

# USER MANUAL

For

## Data Aggregation Device (Beehive)



2020-07 V3.0



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# 1. Description

The GNE data aggregation device Beehive is used in conjunction with GNE data acquisition unit Swarms and power optimizers Honeybee400/800 to collect, aggregate and process PV module data and transmit it to the Internet.

The names and necessary accessories of the front and back parts are shown in the following table:

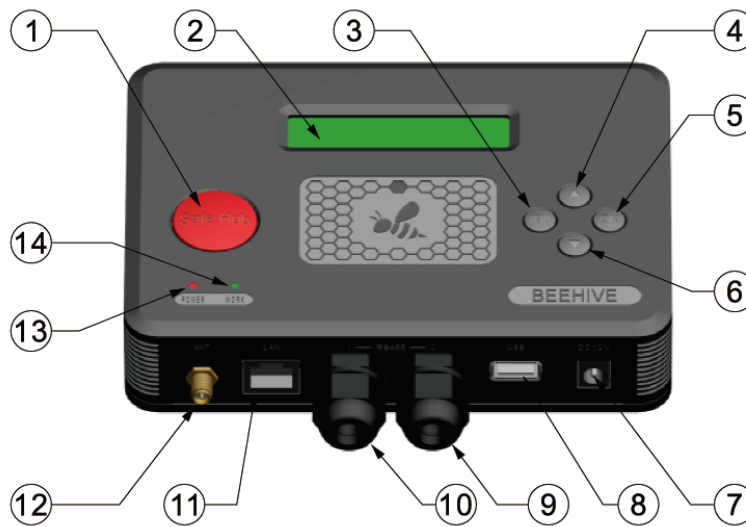


Figure 1-1. Beehive Front



Figure 1-2. Beehive Back

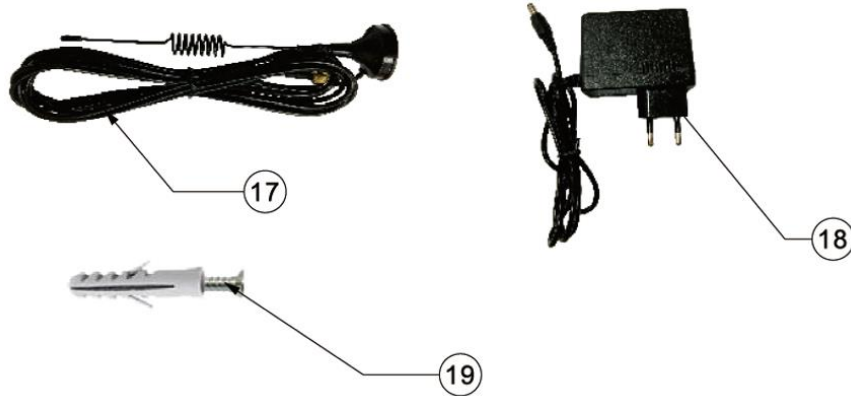


Figure 1-3. Beehive Accessories

Table1-1. Part Number and Name Table

Item	Part Name	Item	Part Name
1	Safehub	9	RS485 port 1
2	Display	10	RD485 port 2
3	MANU	11	LAN cable port
4	▲Up button	12	RF Antenna port
5	OK key	13	Power light
6	▼Down button	14	Status light
7	Power port	15	Screw hole
8	USB port		

## 2. Keys and Lights

### 2.1、Keys

This data aggregation device Beehive has a total of five operation buttons, namely: the menu button MENU, the confirmation button OK, the up button ▲, the down button ▼ and the red shutdown button Safe Hub. The functions of each button are as follows:

#### **MENU button**

- ①. With the display off, turn on the display and enter the Main Menu.
- ②. During the system viewing and setting process, return to the previous menu.
- ③. In the confirmation process of setting, cancel the confirmation operation.
- ④. An error occurred during the setting process, return to the previous item to reset.
- ⑤. When the display shows the Main Menu, close the display.

#### **Confirmation button OK:**

- ①. Enter the lower menu.
- ②. Confirmation of various settings.
- ③. Save after setting.

#### **Up/Down button ▲/▼ :**

- ①. Select different submenus up or down in various levels of menus or view various information.
- ②. In the Wi-Fi account setting process, select the Wi-Fi account name.
- ③. During the password setting process, select different characters.

### Shutdown button Safe Hub :

This key must be used in combination with the up and down keys to shut down or turn on the optimizer output, similar to the computer's Ctrl key.

