GROWATT

The AI-Powered Energy Assistant: Smart Scheduling Mode

***AI* Adds 'Intelligence' to Personal Energy System!**

Unlock the Electricity Bills Savings and Sustainability with Growatt!

This white paper will introduce the connection of energy community and Growatt's solution for customers who want to take part of this application.

What is Smart Scheduling Mode?

The Smart Scheduling Mode is a comprehensive smart mode based on artificial intelligence and big data launched by Growatt, which is suitable for dynamic electricity price application scenarios in the European market. Combining regional historical meteorological information and user electricity consumption habits, this mode can achieve accurate power generation forecasts and load consumption forecasts. By calling the regional day-ahead electricity price data, the dispatch strategy can be dynamically generated. The basic logic of this logic is to take electricity at a low price and feed electricity at a high price, which increases the system revenue for end customers and simplifies the setting process. At the same time, it optimizes the negative electricity price export limitation logic and supports viewing historical dispatch plans.
To fully understand the user's electricity consumption habits, 4 weeks are needed to take the model training to achieve 'real' smart scheduling!

The benefits of Smart Scheduling Mode

Improve Economic Benefits:

- Increase photovoltaic benefits: Through the intelligent scheduling function, the system can use the electricity generated by photovoltaics more efficiently, give priority to powering household loads when electricity prices are high, feed more electricity to earn profits when the feed-in benefits are high, and store excess electricity in the battery.
- Save electricity bills: Through the intelligent scheduling mode, the system can automatically charge the energy storage device when the electricity price is low, and give priority to using the electricity in the energy storage device when the electricity price is high, thereby effectively reducing electricity bills; At the same time, it effectively handles the problem of electricity price feeding to the grid during negative electricity price periods;

Increase Energy Efficiency:

- Intelligent management: Through intelligent dispatch, energy supply and demand can be monitored and analyzed in real-time, and energy distribution can be optimized by combining factors such as weather, historical power generation, electricity consumption data, and dynamic electricity prices to achieve intelligent management of electric energy.
- Accurate prediction and scheduling: Through AI algorithms, accurate predictions of power generation and load consumption are made, the scheduling logic of grid

power / PV / battery is optimized, and the self-consumption rate of PV is increased.

Which kinds of systems support the mode?

Energy storage systems with smart meters and dataloggers for specific inverters installed in the following areas could support the Smart Scheduling Mode.

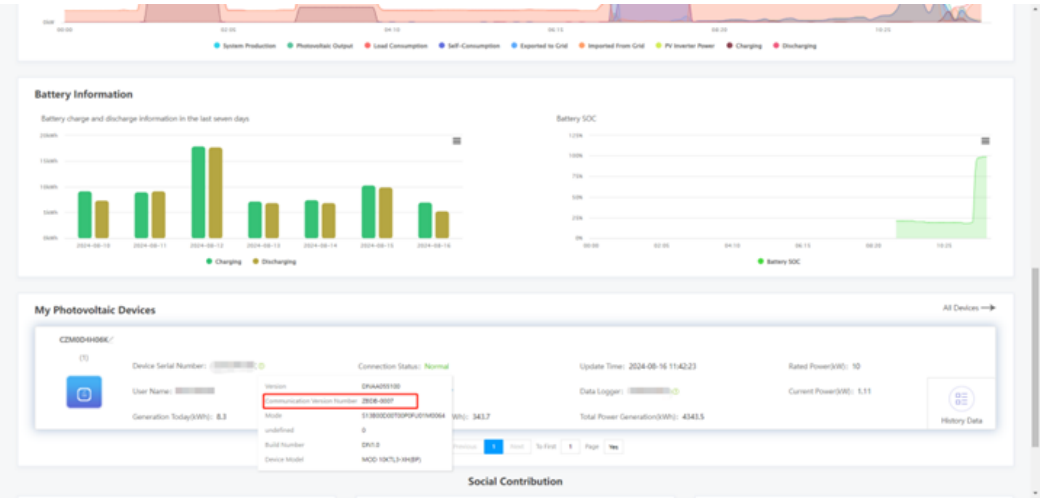
Austira	Belgium	Denmark	Finalnd	France
Germany	Netherlands	Norway	Sweden	Spain
Portugal	Czech Republic	Hungary	United Kingdom	Slovakia
Estonia	Latvia	Lithuania	Poland	

