Fox ESS EV Charger

Operation and Installation Manual of Energy Management System

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# Operation and Installation Manual of Energy Management System

* This Manual introduces the App configuration, installation instructions and working mode instructions for load balance and Photovoltaic Linkage of Fox ESS EV Charger.

Contents

1 Load Balance (Single Unit)

Single unit load balance is suitable for situations where a single EV Charger shares power with other loads.
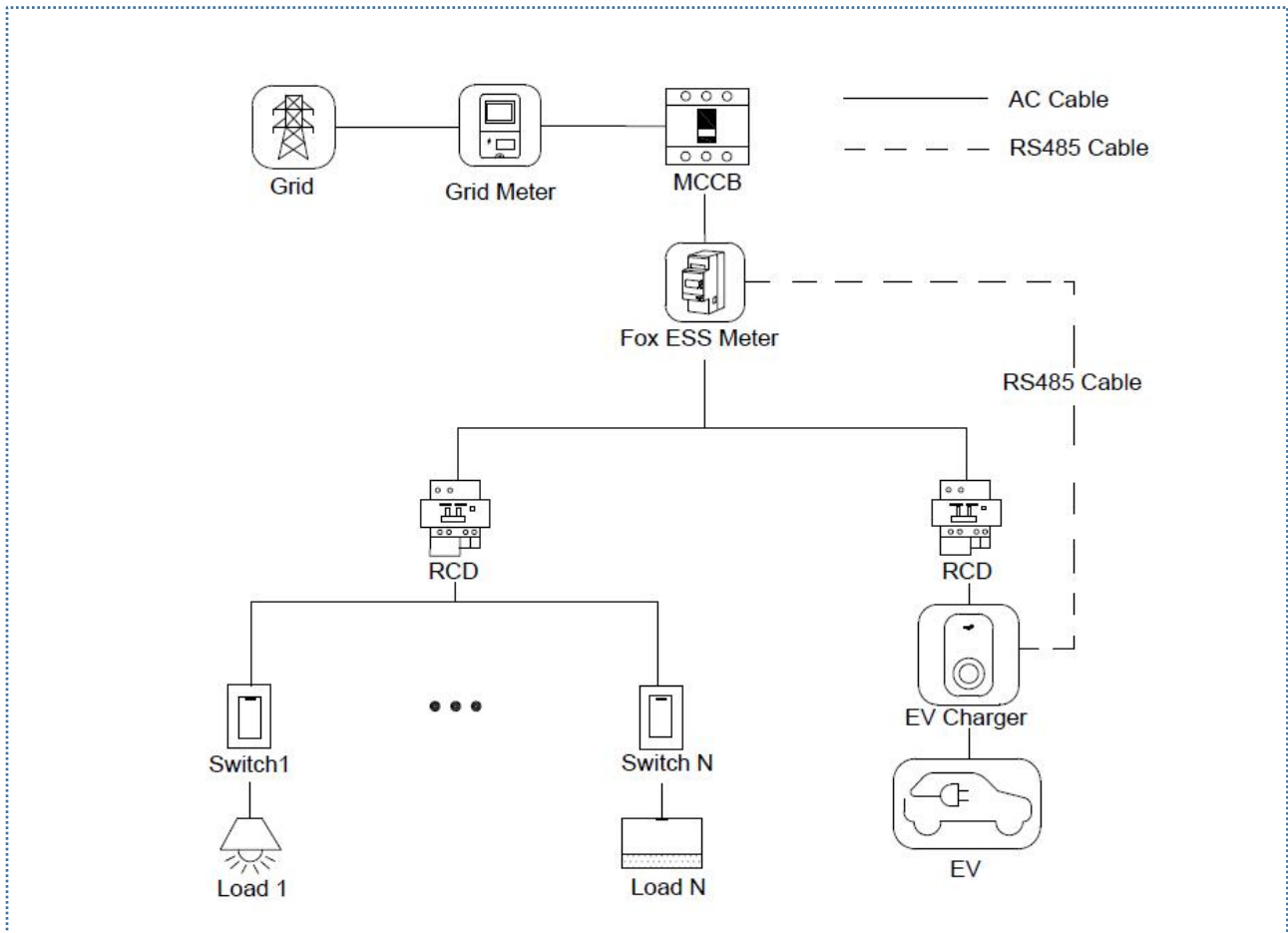
Wiring diagram of single unit load balance system

⚠ Note:

1. To comply with relevant leakage protection standards, please use at least type A RCD or equivalent leakage protector that complies with local standards.

2. The installation must be performed by qualified personnel in accordance with local regulations.

1.1 Installation Guide

RS485 Communication Wiring

RS485 Cable is required to establish communication between the EV Charger and the electric meter.

In order to save time in purchasing electric meter, it is recommended to purchase the following AC meter from local dealer.

◆ Single-phase electric meter ≤ 60A: DDSU666 5(60).

◆ Three-phase electric meter ≤ 80A: DTSU666 5(80).

◆ Three-phase electric meter ≤ 200A: DTSU666 1.5(6).

◆ Three-phase electric meter ≤ 200A: DTSU666 (Dual RS485)

Electric Meter Model	Applicable EV Charger
DDSU666 5(60)A	7.3KW
DTSU666 5(80)A	11KW/22KW
DTSU666 1.5(6)A	11KW/22KW
DTSU666 (Dual RS485)	11KW/22KW

Electric Meter Selection Recommendation Table

⚠ Note:

1. If the total current of the DTSU666 (dual RS485) electric meter is < 80A, it can be directly connected to the circuit. If the total current is > 80A, it should be connected to the circuit with CT, and the connection method of the electric meter should be set to CT connection. For specific setting methods, please refer to the use instructions of the electric meter; Fox ESS brand inverter can share this electric meter with EV Charger.
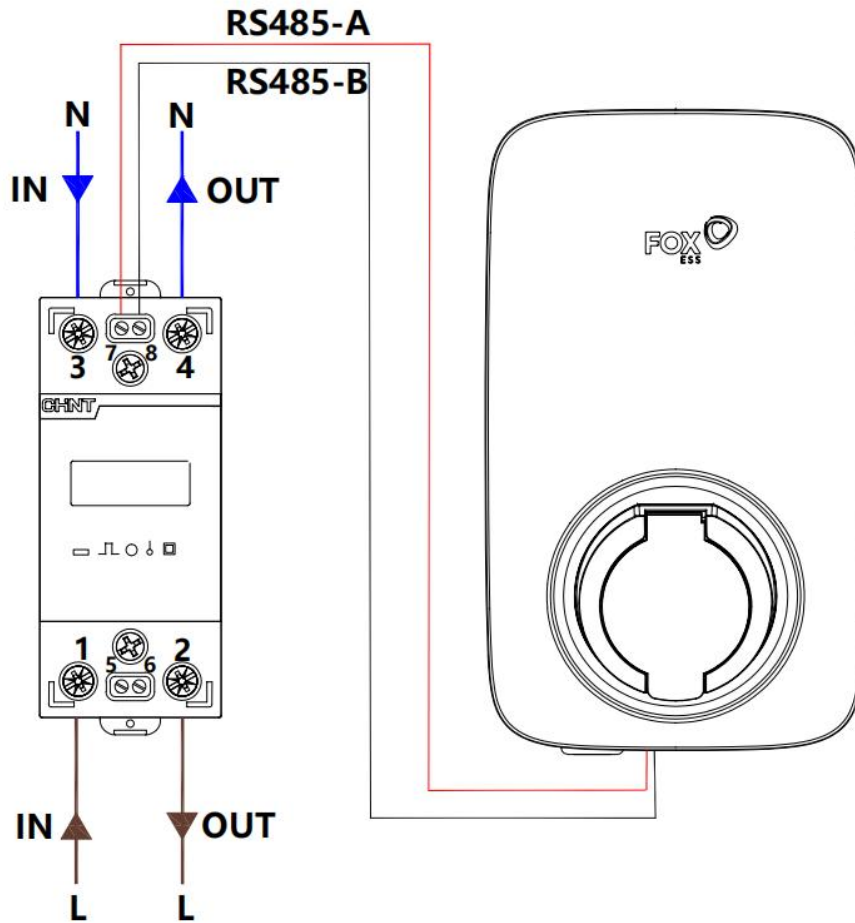
Upper Terminals

N Wire		Communication	
N Input	N Output	RS485-A	RS485-B
3	4	7	8

Lower Terminals

L Wire	
L Input	L Output
1	2
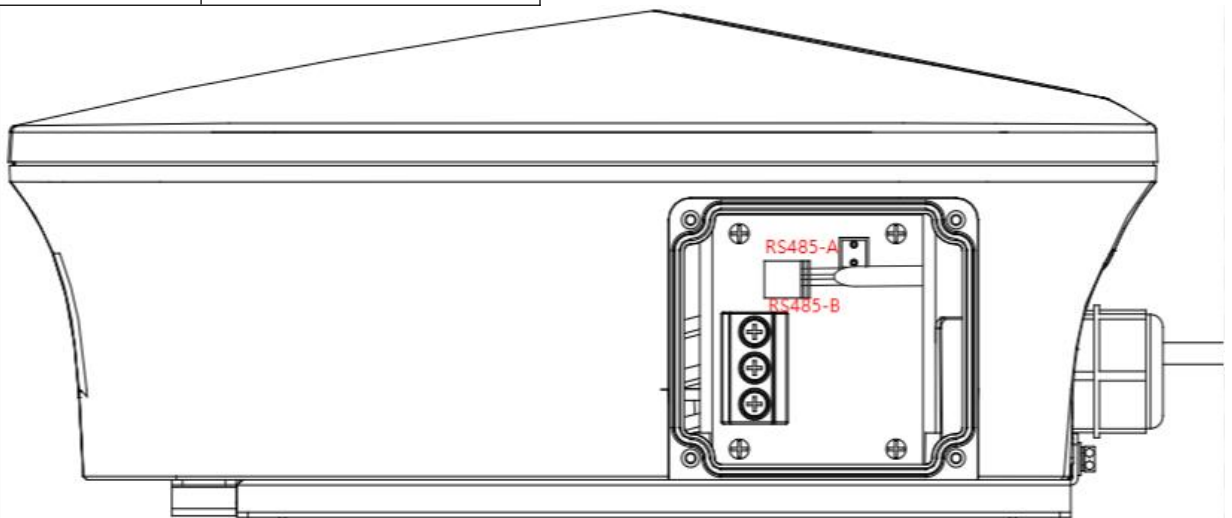
RS485 wiring diagram of single-phase electric meter DDSU666 5(60) and 7.3KW EV Charger

The wire color shown in the diagram is for reference only, please refer to the local wire color for details.