- ①. SafeHub+Up button ▲: turn on optimizer output.
- ②. SafeHub+down key ▼: shut down the optimizer output.

## 2.2、 Lights

The two lights are: power indicator (red) and work indicator (green).

- ①. The red light turns on when power is on. If it is not on, there may be a problem with the power supply or a short circuit.
- ②. The green light flashes at the interval of one second after the initialization is completed, which is the normal working state. If it is on or off for a long time, it means that the device is not working properly.

## 2.3、 Display

The LCD screen will be bright when the LCD screen is powered on, and there will be an initial text display. It will automatically turn off after a few seconds.

When operating the keys, the display will show the corresponding function options.

## 3. Installation

### 3.1 Before Installation

To ensure that Beehive works properly, Beehive needs to be installed in a place where wireless communication and network connection are normal. If installed outdoors, a protective box needs to be added.

There are two ways to install Beehive:

- ① . Horizontal installation (if placed on the desktop).
- ②. Vertical installation (for example, on the wall, refer to "Wall Installation Instructions").

There are two main ways of network connection:

- ①. Network cable connection (recommended method).
- ②. WIFI connection (recommended where the mobile phone WIFI signal 2 or more).

### 3.2. Installation Steps

- ① Insert the network cable into Beehive's network cable interface or WIFI antenna interface and install WIFI rod antenna.
- ② The communication antenna interface is equipped with a communication sucker antenna.
- ③ The power interface is connected to the power adapter.



- ④ Beehive and data collector are correctly connected with RS485 cable (please refer to "Installation User Manual").

### 3.3、 Wall Mounting

- ①. Drill holes according to P3.1 diagram and insert into the expansion tube, then screw in the screw, the exposed height of the screw is 5.5-6.5mm.

Figure 3-1 Punching Diagram

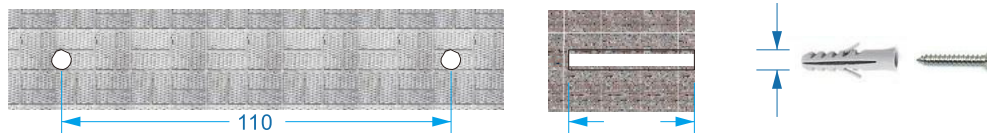


Figure 3-2 Expansion screw installation diagram



- ②. Align the screws with the mounting holes on the back of Beehive, and then move Beehive down so that the screws completely hang on the product and complete the wall installation.

### 3.4、 Start the Beehive

After the Beehive is powered on, the system will be initialized, during which "GNE Beehive initialized... " will be displayed on the screen as shown in figure

3-3.



Figure 3-3 Beehive initialized

During the initialization, it will not work for any button operation. After the initialization is complete, the screen backlight will automatically turn off, and the screen will not display anything, the power indicator (red) is always on, and the work indicator (green) is blinking status.

## 4. Menu Structure

There are 3 options in the Beehive main menu, namely Work Status, Settings, Senior. Work Status and Settings are commonly used options, while Senior options are setting options.

When the display interface is in Senior, you can quickly press "OK▲▲▼▼ OK" to activate the entry, and press the OK button alone to invalidate.

The detailed contents of the menus at various levels are shown in Table 2:

Table 2. Beehive Operation Menu

Main Menu	Second-level menu	Third-level menu	Function
Work Status	IP Address		View IP address
	Swarm	Swarm MAC	View Swam MAC ID
	Honeybee	Honeybee in Addr N	View Honeybee Number in Address 1 or other
	MAC ID		View Beehive MAC ID
	Software Version		View software version
	Time Zone		View time zone
	Date & Time		View date and time
Settings	Network Type	Up/Down to choose	Set network connection method
	WiFi Config	SSID OK->Scan	Search WIFI and select
		Password Set*①	Set password length and fill in password
	Search Swarm		Search the number of the Swarm connected via RS485 cable
Senior②	IP Config	DHCP (Auto IP?)	IP Config
	Start Optimizer	Sure to Open?	Open optimizers' output



	Clear Data	Sure to Clear?	Clear data stored in the Netcard of Beehive
	Export Data	Export data...please wait	Export data stored in the Netcard of Beehive
	Netcard ID		View Netcard ID in Beehive
	Test Hardware	Test KEYS	Test if every key works well
	Time Zone	UP or DN change	Change time zone
	Time & Date	YYYYMMDDHHMM.SS	Change date and time
	Reboot	Sure to Restart?	Restart Beehive

Remark: ①. "\*" means there are lower menus, please OK to enter.

