Energy Monitoring & Analysis System

Version 5.1

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Contents

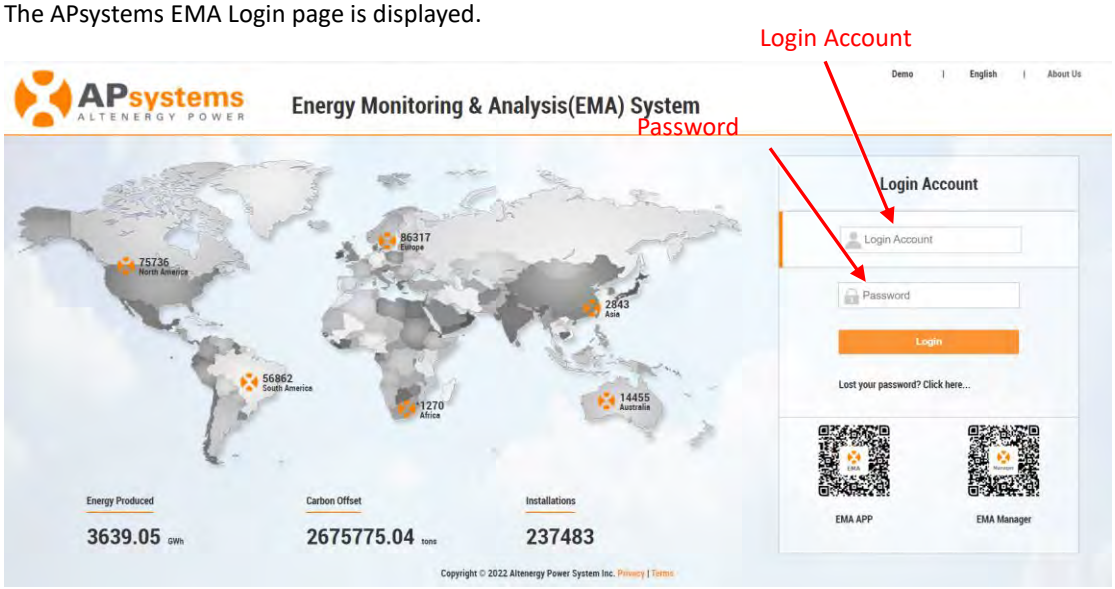
Introduction

The APsystems energy monitoring and analysis system is a monitoring website designed and launched by APsystems that integrates registration, monitoring, operation and maintenance, and management. It is aimed at PV professionals (installers) and enables them to quickly locate customers who need to be managed, monitor the operation of their systems, and remotely tune the operating parameters of their systems, helping PV professionals (installers) to reduce operation and maintenance costs and improve operation and maintenance efficiency.

1. Log onto EMA Website

- Go to http://apsystems.com/
- Click the orange "EMA Login" in the upper right corner of the screen to enter the EMA login page,

The APsystems EMA Login page is displayed.



Note

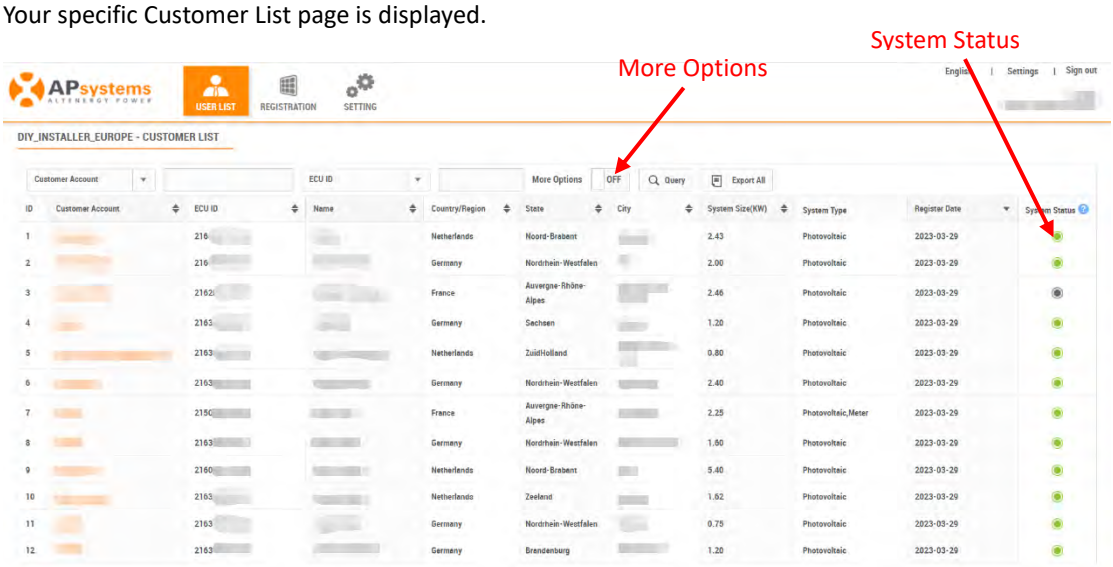
- You will be issued a permanent *login account* and a temporary *password* when you complete the Installer Training of APsystems. Contact APsystems Technical Support to register for Installer Training (go to https://usa.apsystems.com/resources/training, or call 1.844.666.7034)
- The Password is case sensitive.
- If you forget your password, select “Lost your password? Click here …”

- Enter your “Login Account” and “Password”
- Press the “Login” button.

2. Monitoring and Analysis

2.1 Review the Customer's Dashboard

Your specific Customer List page is displayed.



System Status

Working normally.

Some micro-inverters communication interrupt since beginning of day.

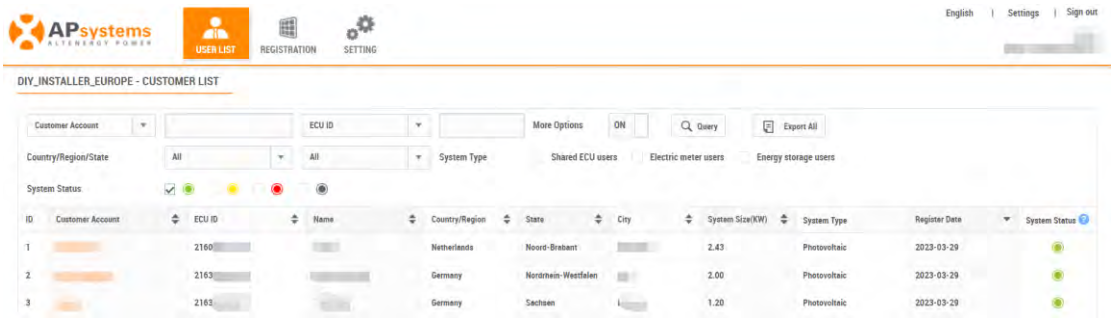
Some micro-inverters have not been properly registered.

ECU disconnected from internet.

The system has never reported production data

Note

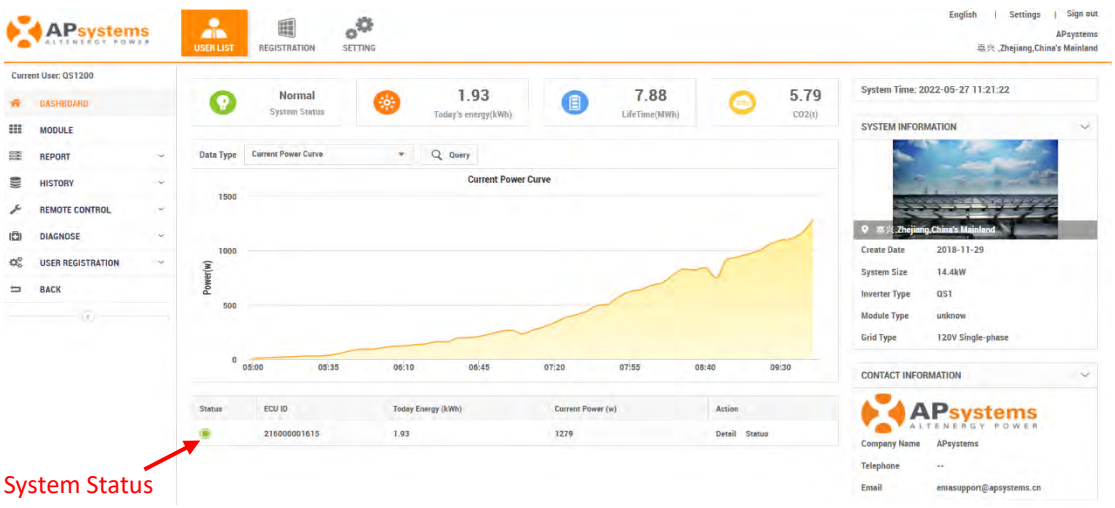
After opening "More Options", you can get more filter items.



