PMC-330

Digital Three-Phase Energy Meter

User Manual

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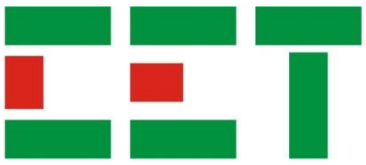
02/09/2012



Ceiec Electric Technology

The information contained in this Manual is believed to be accurate at the time of publication; however, CET assumes no responsibility for any errors which may appear here and reserves the right to make changes without notice. Please consult CET or your local representative for latest product specifications.

Standards Compliance

CE

DANGER

This symbol indicates the presence of danger that may result in severe injury or death and permanent equipment damage if proper precautions are not taken during the installation, operation or maintenance of the device.

CAUTION

This symbol indicates the potential of personal injury or equipment damage if proper precautions are not taken during the installation, operation or maintenance of the device.

DANGER

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

- Installation, operation and maintenance of the meter should only be performed by qualified, competent personnel that have the appropriate training and experience with high voltage and current devices. The meter must be installed in accordance with all local and national electrical codes.
- Ensure that all incoming AC power and other power sources are turned OFF before performing any work on the meter.
- Before connecting the meter to the power source, check the label on top of the meter to ensure that it is equipped with the appropriate power supply, and the correct voltage and current input specifications for your application.
- During normal operation of the meter, hazardous voltages are present on its terminal strips and throughout the connected potential transformers (PT) and current transformers (CT). PT and CT secondary circuits are capable of generating lethal voltages and currents with their primary circuits energized. Follow standard safety precautions while performing any installation or service work (i.e. removing PT fuses, shorting CT secondaries, …etc).
- Do not use the meter for primary protection functions where failure of the device can cause fire, injury or death. The meter should only be used for shadow protection if needed.
- Under no circumstances should the meter be connected to a power source if it is damaged.
- To prevent potential fire or shock hazard, do not expose the meter to rain or moisture.
- Setup procedures must be performed only by qualified personnel familiar with the instrument and its associated electrical equipment.
- DO NOT open the instrument under any circumstances.

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 meter malfunctions. CET accepts no responsibility for the suitability of the meter to the application for which it was purchased.
- Failure to install, set up or operate the meter according to the instructions herein will void the warranty.
- Only CET's duly authorized representative may open your meter. 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.

Table of Contents

Chapter 1 Introduction

This manual explains how to use the PMC-330 Digital Three-Phase Energy Meter. Throughout the manual the term "meter" generally refers to all models. Differences between models are indicated with the appropriate model number.

This chapter provides an overview of the PMC-330 energy meter and summarizes many of its key features.

1.1 Overview

The PMC-330 Digital Three-Phase Energy Meter is CET's latest offer for the low voltage power/energy metering market featuring DIN rail mount, compact construction, high accuracy, multifunction measurements and a large, easy to read LCD display with automatic scrolling. The PMC-330 optionally provides two Digital Inputs for status monitoring and two Digital Outputs for alarming and remote control. The PMC-330 complies with the IEC 62053-21 Class 1 kWh Accuracy Standard. When equipped with the optional RS485 port and Modbus protocol support, the PMC-330 becomes a vital component of an intelligent, multifunction monitoring solution for any Power and Energy Management Systems.

You can setup the meter through its front panel or via our free PMC Setup software. The meter is also supported by our PecStar® iEMS Integrated Energy Management System.

The PMC-330 is available in three models: PMC-330A, PMC-330B and PMC-330C. Following is a list of typical applications for the PMC-330:

- DIN rail mount energy metering
- Industrial and commercial metering
- Substation, building and factory automation
- Sub-metering
- Power quality monitoring

The above are just a few of the many applications. Contact CET Technical Support should you require further assistance with your application.

1.2 Features

Ease of use

- Easy to read LCD with automatic scrolling capability
- Five LED indicators – L1, L2, L3, energy pulsing and kW reverse indication
- Simple, password-protected setup via front panel or free PMC Setup software
- Easy installation with DIN rail mounting, no tools required
- 3-phase power supply, no external control power required
- Direct Input up to 80A without external CT

Basic Measurements

- Bi-directional and per-phase energy measurements
- 3-phase voltage, current and power measurements
- 12-month recording of kWh, kvarh Import/Export/Net/Total and kVAh Total

- TOU tariff metering with 4 tariff rates, 6 seasons, 1 daily profile
- kW Total, kvar Total, kVA Total and Per Phase Current Demands

Power Quality

- Voltage and Current Unbalance
- THD, TOHD, TEHD and K-Factor

Max/Min Log

- Voltage, Current, Frequency, kW, kvar, kVA of this/last month
- Peak Demands of this/last month

SOE Log

- 64 events at 1ms timestamp
- Setup changes, Setpoint events and I/O operations

Setpoints

- 8 user programmable setpoints
- Configurable thresholds and time delays
- DO triggers

Digital Inputs

- 2 channels for external status monitoring
- Self-excited, internally wetted at 24VDC

Digital Outputs

- 2 channels for alarming or remote control, Form A Mechanical Relay

Pulse Outputs

- 1 LED Pulse Output on the front panel for energy pulsing application
- 1 Solid State Digital Output for energy pulsing application
- 1 PPS Solid State Digital Output for clock calibration

Communications

- Optically isolated RS485 port, baud rate from 1200 to 19200bps
- Modbus RTU protocol

Real-time Clock

- Battery-backed real-time clock @ 6ppm
- Clock error ≤ 0.5s/day
- Can be set through front panel or via communications

System Integration

- Supported by our PecStar® iEMS and PMC Setup
- Easy integration into other Automation or SCADA systems via Modbus RTU protocol

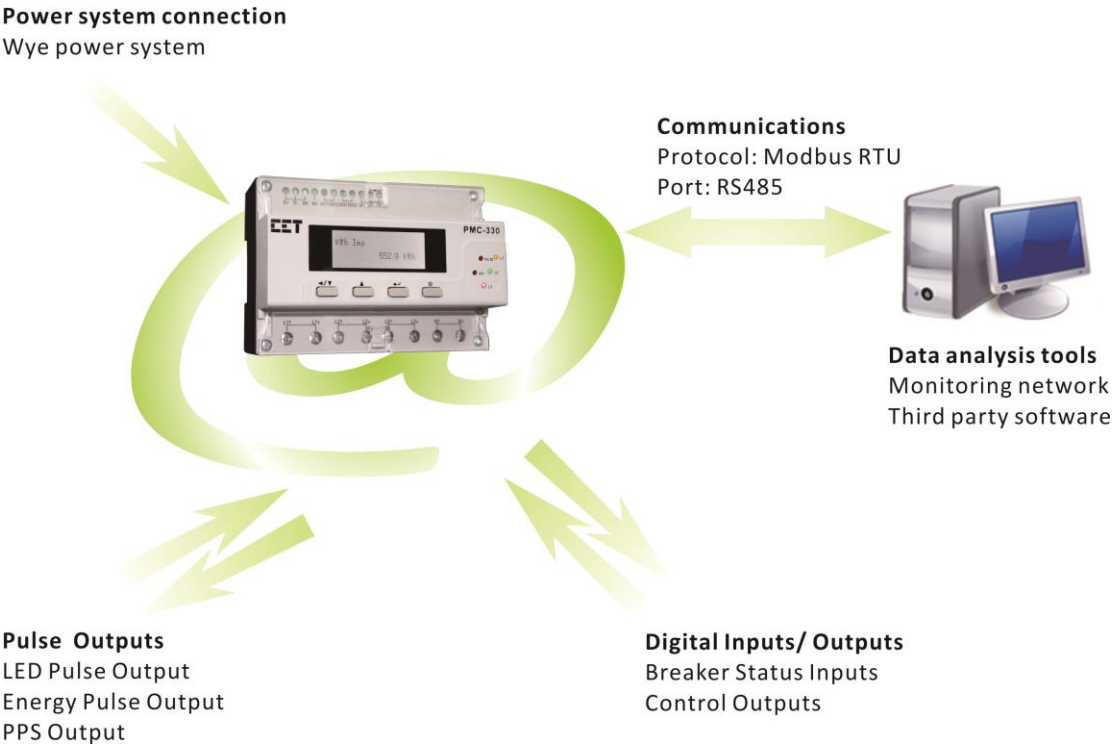
Features and Options List

Features and Options	PMC-330 Models		
Power, Energy and Demand	**A**	**B**	**C**
VLN/VLL per phase and Avg		▪	▪
Current per phase and Avg		▪	▪
kW/ kvar/ kVA per phase and Total		▪	▪
PF per phase and Total		▪	▪
Frequency		▪	▪
kWh Imp, Exp, Net, Total	▪	▪	▪
kvarh Imp, Exp, Net, Total	▪	▪	▪
kVAh Total	▪	▪	▪
kWh, kvarh and kVAh for 12 months	▪	▪	▪
4-Quadrant kvarh		▪	▪
TOU Tariff Metering		▪	▪
kW, kvar, kVA, Ia, Ib, and Ic Demands		▪	▪
Power Quality			
Voltage and Current Unbalance			▪
THD, TOHD, TEHD and K-Factor			▪
Logging and Setpoint			
Max/Min & Peak Demands Recording			▪
SOE Log			▪
Setpoint			▪
Inputs and Outputs			
DI	2*	2*	2*
DO (Mechanical)	2*	2*	2*
Pulse Output (Solid State)	1*	1*	1*
PPS (Solid State)	1*	1*	1*
LED Pulse Output	1	1	1
Communications			
RS-485 Port	1*	1	1

▪ Standard * Optional

1.3 PMC-330 Series' application in Power and Energy Management Systems

The PMC-330 can be used to monitor Wye connected power system. Modbus communications allow real-time data and other information to be transmitted across a RS485 network to an Integrated Energy Management System such as PecStar® iEMS.



1.4 Getting more information

Additional information is available from CET via the following sources:

- Visit www.ceiec-electric.com
- Contact your local representative
- Contact CET directly via email or telephone

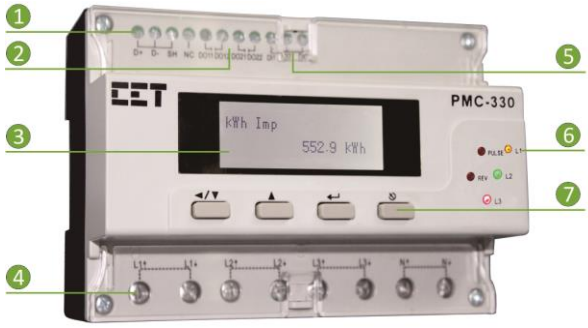
Chapter 2 Installation

Caution

Installation of the PMC-330 should only be performed by qualified, competent personnel that have the appropriate training and experience with high voltage and current devices. The meter must be installed in accordance with all local and national electrical codes.

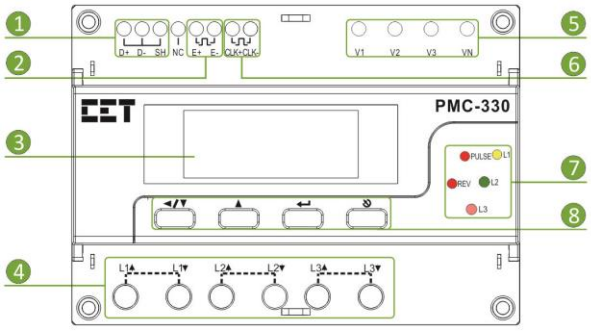
During the operation of the meter, hazardous voltages are present at the input terminals. Failure to observe precautions can result in serious or even fatal injury and equipment damage.

2.1 Appearance



1 RS485 Terminals
2 DO Terminals
3 LCD
4 Voltage and Current Input Terminals
5 DI Terminals
6 LED Indicators
7 Buttons

PMC-330 with Direct Inputs, 2xDI and 2xDO

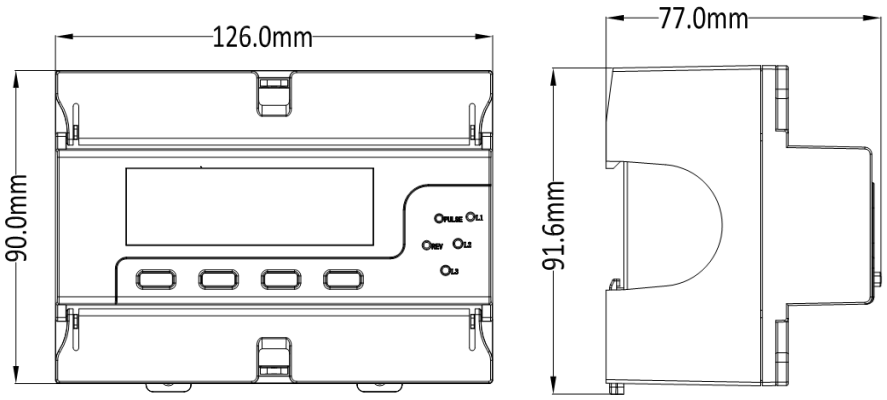


1 RS485 Terminals
2 Energy Pulse Output
3 LCD
4 Current Input Terminals
5 Voltage Input Terminals
6 PPS Output
7 LED Indicators
8 Buttons

PMC-330 with CT Inputs, Energy Pulse and PPS Output

Figure 2-1 Appearance

2.2 Unit Dimensions



Front View **Side View**

Figure 2-2 Dimensions

2.3 Mounting

The PMC-330 Series meter should be installed in a dry environment with no dust and kept away from heat, radiation and electrical noise sources.

Installation steps:

- Move the Installation clips downward to the “unlock” position
- Mount the PMC-330 on the DIN Rail
- Push the installation clip upward into the “lock” position to secure the PMC-330 on the DIN Rail

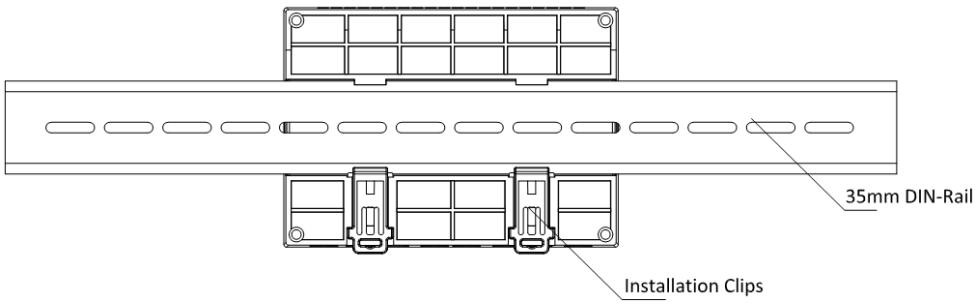


Figure 2-3 Installation

2.4 V&I Inputs Wiring

Please consult the serial number label to ensure that the voltage and current input is less than or equal to the meter’s input specification.

