PMC-1304-3

Communications Processor

User Manual

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Failure to observe the following instructions may result in severe injury or death and/or equipment damage.

- Before connecting the device to the power source, check the label of the device to ensure that it is equipped with the appropriate power supply.
- Under no circumstances should the device be connected to a power source if it is damaged.
- Make sure the device is mounted to a well-grounded mounting surface.
- To prevent potential fire or shock hazard, do not expose the device to rain or moisture.
- DO NOT open or repair the device under any circumstances, unless it is clearly specified in the manual.

Limited warranty

- Ceiec Electric Technology (CET) offers the customer a minimum of 12-month functional warranty on the device for faulty parts or workmanship from the date of dispatch from the distributor. This warranty is on a return to factory for repair basis.
- CET does not accept liability for any damage caused by device malfunctions. CET accepts no responsibility for the suitability of the device to the application for which it was purchased.
- Failure to install, set up or operate the device according to the instructions herein will void the warranty.
- Only CET's duly authorized representative may open your device. The unit should only be opened in a fully anti-static environment. Failure to do so may damage the electronic components and will void the warranty.

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Chapter 1 Introduction

This manual explains how to use the PMC-1304-3 Communications Processor. Throughout the manual the term "PMC-1304-3" generally refers to all models. Differences between models are indicated with the appropriate model number.

This chapter provides an overview of the PMC-1304-3 Communications Processor and summarizes many of its key features.

1.1 Overview

The PMC-1304-3 is the ideal embedded equipment for connecting RS-422 or RS-485 enabled serial devices to an IP-based LAN, making it possible for SCADA or other applications to access serial devices over a LAN for monitoring and control applications. The PMC-1304-3 has been specifically designed with industrial automation in mind and therefore provides un-surpassed performance and reliability under the harshest industrial environments. The basic Model, PMC-1304-3-T, provides Modbus Gateway function from Modbus TCP to RTU and supports interrogation from multiple Modbus Masters. The optional RTU Model, PMC-1304-3-R, provides Modbus Mastering capability with local data caching and logging to enhance overall system performance and redundancy. Not only does the RTU Model support the polling of Real-Time data, it also supports the uploading of Data Logs, Event Logs and Waveform Logs for CET devices that provide these advanced capabilities.

The PMC-1304-3 comes with Tx/Rx LEDs for the serial ports on the front panel. The LEDs not only indicate the network status but also help to monitor the communications activities of the attached serial devices.

The PMC-1304-3 can be setup through its user-friendly web console.

1.2 Features

- Dual 10/100BaseT (RJ45)
- Standard 2Xrs-485, optional 4Xrs-485
- Basic Model
 - Modbus Gateway function for 32 Slave IEDs per RS-485 or a maximum of 128 Slave IEDs per device
- RTU Model
 - Modbus Mastering, Local Data Caching and logging for 64 Slave IEDs per RS-485 port or 256 Slave IEDs per device for a maximum of 25,600 data points.
 - 2GB On-Board Log Memory, sufficient for storing data @ 60-minute interval for 900 days
 - Scheduled uploading of Data Log in CSV format to an external FTP Server
- The PMC-1304-3 is designed to withstand the harshest industrial environments
 - 15kV (contactless) & 6kV (contact) ESD protection and 3kV isolation protection for all Serial signals
 - ✤ 1.5kV isolation protection for Ethernet ports
- Simple port configuration via its built-in web interface
- DIN-Rail or Surface Mounting

Models and Fu	nctions
---------------	---------

Functions	PMC-1304-3 Models		
Functions	т	RTU	
Modbus Gateway		•	
Data collecting and Transmission			
Local Data Logging			
Data Storing		•	
FTP/Uploading CSV Files		•	
Offline Configuration		•	
Online Configuration			
Online Debugging			

Supported

1.3 Typical Applications

The PMC-1304-3 is an ideal instrument to connect serial devices to an IP based Ethernet LAN for any industrial automation systems that require insulation protection as well as high reliability. With its built-in dual Ethernet ports, the PMC-1304-3 is capable of operating under a Single Networking or Dual Networking architecture.

1.3.1 Modbus TCP to RTU Gateway

The PMC-1304-3 supports the Modbus TCP to RTU Gateway function that makes it extremely simple for any Modbus TCP Master Application to interface with Modbus RTU enabled IEDs over a local area network. A simple web-based interface allows the users to easily configure the TCP to RTU address mapping as well as which downstream RS-485 port the Slave IEDs are located.

Notes for Basic Model:

- 32 Slave IEDs per RS-485 port or a maximum of 128 Slave IEDs per device
- 4 Modbus Masters per device



Figure 1-1 Modbus RTU to TCP Gateway

1.3.2 Multiple Modbus TCP Masters Support

The PMC-1304-3 supports multiple Modbus TCP Master simultaneously to facilitate information sharing while minimizing the implementation cost. For highly data or communication intensive applications. The RTU Model is recommended.

Notes for RTU Moles:

- 64 Slave IEDs per RS-485 port or a maximum of 256 Slave IEDs per device
- 16 Modbus Masters per device



Figure 1-2 One PMC-1304-3 Serving 3 Modbus Masters Simultaneous

1.3.3 Data Logging

The RTU Model supports embedded Modbus RTU mastering as well as Local Data Caching and Data Logging of real-time parameters from Slave IEDs for a maximum of 25,600 data points. The device can be configured to perform data logging from 1-minute to 60-minute intervals. With its large on-board non-volatile Log Memory, the device is capable of storing interval. These features enhance the overall system performance and reliability, reduce the CPU loading of the Head-End applications such as EMS, BMS or SCADA and provide an extra level of data redundancy for IEDs without any on-board memory.



Figure 1-3 Multi-site Data Collection through 3G/4G Modems

In addition, the RTU Model may be deployed as a stand-alone Data Logger without any Head-End systems in a Local Area Network or in remote locations when it's paired with an external 3G/4G modem. The RTU Model's FTP allows manual access and uploading of historical information in zipped CSV format. This versatile function allows users to perform simple data logging of Slave IEDs locally or remotely without any expensive software.

Not only does the RTU Model support Modbus Slave Devices from CET, it can also support the Modbus RTU Mastering of practically and 3rd party Modbus IEDs with customized device drivers.



Figure 1-4 Stand-alone Data Logger Application

1.3.4 FTP Client Support

The RTU Model can be configured as an FTP Client to push the most recent data log files in CSV format to an external FTP Server over an intranet or internet at pre-determined intervals from hourly to weekly. This is especially useful for distributed or remote Energy Management applications where real-time data update is not required. The log files will be deposited at the FTP Server at scheduled intervals which can then be processed by 3rd party applications.



Figure 1-5 Data Push to FTP Server in CSV Format

The table below lists the PMC-1304-3's various historical data as per configured recording intervals which can be implemented by **IBD_admin**, please contact your local CET Representatives for authority for further configuration.

Recording Interval ()	Historical Data (Days)
1	15
5	60
10	120
15	180

1.4 Getting more information

Additional information is available from CET via the following sources:

- Visit www.cet-global.com
- Contact your local representative
- Contact CET directly via email or telephone

Chapter 2 Installation

2.1 Appearance



Figure 2-1 Appearance

2.2 Unit Dimension



2.3 Mounting

The PMC-1304-3 should be installed in a dry environment with no dust and kept away from heat, radiation and electrical noise source.

DIN-Rail Mounting

Installation step:

- Before installation, make sure that the DIN rail is already in place
- Move the installation clip at the bottom of the PMC-1304-3 downward to the "unlock" position
- Mount the PMC-1304-3 on the DIN rail
- Push the installation clip upward to the "lock" position to secure the PMC-1304-3 on to the DIN Rail



Figure 2-3 DIN-Rail Mounting

Surface Mounting

Installation steps:

- Pre-drill the mounting holes based on the mounting diagram as shown in Figure 2-4
- Fit the device through the cutout
- Use four screws to fix the device tightly against the panel



Figure 2-4 Surface Cutout Mounting

2.4 Power Supply Wiring

Please consult the serial number label to ensure that the supply voltage is within the range of the PMC-1304-3's power supply specifications.

For AC supply, connect the live wire to the L/+ terminal and the neutral wire to the N/- terminal.

For DC supply, connect the positive wire to the L/+ terminal and the negative wire to the N/- terminal.