Below are the list of supported devices and their versions:

List of supported devices and versions

Inverter Model & Version / Data Collector Model & Version		MOD 3000-10000TL3-XH/ MID 11-30KTL3-XH	MOD 3-15KTL-HU	MIN 2500-6000TL-XH/-XH2	WIT 4-15KHU	SPA 4000-10000TL3 BH-UP	SPH 4000-10000TL3 BH-UP	SPH 3000-6000TL BL-UP	SPA 3000TL BL-UP	NEXA 2000
		ZBDB0007 and above ZBDC0001 and above	ZBdc0024 and above or ZBDC0011 and above	ZABA0016 and above or ZABa-0083 and above	ZDda-01 and above or ZDDA-0001 and above	ZDAA0006 and above	ZDAA0006 and above or ZDAa0091 or ZDAa0093	ZCBC0001 and above	ZCBC0004 and above	System update occurs automatically.
Shinewifi-X		3.1.0.9 and above	/	3.1.0.5 and above	/	3.1.0.5 and above	3.1.0.5 and above	3.1.0.5 and above	3.1.0.5 and above	/
Shinelan-X		3.6.0.8 and above	/	3.6.0.2 and above	/	3.6.0.6 and above	3.6.0.6 and above	3.6.0.6 and above	3.6.0.6 and above	/
GPRS-X2		/	/	/	/	1.5.0.6 and above	2.2.0.5 and above	/	/	/
Shine4G-X		2.2.1.3 and above	/	/	/	1.5.0.6 and above	2.2.0.5 and above	2.2.0.5 and above	/	/
Shinelink-X2		7.0.1.3 and above	/	7.0.0.9 and above	/	7.0.0.9 and above	7.0.0.9 and above	7.0.1.3 and above	7.0.1.3 and above	/
ShineWiLan-X2		7.6.1.2 and above	7.6.1.2 and above	7.6.1.3 and above	7.6.1.2 and above	7.6.1.2 and above	7.6.1.2 and above	7.6.1.2 and above	/	/
Shinelink-X2	ShineLan Box-X2	8.1.2.3 and above	8.1.2.3 and above	8.1.2.3 and above	/	/	/	/	/	/
	ShineRFStick-x2	7.5.1.6 and above	7.5.1.6 and above	7.5.1.6 and above	/	/	/	/	/	/

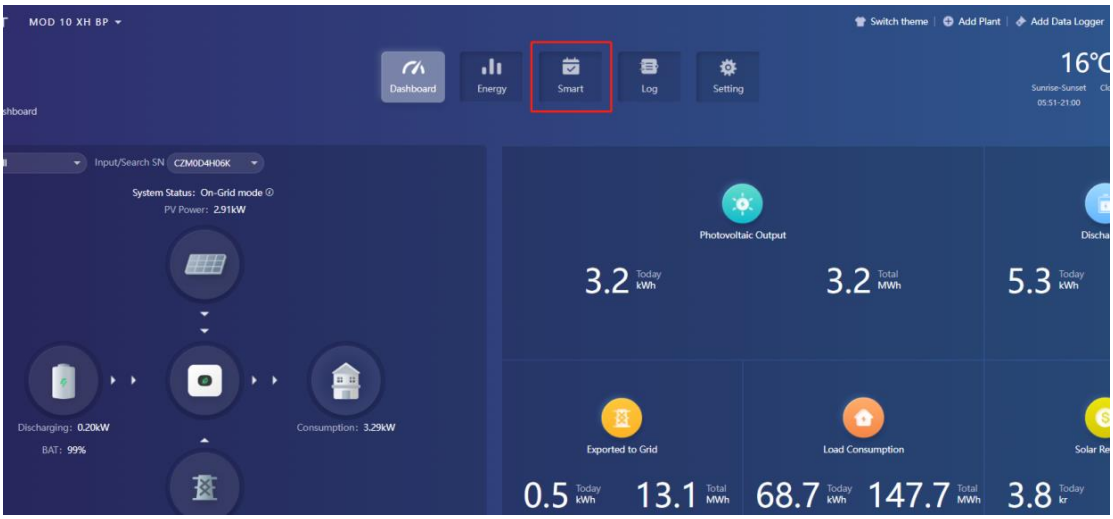
The device model and software version are in the device card. If the software version is too low, it is recommended to upgrade the device software first.



