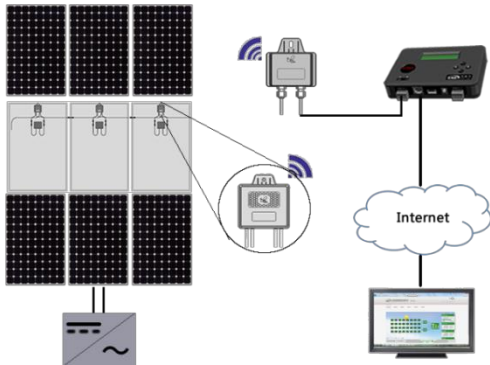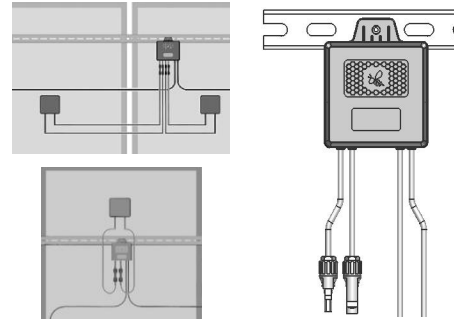# Installation Steps:

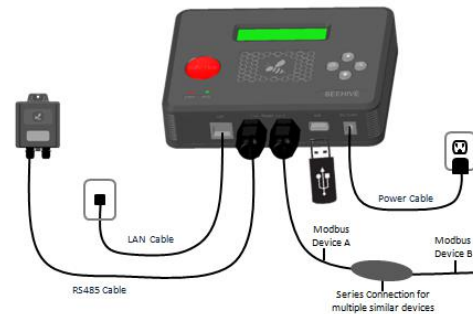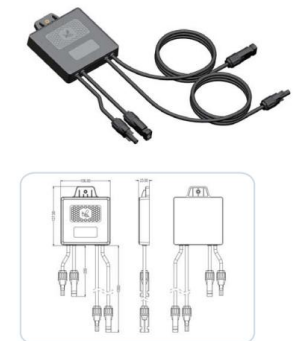| 1. Smart PV diagram (Apidae) | 2. Register MACID of GNE models | 3. Installation of optimizers or PV monitors | 4. Installation of data acquisitoin unit (Swarm) |
| --- | --- | --- | --- |

| 5. Connection to Swarm and Beehive | 6. Installation of data aggregation device (Beehive) | 7. Setup in data cloud center (Honeypot) | 8. Appendix - Product Specification |
| --- | --- | --- | --- |

For more information, please visit GNE website www.gnetek.com, or contact us (email: service@gnetek.com, telephone: +86 519 87281798)

# 1. Smart PV Diagram(Apidae)

**PV Array**



Honeybee350/400
Scouter450

Integrated Optimizer
Smartbee350

Honeybee700/800

**Connection Description:**

- One Beehive can communicate up to 5 Swarms by 485 cable and gather the generation data of 2000 optimizers and monitors
- One Swarm can wirelessly communicate 400 optimizers
- Honeybee350/400: Sole module power optimizer to connect one PV panel
- Honeybee700/800: Dual module power to connect Two PV panels
- Scouter450: Sole module monitor to connect one PV panel

