



User Guide

EMA Manager

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1. Introduction

EMA Manager is a one-stop application specially made for APsystems registered professional solar installers. The content of the EMA Manager is the APP version of features available in installer account via the web portal.

The EMA Manager APP will allow installers, to register end-users, new PV systems, to monitor performance and ensure easy access to all key data without having to log into their laptop.

2. Install and Login EMA Manager

➤ Install

Method 1:

1. Go to Google Play Store or Apple Store
2. Search “EMA Manager”
3. Download and install

Method2:

1. Open <https://apsystems.com>
2. Select your region
3. Click the tab menu “Apps” below “Products”
4. Download and install

Method3:

1. Open <https://www.apsystemsema.com>
2. Scan the QR code for Android or IOS
3. Download and install

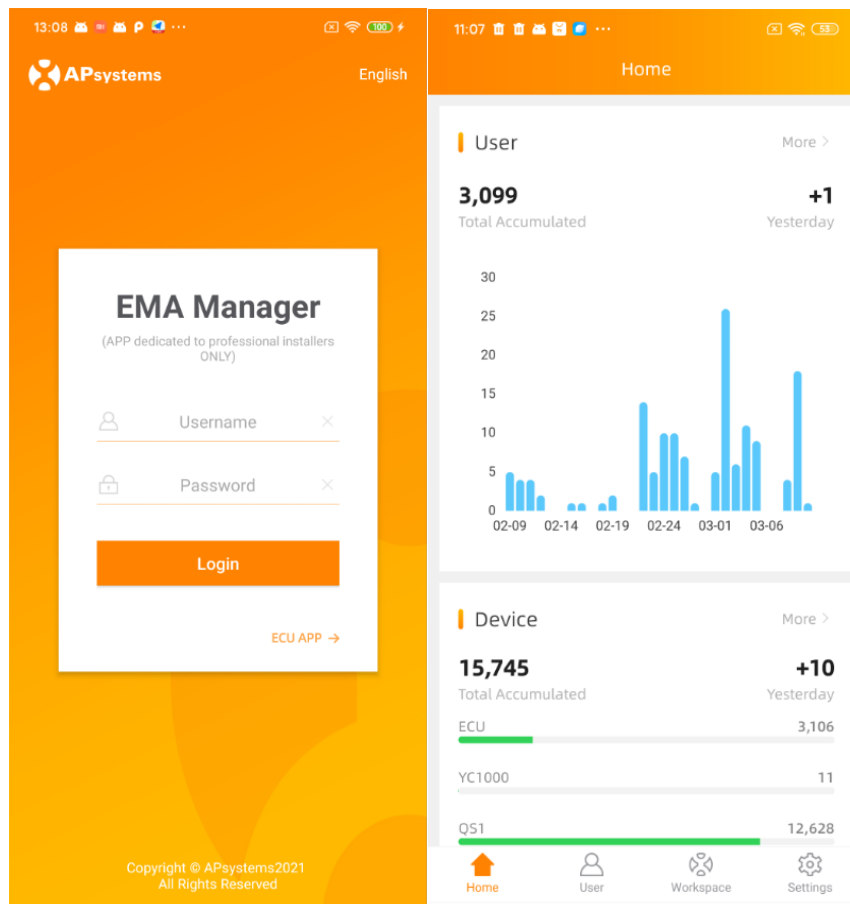
➤ Login

1. Enter your “Username” and “Password”.

Note: Use installer account Username and Password. The Password is case sensitive.

2. Press the “Login” button.

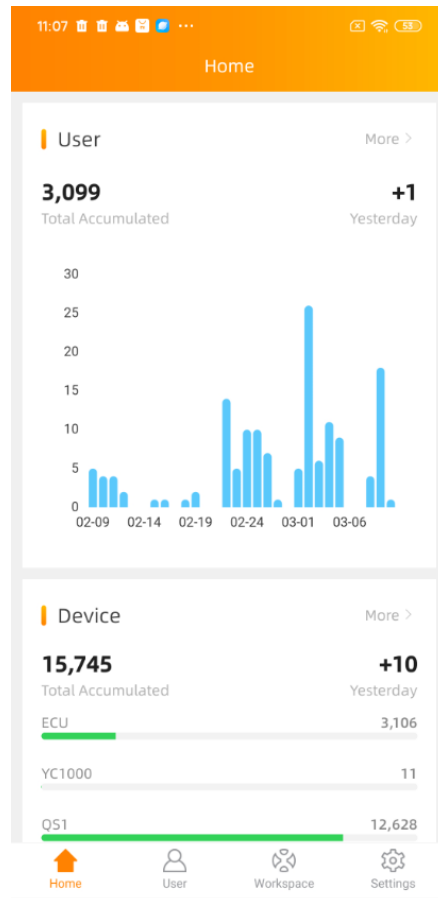
On the home page, a dashboard of your installed portfolio is displayed



Note: If no installation is registered, the dashboard will be empty.

Note: if you need to switch the language, click the **“English”** at the upper right corner and select language of your choice

3. Home (*Installer Level*)



On the home page, installer can visualize

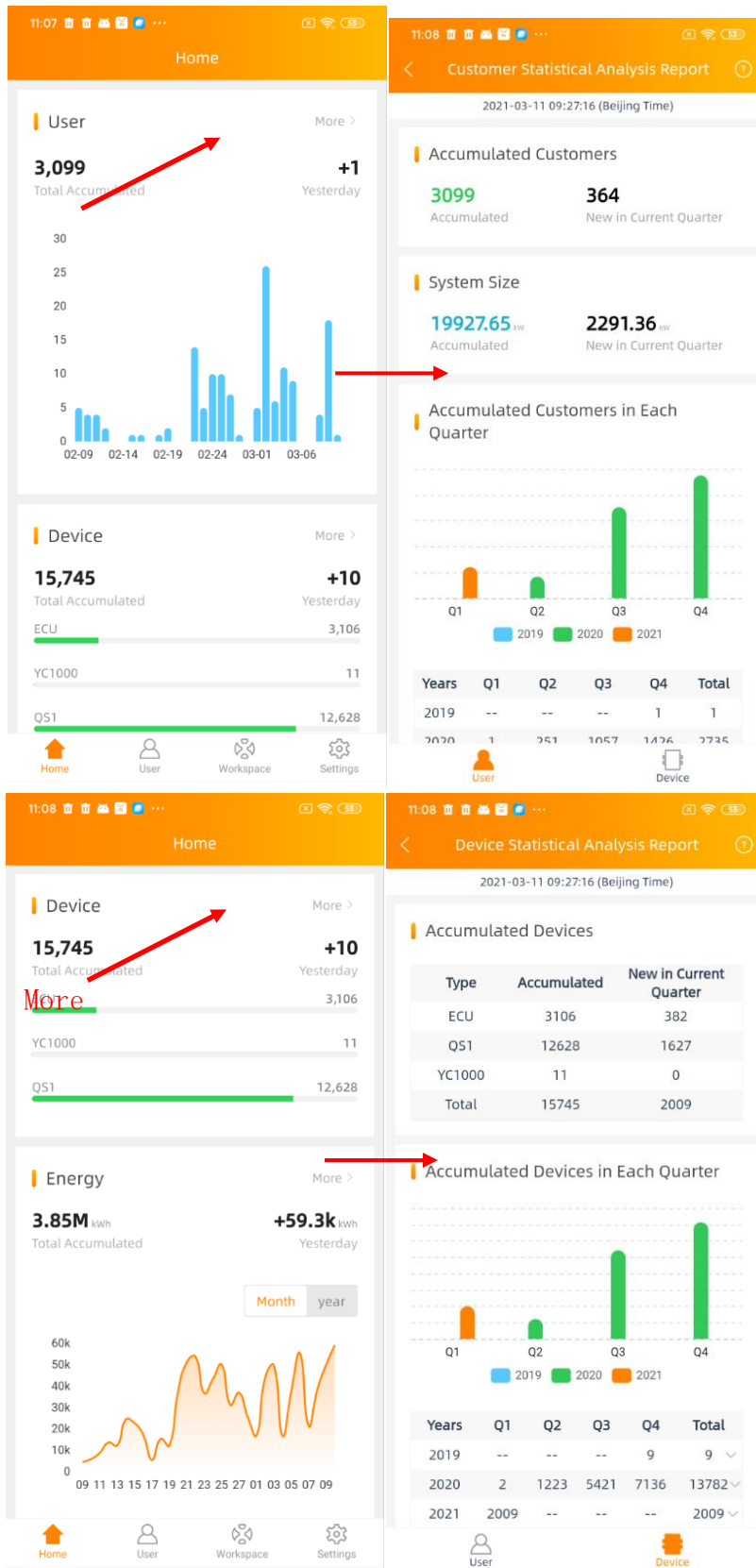
- User: Total number of installations
- Device: Total number and type of micros or ECUs installed
- Energy: cumulative energy produced by the installed portfolio

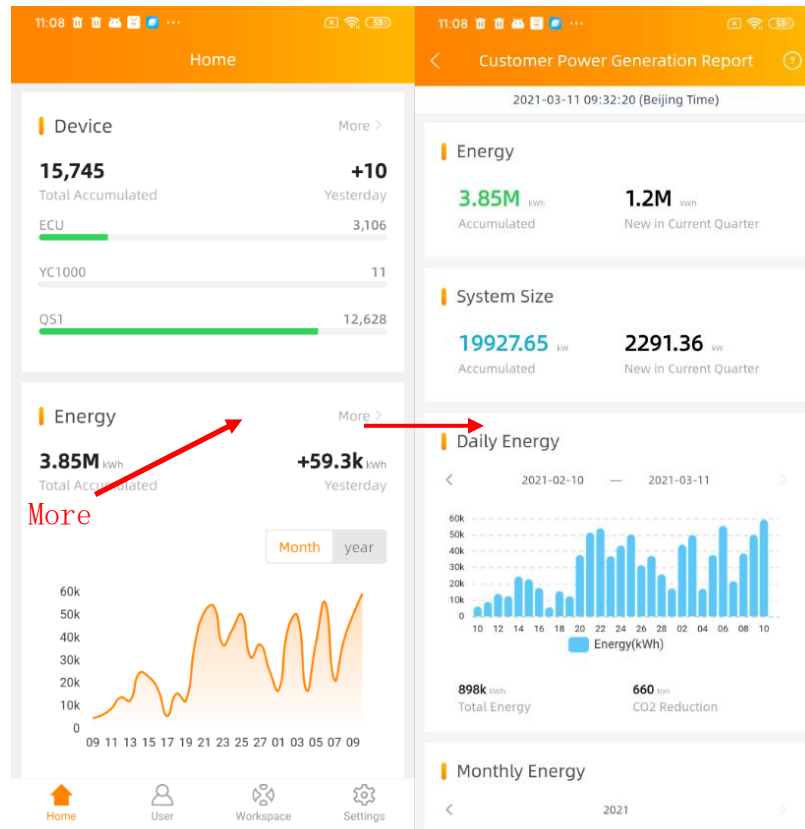
On the home page, data are shown per year, but you have also access to prior day performance (yesterday)

Note: Installers with a network of sub-installers can also access to the details of their sub-installers. But they are not permitted to view the operations and productions directly belonging to their sub-installers for the data security and privacy.

By pressing “more” for each category, there is more granular data available:

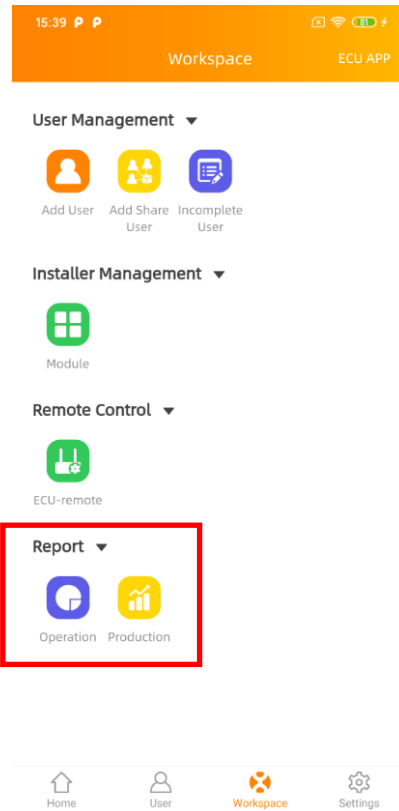
- Per quarter
- Per system size





The “more” information shown above are also available via menu below “Report” in [**Workspace**].

- Operation: View more granular data of user and device.
- Production: View more granular data of production.

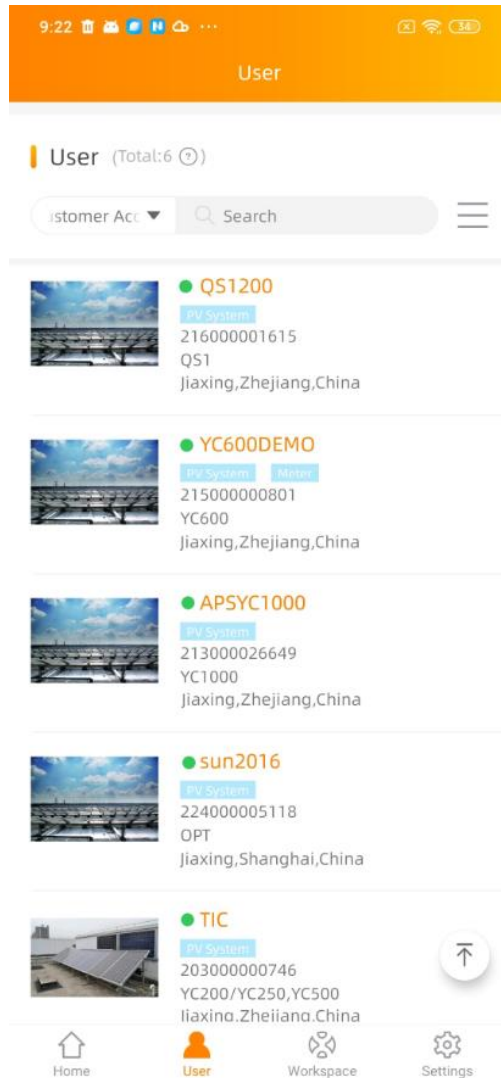


4. User (*Installer Level*)

You can view the detailed production of a single user the same as it shown in EMA APP to the users.

1. Once logged-in, Select the tab menu [**User**] at the bottom of the page.

A list of users is displayed.



Note: A list of your sub-installers can also be displayed if you are a Master installer.

2. Select the user.

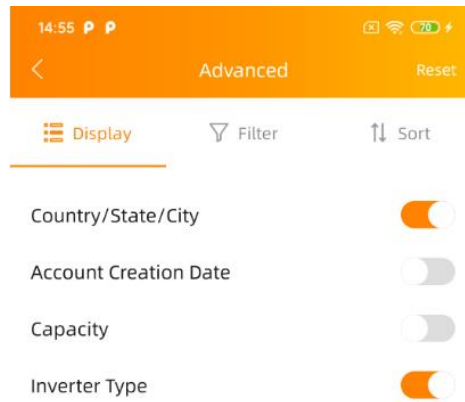
There are multiple selections for you to quickly search.

➤ User List

Click the icon at the right side of the search field, the multiple choice of selections is displayed.

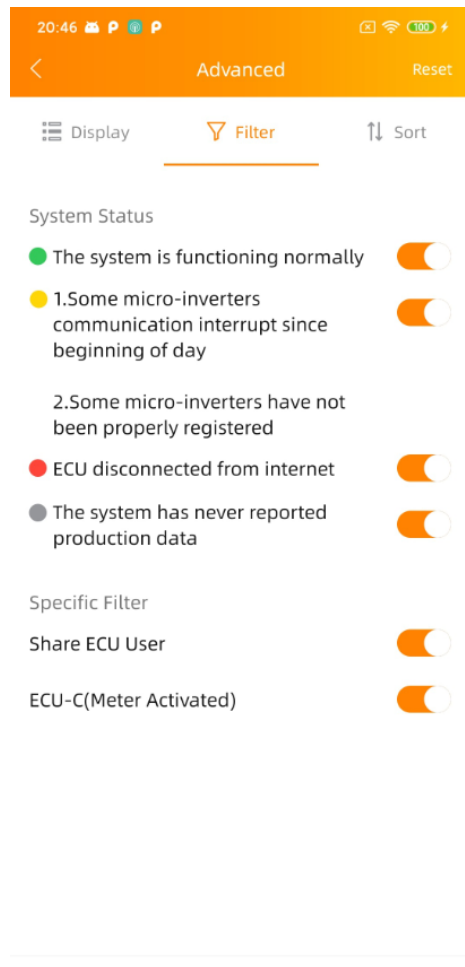
Display

You can select the fields you want to display in the user list.



Filter

You can also filter the user system with system running status and system type.



Green: The system is functioning normally

Yellow: Some micro-inverters communications has been interrupted since beginning of day or the micros have not been properly registered (wrong UID, typo in the UID)

Red: ECU has been disconnected from the internet (power outage, change of router, change of wifi password, wear and tear of the Ethernet cable, loose wifi antenna)

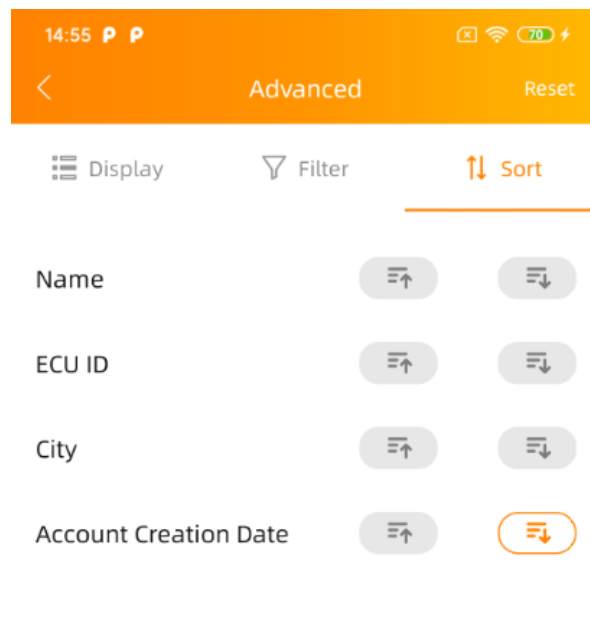
Grey: The system has never reported data (ECU might be connected to the internet, but the micros have not been synchronized in the ECU during commissioning)

Share ECU User: Multiple customers' PV system can be monitored via a single ECU using ECU Share mode. We call these user *"Share ECU User"*.