Upper Terminals

Voltage output			
Ua	Ub	Uc	N
3	6	9	10

Lower Terminals

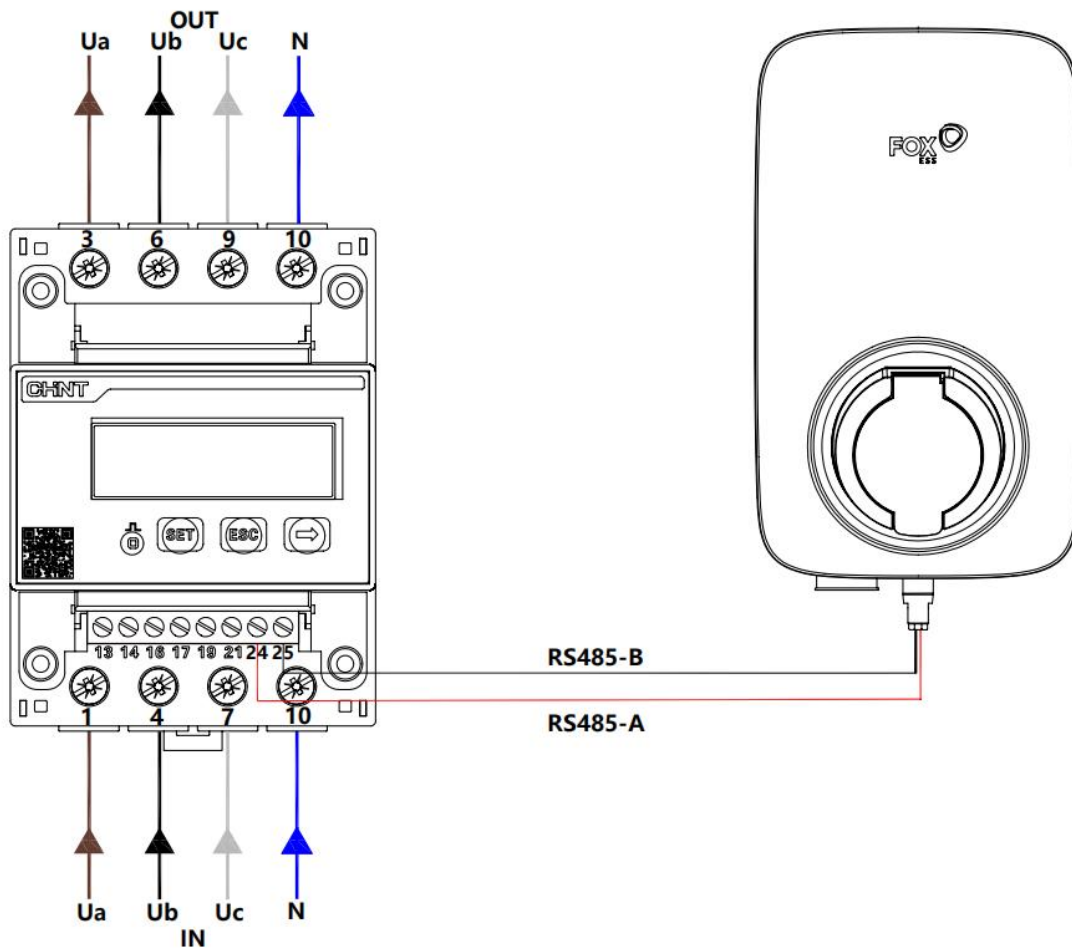| Voltage input				Communication	
Ua	Ub	Uc	N	RS485-A	RS485-B
1	4	7	10	24	25

RS485 wiring diagram of three-phase electric meter DTSU666 5(80)A and 11/22KW EV Charger
The wire color shown in the diagram is for reference only, please refer to the local wire color for details.

4
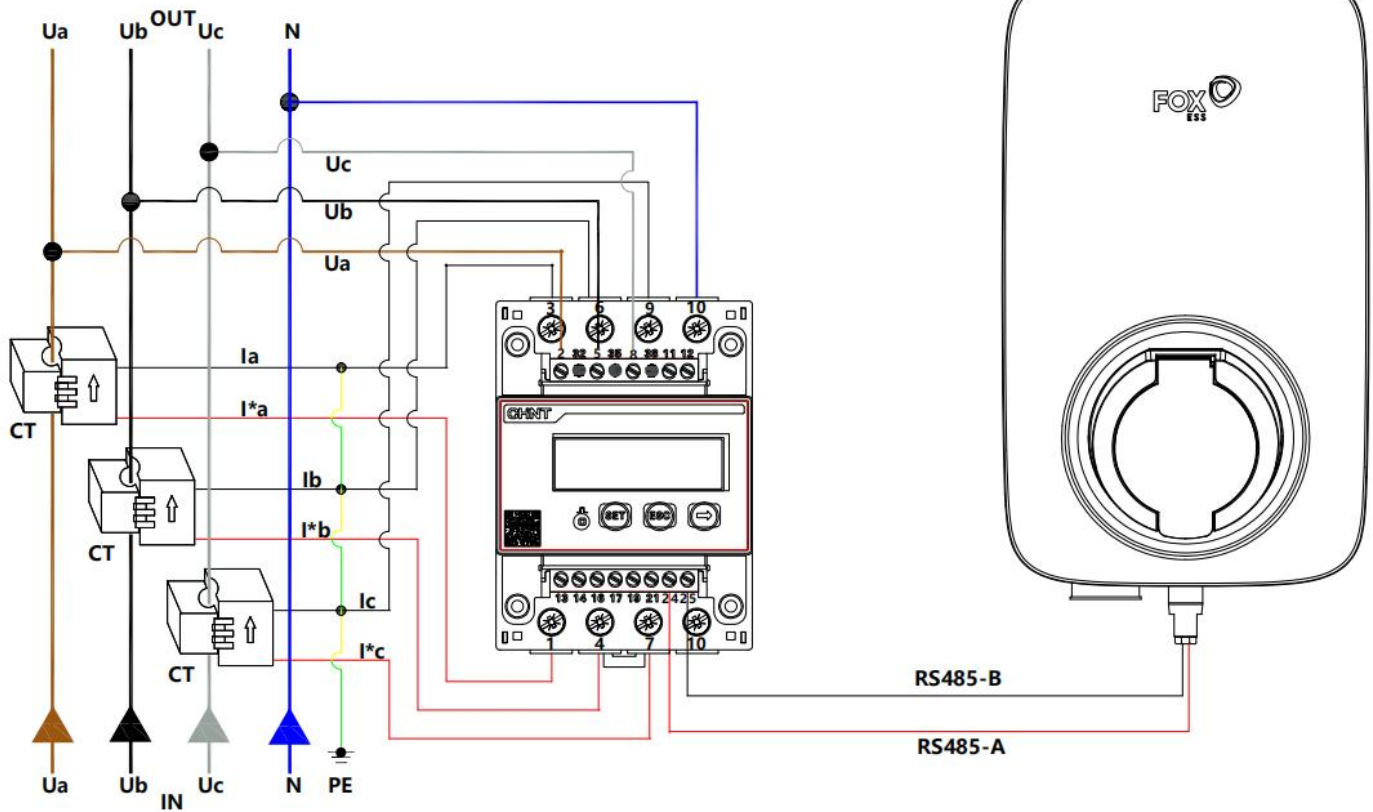
Upper Terminals

Transformer connection			Voltage input			
Ia	Ib	Ic	Ua	Ub	Uc	N
3	6	9	2	5	8	10

Lower Terminals

Transformer connection			Communication	
I*a	I*b	I*c	RS485-A	RS485-B
1	4	7	24	25

RS485 wiring diagram of three-phase electric meter DTSU666 1.5(6) and 11/22KW EV Charger
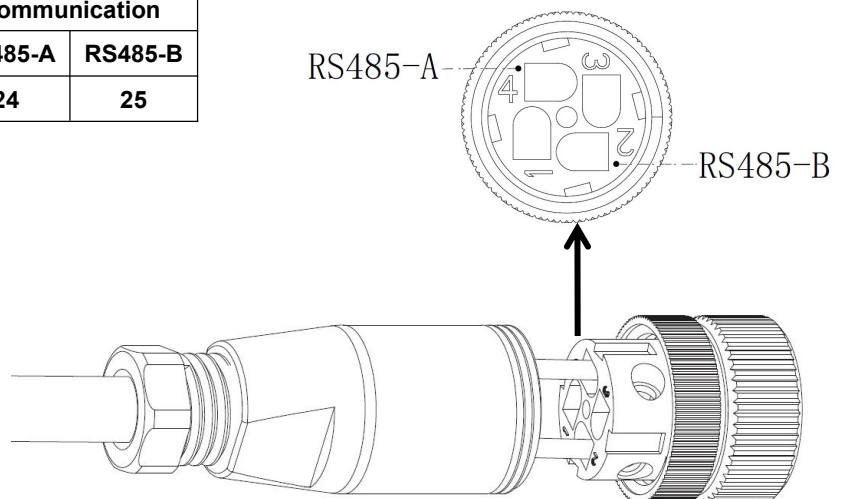**The wire color shown in the diagram is for reference only, please refer to the local wire color for details.**
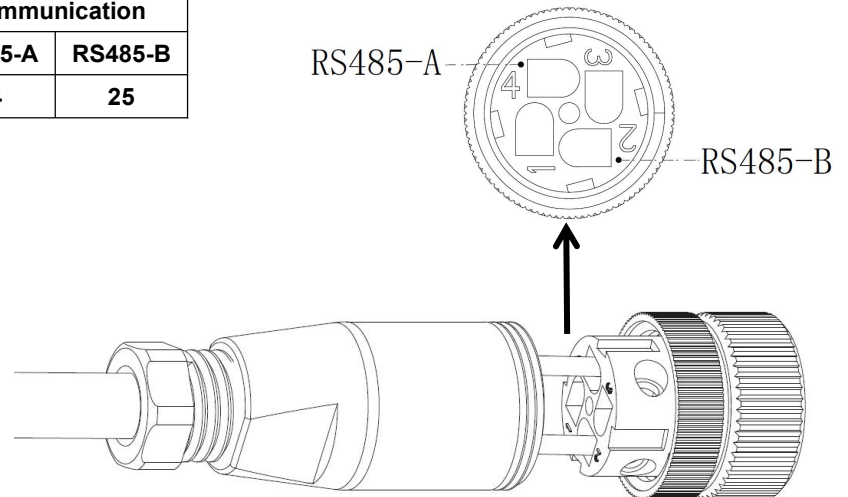
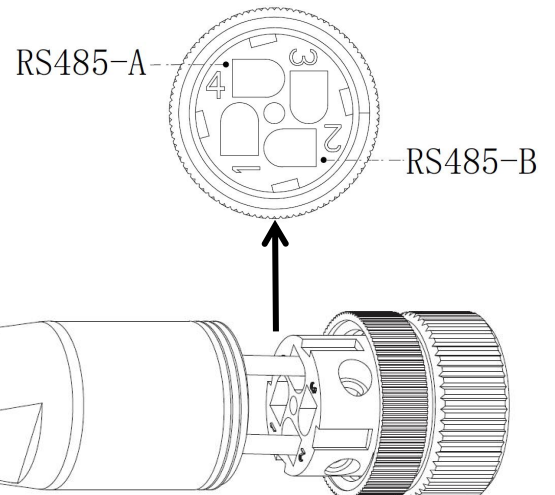**Current < 80A   DTSU666 (Dual RS485) can be directly connected**

