

Edge EMS User Configuration Page

Operation Process

Channel and Channel Point Configuration

The screenshot shows the 'Norton creek solar energy center' user interface. The top navigation bar includes the MONARCH logo, system status (Online), weather information (wind 67°F~79°F), and a user account (admin). The main content area is titled 'channel configuration' and displays a table of channels. The table columns are: ID, Name, Description, Protocol, Enabled, Connected, Error Count, and Operation. There are three entries:

ID	Name	Description	Protocol	Enabled	Connected	Error Count	Operation
1	PCS#1	变流器 #1	modbus_tcp	<input checked="" type="checkbox"/>	Disconnected	0	Detail Points Delete
2	BAMS#1	电池管理系统 #1 (Ampace)	modbus_tcp	<input checked="" type="checkbox"/>	Disconnected	0	Detail Points Delete
3	GENSET#1	柴油发电机组 #1	modbus_rtu	<input type="checkbox"/>	Disconnected	0	Detail Points Delete

The left sidebar includes links for Home, Devices, Alarm, Control, Statistics, and Setting (with Configuration selected). The bottom right corner shows pagination controls (Total 3, 20/page, 1).

Basic Concepts

In the Internet of Things (IoT) system, terminal devices, acquisition gateways, and the Cloud Computing Platform need to implement **functions such as Data Acquisition, remote control command issuance, and device status monitoring** through various communication methods. To achieve standardized device access and data management, the platform, based on the mature experience in the fields of Industrial Internet of Things (IIoT) and Supervisory Control and Data Acquisition (SCADA), has introduced **Channel , Channel Point , Communication Protocol, Four Remote Types (Telemetry/Tele-signal/Tele-control/Tele-adjustment) and Channel Mapping** and other concepts.

These concepts form the basic logic for the system to implement communication between devices and the cloud, and are important references for understanding the device access process, point configuration, data format, and gateway behavior.

Channel

Concept Definition

Channel is the **logical link** used to establish communication between the device (or gateway) and the platform, containing a complete set of necessary configuration information required for data read and write operations.

Simply put, the channel defines:

- Which protocol is used to communicate with the device;
- How to connect the device;
- What parameters are used for data reading and writing?
- How to maintain communication and perform error retries.

Channel is the foundation of device communication and the prerequisite for all point read and write operations.

Configuration items included in the channel

Basic Information:

- `id` : The unique identifier of the channel.
- `name` : The name of the channel.
- `description` : Description of the channel.
- `protocol` : The protocol followed by the channel, currently including `modbus_tcp` , `modbus_rtu` , `virt` , `can` , `di_do` protocols.
- `enabled` : Whether the channel is available.

Parameters:

According to `protocol` dynamic switching, common parameter descriptions:

- **modbus_tcp**
 - `host` : Host address (IP/Domain name). Example: `192.168.1.10` , `http://baidu.com` .
 - `port` : Port (default 502). Range: 1-65535.
 - `connect_timeout_ms` : Connection timeout (positive integer, milliseconds).
 - `read_timeout_ms` : Read timeout (positive integer, milliseconds).
- **modbus_rtu**
 - `device` : Serial device path (e.g., `/dev/ttyS0` , `COM3`)
 - `baud_rate` : Baud rate (typical values: 9600/19200/38400/115200)

- `data_bits` : Data bits (commonly 8)
- `stop_bits` : Stop bits (1 or 2)
- `parity` : Parity bit (N = None, E = Even parity, O = Odd parity)
- `connect_timeout_ms` : Connection timeout (positive integer, milliseconds)
- `read_timeout_ms` : Read timeout (positive integer, milliseconds)
- `retry_interval_ms` : Retry interval after read/write failure (positive integer, milliseconds)

Running Status:

- `Connected` : Whether the channel is connected (Connected/Disconnected).
- `running` : Running state (Running/Stop).
- `last_update` : Last update time.
- `error_count` : Number of errors.
- `last_error` : The last error message.

Point Counts:

- `telemetry` : Number of telemetry points.
 - `signal` : Number of remote signaling points.
 - `control` : Number of remote control points.
 - `Adjustment` : Number of remote adjustment points.
-

Function of the Channel

The entire process of channel communication with the device cannot do without the role of the channel, including:

- How to establish a connection between the platform or gateway (**serial port / TCP / RTU / Ethernet, etc.**) ;
- How to **read data from the device** ;
- How to **write or send commands to the device** ;
- How to monitor communication status and handle exceptions.

Generally understood as:

Channel = "Line + Protocol + Parameters" required for device communication.

Four Remote Functions

Concept Definition

In industrial automation, power systems, and IoT device management, business data is typically organized and managed according to the "Four Remote" classification. The "Four Remote" is a classic data model of SCADA (Supervisory Control and Data Acquisition System), which is widely used in fields such as IIoT platforms, power automation, water utilities, HVAC, and energy management systems.

The Four Remote Classification is used to clarify the "nature and purpose of the point", helping users understand what each point represents, what it can do, and how it is collected or issued.

Telemetry

Concept Definition

Telemetry refers to the **continuous, analog, measurable real-time values** uploaded by the device.

Generally presented in numerical types (integer or floating-point numbers).

Common Examples

- Temperature (°C)
- Humidity (%RH)
- Voltage (V), Current (A)
- Power (kW), Power Factor
- Pressure (kPa), Liquid Level (%)
- Flow, Wind Speed, Rotational Speed
- Energy consumption readings (electricity, gas, water, etc.)

Features

- Mostly **read** operations;
- The value will change in real time as the device operates;
- Usually, it is necessary to configure the acquisition cycle.

Usage in the Platform

Remote measurement points are used in business scenarios such as trend analysis, report statistics, energy consumption monitoring, and operational optimization.

Remote Signal

Concept Definition

Tele-signal refers to discrete state information such as device status, switching value, and enumeration value.

Generally, there are only two states (0/1), and it may also be extended to a small number of enumerated values.

Common Examples

- Run/Stop
- Close/Open
- Started/Not Started
- Alarm/Normal
- Fault / Normal
- Door Open/Close
- A certain relay is energized/released

Features

- Mostly **read** operations;
- Suitable for monitoring device status;
- Change events can trigger alarms.

Usage in the Platform

Tele-signal points are widely used in scenarios such as alarm management, event monitoring, and status recording.

Remote Control

Concept Definition

Remote control refers to the **action command** issued by the platform to the device, which is used to change the operating state of the device.

belongs to "Write Operation".

Common Examples

- Start/Stop Device
- Open/Close Valve
- Close/Open
- Start the exhaust, drainage, and heating equipment

- Restart the Controller
- Switch Mode

Features

- Permission control is required;
- Often requires secondary confirmation or security verification;
- Mostly switch-type commands (0/1).

Usage in the Platform

Remote control is applicable to scenarios such as intelligent operation, remote management, and execution of automated control strategies.

Remote Adjustment

Concept Definition

Remote adjustment refers to remote parameter adjustment, which is used to set the operating parameters of equipment.

It also belongs to "write operations", but different from remote control, remote adjustment acts on the "setpoint" inside the device.

Common Examples

- Temperature Setpoint
- Pressure Upper/Lower Limit Setting
- Frequency Setting (Hz)
- Voltage and Current Protection Thresholds
- Rate Parameter (Electric Meter)
- PID Control Parameters (P/I/D)

Features

- Parametric write operation, not a switching action;
- has a significant impact on the operational performance of the equipment;
- Usually, the range and type need to be verified.

Usage in the Platform

Remote adjustment is often combined with automated control strategies for regulating the environment, optimizing energy efficiency, etc.

Channel Point

Concept Definition

Channel Point refers to the **actual data point (real register address or signal address)** of the device under the specified protocol. A point is the smallest operating unit for data acquisition and instruction issuance.

For example, in the Modbus protocol:

- The voltage may be located at address 40001
- The current may be located at address 40002
- Device start/stop may be located at 00001 (switching value)

These registers or flag bits are referred to as "channel points".

Basic fields of the point

Each channel point typically contains the following information:

- `point_id` : Unique identifier for the point (positive integer).
 - `signal_name` : Business signal name.
 - `value` : Data at the current point.
 - `scale/offset` : Data scaling and offset, used to convert raw values into business values.
 - `unit` : The data unit corresponding to the point.
 - `reverse` : Whether the value needs to be reversed (commonly used for digital signals).
-

Point Classification

The platform classifies points according to the "Four Remote Standards" in the field of industrial automation:

类型	英文	说明
遥测	Telemetry	连续量/模拟量（如温度、电压）
遥信	Signal	状态量/开关量（如开/关、报警）
遥控	Control	平台向设备下发的控制命令（如启停）
遥调	Adjustment	平台下发的设备参数设定值（如频率、电压设定）

The point type determines whether it belongs to the read category (telemetry/remote signaling) or the write category (remote control/remote adjustment).

Channel Point Mapping

Concept Definition

Since the register addresses and protocol structures of different device manufacturers vary, it is necessary to map the "actual device points" to the platform's unified data model.

Channel mapping is used to achieve:

- Original Position → Unified Format
- Protocol Address → Platform Standard Address
- Processing such as multi-register merging, scaling, unit conversion, etc.

The platform converts the underlying register data of devices into a unified data structure through mapping rules, providing standard input for historical data, alarms, and formula calculations.

Map basic fields

Mapping records include:

- `point_id` (corresponding to the point definition table)
- `slave_id` (slave number in protocols such as Modbus)
- `data_type` : 数据类型，有int16、uint16、int32、uint32、float32、int64、uint64、float64、bool。
- `byte_order` : Byte order, such as AB, BA, ABCD, CDAB, etc.
- `function_code` : Register function code, corresponding to different function registers respectively
 - **01:** Read Coils status, used to obtain **read/write switch output** (1 bit).
 - **02:** Read the status of Discrete Inputs, used to obtain **read-only digital inputs** (1 bit).
 - **03:** Read Holding Registers, used to obtain**readable and writable 16-bit register data**(such as setpoints/parameters).
 - **04:** Read Input Registers, used to obtain**read-only 16-bit register data**(such as measured values/collected quantities).
 - **05:** Write Single Coil, used for **writing a digital output** (1 bit).
 - **06:** Write Single Holding Register, used for **writing a 16-bit register value**.
 - **15:** Write Multiple Coils, used for **batch writing multiple digital outputs** (multiple 1-bit).

- **16:** Write Multiple Holding Registers, used for **batch writing multiple 16-bit register values**.
- **register_address**: Register address, the actual location where the device stores data, typically ranging from 1 to 65535.
- **bit_position**: (Applicable to digital signals)

These contents determine how the platform correctly parses the raw device data into usable business data.

Configuration Operation

Query Channel

ID	Name	Description	Protocol	Enabled	Connected	Operation
1	PCS#1	变流器 #1	modbus_tcp	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
2	BAMS#1	电池管理系统 #1 (Ampace)	modbus_tcp	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
3	GENSET#1	柴油发电机组 #1	modbus_rtu	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
4	cs_01	-	modbus_tcp	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
5	ECU1170_GPIO	ECU-1170本机DI/DO	di_do	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>

1. Supports filtering for channels, with the following filtering conditions:

- **protocol**: Channel protocol type (e.g., `modbus_tcp`, `modbus_rtu`, `virt`, `can`, `di_do`).
- **Enabled**: Whether to enable (`Enabled`, `Disabled`).
- **Connected**: Whether it is connected (`Connected`, `Disconnected`).

2. After selecting the filter criteria, click the `Search` button to perform a filtered search.

3. Click the `Reload` button to reset the filter.

View channel details and edit

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Wind 67°F~79°F admin

channel configuration Device model configuration Rules configuration

Protocol: select protocol Enabled: select enabled status Connected: select connected status Reload Search New Channel

ID	Name	Description	Protocol	Enabled	Connected	Operation
1	PCS#1	变流器 #1	modbus_tcp	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
2	BAMS#1	电池管理系统 #1 (Ampace)	modbus_tcp	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
3	GENSET#1	柴油发电机组 #1	modbus_rtu	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
4	cs_01	-	modbus_tcp	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
5	ECU1170_GPIO	ECU-1170本机DI/DO	di_do	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>

Total 5 20/page 1 >

1. Click the **Operation** column in the channel row you want to view **Detail** button to open the channel details pop-up window.

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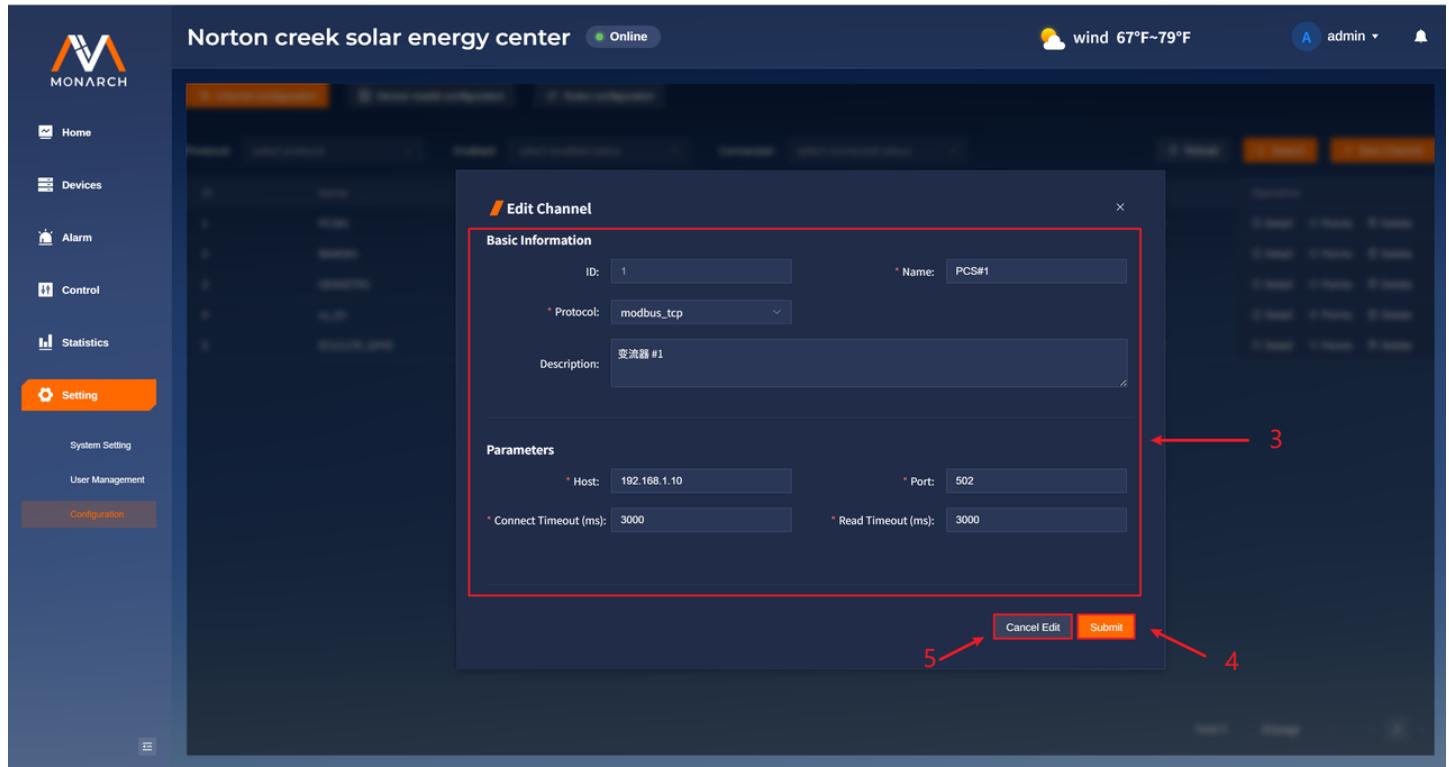
Wind 67°F~79°F admin

Channel Details

Host:	192.168.1.10	Port:	502
Connect Timeout (ms):	3000	Read Timeout (ms):	3000
Runtime Status			
Connected:	Connected	Running:	Running
Last Update:	2025-12-29 15:49:51	Error Count:	
Last Error:	No errors		
Point Counts			
Telemetry:	764	Signal:	109
Control:	17	Adjustment:	553

2

2. Click **Edit** button to enter the editing mode of channel information.

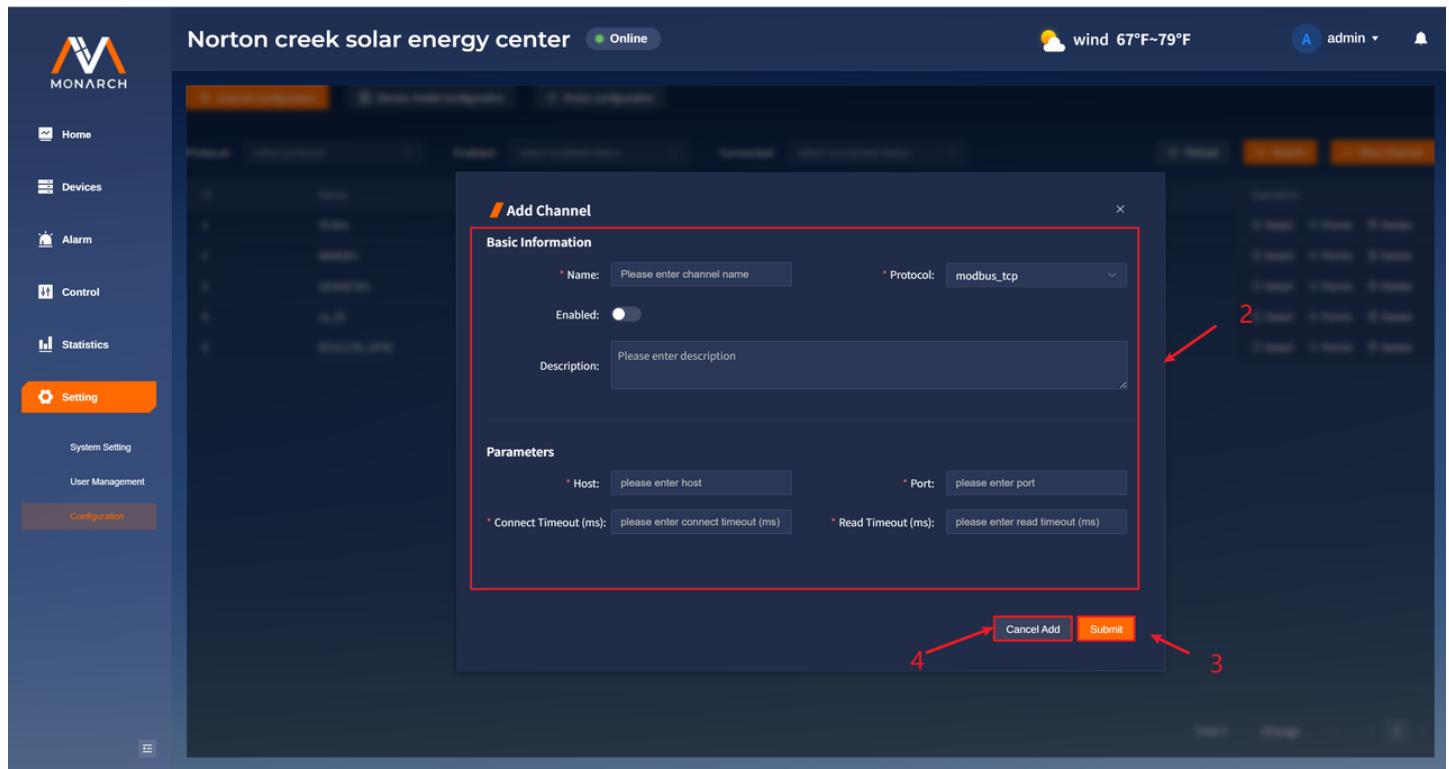


3. Fill in the data value to be modified, with the rules referring to the explanation of the field in the previous step.
4. Click the **Submit** button to submit.
5. Click **Cancel Edit** button to cancel the edit.