Internet

Data Acquisition Unit
Swarm

Data Aggregation Device
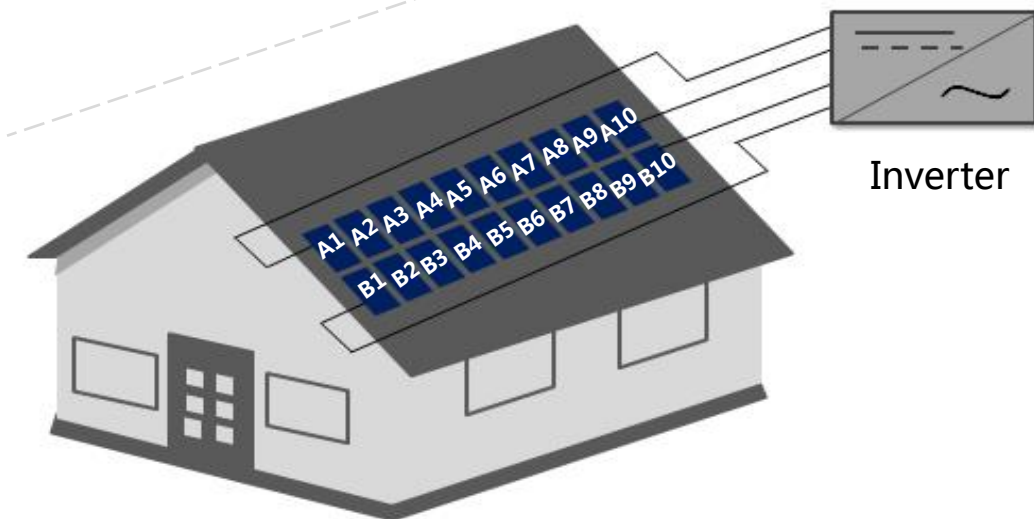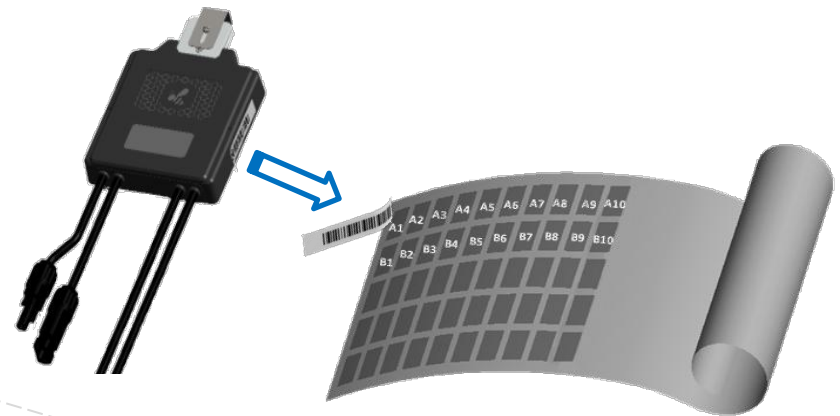Beehive

Data Cloud Center
Honeypot

Inverter

# 2. Register MACID of GNE models

①. Plan the installation location of each power optimizer or PV module monitor
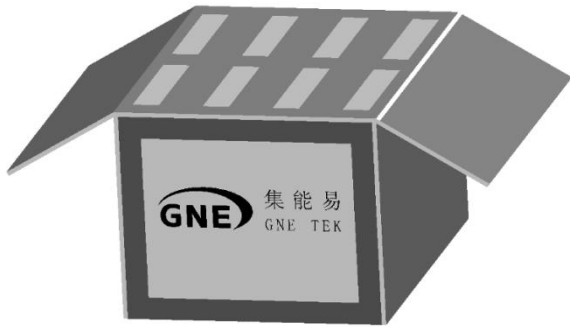
②. Take the power optimizer or PV module monitor and write down the 8-digit MACID number on the plant map, or string list, or construction drawing. And write down the 8-digit MACID number of Swarm and Beehive.

③. The installation position of the power optimizers or the PV module monitors should accord to the previously recorded MACID order.
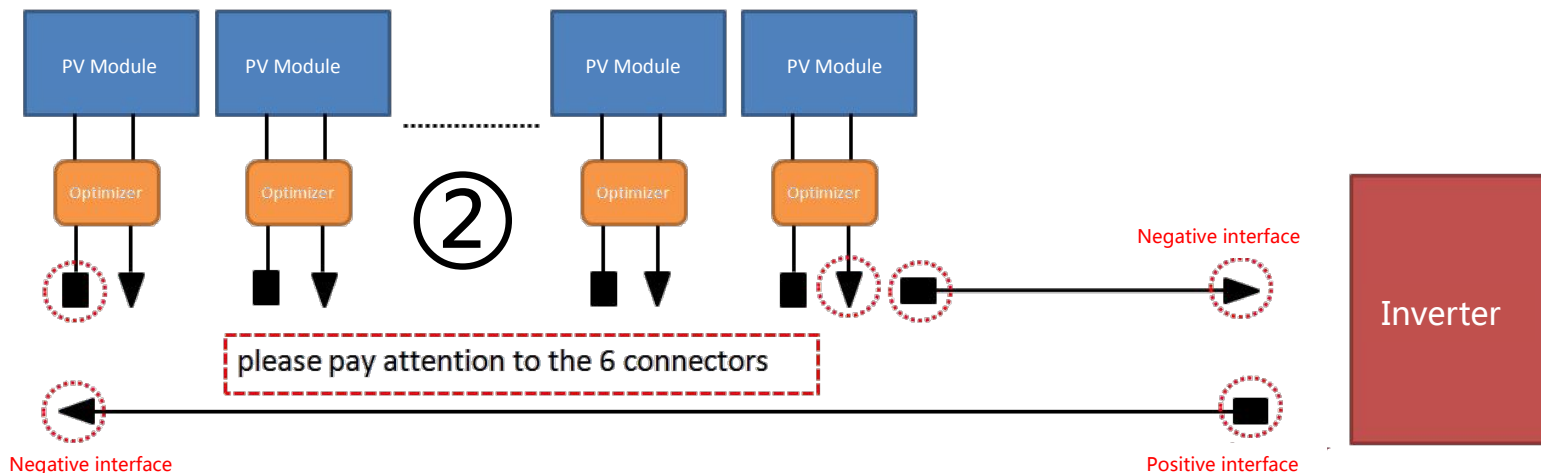
Inverter