ECU-C (Meter Activated): The system is using an ECU-C, with metering functions activated and CTs (current transformers) in place.

Sort

You can select one field to sort the list.



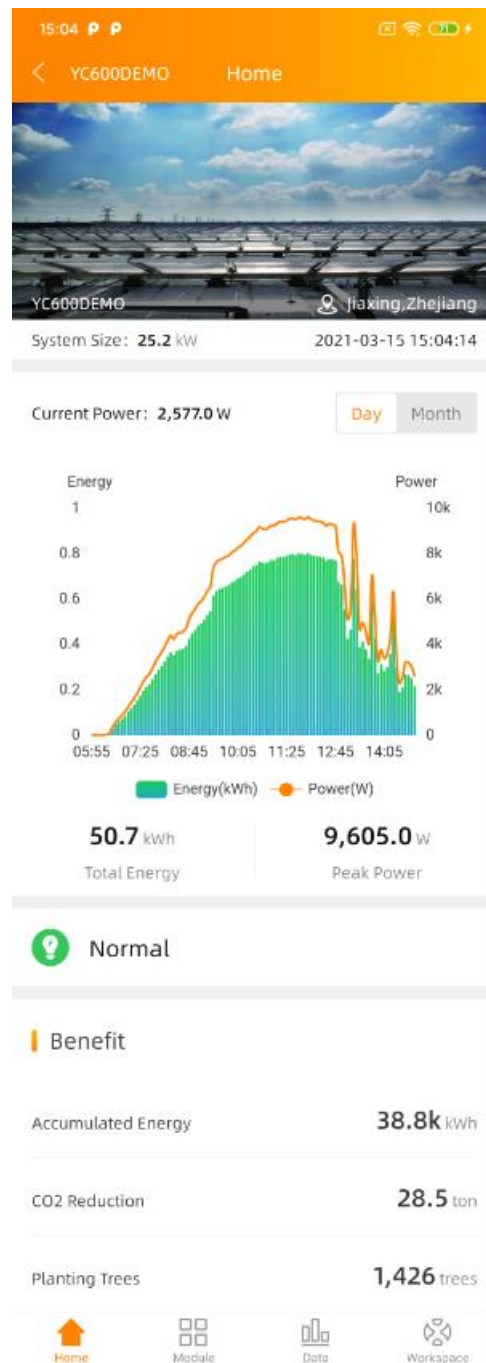
Reset

Click it to reset the query conditions into default settings.



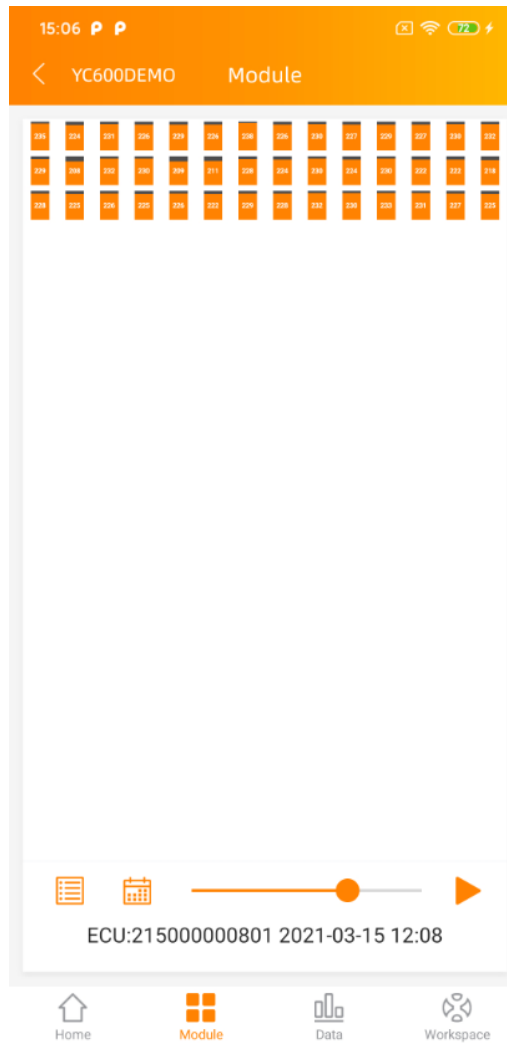
4.1 Home (End User Level)

In this view, you can view the registrations and productions of the user's system with the running status.



4.2 Module (*End User Level*)

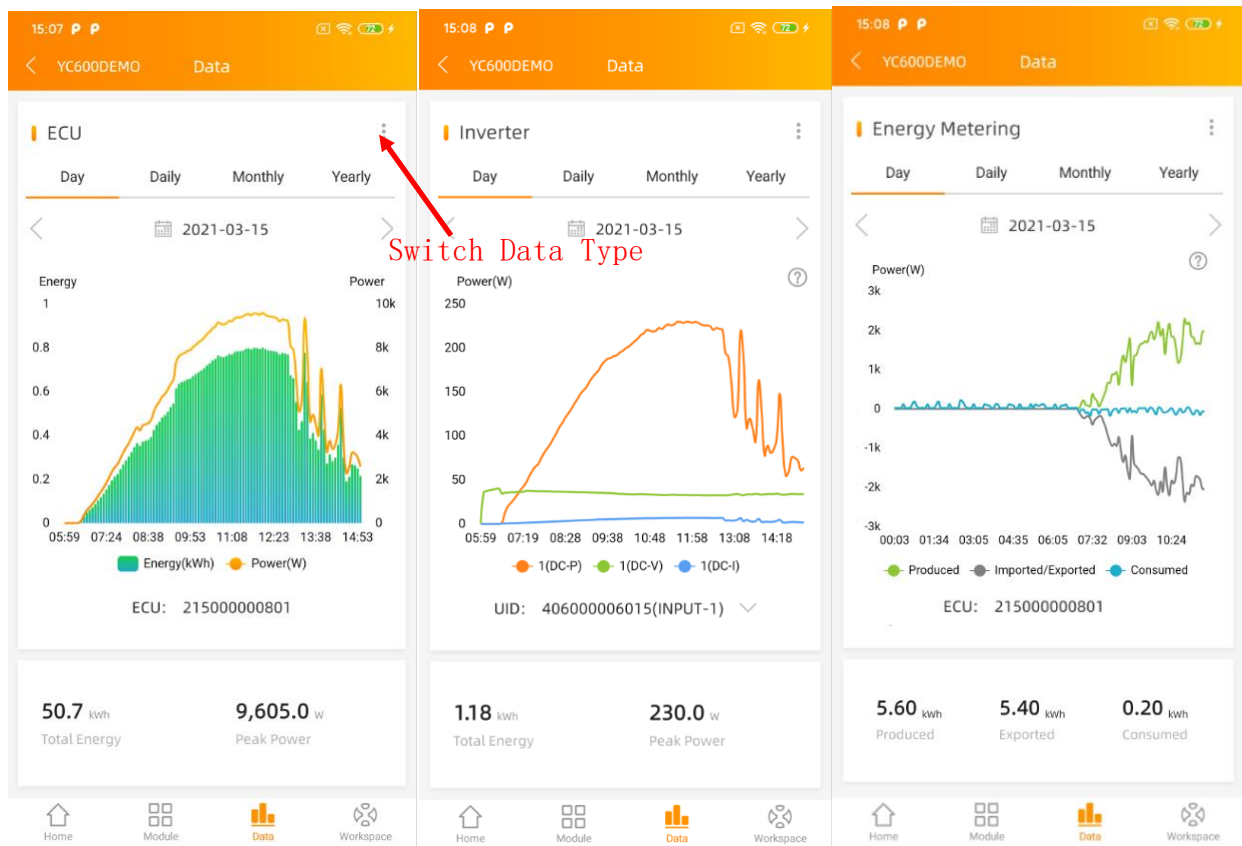
In this view, you can view each panel's power in the whole day or daily energy in 30 days. By using the sliding bar, the data will be automatically shown as per time of day



4.3 Data (End User Level)

In this page, you can view the detailed data on ECU level and inverter level:

- Per day
- Per month
- Per year



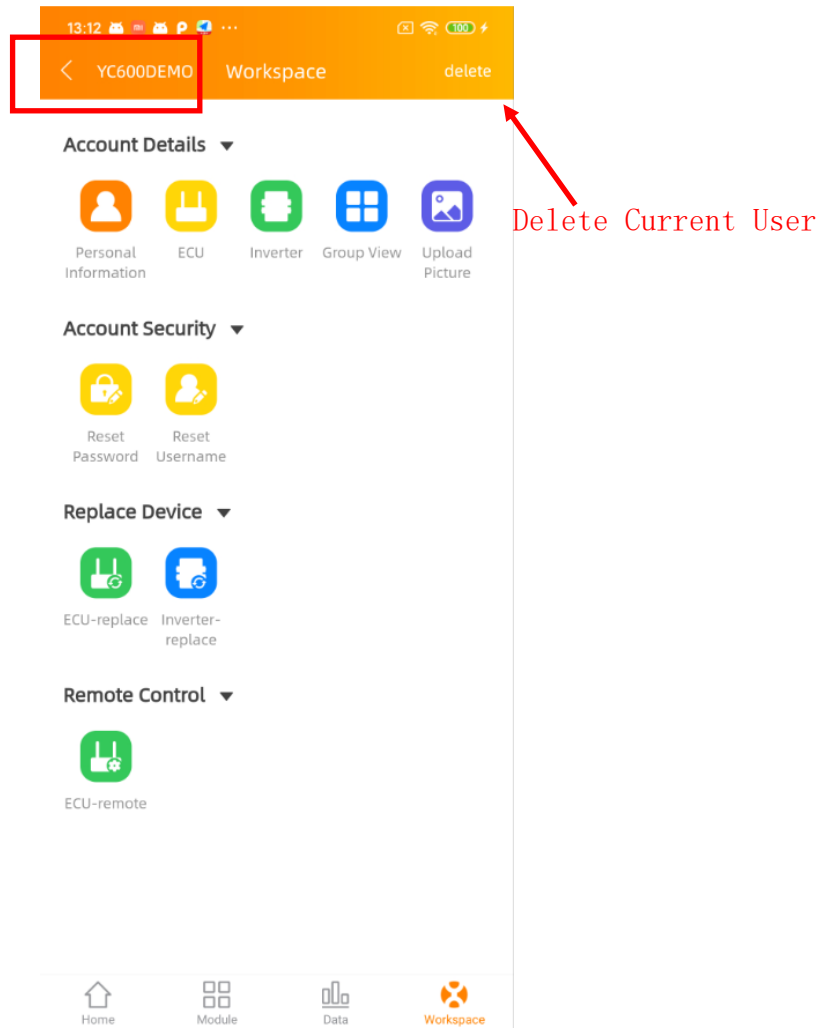
Note: If the system is using an ECU-C, with metering functions activated and CTs (current transformers) in place, you can also visualize PV production, house-hold consumption and grid import/export data on meter level.

4.4 Workspace (End User Level)

In this view, the name of the end-user is visible on the top left hand-side of the header.

In this View, you can manage the chosen user's registration information, change the user's security information, replace the devices and configure the system remotely.

Note: This is specific to one single end user.



➤ Account Details

- **Personal information:** Edit the end user's personal information.
- **ECU:** Add/Edit/Delete ECUs.
- **Inverter:** Add/Edit/Delete inverters.
- **Group View:** Add/Edit/Delete group views.
- **Upload picture:** Upload/Delete pictures.

➤ Account Security

- **Reset password:** Send the reset password email to the end-user.

The end-user will receive a link at his registered email address. By pressing this link, he will be able to reset his password.

- **Reset username:** Apply a new username.

The end-user will be informed of the new username by an email after the new username is agreed.

➤ Replace Device

- **ECU-replace:** Replace the ECU device.
- **Inverter-replace:** Replace the inverter device.

➤ Remote Control

- **ECU-remote**: Manage Inverter UIDs in ECU, Set Grid Profile to ECU
Works only if the ECU is connected to the internet.

Note: Click “Delete” at the upper right corner of the page to delete this user.

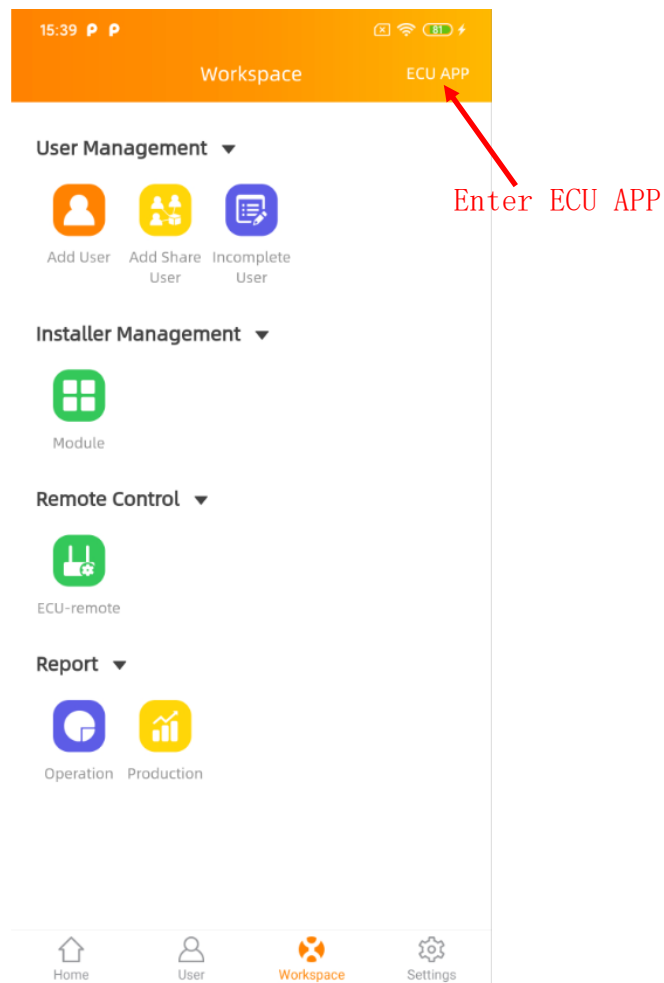
5. Workspace (Installer Level)

In this View, you can manage the user’s registration information and installer’s registration information, configure the system remotely and get granular data of multiple reports.

Note: This is a specific to all end users.

1. Once logged-in, Select the tab menu [**Workspace**] at the bottom of the page.

A list of functions is displayed.



- **User Management**
 - **Add User:** Add a new user installation.
 - **Add Share User:** Add a new share ECU user installation.
 - **Incomplete User:** Resume the registration in case you were interrupted in any of the registration steps.
- **Installer Management**
 - **Module:** Manage your module template or for your sub-installers.
- **Remote Control**
 - **ECU-remote:** Manage Inverter UIDs in ECU, Set Grid Profile to ECU
Works only if the ECU is connected to the internet.
- **Report**
 - **Operation:** View the statistics data of user and device.
 - **Production:** View the statistics data of production.

Note: You can enter “*Local Control (ECU APP)*” without logout, switch your smart phone or tablet to connect to ECU local Wi-Fi and click the “*ECU APP*” at the upper right corner. For more details, view “6. Local Control (ECU APP)”.

5.1 User Management (*Installer Level*)

Introduction of the two different users.

User: Single end-user with one or multiple ECUs

Share User: Share-user is specific to the use of an ECU-Share: 1 ECU to monitor several installations with a generic view for the installer and separated view for each user (typical use case: Social Housing)

5.1.1 Adding a New User Installation

There are five (5) major steps involved in adding a new installation (registering) in the EMA Manager. All the following introductions take the customer as an example.

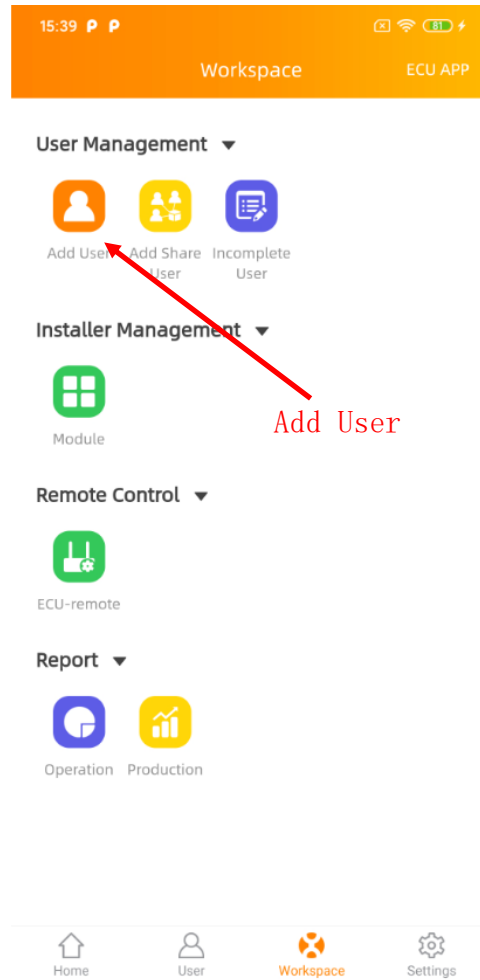
Step 1: Personal Information-Entering the customer’s personal information.

Step 2: ECU Information - Configuring the Energy Communication Unit (ECU).

Step 3: Inverter Information - Configuring the Inverter Information.

Step 4: Group View Information - Configuring the Group View.

Step 5: Upload Pictures (optional) - System Picture and/or Drawing Picture



1. Select the ***“Add User”*** icon.

Start to add a new end user account.

Step 1: Entering the Customer’s Personal Information

2. Click ***“Add Personal Information”***.

Account Info

Personal Information ^

Collect the account and system information. Account Info: username, password, personal information and contact information. System Info: the address of PV system, the basic configuration of PV system.

Account Info

Username *
1-60 bit letters,digits,underscores,@,spaces or.
please enter

Password *
Length 6-32 bits, must contain numbers and letters
please enter

Firstname *
please enter

Lastname - Optional
please enter

Email *
please enter

Phone - Optional
please enter

Allow visitors to access to this system ☐
Enabled this function, users can display this system on other websites through embedded services. Refer to [help] for operation details.

