Data Transfer Unit (DTU)
User Manual

Corporate Headquarters Contact Information

Hoymiles Converter Technology Co.,Ltd.
No.18 Kangjing Road,
Hangzhou 310015,
China

www.hoymiles.com
info@hzconverter.com

DTU User Manual

Table of Contents

1. Important Safety Information

Read this First

This manual contains important instructions to follow during installation and maintenance of the Hoymiles Data Transfer Unit (DTU).

Safety Instructions

·Be aware that only qualified person shall install or replace the DTU.

· Do not attempt to repair the DTU as it contains the parts that are not serviceable to user. If the DTU breaks down, please contact your distributor for maintenance. Opening the DTU without permission will invalidate the warranty.

· Please read all technical instructions and cautions in this manual and on the DTU before installing and using DTU.

Audience

This manual is only for professional installation and maintenance personnel to use.

2. The Hoymiles Microinverter System

The DTU is the key component in Hoymiles microinverter system. It works as the gateway, which is the transfer station of monitoring information in the system. The DTU communicates with microinverters wirelessly via 2.4G RF, collecting the operating data of the system. Meanwhile, it sends control commands to microinverters for adjusting the operating state. In addition, the DTU connects with the Internet to realize the mutual communication of Hoymiles cloud monitoring platform. The operating data from microinverters and the control commands from the cloud-monitoring server will be sent through the DTU to the other end. The remote operation and maintenance are achieved.

The following diagram shows the DTU in the system.
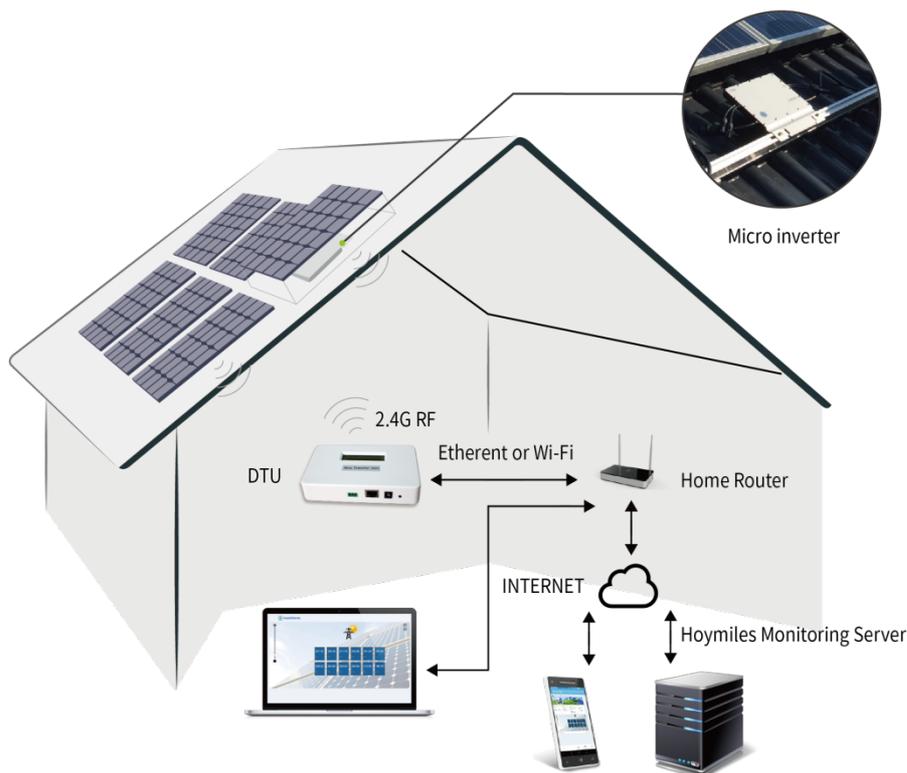
Other Elements in the Hoymiles Microinverter System

The Microinverter: Its main function is energy transfer. It converts the DC output of solar modules into grid-compliant AC power. It also can send the output information of PV panels and the operation data of the microinverters to the DTU, which is the hardware basis of the panel-level monitoring. The efficiency of the Hoymiles microinverters is up to 96.7%, and the MPPT efficiency of the Hoymiles microinverters is up to 99.9%.