# 3. Installation of optimizers or PV monitors

➢ Precautions before installation
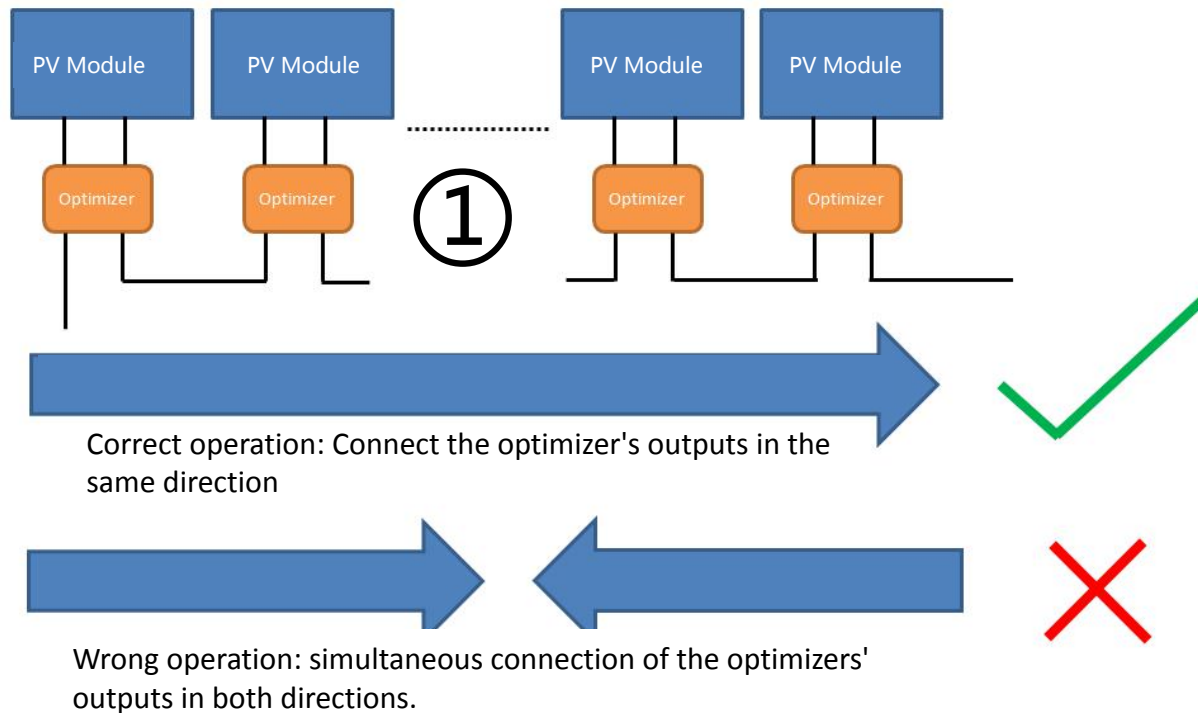


Description: When all the inputs of the optimizers are connected to the output of the PV junction boxes, the outputs of the optimizers are connected in series.

Correct operation: Connect the outputs of the optimizers in the same direction to ensure that the last two ends of the string are the positive and negative two-pole interfaces, not the same-pole interface (as shown in Figure 2).

