

PMC-52xx Brief User Guide

[Version 3.1.7]



ICP DAS CO., LTD.

泓格科技股份有限公司

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Introduction

This document is intended to guide users to quickly implement settings of PMC-52xx. This document can be divided into three parts from basic to advanced settings:

1. **Before Installation:** PMC-52xx Network Setting.
→ [Required settings before installing PMC-52xx.](#)
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/ SMS sending and Schedule functions.
→ [Settings for advanced functions of PMC-52xx.](#)


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

Please Note:

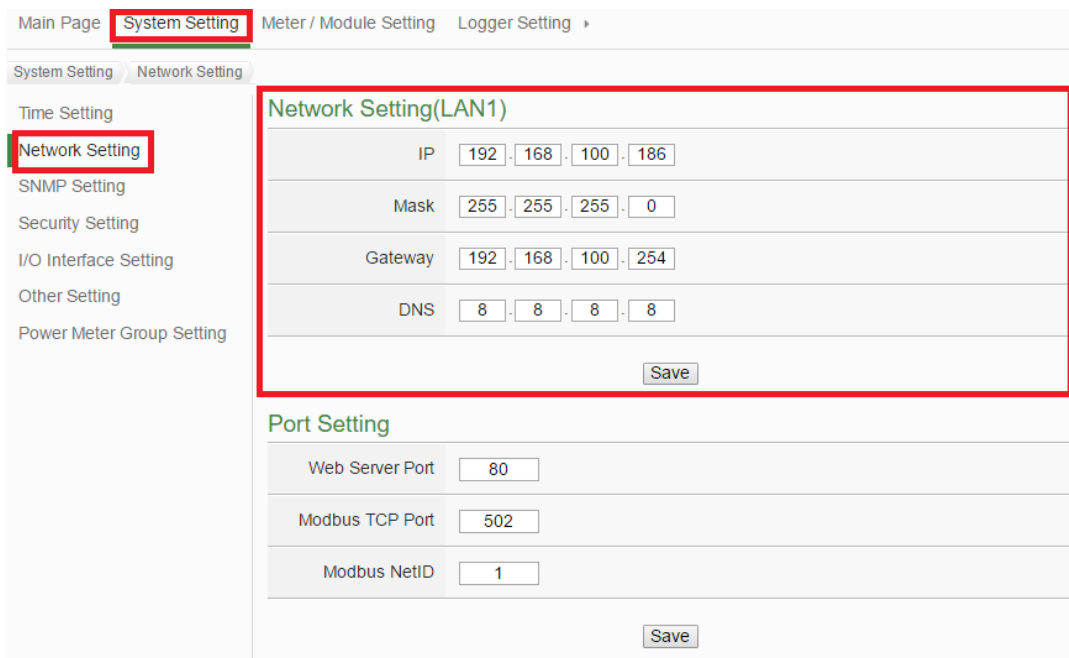
- PMC-52xx provides COM3 (RS-485) and COM4 (RS-485) interfaces for connections to Modbus RTU power meters, and PMC-52xx also provides LAN interface for connections to Modbus TCP power meters.
- A single PMC-52xx can connect to at most 24 ICP DAS Modbus power meters (including Modbus RTU power meters 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-52xx is as follow:</p> <ul style="list-style-type: none">■ IP : 192.168.255.1■ Subnet mask : 255.255.0.0■ Gateway : 192.168.0.1
---	---

- (1) Modify the network settings of the PC or Notebook to be the same network domain as PMC-52xx. For example:
 - IP : 192.168.255.10
 - Subnet mask : 255.255.0.0
 - Gateway : 192.168.0.1
- (2) Connect PMC-52xx **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.



The screenshot shows a web interface with a navigation menu on the left and a main content area. The 'System Setting' menu item is highlighted with a red box. In the main content area, the 'Network Setting (LAN1)' section is also highlighted with a red box. It contains the following configuration fields:

IP	192	168	100	186
Mask	255	255	255	0
Gateway	192	168	100	254
DNS	8	8	8	8

Below these fields is a 'Save' button. The 'Port Setting' section below it contains:

Web Server Port	80
Modbus TCP Port	502
Modbus NetID	1

There is also a 'Save' button at the bottom of the Port Setting section.

