

PMC-224x Brief User Guide

[Version 3.4.1]



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Introduction

This document is intended to guide users to quickly implement settings of PMC-224x. This document can be divided into three parts from basic to advanced settings:

1. **Before Installation:** PMC-224x Network Setting.
→ [Required settings before installing PMC-224x.](#)
2. **Basic Settings:** Scan the connected power meters and start the data logger function.
→ [Quickly build up a power monitoring system.](#)
3. **Advanced Settings:** Given example scenarios for logic rule settings for advanced functions such as I/O module monitoring & control, Email sending and Schedule functions.
→ [Settings for advanced functions of PMC-224x.](#)


This document will give quick guides for basic power meter connection settings and advanced function settings.

Please Note:

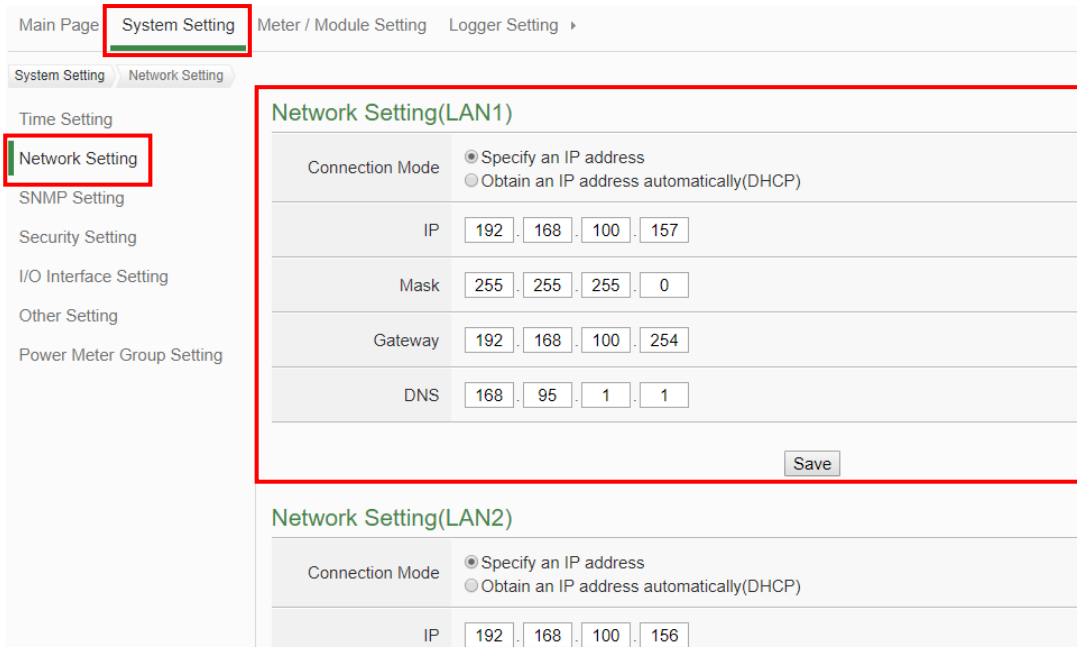
- PMC-224x provides COM3 (RS-485) and COM4 (RS-485) interfaces for connections to Modbus RTU power meters, and PMC-224x also provides LAN interface for connections to Modbus TCP power meters.
- A single PMC-224x can connect to at most 24 ICP DAS Modbus power meters (including Modbus RTU power meters and Modbus TCP power meters)
- A single I/O interface (COM3, COM4, or LAN) can connect to at most 16 ICP DAS Modbus power meters.

■ Before Installation

◆ Network Settings

	<p>The default network setting of LAN1 on PMC-224x is as follow:</p> <ul style="list-style-type: none">■ IP : 192.168.255.1■ Subnet mask : c255.255.0.0■ Gateway : 192.168.0.1
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- (1) Modify the network settings of the PC or Notebook to be the same network domain as PMC-224x. For example:
 - IP : 192.168.255.10
 - Subnet mask : 255.255.0.0
 - Gateway : 192.168.0.1
- (2) Connect PMC-224x **LAN1** to PC by network cable (there is no need for crossover cables).
- (3) Start the browser and input <http://192.168.255.1> in the address bar.
- (4) Input default administrator password “**Admin**” to login into the page.
- (5) After login into the page, go to “System Setting”→”Network Setting” and modify the **LAN1** network setting to fit current network environment.