Correct operation: Connect the optimizer's outputs in the same direction

Wrong operation: simultaneous connection of the optimizers' outputs in both directions.

please pay attention to the 6 connectors

Negative interface

Inverter

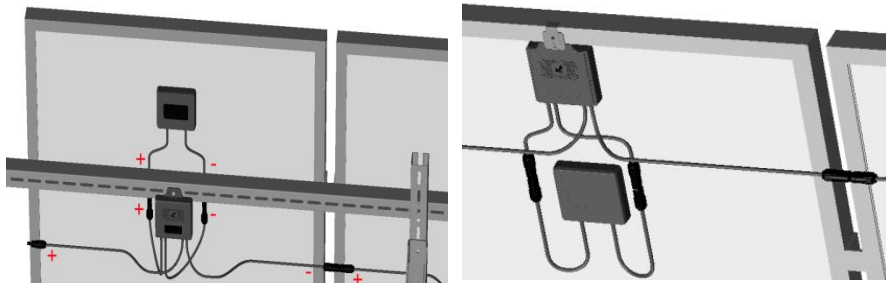Negative interface

Positive interface

# 3. Installation of optimizers or PV monitors

①. Record the product MACID numbers of the optimizers or PV monitor on the system form or power station map or construction drawing to establish a power station in cludy center for tracking the operation status of each panel even the whole PV station.
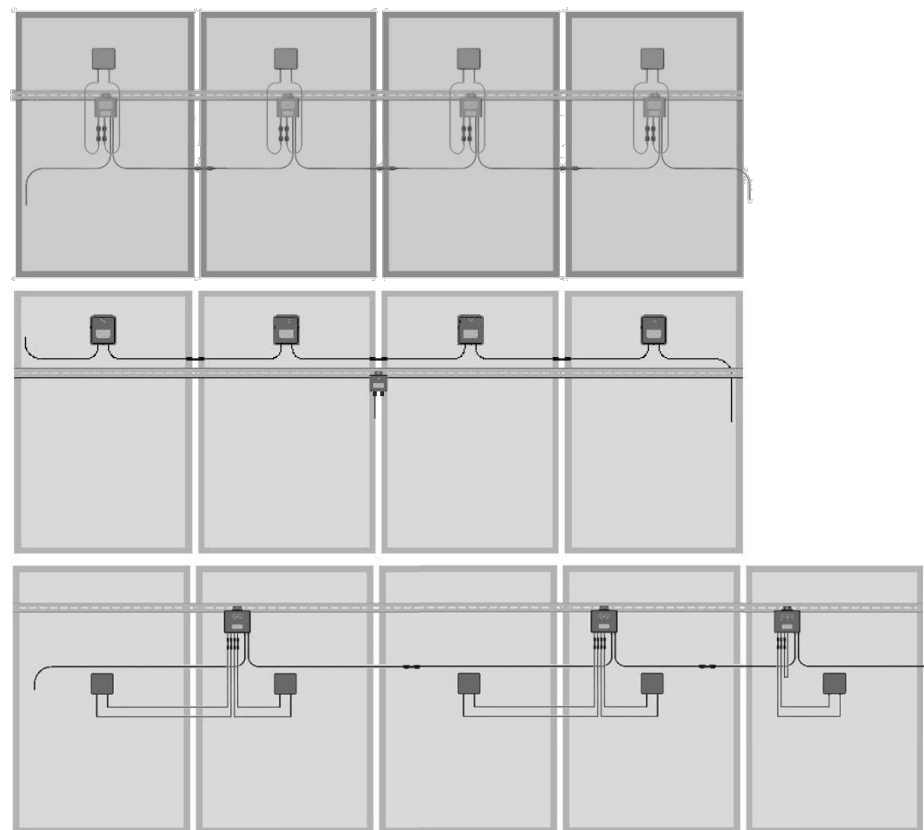
②. Use a screw or cable tie to position the optimizer or PV monitor one by one according to the registered MACID number position, and fix it on the bracket or panel frame. If the bracket has no mounting holes, it can be drilled and mounted with a hole size of 6mm.

**Remarks:**
When connecting the dual module optimizer Honeybee700/800 to one PV panel, one pair of the input cables of the optimizer are connected the output ends of the PV module, and the other pair is directly docked.

③. The shorter pair of cables of the power optimizer or the PV monitor are the input terminals, and the longer pair of cables are the output terminals for the power optimizer or the PV monitor to be connected in series and finally connected to the inver or the combiner box.

