



CET Meter Catalogue



About CET

CET is a leading vendor of Energy Management Systems manufacturing high quality yet economical monitoring solutions which include Digital Power and Energy Meters, PQ Monitors, as well as intelligent Energy Management Systems that cater to a wide range of industries and applications since 1993.

Founded in 1993

2 Production Bases

1000+ Employees

R&D Centres in Shenzhen and Wuhan



Market Presence in 10+ Countries

10+ Distributors

1 Design Institute

Big Data & Cloud Technologies

Sales & Services

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Accreditations



CET Meters

Contents

DIN Rail Meter



PMC-220



PMC-230



PMC-340



PMC-350-C



PMC-352

DIN Rail Meter

PMC-220	01
PMC-230	05
PMC-340	09
PMC-350-C	13
PMC-352	18

Panel Meter



PMC-53A-E



PMC-53A



PMC-53M-A
PMC-53M-E

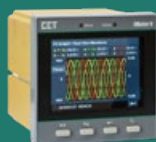


PMC-D726M

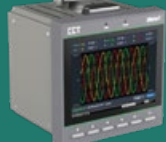
Panel Meter

PMC-53A-E	23
PMC-53A	28
PMC-53M-A	34
PMC-53M-E	38
PMC-D726M	42

Power Quality Monitor



iMeter 6



iMeter 7



iMeter 8



iMeter D7



PMC-660



PMC-670



PMC-680i



PMC-690

Power Quality Monitor

iMeter 6	47
iMeter 7	53
iMeter 8	59
iMeter D7	67
PMC-660	75
PMC-670	80
PMC-680i	86
PMC-690	93

Multi Circuit Monitor



PMC-592



PMC-512-A

Multi Circuit Monitor

PMC-592	99
PMC-512-A	107

PMC-SCCP



5/50A



20/200A

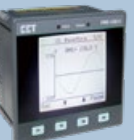


500A

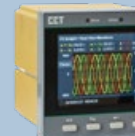
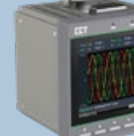
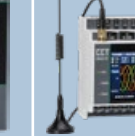


500/5000A

PMC-SCCP	120
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Key Features		DIN Rail Meters						Multi-Function Panel Meters					Key Features	
		PMC-220	PMC-230	PMC-340	PMC-350-C	PMC-352		PMC-D726M	PMC-53A	PMC-53M-A	PMC-53M-E	PMC-53A-E		
General	Class (kWh)	1	1	1 for Direct Input, 0.5S for 5A CT Input	1	1		1	0.5S	0.5S	0.5S	0.5S	Class (kWh)	General
	Dimensions (mm)	 36(W)x90(H)x65(D)	 72(W)x90(H)x68(D)	 126(W)x90(H)x65(D)	 72(W)x95(H)x70(D)	 36(W)x90(H)x65(D)		 72(W)x72(H)x76.8(D)	 96(W)x96(H)x88(D)	 96(W)x96(H)x88(D)	 96(W)x96(H)x88(D)	 96(W)x96(H)x88(D)	Dimensions (mm)	
	Display (Backlit)	B&W (No Backlit)	B&W (No Backlit)	B&W (No Backlit)	B&W (No Backlit)	-		B&W (Backlit)/LED	Dot-Matrix LCD (Backlit)	B&W (Backlit)	High-contrast LED	Dot-Matrix LCD (Backlit)	Display (Backlit)	
	True RMS Sampling Rate	36	36	64	64	64		64	64	64	64	64	True RMS Sampling Rate	
	Battery-backed Real-time Clock	-	√	√	√	-		-	√	√	√	√	Battery-backed Real-time Clock	
	Operating Temperature (°C)	-25 to 70	-25 to 70	-25 to 70	-25 to 70	-25 to 70		-25 to 70	-25 to 70	-25 to 70	-25 to 70	-25 to 70	Operating Temperature (°C)	
Communications	Protocol	Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU (Optional LoRaWAN support at AS923/KR920)	Modbus RTU (Built-in LoRa with configurable ISM Bands for EU863-870, RU864-870, IN865-867, US902-928, AU915-928, AS920-923 and AS923-925)		Modbus RTU	Modbus RTU, BACnet MS/TP, N2 and DNP3.0	Modbus RTU	Modbus RTU	Modbus RTU, Modbus TCP, HTTP, BACnet, DNP3.0, Ethernet Gateway, SNTP, SMTP, TFTP	Protocol	Communications
	RS-485 Port	1	1	1	1	1		(1 Opt.)	1 + (1 Opt.)	1	1	1	RS-485 Port	
	Ethernet	-	-	-	-	-		-	-	-	-	-	Ethernet	
	Web Server	-	-	-	-	-		-	-	-	-	√	Web Server	
I/O	Digital Input (DI)	-	3	(3 Opt.)	(4 Opt.)	3		(2 Opt.)	(6 Opt.)	(4 Opt.)	(4 Opt.)	4	Digital Input (DI)	I/O
	Pulse Counter	-	√	√	√	√		-	√	√	√	√	Pulse Counter	
	Mechanical Digital Output (DO)/ Solid State Output (SS)	1SS	1SS	1SS	(2 Opt.)DO or (2 Opt.)SS	-		(2 Opt.)DO or (2 Opt.)SS	(4 Opt.)DO or (4 Opt.)SS	(2 Opt.)DO	(2 Opt.)DO	2DO or (2 Opt.)SS	Mechanical Digital Output (DO)/ Solid State Output (SS)	
	Analog Input (AI), 0/4-20mA	-	-	-	-	-		-	(1 Opt.)	-	-	(1 Opt.)	Analog Input (AI), 0/4-20mA	
	Analog Output (AO), 0/4-20mA	-	-	-	-	-		(1 Opt.)	(1 Opt.)	-	-	-	Analog Output (AO), 0/4-20mA	
	kWh & kvarh Pulse Output (LED)	√	√	√	√	-		√	√	√	√	√	kWh & kvarh Pulse Output (LED)	
	kWh & kvarh Pulse Output	1	1	1	2	-		(2 Opt.)	(2 Opt.)	-	-	(2 Opt.)	kWh & kvarh Pulse Output	
	IRIG-B (GPS)	-	-	-	-	-		-	-	-	-	-	IRIG-B (GPS)	
Measurements	ULN per Phase & Avg.	1 Phase only	1 Phase only	√	√	√		√	√	√	√	√	ULN per Phase & Avg.	Measurements
	ULL per Phase & Avg.	-	-	√	√	√		√	√	√	√	√	ULL per Phase & Avg.	
	Current per Phase & Avg.	1 Phase only	1 Phase only	√	√	√		√	√	√	√	√	Current per Phase & Avg.	
	Neutral Current (Meas./Calc.)	-	-	(Calc.)	√	-		(Calc.)	√	(Calc.)	(Calc.)	√	Neutral Current (Meas./Calc.)	
	Frequency	√	√	√	√	√		√	√	√	√	√	Frequency	
	kW per Phase & Total	1 Phase only	1 Phase only	√	√	√		√	√	√	√	√	kW per Phase & Total	
	kvar per Phase & Total	1 Phase only	1 Phase only	√	√	√		√	√	√	√	√	kvar per Phase & Total	
	kVA per Phase & Total	1 Phase only	1 Phase only	√	√	√		√	√	√	√	√	kVA per Phase & Total	
	PF per Phase & Total	1 Phase only	1 Phase only	√	√	√		√	√	√	√	√	PF per Phase & Total	
	kWh Import/Export	√	√	√	√	√		√	√	√	√	√	kWh Import/Export	
	kvarh Import/Export	√	√	√	√	√		√	√	√	√	√	kvarh Import/Export	
	kVAh Total	√	√	√	√	√		√	√	√	√	√	kVAh Total	
	Demands & TOU	-	√	√	√	Dmd. Only		√	√	Dmd. Only	Dmd. Only	√	Demands & TOU	
Power Quality	THD Voltage & Current	-	√	√	√	√		√	√	√	√	√	THD Voltage & Current	Power Quality
	TOHD Voltage & Current	-	-	√	√	√		√	√	√	√	√	TOHD Voltage & Current	
	TEHD Voltage & Current	-	-	√	√	√		√	√	√	√	√	TEHD Voltage & Current	
	K-Factor	-	-	√	√	-		√	√	√	√	√	K-Factor	
	Individual Harmonics	-	-	2 nd - 31 st	2 nd - 31 st	2 nd - 31 st		2 nd - 31 st	2 nd - 31 st	2 nd - 31 st	2 nd - 31 st	2 nd - 31 st	Individual Harmonics	
	Voltage/Current Unbalance	-	-	√	√	√		√	√	√	√ (Via Comm.)	√	Voltage/Current Unbalance	
	Waveform Capture on Screen	-	-	-	-	-		-	√	-	-	√	Waveform Capture on Screen	
	Waveform Recording	-	-	-	-	-		-	-	-	-	-	Waveform Recording	
	Dip Swell Detection	-	-	-	-	-		-	-	-	-	-	Dip Swell Detection	
	Transient Detection	-	-	-	-	-		-	-	-	-	-	Transient Detection	
	IEC61000-4-30	-	-	-	-	-		-	-	-	-	-	IEC61000-4-30	
	2-150kHz Conducted Emission	-	-	-	-	-		-	-	-	-	-	2-150kHz Conducted Emission	
Logs	SOE Log	-	32 entries	16 entries (Opt.)	100 entries	16 entries		16 entries	100 entries	100 entries	64 entries	100 entries	SOE Log	Logs
	PQ Log	-	-	-	-	-		-	-	-	-	-	PQ Log	
	Energy Log	-	√	√	√	-		-	√	-	-	√	Energy Log	
	Max./Min. Log	-	-	√	√	-		-	√	√	√	√	Max./Min. Log	
	On-board Log Memory	-	4MB	(2MB Opt.)	4MB	8KB		-	(4MB Opt.)	-	-	8MB	On-board Log Memory	

Legend: (Opt.)-Optional (Via Comm.)-Via Communication (Meas./Calc.)-Measured Value/Calculated Value (Dmd.)-Demand

Key Features		Power Quality Monitors					Power Quality Monitors				Multi-Circuit Monitors		Key Features
		PMC-660	PMC-670	PMC-680i	PMC-690	iMeter 6		iMeter 7	iMeter 8	iMeter D7	PMC-592	PMC-512A	
General	Class (kWh)	0.2S	0.2S	0.2S	0.5S	0.2S		0.2S	0.2S	0.2S	0.5S	1	Class (kWh)
	Dimensions (mm)	 96(W)x96(H)x125(D)	 144(W)x144(H)x129(D)	 192(W)x192(H)x187(D)	 252(W)x160(H)x59(D)	 96(W)x96(H)x119.5(D)		 144(W)x144(H)x129(D)	 192(W)x192(H)x182.4(D)	 145(W)x124(H)x77(D)	 260.5(W)x154(H)x55.5(D)	 126(W)x90(H)x65(D)	Dimensions (mm)
	Display (Backlit)	B&W(Backlit)	Color TFT 640x480 (Backlit)	Color TFT 640x480 (Backlit)	Color TFT 640x480 (Backlit)	Color IPS 320x240 (Backlit)		Color TFT 640x480 (Backlit)	Color TFT 800x480 (Backlit)	Color IPS 320x240 (Backlit)	Optional Color TFT 800x480 (Backlit)	B&W (Backlit)	Display (Backlit)
	True RMS Sampling Rate	256	512	512 or (1024 Opt.)	512	256		1024	1024	1024	64	64	True RMS Sampling Rate
	Battery-backed Real-time Clock	√	√	√	√	√		√	√	√	√	√	Battery-backed Real-time Clock
	Operating Temperature (°C)	-25 to 70	-25 to 70	-25 to 70	-10 to 55	-25 to 70		-25 to 70	-25 to 70	-25 to 70	-25 to 70	-25 to 70	Operating Temperature (°C)
Communications	Protocol	Modbus RTU, Modbus TCP, Optional TCP/IP, Ethernet Gateway, HTTP, SNTP, SMTP	Modbus RTU, Modbus TCP, HTTP, SNTP, SMTP, FTP, Ethernet Gateway, (IEC61850 Opt.)	Modbus RTU, Modbus TCP, HTTP, SNTP, SMTP, FTP, Ethernet Gateway, (IEC61850 Opt.)	Modbus TCP, SNTP & IEC61850	Modbus RTU, Modbus TCP, HTTP, SMTPS, SNTP, FTP, Ethernet Gateway		Modbus RTU, Modbus TCP, HTTP, SNTP, SMTP, FTP, Ethernet Gateway, (IEC61850 Opt.)	Modbus RTU, Modbus TCP, HTTP, SNTP, SMTP, FTP, Ethernet Gateway, IEC61850	Modbus RTU, Modbus TCP, HTTPS, SNTP, SMTP, FTP, MQTT, Ethernet Gateway, IEC61850	Modbus RTU, Modbus TCP, SNMP, SNTP, SMTP, HTTP	Modbus RTU	Protocol
	RS-485 Port	1 or (2 Opt.)	2	(2 Opt.)	-	1		2	2	1	2	2	RS-485 Port
	Ethernet	(1 Opt.)	1	2	1	1		1	2	2	1	-	Ethernet
	Web Server	√	√	√	-	√		√	√	√	√	-	Web Server
I/O	Digital Input (DI)	6	8	8	-	6		8	8 (16 Opt.)	4	2	12	Digital Input (DI)
	Pulse Counter	√	√	√	-	√		√	√	√	√	√	Pulse Counter
	Mechanical Digital Output (DO)/ Solid State Output (SS)	3DO	4DO+2SS	4DO+4SS	-	3DO		4DO+2SS	4DO+4SS or (8 Opt.)DO+4SS	3DO or (3 Opt.)SS	2DO	1DO	Mechanical Digital Output (DO)/ Solid State Output (SS)
	Analog Input (AI), 0/4-20mA	(1 Opt.)	-	-	-	(1 Opt.)		-	(2 Opt.)	(2 Opt.)	-	1	Analog Input (AI), 0/4-20mA
	Analog Output (AO), 0/4-20mA	(1 Opt.)	-	-	-	-		-	(1 Opt.)	-	-	-	Analog Output (AO), 0/4-20mA
	kWh & kvarh Pulse Output (LED)	√	√	√	-	√		√	√	√	√	√	kWh & kvarh Pulse Output (LED)
	kWh & kvarh Pulse Output	-	2	4	-	-		2	4	3	-	-	kWh & kvarh Pulse Output
Measurements	IRIG-B (GPS)	-	√	√	-	-		√	√	√	-	-	IRIG-B (GPS)
	ULN per Phase & Avg.	√	√	√	√	√		√	√	√	√	√	ULN per Phase & Avg.
	ULL per Phase & Avg.	√	√	√	√	√		√	√	√	√	√	ULL per Phase & Avg.
	Current per Phase & Avg.	√	√	√	√	√		√	√	√	√	√	Current per Phase & Avg.
	Neutral Current (Meas./Calc.)	√	√	√	√	√		√	√	√	√	√	Neutral Current (Meas./Calc.)
	Frequency	√	√	√	√	√		√	√	√	√	√	Frequency
	kW per Phase & Total	√	√	√	√	√		√	√	√	√	√	kW per Phase & Total
	kvar per Phase & Total	√	√	√	√	√		√	√	√	√	√	kvar per Phase & Total
	kVA per Phase & Total	√	√	√	√	√		√	√	√	√	√	kVA per Phase & Total
	PF per Phase & Total	√	√	√	√	√		√	√	√	√	√	PF per Phase & Total
	kWh Import/Export	√	√	√	√	√		√	√	√	√	√	kWh Import/Export
	kvarh Import/Export	√	√	√	√	√		√	√	√	√	√	kvarh Import/Export
	kVAh Total	√	√	√	√	√		√	√	√	√	√	kVAh Total
	Demands & TOU	√	√	√	√	√		√	√	√	√	Dmd. Only	Demands & TOU
Power Quality	Maximum Demands	√	√	√	√	√		√	√	√	√	√	Maximum Demands
	Setpoints	√	√	√	√	√		√	√	√	√	√	Setpoints
	THD Voltage & Current	√	√	√	√	√		√	√	√	√	√	THD Voltage & Current
	TOHD Voltage & Current	√	√	√	√	√		√	√	√	√	√	TOHD Voltage & Current
	TEHD Voltage & Current	√	√	√	√	√		√	√	√	√	√	TEHD Voltage & Current
	K-Factor	√	√	√	√	√		√	√	√	√	√	K-Factor
	Individual Harmonics	2 nd - 63 rd	2 nd - 63 rd	2 nd - 63 rd	2 nd - 63 rd	2 nd - 63 rd		2 nd - 63 rd	2 nd - 63 rd	2 nd - 63 rd	2 nd - 31 st	2 nd - 31 st	Individual Harmonics
	Voltage/Current Unbalance	√	√	√	√	√		√	√	√	√	√	Voltage/Current Unbalance
	Waveform Capture on Screen	-	√	√	√	√		√	√	√	-	-	Waveform Capture on Screen
	Waveform Recording	√	√	√	√	√		√	√	√	√	-	Waveform Recording
	Dip Swell Detection	√	√	√	√	√		√	√	√	√	-	Dip Swell Detection
	Transient Detection	√	√	√	√	√		√	√	√	-	-	Transient Detection
Logs	IEC61000-4-30	-	Ed.2ClassA Certified	Ed.2 Class A Certified	Ed.2 Class A Compliant	Ed.3 Class S Compliant		Ed.2 Class A Certified	Ed.3 Class A Compliant	Ed.3 Class A Compliant	-	-	IEC61000-4-30
	2-150kHz Conducted Emission	-	-	-	-	-		-	Compliant	Compliant	-	-	2-150kHz Conducted Emission
	SOE Log	512 entries	1024 entries	1024 entries	1024 entries	512 entries		1024 entries	1024 entries	1024 entries	1000 entries	512 entries	SOE Log
	PQ Log	1000 entries	1024 entries	1024 entries	1024 entries	512 entries		1024 entries	1024 entries	1024 entries	-	-	PQ Log
	Energy Log	√	√	√	√	√		√	√	√	√	√	Energy Log
Logs	Max./Min. Log	√	√	√	√	√		√	√	√	√	-	Max./Min. Log
	On-board Log Memory	4MB	2GB	4GB or (8GB Opt.)	16GB	1GB		2GB	8GB	4GB	1GB	4MB	On-board Log Memory

Legend: (Opt.)-Optional (Via Comm.)-Via Communication (Meas./Calc.)-Measured Value/Calculated Value (Dmd.)-Demand

PMC-220

Single-Phase Multifunction Meter



- ✓ NMI (Australia) Approval
- ✓ IEC 62053-21 Class 1 kWh Accuracy
- ✓ 35 mm DIN mount with Device Dimensions @ 36x90x65 mm
- ✓ 8-digit LCD Display
- ✓ Self-powered, 63A direct Current Input

Features Summary

General

Class (kWh)	1
Dimensions (mm)	36(W)x90(H)x65(D)
Display (Backlit)	B&W(No Backlit)
True RMS Sampling Rate	36
Battery-backed Real-time Clock	-
Operating Temperature (°C)	-25 to 70

Communications

Protocol	Modbus RTU
RS-485 Port	1
Ethernet	-
Web Server	-

Power Quality

THD Voltage & Current	-
TOHD Voltage & Current	-
TEHD Voltage & Current	-
K-Factor	-
Individual Harmonics	-
Voltage/Current Unbalance	-
Waveform Capture on Screen	-
Waveform Recording	-
Dip Swell Detection	-
Transient Detection	-
IEC 61000-4-30	-
2-150kHz Conducted Emission	-

Measurements

ULN per Phase & Avg.	1 Phase only
ULL per Phase & Avg.	-
Current per Phase & Avg.	1 Phase only
Neutral Current (Meas./Calc.)	-
Frequency	✓
kW per Phase & Total	1 Phase only
kvar per Phase & Total	1 Phase only
kVA per Phase & Total	1 Phase only
PF per Phase & Total	1 Phase only
kWh Import/Export	✓
kvarh Import/Export	✓
kVAh Total	✓
Demands & TOU	-
Maximum Demands	-
Setpoints	-

Logs

SOE Log	-
PQ Log	-
Energy Log	-
Max./Min. Log	-
On-board Log Memory	-

I/O

Digital Input (DI)	-
Pulse Counter	-
Mechanical Digital Output (DO)/Solid State Output (SS)	1SS
Analog Input (AI), 0/4-20mA	-
Analog Output (AO), 0/4-20mA	-
kWh & kvarh Pulse Output (LED)	✓
kWh & kvarh Pulse Output	1
IRIG-B (GPS)	-

(Meas./Calc.)- Measured Value/Calculated Value

Main Features

Metering

- IEC 62053-21 and NMI M6-1 Class 1 Certified
- Direct Input up to 63A without external CT
- Low starting Current @ 20mA

Basic Measurements

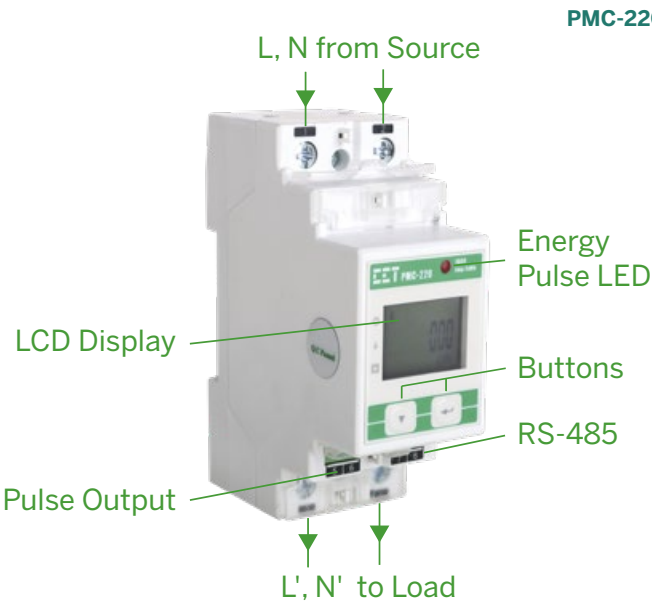
- Voltage, Current, kW, kvar, kVA, PF and Frequency
- kWh and kvarh Import/Export/Tot/Net and kVAh
- Device Operating Time (Running Hours)
- Front Panel & Communication Programming Counters

Digital Outputs

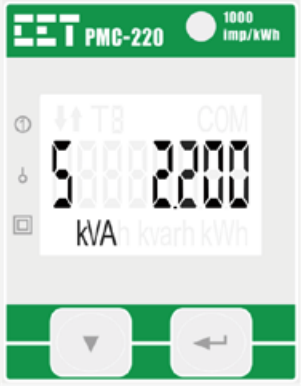
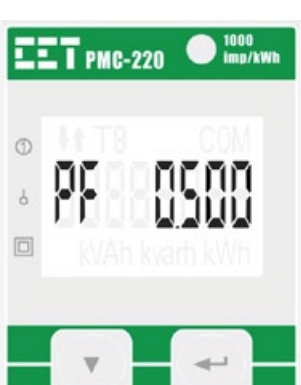
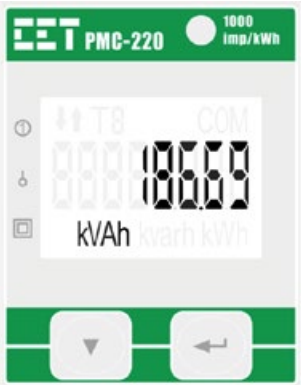
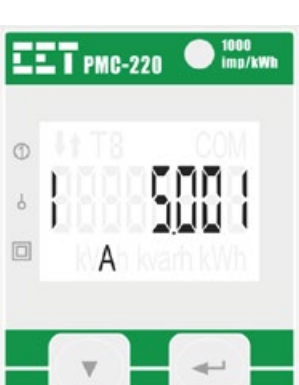
- Solid State Energy Pulse Output @ 1000 imp/kWh

Communication

- Standard RS-485 port with Modbus RTU support



Screen Captures



Accuracy

Parameters	Accuracy	Resolution
Voltage	± 0.5% reading	0.1V
Current	± 0.5% reading	0.001A
kW, kVA	±1.0%	0.001kX
kvar	±1.0%	0.001kvar
kWh	IEC 62053-21 Class 1 NMI M6-1 Class 1	0.01kWh
kvarh	IEC 62053-23 Class 2	0.01kvarh
kVAh	IEC 62053-21 Class 1	0.01kVAh
PF	±1.0%	0.001
Frequency	± 0.02Hz	0.01Hz

Technical Specifications

Measurement Inputs (L, N, L', N')

Voltage (Un)	220VAC	230VAC	240VAC
Overrange (% Un)	120%	115%	110%
Range	95-264VAC		
Current (Ib/Imax)	5A/63A		
Starting Current	0.4% Ib (0.02A)		
Minimum Current	5% Ib (0.25A)		
Frequency	45Hz-65Hz		
Power Supply	Self-powered from 95 to 264VAC		
Maximum Wire Size	25 mm² (4AWG)		
Torque for L, N Terminals	2.5 N.m		

Communications (D+, D-)

RS-485 (Modbus RTU)	Optically Isolated @ 5kVrms
Maximum Wire Size	1.5mm² (16AWG)
Torque for RS-485 Terminals	0.45 N.m

Pulse Output (E+, E-)

Type	Optically Isolated Solid State Relay
Maximum Load Voltage	80 VDC
Maximum Forward Current	50 mA
Maximum Wire Size	1.5 mm² (16AWG)
Torque for Terminals	0.45 N.m

Environmental Conditions

Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	5% to 95% non-condensing
Atmospheric Pressure	70 kPa to 106 kPa
Pollution Degree	2

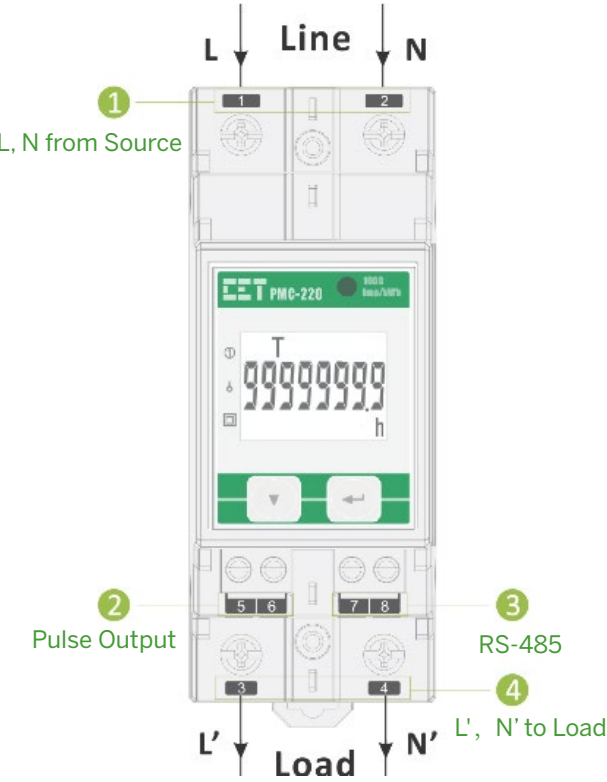
Mechanical Characteristics

Unit Dimensions	36x65x90 mm
Shipping Weight	0.18kg
Shipping Dimensions	120x103x42 mm
Mounting	DIN Rail
IP Rating	51 (Front), 30 (Body)