How do you use the mode?

Step 1: Confirm the Firmware version

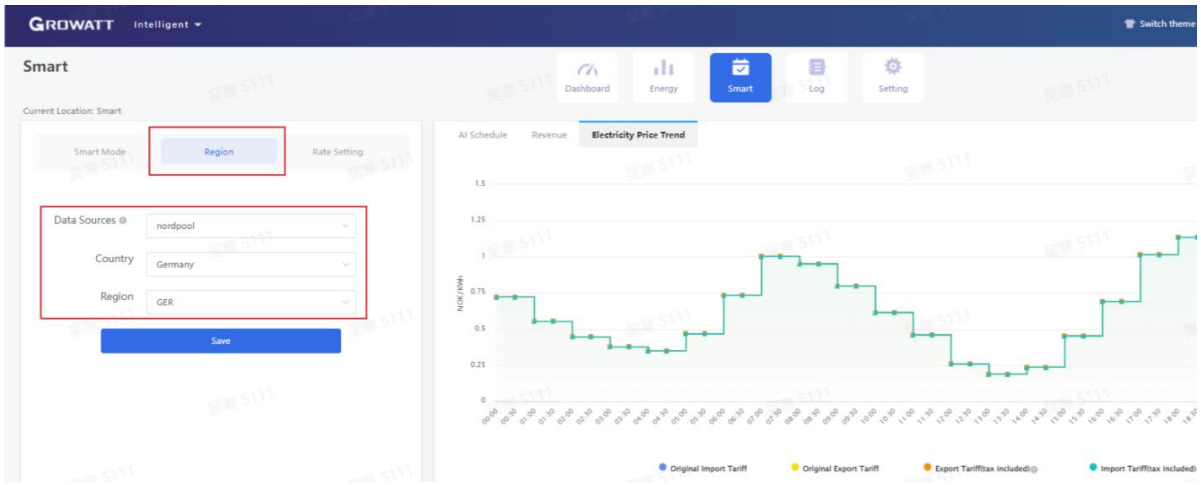
When the device software version and installation location meet the above conditions, the feature will be added in the Server automatically, customer can decide whether to enable the Smart Scheduling Mode.