Figure 2-5 Power Supply Connections

2.5 Chassis Ground Wiring

Installation:

- Connect one end of the ground wire to the Chassis Ground terminal on the PMC-1304-3 using a spade connector
- Connect the other end of the ground wire to an Earth ground



Figure 2-6 Chassis Ground Connection

2.6 Ethernet Port Wiring

Connect one end of the Ethernet cable to PMC-1304-3 Ethernet port and the other end of the cable to the Ethernet network.



Figure 2-7 RJ45 Connector

Pin	Meaning
1	Transmit Data+
2	Transmit Data-
3	Receive Data+
4,5,7,8	NC
6	Receive Data-

Table 2-1 RJ45 Connector Pin Description for 10/100BaseT Applications

2.6.1 Straight through Connection

A straight through RJ45 cable should be used if the PMC-1304-3 is connected to an Ethernet switch or hub. The following figure illustrates the definition of an 8-pin RJ45 straight through cable. The color-coded wires should be connected to the pins of the RJ45 connector as follows:

Pin 1: Orange-W Pin 2: Orange Pin 3: Green-Wh Pin 4: Blue Pin 5: Blue-Whit Pin 6: Green Pin 7: Brown-Wh Pin 8: Brown	'hite iite e nite	Pin 1: Pin 2: Pin 3: Pin 4: Pin 5: Pin 6: Pin 7: Pin 8:	Orange-White Orange Green-White Blue Blue-White Green Brown-White Brown
RJ45 8 00 00 00 00 00 00 00 00 00 00 00 00 0		8 7 6 5 4 3 2 1	RJ45

Figure 2-8 Straight through Connection

2.6.2 Cross-over Connection

A cross-over RJ45 cable should be used if the PMC-1304-3 is connected directly to a PC's Ethernet port. The following figure illustrates the definition of an 8-pin RJ45 cross-over cable. The color-coded wires should be connected to the pins of the RJ45 connector as follows:



Figure 2-9 Cross-over Connection

2.7 Serial Port Wiring

2.7.1 P3 (RS-422/485) Wiring

The P3 port of PMC-1304-3 can be used as a RS-485 or a RS-422 port. The following figure illustrates the RS-422/485 communications connections on the PMC-1304-3:



Table 2-3 RS-422/485 Connection

2.7.2 P4/P5/P6 (RS485) Wiring

The PMC-1304-3 provides three RS-485 ports (P4, P5 and P6). The following figure illustrates the RS-485 communications connections on the PMC-1304-3:



Table 2-3 RS-485 Connection

Chapter 3 Operating the PMC-1304-3

3.1 LED Indicators

There are 12 LED indicators on the PMC-1304-3's front panel as described in the following table.

LED Indi	Indicator Color Status Description		Description			
RUN		Green	On	Abnormal Condition		
			Off	Not powered up or abnormal condition		
			Blinking Working normally			
Alarm		Alarm Red		Red	On	Abnormal condition
		neu	Blinking Restoring default parameters		Restoring default parameters	
P1/P2			On	Connected but no data activities		
		P1/P2		Yellow	Off	Disconnected
			Blinking	Data activities		
P3~P6	Rx	Green	Blinking	Receiving data		
	Tx	Yellow	Blinking	Transmitting data		

Table 3-1 LED Indicators

3.2 Reset Button

The front panel has a **Reset** button. Use a pointed object, such as a straightened paper clip or the tip of a ball-point pen to access the **Reset** button.

- Press and hold the **Reset** button for less than 5 seconds will cause the PMC-1304-3 to initiate a reboot sequence. The reboot process would be completed when the **Run** indicator is off.
- Press and hold the Reset button for longer than 5 seconds will lead the PMC-1304-3 to reset to default, when the Alarm indicator will be on and off with 0.5 second interval, and then blinks for three times.

Chapter 4 Configuring the PMC-1304-3 via the Web Console

This section gives corresponding Web operations for the T Model and RTU Model.

- For the T Model, there is only On-line Web Console that can be used to configure a PMC-1304-3-T.
- For the RTU Model, PMC-1304-3-R Web Console has two programming modes: On-Line and Off-Line. The On-Line mode is used to query and configure a connected PMC-1304-3-R, while the Off-Line mode is used to configure most of parameters for a PMC-1304-3-R without physically connecting to the PMC-1304-3-R.

	PMC-1304-3 Models		
1 st level	2 nd level	т	RTU
	Network	-	•
Device Settings	Time		•
	FTP Password		•
	Channel Settings		•
	Slave IED Management		•
Channel Management	Driver Management		•
	Modbus Gateway	-	•
	Serial Port	-	
Data Cacha Managamant	Cache Management		•
Data Cache Management	Data Cache		•
	Password Setup	-	•
	Statistic		•
System Maintonanco	Clear History		•
System Maintenance	Backup/Restore	-	•
	System Information		•
	Reboot		•

Web Console Menus and Models:

Available

4.1 On-line Web Console Login

1) Open your Internet Explorer with the scripting function enabled. To enable scripting for your browser, right click on your Internet Explorer icon and select Properties from the pop-up dialog box. The **Internet Options** window appears. Select the Security tab and then click on the **Custom Level** button near the bottom of the window. The **Security Settings** window appears. Enable the three options as shown below and then click **OK**.

ternet Options	?! × Security Settings ?!
	Settings:
Select a Web content gone to specify its security settings.	Scripting
	Active scripting
	O Disable
Internet Local intranet Trusted sites Restricted	Enable
sites	O Prompt
Internet	I Allow paste operations via script
This zone contains all Web sites you	O Disable
haven't placed in other zones	Enable
	O Prompt
Security level for this zone	Scripting of Java applets
	O Disable
Custom	Enable
Custom settings.	O Prompt
To use the recommended settings, click Default Level	1 Llear Authoritication
	Reset custom settings
	Parat has been and Parat
Custom Level Default Leve	I Keset to: High
	OK Carcal
OK Cancel /	Apply Cancer

2) The default IP Addresses of the PMC-1304-3's two Ethernet Ports (P1 and P2) are 192.168.0.127 and 192.168.1.127, respectively. Configure the IP address of the PC to the same network segment as the connected Ethernet port. For example, configure the IP Address and the Subnet Mask of the PC as 192.168.0.100 and 255.255.255.0 as shown below, if connected to Ethernet Port 1 192.168.0.127. If connecting to Ethernet Port 2 of the PMC-1304-3, the PC's IP address and Subnet Mask should be configured as 192.168.1.100 and 255.255.255.0, respectively.

Connect using:	You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
his connection uses the following items:	C Obtain an IP address automatically
Client for Microsoft Networks	Use the following IP address:
By Network Load Balancing	IP address: 192 . 168 . 0 . 100
File and Printer Sharing for Microsoft Networks Thermet Protocol (TCP/IP)	Subnet mask: 255 . 255 . 255 . 0
	Default gateway:
Description	C Obtain DNS server address automatically
Transmission Control Protocol/Internet Protocol. The default	Use the following DNS server addresses:
across diverse interconnected networks.	Preferred DNS server:
Show icon in notification area when connected	Alternate DNS server:
✓ Notify me when this connection has limited or no connectivity	Advanced

3) Enter the IP Address of the PMC-1304-3 in the Address input box of the Internet Explorer (IE) and then press **<Enter>**. The default IP address is 192.168.0.127 for Ethernet 1 and 192.168.1.127 for Ethernet 2.

4) The PMC-1304-3's On-line Web Console's Login page appears. Enter the User name and Password. The default user name is "user", and the default password is "123456".



4.2 Off-line Web Console Login

To run the PMC-1304-3 Off-Line Web Console, the program should be installed by double clicking the "PMC-1304-3 Web Console Setup.exe". After installation, double click the "PMC-1304-3_EN" to open Off-Line Web Console. The PMC-1304-3's Off-line Web Console's Login page appears. Enter the User name and Password. The default user name is "user", and the default password is "123456". Click "Login" to choose the way to enter the Web Console.