Set the Wiring Mode to Wye.

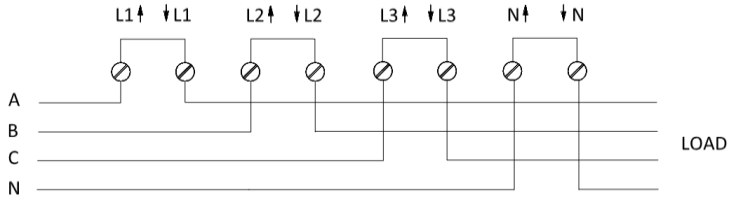


Figure 2-4 V&I Inputs Connections for PMC-330 with Direct Inputs

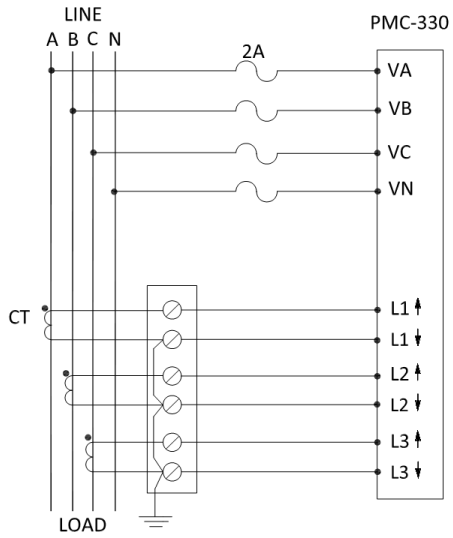


Figure 2-5 V&I Inputs Connections for PMC-330 with CT Inputs

2.5 RS485 Wiring

The PMC-330 provides up to one RS485 port and supports the Modbus RTU protocol. Up to 32 devices can be connected on a RS485 bus. The overall length of the RS485 cable connecting all devices should not exceed 1200m.

If the master station does not have a RS485 communications port, a RS232/RS485 or USB/RS485 converter with optically isolated outputs and surge protection should be used.

The following figure illustrates the RS485 communications connections on the PMC-330:

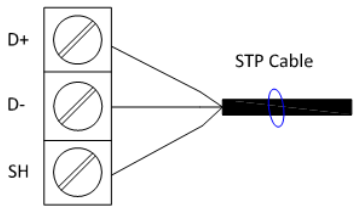


Figure 2-6 RS485 Communications Connections

2.6 Digital Input Wiring

The following figure illustrates the Digital Input connections on the PMC-330:

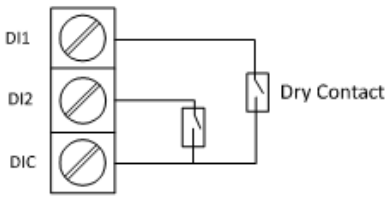


Figure 2-7 DI Connections

2.7 Digital Output Wiring

The following figure illustrates the Digital Output connections on the PMC-330:

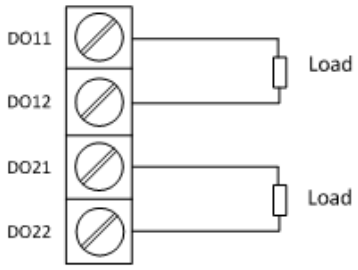


Figure 2-8 DO Connections

2.8 Energy Pulse Output Wiring

The following figure illustrates the Pulse Output connections on the PMC-330:

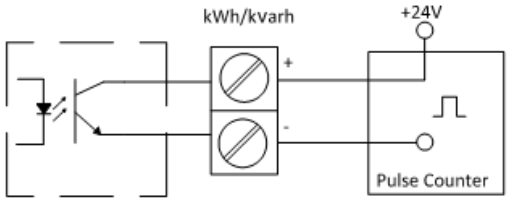


Figure 2-9 Energy Pulse Output Connections

2.9 PPS Output Wiring

The following figure illustrates the PPS Output connections on the PMC-330:

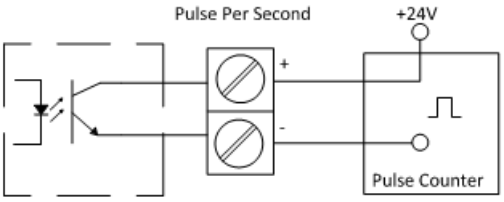


Figure 2-9 PPS Output Connections

Chapter 3 Front Panel

The meter's front panel is used for both display and configuration purposes. The LCD display screen and four buttons allow quick access to view measurements and meter information, configure the parameters and perform maintenance.

Figure 3-1 Front Panel

3.1 LED Indicators

There are five LED indicators on the PMC-330's front panel as described in the following table.

LED Indicator	Color	Description
L1	Yellow	Phase A Energized Indicator
L2	Green	Phase B Energized Indicator
L3	Red	Phase C Energized Indicator
REV	Red	kW Reverse Indicator
PULSE	Red	LED Pulse Output

Table 3-1 LED Indicators

3.2 Buttons

Buttons	View Mode / Menu Level	Parameter configuration via Setup or Maintenance Menu (Default password is a numeric zero "0")
<◄/▼>	Scroll to the next measurement page or the next menu item.	Before a parameter is selected for modification, pressing this button scrolls to the next parameter in the menu. If a parameter is already selected, pressing this button moves the cursor one position to the left if the parameter being changed is a numeric value or scrolls to the next item in the selection list.
<▲>	Scroll to the previous measurement page or the previous menu.	Before a parameter is selected for modification, pressing this button scrolls to the previous parameter in the menu. If a parameter is already selected, pressing this button increments a numeric value or scrolls to the previous item in the selection list.
<◄—>	Pressing this button enters the sub-menu. This button	At the parameter configuration level, pressing this button selects the parameter for modification. After changing

	is ignored at the bottom menu level.	the parameter, pressing this button again saves the new setting into memory.
<⏲>	Pressing this button returns to the previous menu level if it's already in a sub-menu. This button is ignored at the top display level.	At the parameter configuration level, pressing this button cancels the changes and exits the configuration mode.

Table 3-2 Buttons

3.3 Default Screen

The PMC-330 has a default display screen that shows the **kWh Imp** parameter as displayed in Figure 3-2 below. The user can use the <▼/◄> and <▲> keys to scroll and display other parameters. If there is no front panel activity for 3 minutes, the display will return to the default display screen. The user may enable the **Auto Scroll** feature under the **Maintenance** menu. Figure 3-3 below shows the automatic scrolling of the parameters when the **Auto Scroll** feature is enabled.

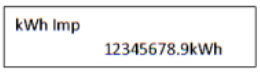


Figure 3-2 Default Display – kW Imp

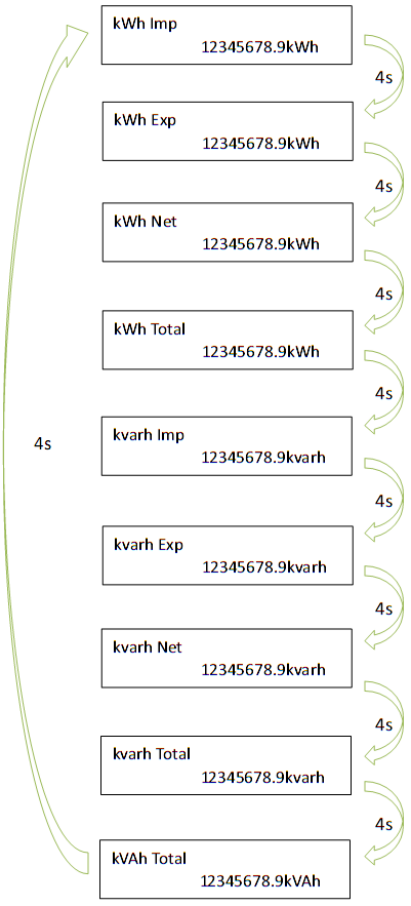


Figure 3-3 Default Screen – Auto Scroll

3.4 PMC-330's Menu

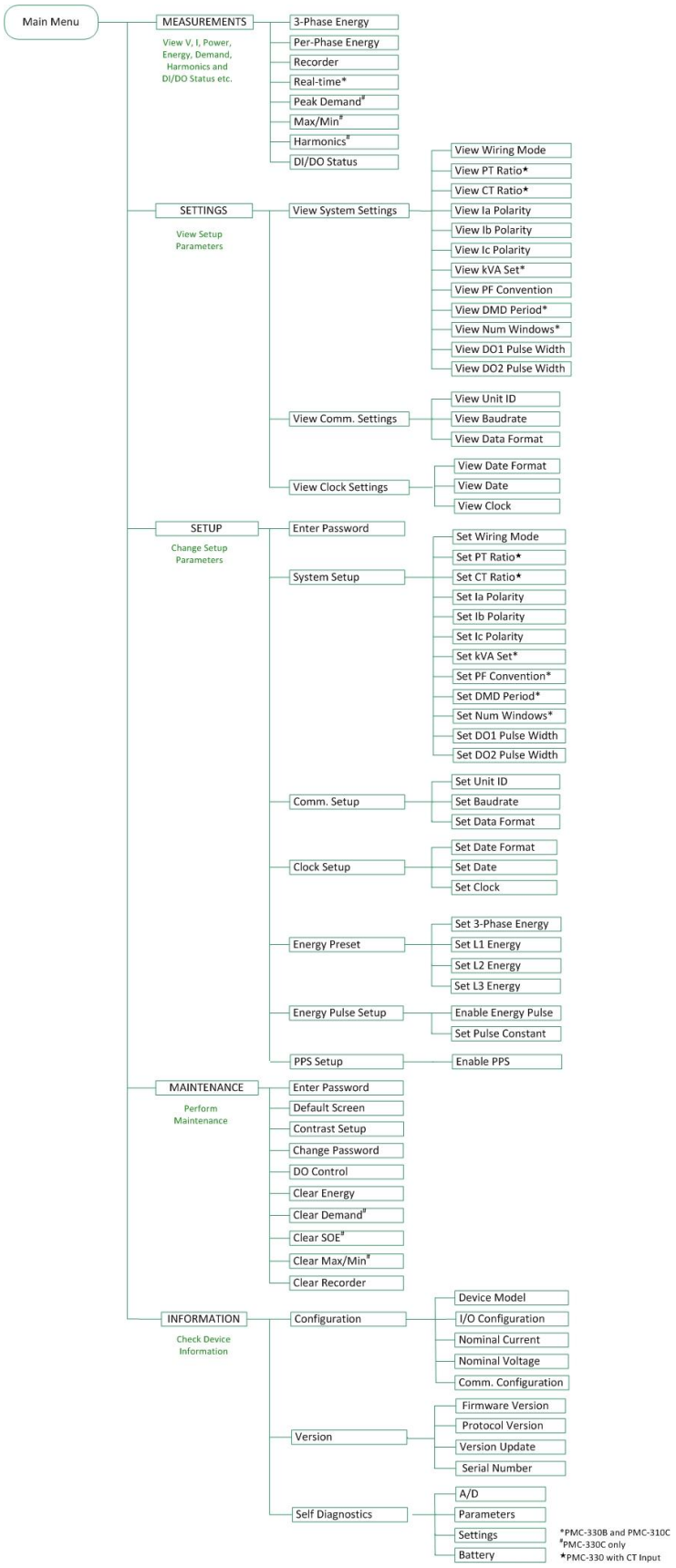


Figure 3-4 PMC-330's Menu

3.5 Using the Front Panel

Pressing <◄┘> button enters the main menu shown as shown below.

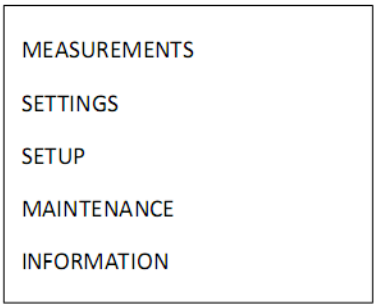


Figure 3-5 Main Menu

There are five options in the main menu:

MEASUREMENTS – View real-time parameters

SETTINGS – View setup parameters

SETUP – Configure setup parameters

MAINTENANCE – Perform maintenance

INFORMATION – View meter information

This section describes front panel navigation within each option.

3.5.1 MEASUREMENTS

From the main menu, scroll to the **MEASUREMENTS** option using the <◄/▼> button and then press the <◄┘> button to enter its sub-menu. The following groups appear:

- 3-Phase Energy – View 3-phase energy measurements
- Per-Phase Energy – View per-phase energy measurements
- Recorder – View monthly energy recording for the present month and the last 12 months
- Real-time – View real-time parameters
- Peak Demand – View peak demands of this month and last month
- Max/Min – View maximum and minimum values of this month and last month
- Harmonics – View harmonics data
- DI/DO Status – View DI and DO status

Measurements in each group:

Group	Parameters Measured	
3-Phase Energy	kWh Import/Export/Net/Total	kWh Import/Export of Tariff A/B/C/D Period*
	kvarh Import/Export/Net/Total kvarh of Q1/Q2/Q3/Q4*	kvarh Import/Export of Tariff A/B/C/D Period*
	kVAh Total	
Per-Phase	**Phase A/B/C:**	

Energy (L1/L2/L3)	kWh Import/Export/Net/Total kWh Import/Export of Tariff A/B/C/D Period*
	Phase A/B/C: kvarh Import/Export/Net/Total kvarh Import/Export of Tariff A/B/C/D Period* kvarh of Q1/Q2/Q3/Q4*
	Phase A/B/C: kVAh
Recorder	kWh Import/Export/Net/Total for present month and the last 12 months kWh Import/Export of Tariff A/B/C/D Period for present month and the last 12 months*
	kvarh Import/Export/Net/Total for present month and the last 12 months kvarh Import/Export of Tariff A/B/C/D Period for present month and the last 12 months* kvarh of Q1/Q2/Q3/Q4 for present month and the last 12 months*
	kVAh Total for the present month and the last 12 months
Real-time*	Va, Vb, Vc, VLN avg, Vab, Vbc, Vca, VLL avg, Ia, Ib, Ic, Iavg, Frequency
	kWa, kWb, kWc, ∑kW, kvara, kvarb, kvarc, ∑kvar, kVAa, kVAb, kVAc, ∑kVA, PFa, PFb, PFc, ∑PF
	V Unbalance, I Unbalance
	Ia Demand, Ib Demand, Ic Demand, ∑kW Demand, ∑kvar Demand, ∑kVA Demand
Peak Demand#	Ia/Ib/Ic Peak Demand of This/Last Month
	∑kW Peak Demand of This/Last Month ∑kW Peak Demand of Tariff A/B/C/D period of This/Last Month
	∑kvar Peak Demand of This/Last Month ∑kvar Peak Demand of Tariff A/B/C/D period of This/Last Month
	∑kVA Peak Demand of This/Last Month
Max/Min#	I max of This/Last Month VLN max of This/Last Month VLL max of This/Last Month FREQ max of This/Last Month ∑kW max of This/Last Month ∑kvar max of This/Last Month ∑kVA max of This/Last Month
	I min of This/Last Month VLN min of This/Last Month VLL min of This/Last Month FREQ min of This/Last Month ∑kW min of This/Last Month ∑kvar min of This/Last Month ∑kVA min of This/Last Month
Harmonics#	Ia K-Factor, Ib K-Factor, Ic K-Factor
	Va/Vb/Vc THD Ia/Ib/Ic THD Va/Vb/Vc TOHD Ia/Ib/Ic TOHD Va/Vb/Vc TEHD Ia/Ib/Ic TEHD
DI/DO Status	DI1 Status, DI2 Status, DO1 Status, DO2 Status

