APsystems

Installation / User Manual

APsystems Energy Communication Unit ECU-B

2024/07/11   REV1.9

Please scan this QR code to download our APPs

or click the link below:
http://q-r.to/1OrC

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1. Introduction

The APsystems Energy Communication Unit (ECU-B) is the information gateway for our inverters.**ECU-B has been specially developed to monitor small PV systems up to 4 PV modules.**The unit collects module performance data from each individual inverter and transfers this information to an Internet database in real time, requiring only a single data and power cable. Through the APsystems Energy Monitoring and Analysis software, the ECU-B gives you precise analysis of each inverter and module in your solar installation from APP. The user-friendly interface lets you access your solar array in seconds.

Hereby, [ALTENERGY POWER SYSTEM INC.] declares that the radio equipment type [ECU-B] is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address: https://emea.apsystems.com/resources/library/

Features

- Collects individual PV module and microinverter statistics
- Communicates in real time
- Requires no additional wiring

The APsystems ECU-B is used in utility-interactive grid-tied applications, typically consisting of five key elements:

- APsystems microinverter(s)
- APsystems Energy Communication Unit (ECU-B)
- EMA Manager APP: for installer to set-up the ECU-B
- EMA APP: to enable end-users to have access to the data and performance of their system anytime, anywhere
- APsystems Energy Monitoring and Analysis (EMA): web-based monitoring and analysis system, for both end-users and installers

If the wireless signal in the area where the microinverter is weak, it is necessary to add a Wi-Fi signal booster at a suitable place between the router and the microinverter.
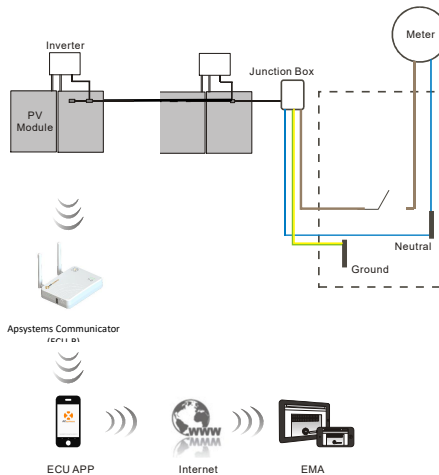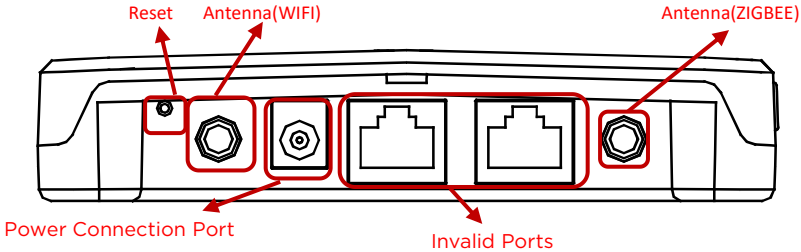

Figure 1

2. Interface Explanation

2.1 Interface Layout

The ECU-B interface includes, (figure 2) from left to right
● Reset button
● Wifi antenna connector (WLAN communication between ECU and router)
● power connection port
● Zigbee antenna connector (communication between ECU and microinverters)

Reset   Antenna(WIFI)   Antenna(ZIGBEE)

Power Connection Port

Invalid Ports

On the side ECU: from top to bottom are:
● USB port : the USB interface is reserved.
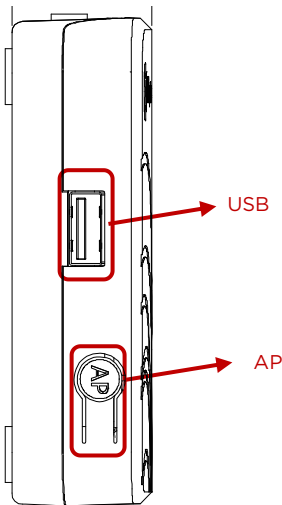● AP button: in case there is need to activate the ECU-B hotspot (see later in the document)

USB

AP

Figure 2

2. Interface Explanation

2.2 Reset

Press the Reset button for three seconds or longer, and the ECU-B will automatically return to the default settings.