Main Page **System Setting** Meter / Module Setting Logger Setting ▶

System Setting > Network Setting

Time Setting

Network Setting

SNMP Setting

Security Setting

I/O Interface Setting

Other Setting

Power Meter Group Setting

Network Setting(LAN1)

Connection Mode	<input checked="" type="radio"/> Specify an IP address <input type="radio"/> Obtain an IP address automatically(DHCP)
IP	192 . 168 . 100 . 157
Mask	255 . 255 . 255 . 0
Gateway	192 . 168 . 100 . 254
DNS	168 . 95 . 1 . 1

Save

Network Setting(LAN2)

Connection Mode	<input checked="" type="radio"/> Specify an IP address <input type="radio"/> Obtain an IP address automatically(DHCP)
IP	192 . 168 . 100 . 156

- (6) After clicking on “Save” button, for the network domain of the PMC-224x and PC are different, it is normal being not able to connect to the webpage, please connect PMC-224x and PC to the actual network environment and then modify the network settings of PC to correct settings to connect to the PMC-224x.

■ Basic Setting

◆ Setup and Scan Power Meters

- (1) Please complete the RS-485 wiring connections of the power meters first and then login into the PMC-224x web page as Administrator, select “System Setting”→”I/O Interface Setting”; make sure the settings of the parameters(Baudrate/Parity/Stop bits) of the COM Port that are connected to the power meter are accurate. After all settings are completed, click “Save” button to save the changes.

Main Page **System Setting** Meter / Module Setting Logger Setting ▶

System Setting I/O Interface Setting

Time Setting

Network Setting

SNMP Setting

Security Setting

I/O Interface Setting

Other Setting

Power Meter Group Setting

I/O Interface Setting Page COM2 **COM3** COM4 LAN

Function

Baudrate bps

Parity None Odd Even

Stop bits 1 2

Silent Interval millisecond(s)

Save

- (2) Select “Meter/Module Setting”→“Power Meter Setting”, and then follow the steps below to scan or add power meters.
- (3) Scan Modbus RTU Power Meters:
 - 3.1 Scan the power meters on the interface of the COM Port(**assuming the power meters are connected to the COM3**).

Main Page System Setting **Meter / Module Setting** Logger Setting ▶

Meter / Module Setting **Power Meter Setting**

XV-Board Setting

I/O Module Setting

Power Meter List (Modbus RTU) **COM3** COM4 LAN

No.	Address	*Power Meter	Nickname
<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="Search"/>	<input type="text"/>

No power meter exists, press this button to create one.

Save

Set the address range to scan:

Scan address from to . This process will take several seconds, it depends on the address range that you set.

COM Port Parity

Baudrate Stop bits

Silent Interval Timeout ms

Scan Cancel

3.2 After the scanning is completed, the power meters connected to the COM Port interface will be displayed, click “Save” to complete the settings of the power meter list.

The screenshot shows a web interface titled "Power Meter List (Modbus RTU)". At the top, there are three tabs: "COM3" (selected), "COM4", and "LAN". Below the tabs is a search icon and a table with the following columns: "No.", "Address", "*Power Meter", and "Nickname".

No.	Address	*Power Meter	Nickname
3	3		
1	1	ICP DAS PM-3114	PM-3114
2	2	ICP DAS PM-2133	PM-2133

Below the table, there are several buttons: "Setting", "Move Up", "Move Down", "Copy", and "Remove". A green arrow points to the "Setting" button. At the bottom center, there is a "Save" button highlighted with a red box.

Please note: if fail to scan the power meters, please make sure the RS-485 cable is properly connected. And then go to [Step 1](#): “System Setting”→”I/O Interface Setting” to make sure the settings of the COM Port that are connected to the power meter are accurate. After all settings are completed, click “Save” button to save the changes and repeat [Step 3.1](#) to perform scanning of the power meters again.

(4) Add Modbus TCP Power Meters:

If there is power meter connected via network, please select LAN to set up the settings(IP, Port, NetID, and Nickname) of the Modbus TCP Power Meter. After all settings are completed, click “+” to add the Modbus TCP Power Meter to the list and then click “Save” to save the settings.

Main Page System Setting Meter / Module Setting Logger Setting >

Meter / Module Setting Power Meter Setting

Power Meter Setting
XV-Board Setting
I/O Module Setting

Power Meter List (Modbus TCP) COM3 COM4 LAN

No.	*IP	Port	NetID	*Power Meter	Nickname
+	1	192.168.100.100	502	1	ICP DAS PM-3112-I ? Ethernet Power Meter

No power meter exists, press this button to create one.