* PMC-330B and PMC-330C
# PMC-330C only

Table 3-3 Measurements

3.5.2 SETTINGS

From the main menu, scroll to the **SETTINGS** option using the <◄/▼> button and then press the <◄┘> button to enter its sub-menu. The following groups appear:

- System Setup –View the system setup parameters
- Comm. Setup – View the communication setup parameters
- Clock Setup – View the date format, Date and Clock of the meter

Settings in each group:

Group	Settings	
	Setup Parameters	**Options/Range**
System Setup	Wiring Mode	WYE/DEMO
	PT Ratio	1
	CT Ratio	1 to 6000
	Ia Polarity	Normal/Reverse
	Ib Polarity	Normal/Reverse
	Ic Polarity	Normal/Reverse
	kVA Calculation*	Vector/Scalar
	PF Convention*	IEC/IEEE/-IEEE
	DMD Period*	1/2/3/5/10/15/30/60 minutes
	Num Windows*	1 to15
	DO1 PW	0.0 to 600.0 seconds
	DO1 PW	0.0 to 600.0 seconds
Comm. Setup	Unit ID	1 to 247
	Baudrate	1200/2400/4800/ 9600/19200bps
	Data Format	8N2/8O1/8E1/8N1/8O2/8E2
Clock Setup	Date Format	MM/DD/YYYY, DD/MM/YYYY, YYYY/MM/DD
	Date	Date of the meter
	Clock	Clock of the meter

* PMC-330B and PMC-330C

Table 3-4 Settings

3.5.3 SETUP

Setup configuration via the front panel is password protected. The user is required to enter a password before making configuration changes to the meter through the front panel. The default password is "0" (numeric zero).

From the main menu, scroll to the **SETUP** option by using the <◄/▼> button and then press the <◄┘> button to enter its sub-menu. The following groups appear:

- System Setup – Configure system setup parameters
- Comm. Setup – Configure communication setup parameters
- Clock Setup – Configure the date format and the date and clock of the meter

- Energy Preset – Preset energy values
- Energy Pulse Setup – Enable energy pulsing
- PPS Setup – Enable PPS pulsing

Configuration in each group:

Group	Configuration		
	Parameters	**Description**	**Options**
System Setup	Wiring Mode	Wiring Connection of the PMC-330	WYE#/DEMO
	PT Ratio	PT Ratio of the PMC-330 with CT Input	1 (Fixed)
	CT Ratio	PT Ratio of the PMC-330 with CT Input	1# to 6000
	Ia Polarity	Ia Polarity	Normal#/Reverse
	Ib Polarity	Ib Polarity	Normal#/Reverse
	Ic Polarity	Ic Polarity	Normal#/Reverse
	kVA Set*	kVA Calculation	Vector#/Scalar
	PF Convention*	P.F. Convention	IEC*/IEEE/-IEEE
	DMD Period*	Sliding Window Interval	1/2/3/5/10/15#/30/60 minutes
	Num Windows*	Number of Sliding Windows	1# to15
	DO1 PW	DO1 Pulse Width	0.0 to 600.0 seconds (Default=1)
	DO2 PW	DO2 Pulse Width	0.0 to 600.0 seconds (Default=1)
Comm. Setup	Unit ID	Modbus Address	1 to 247 (Default=100)
	Baudrate	Data rate in bits per second	1200/2400/4800/ 9600#/19200bps
	Data Format	Data Format	8N2/8O1/8E1#/8N1/8O2/8E2
Clock Setup	Date Format	Date Format	MM/DD/YYYY, DD/MM/YYYY, YYYY/MM/DD
	Date	Date of the meter	YYYY/MM/DD
	Clock	Clock of the meter	HH:MM:SS
Energy Preset	3-Phase Energy	Preset kWh Import	0.0# to 99,999,999.9
		Preset kWh Export	0.0# to 99,999,999.9
		Preset kvarh Import	0.0# to 99,999,999.9
		Preset kvarh Export	0.0# to 99,999,999.9
		Preset kVAh	0.0# to 99,999,999.9
	L1 Energy	Preset kWh Import	0.0# to 99,999,999.9
		Preset kWh Export	0.0# to 99,999,999.9
		Preset kvarh Import	0.0# to 99,999,999.9
		Preset kvarh Export	0.0# to 99,999,999.9
		Preset kVAh	0.0# to 99,999,999.9
	L2 Energy	Preset kWh Import	0.0# to 99,999,999.9
		Preset kWh Export	0.0# to 99,999,999.9
		Preset kvarh Import	0.0# to 99,999,999.9

		Preset kvarh Export	0.0# to 99,999,999.9
		Preset kVAh	0.0# to 99,999,999.9
	L3 Energy	Preset kWh Import	0.0# to 99,999,999.9
		Preset kWh Export	0.0# to 99,999,999.9
		Preset kvarh Import	0.0# to 99,999,999.9
		Preset kvarh Export	0.0# to 99,999,999.9
		Preset kVAh	0.0# to 99,999,999.9
Energy Pulse Setup	Energy Pulse	Enable Energy Pulsing	NO#/kWh/kvarh
	Pulse Constant	Set Pulse Constant	100/400/1000#/3200/5000 (See Table 3-9 Pulse Constant)
PPS Setup	PPS	Enable PPS Pulsing	NO#/YES

* PMC-330B and PMC-330C, #Default

Table 3-5 Setups

3.5.4 MAINTENANCE

A password is required before performing maintenance to the meter through the front panel. The default password is "0" (numeric zero).

From the main menu, scroll to the **MAINTENANCE** option by using the <◄/▼> button and then press the <◄┘> button to enter its sub-menu. The following groups appear:

- Default Screen –Configure the Default Screen
- Contrast Setup – Set LCD Contrasts
- Change Password – Change Password
- DO Control – Perform DO Control
- Clear Energy – Clear Energy measurements and Energy Recorder for the present month
- Clear Demand – Clear Peak Demands of This Month
- Clear Max/Min – Clear Max/Min data of This Month
- Clear SOE – Clear SOE
- Clear Recorder – Clear Energy Recorder of the Last 12 Months

Maintenance in each group:

Group	Function
Default Screen	**Set Default Screen –** Choose between **kWh Imp** and **Auto Scroll** as the default display screen
Contrast Setup	**Set LCD Contrast –** The LCD contrast can be set between zero and nine where the higher value represents a darker contrast
Password Setup	**Change Password –** The Range of password is between 0000 and 9999 The default password is “0” (numeric zero)
DO Control	**DO Control –** Force On

	Force Off Normal
Clear Energy	**Clear the following Energy Measurements – (3-Phase/L1/L2/L3 Energy Data)** kWh Import/Export/Net/Total kvarh Import/Export/Net/Total kvarh of Q1/Q2/Q3/Q4 kVAh total kWh Import/Export of Tariff A/B/C/D Period kvarh Import/Export of Tariff A/B/C/D Period
	Clear the following Energy Recorders for the present month – kWh/kvarh Import/Export/Net/Total kvarh Import/Export/Net/Total kvarh of Q1/Q2/Q3/Q4 kVAh Total kWh Import/Export of Tariff A/B/C/D Period kvarh Import/Export of Tariff A/B/C/D Period
Clear Demand#	**Clear the following Peak Demands of This Month –** Ia/Ib/Ic Peak Demand ∑kW Peak Demand ∑kW Peak Demand of Tariff A/B/C/D period ∑kvar Peak Demand ∑kvar Peak Demand of Tariff A/B/C/D period ∑kVA Peak Demand
Clear SOE#	Clear the SOE Log
Clear Max/Min#	**Clear Max/Min –** I max/min of This Month VLN max/min of This Month VLL max/min of This Month FREQ max of This Month ∑kW max of This Month ∑kvar max of This Month ∑kVA max of This Month
Clear Recorder	**Clear Energy Recorder for the Last 12 Months –** kWh/kvarh Import/Export/Net/Total for the last 12 months kvarh Import/Export/Net/Total for the last 12 months kvarh of Q1/Q2/Q3/Q4 for the last 12 months kVAh Total for the last 12 months kWh Import/Export of Tariff A/B/C/D Period for the last 12 months kvarh Import/Export of Tariff A/B/C/D Period for the last 12 months

PMC-330C only

Table 3-6 Maintenance

3.5.5 INFORMATION

From the main menu, scroll to the **INFORMATION** option by using the <◄/▼> button and then press the <◄┘> button to enter its sub-menu. The following groups appear:

- Configuration – View the configuration of the meter
- Firmware Version – View the version information of the meter
- Self Diagnostics – View diagnostics information

Information in each group:

Group	Settings		
	Parameters	**Description**	**Option**
Configuration	Model	Device Model	330A/330B/330C (PMC-330A/PMC-330B/PMC-330C)
	I/O	I/O Configuration	Pulse+PPS/2DI+2DO
	In	Nominal Current	5A/10A/20A(Direct) 5A(with CT)
	Vn	Nominal Voltage	240V
	Comm. configure	Communication Port Configuration	YES/NO
Version	Firmware	Firmware Version	For example, V1.00.01
	Protocol	Protocol Version	For example, V1.1
	Update	Version Update	For example, 110709
	SN	Serial Number	For example,1108471895
Self Diagnostics	A/D	A/D status	Normal/Fault
	Parameters	Calibration status	Normal/Fault
	Settings	Setup Parameters status	Normal/Fault
	Battery	Battery status	Normal/Fault

Table 3-7 Information

3.6 Front Panel Setup Parameters

The front panel provides the following setup parameters through the **SETUP** menu:

Sub-Menu	Parameters	Description	Options/Range	PMC-330 Model		
				A	**B**	**C**
Enter Password	Enter Password	/	Default=0	▪	▪	▪
System Setup	Wiring Mode	Wiring Connection of the meter	WYE*/DEMO	▪	▪	▪
	PT Ratio	PT Ratio[1]	1(Fixed)	▪	▪	▪
	CT Ratio	CT Ratio[1]	1* to 6000	▪	▪	▪
	Ia Polarity	Ia Polarity	Normal*/Reverse	▪	▪	▪
	Ib Polarity	Ib Polarity	Normal*/Reverse	▪	▪	▪

	Ic Polarity	Ic Polarity	Normal*/Reverse	▪	▪	▪
	kVA Set[1]	kVA Calculation	Vector*/Scalar		▪	▪
	PF Convention[2]	P.F. Convention	IEC*/IEEE/-IEEE		▪	▪
	DMD Period	Sliding Window Interval	1/2/3/5/10/15*/30/60 minutes		▪	▪
	Num Windows	Number of Sliding Windows	1* to15		▪	▪
	DO1 PW	DO1 Pulse Width	0.0 to 600.0 seconds (Default=1.0)	▪	▪	▪
	DO2 PW	DO2 Pulse Width	0.0 to 600.0 seconds (Default=1.0)	▪	▪	▪
Comm. Setup	Unit ID	Set the Modbus Address	1 to247 (Default=100)	▪	▪	▪
	Baudrate	Data rate in bits per second	1200/2400/4800/ 9600*/19200bps	▪	▪	▪
	Data Format	Data Format	8N2/8O1/8E1*/8N1/8O2/8E2	▪	▪	▪
Clock Setup	Date Format	Date Format	MM/DD/YYYY, DD/MM/YYYY, YYYY/MM/DD	▪	▪	▪
	Date	Date of the meter	YYYY/MM/DD	▪	▪	▪
	Clock	Clock of the meter	HH:MM:SS	▪	▪	▪
Energy Present	3-Phase Energy	Preset kWh Import	0 to 99,999,999.9 (Default=0)	▪	▪	▪
		Preset kWh Export	0 to 99,999,999.9 (Default=0)	▪	▪	▪
		Preset kvarh Import	0 to 99,999,999.9 (Default=0)	▪	▪	▪
		Preset kvarh Export	0 to 99,999,999.9 (Default=0)	▪	▪	▪
		Preset kVAh	0 to 99,999,999.9 (Default=0)	▪	▪	▪
	L1 Energy	Preset kWh Import	0 to 99,999,999.9 (Default=0)	▪	▪	▪
		Preset kWh Export	0 to 99,999,999.9 (Default=0)	▪	▪	▪
		Preset kvarh Import	0 to 99,999,999.9 (Default=0)	▪	▪	▪
		Preset kvarh Export	0 to 99,999,999.9 (Default=0)	▪	▪	▪
		Preset kVAh	0 to 99,999,999.9 (Default=0)	▪	▪	▪
	L2 Energy	Preset kWh Import	0 to 99,999,999.9	▪	▪	▪

			(Default=0)			
		Preset kWh Export	0 to 99,999,999.9 (Default=0)	▪	▪	▪
		Preset kvarh Import	0 to 99,999,999.9 (Default=0)	▪	▪	▪
		Preset kvarh Export	0 to 99,999,999.9 (Default=0)	▪	▪	▪
		Preset kVAh	0 to 99,999,999.9 (Default=0)	▪	▪	▪
	L3 Energy	Preset kWh Import	0 to 99,999,999.9 (Default=0)	▪	▪	▪
		Preset kWh Export	0 to 99,999,999.9 (Default=0)	▪	▪	▪
		Preset kvarh Import	0 to 99,999,999.9 (Default=0)	▪	▪	▪
		Preset kvarh Export	0 to 99,999,999.9 (Default=0)	▪	▪	▪
		Preset kVAh	0 to 99,999,999.9 (Default=0)	▪	▪	▪
Energy Pulse Setup	Energy Pulse	Enable Energy Pulsing	NO/kWh*/kvarh	▪	▪	▪
	Pulse Constant[3]	Set Pulse Constant	100/400/1000*/3200/5000	▪	▪	▪
PPS Setup	PPS	Enable PPS Pulsing	NO*/YES	▪	▪	▪

*Default

Table 3-8 Setup Parameters

Notes:

1) The PMC-330 with Direct Inputs doesn't provide PT Ratio and CT Ratio setup parameters.
2) There are two ways to calculate kVA:

   Mode V (Vector method**):** $kVA_{total} = \sqrt{kW_{total}^{\ 2} + kvar_{total}^{\ 2}}$

   Mode S (Scalar method**):** $kVA_{total} = kVA_a + kVA_b + kVA_c$

3) P.F. Convention: -IEEE is the same as IEEE but with the opposite sign.