➢ Select the customer you want to review from the customer list.

2. Monitoring and Analysis

The installer's view of the customer's Dashboard is displayed.



Note

While you are viewing the customer's system data, it is presented differently than the System Owner's view.

Customer View for Comparison

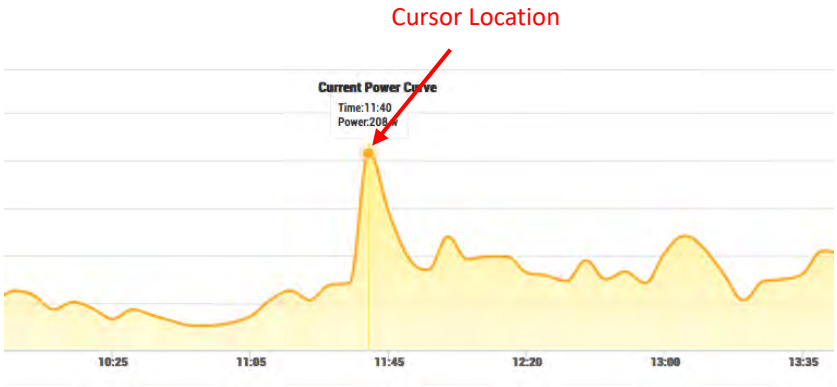
Data Type	Data reporting period; Power for the current day, daily power for the current month, monthly for the current year, and yearly for the lifetime of the system.
Power Curve	Graphic representation of each of the data types.
System Date/Time	The date and time at the array location.

2. Monitoring and Analysis

Personal Information	The customer's personal information.
Today's Energy	The amount of energy produced for today's date – expressed in kWh.
Current Power	The amount of energy being produced at this given time – expressed in watts.
Action	A short cut to ECU reporting (Detail) and reviewing the ECU status.
Installer Contact Information	The installer's contact information. This information shows up on your customer's view of their account.

Note

You can check power production at any given point along the "Power Curve" graphs by moving the curser to the specific time or date in question.

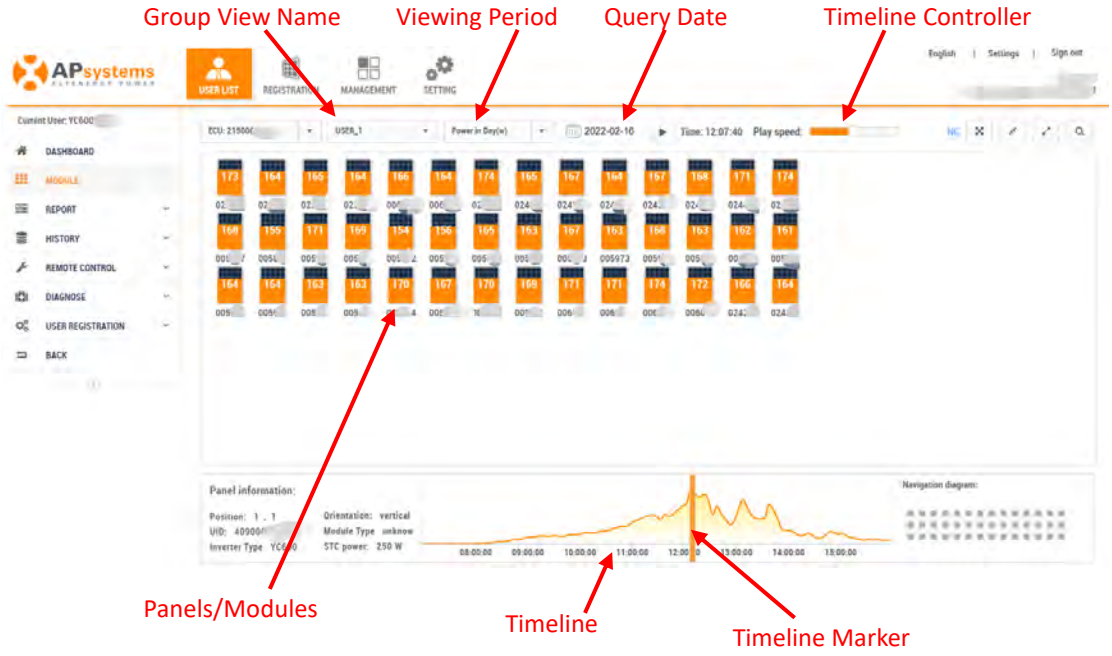


2.2 Review the Customer's Modules

➢ Select "MODULE" in the left side bar.

2. Monitoring and Analysis

The Module Performance page is displayed.



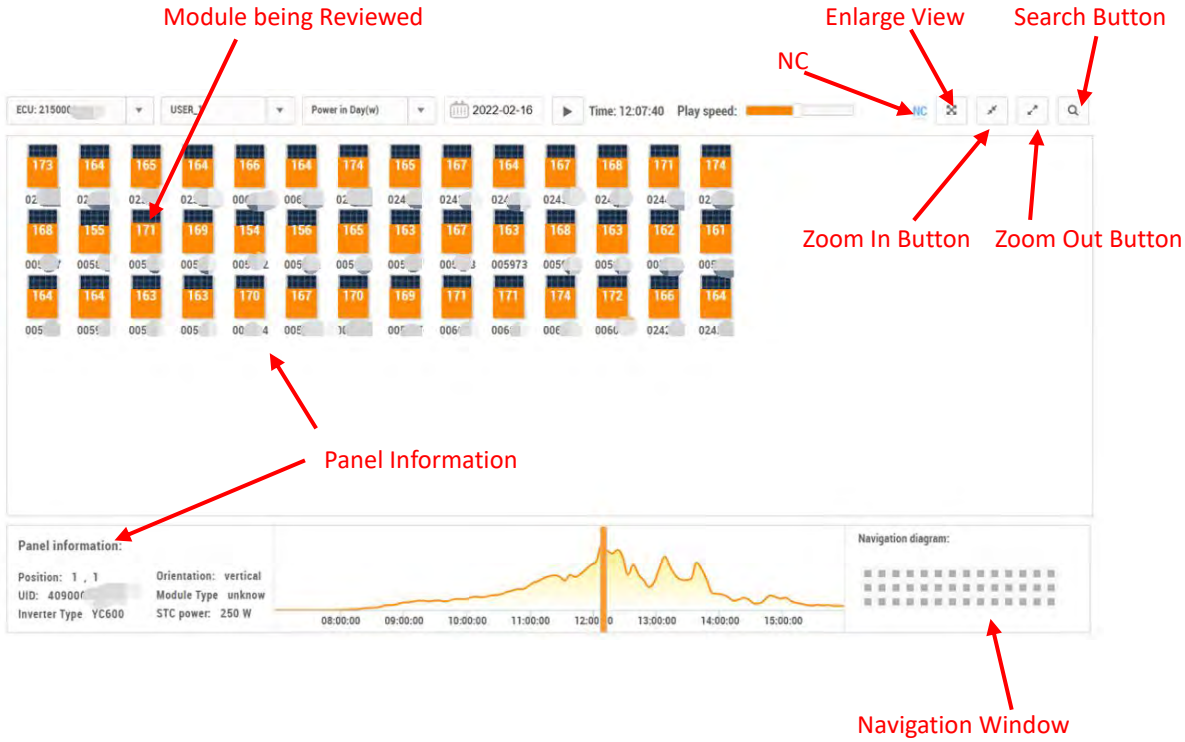
Group View Name	Pulldown of the group names associated with this account.
Viewing Period	Viewing period selection; Power for the current day, and daily energy over the last 30 days.
Query Date	Select date you want to review.
Timeline Controller	Advances the Timeline Marker on the timeline.
Panels/Modules	A graphic representation of how the array is laid out. The number in the center of each module represents the power being generated by the module at the current time – expressed in watts/DC.
System Performance the Timeline	Graphic representation of the power being generated by the entire system during current viewing period.
Timeline Marker	Time indicator for timeline. Power is simultaneously displayed on the panels/modules. There are two ways to display power across time; One, select the time period and press the “Timeline Controller”, and two dragging the timeline marker across the timeline to view a specific production time.