**Cabling sequence**: firstly connect all the input cables of the optimizers to the output cables of the PV junction box, then connect the output cables of all the optimizers in series (please refer to the previous page for notes)
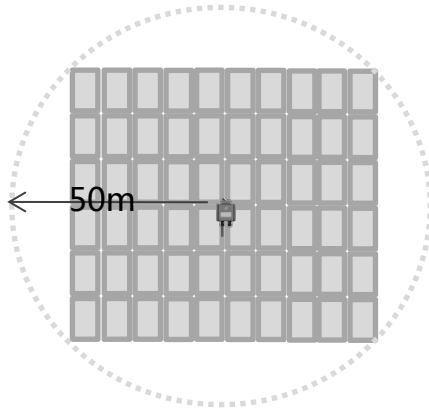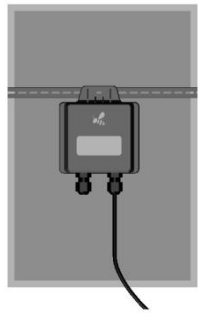
# 4. Installation of data acquisitoin unit (Swarm)

①. Swarm is mounted on the bracket at the center of the PV module array and can be fixed with cable tie or a screw of diameter 6mm.

②. If you need to connect more Swarms, please connect them with RS485 cable.

**Swarm cascade table:**

| Swarm | Cascade | Swarm |
|---|---|---|
| RS485 Terminal | | RS485 Terminal |
| 485B | ↔ | 485B |
| 485A | ↔ | 485A |
| GND | ↔ | GND |
| 12V | ↔ | 12V |

Note:
The data transmission between the Swarm and the power optimizers is wireless, and the effective communication distance is 50 meters.

50m

RS485

RS485

Connect next Swarm

Connect Beehive or the Swarm in the front
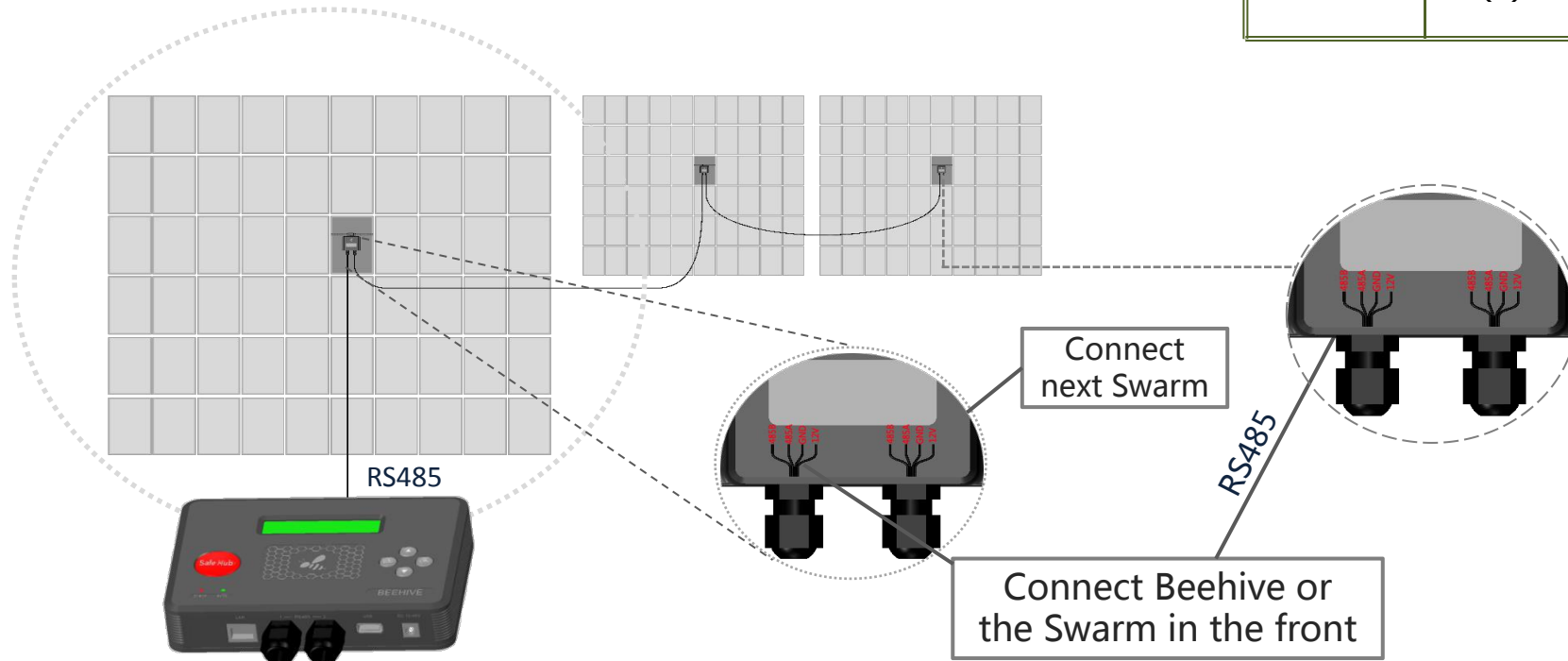
# 5. Connection to Swarm and Beehive