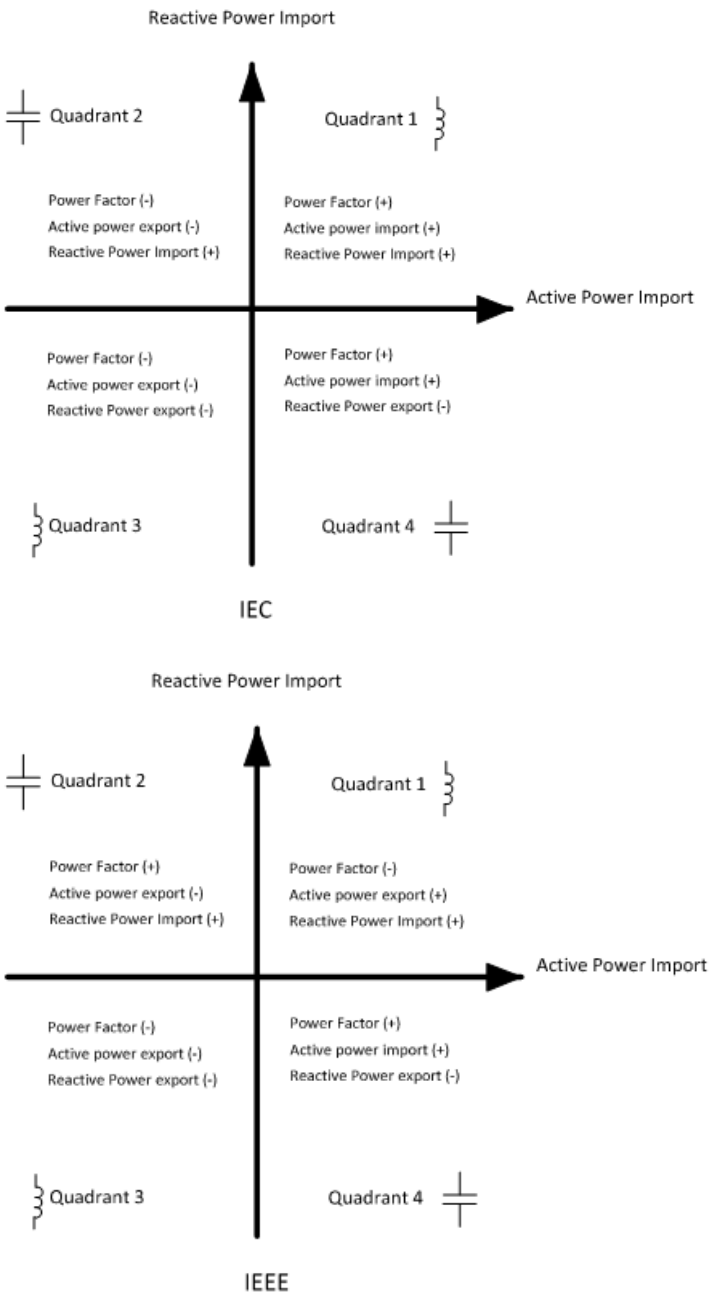


Figure 3-6 Power Factor Definitions

4) The PMC-330 provides different pulse constants for different input ratings:

PMC-330 Configurations	Pulse Constant Options	Default
5A (20A Max), Direct Inputs	100/1000	1000
10A (40A Max), Direct Inputs	100/1000	1000
20A (80A Max), Direct Inputs	100/400	400
5A (80A Max), CT Inputs	1000/3200/5000	1000

Table 3-9 Pulse Constant

3.7 Front Panel Maintenance Parameters

The front panel provides the following parameters through the **MAINTENANCE** menu:

Sub-Menu	Description	Options/Range	PMC-330 Model		
			A	B	C
Enter Password	/	Default=0	▪	▪	▪
Default Screen	Choose the Default Screen	kWh Imp*/Auto Scroll	▪	▪	▪
Contrast Setup	Set LCD Contrast	0 to 9 (Default=4)	▪	▪	▪
Password Setup	Change Password	0000 to 9999	▪	▪	▪
DO Control	DO1 Control	Normal*/ON/OFF	▪	▪	▪
	DO2 Control				
Clear Energy	Clear Energy	NO*/YES	▪	▪	▪
Clear Demand	Clear Peak Demand of This Month	NO*/YES			▪
Clear SOE	Clear the SOE Log	NO*/YES			▪
Clear Max/Min	Clear Max/Min data of This Month	NO*/YES			▪
Clear Recorder	Clear the Energy Records of the Last 12 Months	NO*/YES	▪	▪	▪

*Default

Table 3-10 Setup Parameters

Note:

1) The **Section 3.5.4** provides the detail information for performing maintenance.

Chapter 4 Applications

4.1 Inputs and Outputs

4.1.1 Digital Inputs

The PMC-330 comes optionally with two self-excited Digital Inputs that are internally wetted at 24 VDC. Digital Inputs are typically used for monitoring external status which can help prevent equipment damage, improve maintenance, and track security breaches. The real-time statuses of the Digital Inputs are available on the front panel LCD Display as well as through communications. Changes in Digital Input status are stored as events in the SOE Log in 1 ms resolution.

4.1.2 Digital Outputs

The PMC-330 optionally provides two Digital Outputs which can be used for setpoint alarming, load control, or remote control applications.

Digital Outputs on the PMC-330 can be used in the following applications:

1) **Front Panel Control:** Manually operated from the front panel. Please refer to the **DO Control** parameter in Section 3.5.4 for a detailed description.

2) **Remote Control:** Remotely operated over communications via our free PMC Setup software or the PecStar® iEMS.

3) **Setpoint:** Setpoints can be programmed to trigger DO action upon becoming active. Please refer to Section 4.3 for a detailed description.

Since there are three ways to utilize the Digital Outputs on the PMC-330, a prioritized scheme has been developed to avoid conflicts between different applications. In general, Front Panel Control has the highest priority and can override other applications. Next in the priority list is Remote Control. Setpoints have the lowest priority.

4.1.3 Energy Pulse Output

The PMC-330 comes standard with one front panel LED Pulse Output and one Solid State Digital Output for kWh and kvarh pulsing. Energy Pulse Outputs are typically used for accuracy testing. Energy pulsing can be enabled from the front panel through the **Energy Pulse** setup parameter. The pulse constant can be configured as 100/400/1000/3200/5000 pulses per kWh or kvarh through the **Pulse Constant** setup parameter, and the pulse width is fixed at 80ms.

4.1.4 PPS (Per Pulse Second) Output

The PMC-330 comes standard with one PPS Output which is used for the accuracy testing of its internal clock. The PPS output can be enabled from the front panel through the **PPS** setup parameter.

4.2 Power and Energy

4.2.1 Energy

Basic energy parameters include active energy (kWh), reactive energy (kvarh) and apparent energy (kVAh) with a resolution of 0.1 kxh and a maximum value of ±99,999,999.9. When the maximum value is reached, it will automatically roll over to zero.
The energy can be reset manually or preset to user-defined values through the front panel or via communications.

The PMC-330 provides the following energy measurements:

3-Phase Energy	kWh Import/Export/Net/Total	kWh Import/Export of Tariff A/B/C/D Period*
	kvarh Import/Export/Net/Total kvarh of Q1/Q2/Q3/Q4*	kvarh Import/Export of Tariff A/B/C/D Period*
	kVAh Total	
Per-Phase Energy	**Phase A/B/C:** kWh Import/Export/Net/Total	kWh Import/Export of Tariff A/B/C/D Period*
	Phase A/B/C: kvarh Import/Export/Net/Total kvarh of Q1/Q2/Q3/Q4*	kvarh Import/Export of Tariff A/B/C/D Period*
	Phase A/B/C: kVAh	

* PMC-330B and PMC-330C

Table 4-1 Energy Measurements

4.2.2 Demands (PMC-330B and PMC-330C)

Demand is defined as the average power consumption over a fixed interval (usually 15 minutes) based on the sliding window method. The PMC-330 provides the following setup parameters:

# of Sliding Windows: 1-15

Demand Period: 1, 2, 3, 5, 10, 15, 30, 60 minutes. For example, if the # of Sliding Windows is set as 1 and the Demand Period is 15, the demand cycle will be 1×15=15min.

The PMC-330 provides the following Demand parameters:

Demand	Ia Demand
	Ib Demand
	Ic Demand
	∑kW Demand
	∑kvar Demand
	∑kVA Demand

Table 4-2 Demand Measurements

4.2.3 TOU (PMC-330B and PMC-330C)

The Time-Of-Use (TOU) system allows the user to configure an electricity price schedule inside the PMC-330 and accumulate energy consumption into different TOU rates based on the time of consumption. TOU programming is only supported through communications.

The TOU feature on the PMC-330 supports 4 Tariff Rates, 6 Seasons, 1 Daily Profile for each season and 10 Profile Periods within the Daily Profile. The user can define the start time and the end time for each Season within a year and the Profile Periods in 15-minute steps within a day. All days within a Season have the same Daily Profile since the PMC-330 only supports one Daily Profile for each season. There are four Tariff Rates – Tariff A, Tariff B, Tariff C and Tariff D, which can be applied to any time period.

For each of the four Tariff Rates, the PMC-330 provides the following Energy and Demand information: kWh Import, KWh Export, kvarh Import, kvarh Export, kW Peak Demand of This Month and kW Peak Demand of Last Month, kvar Peak Demand of This Month and kvar Peak Demand of Last Month.

Time-Of-Use data is available through the front panel and communications.

4.3 Setpoints (PMC-330C Only)

The PMC-330C comes standard with 8 user programmable Setpoints which provide extensive control by allowing a user to initiate an action in response to a specific condition. Typical setpoint applications include alarming and fault detection. The setpoints can be programmed over communications and have the following setup parameters:

1) **Setpoint Type:**

   Specify the monitoring condition – Over Setpoint, Under Setpoint, or Disabled.

2) **Setpoint Parameter:**

   Specify the parameter to be monitored, including VLN, VLL, I, ∑kW, ∑kvar, ∑kVA, PF, and Frequency.

3) **Setpoint Active Limit** :

   Specify the value that the setpoint parameter must exceed for Over Setpoint or go below for Under Setpoint for the setpoint to become active.

4) **Setpoint Return Limit**:

   Specify the value that the setpoint parameter must exceed for Under Setpoint or go below for Over Setpoint for the setpoint to become inactive.

5) **Setpoint Active Delay**:

   Specify the minimum duration in seconds that the setpoint condition must be met before the setpoint becomes active. An event will be generated and stored in the SOE Log. The range of the **Setpoint Active Delay** is between 0 and 9,999 (seconds).

6) **Setpoint Return Delay**:

   Specify the minimum duration in seconds that the setpoint Return condition must be met before the setpoint becomes inactive. An event will be generated and stored in the SOE Log. The range of the **Setpoint Return Delay** is between 0 and 9,999 (seconds).

7) **Setpoint Trigger**:

Specify what action the setpoint will take when it becomes active. These actions include No Trigger or Trigger DOx.

4.4 Logging

4.4.1 Energy Recorder (kWh/kvarh/kVAh) for the Present Month and the Last 12 Months

The PMC-330s store monthly energy data for the present month and the last 12 months. The **Energy Self-Read Time** setup parameter allows the user to specify the time and day of the month for the Energy Self-Read operation via communications. The monthly records are stored in the meter's non-volatile memory and will not suffer any loss in the event of power failure. The monthly records are stored on a first-in-first-out basis where the newest monthly record will overwrite the oldest.

The **Energy Self-Read Time** supports two options:

- A zero value means that the Self-Read will take place at 00:00 of the first day of each month.
- A non-zero value means that the Self-Read will take place at a specific time and day based on the formula: Energy Self-Read Time = Day * 100 + Hour where 0 ≤ Hour ≤ 23 and 1 ≤ Day ≤ 28. For example, the value 1512 means that the Self-Read will take place at 12:00pm on the 15th day of each month.

The Energy Records can be reset manually through the front panel or via communications.

The PMC-330 provides the following energy data for the present month and the last 12 months:

Active Energy	kWh Import	kWh Export	kWh Net	kWh Total
	kWh Import of Tariff A period*	kWh Import of Tariff B period*	kWh Import of Tariff C period*	kWh Import of Tariff D period*
	kWh Export of Tariff A period*	kWh Export of Tariff B period*	kWh Export of Tariff C period*	kWh Export of Tariff D period*
Reactive Energy	kvarh Import	kvarh Export	kvarh Net	kvarh Total
	kvarh Import of Tariff A period*	kvarh Import of Tariff B period*	kvarh Import of Tariff C period*	kvarh Import of Tariff D period*
	kvarh Export of Tariff A period*	kvarh Export of Tariff B period*	kvarh Export of Tariff C period*	kvarh Export of Tariff D period*
	kvarh Q1*	kvarh Q2*	kvarh Q3*	kvarh Q4*
Apparent Energy	kVAh Total			

* PMC-330B and PMC-330C

Table 4-3 Energy Measurements for each Monthly Record

4.4.2 Peak Demand Log (PMC-330C Only)

The PMC-330 stores peak demand information of **This Month** and **Last Month** with timestamp for Ia/Ib/Ic/∑kW/∑kvar/∑kVA. All of the peak demand data can be accessed through the front panel LCD as well as communications.

The **Peak Demand Self-Read Time** setup parameter allows the user to specify the time and day of the month for the Peak Demand Self-Read operation via communications. At the specified time in each month, the Peak Demand register of **This Month** is transferred to the Peak Demand register of **Last Month** and then zeroed. The **Peak Demand Self-Read Time** supports two options:

- A zero value means that the Self-Read will take place at 00:00 of the first day of each month.
- A non-zero value means that the Self-Read will take place at a specific time and day based on the formula: Peak Demand Self-Read Time = Day * 100 + Hour where 0 ≤ Hour ≤ 23 and 1 ≤ Day ≤ 28. For example, the value 1512 means that the Self-Read will take place at 12:00pm on the 15th day of each month.