New Channel

ID	Name	Description	Protocol	Enabled	Connected	Operation
1	PCS#1	变流器 #1	modbus_tcp	<input checked="" type="checkbox"/>	Connected	<input type="checkbox"/> Detail <input type="checkbox"/> Points <input type="checkbox"/> Delete
2	BAMS#1	电池管理系统 #1 (Ampace)	modbus_tcp	<input checked="" type="checkbox"/>	Connected	<input type="checkbox"/> Detail <input type="checkbox"/> Points <input type="checkbox"/> Delete
3	GENSET#1	柴油发电机组 #1	modbus_rtu	<input checked="" type="checkbox"/>	Connected	<input type="checkbox"/> Detail <input type="checkbox"/> Points <input type="checkbox"/> Delete
4	cs_01	-	modbus_tcp	<input checked="" type="checkbox"/>	Connected	<input type="checkbox"/> Detail <input type="checkbox"/> Points <input type="checkbox"/> Delete
5	ECU1170_GPIO	ECU-1170本机DI/DO	di_do	<input checked="" type="checkbox"/>	Connected	<input type="checkbox"/> Detail <input type="checkbox"/> Points <input type="checkbox"/> Delete

1. Click the **New Channel** button to open the add pop-up box.



2. Switch the channel protocol through the **Protocol** selection box. Fill in the correct parameter information, and refer to the field description on the details page for field rules.
3. Click the **Submit** button to submit the newly added channel.
4. Click the **Cancel Add** button to cancel the addition.

Adjust the enable state of existing channels

ID	Name	Description	Protocol	Enabled	Connected	Operation
1	PCS#1	变流器 #1	modbus_tcp	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
2	BAMS#1	电池管理系统 #1 (Ampace)	modbus_tcp	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
3	GENSET#1	柴油发电机组 #1	modbus_rtu	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
4	cs_01	-	modbus_tcp	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
5	ECU1170_GPIO	ECU-1170本机DI/DO	di_do	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>

Total 5 20/page < 1 >

1. Click the slider under the Enable column of the corresponding channel row to make adjustments. Set it to Enabled by moving it to the left, and to Disabled by moving it to the right.

Delete existing channels

ID	Name	Description	Protocol	Enabled	Connected	Operation
1	PCS#1	变流器 #1	modbus_tcp	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
2	BAMS#1	电池管理系统 #1 (Ampace)	modbus_tcp	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
3	GENSET#1	柴油发电机组 #1	modbus_rtu	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
4	cs_01	-	modbus_tcp	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
5	ECU1170_GPIO	ECU-1170本机DI/DO	di_do	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>

1. Click the **Delete** button in the **Operation** column of the channel row you want to delete.

Delete Confirmation

Are you sure you want to delete channel GENSET#1?

2. Click **Confirm** button to confirm deletion.

- Click **Cancel** button to cancel deletion.

Channel Point Configuration

The screenshot shows the 'Channel configuration' tab selected in the top navigation bar. The main content area displays a table of channel points with columns for ID, Name, Description, Protocol, Enabled, Connected, and Operation. The 'Operation' column contains a 'Points' button, which is highlighted with a red box and a red arrow labeled 1. Other buttons in this column include 'Detail', 'Delete', and 'Edit'. The table lists five channels: PCS#1, BAMS#1, GENSET#1, cs_01, and ECU1170_GPIO. The right side of the screen includes a weather forecast (wind 67°F~79°F), user information (admin), and pagination controls (Total 5, 20/page).

This screenshot shows the 'Points Table' dialog box. The 'telemetry' tab is active in the header. The main table lists various system status points with columns for Point ID, Point Name, Value, Scale, Offset, Unit, Reverse, and Operation. Each row has a 'Publish' checkbox in the 'Operation' column. A 'Batch Publish' button is located in the toolbar. The dialog also includes a 'View Mode' switch between 'Points' and 'Mappings', a search bar, and buttons for 'Cancel' and 'Edit' at the bottom right. Red annotations numbered 1 through 8 highlight specific UI elements: 1 (Operation column), 2 (Search bar), 3 (View Mode switch), 4 (Batch Publish), 5 (Publish checkboxes), 6 (Export button), 7 (Edit button), and 8 (Cancel button).

- Open the point pop-up window by clicking the **Operation** column's **Points** button in the channel row you want to view.
- The toggle label buttons for point types include **telemetry** , **signal** , **control** , **adjustment** . Click to display the points under the corresponding type.

3. View mode switching: Views are divided into point and point mapping. Click the corresponding button to switch views.
4. Click the **Batch Publish** button to perform batch value distribution operations.
5. Click the **Publish** button in the Operation column to perform the value distribution operation for a single point.
6. Click the **Export** button to export the table data under the current tab in CSV format.
7. Click **Edit** button to enter the editing mode for the point.
8. Click **Cancel** button to close the pop-up window.
9. The point selection box allows manual input for fuzzy search of point names or precise search by selecting point names through the dropdown box.

Point ID	Point Name	Slave ID	Function Code	Register Address	Data Type	Byte Order	Bit Position
1	System_Fault_status	1	3	32	uint16	AB	0
2	System_ON/OFF_status	1	3	33	uint16	AB	0
3	Electrical_room_fan_stop	1	3	36	uint16	AB	0
4	Ac_bus_switch_closed	1	3	37	uint16	AB	0
5	Rack_DC_switch_1_closed	1	3	43	uint16	AB	0
6	AC_module_01_online_status	1	3	90	uint16	AB	0
7	AC_module_01_ON/OFF_status	1	3	91	uint16	AB	0
8	AC_module_01_alarm_status	1	3	92	uint16	AB	0
9	AC_module_01_fault_status	1	3	93	uint16	AB	0

After switching the slider to mapping through the view, the page is parsed as follows:

10. Click the tab to switch the view of point mapping.
11. Click the **Export** button to export the table data under the current tab in CSV format.
12. Click **Edit** button to enter the editing mode for point mapping.
13. Click **Cancel** button to close the pop-up window.

Issue the value of the point

There are two ways to issue the values of points: batch issuance and single-point issuance.

Single-point delivery

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Home Devices Alarm Control Statistics Setting System Setting User Management Configuration

Points Table

View Mode: Points Mappings

telemetry	signal	control	adjustment				
Point Name: <input type="text" value="Search Point Name"/>							
Point ID	Point Name	Value	Scale	Offset	Unit	Reverse	Operation
1	System_Fault_status	34	1	0		false	<input type="button" value="Publish"/>
2	System_ON/OFF_status	0	1	0		false	<input type="button" value="Publish"/>
3	Electrical_room_fan_stop	108	1	0		false	<input type="button" value="Publish"/>
4	Ac_bus_switch_closed	513	1	0		false	<input type="button" value="Publish"/>
5	Rack_DC_switch_1_closed	0	1	0		false	<input type="button" value="Publish"/>
6	AC_module_01_online_status	3	1	0		false	<input type="button" value="Publish"/>
7	AC_module_01_ON/OFF_status	0	1	0		false	<input type="button" value="Publish"/>
8	AC_module_01_alarm_status	3	1	0		false	<input type="button" value="Publish"/>
9	AC_module_01_fault_status	0	1	0		false	<input type="button" value="Publish"/>

Cancel Edit

1

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Home Devices Alarm Control Statistics Setting System Setting User Management Configuration

Points Table

View Mode: Points Mappings

Cancel Edit

Value Publish

Value: 2
3
4

The screenshot shows the MONARCH web interface with the title "Norton creek solar energy center". The top bar includes status indicators like "Online" and "Published successfully", weather information ("wind 67°F~79°F"), and user authentication ("admin"). On the left, a sidebar lists navigation options: Home, Devices, Alarm, Control, Statistics, Setting (which is selected), System Setting, User Management, and Configuration. The main content area is titled "Points Table" and displays a table of data points. The table has columns: Point ID, Point Name, Value, Scale, Offset, Unit, Reverse, and Operation. The "telemetry" tab is selected. A red arrow points to the "Value" column of the first row, which contains the value "12". A red box highlights this value. The "Edit" button at the bottom right of the table is also highlighted with a red box.

Point ID	Point Name	Value	Scale	Offset	Unit	Reverse	Operation
1	System_Fault_status	12	1	0		false	
2	System_ON/OFF_status	1	1	0		false	
3	Electrical_room_fan_stop	108	1	0		false	
4	Ac_bus_switch_closed	513	1	0		false	
5	Rack_DC_switch_1_closed	0	1	0		false	
6	AC_module_01_online_status	3	1	0		false	
7	AC_module_01_ON/OFF_status	0	1	0		false	
8	AC_module_01_alarm_status	3	1	0		false	
9	AC_module_01_fault_status	0	1	0		false	

1. Click the **Publish** button in the point row of the value to be issued to open the single-point value issuance pop-up window.
2. Enter the value to be sent in the input box of Value (for telemetry and adjustment, the value to be sent is an integer or a floating-point number; for signal and control, the value to be sent is 0 or 1).
3. Click **Submit** button to submit a single-point value.
4. Click **Cancel** button to cancel single-point value distribution.
5. Issued successfully, value changed.

Batch Distribution

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Home Devices Alarm Control Statistics Setting System Setting User Management Configuration

Points Table

View Mode: Points Mappings

telemetry signal control adjustment

Point Name: Search Point Name

Point ID	Point Name	Value	Reverse	Operation
1	Grid_interconnection_mode	0	false	✓ Publish
2	Advanced_control_commands_1_bit0	0	false	✓ Publish
3	Advanced_control_commands_1_bit1	0	false	✓ Publish
4	Energy_dispatching_mode	0	false	✓ Publish
5	Active_power_control_mode	0	false	✓ Publish
6	Reactive_power_control_mode	0	false	✓ Publish
7	DC_control_mode	1	false	✓ Publish
8	Control_mode	0	false	✓ Publish
9	Bms_protocol	0	false	✓ Publish

Cancel Edit

1 → Batch Publish Export

Norton creek solar energy center Online

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Home Devices Alarm Control Statistics Setting System Setting User Management Configuration

Points Table

View Mode: Points Mappings

telemetry signal control adjustment

Point Name: Search Point Name

Point ID	Point Name	Value	Scale	Offset	Unit	Reverse	Publish Value
1	System_Fault_status	34	1	0		false	
2	System_ON/OFF_status	0	1	0		false	
3	Electrical_room_fan_stop	108	1	0		false	
4	Ac_bus_switch_closed	513	1	0		false	
5	Rack_DC_switch_1_closed	0	1	0		false	
6	AC_module_01_online_status	3	1	0		false	
7	AC_module_01_ON/OFF_status	0	1	0		false	
8	AC_module_01_alarm_status	3	1	0		false	

Cancel Publish

2 → Submit Publish

3 → Cancel Publish

4 → Publish Value

The screenshot shows the MONARCH platform's Points Table configuration screen. The top navigation bar includes the title "Norton creek solar energy center" and status indicators like "Online", "wind 67°F~79°F", and "admin". The left sidebar has a "Setting" section selected, containing "System Setting", "User Management", and "Configuration". The main content area is titled "Points Table" and shows a table with tabs for "telemetry", "signal", "control", and "adjustment". The "telemetry" tab is active. The table has columns: Point ID, Point Name, Value, Scale, Offset, Unit, Reverse, and Operation. A red box highlights the "Value" column for the first row, and a red arrow points to the value "10". Other rows show values like 1, 108, 513, etc. Buttons at the bottom right include "Batch Publish", "Export", "Cancel", and "Edit".

Point ID	Point Name	Value	Scale	Offset	Unit	Reverse	Operation
1	System_Fault_status	10	1	0		false	
2	System_ON/OFF_status	1	1	0		false	
3	Electrical_room_fan_stop	108	1	0		false	
4	Ac_bus_switch_closed	513	1	0		false	
5	Rack_DC_switch_1_closed	0	1	0		false	
6	AC_module_01_online_status	3	1	0		false	
7	AC_module_01_ON/OFF_status	0	1	0		false	
8	AC_module_01_alarm_status	3	1	0		false	
9	AC_module_01_fault_status	0	1	0		false	

1. Click the Batch Publish button on the tab page you want to perform batch distribution for, and then carry out the batch distribution operation (only applicable to the current tab).
2. Fill in the issued value in the Publish column of the table (for telemetry and adjustment, the issued value is an integer or a floating-point number; for signal and control, the issued value is 0 or 1).
3. Click the Submit Publish button to submit the batch value distribution.
4. Click the Cancel Publish button to cancel the operation of issuing batch values.
5. Issued successfully, value changed.

Batch Modify Points

Norton creek solar energy center Online

MONARCH

- Home
- Devices
- Alarm
- Control
- Statistics
- Setting**
- System Setting
- User Management
- Configuration

Points Table

View Mode: Points Mappings

telemetry	signal	control	adjustment				
Point ID	Point Name	Value	Scale	Offset	Unit	Reverse	Operation
1	System_Fault_status	12	1	0		false	
2	System_ON/OFF_status	1	1	0		false	
3	Electrical_room_fan_stop	108	1	0		false	
4	Ac_bus_switch_closed	513	1	0		false	
5	Rack_DC_switch_1_closed	0	1	0		false	
6	AC_module_01_online_status	3	1	0		false	
7	AC_module_01_ON/OFF_status	0	1	0		false	
8	AC_module_01_alarm_status	3	1	0		false	
9	AC_module_01_fault_status	0	1	0		false	

Batch Publish Export Cancel **Edit**

- Click the **Edit** button in the point view to enter the editing mode for all points.

Norton creek solar energy center Online

MONARCH

- Home
- Devices
- Alarm
- Control
- Statistics
- Setting**
- System Setting
- User Management
- Configuration

Points Table

modified added deleted invalid

Import

Point ID	Point Name	Scale	Offset	Unit	Reverse		
1	System_Fault_status	1	0		false		
2	System_ON/OFF_status	1	0		false		
3	Electrical_room_fan_stop	1	0		false		
4	Ac_bus_switch_closed	1	0		false		
5	Rack_DC_switch_1_closed	1	0		false		
6	AC_module_01_online_status	1	0		false		
7	AC_module_01_ON/OFF_status	1	0		false		
8	AC_module_01_alarm_status	1	0		false		
9	AC_module_01_fault_status	1	0		false		

Cancel Edit **Submit**

- For add, delete, and modify operations during the modification process, filtering can be performed through filtering conditions (only applicable to a single tab table):

- Modified:** Filter the points that have been actually modified. The left side of the modified point records will be displayed in blue, and the modified data will be marked in blue.

2	System_ON/OFF_status	-	3	0	false		
---	----------------------	---	---	---	-------	--	--

- **Added:** Filter the points added through the new addition operation, with the left side of the newly added point records and the data displayed in green.

1782	test	-	1	0	false		
------	------	---	---	---	-------	--	--

- **Deleted:** Filters the points deleted through the deletion operation, with the left side of the deleted point records and the data displayed in red.

1	System_Fault_Status	-	1	0	false		
---	---------------------	---	---	---	-------	--	--

- **invalid:** Screen the points with issues after addition or modification. The left side of the records of points with issues is displayed in orange, and the background is displayed in dark red.

1	test test required and cannot contain spaces	-	1	0	false		
---	---	---	---	---	-------	--	--



Point Configuration Rules:

- point_id: Positive integer (required, non-repeatable)
- signal_name: string, spaces are prohibited (required)
- scale: number (optional, default 1)
- offset: number (optional, default 0)
- unit: string, can be empty or a string without spaces (required)
- reverse: true/false (required)

Note: Modifications to point locations follow the principle of batch modification, i.e., first make modifications locally, and only after all modifications are completed and no errors occur, clicking the Submit button can truly modify the point location data in the channel point locations. The same applies to subsequent modifications of mappings.

Import point information via file

The screenshot shows the MONARCH interface for the Norton creek solar energy center. On the left, there's a sidebar with navigation links: Home, Devices, Alarm, Control, Statistics, Setting (which is selected), System Setting, User Management, and Configuration. The main area is titled 'Points Table' and contains a table with columns: Point ID, Point Name, Scale, Offset, Unit, Reverse, and several edit icons. At the bottom of the table are 'Cancel Edit' and 'Submit' buttons. Above the table, a message says 'Successfully imported 764 points'. The top right corner shows weather information: wind 67°F~79°F and a user status: admin.

Note:

- All imported records will be rendered as "new" (highlighted in green), and will be imported even if there are validation errors, but will be marked as "invalid" for you to correct on the interface.
- Each import will completely overwrite the current point information.