The Remote Monitoring Server: It collects the operation data and status of the microinverters in the system, and provides the panel-level monitoring for the users and maintenance staffs.

3. DTU Basic Operation

3.1 LCD Screen Display at Start Up

When the DTU starts up, it goes through the initial boot sequence. During this initial boot sequence, the DTU LCD screen displays start-up progress as shown:

```
BOOT SYSsetup
```

```
10:26:30

System setup…
```

```
10:27:55

ETH_BSP_Config
```

```
10:27:55

IP: 0.0.0.0
```

3.2 Normal Operation

When the DTU completes start and obtains the IP address, normal operation begins. During the normal operation, the LCD screen displays the basic operation status of the system, and the two screens shown as below alternate all the time.

```
YC    10:27:55    XXXX

IP: 192.168.1.122
```

```
┌─────────────────────────────┐
│  0.16Kw        0.07kWh       │
│                             │
│  ALL:05        LINK:01       │
└─────────────────────────────┘
```

The data indicates:

(1) Web connection information: "YC". This means the DTU is connected to the Internet.

   If it is "NC", the DTU is not connected to the Internet.

(2) Time, e.g. 10:27:55.

(3) Local IP address, e.g. 192.168.1. XXX.

(4) Data of the real-time output power in watts, e.g. 0.16kW.

(5) Data of the today's output energy of the system in kWh, e.g. 0.07kWh.

(6) The total number of microinverters in this system, e.g. ALL: 05.

(7) The number of microinverters normally communicating with DTU, e.g. LINK: 01.

3.3 DTU local Interface

The DTU has the embedded web server. You can use a browser locally to view the operation data and status of the system, manage the devices and clear fault. You need to get your computer connected to the same network with DTU to open the DTU local interface in your browser by entering the IP address shown on the LCD screen.

3.3.1 DTU Home Interface

The home interface shown below will turn up first when you enter the IP address into the browser. In the home interface, the left side displays the basic information of the system, including Total Output Power, Total Energy, Today Energy and CO_2 Saved; the middle form displays the operation data of each microinverter, including PV Voltage, Grid Voltage, Grid Frequency, Grid Power, Today Energy and Internal Temperature. The upward side displays the total number of microinverters, the number of connected microinverters and the number of unconnected microinverters.

DTU User Manual

3.3.2 Ground Fault Reset

Click "Configuration→GFDI Fault" to open the ground fault interface. You can check whether the microinverters have the ground fault or not. If the faults exist, click "Clear Fault" after troubleshooting. If the problem persists, please contact our Technical Support.