- (6) After clicking on “Save” button, for the network domain of the PMC-52xx and PC are different, it is normal being not able to connect to the webpage, please connect PMC-52xx and PC to the actual network environment and then modify the network settings of PC to correct settings to connect to the PMC-52xx.

■ 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-52xx 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

I/O Interface Setting Page COM2 COM3 COM4 LAN

Function Modbus RTU Master

Baudrate 19200 bps

Parity None Odd Even

Stop bits 1 2

Silent Interval 100 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

Power Meter Setting

XV-Board Setting

I/O Module Setting

Power Meter List (Modbus RTU) COM3 COM4 LAN

No. Address *Power Meter Nickname

1 1 Search ?

No power meter 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.

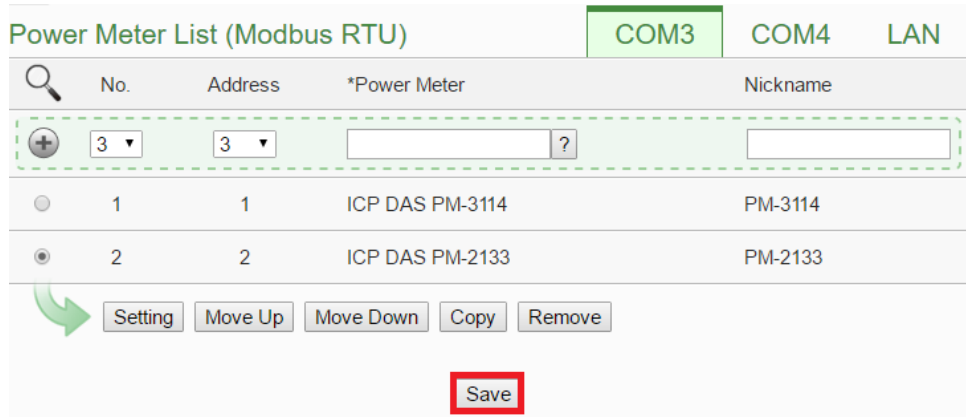
COM Port COM3 Parity None

Baudrate 19200bps Stop bits 1

Silent Interval 100ms Timeout 1000 ms

Scan Cancel

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



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-52xx.

ICP DAS Power Monitoring & Management Solution ICP DAS Co., Ltd. PMC-5231

(6) After saving the settings to the PMC-52xx, 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	Data Classification2	Data Classification3
V	I	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-52xx 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 breadcrumb navigation is: Main Page > System Setting > Meter / Module Setting > **Logger Setting** > Advanced Setting > Rules Setting. The left sidebar has 'Data Logger Setting' selected. The main content area is titled 'Power Data Logger Setting' and contains the following fields:

Function Status	<input checked="" type="checkbox"/> Enable
Log Mode	Average
Column Header	<input type="checkbox"/> Add

Below this is the 'User-Defined Data Logger Setting' section:

Function Status	<input type="checkbox"/> Enable
-----------------	---------------------------------

Then the 'Log Attribute Setting' section:

Log Interval	5 minutes
File Name Format	YYYY-MM-DD.csv
End of Line Character	CRLF(Windows)

A 'Save' button is located at the bottom right of the form.

- (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 breadcrumb navigation is: Main Page > System Setting > Meter / Module Setting > **Logger Setting** > Advanced Setting > Rules Setting. The left sidebar has 'FTP Upload Setting' selected. The main content area is titled 'FTP Upload Setting Page' and contains the following fields:

Function Status	<input checked="" type="checkbox"/> Enable
Remote FTP Server	*Address: ftp://192.168.100.123
	Port: 21
	*ID: Admin
	Password: ****
Data Log Upload Function	<input checked="" type="checkbox"/> Upload Power Data Log
	<input type="checkbox"/> Upload User-Defined Data Log
	Frequency: Every 5 minutes
Event Log Upload Function	<input type="checkbox"/> Upload Event Log

A 'Save' button is located at the bottom right of the form.