Continued …

2. Monitoring and Analysis

Note

Detailed information on each module can be reviewed by clicking on the module.



Search Button	Fuzzy search for inverters by UID number or search for inverters by location
Zoom Out Button	Panels/Modules become larger.
Zoom In Button	Panels/Modules become smaller.
Navigation Window	For large systems, it is possible to quickly locate the corresponding panels/modules positions.
Enlarge View	Enlarge the whole view, hide the panel/module information, the timeline and the navigation window below.
NC	Inverter device without communication.

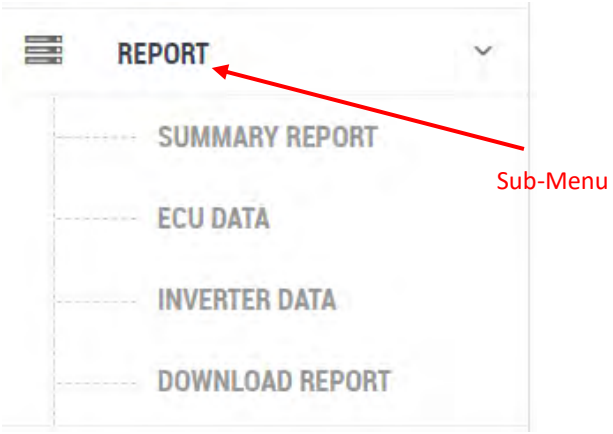
Continued ...

2. Monitoring and Analysis

2.3 Review the Customer's Systems Reports

➢ Select "REPORT" in the left side bar.

The sub-menu areas are displayed under "REPORT".

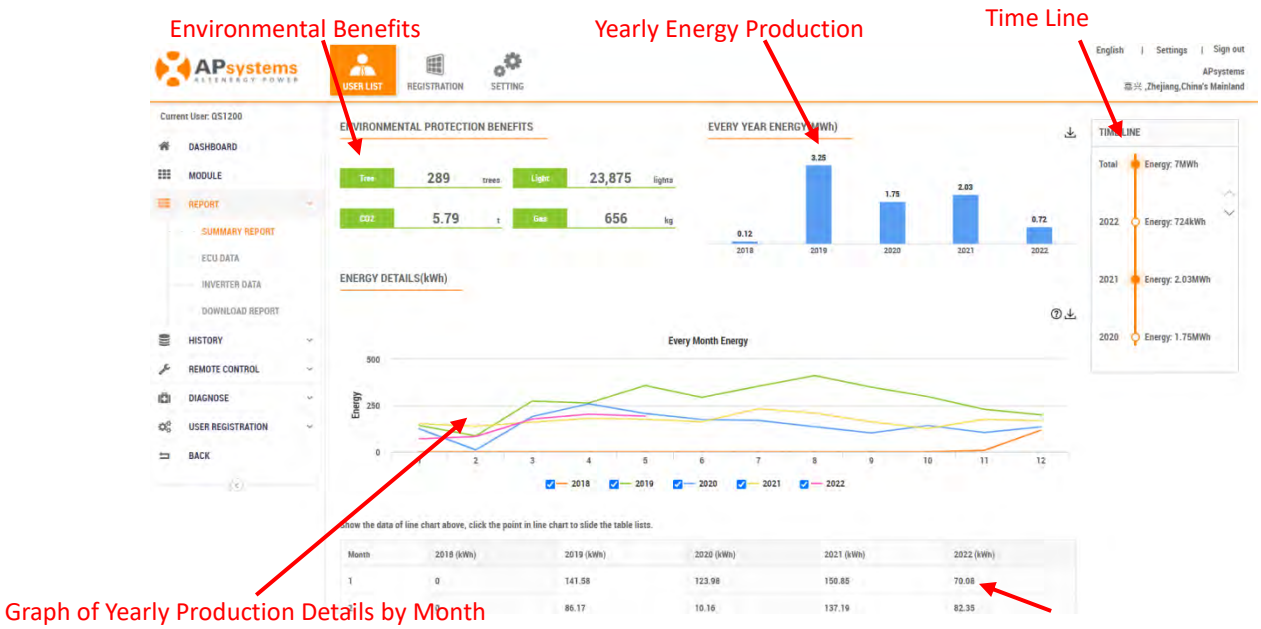


2.3.1 Summary Reports

➢ Select "SUMMARY REPORT" under "REPORT" in the left side bar.

The Summary Report page is displayed.

2. Monitoring and Analysis



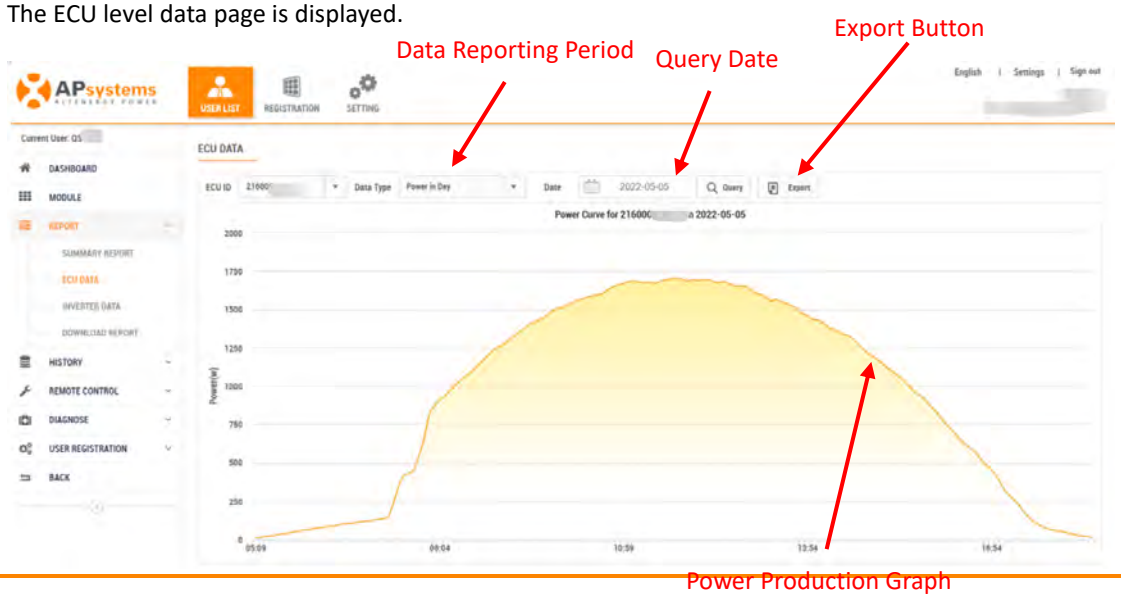
Note

The savings reflected in the Production/Cost Savings timeline are calculations based on the utility company's price per kWh at this location. The price per kWh is entered in the "Price Per kWh" field in the timeline.

