

# BDM-1200-WF/BDM-1600-WF/BDM-2000-WF

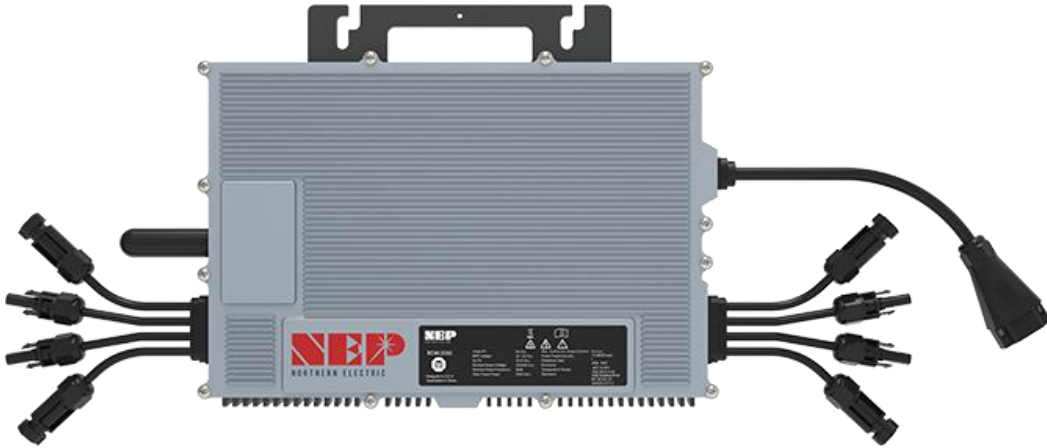
## Quad Trunk Cable Models

### Installation User Manual

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Northern Electric Power Co. Ltd.

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## DISCLAIMERS

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### NEP WARRANTY

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# INFORMATION ON THIS DOCUMENT

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## Target Group

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This document is intended for "[Qualified Persons](#)" and "[End Users](#)".

Tasks marked with a warning symbol and the caption "[Qualified Persons](#)" require associated skills to avoid and deal with the dangers and risks while installing and using the product and tools described in this document.

Tasks not marked do not require qualifications and skill sets, and therefore can be performed by end users.

## Qualified Persons



### QUALIFIED PERSONS

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#### Qualified Persons Required:

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**Qualified persons** are required to be familiar, understand and capable of following all applicable regulations, directives, and laws, and are aware of the potential risks in performing the activities marked in this document.

The following knowledge and skills are required for qualified persons:

- Knowledge of how an inverter works and is operated.
- Knowledge of all applicable standards and directives, including country-specific grid conditions and regulatory guidelines.
- Knowledge and training of how to minimize and deal with dangers and risks associated with using, installing, and repairing electrical devices and installations.
- Knowledge and training in the installation and commissioning of electrical devices, especially those associated with PV systems.
- Knowledge and training of and compliance with this document and all safety information.



### INFORMATION

**"Qualified Person" means he/she is validly licensed from the local authority in:**

- Safely and correctly installing electrical equipment and PV power systems.
  - Safely and properly applying all applicable installation codes in practice.
  - Properly analyzing and minimizing the hazards in performing electrical work and finished works for all persons and properties involved.
  - Selection and application proper Personal Protective Equipment (PPE).
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## End Users

End users can be referred to as any who intend to use the product described in these documents and must avoid performing tasks marked in this document with requirement for qualified persons.

End users should use this document for a comprehensive understanding of general features and functions involved in the product, and as a guideline for performing tasks that do not require qualifications independently.

## **WARNING**

**DO NOT** put this product in use unless it has been successfully installed and commissioned by a qualified person following described requirements and steps in the section of [Installation](#) and [Commissioning](#) as well as all applicable laws and safety regulations.

## Content and Structure

This document describes the unpacking, mounting, installation, commissioning, startup, operation, troubleshooting, maintenance, as well as the disconnection of the product. Applicable inverter models are listed below:

- BDM-1200-WF
- BDM-1600-WF
- BDM-2000-WF

This document, as well as any data, images and illustrations included herein, are reduced to the essential information for the user's guidance, and therefore deviate from the real product. Updates of this document may not be announced.

For the latest version of this document and further information on the described product, please visit website at [northernep.com](http://northernep.com).

For technical problems concerning the products in this document and requiring assistance, please refer to [CONTACT](#).

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## Warning Messages

The following warning messages are used in this document and should be familiarized before installation or operation of the product.

**Failure to follow may result in injury, damage to properties, or a fatal event.**

## **DANGER**

**DANGER** denotes a hazardous situation which, if not avoided, will result in death or severe injury.

## **WARNING**

**WARNING** denotes a hazardous situation which, if not avoided, can result in death or severe or moderate injury.

## **CAUTION**

**CAUTION** denotes a hazardous situation which, if not avoided, can result in moderate or minor injury.

## NOTICE

**NOTICE** denotes a situation which, if not avoided, that can result in property damage.

## FCC COMPLIANCE

This equipment has been evaluated 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 the 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.

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

## SAFETY INSTRUCTIONS

### SAVE THESE INSTRUCTIONS

Users of these documents are cautioned to familiarize themselves with safety instructions contained in this section and always observe when working.

Users are reminded that all electrical or electronic devices come with residual risks despite compliance with international safety requirements and careful construction. To prevent injury and property damage, and to ensure long-term operation of the product, please adhere to all applicable safety instructions in handling and usage of the product.

## DANGER

### **Danger to life due to electrical shock when live components are touched in opened product!**

High voltages and energies are present in live components and cables inside the product during operation, e.g. capacitors, connectors. Touching live components and cables may result in death or severe injuries due to electric shock.

- **DO NOT** open or disassemble the product in any way.
- **DO NOT** touch live components.

## **DANGER**

### **Danger to life due to electrical shock when live DC cables or components are touched!**

High DC voltages are present in the DC cables when PV modules are exposed to light. Touching live DC cables or components may result in death or severe injuries due to electric shock.

- **DO NOT** touch non-insulated parts or cables.
- **DO NOT** touch live components when voltage sources are still connected or just disconnected.
- **DO NOT** connect DC connectors to the product under load.
- Personal protective equipment **MUST** be worn suitably and properly for all work on the product and the system.
- Voltage sources **MUST** be disconnected from the product before all work.

## **DANGER**

### **Danger to life due to electrical shock from touching ungrounded components or from touching live components in case of a ground fault!**

Touching ungrounded PV modules, array frame, inverter or live system component, or parts of the system components that are still live in the event of a ground fault, may result in death or severe injuries due to electric shock.

- PV modules and the array frames, including electrically conductive surfaces, **MUST** be connected and grounded in compliance with all applicable regulations.

In the event of a ground fault,

- **DO NOT** touch any parts or frame of the PV array.
- **DO NOT** touch any cables without reliable insulation.
- **DO NOT** connect the product to any strings with ground faults.
- Before working on the product, voltage resources **MUST** be disconnected.
- Personal protective equipment **MUST** be worn suitably and properly for all work.

## **WARNING**

### **Risk of Injury from exposure to substances, gases, and dusts:**

In rare cases, damaged electrical components can cause formation of toxic chemicals inside the inverter, in such presence of substances, gases, or dusts. Exposure or inhaling such chemical may result in poisoning, skin irritation or burns, breathing difficulty and nausea.

- Personal protective equipment **MUST** be worn suitably and properly for all work.

## **WARNING**

### **Danger to life due to fire or explosion:**

In rare cases, operating under faulty conditions may generate a gas mixture inside any electrical devices, which can be explosive or inflammable while switching operational state (e.g., switching the product ON/OFF in a ground fault event). Flying debris from the fire or explosion may result in death or severe injuries.