🔔 NOTICE

The wireless password will be changed to "88888888".

2.3 Power Connection Port

The power connection port connects power through the power adapter.

2.4 Antenna

The antennas in the package should be connected to ECU-B. One antenna is used for the communication between ECU-B and inverters, the other antenna is used for the Wi-Fi connection between ECU-B and router.

2.5 USB port

The USB interface is reserved.

2.6 AP

The AP button enables to turn on the ECU wifi hotspot. When setting up the ECU, installer needs to first connect to the ECU hotspot via his smart phone or tablet.
Press the AP button for a few seconds: the ECU hotspot will be live for one hour. If more time is needed to set-up the ECU, press the AP button to reactivate the hotspot.

2. Interface Explanation
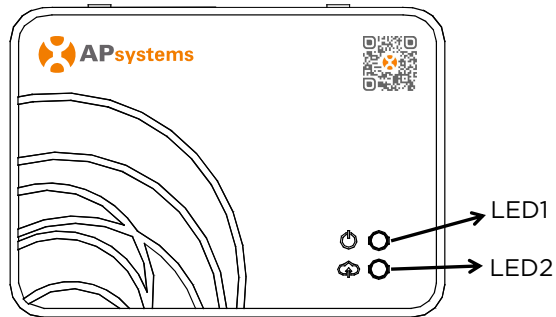

Figure 3

2.7 LED1

LED1 will be ON (green light) when the ECU is powered ON.

2.8 LED2

LED2 will turn on (green light) when ECU is exchanging data with the EMA server.
LED2 will turn off when ECU cannot connect to the EMA server.

3. Hardware Installation

3.1 Preparation

Make sure you have the following components ready before
beginning to install the ECU-B:
- A dedicated standard AC electrical outlet (located as close as possible of the PV array to ensure good communication between ECU and microinverters).
- A wireless router.
- A smartphone or tablet with EMA Manager APP ready to use (see page 10).

3.2 Selecting an Installation Location for the ECU-B

- Choose a location that is as close as possible of the PV array.
- The ECU-B is NOT rated for outdoor use. If installing outdoor, ensure that the ECU-B is put in a waterproof box, and that the antenna (wifi and Zigee) are placed outside of the box to ensure optimum communication. In case you need to use extension antennas to be closer to the PV array, please make sure the extension antennas are Wifi 2.4GHz with SMA connectors male/female. These extension antennas are not supplied by APsystems, but can be purchased at any electrical/PV shop.

3.3 Installation

1) Using a Wall Mount
   When mounting the ECU-B to a wall, make sure to select a cool, dry indoor location.
   - Depending on the wall surface you are mounting the ECU-B to, use either two drywall screws or wall anchors, installed 100 mm apart (The drywall screws and wall anchors are not included in the ECU-B kit).
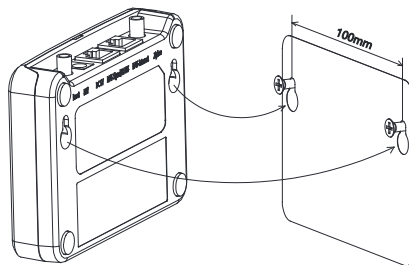   - Align and slide the ECU-B onto the mounting screws.

Figure 4

3. Hardware Installation

2)   if the ECU-B is not mounted on a wall mont, you can put it anywhere on a flat surface or furniture, close to a power outlet.

3.4 Cable Connection

1) Using a Wall Mount
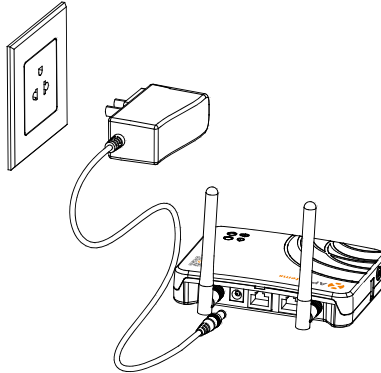- Connect the adapter to the power connection port on the top of the ECU-B.