2.3.2 ECU Reports

➢ Select "ECU DATA" under "REPORT" in the left side bar.

The ECU level data page is displayed.



2. Monitoring and Analysis

Data Reporting Period	Data reporting period; Power for the current day, daily power for the current month, monthly for the current year, and yearly for the lifetime of the system.
Query Date	Select date you want to review.
Export Button	Exports the data in a spreadsheet format.
Power Production Graph	Graphic representation of the system's power production over time.

2.3.3 Inverter Reports

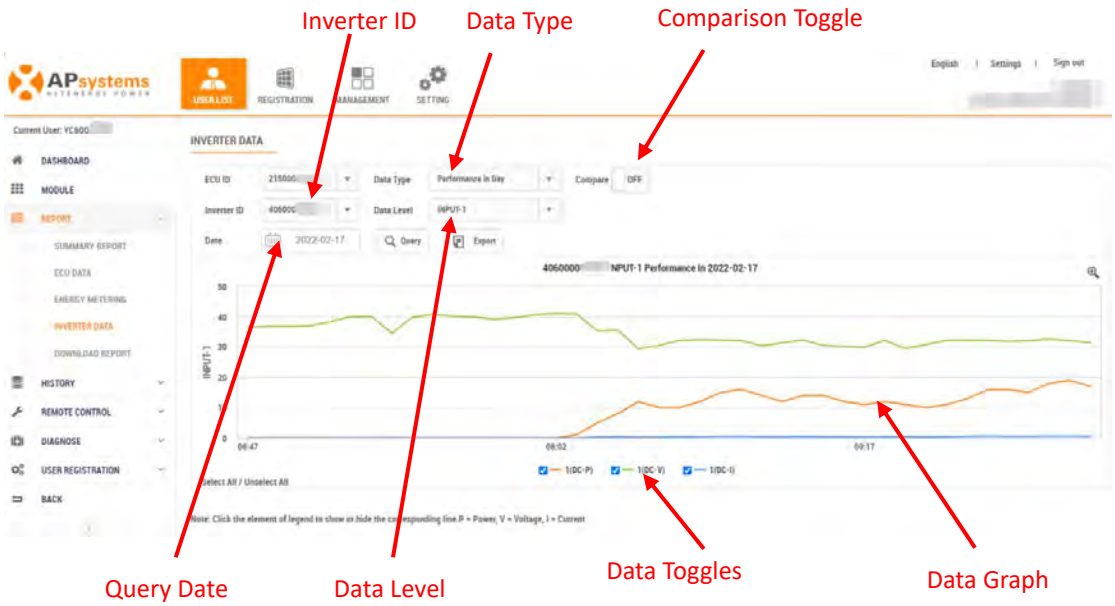
The Inverter Level reports are used to analyze module power (DC – power/watts, volts, and current/amps), grid parameters (AC volts, frequency, and temperature).

Note

This reporting area is extremely useful in troubleshooting inverter problems.

➢ Select "INVERTER LEVEL DATA" under "REPORT" in the left side bar.

The inverter level data page is displayed.



➢ Select inverter ID you want to review from the Inverter ID pulldown.

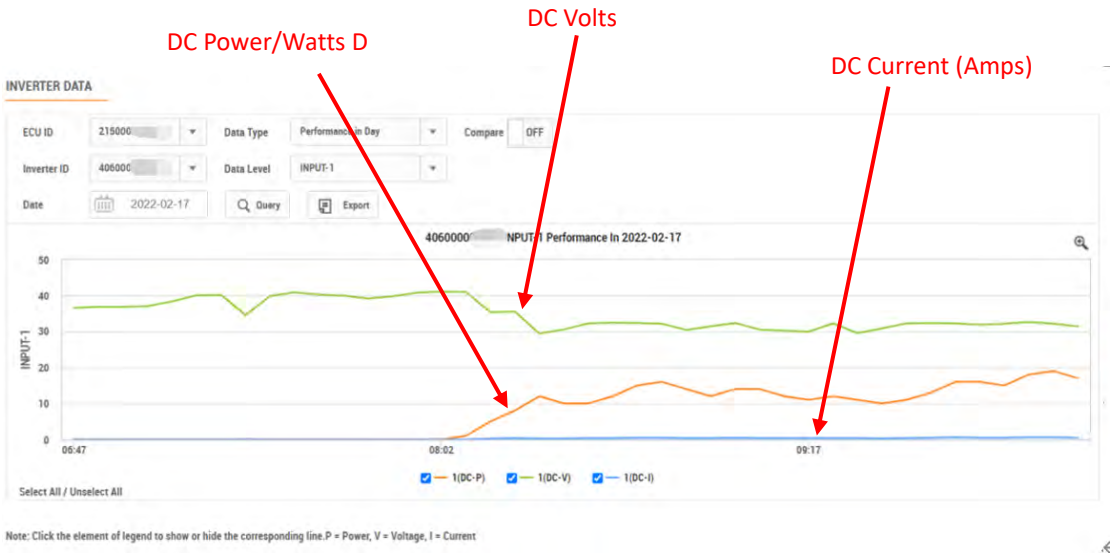
The data graphic for the selected inverter ID is displayed.

Inverter ID	Pulldown field for viewing and selecting the inverter IDs associated with the account.

2. Monitoring and Analysis

Data Type	Data reporting period; power for the current day, daily power for the current month, monthly for the current year, and yearly for the lifetime of the inverter.
Comparison Toggle	ON and OFF toggle for comparing the data/performance of more than one inverter or data level.
Query Date	Select date you want to review.
Data Level	Pulldown field for selecting AC or DC data by channel.
Data Graph	Graphic representation of the selected data types and data levels overtime.
Data Toggles	Used to toggle Data Levels graphs ON or OFF.

1) Examples of Inverter Data Graphs



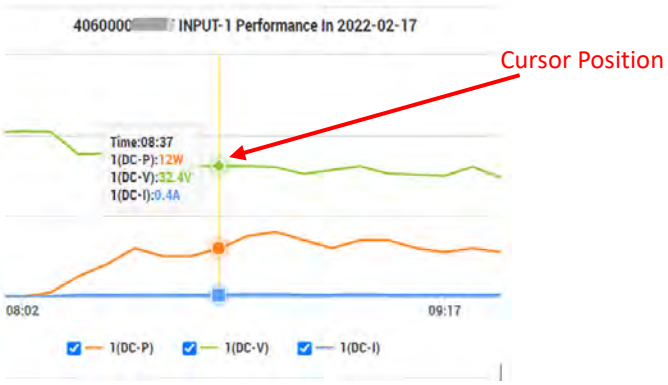
Note

The following in the example above:

Data Type: Power for the current day.
Inverter ID: Different types of inverters will have different numbers of channels.
Data Level: DC Power/Watts, Volts, Current (Amps). Data options will vary depending on the inverter device
Comparison: OFF (so only seeing one inverter channel and/or data level)

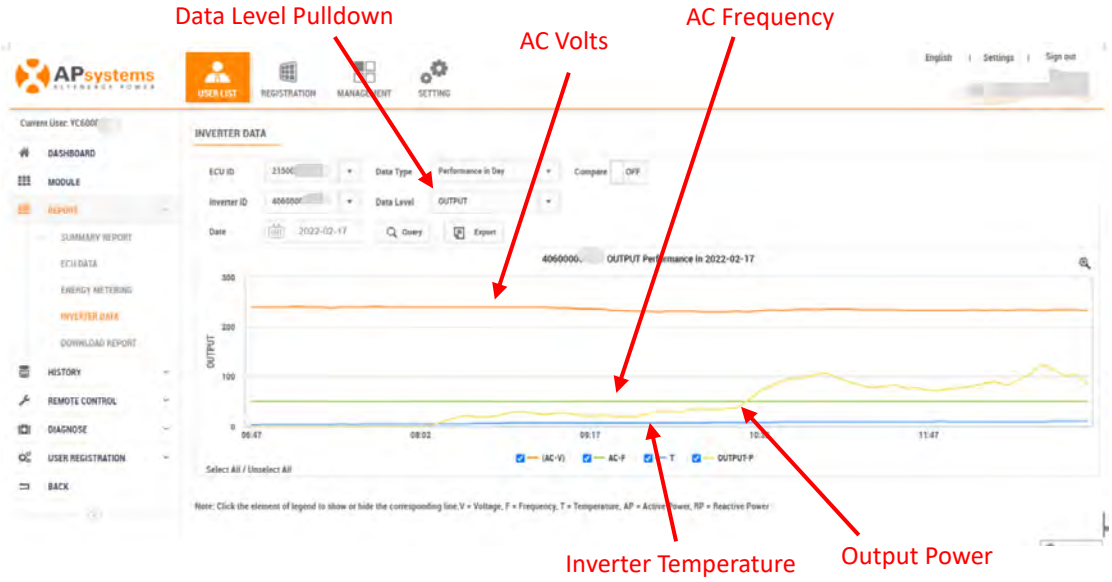
You can see power levels for a specific time by dragging the cursor along the graph.