Fox ESS PV Inverter

RS485-A2
RS485-B2

OUT
Ua Ub Uc N

3 6 9 12
19 21 24 25

DTSU666
Smart Power Sensor
☲ 280/400V,3~ 50/60Hz
Channel1: 5(80)A Class 1   400imp/kWh
Channel2:1.5(6)A Class 0.5S 6400imp/kWh

SET   ESC   ⇒

31 33 34 36 37 39
1 4 7 10

Ua Ub Uc N
IN

RS485-A
RS485-B
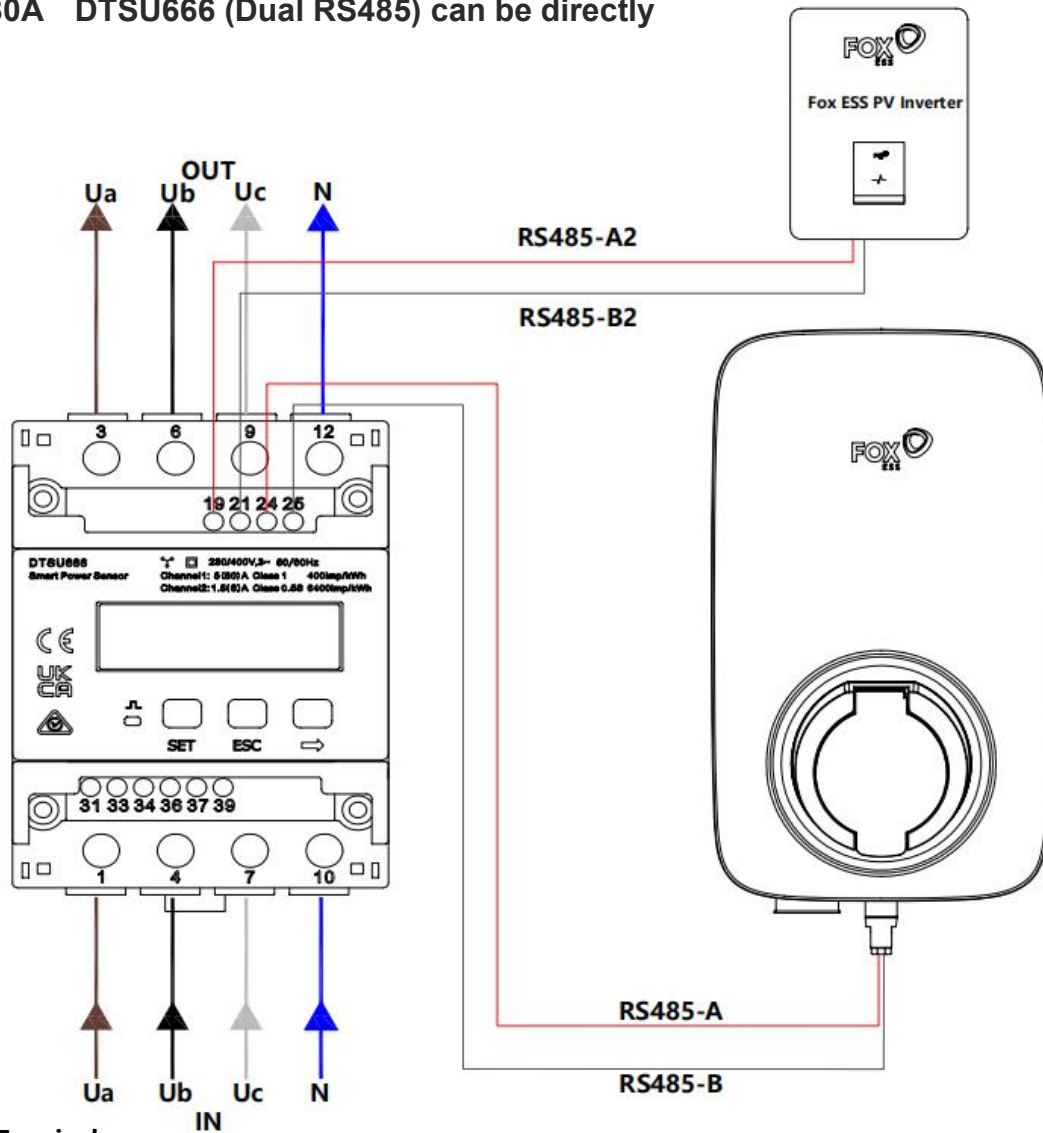
RS485−A
4 3
1 2
RS485−B

Upper Terminals

Voltage output				Communication			
Ua	Ub	Uc	N	RS485-A	RS485-B	RS485-A2	RS485-B2
3	6	9	12	24	25	19	21

Lower Terminals
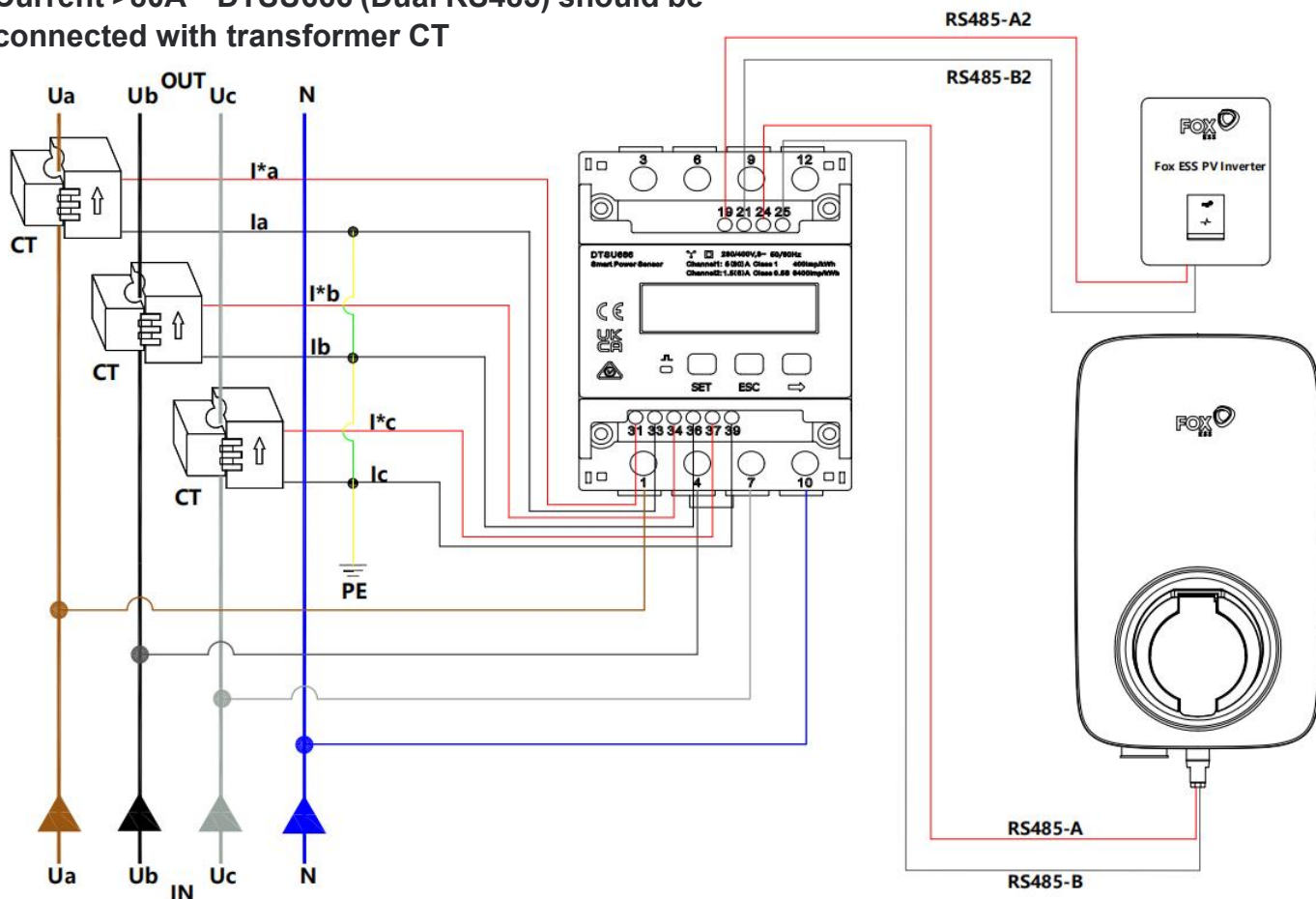
Voltage input			
Ua	Ub	Uc	N
1	4	7	10

RS485 wiring diagram of three-phase electric meter DTSU666 (Dual RS485) and 11/22KW EV Charger

The wire color shown in the diagram is for reference only, please refer to the local wire color for details.