②. Press "OK▲▲▼▼OK" to activate the entry when the display interface is in Senior.

## 5. Operation

### 5.1 Wake up display

The screen backlight turns off after normal startup, and nothing is displayed. If you need to operate the device now, please press the MENU key to wake up the operation interface. The operation interface after waking up is shown in

Figure 5-1.

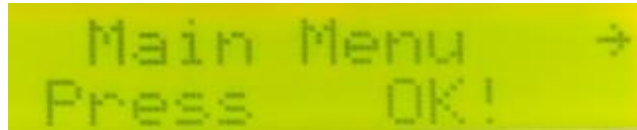


Figure 5-1: display after wake-up

如果需要进行下一步操作，可按下“OK”进入主菜单，如果不需要则按下“MENU”键后屏幕将会关掉显示和背光灯。按下“OK”键进入主菜单，界面如 Figure 5-2。

If you need to proceed to the next step, please press "OK" to enter the main menu. Or press the "MENU" key, the screen will turn off the display and backlight. Press the "OK" button to enter the main menu, the interface is shown in Figure 5-2.



Figure 5-2: Main Menu

Select the corresponding menu according to the menu frame and enter, use the "▲/▼" keys to switch the menu item, and the "OK" key to enter.

## 5.2 Menu “Work Status”

The sub-items of Work Status show the current status for view only.

### 5.2.1 IP Address

This menu is to view the current IP address. operation steps: Main Menu->Work Status->IP Address; The display is shown in Figure 5-3 below:

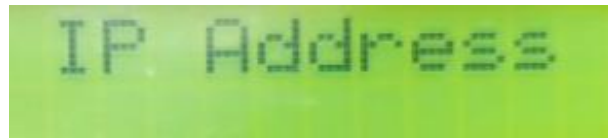


Figure 5-3: IP Address

### 5.2.2 View Swarm

This menu is to view the number of Swarm connected to the Beehive. Operation steps: Main Menu->Work Status->Swarm; the display is shown as

Figure 5-4:

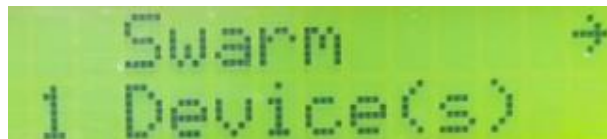


Figure 5-4: No. of Swarm connected

### 5.2.3 View Honeybee

This menu is to view the number of optimizers under Swarms in different address, Operation steps: Main Menu->Work Status->Honeybee; the display is shown as Figure 5-5:

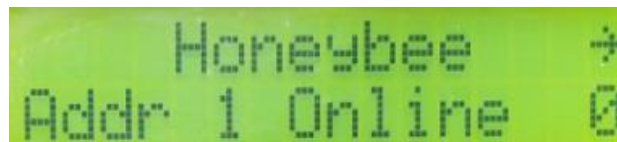


Figure 5-5: No. of optimizers in Swarm 1

View whether the number of optimizers matches the actual installation number. If the number of optimizers is lower than the actual installation number, please contact GNE technical personnel for technical support.

### 5.2.4 Beehive MAC ID

The menu is to view the MAC ID of Beehive , operation steps: Main Menu->Work Status->MAC ID; show in Figure 5-6:



Figure 5-6: Beehive MAC ID

### 5.2.5 Software Version

The menu is to view the software version of the Beehive, operation steps: Main Menu->Work Status->Software Version; shown as Figure 5-7:

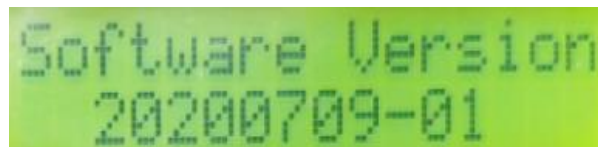


Figure 5-7: software version

### 5.2.6 View Time Zone

This menu is to view the time zone of the Beehive' s location. Usually the time zone is synchronized with the server after the Beehive is connected to the network. Operation steps: Main Menu->Work Status->Time Zone; shown as Figure 5-8:



Figure 5-8: Time zone

If the time zone is inconsistent with the current location, please enter the Senior menu to set it.

### 5.2.7 View Date & Time

This menu is to view the date and time of the Beehive' s location. Usually the date and time are synchronized with the server after the Beehive is connected to the network. Operation steps: Main Menu->Work Status->Date & Time; shown as Figure 5-9:



```
Date: 1970/01/01
Time: 00:03:01
```

Figure 5-9: Date &amp; Time

If the date and the time is inconsistent with the current location, please enter the Senior menu to set it.