2. Monitoring and Analysis

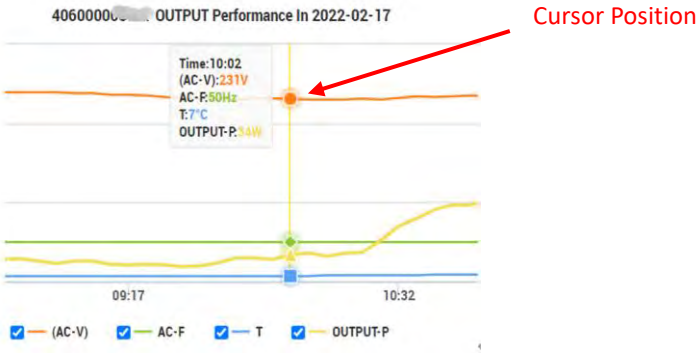


2) To view the AC (grid) parameters on the same channel for the same inverter

➢ Select “OUTPUT” in the “Data Level” pulldown.



You can see parameters for a specific time by dragging the cursor along the graph.



2. Monitoring and Analysis

3) To compare the data levels for two different inverters

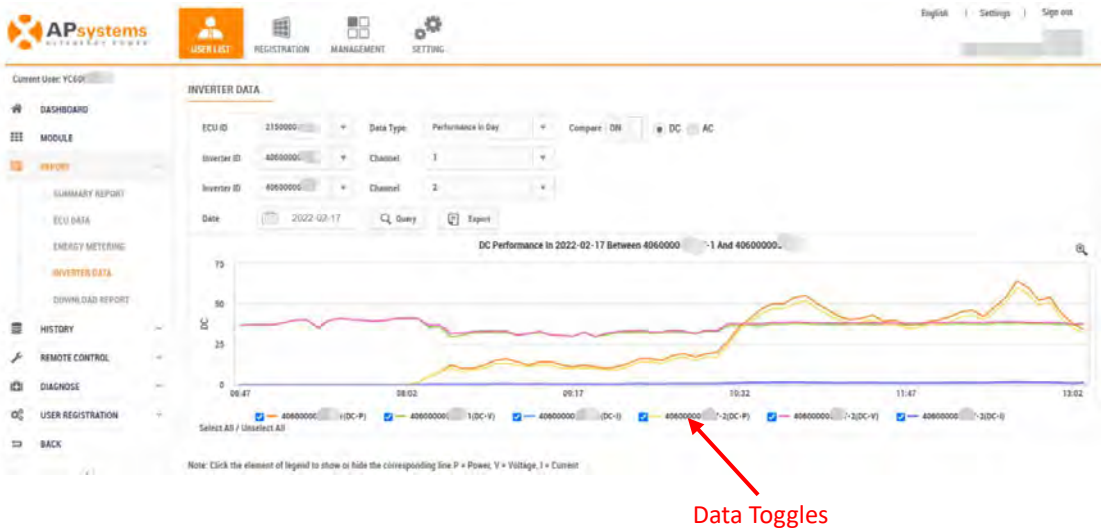
- Turn ON the “Compare” toggle.
- Select the inverters you want to compare.

Note

You can select the same inverter and compare different channels if required.

- Select the Channels you want to compare.
- Select whether you want to compare DC or AC.

The graph with both inverter data levels is displayed.



Note

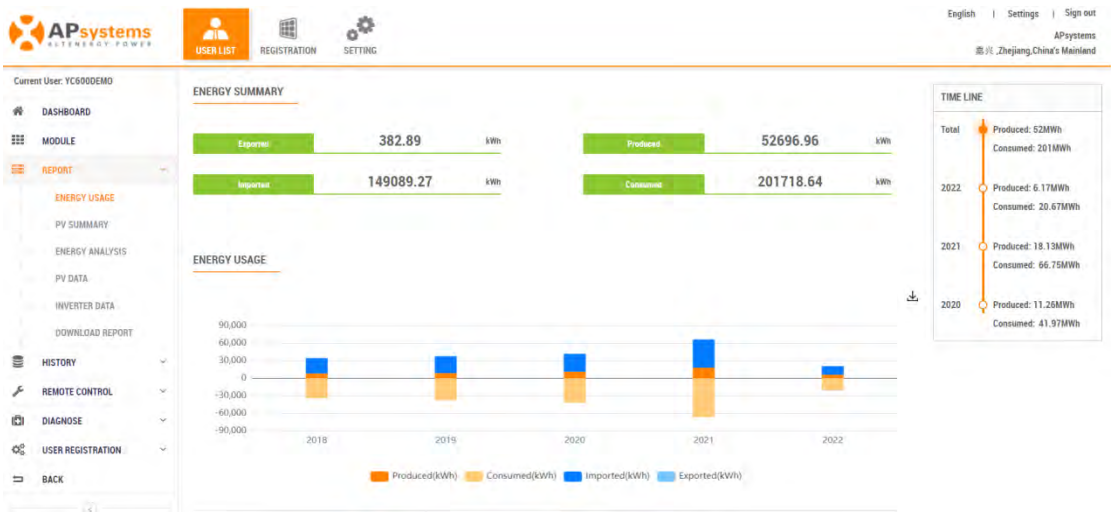
You can toggle graph data elements ON and OFF by using the Data Toggles if needed for clarity of the data.

Note

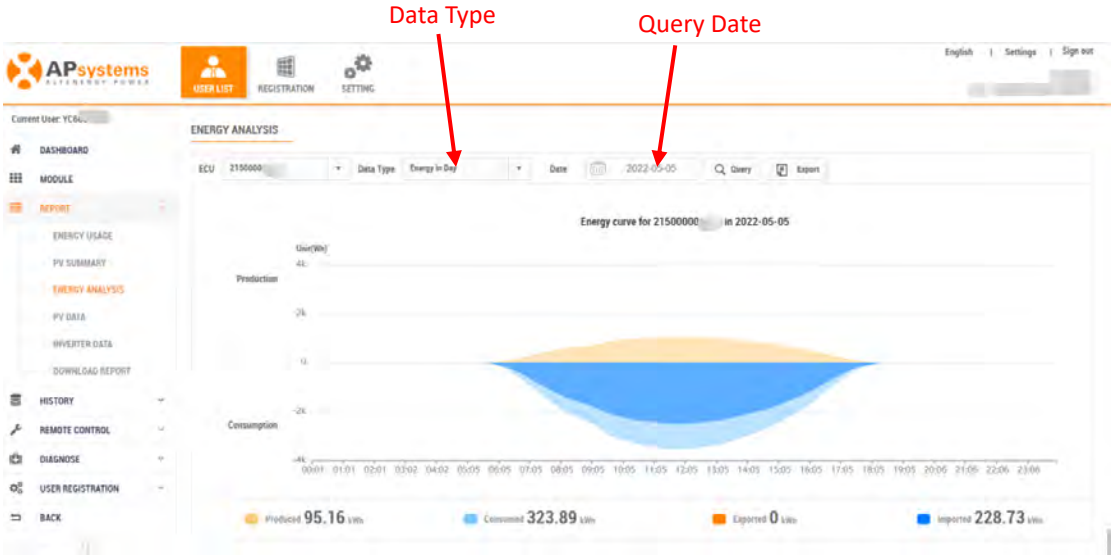
The “Report” of a system with a smart electricity meter installed have additional “Energy Usage” reports and “Energy Analysis” reports compared to pure photovoltaic systems. The “Energy Usage” report and “Energy Analysis” report are shown in the figure below.