Figure 5

🔔 NOTICE

The antennas used for Zigbee port and WI-FI port are exactly the same type, no need to distinguish.

2）Power Distribution Cabinet Installation
- Install the socket on the guide rail (The socket will not be supplied by APsystems Please prepare it yourself).
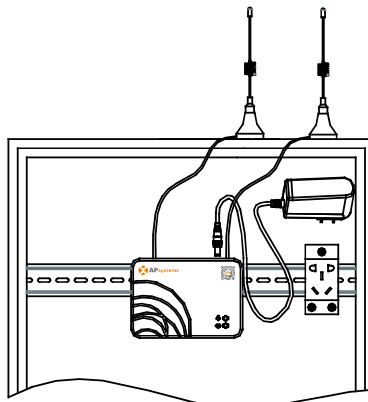- Connect the adapter to the power connection port on the top of the ECU-B.

Figure 6

3. Hardware Instrallation

> 🔔 NOTICE
>
> ECU antennas must be left outside of the cabinet, even if the cabinet is made of plastic. Please make sure the extension antennas are Wifi 2.4GHz with SMA connectors male/female. These extension antennas are not supplied by APsystems, but can be purchased at any electrical/PV shop.

3.5 Internet Connection

Figure 7

Use ECU-B internal WLAN (see Manage the WLAN connection).

> 🔔 NOTICE
>
> ECU-B can communicate with the inverters up to 76 meters (250 ft) with direct sight. ECU-B can utilize Wi-Fi (WLAN) up to 9 meters (30 ft) with direct sight.

> 🔔 NOTICE
>
> 4G router is also supported. ECU can be connected to 4G router by wifi.

4G SIM

Figure 8

4. ECU-B User Interface

Please scan QR code below to have access to our products and APP catalogue, or click this link to download our APPs: http://q-r.to/1OrC.

- EMA Manager APP: for installers
    - Professional installers: all features available
    - DIY (Do It Yourself) installers: only ECU_APP features available
- EMA APP: for end-users only

4.1 Connecting to the ECU-B via the Local Wireless

- Make sure you have downloaded the EMA Manager APP on your smartphone or tablet
- Make sure the ECU-B hotspot is activated (if not, press the AP button for a few second)
- Open Settings > Wi-Fi in your smartphone or tablet
- Select ECU-B hotspot: name is ECU_B_2163XXXX (mimicking ECU-B serial number)
- Connect your smartphone or tablet to the ECU-B hotspot. Default password is "88888888" (8 times 8)
- Once the connection is established with the ECU-B hotspot, open the EMA Manager APP.
- Select "**ECU APP**" to enter into the commissioning tool (you can access to ECU APP without any login or password).
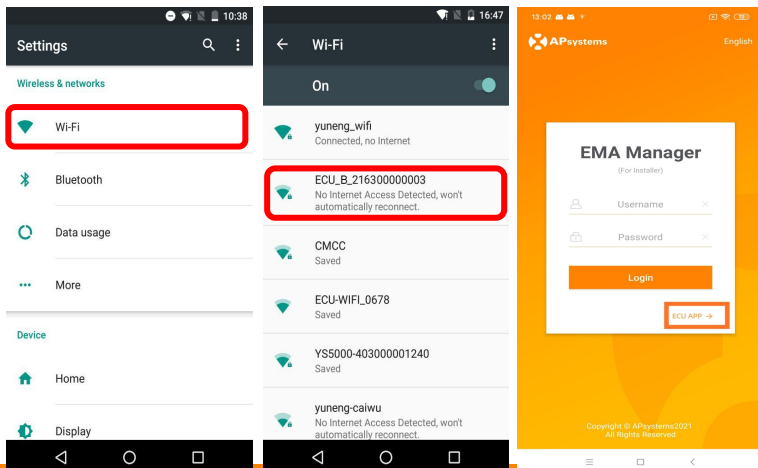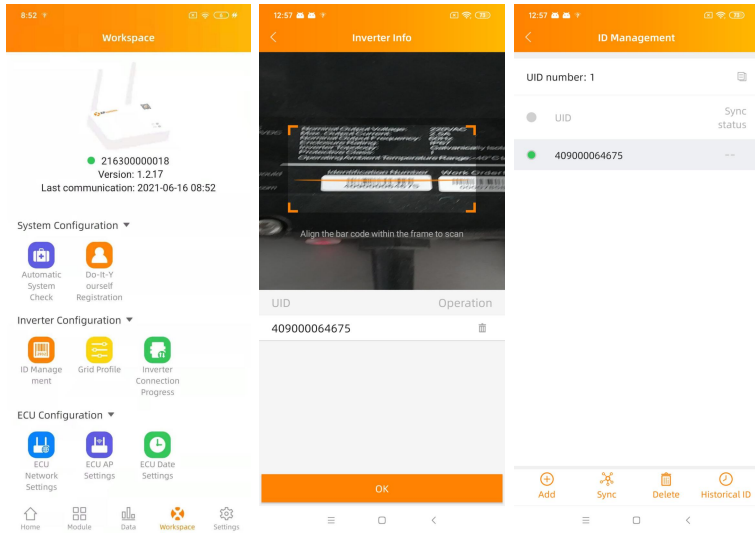
4. ECU-B User Interface