- **DO NOT** work the DC Switch on the product in the event of ground fault.
- Before working on the product, voltage resources **MUST** be disconnected and fully de-energized.
- PV arrays **MUST** be disconnected using a disconnecting device instead of bare hands.

- AC circuit breaker (if any) **MUST** be disconnected.

## **CAUTION**

### **Risk of injury and property damage due to inappropriate modifications or technical specifications!**

Modifications or alterations to the product and its connected system are not allowed unless with written permission of NEP. Unauthorized modifications may cause incompliance with product's technical requirement (e.g., maximum input voltage or current), that may result in moderate or minor injuries, and/or property damages.

- Any guarantee and warranty claims in such cases will be void.

## **CAUTION**

### **Risk of injury due to hot enclosures!**

Touching parts of product enclosure that may get hot during operation (e.g., heatsink) and may result in burn injuries.

- **DO NOT** touch any parts other than the cover lid of the product.
- Before working on the product, voltage resources **MUST** be disconnected and leave the product to cool down for 30 minutes.

## **CAUTION**

### **Risk of injury due to weight of product!**

Lifting the product incorrectly or dropping in transportation or mounting may result in injuries like bruises or muscle strains.

- Make sure to take the weight of product into account in transportation and lifting and proceed carefully.
- To avoid muscle strain or injury, please use proper lifting techniques and any necessary aid/tools.
- Personal protective equipment **MUST** be worn suitable and properly for all work.

## **NOTICE**

### **Damage to product and property due to wrong output type!**

The product described in this document is designed to directly tie with and feed power into a public utility power grid. Connecting the product in any other forms of AC output source or equipment may result in product and property damage.

- **DO NOT** connect AC output of the product to any other sources than the utility grid, which will otherwise void any guarantees and warranty claims.



## NOTICE

### Damage to product due to aggressive cleaning agents!

For purpose of cleaning, using aggressive chemicals and cleaning agents may cause damage to the product and components.

- Use a wet cloth with clear water to clean the product.

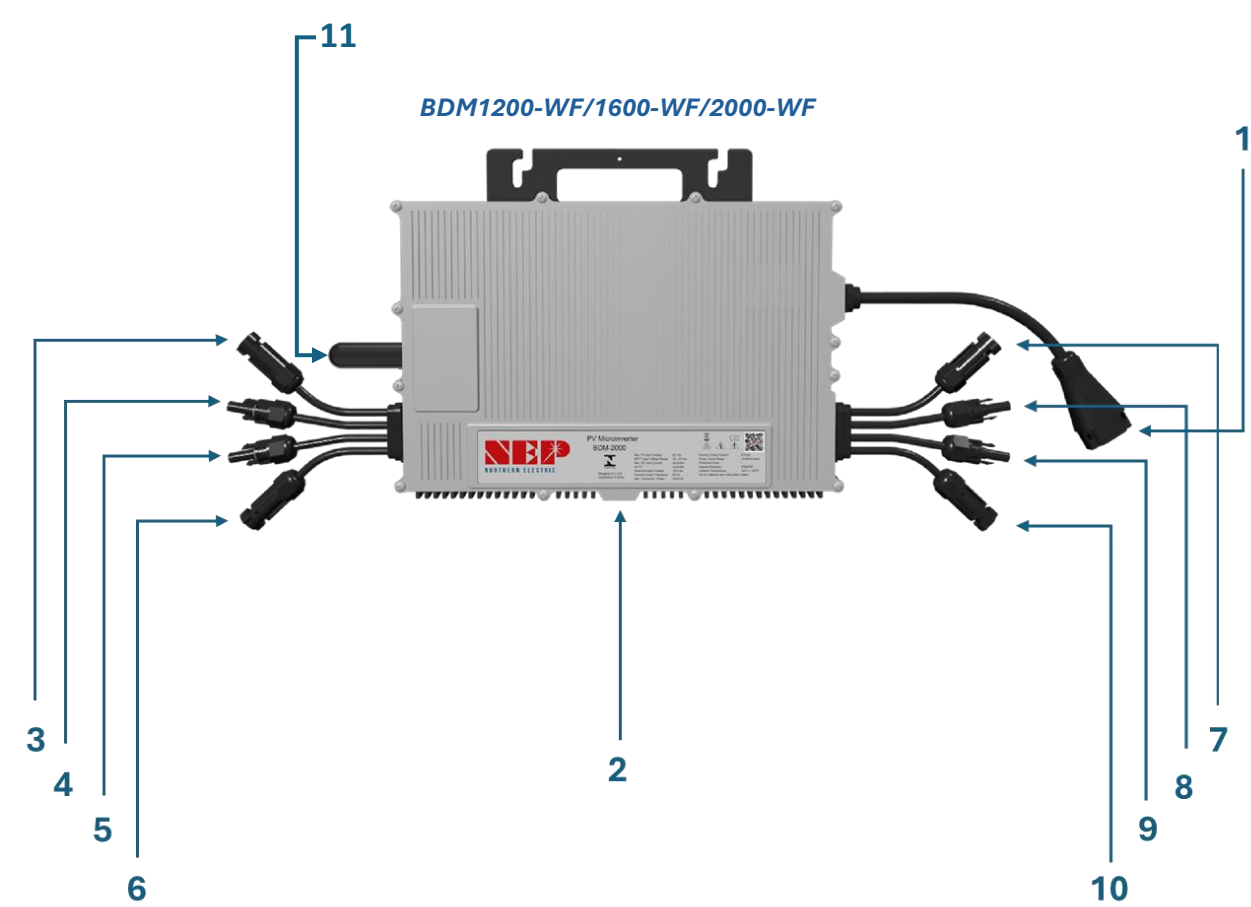


## INFORMATION

The product must **ONLY** be connected and operated with PV arrays of protection class II, in accordance with IEC 61730, application class A. The PV modules must also be compatible with this product. Power sources other than compatible PV arrays **MUST** not be connected and operate with the product.

# OVERVIEWING THE PRODUCT

## Product Overview



1	AC Output Terminal
2	LED display
3	DC input 1 (+)
4	DC input 1 (-)
5	DC input 2 (+)
6	DC input 2 (-)
7	DC input 3 (+)
8	DC input 3 (-)
9	DC input 4 (+)
10	DC input 4 (-)
11	Wi-Fi Antenna



## Identifying the Product

### Serial Number (S/N)

SN is on the sticker which is placed at the right bottom corner of the product.

### Symbols on the label



## INFORMATION

**INFO** denotes information that is important but non-safety-relevant for a task or topic.

Label is located on the side of the inverter. The information on the label includes technical data as well as model and serial number of the device. Safety instructions are listed and explained below:

	<b>Danger!</b> The term “danger” describes an issue which, if ignored can cause personal injury.
	<b>Attention!</b> With the term “attention” a circumstance is listed which may cause property damage if disregarded.
	<b>Instructions for use</b> Under “Instructions for Use” it is pointed out that installation and operating instructions are to be read and understood before installation or repair.
	<b>Caution, Hot Surface!</b> Under “Caution, hot surface” it should be noted that surfaces of equipment may be hot and create a burn hazard.
	<b>Special disposal instructions</b> With “Note Separate Disposal” it is pointed out that this product may not be disposed of with normal garbage. An improperly conducted disposal can lead to damage to the environment.
	<b>ETL Certification</b> This mark certifies that the product complies with all relevant UL requirements for sale in North America.

# INSTALLING THE PRODUCT

## WARNING

### Danger to life due to fire or

All electrical devices can cause fires despite careful construction. Flying debris from the fire or explosion may result in death or severe injuries.