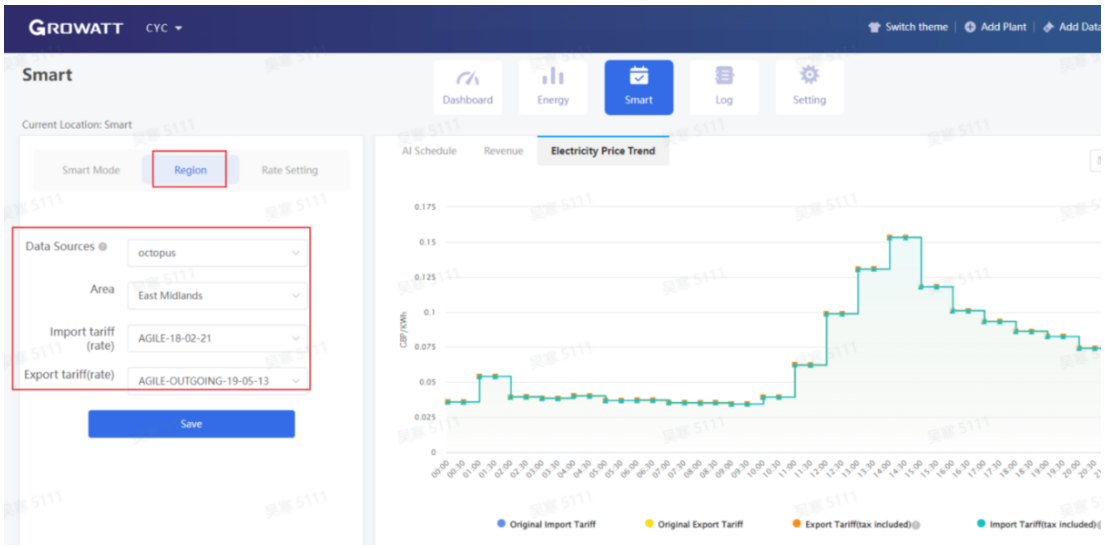
Step 2: Select the electricity price data

Select the dynamic electricity price data source according to the user's region. After the configuration is completed, smart scheduling can be performed. The interface in the different regions is slightly different.

Growatt uses data sources from **Nord Pool** and data from local Energy Exchange company. The interface is as follows:



For the UK, additional **Octopus** data sources are also available:

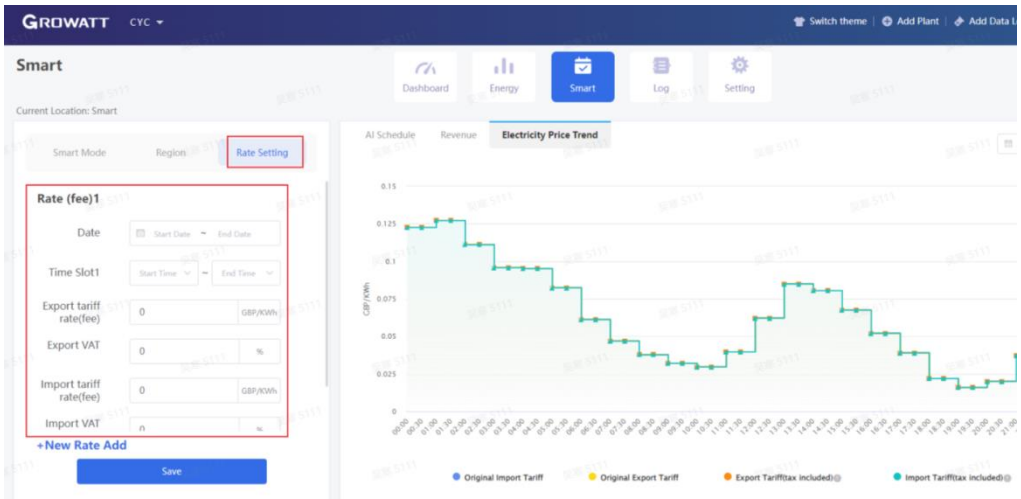


Step 3: Set the grid fee and VAT for export and import power

Here you can configure grid fees and VAT for both power importing and exporting. These settings allow the system to adjust energy exchange costs to better reflect actual local pricing. Grid fees and VAT rates vary by grid operator. Please verify the applicable rates with your local operator.

Users can configure these values based on their actual billing structure (default is 0, in which case the system calculates costs based solely on the energy market price).