4.2 Enter microinverters UID (serial numbers) into the ECU-B

- Click "Workspace", select "ID Management",
  input the microinverters UID (serial number: 12 digits starting with a 4, a 5, a 7 or a 8)   manually or scan the UID with your smartphone or tablet scanner.
- Once the microinverters UID have been entered, please press "Sync"

🔔 NOTICE

Please do not enter the ECU UID into the ID management menu (serial number of 12 digits starting with 2163-).

4. ECU-B User Interface

4.3 Historical ID

- If the ECU accidentally emptied the inverter list, you can use the same mobile phone to quickly restore the inverter id list.

4.4 Delete UID

- In case of wrong entry or typo, select the microinverter UIDs, click "Delete" then click "Sync". The selected UID(s) will be removed from the ECU-B.
- Note: when deleting, please press also "Sync". Otherwise the microinverter will not be removed from the ECU-B.
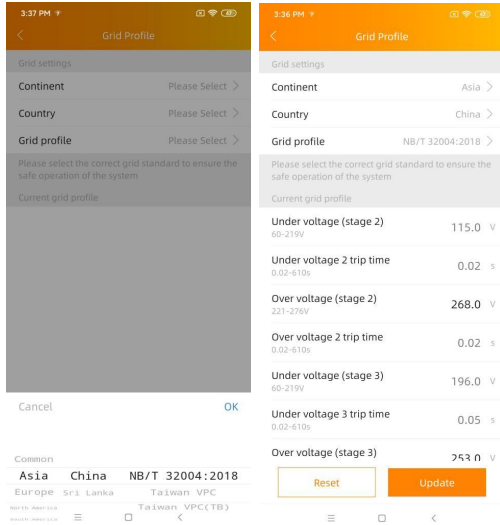
Once the microinverters UID have been successfully entered into the ECU-B, you need to select grid profile and define time zone of your ECU.
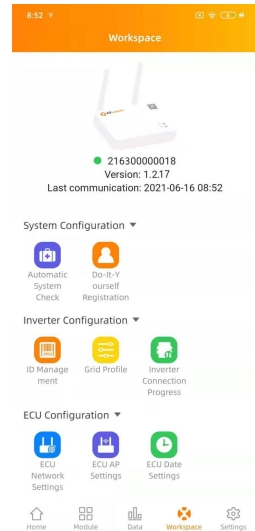
4. ECU-B User Interface

4.5 Grid Profile

- From the work space, select "Grid profile"
- First select country and then the city.

> ⚠ **NOTICE**
>
> If you select the wrong grid profile, the microinverters may not start or may not produce as per optimal performance.