The peak demand data of this month can be reset manually through the front panel or via communications.

The PMC-330 provides the following Peak Demand parameters:

Peak Demand	Ia Peak Demand of This Month	Ia Peak Demand of Last Month
	Ib Peak Demand of This Month	Ib Peak Demand of Last Month
	Ic Peak Demand of This Month	Ic Peak Demand of Last Month
	∑kW Peak Demand of This Month	∑kW Peak Demand of Last Month
	∑kvar Peak Demand of This Month	∑kvar Peak Demand of Last Month
	∑kVA Peak Demand of This Month	∑kVA Peak Demand of Last Month
	∑kW Peak Demand of Tariff A Period of This Month	∑kW Peak Demand of Tariff A period of Last Month
	∑kW Peak Demand of Tariff B Period of This Month	∑kW Peak Demand of Tariff B Period of Last Month
	∑kW Peak Demand of Tariff C Period of This Month	∑kW Peak Demand of Tariff C Period of Last Month
	∑kW Peak Demand of Tariff D period of This Month	∑kW Peak Demand of Tariff D Period of Last Month
	∑kvar Peak Demand of Tariff A Period of This Month	∑kvar Peak Demand of Tariff A period of Last Month
	∑kvar Peak Demand of Tariff B Period of This Month	∑kvar Peak Demand of Tariff B Period of Last Month
	∑kvar Peak Demand of Tariff C Period of This Month	∑kvar Peak Demand of Tariff C Period of Last Month
	∑kvar Peak Demand of Tariff D period of This Month	∑kvar Peak Demand of Tariff D Period of Last Month

Table 4-4 Peak Demand Measurements

4.4.3 Max/Min Log (PMC-330C Only)

The PMC-330C records the minimum and maximum data of **This Month** and **Last Month** with timestamp for VLN/VLL/I/∑kW/∑kvar/∑kVA/frequency. All of the maximum and minimum data can be accessed through the front panel LCD as well as communications.

The **Max/Min Self-Read Time** allows the user to specify the time and day of the month for the Min/Min Self-Read operation. At the specified time in each month, the Max/Min register of **This Month** is transferred to the Max/Min register of **Last Month** and then reset. The **Max/Min Self-Read Time** supports two options:

- A zero value means that the Self-Read will take place at 00:00 of the first day of each month.
- A non-zero value means that the Self-Read will take place at a specific time and day based on the formula: Max/Min Self-Read Time = Day * 100 + Hour where 0 ≤ Hour ≤ 23 and 1 ≤ Day ≤ 28. For example, the value 1512 means that the Self-Read will take place at 12:00pm on the 15th day of each month.

The maximum and minimum data of this month can be reset manually from the front panel or via communications.

The PMC-330 provides the following Max/Min parameters:

Max Value	Min Value
I max of This Month	I min of This Month
VLN max of This Month	VLN min of This Month
VLL max of This Month	VLL min of This Month
∑kW max of This Month	∑kW min of This Month
∑kvar max of This Month	∑kvar min of This Month
∑kVA max of This Month	∑kVA min of This Month
FREQ max of This Month	FREQ min of This Month
I max of Last Month	I min of Last Month
VLN max of Last Month	VLN min of Last Month
VLL max of Last Month	VLL min of Last Month
∑kW max of Last Month	∑kW min of Last Month
∑kvar max of Last Month	∑kvar min of Last Month
∑kVA max of Last Month	∑kVA min of Last Month
FREQ max of Last Month	FREQ min of Last Month

Table 4-5 Max/Min Measurements

4.4.4 SOE Log (PMC-330C Only)

The PMC-330C can store up to 64 events such as power outage, setpoint actions, relay actions, Digital Input status changes and setup changes in its non-volatile memory. Each event record includes the event classification, its relevant parameter values and a timestamp in 1ms resolution.
All event records can be retrieved via communications. If there are more than 64 events, the newest event will replace the oldest event on a first-in-first-out basis. The SOE Log can be reset from the front panel or via communications.

4.5 Power Quality (PMC-330C Only)

4.5.1 Harmonics

The PMC-330C provides harmonic analysis for THD, TOHD and TEHD. All harmonic parameters are available through communications as well as the front panel LCD display.

The PMC-330 provides the following Harmonic measurements:

Harmonics Measurements	Ia K-Factor	Ib K-Factor	Ic K-Factor
	Ia THD	Ib THD	Ic THD
	Va THD	Vb THD	Vc THD
	Ia TOHD	Ib TOHD	Ic TOHD
	Va TOHD	Vb TOHD	Vc TOHD
	Ia TEHD	Ib TEHD	Ic TEHD
	Va TEHD	Vb TEHD	Vc TEHD

Table 4-6 Harmonic Measurements

4.5.2 Unbalance

The PMC-330 can measure Voltage and Current Unbalances. The calculation method of Voltage and Current Unbalances is listed below:

$$\text{Voltage Unblance} = \frac{V_2}{V_1} \times 100\%,$$

V_1 is positive sequence voltage and V_2 is negative sequence voltage.

$$\text{Current Unblance} = \frac{I_2}{I_1} \times 100\%$$

I_1 is positive sequence current and I_2 is negative sequence current.

Chapter 5 Modbus Register Map

This chapter provides a complete description of the Modbus register map (**Protocol Versions 1.5** and above) for the PMC-330 Series energy meter to facilitate the development of 3rd party communications driver for accessing information on the PMC-330. In general, the registers on the PMC-330 are implemented as Modbus Holding Registers with the exception of the DO Control registers, which are implemented as "Write Only" Modbus Coil Registers. The PMC-330 supports the following Modbus functions:

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 Basic Measurements

Register	Property	Description	Format	Multiplier/Unit	PMC-330 Models		
					A	B	C
0000	RO	Va	UINT32	×100, V[1]		▪	▪
0002	RO	Vb	UINT32	×100, V		▪	▪
0004	RO	Vc	UINT32	×100, V		▪	▪
0006	RO	VLN average	UINT32	×100, V		▪	▪
0008	RO	Vab	UINT32	×100, V		▪	▪
0010	RO	Vbc	UINT32	×100, V		▪	▪
0012	RO	Vca	UINT32	×100, V		▪	▪
0014	RO	VLL average	UINT32	×100, V		▪	▪
0016	RO	Ia	UINT32	×1000, A		▪	▪
0018	RO	Ib	UINT32	×1000, A		▪	▪
0020	RO	Ic	UINT32	×1000, A		▪	▪
0022	RO	I average	UINT32	×1000, A		▪	▪
0024	RO	kWa	INT32	×1000, kW		▪	▪
0026	RO	kWb	INT32	×1000, kW		▪	▪
0028	RO	kWc	INT32	×1000, kW		▪	▪
0030	RO	∑kW	INT32	×1000, kW		▪	▪
0032	RO	kvara	INT32	×1000, kvar		▪	▪
0034	RO	kvarb	INT32	×1000, kvar		▪	▪
0036	RO	kvarc	INT32	×1000, kvar		▪	▪
0038	RO	∑kvar	INT32	×1000, kvar		▪	▪
0040	RO	kVAa	INT32	×1000, kVA		▪	▪
0042	RO	kVAb	INT32	×1000, kVA		▪	▪
0044	RO	kVAc	INT32	×1000, kVA		▪	▪
0046	RO	∑kVA	INT32	×1000, kVA		▪	▪
0048	RO	P.F.a	INT16	×1000		▪	▪
0049	RO	P.F.b	INT16	×1000		▪	▪

0050	RO	P.F.c	INT16	×1000		▪	▪
0051	RO	∑P.F.	INT16	×1000		▪	▪
0052	RO	FREQ	UINT16	×100, Hz		▪	▪
0053	RO	Voltage Unbalance	UINT16	×1000			▪
0054	RO	Current Unbalance	UINT16	×1000			▪
0055	RO	Reserved					
0057	RO	∑kW Demand	UINT32	×1000, kW		▪	▪
0059	RO	∑kvar Demand	UINT32	×1000, kvar		▪	▪
0061	RO	∑kVA Demand	UINT32	×1000, kVA		▪	▪
0063	RO	Ia Demand	UINT32	×1000, A		▪	▪
0065	RO	Ib Demand	UINT32	×1000, A		▪	▪
0067	RO	Ic Demand	UINT32	×1000, A		▪	▪
0069 - 0074		Reserved					
0075	RO	DI Status[2]	Bitmap		▪	▪	▪
0076	RO	DO Status[3]	Bitmap		▪	▪	▪
0077	RO	Running Status[4]	Bitmap		▪	▪	▪
0078	RO	Setpoint Alarm[5]	Bitmap				▪
0079	RO	SOE Pointer[6]	UINT32				▪
0081 - 0099		Reserved					

Table 5-1 Basic Measurements

Notes:

1) "×100, V" indicates the value returned in the register is 100 times the actual engineering value with the unit V (voltage). For example, if a register contains a value 22003, the actual value is 22003/100=220.03V.

2) For the **DI Status** register, the bit values of B0 to B1 represent the states of DI1 to DI2, respectively, with "1" meaning active (closed) and "0" meaning inactive (open).

3) For the **DO Status** register, the bit values of B0 to B1 represent the states of DO1 to DO2, respectively, with "1" meaning active (closed) and "0" meaning inactive (open).

4) The **Running Status** register indicates the running states with a bit value of 1 meaning active and 0 meaning inactive. The following table illustrates the details of the **Running Status** register.

Bit	Meaning
B0	Reserved
B1	Phase A Energized
B2	Phase B Energized
B3	Phase C Energized
B4	kW Reverse
Other bits	Reserved

Table 5-2 Running Status Register (0077)

5) The **Setpoint Alarm** register indicates the setpoint alarm states with a bit value of 1

meaning active and 0 meaning inactive. The following table illustrates the details of the **Setpoint Alarm** register.

Bit	Alarm Event
B0	Setpoint 1
B1	Setpoint 2
B2	Setpoint 3
B3	Setpoint 4
B4	Setpoint 5
B5	Setpoint 6
B6	Setpoint 7
B7	Setpoint 8
Other bits	Reserved

Table 5-3 Setpoints Alarm Register (0078)

6) The range of the **SOE Pointer** is between 0 and 0xFFFFFFFF. The **SOE Pointer** is incremented by one for every event generated and will roll over to 0 if its current value is 0xFFFFFFFF. Since the **SOE Pointer** is a 32-bit value and the SOE Log capacity is relatively small with only 64 events in the PMC-330, an assumption has been made that the **SOE pointer** will never roll over. If a **Clear SOE** is performed from the front panel or via communications, the **SOE Pointer** will be reset to zero and then immediately incremented by one with a new "Clear SOE via Front Panel" or "Clear SOE via Communications" event. Therefore, any 3rd party software should assume that a **Clear SOE** action has been performed if it sees the **SOE Pointer** rolling over to one or to a value that is smaller than its own pointer. In this case, the new **SOE Pointer** also indicates the number of events in the SOE Log if it is less than 64. Otherwise, there will always be 64 events in the SOE Log.

5.2 Energy Measurements

The Energy registers have a maximum value of 999,999,999 and will roll over to zero automatically when it is reached. And the energy register value is 10 times the actual value.

5.2.1 3-Phase Energy Measurements

Register	Property	Description	Format	Multiplier /Unit	PMC-330 Model		
					A	B	C
0100	RW	kWh Import	UINT32	x10, kWh	■	■	■
0102	RW	kWh Export	UINT32	x10, kWh	■	■	■
0104	RO	kWh Net	INT32	x10, kWh	■	■	■
0106	RO	kWh Total	UINT32	x10, kWh	■	■	■
0108	RW	kvarh Import	UINT32	x10, kvarh	■	■	■
0110	RW	kvarh Export	UINT32	x10, kvarh	■	■	■
0112	RO	kvarh Net	INT32	x10, kvarh	■	■	■
0114	RO	kvarh Total	UINT32	x10, kvarh	■	■	■
0116	RW	kVAh	UINT32	x10, kVAh	■	■	■
0118	RW	kWh Import of Tariff A period	UINT32	x10, kWh		■	■

0120	RW	kWh Export of Tariff A period	UINT32	x10, kWh		▪	▪
0122	RW	kWh Import of Tariff B period	UINT32	x10, kWh		▪	▪
0124	RW	kWh Export of Tariff B period	UINT32	x10, kWh		▪	▪
0126	RW	kWh Import of Tariff C period	UINT32	x10, kWh		▪	▪
0128	RW	kWh Export of Tariff C period	UINT32	x10, kWh		▪	▪
0130	RW	kWh Import of Tariff D period	UINT32	x10, kWh		▪	▪
0132	RW	kWh Export of Tariff D period	UINT32	x10, kWh		▪	▪
0134	RW	kvarh Import of Tariff A period	UINT32	x10, kvarh		▪	▪
0136	RW	kvarh Export of Tariff A period	UINT32	x10, kvarh		▪	▪
0138	RW	kvarh Import of Tariff B period	UINT32	x10, kvarh		▪	▪
0140	RW	kvarh Export of Tariff B period	UINT32	x10, kvarh		▪	▪
0142	RW	kvarh Import of Tariff C period	UINT32	x10, kvarh		▪	▪
0144	RW	kvarh Export of Tariff C period	UINT32	x10, kvarh		▪	▪
0146	RW	kvarh Import of Tariff D period	UINT32	x10, kvarh		▪	▪
0148	RW	kvarh Export of Tariff D period	UINT32	x10, kvarh		▪	▪
0150	RW	kvarh Q1	UINT32	x10, kvarh		▪	▪
0152	RW	kvarh Q2	UINT32	x10, kvarh		▪	▪
0154	RW	kvarh Q3	UINT32	x10, kvarh		▪	▪
0156	RW	kvarh Q4	UINT32	x10, kvarh		▪	▪