3.3.3 Time Setting

Click "Configuration→Date/Time" to open the time setting interface. You can enter your local date/time in the corresponding box and click "Send" to save.
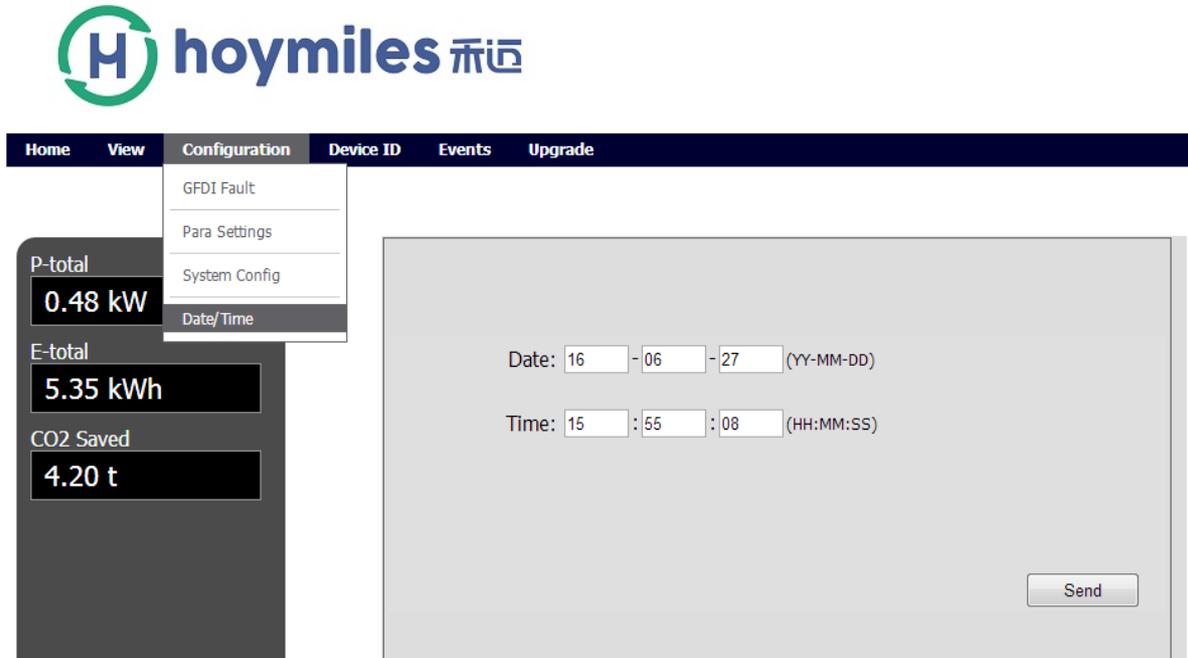
3.3.4 Device ID Management

During the first-time installation or maintenance of DTU, you need to add or delete the microinverters' IDs to realize the monitoring of whole system.

(1) Manual Mode

Click "Device ID→Manual Config" to open the manual ID management interface.

You need add the IDs into the blank box shown as below manually, and then click "Add ID".

DTU User Manual

After inputting all of microinverters' IDs, you need to click "Reg ID" to finish registration. Then you can see the detailed operating information of system in the home interface.

If one microinverter happens to break down and need to be replaced, you need to find that

DTU User Manual

microinverter's ID and click "Delete".

(2) Auto Mode

Click "Device ID→Auto Scan" to open the auto ID managemnet interface.

Click "Scan ID" to start automatic search for microinverters. When the DTU detects all the microinverters' IDs, you need to click "Reg ID" to finish registration. If the DTU cannot detect all the microinverters in the system over 30 minutes, please use manual mode instead.

4. DTU Installation

4.1 System Capacity

The DTU is capable of monitoring up to 99 MI-250 microinverters or 49 MI-500 microinvrerters.

4.2 Required Basic Conditions

1. Before installing the DTU, ensure the site meets the following requirements:

   (1) Standard 220VAC power outlet

   (2) Stable broadband Internet connection

   (3) Router with Ethernet port or LAN

2. The DTU installation's environmental requirements:

   (1) Away from dust, liquid, acidic or corrosive gas

   (2) Temperature between -20ºC and 45ºC

3. If you plan to install the DTU on the wall, two #8(4.166mm diameter) screws and a screwdriver shall be prepared in advance.