Option	Option Description			
	If the user is running it for first time, the New			
Last Configuration	Configuration should be used, otherwise, select			
	Last Configuration			
	Soloct the model and then perform configuration	Default:		
New Configuration	based on its default and	PMC-1304-3-R-00-04-2-		
	based on its default one	T2-XX-XXXX-I		
Import Configuration Import a backup configuration file				
Synchronize Device: Syr	nchronize the PMC-1304-3's device configuration to O	ff-Line Web Console via		
an Ethernet connection				
ID Address	Enter the static IP address of PMC-1304-3 to	0.0.0.0 to		
IP Address	synchronize device configuration	255.255.255.255		
Discover DMC 1204	Discover the IP addresses of all PMC-1304-3 in			
Discover PIVIC-1304	LAN to choose			
<enter></enter>	Enter the selected configuration page			

4.3 Web Interface

4.3.1 Device Settings

4.3.1.1 Network Settings

This option is available in both T Model and RTU Model. For the RTU Model, this option exists in both the On-Line and Off-Line programming modes.

Click on **Network** under **Device Settings** on the left-hand pane and the following screen appears. Modify the networking settings based on the actual situation. Click **Submit>** and **Save>** to save your changes. Please be reminded that the IP addresses for the two Ethernet ports should not be in the same subnet.

T Model:

	PMC-13	04 Web Console	🔛 Save 🛛 Quit
 Device Settings 	宁 Submit		
Network	Ethernet 1		
 Channel Management 	ID Address	100,100,0,107	
Serial Port	IF Address	192.168.0.127	
Modbus Gateway	Subnet Mask	255.255.255.0	
 System Maintenance 			
Password Setup	Ethernet 2		
Backup/Restore	IP Address	192.168.1.127	
System Information	Subnet Mask	255.255.255.0	
Reboot			
	Others		
	Default Gateway	192.168.0.1	

RTU Model:

	PMC-130	4 Web Console	Save Quit
 Device Settings 			
Network	Ethernet 1		
Time	IR Addrose	100,100,0,107	
Channel Management	ir Address	192.168.0.127	
 Data Cache Management 	Subnet Mask	255.255.255.0	
 System Maintenance 	Ethernet 2		
	Lucinetz		
	IP Address	192.168.1.127	
	Subnet Mask	255.255.255.0	
	0		
	Others		
	Default Gateway	192.168.0.1	
	DNS1		
	DNS2		
	DN32		

Option	Description	Setting
	Configure the DMC 1204 2's ID address	Default IP1 = 192.168.0.127
IP Address	Configure the PMC-1504-5 STP address	Default IP2 = 192.168.1.127
Subnet Mask	Configure the Subnet Mask	Default = 255.255.255.0
Default Gateway	Configure the Default Gateway's IP address	Default = 192.168.0.1
	Configure the Domain Name System (DNS) that	
DNS1/DNS2	connected to the network. The two parameters	Default =Null
	are only available in the RTU Model.	

Notes:

- 1) The IP addresses for the two Ethernet ports must be in different subnets.
- 2) The Default Gateway must be in the same subnet as one of the IP addresses.
- 3) Click **<Submit>** at the upper left-hand corner of the right-hand pane to store the new configuration in a local cache before leaving this page.
- 4) Save configuration.
 - For on-line mode, click <Save> at the upper right-hand corner of the web page to save the new configuration and it will be take effect only after the device reboots.
 - For off-line model, click <Save> at the upper right-hand corner of the web page to save the new configuration to the device's configuration file that is stored on the PC for Off-Line programming and then synchronize the new configuration to the device via System Maintenance > Backup/Restore > Synchronization Settings menu.
- 5) Click <**Quit**> to leave the PMC-1304-3 Web Console. Please ensure that your changes have been saved before leaving.

4.3.1.2 Time Settings

This option exists in both the On-Line and Off-Line programming modes, but only for the RTU Model.

Click on **Time** under **Device Settings** on the left-hand pane and the following screen appears. Click **Submit>** and **Save>** to save your changes after modification.

Off-line Mode:

PMC-1304 Web Console				
Device Settings Network Time	Ŷ Submit Time			
Channel Management Data Cache Management System Maintenance	Time Zone Clock Source	(UTC+08:00) Beijing, Cho v SNTP v		
	SNTP Settings	127.0.0.1		
	Time Sync. Interval (min) Accept Time Broadcast	60 ×		

On-line Mode:

EET	PMC-13	04 Web Console
Device Settings Network	☆ Submit Device Clock	
Time FTP Password	Device Date	2016-08-31 🔹
Channel Management	Device Time	11:03:21 🔹
Data Cache Management	Sync. PC Clock	
System Maintenance	Time Settings	
	Time Zone	(UTC+08:00) Beijing, Chor 🔍
	Clock Source	SNTP 👻
	SNTP Settings	
	Server IP	127.0.0.1
	Time Sync. Interval (min)	60
	Accept Time Broadcast	

Option	Description	Setting			
Device Clock (On-line Mode)					
Device Date	Configure the device date				
Device Time	Configure the device time				
Sunc BC Clock	Synchronize with PC Clock by selecting	Dofault - Dicablod			
Sync. PC Clock	check-box	Delault – Disableu			
Time Settings					
Time Zone	Configure the Time Zone	Default = UTC + 08:00			
	Select the clock source for Time Sync.				
Clock Source	RTC: Internal RTC	Default = RTC			
	SNTP: Simple Network Time Protocol				
SNTP Settings					
Server IP	Specify the SNTP Server's IP address	Default = 127.0.0.1			
Time Sync. Interval	Specify how often the PMC-1304-3 contacts the	1 to 300 minutes			
(min)	NTP server for the correct time	Default = 60			
Accept Time	Allow the DMC 1204 2 to accept time broadcast	Dofault - disabled			
Broadcast					

Notes:

1) The Default Gateway must be properly configured if the SNTP Server is not located on the same subnet as one of the Ethernet ports.

4.3.1.3 FTP Password

The PMC-1304-3's built-web supports modifying FTP Password when the device is deployed as a FTP Client. This option only exists in the RTU Model's On-line programming mode. Click on **FTP Password** under **Device Settings** on the left-hand pane and the following screen appears. Enter the old username, old password, new user name and new password, and then click **Submit** to store the new password.

EET	PMC-1304 Web Console	🔚 Save 🛛 Quit
Device Settings Network Time	¹ Submit FTP Password Setup Old Username	
FTP Password Channel Management Data Cache Management	Old Password	
System Maintenance	New Password Confirm Password	

4.3.2 Channel Management

4.3.2.1 Channel Settings

This option exists in both the On-Line and Off-Line programming modes, but only for the RTU Model.

Click on **Channel Settings** under **Channel Management** on the left-hand pane and the following screen appears.

EET		PI	MC-1304	Web Cons	sole			C	🚽 Save (Quit
✓ Device Settings	얍 Sub	omit								
Network		Enabled	Description	Channel Config	Baudrate	Data Bits	Parity	Stop Bits	Advanced	1
Time	P3	 Image: A second s	Channel 1	ModbusMaster	9600	8	Even	1	Ú7	-
 Channel Management 	P4	v	Channel 2	ModbusMaster	9600	8	Even	1	Ċ7	
Channel Settings	P5	V	Channel 3	ModbusMaster	9600	8	Even	1	Ċ	
Slave IED Management	P6	V	Channel 4	ModbusMaster	9600	8	Even	1	Ċ	
Driver Management										
Modbus Gateway										
 Data Cache Management 										
 System Maintenance 										

Click on a particular parameter to modify the detailed settings.

Option	Description	Setting
Enabled	Checked if the Channel is enabled	Enabled by default
Description	Channel description	Default = "Channel X"
Channel Config	Only support ModbusMaster, cannot be modified	ModbusMaster
Baudrate	Select the Baudrate	300, 600, 1200, 2400, 4800, 9600*, 19200, 38400, 57600, 115200

Data Bits	Select the number of Data Bits	5, 6, 7, 8*
Parity	Select the Parity setting	None, Odd, Even*, Mark, Space
Stop Bits	Select the number of Stop Bits	1*, 2

*Default

Advanced Settings

Advanced Settings		
Polling Delay (ms)	30	* *
Packet Timeout (ms)	1000	▲ ▼
Byte Timeout (ms)	20	
Transmit Delay (ms)	0	* *
Time Sync. Interval (s)	300	▲ ▼
Loop Delay (s)	0	
Reserved		

Option	Description	Setting	
Polling Dolay (ms)	Time delay between the requests of conceptive Slave IEDs	0 to 60000 ms	
Politing Delay (IIIS)	Time delay between the requests of consecutive slave iebs	Default = 30	
Packet Timeout	The maximum waiting time for a response packet	0 to 60000 ms	
(ms)	The maximum waiting time for a response packet	Default = 1000	
	Specify the maximum amount of time between the	0 to 60000 ms	
Byte Timeout (ms)	reception of two consecutive bytes before a packet frame is	$D_{\rm of}$	
	considered to have ended	Delault – 20	
Transmit Delay	Time delay for sending the next request packet after the last	0 to 60000 ms	
(ms)	response packet has been received	Default = 0	
Time Sync. Interval	Salast how often the Time Suns. Dackets are sent	0 to 60000 s	
(s)	Select now often the time sync. Fackets are sent	Default = 300	
Loop Dolay (c)	Time delay between successive scans of the entire loop of	0 to 60000 s	
Loop Delay (S)	Slave IEDs	Default = 0	
Reserved	Enter extended parameters	Default =Null	

Notes:

1) Only experienced personnel should modify the Advanced Settings of the PMC-1304-3.