- (3) Save the settings to PMC-52xx, 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-52xx also provides **I/O module control**, **Email/SMS sending** and **Schedule** functions. With the **IF-THEN-ELSE** logic rules function, PMC-52xx offers more thought-out power demand management and monitoring functions. The following application is an example that will give more introductions of these functions:

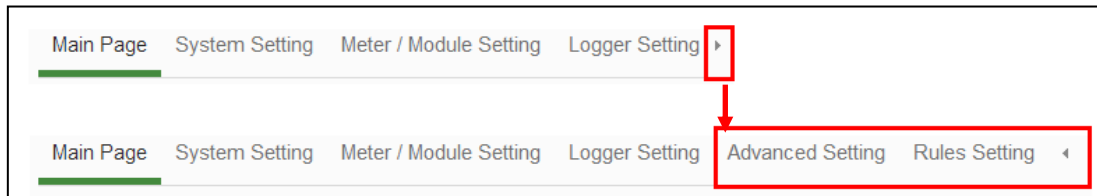
Please note: The SMS function is for PMC-5231M-3GWA/4GE/4GC only.

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 and SMS 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	Send SMS	
	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-52xx 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

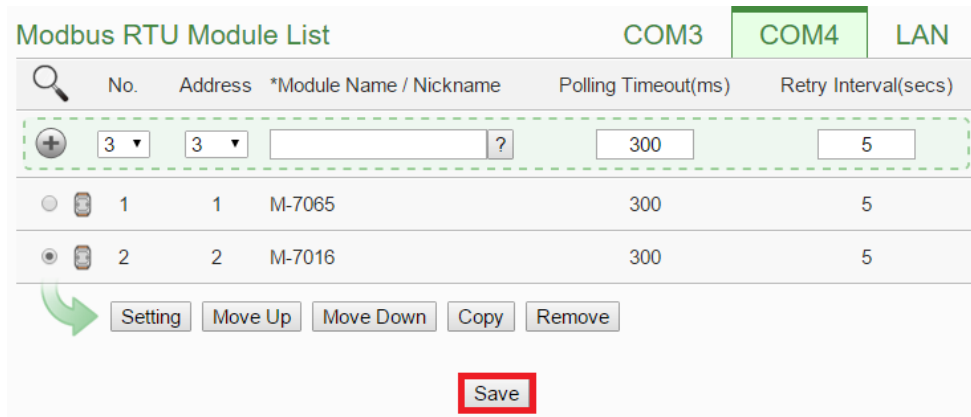
Set the address range to scan:

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

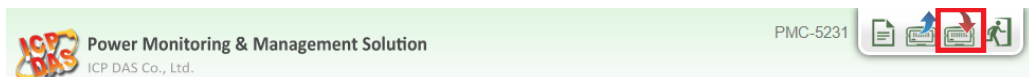
Scan Cancel

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-52xx User manual.
- (5) Save the settings to the PMC-52xx (the user could also save the settings later after all other settings are completed)

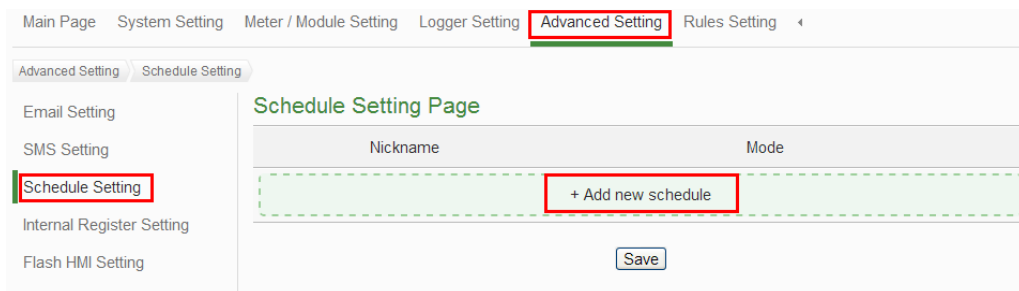


◆ Schedule Setting

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

Weekday Schedule setting steps:

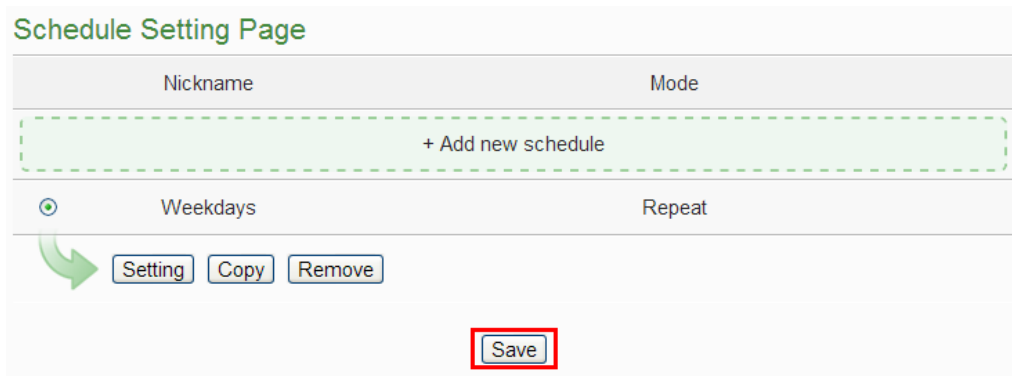
- (1) Login into the PMC-52xx web page as the Administrator, select “Advanced Setting”→“Schedule Setting”→“Add new schedule”.



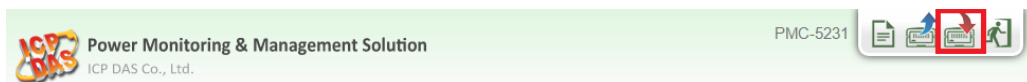
- (2) Please follow the figures and descriptions below to complete the settings, after all settings are completed, click “OK” button.

The screenshot shows two sections of the form. The first section, 'Schedule Schedule Setting', has a '*Nickname' field with the value 'Weekdays' and a 'Description' field with the value 'Weekdays(8.00a.m. to 5:00p.m.)'. The second section, 'Schedule Content Setting', has a 'Mode' field with 'Repeat' selected, a '*Day(s) of Week' field with 'Mon', 'Tue', 'Wed', 'Thu', and 'Fri' checked, an 'Exception Date(s)' field with an 'Add' button, and a '*Time Range(s)' field with '08:00:00' and '17:00:00' selected, and 'Add' and 'Remove' buttons. At the bottom, there are 'OK' and 'Cancel' buttons, with the 'OK' button highlighted in red.

(3) Save schedule settings.



(4) Save the settings to the PMC-52xx (the user could also save the settings later after all other settings are completed).

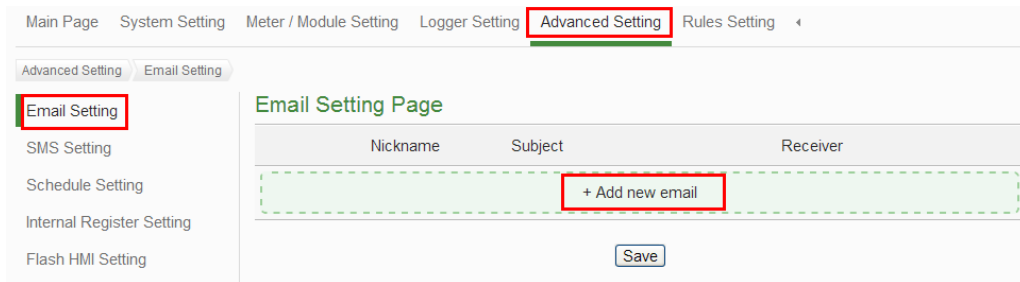


◆ Email Setting

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

Email setting steps:

- (1) Login into the PMC-52xx 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 #ccc; 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>

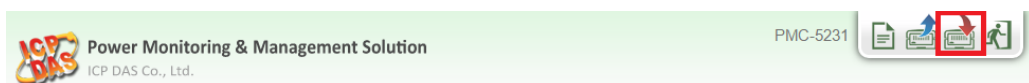
- Click “OK” to complete the settings.