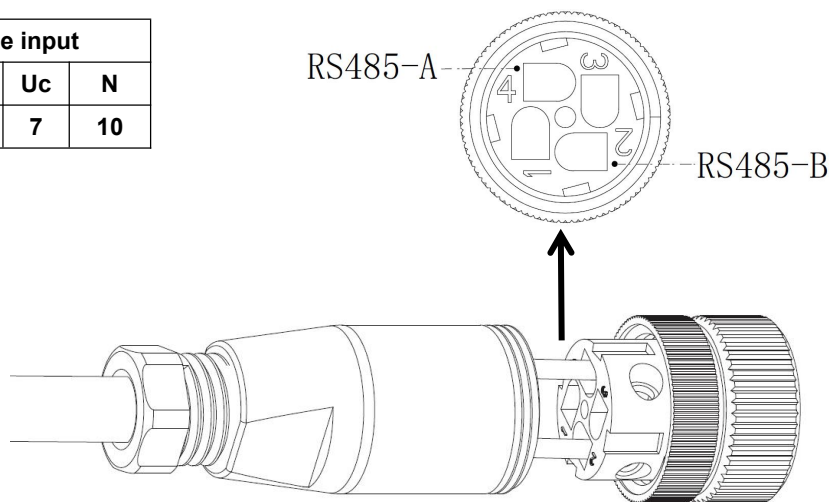**Current >80A   DTSU666 (Dual RS485) should be connected with transformer CT**

Upper Terminals

Communication			
RS485-A	RS485-B	RS485-A2	RS485-B2
24	25	19	21

Lower Terminals

Transformer connection						Voltage input			
I*a	Ia	I*b	Ib	I*c	Ic	Ua	Ub	Uc	N
31	33	34	36	37	39	1	4	7	10

RS485 wiring diagram of three-phase electric meter DTSU666 (Dual RS485) and 11/22KW EV Charger
The wire color shown in the diagram is for reference only, please refer to the local wire color for details.
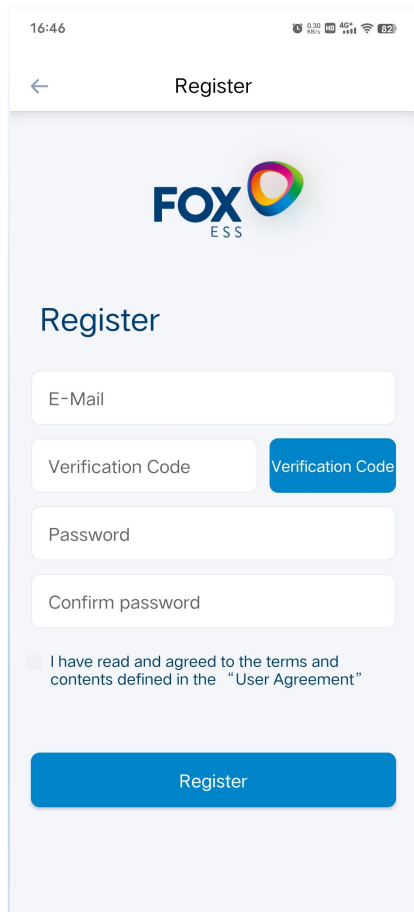
1.2 Configuration

After installing and connecting all units according to the wiring diagram, enable the single unit load balance function through the FoxSwitch App according to the following steps.
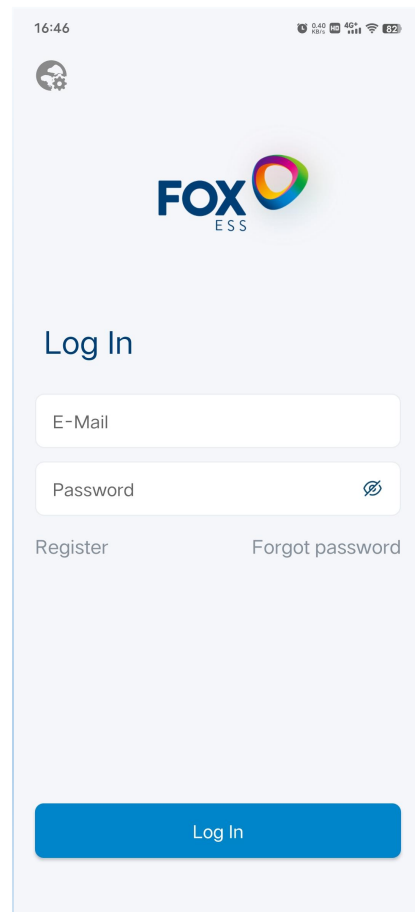
1. Download the FoxSwitch App

Download and install the APP by going to the App Store or Google Play and searching "FoxSwitch".

2. Account login

Please log in to FoxSwitch with your account and password. If you do not have an account, please register and then log in.
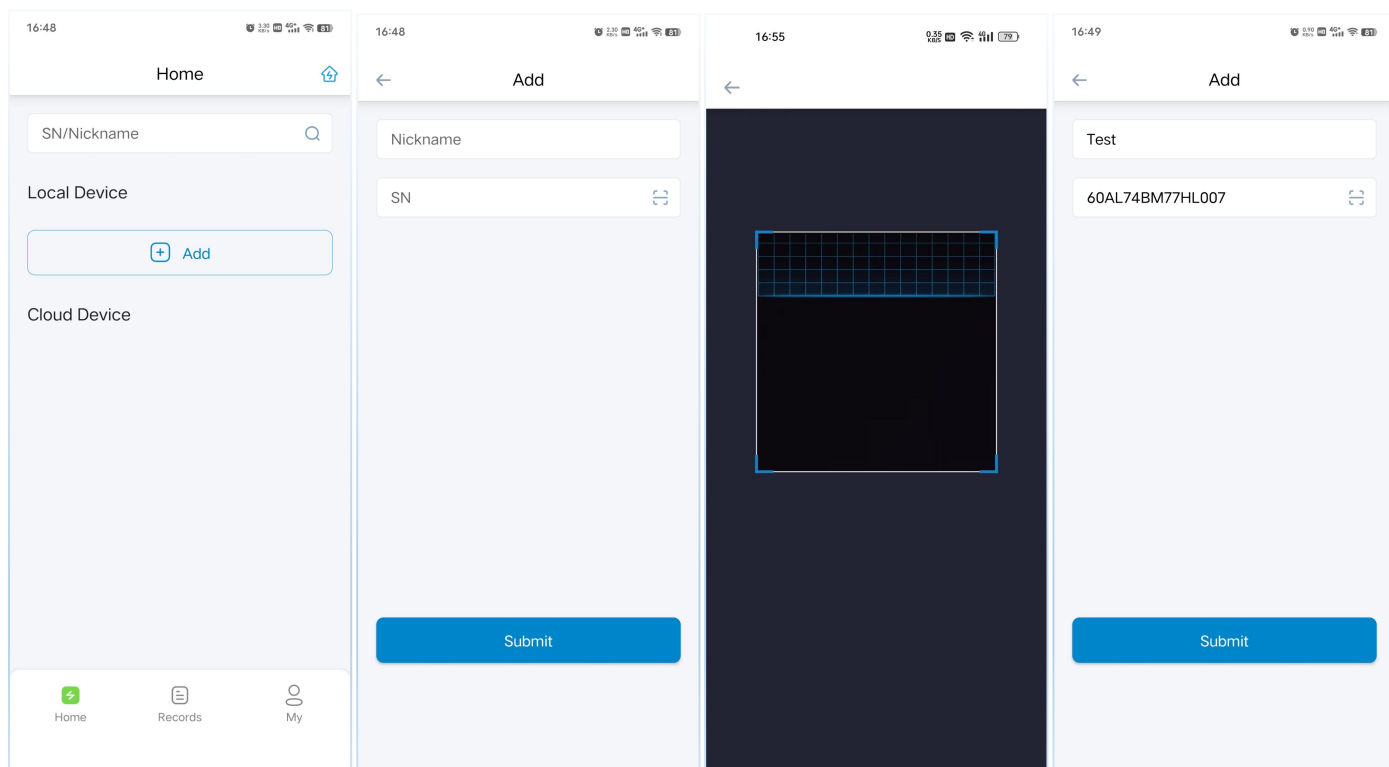

3. Add EV Charger

Click the Add button to enter the Add EV Charger interface. You can directly scan the QR code on the EV Charger or manually enter the SN and then name the EV Charger and click Submit to add it successfully.


4. Connect the EV Charger with Bluetooth

The newly added EV Charger will be displayed in the Local Device List. Click the Bluetooth icon of the newly added EV Charger, and enter the EV Charger Control interface.
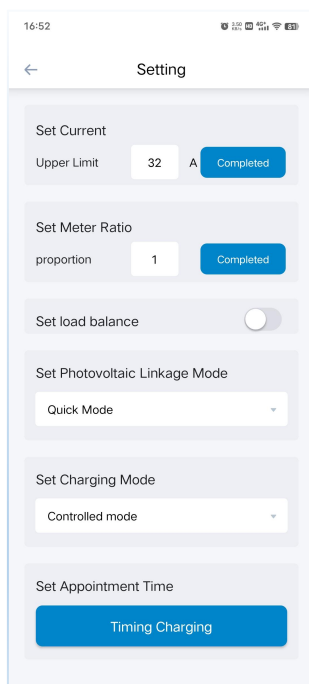
5. Enable the load balance function

Click the button in the upper right corner of the EV Charger Control interface, click the Setting menu, enter the EV Charger Setting interface, click the Load Balance switch, and configure the load balance limit current parameters, complete configuring load balance.
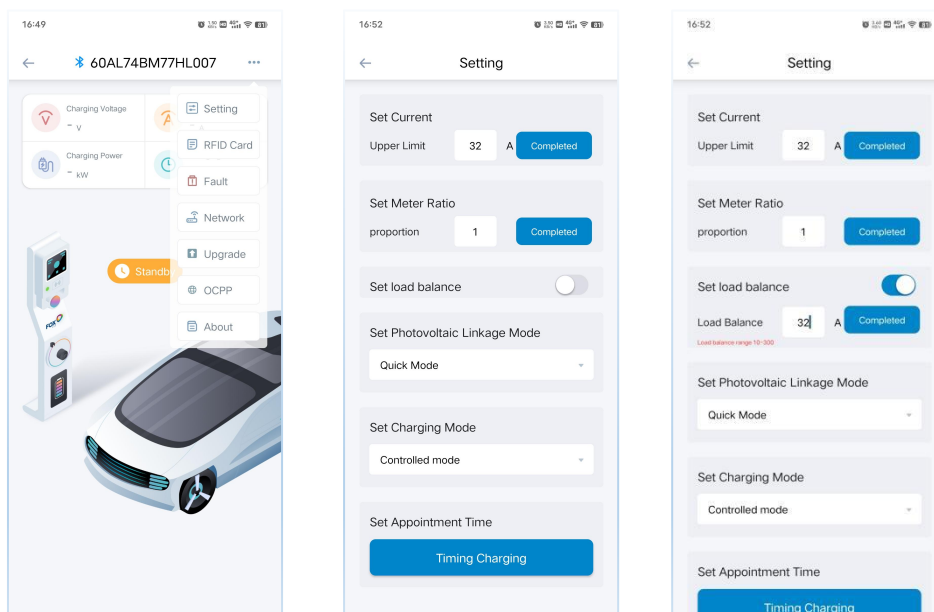
* The threshold current value of load balance should be lower than the rated current of the circuit breaker (MCCB), and the setting range of load balance current is 10~300A.