Table 5-4 3-Phase Energy Measurements

5.2.2 Phase A (L1) Energy Measurements

Register	Property	Description	Format	Multiplier /Unit	PMC-330 Model		
					A	B	C
0400	RW	kWh Import	UINT32	x10, kWh	▪	▪	▪
0402	RW	kWh Export	UINT32	x10, kWh	▪	▪	▪
0404	RO	kWh Net	INT32	x10, kWh	▪	▪	▪
0406	RO	kWh Total	UINT32	x10, kWh	▪	▪	▪
0408	RW	kvarh Import	UINT32	x10, kvarh	▪	▪	▪
0410	RW	kvarh Export	UINT32	x10, kvarh	▪	▪	▪
0412	RO	kvarh Net	INT32	x10, kvarh	▪	▪	▪
0414	RO	kvarh Total	UINT32	x10, kvarh	▪	▪	▪
0416	RW	kVAh	UINT32	x10, kVAh	▪	▪	▪
0418	RW	kWh Import of Tariff A period	UINT32	x10, kWh		▪	▪
0420	RW	kWh Export of Tariff A period	UINT32	x10, kWh		▪	▪
0422	RW	kWh Import of Tariff B period	UINT32	x10, kWh		▪	▪
0424	RW	kWh Export of Tariff B period	UINT32	x10, kWh		▪	▪
0426	RW	kWh Import of Tariff C period	UINT32	x10, kWh		▪	▪
0428	RW	kWh Export of Tariff C period	UINT32	x10, kWh		▪	▪
0430	RW	kWh Import of Tariff D period	UINT32	x10, kWh		▪	▪
0432	RW	kWh Export of Tariff D period	UINT32	x10, kWh		▪	▪
0434	RW	kvarh Import of Tariff A period	UINT32	x10, kvarh		▪	▪

0436	RW	kvarh Export of Tariff A period	UINT32	x10, kvarh		▪	▪
0438	RW	kvarh Import of Tariff B period	UINT32	x10, kvarh		▪	▪
0440	RW	kvarh Export of Tariff B period	UINT32	x10, kvarh		▪	▪
0442	RW	kvarh Import of Tariff C period	UINT32	x10, kvarh		▪	▪
0444	RW	kvarh Export of Tariff C period	UINT32	x10, kvarh		▪	▪
0446	RW	kvarh Import of Tariff D period	UINT32	x10, kvarh		▪	▪
0448	RW	kvarh Export of Tariff D period	UINT32	x10, kvarh		▪	▪
0450	RW	kvarh Q1	UINT32	x10, kvarh		▪	▪
0452	RW	kvarh Q2	UINT32	x10, kvarh		▪	▪
0454	RW	kvarh Q3	UINT32	x10, kvarh		▪	▪
0456	RW	kvarh Q4	UINT32	x10, kvarh		▪	▪

Table 5-5 Phase A Energy Measurements

5.2.3 Phase B (L2) Energy Measurements

Register	Property	Description	Format	Multiplier /Unit	PMC-330 Model		
					A	B	C
0550	RW	kWh Import	UINT32	x10, kWh	▪	▪	▪
0552	RW	kWh Export	UINT32	x10, kWh	▪	▪	▪
0554	RO	kWh Net	INT32	x10, kWh	▪	▪	▪
0556	RO	kWh Total	UINT32	x10, kWh	▪	▪	▪
0558	RW	kvarh Import	UINT32	x10, kvarh	▪	▪	▪
0560	RW	kvarh Export	UINT32	x10, kvarh	▪	▪	▪
0562	RO	kvarh Net	INT32	x10, kvarh	▪	▪	▪
0564	RO	kvarh Total	UINT32	x10, kvarh	▪	▪	▪
0566	RW	kVAh	UINT32	x10, kVAh	▪	▪	▪
0568	RW	kWh Import of Tariff A period	UINT32	x10, kWh		▪	▪
0570	RW	kWh Export of Tariff A period	UINT32	x10, kWh		▪	▪
0572	RW	kWh Import of Tariff B period	UINT32	x10, kWh		▪	▪
0574	RW	kWh Export of Tariff B period	UINT32	x10, kWh		▪	▪
0576	RW	kWh Import of Tariff C period	UINT32	x10, kWh		▪	▪
0578	RW	kWh Export of Tariff C period	UINT32	x10, kWh		▪	▪
0580	RW	kWh Import of Tariff D period	UINT32	x10, kWh		▪	▪
0582	RW	kWh Export of Tariff D period	UINT32	x10, kWh		▪	▪
0584	RW	kvarh Import of Tariff A period	UINT32	x10, kvarh		▪	▪
0586	RW	kvarh Export of Tariff A period	UINT32	x10, kvarh		▪	▪
0588	RW	kvarh Import of Tariff B period	UINT32	x10, kvarh		▪	▪
0590	RW	kvarh Export of Tariff B period	UINT32	x10, kvarh		▪	▪
0592	RW	kvarh Import of Tariff C period	UINT32	x10, kvarh		▪	▪
0594	RW	kvarh Export of Tariff C period	UINT32	x10, kvarh		▪	▪
0596	RW	kvarh Import of Tariff D period	UINT32	x10, kvarh		▪	▪
0598	RW	kvarh Export of Tariff D period	UINT32	x10, kvarh		▪	▪
0600	RW	kvarh Q1	UINT32	x10, kvarh		▪	▪

0602	RW	kvarh Q2	UINT32	x10, kvarh		▪	▪
0604	RW	kvarh Q3	UINT32	x10, kvarh		▪	▪
0606	RW	kvarh Q4	UINT32	x10, kvarh		▪	▪

Table 5-6 Phase B Energy Measurements

5.2.4 Phase C (L3) Energy Measurements

Register	Property	Description	Format	Multiplier /Unit	PMC-330 Model		
					A	B	C
0700	RW	kWh Import	UINT32	x10, kWh	▪	▪	▪
0702	RW	kWh Export	UINT32	x10, kWh	▪	▪	▪
0704	RO	kWh Net	INT32	x10, kWh	▪	▪	▪
0706	RO	kWh Total	UINT32	x10, kWh	▪	▪	▪
0708	RW	kvarh Import	UINT32	x10, kvarh	▪	▪	▪
0710	RW	kvarh Export	UINT32	x10, kvarh	▪	▪	▪
0712	RO	kvarh Net	INT32	x10, kvarh	▪	▪	▪
0714	RO	kvarh Total	UINT32	x10, kvarh	▪	▪	▪
0716	RW	kVAh	UINT32	x10, kVAh	▪	▪	▪
0718	RW	kWh Import of Tariff A period	UINT32	x10, kWh		▪	▪
0720	RW	kWh Export of Tariff A period	UINT32	x10, kWh		▪	▪
0722	RW	kWh Import of Tariff B period	UINT32	x10, kWh		▪	▪
0724	RW	kWh Export of Tariff B period	UINT32	x10, kWh		▪	▪
0726	RW	kWh Import of Tariff C period	UINT32	x10, kWh		▪	▪
0728	RW	kWh Export of Tariff C period	UINT32	x10, kWh		▪	▪
0730	RW	kWh Import of Tariff D period	UINT32	x10, kWh		▪	▪
0732	RW	kWh Export of Tariff D period	UINT32	x10, kWh		▪	▪
0734	RW	kvarh Import of Tariff A period	UINT32	x10, kvarh		▪	▪
0736	RW	kvarh Export of Tariff A period	UINT32	x10, kvarh		▪	▪
0738	RW	kvarh Import of Tariff B period	UINT32	x10, kvarh		▪	▪
0740	RW	kvarh Export of Tariff B period	UINT32	x10, kvarh		▪	▪
0742	RW	kvarh Import of Tariff C period	UINT32	x10, kvarh		▪	▪
0744	RW	kvarh Export of Tariff C period	UINT32	x10, kvarh		▪	▪
0746	RW	kvarh Import of Tariff D period	UINT32	x10, kvarh		▪	▪
0748	RW	kvarh Export of Tariff D period	UINT32	x10, kvarh		▪	▪
0750	RW	kvarh Q1	UINT32	x10, kvarh		▪	▪
0752	RW	kvarh Q2	UINT32	x10, kvarh		▪	▪
0754	RW	kvarh Q3	UINT32	x10, kvarh		▪	▪
0756	RW	kvarh Q4	UINT32	x10, kvarh		▪	▪

Table 5-7 Phase C Energy Measurements

5.3 Energy Recorder (kWh/kvarh/kVAh) for the Present Month and the Last 12 Months

Register	Property	Description	Format	Multiplier /Unit	PMC-330 Model		
					A	B	C
0250	RW	Month[1]	UINT16	0 to 12 Default=0	■	■	■
0251	RO	High-order Byte: Year (0-99) Low-order Byte: Month (1-12)	UINT16	Time Stamp[2] (20YY/MM/DD HH:MM:SS)	■	■	■
0252	RO	High-order Byte: Day (1-31) Low-order Byte: Hour (0-23)	UINT16		■	■	■
0253	RO	High-order Byte: Minute (0-59) Low-order Byte: Second (0-59)	UINT16		■	■	■
0254	RW	kWh Import	UINT32	x10, kWh	■	■	■
0256	RW	kWh Export	UINT32	x10, kWh	■	■	■
0258	RO	kWh Net	INT32	x10, kWh	■	■	■
0260	RO	kWh Total	UINT32	x10, kWh	■	■	■
0262	RW	kvarh Import	UINT32	x10, kvarh	■	■	■
0264	RW	kvarh Export	UINT32	x10, kvarh	■	■	■
0266	RO	kvarh Net	INT32	x10, kvarh	■	■	■
0268	RO	kvarh Total	UINT32	x10, kvarh	■	■	■
0270	RW	kVAh	UINT32	x10, kVAh	■	■	■
0272	RW	kWh Import of Tariff A period	UINT32	x10, kWh		■	■
0274	RW	kWh Export of Tariff A period	UINT32	x10, kWh		■	■
0276	RW	kWh Import of Tariff B period	UINT32	x10, kWh		■	■
0278	RW	kWh Export of Tariff B period	UINT32	x10, kWh		■	■
0280	RW	kWh Import of Tariff C period	UINT32	x10, kWh		■	■
0282	RW	kWh Export of Tariff C period	UINT32	x10, kWh		■	■
0284	RW	kWh Import of Tariff D period	UINT32	x10, kWh		■	■
0286	RW	kWh Export of Tariff D period	UINT32	x10, kWh		■	■
0288	RW	kvarh Import of Tariff A period	UINT32	x10, kvarh		■	■
0290	RW	kvarh Export of Tariff A period	UINT32	x10, kvarh		■	■
0292	RW	kvarh Import of Tariff B period	UINT32	x10, kvarh		■	■
0294	RW	kvarh Export of Tariff B period	UINT32	x10, kvarh		■	■
0296	RW	kvarh Import of Tariff C period	UINT32	x10, kvarh		■	■
0298	RW	kvarh Export of Tariff C period	UINT32	x10, kvarh		■	■
0300	RW	kvarh Import of Tariff D period	UINT32	x10, kvarh		■	■
0302	RW	kvarh Export of Tariff D period	UINT32	x10, kvarh		■	■
0304	RW	kvarh Q1	UINT32	x10, kvarh		■	■
0306	RW	kvarh Q2	UINT32	x10, kvarh		■	■
0308	RW	kvarh Q3	UINT32	x10, kvarh		■	■
0310	RW	kvarh Q4	UINT32	x10, kvarh		■	■

Table 5-8 Energy Recorder

Notes:

1) This register represents the Monthly Energy Recorder to read and must be first written. The range of this register is from 0 to 12, which represents the Present Month and the Last 12 Months. For example, if the current month is 2011/07, "0" means 2011/07, "1" means 2011/06, "2" means 2011/05, ……"12" means "2010/07". The "**Month**" register with address 0250 must first be written with a value between 0 and 12 before the registers from 0250 to 0302 in the Monthly Recorder should be read. For example, if the Energy Recorder of last month is to be read, the value "1" should be first written into register # 250 before reading registers # 0250 to 0302 in a single transaction. Reading the "Month" register would ensure that the correct monthly energy recorder is read.
2) For Energy Recorders of the Last 12 Months, the time stamp shows the exact self read time (20YY/MM/DD HH:MM:SS). For Energy Recorder of the Present Month, the time stamp shows the current time of the meter.
3) The Energy Recorder for the Present Month can be modified, but the Energy Recorders for the Last 12 Months can only be read.

5.4 Peak Demands (PMC-330C Only)

The Peak Demand data is 1000 times the actual value. For example, if the register # 1000 contains a value of 123456, the actual ∑kW Peak Demand value is 123.456kW.

Register	Property	Description	Format	Multiplier /Unit
1000	RO	∑kW Peak Demand of This Month	See Table 5-18 DMD-LOG Data Structure	x1000, kW
1005	RO	∑kvar Peak Demand of This Month		x1000, kvar
1010	RO	∑kVA Peak Demand of This Month		x1000, kVA
1015	RO	Ia Peak Demand of This Month		x1000, A
1020	RO	Ib Peak Demand of This Month		x1000, A
1025	RO	Ic Peak Demand of This Month		x1000, A
1030	RO	∑kW Peak Demand of Last Month		x1000, kW
1035	RO	∑kvar Peak Demand of Last Month		x1000, kvar
1040	RO	∑kVA Peak Demand of Last Month		x1000, kVA
1045	RO	Ia Peak Demand of Last Month		x1000, A
1050	RO	Ib Peak Demand of Last Month		x1000, A
1055	RO	Ic Peak Demand of Last Month		x1000, A
1060	RO	∑kW Peak Demand of Tariff A period of This Month		x1000, kW
1065	RO	∑kW Peak Demand of Tariff B Period of This month		x1000, kW
1070	RO	∑kW Peak Demand of Tariff C Period of This Month		x1000, kW
1075	RO	∑kW Peak Demand of Tariff D Period of This Month		x1000, kW
1080	RO	∑kvar Peak Demand of Tariff A period of This Month		x1000, kvar
1085	RO	∑kvar Peak Demand of Tariff B Period of This month		x1000, kvar
1090	RO	∑kvar Peak Demand of Tariff C Period of This Month		x1000, kvar
1095	RO	∑kvar Peak Demand of Tariff D Period of This Month		x1000, kvar
1100	RO	∑kW Peak Demand of Tariff A period of Last Month		x1000, kW
1105	RO	∑kW Peak Demand of Tariff B Period of Last month		x1000, kW

1110	RO	∑kW Peak Demand of Tariff C Period of Last Month		x1000, kW
1115	RO	∑kW Peak Demand of Tariff D Period of Last Month		x1000, kW
1120	RO	∑kvar Peak Demand of Tariff A period of Last Month		x1000, kvar
1125	RO	∑kvar Peak Demand of Tariff B Period of Last month		x1000, kvar
1130	RO	∑kvar Peak Demand of Tariff C Period of Last Month		x1000, kvar
1135	RO	∑kvar Peak Demand of Tariff D Period of Last Month		x1000, kvar

Table 5-9 Peak Demand

5.5 Max/Min Log (PMC-330C Only)

Register	Property	Description	Format	Multiplier/Unit
1500	RO	I max/min of This Month	Table 5-19 Max-Min-LOG Data Structure	x1000, A
1512	RO	VLN max/min of This Month		x100, V
1524	RO	VLL max/min of This Month		x100, V
1536	RO	∑kW max/min of This Month		x1000, kW
1548	RO	∑kvar max/min of This Month		x1000, kvar
1560	RO	∑kVA max/min of This Month		x1000, kVA
1572	RO	FREQ max/min of This Month		x100, Hz
1584	RO	I max/min of Last Month		x1000, A
1596	RO	VLN max/min of Last Month		x100, V
1608	RO	VLL max/min of Last Month		x100, V
1620	RO	∑kW max/min of Last Month		x1000, kW
1632	RO	∑kvar max/min of Last Month		x1000, kvar
1644	RO	∑kVA max/min of Last Month		x1000, kVA
1656	RO	FREQ max/min of Last Month		x100, Hz

Table 5-10 Max/Min Log

5.6 Harmonics Measurements (PMC-330C Only)

The value of THD/TOHD/TEHD data returned is 10000 times the actual value. For example, if the register contains a value of 1031, the actual harmonic value is 0.1031 or 10.31%. The value of the K Factor data returned is 10 times the actual value.