Save

Power Meter List (Modbus TCP) COM3 COM4 LAN

No.	*IP	Port	NetID	*Power Meter	Nickname
+	2		502	1	?
●	1	192.168.100.100	502	1	ICP DAS PM-3112-MTCP Ethernet Power Meter

Setting Move Up Move Down Copy Remove

Save

(5) Save the settings to the PMC-224x.

ICP DAS Power Monitoring & Management Solution PMC-5231

(6) After saving the settings to the PMC-224x, the settings of the connections to the power meters are completed. After the system is initialized, the power information of the connected power meters will be displayed on the home page.

Power Data Overview

Power Data Classification

Data Classification1: V Data Classification2: I Data Classification3: kW

Power Meters

PM-3114 Connection status				
Loop	V	I	kW	
Loop 1	105.592	0.495	0.000	
Loop 2	105.592	0.000	0.000	
Loop 3	105.607	0.000	0.000	
Loop 4	105.607	0.000	0.000	

Detailed information

PM-2133 Connection status				
Loop	V	I	kW	
Phase A	0.000	0.000	0.000	
Phase B	0.000	0.000	0.000	
Phase C	0.000	0.000	0.000	
Total / A...	0.000	0.000	0.000	

Detailed information

Refresh

◆ Start Data Logger

- (1) Login into the PMC-224x as administrator and select “Logger Setting”→ “Data Logger Setting”→ “Enable” Function Status, after the setting is completed, click “Save” to save the settings.

The screenshot shows the 'Data Logger Setting' page. The 'Function Status' is set to 'Enable'. The 'Log Mode' is set to 'Average'. The 'Column Header' is set to 'Add'. The 'User-Defined Data Logger Setting' section has 'Function Status' set to 'Disable'. The 'Log Attribute Setting' section has 'Log Interval' set to '5 minutes', 'File Name Format' set to 'YYYY-MM-DD.csv', and 'End of Line Character' set to 'CRLF(Windows)'. A 'Save' button is located at the bottom right.

- (2) If the user would like to send the power data file to the FTP server of the control center, please click “Enable” and complete settings on the “FTP Upload Setting” Page. After all settings are completed, click “Save” button to save the changes.

The screenshot shows the 'FTP Upload Setting Page'. The 'Function Status' is set to 'Enable'. The 'Remote FTP Server' section includes fields for '*Address' (ftp://192.168.100.123), 'Port' (21), '*ID' (Admin), and 'Password' (masked with dots). The 'Data Log Upload Function' section has 'Upload Power Data Log' checked, 'Upload User-Defined Data Log' unchecked, and 'Frequency' set to 'Every 5 minutes'. The 'Event Log Upload Function' section has 'Upload Event Log' unchecked. A 'Save' button is located at the bottom right.

- (3) Save the settings to PMC-224x, and then the Data Logger function will be enabled. The system will start to save the power data in the MicroSD card.

■ Advanced Setting

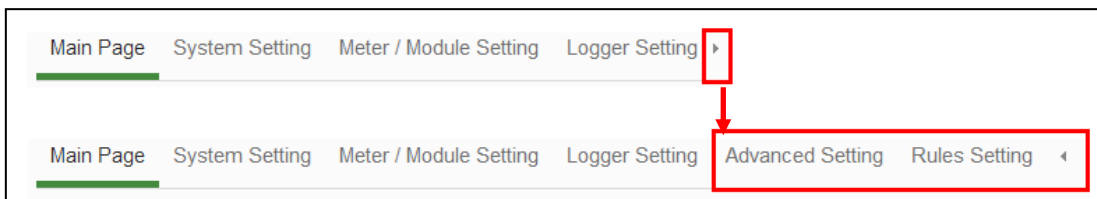
In addition to collection, statistical analysis, recording and display of the power data, PMC-224x also provides **I/O module control**, **Email sending** and **Schedule** functions. With the **IF-THEN-ELSE** logic rules function, PMC-224x offers more thought-out power demand management and monitoring functions. The following application is an example that will give more introductions of these functions:

Set up a power monitoring system that will monitor if the electricity usage is unusual during **weekdays** ((Monday to Friday / 8.00a.m. to 5:00p.m.)). If any unusual condition is detected, the system will **send email and SMS message** to related personnel and **the DO channel of the Modbus I/O module will be set as “ON” to turn on the warning light.**

The user has to complete the Condition/Action settings of adding I/O modules, Schedule, Email first, and then these settings can be included in the IF-THEN-ELSE logic settings for editing rules for monitoring, shown as below:

IF	THEN	ELSE
Schedule: Weekdays	Send Email	
Unusual electricity usage	Turn on warning light	Turn off warning light

Please note: The Advanced Setting function is hidden by default, click on the expand button to display the option, shown as below:



◆ Setup and Scan Modbus I/O Modules

Description: Set up the "Modbus I / O modules" for the application example ◦

Steps:

- (1) Please complete the RS-485 wiring connections of the M-7000 modules first and then login into the PMC-224x web page as the Administrator, select "System Setting"→"I/O Interface Setting" to make sure the parameters(Baudrate/Parity/Stop bits) of the COM Port connected are accurate. After all settings are completed, click "Save" button to save the changes.