System Info

Installer *
APSInstallertest

Country *
China

State/Province *
Zhejiang

City *
please enter

Address - Optional
please enter

Postal Code - Optional
please enter

System Size (kW) *
 $\text{System Size(kW)} = \text{Pmax(W)} * \text{Number of Modules} / 1000$
please enter

Module Type *
please enter

Module Maximum Power(Pmax) (W) *
200-1000
330

Grid Type *
120V 120V Single-phase

Remark
please enter

0/200

OK

➤ Account Info

Username

This is a single “name” (typically the customer’s last name) that identifies this specific customer’s installation. The username appears in the customer’s area on the EMA.
(Required)

Only “letters”, “numeric digits”, “underscores”, “@”, “spaces”, and “.” Can be used when creating a username. And the username is not case sensitive.

Note: A username cannot be modified, once you submit the *PERSONAL INFO*. If your customer wants to modify the username, you can submit the username modification application after finish account registration. For details, please refer to “4.4 *Workspace (End User Level)*”.

<i>Password</i>	This is a temporary password that is emailed to your customer so they can access their account on the EMA. Your customer can change their password should they so choose. (Required) The set password must contain letters and numbers.
<i>First Name</i>	Your customer’s first name. (Required)
<i>Last Name</i>	Your customer’s last name. (Optional)
<i>Email</i>	This is your customer’s email address. (Required)
<i>Phone Number</i>	Your customer’s phone number. (Optional)
<i>Allow visitors to Access to this system</i>	Your customer can share his system on other website. (Optional) Note: If enabled, it will display an authorization code to be used in embedding this specific customer’s system on other website.

➤ **System Info**

<i>Installer</i>	This field is automatically generated by the system and can be changed using the pull-down selector if necessary. (Required)
<i>Country</i>	This field is automatically generated by the system and can be changed using the pull-down selector if necessary. (Required)
<i>State/Province</i>	This field is automatically generated by the system and can be changed using the pull-down selector if necessary. (Required)
<i>City</i>	Customer’s city. (Required)
<i>Address</i>	Customer’s street address. (Optional)
<i>Postal Code</i>	Customer’s postal code. (Optional)

<i>System Size</i>	Customer's overall system size. (Required)
<i>Module Type</i>	Customer's solar panel type. (Required)
<i>Module Maximum Power(Pmax)</i>	The maximum power of customer's solar panel. (Required)
<i>Grid Type</i>	Grid environment where the system is connected to the grid (Required)
<i>Remarks</i>	Add any notes that you may find useful at a later date. (Optional)

3. Click "OK".

Note: Once you have clicked "OK" button in any of the major registration steps (1-5), your customer's information is saved in the system and you can step away from the process and resume by selecting "*Incomplete User*" (Refer to **5.1.3 Resume an Incomplete Registration**).

Step 2: Configure the Energy Communication Unit (ECU)

4. Click "**Add ECU**"

The Add ECU window is displayed.

18:26

Add User

Personal Information

Username : testuser

Address : China Zhejiang Jiaxing

ECU Information

ECU

Inverter Information

Inverter

Group View Information

Group View

Upload Picture(Optional)

Picture

14:50

ADD ECU

ECU Info ^

Input the right ECU ID, its timezone will be the local timezone.

ECU ID *

12-digit number located on the top of ECU, or on the front flap of the shipping box.

please enter

OK

5. Enter the 12-digit ECU UID number(s) into the ECU ID field.

The ECU UID is located on the back of the ECU, as well as on the front flap of the shipping box.



*The ECU UID is a unique APsystems “serial number” that is assigned to the ECU during manufacturing. It is **NOT** the IP Address of the device.*

It is critical that you enter the ECU UID correctly because the EMA uses this number to identify the system to ensure monitoring and reporting.

6. Click “OK”.

Once you have entered all of the ECU UID numbers to be installed at a specific location, go to step 3.

Step 3: Configuring the Inverter Information

Note: In order to improve the registration efficiency, you can skip this step and register inverters by scanning UIDs in step 4 “Configure the Group View” directly.

7. Click “**Add Inverter**”

The Inverter Information page is displayed.

The image displays two side-by-side screenshots of a mobile application interface. The left screenshot, titled "Add User", shows a form with sections for "Personal Information" (Username: testuser, Address: China Zhejiang Jiaxing), "ECU Information" (ECU: 216000056231, Timezone: Asia/Shanghai), "Inverter Information" (a plus icon and the word "Inverter"), "Group View Information" (a plus icon and the words "Group View"), and an optional "Upload Picture" field. The right screenshot, titled "Add UID", shows the "INVERTER INFO" section with instructions on where to find the UID, the "ECU ID" (216000052346), the "Add method" (three steps: 1. Link ECU and inverter through "ID Management" by ECU APP at the installation site. 2. Connect ECU to the internet, report the link information to EMA. 3. EMA or EMA Manager read the link information and add the inverter ID automatically.), and the "Import From ECU" option. An orange "OK" button is visible at the bottom of the right screen.

In this step you are assigning the inverters to their associated ECU(s).

8. Select the ECU (ECU Selection field).

9. Select the “*Add method*”.

There are three methods for adding inverters into EMA.

Cancel

OK

Import From ECU

Input

Scan

Note: Each inverter has a unique 12 digits UID which is located on the front of the inverter, as well as on the back flap of the inverter's shipping box.



- **Add Method 1: Import from ECU (Recommend)**
- A. Select "Import from ECU" in [Add Method]
- B. Click "OK"

This method can only be used when the ECU has been already commissioned on site (using the ECU_APP) and connected to the internet. (please see ECU Quick Install Guide for more info)

Note: This list can be edited if necessary by selecting either “*Edit*” for each inverter and its associated channel.

➤ **Add Method 2: Input**

- A. Select “*Input*” in [Add Method]
- B. Select “*Type*”.

Note: You'll be presented with a number of inverter types. Select the type you are installing, remembering that the QS1, QS1A and YC1000 has up to four (4) channels (1, 2, 3 & 4), the YC600 has two (2) channels (1&2).

C. Input the UIDs in the input box.

Note: Only UIDs matching the selected type can be added. If you select micro type "YC600" but enter UID of a QS1 "80x-", an error message will be displayed.

D. Click "OK"

➤ **Add Method 3: Scan**

A. Select "Scan" in [Add Method]

B. Select "Type"

20:16

< Add UID

INVERTER INFO ^

Collect the Inverter of PV system. UID is a 12-digit number located on the top of inverter, as well as on the front flap of the shipping box.

ECU ID *
216000056231

Add method *
Add inverter id through scanning the 12-digits barcode.
Scan

Type *
YC600

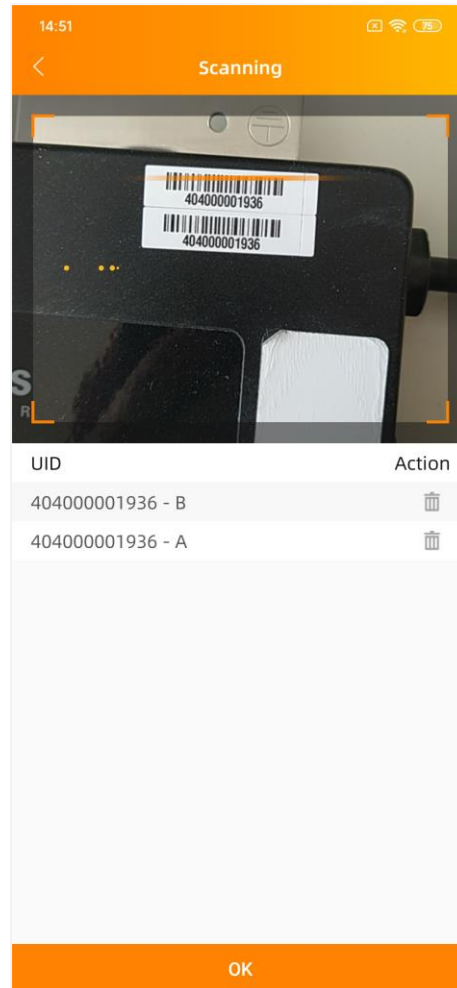
Channel *
1,2

Next

Note: You'll be presented with a number of inverter types. Select the type you are installing, remembering that the QS1, QS1A and YC1000 has up to four (4) channels (1, 2, 3 & 4), the YC600 has two (2) channels (1&2).

C. Click "Next"

The scanning page is displayed.



D. Scan the UID bar code.

Note: Only UIDs with the same type selected before can be scanned.

E. Click “OK”

Step 4: Configuring the Group View

This step will allow you to create the layout of the PV system.

11. Click **“Add Group View”**

The Create View page is displayed.

The image displays two side-by-side screenshots of a mobile application interface.

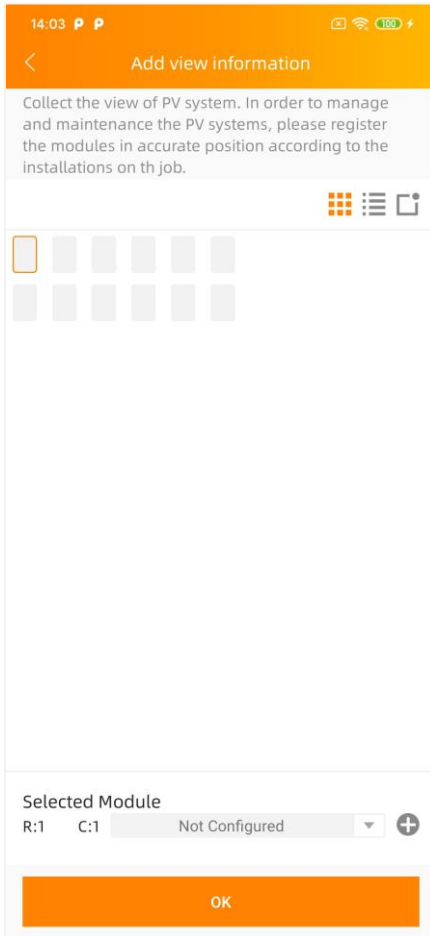
The left screenshot shows the "Add User" screen. It has an orange header bar with a back arrow, "Add User", and "Delete". The screen is divided into four sections: "Personal Information" (Username: testuser, Address: China Zhejiang Jiaxing), "ECU Information" (ECU: 216000056231, Timezone: Asia/Shanghai), "Inverter Information" (ECU: 216000056231, Number of Inverters: 2, with two input fields containing 801000001234 and 801000001235), and "Group View Information" (with a plus icon and "Group View" text). Each section has a plus icon to add more information.

The right screenshot shows the "Create View" screen. It has an orange header bar with a back arrow and "Create View". Below the header is a "Group View Info" section with a dropdown arrow and a note: "Please register the module in accurate position according to the installation on the job." Below this are four fields: "ECU ID" (with a dropdown arrow and value 216000056231), "Group View Name" (with a red asterisk and a note: "1-30 bit letters,digits,underscores,@,spaces,- or. please enter"), "Row" (with a red asterisk and a note: "1-80 please enter"), and "Column" (with a red asterisk and a note: "1-80 please enter"). At the bottom is a grey button labeled "Next".

In this step you will fill in the basic view information.

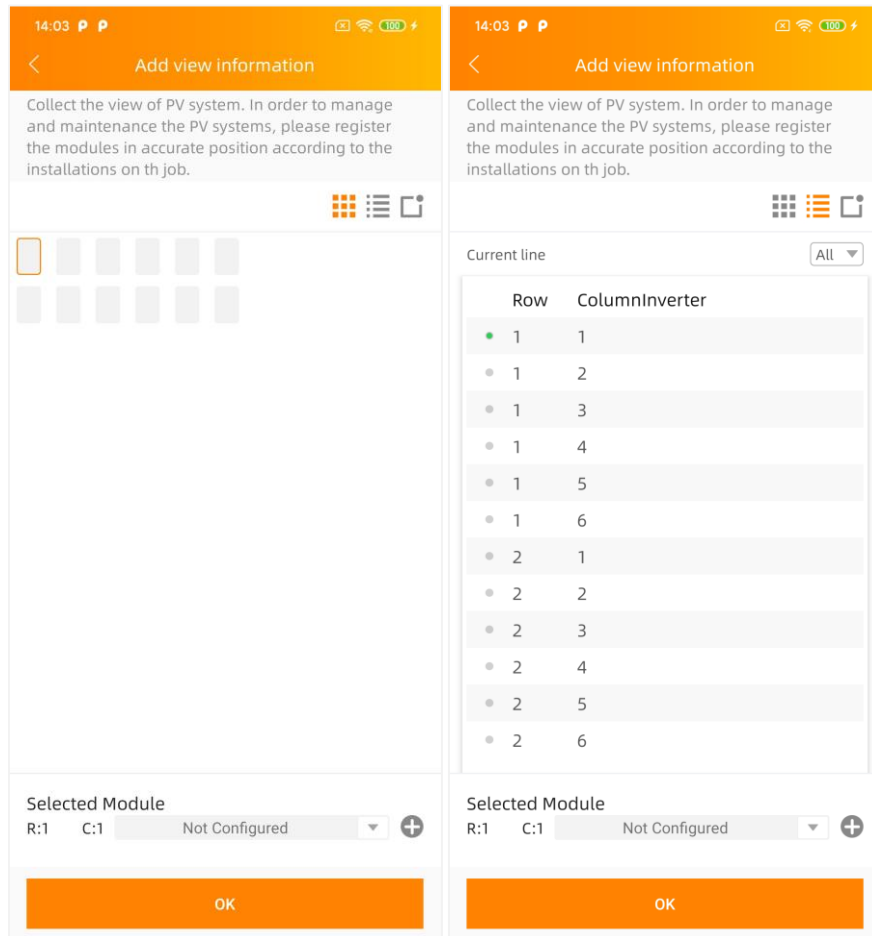
12. Click **“Next”**

The panel layout page is displayed.

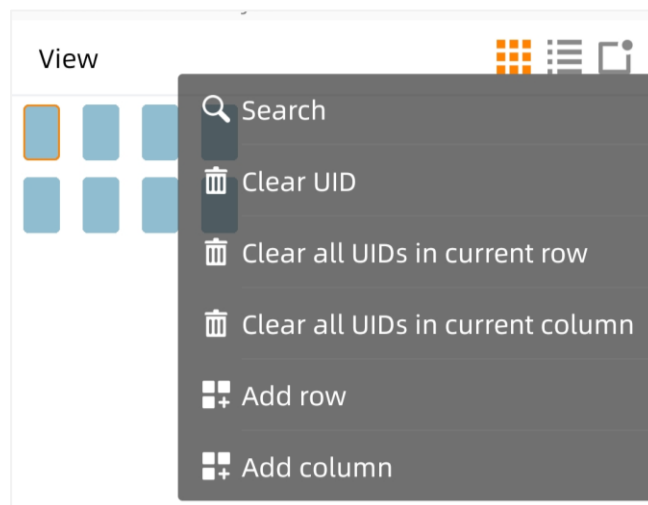


There are 2 modes to display the layout details: Module mode or list mode.

- **Module Mode:** Show the module position details in one page
- **List Mode:** Show the inverter UIDs with the position in a list format



There are 6 shortcut buttons to help you simplify the view registration.

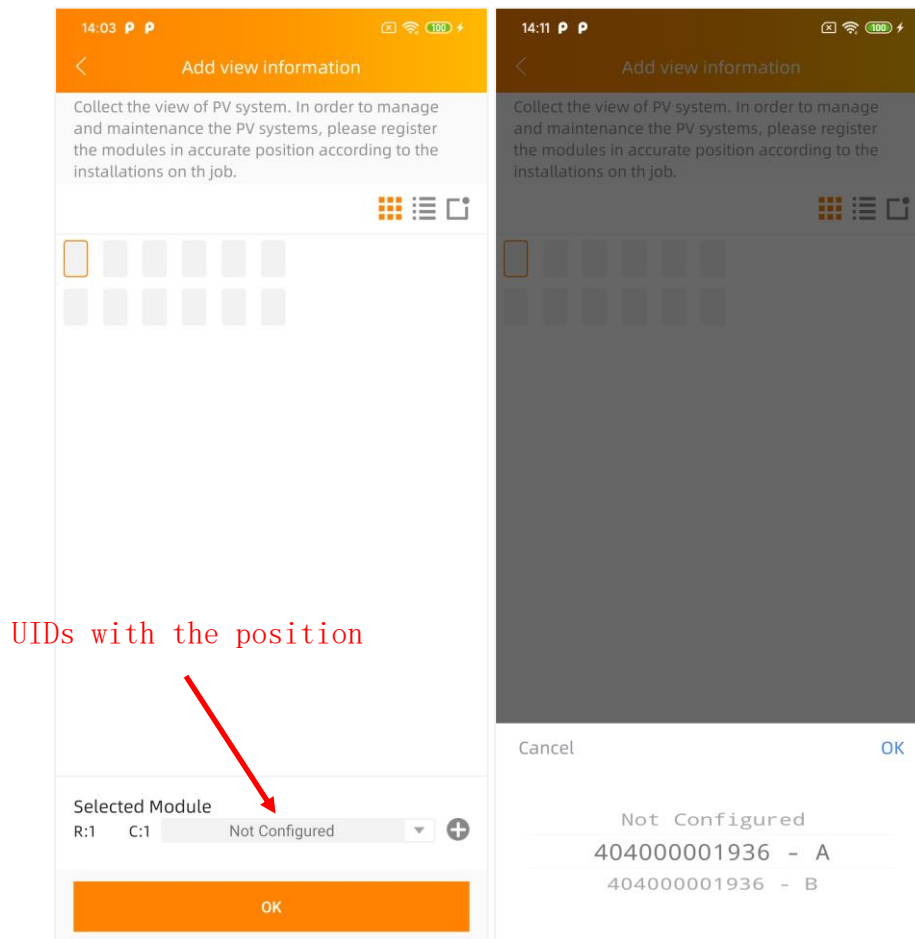


- **Search:** Search UID.
- **Clear UID:** Delete UID located on the selected module.
- **Clear all UIDs in current row:** Delete all the UIDs located in the selected row

- **Clear all UUIDs in current column:** Delete all the UUIDs located in the selected column
- **Add row:** Add a new row of empty modules to the bottom of the view.
- **Add Column:** Add a new column of empty modules to the far right of the view.

There are 3 methods for adding views into EMA.