6. Meter Ratio setting

Please set the corresponding Meter Ratio according to the type of installed electric meter. The default setting for direct-connected electric meter is 1. For CT electric meter, please set it according to the ratio of the corresponding CT.

1.3 Introduction of the Function

Enable the load balance function through FoxSwitch, the EV Charger can obtain the current data of the household load in real time through the Fox ESS electric meter, and adjust the charging current of the EV Charger in real time according to the current threshold set by the load balance.

Function example:

It is known that the rated current of the circuit breaker (MCCB) is 40A.

You can set the load balance threshold current to 40A.
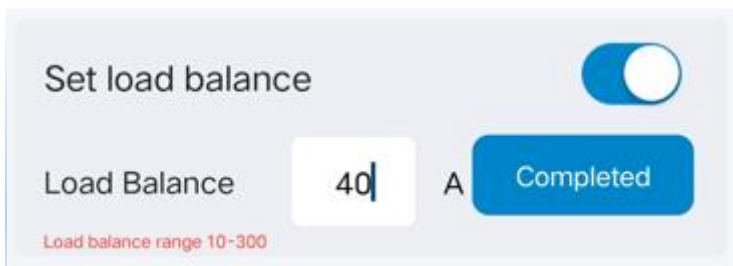
Charging current = 40A - household load current (6A $\leq$ charging current of EV Charger $\leq$ 32A).

When the household load current is 5A, the charging current is 32A;

When the household load is 15A, the charging current is 40A-15A=25A;

When the household load is 34A, the charging current is 40A-34A=6A;

When the household load is 35A, the charging current is 40A-35A=5A, and when it is < 6A, the EV Charger is in charging pause state;

When the household load is 33A, the charging current is 40A-33A=7A, and When it is >6A, the EV Charger resumes charging.

* According to relevant standards, the minimum starting current of EV Charger is 6A.

2 Load Balance (Multiple Units)

Multi-unit load balance is suitable for situations where multiple EV Chargers share power with other loads.
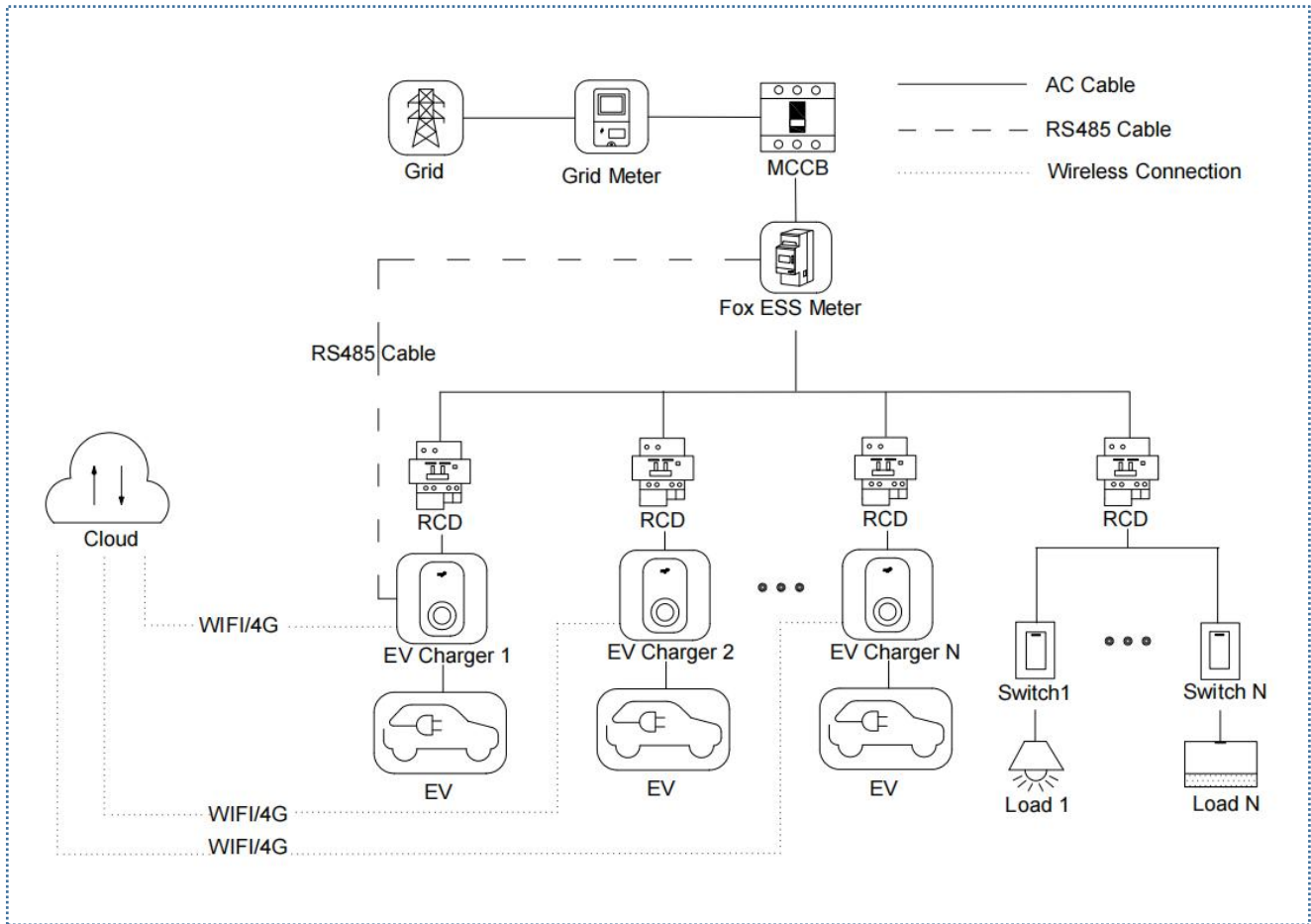
System wiring diagram of multi-unit load balance

⚠ Note:

1. To comply with relevant leakage protection standards, please use at least type A RCD or equivalent leakage protector that complies with local standards.

2. The installation must be performed by qualified personnel in accordance with local regulations.

2.1 Installation Guide

RS485 Communication Wiring

The wiring method for the meter and RS485 used are the same and will not be elaborated in detail. For detailed wiring information, refer to the wiring instructions in Section 1.1.
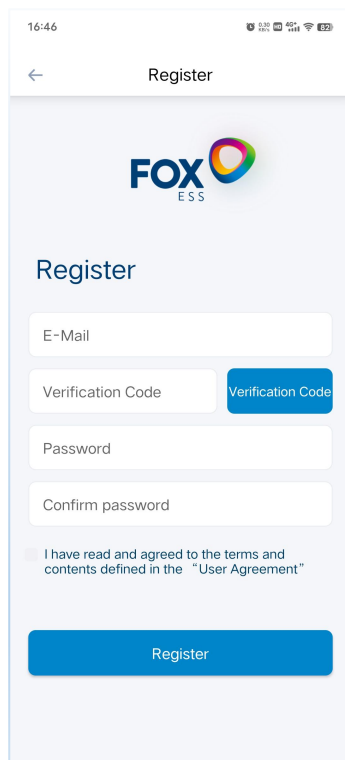
2.2 Configuration

After installing and connecting all units according to the wiring diagram, enable the station level load balance function through the FoxSwitch App according to the following steps.

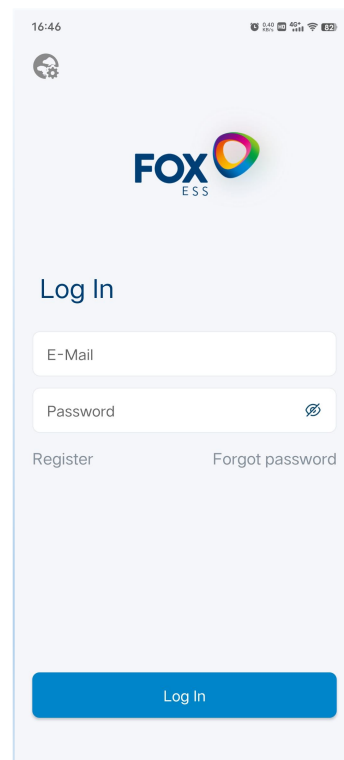1. Download the FoxSwitch App

Download and install the APP by going to the App Store or Google Play and searching "FoxSwitch".