① Determine where the Beehive is installed and the length of RS485 cable from the Beehive to the Swarm

② Open the back covers of the Beehive to the Swarm

③ Connect the 485 cable to the RS485 port numbered 1 on the Beehive (refer to the right table for the wiring connection table) and tighten it with a flat head screwdriver.

④ Connect the other end of the 485 cable to any one RS485 interface of the Swarm, and the wiring order of the four color wires of the RS485 in the Swarm and the Beehive are consistent. Note: Any error in the connection order would cause damage to the Swarm or the Beehive.

⑤ Tighten the screws on the back cover of the Swarm and the Beehive with a cross screwdriver.

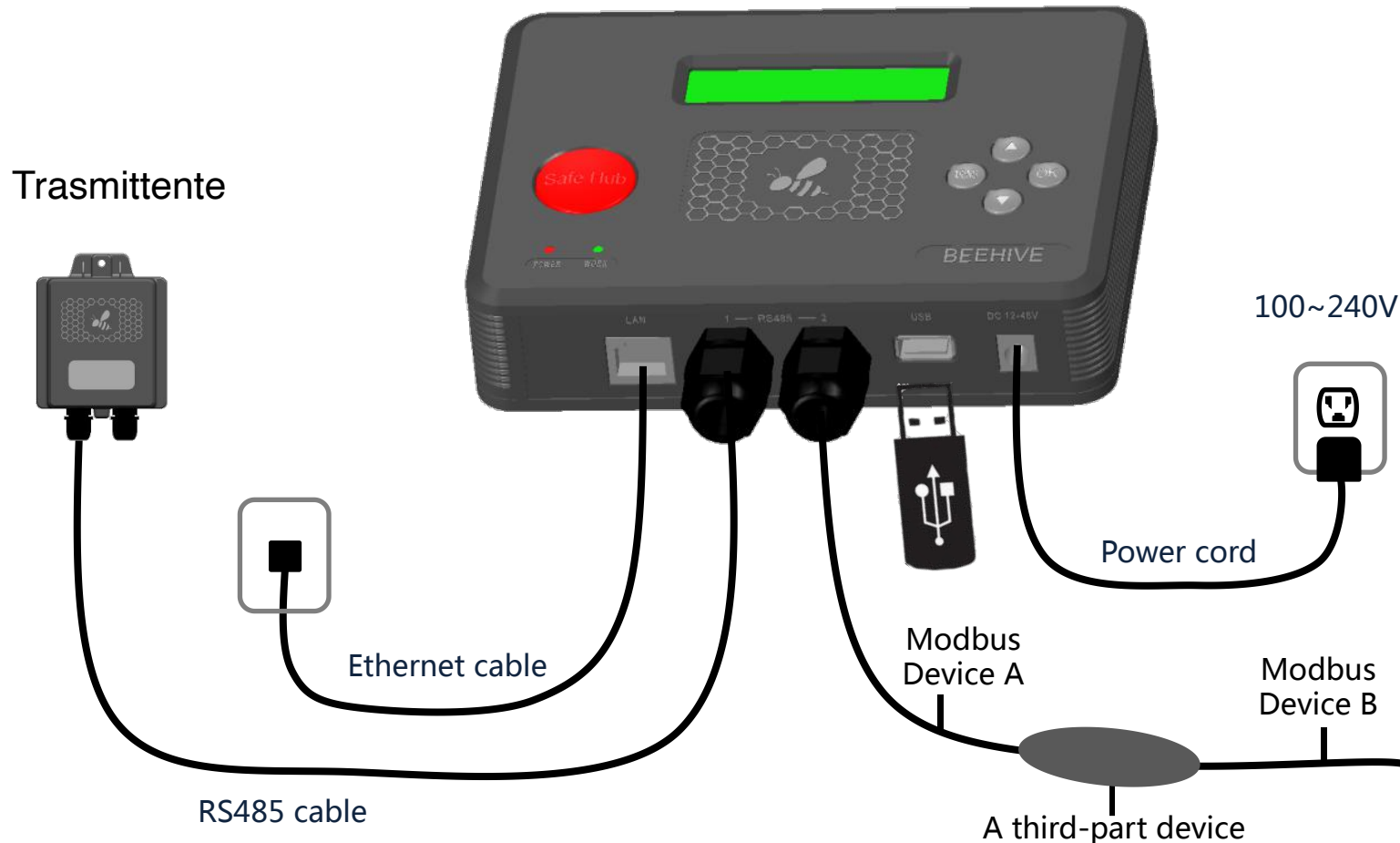## The wiring connection table of Swarm and Beehive