➤ **Method 1: Distribute (Recommend)**



A. Select the UUID for the position

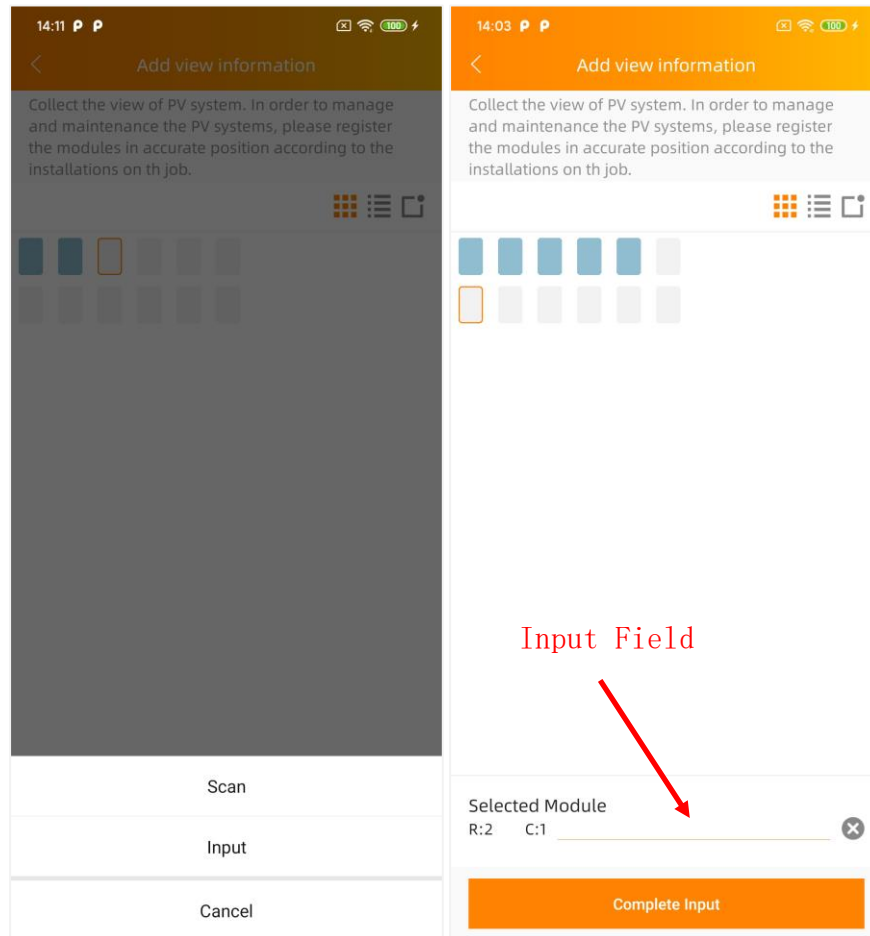
Note: When distribute the UUIDs with the position, make sure you have registered the UUIDs in step 3 (configuring the inverters information, see page 24), or you have entered all of the UUIDs into the ECU, and that ECU is correctly connected to the internet so that the APsystems server can retrieve the UUIDs.

B. Click “OK”

➤ **Method 2: Input**

A. Click + “Add Button” and choose “Input”

The input page is displayed.



Input the UIDs in input field, the channel will be auto filled after you entered the UID.

B. Click “*Complete Input*” after finishing inputting

14:03 P P

Add view information

Collect the view of PV system. In order to manage and maintenance the PV systems, please register the modules in accurate position according to the installations on th job.

Selected Module

R:2 C:5 Not Configured +

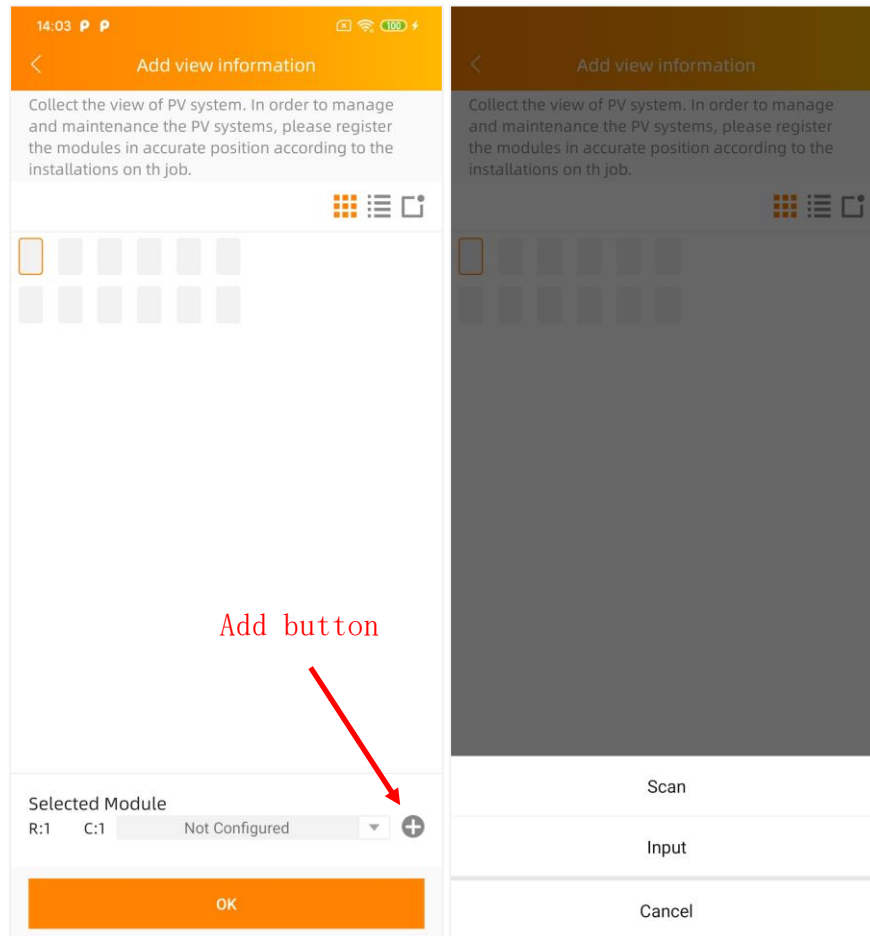
OK

C. Click “Ok”

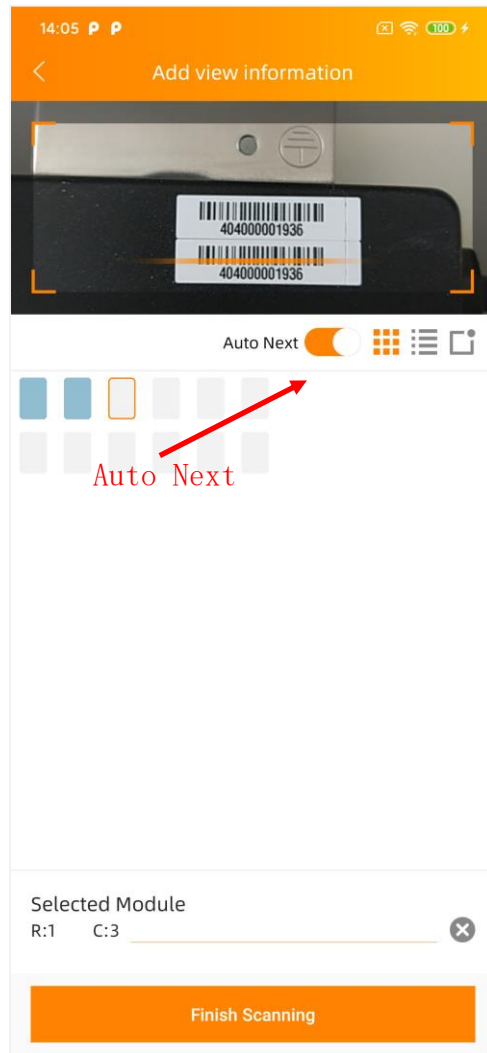
➤ **Method 3: Scan**

A. Click + “Add Button” and choose “Scan”

The scan page is displayed.



Scan the UID bar code to collect the UIDs. Please register the modules in accurate position according to the installations on the job.



Note: Turn on “Auto Next”, the next empty panel will be automatically selected in horizontal sequence when scanning. Or else you need to choose the next panel.

- B. Click “Finish Scanning”
- C. Click “OK”

Note: The inverter ID can be registered as well even if it hasn’t been registered in Step 3 “Configuring the inverter information” (see page 24]

20:21 [Icons]

< Add User Delete

Personal Information

Username : testuser
Address : China Zhejiang Jiaxing

ECU Information

ECU : 216000056231
Timezone: Asia/Shanghai

+ ECU

Inverter Information

ECU : 216000056231
Number of Inverters : 2
801000001234 801000001235

+ Inverter

Group View Information

Group View : East View
R:2 C:2 Number of Panels: 4

+ Group View

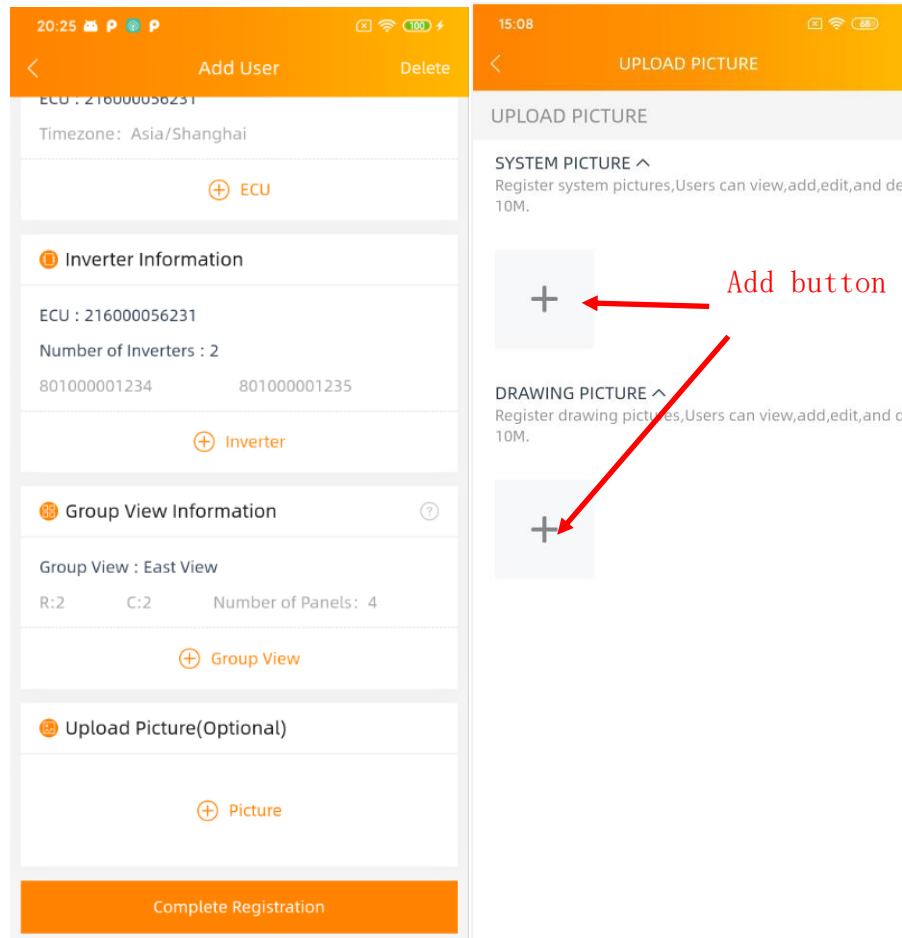
13. Click “**Complete Registration**”

If your customer does not have installation drawings or photo to upload, the registration is complete.

Step 5: Uploading the System Picture and/or Drawing Picture (optional)

14. Click “**Upload Picture**”

The upload picture page is displayed.



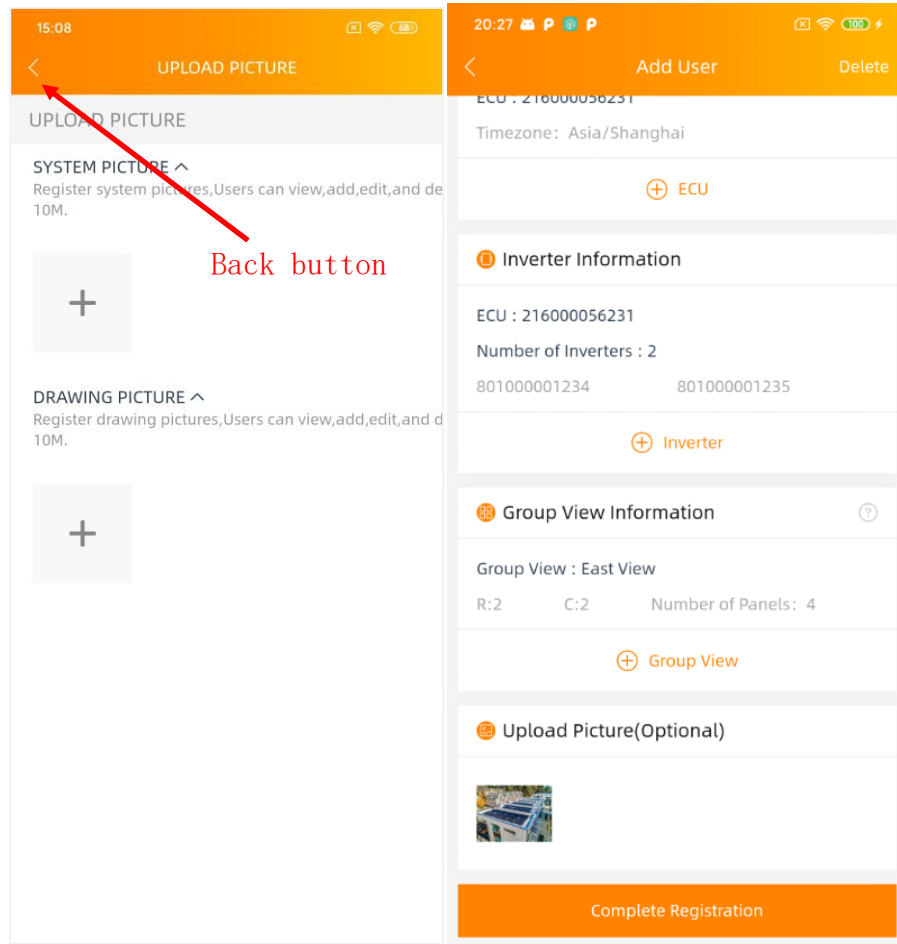
The System Picture is displayed on the customer's Dashboard and the installation drawings are displayed on the customer's Module Performance page.

Following formats are supported:

- .jpeg
- .jpg
- .png
- .pdf

15. Click "Add"

Choose the installation drawing or photo you want to upload. Make sure you have authorized the EMA Manager APP to access to the pictures stored in your smart phone or tablet.



16. Once the pictures or drawings have been uploaded, Click “Back” and then “**Complete Registration**”.

5.1.2 Adding a New Share User Installation

Multiple customers' PV system can be monitored via a single ECU using ECU Share mode.

The “master” of ECU Share can see all sub-systems, while every owner of a sub-system can only see its own.

Require: First: register “Share ECU Master User”, then: register “Share ECU Sub User”.

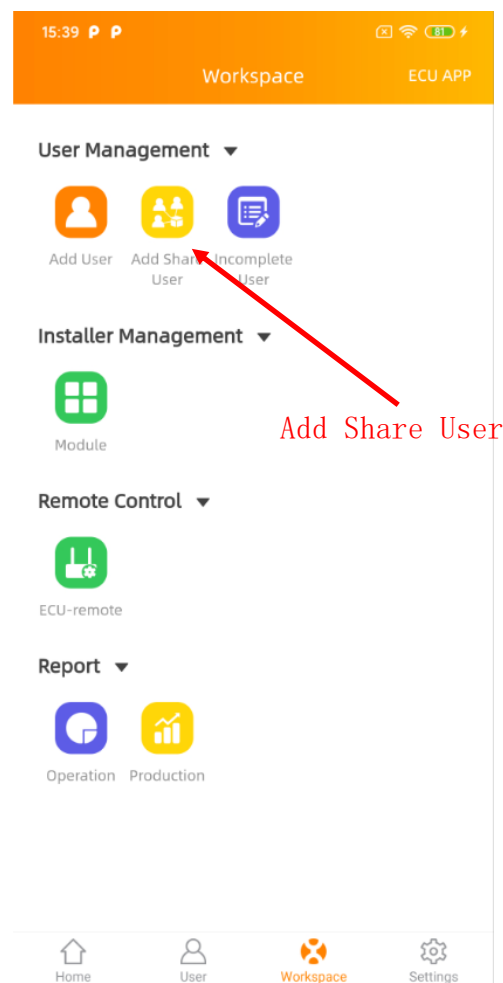
- Master User

Manage all of the micros connected to the same ECU

- Sub User

Monitor their own system only

Note: In order to register sub-user via ECU Share mode, you need to have the “ECU Share” function enabled on your installer account. Please contact your local APsystems Technical Support to have this feature activated.



1. Select the “**Add Share User**” icon.

Start to add a new share user account.

Adding Share ECU Master User

The screenshot shows a mobile application interface for adding a new share user. At the top, there is an orange header bar with the time '15:09' on the left and status icons (signal, Wi-Fi, battery) on the right. Below the header, the title 'Share User' is centered. Underneath the title, there are two tabs: 'Master User' (which is selected and highlighted with an orange underline) and 'Sub User'. The main content area is divided into five sections, each with a header and a corresponding add button (a circle with a plus sign):

- Personal Information:** The header has a person icon. Below it is a button labeled 'Personal Information'.
- ECU Information:** The header has a car icon. Below it is a button labeled 'ECU'.
- Inverter Information:** The header has a gear icon. Below it is a button labeled 'Inverter'.
- Group View Information:** The header has a group of people icon and a question mark icon on the right. Below it is a button labeled 'Group View'.
- Upload Picture(Optional):** The header has a camera icon. Below it is a button labeled 'Picture'.

There are five (5) major steps involved in adding a new Share ECU Master User (registering) in the EMA Manager. They are the same as the ones used to add a new user (For details, please refer to “*Adding a New User Installation*”).

Step 1: Personal Information - Entering the customer’s personal information.

Step 2: ECU Information - Configuring the Energy Communication Unit (ECU).

Step 3: Inverter Information - Configuring the Inverter Information.

Step 4: Group View Information - Configuring the Group View.