Main Page System Setting Meter / Module Setting Logger Setting ▶

System Setting I/O Interface Setting

Time Setting
Network Setting
SNMP Setting
Security Setting
I/O Interface Setting
Other Setting
Power Meter Group Setting

I/O Interface Setting Page COM2 COM3 COM4 LAN

Function	Modbus RTU Master
Baudrate	19200 bps
Parity	<input checked="" type="radio"/> None <input type="radio"/> Odd <input type="radio"/> Even
Stop bits	<input checked="" type="radio"/> 1 <input type="radio"/> 2
Silent Interval	100 millisecond(s)

Save

- (2) Select "Meter/Module Setting"→"I/O Module Setting", and then follow the steps below to scan or add I/O Modules to the list.
- (3) Scan ICP DAS M-7000 Modules

3.1 Scan the I/O modules on the interface of the COM Port that are connected to the M-7000 Modules (**assuming the M-7000 Modules are connected to the COM4**).

Main Page System Setting Meter / Module Setting Logger Setting ▶

Meter / Module Setting I/O Module Setting

Power Meter Setting
I/O Module Setting

Modbus RTU Module List COM3 COM4 LAN

No.	Address	*Module Name / Nickname	Polling Timeout(ms)	Retry Interval(secs)
1	1	Search	300	5

No module exists, press this button to create one.

Save

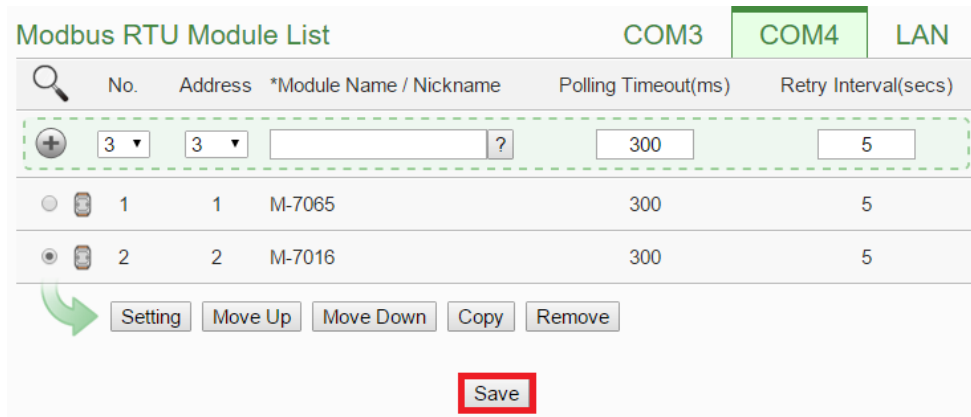
Set the address range to scan:

Scan address from 1 to 16. This process will take several seconds, it depends on the address range that you set.

COM Port COM3 Parity None
Baudrate 19200bps Stop bits 1
Silent Interval 100ms Timeout 1000 ms

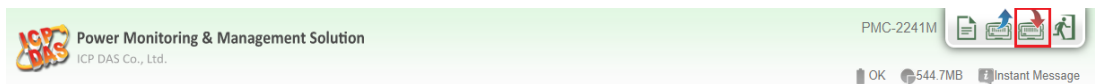
Scan Cancel

3.2 After the scanning is completed, the M-7000 Modules connected to the COM Port interface will be displayed, click “Save” to complete the settings of the M-7000 I/O Module List.



Please note: if fail to scan the I/O modules, please make sure the RS-485 cable is properly connected. And then go to [Step 1](#): “System Setting”→”I/O Interface Setting” to make sure the settings of the COM Port that are connected to the I/O Module are accurate. After all settings are completed, click “Save” button to save the changes and repeat [Step 3.1](#) to perform scanning of the I/O modules again.

