Export Power Control

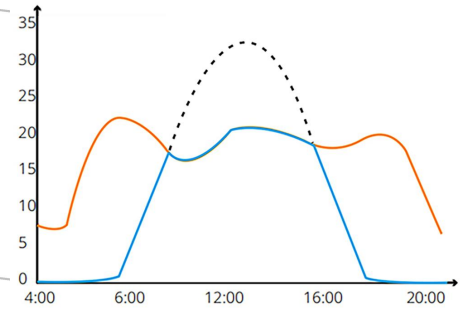
ECU-R with CHINT Meter Solution

Overview

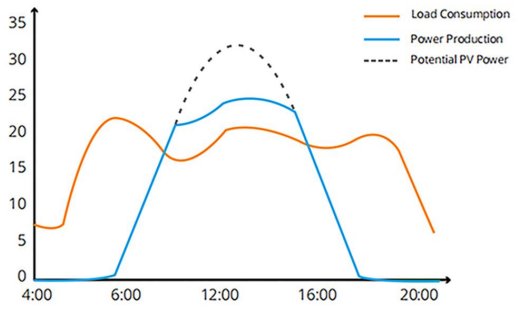
Export Power Control is a power solution that can intelligently control the output power of photovoltaic systems and accurately display photovoltaic power generation, consumed power, and export/import power data. It can meet the requirements of prohibiting or restricting the transmission of photovoltaic power generated to the grid and the accuracy requirements of photovoltaic data monitoring.

Export Power Control is composed of the CHINT electric meter, the APsystems Energy Communication Unit (ECU-R), and an optional current transformer (CT).

In the case of export power limitation, the electric meter and CT should be installed on the grid side. As shown below, the ECU-R will adjust the photovoltaic power production according to the export power sent from the electric meter via RS485. This way, the export power does not exceed the preset limit.



0W export power control



2kW export power control

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System Composition



Energy Communication Unit (ECU-R)

ECU-R is the information gateway for our microinverters. ECU-R not only collects and transfers inverter data but also serves as the control center for export management solution. After ECU-R receives data from the electric meter, it accordingly adjusts the output power of the microinverters.



Electric Meter CHINT (DDSU666 ,DTSU666 And DSSU666)

The CHINT electric meter is suitable for single-phase,split-phase and three-phase power grids. It can measure and display electric parameters in the circuit, including voltage, current, power, frequency, power factor, and active energy. The network can be realized through RS485 communication.



Current Transformer (CT)

The CT is used to measure the current and electric energy in AC circuits. If the electric meter cannot be directly connected to the circuit or the system capacity is slightly higher than the desired level, a meter with an external CT is preferred.

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Meter Selection

Grid Type	APsystems Material Part No.	CHINT Meter Model	Reference Voltage & Frequency	Current Access Type	CT	Application
Single-phase (1P2W)	2273020003	DDSU666-5(80)A	220/230V 50/60Hz	Direct connection	No need	Circuits whose current is within 80A
	2273001003	DDSU666-100/40mA	230V 50/60Hz	Via CT	Standard configuration: 1 CT of 100A, with package;	Circuits whose current is within 100A
	2273002003	DDSU666-1.5(6)A	220/230V 50/60Hz		Purchased by the customer: 1 CT, secondary current must be 1A or 5A.;	Circuits whose current exceeds 100A
Split-phase (2P3W)	2270110003	DTSU666-250/50mA	120/240V 50/60Hz	Via CT	Standard configuration: 2 CTs of 250A, with package;	Circuits whose current is within 250A
Three-phase Three-wire (3P3W)	2270203003	DSSU666-1.5(6)A	3×400V 50/60Hz	Via CT	Purchased by the customer: 2 CTs, secondary current must be 1A or 5A.	Maximum current ratio is 9999
	2270204003	DSSU666-1.5(6)A	3×480V 50/60Hz (customize)	Via CT	Purchased by the customer: 2 CTs, secondary current must be 1A or 5A.	Maximum current ratio is 9999

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Three-phase four-wire (3P4W)	2270105003	DTSU666-250A/50mA	3×230/400V 50/60Hz	Via CT	Standard configuration: 3 CTs of 250A, with package;	Circuits whose current is within 250A
	2270107003	DTSU666-1.5(6)A		Via CT	Purchased by the customer: 3 CTs, secondary current must be 1A or 5A.	Circuits whose current exceeds 250A
	2270108003	DTSU666-1.5(6)A	3×277/480V 50/60Hz (customize)	Via CT	Purchased by the customer: 3 CTs, secondary current must be 1A or 5A.	Maximum current ratio is 9999
	2270106003	DTSU666-250A/50mA	3×120/208V 50/60Hz	Via CT	Standard configuration: 3 CTs of 250A, with package;	Circuits whose current is within 250A

Wiring of Electric Meters with ECU-R

The electric meter and CT installed on the grid side are necessary for export power limitation. If additional photovoltaic power needs to be generated, an electric meter and CT must also be installed on the photovoltaic power side.

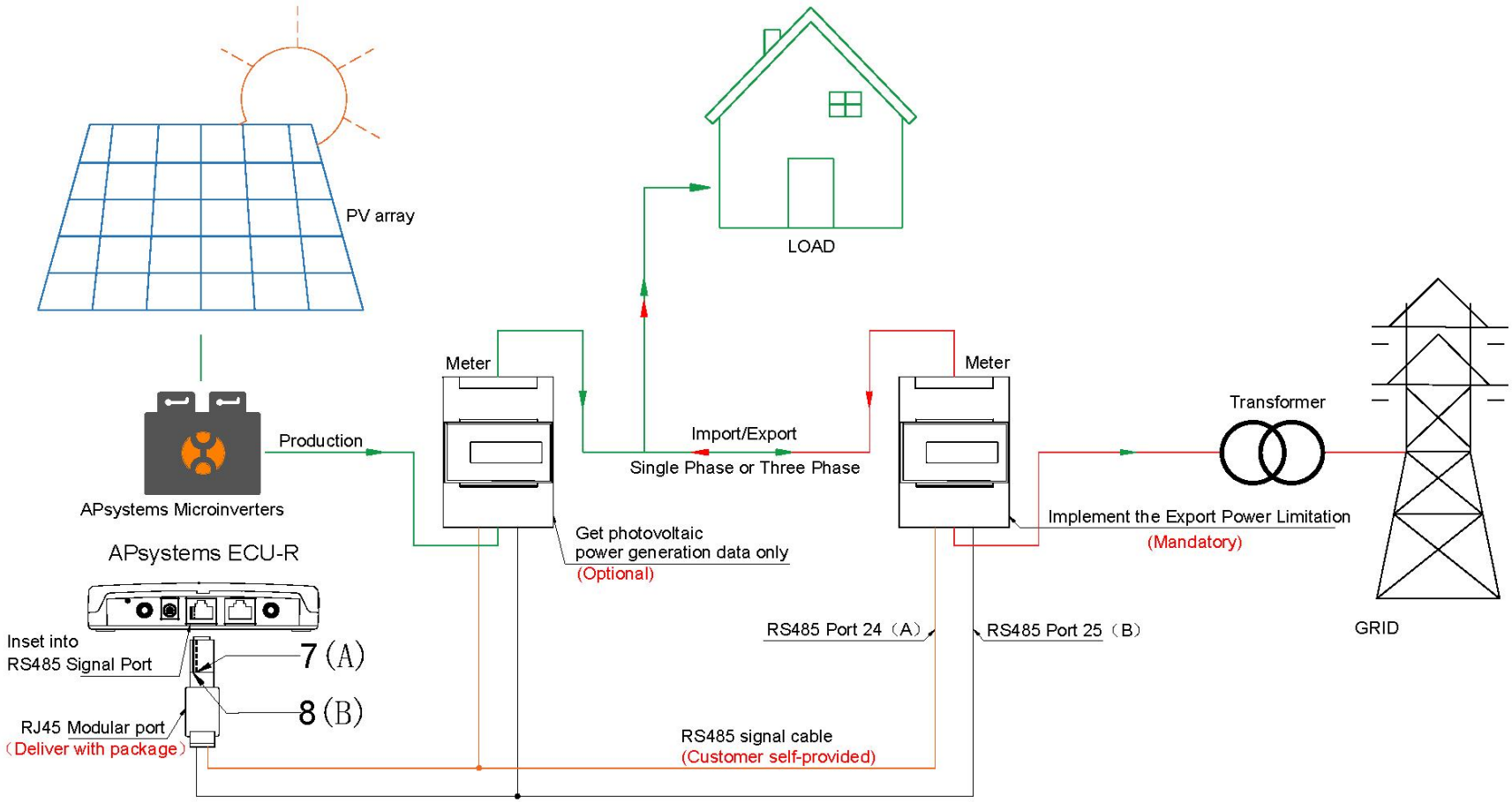
Export Power Control supports all APsystems microinverters. The three-phase micro-inverter is completely balanced. Therefore, power generation of the three phases will be uniformly limited if the power at any phase flows to the grid.