DTU User Manual

hoymiles

4.3 Installation Sequence

```
1. Install the PV modules
   and microinverters
```
↓
```
2. Locate the DTU
```
↓
```
3. Connect to the Internet
```
↓
```
4. Check the Internet
   connection
```
↓
```
5. Device ID management
```
→
```
6. Check the connection
   between microinverters and
   DTU
```
↓
```
7. Wall-mount the DTU
   (optional)
```
↓
```
8. Complete the installation
   map
```
↓
```
9. Create a monitoring
   account
```
↓
```
10. View system
    performance
```
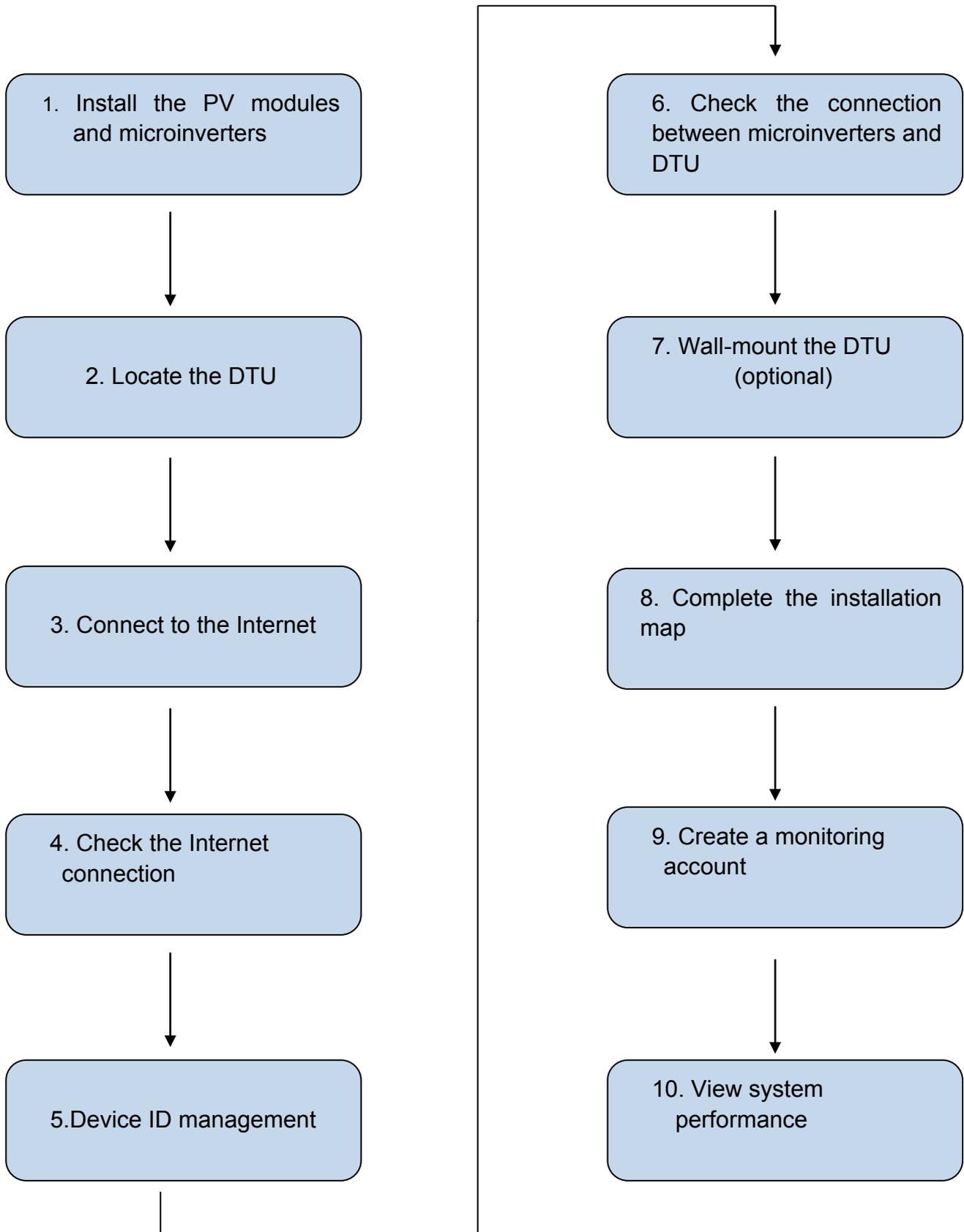
4.4 Install the DTU

To install the DTU, perform the following steps.

1. **Install the PV Modules and Microinverters**

   Install the PV modules and the micorinverters as directed by the installastion manuals.

2. **Locate the DTU**

   The communication distance of Hoymiles DTU is 200m in the open space. But in the real installation, the environment may be more complex. It may have some obstacles like walls or roofs, which will reduce the communication distance.