Step 5: Upload Pictures (optional) - System Picture and/or Drawing Picture

Adding Share ECU Sub User

The screenshot shows a mobile application interface for adding a sub-user. At the top, there's an orange header with a back arrow, the title 'Share User', and status icons. Below the header, there are two tabs: 'Master User' and 'Sub User', with 'Sub User' being the active tab. The main content area is divided into several sections, each with a plus icon and a label: 'ECU Information' (with a red arrow pointing to it and the text 'Add Share ECU First'), 'Personal Information', 'Group View Information', and 'Upload Picture(Optional)'. Each section has a corresponding plus icon and label below it: '+ ECU', '+ Personal Information', '+ Group View', and '+ Picture'. At the bottom, there is a 'Complete Registration' button.

There are four (4) major steps involved in adding a new Share ECU Sub User in the EMA Manager.

Step 1: ECU Information - Configuring the Energy Communication Unit (ECU).

Note: When add new share ECU sub user, you need to add the share ECU first.

11:05

< Add ECU

ECU Info ^

Input the accurate shared ECU ID. The shared ECU sub-user will share the system information with shared ECU master user once the ECU was registered below shared ECU master user.

ECU ID *

12-digit number located on the top of ECU, or on the front flap of the shipping box.

please enter

OK

Step 2: Personal Information - Entering the customer's personal information.

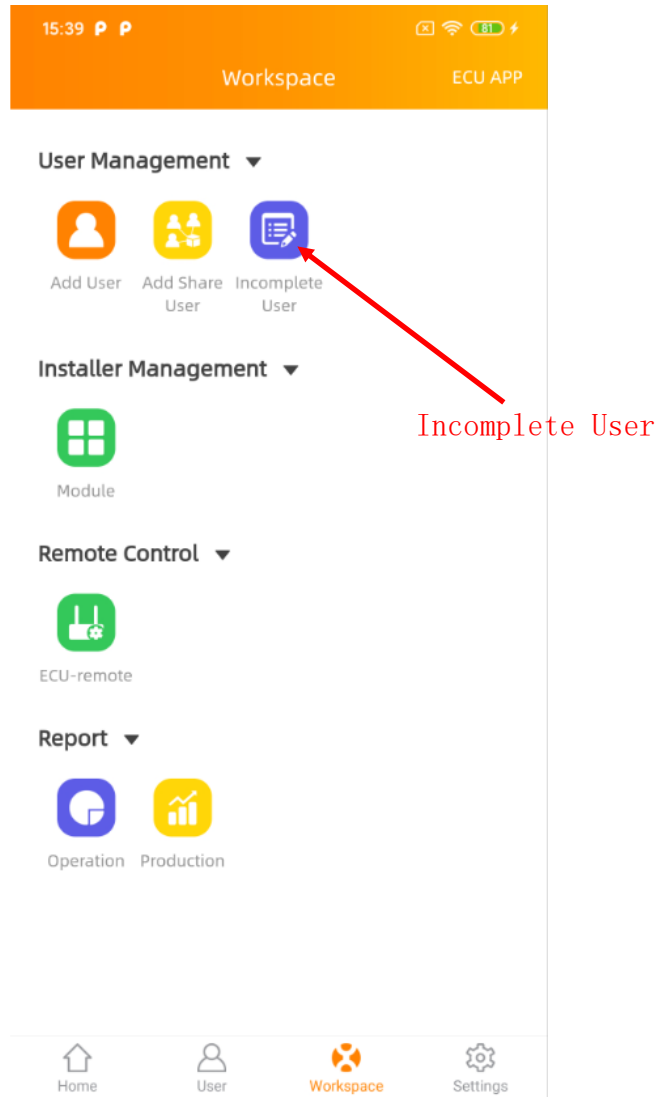
Step 3: Group View Information - Configuring the Group View.

Note: In this step, you are only permitted to arrange the inverters.

Step 4: Upload Pictures (optional) - System Picture and/or Drawing Picture.

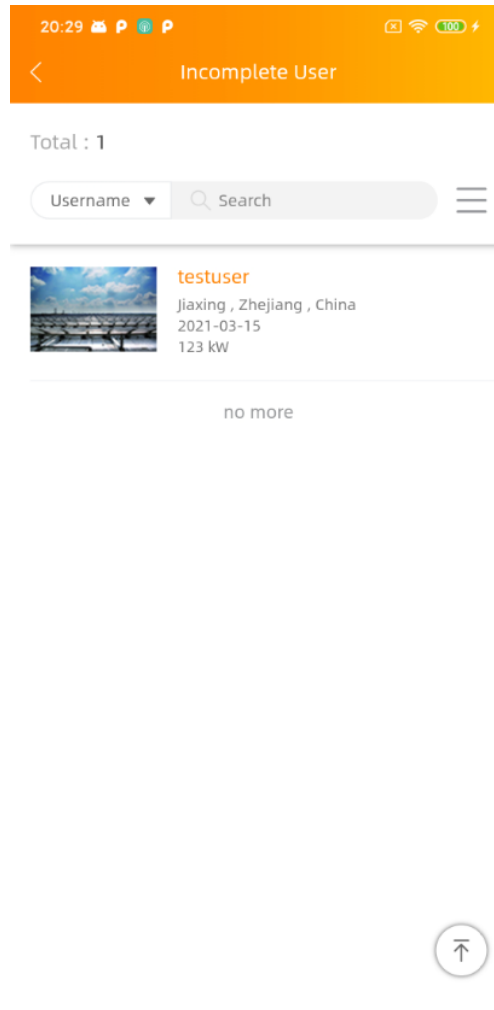
5.1.3 Resume an Incomplete Registration

In case you were interrupted in any of the registration steps (1-5), your customer's information is saved in the system. You can resume the registration by selecting *"Incomplete User"* under *"User Management"*.



1. Select the ***"Incomplete User"*** icon.

A list of your incomplete user registrations is displayed.



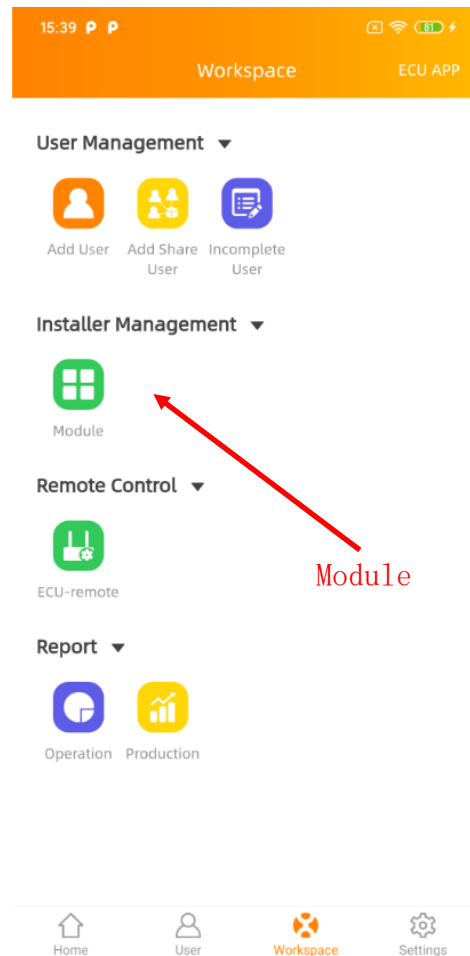
2. Select the customer account you want to complete.
3. Continue where you left off following the steps in the previous section. Refer to **[5.1.1 Adding a New User Installation]** or **[5.1.2 Adding a New Share User Installation]**.

5.2 Installer Management (*Installer Level*)

5.2.1 Adding a New Module

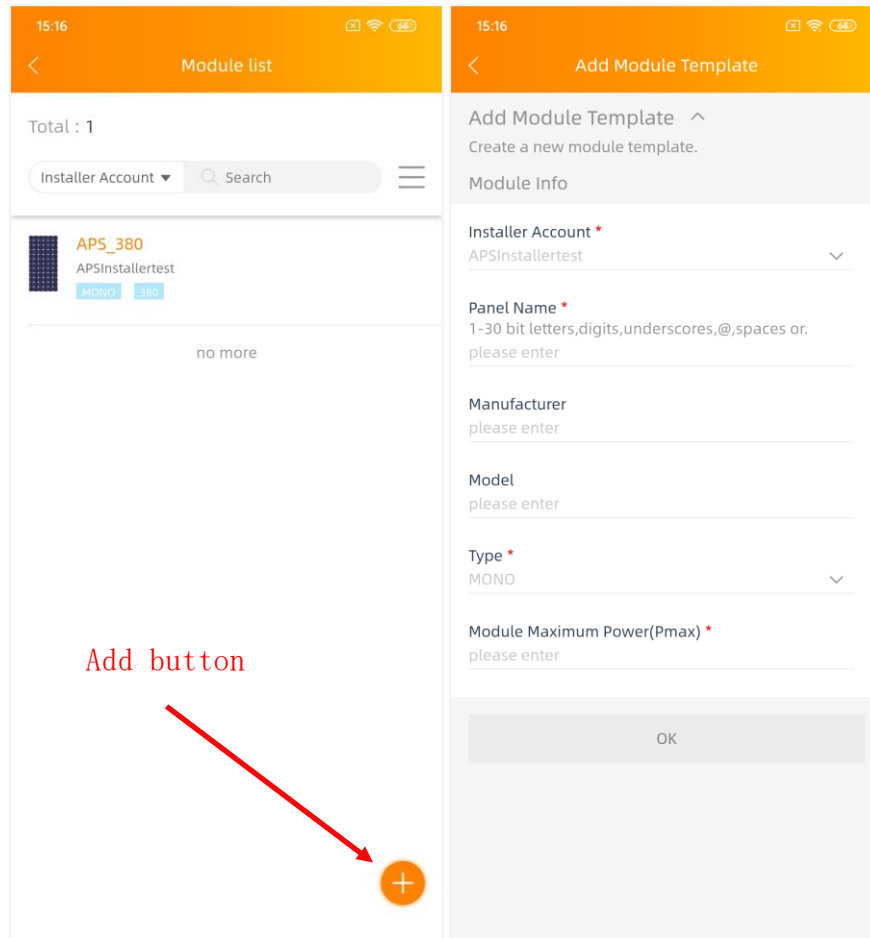
You can manage your module template or for your sub-installers.

The module template could be used to distinguish the module type installed at end-user.



1. Select the “**Module**” icon.

A list of module templates is displayed.



2. Click “Add” at the bottom right of the list.

The New Module page is displayed. Fill in the module details by field, make sure to include all required information.

Note: You can select a module to modify its information.

➤ Module Information

Installer Account Select the installer you want to add a new module template. It is displayed when you have a Master Installer account and sub-installers in your portfolio.

Panel Name This is a single “name” that identifies this specific panel (**Required**)
Only “letters”, “numeric digits”, “underscores”, “@”, “spaces”, and “.” Can be used when creating a username. the username is not case sensitive. (**Required**)

Module Maximum Power The maximum power of module template. (**Required**)

<i>Type</i>	The type of module template. (Required)
<i>Manufacturer</i>	Company name of module template. (Optional)
<i>Model</i>	The model of module template. (Optional)

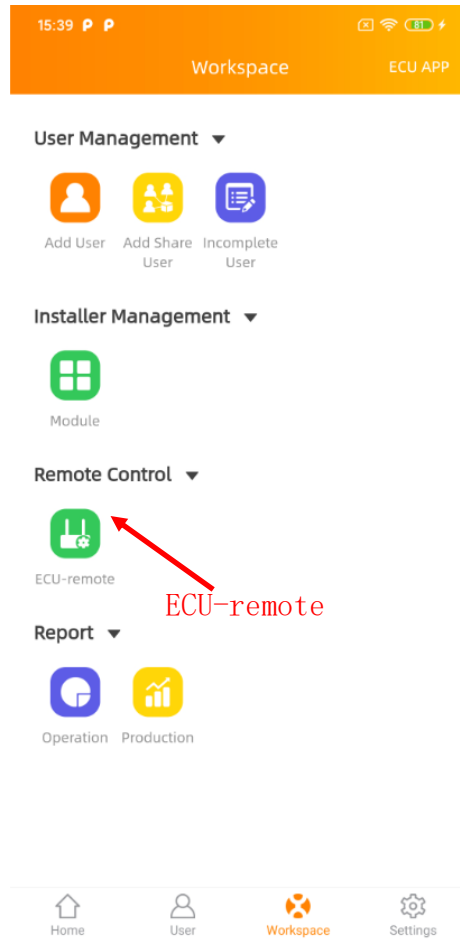
5.3 Remote Control– ECU Management (*Installer Level*)

The ECU has been designed with remote connection and management functionality.

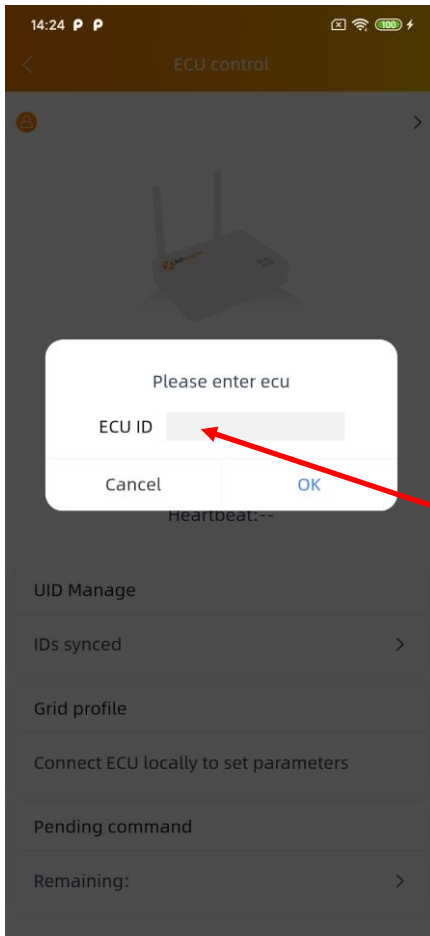
You can access this remote functionality through the EMA Manager APP, using your installer login credentials. Changes made remotely do not take effect until the ECU's next reporting cycle.

The ECU remote functionality allows you to do the following:

- Manage Inverter UIDs



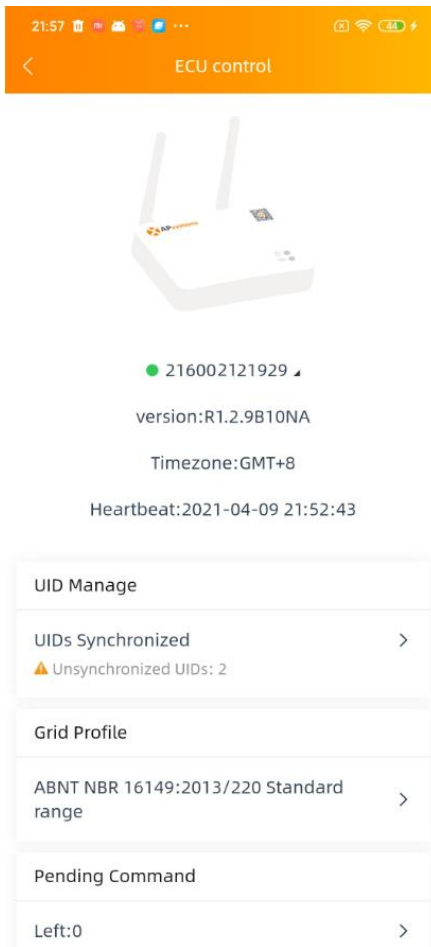
1. Select the ***“ECU-remote”*** icon.



Input field

2. Enter the ECU ID

The remote control page is displayed. You can get overview the ECU's configurations, including the version of software in ECU, the time zone ECU set, the ECU's heartbeat (The last time ECU connected to the EMA) server.

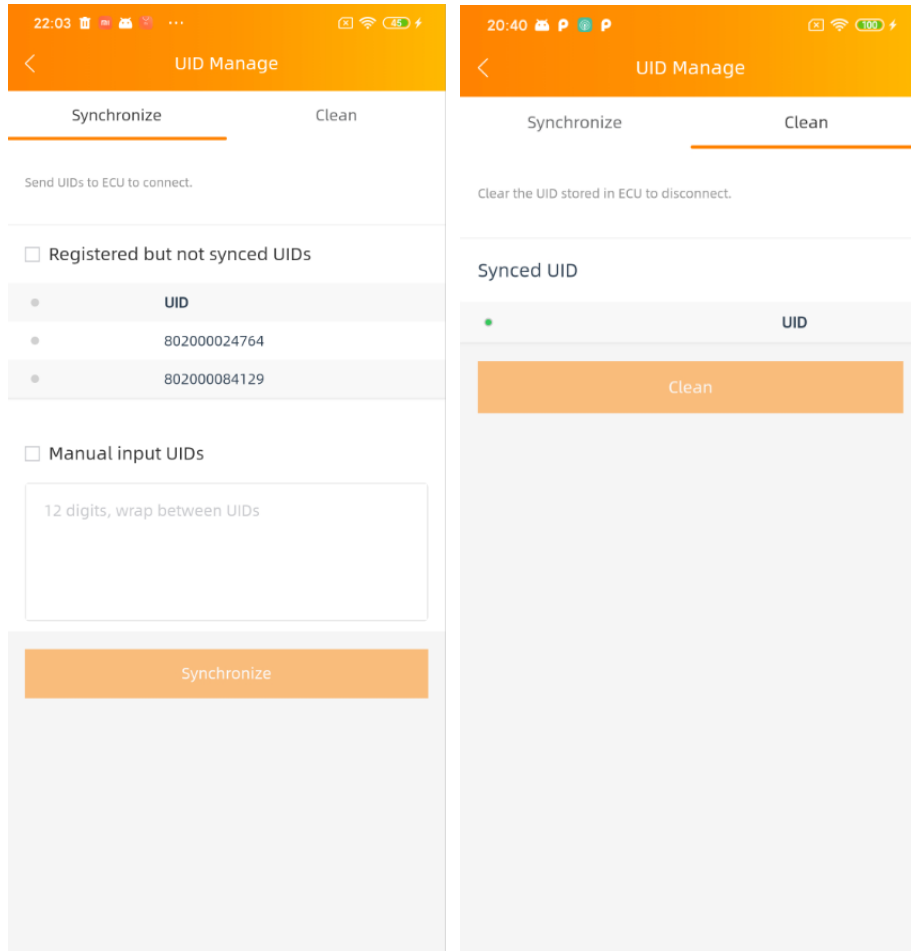


Note: You can enter this function as well by clicking “*ECU-remote*” below “*Remote Control*”. Refer to [4.4 *Workspace (End User Level)*] - see pages 15.