| Swarm | Cascade | Swarm | | Beehive | | | A third device |
|---|---|---|---|---|---|---|---|
| RS485 Terminal | | RS485 Terminal | | RS485 Terminal 1 | RS485 Terminal 2 | | RS485 Terminal |
| 485B | ←→ | 485B | ←→ | 485B | 485B | ←→ | 485B |
| 485A | ←→ | 485A | ←→ | 485A | 485A | ←→ | 485A |
| GND | ←→ | GND | ←→ | GND | GND | ←→ | GND |
| 12V | ←→ | 12V | ←→ | VCC | VCC-USER | | |

# 6. Installation of data aggregation device (Beehive)

Notes for Operation:

1. The protection grade of the Beehive is IP20 and needs to be installed indoors. If it needs to be installed outdoors, please add a waterproof box.

2. Connect power, ethernet cable or third-party device to the corresponding terminals.

3. Test whether the Swarm and the network cable work normally (select "FIND 485" in the menu of the Beehive, press "OK", then the connection number of the 485 devices will be displayed)

Trasmittente

100~240V

Power cord

Ethernet cable

Modbus Device A

Modbus Device B

RS485 cable

A third-part device

# 7. Setup in data cloud center (Honeypot)

Log in the GNE homepage: http://gne.gnetek.com,
click on the monitoring center in the upper right corner
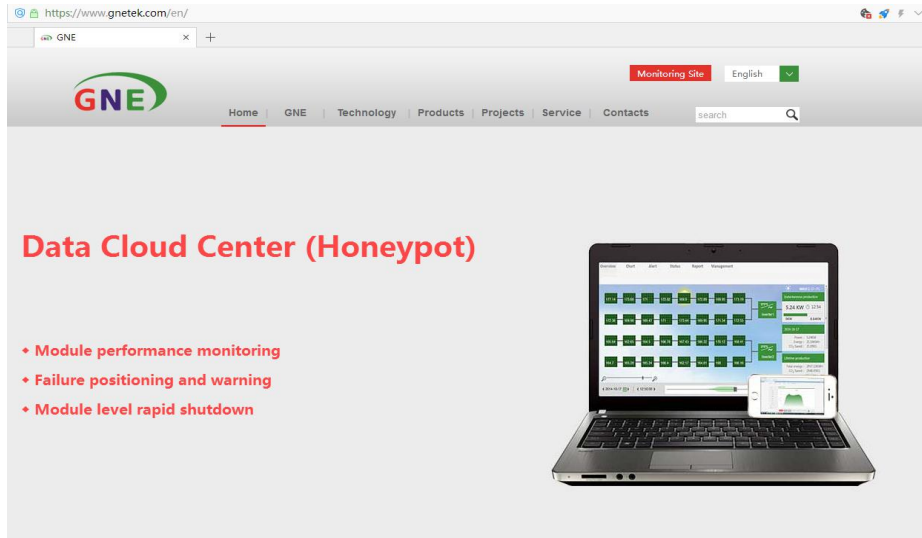
① New Account Register