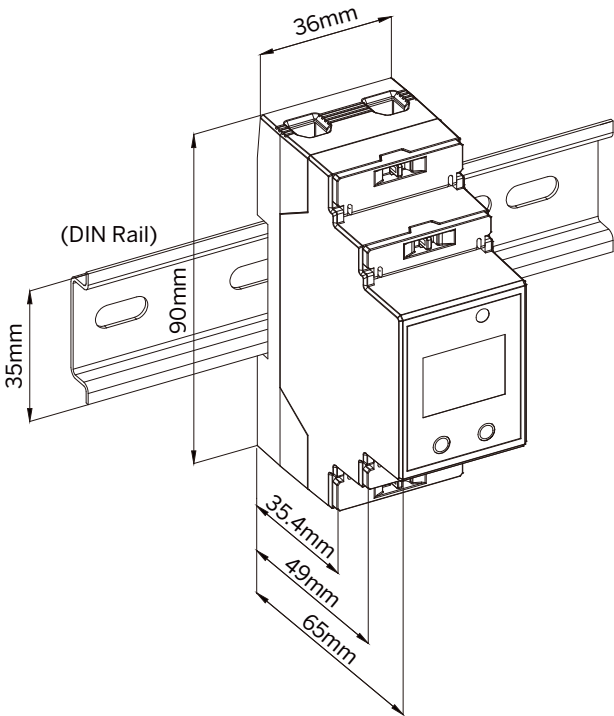
Ordering Information

Product Code							Description
PMC-220 Digital Single-Phase Energy Meter							
Input Current	C				5A (63A maximum), Direct Input		
Input Voltage		3				95V-240V AC ±10%	
System Frequency			5				45Hz-65Hz
Communications				A		1xRS-485	
Language					E	English	
PMC-220	-	C	3	5	A	E	PMC-220-C35AE (Standard Model)

Terminals Diagram



Device View and Dimensions



PMC-230

Single-Phase Multifunction Meter
(With 100A Disconnect Relay)



- ✓ 4MB for Event & Data Recording
- ✓ NMI (Australia) Approval
- ✓ IEC 62053-21 Class 1 kWh Accuracy
- ✓ Self-powered, 63A direct Current Input
- ✓ Internal 100A Disconnect Relay (Australia NER Compliance)
- ✓ 35 mm DIN mount with Device Dimensions @ 72x90x68 mm
- ✓ 8-digit LCD Display

Features Summary

General

Class (kWh)	1
Dimensions (mm)	72(W)x90(H)x68(D)
Display (Backlit)	B&W(No Backlit)
True RMS Sampling Rate	36
Battery-backed Real-time Clock	✓
Operating Temperature (°C)	-25 to 70

Communications

Protocol	Modbus RTU
RS-485 Port	1
Ethernet	-
Web Server	-

Measurements

ULN per Phase & Avg.	1 Phase only
ULL per Phase & Avg.	-
Current per Phase & Avg.	1 Phase only
Neutral Current (Meas./Calc.)	-
Frequency	✓
kW per Phase & Total	1 Phase only
kvar per Phase & Total	1 Phase only
kVA per Phase & Total	1 Phase only
PF per Phase & Total	1 Phase only
kWh Import/Export	✓
kvarh Import/Export	✓
kVAh Total	✓
Demands & TOU	✓
Maximum Demands	✓
Setpoints	-

Logs

SOE Log	32 entries
PQ Log	-
Energy Log	✓
Max./Min. Log	-
On-board Log Memory	4MB

I/O

Digital Input (DI)	3
Pulse Counter	✓
Mechanical Digital Output (DO)/Solid State Output (SS)	1SS
Analog Input (AI), 0/4-20mA	-
Analog Output (AO), 0/4-20mA	-
kWh & kvarh Pulse Output (LED)	✓
kWh & kvarh Pulse Output	1
IRIG-B (GPS)	-

Power Quality

THD Voltage & Current	✓
TOHD Voltage & Current	-
TEHD Voltage & Current	-
K-Factor	-
Individual Harmonics	-
Voltage/Current Unbalance	-
Waveform Capture on Screen	-
Waveform Recording	-
Dip Swell Detection	-
Transient Detection	-
IEC61000-4-30	-
2-150kHz Conducted Emission	-

(Meas./Calc.)-Measured Value/Calculated Value

Main Features

Metering

- IEC 62053-21 Class 1 and NMI M6-1 Certified by UL
- Direct Input up to 63A with 100A Disconnect Relay
- Low starting Current @ 20mA

Basic Measurements

- U, I, P, Q, S, PF, Frequency and Operating Time
- kWh and kvarh Import/Export and kVAh
- Two TOU schedules with 4 Seasons, 12 Daily Profiles and 4 Tariffs
- Demands and Maximum Demands for U, I, P/Q/S with Timestamp for This Month & Last Month (or Since Last Reset & Before Last Reset)
- U and I THD

Disconnect Relay (Internal)

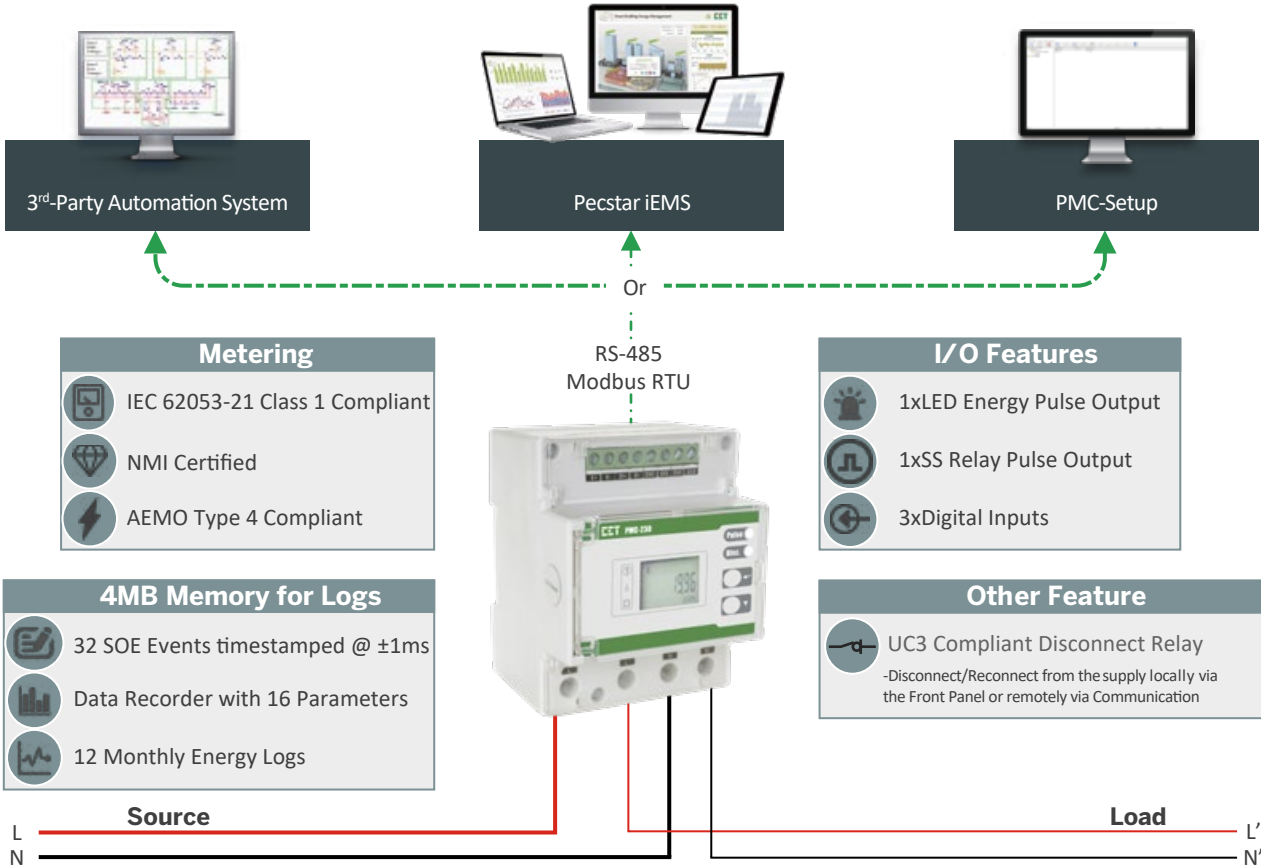
- UC3 Compliant Disconnect Relay that can be activated locally from the Front Panel or remotely via communication

Data and Event Recorders

Data Recorder

- 4MB Log Memory, capable of recording 16 parameters at 5-minute interval for 6 months
- One Data Recorder Log of 16 parameters
- Recording Interval from 1 second to 40 days
- Configurable Depth (maximum 65535) and Recording Offset

Typical Application



Accuracy

Parameters	Accuracy	Resolution
Voltage	±0.5%	0.1V
Current	±0.5%	0.001A
P, Q, S	±1.0%	0.001kW/kvar/kVA
kWh	IEC 62053-21 Class 1	0.01kWh
kvarh	IEC 62053-23 Class 2	0.01kvarh
PF	±1.0%	0.001
Frequency	±0.02Hz	0.01Hz

Technical Specifications

Measurement Inputs (L, N, L', N')

Voltage (Un)	220VAC	230VAC	240VAC
Overrange (% Un)	120%	115%	110%
Range	95-264VAC		
Burden	<3VA		
Current (Ib/I _{max})	5A/63A		
Starting Current	0.4% Ib (20mA)		
Minimum Current	5% Ib (0.25A)		
Burden	<3VA		
Frequency	50Hz/60Hz		
Power Supply	Self-powered from 95 to 264VAC		
Maximum Wire Size	25 mm² (4AWG)		
Torque for L, N Terminals	2.5 N.m		

Disconnect Relay

Rated Load (Resistive)	100A @ 250VAC
Response Time	20ms
Short-time Overcurrents	7000A (-10% to +0%) @ 60ms
Service Life (Mech./Elec.)	100k/5k Operations
Rated Making Capacity @ 1.15Un and PF=1	63A maximum
Rated Breaking Capacity @ 1.15Un and PF=1	63A maximum
Dielectric (AC Voltage)	4kV @ 1minute (Contact to Coil), 2kV @ 1minute (Contact to Contact)
Insulation Resistance	1000MΩ/500VDC

Communications (D+, D-)

RS-485 (Modbus RTU)	Optically Isolated @ 5kVrms
Maximum Wire Size	1.5 mm² (16AWG)
Torque for RS-485 Terminals	0.45 N.m

Digital Inputs (DI1, DI2, DI3, DIC)

Type	Dry Contact, 12VDC internally wetted
Sampling	1000Hz
Hysteresis	1ms minimum

SS Pulse Output (E+, E-)

Type	Optically Isolated Solid State Relay
Maximum Load Voltage	80 VDC
Maximum Forward Current	50 mA
Maximum Wire Size	1.5 mm² (16AWG)
Torque for Terminals	0.45 N.m

Environmental Conditions

Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	5% to 95% non-condensing
Atmospheric Pressure	70 kPa to 106 kPa
Pollution Degree	2

Mechanical Characteristics

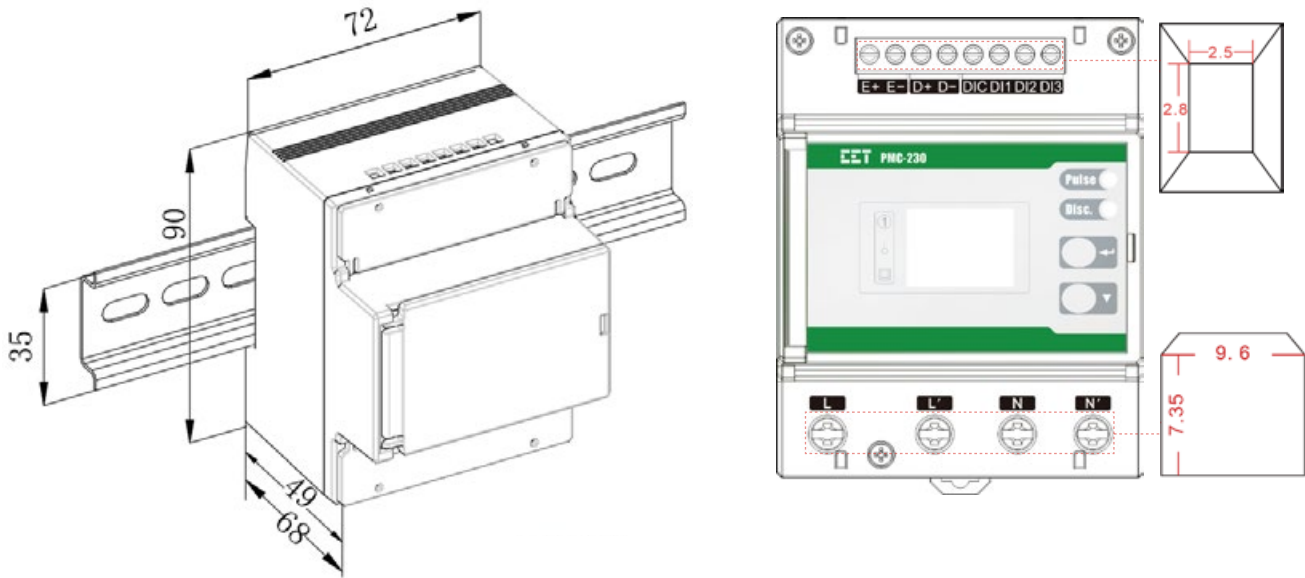
Unit Dimensions	72(W)x68(D)x90(H) mm
Mounting	DIN Rail
IP Rating	51 (Front), 30 (Body)

Ordering Information

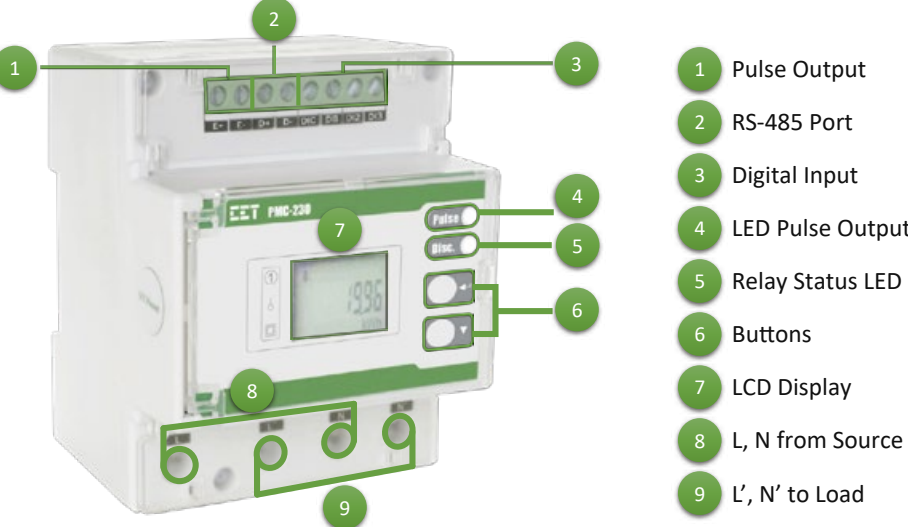
Product Code								Description	
PMC-230 Single-Phase Multifunction Energy Meter									
Basic Function		B				4MB Memory, 1xData Recorder, 3xDI, 1xLED Pulse Output, 1xSS Pulse Output, 1xRS-485 and an internal UC3 Compliant Disconnect Relay			
Input Current			C						
Input Voltage				3			95V-240VAC ±10%		
System Frequency					5			50Hz/60Hz	
Communications						A		1xRS-485	
Language							E	English	
PMC-230		-	B	C	3	5	A	E	PMC-230-BC35AE (Standard Model)

Device View and Dimensions

Unit: mm



Appearance



PMC-340

Three-Phase Energy Meter



- ✓ 2MB Memory for Event & Data Recording (Optional)
- ✓ NMI (Australia) Approval
- ✓ IEC 62053-21 Class 1 and IEC 62053-22 Class 0.5S
- ✓ Self-powered, 100A Direct Input or 5A CT Input
- ✓ 35 mm DIN mount with Device Dimensions @ 126x90x65 mm
- ✓ 8-digit LCD Display

Features Summary

General

Class (kWh)	1 for Direct Input, 0.5S for 5A CT Input
Dimensions (mm)	126(W)x90(H)x65(D)
Display (Backlit)	B&W (No Backlit)
True RMS Sampling Rate	64
Battery-backed Real-time Clock	✓
Operating Temperature (°C)	-25 to 70

Communications

Protocol	Modbus RTU
RS-485 Port	1
Ethernet	-
Web Server	-

Measurements

ULN per Phase & Avg.	✓
ULL per Phase & Avg.	✓
Current per Phase & Avg.	✓
Neutral Current (Meas./Calc.)	Calc.
Frequency	✓
kW per Phase & Total	✓
kvar per Phase & Total	✓
kVA per Phase & Total	✓
PF per Phase & Total	✓
kWh Import/Export	✓
kvarh Import/Export	✓
kVAh Total	✓
Demands & TOU	✓
Maximum Demands	✓
Setpoints	-

Logs

SOE Log	16 entries (Opt.)
PQ Log	-
Energy Log	✓
Max./Min. Log	✓
On-board Log Memory	(2MB Opt.)

I/O

Digital Input (DI)	(3 Opt.)
Pulse Counter	✓
Mechanical Digital Output (DO)/Solid State Output (SS)	1SS
Analog Input (AI), 0/4-20mA	-
Analog Output (AO), 0/4-20mA	-
kWh & kvarh Pulse Output (LED)	✓
kWh & kvarh Pulse Output	1
IRIG-B (GPS)	-

Power Quality

THD Voltage & Current	✓
TOHD Voltage & Current	✓
TEHD Voltage & Current	✓
K-Factor	✓
Individual Harmonics	2 nd - 31 st
Voltage/Current Unbalance	✓
Waveform Capture on Screen	-
Waveform Recording	-
Dip Swell Detection	-
Transient Detection	-
IEC61000-4-30	-
2-150kHz Conducted Emission	-

(Opt.)-Optional (Meas./Calc.)-Measured Value/Calculated Value

Main Features

Metering

Basic Measurements

- True RMS Measurement
- Voltage, Current, kW, kvar, kVA, PF, Phase Angle and Frequency
- Per Phase and Total kWh and kvarh Import/Export/Tot/Net and kVAh
- 4-Quadrant kvarh
- Device Operating Time (Running Hours)
- Voltage and Current THD, TOHD, TEHD, Individual Harmonics up to 31st and Unbalance
- Current K-Factor, Crest Factor, TDD, TDD Odd and TDD Even
- I1, I2, I3, kW/kvar/kVA Total Demands and Maximum Demands
- Max./Min. Log
- 12 monthly recording of kWh/kvarh Import/Export/Tot/Net, kVAh, kvarh Q1-Q4 as well as kWh/kvarh Import/Export and kVAh per Tariff
- Two TOU schedules, each providing:
 - 12 Seasons
 - 20 Daily Profiles, each with 12 Periods in 15-minute interval
 - 90 Holidays or Alternate Days
 - 4 Tariffs, each providing the following information
 - kWh/kvarh Import/Export, kVAh
 - kW/kvar/kVA Maximum Demands

Real-Time Clock

- Battery-backed Real-time clock @ 6ppm
- Clock error ≤ 0.5s/day

Data and Event Recorders

Data Recorder Log (Optional)

- 2MB Log Memory
- 16 measurements @ 10-minute interval for 197 days

SOE Log

- 16 SOE events time-stamped to 1ms resolution

Inputs and Outputs

Digital Inputs (Optional)

- 3 channels for external status monitoring and pulse counting
- Self-excited, internally wetted at 24VDC

Pulse Outputs

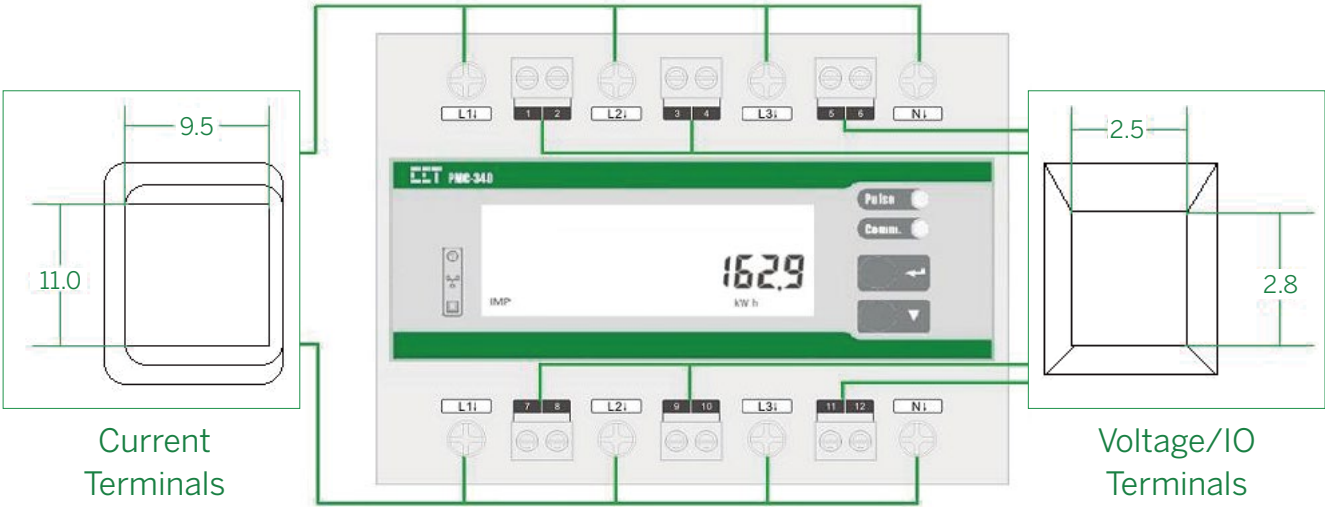
- 1 Front Panel LED and 1 Solid State Pulse Output for energy pulsing application

Communications

- Optically isolated RS-485 port, baud rate from 1,200 to 19,200 bps
- Modbus RTU protocol

Appearance

Unit: mm



Accuracy

Parameters	Accuracy	Resolution
Voltage	± 0.5%	0.01V
Current	± 0.5%	0.001A
P, Q, S	± 1.0%	0.01kW/kvar/kVA
kWh, kVAh	IEC 62053-21 Class 1 for 100A Direct Input IEC 62053-22 Class 0.5S for 5A CT Input	0.01kXh
kvarh	IEC 62053-23 Class 2	0.01kvarh
PF	± 1.0%	0.001
Frequency	± 0.02Hz	0.001Hz
Harmonics	IEC 61000-4-7 Class B	0.1%

Technical Specifications

Current Inputs (L1, L2, L3, N)

Voltage (Un)	220VAC	230VAC	240VAC
Overrange (% Un)	120%	115%	110%
Range	168-264VAC (Self-powered)		
Burden	<10VA/phase		
Direct Current Input	Current (Ib/Imax)	20A/100A	
	Range	0.4% Ib to Imax	
	Starting Current	0.4% Ib	
	Burden	<4VA/phase	
	Maximum Wire Size	35 mm² (3 AWG)	
CT Input Option Note: Voltage input at Terminal (1, 2, 3, 4)	Maximum Torque	2.5 N.m	
	Current (In/Imax)	5A/6A	
	Range	(0.1%-120%) In	
	Starting Current	0.1% In	
	Burden	<0.5VA/phase	
	Frequency	45Hz-65Hz	

Digital Inputs (PMC-340B only) (Terminal 7, 8, 9, 10)

Type	Self-excited, internally wetted at 24VDC
Sampling	1000Hz

Pulse Output (Selectable - kWh/kvarh) (Terminal 5, 6)

Pulse Constant	1/10/100/1000/3200 imp/kWh (imp/kvarh)
Isolation	Optical
Maximum Load Voltage	80V
Maximum Forward Current	50mA
Pulse Width	60-150ms

Communications (Terminal 11, 12)

RS-485	Modbus RTU
Baud Rate	1200/2400/4800/9600/19200 bps
Maximum Wire Size	1.5mm² (16AWG)
Maximum Torque	0.45 N.m

Environmental Conditions

Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	5% to 95% non-condensing
Atmospheric Pressure	70 kPa to 106 kPa
Pollution Degree	2

Mechanical Characteristics

PMC-340

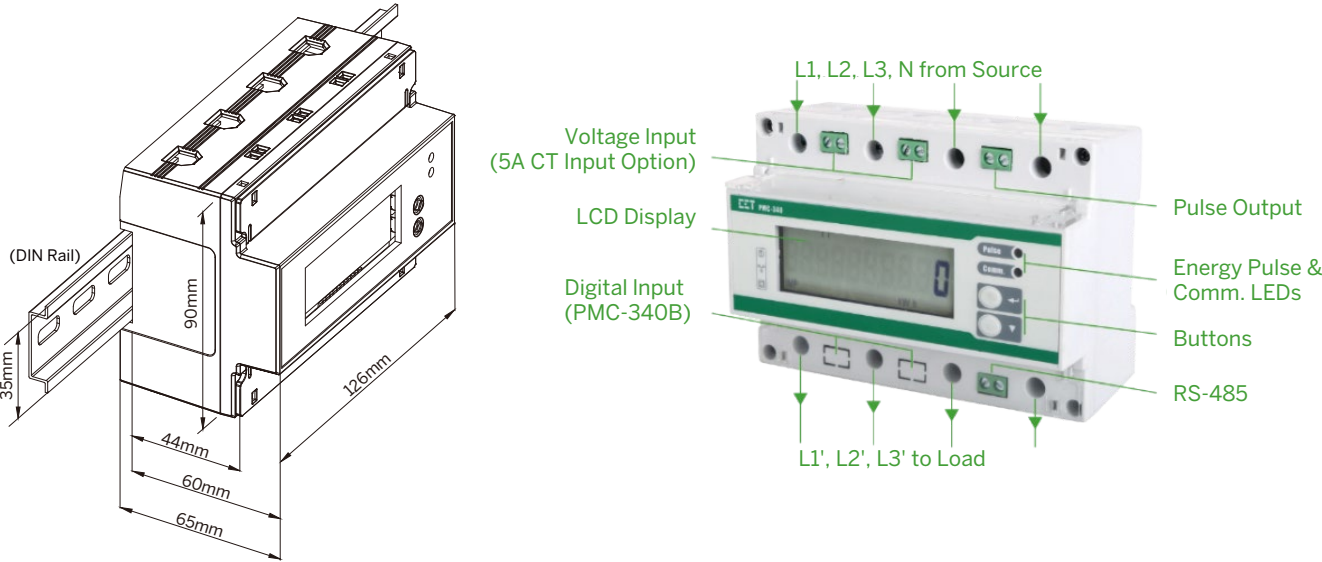
Mounting	DIN Rail
Unit Dimensions	126x90x65 mm
Shipping Dimensions	165x140x110 mm
Shipping Weight	0.79kg
IP Rating	51 (Front), 30 (Body)