5.3.1 Manage Inverter UIDs

1. Click the “*UID Manage*”.

The “UID manage” page is displayed.



Note: If there are some micros UID's registered in EMA but not sent to ECU, it will show a warning icon.

- **Synchronize** (Send the UID's to ECU, then ECU will connect these inverters.)

You can send a list of UID's registered in the EMA but not synchronized into the ECU, either one by one or as a group.

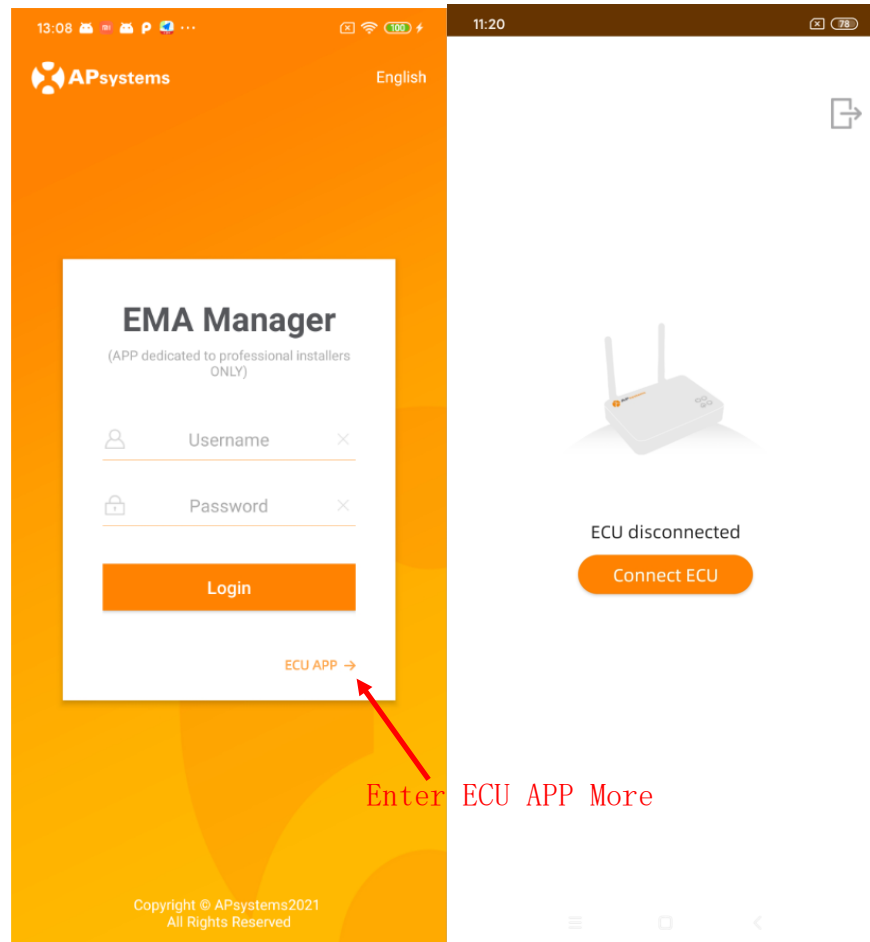
- **Clean** (Send the UID's to ECU, then ECU will disconnect this inverters)

Select the UID's you want to disconnect.

6. Local Control (*ECU APP*)

The ECU has been designed with local connection and management functionality. You can access this local functionality through EMA Manager.

Click “*ECU APP*” to enter this function.

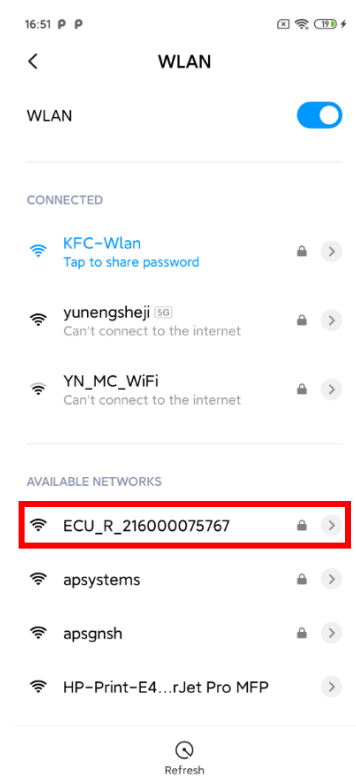


You will be noticed if your smart phone or tablet do not connect to the ECU Wi-Fi at first.

- Step1: press the AP button of the ECU to activate the ECU wifi hot-spot



- Step2: Open Wi-Fi setting in your smartphone, select ECU's hotspot. Hotspot's name is similar to ECU's ID.



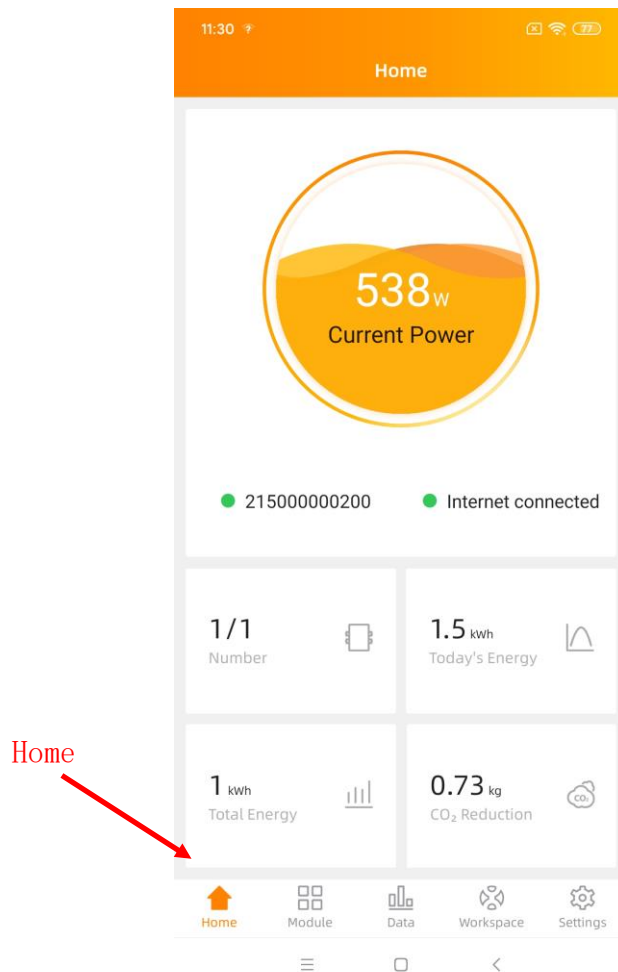
- Step3: Connecting to the ECU-R via the Local Wireless.

Note: The default password is “88888888”. (8 times 8)

- Step 4: Open EMA Manager.
- Step 5: Click “**ECU APP**” to enter “**Local Control**”

Note: Once logged-in, you can also click “**ECU APP**” at the upper right corner of “**Workspace**” to enter “**Local Control**”. View it in “5. Workspace (Installer Level)”.



6.1 Home (ECU APP)





On the home page, installer can visualize:

- Systems info of ECU ID
- The number of connected inverters communicating with the ECU / total number of inverters installed
- Today's power output
- Total power output since installation
- CO₂ Reduction since installation

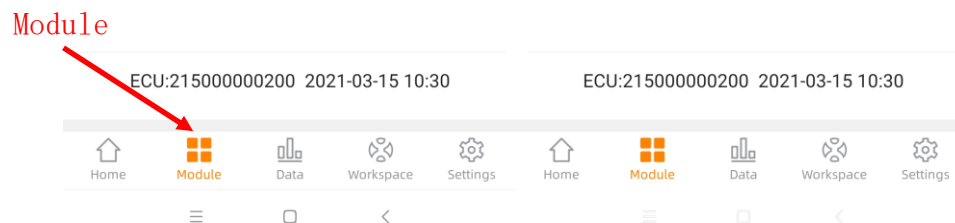
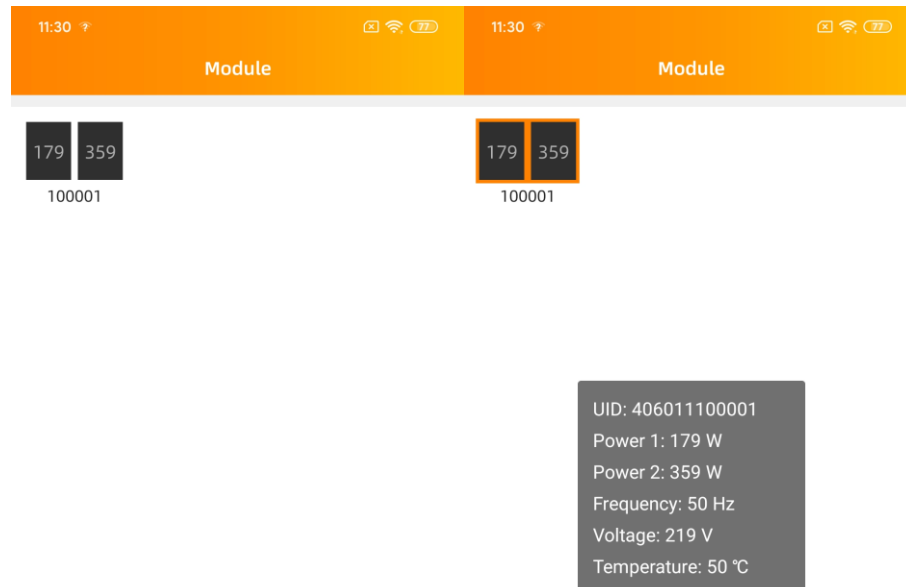
The light in front of the ECU UID shows the status between mobile phone and ECU:

-  : The mobile phone connects to the ECU.
-  : The mobile phone fails to connect to the ECU.

The light in front of "Internet disconnected" shows the status between ECU and internet.

-  : The ECU connects to internet.
-  : The ECU fails to connect to the internet.

6.2 Module (ECU APP)



On the module page, installer can visualize the performance of inverters connected to the ECU.

According to different models of inverter, each inverter would have the corresponding panels displaying the real time power.

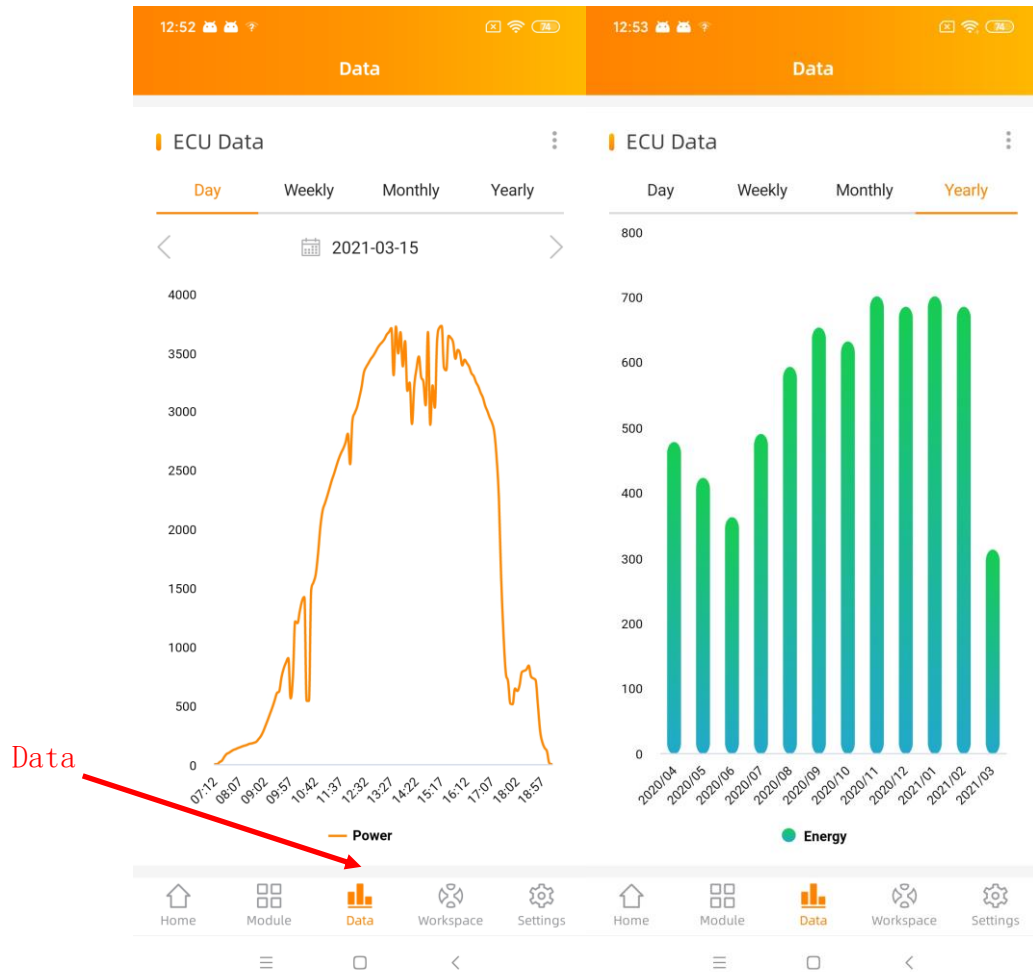
(even if some DC channels are not connected on purpose, the ECU_APP will display the maximum number of panels which can be connected to a given micro-inverter

Example: if only 3 inputs of a QS1 or YC1000 are used, the ECU_APP will display 4 modules connected to the micro, even if the 4th module does not exist)

Removing the non-connected panel is done when creating the layout of the PV system in end-user account creation (step 4)

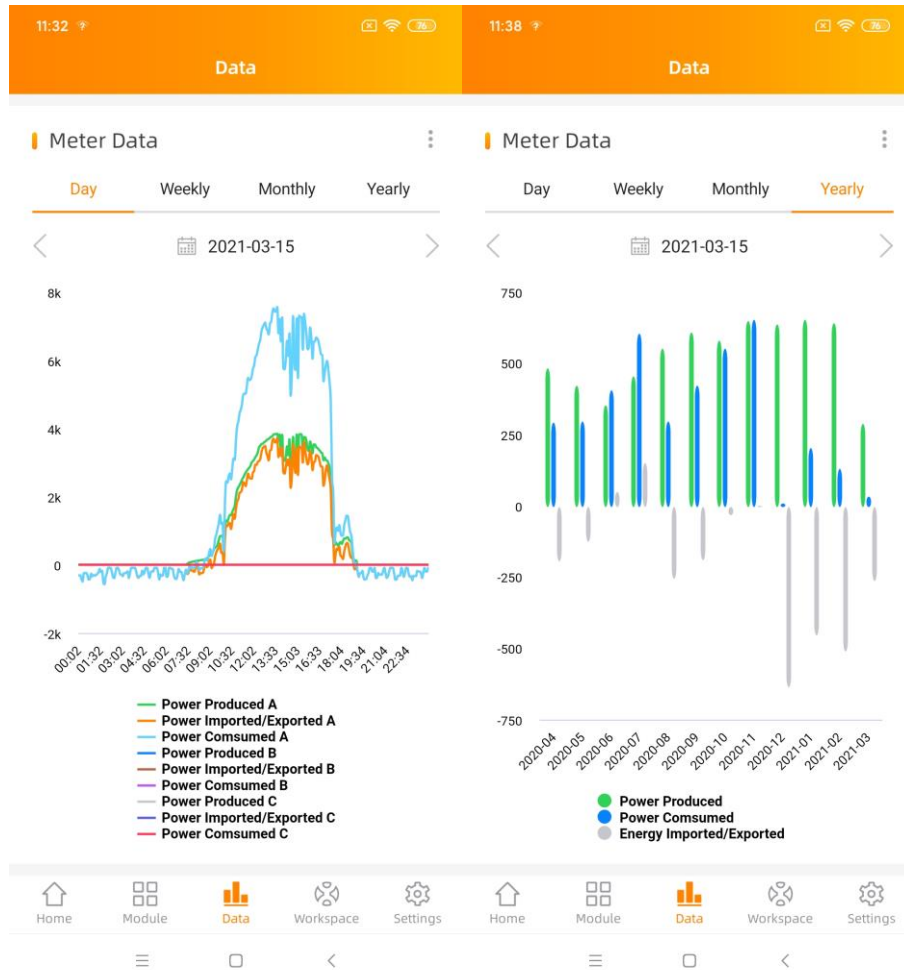
Click “Panel”, the detailed information of the inverter shall be displayed, including inverter ID, PV module power, grid voltage, frequency and temperature.

6.3 Data (ECU APP)



In this page, you can view the detailed data on ECU level:

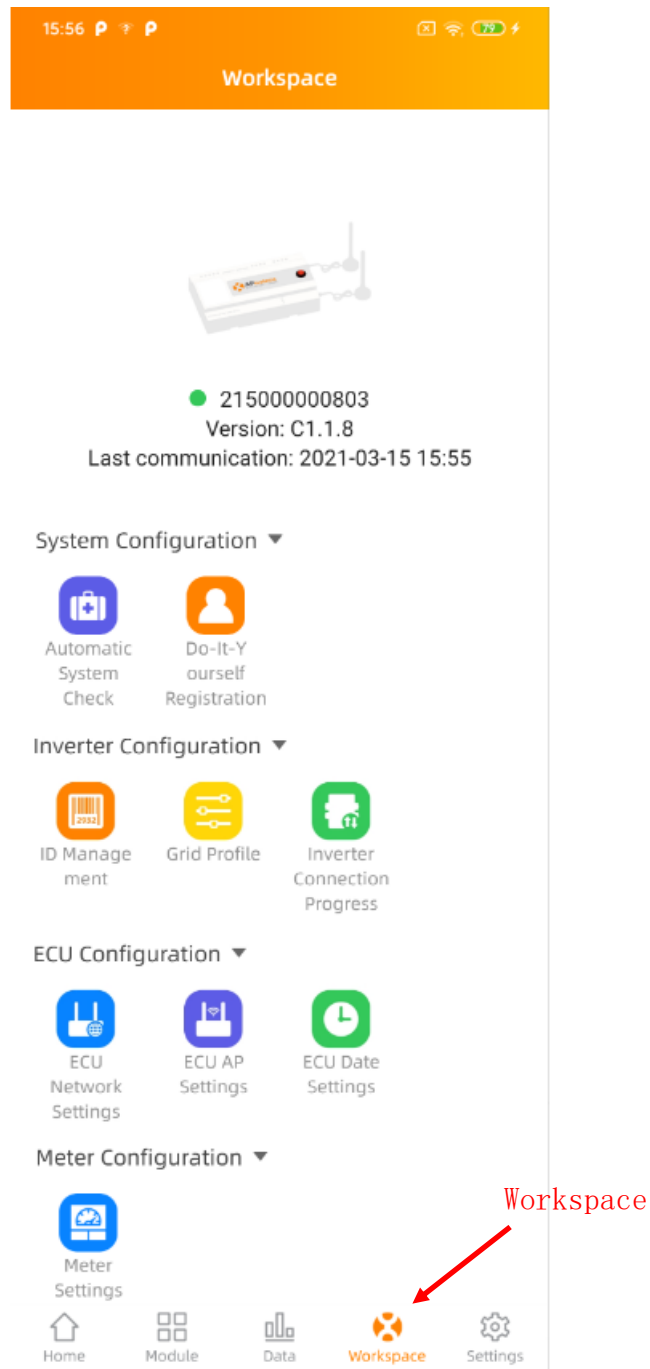
- Per day
- Per month



Note: If it is a ECU-C, with metering functions activated and CTs (current transformers) in place, you can also visualize PV production, house-hold consumption and grid import/export data on meter level.