The configuration interface is shown below:

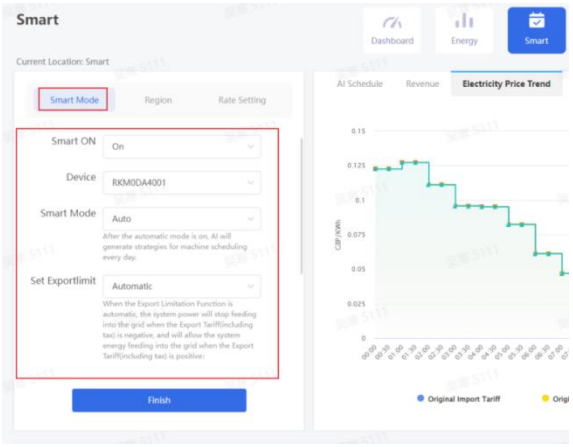


Step 4: Enable the Smart Scheduling Mode

The system supports two modes: **Automatic mode** and **Manual mode**.

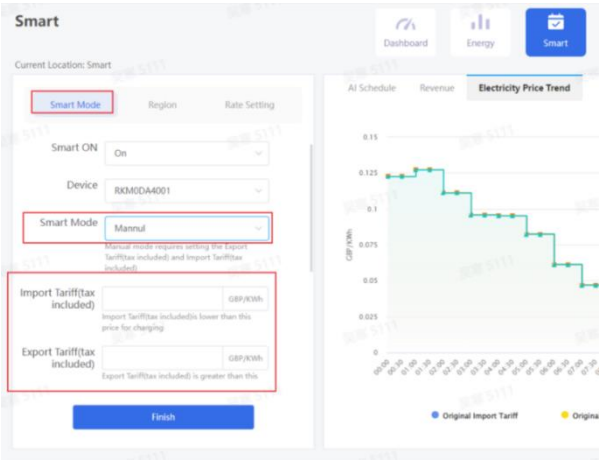
The Automatic mode: System runs automatically according to whole day energy price. The algorithm helps the system reach the maximum profit.

If the customer wants to use the **Automatic** Mode, just enable the function, select the [**Automatic**] mode, and click the "**Finish**" button.



Manual mode: Under this mode, customer can set the import energy price (low energy price) and export energy price (high energy price). The system works based on the customer's individual settings.

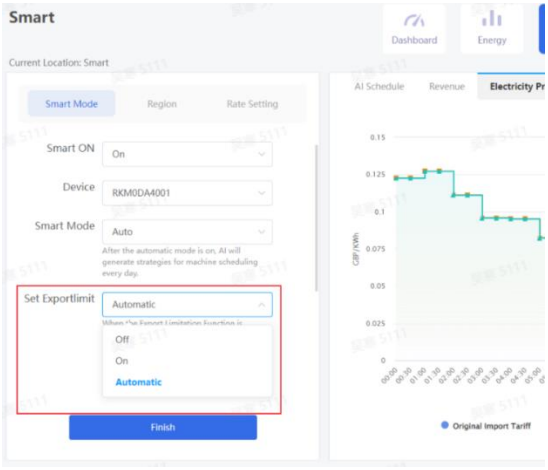
The operation interface is as below:



When the Smart Mode is enabled, the system will charge during low electricity price periods, discharge during high electricity price periods, and keep in Load First Mode (self-consumption) during other periods.

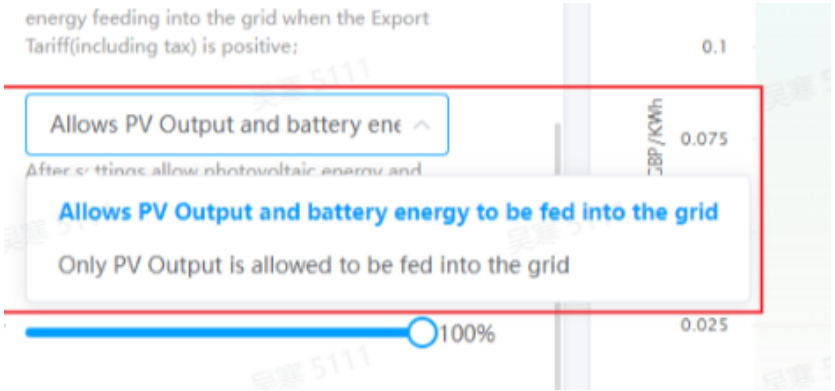
Step 5: Export Limitation Setting

There are 3 different export limitation settings for customer:



OFF: There is no limitation for power feed-in, the system power can be freely fed into the grid.
ON: The system power will not be fed into the grid.
Automatic: The system power will stop feeding into the grid when the Export Tariff (including grid feed and VAT) is negative and will allow the system energy to feed into the grid when the Export Tariff (including grid feed and VAT) is positive.