   The range of signal reduction for possible obstacles at the site has been shown below:

Material	Relative signal range reductions
Wood/Glass	0-10%
Stone/Pressed cardboard	10%-40%
Reinforced concrete(reduction increases with amount of reinforcement)	10%-90%
Metal	Up to 100%

   Therefore, the DTU shall be placed as close to the microinverters as possible at the site to ensure good communication between DTU and microinverters.
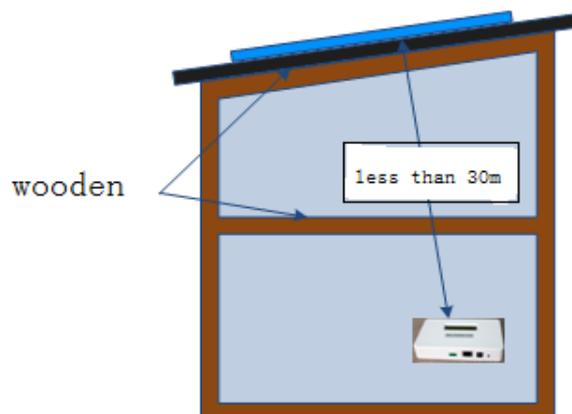
   The typical installation positions of the DTU are shown as below. In the real installation, you can refer to these scenarios.

Ground Mounting Commercial Solar System

Roof Mounting Residential Solar System

1. The wooden building:

2. The reinforced concrete building:
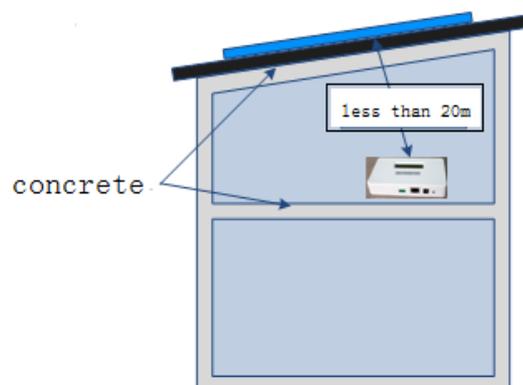
3. Connect to the Internet

Connect to a broadband router using one of these two methods, described in the following sections:

・Ethernet Cable

・Power Line Communication Bridges

(1) Ethernet Cable

a. Plug the Ethernet cable into the RJ-45 port on the DTU.

b. Plug the other end of the cable into a spare port on the broadband router.
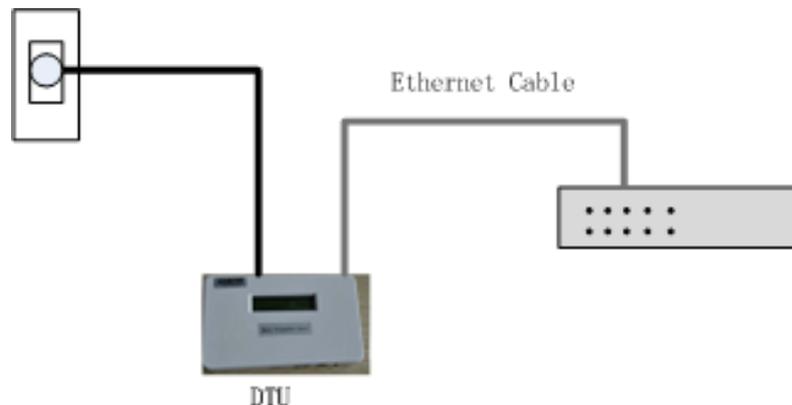
(2) Power Line Communication Bridges

a. Plug one of the bridges into the same AC outlet that the DTU is using.

b. Connect one end of the Ethernet cable to the Ethernet port on the DTU, connect the other end of that Ethernet cable to the bridge.

c. Plug the other bridge to an AC outlet near the broadband router.

d. Connect one end of a second Ethernet cable to the second bridge, connect the other end of the Ethernet cable into the broadband router.

e. Please refer to the user manual of power line communication bridge for the matching and setting

f. If the broadband router is operational, connect the DTU to the power supply and wait for connection.