Ordering Information

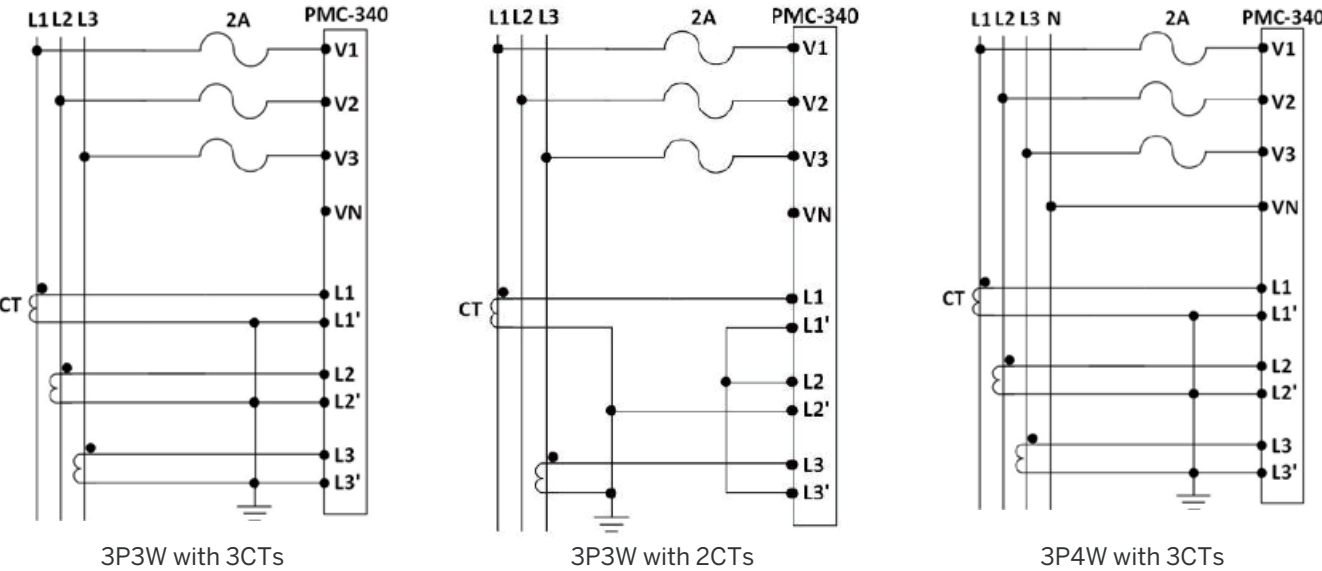
Product Code					Description				
PMC-340 Digital Three-Phase Energy Meter									
Basic Function	A					Basic Model			
	B*					Model A + 3xDI + 2MB Log Memory			
Input Current			A				20A (100A), Direct Input		
			B				5A (6A), CT Input		
Input Voltage				3				240ULN/415ULL	
System Frequency					5				45-65Hz
Reserved						X			None
Communications							A		1xRS-485
Display Language								E	English
PMC-340	-	A	A	3	5	X	A	E	PMC-340-AA35XAE (Standard Model)

* Additional charges apply

Device View and Dimensions



Wiring Diagrams



PMC-350-C

Three-Phase Energy Meter



- ✓ 4MB for Event & Data Recording
- ✓ Optional AS923/KR920 LoRaWAN Module
- ✓ IEC 62053-21 Class 1 and IEC 62053-23 Class 2
- ✓ Optional Split-Core CT (SCCT)
- ✓ 35 mm DIN mount with Device Dimensions @ 72x95x70 mm

Features Summary

General		Communications		Measurements	
Class (kWh)	1	Protocol	Modbus RTU (Optional LoRaWAN support at AS923/KR920)	ULN per Phase & Avg.	✓
Dimensions (mm)	72(W)x95(H)x70(D)			ULL per Phase & Avg.	✓
Display (Backlit)	B&W (No Backlit)	RS-485 Port	1	Current Per Phase & Avg.	✓
True RMS Sampling Rate	64	Ethernet	-	Neutral Current (Meas./Calc.)	✓
Battery-backed Real-time Clock	✓	Web Server	-	Frequency	✓
Operating Temperature (°C)	-25 to 70			kW per Phase & Total	✓
				kvar per Phase & Total	✓
				kVA per Phase & Total	✓
				PF per Phase & Total	✓
				kWh Import/Export	✓
				kvarh Import/Export	✓
				kVAh Total	✓
				Demands & TOU	✓
				Maximum Demands	✓
				Setpoints	✓
I/O		Power Quality		Logs	
Digital Input (DI)	(4 Opt.)	THD Voltage & Current	✓	SOE Log	100 entries
Pulse Counter	✓	TOHD Voltage & Current	✓	PQ Log	-
Mechanical Digital Output (DO)/Solid State Output (SS)	(2 Opt.)DO or (2 Opt.)SS	TEHD Voltage & Current	✓	Energy Log	✓
Analog Input (AI), 0/4-20mA	-	K-Factor	✓	Max./Min. Log	✓
Analog Output (AO), 0/4-20mA	-	Individual Harmonics	2 nd - 31 st	On-board Log Memory	4MB
kWh & kvarh Pulse Output (LED)	✓	Voltage/Current Unbalance	✓		
kWh & kvarh Pulse Output	2	Waveform Capture on Screen	-		
IRIG-B (GPS)	-	Waveform Recording	-		
		Dip Swell Detection	-		
		Transient Detection	-		
		IEC61000-4-30	-		
		2-150kHz Conducted Emission	-		

(Opt.)-Optional (Meas./Calc.)-Measured Value/Calculated Value

Main Features

Metering

- ### Basic Measurements
- ULN, ULL per Phase and Average
 - Current per Phase and Average with calculated Neutral
 - kW, kvar, kVA per Phase and Total
 - PF per Phase and Total
 - kWh, kvarh Import/Export/Net/Total and kVAh Total
 - Frequency
 - Optional Iresidual and Temperature Measurements
 - Optional DI for Status Monitoring and Utility Pulse Counting

- ### Advanced Measurements
- U and I THD, TOHD, TEHD and Individual HD up to 31st
 - Current TDD, TDD Odd, TDD Even, K-Factor and Crest Factor
 - U and I Unbalance and Phase Angle
 - Fundamental kW and PF
 - kvarh Q1-Q4
 - Present, Predicted and Max. Demands

- ### Multi-Tariff TOU Capability
- Two TOU schedules, each providing
 - 12 Seasons
 - 20 Daily Profiles with 12 Periods in 15-minute interval
 - 90 Holidays or Alternate Days
 - 8 Tariffs, each providing the following information
 - kWh/kvarh Import/Export, kVAh
 - kW/kvar/kVA Max. Demands

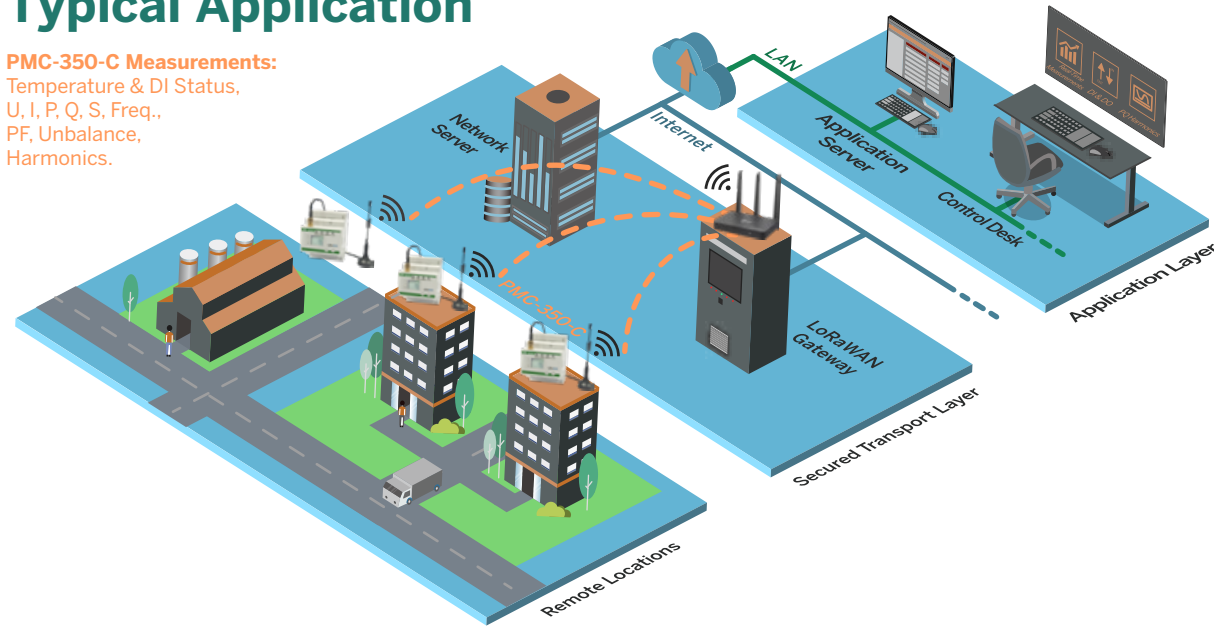
Data and Event Recorders

- ### Max./Min. Log
- Max./Min. Log with Timestamp for Real-time measurements
 - Configurable for This Month/Last Month or Before/Since Last Reset

- ### Monthly Energy Log
- 12 monthly recording of kWh, kvarh Import/Export/Total/Net, kVAh, kvarh Q1-Q4 as well as kWh/kvarh Import/Export and kVAh per Tariff

Typical Application

PMC-350-C Measurements:
Temperature & DI Status,
U, I, P, Q, S, Freq.,
PF, Unbalance,
Harmonics.



Accuracy

Parameters	Accuracy	Resolution
Voltage	± 0.5%	0.01V
Current	± 0.5%	0.001A
kW, kvar, kVA	± 1.0%	0.001kW/kvar/kVA
kWh	IEC 62053-21: Class 1	0.01kWh
kvarh	IEC 62053-23: Class 2	0.01kvarh
PF	± 1.0%	0.001
Frequency	± 0.02Hz	0.01Hz
In (Calculated)	± 1.0%	0.001A
THD	IEC 61000-4-7 Class B	0.001%
Iresidual	± 1.0%	0.1mA
Temperature	± 1°C	0.1°C

Technical Specifications

Voltage Inputs (V1, V2, V3, VN)

Voltage (Un)	277ULN/480ULL
Range	90V to 1.2Un
Burden	<2W/phase
Frequency	45-65Hz

Current Inputs (I11, I12, I21, I22, I31, I32)

	SCCT Option	SCCTA Option
Current (In)	40mA	2mA
Range	0.15%-100% In	0.1%-120% In
Starting Current	0.15% In	0.1% In
Burden	<0.25VA per phase	<0.25VA per phase
External SCCTs	100A/40mA	5A/2mA
	200A/40mA	
	400A/40mA	
	800A/40mA	
	1600A/40mA	

Power Supply (L+, N-)

Standard	95-250VAC/DC, ±10%, 47-440Hz
Burden	<2W
Overvoltage Category	CAT III up to 300ULN

Optional Digital Inputs (DI1, DI2, DI3, DI4, DIC)

Type	Dry contact, 24VDC internally wetted
Sampling	1000Hz
Hysteresis	1ms minimum

Optional Digital Outputs (DO11, DO12, DO21, DO22)

Type	Form A Mechanical Relay
Loading	5A @ 250VAC or 30VDC

Optional RTD Temperature Inputs (TC1, TC2, TC3, TC4)

RTD Type	2-Wire PT100 (sensor not included)
PT100	-40°C to 200°C
Alarm Range	45°C to 140°C

Optional Residual Current Inputs (-IR, IR)

Range	20mA-2000mA
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Mechanical Characteristics

Mounting	DIN Rail
Unit Dimensions	72(W)x95(H)X70(D) mm
IP Rating	IP30

Optional Solid State Energy Pulse Output (kWh/kvarh) (E1+, E1-, E2+, E2-)

Pulse Constant	10/100/1000/3200 imp/kxh
Isolation	Optical
Max. Load Voltage	80V
Max. Forward Current	50mA
Pulse Width	80 ± 20ms

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
Pollution Degree	2

Communications

RS-485 (Standard)	Protocol	Modbus RTU
	Baud Rate	1200/2400/4800/9600/19200/38400 bps
LoRaWAN (Optional)		LoRaWAN™ Specification 1.0.2 Class A/C Compliance
ISM Bands	AS923/KR920	Applicable to the following Regions: Australia, Brunei, Cambodia, Hong Kong, Indonesia, Japan, Laos, Malaysia, New Zealand, Pakistan, Singapore, South Korea, Taiwan, Thailand, Vietnam

Ordering Information

Product Code											Description									
PMC-350 3-Phase LoRaWAN DIN Energy Meter																				
Basic Function	C						Multifunction Measurements, LCD Display, 1xRS-485													
Input Current		SCCT						40mA Input for use with 100A/40mA, 200A/40mA, 400A/40mA, 800A/40mA or 1600A/40mA SCCTs (SCCTs not included)												
		SCCTA						2mA Input for use with 5A/2mA SCCT (SCCTs not included)												
Input Voltage			5						277ULN/480ULL + 20% (1P2W ULN, 1P2W ULL, 1P3W, 3P3W, 3P4W, Demo)											
Power Supply				2						95-250 VAC/VDC, 47-440Hz										
Frequency					5						45-65Hz									
Expansion 1*							N						None							
							A						4xDI + 2xDO (Mechanical Relay)							
							B						4xDI + 2xSS Pulse Output							
Expansion 2*								N						None						
								T						4xRTD + 1xResidual Inputs						
Expansion Communication*									N						None					
									6#						LoRaWAN @ AS923 with Internal Antenna					
									7#						LoRaWAN @ AS923 with External Antenna					
Language										E						English				
PMC-350	-	C	SCCT	5	2	5	N	N	7	E						PMC-350-CSCCT525NN7E (Standard Model)				

* Additional charges apply.
ISM Bands AS923/KR920 - Applicable to the following Regions: Australia, Brunei, Cambodia, Hong Kong, Indonesia, Japan, Laos, Malaysia, New Zealand, Pakistan, Singapore, South Korea, Taiwan, Thailand, Vietnam.

Accessories

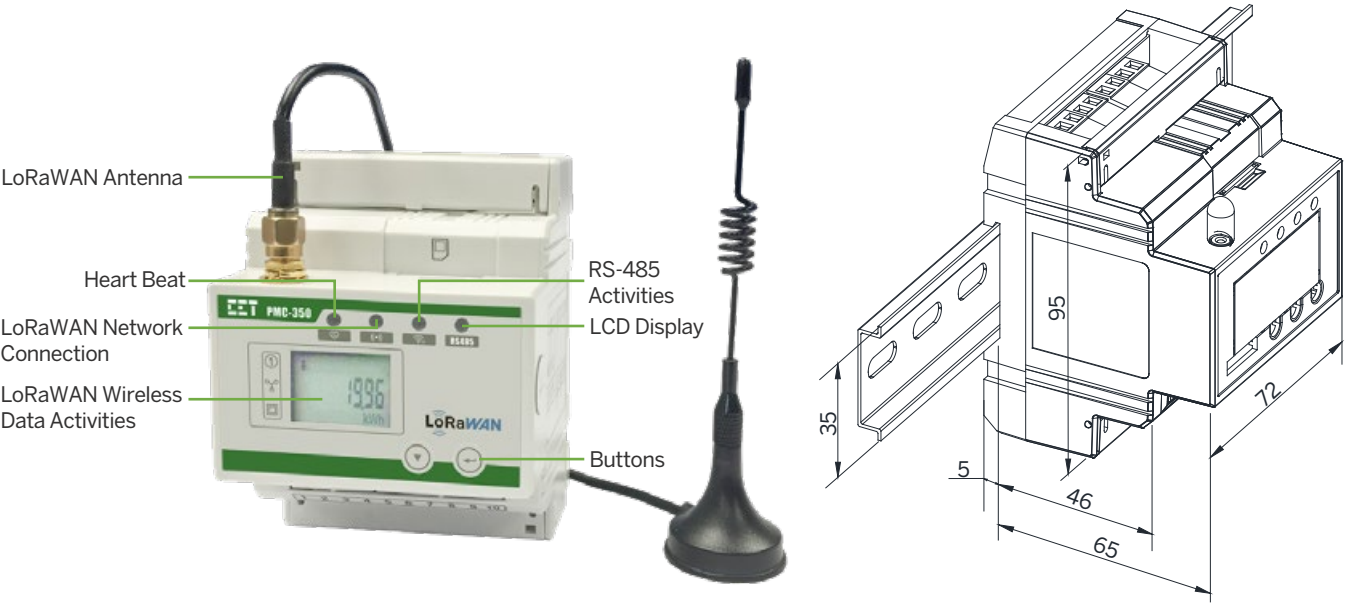
External Split-Core CTs	Specification	Accuracy	Aperture	Cable Length
PMC-SCCT-5A-2mA-16-A	5A, 1-phase Split-Core CT with Pluggable Connector	2.0	Ø16mm	2m
PMC-SCCT-100A-40mA-16-A	100A, 1-phase Split-Core CT with Pluggable Connector	0.5	Ø16mm	2m
PMC-SCCT-200A-40mA-24-A	200A, 1-phase Split-Core CT with Pluggable Connector	0.5	Ø24mm	2m
PMC-SCCT-400A-40mA-35-A	400A, 1-phase Split-Core CT with Pluggable Connector	0.5	Ø35mm	2m
PMC-SCCT-800A-40mA-A	800A, 1-phase Split-Core CT	0.5	80x50mm	2m*
PMC-SCCT-1600A-40mA-A	1600A, 1-phase Split-Core CT	0.5	130x55mm	2m*

Product Name	Part Number	Specification
Cable for 800A/1600A Split-Core CT	PMC-BCC-350-2	2m with 2-Pin Black Pluggable Connector for 800A and 1600A SCCTs
DIN Panel Mounting Adapter	PMC-PMA-4	Panel Mounting Adapter for 4P DIN Rail Mounting devices

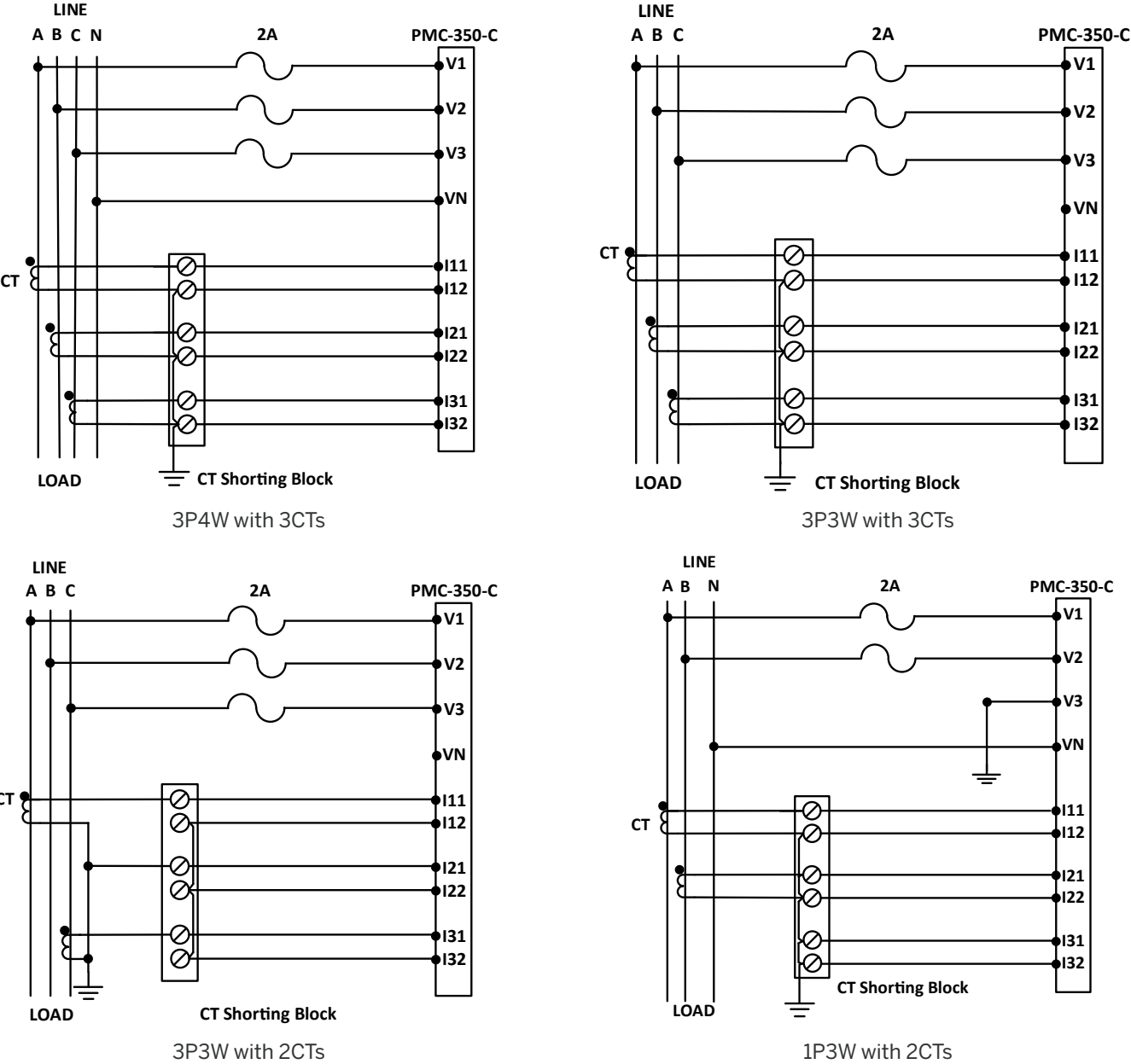
1) Please refer to Cable Length for details and contact the factory in advance for special requirements.
2) One PMC-350-C can be equipped with 3 pcs of SCCT.

Device View and Dimensions

Unit: mm



Wiring Diagrams



PMC-352
Three-Phase Energy Meter



- ✓ 8KB Memory for Event Recording
- ✓ Optional LoRa (860-935 MHz) Module
- ✓ IEC 62053-21 Class 1 and IEC 62053-23 Class 2
- ✓ Optional Split-Core CT (SCCT)
- ✓ 35 mm DIN mount with Device Dimensions @ 36x90x65 mm

Features Summary

General		Communications		Measurements	
Class (kWh)	1	Protocol	Modbus RTU (Built-in LoRa with configurable ISM Bands for EU863-870, RU864-870, IN865-867, US902-928, AU915-928, AS920-923 and AS923-925)	ULN per Phase & Avg.	✓
Dimensions (mm)	36(W)x90(H)x65(D)	RS-485 Port	1	ULL per Phase & Avg.	✓
Display (Backlit)	-	Ethernet	-	Current Per Phase & Avg.	✓
True RMS Sampling Rate	64	Web Server	-	Neutral Current (Meas./Calc.)	-
Battery-backed Real-time Clock	-			Frequency	✓
Operating Temperature (°C)	-25 to 70			kW per Phase & Total	✓
				kvar per Phase & Total	✓
				kVA per Phase & Total	✓
				PF per Phase & Total	✓
				kWh Import/Export	✓
				kvarh Import/Export	✓
				kVAh Total	✓
				Demands & TOU	Dmd. Only
				Maximum Demands	-
				Setpoints	✓
				Logs	
				SOE Log	16 entries
				PQ Log	-
				Energy Log	-
				Max./Min. Log	-
				On-board Log Memory	8KB

(Opt.)-Optional (Meas./Calc.)-Measured Value/Calculated Value

Main Features

Metering

- Wireless IoT energy metering with the LoRa technology
- Long-Range wireless communication capability

Basic Measurements

- ULN, ULL and I per Phase and Average
- P, Q, S and PF per Phase and Total
- kWh, kvarh Import/Export/Net/Total and kVAh Total
- Frequency and Device Operating Time (Running Hours)

Advanced Measurements

- U and I THD, TOHD, TEHD and Individual Harmonics up to 31st
- U and I Unbalance and Phase Angle
- Fundamental P and Displacement PF
- kvarh Q1-Q4
- Present Demands for kW/kvar/kVA Total and per Phase Current

Data and Event Recorders

SOE Log

- 16 events time-stamped to ±1ms resolution
- Setup changes, Setpoint, DI Status changes, Clear actions, etc.

Inputs and Outputs

Digital Inputs

- 3xDI for Status Monitoring or Utility Pulse Counting

Temperature Monitoring

- 4xNTC Inputs for Temperature Monitoring (sensor not included)

Communications

- Optically isolated RS-485 port at 1,200 to 38,400 bps
- Built-in LoRa with configurable ISM Bands for EU863-870, RU864-870, IN865-867, US902-928, AU915-928, AS920-923 and AS923-925
- Modbus RTU protocol

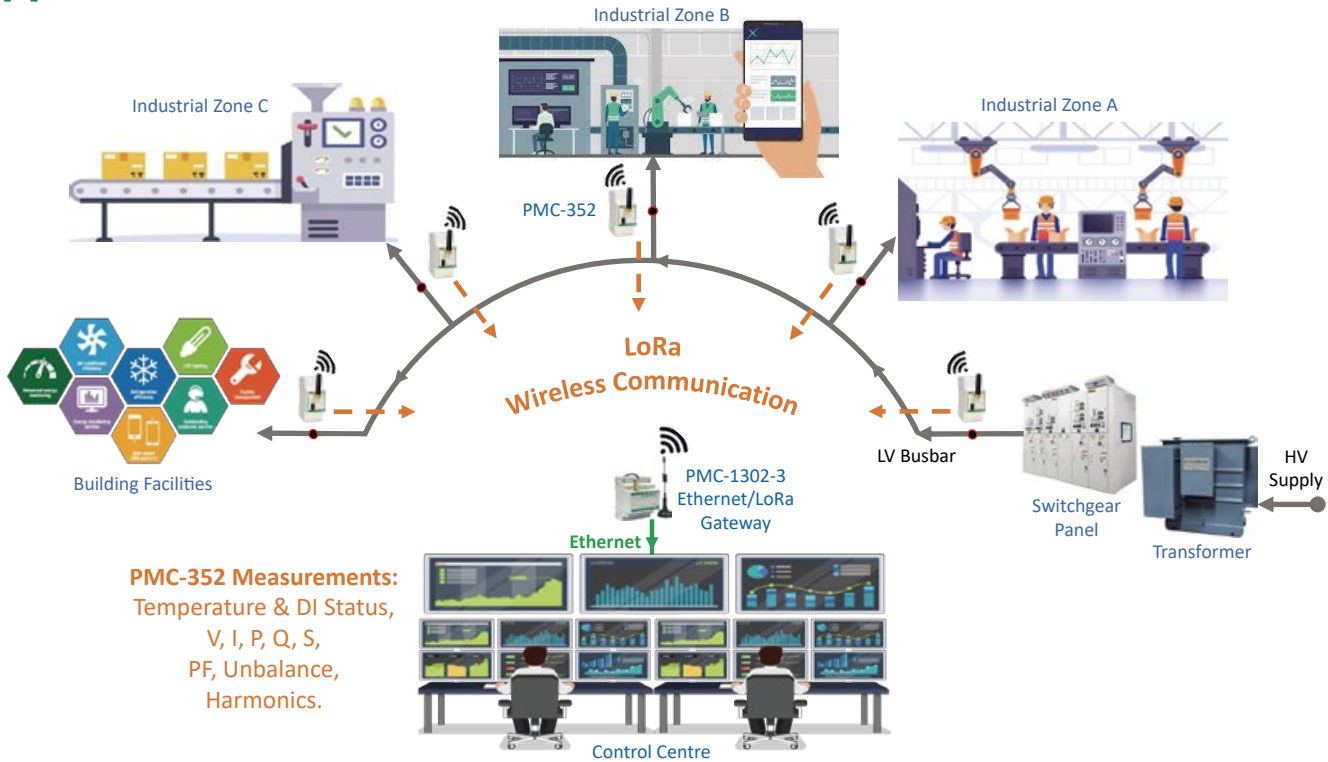
Diagnostics

- Frequency Out-of-Range, Loss of Voltage/Current
- kW Direction per Phase and Total, Possible incorrect CT Polarity
- Incorrect U & I Phase Sequence

Setpoints

- 10 user programmable Setpoints with extensive list of monitoring parameters including Voltage, Current, Power and THD, etc.
- Configurable thresholds, time delays and parameters

Application



Accuracy

Parameters

	Accuracy	Resolution
Voltage	±0.5%	0.0001V
Current	±0.5%	0.0001A
kW, kvar, kVA	±1.0%	0.0001kW/kvar/kVA
kWh	IEC 62053-21 Class 1	0.01kWh
kvarh	IEC 62053-23 Class 2	0.01kvarh
PF	±1.0%	0.0001
Frequency	±0.02Hz	0.0001Hz
THD	IEC 61000-4-7 Class B	0.0001%
Temperature	±1°C	0.001°C

Technical Specifications

Voltage Inputs (V1, V2, V3, VN)

Voltage (Un)	277ULN/480ULL
Range	40V to 1.2Un (88V to 550V for Self-Powered option)
Burden	<0.02VA/phase
Frequency	45-65Hz

Current Inputs (I11, I12, I21, I22, I31, I32)

	SCCT Option	SCCTA Option
Current (In)	40mA	2mA
Range	0.15%-100% In	0.1%-120% In
Starting Current	0.15% In	0.2% In
External SCCTs	100A/40mA	5A/2mA
	200A/40mA	
	400A/40mA	
	800A/40mA	
	1600A/40mA	

Power Supply (L+, N-)

Standard	60-264VAC/DC, ±10%, 47-440Hz
Optional	88V-550VAC, Self-Powered via Uca (U31)
Burden	<2W

Digital Inputs (DI1, DI2, DI3, DIC)

Type	Dry contact, 12VDC internally wetted
Sampling	1000Hz
Hysteresis	1ms minimum

NTC Temperature Inputs (TC1, TC2, TC3, TC4)

NTC Type	2-Wire Thermistors (sensor not included)
Measurement Range	-20°C to 140°C

Communications

RS-485 (Standard)	Protocol	Modbus RTU
	Baud Rate	1200/2400/4800/9600/19200/38400 bps
LoRa	RF Range	860-935 MHz (Configurable)
	ISM Bands	EU863-870, RU864-870, IN865-867, US902-928, AU915-928, AS920-923, AS923-925
	RF Output Power	19 dBm (Maximum)
	Receiver Sensitivity	-137 dBm (Maximum)
	Output Watts	0.03 (Typical)
	FCC Part 15C	Certified by TCB

Mechanical Characteristics

Unit Dimensions	36(W)x65(D)x90(H) mm
Mounting	DIN Rail
IP Rating	IP30

Environmental Conditions

Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	5% to 95% non-condensing
Atmospheric pressure	70 kPa to 106 kPa
Pollution Degree	2

Ordering Information

Product Code								Description									
PMC-352 3-Phase Wireless DIN Rail Energy Meter																	
Basic Function	C							Multifunction Measurements, 1xRS-485									
Input Current		A							40mA Input for use with 100A/40mA, 200A/40mA, 400A/40mA, 800A/40mA or 1600A/40mA SCCTs (SCCTs not included)								
		B							2mA Input for use with 5A/2mA SCCT (SCCTs not included)								
Input Voltage			3							277ULN/480ULL ±15%							
Power Supply				2							60-264VAC/DC, 47-440Hz						
				N*							88-550VAC, Self-Powered from Uca (or U31)^						
Frequency					5							45-65Hz					
I/O						A							3×DI				
Expansion Communication*							N							None			
							7*							LoRa (860-935 MHz) configurable for EU863-870, RU864-870, IN865-867, US902-928, AU915-928, AS920-923, AS923-925			
Language								E					English				
PMC-352	C	A	3	2	5	A	N	E					PMC-352-CA325ANE (Standard Model)				

* Additional charges apply.
^ The Self-Powered option is only supported for 3-phase power system. If the PMC-352 is used in a single-phase application, Power Supply option 2 should be selected.