Advanced Setting of Power Export:
Under no export limitation setting, customer can select 2 different working statuses, to decide which energy is allowed to feed in to grid.
Allow PV Output and battery energy to be fed into the grid: the PV and battery power will be allowed to be fed into the grid to obtain benefits at the same time.
Only PV Output is allowed to be fed into the grid: Only the photovoltaic power will be allowed to be fed into the grid to obtain benefits.

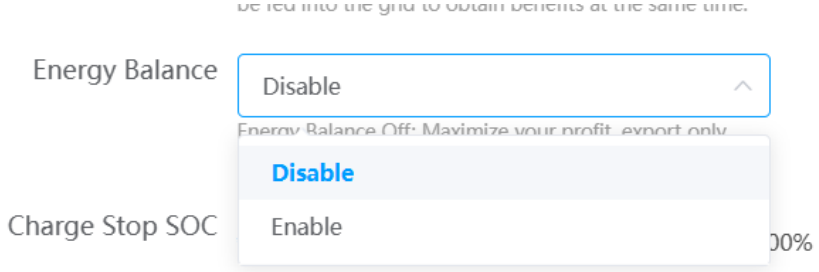


Energy balance function:
The Energy Balance function determines how the battery is used after low energy price periods.

If enabled, the battery primarily supports self-consumption. It will power your loads during subsequent normal-price periods, reducing reliance on grid power.

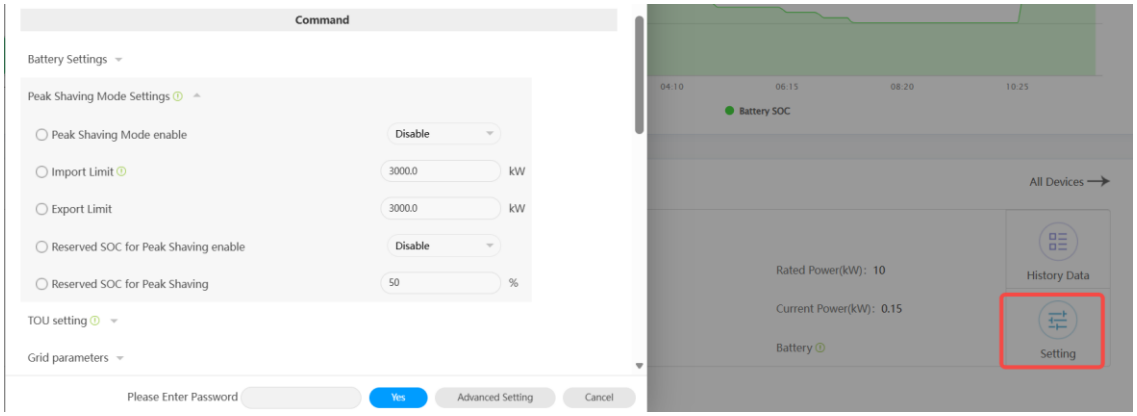
If disabled, the battery switches to a profit-optimization mode. It will conserve its stored energy

to supply your loads specifically during high energy price periods, which are automatically identified by the Cloud-AI algorithm to maximize your economic savings.
Enable: Battery discharge for self-consumption and feed to the grid during high energy price periods.
Disable: Maximize your profit, battery discharge only during high energy price periods.