2. Monitoring and Analysis

Energy Usage



Energy Analysis



Data Type	Data reporting period; power for the current day, daily power for the current month monthly for the current year, and yearly for the lifetime of the energy metering.
Query Date	Select date you want to review.
Produced	The power generated by solar panels.
Imported	The power source provided by utility companies.
Exported	The solar panels provided power to the utility grid.
Consumed	The amount of power being used by appliances.

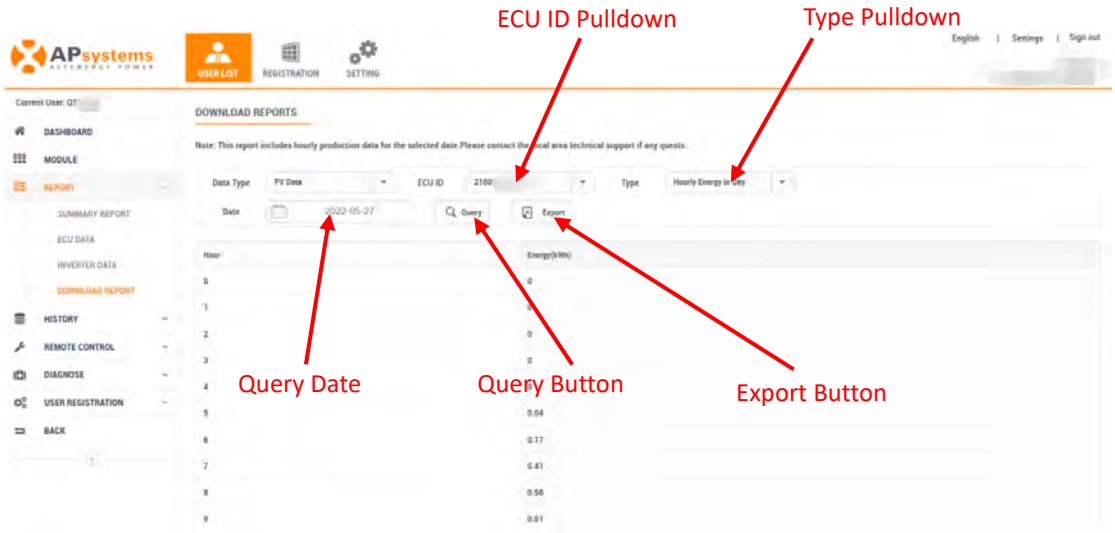
2. Monitoring and Analysis

2.3.4 Download Reports

The reports in this area are detailed numeric reports that can be exported to a spreadsheet.

➢ Select “DOWNLOAD REPORT” under “REPORT” in the left side bar.

The Download Reports data page is displayed.



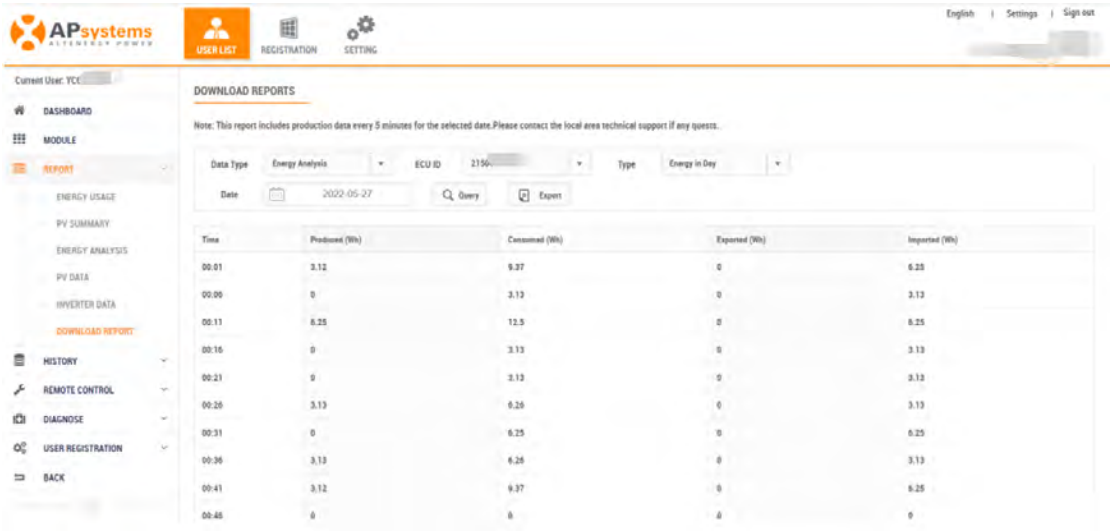
ECU ID Pulldown	Pulldown field for viewing and selecting the ECU ID.
Type Pulldown	There are a number of report “types” you can select. • Hourly Energy for the day • Detailed Daily Energy for a week (prior to the Query Date) • Meter Hourly Energy in Month • Daily Energy for a specified period • Daily Energy for a specified year • Weekly Energy for a specified year • Monthly Energy for a year • Yearly Energy for the lifetime of the system
Query Date	Select date, or data range where appropriate you want to review
Query Button	The “Query” activates the reporting process for the Type and Date(s)You have selected.
Export Button	Exports the data in a spreadsheet format.

2. Monitoring and Analysis

Note

The “Download Report” of a system with a smart electricity meter installed has one more “Energy Analysis” report than the pure photovoltaic system. The “Energy Analysis” page is shown in the figure below.

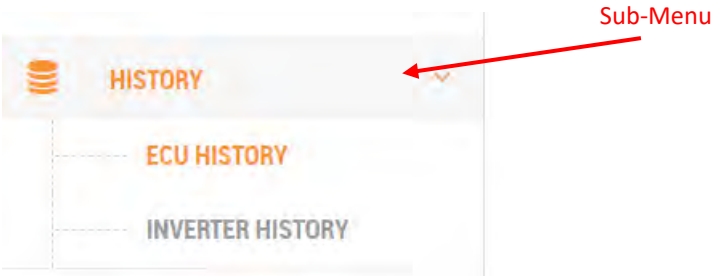
Energy Analysis



2.4 Reviewing System Maintenance History

➢ Select “HISTORY” in the left side bar.

The sub-menu areas are displayed under “HISTORY”.

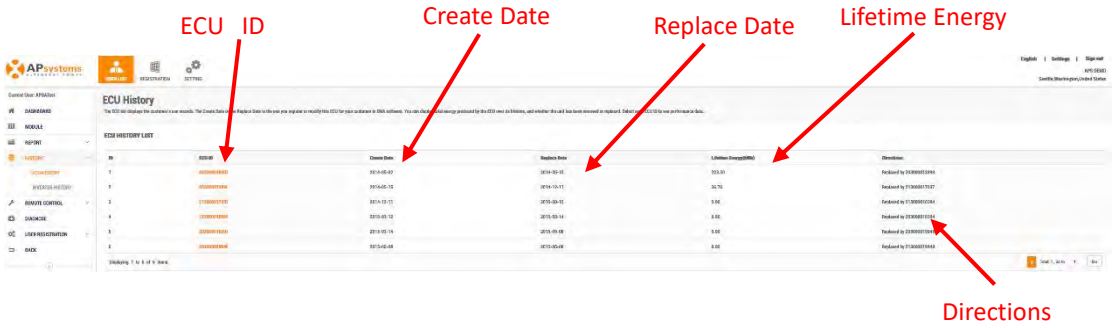


2.4.1 ECU History

➢ Select “ECU HISTORY” under “HISTORY” in the left side bar.