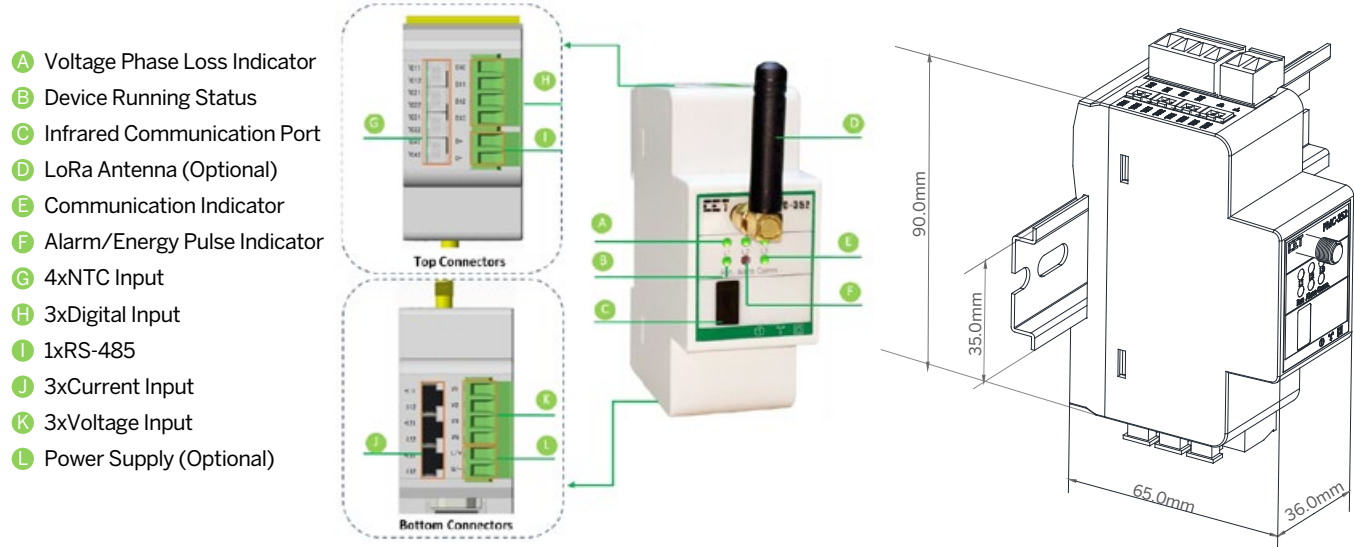
Accessories

Split-Core CTs	Specification	Accuracy	Diameter	Cable Length
PMC-SCCT-5A-2mA-16-A	5A, 1-phase Split-Core CT with Pluggable Connector	2.0	Ø16mm	2m
PMC-SCCT-100A-40mA-16-A	100A, 1-phase Split-Core CT with Pluggable Connector	0.5	Ø16mm	2m
PMC-SCCT-200A-40mA-24-A	200A, 1-phase Split-Core CT with Pluggable Connector	0.5	Ø24mm	2m
PMC-SCCT-400A-40mA-35-A	400A, 1-phase Split-Core CT with Pluggable Connector	0.5	Ø35mm	2m
PMC-SCCT-800A-40mA-A	800A, 1-phase Split-Core CT	0.5	80x50mm	2m*
PMC-SCCT-1600A-40mA-A	1600A, 1-phase Split-Core CT	0.5	130x55mm	2m*

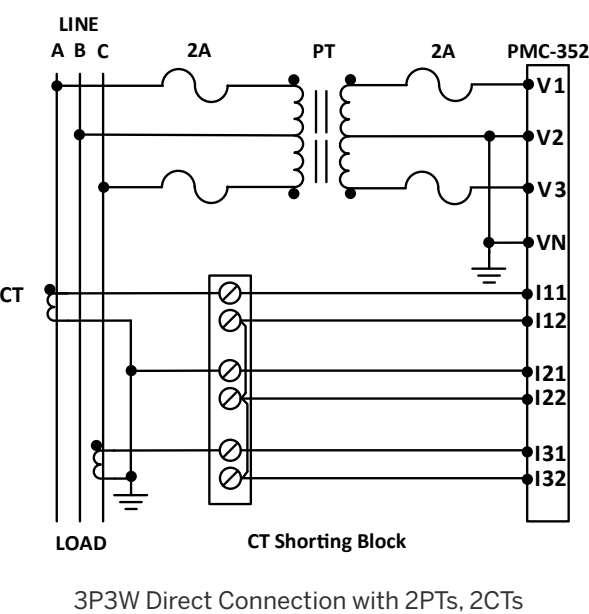
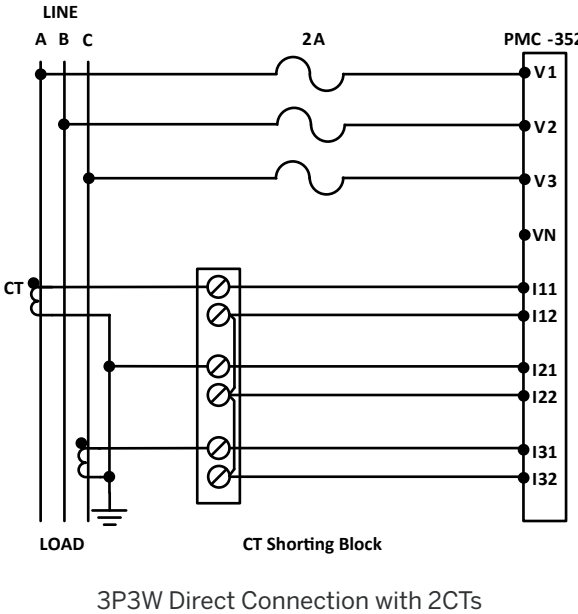
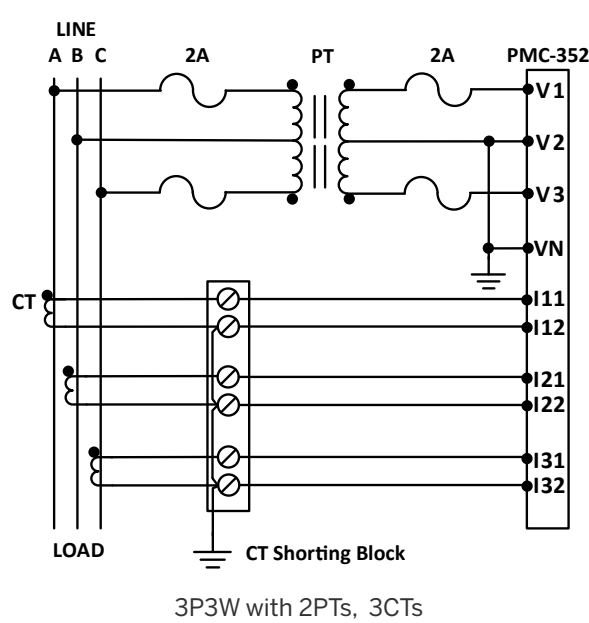
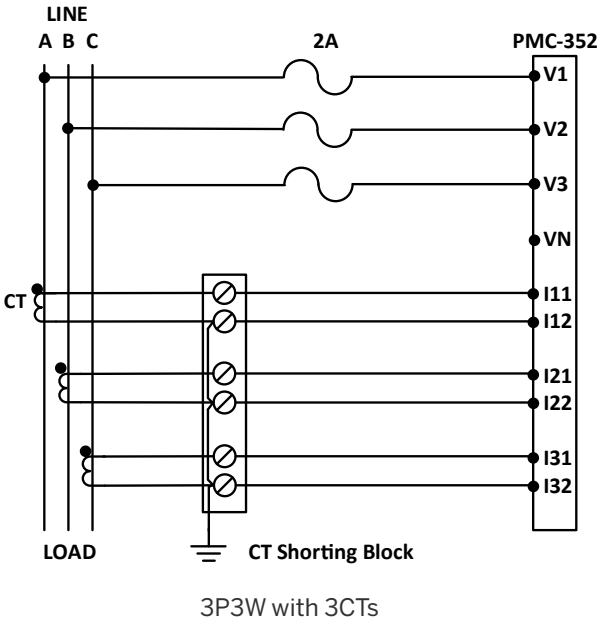
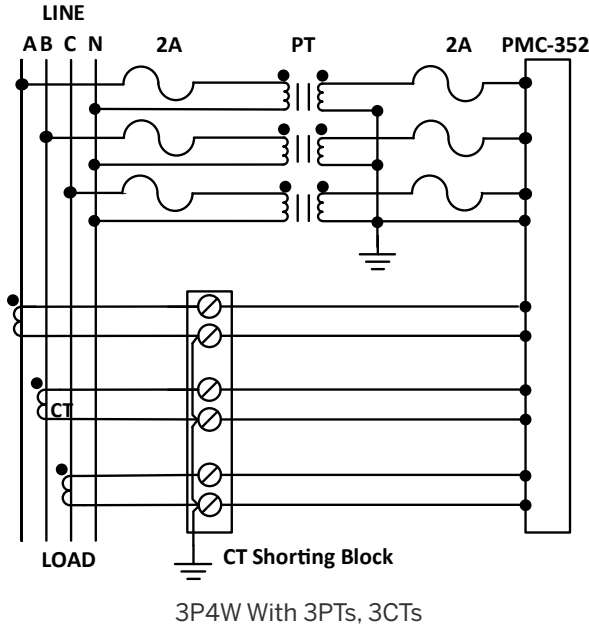
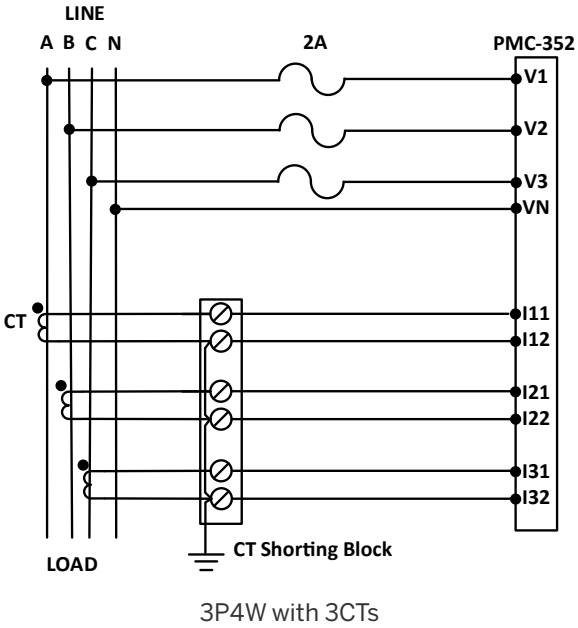
* The PMC-SCCT-800A-40mA-A and PMC-SCCT-1600A-40mA-A come with PMC-BCC-350-2, which is a 2m cable with 2-Pin Black Pluggable Connector.

Device View and Dimensions

Unit: mm



Wiring Diagrams



PMC-53A-E

Ethernet Multifunction Meter



- ✓ Compliance with the IEC 62053-22 Class 0.5S Standard
- ✓ DIN form factor measuring @ 96x96x88 mm
- ✓ A large, backlit, Dot-Matrix LCD
- ✓ On-board password protected Web Server
- ✓ Optional Split-Core CT (SCCT)

Features Summary

General	
Class (kWh)	0.5S
Dimensions (mm)	96(W)x96(H)x88(D)
Display (Backlit)	Dot-Matrix LCD (Backlit)
True RMS Sampling Rate	64
Battery-backed Real-time Clock	✓
Operating Temperature (°C)	-25 to 70

Communications	
Protocol	Modbus RTU, Modbus TCP, BACnet, DNP3.0, Ethernet Gateway, SNTP, SMTP, TFTP
RS-485 Port	1
Ethernet	1
Web Server	✓

I/O	
Digital Input (DI)	4
Pulse Counter	✓
Mechanical Digital Output (DO)/Solid State Output (SS)	2DO or (2 Opt.)SS
Analog Input (AI), 0/4-20mA	(1 Opt.)
Analog Output (AO), 0/4-20mA	-
kWh & kvarh Pulse Output (LED)	✓
kWh & kvarh Pulse Output	(2 Opt.)
IRIG-B (GPS)	-

Power Quality	
THD Voltage & Current	✓
TOHD Voltage & Current	✓
TEHD Voltage & Current	✓
K-Factor	✓
Individual Harmonics	2 nd - 31 st
Voltage/Current Unbalance	✓
Waveform Capture on Screen	✓
Waveform Recording	-
Dip Swell Detection	-
Transient Detection	-
IEC 61000-4-30	-
2-150kHz Conducted Emission	-

Measurements	
ULN per Phase & Avg.	✓
ULL per Phase & Avg.	✓
Current per Phase & Avg.	✓
Neutral Current (Meas./Calc.)	✓
Frequency	✓
kW per Phase & Total	✓
kvar per Phase & Total	✓
kVA per Phase & Total	✓
PF per Phase & Total	✓
kWh Import/Export	✓
kvarh Import/Export	✓
kVAh Total	✓
Demands & TOU	✓
Maximum Demands	✓
Setpoints	✓

Logs	
SOE Log	100 entries
PQ Log	-
Energy Log	✓
Max./Min. Log	✓
On-board Log Memory	8MB

(Opt.)-Optional (Meas./Calc.)-Measured Value/Calculated Value

Main Features

Metering

Basic Measurements

- ULN, ULL per Phase and Average with Neutral-to-Ground Voltage (Ung)
- Current per Phase and Average with calculated Neutral
- P, Q, S, PF per Phase and Total
- kWh, kvarh Import/ Export/Net/Total and kVAh Total
- Frequency
- Device Operating Time (Running Hours)
- Optional Neutral Current I4 measurement
- Optional Residual Current Ir measurement
- 12 Monthly Logs of kWh, kvarh Imp/Exp/Tot/Net, kVAh and kvarh Q1-Q4

Advanced Measurements

- 1-cycle Real-time U & I Waveform Display @ 1s update rate
- U and I THD, TOHD, TEHD and Individual Harmonics up to 31st
- Current TDD, TDD Odd, TDD Even, K-Factor and Crest Factor
- U and I Unbalance and Phase Angle
- Displacement PF
- Fundamental U, I and P per Phase
- Total Fundamental P & Total Harmonic P
- U and I Symmetrical Components
- kvarh Q1-Q4
- Interval Energy for kWh/kvarh Import/Export and kVAh

Demands

- Present, Predicted and Maximum Demands for ULN, ULL, I per Phase and Average as well as P/Q/S Total with Timestamp for This Month & Last Month (or Since Last Reset & Before Last Reset)

Multi-Tariff TOU Capability

- Two TOU schedules, each providing:
 - 12 Seasons
 - 20 Daily Profiles, each with 12 Periods in 15-minute interval
 - 90 Holidays or Alternate Days
 - 8 Tariffs

Data and Event Recorders

Max./Min. Log

- Max./Min. Log with Timestamp for Real-time Measurement such as Voltage, Current, In, I4, Ir, Freq., kW, kvar, kVA, PF, Unbalance, K-Factor, Crest Factor and THD
- Configurable for This Month & Last Month (or Since Last Reset & Before Last Reset)

Freeze Log

- 60 Daily Freeze Logs for kWh/kvarh/kVAh Total and kW/kvar/kVA Maximum Demands
- 36 Monthly Freeze Logs for kWh/kvarh/kVAh Total and kW/kvar/kVA Maximum Demands with Timestamps

Data Recorder Log

- 5 Data Recorders of 16 parameters each for Real-time Measurements, Harmonics, Energy, Demand, TOU, Pulse Counters, etc.
- Recording interval from 1 minute to 40 days
- Configurable capacity up to a max. of 1145 days at 15-minute interval for 1 Data Recorder with 16 parameters for HK BEC2018 Compliant Recording

SOE Log

- 100 events time-stamped to ±1ms resolution
- Setup changes, Setpoint, DI status changes and DO operations

Inputs and Outputs

Digital Inputs

- 4 channels, volt free dry contact, 24VDC internally wetted
- 1000Hz sampling for status monitoring with programmable debounce
- Pulse counting with programmable weight for each channel for collecting WAGES (Water, Air, Gas, Electricity, Steam) information
- Tariff switching based on DI status

Digital Outputs

- 2 Form A mechanical relays for alarming and general purpose control

Pulse Outputs (Optional)

- 2 Form A Solid State Relays for kWh and kvarh pulsing

Analog Inputs (Optional)

- I4 Current Input for Neutral Current Measurement
- Ir Input for Residual Current Measurement
- 0/4-20mA DC input with programmable zero and full scales

Communications

- One 100BaseT Ethernet Port, supporting Modbus TCP, HTTP, SMTP, SNTP and TFTP
- One optically isolated RS-485 port at maximum 38,400 bps, supporting selectable protocol for Modbus RTU, BACnet MS/TP, DNP 3.0 and Ethernet Gateway
- Built-in Web Server for data viewing and configurations

Setpoints

- 9 user programmable setpoints with extensive list of monitoring parameters including Voltage, Current, Power, PF, Current and Power Demand, Unbalance and THD, etc.
- Configurable thresholds, time delays, DO and Alarm Email triggers

Accuracy Parameters

Parameters	Accuracy		Resolution
Voltage	± 0.2%		0.001V
Current	± 0.2%		0.001A
I4 (measurement)	± 0.2%		0.001A
Ir (measurement)	± 0.5%		0.001A
P, Q, S	± 0.5%		0.001kX
kWh, kVAh	5A/1A Option	IEC 62053-22 Class 0.5S ANSI C12.20 Class 0.2	0.1kXh
	SCCT Option	IEC 62053-21 Class 1	
kvarh	5A/1A Option	IEC 62053-24 Class 0.5S IEC 62053-23 Class 2	0.1kvarh
	SCCT Option	IEC 62053-24 Class 1 IEC 62053-23 Class 2	
PF	± 0.5%		0.001
Frequency	± 0.02Hz		0.01Hz
THD	IEC 61000-4-7 Class B		0.001%
K-Factor	IEC 61000-4-7 Class B		0.001
Phase Angle	± 1°		0.1°

Technical Specifications

Voltage Inputs (V1, V2, V3, VN)

Standard Un	400ULN/690ULL
Range	10V to 1.2Un
Overload	1.2xUn continuous, 2xUn for 1s
Burden	<0.02VA per phase
Measurement Category	CAT III up to 600ULL
Frequency	45-65Hz

Current Inputs (I11, I12, I21, I22, I31, I32)

Standard In	Standard 5A, Optional 1A
SCCT Options	100A/200A/400A/800A/1600A to 40mA Output
Range	0.1% to 200% In
Starting Current	0.1% In
Overload	2xIn continuous, 20xIn for 1s
Measurement Category	CAT III up to 600ULL
Burden	<0.15VA per phase @ 5A

Power Supply (L+, N-)

Standard	95-250VAC/DC, ±10%, 47-440Hz
Optional	20-60VDC
Burden	<3W
Overvoltage Category	CAT III up to 300ULN

Digital Inputs (DI1, DI2, DI3, DI4, DIC)

Type	Dry contact, 24VDC internally wetted
Sampling	1000Hz
Hysteresis	1ms minimum

Digital Outputs (DO11, DO12, DO21, DO22)

Type	Form A Mechanical Relay
Loading	5A @ 250VAC or 30VDC

Optional SS Pulse Outputs (E1+, E1-, E2+, E2-)

Type	Form A Solid State Relay
Isolation	Optical
Maximum Load Voltage	50VDC
Maximum Forward Current	50mA

Optional Analog Input (AI+, AI-)

Type	0-20/4-20 mA
Overload	24 mA maximum

Optional I4 Input (I41, I42)

In	5A (5A/1A Auto-scaling)
Range	0.1% to 120% In
Starting Current	0.1% In

Optional Residual Current Input (IR11, IR12)

In	0.5mA
Range	2% to 500% In
CT Type	Solid-Core or Split-Core Residual Current CT

Mechanical Characteristics

Panel Cutout	92x92 mm (3.62"x3.62")
Unit Dimensions	96x96x88 mm
IP Rating	65 (Front Panel), 30 (Body)

Ordering Information

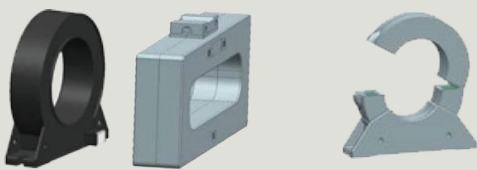
Product Code										Description		
PMC-53A-E Ethernet Multifunction Meter												
Basic Function		E	Dot-Matrix LCD, Monthly & Daily Freeze Log, Data Recorder, 8MB Memory, 1x100BaseT Ethernet Port and 1xRS-485 (Modbus RTU, BACnet MS/TP and DNP 3.0)									
Input Current			5				5A/1A Auto-Scaling (Class 0.5S for 5A and Class 1 for 1A)					
			1				1A (Class 0.5S)					
			4^				For use with 100A, 200A, 400A, 800A and 1600A to 40mA Split-Core CTs					
Input Voltage				9				400ULN/690ULL				
Power Supply					2				95-250 VAC/DC, 47-440Hz			
					3				20-60VDC			
Frequency						5				45Hz-65Hz		
I/O								A	4xDI +2xDO (Mechanical Relay)			
								B	4xDI +2xSS Pulse Output			
Analog Inputs									X	None		
									A*^	I4 (5A/1A Auto-Scaling) +AI (0/4-20mA) +Ir (0-0.5mA)		
Language										E	English	
PMC-53A		-	E	-	5	9	2	5	A	X	E	PMC-53A-E-5925AXE (Standard Model)

* Additional charges apply

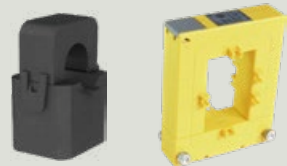
^ The Analog Inputs Option A is not available for the Input Current Option 4

Accessories

Residual Current CT

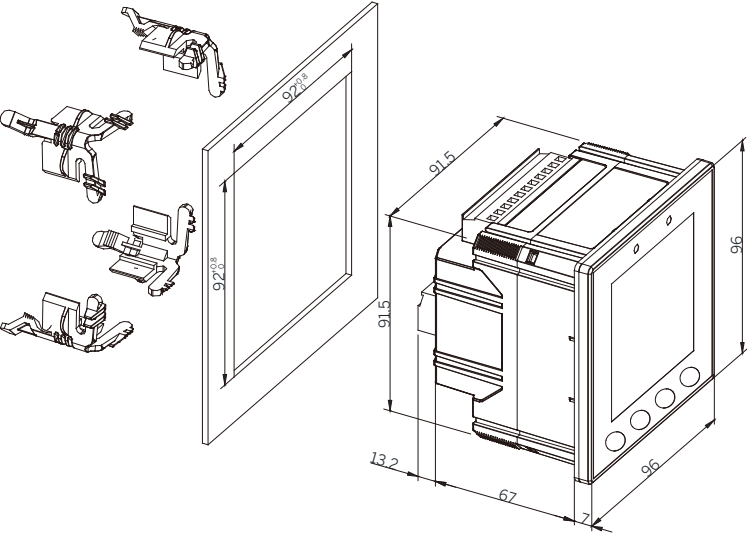
Solid-Core Models	160A (CT517203, Ø=46 mm)		Solid-Core Models	Split-Core Models
	400A (CT517403, Ø=80 mm)			
	1000A (CT517603, Ø=120 mm)			
	630A (CT519703, 220x50 mm)			
Split-Core Models	160A (CT553203, Ø=48 mm)			
	225A (CT553303, Ø=68 mm)			
Primary Input	1A (Residual Current) @ 50/60Hz	/		
Secondary Output	0.5mA	/		
Range	2-500%	/		
Accuracy	Class 0.5 (Solid-Core), Class 3 (Split-Core)	/		

Split-Core CT

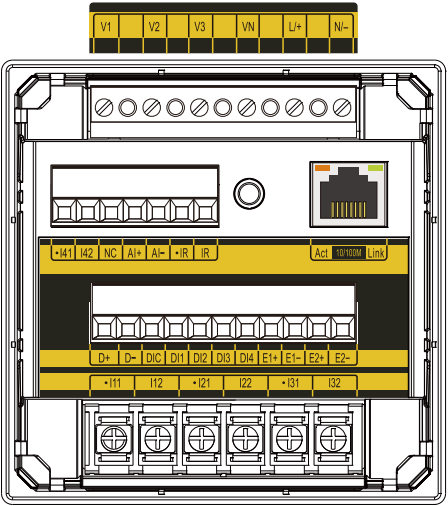
Models	100A (PMC-SCCT-100A-40mA-16-A, Ø=16mm)	
	200A (PMC-SCCT-200A-40mA-24-A, Ø=24mm)	
	400A (PMC-SCCT-400A-40mA-35-A, Ø=35mm)	
	800A (PMC-SCCT-800A-40mA-A, 80x50mm)	
	1600A (PMC-SCCT-1600A-40mA-A, 130x55mm)	
Primary Input	100A/200A/400A/800A/1600A @ 50/60Hz	/
Secondary Output	40mA	/
Range	0.15%-120%In	/
Accuracy	Class 0.5	/