2. Account login

Please log in to FoxSwitch with your account and password. If you do not have an account, please register and then log in.
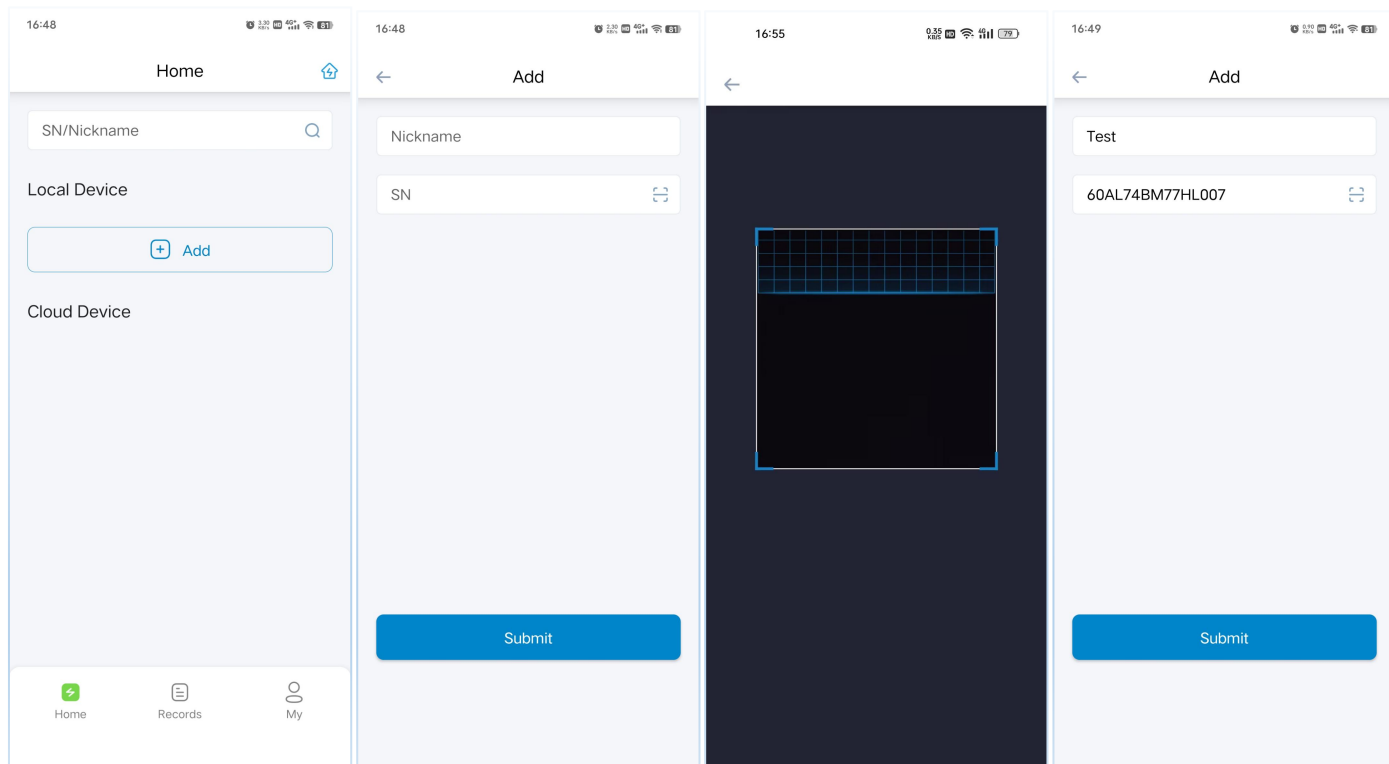

3. Add EV Charger

Click the Add button to enter the Add EV Charger interface. You can directly scan the QR code on the EV Charger or manually enter the SN and then name the EV Charger and click Submit to add it successfully.


4. Connect the EV Charger with Bluetooth

The newly added EV Charger will be displayed in the Local Device List. Click the Bluetooth icon of the newly added EV Charger, and enter the EV Charger Control interface.

5. Network Connection Setting

Click the button in the upper right corner of the EV Charger Control interface, click the Network Setting menu, enter the EV Charger Network Setting interface, click the WIFI Parameter Setting button at the top, enter your WIFI name and password, then click the Setting button to complete the WIFI network Setting; if your EV Charger contains 4G network configuration, please click the 4G Parameter Setting button at the top and then directly click the Setting button to complete 4G network setting.

To ensure the network configuration stability, it is recommended to cut off power supply and restart the EV Charger after configuring the network. After the network is set up successfully, the EV Charger will be displayed in the Cloud Device List.
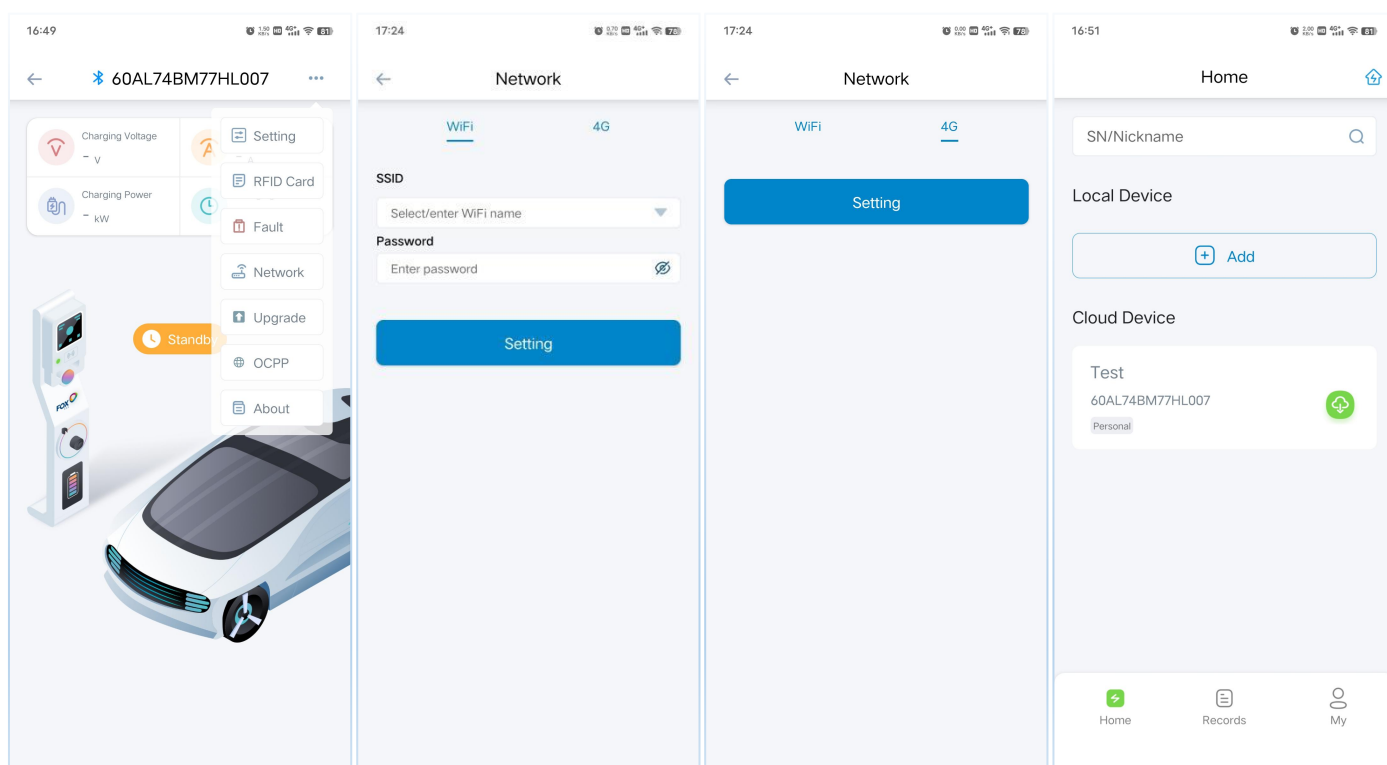
For the remaining EV Charger network configuration, please repeat Steps 3-5 to complete the network connection Setting.

6. Create and configure the Power Station

(1) Click the Power Station icon in the upper right corner of the APP homepage, enter the My Power Station interface, click the "+" icon in the upper right corner, enter the Station name in the pop-up dialog box, and then click the Confirm button to create the Station.
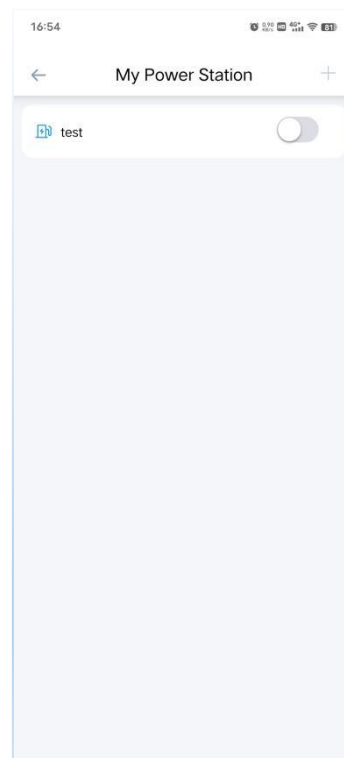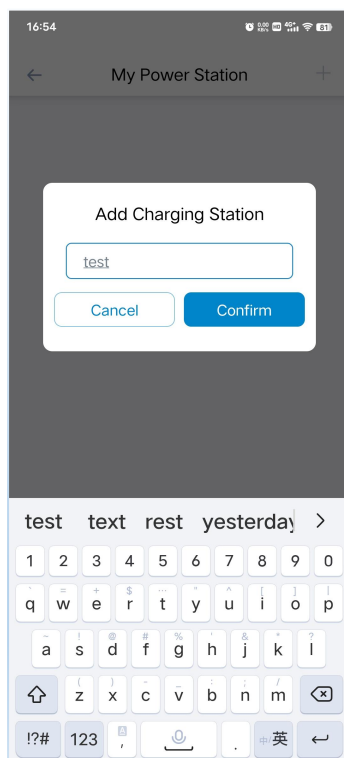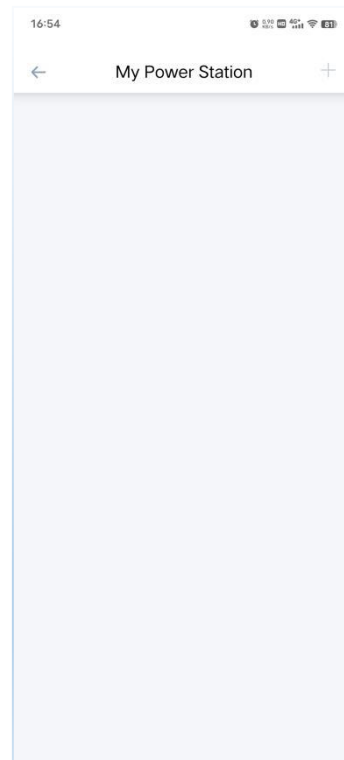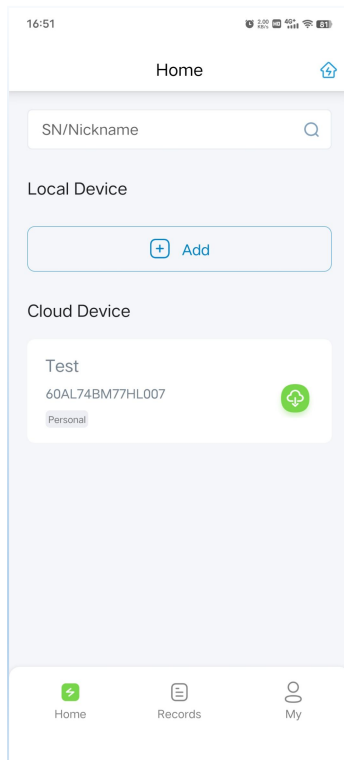
(2) Click on the newly created Power Station, enter the Power Station Setting interface, set the current threshold of the Power Station. The set value should be lower than the rated current of the circuit breaker (MCCB); set the corresponding Meter Ratio according to the type of installed electric meter. The default setting for direct-connected meter is 1, for CT electric meter, please set according to the ratio of corresponding CT; click the "+" icon on the right side of the Device List, then select the SN of EV Charger that needs to be added to the Station, click the Confirmation button to add the EV Charger to the Station; then, enable the load balance function, complete configuring the station level load balance.
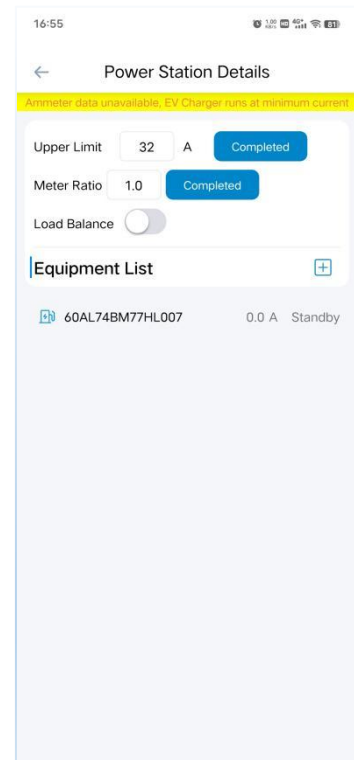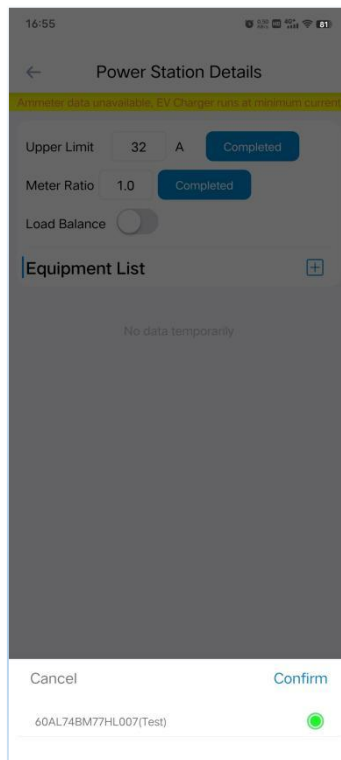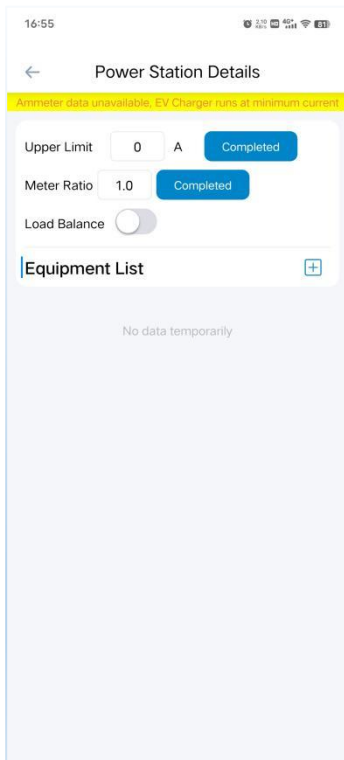
2.3 Introduction of the Function