1. Click the Import button, select a point file in CSV format for import, and the file format content has the following requirements:

- **期望表头:** point_id,signal_name,scale,offset,unit,reverse
- **Field Description:** Follow the requirements of the point configuration rules.
- **Format Screenshot:**

point_id	point_name	value	scale	offset	unit	reverse
1	System_Fault_status	12	1	0		FALSE
2	System_ON/OFF_status	1	1	0		FALSE
3	Electrical_room_fan_stop	108	1	0		FALSE
4	Ac_bus_switch_closed	513	1	0		FALSE
5	Rack_DC_switch_1_closed	0	1	0		FALSE
6	AC_module_01_online_status	3	1	0		FALSE
7	AC_module_01_ON/OFF_stat	0	1	0		FALSE
8	AC_module_01_alarm_status	3	1	0		FALSE
9	AC_module_01_fault_status	0	1	0		FALSE
10	EPO	0	1	0		FALSE
11	CAN_A_comm_Fault	8	1	0		FALSE
12	Module_Fan_fault_1	0	1	0		FALSE
13	Module_over_temperature_1	0	1	0		FALSE

New Point

Point ID	Point Name	Scale	Offset	Unit	Reverse	Actions
788	Enter signal name	1	0	Enter unit	false	<input checked="" type="checkbox"/> <input type="button" value="√"/>
767	test	1	0	Enter unit	false	<input checked="" type="checkbox"/> <input type="button" value="X"/>
1	System_Fault_status	1	0	Enter unit	false	<input checked="" type="checkbox"/> <input type="button" value="X"/>
2	System_ON/OFF_status	1	0	Enter unit	false	<input checked="" type="checkbox"/> <input type="button" value="X"/>
3	Electrical_room_fan_stop	1	0	Enter unit	false	<input checked="" type="checkbox"/> <input type="button" value="X"/>
4	Ac_bus_switch_closed	1	0	Enter unit	false	<input checked="" type="checkbox"/> <input type="button" value="X"/>
5	Rack_DC_switch_1_closed	1	0	Enter unit	false	<input checked="" type="checkbox"/> <input type="button" value="X"/>
6	AC_module_01_online_status	1	0	Enter unit	false	<input checked="" type="checkbox"/> <input type="button" value="X"/>
7	AC_module_01_ON/OFF_status	1	0	Enter unit	false	<input checked="" type="checkbox"/> <input type="button" value="X"/>

1. Click the Add New Icon button, and a fillable point row record will appear in the first row of the corresponding tab table.
2. Fill in the content for the fillable rows, following the configuration rules.
3. Click the icon button to complete the local addition of the filled-in point.
4. Click the icon button to cancel the local addition of the filled-in point.
5. After confirming the addition, the style of the point record is as shown in the figure and can be filtered using the "added" filter condition.

 Note: During the addition process, each tab only supports adding up to one point, i.e., only one new row will appear. Only after clicking the confirmation icon or the cancellation icon can a new row be added again. If the existing new row has not been confirmed or cancelled, clicking the add button again will not result in the appearance of a new row.

Delete Point

Points Table

telemetry	signal	control	adjustment	modified	added	deleted	invalid
Point Name:	Search Point Name						
Point ID	Point Name	Scale	Offset	Unit	Reverse		
767	test	1	0		false		
1	System_Fault_status	1	0		false		
2	System_ON/OFF_status	1	0		false		
3	Electrical_room_fan_stop	1	0		false		
4	Ac_bus_switch_closed	1	0		false		
5	Rack_DC_switch_1_closed	1	0		false		
6	AC_module_01_online_status	1	0		false		
7	AC_module_01_ON/OFF_status	1	0		false		
8	AC_module_01_alarm_status	1	0		false		

Cancel Edit Submit

1. Click the delete icon button of the row to be deleted to locally delete the point.
2. The style of the point record after local deletion is shown in the figure and can be filtered using the "deleted" filter condition.
3. You can click the restore icon after deleting a row to restore it, which will undo the local deletion operation.

Modify Point

Points Table

telemetry	signal	control	adjustment	modified	added	deleted	invalid
Point Name:	Search Point Name						
Point ID	Point Name	Scale	Offset	Unit	Reverse		
767	test	1	0	Enter unit	false		
1	System_Fault_status	2	0	Enter unit	false		
2	System_ON/OFF_status	2	0	Enter unit	false		
3	Electrical_room_fan_stop	1	0		false		
4	Ac_bus_switch_closed	1	0		false		
5	Rack_DC_switch_1_closed	1	0		false		
6	AC_module_01_online_status	1	0		false		
7	AC_module_01_ON/OFF_status	1	0		false		
8	AC_module_01_alarm_status	1	0		false		

Cancel Edit Submit

1. Click the modification icon button of the point to be modified to modify the point.

2. Modify the points according to the configuration rules of the points. When modifying existing points, the id cannot be modified.
3. If you are modifying a newly added point, you can modify the ID.
4. Click the confirmation icon button to locally save the modifications to the point.
5. Click the cancel icon button to cancel the current modification to the point.
6. The style of the locally modified point record is shown in the figure, and it marks the modified data in blue. It can be filtered using the "modified" filter condition.

Submit all changes

The screenshot shows the MONARCH software interface with the title 'Norton creek solar energy center'. On the left is a sidebar with icons for Home, Devices, Alarm, Control, Statistics, Setting (which is selected), System Setting, User Management, and Configuration. The main area is titled 'Points Table' and has tabs for telemetry, signal, control, and adjustment. A search bar for 'Point Name' is present. Below is a table with columns: Point ID, Point Name, Scale, Offset, Unit, Reverse, and a '+' button. A row contains 'must positive integer' under Point Name, 'test' under Point Name, '1' under Scale, '0' under Offset, 'false' under Reverse, and edit/delete icons. A red box surrounds this row. Three red arrows point to the 'Submit' button at the bottom right of the table (1), the 'Cancel Edit' button next to it (2), and the bottom right corner of the table area (3).

1. When submitting, it must be ensured that the modified point data is correct, and error messages will appear below the incorrect data.
2. Click the Submit button to submit batch modifications.
3. Click the Cancel Edit button to exit the modification, and the point table will display the initial values.



Note: There is no need to manually perform a query. After directly clicking the Submit button, if there are any issues, you can directly jump to the relevant page.

Export point CSV file

Norton creek solar energy center Online

MONARCH

Home Devices Alarm Control Statistics Setting System Setting User Management Configuration

Points Table

View Mode: Points Mappings

telemetry	signal	control	adjustment				
Point ID	Point Name	Value	Scale	Offset	Unit	Reverse	Operation
1	System_Fault_status	12	1	0		false	
2	System_ON/OFF_status	1	1	0		false	
3	Electrical_room_fan_stop	108	1	0		false	
4	Ac_bus_switch_closed	513	1	0		false	
5	Rack_DC_switch_1_closed	0	1	0		false	
6	AC_module_01_online_status	3	1	0		false	
7	AC_module_01_ON/OFF_status	0	1	0		false	
8	AC_module_01_alarm_status	3	1	0		false	
9	AC_module_01_fault_status	0	1	0		false	

Cancel Edit

- Clicking the Export button allows you to export the table data under the current tab, with the export format being .csv and the file name being: channel name + tab name (telemetry/signal/control/adjustment) + current timestamp.

Channel Point Mapping Configuration

Batch modify the mapping of points

Norton creek solar energy center Online

MONARCH

Home Devices Alarm Control Statistics Setting System Setting User Management Configuration

Mappings Table

View Mode: Points Mappings

telemetry	signal	control	adjustment				
Point ID	Point Name	Slave ID	Function Code	Register Address	Data Type	Byte Order	Bit Position
1	System_Fault_status	1	3	32	uint16	AB	0
2	System_ON/OFF_status	1	3	33	uint16	AB	0
3	Electrical_room_fan_stop	1	3	36	uint16	AB	0
4	Ac_bus_switch_closed	1	3	37	uint16	AB	0
5	Rack_DC_switch_1_closed	1	3	43	uint16	AB	0
6	AC_module_01_online_status	1	3	90	uint16	AB	0
7	AC_module_01_ON/OFF_status	1	3	91	uint16	AB	0
8	AC_module_01_alarm_status	1	3	92	uint16	AB	0
9	AC_module_01_fault_status	1	3	93	uint16	AB	0

Cancel Edit

- In the mappings view, click the Edit button to enter the modification of point mapping.

Point ID	Point Name	Slave ID	Function Code	Register Address	Data Type	Byte Order	Bit Position	Operation
1	System_Fault_status	1	3	32	uint16	AB	0	<input checked="" type="checkbox"/>
2	System_ON/OFF_status	1	3	33	uint16	AB	0	<input checked="" type="checkbox"/>
3	Electrical_room_fan_stop	1	3	36	uint16	AB	0	<input checked="" type="checkbox"/>
4	Ac_bus_switch_closed	1	3	37	uint16	AB	0	<input checked="" type="checkbox"/>
5	Rack_DC_switch_1_close_d	1	3	43	uint16	AB	0	<input checked="" type="checkbox"/>
6	AC_module_01_online_status	1	3	90	uint16	AB	0	<input checked="" type="checkbox"/>
7	AC_module_01_ON/OFF_s	1	3	91	uint16	AB	0	<input checked="" type="checkbox"/>
8	AC_module_01_alarm_sta	1	3	92	uint16	AB	0	<input checked="" type="checkbox"/>

2. Modification operations during the modification process can be filtered by using filtering conditions:

- **Modified:** Filter the points that have been actually modified. The left side of the modified point records will be displayed in blue, and the modified data will be marked in blue.

1	Total_Start	2	16	1001	bool	AB	<input checked="" type="checkbox"/>
---	-------------	---	----	------	------	----	-------------------------------------

- **invalid:** Screen the points with issues after addition or modification. The left side of the records of points with issues is displayed in orange, and the background is displayed in dark red.

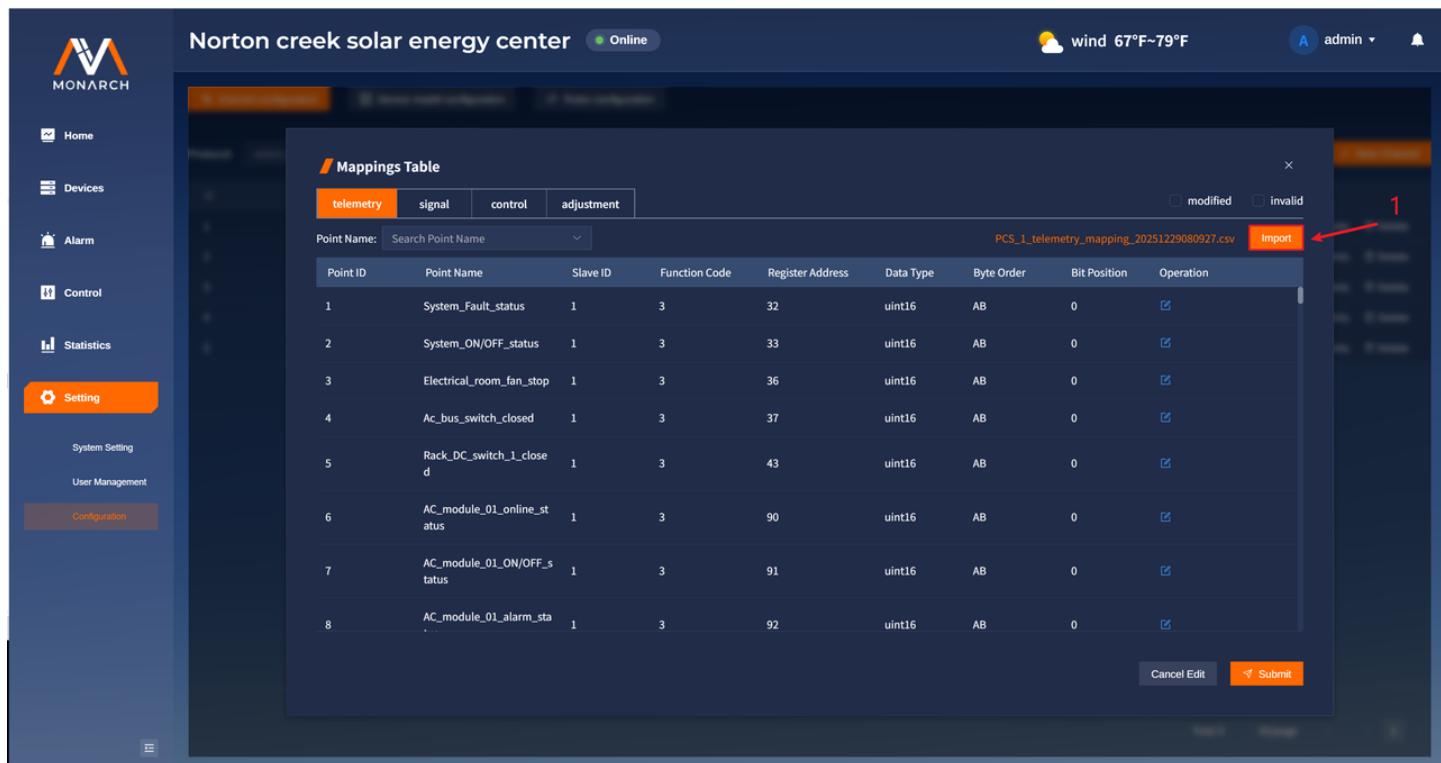
1	System_Fault_status	-1 must be 1-247	3	4	5 not allowed	1 not allowed	2	<input checked="" type="checkbox"/>
---	---------------------	---------------------	---	---	------------------	------------------	---	-------------------------------------

Point Mapping Configuration Rules:

- Function Code (FC) depends on the current Tab (pointType):
 - telemetry: 3、4
 - signal: 1、2、3、4
 - control: 5、15、6、16
 - adjustment: 6、16
- Data Type:
 - telemetry: int16、uint16、int32、float32、uint32、int64、uint64、float64
 - signal/: Same as telemetry, additionally allows bool

- control: same as telemetry, additionally allows bool
- adjustment: 同 telemetry
- The available options for Byte Order are determined by the data length:
 - bool: No limit
 - 16-bit: AB, BA
 - 32 位: AB、BA、ABCD、DCBA、BADC、CDAB
 - 64-bit: On the basis of 32-bit, ABCDEFGH, HGFEDCBA, BADCFEHG, and GHEFCDAB are added
- Bit Position: Editable (0-15) only when "dataType is bool and functionCode is 3/4" or for 16-bit integer types; fixed at 0 for other types.

Import point mapping information via file



The screenshot shows the MONARCH software interface with the title 'Norton creek solar energy center' and status 'Online'. The left sidebar includes 'Home', 'Devices', 'Alarm', 'Control', 'Statistics', 'Setting' (which is selected), 'System Setting', 'User Management', and 'Configuration'. The main area displays a 'Mappings Table' dialog. The table has columns: telemetry, signal, control, adjustment, Point Name (Search Point Name dropdown), modified, invalid, Point ID, Point Name, Slave ID, Function Code, Register Address, Data Type, Byte Order, Bit Position, and Operation. The 'Import' button in the top right of the dialog is highlighted with a red arrow. The table contains 8 rows of data:

Point ID	Point Name	Slave ID	Function Code	Register Address	Data Type	Byte Order	Bit Position	Operation
1	System_Fault_status	1	32	uint16	AB	0	<input checked="" type="checkbox"/>	
2	System_ON/OFF_status	1	33	uint16	AB	0	<input checked="" type="checkbox"/>	
3	Electrical_room_fan_stop	1	36	uint16	AB	0	<input checked="" type="checkbox"/>	
4	Ac_bus_switch_closed	1	37	uint16	AB	0	<input checked="" type="checkbox"/>	
5	Rack_DC_switch_1_closed	1	43	uint16	AB	0	<input checked="" type="checkbox"/>	
6	AC_module_01_online_status	1	90	uint16	AB	0	<input checked="" type="checkbox"/>	
7	AC_module_01_ON/OFF_status	1	91	uint16	AB	0	<input checked="" type="checkbox"/>	
8	AC_module_01_alarm_status	1	92	uint16	AB	0	<input checked="" type="checkbox"/>	

Buttons at the bottom of the dialog include 'Cancel Edit' and 'Submit'.

Note:

1. When modifying instance point mapping in the form of file import, it will **completely overwrite** the current point routing information.
2. During import, matching will be performed one by one based on the point ID. **If the point ID in the file does not exist among the points on the page, it will be ignored; if there are duplicate point mapping information in the file, the later point mapping information will be used.**

- Click the Import button, select a point file in CSV format for import, and the file format content has the following requirements:

- 期望表头:**

```
point_id,slave_id,function_code,register_address,data_type,byte_order,bit_position
```

- Field Description:** Follow the requirements of the point configuration rules.

- Format Screenshot:**

	A	B	C	D	E	F	G	H
1	point_id	slave_id	function_code	register_address	data_type	byte_order	bit_position	
2	1	1	3	12289	uint16	AB	0	
3	2	1	3	12290	uint16	AB	0	
4	3	1	3	12291	uint16	AB	0	
5	4	1	3	12292	uint16	AB	0	
6	5	1	3	12293	uint16	AB	0	
7	6	1	3	12294	uint16	AB	0	
8	7	1	3	12295	uint16	AB	0	
9	8	1	3	12296	uint16	AB	0	
10	9	1	3	12297	uint16	AB	0	
11	10	1	3	12298	uint16	AB	0	
12	11	1	3	12299	uint16	AB	0	



Note:

- All imported records will be rendered as "new" (highlighted in green), and will be imported even if there are validation errors, but will be marked as "invalid" for you to correct on the interface.
- Secondary import will make modifications on the existing basis.
- If the point_id in the imported record does not match any corresponding point, then this record will not be written to the page.