- **DO NOT** install the product in environment with any flammable materials
- **DO NOT** install the product in environment with any potentially explosive items

## CAUTION

### Risk of injury due to weight of

Lifting the product incorrectly or dropping in transportation or mounting may result in injuries like bruises or muscle

- Make sure to take the weight of product into account for transportation and lifting and proceed
- To avoid muscle strain or injury, please use proper lifting techniques and any necessary aid/tools.
- Personnel **MUST** use suitable and proper personal protective equipment during all

## CAUTION

### Risk of injury due to cables routed in

Drilling holes into a wall may damage power cables or pipes for gas or water routed

- Make sure to take cables or pipes into account before drilling.
- Personnel **MUST** use suitable and proper personal protective equipment

## INFORMATION

### Risk of shortened product lifespan due to inappropriate installation

Installing the product in an inappropriate environment may risk shortening its lifespan. To ensure optimal performance and operation, please:

- **DO NOT** install the product in exposure to direct sunlight.
- **DO NOT** install the product in exposure to rain and snow.

## INFORMATION

The pollution degree of the external environment for NEP's inverters is **PD3**.

Pollution Degree 3 indicates:

Conductive pollution occurs, or dry, non-conductive pollution occurs and

## Safety

### Lightning Surge Suppression

## INFORMATION

Lightning does not actually need to strike the PV equipment or connected building to cause damage. Often, a strike nearby will induce voltage spikes in the electrical grid that can damage equipment. NEP microinverters have integrated surge protection, which surpasses that of most string inverters. However, if the surge has sufficient energy, the protection built into the microinverter can be exceeded, and the equipment can be damaged.

Since the NEP Limited Warranty does not cover “acts of God” such as lightning strikes, and since lightning strikes can occur anywhere, it is best practice to install surge protection as part of any solar installation. Installation of surge protection devices should follow vendor instructions.

## Parts required

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In addition to the microinverters, PV modules, racking, junction boxes and associated hardware, parts necessary for ease and completion of proper installation, include the following:

- Trunk Cable
- Trunk End Cap (*One per branch circuit or split branch array section*)
- Trunk T Seal Cap (*Required for unused trunk T connections*)
- MC4 Seal Cap (*Required for unused DC input terminals*)
  - Male MC4 Seal
  - Female MC4 Seal
- Trunk Opening Tool
- Trunk Disconnecting Tool

### Other Parts and Tools Required

In addition to your PV array and its associated hardware, you will need the following parts:

- Junction box(s)
- Combiner Panel (*Used when installing multiple branch circuits*)
- Sockets, wrenches for mounting hardware
- Cable clips/ties (*For trunk cable and wire management*)
- Cord-grip strain relief (*One per each AC cable entrance into junction box*)

## Procedure of Mounting

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### WARNING

**ONLY USE ELECTRICAL SYSTEM COMPONENTS APPROVED FOR WET LOCATIONS!**

1. Measuring service and installing the AC branch circuit junction box.
2. Attaching the microinverter to the racking.
3. Connecting the microinverter wiring harnesses.
4. Grounding the system (optional).
5. Completing the microinverter installation map and connecting the PV modules.

DC circuits of microinverter are isolated and insulated from ground. Each microinverter contains integrated ground protection.

## CONNECTING THE PRODUCT

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### Safety: Electrical Connections

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## **DANGER**

### **Danger to life due to electric shock!**

**DO NOT** touch any live component.

To prevent risk of electric shock during installation and maintenance, please make sure that the AC and DC inputs are properly sealed. **DO NOT** stay close to the instruments while there are severe weather conditions including storm, lightning, heavy moisture etc.

## **AC Connection**

### **STEP 1 - Install the AC Branch Circuit Junction Box**

Measure service entrance AC voltage to verify compatibility with NEP MLPE ranges. Acceptable ranges may vary according to local grid. See tables below for parameter specifics for the BDM-1200-WF, BDM-1600-WF, & BDM-2000-WF microinverters.

- North America
  - 240 Volt AC Single Phase

<b>L1 to L2</b>	<b>240 Vac</b>	<b>211-264 Vac</b>
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- 208 Volt AC Three Phase

<b>L1 to L2</b>	<b>208 Vac</b>	<b>183-228 Vac</b>
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Mount a suitable junction box at the desired location on the PV racking system or directly adjacent thereto (typically at the end of a row of modules).

Connect the open wire end of the BQ Tail Cable into the junction box using an appropriate gland or strain relief fitting. The AC interconnect cable requires a strain relief connector with an opening of 3/8 of an inch in diameter.

### **STEP 2 - Attach product to the Racking**

Mark the approximate edges of each PV module on the roof or racking system. Evaluate the location of the microinverter with respect to the PV modules that are to be connected into each microinverter. Make any adjustments needed regarding junction boxes and/or any other obstructions.

## **WARNING**

ALLOW A MINIMUM OF .75 INCHES BETWEEN THE TOP OF THE ROOF AND THE BOTTOM OF THE MICROINVERTER. WE ALSO RECOMMEND THAT YOU ALLOW .5 INCHES BETWEEN THE BACK OF THE PV MODULE AND THE TOP OF THE MICROINVERTER. DO NOT MOUNT MICROINVERTER IN A LOCATION THAT ALLOWS LONG-TERM EXPOSURE TO DIRECT SUNLIGHT.

Mount microinverters and junction boxes at each of these suitable locations using hardware recommended by your module racking vendor.

### **STEP 3 - Interconnect Microinverters into branch**

Each microinverter comes with one AC output cable with a T-connection connector at the end. Plug the AC connector of each microinverter into a designated Trunk Cable T to form a continuous AC branch circuit. Please check the microinverter specification sheet and rating label of the trunk cable for the maximum allowable number of microinverters on one AC branch circuit.

## **⚠ WARNING**

DO NOT EXCEED THE MAXIMUM NUMBER OF MICROINVERTERS IN AN AC BRANCH CIRCUIT, AS DISPLAYED ON THE UNIT-RATING LABEL. For 12 AWG trunk cable, EACH AC BRANCH CIRCUIT MUST BE SOURCED FROM A DEDICATED BRANCH CIRCUIT PROTECTED BY A 20A MAXIMUM BREAKER.

Install a protective Trunk End Cap on the Trunk Cable T at the end of the branch as well as the end of each section of a branch when a single branch circuit is divided between more than one array/array sections.