Broadband Router

Power line
communication bridges

DTU
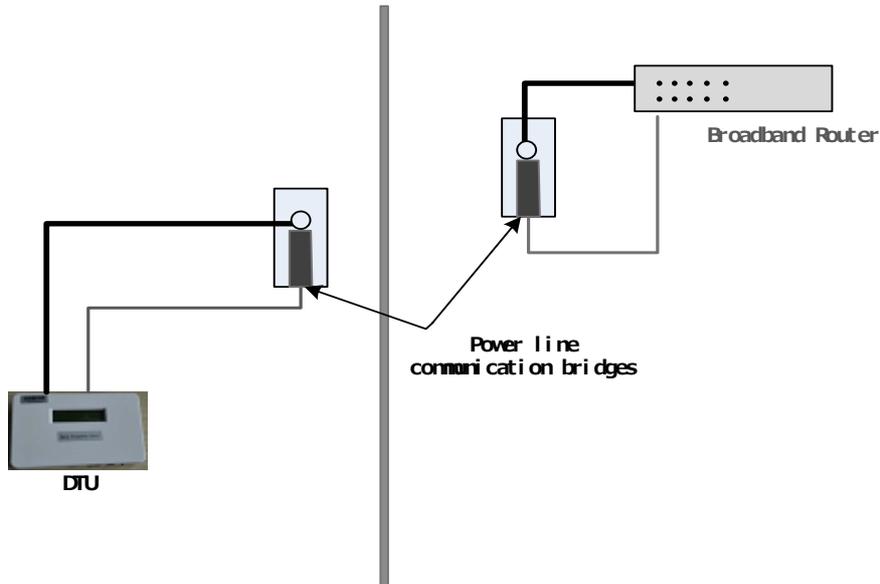
4. Check the Internet Connection

a. Look for the "YC" indication."YC" indicates DTU communicates with the Internet.

YC 10:27:55 XXXX

IP: 192.168.1.122
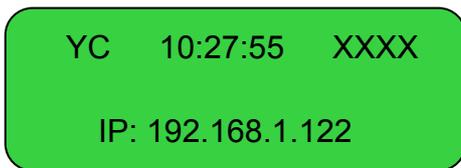
b. If it still shows "NC" for several minutes after connecting to the broadband router, see "Troubleshooting" on page 23.

5. Devices ID Management

Add all microinverters' IDs by auto mode or manual mode, refer to "Devices ID Management" on page 10.

6. Check the Connection between Microinverters and DTU

a. The following two methods will be used to check the connection between microinverters and DTU:

(1) Open the local main interface. If the number of "total device" is the same with the number of "on-line", it indicates the communication of the DTU and microinverters is normal.

Total Device: 12 On-line: 12 Off-grid: 00-YC View as: English |

(2) Look for the LCD screen display. If the number of Linked microinverters is the same with the number of total microinverters, it indicates the communication of the DTU and microinverters is normal.

```
0.16Kw       0.07kWh

ALL:05        LINK:05
```

b. If the number of Linked microinverters is less than the number of all microinverters, see "Troubleshooting" on page 23.

7. **Wall Mounting(optional)**

After the DTU has detected all microinverters of this system, you can mount the DTU on a wall near this location.

● Step 1. Mount the DTU in a cool and dry location and avoid heat-generating devices (oven, warmer).

● Step 2. Use two drywall screws or wall anchors to affix the DTU to the wall mounted at the dimensions about 100mm. The maximum screw head diameter is 0.35", a #8 screw is recommended.

● Step 3. Slide the DTU onto the mounting screws, aligning the DTU screw holes with the screws installed in step 2.
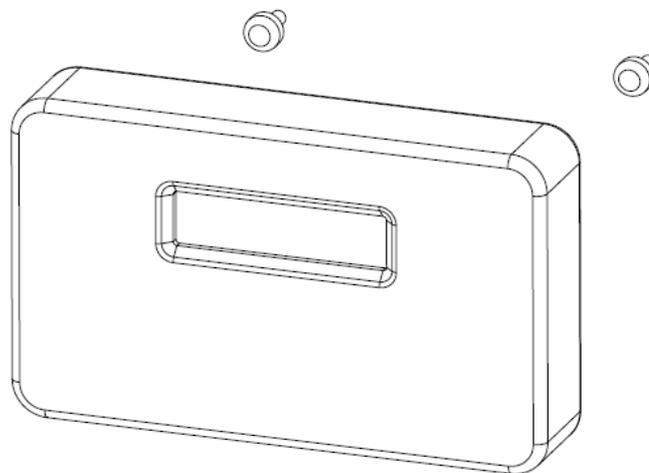
8. Complete the Installation Map