Manually modify point mapping

Point ID	Point Name	Slave ID	Function Code	Register Address	Data Type	Byte Order	Bit Position	Operation
1	System_Fault_status	1	3	32	uint16	AB	0	<input checked="" type="checkbox"/> <input type="checkbox"/>
2	System_ON/OFF_status	1	3	33	uint16	AB	0	<input checked="" type="checkbox"/>
3	Electrical_room_fan_stop	2	3	36	uint16	AB	0	<input checked="" type="checkbox"/>
4	Ac_bus_switch_closed	1	3	37	uint16	AB	0	<input checked="" type="checkbox"/>
5	Rack_DC_switch_1_close	1	3	43	uint16	AB	0	<input checked="" type="checkbox"/>
6	AC_module_01_online_status	1	3	90	uint16	AB	0	<input checked="" type="checkbox"/>
7	AC_module_01_ON/OFF_status	1	3	91	uint16	AB	0	<input checked="" type="checkbox"/>
	AC_module_01_alarm_sta							

1. Click the modification icon button of the point to be modified to modify the point.
2. Modify the points according to the configuration rules of the points. When modifying existing points, the id cannot be modified.
3. Click the confirmation icon button to locally save the modifications to the point.
4. Click the cancel icon button to cancel the current modification to the point.
5. The style of the locally modified point record is shown in the figure, and it marks the modified data in blue. It can be filtered using the "modified" filter condition.

Submit all changes

Point ID	Signal Name	Slave ID	Function Code	Register Address	Data Type	Byte Order	Bit Position	Operation
1	System_Fault_Status	-1 must be 1-247	3	4	5 not allowed	1 not allowed	2	<input checked="" type="checkbox"/>

1. When submitting, it must be ensured that the modified point mapping data is correct, and error messages will appear below the incorrect data.
2. Click the **Submit** button to submit batch modifications.
3. Click the **Cancel Edit** button to exit the modification, and the point table will display the initial values.



Note: There is no need to manually perform a query. After directly clicking the Submit button, if there are any issues, you can directly jump to the relevant page.

Export point mapping CSV file

Norton creek solar energy center Online

MONARCH

Home Devices Alarm Control Statistics Setting System Setting User Management Configuration

Mappings Table

View Mode: Points Mappings

telemetry	signal	control	adjustment				
Point Name: Search Point Name							
Point ID	Point Name	Slave ID	Function Code	Register Address	Data Type	Byte Order	Bit Position
1	System_Fault_status	1	3	32	uint16	AB	0
2	System_ON/OFF_status	1	3	33	uint16	AB	0
3	Electrical_room_fan_stop	1	3	36	uint16	AB	0
4	Ac_bus_switch_closed	1	3	37	uint16	AB	0
5	Rack_DC_switch_1_closed	1	3	43	uint16	AB	0
6	AC_module_01_online_status	1	3	90	uint16	AB	0
7	AC_module_01_ON/OFF_status	1	3	91	uint16	AB	0
8	AC_module_01_alarm_status	1	3	92	uint16	AB	0
9	AC_module_01_fault_status	1	3	93	uint16	AB	0

Cancel Export

1. Clicking the Export button allows you to export the table data under the current tab, with the export format being.csv and the file name being: channel name + tab name (telemetry/signal/control/adjustment) + "_mapping" + current timestamp.

Device Instance and Instance Point Configuration

Norton creek solar energy center Online

MONARCH

Home Devices Alarm Control Statistics Setting System Setting User Management Configuration

channel configuration Device model configuration Rules configuration

Protocol: select protocol Enabled: select enabled status Connected: select connected status Reload Search New Channel

ID	Name	Description	Protocol	Enabled	Connected	Operation
1	PCS#1	变流器 #1	modbus_tcp	<input checked="" type="checkbox"/>	Disconnected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
2	BAMS#1	电池管理系统 #1 (Ampace)	modbus_tcp	<input checked="" type="checkbox"/>	Disconnected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
3	GENSET#1	柴油发电机组 #1	modbus_rtu	<input checked="" type="checkbox"/>	Connected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
4	ECU1170_GPIO	ECU-1170 本机 DI/DO	di_do	<input type="checkbox"/>	Disconnected	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>

Total 4 20/page 1

Basic Concepts

In the microgrid EMS, in order to standardize device access and point management, basic concepts such as **product, instance, instance point, and point routing (mapping)** are

introduced: **Product** defines the standard capabilities and point model of a class of devices; **Instance** is a specific device object of the product on site; **Instance point** is used to express the configuration and operation data of the device, and is divided into **property / measurement / action** according to its purpose; **Instance mapping (routing)** binds the instance point to the on-site channel point (and distinguishes the four-remote types T / S / C / A), thereby achieving accurate docking of measurement data upload and control / adjustment command issuance.

Product

Concept Definition

Product is a **standardized model** of a type of device/system on the platform, used to abstract the capabilities and data interfaces that such objects should have in the EMS. A product does not represent a specific device on-site, but rather **the common structure and standard interfaces of devices of the same type**, describing what such devices should look like and what capabilities they should have on the platform:

- What are the points (attribute points, measurement points, action points)?
- What does each point represent (e.g., SOC, power, alarm, start/stop, power setting, etc.)

The product is not a specific piece of equipment on-site, but rather a "general definition applicable to similar equipment".

The following products are provided in this project:

- **battery_cell** (cell)
 - **Definition** : The smallest electrochemical unit of a battery system.
 - **Function**: Provides the most fundamental data sources such as voltage and temperature, serving as the foundation for BMS's refined monitoring and safety assessment.
- **battery_module** (Battery Module)
 - **Definition**: A structural and electrical combination unit composed of multiple cells.
 - **Function**: Aggregates cell-level data, commonly used for management and display of module voltage, temperature distribution, equalization/protection, etc.
- **battery_cluster** (Battery Cluster / Battery Pack)
 - **Definition**: A higher-level aggregation unit composed of multiple battery modules (also often corresponding to the management scope of "a cluster BMS").
 - **Function**: Provide key operational views such as cluster-level SOC/SOH, cluster voltage/current, and cluster alarms, facilitating the EMS to implement strategies and ensure safety linkage.
- **battery_stack** (Battery Stack / Battery Series)

- **Definition** : A system-level series-parallel combination unit composed of multiple battery clusters (which often corresponds to a battery stack in engineering).
 - **Function**: Provide system-level DC side key quantities (total voltage/total current/total power, etc.) and stack-level alarms for linkage with PCS/DC conversion units.
- **battery_pack** (**Battery Pack/Battery System Pack**)
 - **Definition** : The battery side in the EMS is more of an abstract object of "asset/system" (usually used to summarize the overall capabilities of an energy storage battery system).
 - **Function**: Used for capacity, rated parameters, operation statistics, alarm summary, reporting, and asset management; often serves as the top-level object on the BESS battery side.
- **dc_dc_converter** (**DC/DC Converter**)
 - **Definition** : DC-DC power conversion equipment (step-up/step-down/isolation, etc.).
 - **Function**: Achieve matching of different DC bus voltage levels, energy regulation, and protection coordination; commonly used in the power control link on the battery side/DC bus side.
- **pcs** (**Power Conversion System / PCS**)
 - **Definition** : Core power conversion equipment (DC↔AC) for energy storage systems.
 - **Function**: Performs charge and discharge power control, grid-connected/stand-alone operation, reactive power support, power quality control, etc.; is a key object for the issuance and execution of EMS strategies.
- **diesel_generator** (**Diesel Generator**)
 - **Definition** : Controllable reserve/emergency/peak-shaving power source.
 - **Function**: Provide stable power supply in off-grid or weak grid scenarios; support start-stop control, power regulation, and monitoring of operating status and faults.
- **motor** (**electric motor**)
 - **Definition**: Motor-type loads/devices (can be abstracted as power equipment or key process equipment).
 - **Function**: Used to monitor operating status, power/current, etc.; in some scenarios, it can be used for start/stop/speed control (depending on the on-site control system and connected points).
- **load** (**load**)
 - **Definition** : Aggregate objects or controllable load objects on the electricity consumption side (such as park load, building load, production line load, etc.).

- **Function:** Serves as the core input for EMS load forecasting, energy balance, peak shaving and valley filling, and demand response; when extended to controllable loads, it supports strategy linkage.
- **pv_string** (**Photovoltaic String**)
 - **Definition :** A power generation unit formed by connecting components in series.
 - **Function:** String-level voltage/current/power monitoring, facilitating the location of issues such as shading, mismatch, and attenuation (subject to access capabilities).
- **pv_optimizer** (**Optimizer**)
 - **Definition :** Power optimization and monitoring device at the component/string level.
 - **Function:** Improve power generation efficiency, support finer-grained monitoring and fault location; usually associated with string/component-level data.
- **pv_combiner** (**Combiner Box**)
 - **Definition:** A device that combines multiple strings in parallel and converges them to a DC bus.
 - **Function:** Aggregates string circuits, provides monitoring and protection information such as branch current, switch, and lightning protection, and is a key node between the string and the inverter.
- **pv_inverter** (**Photovoltaic Inverter**)
 - **Definition :** A device that converts photovoltaic direct current into alternating current for grid connection/power supply.
 - **Function:** Output power control, grid-connected operation management, reactive power/power quality support, status alarm monitoring; it is the main controlled/monitored object on the PV side of the EMS.
- **gateway** (**Gateway**)
 - **Definition:** A collection and protocol conversion node that connects field devices to the cloud/platform.
 - **Function:** Bear channels and protocols, complete data acquisition and upload as well as instruction issuance; be responsible for point mapping, caching, edge computing/forwarding, etc. (according to implementation capabilities).
- **station** (**site/station**)
 - **Definition:** The top-level organizational object of a microgrid/station (a project or a station).

- **Function:** It carries the device tree, topology, and aggregated indicators (such as station-level power/energy/alarm) of the station, serving as a unified entry for permissions, reports, scheduling strategies, and operation and maintenance management.
-

Function

- Unify the point set and semantics of similar devices (standardization)
 - Supports batch instantiation (multiple device instances can be created for the same product)
 - Facilitates system access, operation and maintenance, and configuration reuse
-

Instance

Concept Definition

Instance is the specific objectified expression of the product model in on-site engineering (Asset/Device Instance), corresponding to an actually existing device, a system unit, or a logical object (such as `PCS_01`, `BESS_01`, `PCC_METER_01`). An instance has a unique identifier `instance_id` and is bound to a `product_name`, inheriting the point system of that product.

The instance is not only the "device entry" of the display layer, but also the **smallest business carrying unit** for the platform to perform state calculation, control issuance, alarm positioning and other behaviors.

Field Explanation

`instance_id` : The ID of the instance, which is a unique identifier.

`instance_name` : The name of the instance.

`product_name` : The name of the product to which the instance belongs.

`properties` : Attributes of the instance itself.

Function

- Drop "Template (Product)" onto "Field Object (Instance)"
- **Configuration properties (properties) and operating points (measurement/action) of the instance that carries the product device**
- Establish mapping with on-site channels (four remote functions) to achieve data acquisition and control issuance

Instance Location

Concept Definition

Instance Point is the "data interface" of an instance in the platform, used to express all information about the instance that can be configured, observed, and controlled.

Instance points are divided into the following three categories:

- **Property Point** is used to describe the "static/semi-static configuration parameters" of a device, such as rated power, capacity, communication address, control strategy parameters, alarm threshold, etc.

Function:

- As the configuration data source for the instance
- Used for strategy calculation, limit verification, display, and operation and maintenance configuration
- Usually does not change frequently (can be manually configured/ written by strategy)

- **Measurement Point** represents the "collectable status/telemetry/remote signaling" data of the device, such as voltage, current, power, SOC, switch status, alarm status, etc.

Function:

- Real-time Monitoring and Visualization
- Input data for alarms, linkages, reports, and optimized scheduling

- **Action point** refers to a point that represents "controllable/regulatable", such as start/stop, closing/opening, active/reactive power setting, charge/discharge power setting, mode switching, etc.

Function:

- EMS control closed-loop output (strategy/ manual operation → sent to device)
- Supports two types of instructions: Control and Adjustment

Field Explanation

`point_id` : The unique identifier of a point within its point classification.

`name` : Point name.

`value` : The value of the current point.

`unit` : The unit of the point.

`description` : Remarks information for the point.

Function

- Unified semantic and data governance. Uniformly map the original point numbers from different protocols and different manufacturers to consistent semantic points, facilitating the understanding and reuse of upper-level applications.

- As the basic granularity for monitoring and alarming. Trend curves, threshold alarms, event linkage, and report statistics all take points as the basic objects.
- As the input/output interface of the control closed-loop, the strategy reads the measurement points to form a state judgment, and writes the target value to the action points to trigger the issuance.

Instance Point routing

Concept Definition

Instance point mapping is the configuration relationship that binds the "instance points" in the platform to the "channel points/point numbers" in the field, answering a key question:

Which channel and point number at the site does this point of this instance correspond to? Which category of the four remote functions does it belong to?

For the `measurement` point, the type of its corresponding channel point can only be `Telemetry` and `Signal`.

For the `action` point, the type of its corresponding channel point can only be `Control` and `Adjustment`.

`property` point, as an inherent attribute, has no routing information.

Field Explanation

`point_id` : The ID corresponding to the instance point.

`name` : The name of the corresponding point.

`channel_id` : The ID of the channel corresponding to the routing point.

`channel_type` : Four-remote type of the channel corresponding to the routing point.

`channel_point_id` : The channel point ID of the route corresponding to the point.

Function

- Data uplink (collection). Data collected by the channel is routed to the corresponding measurement point according to the mapping.
- Command Downlink (Control). The value written to the action point is routed to the corresponding channel point number according to the mapping and sent to the device.
- Decouple business from protocol. The business side only cares about the semantics of data points; the communication side only cares about address point numbers; mapping connects the two, facilitating protocol replacement, gateway replacement, and point table modification.

Configuration Operation

Query device instance

Norton creek solar energy center Online

channel configuration Device model configuration Rules configuration

productName: Please select productName 1

productName: battery_pack
diesel_generator
pcs
pv_inverter

Product Name

ID Instance Name Product Name Operation

1 battery_01 battery_pack Detail Points Delete
2 diesel_gen_01 diesel_generator Detail Points Delete
3 pcs_01 pcs Detail Points Delete
4 pv_01 pv_inverter Detail Points Delete

Total 4 20/page 1 >

1. Supports filtering instances. Filtering conditions include:

- Product_Name: The name of the product to which the instance belongs.
2. Click the Search button to perform a filtered search.
3. Click the Reload button to reset the search.

Add a new device instance

Norton creek solar energy center Online

channel configuration Device model configuration Rules configuration

productName: Please select productName 1

productName: battery_pack
diesel_generator
pcs
pv_inverter

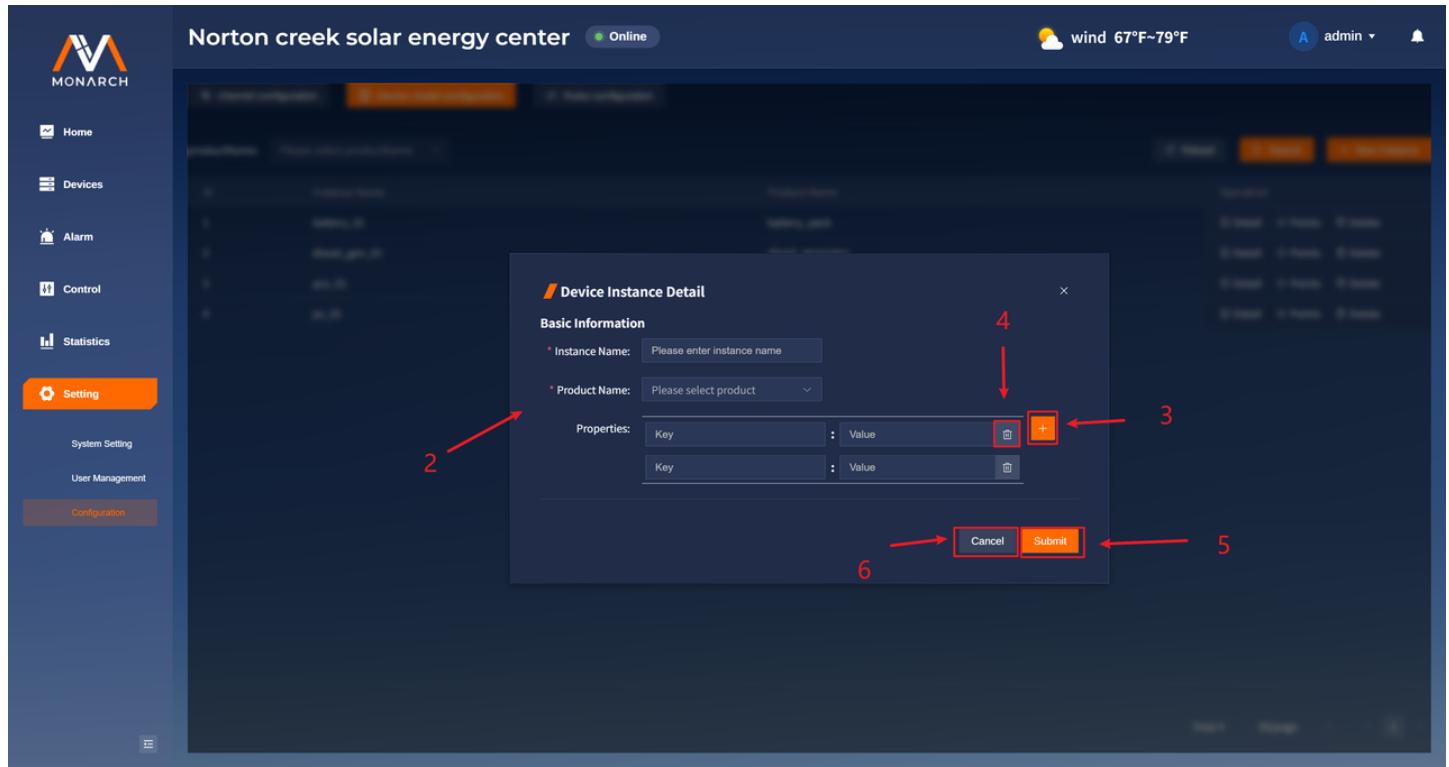
Product Name

ID Instance Name Product Name Operation

1 battery_01 battery_pack Detail Points Delete
2 diesel_gen_01 diesel_generator Detail Points Delete
3 pcs_01 pcs Detail Points Delete
4 pv_01 pv_inverter Detail Points Delete

+ New Instance 1

Total 4 20/page 1 >



1. Click the **New Instance** button to open the new instance pop-up window.
2. Fill in the correct parameters, and refer to the field description in the basic concept instance for field details.
3. Click the property add icon button to add a property value.
4. Clicking the attribute deletion icon button allows you to delete the corresponding attribute value.
5. Click the **Submit** button to submit the newly added instance.
6. Click the **Cancel** button to cancel the addition.