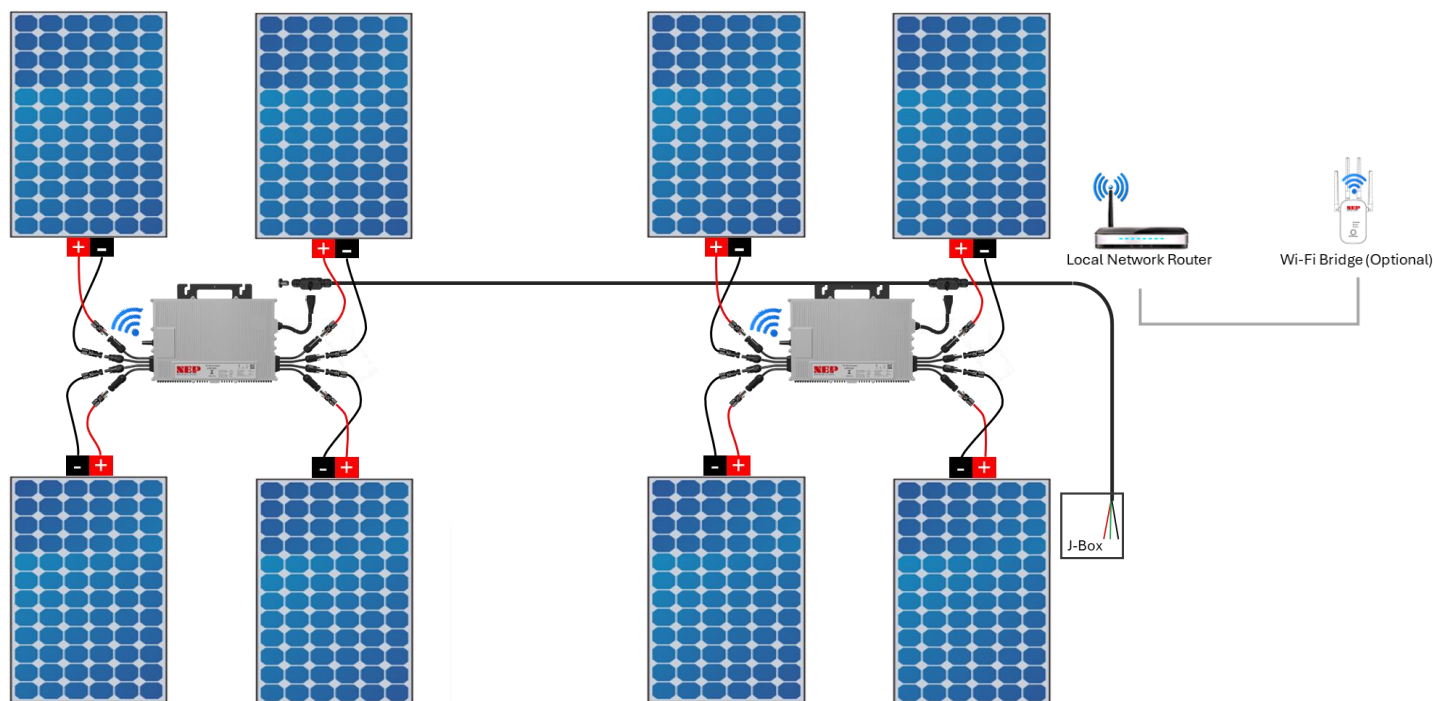
## **i INFORMATION**

NEP microinverters are compatible to be able to interconnect with other NEP microinverter models.

## **⚠ WARNING**

MAKE SURE PROTECTIVE SEAL CAPS HAVE BEEN APPLIED ON ALL UNUSED TRUNK T CONNECTIONS.  
MAKE SURE PROTECTIVE END CAPS HAVE BEEN APPLIED ON ALL UNUSED AC CONNECTORS.  
MAKE SURE PROTECTIVE END CAPS HAVE BEEN APPLIED ON THE END OF TRUNK CABLE.

### Typical Trunk Cable Topology



### STEP 4 - Ground the system

Each product has an integrated ground protection circuit. The grounding wire is within the trunk cable and should be securely connected to the ground connector in the junction box. *(NEP Microinverters may also be grounded through the racking)*

## STEP 5 - Map Microinverter Serial #s & connecting the PV Modules

A serial number map is a diagrammatic representation of the physical location of each microinverter in your PV installation. The virtual array in NEPViewer monitoring portal is created from the map you create. It will be handy when installing multiple microinverter/MLPE devices.

Each product has a removable serial number sticker located on the face of the mounting plate. Scan or enter this serial number into the NEPViewer App and correspond it to the location on the map, when building the layout in the monitoring portal.

## DC Connection

### Safety: Connecting DC

#### **DANGER**

##### **Danger to life due to electrical shock when live DC cables or components are touched!**

High DC voltages are present in the DC cables when PV modules are exposed to light. Touching live DC cables or components may result in death or severe injuries due to electric shock.

- **DO NOT** touch non-insulated parts or cables.
- **DO NOT** touch live components when voltage sources are still connected or just disconnected.
- **DO NOT** connect DC connectors to the device under load.
- Personal protective equipment **MUST** be worn suitably and properly for all work related to the product and the system.
- Voltage sources **MUST** be disconnected from the product before beginning work and until all work is completed.

#### **DANGER**

##### **Danger to life due to electrical shock from touching ungrounded components or from touching live components in case of a ground fault!**

Touching ungrounded PV modules, array frame, inverter or live system component, or parts of the system components that are still live in the event of a ground fault, may result in death or severe injuries due to electric shock.

- PV modules and the array frames, including electrically conductive surfaces, **MUST** be connected and grounded in compliance with all applicable regulations.

In the event of a ground fault,

- **DO NOT** touch any parts or frame of the PV array.
- **DO NOT** touch any cables without reliable insulation.
- **DO NOT** connect the product to any branch circuits with ground faults.
- Before working on the product, voltage sources **MUST** be disconnected.
- Personal protective equipment **MUST** be worn suitably and properly for all work performed.

## CAUTION

### Risk of injury and/or property damage!

In connection of DC cables to the inverter, maximum input current and voltage **MUST** not exceed permitted range as stated in [Product Parameters](#).

- Any guarantee and warranty claims in such cases will be voided.

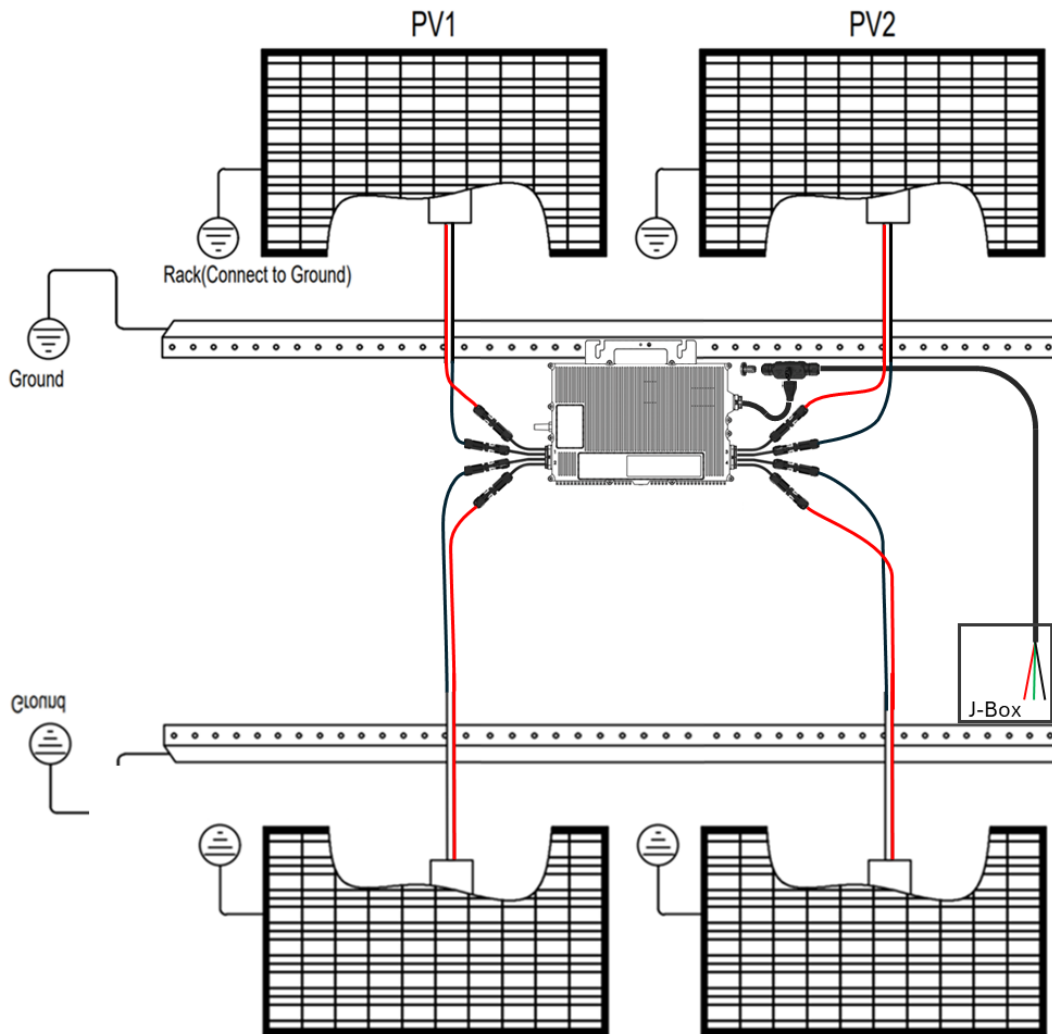
## Requirements for PV Modules

- When multiple PV modules are to connect to a single microinverter, they should be of the same model type and power class.
- When multiple PV modules are to connect to a single microinverter, they should be aligned properly and consist of identical tilt and azimuth.
- **DO NOT** connect (series or parallel) more than one module per DC input of each microinverter.
- For connection of PV modules to the microinverter, all PV modules **MUST** be fitted with DC connectors that are compatible with those of the microinverter.
- When assembling the DC connections, cables **MUST** be equipped with DC connectors of the correct polarity. e.g., **[positive]** connection cable to **[positive]** DC connectors, **[negative]** connection cable to **[negative]** DC connectors.
- Before connecting the PV modules to the microinverter, verify the AC branch circuit is **OFF**.
- The DC input voltage & DC input current of the PV module **MUST** never exceed the maximum input voltage and current of the microinverter.