## 5.3. Menu “Settings”

There are three options under the menu Settings: Network Type (optional with network cable or WiFi), WiFi Config (if you choose WIFI to access Internet), Search Swarm connected to the Beehive.

### 5.3.1 Network Type

Set up net cable to access Internet:



- a、 Operation steps: Main Menu->Settings->NetWork Type; shown in Figure 5-10:

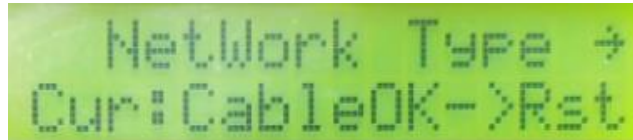


Figure 5-10: select cable to access Internet

- b、 Press "OK" to enter Network type, use "▲/▼" to select "Cable", then press OK to save and restart; shown as Figure 5-11:

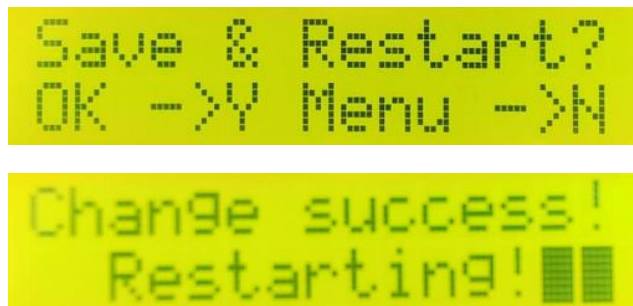


Figure 5-11: Save cable communication and restart

### 5.3.2 WiFi Setting

Set up WIFI to access Internet:

- a、 Operation steps: Main Menu->Settings->NetWork Type;
- b、 Press "OK" to select WiFi by pressing the keys "▲/▼", then save and restart;



Figure 5-12: select WiFi to access Internet

- c、 After restart, enter Main Menu->Settings->WiFi Config->SSID OK->Scan, to

search the WiFi account and wait for the result;



```
SSID: OK->Scan
GNE4
```

Figure 5-13: scan WiFi account

- d、 Select the right WiFi account, confirm and save;
- e、 Enter the Password Set, press OK to reset, then set up the length of WiFi password. If the WiFi account has no password, please fill in the length with 00

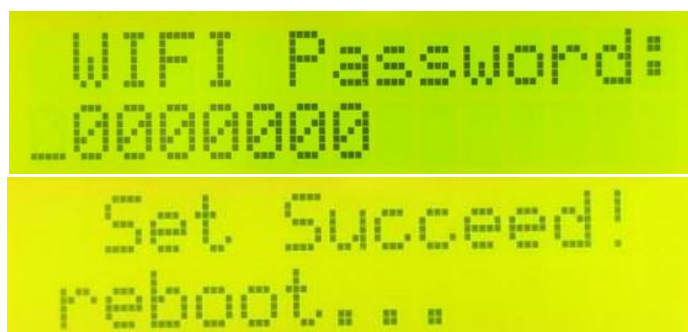


```
Password Set ->
OK -> Reset

Password length:
08
```

Figure 5-14: Set up the length if password

- f、 Key in the password with the right digit, letter, or character by pressing the keys "▲/▼" , then save and reboot.



```
WIFI Password:
_00000000

Set Succeed!
reboot...
```

Figure 5-15: key in WiFi password and reboot

- g、 Wait for 30seconds after Beehive reboot, enter the Main Menu->Work Status->IP Address, and view the IP address, if IP address is displayed, it means

the WiFi is set up well.

h、 Enter the Main Menu->Work Status->Date & Time, to view the current date and time, if the data shows rightly, it means the change is successful, or please reset up the date and time in the menu of Senior.

### 5.3.3 Search Swarm

This menu is used to find and record all the Swarms connected to the RS485 bus, operation steps: Main Menu->Settings->Search Swarm, press OK to search and waiting for the result. The display is shown in Figure 5-16.



Figure 5-16: Find RS485

When the search is complete, the quantity is displayed. If the displayed number matches the actual connection number, it indicates that the RS485 connection is correct. If it does not match it, please check the connection and press the menu item again.

## 5.4、 Menu "Senior"

The Senior menu is a special operation option. No operation when it is not necessary. If needed, press "OK▲▲▼▼OK" quickly to enter under the display of Senior.