The following illustrations show different solutions in which electric meters with ECU-R are applied.

Without CT Connection

The electric meter can be installed on the Grid side and PV side. This solution is applicable only to circuits whose current is less than 80A.

The following drawing is applicable for CHINT Meter DDSU666-5(80)A-220/230V.

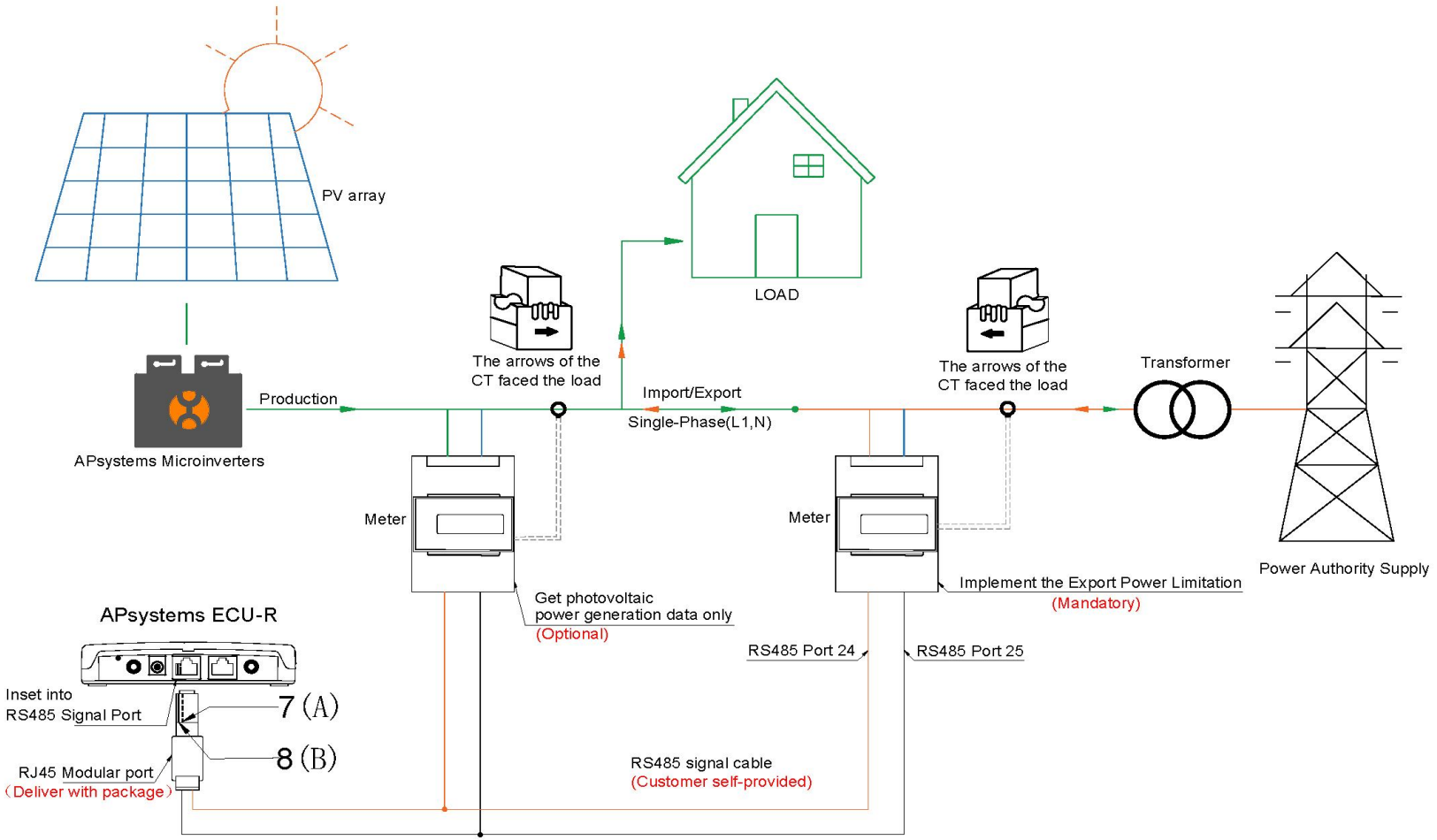


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With CT Connection

◆ Single-phase System(L,N)

The following drawing is applicable for CHINT Meter DDSU666-100A/40mA-230V, DDSU666-CT-1.5(6)A-220/230V

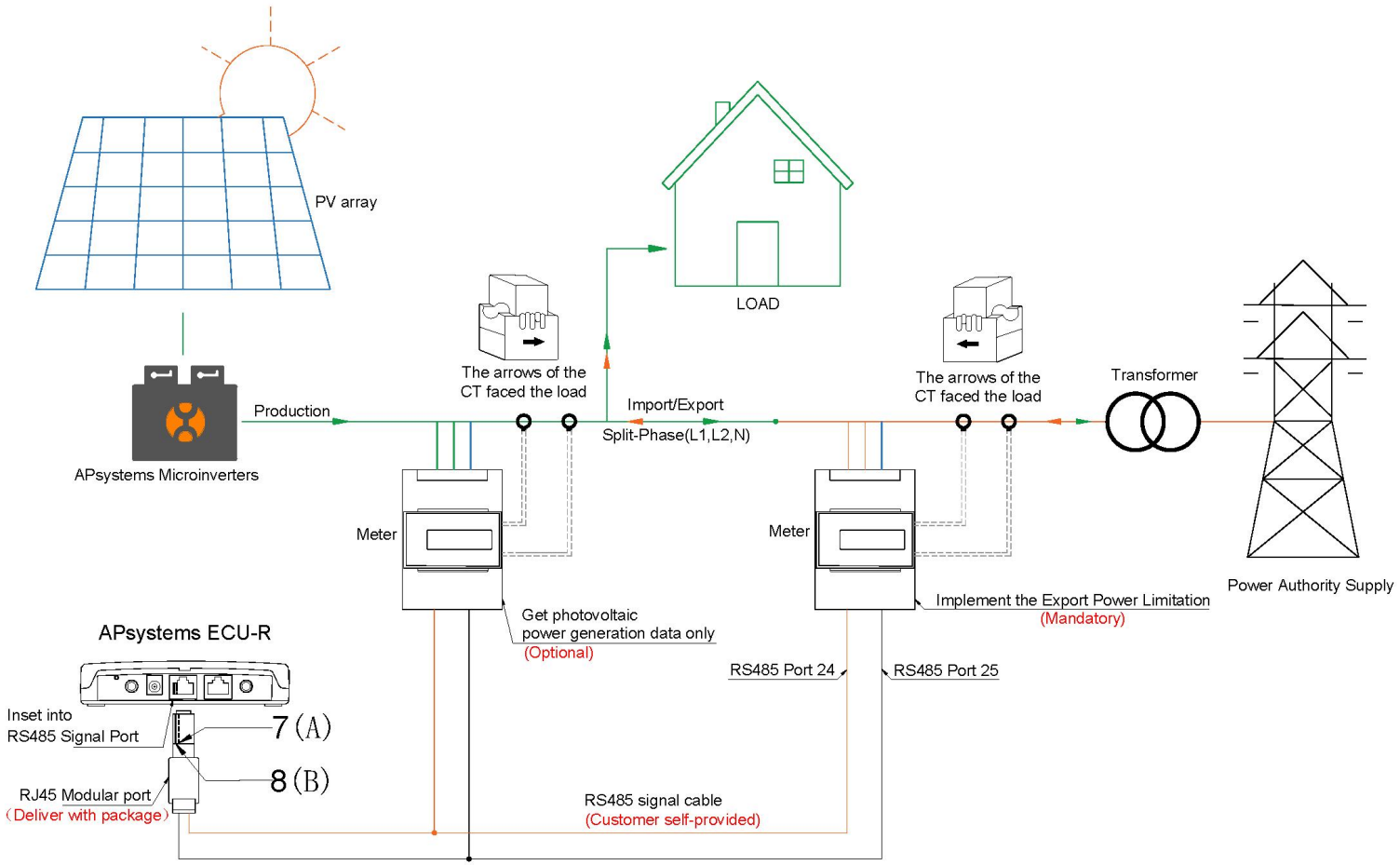


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◆ Split-phase System(L1,L2,N)