View device instance details

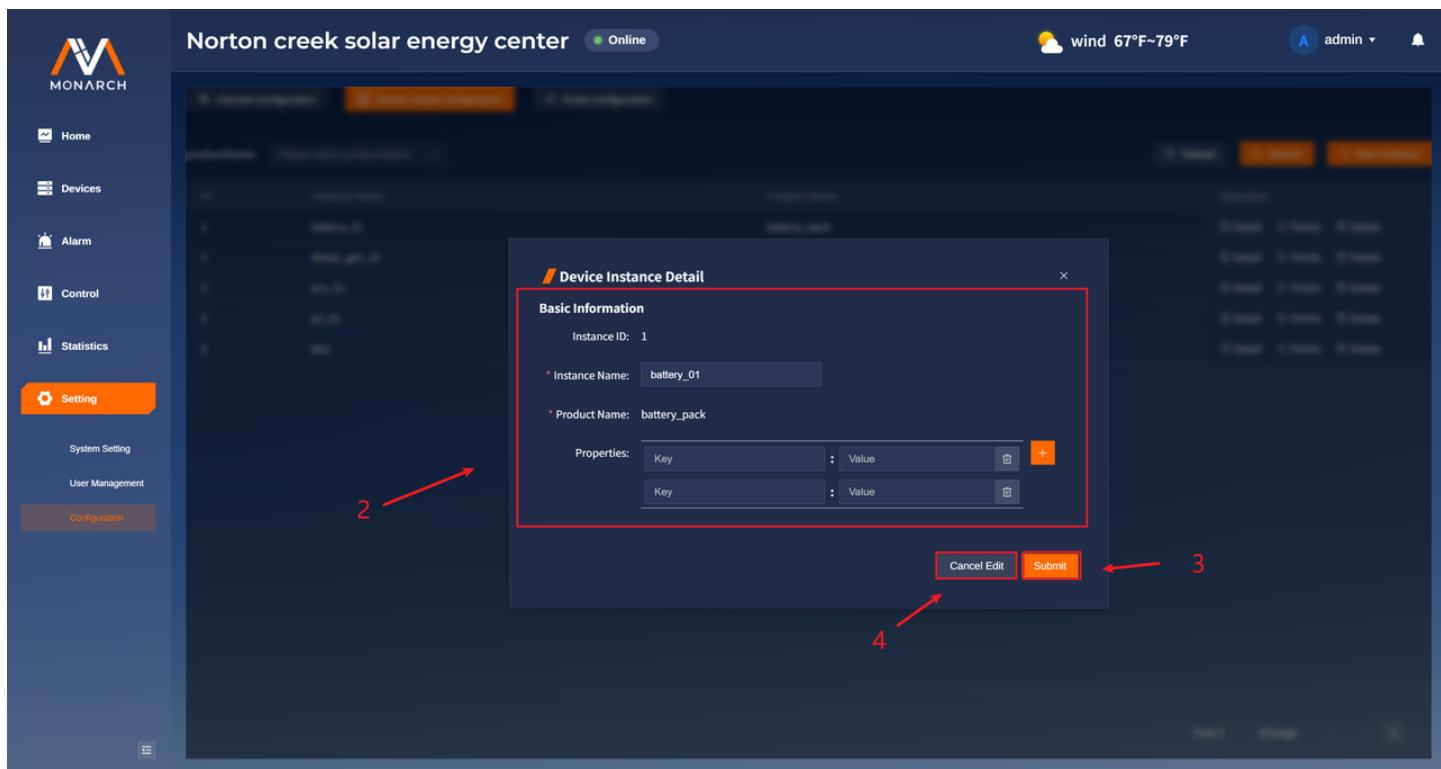
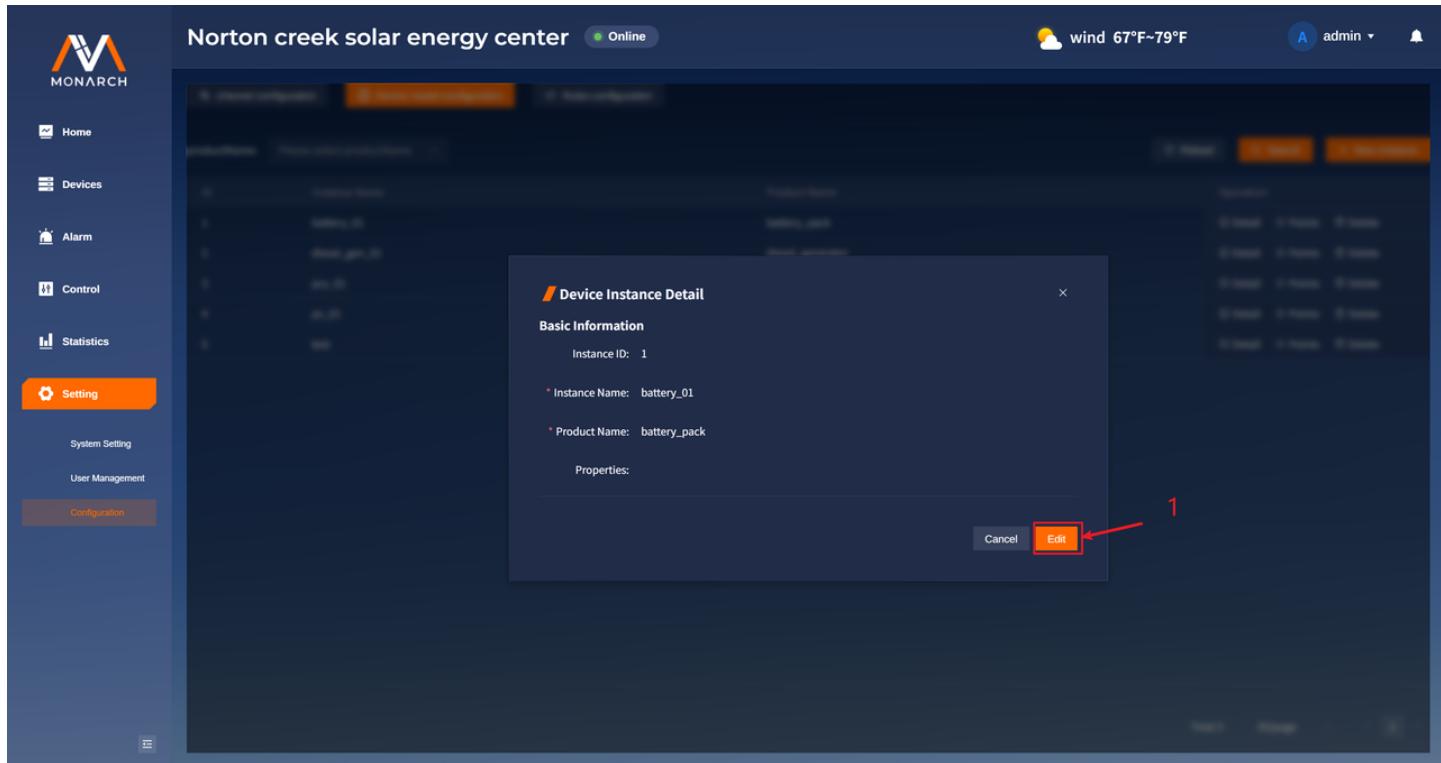
The screenshot shows a list of device instances in the 'Device model configuration' section. The table has columns for ID, Instance Name, Product Name, and Operation. A red arrow points to the 'Detail' button in the operation column for the first instance, 'battery_01'. The 'Detail' button is highlighted with a red border.

ID	Instance Name	Product Name	Operation
1	battery_01	battery_pack	<input checked="" type="button"/> Detail <input type="button"/> Points <input type="button"/> Delete
2	diesel_gen_01	diesel_generator	<input type="button"/> Detail <input type="button"/> Points <input type="button"/> Delete
3	pcs_01	pcs	<input type="button"/> Detail <input type="button"/> Points <input type="button"/> Delete
4	pv_01	pv_inverter	<input type="button"/> Detail <input type="button"/> Points <input type="button"/> Delete

The screenshot shows a 'Device Instance Detail' pop-up window. It contains a 'Basic Information' section with fields for Instance ID (1), Instance Name (battery_01), and Product Name (battery_pack). There is also a 'Properties:' section which is currently empty. At the bottom of the window are 'Cancel' and 'Edit' buttons.

1. Click the **Operation** column in the instance you want to view, then click the **Detail** button to open the instance details pop-up window.

Edit Device Instance



1. In the pop-up window for viewing instance details, click the **Edit** button to enter the edit mode for instance information.
2. During the modification, except that **Product Name** cannot be modified, the rest of the modifications are consistent with those in the addition.
3. Click the **Submit** button to modify and submit.
4. Click **Cancel Edit** button to cancel the edit.

Delete the existing device instance

Norton creek solar energy center Online

productName: Please select productName

ID	Instance Name	Product Name	Operation
1	battery_01	battery_pack	Detail Points Delete
2	diesel_gen_01	diesel_generator	Detail Points Delete
3	pcs_01	pcs	Detail Points Delete
4	pv_01	pv_inverter	Detail Points Delete
5	test	battery_cell	Detail Points Delete

Total 5 20/page < 1 >

Norton creek solar energy center Online

productName: Please select productName

ID	Instance Name	Product Name	Operation
1	battery_01	battery_pack	Detail Points Delete
2	diesel_gen_01	diesel_generator	Detail Points Delete
3	pcs_01	pcs	Detail Points Delete
4	pv_01	pv_inverter	Detail Points Delete
5	test	battery_cell	Detail Points Delete

Delete Instance
Are you sure you want to delete instance "test"?
Cancel Confirm

Total 5 20/page < 1 >

1. Click the **Delete** button in the **Operation** column of the device instance row you want to delete to perform the deletion.
2. Click **Confirm** button to confirm deletion.
3. Click **Cancel** button to cancel deletion.

Device Instance Point Configuration

Norton creek solar energy center Online

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productName: Please select productName

ID	Instance Name	Product Name	Operation
1	battery_01	battery_pack	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
2	diesel_gen_01	diesel_generator	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
3	pcs_01	pcs	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
4	pv_01	pv_inverter	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>
5	test	battery_cell	<input type="button" value="Detail"/> <input type="button" value="Points"/> <input type="button" value="Delete"/>

Total 5 20/page < 1 >

Norton creek solar energy center Online

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Points Table

View Mode:

property	measurement	action			
Point Name: Search Point Name					
Point ID	Point Name	Value	Unit	Description	Operation
1	Pack Voltage	0	V		<input type="button" value="Execute"/>
2	Pack Current	0	A		<input type="button" value="Execute"/>
3	SOC	0	%		<input type="button" value="Execute"/>
4	SOH	0	%		<input type="button" value="Execute"/>
5	Cell Voltages Array	0	V		<input type="button" value="Execute"/>
6	Cell Temperatures Array	0	°C		<input type="button" value="Execute"/>
7	Max Cell Voltage	0	V		<input type="button" value="Execute"/>
8	Min Cell Voltage	0	V		<input type="button" value="Execute"/>
9	Average Cell Voltage	0	V		<input type="button" value="Execute"/>

1. By clicking the **Points** button in the **Operation** column of the device instance row you want to view, open the point pop-up window.
2. **View Mode** The selection box is used to switch views, which are divided into point view and point routing view. Click the button to switch (default is point view).
3. Label buttons for switching the point types displayed in the table. There are three labels in the point view: **Property**, **measurement**, **action**.
4. The point selection box allows manual input for fuzzy search of point names or precise search by selecting point names through the dropdown box.

5. **Export** button, used to export the current point type table data in CSV format.
6. **Execute** button, used to execute the issued point value.
7. **Cancel** button, used to close the pop-up box.

Point command issued

Norton creek solar energy center Online

MONARCH

- Home
- Devices
- Alarm
- Control
- Statistics
- Setting**
- System Setting
- User Management
- Configuration

Points Table

View Mode: Points Routing

property	measurement	action			
Point Name: Search Point Name					
Point ID	Point Name	Value	Unit	Description	Operation
1	Enable Pack	10			<input type="button" value="Execute"/>
2	Disable Pack	-			<input type="button" value="Execute"/>
3	Start Cell Balancing	-			<input type="button" value="Execute"/>
4	Stop Cell Balancing	-			<input type="button" value="Execute"/>

Cancel

Norton creek solar energy center Online

MONARCH

- Home
- Devices
- Alarm
- Control
- Statistics
- Setting**
- System Setting
- User Management
- Configuration

Points Table

View Mode: Points Routing

Execute

* Value:

Cancel

The screenshot shows the 'Points Table' section of the MONARCH software. The table has columns: Point ID, Point Name, Value, Unit, Description, and Operation. Row 1 contains 'Enable Pack' with a value of '20'. Step 5 indicates that the value '5' should be entered into the 'Value' field of this row.

Point ID	Point Name	Value	Unit	Description	Operation
1	Enable Pack	20	-	-	Execute
2	Disable Pack	-	-	-	Execute
3	Start Cell Balancing	-	-	-	Execute
4	Stop Cell Balancing	-	-	-	Execute

1. Click the Execute button in the Operation column of the row where the point of a certain value to be executed is located to open the execution pop-up window.
2. Enter the value (number) to be executed.
3. Click the Submit button to submit.
4. Click the Cancel button to cancel the submission.
5. The value changes after successful submission.

Export point CSV file

The screenshot shows the 'Points Table' section of the MONARCH software. The 'Export' button at the top right of the table area is highlighted with a red box and a red arrow labeled '1' pointing to it.

Point ID	Point Name	Value	Unit	Description	Operation
1	Enable Pack	10	-	-	Execute
2	Disable Pack	-	-	-	Execute
3	Start Cell Balancing	-	-	-	Execute
4	Stop Cell Balancing	-	-	-	Execute

- Click the Export button to export the currently displayed table data. The file name format of the exported CSV file is:**Instance Name_Point Type (property/measurement/action)_points_Current Timestamp.csv**, as shown in the figure below:

	A	B	C	D	E
1	point_id	point_name	value	unit	description
2	1	Enable Pack			
3	2	Disable Pack			
4	3	Start Cell Balancing			
5	4	Stop Cell Balancing			
6					
7					
8					
9					

Device Instance Point Routing Configuration

Point ID	Point Name	Channel	Point Type	Point	Enabled
1	Pack Voltage	BAMS#1	Telemetry	BamsVoltage	true
2	Pack Current	BAMS#1	Telemetry	BamsCurrent	true
3	SOC	BAMS#1	Telemetry	BamsPower	true
4	SOH	BAMS#1	Telemetry	BamsSoc	true
5	Cell Voltages Array	BAMS#1	Telemetry	BamsSoh	true
6	Cell Temperatures Array	BAMS#1	Telemetry	BamsPermitChgPower	true
7	Max Cell Voltage	BAMS#1	Telemetry	BamsPermitDsgPower	true
8	Min Cell Voltage	BAMS#1	Telemetry	BamsPermitChgCurrent	true
9	Average Cell Voltage	BAMS#1	Telemetry	BamsPermitDsgCurrent	true

- Switch views by clicking Routing in the view Mode to open the instance point routing view.
- Edit button, click to enter the modification mode of the point route.

 Note: `property` points are inherent attributes of the product and do not need to be connected to channel points via routing. Therefore, only `measurement` type and `action` type are included in the point routing.

Export point routing CSV file

The screenshot shows the MONARCH web interface for the Norton creek solar energy center. On the left sidebar, under the 'Setting' section, the 'Configuration' option is selected. In the main content area, a modal window titled 'Routings Table' is open. The table has columns for Point ID, Point Name, Channel, Point Type, Point, and Enabled. A red arrow points from the number '1' to the 'Export' button at the bottom right of the table.

Point ID	Point Name	Channel	Point Type	Point	Enabled
1	Pack Voltage	BAMS#1	Telemetry	BamsVoltage	true
2	Pack Current	BAMS#1	Telemetry	BamsCurrent	true
3	SOC	BAMS#1	Telemetry	BamsPower	true
4	SOH	BAMS#1	Telemetry	BamsSoc	true
5	Cell Voltages Array	BAMS#1	Telemetry	BamsSoh	true
6	Cell Temperatures Array	BAMS#1	Telemetry	BamsPermitChgPower	true
7	Max Cell Voltage	BAMS#1	Telemetry	BamsPermitDsgPower	true
8	Min Cell Voltage	BAMS#1	Telemetry	BamsPermitChgCurrent	true
9	Average Cell Voltage	BAMS#1	Telemetry	BamsPermitDsgCurrent	true

- Click the Export button to export the currently displayed table data. The file name format of the exported CSV file is:**Instance Name_Point Type(measurement/action)_routing_Current Timestamp.csv**, as shown in the figure below:

A	B	C	D	E	F	G	H	
1	point_id	point_name	channel_id	channel_name	channel_point_type	channel_point_id	channel_point_name	enabled
2	1	Pack Voltage	2	BAMS#1	T	1	BamsVoltage	TRUE
3	2	Pack Current	2	BAMS#1	T	2	BamsCurrent	TRUE
4	3	SOC	2	BAMS#1	T	3	BamsPower	TRUE
5	4	SOH	2	BAMS#1	T	4	BamsSoc	TRUE
6	5	Cell Voltages Array	2	BAMS#1	T	5	BamsSoh	TRUE
7	6	Cell Temperatures Arra	2	BAMS#1	T	6	BamsPermitChgPower	TRUE
8	7	Max Cell Voltage	2	BAMS#1	T	7	BamsPermitDsgPower	TRUE
9	8	Min Cell Voltage	2	BAMS#1	T	8	BamsPermitChgCurrent	TRUE
10	9	Average Cell Voltage	2	BAMS#1	T	9	BamsPermitDsgCurrent	TRUE
11	10	Cell Voltage Imbalance	2	BAMS#1	T	10	BamsBcuSocDiff	TRUE
12	11	Max Cell Temperature	2	BAMS#1	T	11	BamsBcuMinSoc	TRUE
13	12	Min Cell Temperature	2	BAMS#1	T	12	BamsBcuMinSocNo	TRUE
14	13	Balancing Status Array	2	BAMS#1	T	13	BamsBcuMaxSoc	TRUE
15	14	Protection Status	2	BAMS#1	T	14	BamsBcuMaxSocNo	TRUE
16	15	Cell Count	2	BAMS#1	T	15	BamsMaxCellVol	TRUE
17								
18								
19								
20								
21								
22								
23								

In the exported file, point_type is displayed in abbreviated form, with the corresponding rules as follows: T corresponds to Telemetry, S corresponds to Signal, C corresponds to Control, and A corresponds to Adjustment.