4. ECU-B User Interface

4.6 Time management

- From the workspace, please select menu "ECU Date Settings"
manual set-up, click "Date", "Time" and "Timezone" to modify.
- Automated set-up: Click "Time quick setting": the APP will synchronise on the
time and time zone as per smartphone or tablet settings.
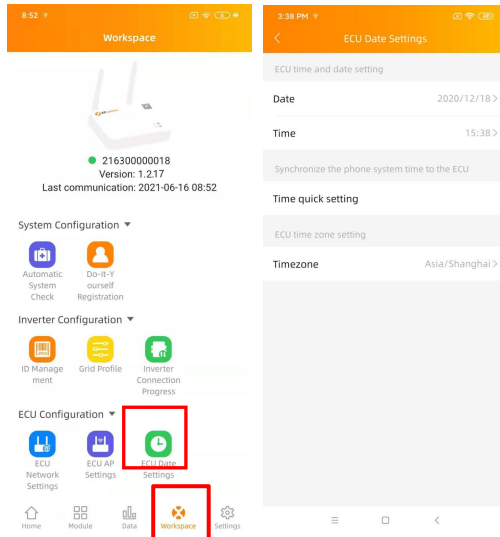
4.7 ECU Network Settings

4.7.1 WLAN

- From the Workspace menu, select "ECU Network settings"
- Swipe down the screen, the available SSIDs will be displayed
- Select the network of your choice and enter its password
- When connecting to the local Wifi, the smartphone or tablet may lose its
connection to the ECU hotspot and connect to other wifi network or 4G.
- If more operations are needed to finish-up the ECU commissioning, please make
sure to reconnect your smartphone or tablet to the ECU hotspot (may have to
press the AP button to re-activate the hotspot)

4. ECU-B User Interface
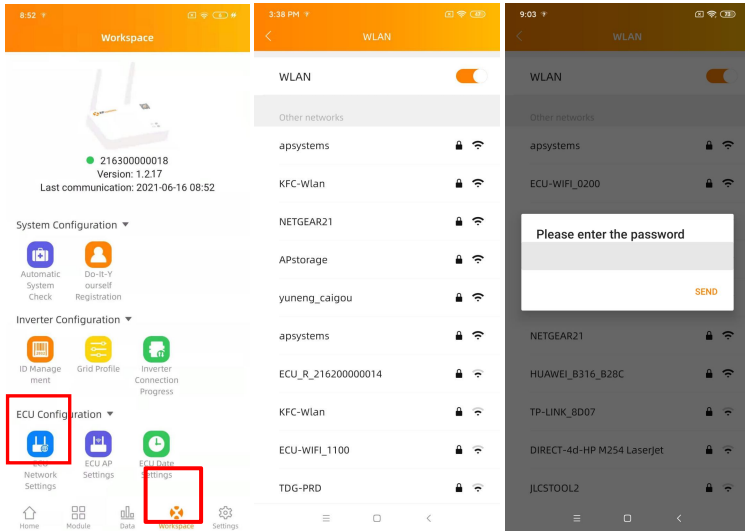
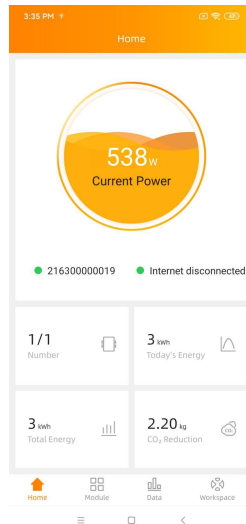- When your smartphone or tablet is connected to the ECU hotspot again, you can open the ECU APP home page and check the internet connection status.

- The first bullet (with ECU UID) when green shows that the smartphone/tablet is properly connected to the ECU hotspot.

- The 2nd bullet shall be green if the wifi connection has been successfully established.
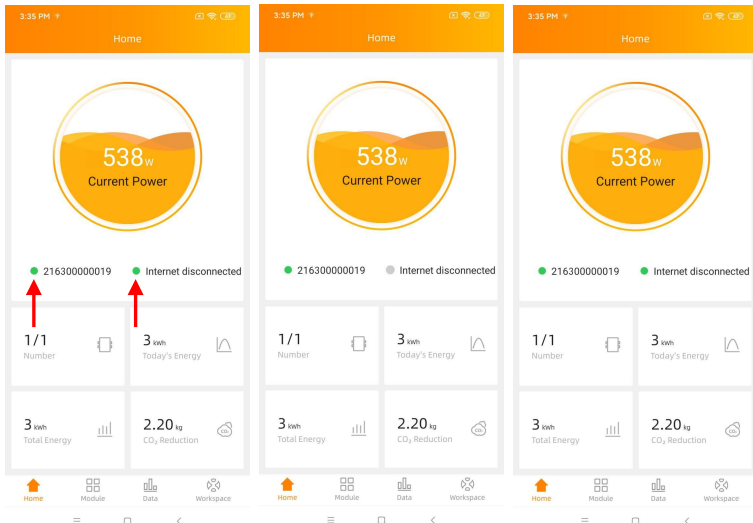
4. ECU-B User Interface