- (4) To add other Modbus RTU or Modbus TCP I/O Modules, please refer to Chapter 7 in the PMC-224x User manual.
- (5) Save the settings to the PMC-224x (the user could also save the settings later after all other settings are completed)

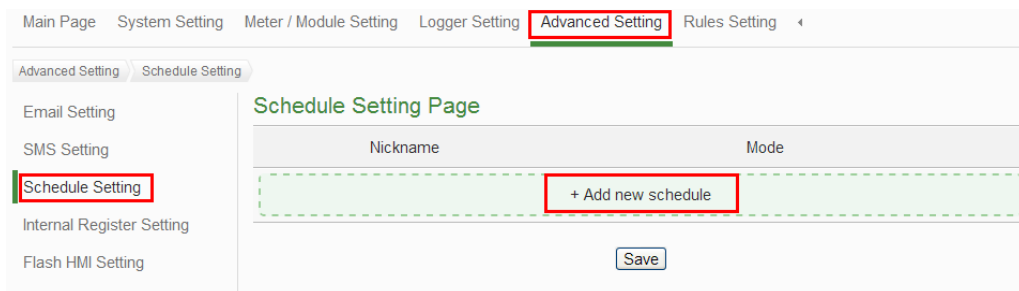


◆ Schedule Setting

Description: Set up the "weekdays (Monday to Friday / 8.00a.m. to 5:00p.m.)" settings for the application example.

Weekday Schedule setting steps:

- (1) Login into the PMC-224x web page as the Administrator, select “Advanced Setting”→“Schedule Setting”→“Add new schedule”.



- (2) Please follow the figures and descriptions below to complete the settings, after all settings are completed, click “OK” button.

The screenshot shows two sections of the form. The first section, 'Schedule Schedule Setting', has a table with the following fields:

*Nickname	Weekdays
Description	Weekdays(8.00a.m. to 5:00p.m.)

The second section, 'Schedule Content Setting', has the following fields:

Mode: Calendar Repeat

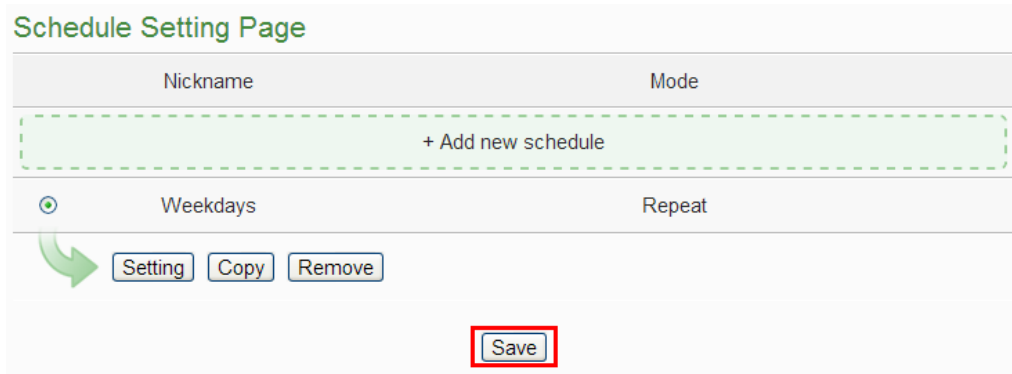
*Day(s) of Week: Sun Mon Tue Wed Thu Fri Sat

Exception Date(s):

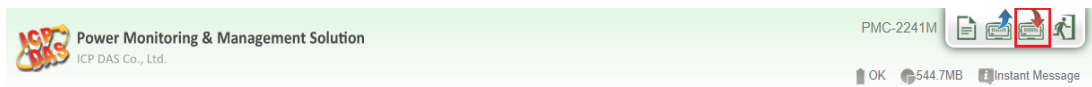
*Time Range(s): 08 : 00 : 00 ~ 17 : 00 : 00

At the bottom, there are two buttons: 'OK' (highlighted in red) and 'Cancel'.

(3) Save schedule settings.



(4) Save the settings to the PMC-224x (the user could also save the settings later after all other settings are completed).