Device View and Dimensions

Unit: mm

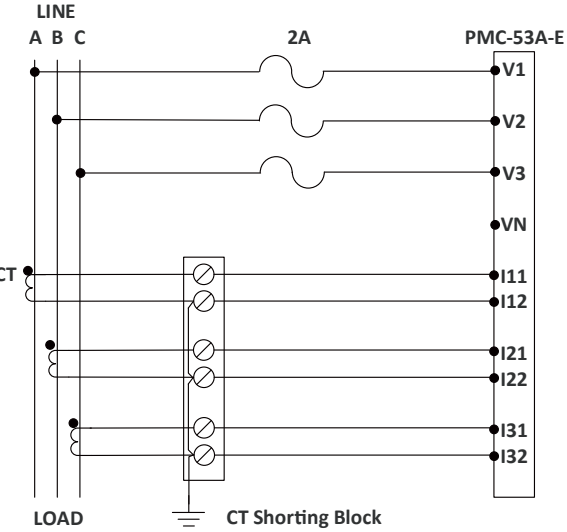


Panel Cutout

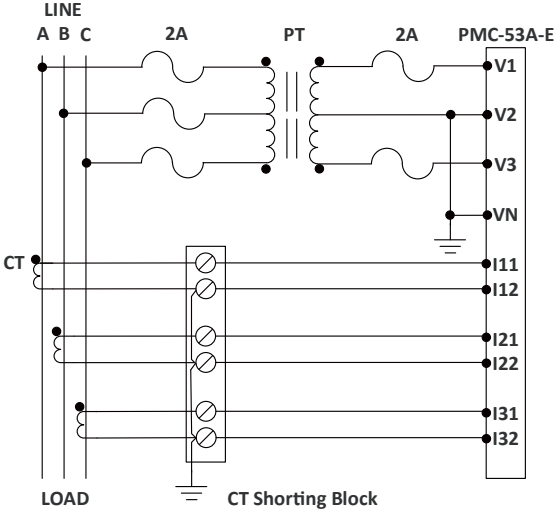


Rear View

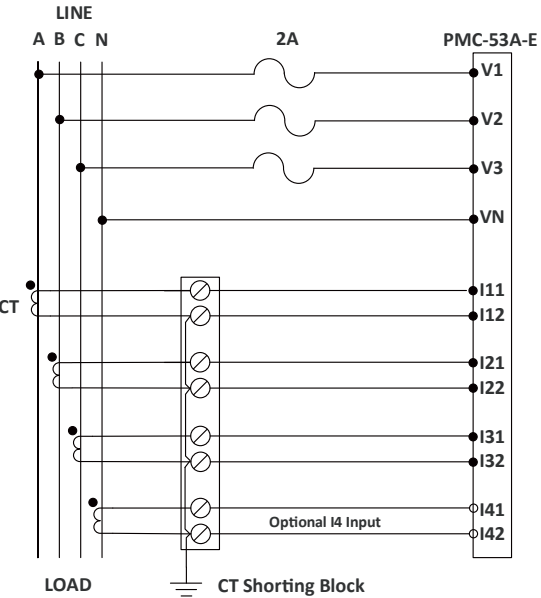
Wiring Diagrams



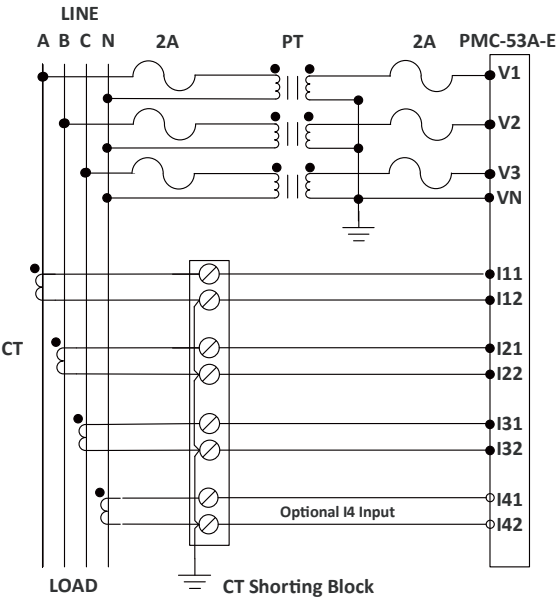
3P3W Direct Connection with 3CTs



3P3W with 2PTs and 3CTs



3P4W Direct Connection with 4CTs
(Optional I41 & I42)



3P4W with 3PTs and 4CTs
(Optional I41 & I42)

PMC-53A
Intelligent Multifunction Meter



- ✓ Compliance with the IEC 62053-22 Class 0.5S Standard
- ✓ DIN form factor measuring @ 96x96x88 mm
- ✓ A large, backlit, Dot-Matrix LCD

Features Summary

General

Class (kWh)	0.5S
Dimensions (mm)	96(W)x96(H)x88(D)
Display (Backlit)	Dot-Matrix LCD (Backlit)
True RMS Sampling Rate	64
Battery-backed Real-time Clock	✓
Operating Temperature (°C)	-25 to 70

Communications

Protocol	Modbus RTU, BACnet MS/TP, N2 and DNP3.0
RS-485 Port	1 + (1 Opt.)
Ethernet	-
Web Server	-

Measurements

ULN per Phase & Avg.	✓
ULL per Phase & Avg.	✓
Current per Phase & Avg.	✓
Neutral Current (Meas./Calc.)	✓
Frequency	✓
kW per Phase & Total	✓
kvar per Phase & Total	✓
kVA per Phase & Total	✓
PF per Phase & Total	✓
kWh Import/Export	✓
kvarh Import/Export	✓
kVAh Total	✓
Demands & TOU	✓
Maximum Demands	✓
Setpoints	✓

Power Quality

THD Voltage & Current	✓
TOHD Voltage & Current	✓
TEHD Voltage & Current	✓
K-Factor	✓
Individual Harmonics	2 nd - 31 st
Voltage/Current Unbalance	✓
Waveform Capture on Screen	✓
Waveform Recording	-
Dip Swell Detection	-
Transient Detection	-
IEC 61000-4-30	-
2-150kHz Conducted Emission	-

I/O

Digital Input (DI)	(6 Opt.)
Pulse Counter	✓
Mechanical Digital Output (DO)/Solid State Output (SS)	(4 Opt.)DO or (4 Opt.)SS
Analog Input (AI), 0/4-20mA	(1 Opt.)
Analog Output (AO), 0/4-20mA	(1 Opt.)
kWh & kvarh Pulse Output (LED)	✓
kWh & kvarh Pulse Output	(2 Opt.)
IRIG-B (GPS)	-

(Opt.)-Optional (Meas./Calc.)-Measured Value/Calculated Value

Main Features

Metering

Basic Measurements

- ULN, ULL per Phase and Average
- Current per Phase and Average with calculated Neutral
- kW, kvar, kVA, PF per Phase and Total
- kWh, kvarh Import/Export/Net/Total and kVAh Total
- Frequency
- Device Operating Time (Running Hours)
- Optional I4 Measurements
- Calculated Residual Current Ir (with optional I4 Input)

Advanced Measurements

- 1-cycle Real-time U & I Waveform Display @ 1s update rate
- U and I THD, TOHD, TEHD and Individual Harmonics up to 31st
- Current TDD, TDD Odd, TDD Even, K-Factor and Crest Factor
- U and I Unbalance and Phase Angle
- Displacement PF
- Fundamental U, I and P per Phase
- Total Fundamental kW & Total Harmonic kW
- U and I Symmetrical Components
- kvarh Q1-Q4

- Interval Energy for kWh/kvarh Import/Export and kVAh

Demands

- Predicted Demands and Maximum Demands for kW/kvar/kVA Total and per Phase Current with Time-stamp for This Month & Last Month (or Since Last Reset & Before Last Reset)

Multi-Tariff TOU Capability

- Two TOU schedules, each providing:
 - 12 Seasons
 - 20 Daily Profiles, each with 12 Periods in 15-minute interval
 - 90 Holidays or Alternate Days
 - 8 Tariffs

Data and Event Recorders

Maximum Demand Log

- Maximum Demand Log with Timestamps for Ia, Ib, Ic, kW, kvar, kVA for the month and kW, kvar, kVA for TOU Tariffs 1 to 8
- Configurable through the Front Panel as well as communications for This Month & Last Month (or Since Last Reset & Before Last Reset)

Max./Min. Log

- Max./Min. Log with Timestamps for parameters such as Voltage, Current, In, I4, Freq., kW, kvar, kVA, PF, Unbalance, K-Factor, Crest Factor and THD
- Configurable for This Month & Last Month (or Since Last Reset & Before Last Reset)

Monthly Energy Log

- Energy Log with Timestamps for kWh, kvarh Import/

Export/Net/Total, kWh, kvarh Import/Export for TOU Tariffs 1 to 8, kVAh Total & kvarh Q1-Q4

- Configurable through communications for present and the last 12 months

Daily/Monthly Freeze Log (Optional)

- Daily/Monthly Log with Timestamps for kWh, kvarh, kVAh Total & Maximum Demand kW, kvar, kVA Total
- Configurable through communications for 60 daily freeze records and 36 monthly freeze records

Data Recorder (Optional)

- 5 Data Recorders of 16 parameters each for Real-time measurements, Harmonics, Energy, Demand, TOU, Pulse Counters, etc.
- Recording interval from 1 minute to 40 days
- Configurable capacity up to a maximum of 100 days at 15-minute interval

SOE Log

- 100 events time-stamped to $\pm 1\text{ms}$ resolution
- Recording Events for Setup changes, Setpoint and DI status changes as well as DO operations

Inputs and Outputs

Digital Inputs (Optional)

- Up to 6 channels, volt free dry contact, 24VDC internally wetted
- 1000Hz sampling for status monitoring with programmable debounce
- Pulse counting with programmable weight for each channel for collecting WAGES (Water, Air, Gas, Electricity, Steam) information
- Tariff switching based on DI status

Digital Outputs (Optional)

- Up to 4 Form A mechanical relays for alarming and general purpose control

Pulse Outputs (Optional)

- Up to 4 Form A Solid State Relays for kWh and kvarh pulsing

Analog Inputs and Outputs (Optional)

- Optional AI and AO modules for Analog applications
- 0/4-20mA DC input with programmable zero and full scales

Communications

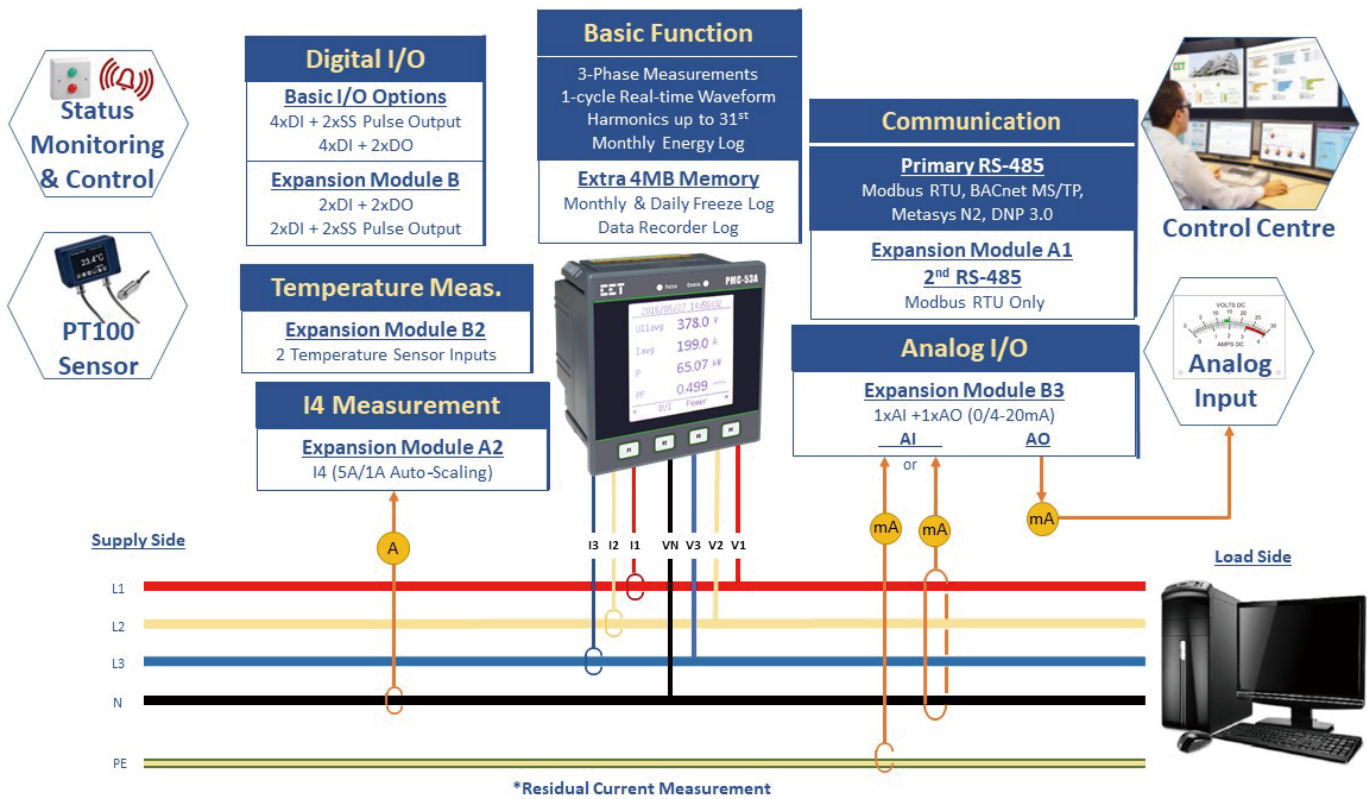
- Optically isolated RS-485 port at maximum 38,400 bps
- Selectable Modbus RTU, BACnet MS/TP, Metasys N2 and DNP 3.0
- Optional 2nd RS-485 port (Modbus RTU only)

Setpoints

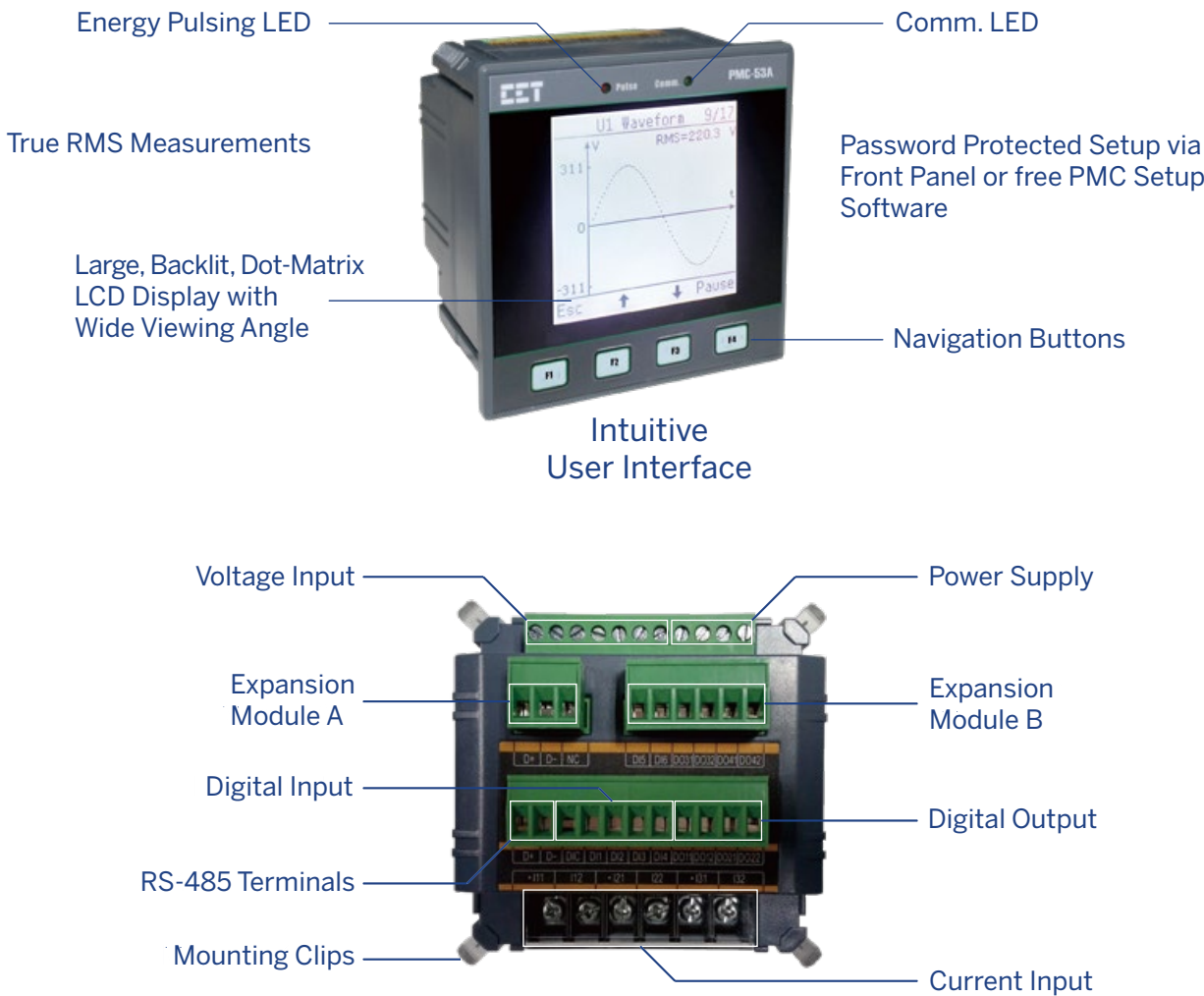
Supports comprehensive monitoring and control functions such as SOE Logging, Data Recording or DO Triggering for Alarm or Control Actions.

- 9 user-programmable setpoints
- Configurable thresholds, time delays and DO triggers

Typical Application



Appearance



Accuracy

Parameters	Accuracy	Resolution
Voltage	± 0.2% Reading + 0.05% F.S.	0.001V
Current	± 0.2% Reading + 0.05% F.S.	0.001A
I4 (measurement)	± 0.2%	0.001A
P, Q, S	± 0.5% Reading + 0.05% F.S.	0.001kX
kWh, kVAh	IEC 62053-22 Class 0.5S ANSI C12.20 Class 0.2 EN 50470-1/3: 2006 Class C	0.1kXh
kvarh	IEC 62053-24 Class 0.5S IEC 62053-23 Class 2	0.1kvarh
PF	± 0.5%	0.001
Frequency	± 0.02Hz	0.01Hz
THD	IEC 61000-4-7 Class B	0.001%
K-Factor	IEC 61000-4-7 Class B	0.001
Phase Angle	± 1°	0.1°

Technical Specifications

Voltage Inputs (V1, V2, V3, VN)

Standard Un	400ULN/690ULL
Range	10V to 1.2Un
Overload	1.2xUn continuous, 2xUn for 1s
Burden	<0.02VA per phase
Measurement Category	CAT III up to 600ULL
Frequency	45-65Hz

Current Inputs (I11, I12, I21, I22, I31, I32)

Standard In	5A, Optional 1A
Range	0.1% to 200% In
Starting Current	0.1% In
Overload	2xIn continuous, 20xIn for 1s
Measurement Category	CAT III up to 600ULL
Burden	<0.15VA per phase

Optional I4 Input (I41, I42)

In	5A (5A/1A Auto-scaling)
Range	0.1% to 200% In
Starting Current	0.1% In

Power Supply (L+, N-)

Standard	95-250VAC/DC, ±10%, 47-440Hz
Optional	20-60VDC
Optional	95-480VAC/DC, ±10%, 47-440Hz
Burden	<2W
Overvoltage Category	CAT III up to 300ULN

Optional Digital Inputs (DI1, DI2, DI3, DI4, DIC)

Type	Dry contact, 24VDC internally wetted
Sampling	1000Hz
Hysteresis	1ms minimum

Optional Digital Outputs (DO11, DO12, DO21, DO22)

Type	Form A Mechanical Relay
Loading	5A @ 250VAC or 30VDC

Optional Pulse Outputs (kWh, kvarh)

Type	Form A Solid State Relay
Isolation	Optical
Maximum Load Voltage	80V
Maximum Forward Current	50mA

Optional Analog Input

Range	0-20mA or 4-20mA
Overload	24mA

Optional Analog Output

Range	0-20mA or 4-20mA
Loading	500Ω maximum
Overload	24mA

Installation Torque

Current Inputs	12lb-in (1.3N.m)
Power Supply, Voltage Inputs, RS-485 and I/O	5lb-in (0.5N.m)

Environmental Conditions

Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	5% to 95% non-condensing
Atmospheric Pressure	70 kPa to 106 kPa

Mechanical Characteristics

Panel Cutout	92x92 mm (3.62"x3.62")
Unit Dimensions	96x96x88 mm
IP Rating	65

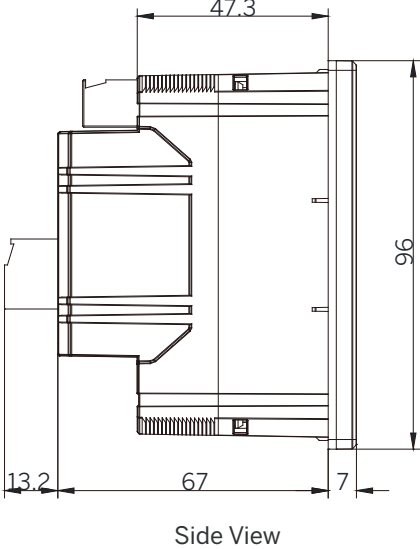
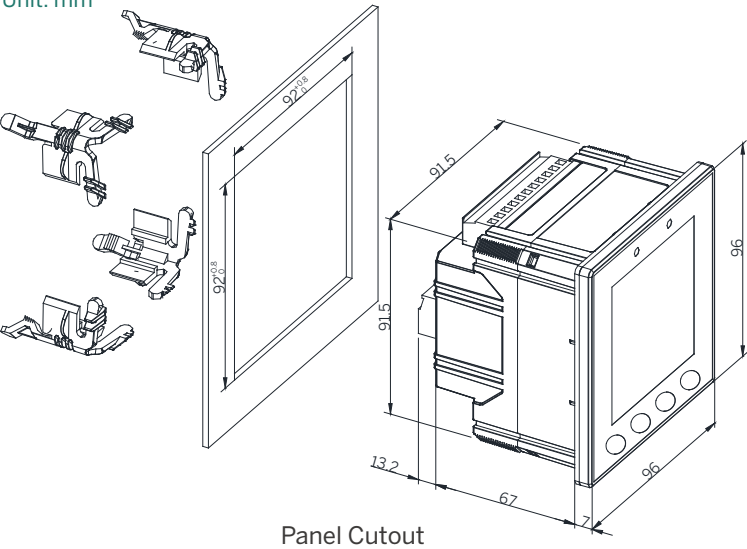
Ordering Information

Product Code										Description
PMC-53A Intelligent Multifunction Meter										
Basic Function	1									Dot-Matrix LCD, 1xRS-485 with Multiple Protocol, Monthly Energy Log
	2*									Model 1 + Monthly & Daily Freeze Log, Data Recording Log, 4MB Memory
	3*									Model 1 + 4xDI + 2xSS Pulse Output
	A*									Model 1 + 4xDI + 2xDO (Mechanical Relay)
	B*									Model A + Monthly & Daily Freeze Log, Data Recording Log, 4MB Memory
Input Current		5								5A/1A Auto-Scaling (Class 0.5S for 5A and Class 1 for 1A)
		1								1A
Input Voltage			9							400ULN/690ULL
Power Supply				2						95-250 VAC/DC, 47-440Hz
				3						20-60VDC
				4						95-480 VAC/DC, 47-440Hz
Frequency					5					45Hz-65Hz
Language						E				English
Expansion A*							A1			1xRS-485
							A2			I4 (5A/1A Auto-Scaling)
Expansion B*								B1		2xDI + 2xDO (Mechanical Relay)
								B2		2xRTD (PT100 sensors not included)
								B3		1xAI + 1xAO (0/4-20mA)
								B4		2xDI + 2xSS Pulse Output
PMC-53A	-	1	5	9	2	5	E	-	-	PMC-53A-15925E (Standard Model)

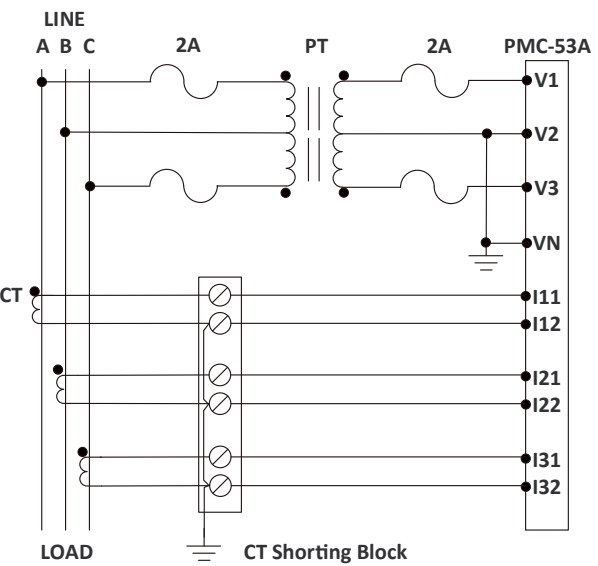
* Additional charges apply
1) Model No. with only one Expansion can be written as PMC-53A-15925E-Ax or PMC-53A-15925E-Bx
2) Model No. with both Expansions can be written as PMC-53A-15925E-Ax-Bx
3) Options B1 and B4 for Expansion B are invalid with options 1, and 2 under Basic Function

Device View and Dimensions

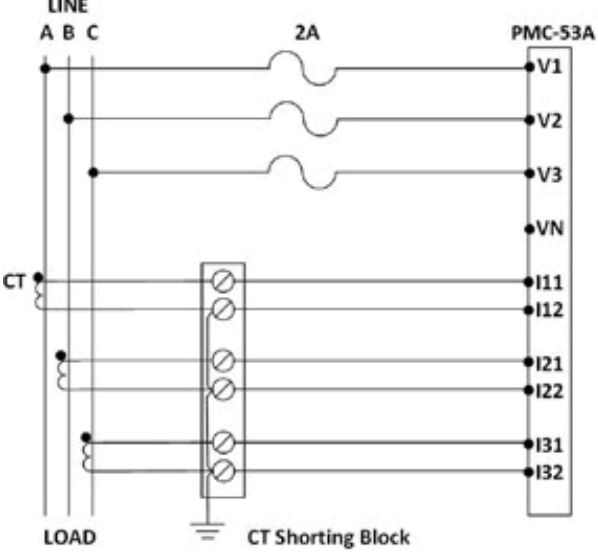
Unit: mm



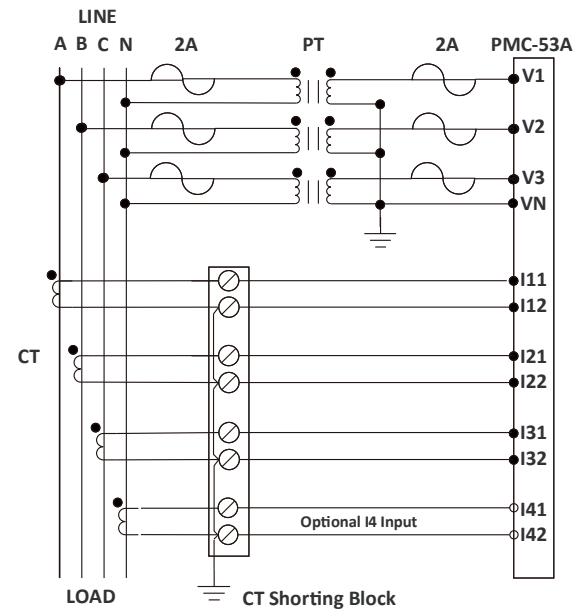
Wiring Diagrams



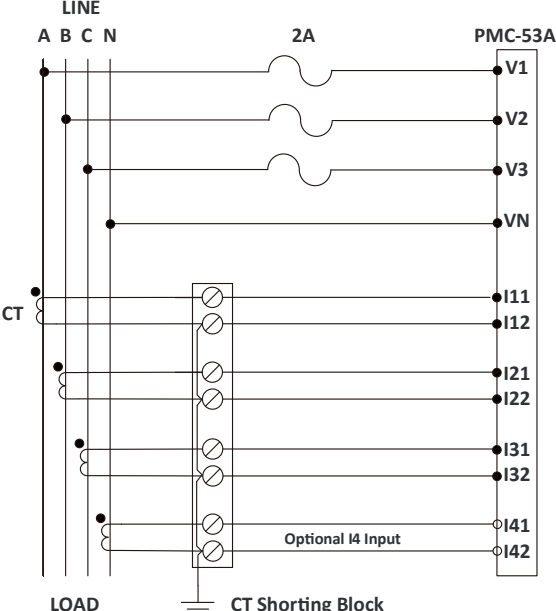
3P3W Delta with 2PTs and 3CTs



3P3W Direct Connection with 3CTs



3P4W with 3PTs and 4CTs
(Optional I41 & I42)