Batch modify instance point routing

Norton creek solar energy center Online

MONARCH

- Home
- Devices
- Alarm
- Control
- Statistics
- Setting
- System Setting
- User Management
- Configuration

Routings Table

View Mode: Points Routing

Point ID	Point Name	Channel	Point Type	Point	Enabled
1	Pack Voltage	BAMS#1	Telemetry	BamsVoltage	true
2	Pack Current	BAMS#1	Telemetry	BamsCurrent	true
3	SOC	BAMS#1	Telemetry	BamsPower	true
4	SOH	BAMS#1	Telemetry	BamsSoc	true
5	Cell Voltages Array	BAMS#1	Telemetry	BamsSoh	true
6	Cell Temperatures Array	BAMS#1	Telemetry	BamsPermitChgPower	true
7	Max Cell Voltage	BAMS#1	Telemetry	BamsPermitDsgPower	true
8	Min Cell Voltage	BAMS#1	Telemetry	BamsPermitChgCurrent	true
9	Average Cell Voltage	BAMS#1	Telemetry	BamsPermitDsgCurrent	true

Cancel Edit

Norton creek solar energy center Online

MONARCH

- Home
- Devices
- Alarm
- Control
- Statistics
- Setting
- System Setting
- User Management
- Configuration

Routings Table

modified invalid

Point ID	Point Name	Channel	Channel Point Type	Channel Point	Enabled	Operation
1	Pack Voltage	BAMS#1	Telemetry	BamsVoltage	true	<input checked="" type="checkbox"/>
2	Pack Current	BAMS#1	Telemetry	BamsCurrent	true	<input checked="" type="checkbox"/>
3	SOC	BAMS#1	Telemetry	BamsPower	true	<input checked="" type="checkbox"/>
4	SOH	BAMS#1	Telemetry	BamsSoc	true	<input checked="" type="checkbox"/>
5	Cell Voltages Array	BAMS#1	Telemetry	BamsSoh	true	<input checked="" type="checkbox"/>
6	Cell Temperatures Array	BAMS#1	Telemetry	BamsPermitChgPower	true	<input checked="" type="checkbox"/>
7	Max Cell Voltage	BAMS#1	Telemetry	BamsPermitDsgPower	true	<input checked="" type="checkbox"/>
8	Min Cell Voltage	BAMS#1	Telemetry	BamsPermitChgCurrent	true	<input checked="" type="checkbox"/>
9	Average Cell Voltage	BAMS#1	Telemetry	BamsPermitDsgCurrent	true	<input checked="" type="checkbox"/>

Cancel Edit Submit

- Click the **Edit** button to enter the editing mode of the point route.
 - Modification operations during the modification process can be filtered by using filtering conditions:
- Modified:** Filter the points that have been actually modified. The left side of the modified point records will be displayed in blue, and the modified data will be marked in blue.

2	Pack Current	PCS#1	Telemetry	System_ON/OFF_status	true	<input checked="" type="checkbox"/>
---	--------------	-------	-----------	----------------------	------	-------------------------------------

- **invalid:** Screen the points with issues after addition or modification. The left side of the records of points with issues is displayed in orange, and the background is displayed in dark red.

1	Pack Voltage	999 Does not exist	Telemetry	1 Does not exist	true	<input checked="" type="checkbox"/>
---	--------------	-----------------------	-----------	---------------------	------	-------------------------------------



Point routing configuration rules:

Channel is the channel where the channel point for the routing mapping of the device instance point is located.

Channel Point Type is the four-remote type to which the channel point of the device instance point routing mapping belongs. Among them, for the device instance point of type **measurement**, it can only be **Telemetry** and **Signal**. For the device instance point of type **action**, it can only be **Control** and **Adjustment**.

Channel Point is the channel point for the routing mapping of the device instance point.

The three options have a sequential order and need to be selected in the order of **Channel** -> **Channel Point Type** -> **Channel Point**.

Manually modify the routing information of the point

Routings Table						
<input checked="" type="radio"/> measurement		<input type="radio"/> action				
Point ID	Point Name	Channel	Channel Point Type	Channel Point	Enabled	Operation
1	Pack Voltage	BAMS#1	Telemetry	BamsCurrent	true	<input checked="" type="checkbox"/>
2	Pack Current	BAMS#1	Telemetry	BamsCurrent	true	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
3	SOC	BAMS#1	Telemetry	BamsPower	true	<input checked="" type="checkbox"/>
4	SOH	BAMS#1	Telemetry	BamsSoc	true	<input checked="" type="checkbox"/>
5	Cell Voltages Array	BAMS#1	Telemetry	BamsSoh	true	<input checked="" type="checkbox"/>
6	Cell Temperatures Array	BAMS#1	Telemetry	BamsPermitChgPower	true	<input checked="" type="checkbox"/>
7	Max Cell Voltage	BAMS#1	Telemetry	BamsPermitDsgPower	true	<input checked="" type="checkbox"/>
8	Min Cell Voltage	BAMS#1	Telemetry	BamsPermitChgCurrent	true	<input checked="" type="checkbox"/>
9	Average Cell Voltage	BAMS#1	Telemetry	BamsPermitDsgCurrent	true	<input checked="" type="checkbox"/>

1. Click the modification icon button of the point route to be modified to modify the point.
2. Modify the point routing according to the configuration rules of point routing. When modifying an existing point, the id cannot be modified.

3. Click the confirmation icon button to locally save the modifications to the point routing.
4. Click the cancel icon button to cancel the current local modification to the point routing.
5. The style of the locally modified point routing record is shown in the figure, which marks the modified data in blue. It can be filtered using the "modified" filter condition.

Import point routing information via file

The screenshot shows the MONARCH software interface for the 'Norton creek solar energy center'. The left sidebar includes links for Home, Devices, Alarm, Control, Statistics, Setting (which is selected), System Setting, User Management, and Configuration. The main area displays a 'Routings Table' with the following columns: Point ID, Point Name, Channel, Channel Point Type, Channel Point, Enabled, and Operation. There are two additional columns at the top: 'measurement' and 'action'. A search bar for 'Point Name' is also present. At the bottom of the table are 'Cancel Edit' and 'Submit' buttons. A red arrow points to the 'Import' button located at the bottom right of the table area. The table data is as follows:

Point ID	Point Name	Channel	Channel Point Type	Channel Point	Enabled	Operation
1	Pack Voltage	BAMS#1	Telemetry	BamsVoltage	true	<input checked="" type="checkbox"/>
2	Pack Current	BAMS#1	Telemetry	BamsCurrent	true	<input checked="" type="checkbox"/>
3	SOC	BAMS#1	Telemetry	BamsPower	true	<input checked="" type="checkbox"/>
4	SOH	BAMS#1	Telemetry	BamsSoc	true	<input checked="" type="checkbox"/>
5	Cell Voltages Array	BAMS#1	Telemetry	BamsSoh	true	<input checked="" type="checkbox"/>
6	Cell Temperatures Array	BAMS#1	Telemetry	BamsPermitChgPower	true	<input checked="" type="checkbox"/>
7	Max Cell Voltage	BAMS#1	Telemetry	BamsPermitDsgPower	true	<input checked="" type="checkbox"/>
8	Min Cell Voltage	BAMS#1	Telemetry	BamsPermitChgCurrent	true	<input checked="" type="checkbox"/>
9	Average Cell Voltage	BAMS#1	Telemetry	BamsPermitDsgCurrent	true	<input checked="" type="checkbox"/>



Note:

1. When modifying instance point routing in the form of file import, it will **completely overwrite** the current point routing information.
2. During import, matching will be performed one by one based on the point ID. **If the point ID in the file does not exist among the points on the page, it will be ignored; if there are duplicate point routing information in the file, the later point routing information will be used.**

1. Click the Import button, select a point file in CSV format for import, and the content of the file must meet the following requirements:
- **Expected table headers (must include the following header information; other additional headers may also exist, but they will not have any effect):**

```
point_id,point_name,channel_id,channel_point_type,channel_point_id,enabled
```

After import, the matching of point and routing information will be performed based on `point_id`.

- **Field Description:**

- `point_id` is the ID of the instance point. If the point does not exist, this point routing information is invalid.
- `point_name` is the name of the instance point.
- `channel_id` is the ID of the channel to which the channel point of the routing mapping belongs. If the channel does not exist, the corresponding channel point is also considered non-existent, and an error message will be displayed.
- `channel_point_type` is the point type to which the channel point of the routing mapping belongs (Four Remote: T/S/C/A), which accepts the abbreviations of Four Remote: `T`, `S`, `C`, `A`, and also accepts the full names of Four Remote: `Telemetry`, `Signal`, `Control`, `Adjustment` (note that the case requirements of the letters must be strictly followed).
- `channel_point_id` is the channel point ID for route mapping. If this point does not exist, an error message will be displayed.
- `enabled` is a flag indicating whether the mapping for this point is available, accepting `false` and `true` as two values.

- **Format Screenshot:**

	A	B	C	D	E	F	G	H	I	J	K
1	point_id	point_name	channel_id	channel_point_type	channel_point_id	enabled					
2		1 Pack Voltage		2 T		1	TRUE				
3		2 Pack Current		2 T		2	TRUE				
4		3 SOC		2 T		3	TRUE				
5		4 SOH		2 T		4	TRUE				
6		5 Cell Voltages Array		2 T		5	TRUE				
7		6 Cell Temperatures Array		2 T		6	TRUE				
8		7 Max Cell Voltage		2 T		7	TRUE				
9		8 Min Cell Voltage		2 T		8	TRUE				
10		9 Average Cell Voltage		2 T		9	TRUE				
11		10 Cell Voltage Imbalance		2 T		10	TRUE				
12		11 Max Cell Temperature		2 T		11	TRUE				
13		12 Min Cell Temperature		2 T		12	TRUE				
14		13 Balancing Status Array		2 T		13	TRUE				
15		14 Protection Status		2 T		14	TRUE				
16		15 Cell Count		2 T		15	TRUE				
17											
18											
19											
20											
21											
22											
23											

Submit all changes

The screenshot shows the MONARCH platform interface for managing routing tables. The main title is "Norton creek solar energy center" with a status of "Online". The top right shows weather information: wind at 67°F~79°F. The left sidebar includes links for Home, Devices, Alarm, Control, Statistics, Setting (selected), System Setting, User Management, and Configuration. The main content area is titled "Routings Table" and has tabs for "measurement" (selected) and "action". It includes filters for "modified" and "invalid" data, a search bar for "Point Name", and an "Import" button. A table lists routing details with columns: Point ID, Point Name, Channel, Channel Point Type, Channel Point, Enabled, and Operation. One row is highlighted with a red border and contains the following data:

Point ID	Point Name	Channel	Channel Point Type	Channel Point	Enabled	Operation
1	Pack Voltage	999 Does not exist	Telemetry	1 Does not exist	true	<input checked="" type="checkbox"/>

Three red arrows are overlaid on the interface:

- Arrow 1 points to the "Does not exist" error message under the Channel column.
- Arrow 2 points to the "Submit" button at the bottom right of the table.
- Arrow 3 points to the "Cancel Edit" button at the bottom right of the table.

1. When submitting, it must be ensured that the modified point data is correct, and error messages will appear below the incorrect data.
2. Click the **Submit** button to submit batch modifications.
3. Click the **Cancel Edit** button to exit the modification, and the point table will display the initial values.



Note: There is no need to manually perform a query. After directly clicking the Submit button, if there are any issues, you can directly jump to the relevant page.

Rule Configuration

Basic Concepts

In the EMS system, devices such as batteries, PCS, photovoltaics, and diesel generators need to operate collaboratively under constantly changing operating conditions. The system needs to make judgments based on real-time measurement data and promptly issue control instructions or adjust operating parameters (such as power setting, start/stop, mode switching, etc.) to achieve the goals of safety, stability, and economic optimization. To achieve standardized configuration and visual management of strategies, the platform has introduced **Rule** and **Rule Flow** and other concepts.

Rules

Concept Definition

Rules are the basic units in EMS used to express "operating strategies" and are used to describe the control logic that the system should adopt under specific operating conditions. They take real-time data (measured values/status quantities/calculation results) as inputs, determine the current scenario through conditional judgment, and output the corresponding control actions or parameter adjustment results.

Function

- **Policy solidification and automated execution:** Configure manual experience/scheduling strategies into system-executable logic to achieve unattended policy operation.
- **Implementation of Operational Objectives:** Automatically select appropriate control measures under different operating conditions, centered around objectives such as safety, stability, economy, and efficiency.

- **Unified Management and Reuse:** Rules can be centrally managed (enabled/disabled, priority, etc.), facilitating reuse and migration across different sites or projects.

Rule Link

Concept Definition

Rule chain is the visual execution process within a rule, which describes the complete execution path of a rule from start to end in the form of "nodes + connections". It breaks down the rule into multiple steps (such as start, condition judgment, action execution, end), and expresses different processing paths under different conditions through branching structures.

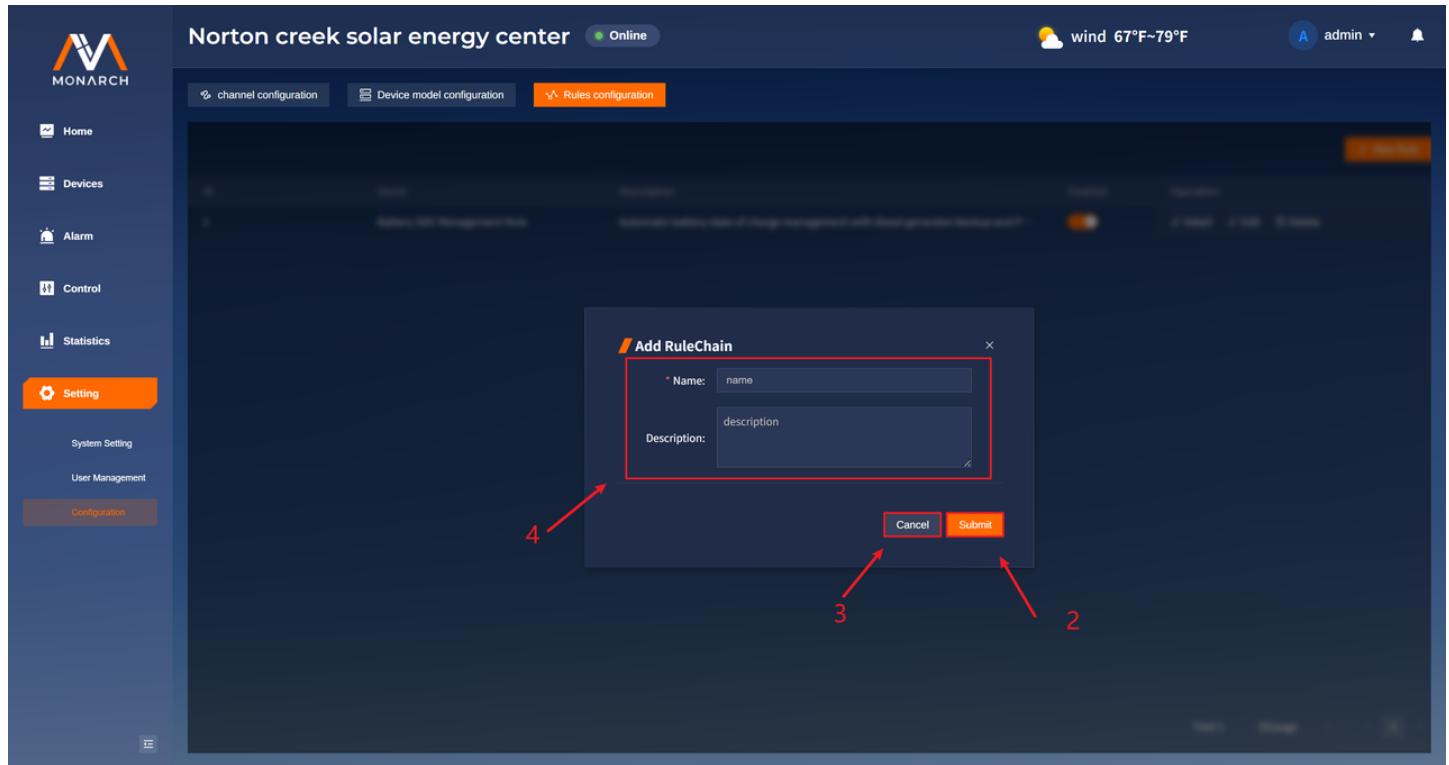
Function

- **Clearly express complex logic :** Present strategies with multiple conditions, multiple branches, and multiple actions in the form of flowcharts to reduce the cost of understanding and configuration.
- **Traceability and Diagnosability:** During runtime, it can locate the actual execution path and key node data, helping to quickly troubleshoot "why it is executed this way".
- **Easy Maintenance and Iteration:** Quickly adjust strategy steps and branch relationships through a graphical structure, support version management, and import/export for reuse.

Configuration Operation

New Rule

ID	Name	Description	Enabled	Operation
1	Battery SOC Management Rule	Automatic battery state of charge management with diesel generator backup and P...	<input checked="" type="checkbox"/>	Detail Edit Delete



1. Click the **New Rule** button to open the New Rule pop-up window.
2. Enter the name (required) and description information (optional) of the input rule.
3. Click the **Submit** button to submit the new rule.
4. Click **Cancel** button to cancel the new operation and close the pop-up window.

Modify Rules

The screenshot shows the 'Norton creek solar energy center' dashboard. The 'Rules configuration' tab is active. A table lists a single rule entry: ID 1, Name 'Battery SOC Management Rule', Description 'Automatic battery state of charge management with diesel generator backup and P...', Enabled status (switch is on), and actions: 'Detail', 'Edit' (highlighted with a red box), and 'Delete'. Red numbered arrows point to the 'Edit' button in the table (arrow 1) and the 'Edit' button in the 'Edit Rule' dialog (arrow 2).