When the system is energized and the DTU detects the microinverters, you need complete the installation map.

a. Peel the serial number label from the DTU.
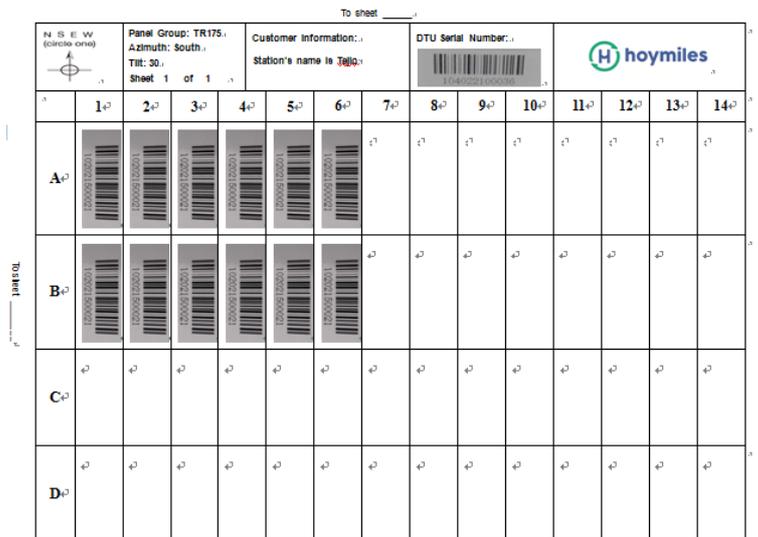
b. Place the label on the installation map.

9. Create a Monitoring Account

You need send the basic system information noted as below to Hoymiles (monitor@hzconverter.com), and our staffs will create the monitoring account for you.

Station's Name	Required
Station's Geographic Position	Required (e.g. 106.11°, -6.12° No.18 Kangjing Road, Hangzhou)
Station's Timezone	Required (e.g. Beijing or eastern eight zones)
Username and password	Required (e.g. Demo, Demo)
System Capacity	Required (e.g. 3kW)
Station's Description	Required (e.g. 12 pcs Jinko 250W modules + 12 Hoymiles MI-250 microinverters)
Station's Picture	Optional (should be given as attachment)
Installation Map	Required (should be given as attachment)

Note: The last two should be given as attachment.

