliance information statement

Hoymiles Microinverter (model: HMS-400/450/500-1T) has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.

2. This device must accept any interference received, including interference that may cause undesired operation.

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