ID	Name	Description	Enabled	Operation
1	Battery SOC Management Rule	Automatic battery state of charge management with diesel generator backup and P...	<input checked="" type="checkbox"/>	Detail Edit Delete

The screenshot shows the MONARCH web interface with a dark blue theme. On the left is a sidebar with icons for Home, Devices, Alarm, Control, Statistics, Setting (which is selected), System Setting, User Management, and Configuration. The main area is titled "Norton creek solar energy center" and shows an "Online" status. At the top right are weather icons (wind, 67°F~79°F) and a user account (admin). Below the title are three tabs: "channel configuration", "Device model configuration", and "Rules configuration" (highlighted in orange). A large central window displays a table of rules. One row is selected, and a modal dialog box titled "Edit RuleChain" is overlaid. The dialog contains fields for "Name" (Battery SOC Management Rule) and "Description" (Automatic battery state of charge management with diesel generator backup and PV curtailment). At the bottom of the dialog are "Cancel" and "Submit" buttons. Red numbered arrows point to specific elements: arrow 2 points to the "Name" input field, arrow 3 points to the "Submit" button, and arrow 4 points to the "Cancel" button.

1. Click the **Edit** button in the **Operation** column of the rule row you want to modify to open the edit dialog box.
2. Modify the name and description information of the rule you want to change.
3. Click **Submit** button to submit the edited information.
4. Click **Cancel** button to cancel the submission of edited information and close the pop-up window.

Delete Rule

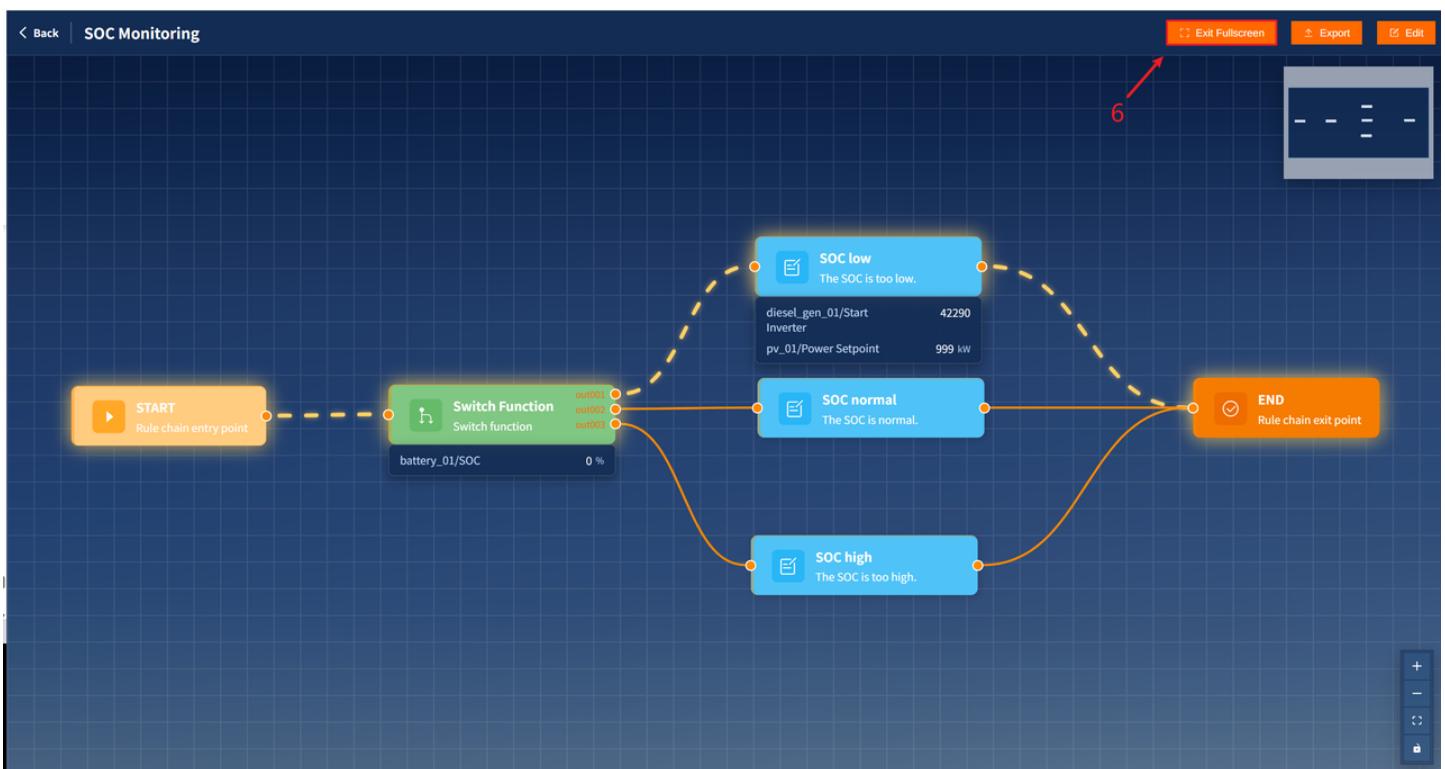
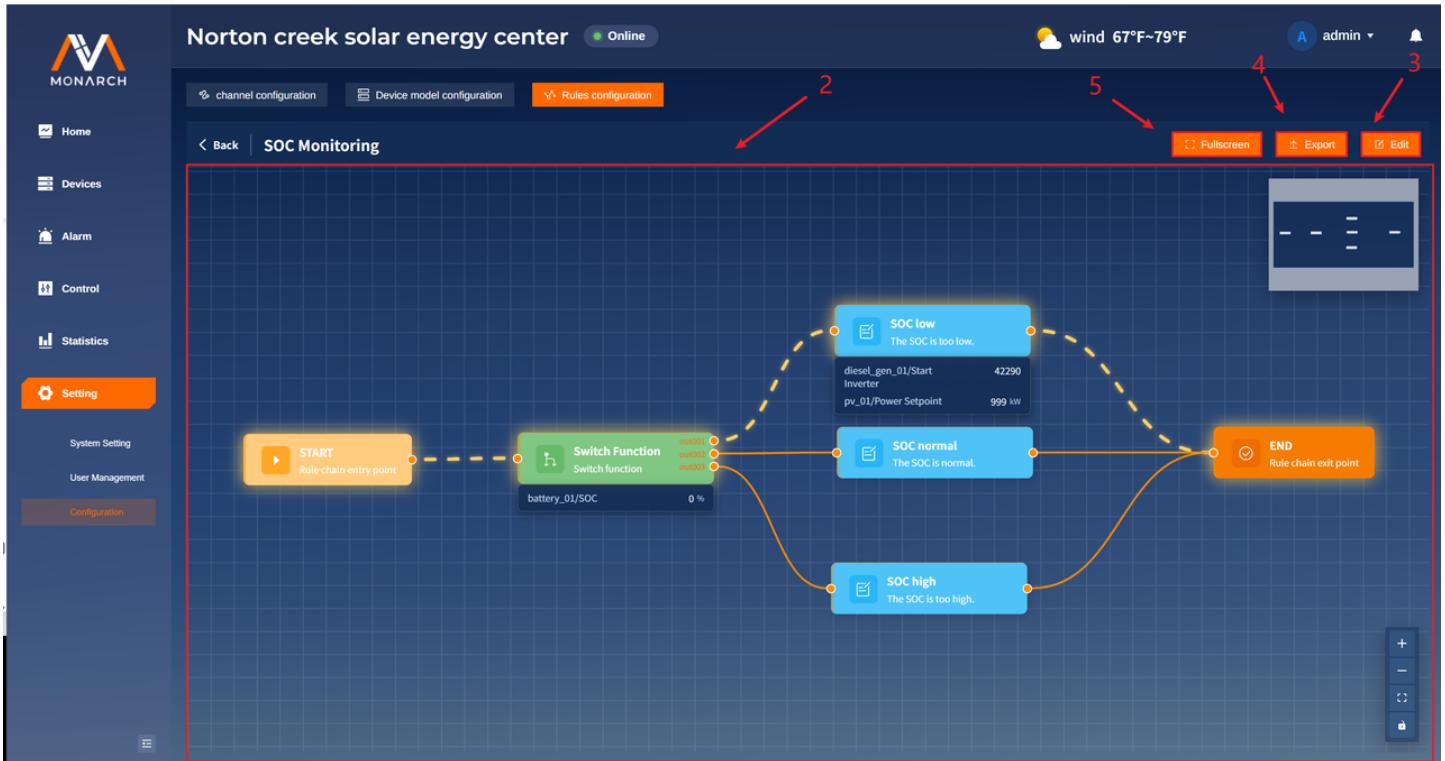
The screenshot shows the MONARCH web interface with a dark blue theme. The left sidebar is identical to the previous screenshot. The main area displays a table of rules. One row is selected, and a red arrow labeled '1' points to the "Delete" icon in the "Operation" column of that row. The table columns are ID, Name, Description, Enabled, Operation, Detail, Edit, and Delete. The selected rule has ID 1, Name "Battery SOC Management Rule", and Description "Automatic battery state of charge management with diesel generator backup and P...". The "Enabled" switch is turned on. The "Operation" column contains icons for Detail, Edit, and Delete.

The screenshot shows the 'Rules configuration' section of the MONARCH interface. A table lists a single rule named 'Battery SOC Management Rule' with ID 1. The 'Operation' column for this rule contains a 'Delete' button, which is highlighted with a red box and labeled '1'. A modal dialog titled 'Delete Confirmation' is displayed over the table, containing the question 'Are you sure you want to delete this record?' with 'Cancel' and 'Confirm' buttons. Red arrows labeled '2' and '3' point to the 'Confirm' and 'Cancel' buttons respectively.

1. Click the **Operation** column's **Delete** button of the rule row you want to delete to open the confirmation prompt dialog for deletion.
2. Click **Confirm** button to confirm deletion.
3. Click **Cancel** button to cancel deletion.

View details of the rule chain and real-time execution chain

The screenshot shows the 'Rules configuration' section of the MONARCH interface. A table lists a single rule named 'Battery SOC Management Rule' with ID 1. The 'Operation' column for this rule contains a 'Detail' button, which is highlighted with a red box and labeled '1'. The other buttons in the 'Operation' column ('Edit' and 'Delete') are also highlighted with red boxes.



1. Click the **Operation** column's **Detail** button of the rule row you want to view, and you will be redirected to the rule chain details page.
2. The highlighted path in the rule chain is the path executed by the current rule, and the specific data of the nodes in the currently executed path will be displayed below the nodes.
3. Click the **Edit** button to enter the rule chain editing state.
4. Click the **Export** button to export the current rule chain. The format of the exported file is **.json file**, and the specific content structure is as follows:

```
1  {
2      "cooldown_ms": 5000, //循环间隔
3      "description": "Control the diesel generators and photovoltaic systems based
4          on the values of SOC.",//规则链描述
5      "enabled": true,//是否可用
6      "flow_json": {//用于记录点位以及线段的信息
7          "edges": [//所有线段的信息
8              {
9                  "id": "edge-1766625864321",//线段id
10                 "source": "start",//线段起点节点
11                 "target": "node-1766625792260",//线段结束节点
12                 "sourceHandle": "right",//线段起点节点的输出点位id
13                 "targetHandle": "left");//线段终点节点的接受点位id
14             },
15             {
16                 "id": "edge-1766627137707",
17                 "source": "node-1766625792260",
18                 "target": "node-1766627111063",
19                 "sourceHandle": "out001",
20                 "targetHandle": "left"
21             },
22             {
23                 "id": "edge-1766627164179",
24                 "source": "node-1766627111063",
25                 "target": "end",
26                 "sourceHandle": "right1",
27                 "targetHandle": "left"
28             },
29             {
30                 "id": "edge-1766627167317",
31                 "source": "node-1766627120005",
32                 "target": "end",
33                 "sourceHandle": "right1",
34                 "targetHandle": "left"
35             },
36             {
37                 "id": "edge-1766627188300",
38                 "source": "node-1766627123081",
39                 "target": "end",
40                 "sourceHandle": "right1",
41                 "targetHandle": "left"
42             },
43             {
44                 "id": "edge-1766970657249",
45                 "source": "node-1766625792260",
46                 "target": "node-1766627120005",
47                 "sourceHandle": "out002",
```

```
47         "targetHandle": "left"
48     },
49     {
50         "id": "edge-1766970658549",
51         "source": "node-1766625792260",
52         "target": "node-1766627123081",
53         "sourceHandle": "out003",
54         "targetHandle": "left"
55     }
56 ],
57 "nodes": [ //所有节点的信息
58 {
59     "id": "start", //节点的id
60     "type": "start", //起始节点
61     "position": { //画布中的位置
62         "x": -213, //x轴坐标
63         "y": 107 //y轴坐标
64     },
65     "data": { //内部数据
66         "config": { //点位配置
67             "wires": { //输出点位以及其对应的节点id (除特殊类型点位以外其余默认为
68                 "default": [
69                     "node-1766625792260"
70                 ]
71             }
72         },
73         "description": "START", //节点描述信息
74         "id": "start", //节点id
75         "label": "START", //节点的标题
76         "status": "", //节点状态, 保留
77         "type": "start" //节点类型
78     }
79 },
80 {
81     "id": "end",
82     "type": "end", //结束点位
83     "position": {
84         "x": 629,
85         "y": 101
86     },
87     "data": {
88         "config": {
89             "wires": {
90                 "default": []
91             }
92         },
93     }
94 }
```

```
93         "description": "END",
94         "id": "end",
95         "label": "END",
96         "status": "",
97         "type": "end"
98     }
99 },
100 {
101     "id": "node-1766625792260",
102     "type": "custom",//自定义的节点类型
103     "position": {
104         "x": 25,
105         "y": 106
106     },
107     "data": {
108         "cardId": "function-2",
109         "config": {//该节点为function-switch类型的节点，主要用来条件判断
110             "rule": [//记录输出点位以及具体规则判断
111                 {
112                     "name": "out001",//输出点位的名称，与wires中的输出点位对应
113                     "rule": [//具体的规则
114                         {
115                             "operator": "<=",//操作符
116                             "type": "variable",//记录的类型参数，此时只有一条规则
117                             "value": 5,//数值
118                             "variables": "X1"//比较的值的名称，与variables中所给予的名称相同
119                         }
120                     ],
121                     "type": "default"//保留字段
122                 },
123                 {
124                     "name": "out002",
125                     "type": "default",
126                     "rule": [
127                         {
128                             "type": "variable",
129                             "variables": "X1",
130                             "operator": ">=",
131                             "value": 49
132                         },
133                         {
134                             "type": "relation",//记录的类型参数，为relation说明这是一个连接
符号，以此处理多个判断规则
135                             "value": "And"//连接的符号为And
136                         },
137                         {
138                             "type": "variable",
```

```
139             "variables": "X1",
140             "value": 99,
141             "operator": "<"
142         }
143     ]
144 },
145 {
146     "name": "out003",
147     "type": "default",
148     "rule": [
149         {
150             "type": "variable",
151             "variables": "X1",
152             "operator": ">",
153             "value": 99
154         }
155     ]
156 }
157 ],
158 "variables": [ //所需要参数定义
159 {
160     "instance_id": 1, //点位所属实例的id
161     "instance_name": "battery_01", //点位所属实例的名称
162     "name": "X1", //默认给予名称，用于在节点规则中配置，规则为"X+num"
163     "pointType": "measurement", //点位的类型
164     "point_name": "SOC", //点位的名称
165     "type": "single", //参数定义的类型，分为single和combined
166     "unit": "%", //点位的单位
167     "point_id": 3, //点位的id
168     "formula": [] //当参数定义类型为combined的时候，记录组合类参数定义的形式
169 }
170 ],
171 "wires": { //对于“function-switch”功能卡片，其会有多个接口，此处记录了每个输出节点所对应的下一个点位的id。
172     "out001": [
173         "node-1766627111063"
174     ],
175     "out002": [
176         "node-1766627120005"
177     ],
178     "out003": [
179         "node-1766627123081"
180     ]
181 }
182 },
183 "description": "Switch function",
```

```
184         "id": "node-1766625792260",
185         "label": "Switch Function",
186         "type": "function-switch",
187         "status": ""
188     }
189 },
190 {
191     "id": "node-1766627111063",
192     "type": "custom",
193     "position": {
194         "x": 300,
195         "y": -5
196     },
197     "data": {
198         "cardId": "action-1",
199         "config": {
200             "rule": [ //规则配置
201                 {
202                     "Variables": "X1", //定义的参数值
203                     "value": 42290 //赋予的值 (如果是数字则是具体的数值, 如果是字符串, 则赋予对应参数的值)
204                 },
205                 {
206                     "Variables": "X2",
207                     "value": 999
208                 }
209             ],
210             "variables": [
211                 {
212                     "formula": [],
213                     "instance_id": 2,
214                     "instance_name": "diesel_gen_01",
215                     "name": "X1",
216                     "pointType": "action",
217                     "point_id": 1,
218                     "point_name": "Start Inverter",
219                     "type": "single",
220                     "unit": ""
221                 },
222                 {
223                     "name": "X2",
224                     "type": "single",
225                     "instance_id": 4,
226                     "instance_name": "pv_01",
227                     "pointType": "action",
228                     "point_id": 5,
229                     "point_name": "Power Setpoint",