Register	Property	Description	Format	Multiplier
2000 - 2002		Reserved		
2003	RO	Ia K Factor	UINT16	×10
2004	RO	Ib K Factor	UINT16	×10
2005	RO	Ic K Factor	UINT16	×10
2006	RO	Va TOHD	UINT16	×10000
2007	RO	Vb TOHD	UINT16	×10000
2008	RO	Vc TOHD	UINT16	×10000
2009	RO	Ia TOHD	UINT16	×10000
2010	RO	Ib TOHD	UINT16	×10000
2011	RO	Ic TOHD	UINT16	×10000

2012	RO	Va TEHD	UINT16	×10000
2013	RO	Vb TEHD	UINT16	×10000
2014	RO	Vc TEHD	UINT16	×10000
2015	RO	Ia TEHD	UINT16	×10000
2016	RO	Ib TEHD	UINT16	×10000
2017	RO	Ic TEHD	UINT16	×10000
2018	RO	Va THD	UINT16	×10000
2019	RO	Vb THD	UINT16	×10000
2020	RO	Vc THD	UINT16	×10000
2021	RO	Ia THD	UINT16	×10000
2022	RO	Ib THD	UINT16	×10000
2023	RO	Ic THD	UINT16	×10000

Table 5-11 Harmonics Measurements

5.7 Setup Parameters

Register	Property	Description	Format	Range/Options	PMC-330 Model		
					A	B	C
6000	RW	PT Ratio[1]	UINT16	1 (Fixed)	■	■	■
6001	RW	CT Ratio[1]	UNIT16	1 (Fixed for Direct Inputs) 1* to 6000 (CT Inputs)	■	■	■
6002	RW	Wiring Mode	UINT16	0=WYE* 2=DEMO	■	■	■
6003	RW	Unit ID	UINT16	1 to 247 (Default = 100)	■	■	■
6004	RW	Baud rate	UINT16	0=1200 1=2400 2=4800 3=9600* 4=19200	■	■	■
6005	RW	Configuration	UINT16	0=8N2 1=8O1 2=8E1* 3=8N1 4=8O2 5=8E2	■	■	■
6006	RW	PF Convention	UINT16	0=IEC* 1=IEEE 2=-IEEE	■	■	■
6007	RW	kVA Calculation	UINT16	0=Vector* 1=Scalar		■	■
6008	RW	DO1 Pulse Width	UINT16	0 to 6000 (x0.1s) 0 = Latch Mode	■	■	■
6009	RW	DO2 Pulse Width	UINT16		■	■	■

				(Default = 10)			
6010	RW	Setpoint 1	Setpoint Data Structure	See Section 5.12.3			▪
6019	RW	Setpoint 2					
6028	RW	Setpoint 3					
6037	RW	Setpoint 4					
6046	RW	Setpoint 5					
6055	RW	Setpoint 6					
6064	RW	Setpoint 7					
6073	RW	Setpoint 8					
6082	RW	Ia Polarity	UINT16	0=Normal* 1=Reverse	▪	▪	▪
6083	RW	Ib Polarity	UINT16	0=Normal* 1=Reverse	▪	▪	▪
6084	RW	Ic Polarity	UINT16	0=Normal* 1=Reverse	▪	▪	▪
6085	RW	TOU Season 2 Start Day	UINT16	See Section 5.12.4 TOU Profile Data Structure		▪	▪
6086	RW	TOU Season 3 Start Day	UINT16				
6087	RW	TOU Season 4 Start Day	UINT16				
6088	RW	TOU Season 5 Start Day	UINT16				
6089	RW	TOU Season 6 Start Day	UINT16				
6090	RW	TOU Season 1 Profile Periods	TOU Profile Data Structure				
6109	RW	TOU Season 2 Profile Periods					
6128	RW	TOU Season 3 Profile Periods					
6147	RW	TOU Season 4 Profile Periods					
6166	RW	TOU Season 5 Profile Periods					
6185	RW	TOU Season 6 Profile Periods					
6204	RW	Demand Period	UINT16	1, 2, 3, 5, 10, 15*, 30, 60 (minutes)		▪	▪
6205	RW	Number of Sliding Windows	UINT16	1* to 15		▪	▪
6206	RW	Peak Demand Self-Read Time[2]	UINT16	0*			▪
6207	RW	Max/Min Self-Read Time[3]	UINT16	Default=0			▪

6208	RW	Energy Pulse	UINT16	0=Disable Energy Pulse 1=Enable kWh Pulse* 2=Enable kvarh Pulse	▪	▪	▪
6209	RW	Energy Pulse Constant[3]	UINT16	0=1000* 1=100 2=3200 3=5000 4=400	▪	▪	▪
6210	RW	Energy Self-Read Time[4]	UINT16	Default=0	▪	▪	▪
6211	RW	PPS	UINT16	0=Disabled* 1=Enabled	▪	▪	▪
6212	RW	Default Screen	UINT16	0= kWh Import* 1=Auto Scroll (See Section 3.3)	▪	▪	▪
6213	RW	Date Format	UINT16	0=MM/DD/YYYY* 1=DD/MM/YYYY 2=YYYY/MM/DD	▪	▪	▪
6214 - 6219		Reserved					
6220	WO	Clear Energy Recorder	UINT16	Writing “0xFF00” to the register clears the Energy Recorder of the Last 12 Months	▪	▪	▪
6221	WO	Clear Energy	UINT16	Writing “0xFF00” to the register resets 3-Phase/Phase A/Phase B/Phase C Energy to “0” and clear Energy Recorder of Present Month	▪	▪	▪
6222	WO	Clear SOE	UINT16	Writing “0xFF00” to the register clears the SOE Log and resets its pointer to “0”			▪
6223	WO	Clear Peak Demand of This month	UINT16	Writing “0xFF00” to the register clears the Peak Demand of This month			▪
6224	WO	Clear Max/Min of This Month	UINT16	Writing “0xFF00” to the register clears the Max/Min of This month			▪

* Default

Table 5-12 Setup Parameters

Notes:

1) When the Current Input is direct input (without CTs), these two registers are reserved.

2) There are two types of Peak Demand Self-Read Time. The value 0 indicates that the transfer will happen at 24:00 of the last day of every month. A non-zero value indicates that the transfer will happen at a specific time based on the formula [Hour+Day*100] where 0≤Hour≤23 and 1≤Day≤28. For example, the value 1512 means that the Peak Demand of This Month will be transferred to the Peak Demand of Last Month register at 12:00pm on the 15th day of each month.
3) Please see **Table 3-9 Pulse Constant.**
4) There are two types of Max/Min Self-Read Time. The value 0 indicates that the transfer will happen at 24:00 of the last day of every month. A non-zero value indicates that the transfer will happen at a specific time based on the formula [Hour+Day*100] where 0≤Hour≤23 and 1≤Day≤28. For example, the value 1512 means that the Max/Min of This Month will be transferred to the Max/Min of Last Month register at 12:00pm on the 15th day of each month.
5) There are two types of Energy Self-Read Time. The value 0 indicates that the transfer will happen at 24:00 of the last day of every month. A non-zero value indicates that the transfer will happen at a specific time based on the formula [Hour+Day*100] where 0≤Hour≤23 and 1≤Day≤28. For example, the value 1512 means that the Energy of This Month will be transferred to the Energy of Last Month register at 12:00pm on the 15th day of each month; and at the same time, the Energy of last Month will be transferred to the Energy of the Month before last register, …..

5.8 SOE Log (PMC-330C Only)

The SOE Pointer points to the register address within the SOE Log where the next event will be stored. The following formula is used to determine the register address of the most recent SOE event referenced by the SOE Pointer value:

Register Address = 10000 + Modulo((SOE Pointer-1)/64)*8

Register	Property	Description	Format
10000 -10007	RO	Event 1	**Table 5-22 SOE LOG Data Structure**
10008 - 10015	RO	Event 2	
10016 - 10023	RO	Event 3	
10024 - 10031	RO	Event 4	
10032- 10039	RO	Event 5	
10040 - 10047	RO	Event 6	
10048 - 10055	RO	Event 7	
10056 - 10063	RO	Event 8	
10064 - 10071	RO	Event 9	
10072 - 10079	RO	Event 10	
10080 - 10087	RO	Event 11	
10088 - 10095	RO	Event 12	
……			
10504 - 10511	RO	Event 64	

Table 5-13 SOE Log

5.9 Time

There are two sets of Time registers supported by the PMC-330 - Year/Month/Day/Hour/Minute/Second (Register # 9000 to 9002) and UNIX Time (Register # 9004). When sending time to the PMC-330 over Modbus communications, care should be taken to only write one of the two Time register sets. All registers within a Time register set must be written in a single transaction. If registers 9000 to 9004 are being written to at the same time, both Time register sets will be updated to reflect the new time specified in the UNIX Time register set (9004) and the time specified in registers 9000-9002 will be ignored. Writing to the Millisecond register (9003) is optional during a Time Set operation. When broadcasting time, the function code must be set to 0x10 (Pre-set Multiple Registers). Incorrect date or time values will be rejected by the meter.

Register	Property	Description	Format	Note
9000	RW	High-order Byte: Year	UINT16	0-99 (Year-2000)
		Low-order Byte: Month		1 to 12
9001	RW	High-order Byte: Day	UINT16	1 to 31
		Low-order Byte: Hour		0 to 23
9002	RW	High-order Byte: Minute	UINT16	0 to 59
		Low-order Byte: Second		0 to 59
9003	RW	Millisecond	UINT16	0 to 999
9004	RW	UINX Time	UINT32	(0 to 4102444800) This time shows the number of seconds since 00:00:00 January 1, 1970

Table 5-14 Time Registers

5.10 DO Control

The DO Control registers are implemented as “Write-Only” Modbus Coil Registers and can be controlled with the Force Single Coil command (Function Code 0x05). The PMC-330 does not support the Read Coils command (Function Code 0x01) because DO Control registers are “Write-Only”. Register 0076 (DO Status) should be read instead to determine the current DO status.

The PMC-330 adopts the ARM before EXECUTE operation for the remote control of its Digital Outputs. Before executing an OPEN or CLOSE command on a Digital Output, it must be “Armed” first. This is achieved by writing the value 0xFF00 to the appropriate register to “Arm” a particular DO operation. The DO will be “Disarmed” automatically if an “Execute” command is not received within 15 seconds after it has been “Armed”. If an “Execute” command is received without first having received an “Arm” command, the meter ignores the “Execute” command and returns the 0x04 exception code.

Register	Property	Description	Note	PMC-330 Model		
				A	B	C
9100	WO	Arm DO1 Close	Writing “0xFF00”	▪	▪	▪
9101	WO	Execute DO1 Close	Writing “0xFF00”	▪	▪	▪
9102	WO	Arm DO1 Open	Writing “0xFF00”	▪	▪	▪
9103	WO	Execute DO1 Open	Writing “0xFF00”	▪	▪	▪

9104	WO	Arm DO2 Close	Writing “0xFF00”	▪	▪	▪
9105	WO	Execute DO2 Close	Writing “0xFF00”	▪	▪	▪
9106	WO	Arm DO2 Open	Writing “0xFF00”	▪	▪	▪
9107	WO	Execute DO2 Open	Writing “0xFF00”	▪	▪	▪

Table 5-15 DO Control

5.11 Meter Information

Register	Property	Description	Format	Note
9800 - 9819	RO	Meter Model[1]	UINT16	PMC-330A/330B/330C
9820	RO	Firmware Version	UINT16	e.g. 10000 shows the version is V1.00.00
9821	RO	Protocol Version	UINT16	e.g. 11 shows the version is V1.1
9822	RO	Firmware Update Date: Year-2000	UINT16	e.g.100709 means July 9,2010
9823	RO	Firmware Update Date: Month	UINT16	
9824	RO	Firmware Update Date: Day	UINT16	
9825	RO	Serial Number: XX(Year-2000) - XX(Month) - XX(Lot Number) - XXXX(Meter Number)	UINT32	e.g. 1008471895 means that this meter was the 1895th meter manufactured in Lot 47 of August 2010
9827 - 9828	RO	Reserved		
9829	RO	Configuration	UINT16	B4B3B2: 001= 2DI+2DO 010= 1 Pulse Output+1PPS B5: 0= No RS485 1= 1xRS485 Other Bits are reserved
9830	RO	Current configuration	UINT16	0x00=5A (Direct Input) 0x01=10A (Direct Input) 0x02=20A (Direct Input) 0x80=5A (with CTs)
9831	RO	Voltage configuration	UINT16	0x00=415V

Table 5-16 Meter Information

Note:

1) The Meter Model appears in registers 9800 to 9819 and contains the ASCII encoding of the string “PMC-330A” as shown in the following table.

Register	Value(Hex)	ASCII
9800	0x50	P
9801	0x4D	M
9802	0x43	C
9803	0x2D	-
9804	0x33	3
9805	0x33	3
9806	0x30	0
9807	0x41	A
9808-9819	0x20	<Null>

Table 5-17 ASCII Encoding of "PMC-330A"

5.12 Data Format

5.12.1 Peak Demand Data Structure

Offset	Parameter	Description	Format
+0	Time Stamp	High-order Byte: Year-2000 (0 to 99) Low-order Byte: Month (1 to 12)	UINT16
+1		High-order Byte: Day (1 to 28/29/30/31) Low-order Byte: Hour (0 to 23)	UINT16
+2		High-order Byte: Minute (0 to 59) Low-order Byte: Second (0 to 59)	UINT16
+3	Peak Demand	Peak Demand Value	INT32

Table 5-18 DMD-LOG Data Structure

Notes:

1) If the value of Peak Demand resister is "0", the Time Stamp register is reserved.
2) The Registers +0 to +3 must be read at the same time.