## DC Connection Procedure

Completely install all microinverters and all system inter-wiring connections prior to installing the PV modules.

1. Mount the PV modules above/adjacent to their corresponding microinverter. Each microinverter comes with four sets of DC input ports with oppositely sexed DC connectors.
2. Connecting each module to its designated set of DC inputs (-/+) start by connecting the positive DC wire from the PV module to the negatively marked DC connector (male pin) of the microinverter. Then connect the negative DC wire from the PV module to the positively marked DC connector (female pin) of the microinverter. Repeat for all remaining PV modules using one microinverter for up to four modules.



## Removing DC Safety: Disconnection

### **⚠ DANGER**

#### **Danger to life due to electrical shock when live components are touched in opened product!**

High voltages and energies are present in live components and cables inside the product during operation, e.g. capacitors, connectors. Touching live components and cables may result in death or severe injuries due to electric shock.

- **DO NOT** open the product.
- **DO NOT** touch live components.

The product **MUST ONLY** be opened for maintenance reasons by a qualified person after:

- Both DC and AC switches or isolators, if any, externally connected or integrated, are switched to OFF.
- Both DC and AC connections are sealed or terminated.
- Voltages inside the product are fully discharged.



## **DANGER**

### **Danger to life due to electrical shock when live DC cables or components are touched!**

High DC voltages are present in the DC cables when PV modules are exposed to light. Touching live DC cables or components may result in death or severe injuries due to electric shock.

- **DO NOT** touch ungrounded parts that may be energized or non-insulated cables.
- **DO NOT** touch live components when voltage sources are still connected or recently disconnected.
- **DO NOT** connect DC connectors to the product under load.
- Personal protective equipment **MUST** be worn suitably and properly for all work on the product and the system.
- Voltage sources **MUST** be disconnected from the product before all work begins through completion.

## **CAUTION**

### **Risk of injury due to weight of product!**


Lifting the product incorrectly or dropping in transportation or mounting may result in injuries like bruises or muscle strains.

- Make sure to take the weight of product into account in transportation and lifting and proceed carefully.
- To avoid muscle strain or injury, please use proper lifting techniques and any necessary aid/tools.
- Personal protective equipment **MUST** be worn suitably and properly for all work performed.

## **Procedure of Disconnecting**

## **QUALIFIED PERSONS**

Before any work on the disconnection of an inverter, **ALWAYS** disconnect it from all voltage sources in the described sequence as following.

1. Disconnect the AC by opening the branch circuit breaker/overcurrent protection device (OCPD).
2. Disconnect the first AC connector in the branch circuit.
3. Cover the module with an opaque cover.
4. Using a DC current probe, verify there is no current flowing in the DC wires between the PV module and the microinverter.
5. Care should be taken when measuring DC currents, most clamp-on meters must be zeroed first and tend to drift with time.
6. Use a suitable measuring device to ensure that **no voltage** is left at the DC inputs of the inverter.
7. Disconnect the PV module DC wire connectors from the microinverter.
  - **Do not pull on the cable.** Instead, use the disassembly tool for PV connectors at the point of interconnection of female and male connectors.
  - Pull out the connectors in a downward direction.
8. Remove the microinverter from the PV array racking.
9. Use a suitable measuring device to ensure that **no voltage** is left at the AC inputs.
  - Measure the voltage by inserting the probe into the opening of each terminal.
  - Check the voltages between L and N (L1 and L2), and between L and  (L1 and Ground).
10. If necessary, remove the M5 screw securing the inverter to mounting bracket. Lift the inverter from the mounting bracket.



## **Re-install Microinverter**

1. Attach the replacement microinverter to the PV module racking using hardware recommended by your module racking vendor.
2. Connect the AC cable of the replacement microinverter to the designated trunk cable T connector to complete the branch circuit connections.
3. Complete the connection map and connect the PV Modules.
  1. Complete the connection map.
  2. Each microinverter has a removable serial number located on the mounting plate. Enter or scan this serial number(s) the NEPViewer App and correspond it to a number in the connection map, when building the layout in the monitoring portal.
  3. Connect the PV Modules.
  4. Completely install all microinverters and all system inter-wiring connections prior to installing the PV modules.
    1. Mount the PV modules above their corresponding microinverter. Each microinverter comes with four sets of two oppositely sexed DC connectors.
    2. Connecting each module to its designated set of DC inputs (-/+) start by connecting the positive DC wire from the PV module to the negatively marked DC connector (male pin) of the microinverter. Then connect the negative DC wire from the PV module to the positively marked DC connector (female pin) of the microinverter. Repeat for all remaining PV modules.
4. Ensure the re-installed microinverter is connected to the local network, using the following commissioning outline below.

# COMMISSIONING

## **WARNING**

CONNECT MICROINVERTER TO THE ELECTRICAL UTILITY GRID ONLY AFTER RECEIVING PRIOR APPROVAL FROM THE UTILITY COMPANY.

## **WARNING**

BE AWARE THAT ONLY QUALIFIED PERSONNEL CAN CONNECT MICROINVERTER TO THE ELECTRICAL UTILITY GRID.

## **WARNING**

ENSURE THAT ALL AC AND DC WIRING IS CORRECT. ENSURE THAT NONE OF THE AC AND DC WIRES IS PINCHED OR DAMAGED. ENSURE THAT ALL JUNCTION BOXES ARE PROPERLY CLOSED.

## Commissioning

### Monitoring Configuration

#### BDM (Wi-Fi) Commissioning Configuration

## **NOTICE**

### DO NOT CONNECT AC

In the state of DC connected, AC disconnected, AP mode of the microinverter will be activated.

If AC connected by accident, please unplug AC, DC to wait for memory clearance of the microinverter.

## **NOTICE**

### Find the AP Number

An eight-digit string can be found under the barcode on the sticker.  
This is the **AP Number**. Be sure to collect these serial number stickers and map them, oriented to match the install.