2. Monitoring and Analysis

The ECU History page is displayed.



ECU ID List	A list of all of the ECU that have been on the system.
Create Date	The date the ECU was activated on the EMA.
Replace Date	The date the ECU was replaced and edited on the EMA.
Lifetime Energy	A history of the amount of energy (expressed in kWh) produced while the ECU was on the system.
Directions	Documented replacement of old and new ECU equipment.

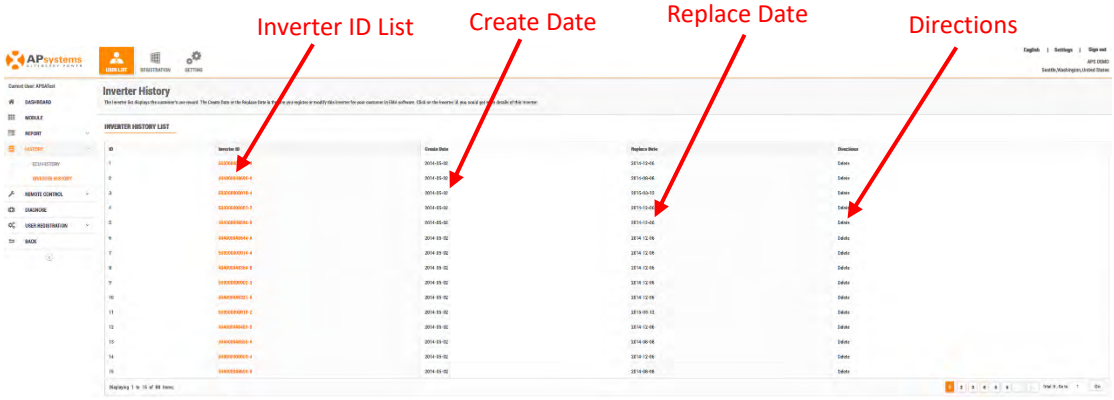
Note

Clicking on the ECU ID in the ECU ID List allows you to review power production from the date the ECU was first activated on the EMA.

2.4.2 Inverter History

➢ Select “INVERTER HISTORY” under “HISTORY” in the left side bar.

The Inverter History page is displayed.



Inverter ID List	A list of all of the inverters that have been on the system.

2. Monitoring and Analysis

Create Date	The date the inverter was activated on the EMA.
Replace Date	The date the inverter was replaced and edited on the EMA.
Directions	Documented replacement of old and new inverter equipment.

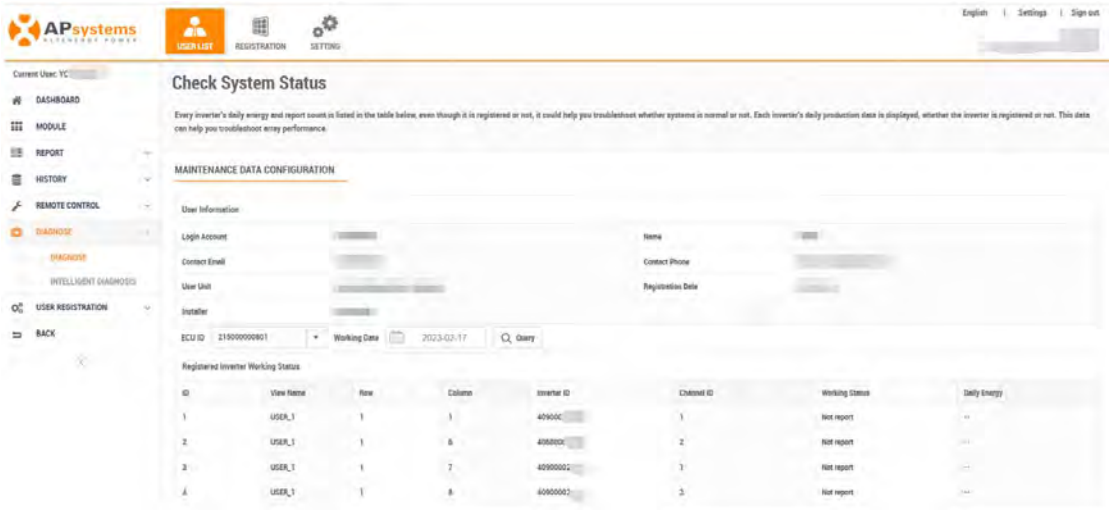
2.5 Reviewing Diagnose

Display the status of the system, and attach some recommendations if the status is not healthy.

2.5.1 Diagnose

➢ Select “DIAGNOSE” in the left side bar.

The system’s information is displayed under “DIAGNOSE”.



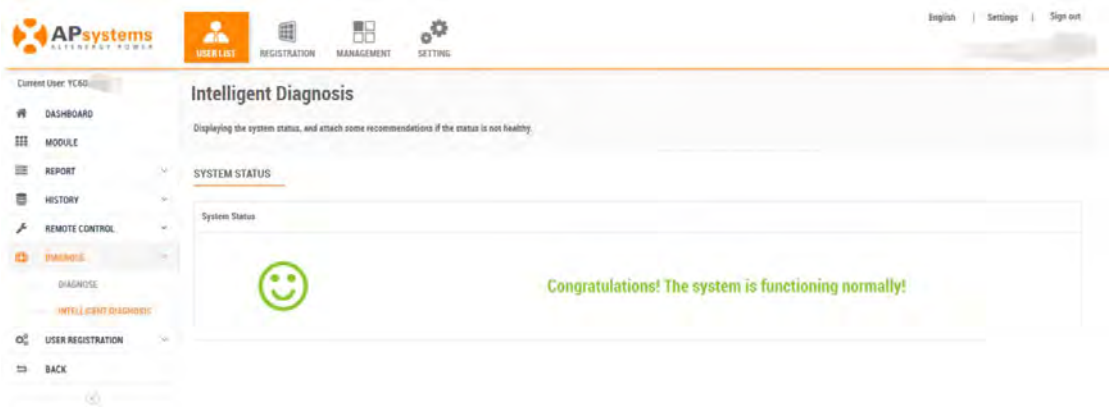
2.5.2 Intelligent Diagnosis

➢ Select “Intelligent Diagnosis” under “DIAGNOSE” in the left side bar.

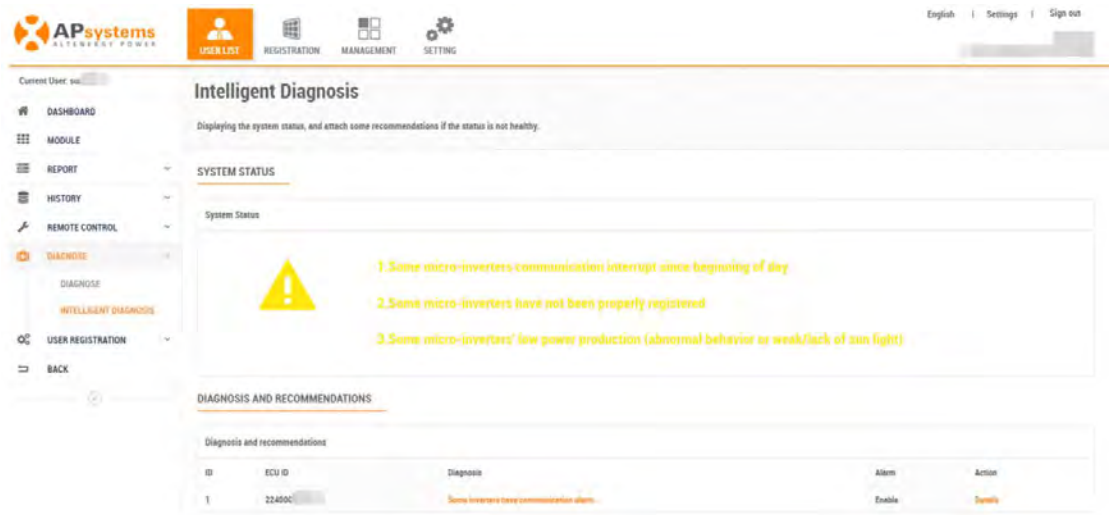
The system status and some recommendations are displayed.