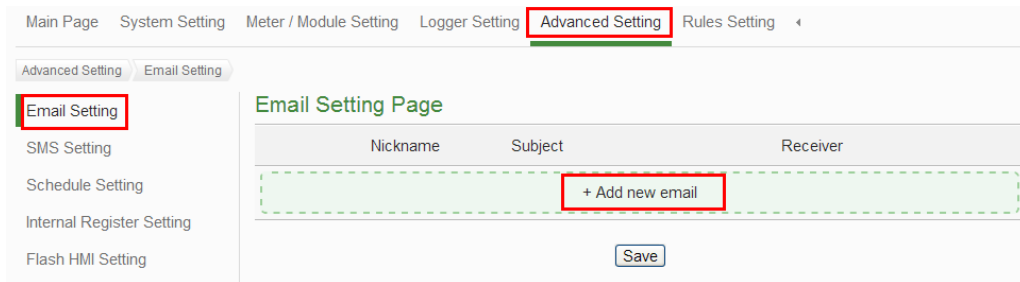


◆ Email Setting

Description: Set up the "Email" settings for the application example

Email setting steps:

- (1) Login into the PMC-224x web page as the Administrator, select “Advanced Setting”→“Email Setting”→”Add new email”.



- (2) Please follow the figures and descriptions below to complete the settings.

- Input the Nickname and Description of the Email.

Email Email 1 Setting

*Nickname	<input type="text" value="Email Alarm"/>
Description	<input type="text" value="Unusual electricity usage Alarm"/>

- Set up SMTP Server and its ID/Password.

SMTP Server Setting

*SMTP Server	<input type="radio"/> Specify an address of SMTP server <input checked="" type="radio"/> Google Gmail - smtp.gmail.com
Port	<input type="text" value="465"/>
Authentication	<input checked="" type="checkbox"/> Enable *ID <input type="text" value="Admin"/> Password <input type="password" value="****"/> Security <input type="text" value="SSL"/>

- Set up Sender Name and Receiver information.

Email Address Setting

*Sender Name	<input type="text" value="Admin"/>
*Sender Email Address	<input type="text" value="Admin@gmail.com"/>
*Receiver Email Address	<input type="text" value="Admin@gmail.com"/> <input type="button" value="Remove"/> <input type="button" value="Add"/>
Email Setting Test	<input type="button" value="Send"/>

- Input Email content.

Email Content Setting


*Subject	<input type="text" value="Unusual electricity usage Alarm"/>
*Content	<div style="border: 1px solid gray; padding: 5px;"><p style="text-align: right;">View Edit</p><p>Unusual electricity usage!! Current Electricity : PM-2133 Total / Average Daily Accumulated Electricity</p></div>

- Click “OK” to complete the settings.

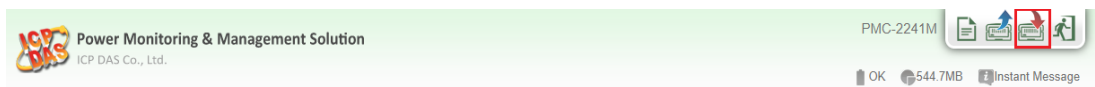
(3) Save Email Settings.

Email Setting Page

Nickname	Subject	Receiver
+ Add new email		
<input checked="" type="radio"/> Email Alarm	Unusual electricity usage Alarm	Admin@gmail.com



- (4) Save the settings to the PMC-224x (the user could also save the settings later after all other settings are completed).



◆ IF-THEN-ELSE Rule Setting

Description: Edit the "IF-THEN-ELSE Rule" in the application example. Please implement the settings of the following configuration before editing the IF-THEN-ELSE Rule: adding new Power Meter / adding new Modbus I/O Module / Schedule / Email / SMS.

Rule Setting steps:

- (1) Login into the PMC-224x web page as the Administrator, select “Rules Setting”→“Add new rule”.



- (2) Please follow the figures and descriptions below to complete the settings.

- Input the Nickname and Description, and then click “Enable”.

Rule Information Setting

*Nickname	Electricity Usage Rule
Description	Unusual Electricity Usage Rule
Status	<input checked="" type="radio"/> Enable <input type="radio"/> Disable

- Set up IF Condition: Set up the time range to be weekdays.

The first screenshot shows the 'IF' configuration menu with 'Schedule' selected. The second screenshot shows the 'Schedule Condition Setting' dialog where 'Weekdays' is selected for the 'Schedule' field and 'In Range' for the 'Status' field. The third screenshot shows the final 'IF' configuration with 'Schedule(Weekdays) In Range' displayed.

■ **Set up IF Condition:** When Daily Accumulated Electricity is over 500 kWh

The process starts with selecting the condition type. The 'Power Meter' option is chosen, leading to a list of electricity-related metrics. 'Daily Accumulated Electricity' is selected.

The configuration window 'Power Meter (Daily Accumulated Electricity) Condition Setting' shows the following details:

Power Meter & Loop / Phase	Operator	Value
COM2 PM-2133(2:PM-2133) Total / Average	>=	500

The 'OK' button is highlighted, leading to the final IF condition configuration screen. The condition is set to 'AND' and is displayed as:

COM2 PM-2133(2:PM-2133) Total / Average Daily Accumulated Electricity >= 500 kWh

■ **Set up THEN Action:** Send Email

The process starts with selecting the action type. 'Email' is chosen from the 'Set an Action' menu.