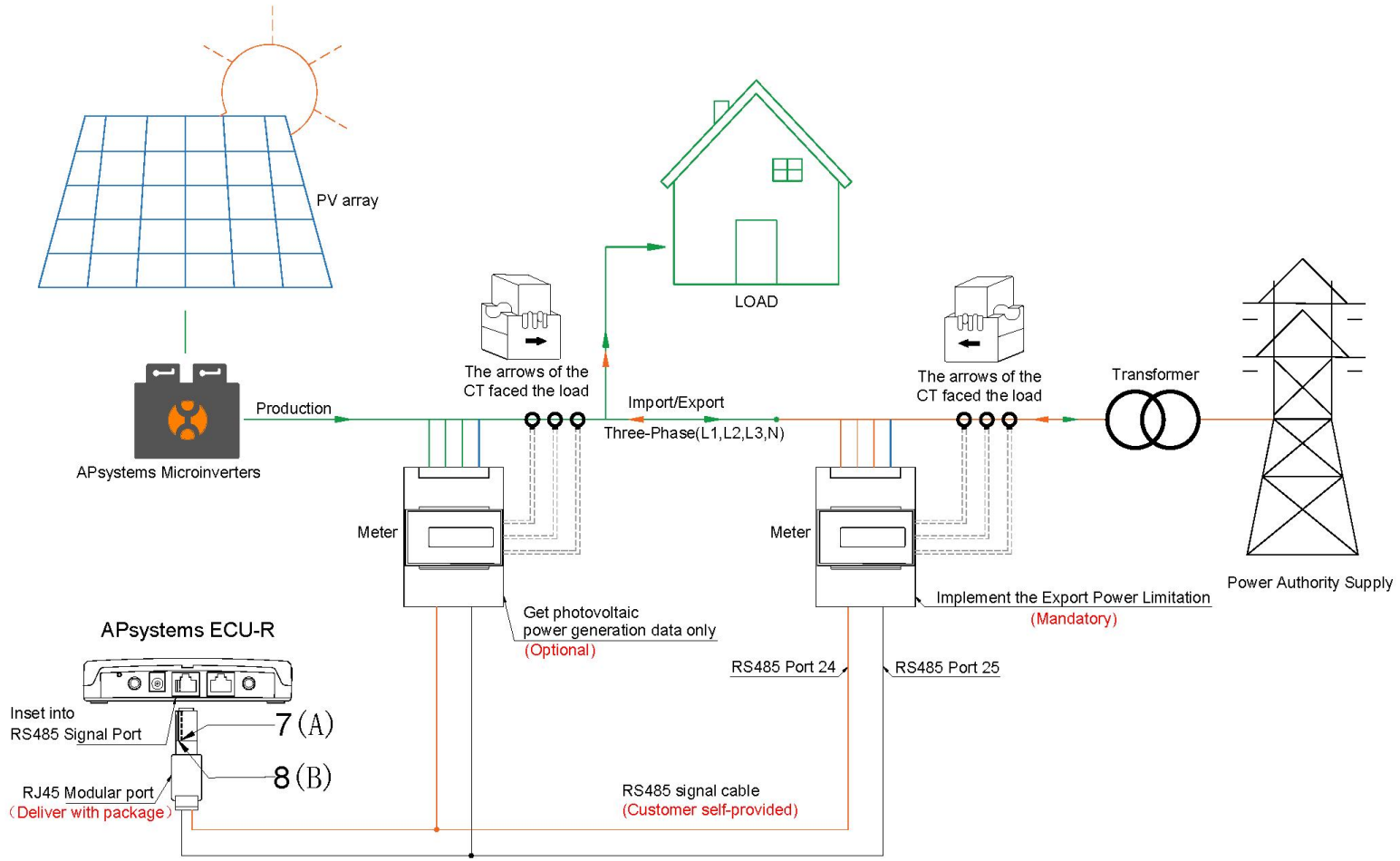
The following drawing is applicable for CHINT Meter DTSU666-250/50mA-120/240V.



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◆ Three-phase System 3P4W

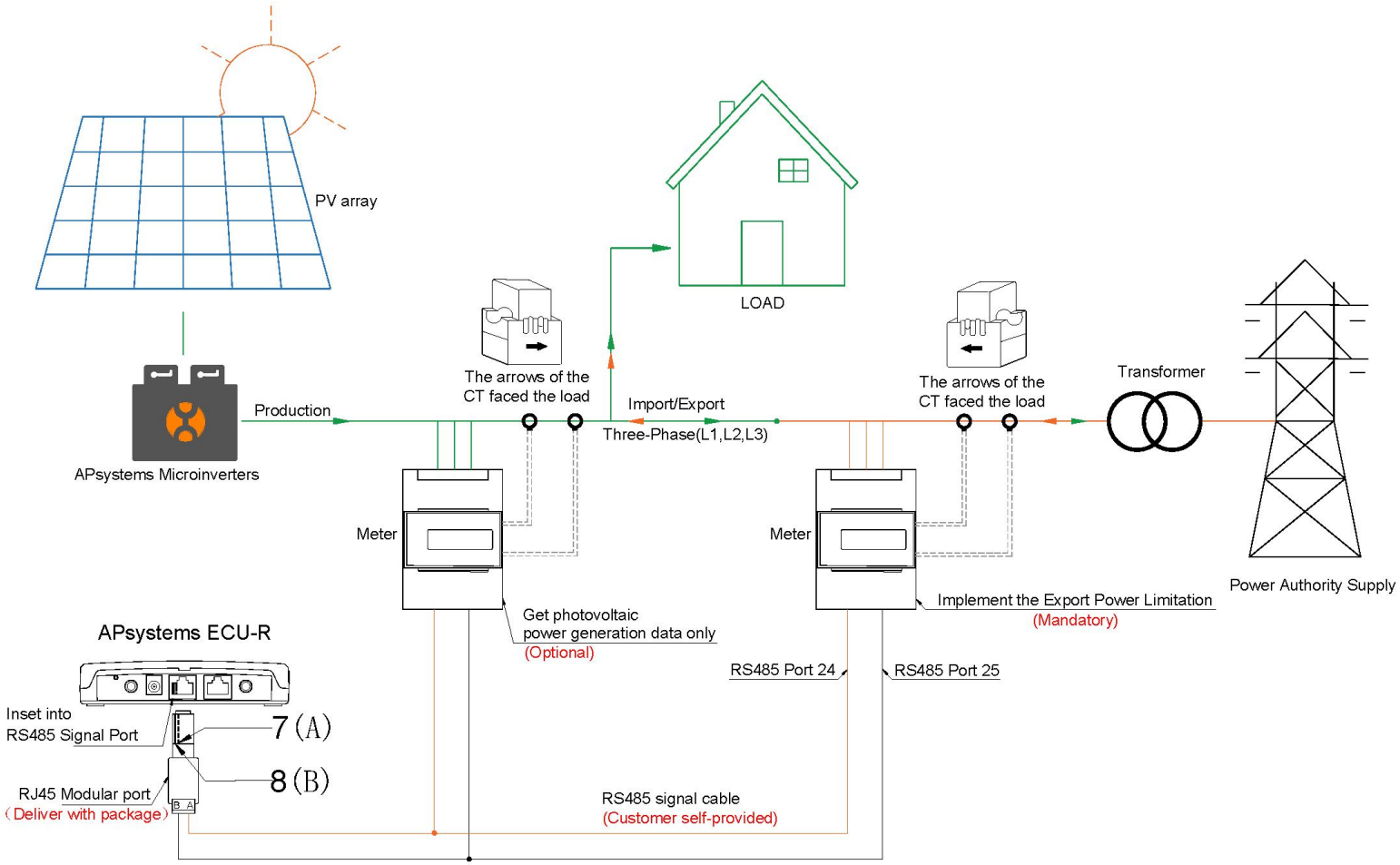
The following drawing is applicable for CHINT Meter DTSU666-250A/50mA-3 × 230/400V, DTSU666-1.5(6)A-3 × 230/400V, DTSU666-250A/50mA-3×120/208V, DTSU666-1.5(6)A-3×277/480V.