Enable the power Station load balance function through FoxSwitch, the EV Charger can obtain the current data of the other loads in real time through the Fox ESS electric meter, and adjust the charging current of all EV Charger in the station in real time according to the current threshold set by the power station load balance.

Function example:

It is known that the rated current of the circuit breaker (MCCB) is 200A.

The load balance threshold current of the power station can be set to 200A.

Upper Limit	200	A	Completed
Meter Ratio	1.0		Completed
Load Balance	⬤		

6 EV Chargers have been added to this power station.

Charging current = (200A-current of other loads)/number of EV Chargers (6A ≤ charging current of EV Charger≤32A).

When the other loads current is 5A, the charging current is 32A;

When the other loads is 50A, the charging current is (200-50)/6=25A;

When the other loads is 164A, the charging current is (200-164)/6=6A;

When the other loads is 170A, the charging current is (200-170)/6=5A, and when it is

< 6A, the EV Charger is in charging pause state;

When the other loads is 158A, the charging current is (200-158)/6=7A, and When it

is >6A, the EV Charger resumes charging.

* When the EV Charger of the power station is offline, it will be charged with 6A current; if the EV Charger network connected to the RS485 communication of the electric meter is offline, all EV Chargers in the station will be charged with 6A current.

* According to relevant standards, the minimum starting current of EV Charger is 6A.

3 Photovoltaic Linkage

The Photovoltaic Linkage mode is suitable for situations where a single EV Charger uses solar energy and grid power simultaneously. Photovoltaic Linkage mode is divided into green mode that only uses solar energy or economic mode that prioritizes the use of solar energy.
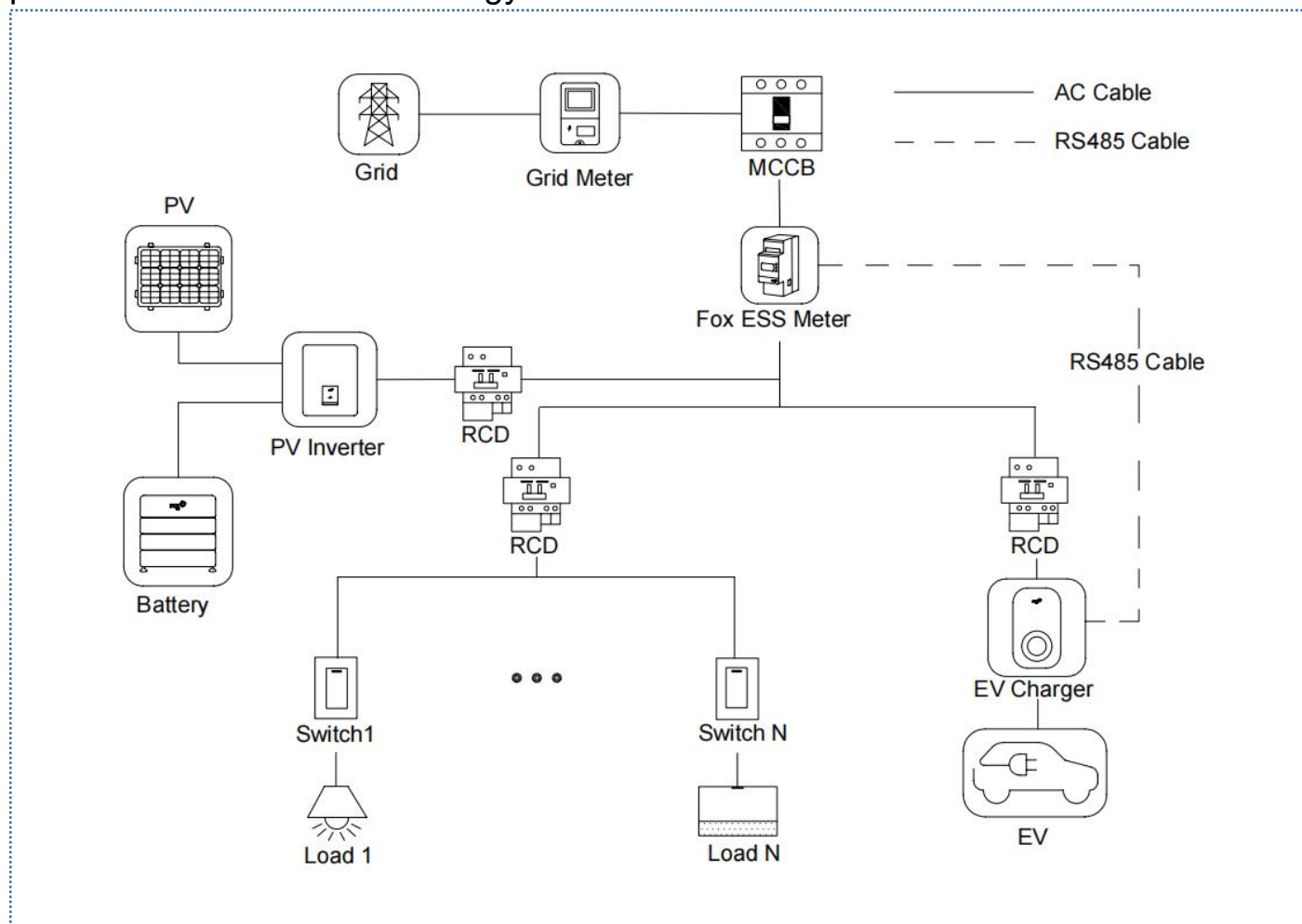
System wiring diagram of Photovoltaic Linkage (Fox ESS brand inverter can share DTSU666 dual RS485 electric meter with EV Charger)

⚠️ Note:

1. To comply with relevant leakage protection standards, please use at least type A RCD or equivalent leakage protector that complies with local standards.

2. The installation must be performed by qualified personnel in accordance with local regulations.

3.1 Installation Guide

RS485 Communication Wiring

The wiring method for the meter and RS485 used are the same and will not be elaborated in detail. For detailed wiring information, refer to the wiring instructions in Section 1.1.
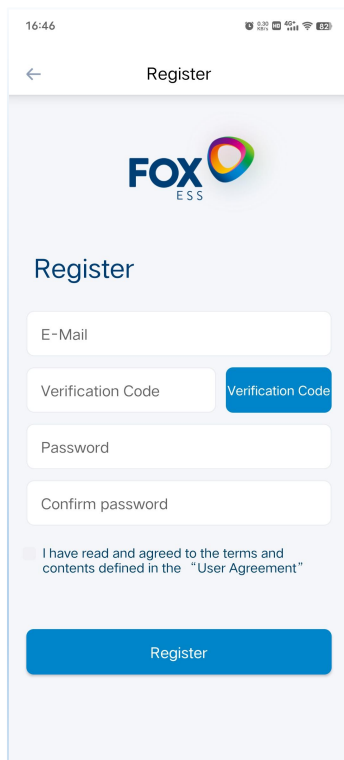
3.2 Configuration

After installing and connecting all units according to the wiring diagram, enable the station level load balance function through the FoxSwitch App according to the following steps.