(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
	<input type="button" value="Setting"/> <input type="button" value="Copy"/> <input type="button" value="Remove"/>	
<input type="button" value="Save"/>		

- (4) Save the settings to the PMC-52xx (the user could also save the settings later after all other settings are completed).



◆ **SMS Setting** (This function is for PMC-5231M-3GWA/4GE/4GC only.)

Description: Set up the "SMS" settings for the application example.

SMS setting steps:

(1) Add new SMS alarm settings:

Select “Advanced Setting”→“SMS Setting”→“Add new SMS alarm”.

The screenshot shows a web interface for configuring SMS settings. The navigation menu includes 'Main Page', 'System Setting', 'Meter / Module Setting', 'Logger Setting', 'Advanced Setting', and 'Rules Setting'. The 'Advanced Setting' menu is expanded, showing 'SMS Setting' as the selected option. The 'SMS Setting' page has a sub-menu with 'SMS Alarm' and 'SMS Command'. The 'SMS Alarm' button is highlighted in green. Below the sub-menu, there is a 'PIN Code' input field. The 'SMS Alarm List' table has columns for 'Nickname', 'Phone Numbers', and 'Message'. A '+ Add new SMS alarm' button is highlighted in red. A 'Save' button is located at the bottom of the page.

Please note: if the SIM card is protected with PIN, input the PIN code.

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

The screenshot shows the 'SMS Alarm SMS Alarm 1 Setting' form. The form has the following fields and controls:

- *Nickname:** SMS Alarm
- Description:** Unusual electricity usage Alarm
- *Phone Number:** 0912345678. There is an 'Add' button and a 'Remove' button.
- *Message:** Unusual electricity usage!! Current Electricity: PM-2133 Total / Average Daily Accumulated Electricity. There are 'View' and 'Edit' buttons above the message text area.

The 'Add' button is highlighted in blue. At the bottom of the form, there are 'OK' and 'Cancel' buttons.


(3) Save SMS settings.

SMS Setting Page SMS Alarm SMS Command

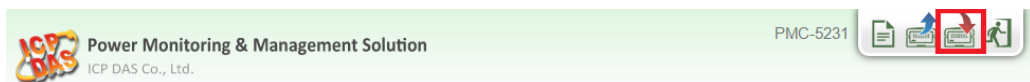
PIN Code

SMS Alarm List

Nickname	Phone Numbers	Message	
+ Add new SMS alarm			
<input checked="" type="radio"/>	SMS Alarm	0912345678	Unusual electricity usage!! Current Electricity: \$C2M2m58



(4) Save the settings to the PMC-52xx (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-52xx 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 sequence of screenshots shows the configuration process for an IF condition. The first screenshot shows the 'IF' configuration screen with a dropdown menu for 'Add a new Condition' where 'Schedule' is selected. The second screenshot shows the 'Schedule Condition Setting' screen where the 'Schedule' is set to 'Weekdays' and the 'Status' is 'In Range'. The 'OK' button is highlighted. The third screenshot shows the final 'IF' configuration screen where the condition is set to 'Schedule(Weekdays) In Range'.

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

The first screenshot shows the 'IF' configuration interface. A dropdown menu is open under 'Set a Condition', and 'Daily Accumulated Electricity' is highlighted. A red box highlights this option. An arrow points to the 'Power Meter (Daily Accumulated Electricity) Condition Setting' dialog box. In this dialog, the 'Power Meter & Loop / Phase' is set to 'COM2' and 'PM-2133(2:PM-2133)'. The 'Operator' is set to '>=' and the 'Value' is '500'. A red box highlights the 'OK' button.