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◆ Three-phase System 3P3W

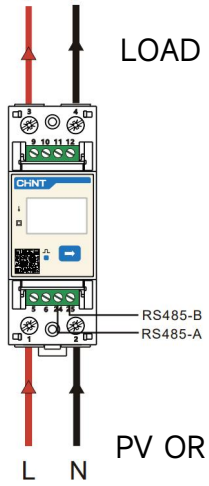
The following drawing is applicable for CHINT Meter DSSU666-1.5(6)A-3×400V, DSSU666-1.5(6)A-3×480V.



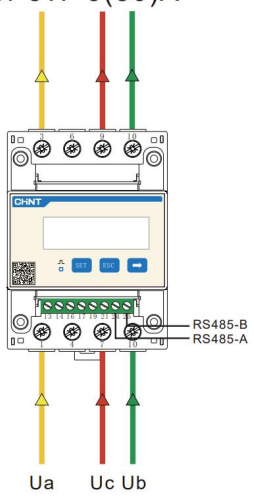
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Detail Wiring of CHINT Meter

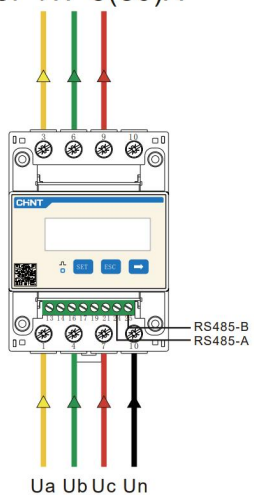
5(80)A



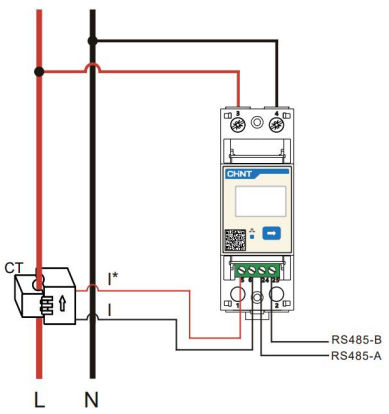
3P3W 5(80)A



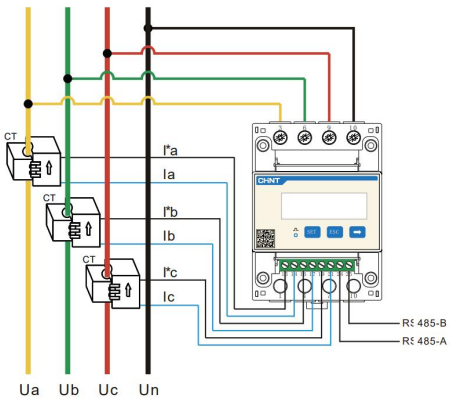
3P4W 5(80)A



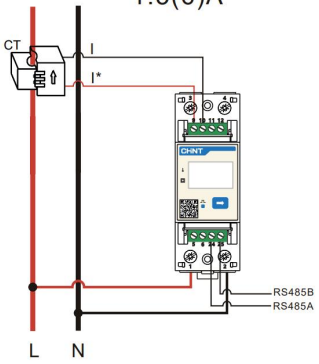
DDSU666 100A/40mA



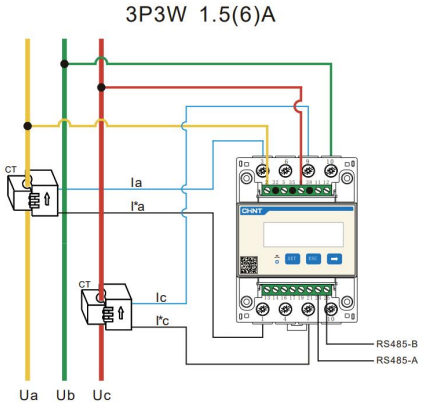
3P4W 100A/40mA,250A/50mA



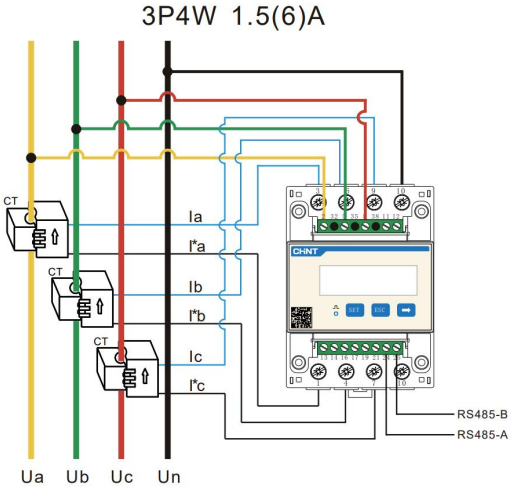
1.5(6)A



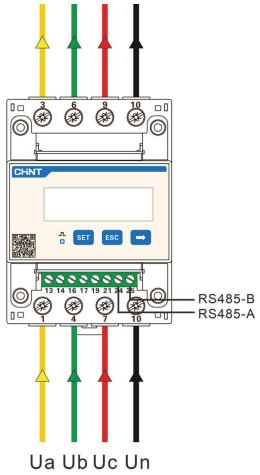
3P3W 1.5(6)A



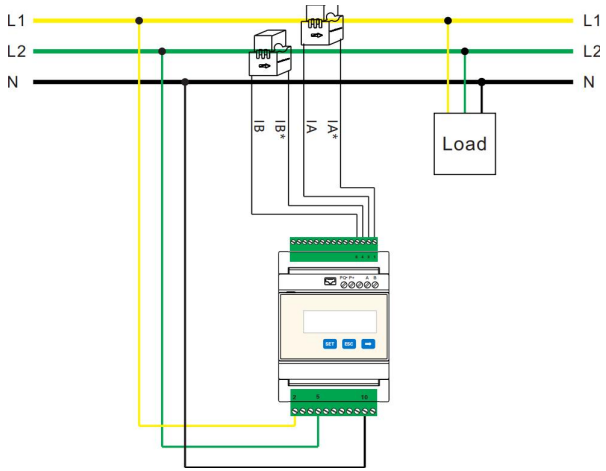
3P4W 1.5(6)A



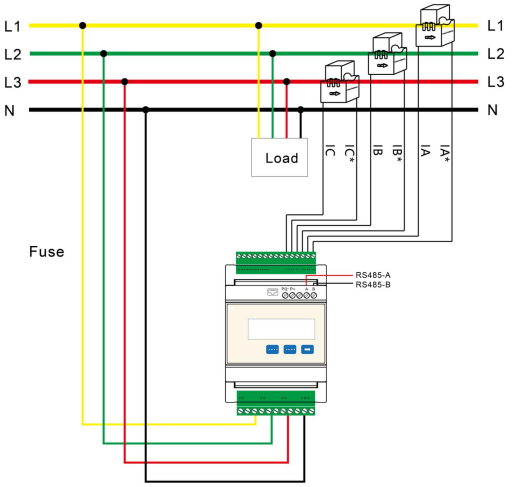
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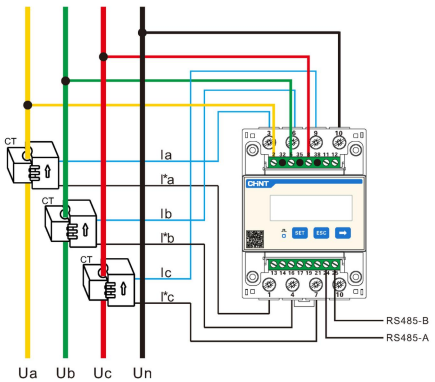
DTSU666-5(80)A-3X277/480V



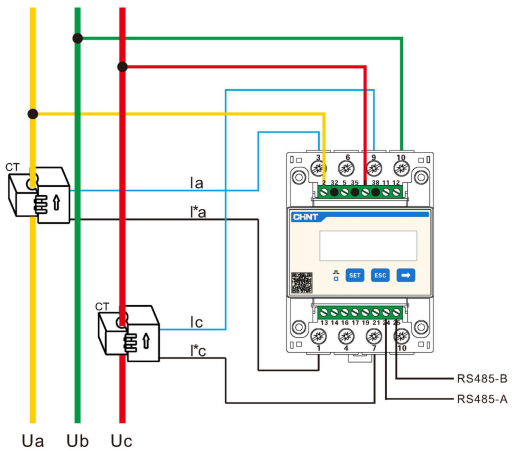
DTSU666-100/40mA-120/240V
DTSU666-250/50mA120/240V