4.3.2.2 Driver Management

This option exists in both the On-Line and Off-Line programming modes, but only for the RTU Model. For the On-Line mode, only .SO file can be uploaded while .DRI file can be uploaded for the Off-Line mode.

Click on **Driver Management** under **Channel Management** on the left-hand pane and the following screen appears.

Conce county	📫 Add Driver 🛛 🔞 Se	elect All 🗙 Remove Driver		
Network	No.	Select	Driver	Protocol
Time	1		PMC-53MV62	Modbus
Channel Management	2		SND-ION7350V10	Modbus
Channel Settings	3		PMC-680iV30	Modbus
Slave IED Management	4		PMC-660V14	Modbus
Driver Management				
Modbus Gateway				
Data Cache Management				
Cache Management				
Data Cache				
Data Cache System Maintenance				
Data Cache System Maintenance Password Setup				

Option	Description	Setting
Add Driver	Add a new Driver by clicking Add Driver	
Select All	Select all drivers	
Remove Driver	Remove the selected (checked) driver(s)	
Select	Select a Driver by checking the check box	Default = Un-checked
Driver	Driver Description	
Protocol	The Protocol implemented for the Driver	

Notes:

1) Once the driver has been removed, all devices requiring this driver will be removed, and their corresponding data will become N/A.

Add Driver

Add Driver	×
Browse Cancel	
File extension should be .DRI, and its size must be less than 4MB.	
Information	
 Processing Completed! 	
Upload	se

Click Browse... to select a .DRI file and the file size must be less than 4MB.

Click Upload, the process information will be shown under Information.

Remove Driver

Select a driver from the driver list and click **Remove Driver**, the warning information will be shown as below. Click **OK** to remove the driver and **Cancel** to give up removing.

Warning!	X
Once the Driver has been remo requiring this Driver will be remo corresponding data will become	ved, all IEDs oved, and their e N/A.
	OK Cancel

4.3.2.3 Slave IED Management

This option exists in both On-Line and Off-Line programming modes, but only for RTU Model. Please note that before adding slave IED, the corresponded drivers should be configured.

Click on **Slave IED Management** under **Channel Management** on the left-hand pane and the following screen appears.



Option	Description	Setting
Channel X	Select the Channel to modify	Channel 1 to 4
Сору	Copy from this Channel to another	
New	Add a new Slave IED	
Remove	Remove the selected Device	
No.	IED number	
IED Description	IED description	Maximum 51 characters
Driver	Driver description	
Unit ID	Slave IED Unit ID	
Mayoform Decord	Enable the collection of Waveform Records for	Enable or Disable
wavelorm Record	CET devices that support this feature	Default = Disable
Reserved	Enter extended parameters	NULL = Default
Data Map	View Driver's Data Map for the IED	

Notes:

- 1) Once the slave IED has been removed, its corresponding data will become N/A.
- 2) Use <Shift> and <Ctrl> keys to select multiple devices.

Click on Circ icon on the right side to reveal the data mapping information for a particular Driver as illustrated below. The data mapping is divided into five categories: AI (Analog Input), DI (Digital Input), SOE (Sequence of Event), Energy (Electrical energy) and DO (Digital Output).

Device Settings						
Network	Ø Bac	<pre>(IED: dev_1(PMC-530AV33)</pre>				
Time	AI	DI SOE Energy DO				
Channel Management	😰 Su	omit				
Channel Settings	No.	Description	Unit			
Slave IED Management	1	Van	V		4	
Drives Management	2	Vbn	V			
Jriver Management	3	Ven	V			
Nodbus Gateway	4	Vin average	V			
Data Cache Management	5	Vab	V	V		
System Maintenance	6	Vbc	V			
	7	Vca	V	V		
	8	VII average	V	V		
	9	la	A	A		
		lb	A			
	11	Ic	A			
	12	l average	A			
	13	kWa	KW			
	14	kWb	KW			
	15	kWc	KW			
	16	ΣkW	KW			
	17	kvara	kvar			
	18	kvarb	kvar			
	19	kvarc	kvar			
	20	∑kvar	kvar			
	21	kVAa	KVA			
	22	kVAb	KVA			
	33	W/Ar	K//Q			
	1 - 50 c	f 241 results		« < 1 2 3 4 5 > »	50 •	
					50	

Option	Description	Setting
<back></back>	Return to Slave IED Management page	
IED: XXXX	IED's name and Driver info.	
AI	Analog Input data	
DI	Digital Input data	
SOE	Sequence of Event	
Energy	Electrical energy data	
DO	Digital Output data	
Description	Parameter name	Maximum 31 characters
Unit	Measurement unit	

4.3.2.4 Modbus Gateway

This option is available in both T and RTU Models. For the RTU Model, it exists in both the On-Line and Off-Line programming modes.

Click on **Modbus Gateway** under **Channel Management** on the left-hand pane and the following screen appears. **Modbus Gateway** is used to configure mapping relationship between Ethernet and Modbus Gateway of the serial port.

T Model:

EET		PMC-130	4 Web Console		Save Qu
 Device Settings 	C N	lew 🗙 Remove 😙 Sul	omit		
Network	No.	Channel	Unit ID (Local)	Map ID (Remote)	
 Channel Management 	1	P3	1	1	
Serial Port	2	P3	2	2	
Modbus Gateway	3	P3	3	3	
 System Maintenance 	4	P3	4	4	
Password Setup					
Backup/Restore					
System Information					
Reboot					

RTU Model:

EET		PMC-13	04 Web Console		Save Quit
 Device Settings 	C Ne	w 🗙 Remove 🕆 Subr	nit		
Network	No.	Channel	Unit ID (Local)	Map ID (Remote)	
Time	1	P3	1	1	
 Channel Management 	2	P3	2	2	
Channel Settings	3	P3	3	3	
Slave IED Management	4	P3	4	4	
	5	P3	5	5	
Driver Management	6	P4	1	6	
Modbus Gateway	7	P4	2	7	
Data Cache Management	8	P4	3	8	
	9	P4	4	9	
 System Maintenance 	10	P4	5	10	

Option	Description	Setting
New	Add a new mapping relationship by clicking New.	
Remove	Remove the selected mapping relationship.	
No.	Modbus Gateway number	
Channel	Channel P3 to P6.	
Unit ID (Local)	Serial Device's Unit ID, each of channel's unit ID must be unique.	1~247
	Ethernet Mapping ID, each of Map ID must be	
Map ID (Remote)	unique, no matter it belongs to same channel or	1~247
	not.	

Notes:

1) The default port number of Modbus Gateway is 502.

4.3.2.5 Serial Port

This option is only available in the T model.

Click on **Serial Port** under **Channel Management** on the left-hand pane and the following screen appears.

 Device Settings 	😭 Submi	t					
Network		Baudrate	Data Bits	Parity	Stop Bits	Packet Timeout (ms)	Byte Timeout (ms)
 Channel Management 	P3	9600	8	Even	1	1000	20
Serial Port	P4	9600	8	Even	1	1000	20
Modhus Gatoway	P5	9600	8	None	1	1000	20
Moubus Galeway	P6	9600	8	Even	1	1000	20
 System Maintenance 							
Password Setup							
Backup/Restore							
System Information							

Option	Description	Setting	
		300, 600, 1200, 2400,	
Baudrate	Select the Baudrate	4800, 9600*, 19200,	
		38400, 57600, 115200	
Data Bits	Select the number of Data Bits	5, 6, 7, 8*	
Darity	Select the Darity setting	None, Odd, Even*,	
Parity	Select the Parity setting	Mark, Space	
Stop Bits	Select the number of Stop Bits	1*, 2	
		0 to 60000 ms	
Packet Timeout (ms)	The maximum waiting time for a response packet	Default = 1000	
	Specify the maximum amount of time between the	0 to 60000 mc	
Byte Timeout (ms)	reception of two consecutive bytes before a packet		
	frame is considered to have ended	Default = 20	

Notes:

1) PMC-1304-3 supports up to 16 TCP connections for Client access over Ethernet.