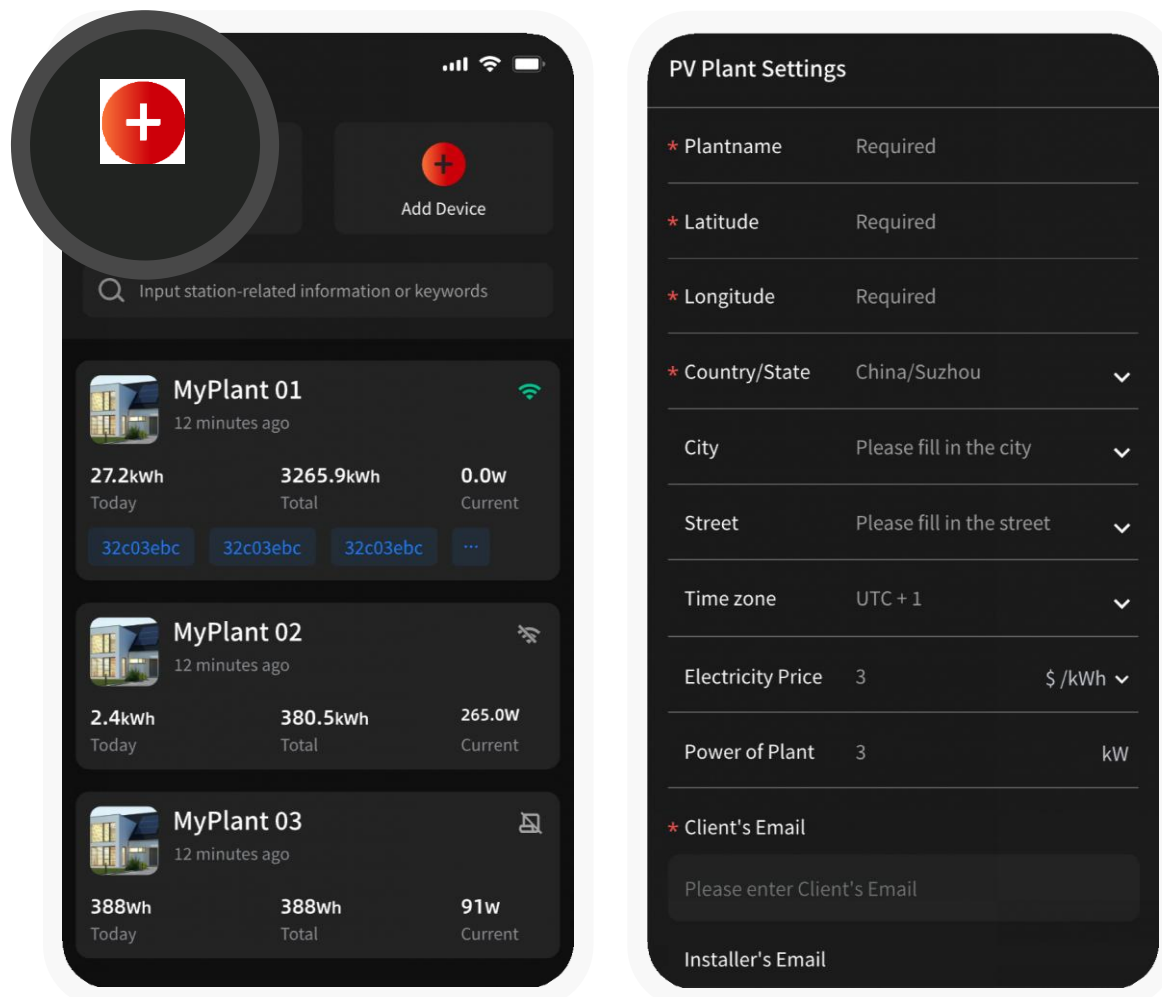
# How to build a new plant

01

1. Open NEP APP



2. Click the “Add Plant” icon in the upper left corner to fill in the power station specific information



## How to add a new device to an existing PV Plant

02

### Caution:

1. Do not plugin the AC cables.
2. Check the access rights of the mobile phone:
  - Turn on/enable the following

Bluetooth

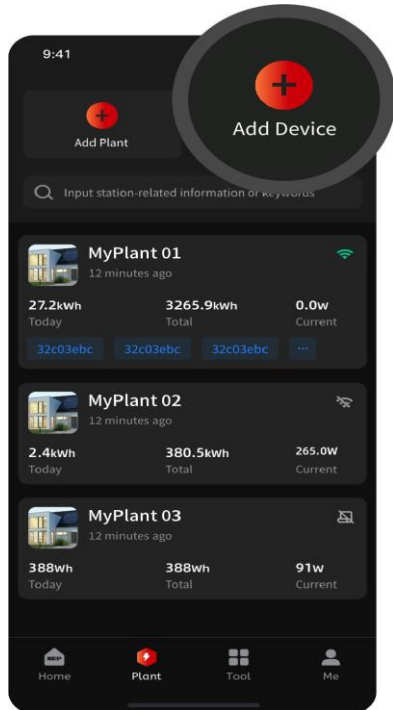
Wi-Fi

Location

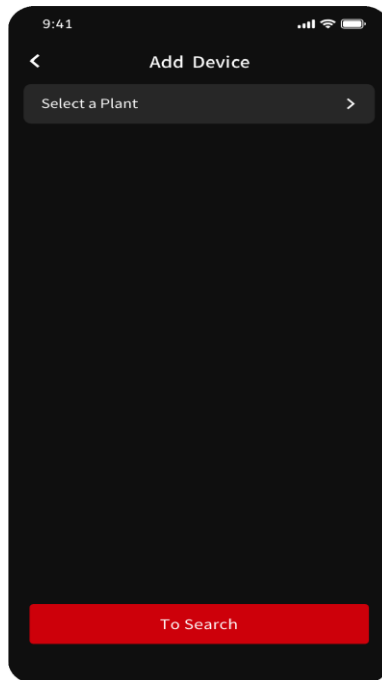
Camera

3. Try not to move your device too far from the router.

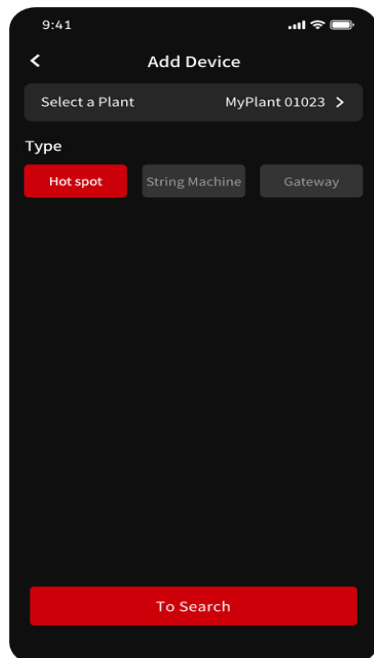
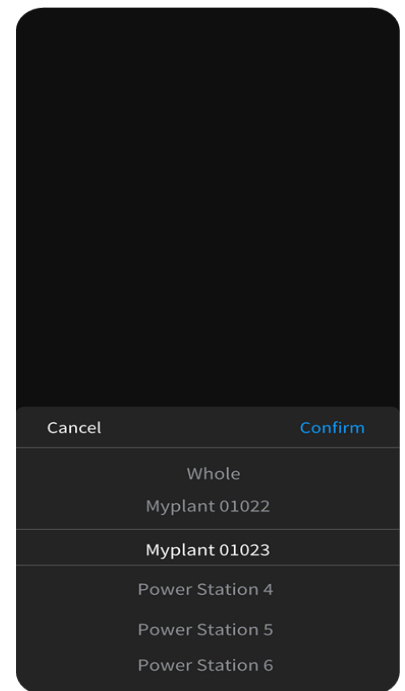
# Add device:



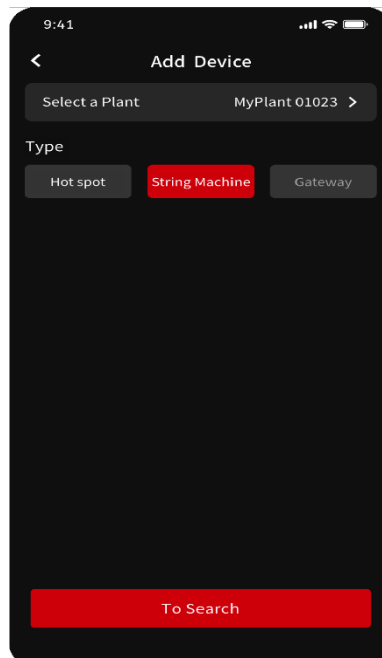
1. Click “Add Device”