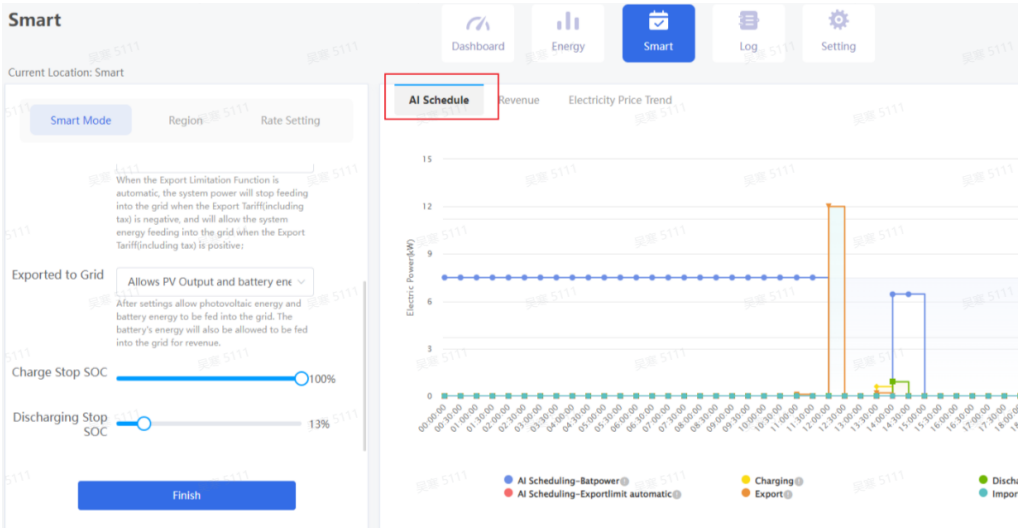
Peak shaving for main breaker protection

The import limit for main breaker protection can be configured by the customer.
During battery charging in low energy price periods, the combined power draw from charging and household loads may exceed the main breaker's maximum allowed grid import power, which could trip the circuit breaker.
To prevent this, customers can set an import limit in Peak Shaving Mode Settings. This feature ensures that the total power imported from the grid stays within a safe threshold.
The value should be set according to the main breaker's rated capacity.

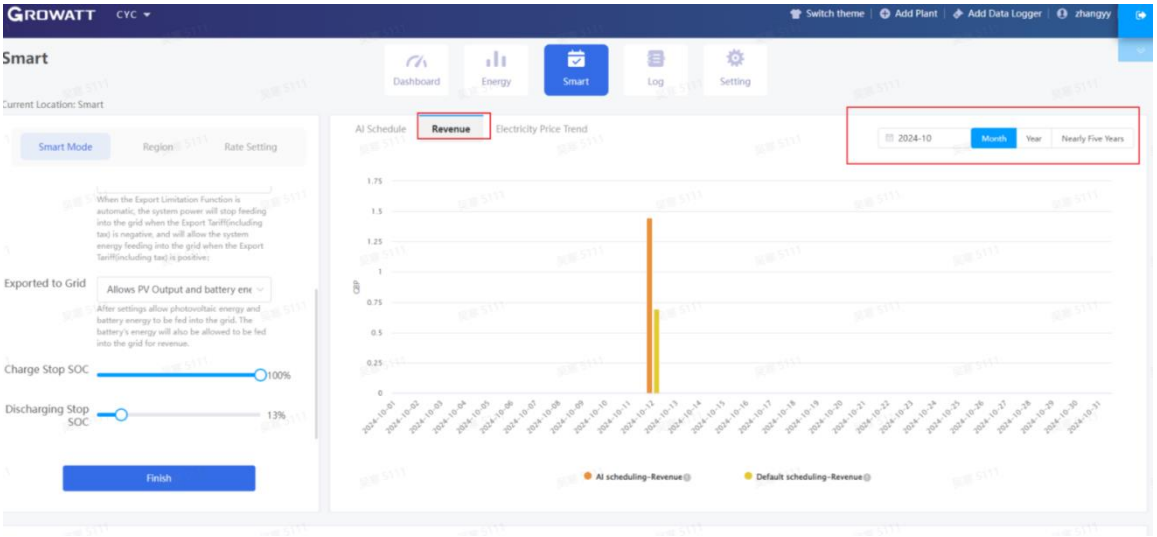


FAQ

➢ How to see the AI Schedule?