6.4 Workspace (ECU APP)

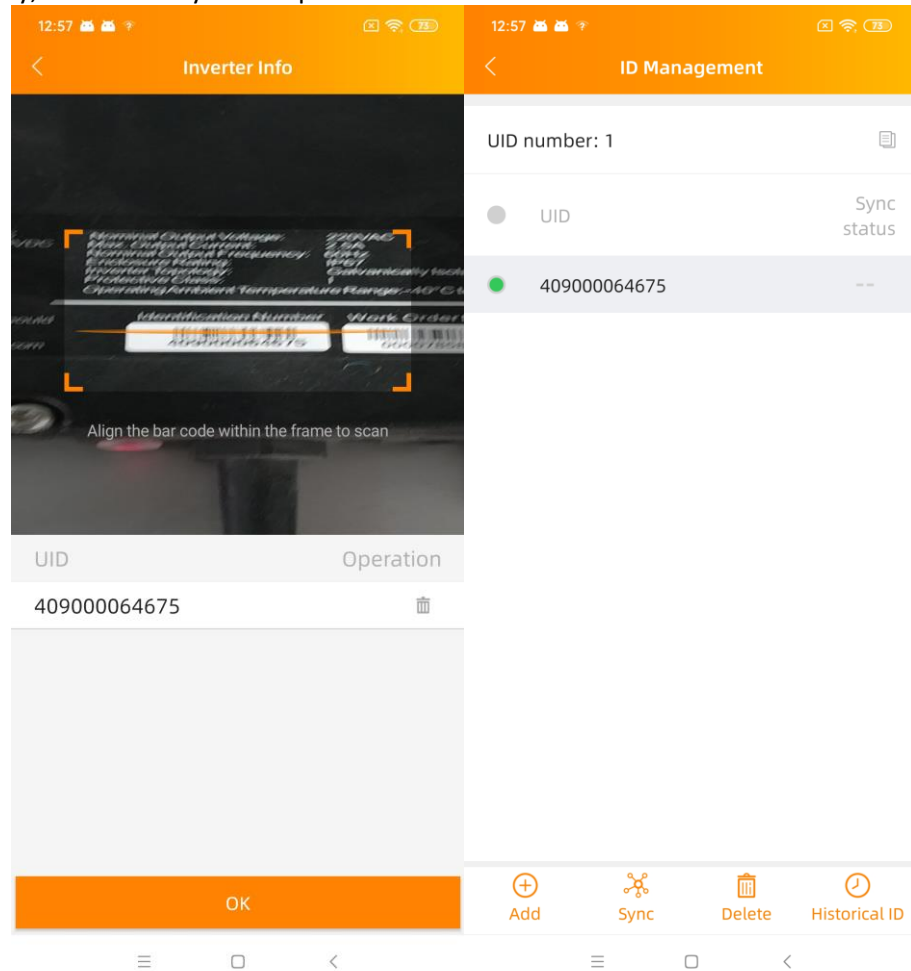
In this View, you can manage the ECU's system information.



6.4.1 ID Management

➤ Add UID

Click “**Workspace**”, select “**ID Management**”, input the UID manually or scan the UID by camera. If there is no need to modify, then click “Sync” to update the UIDs onto ECU.



➤ **Historical ID**

You can find the UID used in history and you can restore them.

Select the desired history ID and click “Restore”, these IDs will be added in the ID list.

When you want to enter the inverter ID list in one ECU into another, this feature becomes very handy.



➤ **Delete UID**

Select the UIDs, click “Delete” then click “Sync”. The UIDs selected are deleted on the ECU.

6.4.2 Grid Profile

User needs to select grid profile when installing the system.

The image displays two side-by-side screenshots of a mobile application's 'Grid Profile' settings screen. The left screenshot shows the initial state where 'Continent', 'Country', and 'Grid profile' are all set to 'Please Select'. The right screenshot shows the settings after selection: 'Continent' is 'Asia', 'Country' is 'China', and 'Grid profile' is 'NB/T 32004:2018'. Below these settings, there is a section for 'Current grid profile' with various voltage and trip time parameters for stages 2 and 3. At the bottom, there are 'Reset' and 'Update' buttons.

Parameter	Value
Under voltage (stage 2)	115.0 V
Under voltage 2 trip time	0.02 s
Over voltage (stage 2)	268.0 V
Over voltage 2 trip time	0.02 s
Under voltage (stage 3)	196.0 V
Under voltage 3 trip time	0.05 s
Over voltage (stage 3)	253.0 V

Common

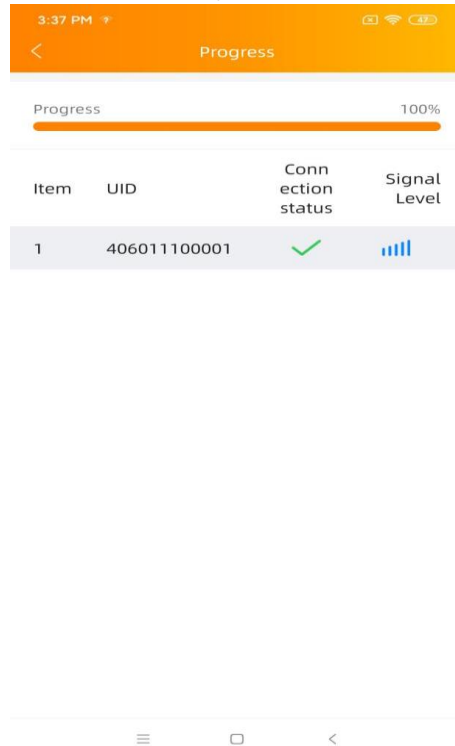
Continent	Country	Grid profile
Asia	China	NB/T 32004:2018
Europe	Sri Lanka	Taiwan VPC
North America		Taiwan VPC(TB)
South America		

Reset Update

Note: If you select a grid profile not adequate in your region, the inverters may not start or may not produce as per optimal performance

6.4.3 Inverter Connection Progress

Show the direct communication quality between each inverter and ECU. Show the connection progress and communication quality between each inverter and ECU, 100% means the connection is finished.



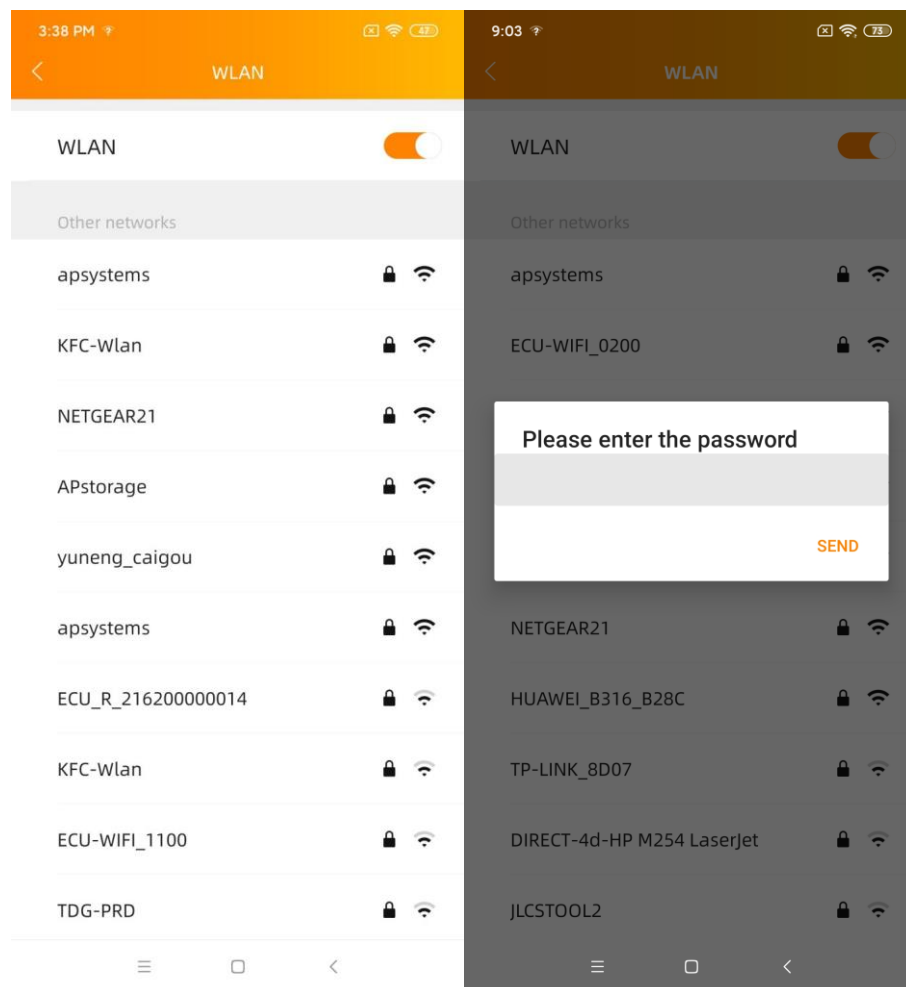
6.4.4 ECU Network Settings

➤ WLAN

The page will show up ECU's wireless connection status. Swipe down the screen and choose the available SSID to connect.

- Step1: Click the SSID.
- Step2: Enter the password.
- Step3: Click "**Send**"
- Step4: ECU restarts automatically.

Note: You need to reconnect your smart phone or tablet to the ECU's hotspot if the connections failed once the signals disappeared during the ECU restarting time.



➤ LAN

ECU's wired network setting has 2 options: automatically obtain an IP address or use a fixed IP address. Obtaining an IP address automatically means the router would distribute IP to ECU automatically. When use fixed IP, please enter IP address, Subnet mask, Default gateway, Preferred DNS server and Alternate DNS server.

The image displays two side-by-side screenshots of the ECU's LAN configuration interface. Both screens show the same settings, but the 'Obtain an IP address automatically' toggle is turned off in the left screenshot and turned on in the right screenshot.

Setting	Left Screenshot (Toggle Off)	Right Screenshot (Toggle On)
Obtain an IP address automatically	Off	On
MAC address	80:97:1B:02:6A:F7	80:97:1B:02:6A:F7
IP address	192.168.131.228	192.168.131.228
Subnet mask	255.255.255.0	
Default gateway	192.168.131.0	
Preferred DNS server	0.0.0.0	
Alternate DNS server	0.0.0.0	
Update button	Visible	Not visible

6.4.5 ECU AP Settings

Please reconnect the ECU's hotspot after setting the password. On the page, you can change Password.

If user forgets the password, hardware reset could be carried out. The initial password would be "88888888".

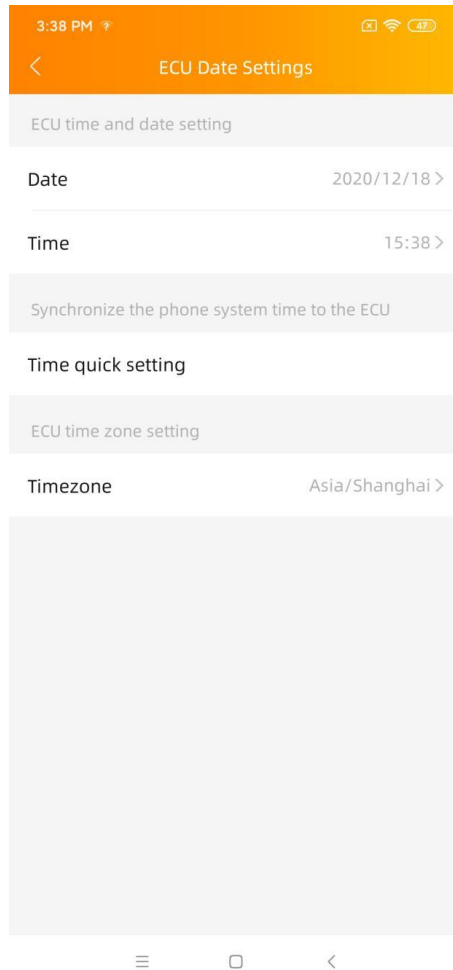
The screenshot shows a mobile application interface for "ECU AP Settings". At the top, there is an orange header bar with a back arrow on the left, the title "ECU AP Settings" in the center, and status icons (time 3:38 PM, signal, Wi-Fi, and battery at 47%) on the right. Below the header, there are three input fields, each with a label on the left and a placeholder text on the right: "Old Password" with "Input old password", "New Password" with "Input password", and "Confirm" with "Input password again". Below these fields is a light gray informational box containing the text: "Please reconnect the ECU's hotspot after setting the password". Underneath this box is a large, light gray rectangular area, and above it is a "Save" button in orange text. At the very bottom of the screen, there is a standard Android navigation bar with three icons: a hamburger menu, a square home button, and a back arrow.

6.4.6 ECU Data Settings

Enter the page, the time and time zone of ECU shall be displayed on the right side of the page.

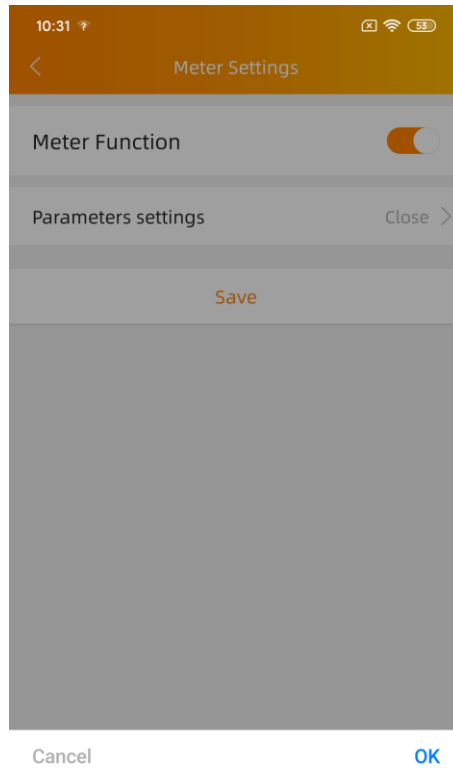
Click “Date”, “Time” or “Timezone” to modify.

Click “Time quick setting”, APP will set the date and time of the phone for ECU, user doesn't need to set date and time manually.



6.4.7 Meter Settings

If it is a ECU-C, with metering functions activated and CTs (current transformers) in place, the meter settings will be displayed, and different control functions can be selected.



Close

Zero Export

Redundant Energy Control

Three Phase Balance

➤ **Zero Export (only works with ECU-C in single phase and tri-phase systems)**

Zero Export Function

- Only works with ECU-C in Single-phase and Three-phase systems
- Not compatible with Split-phase systems as commonly used in North American residential electrical service

Using the Zero Export function

- Select 'Meter Settings'
- Slide the 'Meter Function' to the 'On' position
- Select 'Zero Export' in the slide menu at the bottom of the page and select OK
- After turning on the Zero Export Function, please set a Power Limit in kW. The default value is 0.

The ECU-C measures the array production and site consumption and will curtail power production to meet (or exceed if selected) the site consumption. Example: if the Power Limit is set to 0 and the site is using 10kW and the array is producing 8kW the inverters will operate at 100%. Conversely, if the if the if the Power Limit is set to 0 and the site is using 3kW and the array can produce 8kW the inverters will curtail power production to meet the demand. In addition, the ECU-C is designed to dynamically adjust to the changing demand of the site automatically in real-time to realize the full potential of the array.

The screenshot shows a mobile application interface for 'Meter Settings'. At the top, there is a status bar with the time 10:42, signal strength, Wi-Fi, and battery level (53%). Below the status bar is a yellow header with a back arrow and the title 'Meter Settings'. The main content area has a light gray background and contains several settings sections separated by horizontal lines. The first section is 'Meter Function' with a toggle switch that is currently turned on. The second section is 'Parameters settings' with a sub-section 'Zero Export' and a right arrow. The third section is 'Power Limit' with a text input field containing '12.000' and a unit selector 'kW'. The fourth section is 'Inverter 3-Phase Configuration' with a status 'Not Configured' and a right arrow. At the bottom of the settings area is a yellow 'Save' button. Below the settings area is a large, empty gray rectangular box.

➤ **Redundant Energy Control – only works with one single phase equipment**

Redundant Energy Control Feature

- Only works with ECU-C in Single-phase
- Cannot be combined with zero-export feature

Using the Redundant Energy Control function

- Select 'Meter Settings'
- Slide the 'Meter Function' to the 'On' position
- Select the 'Redundant Energy Control' under 'Parameter settings'

This function is to control the opening of the external AC contactor by closing the ECU-C relay when the power of the uploaded power grid reaches a certain power value, to supply power to external electrical equipment e.g., water heater, pool pump, air conditioner, etc. Example: the power requirements of a water heater is 2kW, and the turn-on threshold can be set to 2.1kW (it is recommended to keep a margin), so when the array power exceeds 2.1KW compared to the house-hold consumption, the water heater is powered by the relay control and does not consume grid power.