4.3.2 Data Cache Management

This option is only available in the RTU Model. RTU Model can sever as a standalone data logger which provides 2GB On-Board Memory, sufficient for storing data from downstream IED @ 60 minutes interval for 900 days.

4.3.2.1 Cache Management

This option exists in both the On-Line and Off-Line programming modes.

Click on **Cache Management** under **Data Cache Management** on the left-hand pane and the following screen appears.

 Device Settings 	🗘 Subn	nit						
Network		Enabled	Description	Slave Protocol	Server Port	Client IP	Data Export	
Time	1	Disable 👻	Data Cache 1	ModbusTcp	2001	Any	Úr	
 Channel Management 	2	×	Data Cache 2	ModbusTcp	2002	Any	Ċ7	1
 Data Cache Management 						1		
Cache Management								
Data Cache								
System Maintenance								

Option	Description	Setting
Epoblod	Enable the Data Cache	Enable or Disable
LIIabled		Default = Disable
Description	Data Cache Name	Default = Data Cache X
Slave Protocol	Only support ModbusTcp and cannot be modified.	Default = ModbusTcp
Slave Port	Slave Communications Port	Default = 2001 to 2002
	If the IP address is entered, only the Client with the	0.0.0.0 to
Client IP	specified IP Address will have access to this particular Data	255.255.255.255
	Cache. Otherwise, keep it empty to allow access by any	Default = Any
	Clients.	-

Notes:

1) PMC-1304-3 supports up to 16 TCP connections for Client access over Ethernet.

Data Export Setting

Click the \Box icon on the right to edit the Data Cache configuration.

The following dialog box displays in the Basic Settings when the Slave Port is set to Ethernet.

Ceiec Electric Technology

Logging		
Interval	5 min -75 Dava	
	-ro bays	
Schedule		
Interval	1 Hour 👻	
Time of Day	00:00	
Time of Day	UU:UU	
Day of the Week	Sunday -	
FTP Server		
Server		
001101		
Server Port	21	
Username		
Password		
Directory		
Directory		
Modo	Dessive	

Option	Description	Setting
Logging		
Interval	The interval of storing data that belong to the channel.	1~60min
Schedule		
Interval	The interval of FTP server uploads CSV file. When the Logging' s Interval is set to 1min, the weekly option for Schedule' s Interval is not available.	1hour, 4hour, 8hour, 12hour, daily, weekly
Time of Day	Configure a fixed time to upload CSV file. This is valid only Interval is set to Daily or Weekly.	Default = 00:00
Day of the Week	Configure a fixed day to upload CSV file. This is valid only Interval is set to Weekly.	Default = Sunday
FTP Server		·
Server	FTP Server IP address or domain name.	
Server Port	FTP Server port.	Default = 21
User Name	The user name to login FTP Server.	
Password	The password to login FTP Server.	
Directory	The directory that store CSV files.	
Mode	The mode of FTP Server.	Passive (Default), Active

Notes:

1) The On-line mode support testing configuration via clicking **Test Data Export.**

Ceiec Electric Technology

Test Data Export		
Logging		
Interval	1 min	- =15 Days
Schedule		
Interval	8 Hour	*
Time of Day	00:00	Ψ.
Day of the Week	Sunday	w
FTP Server		
Server		
Server Port	21	
Username		
Password		
Directory		
Mode	Daesius	

4.3.2.2 Data Cache

This option exists in both the On-Line and Off-Line programming modes. Click on **Data Cache** under **Data Cache Management** on the left-hand pane and the following screen appears.

Off-line Mode:

EET	PMC-1304 Web Console	Save Quit
Device Settings Network Time	Data Cache 1 If Add Parameters Im Copy Im Export Parameters to Excel Al Di SOE Energy DO DO Do Di <lidi< li=""></lidi<>	
Channel Management Data Cache Management Cache Management	No. Parameter Description IED Description Channel Description Scaling Factor Deadbar	1d(%)
Data Cache System Maintenance		

On-line Mode:

Coloc	E	loctric	Too	hno	0011
CEIEC	Г.	IPUTTU	THE C		IUS V
00.00	_				~ ~ ~ /

 Device Settings 	Data C	ache 1	👻 🍫 Re	fresh 📄 Expo	rt Data Log				
Network	AI	DI	SOF	Energy	DO				
Time				=					
Channel Management	No.	Parameter Description	IED Description	Channel Description	Scaling Factor	Deadband(%)	Real-time Value	Unit	
Data Cache Management	1	Van	test(PMC-	Channel 2	1.000	1.000	219.540		
Cache Management			test(PMC-						- 1
Data Cache	2	Vbn	D726MV10)	Channel 2	1.000	1.000	219.510		
System Maintenance	3	Vcn	test(PMC- D726MV10)	Channel 2	1.000	1.000	219.430		
Password Setup	4	Vin average	test(PMC- D726MV(10)	Channel 2	1.000	1.000	219.490		
Statistics Clear History	5	Vab	test(PMC- D726MV10)	Channel 2	1.000	1.000	380.250		
Backup/Restore	6	Vbc	test(PMC- D726MV10)	Channel 2	1.000	1.000	380.200		
System Information	7	Vca	test(PMC- D726MV10)	Channel 2	1.000	1.000	380.060		
Rebuu	8	VII average	test(PMC- D726MV10)	Channel 2	1.000	1.000	380.170		
	9	la	test(PMC- D726MV10)	Channel 2	1.000	1.000	5.001		
	10	Ib	test(PMC- D726MV10)	Channel 2	1.000	1.000	5.001		
	11	Ic	test(PMC- D726MV10)	Channel 2	1.000	1.000	5.000		
	12	I average	test(PMC- D726MV10)	Channel 2	1.000	1.000	5.001		
	13	kWa	test(PMC- D726MV10)	Channel 2	1.000	1.000	0.992		
	14	kWb	test(PMC- D726MV10)	Channel 2	1.000	1.000	0.991		
	1-29	of 29 results	test(PMC-	050	4 000	4 000	0.000	< 1 1 > » 50	

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Copy

Option	Description	Setting
Data Cache X	Select which Cache to modify	
Add Parameters	Add parameters to the selected Data Cache	
Conv	Copy parameters from the selected Data Cache to	
Сору	another Data Cache	
Export Parameters to	Event all the parameters in colorted Data Cashe to Even	
Excel (Off-line mode)	export all the parameters in selected Data Cache to excel	
Export Data log	Export data logs to Excel file. Users can open the excel	
(On-line mode)	file or save it after clicking Export Data Log.	
Al1	Analog Input data for the selected Data Cache	
DI ²	Digital Input data for the selected Data Cache	
SOE ³	Sequence Of Events for the selected Data Cache	
Energy ⁴	Electrical Energy data for the selected Data Cache	
DO ⁵	Digital Output data for the selected Data Cache	
Pamova Paramators	Remove the selected parameters and fill the original	
Remove Parameters	position with N/A, a null parameter	
Delete Parameters	Delete the selected parameters to delete shift the next	
Delete Falameters	parameters up by one position	
	The parameters which have been removed will be	
Sort	deleted from the list, and the remaining parameters will	
	be sorted again.	
No.	Parameter index	
Parameter Description	View-only Parameter name	
IED Description	View-only IED name	
Channel Description	The Channel to which a parameter belongs	

Scaling Factor	PMC-1304-3 transmits the product of real-value and	0.001 to 1000
Scaling Factor	scaling factor. This is only valid for IEC101 or IEC104.	Default = 1.000
Deadband	When the value of a parameter fluctuates by an amount	
	that is larger than the specified Deadband, PMC-1304-3	0.001 to 100
	will upload the value to the Master using Report by	
	Exception.	Default = 1.000
	This is only valid for IEC101 or IEC104	

Notes:

- 1) The maximum no. of AI in each Data Cache is 2048.
- 2) The maximum no. of DI in each Data Cache is 2048.
- 3) The maximum no. of SOE in each Data Cache is 1024.
- 4) The maximum no. of Energy in each Data Cache is 1024.
- 5) The maximum no. of DO in each Data Cache is 512.
- 6) Use <Shift> and <Ctrl> keys to select multiple devices.