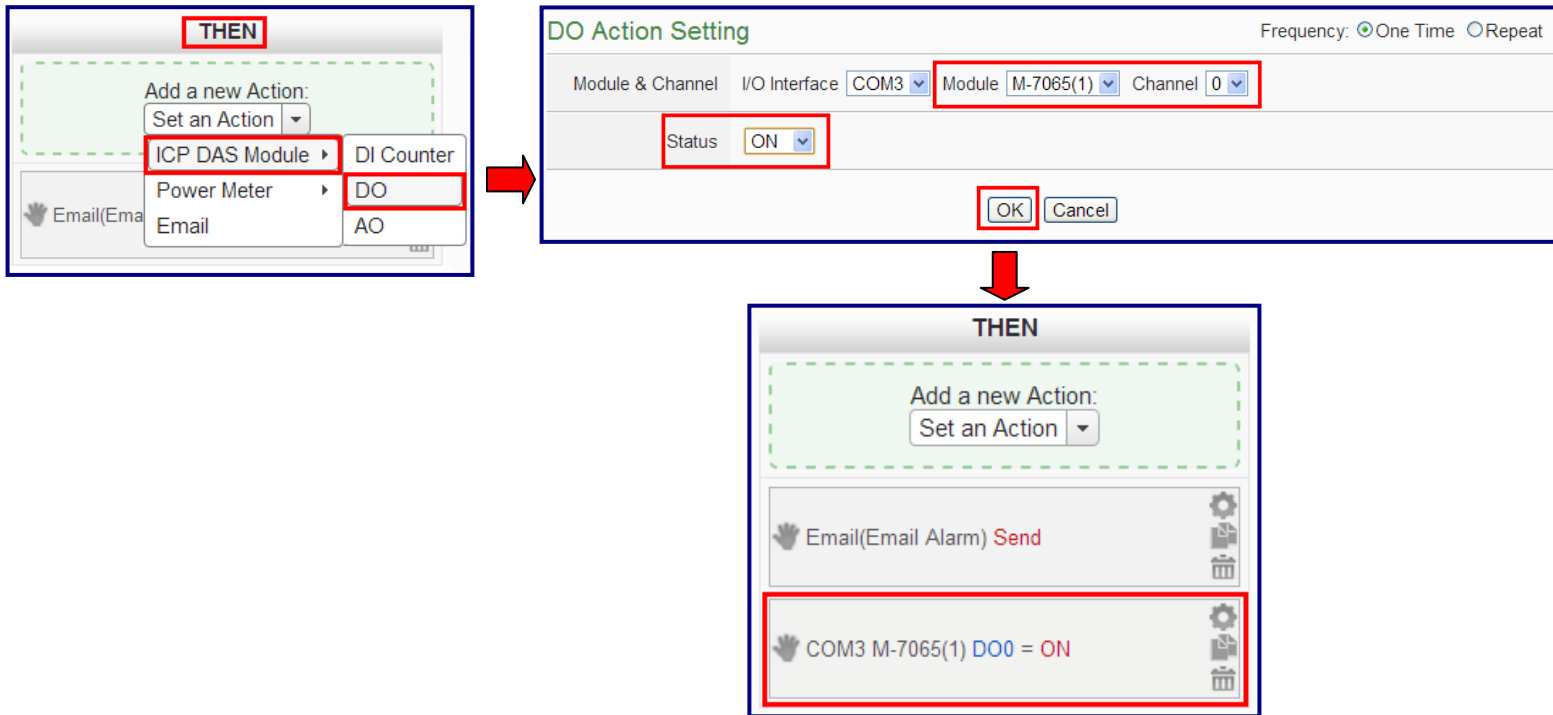
The configuration window 'Email Action Setting' shows the following details:

Field	Value
Email	Email Alarm
Action	Send
Email Information	
Receiver Email Address	Admin@gmail.com
Subject	Unusual electricity usage Alarm
Content	Unusual electricity usage!! Current Electricity: SC2M2m58