### 5.4.1 Reset IP

- a、 Enter operations Main Menu->Senior->IP Config, OK->Reset IP. The display shows below option in figure 5-17.



```
DHCP (Auto IP?)  
OK -> Y Menu -> N
```

Figure 5-17: Reset IP

- b、 Press OK to select Auto IP, it returns to the display of IP Config.



```
IP Config ->  
OK -> Reset IP
```

Figure 5-18: select Auto IP

- c、 Press menu to reset IP and enter the next display, then fill in IP Address, Subnet Mask, Gateway and DNS Server one by one, after reset, please OK to save.



```
Set IP Succeed!  
Press OK
```

Figure 5-19: Reset IP

### 5.4.2 Start Optimizer

The Senior menu is to open the optimizers under the Beehive.

- a、 Enter Main Menu->Senior->Start Optimizer, OK->ON.



```
Start Optimizer->  
OK -> ON
```

Figure 5-20: 开启优化器

b、 The display shows Sure to open, after press OK



Figure 5-21: Sure to open

c、 Press OK to key in password of the Beehive ,the defaulted password is 111111 , then Beehive will open the optimizers.



Figure 5-22: Open power

### 5.4.3 Clear Data

The Senior menu is to clear the data stored in the netcard of the Beehive, with operations Main Menu->Senior->Clear Data, press OK to clear and restart.

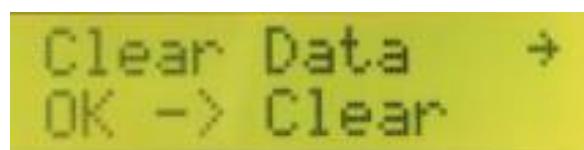


Figure 5-23: Clear data

### 5.4.4 Export Data

The Senior menu is to export the data stored in the netcard of the Beehive to USB disk, with operations Main Menu->Senior->Export Data, press OK to export data, and press any key to return after finished.



Figure 5-24: Export data

#### 5.4.5 View ID

The Senior menu is to view the IP of the netcard in the Beehive, after operations Main Menu->Senior->Netcard ID, it shows the ID number as Figure 5-25.



Figure 5-25: View Netcard ID

#### 5.4.6 Test Hardware

The Senior menu is to test if the keys work well, after operations Main Menu->Senior->Test Hardware, press OK to test each key of the Beehive.



Figure 5-26: Test Keys

#### 5.4.7 Set up Time Zone

This menu is to set up the time zone when the network is abnormal and the server time cannot be synchronized. With operations Main Menu->Senior->Time



Zone, press OK to select the related time zone.



Figure 5-27: Set Time Zone

After change, please enter Main Menu->Work Status->Time Zone to view the new time zone.

#### 5.4.8 Set Time & Date

This menu is to set up the date and time when the network is abnormal and the server time cannot be synchronized. With operations Main Menu->Senior->Time Zone, the display shows in Figure 5-28.



Figure 5-28: Set up Time and Date

The display shows two lines, after entering the setting interface, where the upper line YYYYMMDDHHMM:SS is the English initials of year, month, day, hour, minute, and second (ie year, month, day, hour, minute, second). The number corresponding to the second line can be set. Shown as Figure 5-29:



Figure 5-29: Time and Date

For example, the current time is 201612261008.50, if you want to modify the corresponding position, use the left and right keys (that is, MENU key and OK key) to select the corresponding position (the currently bit will flash), and use the up and down keys to adjust to the desired digital. After the modification is completed, keep pressing the "OK" button to the last digit (that is, no matter which digit is modified to be saved, you must press the "OK" button to the last digit), continue to press the "OK" button, save appears Interface, such as Figure 5-30.



```
Save Chnge&Quit?  
OK -> Y Menu->N
```

Figure 5-30: change date and time

If you want to save the changes, press the "OK" button, if you do not save, press "MENU" will return to the date setting interface, if you want to exit, keep pressing the "MENU" button to the leftmost digit (ie the first Number), press the "MENU" button again, and a system prompt "Quit without save?" will be entered. If you confirm to exit, press "OK", otherwise press the "MENU" button to stay Time setting interface. After saving successfully, a prompt interface (Set Time Succeed) for successful modification will appear. After prompting 2S, it will automatically return to the previous menu. If the modification is unsuccessful, the setting time will be incorrect, and the modification will fail.



After modifying the time and date, please enter Main Menu->Work Status->Date & Time to check the changed date and time.

### 5.4.9 Reboot

If need to reboot Beehive, enter Main Menu->Senior->Reboot, after press OK, it shows Sure to restart or not, press OK again to reboot , shown as below figures:



Figure 5-31: Reboot