Select language

New account Register

② Fill in the information of the new account

# 7. Setup in data cloud center (Honeypot)

③ Fill in the information of the inverter and the panel

Add more inverters or panels if needed

④ Fill in the 8-digit of MACID of the Beehive

⑤ Select optimizer model, fill in 8 digits of MACID of the optimizers



Station List | Search the station

Plant    User    Administration    ✖ Delete

1.Station information | 2. Inverter & Module | 3. Data Devices | 4. Station Setting | 5. Layouts

Inverter                                                        + Add More

Inverter

*Label:           [            ] Is required    nManufacturer:  [            ]
Model:            [            ]                *Peak power(kW):  [            ] Is required
*Number of strings:  [  1  ]                   *Modules per string:  [            ] Is required

Module                                                          + Add More

Module

Manufacturer:     [            ]                Model:          [            ]
*Module power(W):  [            ] Is required

Save

Station List | Search the station

Plant    User    Administration

1.Station information | 2. Inverter & Module | 3. Data Devices | 4. Station Setting | 5. Layouts

Beehive Setting

*Unit Id:  [ 91001643 ]          Device:  OFF

Save

admin   Sign Out

Plant    User    Administration    ✖ Delete

1.Station information | 2. Inverter & Module | 3. Data Devices | 4. Station Setting | 5. Layouts

Mode A   Mode B

Station Setting                                                + Add More

Inverter-Growatt

String-A

| Honeybee-700 ▼ | MAC ID: | 60020885 | -1 | Module: | NSP(305W) ▼ | Delete | Insert |
| | MAC ID: | 60020885 | -2 | Module: | NSP(305W) ▼ | | |
| Honeybee-700 ▼ | MAC ID: | 60021770 | -1 | Module: | NSP(305W) ▼ | Delete | Insert |
| | MAC ID: | 60021770 | -2 | Module: | NSP(305W) ▼ | | |
| Honeybee-700 ▼ | MAC ID: | 60020951 | -1 | Module: | NSP(305W) ▼ | Delete | Insert |
| | MAC ID: | 60020951 | -2 | Module: | NSP(305W) ▼ | | |
| Honeybee-700 ▼ | MAC ID: | 60021700 | -1 | Module: | NSP(305W) ▼ | Delete | Insert |

# 7. Setup in data cloud center (Honeypot)

⑥ Adjust the location of the optimizers per the physical layout of the PV station

# Appendix - Product Specification

| SPECIFICATION | | MODEL | | | | |
|---|---|---|---|---|---|---|
| | | Honeybee350 | Honeybee700 | Honeybee400 | Honeybee800 | Scouter450 |
| **INPUT** | Max. Input Power | 350 W | 350*2 W | 450 W | 450*2 W | 450W |
| | Max. Input Voltage | 60 Vdc | | 75 Vdc | | 75 Vdc |
| | Min.Module MPPT Voltage | 16 Vdc | | 12 Vdc | | - |
| | Max. Input Current | 10 Adc | | 13 Adc | | 13 Adc |
| | Short Circuit Current | 15 Adc | | | | |
| **OUTPUT** | Output Power Range | 0~350 W | 0~350*2 W | 0~450 W | 0~450*2 W | 0~450W |
| | Max Output Current | 11 Adc | | 13 Adc | | 13 Adc |
| | Output Voltage Range | 0 ~ Voc | | | | |
| | Max System Voltage | 1000 Vdc | | 1500 Vdc | | 1500 Vdc |
| **EFFICIENCY** | Max. Converter Efficiency | 99.50% | 99.60% | 99.60% | 99.60% | 99.90% |
| **INSTALLATION SPECIFICATION** | Size (L*W*T, mm) | 127.5*106*22 | 130.5*129*25 | 130.3*109.6*25 | 130*132*24.5 | 127.5x106x22 |
| | Weight | 530 g | 810 g | 588 g | 765 g | 400g |
| | Input Linker | MC4 | | MC4 | | MC4 |
| | Output Linker | MC4 | | MC4 | | MC4 |
| | Working Temperature | -40 ~ +85 ℃ | | | | |
| | Inbreaking Protection | IP65 | | IP67 | | IP67 |
| | Relative Humidity | 0~100% | | | | |
| **STANDARD COMPLIANCE** | EMC | 7IEC61000-6-2, IEC61000-6-37 | | | | |
| | Safety Regulations | IEC62109-1 (Class II safety) | | | | |
| | Overvoltage Category | III | | | | |
| | Certificate | CQC/TUV/CSA | | CE | | - |