The screenshot shows a mobile application interface for 'Meter Settings'. At the top, there is a status bar with the time 10:42, signal strength, Wi-Fi, and battery level (53%). Below the status bar is an orange header with a back arrow and the title 'Meter Settings'. The main content area has a white background with a light gray border. It contains a toggle switch for 'Meter Function' which is currently turned on (orange). Below this is a section titled 'Parameters settings' with a right arrow. Under 'Parameters settings', there is a sub-section 'Redundant Energy Control' with a right arrow. Below this, there is a 'Power Limit' field with a value of '40.000' and a unit of 'kW'. At the bottom of the form, there is a 'Save' button.

➤ **Three-phase Balance (only works with ECU-C in tri-phase systems)**

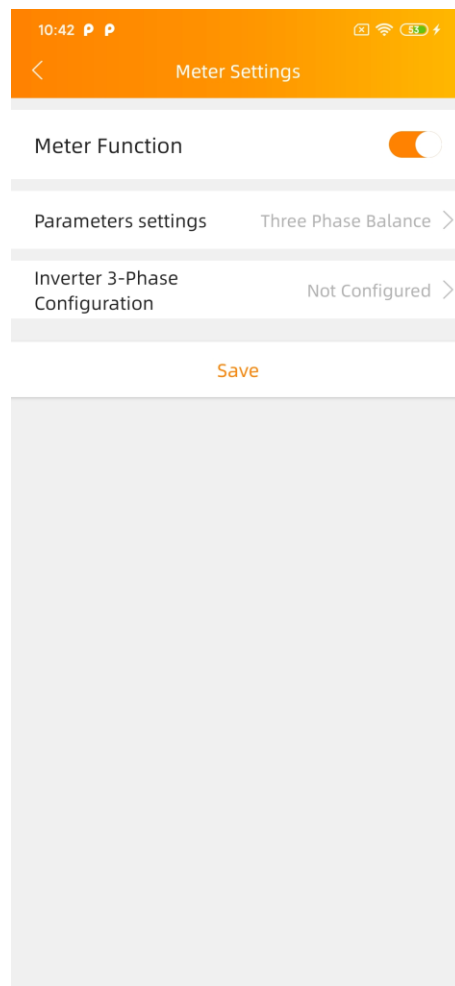
Three-phase Balance Function

- Only works with ECU-C in Three-phase systems
- The balance is set to ensure that phase difference does not exceed 16 amps

Using the Three-phase Balance function

- Select 'Meter Settings'
- Slide the 'Meter Function' to the 'On' position
- Select the 'Three Phase Balance' under 'Parameter settings'

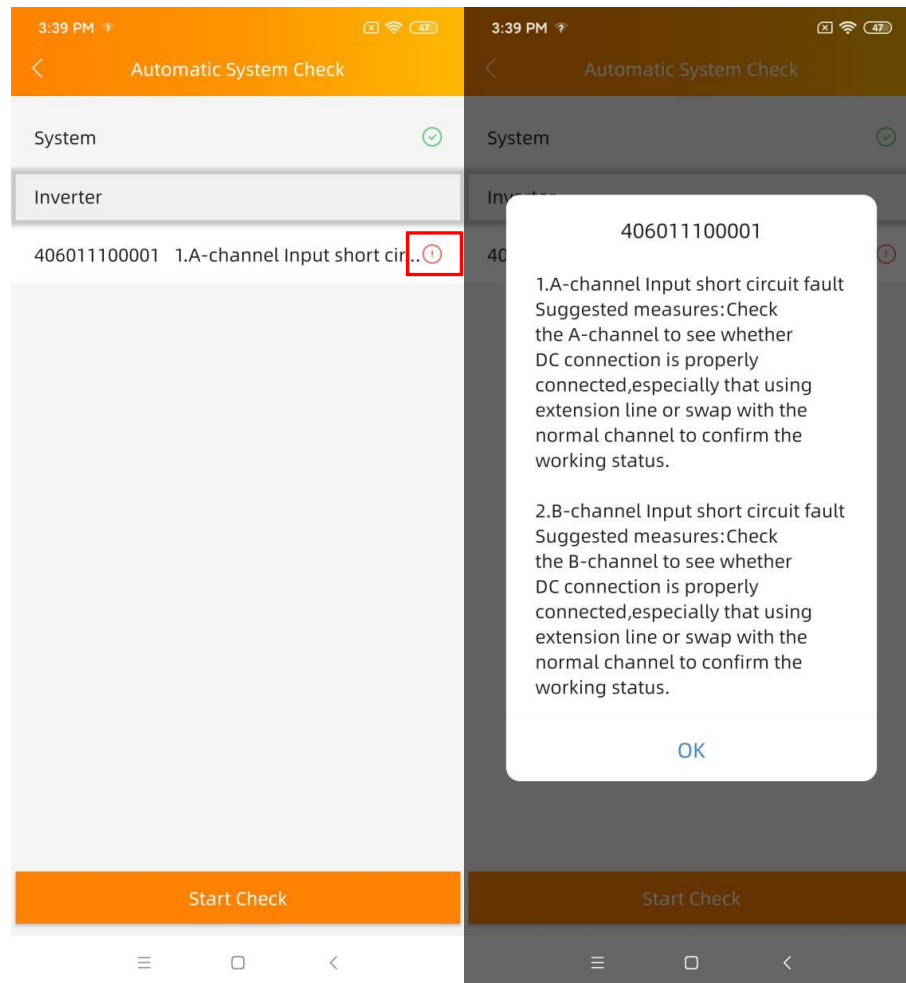
If a three-phase system comprised of APsystems' Single-phase micro-inverters e.g., YC600 or QS1, the user will have to manually configure which inverters serial numbers are connected to each separate phase in the 'Inverter 3-Phase Configuration' section and then select Save. There are two different methods for Phase loss detection; through an external CT for the fastest and most accurate response time and through the micro-inverter data collected every five minutes, a slower and less accurate method but does not require an external CT.



6.4.8 Automatic System Check

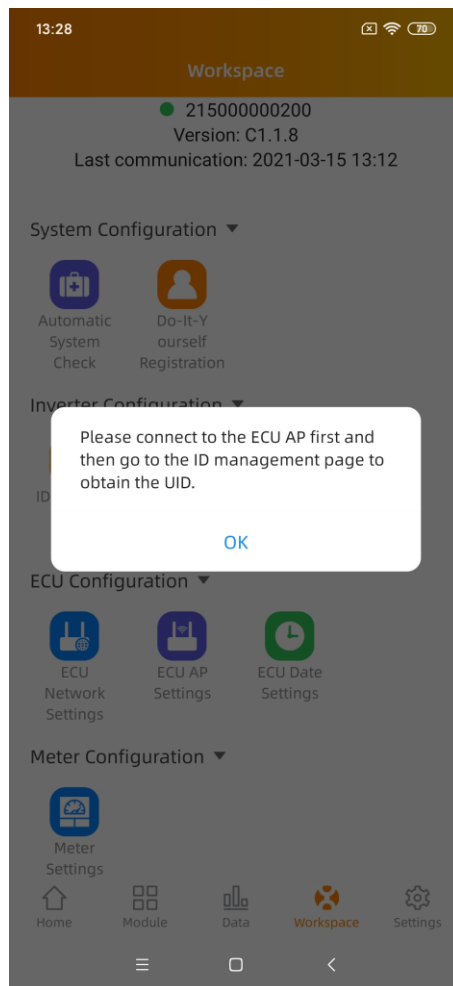
Check the running status of the system, if there are issues, click the icon to view the reason and check the installation to solve it

Please remember that the ECU_APP will always consider that all micro DC-inputs are connected to a PV panel (i.e: a quad is connected to 4 panels, a duo to 2 panels). As such, if one DC-input is not connected voluntarily, the ECU_APP will show a warning “channel no panel connected”. Based on knowledge of the system layout, the warning can be ignored



7. Do-It-Yourself Registration (*ECU APP*)






This only applies to home-owners “do it yourself” installers to create EMA account. Make sure the ECU has been configured properly using the steps described in section 6.1 to 6.4. Otherwise warning message is displayed, as shown below.


































































































Make sure to connect your phone to the local internet and not to the ECU hot-spot. Then enter the information required (items with an * are mandatory) and click “Sync EMA”.

Then you will receive an email prompting you to open your EMA account. You can monitor the performance of your system using the EMA APP.

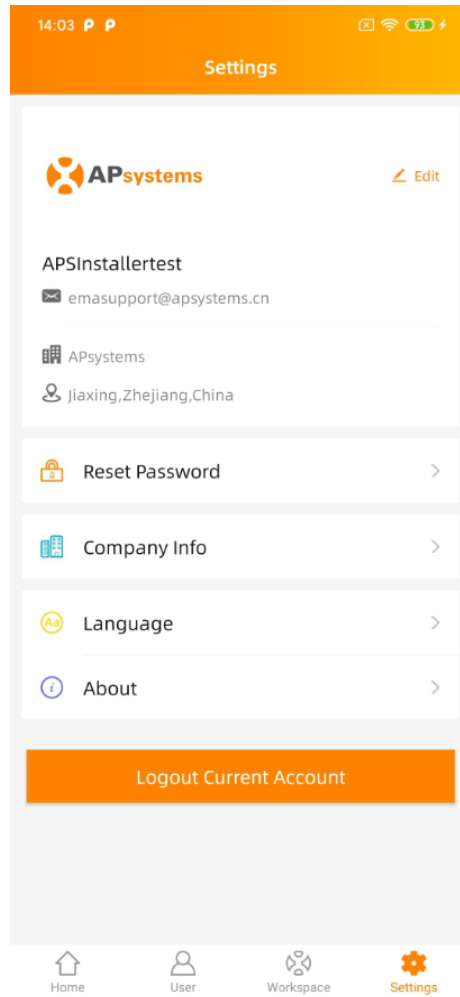
9:38





8. Manage Your Own Information (*Installer Level*)

1. Once logged-in, Select the tab menu [**Settings**] at the bottom of the page.

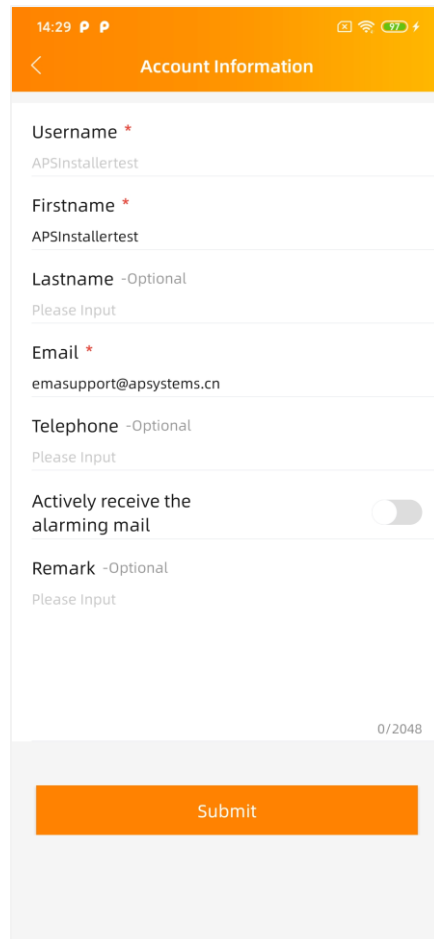


In this function, you can manage your own registration information, view the introduction of the APP and get some helps.

8.1 Modify Account Information (*Installer Level*)

1. Select the “**Edit**” at the upper right corner.

Edit the account details by field, make sure including all required information.



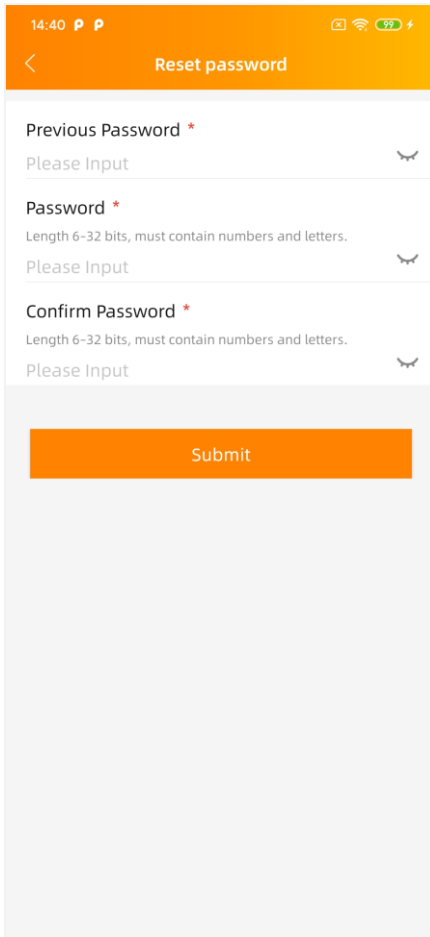
The screenshot shows a mobile application interface for editing account information. At the top, there is an orange header bar with a back arrow on the left and the title "Account Information" in the center. Below the header, the form contains several input fields: "Username *" with the value "APSSinstallertest", "Firstname *" with the value "APSSinstallertest", "Lastname -Optional" with the placeholder "Please Input", "Email *" with the value "emasupport@apsystems.cn", and "Telephone -Optional" with the placeholder "Please Input". There is also a toggle switch for "Actively receive the alarming mail" which is currently turned off. At the bottom of the form, there is a "Remark -Optional" field with the placeholder "Please Input". A character count "0/2048" is displayed to the right of this field. At the very bottom of the screen, there is a large orange button labeled "Submit".

2. Click “Submit”.

8.2 Reset Password (*Installer Level*)

1. Select the “Reset password”.

Fill in the details by field.



The screenshot shows a mobile application interface for resetting a password. At the top, there is an orange header bar with a back arrow on the left and the text "Reset password" in the center. Below the header, the form consists of three input fields, each with a label, a hint, and a toggle icon on the right. The first field is labeled "Previous Password *" with the hint "Please Input". The second field is labeled "Password *" with the hint "Length 6-32 bits, must contain numbers and letters." and "Please Input". The third field is labeled "Confirm Password *" with the hint "Length 6-32 bits, must contain numbers and letters." and "Please Input". At the bottom of the form, there is a large orange button labeled "Submit". The status bar at the very top shows the time as 14:40, signal strength, Wi-Fi, and battery level at 99%.

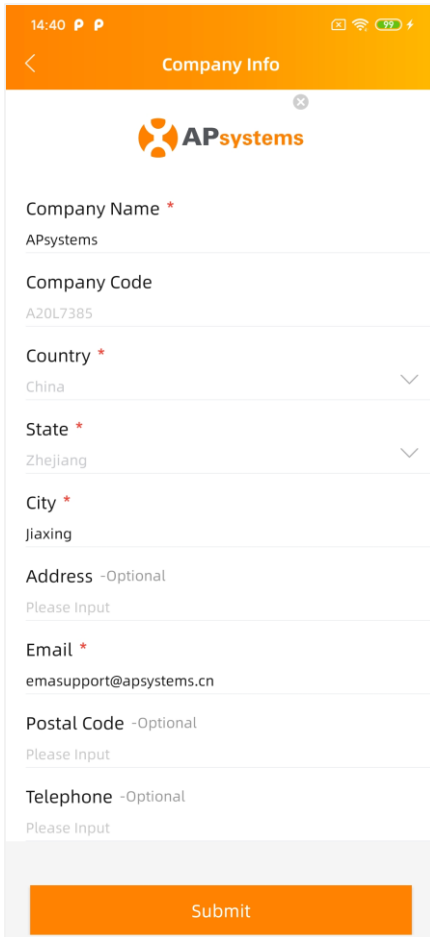
Note: Only when the previous password inputted is right, the new password can be set.

2. Click “Submit”.

8.3 Modify Company Information (*Installer Level*)

1. Select the “Company Info”.

Edit the company details by field; make sure including all required information.



The screenshot shows a mobile application interface for editing company information. The title bar is orange with a back arrow and the text 'Company Info'. Below the title bar is the APsystems logo. The form contains several input fields with labels and asterisks indicating required fields: 'Company Name *' (filled with 'APsystems'), 'Company Code' (filled with 'A20L7385'), 'Country *' (filled with 'China'), 'State *' (filled with 'Zhejiang'), 'City *' (filled with 'Jiaxing'), 'Address -Optional' (placeholder 'Please Input'), 'Email *' (filled with 'emasupport@apsystems.cn'), 'Postal Code -Optional' (placeholder 'Please Input'), and 'Telephone -Optional' (placeholder 'Please Input'). At the bottom is an orange 'Submit' button.

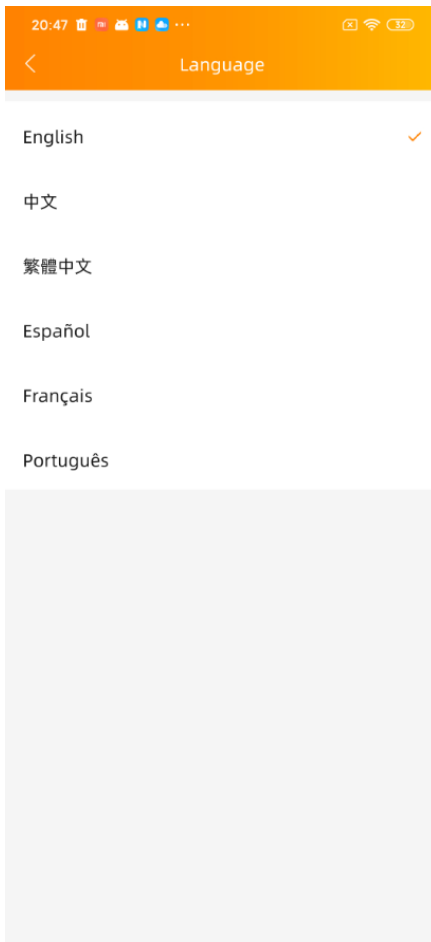
Field	Value	Required
Company Name	APsystems	Yes
Company Code	A20L7385	No
Country	China	Yes
State	Zhejiang	Yes
City	Jiaxing	Yes
Address	Please Input	No
Email	emasupport@apsystems.cn	Yes
Postal Code	Please Input	No
Telephone	Please Input	No

2. Click “Submit”.

8.4 Change APP's Language (*Installer Level*)

1. Select the “Language”.

Select the language you need.



Note: APP supports 6 languages (English, 中文, 繁體中文, Español, Português, Français), so far, using the system language of the phone as its default language. If the system language is not included within these 6 languages, English is used as default.

2. Click “Submit”.