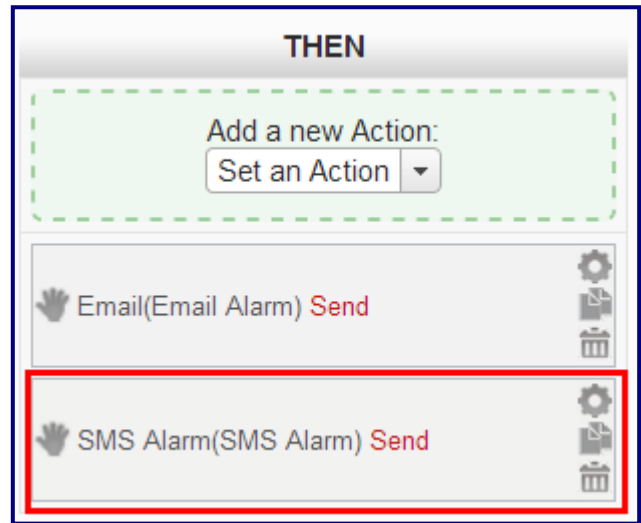
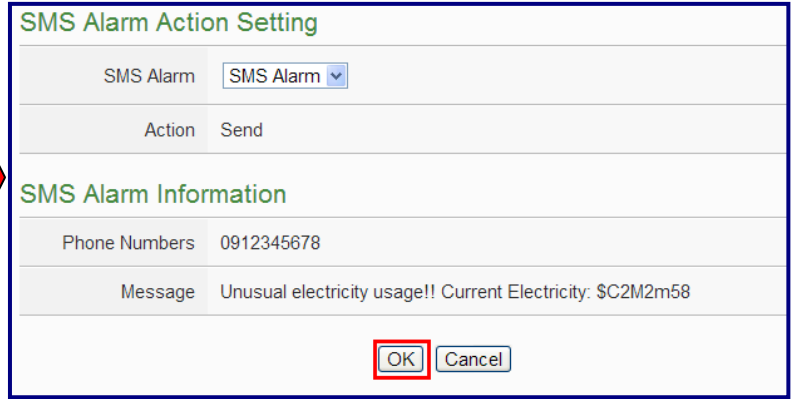
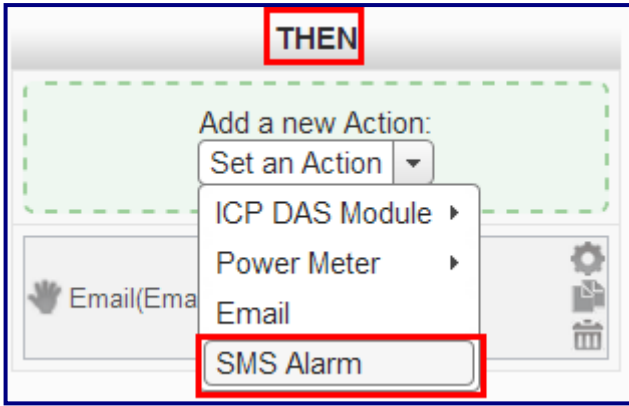
The second screenshot shows the 'IF' configuration interface after the condition is added. The condition is listed as 'COM2 PM-2133(2:PM-2133) Total / Average Daily Accumulated Electricity >= 500 kWh'. A red box highlights this condition entry.