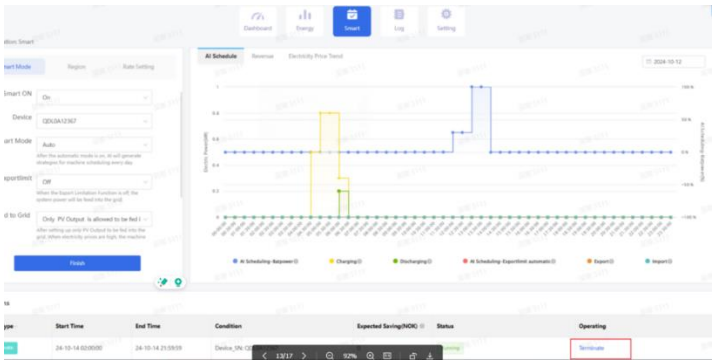


➢ How to see the revenue?

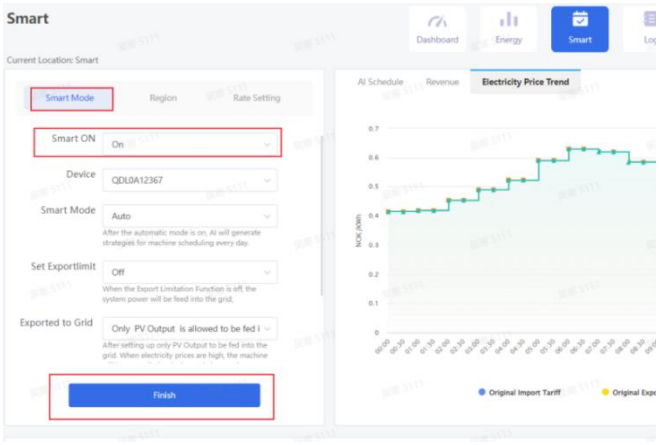


Note: The profit will be calculated at 8:00AM the next day.

➢ How to stop the current plan?



➢ How to turn off the Smart Scheduling Mode?

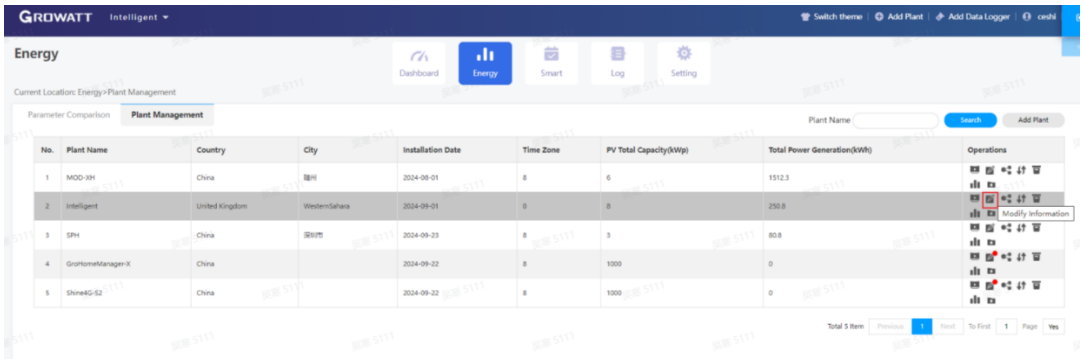


- **How to apply for permission if the device software version does not meet the requirements, but the customer wants to use Smart Scheduling Mode**

  Please contact the regional after-sales service engineer to upgrade the device and datalogger to the special version, then the smart scheduling mode could be enabled.

- **How to change the currency unit?**

Step 1: Enter to the list of plant, Energy>Plant Management, and take the modification.



Step 2: Select the currency unit and save the settings.