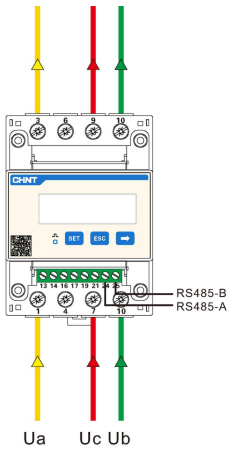
DTSU666-100A/40mA-3X120/208V
DTSU666-250A/50mA-3X120/208V



DTSU666-1.5(6)A-3X277/480V



DSSU666-1.5(6)A-3X480V



DSSU666-5(80)A-3X480V

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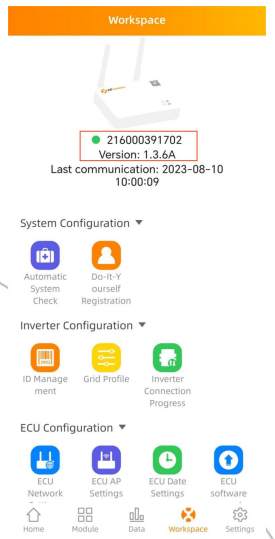
Electric Meter Settings

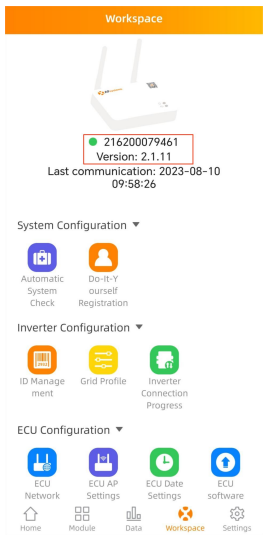
The electric meter function can be enabled on the ECU-R or Energy Monitoring & Analysis (EMA) platform. The EMA platform provides views to display detailed data. Client can select an export power limitation function and then enter the electric meter configuration page to configure the electric meter type and set the Modbus address.

If there is only one Meter in the system, the default Modbus address 1 is used. when the meter and the CT are installed both on the PV side and on the grid side, the Modbus address of one of the meters must be set to 2 in the 'Meter Configuration' page of the APP, and the internal Modbus address of the meter must also be manually set to 2 (see below for details)

Only the type of 1.5(6) of electric meter needs to set the CT ratio; the secondary current must be 1A or 5A.

ECUs have 2 types of UID numbers: those starting with 2160 and 2162. The red box corresponds to the UID number and APP version number, if you need to implement the export power control function, 2160 needs the software version of 1.3.6 or more, 2162 needs the software version of 2.1.11 or more.



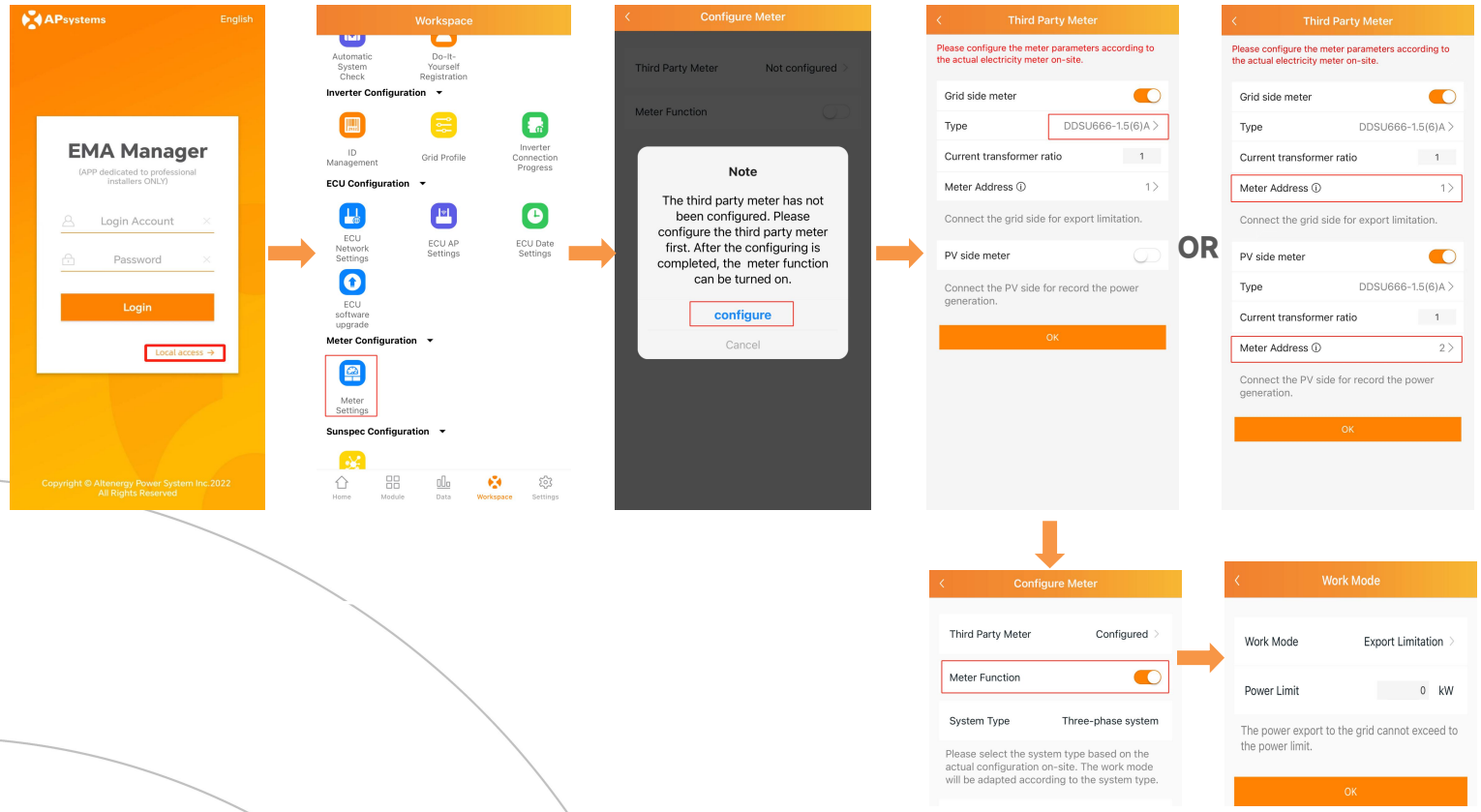


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◆ Electric Meter Configuration on ECU-R Local

By connecting to the ECU-R hotspot via mobile phone, enter the Workspace and select "Meter Settings". Then, configure the electric meter information and set the power limit.

At present, if you only have one Meter and need to realize the function of export power control, you can only fill in "Grid side meter" in "Configure Meter", and if you need to realize the function of measuring PV power generation data, you can fill in "PV side meter".