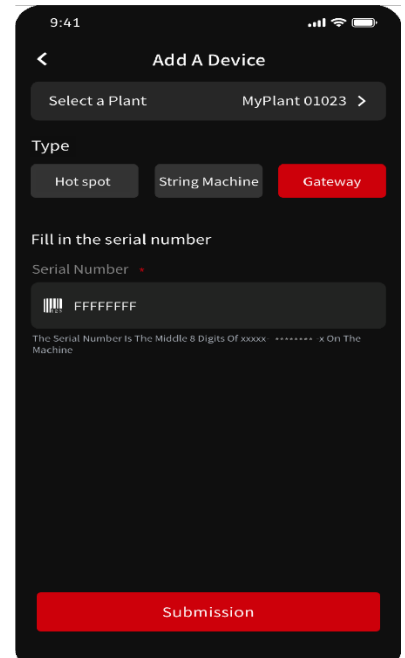
2. Select the desired Plant



3. Select the device type

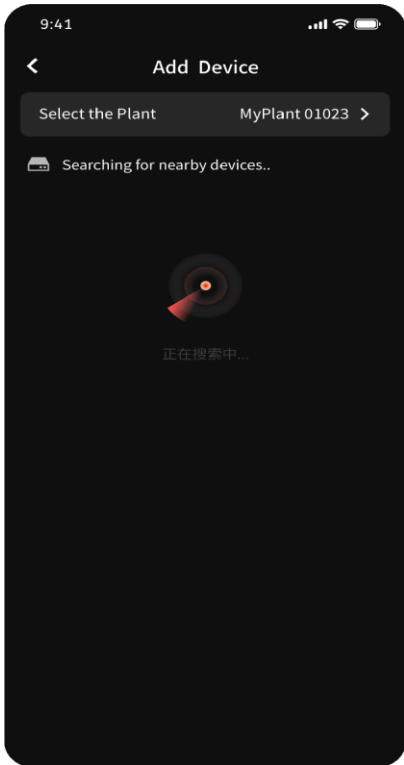


4. If it is a microinverter or serial machine , you can directly click “Search” to search for equipment.

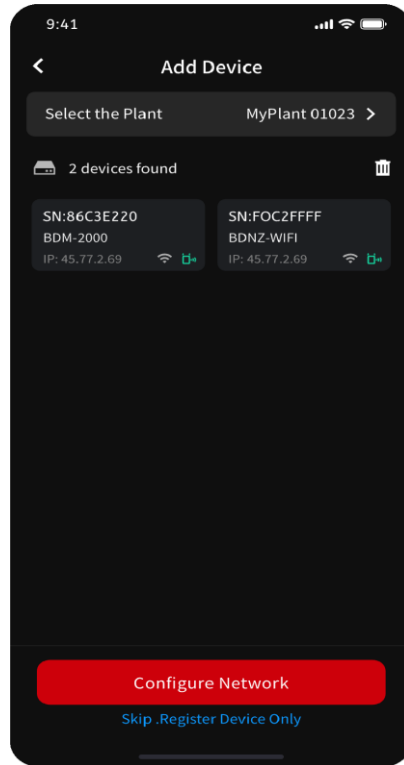


5. If the device is a gateway, enter it in the “Fill in the serial number” then click “Submission”.

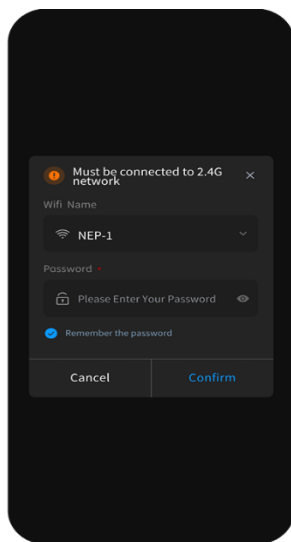
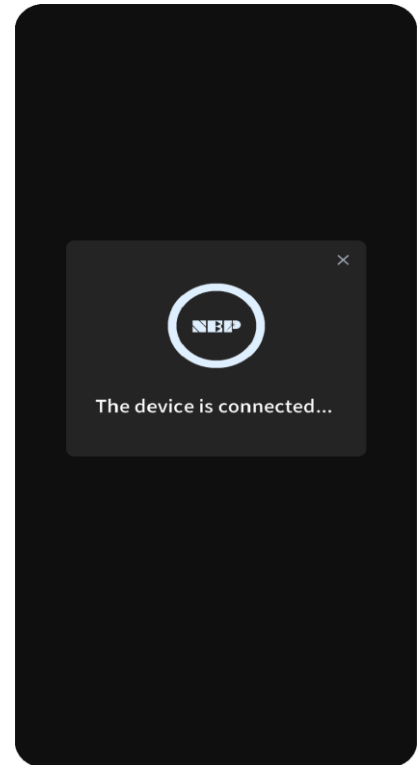
# 1. Click the distribution network to complete the distribution network and successfully add the equipment to the power station.



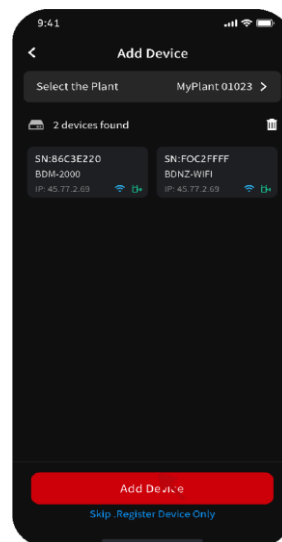
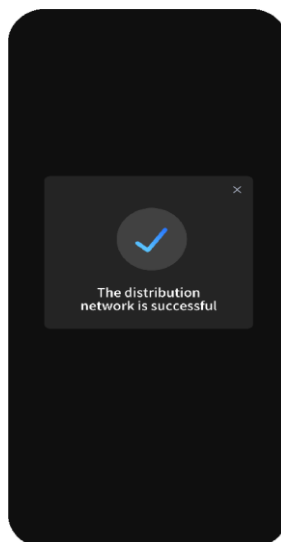
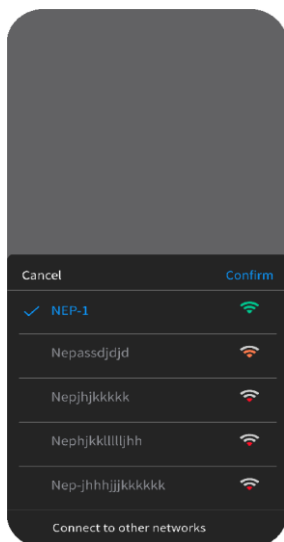
1. Search for nearby devices



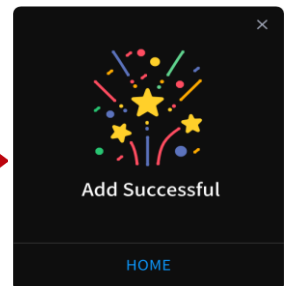
2. Once devices are found, click “Configure Network”.



3. Select Wi-fi Name and enter Wi-fi Password. Click “Confirm”.



4. Click “Add Device” → Success!






## Start Power Generation

Following these steps to commission the microinverter PV system:

1. Turn on the main utility-grid AC circuit breaker.
2. Turn on the AC disconnects and/or circuit breakers for each microinverter AC branch circuit.
3. The Wi-Fi microinverter(s) will start to send performance data over the Wi-Fi network signal. The time required for each microinverter in the system to report to the NEPViewer Portal will vary with the number of microinverters in the system.

## Operating Instructions

The microinverter powers when sufficient DC voltage from the module is applied. The status LED will start flashing after sufficient DC power is applied as an indication that the microinverter is live.