```

```
230             "unit": "kW",
231             "formula": []
232         }
233     ],
234     "wires": {
235         "default": [
236             "end"
237         ]
238     }
239 },
240 "description": "The SOC is too low.",
241 "id": "node-1766627111063",
242 "label": "SOC low",
243 "type": "action-changeValue", //该类型的节点可以用来执行某些action或者修改
点位的值。
244         "status": ""
245     }
246 },
247 {
248     "id": "node-1766627120005",
249     "type": "custom",
250     "position": {
251         "x": 302,
252         "y": 101
253     },
254     "data": {
255         "cardId": "action-1",
256         "config": {
257             "rule": [
258                 {
259                     "Variables": "X1",
260                     "value": 42289
261                 },
262                 {
263                     "Variables": "X2",
264                     "value": 999
265                 }
266             ],
267             "variables": [
268                 {
269                     "name": "X1",
270                     "type": "single",
271                     "instance_id": 2,
272                     "instance_name": "diesel_gen_01",
273                     "pointType": "action",
274                     "point_id": 1,
275                     "point_name": "Start Inverter",
```

```
276         "unit": "",  
277         "formula": []  
278     },  
279     {  
280         "name": "X2",  
281         "type": "single",  
282         "instance_id": 4,  
283         "instance_name": "pv_01",  
284         "pointType": "action",  
285         "point_id": 5,  
286         "point_name": "Power Setpoint",  
287         "unit": "kW",  
288         "formula": []  
289     }  
290 ],  
291     "wires": {  
292         "default": [  
293             "end"  
294         ]  
295     }  
296 },  
297     "description": "The SOC is normal.",  
298     "id": "node-1766627120005",  
299     "label": "SOC normal",  
300     "type": "action-changeValue",  
301     "status": ""  
302 },  
303 },  
304 {  
305     "id": "node-1766627123081",  
306     "type": "custom",  
307     "position": {  
308         "x": 297,  
309         "y": 219  
310     },  
311     "data": {  
312         "cardId": "action-1",  
313         "config": {  
314             "rule": [  
315                 {  
316                     "Variables": "X1",  
317                     "value": "X2"  
318                 }  
319             ],  
320             "variables": [  
321                 {  
322                     "name": "X1",  
323                 }  
324             ]  
325         }  
326     }  
327 }
```

```

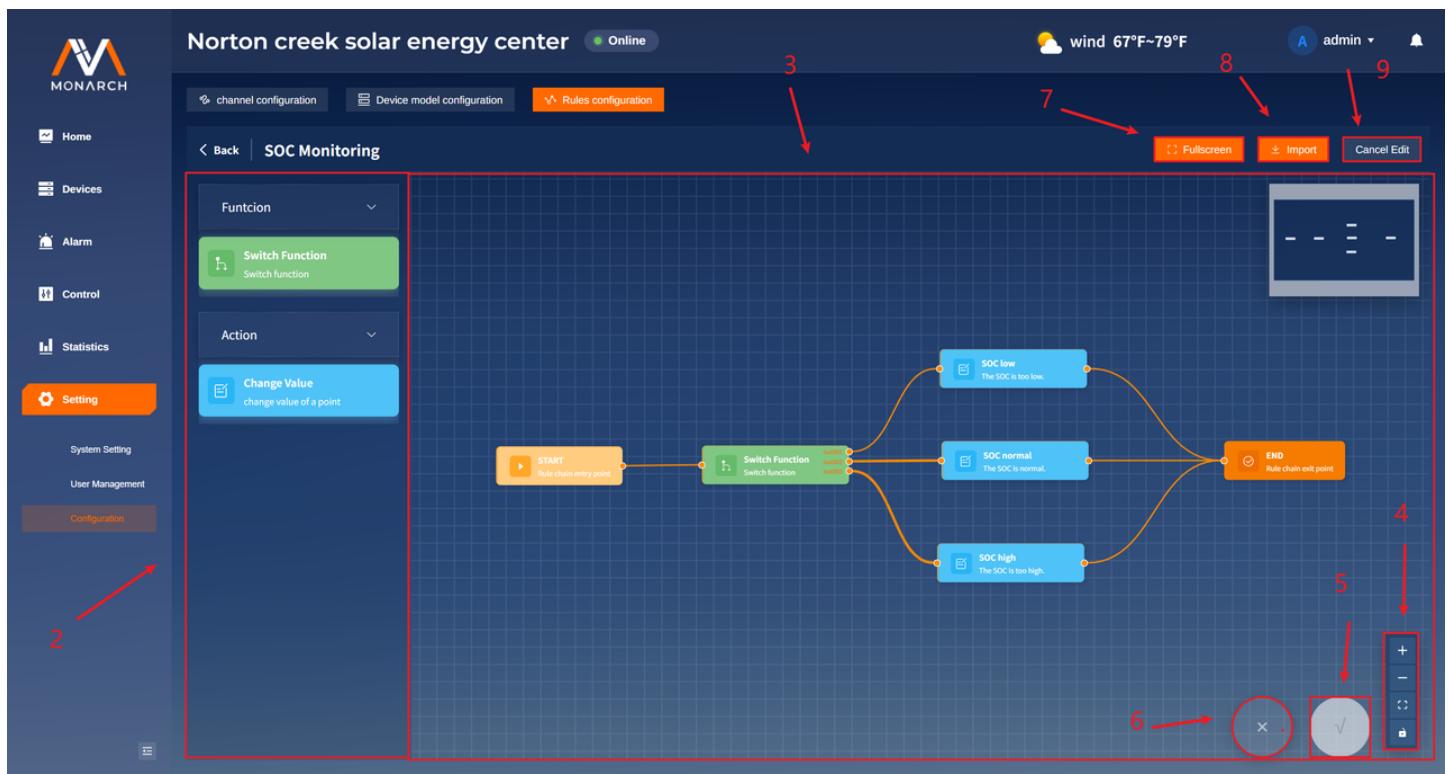
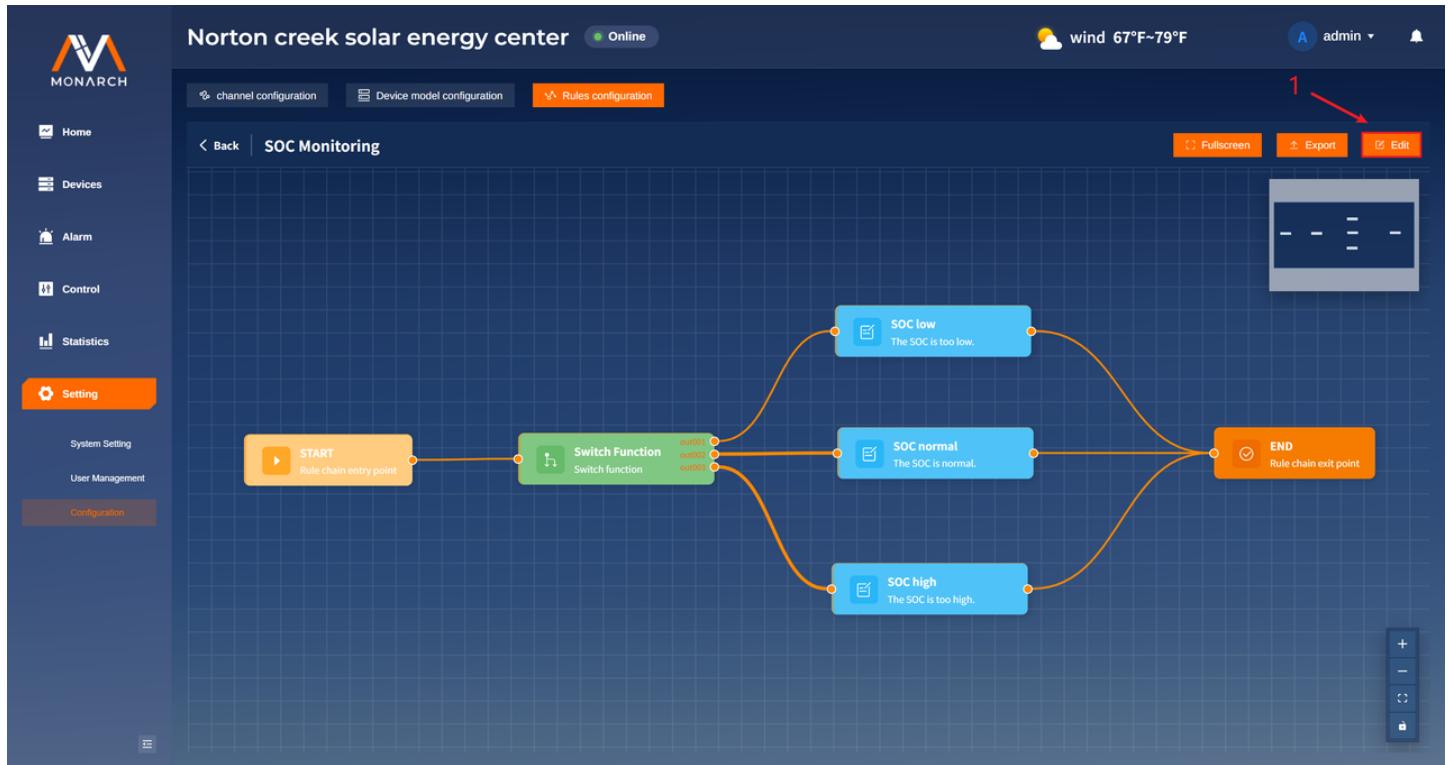
323             "type": "single",
324             "instance_id": 4,
325             "instance_name": "pv_01",
326             "pointType": "action",
327             "point_id": 5,
328             "point_name": "Power Setpoint",
329             "unit": "kW",
330             "formula": []
331         },
332     {
333         "name": "X2",
334         "type": "single",
335         "instance_id": 3,
336         "instance_name": "pcs_01",
337         "pointType": "measurement",
338         "point_id": 2,
339         "point_name": "DC Power",
340         "unit": "kW",
341         "formula": []
342     }
343 ],
344     "wires": {
345         "default": [
346             "end"
347         ]
348     }
349 },
350     "description": "The SOC is too high.",
351     "id": "node-1766627123081",
352     "label": "SOC high",
353     "type": "action-changeValue",
354     "status": ""
355   }
356 }
357 ]
358 },
359   "format": "vue-flow",
360   "id": "1",//规则id
361   "name": "SOC Monitoring",//规则名称
362   "priority": 10//优先级
363 }

```

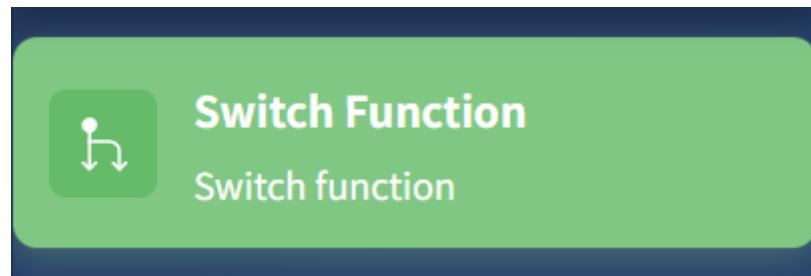
5. Click the **FullScreen** button to enter full-screen mode.

6. Click the **Exit Fullscreen** button to exit fullscreen mode.

Modify the rule link

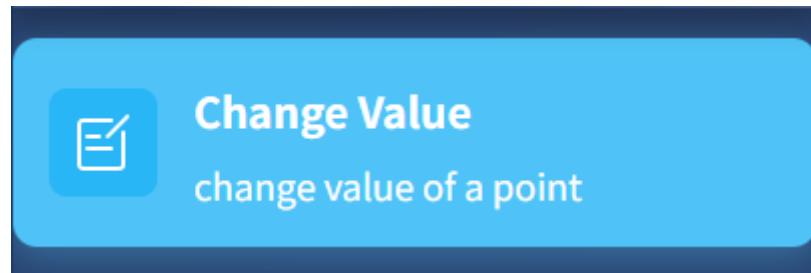


1. Click **Edit** button to enter the editing mode of the rule chain.
2. Here is a custom function card. You can use the mouse to click on the desired card and drag it to place it on the canvas of the rule chain. Different cards have different functions:
 - o **Switch Function - Value Judgment Card**



This card is mainly used to determine whether the value of the point data of an instance meets a certain condition.

- **Change Value - Data Modification Card**



This card is mainly used to modify the point data of a specific instance.

3. This is the canvas for the rule chain, where you can configure cards and draw connections. The basic operations are as follows:

- The canvas must have both a Start card and an End card. The rule chain must start with the Start card and end with the End card.
- The point on the left side of the card is the input point, which can only serve as the end point of a connection; the point on the right side of the card is the output point, which can only serve as the starting point of a connection.
- When a deletion operation is required, click on the card or line segment, and then press the "Backspace" key on the keyboard to delete.
- Double-click the card to configure the internal parameters of the card. Different card types have different data to be edited:
 - **Switch Function - Value Judgment Card**

The screenshot shows the 'Edit Switch Function' dialog box. At the top, there are tabs for 'channel configuration', 'Device model configuration', and 'Rules configuration'. The 'Rules configuration' tab is active. The dialog is titled 'Edit Switch Function'. It has two main sections: 'Basic Settings' and 'Variable Settings'. The 'Basic Settings' section contains fields for 'label' (set to 'Switch Function') and 'description' (set to 'Switch function'). The 'Variable Settings' section contains three rows: X1 (single measurement 'battery_01' for point 'SOC'), X2 (single measurement 'battery_01' for point 'Pack Current'), and X3 (combined calculation 'X1 + 21' for point 'X2'). To the right of these sections is a 'Rule Settings' panel containing three rules (out001, out002, out003) with various conditions and operators. A red arrow labeled 'a' points to the 'Basic Settings' section, and a red arrow labeled 'b' points to the 'Variable Settings' section.

1. The first part is the basic information area, mainly the information displayed on the card: `label` is the title information of the card, `description` is the description information of the card.
2. The second part is the parameter definition area, where parameters are declared:

This screenshot shows the 'Variable Settings' section. It displays a list of parameters. The first parameter is X1, which is defined as single measurement 'battery_01' for point 'SOC'. To the right of this list are two buttons: a green 'Add' button (+) and a red 'Delete' button (-).

Click the Add button to create a new parameter definition, and the name assigned to each parameter is `X + auto-incrementing serial number`.

Click the delete icon button corresponding to each parameter to delete that parameter.

There are two types of parameter declarations: `single` and `combined` types, with the following rules:

`single` type defines a single parameter, and users only need to select the instance name, point type, and point name in sequence.

This screenshot shows the 'Variable Settings' section again, but this time it only displays one parameter: X1, which is defined as single measurement 'battery_01' for point 'SOC'.

`Combined` type is a combined parameter definition, where users can select already defined parameters or manually enter numbers for combined calculations, supporting the selection of operators: +, -, *, /. Users can click the **green add icon**

button below to add a row of data operation parameters, and click the **red delete icon button** on the right side of the corresponding operation data to delete this row of data.

X3: single combined

X1	+	X2
+	21	(

(

3. The third part defines the judgment rule area, where rules are declared:

Rule Settings

out001:	X1	<=	5
---------	----	----	---

(

(

Click the orange new icon button to add a new rule. The name given to each newly added rule is **out + auto-increment column number**.

Click the delete icon button corresponding to each rule to delete that rule.

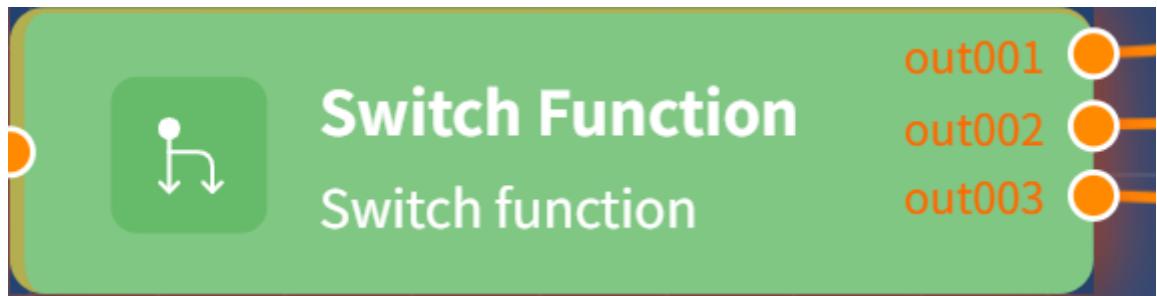
out002:	X1	<	99
And	X1	>=	49

(

(

Based on the parameter names in the parameter definition, users can select the defined parameters here to compare with other parameters or values. Users can click the **green add button** to add an additional row of rule judgment and perform combined judgment (currently only the And judgment is allowed between two judgments, meaning both conditions must be met). Users can click the **red delete button** behind the corresponding rule to delete this row of rule judgment.

Note: Each complete **outxxx** rule will generate a corresponding point on the node card, and only when the judgment conditions are met will the next node connected to this point be executed.



- Change Value - Data Modification Card

The screenshot shows the 'Edit SOC low' card in the MONARCH software. The card has three main sections:

- Basic Settings:** Contains the label "SOC low" and the description "The SOC is too low".
- Variable Settings:** Contains two entries: X1 (diesel_gen_01) set to action "Start Generator" and X2 (pv_01) set to action "Power Setpoint".
- Rule Settings:** Contains two rules: X1 = 42290 and X2 = 999.

1. The first part is the basic information area, mainly the information displayed on the card: `label` is the title information of the card, `description` is the description information of the card.
2. The second part is the parameter definition area, where parameters are declared in the same way as in **Switch Function**.
3. The third part is the modification rule definition area, where instance point parameters are modified.

This is a close-up view of the 'Rule Settings' section of the card. It displays two rules:

- X1 = 42290
- X2 = 999

An orange '+' button is located at the top right for adding new rules. A red box highlights the delete icon (trash can) next to the second rule.

Click the orange Add icon button to add a new parameter modification rule.

Click the delete icon button corresponding to each modification rule to delete the rule.

The parameter settings are divided into left and right parameters. The overall logic is to modify the left parameter to the value or parameter on the right. The left selection box can only select `single` type parameters; the right selection box can select any defined parameter or custom value.

4. The canvas controls, from top to bottom, are: the button to zoom in on the canvas, the button to zoom out on the canvas, the button for the rule chain to self-adapt to the canvas size, and the button to disable/enable canvas operations.
5. Rule chain save button. Saving is only allowed when adding, modifying, or deleting points/line segments.
6. Rule chain cancel button. Cancellation is only allowed when adding, modifying, or deleting points/line segments, and it will restore the rule chain to its state before being saved.
7. `Fullscreen` button, click to open the full-screen editing state.
8. `Import` button, after clicking, you can select a.json file to perform the import operation of the rule chain. The format requirements for the.json file are the same as those for the exported.json file.
9. `Cancel Edit` button, click to exit the editing state.