4.3.2 System Maintenance

4.3.2.1 Password Setup

This option is available in both T and RTU Models. For RTU Models, this option exists in both the On-Line and Off-Line programming modes. However, on-line mode and off-line mode have their own password, please login corresponding web to modify passwords.

Click on **Password Setup** under **System Maintenance** on the left-hand pane and the following screen appears. Click **<Submit>** and then **<Save>** to save your changes after modification.

EET	PMC-1380 Web Console	🔛 Save 🛛 Quit
 Device Settings Channel Management Data Cache Management 	Submit Password Setup Chang Liser Name and Password	
System Maintenance Password Setup Backup/Restore	Old User Name	
System Information	New User Name	
	Confirm Password	

Option	Description	Setting
Old User Name	Enter the old user name	
Old Password	Enter the old password	
New User Name	Enter the new user name	The new User Name cannot be admin .
New Password	Enter the new password	
Confirm Password	Confirm the new password	

4.3.2.2 Channel Debugging

The RTU Model has capacity of debugging channels and capturing four channels sending and receiving message. However, this menu only exists in both the On-Line programming modes.

Click on Statistics under System Maintenance on the left-hand pane and the following screen appears.

PMC-1304 Web Console					Quit	
Device Settings	<i>ø</i> .,	Refresh				
Channel Management	-	Status	Tx (Bytes)	Rx (Bytes)	Connected Time (s)	
Data Cache Management	1	Open	0	0	0	
- System Maintonanco	2	Close	0	0	0	
• System Maintenance	3	Close	0	0	0	
Password Setup	4	Close	0	0	0	
Statistics						
Clear History						
Backup/Restore						
System Information						
Pohoot						

Option	Description	Setting
Status	The status of the serial port, open or closed.	
Tx (Bytes)	The data (bytes) that the device transmitted.	
Rx (Bytes)	The data (bytes) that the device received.	
Connected Time (s)	The time the serial port has been connected.	

4.3.2.3 Clear History

This option only exists in the RTU Model's on-line programming mode.

Click on **Clear History** under **System Maintenance** on the left-hand pane and the following screen appears. Click **Clear History** to clear all data logs, waveform records and SOE logs. Once clear completed, the device will reboot automatically.

EET	PMC-1304 Web Console	🔡 Save	Quit
Device Settings	Clear History		
 Channel Management 			
Data Cache Management	Notes:		
- System Maintenance	All Data Logs, Waveform Records, SOE Logs will be cleared.		
Password Setup	 The PMC-1304 will reboot after the Clear History operation is complete. 		
Statistics			
Clear History			
Backup/Restore			
System Information			
Reboot			

4.3.2.4 Backup/Restore

This option is available in both T and RTU Models. For the RTU Models, this option exists in both the On-Line and Off-Line programming modes.

Click on **Backup/Restore** under **System Maintenance** on the left-hand pane and the following screen appears.

T Model:

EET	PMC-1304 Web Console	Save Quit
✓ Device Settings	Reskun/Pastere	
Network	Backupirkestore	
 Channel Management 	Exporting configuration file, please wait	
Serial Port	Backup configuration	
Modbus Gateway	System Will Reboot After Restore configuration Succeeded	
 System Maintenance 	Select configuration file to restorel	
Password Setup	Browse	
Backup/Restore	Restore configuration	
System Information		
Reboot	Load Factory Default	
	Loading Factory Default, please wait	
	System Will Reboot After Load Factory Default Succeeded!	
	Load Factory Default	

RTU Model:

ET	PMC-1304 Web Console
Device Settings Network Time	BackupiRestore • Exporting configuration file, please walt
Channel Management	Backup configuration
 Data Cache Management Cache Management Data Cache 	Select configuration file to restore! Browse Restore configuration
System Maintenance	
Backup/Restore	Load Factory Default Loading Factory Default, please wait
	Synchronization Settings Synchronize between the Web Console and PMC-1304 PMC-1304's IP: PMC-1304's IP: PMC-1304's IP: PMC-1304 Discover PMC-1304

Option	Description	Setting
Packup Configuration	Create a backup copy, named "cmdata.cfg", of the Web	
Backup Comgulation	Console's configuration on the local computer.	
Drowco	Select a configuration file on the local computer to	
BIOWSE	restore to the Web Console	
Restore Configuration	Restore the selected configuration to the Web Console	
	Reset all settings of the Web Console's configuration file	
Load Factory Default	to factory default. All previous settings are	
	overwritten.	
	Specify the ID address of the DMC 1204 2 to synchronize	0.0.0.0 to
PIVIC-1504 5 IP	Specify the P address of the PMC-1504-5 to synchronize	255.255.255.255
PMC-1304 -> Web	Upload the complete configuration from the connected	
Console ^{#*}	PMC-1304-3 to the Web Console	
Web Console ->	Download the complete configuration from the Web	
PMC-1304 ^{#*}	Console to the connected PMC-1304-3	
	Discover if there are any PMC-1304-3 devices on the	
	LAN and list their IP addresses	

* This option exists only in the Off-Line programming mode. # This option exists only in the RTU Model.

4.3.2.5 System Information

This option is available in both T and RTU Models. For the RTU Model, it exists in both the On-Line and Off-Line programming modes.

Click on **System Information** under **System Maintenance** on the left-hand pane and the following screen appears. The user will need to select the correct PMC-1304-3 model by specifying the requested information here to create a factory default configuration for making further changes. It's not recommended to use this option to create an off-line configuration file for a PMC-1304-3. It would be easier and safer for the user to connect to a real PMC-1304-3 for the first time and then to upload its configuration for future off-line changes.

T Model:

Device Settings Version Version	PMC-1304 Web Console				
• Channel Management PMC-1304-3- [T •] 00-04 •] 2 •] T2-XX-XXXX •] E • Serial Port Information • System Maintenance Name Password Setup Backup/Restore					
Serial Port Information • System Maintenance Name Password Setup BackupRestore Version 1.00.11					
System Maintenance Name PMC-1304-3 Password Setup Backup/Restore Version 1.00.11					
Password Setup Backup/Restore Version 1.00.11					
System Information Date 2016-01-15					
Reboot S/N 1507230001					
MAC 1 00-00-93-ef-68-11					
MAC 2 00-00-93-ef-68-12					

RTU Model:

EET	PMC-13	04 Web Console	Save Quit
Device Settings Network Time		-04 v.)[2 v.)[T2-XXXXXX v.)[E v]	
Channel Management Data Cache Management	Information		
Cache Management Data Cache	Name	PMC-1304-3	
- System Maintenance	Version	1.00.10	
Password Setup	Date	2015-10-19	
Backup/Restore System Information	S/N	1307230001	
	MAC 1	00-00-93-ef-68-11	
	MAC 2	00-00-93-ef-68-12	

Option	Description	Setting
	Salact the correct model for	Default =
Model	configuration	PMC-1304-3-T-00-04-2-T2-XX-XXXX-E
	configuration	/PMC-1304-3-R-00-04-2-T2-XX-XXXX-E
Name	Specify a name for the PMC-1304-3	Default = PMC-1304-3 (Max. 31 characters)
Version	Firmware Version	
Date	Firmware's Date and Time	
S/N	Device's Serial Number	
MAC1	MAC address of Ethernet Port 1	
MAC2	MAC address of Ethernet Port 2	

4.3.2.6 Reboot

This option is available in both T and RTU Models. For the RTU Model, it exists only in the On-Line programming mode.

Click on **Reboot** under **System Maintenance** on the left-hand pane and the following screen appears. After reading notes carefully, users can click **Reboot** to restart the device.