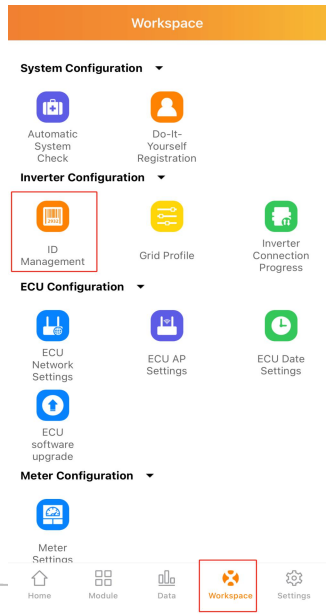


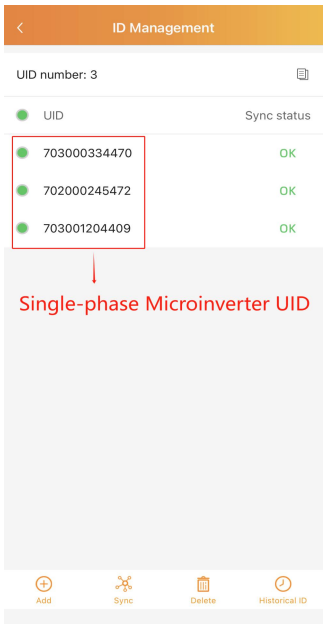
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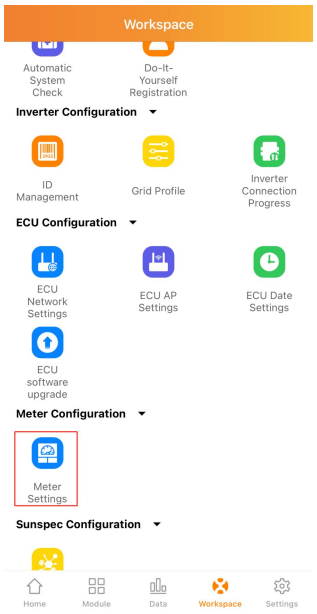
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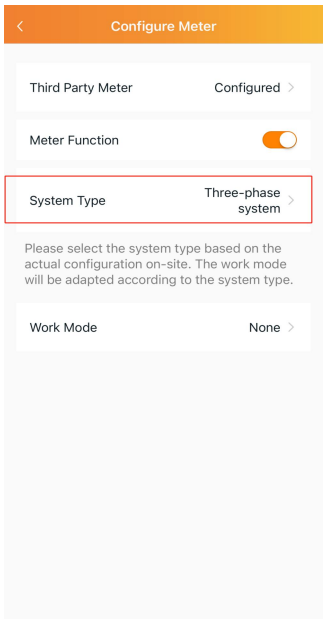
◆ Meter configuration for single-phase inverters as three-phase grid connection (Zero Export control)

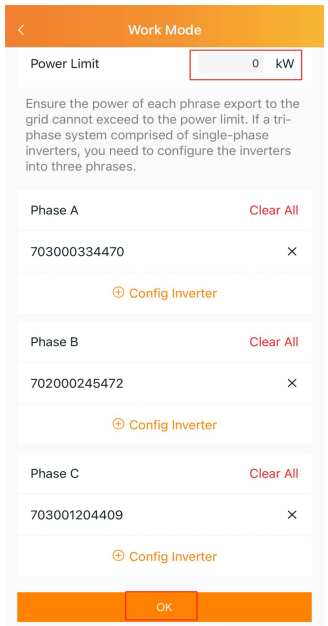
If you want to use a single-phase microinverter as a three-phase grid-connected, and the number of units is more than 3, and want to achieve the effect of Zero Export Control, you need to do the following operations, as shown in the diagram below.











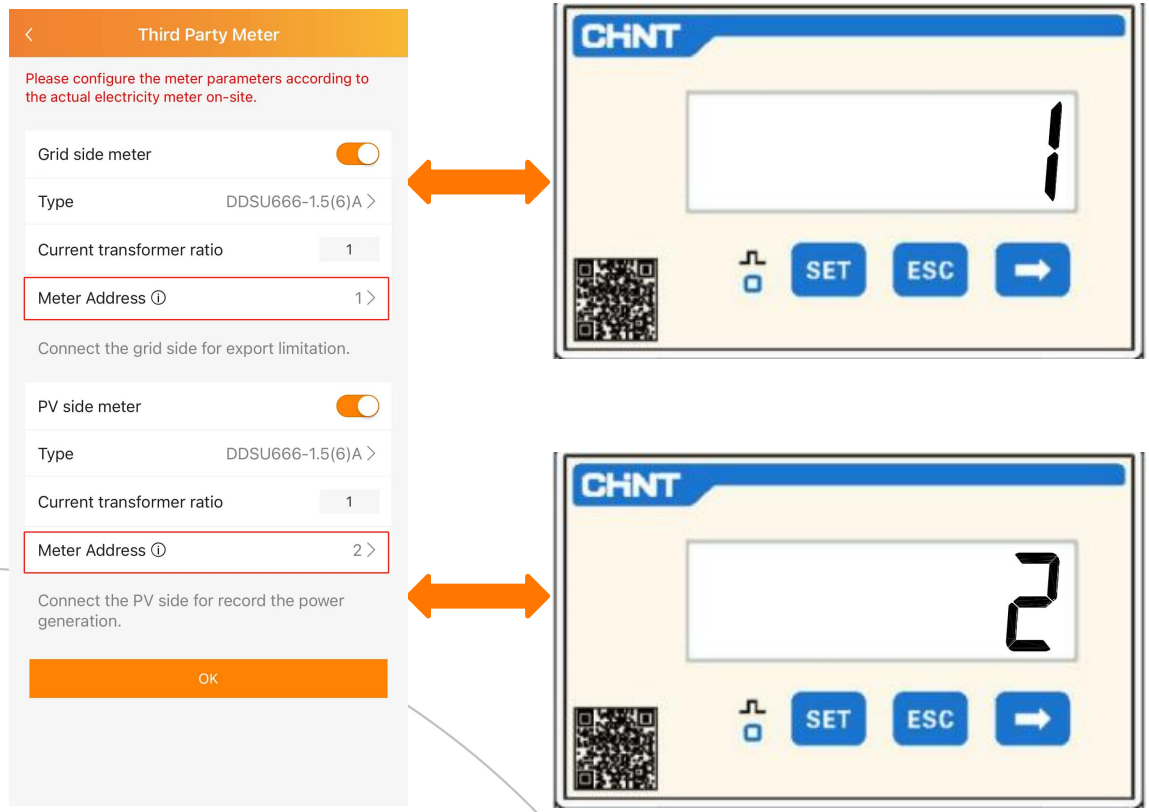
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◆ How to change the Modbus address of the meter（When two meters exist on a system)

Each meter has a factory-set Mod bus address of 1.

If the customer's system has meters installed on both the PV side and the grid side, the Modbus address of one of the meters needs to be manually changed to 2. The Modbus address of the meter is the same as the Modbus address of the ‘Meter Configuration’ when accessing the ECU locally from the mobile app，as shown：



Modbus address of the Grid-side meter

Modbus address of the PV-side meter

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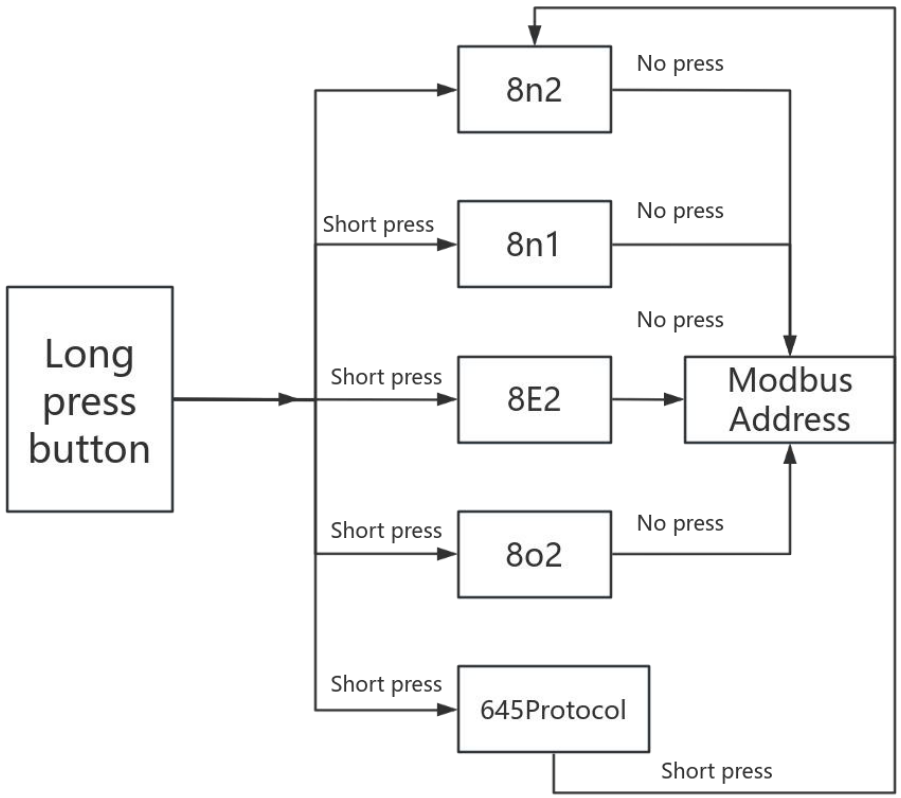
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◆ **The single-phase meter modifies the Modbus address as follows:**