3P4W Direct Connection with 4CTs
(Optional I41 & I42)

PMC-53M-A
Digital Multifunction Meter



- ✓ Compliance with the IEC 62053-22 Class 0.5S Standard
- ✓ DIN form factor measuring @ 96x96x88 mm
- ✓ A large, backlit, 7-Segment LCD

Features Summary

General

Class (kWh)	0.5S
Dimensions (mm)	96(W)x96(H)x88(D)
Display (Backlit)	B&W(Backlit)
True RMS Sampling Rate	64
Battery-backed Real-time Clock	✓
Operating Temperature (°C)	-25 to 70

Communications

Protocol	Modbus RTU
RS-485 Port	1
Ethernet	-
Web Server	-

Measurements

ULN per Phase & Avg.	✓
ULL per Phase & Avg.	✓
Current per Phase & Avg.	✓
Neutral Current (Meas./Calc.)	Calc.
Frequency	✓
kW per Phase & Total	✓
kvar per Phase & Total	✓
kVA per Phase & Total	✓
PF per Phase & Total	✓
kWh Import/Export	✓
kvarh Import/Export	✓
kVAh Total	✓
Demands & TOU	Dmd. Only
Maximum Demands	✓
Setpoints	✓

I/O

Digital Input (DI)	(4 Opt.)
Pulse Counter	✓
Mechanical Digital Output (DO)/Solid State Output (SS)	(2 Opt.)DO
Analog Input (AI), 0/4-20mA	-
Analog Output (AO), 0/4-20mA	-
kWh & kvarh Pulse Output (LED)	✓
kWh & kvarh Pulse Output	-
IRIG-B (GPS)	-

Power Quality

THD Voltage & Current	✓
TOHD Voltage & Current	✓
TEHD Voltage & Current	✓
K-Factor	✓
Individual Harmonics	2 nd - 31 st
Voltage/Current Unbalance	✓
Waveform Capture on Screen	-
Waveform Recording	-
Dip Swell Detection	-
Transient Detection	-
IEC 61000-4-30	-
2-150kHz Conducted Emission	-

Logs

SOE Log	100 entries
PQ Log	-
Energy Log	-
Max./Min. Log	✓
On-board Log Memory	-

(Opt.)-Optional (Meas./Calc.)-Measured Value/Calculated Value (Dmd.)-Demand

Main Features

Metering

Basic Measurements

- ULN, ULL per Phase and Average
- Current per Phase and Average with calculated Neutral Current
- kW, kvar, kVA, PF per Phase and Total
- kWh, kvarh Import/Export/Net/Total and kVAh Total
- Frequency
- Device Operating Time (Running Hours)
- Optional DI Pulse Counters

Advanced Measurements

- U and I THD, TOHD, TEHD and Individual Harmonics up to 31st
- Current TDD, TDD Odd, TDD Even, K-Factor and Crest Factor
- U and I Unbalance and Phase Angle
- Displacement PF
- Fundamental U, I and kW per Phase
- Total Fundamental kW & Total Harmonic kW
- U and I Symmetrical Components
- kvarh Q1-Q4

Demands

- Predicted Demands and Maximum Demands for kW/ kvar/kVA Total and per Phase Current with Time-stamp for This Month & Last Month (or Since Last Reset & Before Last Reset)

Data and Event Recorders

Max./Min. Log

- Max./Min. Log with Timestamp for Real-time measurements such as Voltage, Current, In, Freq., kW, kvar, kVA, PF, Unbalance, K-Factor, Crest Factor and THD

- Configurable for This Month & Last Month (or Since Last Reset & Before Last Reset)

SOE Log

- 100 events time-stamped to ±1ms resolution
- Setup changes, Setpoint, DI status changes and DO operations

Inputs and Outputs

Digital Inputs (Optional)

- 4 channels, volt free dry contact, 24VDC internally wetted
- 1000Hz sampling for status monitoring with programmable debounce
- Pulse counting with programmable weight for each channel for collecting WAGES (Water,Air, Gas, Electricity, Steam) information

Digital Outputs (Optional)

- 2 Form A mechanical relays for alarming and general purpose control
- 5A @ 250VAC or 30VDC

Communications

- Optically isolated RS-485 port at maximum 38,400 bps
- Standard Modbus RTU support

Setpoints

- 9 user programmable setpoints with extensive list of monitoring parameters including Voltage, Current, Power, THD, etc.
- Configurable thresholds, time delays and DO triggers

Accuracy

Parameters	Accuracy	Resolution
Voltage	± 0.2% Reading + 0.05% F.S.	0.001V
Current	± 0.2% Reading + 0.05% F.S.	0.001A
P, Q, S	± 0.5% Reading + 0.05% F.S.	0.001kX
kWh, kVAh	IEC 62053-22 Class 0.5S	0.01kXh
kvarh	IEC 62053-23 Class 2	0.01kvarh
PF	± 0.5%	0.001
Frequency	± 0.02Hz	0.01Hz
THD	IEC 61000-4-7 Class B	0.001%
K-Factor	IEC 61000-4-7 Class B	0.001
Phase Angle	± 1°	0.1°

Technical Specifications

Voltage Inputs (V1, V2, V3, VN)

Standard Un	400ULN/690ULL
Range	10V to 1.2Un
Overload	1.2xUn continuous, 2xUn for 1s
Burden	<0.02VA per phase
Measurement Category	CAT III up to 600ULL
Frequency	45-65Hz

Current Inputs (I11, I12, I21, I22, I31, I32)

Standard In	5A (5A/1A Auto-Scaling)
Range	0.1% to 200% In
Starting Current	0.1% In
Overload	2xIn continuous, 20xIn for 1s
Measurement Category	CAT III up to 600ULL
Burden	<0.15VA per phase

Power Supply (L+, N-)

Standard	95-250VAC/DC, ±10%, 47-440Hz
Burden	<2W
Overvoltage Category	CAT III up to 300ULN

Digital Inputs (DI1, DI2, DI3, DI4, DIC)

Type	Dry contact, 24VDC internally wetted
Sampling	1000Hz
Hysteresis	1ms minimum

Digital Outputs (DO11, DO12, DO21, DO22)

Type	Form A Mechanical Relay
Loading	5A @ 250VAC or 30VDC

Installation Torque

Current Inputs	1.3 N.m
Power Supply, Voltage Inputs, RS-485, I/O	0.5 N.m

Environmental Conditions

Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	5% to 95% non-condensing
Atmospheric Pressure	70 kPa to 106 kPa

Mechanical Characteristics

Panel Cutout	92x92 mm (3.62"x3.62")
Unit Dimensions	96x96x88 mm
IP Rating	65

Ordering Information

Product Code											Description						
PMC-53M-A DIN96 Intelligent Multifunction Meter																	
Basic Function		A									7-segment LCD, 1xRS-485 with Modbus						
Input Current				5								5A/1A Auto-Scaling (Class 0.5S for 5A and Class 1 for 1A)					
Input Voltage						9						400ULN/690ULL					
Power Supply								2					95-250 VAC/DC, 47-440Hz				
Frequency										5				45Hz-65Hz			
I/O												X		None			
												B*		4xDI+2xDO			
Communications												A		1xRS-485			
Language														E		English	
PMC-53M		-	A	-	5	9	2	5	X	A	E	PMC-53M-A-5925XAE (Standard Model)					

* Additional charges apply

Device View and Dimensions

Unit: mm



- 1

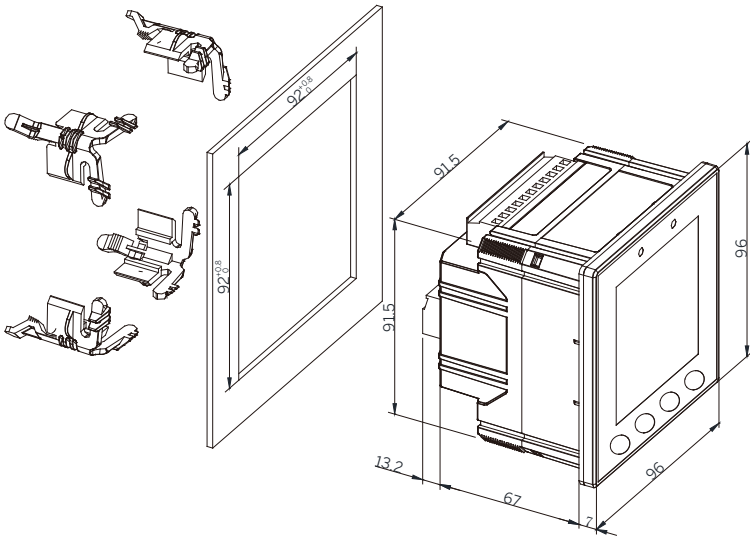
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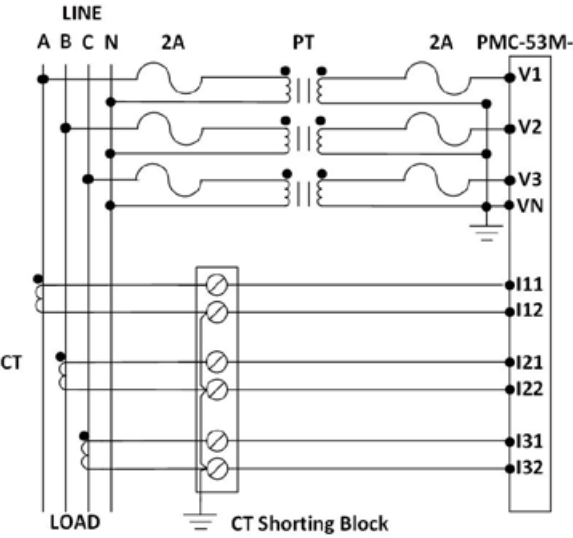
6

7
- LED Pulse Output
- Comm. Indicator
- Enclosure
- Units
- Front Panel
- Measurements
- Buttons

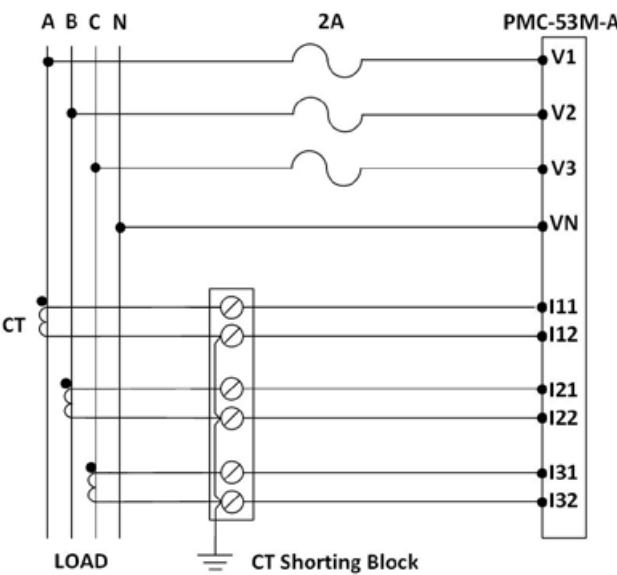


Panel Cutout

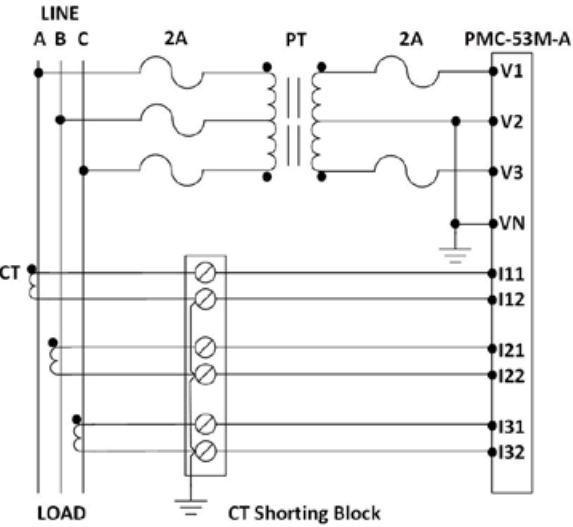
Wiring Diagrams



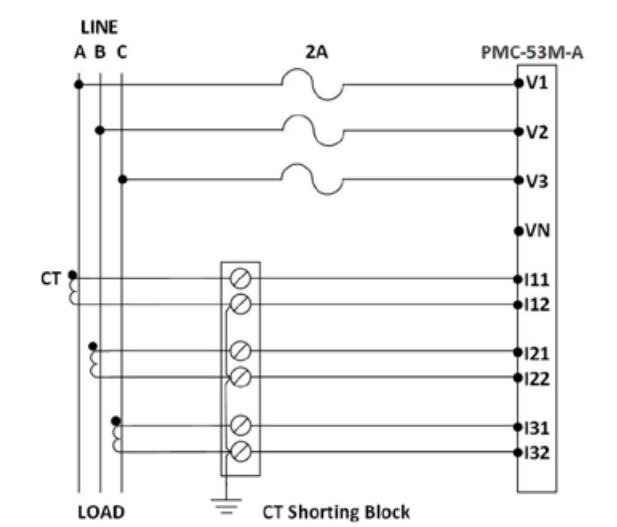
3P4W with 3PTs and 3CTs



3P4W Direct Connection with 3CTs



3P3W with 2PTs and 3CTs



3P3W Direct Connection with 3CTs

PMC-53M-E
Digital Multifunction Meter



- ✓ Compliance with the IEC 62053-22 Class 0.5S Standard
- ✓ DIN form factor measuring @ 96x96x88 mm
- ✓ High-Contrast 7-Segment LED Display

Features Summary

General

Class (kWh)	0.5S
Dimensions (mm)	96(W)x96(H)x88(D)
Display (Backlit)	High-contrast LED
True RMS Sampling Rate	64
Battery-backed Real-time Clock	✓
Operating Temperature (°C)	-25 to 70

Communications

Protocol	Modbus RTU
RS-485 Port	1
Ethernet	-
Web Server	-

Measurements

ULN per Phase & Avg.	✓
ULL per Phase & Avg.	✓
Current per Phase & Avg.	✓
Neutral Current (Meas./Calc.)	Calc.
Frequency	✓
kW per Phase & Total	✓
kvar per Phase & Total	✓
kVA per Phase & Total	✓
PF per Phase & Total	✓
kWh Import/Export	✓
kvarh Import/Export	✓
kVAh Total	✓
Demands & TOU	Dmd. Only
Maximum Demands	✓
Setpoints	✓

I/O

Digital Input (DI)	(4 Opt.)
Pulse Counter	✓
Mechanical Digital Output (DO)/Solid State Output (SS)	(2 Opt.)DO
Analog Input (AI), 0/4-20mA	-
Analog Output (AO), 0/4-20mA	-
kWh & kvarh Pulse Output (LED)	✓
kWh & kvarh Pulse Output	-
IRIG-B (GPS)	-

Power Quality

THD Voltage & Current	✓
TOHD Voltage & Current	✓
TEHD Voltage & Current	✓
K-Factor	✓
Individual Harmonics	2 nd - 31 st
Voltage/Current Unbalance	✓ (Via Comm.)
Waveform Capture on Screen	-
Waveform Recording	-
Dip Swell Detection	-
Transient Detection	-
IEC 61000-4-30	-
2-150kHz Conducted Emission	-

Logs

SOE Log	64 entries
PQ Log	-
Energy Log	-
Max./Min. Log	✓
On-board Log Memory	-

(Opt.)-Optional (Via Comm.)-Via Communication (Meas./Calc.)-Measured Value/Calculated Value (Dmd.)-Demand

Main Features

Metering

Basic Measurements

- ULN, ULL per Phase and Average
- Current per Phase and Average with calculated Neutral Current
- kW, kvar, kVA, PF per Phase and Total
- kWh, kvarh Import/Export/Net/Total and kVAh Total
- Frequency
- Device Operating Time (Running Hours)
- DI Pulse Counters

Advanced Measurements

- U and I THD, TOHD, TEHD and Individual Harmonics up to 31st
- Current TDD, TDD Odd, TDD Even, K-Factor and Crest Factor
- U and I Unbalance and Phase Angle
- Displacement PF
- kvarh Q1-Q4

Demands

- Predicted Demands and Maximum Demands for kW/ kvar/kVA Total and per Phase Current with Time-stamp for This Month & Last Month (or Since Last Reset & Before Last Reset)

Data and Event Recorders

Max./Min. Log

- Max./Min. Log with Timestamp for Real-time measurements such as Voltage, Current, In, Freq., kW, kvar, kVA, PF, Unbalance, K-Factor, Crest Factor and THD
- Configurable for This Month & Last Month (or Since Last Reset & Before Last Reset)

Accuracy

Parameters	Accuracy	Resolution
Voltage	± 0.2% Reading + 0.05% F.S.	0.001V
Current	± 0.2% Reading + 0.05% F.S.	0.001A
P, Q, S	± 0.5% Reading + 0.05% F.S.	0.001kX
kWh, kVAh	IEC 62053-22 Class 0.5S	0.1kXh
kvarh	IEC 62053-23 Class 2	0.1kvarh
PF	± 0.5%	0.001
Frequency	± 0.02Hz	0.01Hz
THD	IEC 61000-4-7 Class B	0.001%
K-Factor	IEC 61000-4-7 Class B	0.001
Phase Angle	±1°	0.1°

SOE Log

- 64 events time-stamped to ±1ms resolution
- Setup changes, Setpoint and DI status changes and DO operations

Inputs and Outputs

Digital Inputs (Optional)

- 4 channels, volt free dry contact, 24VDC internally wetted
- 1000Hz sampling for status monitoring with programmable debounce
- Pulse counting with programmable weight for each channel for collecting WAGES (Water, Air, Gas, Electricity, Steam) information

Digital Outputs (Optional)

- 2 Form A mechanical relays for alarming and general purpose control
- 5A @ 250VAC or 30VDC

Communications

- Optically isolated RS-485 port at maximum 38,400 bps
- Standard Modbus RTU support

Setpoints

- 9 user programmable setpoints with extensive list of monitoring parameters including Voltage, Current, Power, THD, etc.
- Configurable thresholds, time delays and DO triggers

Technical Specifications

Voltage Inputs (V1, V2, V3, VN)

Standard Un	400ULN/690ULL
Range	10V to 1.2Un
Overload	1.2xUn continuous, 2xUn for 1s
Burden	<0.02VA per phase
Measurement Category	CAT III up to 600ULL
Frequency	45-65Hz

Current Inputs (I11, I12, I21, I22, I31, I32)

Standard In	5A (5A/1A Auto-Scaling)
Range	0.1% to 200% In
Starting Current	0.1% In
Overload	2xIn continuous, 20xIn for 1s
Measurement Category	CAT III up to 600ULL
Burden	<0.15VA per phase

Power Supply (L+, N-)

Standard	95-250VAC/DC, ±10%, 47-440Hz
Burden	<2W
Overvoltage Category	CAT III up to 300ULN

Digital Inputs (DI1, DI2, DI3, DI4, DIC)

Type	Dry contact, 24VDC internally wetted
Sampling	1000Hz
Hysteresis	1ms minimum

Digital Outputs (DO11, DO12, DO21, DO22)

Type	Form A Mechanical Relay
Loading	5A @ 250VAC or 30VDC

Installation Torque

Current Inputs	1.3 N.m
Power Supply, Voltage Inputs, RS-485, I/O	0.5 N.m

Environmental Conditions

Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	5% to 95% non-condensing
Atmospheric Pressure	70 kPa to 106 kPa

Mechanical Characteristics

Panel Cutout	92x92 mm (3.62"x3.62")
Unit Dimensions	96x96x88 mm
IP Rating	65

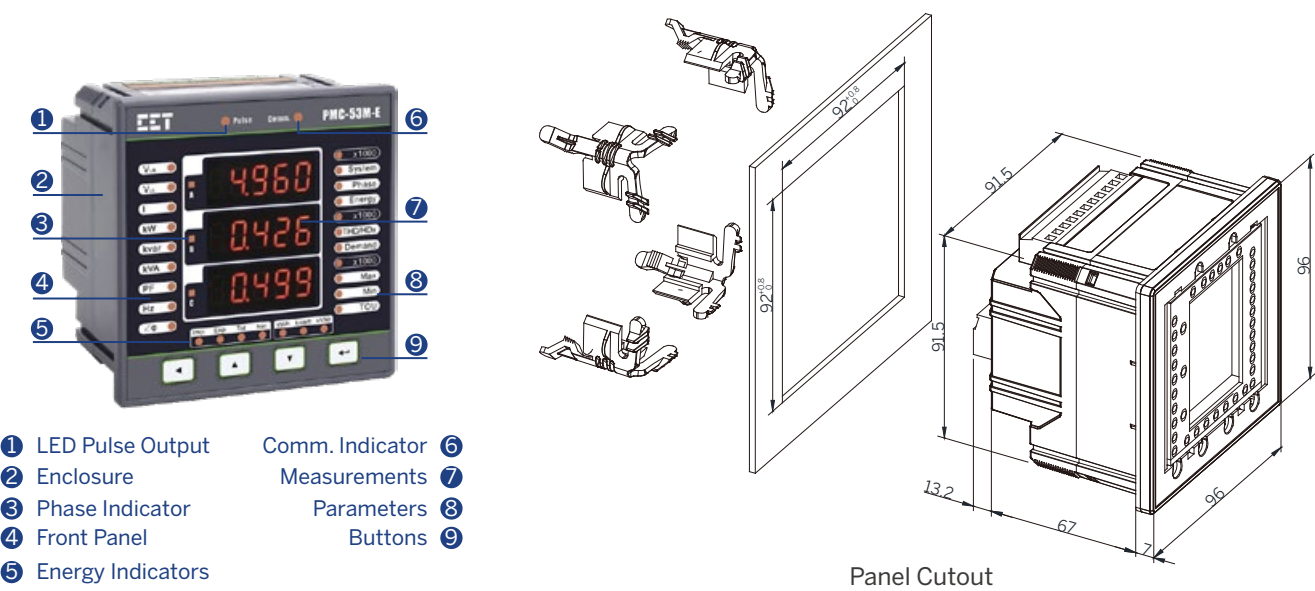
Ordering Information

Product Code											Description
PMC-53M-E DIN96 Intelligent Multifunction Meter											
Basic Function	E										Multifunction Measurements, LED Display
Input Current		5									5A/1A Auto-Scaling (Class 0.5S for 5A and Class 1 for 1A)
Input Voltage			9								400ULN/690ULL
Power Supply				2							95-250 VAC/DC, 47-440Hz
Frequency					5						45Hz-65Hz
I/O						X					None
						B*					4xDI+2xDO
Communications							A				1xRS-485
Language								E			English
PMC-53M	-	E	-	5	9	2	5	X	A	E	PMC-53M-E-5925XAE (Standard Model)

* Additional charges apply

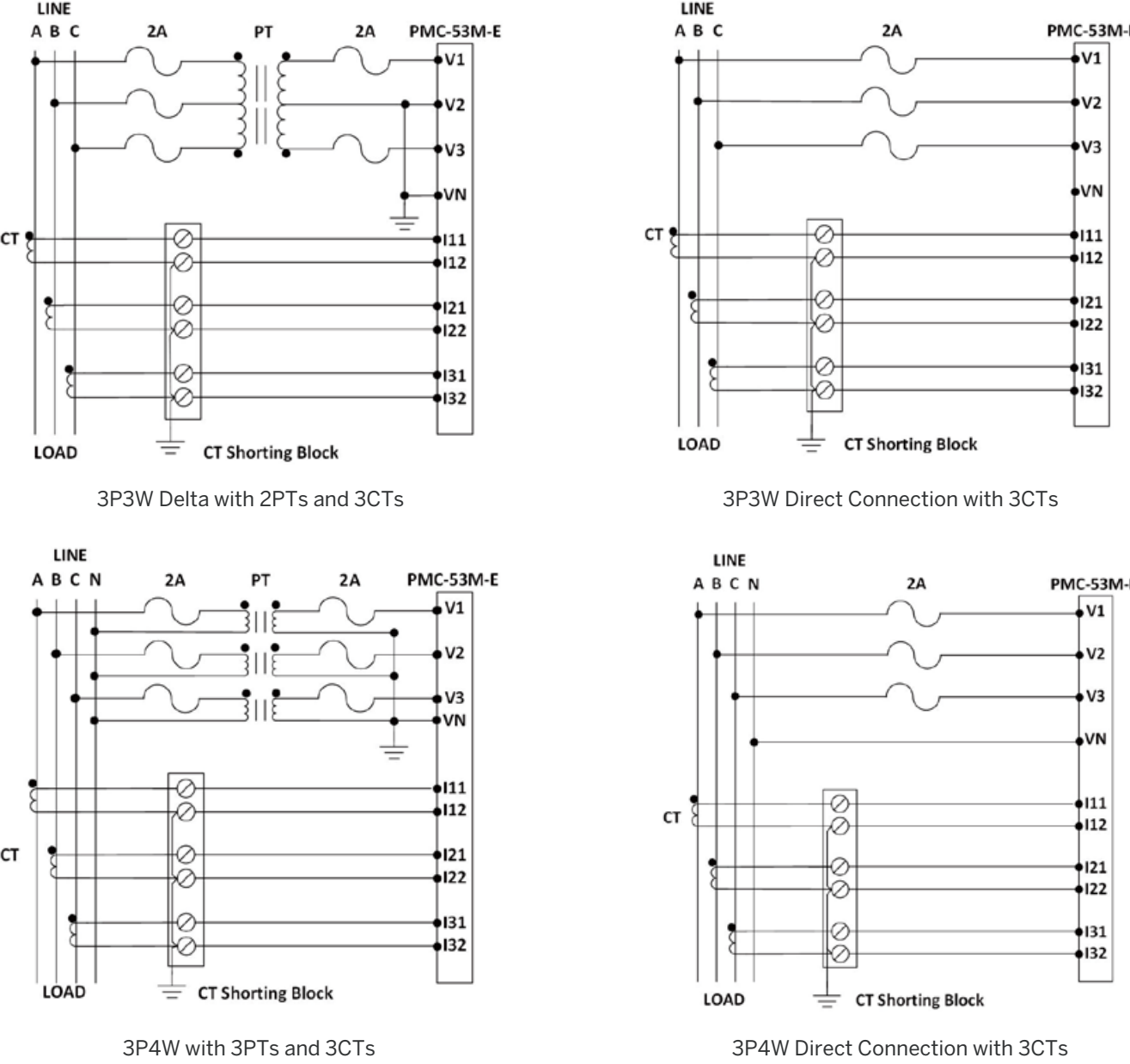
Device View and Dimensions

Unit: mm



- 1 LED Pulse Output
- 2 Enclosure
- 3 Phase Indicator
- 4 Front Panel
- 5 Energy Indicators
- 6 Comm. Indicator
- 7 Measurements
- 8 Parameters
- 9 Buttons

Wiring Diagrams



PMC-D726M
Digital Multifunction Meter



- ✓ Compliance with the IEC 62053-21 Class 1 kWh Accuracy
- ✓ DIN size @ 72x72x71.8 mm (LCD), @ 72x72x76.8 mm (LED)
- ✓ 4-digit, backlit LCD or High-Contrast LED Display
- ✓ Optional Split-Core CT (SCCT)