■ **Set up THEN Action: Send Email**

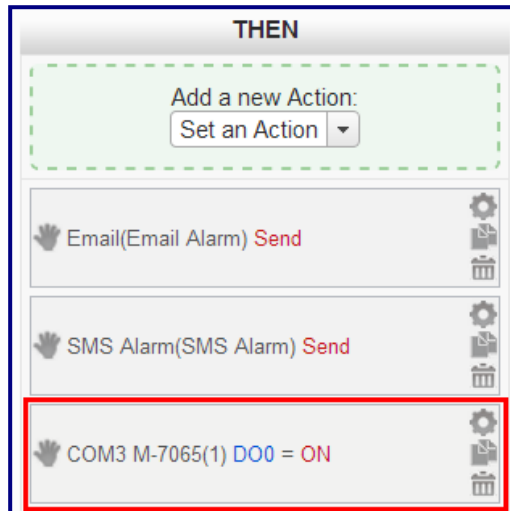
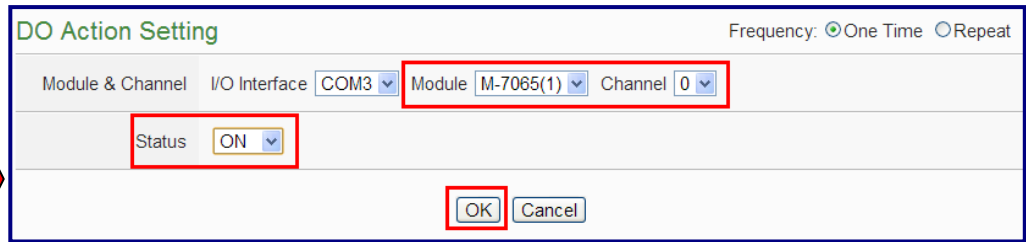
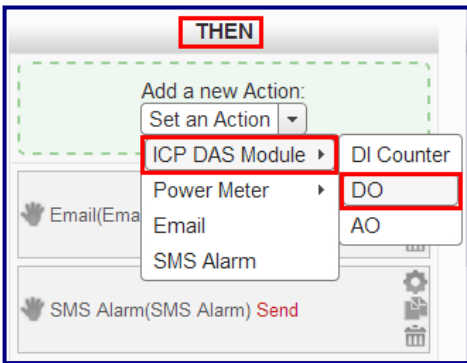
The first screenshot shows the 'THEN' configuration interface. A dropdown menu is open under 'Set an Action', and 'Email' is highlighted. A red box highlights this option. An arrow points to the 'Email Action Setting' dialog box. In this dialog, the 'Email' is set to 'Email Alarm' and the 'Action' is 'Send'. The 'Email Information' section shows the 'Receiver Email Address' as 'Admin@gmail.com', the 'Subject' as 'Unusual electricity usage Alarm', and the 'Content' as 'Unusual electricity usage!! Current Electricity: \$C2M2m58'. A red box highlights the 'OK' button.

The second screenshot shows the 'THEN' configuration interface after the action is added. The action is listed as 'Email(Email Alarm) Send'. A red box highlights this action entry.

■ Set up THEN Action: Send SMS Alarm



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



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

The process starts with selecting the 'ELSE' section. A menu is shown with 'ICP DAS Module' selected, which opens a sub-menu where 'DO' is chosen under the 'Power Meter' category. This leads to the 'DO Action Setting' dialog box. In this dialog, the 'Module' is set to 'M-7065(1)' and the 'Channel' is '0'. The 'Status' is set to 'OFF'. The 'OK' button is highlighted. Below this, the 'ELSE' section of the rule editor is shown, displaying the configured action: 'COM3 M-7065(1) DO0 = OFF'.

(3) Save Rule Settings

The 'Rule Content Setting' dialog is shown with three sections: 'IF', 'THEN', and 'ELSE'. The 'IF' section contains two conditions: 'Schedule(Weekdays) In Range' and 'COM2 PM-2133(2:PM-2133) Total / Average Daily Accumulated Electricity >= 500 kWh'. The 'THEN' section contains three actions: 'Email(Email Alarm) Send', 'SMS Alarm(SMS Alarm) Send', and 'COM3 M-7065(1) DO0 = ON'. The 'ELSE' section contains one action: 'COM3 M-7065(1) DO0 = OFF'. The 'Save' button is highlighted. Below this, the 'Rules Setting' screen is shown, displaying the 'Rule Overview' for the 'Electricity Usage Rule'. The overview summarizes the rule logic: '< 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) SMS Alarm(SMS 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-52xx

The footer of the software interface is shown, featuring the 'ICP DAS' logo, the text 'Power Monitoring & Management Solution' and 'ICP DAS Co., Ltd.', the version number 'PMC-5231', and a toolbar with a highlighted save icon.