LED Explanation		Flashing per 1 sec	Flashing per 2 sec	Flashing per 4 sec
		WiFi Connected AC connected	WiFi Connected Inverter Standby	WiFi Connected Inverter Working
		WiFi not connected AC disconnected	Inverter Alert	Inverter Alert
		WiFi not connected AC connected	WiFi not connected Inverter standby	WiFi not connected Inverter working

## TROUBLESHOOTING

In case of fault, BDM inverter has multiple protective functions and stops output power. The fault message for BDM Wi-Fi will be sent through Wi-Fi internet connection and can be monitored through NEPViewer (please refer to the tech note "Configuring BDM Wi-Fi"). The alert message is a 16-bit code.





## WARNING

DO NOT ATTEMPT TO REPAIR THE MICROINVERTER; IT CONTAINS NO USER-SERVICEABLE PARTS. IF TROUBLESHOOTING METHODS FAIL, PLEASE RETURN THE MICROINVERTER TO YOUR DISTRIBUTOR FOR MAINTENANCE.



## WARNING

NEVER DISCONNECT THE DC WIRE CONNECTORS UNDER LOAD. ENSURE THAT NO CURRENT IS FLOWING IN THE DC WIRES PRIOR TO DISCONNECTING. AN OPAQUE COVERING MAY BE USED TO COVER THE MODULE PRIOR TO DISCONNECTING.

Error Bit Code	Portal Status Code	Error
Bit-0	0x0001	DC over voltage
Bit-1	0x0002	DC under voltage
Bit-2	0x0004	Hardware error
Bit-3	0x0008	Inverter over voltage
Bit-4	0x0010	Frequency over
Bit-5	0x0020	Frequency under
Bit-6	0x0040	AC voltage RMS over
Bit-7	0x0080	AC voltage RMS under
Bit-8	0x0100	Peak AC voltage over
Bit-9	0x0200	AC current RMS over
Bit-10	0x0400	Peak AC current over
Bit-11	0x0800	Temperature over
Bit-12	0x1000	ADC error
Bit-13	0x2000-WF	GFDI fault indicator
Bit-14	0x4000	Relay fault
Bit-15	0x8000	Communication Error

## **WARNING**

PRODUCT IS POWERED BY DC POWER FROM PV MODULES. MAKE SURE YOU DISCONNECT THE DC CONNECTIONS AND RECONNECT DC POWER TO WATCH FOR THE TWO SECONDS LED ON AND TWO SECONDS LED OFF AFTER DC IS APPLIED.

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## **WARNING**

ALWAYS DISCONNECT AC POWER BEFORE DISCONNECTING PV MODULE WIRES FROM MICROINVERTER. THE AC CONNECTOR OF THE FIRST MICROINVERTER IN A BRANCH CIRCUIT IS SUITABLE AS A DISCONNECTING MEANS ONCE THE AC BRANCH CIRCUIT BREAKER IN THE LOAD CENTER HAS BEEN OPENED.

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### Troubleshooting an inoperable BDM microinverter

To troubleshoot an inoperable microinverter, follow the steps in the order shown:

1. Check the connection to the utility grid. Verify that the utility voltage and frequency are within allowable ranges shown in the label of microinverter.
2. Verify utility power is present at the inverter in question by removing AC, then DC power. Never disconnect the DC wires while the microinverter is producing power. Re-connect the DC module connectors and then watch for the LED blinks.
3. Check the AC branch circuit interconnection harness between all the microinverter. Verify that each inverter is energized by the utility grid as described in the previous step.
4. Make sure that any AC disconnects are functioning properly and are closed.
5. Verify the PV module DC voltage is within the allowable range shown in the label of microinverter.
6. Check the DC connections between the microinverter and the PV module.
7. If the problem persists, please call customer support at [NEP](#).

## **WARNING**

DO NOT ATTEMPT TO REPAIR THE MICROINVERTER; IT CONTAINS NO USER-SERVICEABLE PARTS. IF TROUBLESHOOTING METHODS FAIL, PLEASE RETURN THE MICROINVERTER TO YOUR DISTRIBUTOR FOR MAINTENANCE.

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# RECYCLING AND DISPOSAL

## **NOTICE**



In requirement of EPA, dispose the product using methods that are in accordance with local regulations for electronic waste.

When the product described in this document is involved and categorized in the regulations of **Environmental Protective Agency (EPA)**. Such regulations shall be applied during disposal and recycling of the product.

In countries and regions where equivalent regulations to EPA have been implemented in the disposal of electrical and electronic waste, disposing methods in accordance with all applicable laws should be taken.

- If the product is to be stored away or shipped, pack the inverter using the original packaging or packaging that is suitable for the weight and dimensions of the product.
- If the product is no longer required or replacement of the product is arranged or is to be arranged:
  - **DO NOT** dispose of the product together with the household waste.
  - Inform your dealer of the product or an authorized partner of NEP with information of the disposing product.
  - Dispose the product to a suitably authorized facility for recycling electrical and electronic waste.

## PRODUCT PARAMETERS

Model	BDM-1200-WF	BDM-1600-WF	BDM-2000-WF
Input (DC)			
Recommended Max PV Power:	450 W x 4	600 W x 4	750 W x 4
Max DC Open Circuit Voltage:	60 Vdc	60 Vdc	60 Vdc
Max DC Input Current (Isc):	25A x 4	25A x 4	25A x 4
MPPT Tracking Accuracy:	>99.5%	>99.5%	>99.5%
MPPT Tracking Range:	22-55 Vdc	22-55 Vdc	22-55 Vdc
Maximum Back-feed Current to Array:	0A	0A	0A
Output (AC)			
Peak AC Output Power:	1300 W	1600-WF W	2000-WF W
Max Continuous Output Power (1φ):	1280 W	1536 W	1920 W
Max Continuous Output Power (3φ):	1102 W	1331 W	1664 W
Nominal Power Grid Voltage (1φ):	240 Vac (adjustable)		
Nominal Power Grid Voltage (3φ):	208 Vac (adjustable)		
Allowable Power Grid Voltage (1φ):	211-264 Vac		
Allowable Power Grid Voltage (3φ):	183-228 Vac		
Rated Output Current (1φ):	5.3A	6.0A	8.0A
Rated Output Current (3φ):	5.3A	6.0A	8.0A
Maximum Units Per 20A Branch (1φ):	3	2	2
Maximum Units Per 30A Branch (1φ):	4	4	3
Maximum Units Per 20A Branch (3φ):	3	2	2
Maximum Units Per 30A Branch (3φ):	4	4	3
(All NEC adjustment factors considered)			
Allowable Power Grid Frequency:	59.3-60.5 Hz (adjustable)		
THD:	<5% (at rated power)		
Power Factor (cos phi, fixed):	-0.9~0.9		
Current (inrush) (Peak and Duration):	24A, 15 us		
Nominal Frequency:	60 Hz		
Max Output Fault Current:	17.3 Arms for 3 cycles		
Max Output Overcurrent Protection:	20A		
System Efficiency			
Weighted Average Efficiency (CEC):	95.5%		
Nighttime Tare Loss:	.11 W		
Protection Function			
Over/Under Voltage Protection:	Yes		
Over/Under Frequency Protection:	Yes		
Anti-Islanding Protection:	Yes		
Over Current Protection:	Yes		
Reverse DC Polarity Protection:	Yes		
Overload Protection:	Yes		
Protection Degree:	NEMA-6 / IP-66 / IP-67		
Ambient Temperature:	-40°F to +149°F (-40°C to +65°C)		
Operating Temperature:	-40°F to +185°F (-40°C to +85°C)		
Display:	LED Light		
Communications:	Powerline Communications		
Environment Category:	Indoor and Outdoor		
Wet Location:	Suitable		
Pollution Degree:	PD 3		
Over Voltage Category:	II (PV), III (AC MAINS)		