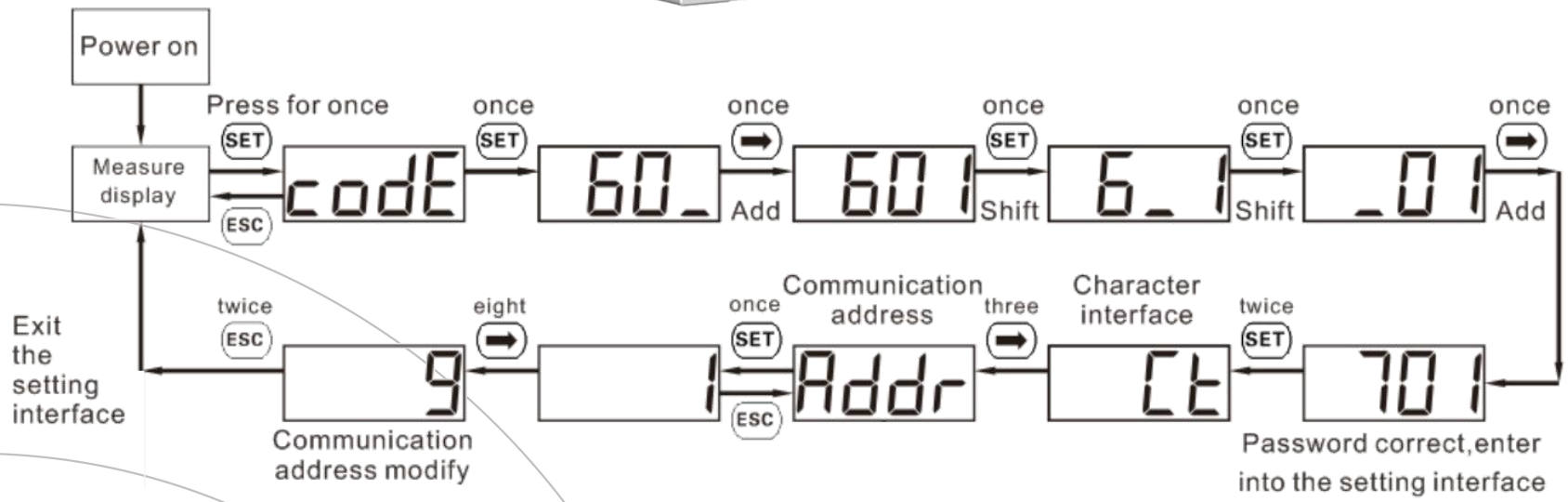




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◆ **The three-phase meter modifies the Modbus address as follows:**

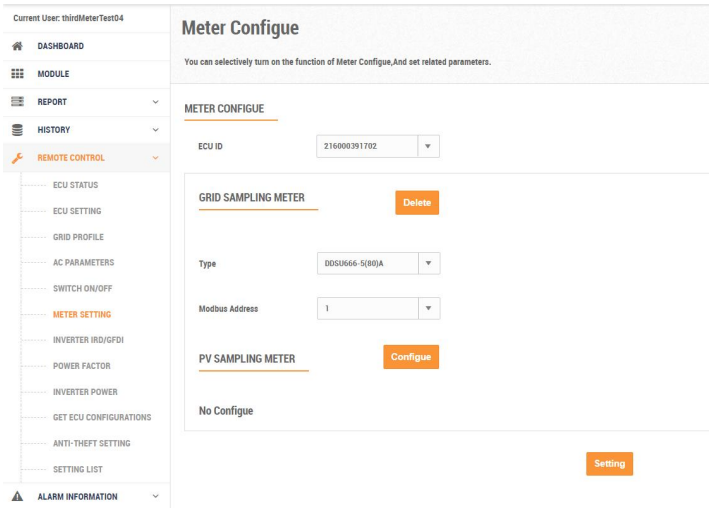




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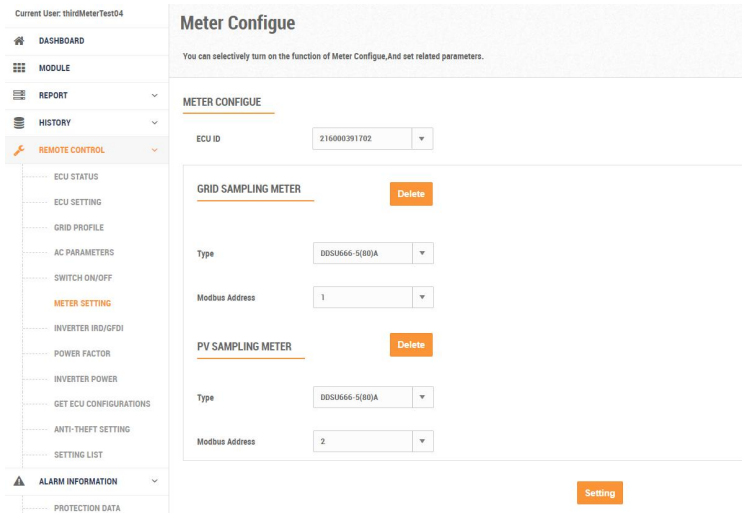
◆ Electric Meter Configuration on EMA（Remote Control)

After you configure the electric meter information on ECU-R local, the EMA Web will display the configuration. The EMA page supports remote configuration antion of electric meter information.



Scene1

OR



Scene2

Scene1: Configure only"GRID SAMPLING METER"for **Zero export control**.

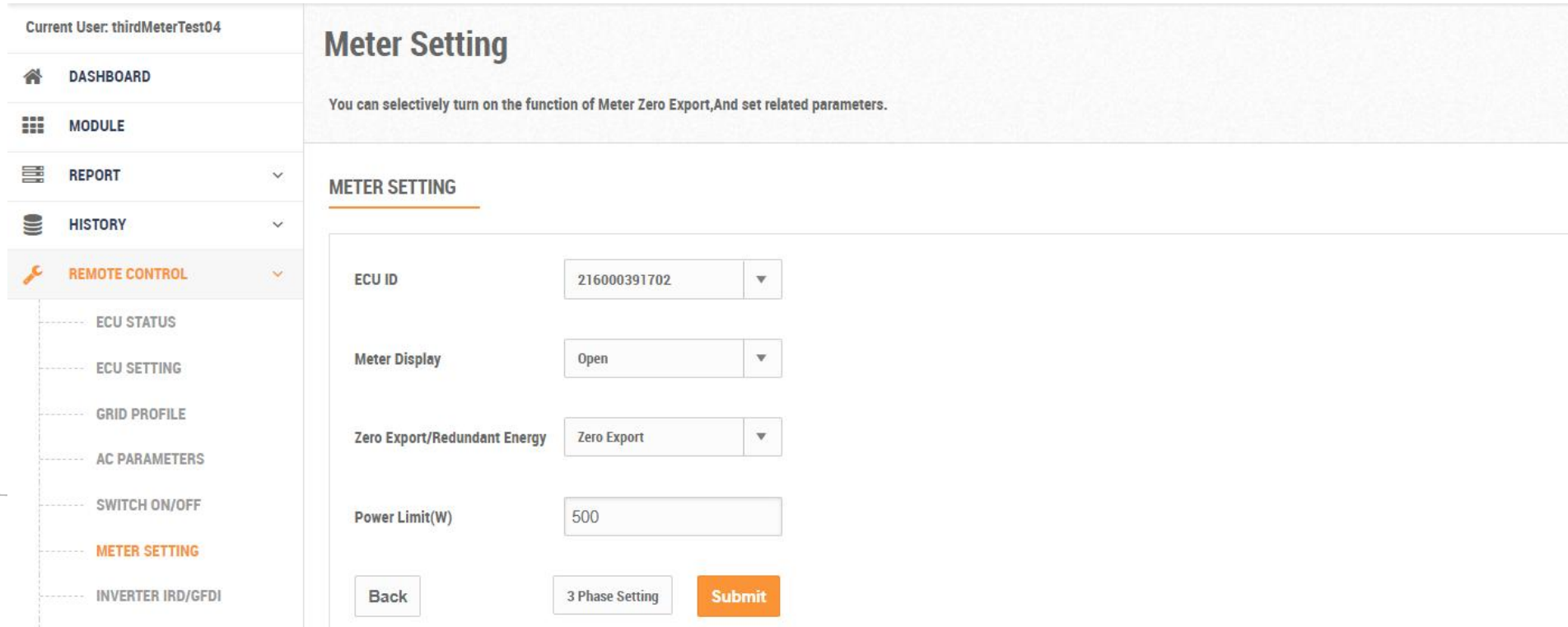
Scene2: Configuration of "GRID SAMPLING METER" and "PV SAMPLING METER" for simultaneous **Zero export control** and **PV generation measurement.**

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◆ Power Limit Setting on EMA

After you configure the electric meter information, the system applies the configuration and redirects to the meter function settings page within 15–20 minutes. If you want to modify the electric meter configuration, click "Back" to go back to the meter configuration page.