T Model:

EET	PMC-1304 Web Console
Device Settings	PReboot
Channel Management	Neter
Serial Port	Notes: Please make sure that the current configuration has been saved before rebooting or your changes will be lost
Modbus Gateway	The new configuration will take effect after reboot.
 System Maintenance 	 Use the IP address <192.168.0.127> to connect to the PMC-1304 after reboot.
Password Setup	
Backup/Restore	
System Information	
Reboot	

RTU Model:

SET	PMC-1304 Web Console
Device Settings	Reboot
 Channel Management 	·
Channel Settings	Notae:
Slave IED Management	 Please make sure that the current configuration has been saved before rebooting or your changes will be lost.
Driver Management	The new configuration will take effect after reboot.
Modbus Gateway	 Use the IP address <192.168.1.127> to connect to the PMC-1304 after reboot.
 Data Cache Management 	
Cache Management	
Data Cache	
 System Maintenance 	
Password Setup	
Statistics	
Clear History	
Backup/Restore	
System Information	
Reboot	

Chapter 5 Modbus Register Map

This chapter provides a complete description of the Modbus register map (Protocol Version 1.1 and above) for the PMC-1304-3-R communication processor to facilitate the development of 3rd party communication driver for accessing information on the RTU Model.

The PMC-1304-3-R supports the following Modbus function:

- 1) Read Holding Registers (Function Code 0x03)
- 2) Force Single Coil (Function Code 0x05)
- 3) Preset Multiple Registers (Function Code 0x10)

For a complete Modbus Protocol Specification, please visit http://www.modbus.org.

5.1 Analog Input Register

Register	Property	Description	Format
40000	RO	Al1	Float
40002	RO	AI2	Float
40004	RO	AI3	Float
	RO		Float
44094	RO	AI2048	Float

Table 5-1 AI Measurements

Notes:

1) When the Alx's reading is 0x7fffffff, the register value is invalid. For example, when the Al's corresponding IDE cannot be connected normally; the register's reading would be 0x7fffffff.

Register	Property	Description	Format
45000	RO	DI01~DI16	UINT16
45001	RO	DI17~DI32	UINT16
45002	RO	DI33~DI48	UINT16
	RO		UINT16
45127	RO	DI2033~DI2048	UINT16
45128	RO	SOE Total ¹	UINT32

5.2 Digital Input Register

Table 5-2 DI Measurements

Notes:

- The range of the registers is between 0 and 0xFFFFFFF, the register will roll over to 1 if its current value is 0xFFFFFFFF, as the resetting register will be recorded as a SOE event. The master will read the register's value and compare with last reading.
 - If the latest value is same as the last value, there is no newly SOE event.
 - If the latest value is different from the last value, there are newly SOE events. For example, the last reading and the latest reading are 10 and 15, respectively, then there are 5 newly SOE events.
- 2) Each of connected devices will be defined as a virtual DI to show communication status, where 1 means **Connected**, while 0 means **Disconnected**.

5.3 Energy Register

Reg	ister	Property	Description	Forn	nat
46000	46000	RO	PI1	INT32	INT64
46002	46004	RO	PI2	INT32	INT64
46004	46008	RO	PI3	INT32	INT64
		RO		INT32	INT64
48046	50092	RO	PI1024	INT32	INT64

Table 5-3 Energy Measurements

Notes:

1) When the PIx's reading is 0x7fffffff, the register value is invalid. For example, when the PI's corresponding IDE cannot be connected normally, and the register's reading would be 0x7fffffff.

5.4 Remote Control

Register	Property	Description	Format		
61000	WO	Arm Remote Control #1 Close/Open	UINT16		
61001	WO	Execute Remote Control # 1 Close/Open	UINT16		
61002	WO	Arm Remote Control #2 Close/Open	UINT16		
61003	WO	Execute Remote Control #2 Close/Open	UINT16		
	WO		UINT16		
62022	WO	Arm Remote Control #512 Close/Open	UINT16		
62023	WO	Execute Remote Control #512 Close/Open	UINT16		
Table 5-4 Remote Control					

Notes:

1) Only writing the value 0xFF00 to the specific register to "Arm" or "Execute" a particular relay.

5.5 SOE

Register	Property	Description	Format
52000~52009	RO	SOE1	
52010~52019	RO	SOE2	Cas Table F. C
52020~52029	RO	SOE3	See Table 5-6
52030~52039	RO	SOE4	SUE LUG Dala
	RO		Structure
54550~54559	RO	SOE256	

Table 5-5 SOE Buffer

Offset	Properties	Description	Format	Note
.0	DO	High-order Byte: Storage Location		-
+0	ĸŬ	Low-order Byte: Event Classification	UINT16	
. 1	DO	High-order Byte: Channel No		
+1	+1 KO	Low-order Byte: Unit ID ¹	UINT16	
		High-order Byte: Reserved		
+2	RO		UINT16	1=Alarm Return/Open
		Low-order Byte: DPI		2=Alarm/Closed
+3	RO	SOE Position No in Data Cache	UINT16	

. 4		High-order Byte: Year (-2000)		0-99 (Year-2000)
+4	ĸŬ	Low-order Byte: Month	UINT16	1 to 12
	DO	High-order Byte: Day		1 to 31
+5	+5 KU	Low-order Byte: Hour		0 to 23
16	+6 RO	High-order Byte: Minute		0 to 59
+0		Low-order Byte: Second		0 to 59
+7	RO	Millisecond	UNIT16	0 to 999
+8	RO	Event Value ²	Float	-

Table 5-6 SOE Log Data Structure

Notes:

- 1) The unit ID is the actually communication ID. Only the last 2 characters will be uploaded if ID is longer than 4 characters, for example a device's unit ID is 123456789012, then only 12 will be uploaded.
- 2) Please refer to connected device's user manual to find the event meaning. Invalid operation will be recorded as 0x7fffffff.

Register	Property	Description Format		Note
60000	WO	High-order Byte: Year		1-37 (Year-2000)
60000	VVO	Low-order Byte: Month		1 to 12
60001	14/0	High-order Byte: Day	UINT16	1 to 31
60001	WO	Low-order Byte: Hour		0 to 23
60002	14/0	High-order Byte: Minute		0 to 59
60002	vvO	Low-order Byte: Second		0 to 59
60003	WO	Millisecond	UINT16	0 to 999

5.6 Time

Table 5-7 Time Registers

5.7 Data Recorder Log

The PMC-1304-3's real-time data, including AI and PI, is recorded as data recorder log. A DR log records all of the AI and PI data in data cache at a certain moment. As for recording depth, users can configure via the **Data Export** web interface under **Data Cache Management** > **Cache Management** menu.

Register	Property	Description	Format
30000	RO	DR Log Index	UINT32
30002	RW	Current DR Log Pointer	UINT32
30004	RO	DR Depth	UINT16
20005	RO	High-order Byte: Year	
30005		Low-order Byte: Month	UINTIO
20006	High-order Byte: Day	High-order Byte: Day	
50000 KU	ĸŬ	Low-order Byte: Hour	UINTIO
30007	DO	High-order Byte: Minute	
	кO	Low-order Byte: Second	

Table 5-8 Data Recorder Log

Notes:

- 1) The register 30000~30007 should be read at the same time.
- 2) **DR Log Index** indicates the latest DR Log index in data cache, and its range is between 0 to 0xFFFFFFFF. The register is incremented by 1 and will roll over to 1 when its current value is 0xFFFFFFFF.
- 3) The **Current DR Log Index** indicates the DR Log index which is reading now.