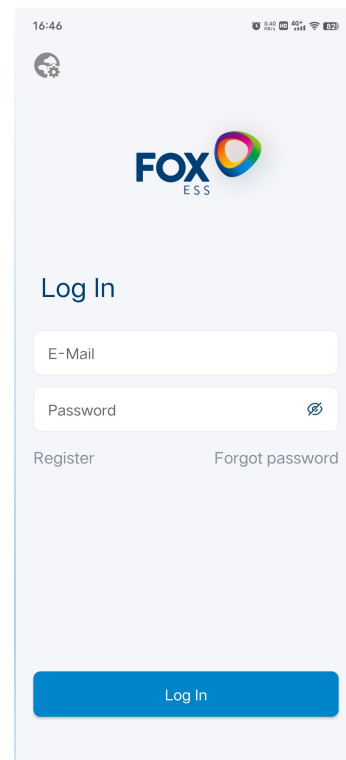1. Download the FoxSwitch App

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2. Account login

Please log in to FoxSwitch with your account and password. If you do not have an account, please register and then log in.
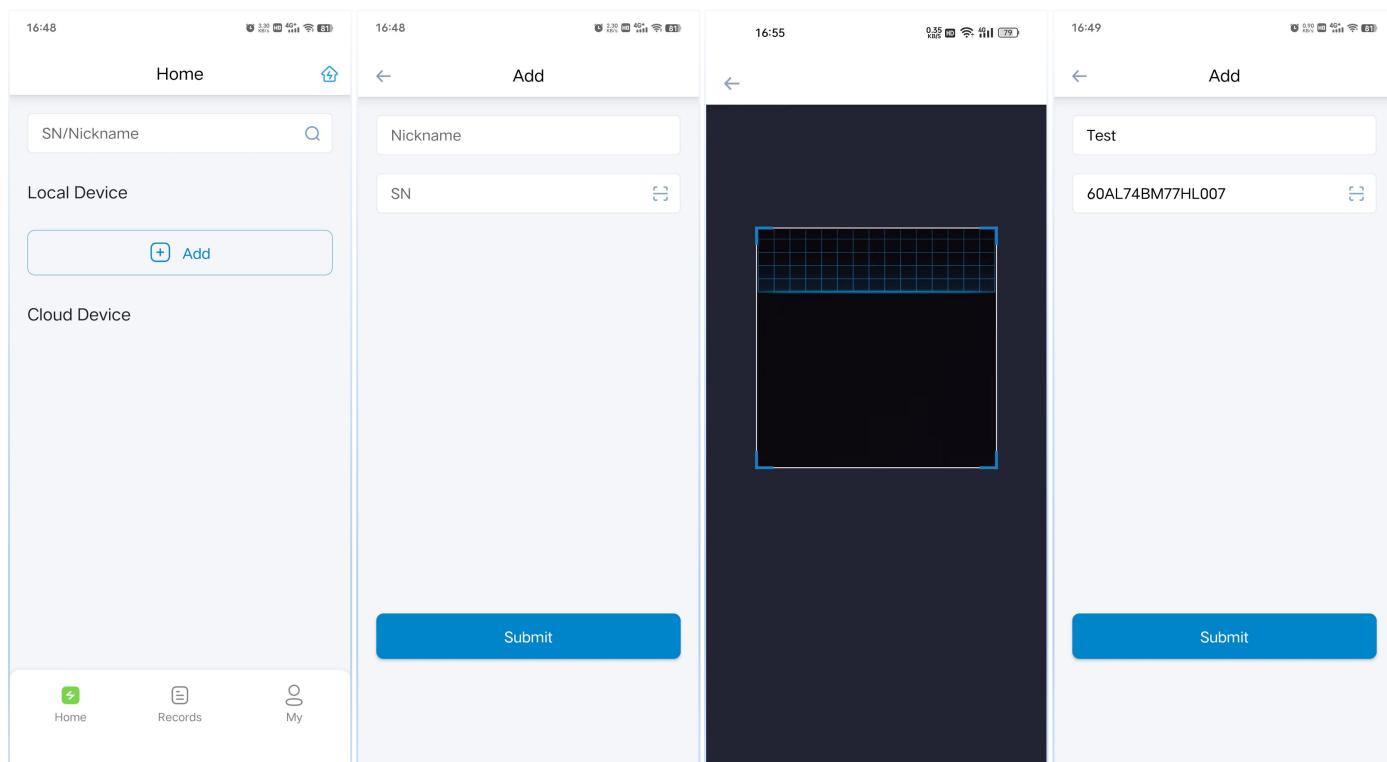

3. Add EV Charger

Click the Add button to enter the Add EV Charger interface. You can directly scan the QR code on the EV Charger or manually enter the SN and then name the EV Charger and click Submit to add it successfully.


4. Connect the EV Charger with Bluetooth

The newly added EV Charger will be displayed in the Local Device List. Click the Bluetooth icon of the newly added EV Charger, and enter the EV Charger Control interface.

5. Setting to Enable Photovoltaic Linkage Function

Click the button in the upper right corner of the EV Charger Control interface, click the Setting menu, enter the EV Charger Setting interface, and set the Photovoltaic Linkage mode to green mode or economic mode according to your demands.
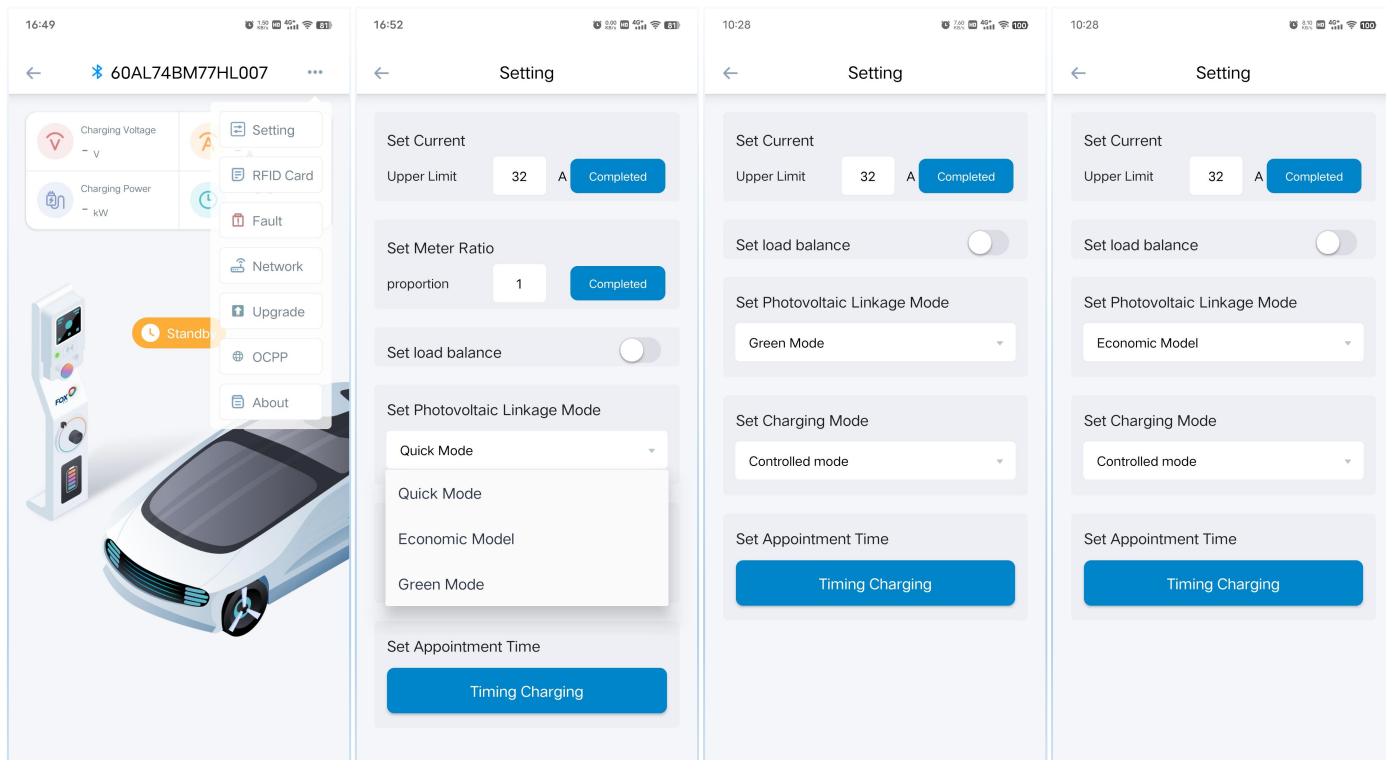
6. Meter Ratio Setting

Please set the corresponding Meter Ratio according to the type of installed electric meter. The default setting for direct-connected electric meter is 1. For CT electric meter, please set it according to the ratio of the corresponding CT.
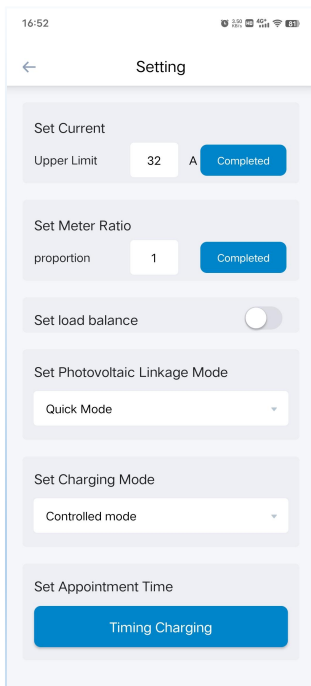
3.3 Introduction of the Function

Through FoxSwitch, you can choose Photovoltaic Linkage green mode or economic mode. The EV Charger can obtain the power generation current data of the inverter through the Fox ESS electric meter in real time, and control the EV Charger to only use solar energy or give priority to solar energy according to the Photovoltaic Linkage mode you selected.

Green mode:

1. When solar energy > household load + minimum starting current of EV Charger (6A).

   Charging current = solar energy - household load (6A $\leq$ charging current of EV Charger $\leq$ 32A).

2. When solar energy < household load + minimum starting current of EV Charger (6A).

   The EV Charger is in charging pause state, and charging can be resumed when solar energy > household load + 6.5A.

Economic mode:

1. When solar energy > household load + minimum starting current of EV Charger (6A).

   Charging current = solar energy - household load (6A $\leq$ charging current of EV Charger $\leq$ 32A).

2. When solar energy < household load + minimum starting current of EV Charger (6A).

   Charging current = 6A = solar energy - household load + grid power.