5.12.2 Max/Min Data Structure

Offset	Parameter	Description	Format
+0	Time Stamp for Min Value	High-order Byte: Year-2000 (0 to 99)	UINT16
		Low-order Byte: Month (1 to 12)	
+1		High-order Byte: Day (1 to 28/29/30/31)	UINT16
		Low-order Byte: Hour (0 to 23)	
+2		High-order Byte: Minute (0 to 59)	UINT16
		Low-order Byte: Second (0 to 59)	
+3	Min Value	Min Value (Initial Value: 0X7FFF FFFF)	INT32
+5	Min Value's Phase[1]	0: Invalid Data 1: Phase A 2: Phase B 3: Phase C	UINT16
+6	Time Stamp	High-order Byte: Year-2000 (0 to 99)	UINT16

	for Max Value	Low-order Byte: Month (1 to 12)	
+7		High-order Byte: Day (1 to 28/29/30/31)	UINT16
		Low-order Byte: Hour (0 to 23)	
+8		High-order Byte: Minute (0 to 59)	UINT16
		Low-order Byte: Second (0 to 59)	
+9	Max Value	Max Value (Initial Value: 0X8000 0001)	INT32
+11	Max Value's Phase[1]	0: Invalid Data 1: Phase A 2: Phase B 3: Phase C	UINT16

Table 5-19 Max-Min-LOG Data Structure

Notes:

1) For Max/Min value - ∑kW, ∑kvar, ∑kVA and Frequency, the values in Register +5 and Register +11 are "0", which has no meaning.
2) For Max/Min Log of Last Month, if the values of **Time Stamp** registers are "0", the **Max/Min Value** registers are reserved.
3) The Registers +0 to +11 must be read at the same time.

5.12.3 Setpoint Data Structure

Offset	Format	Parameter	Description
+0	UINT16	Setpoint Type	Bit1 Bit0: 00=Disabled 01=Over Setpoint 10=Under Setpoint
+1	UINT16	Setpoint Parameter	0=None, 1=VLN, 2=VLL, 3=I, 4=∑kW, 5=∑kvar, 6=∑kVA, 7=PF, 8=Frequency
+2	INT32	Setpoint Active Limit	Setpoint Active Limit
+3	INT32	Setpoint Return Limit	Setpoint Return Limit
+4	UINT16	Setpoint Active Delay	0-9999 (seconds)
+5	UINT16	Setpoint Return Delay	0-9999 (seconds)
+6	UINT16	Setpoint Trigger	0= No Trigger, 1=Trigger DO1, 2=Trigger DO2

Table 5-20 Setpoint Data Structure

Note:

1) The **Setpoint Limit** for I/PF/∑kW/∑kvar/∑kVA is 1000 times the actual value. For example, if the actual desired limit for PF is 0.866, the **Setpoint Limit** should be specified as 866. And the **Setpoint Limit** for VLN/VLL/Frequency is 100 times the actual value.

5.12.4 TOU Profile Data Structure

The TOU feature supports 4 Tariff Rates, 6 Seasons, 1 Daily Profile with 10 Profile Periods. The user can define the Start Day for each Season within a year and the Profile Periods in 15-minute steps within a day. All days within a Season have the same Daily Profiles. All registers within the TOU Profile Data Structure are required to be written in a single transaction with Function Code 0x10

(Preset Multiple Registers).

- **Tariff Rate:**

  There are four tariff rates – Tariff A, Tariff B, Tariff C and Tariff D. The tariff rates can be applied to any time period.

- **Season X Start Day:**

  There is no Season 1 **Start Day** because Season 1 always starts on the first day of the year. Only the **Start Days** for Seasons 2 to 6 need to be programmed. For the PMC-330, a year consists of 366 days to account for the leap year. February is presumed to always have 29 days. For example, if the Season 2 **Start Day** is on March 1st, it should be programmed as 31+29+1 = 61. The Season X **Start Day** should always be greater than the Season X-1 **Start Day**. If the TOU has only 4 seasons, the Season 5 and 6 **Start Days** should be programmed with the value 366.

- **Season X Daily Profile Periods:**

  There are 10 Profile Periods within the Daily Profile. The Profile **Period Start Time** is programmed with values between 1 to 96 in 15-minute steps. There is no Profile **Period 1 Start Time** because it always starts at 00:00. Only Profile **Period Start Times** 2 to 10 need to be programmed. The Profile **Period Start Time** X should always be greater than the Profile **Period Start Time** X-1. If a Daily Profile has only 5 Profile Periods, the Profile **Period Start Times** 6 to 10 should be programmed with the value 96.

Offset	Format	Description	Range/Option
+0	UINT16	Profile Period 2 Start Time	1 to 96
+1	UINT16	Profile Period 3 Start Time	
+2	UINT16	Profile Period 4 Start Time	
+3	UINT16	Profile Period 5 Start Time	
+4	UINT16	Profile Period 6 Start Time	
+5	UINT16	Profile Period 7 Start Time	
+6	UINT16	Profile Period 8 Start Time	
+7	UINT16	Profile Period 9 Start Time	
+8	UINT16	Profile Period 10 Start Time	
+9	UINT16	Profile Period 1 Tariff Rate	0= Tariff A 1= Tariff B 2= Tariff C 3= Tariff D
+10	UINT16	Profile Period 2 Tariff Rate	
+11	UINT16	Profile Period 3 Tariff Rate	
+12	UINT16	Profile Period 4 Tariff Rate	
+13	UINT16	Profile Period 5 Tariff Rate	
+14	UINT16	Profile Period 6 Tariff Rate	
+15	UINT16	Profile Period 7 Tariff Rate	
+16	UINT16	Profile Period 8 Tariff Rate	
+17	UINT16	Profile Period 9 Tariff Rate	
+18	UINT16	Profile Period 10 Tariff Rate	

Table 5-21 TOU Profile Data Structure

5.12.5 SOE Log Data Structure

Offset	Properties	Description
+0	RO	Reserved
+1	RO	High-order Byte: Event Classification (Table 5-23)
		Low-order Byte: Sub-Classification (Table 5-23)
+2	RO	High-order Byte: Year (Year-2000=0 to 99)
		Low-order Byte: Month (0 to 12)
+3	RO	High-order Byte: Day (0 to 31)
		Low-order Byte: Hour (0 to 23)
+4	RO	High-order Byte: Minute (0 to 59)
		Low-order Byte: Second (0 to 59)
+5	RO	Millisecond (0 to 999)
+6	RO	Event Value High-order Word
+7	RO	Event Value Low-order Word

Table 5-22 SOE LOG Data Structure

The following table shows the Event Classification:

Event Classification	Sub-Classification	Event Value Scale/Option	Description
1	1	1/0	DI1 Close/DI1 Open
	2	1/0	DI2 Close/DI2 Open
	3	1/0	DO1Close/DO1 Open
	4	1/0	DO2 Close/DO2 Open
2	1	Trigger Value	Over VLN Setpoint Active
	2	Trigger Value	Over VLL Setpoint Active
	3	Trigger Value	Over Current Setpoint Active
	4	Trigger Value	Over ∑kW Setpoint Active
	5	Trigger Value	Over ∑kvar Setpoint Active
	6	Trigger Value	Over ∑kVA Setpoint Active
	7	Trigger Value	Over PF Setpoint Active
	8	Trigger Value	Over Frequency Setpoint Active
	9	Trigger Value	Under VLN Setpoint Active
	10	Trigger Value	Under VLL Setpoint Active
	11	Trigger Value	Under Current Setpoint Active
	12	Trigger Value	Under ∑kW Setpoint Active
	13	Trigger Value	Under ∑kvar Setpoint Active
	14	Trigger Value	Under ∑kVA Setpoint Active
	15	Trigger Value	Under PF Setpoint Active
	16	Trigger Value	Under Frequency Setpoint Active
	0x80H+1	Return Value	Over VLN Setpoint Return
	0x80H+2	Return Value	Over VLL Setpoint Return
	0x80H+3	Return Value	Over Current Setpoint Return
	0x80H+4	Return Value	Over ∑kW Setpoint Return

	0x80H+5	Return Value	Over ∑kvar Setpoint Return
	0x80H+6	Return Value	Over ∑kVA Setpoint Return
	0x80H+7	Return Value	Over PF Setpoint Return
	0x80H+8	Return Value	Over Frequency Setpoint Return
	0x80H+9	Return Value	Under VLN Setpoint Return
	0x80H+10	Return Value	Under VLL Setpoint Return
	0x80H+11	Return Value	Under Current Setpoint Return
	0x80H+12	Return Value	Under ∑kW Setpoint Return
	0x80H+13	Return Value	Under ∑kvar Setpoint Return
	0x80H+14	Return Value	Under ∑kVA Setpoint Return
	0x80H+15	Return Value	Under PF Setpoint Return
	0x80H+16	Return Value	Under Frequency Setpoint Return
3			Reserved
4	1	0	Setting Parameters Error
	2	0	Calibration Parameters Error
5	1	0	Power On
	2	0	Power Off
	3	0	Setup Changes via Front Panel
	4	0	Set Clock via Front Panel
	5	0	Clear SOE via Front Panel
	6	0	Clear 3-Phase/Phase A/Phase B/Phase C Energy and Energy Recorder of Present Month via Front Panel
	7	0	Clear Peak Demand of This Month via Front Panel
	8	0	Clear Max/Min of This Month via Front Panel
	9		Clear Energy Recorder of the Last 12 Months via Front Panel
	10	0	Setup Changes via Communications
	11	0	Clear SOE via Communications
	12	0	Clear 3-Phase/Phase A/Phase B/Phase C Energy and Energy Recorder of Present Month via Communications
	13	0	Clear Peak Demand of This Month via Communications
	14	0	Clear Max/Min of This Month via Communications
	15	0	Clear Energy Recorder of the Last 12 Months via Communications

Table 5-23 Event Classification

Note:

1) The **Trigger Value and Return Value** for I/PF/∑kW/∑kvar/∑kVA is 1000 times the actual value. And the **Trigger Value and Return Value** for VLN/VLL/Frequency is 100 times the actual value.

Appendix A - Technical Specifications

Inputs (L1, L2, L3, N)	
Voltage (Vn)	240VLN/415VLL 0.8 to 1.1 Vn
Current (In/Imax)	5A/20A, 10A/40A, 20A/80A direct input (0.1% Imax to Imax) CT Input at 5A/6A (0.1% In to Imax)
Frequency	50/60Hz
Power Supply	3-phase power supply from 0.7 to 1.2 Vn
Digital Inputs (DI1, DI2, DIC)	
Type	Dry contact, 24VDC internally wetted
Pulse width	20ms
Digital Outputs (DO11, DO12, DO21, DO22)	
Type	Form A Mechanical Relay
Loading	5A @ 250VAC / 30VDC
Solid State Energy Pulse Output (Selectable - kWh/kvarh)	
Pulse constant	5000/3200/1000/400/100
Isolation	Optical
Max. Load Voltage	80V
Max. Forward Current	50mA
1 Pulse Per Second Output (CLK+, CLK-)	
Duty Cycle	50%
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 106 kPa

Accuracy

Parameters	Accuracy	Resolution
Voltage	±0.5%	0.01V
Current	±0.5%	0.001A
kW, kvar, kVA	±1%	0.001kW/kvar/kVA
kWh, kVAh	IEC 62053-21 Class 1 for Direct Inputs	0.1kWh
	IEC 62053-22 Class 0.5S for 5A CT Inputs	
kvarh	IEC 62053-23 Class 2	0.1kvarh
P.F.	±1%	0.001
Frequency	±0.02Hz	0.01Hz
Harmonics	IEC 61000-4-7 Class B	0.1%
K-Factor	IEC 61000-4-7 Class B	0.1

Appendix B - Standards Compliance

Safety Requirements		
CE LVD 2006/95/EC		EN61010-1-1-2001
Insulation Dielectric test Insulation resistance Impulse voltage		IEC 60255-5-2000 2kV @ 1 minute >100MΩ 5kV, 1.2/50μs
Electromagnetic Compatibility **CE EMC Directive 2004/108/EC (EN 61326: 2006)**		
Immunity Tests		
Electrostatic discharge		IEC 61000-4-2:2001 Level IV
Radiated fields		IEC 61000-4-3:2008 (10 V/m)
Fast transients		IEC 61000-4-4:2004 Level IV
Surges		IEC 61000-4-5:2005 Level IV
Conducted disturbances		IEC 61000-4-6:2006 Level III
Magnetic Fields		IEC 61000-4-8:2009 Level IV
Oscillatory waves		IEC 61000-4-12:1995 Level III
Radio Disturbances		CISPR 22:2006, Level B
Emission Tests		
Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment		EN 55011: 2009 (CISPR 11)
Limits and methods of measurement of radio disturbance characteristics of information technology equipment		EN 55022: 2006+A1: 2007 (CISPR 22)
Limits for harmonic current emissions for equipment with rated current ≤16 A		EN 61000-3-2: 2006+A1: 2009
Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current ≤16 A		EN 61000-3-3: 2006
Emission standard for residential, commercial and light-industrial environments		EN 61000-6-3: 2007
Electromagnetic Emission Tests for Measuring Relays and Protection Equipment		IEC 60255-25: 2000
Mechanical Tests		
Vibration Test	Response	IEC 60255-21-1 Level I
	Endurance	IEC 60255-21-1 Level I
Shock Test	Response	IEC 60255-21-2 Level I
	Endurance	IEC 60255-21-2 Level I
Bump Test		IEC 60255-21-2 Level I

CE

Appendix C - Ordering Guide

Ceiec Electric Technology

Version 20110804

Product Code	Description
PMC-330 Digital Three-Phase Energy Meter	
Basic Function	
A	Bi-directional Energy Metering + Energy Data for 12 Months
B	Model A + Multifunction Metering + TOU + Demands
C	Model B + THD + Setpoint + Max/Min + Peak Demands + SOE Log
Input Current	
A	20A (80A); Direct Input
B	10A (40A); Direct Input
C	5A (20A); Direct Input
D	5A (6A); CT Input
Input Voltage	
3	240VLN/415VLL
System Frequency	
5	50Hz
6	60Hz
DI/DO	
A	1 SS Pulse Output + 1 Pulse Per Second
B#	2 DO + 2 DI
Communications	
X^	None
A#	1 RS-485 Port
Display Language	
E	English

PMC-330	C	-	D	3	5	B	A	E	PMC-330C-D35BAE (Standard Model)

Standard Configuration

^ "X" option only apply to the Model "A"

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