AI Log Buffer

Register	Property	Description	Format
30100	RO	Al1	Float
30102	RO	AI2	Float
32104	RO	AI3	Float
34194	RO	AI2048	Float

Table 5-9 AI Log Buffer

PI Log Buffer

Register		Property	Description	For	mat
35000	35000	RO	PI1	INT32	INT64
35002	35004	RO	PI2	INT32	INT64
35004	35008	RO	PI3	INT32	INT64
37046	39092	RO	PI1024	INT32	INT64

Table 5-10 PI Log Buffer

5.8 Historic SOE Log

Register	Property	Description	Format
25000	RO	SOE Log Index	UINT32
25002	RW	Current SOE Log Pointer	UINT32

Table 5-11 Historical SOE Log

Register	Property	Description	Format
25100~25109	RO	SOE#1	
25110~25119	RO	SOE#2	
25120~25129	RO	SOE#3	See Table 5-13
25130~25139		SOE#4	Historic SOE Log
			Data Structure
27650~27659	RO	SOE#256	

Table 5-12 Historical SOE Log Buffer

Offset	Properties	Description	Format	Note
.0	DO	High-order Byte: Storage Location		
+0	KU	Low-order Byte: Event Classification	UINT16	
	50	High-order Byte: Channel No		
+1	RO	Low-order Byte: Unit ID ¹	UINT16	
		High-order Byte: Reserved		
+2	RO		UINT16	1=Alarm Return/Open
		Low-order Byte: DPI		2=Alarm/Closed
+3	RO	SOE Position No in Data Cache	UINT16	
+4	RO	High-order Byte: Year (-2000)		0-99 (Year-2000)
		Low-order Byte: Month	UINT16	1 to 12
	DO	High-order Byte: Day		1 to 31
-+5	ĸŬ	Low-order Byte: Hour		0 to 23
	RO	High-order Byte: Minute		0 to 59
+6		Low-order Byte: Second	UINT16	0 to 59
+7	RO	Millisecond	UNIT16	0 to 999
+8	RO	Event Value ²	Float	-

Table 5-13 Historical SOE Data Structure

Notes:

- 1) The unit ID is the actually communication ID. Only the last 2 characters will be uploaded if ID is longer than 4 characters, for example a device's unit ID is 123456789012, then only 12 will be uploaded.
- 2) Please refer to connected device's user manual to find the event meaning. Invalid operation will be recorded as 0x7fffffff.

5.9 WFR Log

The PMC-1304-3 can read and store waveform into /wave directory in FTP server. Masters can retrieve waveform via FTP protocol with user name **cetadmin** and password **Ceiec4567\$%^&**. Up to 4 channels and 4 directories can be defined in /wave which should follow the rules below:

/wave/channel directory/device directory/file name

Where

- Channel directory name should be channel1 to channel4
- The device directories correspond to communication ports and should be defined according to the unit IDs of the connected devices.
- All of the waveforms which were generated by the same device are stored in corresponding directory. Each of directories can store 8 waveforms at most with first-in-first-out mode.

For example: /wave/channel2/10/20150517150110150 indicates the waveform file which was generated at 15:01:10 150ms, 17th May, 2015, by the device whose Unit ID is 10 and belongs to P4.

Notes:

1) All of the directories that used to store waveform files must start with wave.

2) When a device's unit ID is modified or deleted, the sub-directory that corresponds to the unit ID would be deleted.

Register	Property	Description	Format
64000	RO	Waveform Index	UINT32
64002	RW	Current waveform Pointer	UINT32

Table 5-14 Waveform Log

Notes:

- 1) If the reading of **Waveform Index** is larger than last time, it indicates that there are newly generated waveform files.
- 2) The **Current waveform Pointer**'s range is 0 to 0xFFFFFF, the register will roll over to 1, which will be used to retrieve the latest waveform, if its current value is 0xFFFFFFF.
- 3) The registers 64000 to 64003 should be read continuously at the same time when retrieving waveform log.

Register	Property	Description	Format
64010~64034	RO	Waveform Storage Directory	ASCII

Table 5-15 Waveform Storage Directory

5.10 Device Information

Register	Property	Description	ASCII	Note
65000	RO	Device Model ¹	ASCII	
				e.g. 10000
65020	PO	Firmware Version	UINT16	shows the
65020	ĸŬ			version is
				V1.00.00
				e.g. 10 shows
65021	RO	Protocol Version	UINT16	the version is
				V1.0
65022	RO	Firmware Update Date: Year-2000	UINT16	e.g.150709
65023	RO	Firmware Update Date: Month	UINT16	means July
65024	RO	Firmware Update Date: Day	UINT16	9,2015
		Franke Data Tura		0: Unit32
05025	кО	Energy Data Type		1: Int64
65026	RO	Reserved	UINT16	

Table 5-16 Device Information

Note:

1) The Device Model appears in registers 65000 to 65019 and contains the ASCII encoding of the string "PMC-1304-3" as shown in the following table.

Register	Value(Hex)	ASCII
65000	0x50	Р
65001	0x4D	М
65002	0x43	С

65003	0x2D	-
65004	0x31	1
65006	0x33	3
65007	0x30	0
65008	0x34	4
65009	0x2D	-
65010	0x33	3
65010~65019	0x20	<null></null>

Table 5-17 ASCII Encoding of "PMC-1304-3"

Appendix A Technical Specifications

10/100 Base Ethernet Port (P1, P2)					
Standard 10/100BaseT, RJ45 connector					
Cable	CAT5, CAT5e (100m maximum)				
Serial Ports (P3, P4, P5, P6)					
Standard 1xRS-422/485 (P3), 3 xRS-485 (P4,P5, P6)					
Comm. Parameters					
Data bits	5, 6, 7, 8				
Stop bits	1, 2				
Parity	None, Even, Odd, Mark, Space				
Baud rate	300 to 115,200 bps				
	LED Indicators				
	On – Abnormal condition				
Run (Green)	Blinking – Working normally				
	Off – Not powered up or abnormal condition				
	On – Abnormal condition				
Alarm (Red)	Blinking – Restoring default parameters				
	On – Connected but no data activities				
P1 &P2 (Yellow)	Blinking – Data activities				
	Off – Disconnected				
P3&P4&P5&P6					
Rx – Green Blinking – Receiving data					
Tx - Yellow Blinking – Transmitting data					
Protocol					
Protocol Modbus RTU, Modbus TCP, FTP, HTTP					
Power Supply (L/+, N/-)					
Standard 95-250VAC/DC, 47-440Hz					
Burden	<5W				
	Protection				
ESD Protection	15kV (Contactless) and 6kV (Contact) ESD protection for all serial				
	signals				
Isolation Protection	3kV for all Serial signals				
	1.5kV for Ethernet Ports				
Environmental Conditions					
Operating Temp.	-25°C to +70°C				
Storage Temp.	-40°C to +85°C				
Humidity	5% to 95% non-condensing				
Atmospheric pressure	70 kPa to 110kPa				
	Mechanical Characteristics				
Casing	Galvanized Iron				
Unit Dimensions 115x63x145mm					
Shipping Weight 0.95kg					

Shipping Dimensions	300x210x150mm
Mounting	DIN-Rail or Surface Mounting
IP Rating	30

Appendix B Standards Compliance

Safety Requirements					
Insulation		IEC 60255-5-2000			
Dielectric Test		2kV @ 1 minute			
Insulation Resistance		>100MΩ			
Impulse Voltage		5kV			
	Electroma	gnetic Compatibility			
Electrostatic Discharge		IEC 61000-4-2:2001 Level IV			
Radiated Fields		IEC 61000-4-3:2006 Level III			
Fast Transients		IEC 61000-4-4:2004 Level IV			
Surges		IEC 61000-4-5:2005 Level IV			
Conducted Disturbance	25	IEC 61000-4-6:2006 Level III			
Magnetic Fields		IEC 61000-4-8:2001 Class III			
Oscillatory waves		IEC 61000-4-12:1995 Level III			
Mechanical Tests					
Vibration Tost	Response	IEC 60255-21-1:1988 Level I			
VIDIATION TEST	Endurance	IEC 60255-21-1:1988 Level I			
Charly Tast	Response	IEC 60255-21-2:1988 Level I			
SHUCK TEST	Endurance	IEC 60255-21-2:1988 Level I			
Bump Test		IEC 60255-21-2:1988 Level I			

Appendix C Ordering Guide

					Ceiec Electric Technole	ogy Version 20160121
Product Cod	le					Description
PMC-1304-3 Co	omn	nunic	atio	ns P	rocessor	
	Bas	sic Fu	ncti	on		
	Т					Modbus TCP/RTU Gateway with Multi-Master Support
	R*					Modbus Mastering with 2GB On-Board Storage
	Г	Seri	al Po	ort		
	L.	00-0)2			2xRS-485 (P3-P4)
	L.	00-0)4*			4xRS-485 (P3-P6)
	L.			Ρον	ver Supply	
	L.			2		95-250VAC/DC, 47-440Hz
	L.	- 1		Г	Ethernet Port	t
	L.				T2-XX-XXXX	100BaseT (P1/P2)
	L.					Interface Language
				L		E English
				Ļ		
PMC-1304-3 -	- T -	00-0	02 -	2 -	T2-XX-XXXX -	- E PMC-1304-3-T-00-02-2-T2-XX-XXXX-E (Standard Model)
* Additional ch	arge	es app	oly			

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