Features Summary

General		Communications		Measurements	
Class (kWh)	1	Protocol	Modbus RTU	ULN per Phase & Avg.	✓
Dimensions (mm)	72(W)x72(H)x76.8(D)	RS-485 Port	(1 Opt.)	ULL per Phase & Avg.	✓
Display (Backlit)	B&W(Backlit)/LED	Ethernet	-	Current per Phase & Avg.	✓
True RMS Sampling Rate	64	Web Server	-	Neutral Current (Meas./Calc.)	Calc.
Battery-backed Real-time Clock	-			Frequency	✓
Operating Temperature (°C)	-25 to 70			kW per Phase & Total	✓
I/O		Power Quality		kvar per Phase & Total	✓
Digital Input (DI)	(2 Opt.)	THD Voltage & Current	✓	kVA per Phase & Total	✓
Pulse Counter	-	TOHD Voltage & Current	✓	PF per Phase & Total	✓
Mechanical Digital Output (DO)/Solid State Output (SS)	(2 Opt.)DO or (2 Opt.)SS	TEHD Voltage & Current	✓	kWh Import/Export	✓
Analog Input (AI), 0/4-20mA	-	K-Factor	✓	kvarh Import/Export	✓
Analog Output (AO), 0/4-20mA	(1 Opt.)	Individual Harmonics	2 nd - 31 st	kVAh Total	✓
kWh & kvarh Pulse Output (LED)	✓	Voltage/Current Unbalance	✓	Demands & TOU	✓
kWh & kvarh Pulse Output	(2 Opt.)	Waveform Capture on Screen	-	Maximum Demands	✓
IRIG-B (GPS)	-	Waveform Recording	-	Setpoints	✓
		Dip Swell Detection	-	Logs	
		Transient Detection	-	SOE Log	16 entries
		IEC 61000-4-30	-	PQ Log	-
		2-150kHz Conducted Emission	-	Energy Log	-
				Max./Min. Log	-
				On-board Log Memory	-

(Opt.)-Optional (Meas./Calc.)-Measured Value/Calculated Value

Basic Measurements

Basic Measurements

- ULN, ULL per Phase and Average
- Current per Phase and Average with calculated Neutral Current
- kW, kvar, kVA, PF per Phase and Total
- Bi-directional energy measurements
- Frequency

Multi-Tariff TOU Capability

- One TOU schedule, providing
 - 6 Seasons
 - 6 Daily Profiles, each with 6 Periods in 15-minute interval
 - 10 Holidays or Alternate Days
 - 4 Tariffs, each providing kWh and kvarh Import/Export and kVAh

Demands

- Demands and Maximum Demands Timestamp for per Phase Current, kW Total, kvar Total and kVA Total

Event Recorder

SOE Log

- 16 events time-stamped to $\pm 1\text{ms}$ resolution
- Record all setup, Setpoint and Digital Input status changes

Appearance



Inputs and Outputs

Digital Inputs (Optional)

- 2 channels, volt free dry contact, 24VDC internally wetted
- 1000Hz sampling for status monitoring

Digital Outputs (Optional)

- 2 Form A mechanical relays for alarming and general purpose control
- 5A @ 250VAC or 30VDC

Pulse Outputs (Optional)

- 2 Solid State Relays for Energy Pulsing Applications

Analog Output (Optional)

- Optional AO module for Analog application
- 0/4-20mA DC input with programmable zero and full scale

Communications

- Optically isolated RS-485 port at 1,200 to 19,200 bps
- Modbus RTU support

Setpoints

- 6 user programmable setpoints with extensive list of monitoring parameters including Voltage, Current, Power, and Demand
- Configurable Threshold and Time Delay
- SOE Logging and DO trigger

Accuracy

PMC-D726M

Parameters	Accuracy	Resolution
Voltage	± 0.2% reading	0.1V
Current	± 0.2% reading	0.001A
P, Q, S	± 0.5% Reading	0.001kX
kWh	IEC 62053-21 Class 1	0.01kXh
kvarh	IEC 62053-23 Class 2	0.01kvarh
PF	± 1.0% reading	0.001
Frequency	± 0.02Hz	0.01Hz
AO	± 1% F.S.	-
Harmonics	IEC 61000-4-7 Class B	0.1%
K-Factor	IEC 61000-4-7 Class B	0.1

Technical Specifications

Voltage Inputs (V1, V2, V3, VN)

Standard	240ULN/415ULL
Range	10V to 120% Un
Starting Voltage	10V
PT Ratio	1-1,000,000 (Primary), 1-690 (Secondary)
Overload	1.2xUn continuous, 2xUn for 1s
Burden	<0.02VA per phase
Frequency	45-65Hz

Current Inputs (I11, I12, I21, I22, I31, I32)

Standard Input	5A
Optional Input	1A
CT Ratio	1-30,000 (Primary), 1-5 (Secondary)
Optional SCCT Input	2mA (SCCTA Option for 5A SCCT) 40mA (SCCT Option for 100-800A SCCT)
Range	0.1% to 120% In
Starting Current	0.1% In
Overload	1.2xIn continuous, 10xIn for 10s, 20xIn for 1s
Burden	<0.25VA per phase

Power Supply (L/+, N/-)

Standard	95-250VAC/DC, $\pm 10\%$, 47-440Hz
Burden	<2W

Digital Inputs (DI1, DI2, DIC)

Type	Dry contact, 24VDC internally wetted
Sampling	1000Hz
Hysteresis	1ms minimum

Digital Outputs (DO11, DO12, DO21, DO22)

Type	Form A Mechanical Relay
Loading	5A @ 250VAC or 30VDC

Analog Output (AO+, AO-)

Type	0-20/4-20 mA
Parameter	Selectable
Loading	500 Ω maximum
Overload	24 mA maximum

Environmental Conditions

Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	5% to 95% non-condensing
Atmospheric Pressure	70 kPa to 106 kPa

Mechanical Characteristics

Panel Cutout	68x68 mm
Unit Dimensions	72x72x71.8 mm (LCD), 72x72x76.8 mm (LED)
IP Rating	52
Shipping Weight	0.802 kg
Shipping Dimensions	125x110x80 mm

PMC-D726M Split-Core CT Spec

Split-Core CTs Model # (PMC-SCCT)	Rating	Accuracy	Aperture (mm)	Output Wire	I _{max}	Maximum Burden
100A-40mA-16-A	100A/40mA	0.5	Ø16	2m	200A	10Ω
200A-40mA-24-A	200A/40mA	0.5	Ø24	2m	240A	10Ω
400A-40mA-35-A	400A/40mA	0.5	Ø35	2m	480A	10Ω
800A-40mA-A	800A/40mA	0.5	80×50	2m	960A	10Ω
5A-2mA-16-A	5A/2mA	2.0	Ø16	2m	20A	226Ω

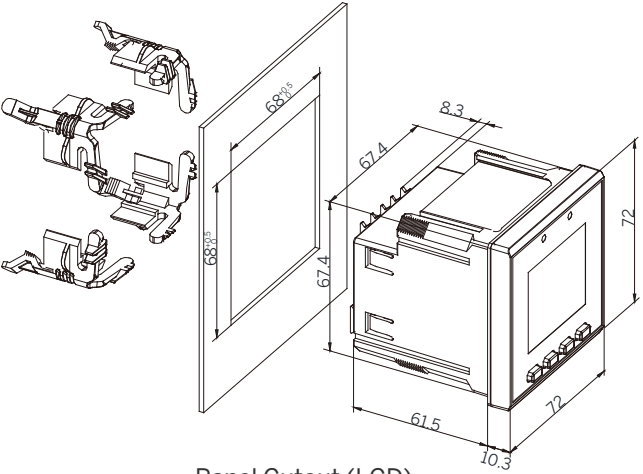
Ordering Information

Product Code										Description	
PMC-D726M DIN72 3-Phase Multifunction Meter											
Display Screen	""								LED		
	L								LCD		
Input Current		5								5A	
		1								1A	
		SCCT*								For use with 100A, 200A, 400A and 800A SCCTs with 40mA Output	
		SCCTA*								For use with 5A SCCT with 2mA Output	
Input Voltage			3							240V/415V	
Power Supply				2						95/250V AC/DC, 47-440Hz	
System Frequency					5					45-65Hz	
I/O						X			None		
						A*			2×DI		
						C*			1×AO		
						D*			2×DI+2×DO		
						E*			2xDI+2xSS Pulse Output		
Communications							X		None		
							A		1×RS-485 Port, Modbus		
Display Language								E	English		
PMC-D726M	-	5	3	2	5	X	A	E	PMC-D726M-5325XAE (LED Example)		
PMC-D726M	-	L	5	3	2	5	X	A	E	PMC-D726M-L5325XAE (LCD Example)	

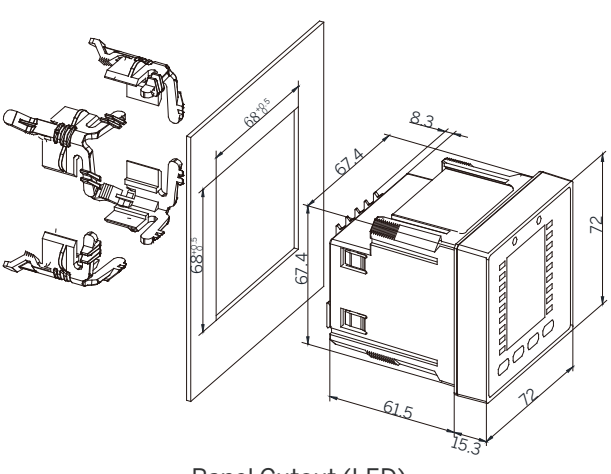
* Additional charges apply

Device View and Dimensions

Unit: mm



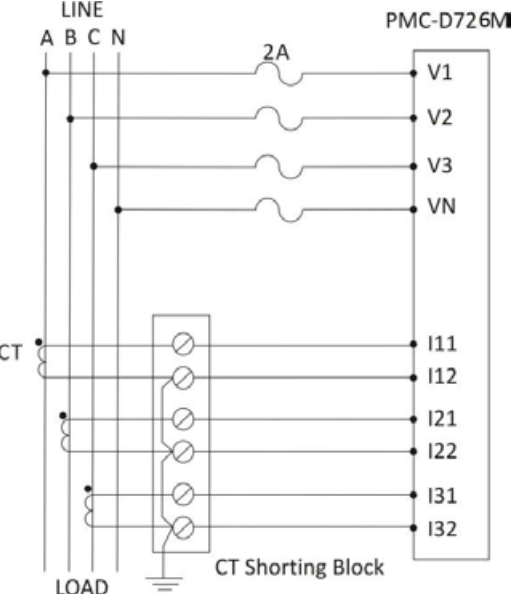
Panel Cutout (LCD)



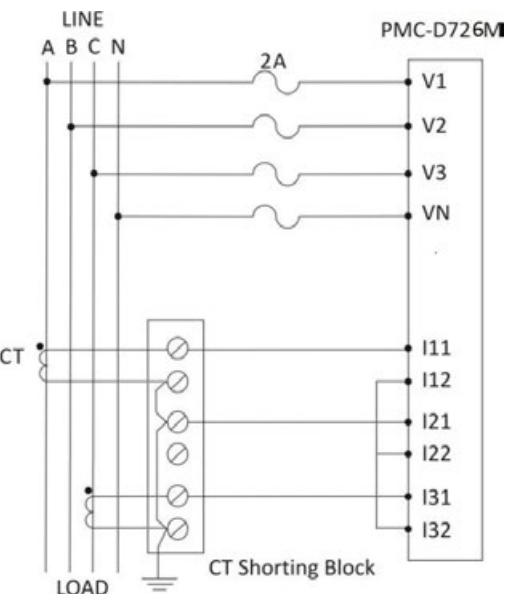
Panel Cutout (LED)

PMC-D726M

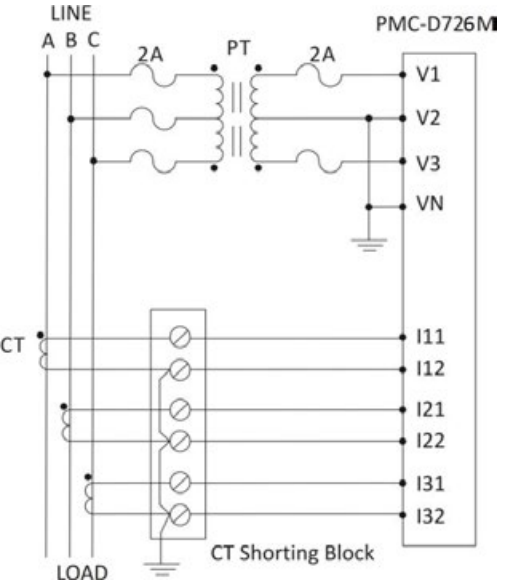
Wiring Diagrams



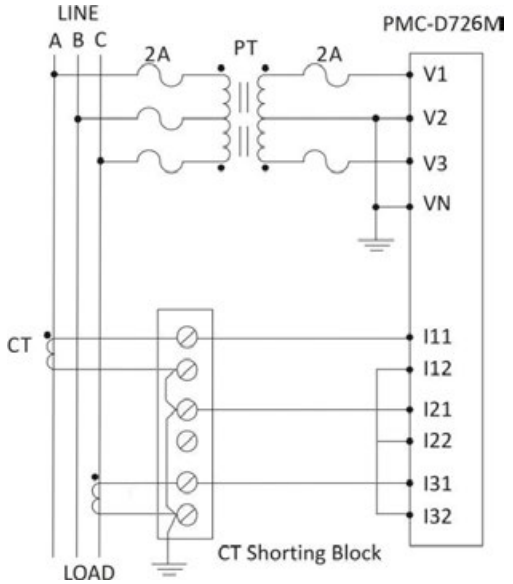
3-phase 4-Wire Wye, no PTs, 3CTs



4-Wire Wye, no PTs, 2CTs



3-phase 3-Wire Delta, 2PTs, 3CTs



3-phase 3-Wire Delta, 2PTs, 2CTs

iMeter 6

Advanced Power Quality Monitor



- ✓ 1GB On-board Log Memory
- ✓ Class 0.2S Revenue Metering
- ✓ DIN form factor measuring @ 96x96x119.5 mm
- ✓ IPS Color Dot-Matrix Display @ 320x240
- ✓ 100BaseT Ethernet Port and RS-485 Port
- ✓ IEC 61000-4-30 Class S Compliance

Features Summary

General

Class (kWh)	0.2S
Dimensions (mm)	96(W)x96(H)x119.5(D)
Display (Backlit)	Color IPS 320x240(Backlit)
True RMS Sampling Rate	256
Battery-backed Real-time Clock	✓
Operating Temperature (°C)	-25 to 70

Communications

Protocol	Modbus RTU, Modbus TCP, HTTP, SMTPS, SNTP, FTP, Ethernet Gateway
RS-485 Port	1
Ethernet	1
Web Server	✓

Measurements

ULN per Phase & Avg.	✓
ULL per Phase & Avg.	✓
Current per Phase & Avg.	✓
Neutral Current (Meas./Calc.)	✓
Frequency	✓
kW per Phase & Total	✓
kvar per Phase & Total	✓
kVA per Phase & Total	✓
PF per Phase & Total	✓
kWh Import/Export	✓
kvarh Import/Export	✓
kVAh Total	✓
Demands & TOU	✓
Maximum Demands	✓
Setpoints	✓

Logs

SOE Log	512 entries
PQ Log	512 entries
Energy Log	✓
Max./Min. Log	✓
On-board Log Memory	1GB

I/O

Digital Input (DI)	6
Pulse Counter	✓
Mechanical Digital Output (DO)/Solid State Output (SS)	3DO
Analog Input (AI), 0/4-20mA	(1 Opt.)
Analog Output (AO), 0/4-20mA	-
kWh & kvarh Pulse Output (LED)	✓
kWh & kvarh Pulse Output	-
IRIG-B (GPS)	-

Power Quality

THD Voltage & Current	✓
TOHD Voltage & Current	✓
TEHD Voltage & Current	✓
K-Factor	✓
Individual Harmonics	2 nd - 63 rd
Voltage/Current Unbalance	✓
Waveform Capture on Screen	✓
Waveform Recording	✓
Dip Swell Detection	✓
Transient Detection	✓
IEC 61000-4-30	Ed.3 Class S Compliant
2-150kHz Conducted Emission	-

(Opt.)-Optional (Meas./Calc.)-Measured Value/Calculated Value

Main Features

Metering

Basic Measurements (1 second update)

- 3-Phase Voltage, Current and Power Measurements
- Neutral Current (I4), Calculated Residual Current (Ir) and Frequency
- kWh, kvarh Import/Export/Net/Total and kVAh Total
- kvarh Q1-Q4
- Interval Energy
- Voltage and Current Phase Angle
- Device Operating Time (Running Hours)
- DI Pulse Counters
- Optional AI Measurement

High-Speed Measurements

- 3-Phase Voltage @ 1 cycle
- 3-Phase Current and Neutral Current (I4) @ 1 cycle
- 3-Phase Power and Power Factor @ 1 cycle

Demands

- Present and Predicted Demands for 3-phase Voltage, Current, Power, PF, I4, Frequency, U and I Unbalance and THD
- Maximum Demands with Timestamp for Current and Power of This Month & Last Month (or Since Last Reset & Before Last Reset)
- Max./Min. values per demand interval
- Demand synchronization with DI

Multi-Tariff TOU Capability

- Two independent sets of TOU Schedules
 - Up to 12 Seasons
 - 90 Holidays or Alternate Days
 - 20 Daily Profiles, each with 12 Periods at minimum 15-minute interval
 - 8 Tariffs, each providing kWh/kvarh Import/Export and kVAh
- Switching between two TOU schedules according to pre-programmed time and logged as an SOE event

Data and Event Recorders

- 1GB on-board Memory

Energy Log

- Interval recording of kWh/kvarh Import/Export and kVAh Total in programmable recording interval from 1 min to 65535 mins
- Support FIFO or Stop-When-Full Recording Mode

Data Recorder (DR) Log

- 12 Standard DR Logs and 4 High-Speed DR Logs
- Recording Interval from 1s to 40 days for Standard DR Log and 1 to 60 cycles for High-Speed DR Log
- Up to 16 Programmable Parameters for each DR Log with programmable sources which include almost all Real-time Measurements, Harmonics, Unbalance, Demand and Accumulative Energy measurements
- Configurable Depth and Recording Offset
- Support FIFO or Stop-When-Full Recording Mode

PQ Log

- 512 entries time-stamped to ± 1 ms resolution
- Dips/Swells/Interruptions and Transients detection

Max./Min. Log

- Logging of Max./Min. values for Measurements such as Voltage, Current, Frequency, P, Q, S, PF, Unbalance, K-Factor and THD with Timestamp for This Month & Last Month (or Since Last Reset & Before Last Reset)

SOE Log

- 512 events time-stamped to ± 1 ms resolution
- Setup changes, Setpoint events and I/O operations

Inputs and Outputs

Digital Inputs

- 6 channels, volt free dry contact, 24VDC internally wetted
- 1000Hz sampling for status monitoring with programmable debounce
- Pulse counting with programmable weight for each channel for collecting WAGES (Water, Air, Gas, Electricity, Steam) information
- Demand Synchronization
- Tariff switching based on DI status

Digital Outputs

- 3 channels Form A Mechanical Relays for alarming and control

Analog Input (Optional)

- 0/4-20mA DC input with programmable zero and full scales
- Can be used to measure external transducer signal such as Residual or Leakage Current

Communications

RS-485 (P1)

- Optically isolated RS-485 ports
- Baud rate from 1200 to 38,400bps
- Modbus RTU, Ethernet Gateway

Ethernet (P2)

- 10/100BaseT Ethernet Port with RJ45 connector
- Built-in Web Server for easy data viewing, setup configuration and firmware upgrade
- Modbus RTU over TCP/IP, Modbus TCP, HTTP, SMTP, SNTP, FTP

Setpoints

- 16 standard setpoints with extensive list of monitoring parameters including Voltage, Current, Power, Demand, Unbalance, Sequence Components, THD, Phase Loss and Phase Reversal, etc.
- 8 High-Speed Setpoints for Voltage, Current, Power, PF, Freq. Dev. and DI
- Configurable thresholds and time delays
- 6 Logical Modules supporting AND/OR/NAND/NOR operations
- SOE, WF Recording, Data Recorder, DO and Email Alarm Trigger

Power Quality Metering

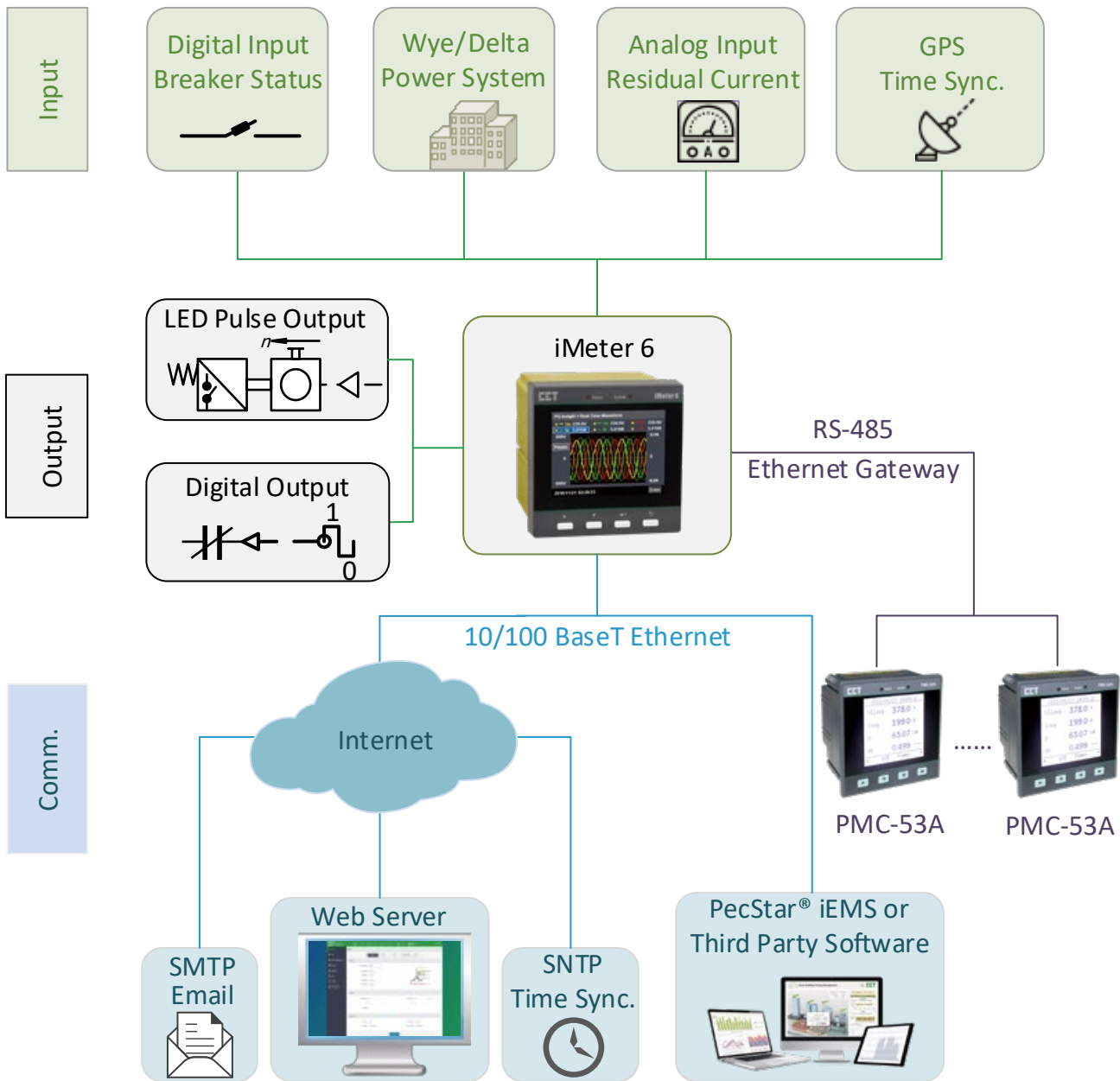
IEC 61000-4-30 Class S Compliance

- Waveform Recording at 256 samples/cycle
- Fundamental Measurements for 3-phase Voltage, Current, Power, PF and I4
- Voltage and Current Unbalance and Symmetrical Components
- Voltage and Frequency Deviation
- THD, TOHD, TEHD, Crest Factor, K-Factor and TDD
- Individual harmonics up to 63rd
- Dips/Swells/Interruptions Detection and Transients Capture

Waveform Capture and Waveform Recorder

- 2 independent groups of Waveform Recorders with a combined total of 256 entries
- Simultaneous capture of 3-phase Voltage and Current signals
- Programmable formats and pre-fault cycles from 256x20 to 16x320
- Support FIFO Recording Mode

Typical Application



Accuracy

Parameters	Accuracy	Resolution
Voltage	± 0.1%	0.01V
Current	± 0.1%	0.001A
I4 Measured	± 0.1%	0.001A
P, Q, S	± 0.2%	0.001kX
kWh, kVAh	IEC 62053-22 Class 0.2S	0.1kXh
kvarh	IEC 62053-24 Class 0.5S	0.1kvarh
PF	± 0.2%	0.001
Frequency	± 0.01Hz	± 0.01 Hz
Harmonics	IEC 61000-4-7 Class A	0.01%
K-Factor	IEC 61000-4-7 Class A	0.01
Phase Angle	± 1°	± 0.1°
AI	± 0.5%	-

Technical Specifications

Voltage Inputs (V1, V2, V3, VN)

Standard Un	240ULN/415ULL
Optional (Un)	69ULN/120ULL, 400ULN/690ULL
Range	10% to 120% Un
PT Ratio	1-10,000
Overload	1.2xUn continuous, 2xUn for 10s
Burden	<0.5VA @ 240V
Frequency	45-65Hz

Current Inputs (I11, I12, I21, I22, I31, I32, I41, I42)

Standard (In/Imax)	5A/10A
Optional (In/Imax)	1A/2A
Range	0.1% to 200% In
CT Ratio (I1-I3)	1-6,000 (5A) or 1-30,000 (1A)
I4 Ratio	1-10,000
Overload	2xIn continuous, 20xIn for 1s
Burden	<0.25VA @ 5A

Power Supply (L+, N-)

Standard	95-277VAC L-N/415VAC L-L, 45-65Hz 90-300VDC
Burden	<10VA/6W @ 240V

Digital Inputs (DI1, DI2, DI3, DI4, DI5, DI6, DIC)

Type	Dry contact, 24VDC internally wetted
Sampling	1000Hz
Hysteresis	1-1,000ms programmable

Digital Outputs (DO11, DO12, DO21, DO22, DO31, DO32)

Type	Form A Mechanical Relay
Loading	5A @ 250VAC/30VDC

LED Pulse Outputs (kWh, kvarh)

Type	Optical
Pulse Constant	1000/3200/5000/6400/12800 imp/kXh

Analog Input (AI+, AI-)

Type	0-20/4-20 mA
Overload	24 mA maximum

Environmental Conditions

Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	5% to 95% non-condensing
Atmospheric Pressure	70 kPa to 106 kPa
Altitude	< 2000m
Pollution Degree	2
Measurement Category	CAT III

Mechanical Characteristics

Enclosure	Aluminum Alloy
Panel Cutout	92x92 mm
Unit Dimensions	96x96x119.5 mm
Shipping Dimensions	170x140x160 mm (6.69"x5.51"x6.30")
IP Rating	54
Shipping Weight	1.1 kg