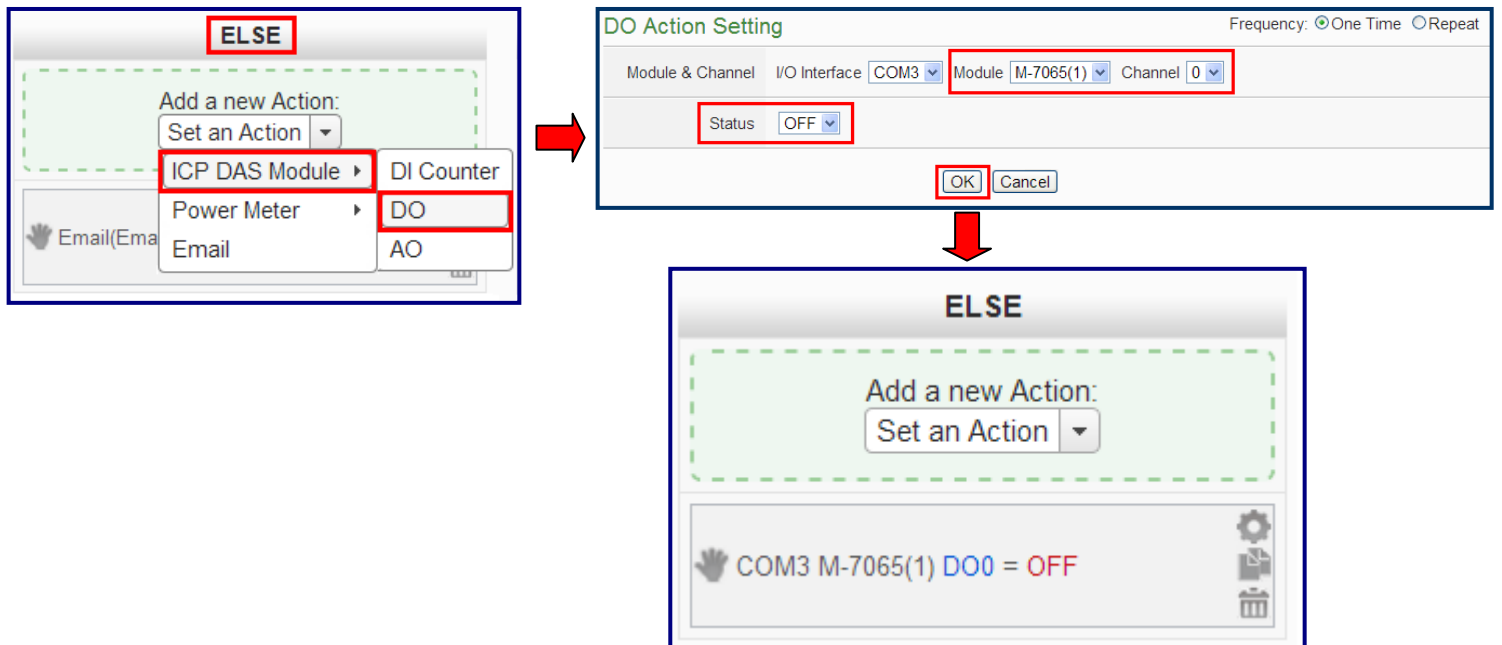
The 'OK' button is highlighted, leading to the final THEN action configuration screen. The action is displayed as:

Email(Email Alarm) Send

■ **Set up THEN Action: Turn on warning light (M-7065 DO0=ON)**



■ **Set up ELSE Action: Turn off warning light (M-7065 DO0=OFF)**



(3) Save Rule Settings

Rule Content Setting

IF	THEN	ELSE
<p>Add a new Condition: Set a Condition</p>	<p>Add a new Action: Set an Action</p>	<p>Add a new Action: Set an Action</p>
<p>Schedule(Weekdays) In Range</p> <p>COM2 PM-2133(2:PM-2133) Total / Average Daily Accumulated Electricity >= 500 kWh</p>	<p>Email(Email Alarm) Send</p> <p>COM3 M-7065(1) DO0 = ON</p>	<p>COM3 M-7065(1) DO0 = OFF</p>

Save **Cancel**



Rules Setting

+ Add new rule

Electricity Usage Rule

Rule Overview

Electricity Usage Rule
Unusual Electricity Usage Rule

< IF >
Schedule(Weekdays) **In Range** (AND)
COM2 PM-2133(2:PM-2133) **Total / Average Daily Accumulated Electricity** >= **500 kWh**

< THEN >
Email(Email Alarm) **Send** (One Time)
COM3 M-7065(1) **DO0 = ON** (One Time)

< ELSE >
COM3 M-7065(1) **DO0 = OFF** (One Time)

(4) Save the settings to the PMC-224x

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OK 544.7MB Instant Message