2. Monitoring and Analysis

The system is functioning normally

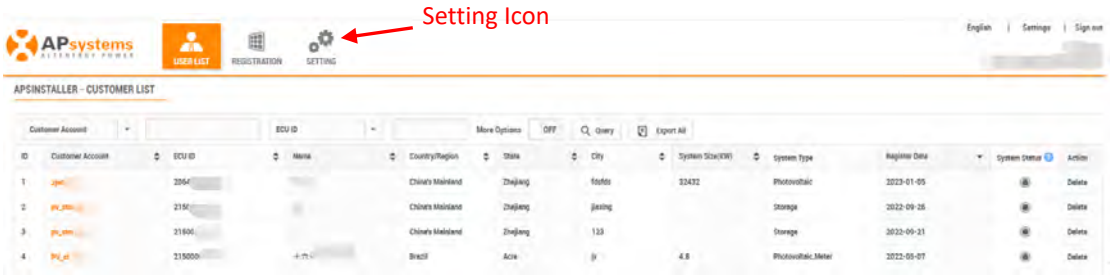


The system status is not healthy



3. System Management

➢ Select the “Setting” Icon at the top of the page.



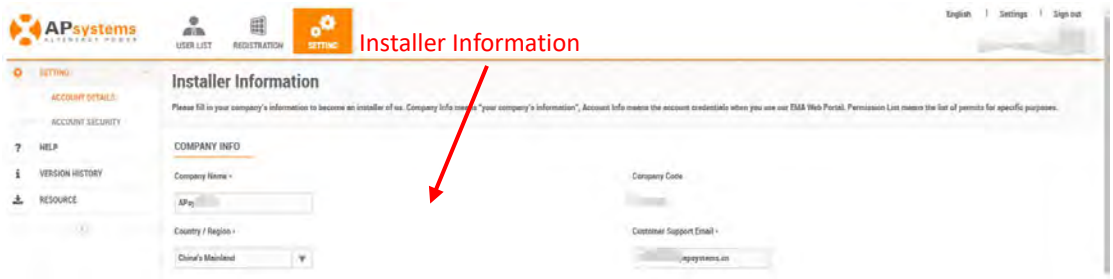
The Settings page is displayed.

3.1 Setting

3.1.1 Account Details

➢ Select the “Account Details” Icon on the left side of the page.

The “Account Details” page is displayed.



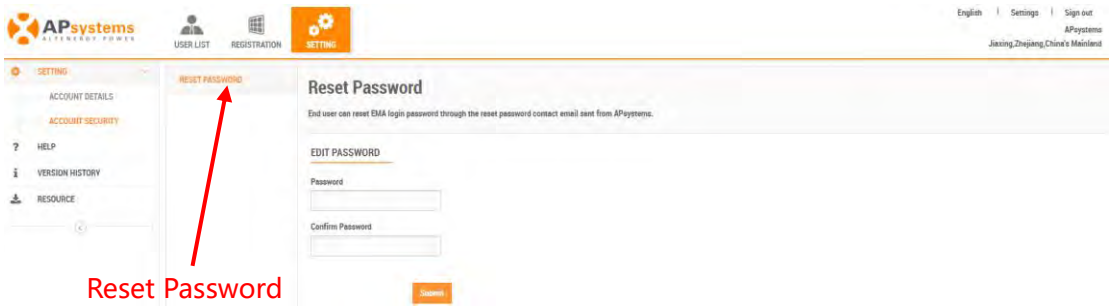
Note

Edit any of your personal information (except for your Username). Contact your installer if you need your username changed.

3. System Management

3.1.2 Account Security

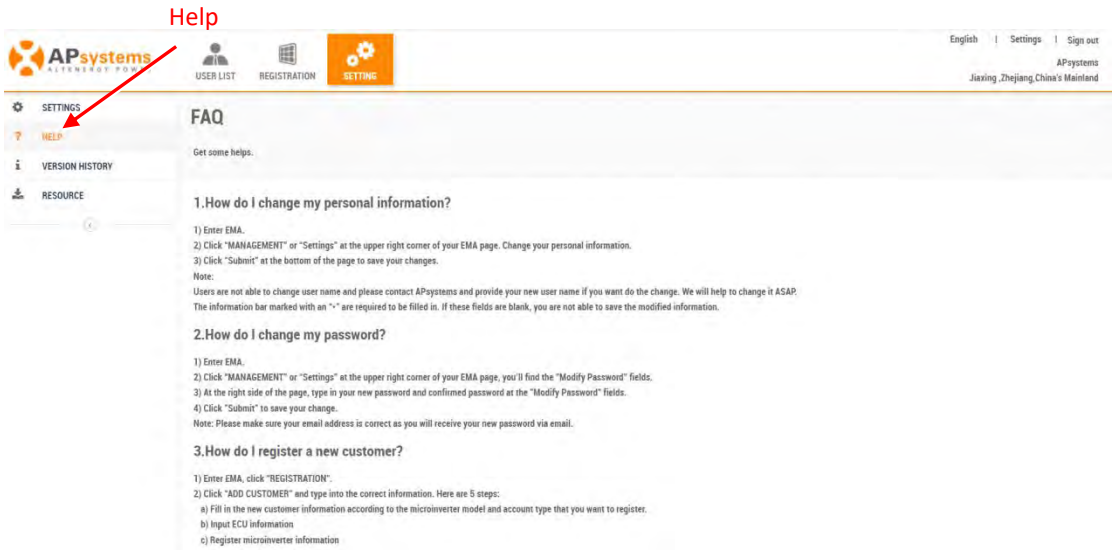
➢ Select the “Account Security” Icon on the left side of the page.
The “Account Security” page is displayed.



3.2 Help

➢ Select the “Help” Icon on the left side of the page.

The Help page is displayed.

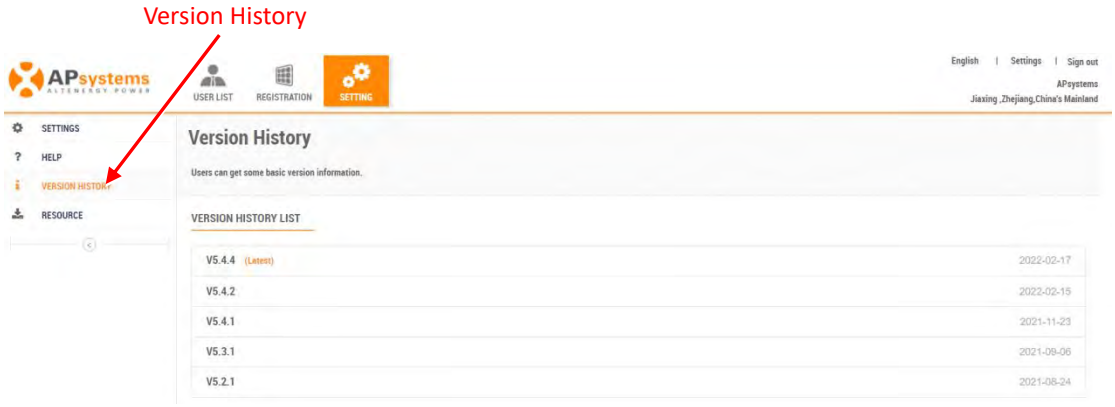


3. System Management

3.3 Version History

➢ Select the “Version History” Icon on the left side of the page.

The Version History page is displayed.



3.4 Resource

➢ Select the “Resource” Icon on the left side of the page.

The Resource page is displayed.