DTU User Manual

10. View System Performance

Once the monitoring account is created, you can enter your username and password to log in to the monitoring web (monitor.hoymiles.com) to view site data.
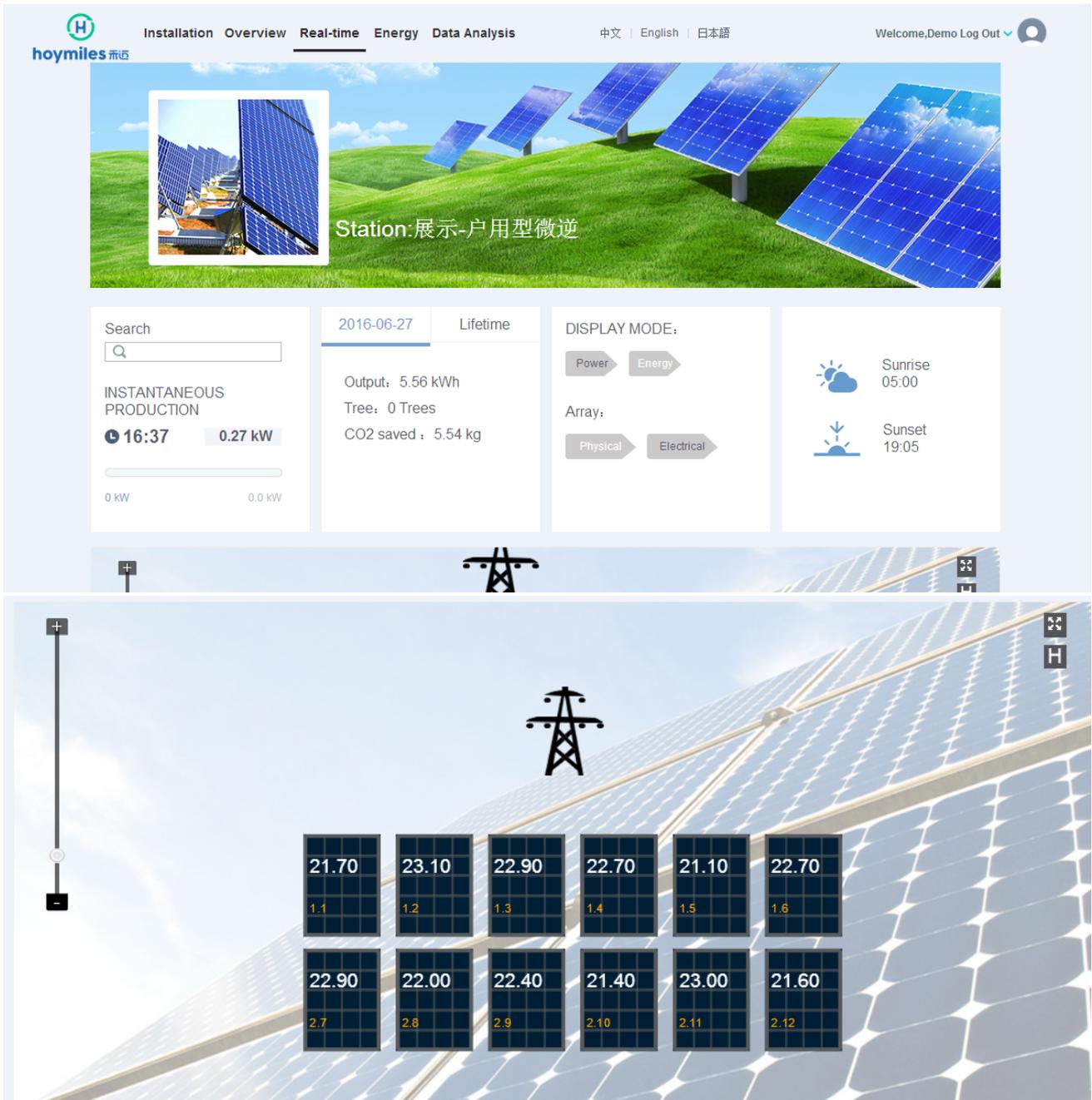
5. Troubleshooting

5.1 LCD screen displays "NC"

This means that the DTU has no connection to the remote monitoring server.

   (1) Check network connectivity to the router.

   (2) Check whether the router can connect to the Internet or not.

5.2 The number of linked microinverters is less than total number of microinverters

"LINK: XX" is an indication of the number of connected microinverters. If this number is less than total number of microinverters in the system, it indicates that some microinverters can't communicate with the DTU. To troubleshoot this issue:

   (1) Relocate the DTU to ensure that the DTU can detect all the microinverters in the system.

   (2) If this problem occurs when light intensity is low, try again during daylight hours.

hoymiles

6. Technical Data

Model	DTU
Communication to Microinverter	
Type	2.4G RF
Sample rate	5 minutes
Maximum distance (free space)	200m
Maximum number of inverters connected	99 MI-250 or 49 MI-500
Communication to Router/PC	
RJ45 Ethernet	10M/100M
Power Supply	
Type	External plug-in adapter
Adapter input voltage / frequency	100 to 240 V AC / 50 or 60Hz
Adapter output voltage / current	5V / 0.8A
Power consumption	2.5W typical, 5W maximum
Mechanical Data	
Ambient temperature range ( )	-20°C to 55°C
Dimensions (W×H×D)	149mm×90mm×31mm
Weight	0.22kg
Mounting system	Wall mounting
Display	16 Characters x 2 lines LCD
Features	
Standard	IEC60950 IEC61000-6-2 FCC Part15 Class B / Class C
Standard warranty	2 years