4.8 Checking the commissioning of the ECU-B

- Once the ECU-B has been commissioned, installer can check status on the home page of the ECU APP:
- Several infos are displayed
  - Systems info (ECU UID, serial number)
  - number of microinverters communicating with the ECU / total number of microinverters entered in the ECU (with ID Management menu).

- Status of connectivity
- The traffic light (on the left) in front of the ECU UID shows connectivity status between smartphone or tablet and ECU hotspot:
  - Smartphone or tablet is connected to the ECU hotspot.
  - Smartphone or tablet is not connected to the ECU hotspot. Please try again by pressing the AP button.
- The traffic light (on the right) shows connectivity status between the ECU and the local internet
  - The ECU is connected to the local internet.
  - The ECU is not connected to the internet.

Other info visible from the home page
  power output of the day
  -Total power output since installation
  -CO$_2$Reduction since installation.
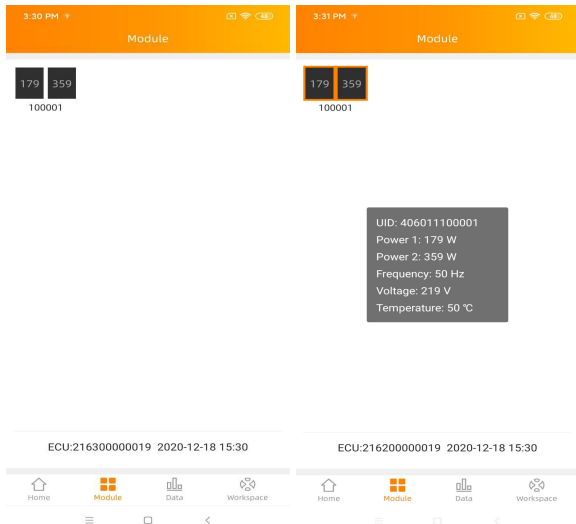
4. ECU-B User Interface

4.9 Module

- This page displays the microinverters entered in the ECU (Menu ID Management) and properly registered by the ECU

A dual microinverter will be shown by default with 2 PV modules, while a quad microinverters will be shown by default with 4 PV modules.

if some DC channels are not connected on purpose, the ECU_APP will display the maximum number of panels which can be connected to a given microinverter

- Removing un-used channel needs to be done from the EMA installer account when creating end-user account.
- On the module page, installer can visualize the performance of microinverters registered into the ECU.

Click "Panel": the detailed information of the microinverter is displayed, including inverter UID, PV module DC power, grid voltage, frequency and temperature.
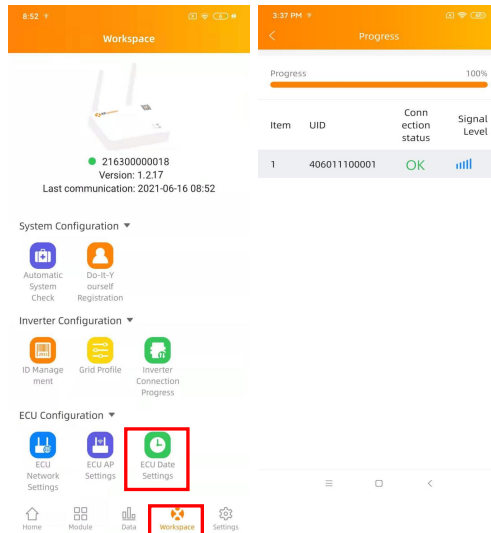
4. ECU-B User Interface