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Data Display on EMA

The electric meter transfers export/import power data and photovoltaic power generation data to the ECU-R via RS-485. Then, the ECU-R uploads the data to the EMA platform by using the router or a wireless network. Users can view energy information on the EMA platform or through the mobile application.

◆ Export/Import Data

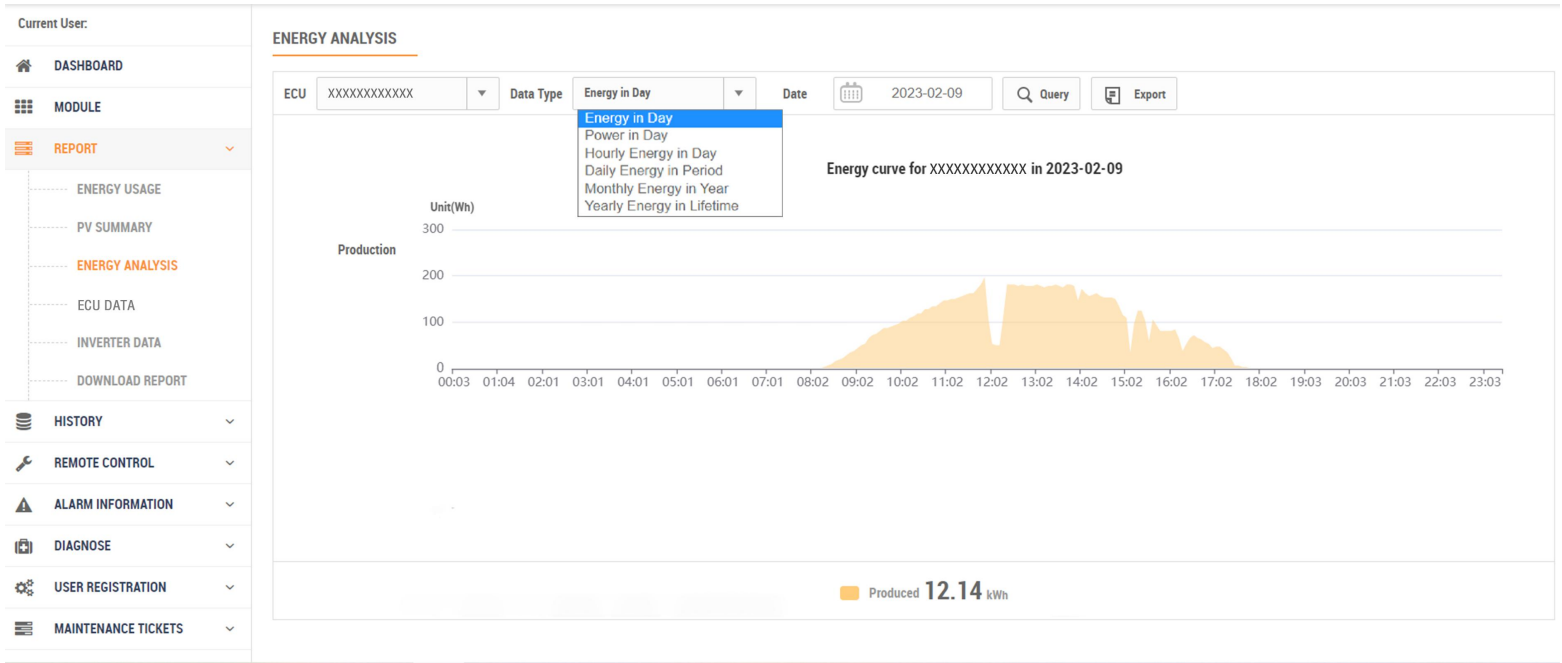


Note: Electric Meter and CT are installed on the grid side.In this case,the Meter serves as an export power limitation!

If you just want to implement an export power limitation,you can just install one Meter on the grid side.

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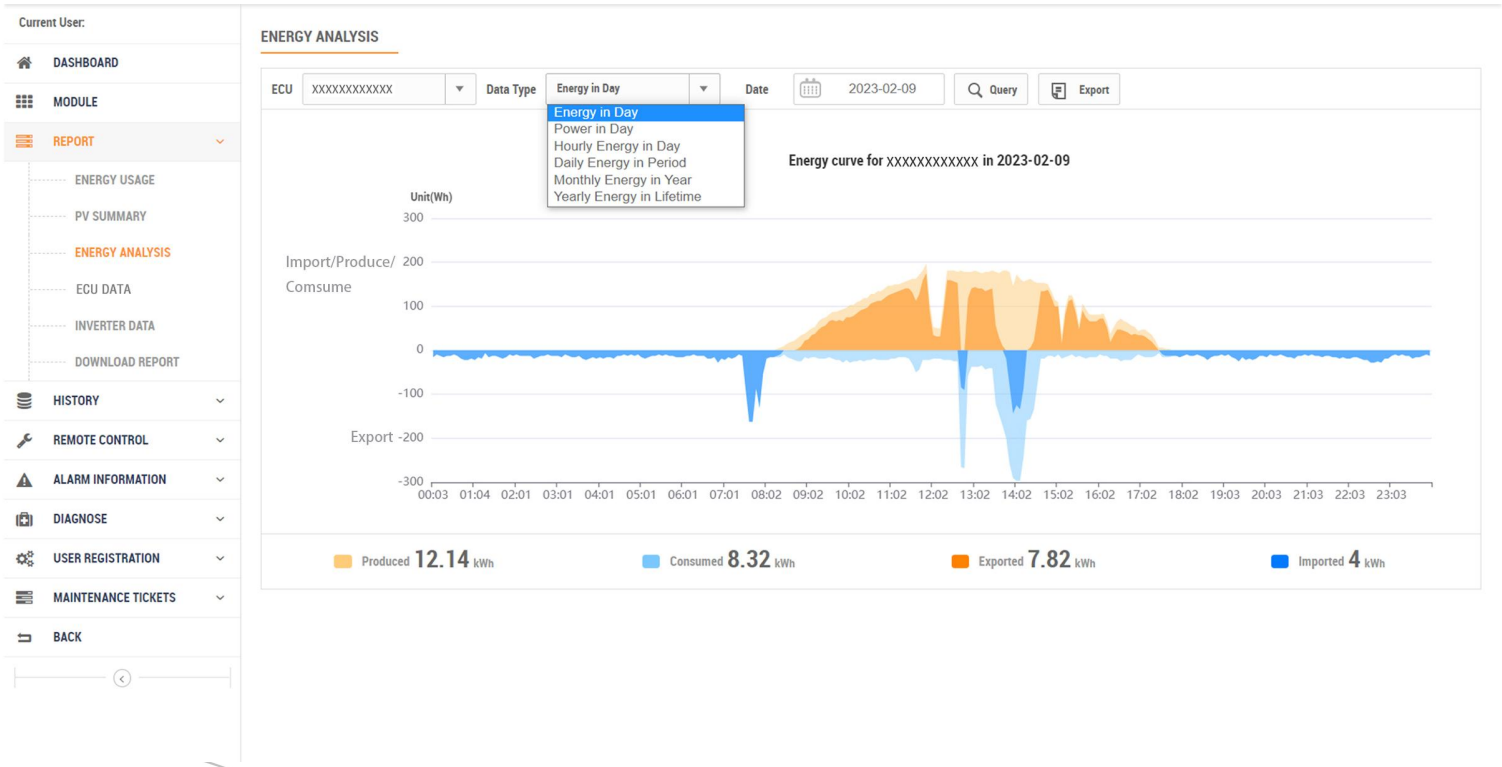
◆ Photovoltaic Power Generation Data



Note: Electric meter and CT (optional) are installed on the photovoltaic side,at this time the meter is used to measure PV power Generation data and does not have the role of export power limitation!

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◆ Photovoltaic Power Generation, Consumed Power, and Export/Import Power Data



Note: This picture shows Electric meter are installed on the photovoltaic and grid sides,Simultaneous Zero Export Control and photovoltaic power data acquisition!

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