4.10 Data

- In this Menu, you can view the detailed data at system level:
  - Per day
  - Per month
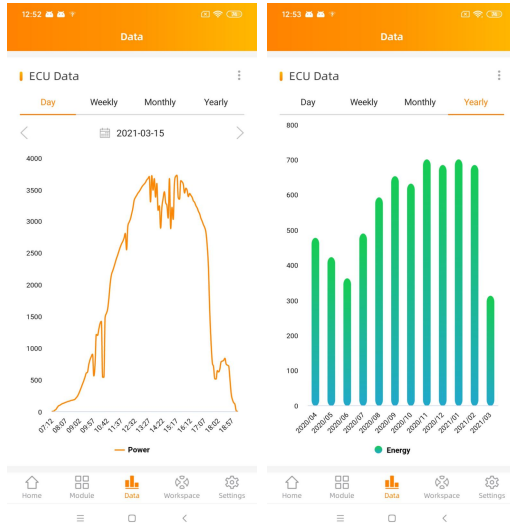
4.11 Inverter Connection Progress

- This menu shows the connection progress and communication quality between microinverter and ECU, 100% means the connection is over.

- The invereters with "OK" have connected ECU

4. ECU-B User Interface

4.12 Automatic System Check

- Once the ECU has been commissioned, the menu "Automatic System Check" can help you to check proper communication and production of each microinveters.
- This menu also gives some basic troubleshooting tips.
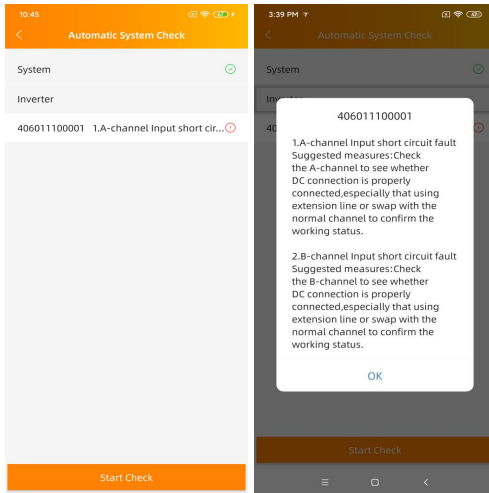
4.13 ECU AP Settings

- This menu can be used if you would like to change the default password of the ECU-B hotspot.
- Please connect to the ECU hostpot first, open the menu "ECU APP settings" and change the password at your convenience.
- If doing a reset of the ECU, password will be reinitialized as 88888888.
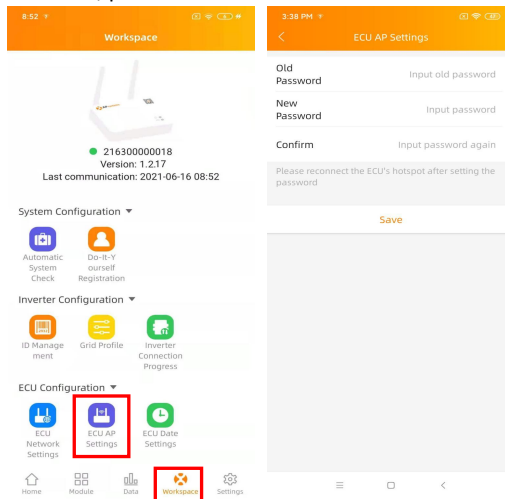
4. ECU-B User Interface

4.14 Do-It-Yourself Registration

- **This menu is only for DIY installers: it will allow DIY installer to create their EMA account by themselves. They can later on access to their account via the EMA APP.**
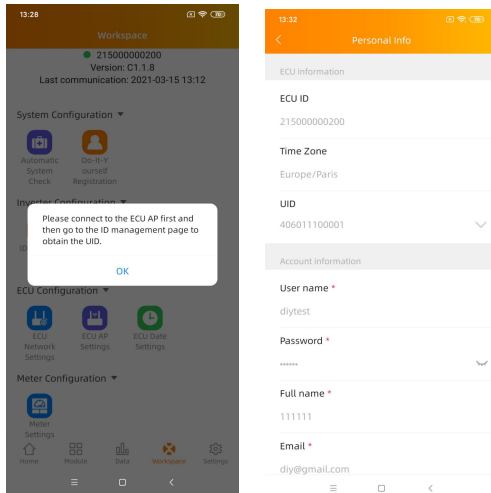- Once the ECU has been properly commissioned, make sure to connect your smartphone or tablet to local internet.
- Enter "Do it Yourself Registration Menu" and follow instructions to create your own EMA account.

4.15 Settings

- This basic menu allows you to change the Language: 6 languages are available: English, French, Spanish, Portuguese, Simplified Chinese and traditional Chinese.
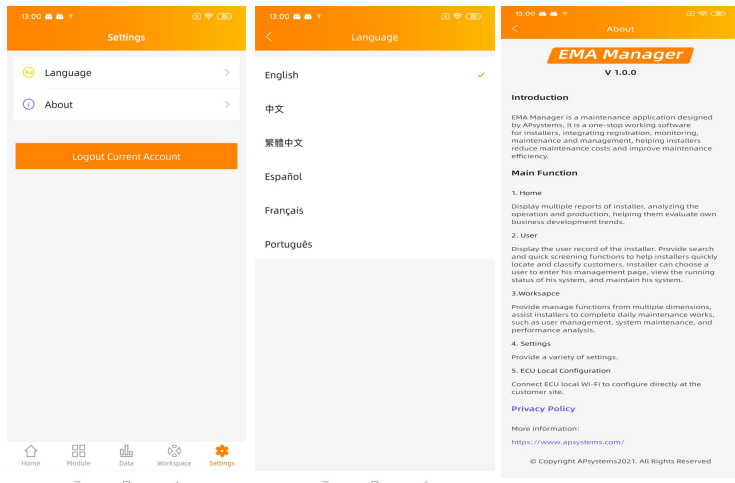
5. Technical Data

5.1 Disposal of your old appliance

:: **WEEE** (for Europe)

1. When this crossed-out wheeled bin symbol is attached to a product, it means the product is covered by the European Directive 2002/96/EC.

2. All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities.

3. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health.

4. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or the shop where you purchased the product.

CAUTION

The professional person is allowed to replace the battery.

Do not ingest battery, Chemical Burn Hazard.

This product contains a coin/button cell battery. If the coin/button cell battery is swallowed, it can cause severe internal burns in just 2 hours and can lead to death.Keep new and used batteries away from children.If you think batteries might have been swallowed or placed inside any part of the body, seek immediate medical attention.

5. Technical Data

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Please note that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits fora 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 radiateradio 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 useris encouraged to try to correct the interference by one or more of the following measures:
-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

6. ECU-B Datasheet

Model	ECU-B
Communication to Microinverter	
Communication	ZigBee 2.4 GHz
Maximum Communicating Input channels*	4
Communication to EMA	
Wireless	Wi-Fi 802.11g/n /GSM Cellular
Wireless Security	WEP, WPA2-PSK
USB Interface	5Vdc - 0.5A Output
Power Data	
Power Supply	5V, 2A
Power Consumption	1.7 W
Product Specifications	
Frequency Range	2412MHZ-2472MHZ (WIFI), 2405mhz-2480mhz (ZigBee)
RF Output Power (EIRP)	16.56 dbm (WIFI), 9.50dbm (ZigBee)
Type of Antenna	External antenna
Modulation	DSSS, OFDM
Mode of Operation(Simplex/Duplex)	Duplex
Mechanical Data	
Dimensions (W×H×D)	122 mm x 87 mm x 25 mm (4.8'' x 3.4'' x 0.98'')
Weight	150g (0.33lbs)
Operating Ambient Temperature Range	-20°C to +65°C (-4°F to +149°F)
Cooling	Natural Convection; No Fans
Enclosure Environmental Rating	Indoor - NEMA 1 (IP20)
Warranty	3 Years Standard

For example 2pcs of DS3 or DS3D, 1pcs of QT2 or QT2D.

7. Contact Information

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