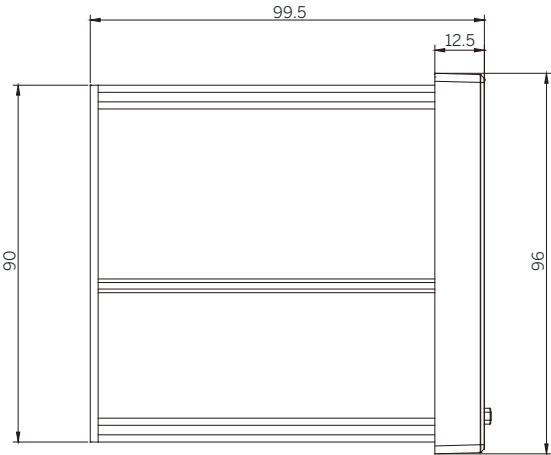
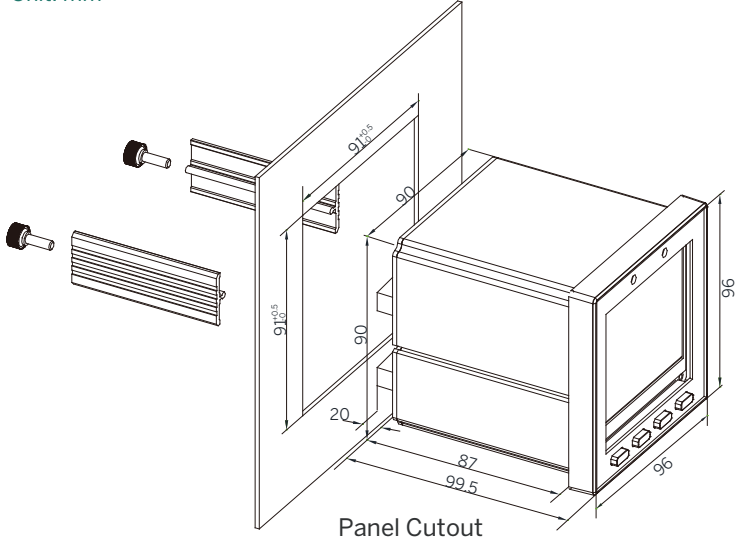
Ordering Information

Product Code											Description
iMeter 6 Advanced Power Quality Monitor											
Basic Function	256 samples/cycle, Class 0.2S Compliant, 3-phase Metering, Demands, Max. Demands, Max./Min., SOE Log, Individual Harmonics to 63 rd , 1GB Log Memory, 16 Data Recorders, High-Speed Data Recording, WF Recording, Dips/Swells/Interruptions and Transients Detection										
Display Screen	B										Color Dot-Matrix IPS Display (320x240 Resolution)
Input Current (I1, I2, I3, I4 [#])		5									5A
		1									1A
Input Voltage (V1, V2, V3)			1								69V/120V
			3								240V/415V
			9*								400V/690V
Power Supply				2							95-277VAC L-N/415VAC L-L 45-65Hz, 90-300VDC
System Frequency					5						45Hz-65Hz
DI/DO						A					6xDI + 3xDO
AI							X				None
							A*				1xAI (0-20mA or 4-20mA DC) [#]
Communications									D		1x10/100BaseT Ethernet port + 1xRS-485 port
Display Language										E	English
iMeter 6	-	B	5	3	2	5	A	X	D	E	iMeter 6-B5325AXDE (Standard Model)

* Additional charges apply
The I4 Input is replaced by the AI Option A

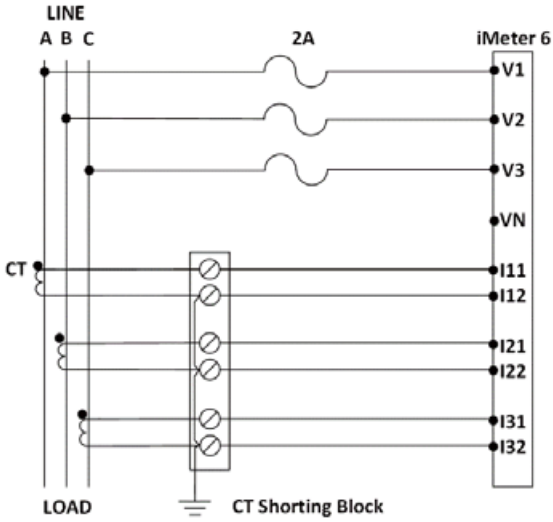
Device View and Dimensions

Unit: mm

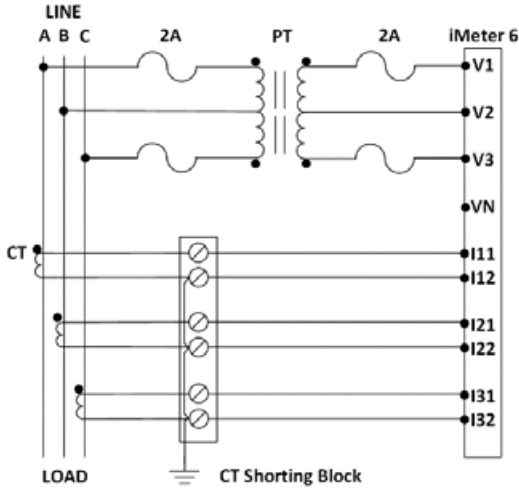


Side View

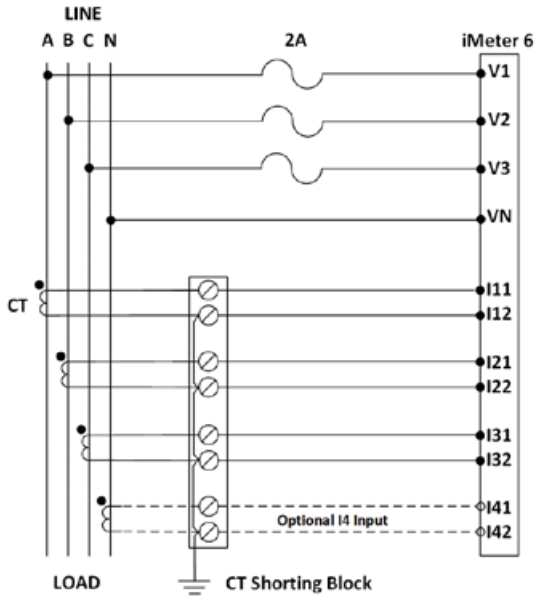
Wiring Diagrams



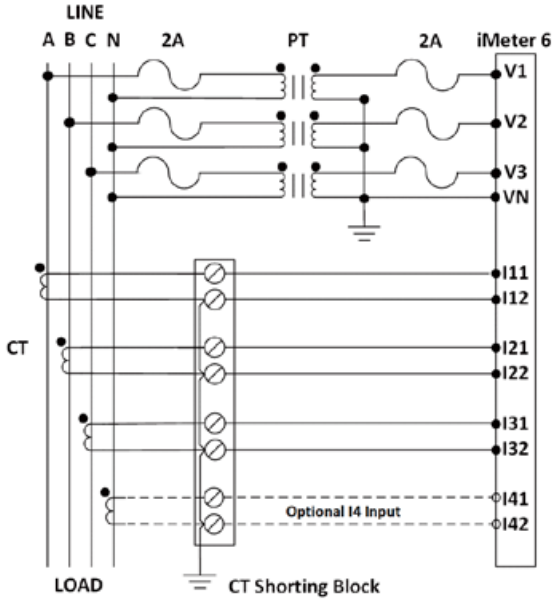
3P3W Direct Connections with 3CTs



3P3W Open Delta with 2PTs, 3CTs



3P4W Wye Direct Connection with 3CTs or 4CTs
(Optional I4 Input)



3P4W Wye with 3PTs and 3CTs or 4CTs
(Optional I4 Input)

iMeter 7

Advanced Power Quality Monitor



- ✓ 2GB On-board Memory
- ✓ IEC 62053-22 Class 0.2S
- ✓ Unit Dimensions @ 144×144×129 mm
- ✓ High-Resolution, Color TFT LCD Display
- ✓ Standard 100BaseT Ethernet port and dual RS-485 Ports
- ✓ IEC 61000-4-30 Edition 2 Class A
- ✓ EN 50160 and optional IEC61850
- ✓ On-board password protected Web Server

Features Summary

General

Class (kWh)	0.2S
Dimensions (mm)	144(W)x144(H)x129(D)
Display (Backlit)	Color TFT 640x480(Backlit)
True RMS Sampling Rate	1024
Battery-backed Real-time Clock	✓
Operating Temperature (°C)	-25 to 70

Communications

Protocol	Modbus RTU, Modbus TCP, HTTP, SNMP, SMTP, FTP, Ethernet Gateway, (IEC61850 Opt.)
RS-485 Port	2
Ethernet	1
Web Server	✓

Measurements

ULN per Phase & Avg.	✓
ULL per Phase & Avg.	✓
Current per Phase & Avg.	✓
Neutral Current (Meas./Calc.)	✓
Frequency	✓
kW per Phase & Total	✓
kvar per Phase & Total	✓
kVA per Phase & Total	✓
PF per Phase & Total	✓
kWh Import/Export	✓
kvarh Import/Export	✓
kVAh Total	✓
Demands & TOU	✓
Maximum Demands	✓
Setpoints	✓

I/O

Digital Input (DI)	8
Pulse Counter	✓
Mechanical Digital Output (DO)/Solid State Output (SS)	4DO+2SS
Analog Input (AI), 0/4-20mA	-
Analog Output (AO), 0/4-20mA	-
kWh & kvarh Pulse Output (LED)	✓
kWh & kvarh Pulse Output	2
IRIG-B (GPS)	✓

Power Quality

THD Voltage & Current	✓
TOHD Voltage & Current	✓
TEHD Voltage & Current	✓
K-Factor	✓
Individual Harmonics	2 nd - 63 rd
Voltage/Current Unbalance	✓
Waveform Capture on Screen	✓
Waveform Recording	✓
Dip Swell Detection	✓
Transient Detection	✓
IEC 61000-4-30 Ed.2 Class A Certified	
2-150kHz Conducted Emission	-

Logs

SOE Log	1024 entries
PQ Log	1024 entries
Energy Log	✓
Max./Min. Log	✓
On-board Log Memory	2GB

(Opt.)-Optional (Meas./Calc.)-Measured Value/Calculated Value

Main Features

Metering

Basic Measurements (1-second update)

- 3-Phase U, I, P, Q, S, PF, Phase Angle as well as U4, I4 and Frequency
- kWh, kvarh Import/Export/Net/Total and kVAh Total

High-Speed Measurements for Event Detection

- 3-Phase U, I, P, Q, S, PF, Phase Angle as well as U4 and I4 @ ½ cycle
- Frequency @ 5 cycles

Demand

- Present and Predicted Demand for 3-phase U, I, P, Q, S, PF as well as U4, I4 and Frequency
- Present Demand of 4-phase U & I THD/TOHD/TEHD, 4-phase Current K-Factor, U/I Unbalance, Over and Under Deviation of Voltage and Frequency, 4-phase Fundamental Current
- Maximum Demand for This Month & Last Month (or Since Last Reset & Before Last Reset)
- Demand Synchronization with DI

Multi-Tariff TOU Capability

- Two independent sets of TOU Schedules
 - Up to 12 Seasons
 - 90 Holidays or Alternate Days and 3 Weekdays
 - 20 Daily Profiles, each with 12 Periods in 15-minute intervals
 - 8 Tariffs, each providing the following information:
 - kWh/kvarh Import/Export and kVAh
 - P & Q Import/Export Maximum Demands time-stamped
 - Register rollover at 100,000,000,000.000kXh
- 12 Historical Logs for Energy and Maximum Demand

Data and Event Recorders

- 2 GB on-board log Memory

Interval Energy Recorder (IER) and Accumulative Energy Recorder (AER)

- Both IER Log and AER Log support recording of Total RMS kWh, kvarh Import/Export/Total/Net and kVAh, Total Fundamental/Harmonic kWh, kvarh Import/Export
- Recording interval from 1 to 65,535 minutes
- Maximum Recording Depth @ 65,535 records for IER and AER individually

Statistical Data Recorder (SDR)

- 8 SDR logs of 64 parameters each
- Recording of Max., Min., Avg. and 95th percentile for Real-time Measurements including U, I, Freq., P, Q, S, PF, Harmonics, Deviations and Unbalances
- Recording Interval from 0 to 60 minutes
- 90 days @ 3-minute, 300 days @ 10-minute, 450 days @ 15-minute

Max./Min. Recorder (MMR)

- 4 Max./Min. Recorders of 20 parameters each
- RMS/Fundamental/Harmonic/Interharmonic Measurements, Demands, Deviations, Unbalances and Flicker
- Two transfer modes:
 - Manual: Max./Min. Since Last Reset & Before Last Reset
 - Auto: Max./Min. of This Month & Last Month

SOE Log

- 1024 FIFO events time-stamped to ±1ms resolution
- Setpoint events, I/O operations, Dips/Swells/Interruptions, Transients, Rapid Voltage Changes, Inrush Current, Mains Signalling Voltage, etc.
- Record the characteristics data of Setpoint event as well as Waveform, ITIC and SEMI F47 Curve for PQ events

Device Log

- 1024 FIFO entries time-stamped to ±1ms resolution
- Power On/Off, Setup changes, Time Sync., Device Operations, and Self-diagnostics

Inputs and Outputs

Digital Inputs

- Standard 8 channels, volt free dry contact, 24VDC Internal Excitation

Digital Outputs

- Standard 6 channels for control, alarming and pulsing applications

Communications

RS-485 (P1, P2)

- Dual optically isolated RS-485 ports with baud rate from 1.2kbps to 38.4 kbps
- Protocol supported: Modbus RTU, Ethernet Gateway
- Time Sync. via P1 with GPS 1PPS or IRIG-B outputs

Ethernet Port (P3)

- 1x10/100BaseT with RJ45 connector
- Built-in Web Server for easy data viewing, Firmware Upgrade and setup configuration
- Protocol supported: Modbus TCP, HTTP, SNMP, SMTP, FTP, optional IEC61850
- Multiple simultaneous client connections:
 - 8xModbus TCP
 - 8xIEC61850 (optional)

Setpoints

PQ Setpoints

- Transients, Dips, Swells, Interruptions
- Rapid Voltage Change
- Inrush Current
- Trigger RO, SOE Log, WFR, DWR, RMSR and Alarm Email

Control Setpoints

- 16 High-Speed (½ cycle) Setpoint and 24 Standard (1s) Setpoint
- Extensive monitoring sources including U, I, P, Q, S, Demands, Harmonics, Unbalances, Deviations, Flickers, Phase Reversal, etc.
- Configurable thresholds and time delays
- Trigger RO, SOE Log, WFR, DWR, RMSR and Alarm Email

Power Quality Metering
IEC 61000-4-30 Edition 2 Class A Certified

- Power Frequency
- Magnitude of the Supply Voltage
- Flicker
- Supply Voltage Dips/Swells
- Voltage Interruptions
- Transient Voltages
- Supply Voltage Unbalance
- Voltage Harmonics and Interharmonics
- Mains Signalling Voltage on Supply Voltage
- Rapid Voltage Changes
- Measurement of Over and Under Deviation Parameters

Harmonic and Interharmonic Measurements

- IEC 61000-4-7 Compliance
- K-Factor for Current, Crest Factor for Current and Voltage
- U and I THD, TOHD, TEHD, TIHD, TEIHD and TOIHD
- U and I Individual Harmonics (%HD, RMS and Angle) from 2nd to 63rd #
- U and I Individual Interharmonics (%IHD and RMS) from 0 to 63rd #
- Total Harmonic P, Q, S and PF
- Harmonic P, Q, S and PF from 2nd to 63rd
- Fundamental U, I, P, Q, S, Phase Angle and Displacement PF
- Fundamental kWh, kvarh Import/Export/Net/Total
- Total Harmonic kWh, kvarh Import/Export/Net/Total
- Total Harmonic kWh, kvarh Import/Export from 2nd to 63rd
#%HD and %IHD can be configured as % of Fundamental, % of U/I nominal or % of RMS

Sequence and Unbalances

- Zero, Positive and Negative Sequence Components
- U and I Unbalance based on Zero and Negative Sequence Components

Dips, Swells, Interruptions and Transients Recording

- Dips, Swells, Interruptions detection @ 10ms (½ cycle at 50Hz)
- Transients capture as short as 40µs at 512 samples @ 50Hz for sub-cycle disturbances such as capacitor switching and resonance phenomena
- Trigger for RO, WFR, DWR, RMS Recording, SOE and Alarm Email
- Display of ITIC or SEMI F47 plot as well as the Event WFR or DWR on the Front Panel and Web Interface

Rapid Voltage Change (RVC)

- Detection of a quick transition in RMS Voltage between two steady-states

Inrush Current Monitoring

- Monitoring of the ½ cycle RMS Current and recording of the Current Waveforms associated with events such as motor starting and transformer being energized

Disturbance Direction Indicator

- Determine if a Dip Event is located upstream or downstream
- Pinpoint if the cause of the event is external or internal

PQ Event Counters

- Dips, Swells, Interruptions, Transients, Rapid Voltage Changes, Inrush Current, Mains Signalling Voltages and Total PQ Event Counters

Real-Time Waveform Capture (WFC) and Waveform Recorder (WFR)

- Real-time WFC @ 128 samples/cycle x 4 cycles via Front Panel and Web Interface
- WFR with maximum 128 entries
- Simultaneous capture of 3-phase Voltage and Current Inputs
- COMTRADE file format, downloadable from the on-board Web Server or FTP Server

Disturbance Waveform Recording (DWR)

- 128 entries
- Simultaneous recording of all Voltage (U1-U4) and Current (I1-I4) Inputs

RMS Recorder (RMSR)

- 128 entries
- 8 parameters maximum, selectable U, I, P, Q, S, PF, Freq., Freq. Deviation
- Recording Interval from 0.5 to 60 cycles
- 72 seconds of ½ cycle RMS recording @ 50Hz or 60 seconds @ 60Hz

Accuracy

iMeter 7

Parameters	Accuracy	Resolution
Voltage	± 0.1%	0.01V
Current	± 0.1%	0.001A
P, Q, S	± 0.2%	0.001W/var/VA
PF	± 0.5%	0.001
Frequency	± 0.003Hz	0.001Hz
kWh, kVAh	IEC 62053-22 Class 0.2S	0.1kXh
kvarh	IEC 62053-24 Class 0.5S	0.1kvarh
Harmonics	IEC 61000-4-7 Class A	0.001
K-Factor	IEC 61000-4-7 Class A	0.01
Phase Angle	± 0.2°	0.1°
Voltage Unbalance	±0.1%	0.01%
Current Unbalance	± 0.5%	0.01%
Pst, Plt	± 5%	0.001
Dip/Swell/Interruption	Voltage: ± 0.2%Un, Duration: ± 1 cycle	0.01%

Technical Specifications

Voltage Inputs (V1, V2, V3, VN, V4, V4N)

Standard (Un)		400ULN/690ULL +20%
Range		10V to 120% Un for 400ULN nominal
Overload		1.2xUn continuous, 4xUn for 1s
Burden		< 0.1VA/per phase
PT Ratio	Primary	1-1,000,000V
	Secondary	1-1,500V
	V4 Primary	1-1,000,000V
	V4 Secondary	1-1,500V
Frequency		40Hz-60Hz @ 50Hz, 48Hz-72Hz @ 60Hz

Current Inputs (-I11, I12, -I21, I22, -I31, I32, -I41, I42)

Standard (In)		5A (Standard), 1A (Optional)
Range		1% to 400% In
Starting Current		0.1% In
Overload		4xIn continuous, 10xIn for 1s
Burden		< 0.5VA/per phase @ 5A
		< 0.1VA/per phase @ 1A
CT Ratio	Primary	1-30,000A
	Secondary	1-50A
	I4 Primary	1-30,000A
	I4 Secondary	1-50A

Power Supply (L+, N-, G)

Standard	95-250VAC/VDC ±10%, 47-440Hz
Optional	20-60VDC
Burden	< 22VA/9W
Overvoltage Category	CAT III 300V

Digital Inputs (DIC, DI1, DI2, DI3, DI4, DI5, DI6, DI7, DI8)

Standard	Dry contact, 24VDC internally wetted
Sampling	1000Hz
Hysteresis	1ms minimum

Digital Outputs (RO11/RO12, RO21/RO22, RO31/RO32, RO41/RO42)

Type	Form A Mechanical Relay
Loading	5A @ 250VAC/30VDC

Pulse Outputs (DO1+, DO1-, DO2+, DO2-)

Type	Form A Solid State Relay
Isolation	Optical
Maximum Load Voltage	30VDC
Maximum Forward Current	50mA

Environmental Conditions

Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	5% to 95% non-condensing
Atmospheric Pressure	63 kPa to 110 kPa
Pollution Degree	2
Measurement Category	CAT IV 1000V

Mechanical Characteristics

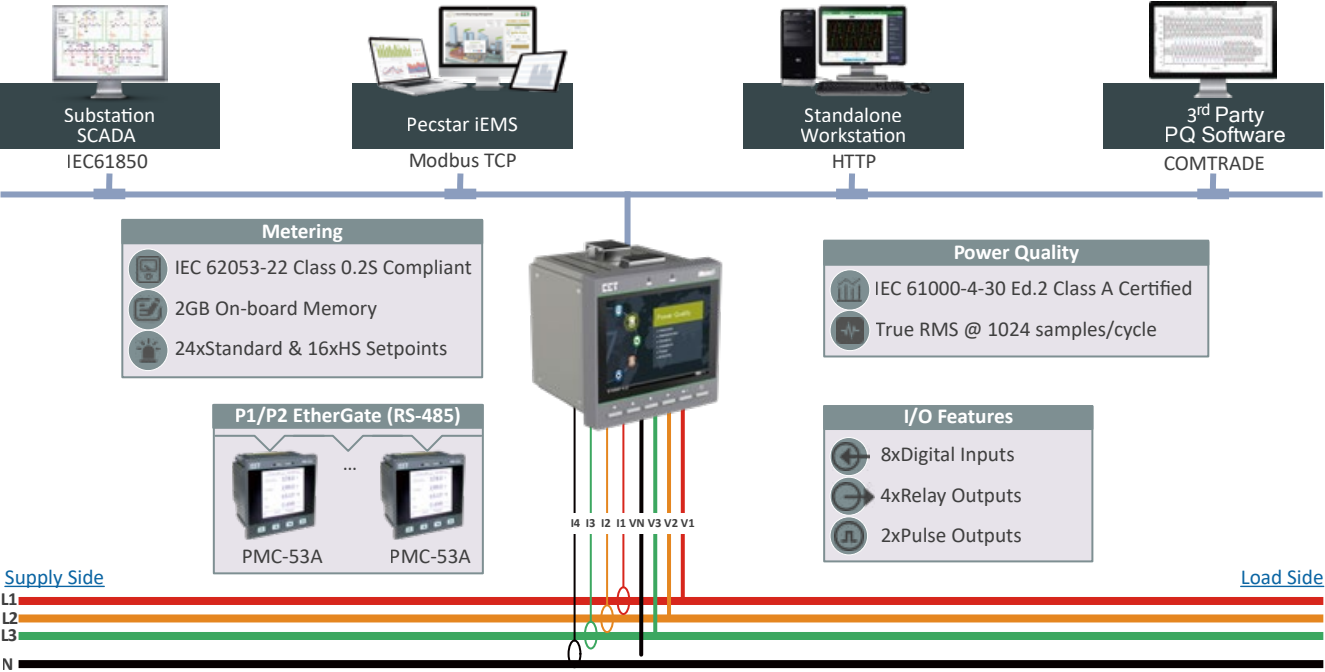
Panel Cutout	138x138 mm
Unit Dimensions	144x144x129 mm
IP Rating	52

Ordering Information

Product Code										Description			
iMeter 7 Advanced Power Quality Monitor													
Input Current	5							5A					
	1							1A					
Input Voltage		9							400ULN/690ULL + 20%				
Power Supply			2							95-250VAC/DC ±10%, 47-440Hz			
			3							20-60VDC			
System Frequency				5							50Hz		
				6							60Hz		
I/O					A					8xDI + 4xRO (Mechanical Relay) + 2xDO (Solid State Relay)			
Communications						A					2xRS-485 + 1x100BaseT		
IEC61850							X					None	
							A*					Support IEC61850 Protocol	
Display Language									E	English			
iMeter 7	-	5	9	2	5	A	A	X	E	iMeter 7-5925AAXE (Standard Model)			

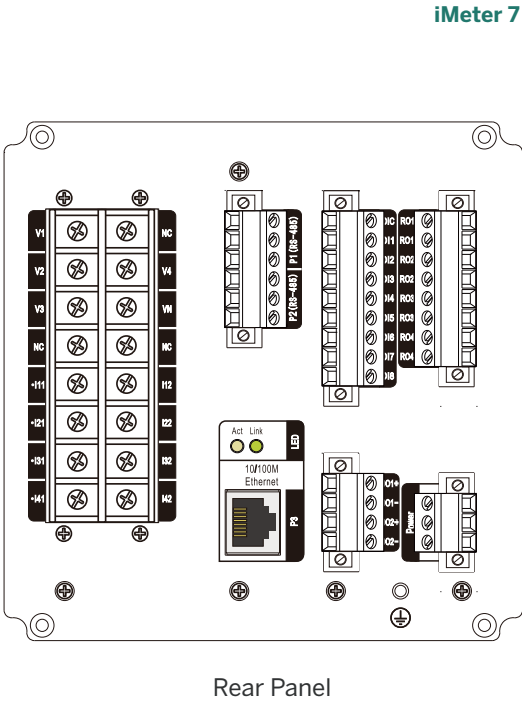
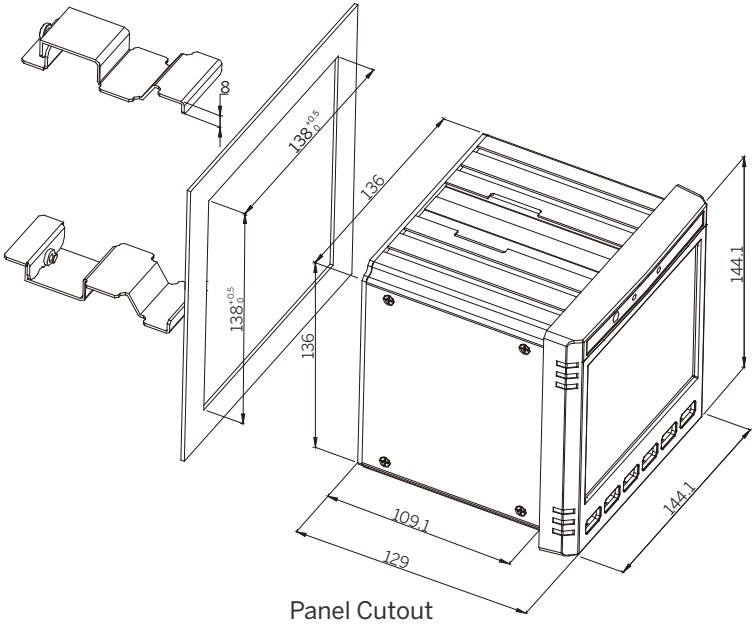
* Additional charges apply

Typical Application

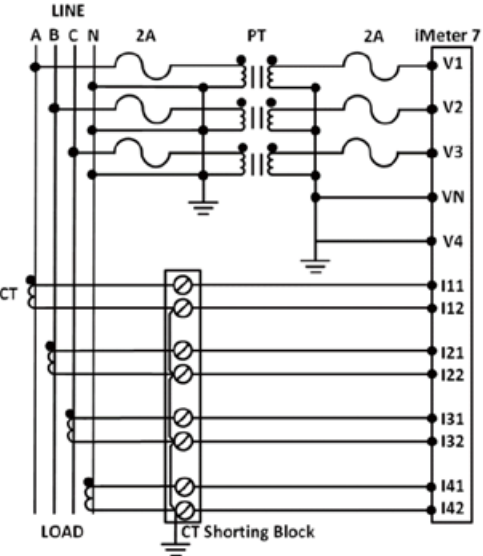


Device View and Dimensions

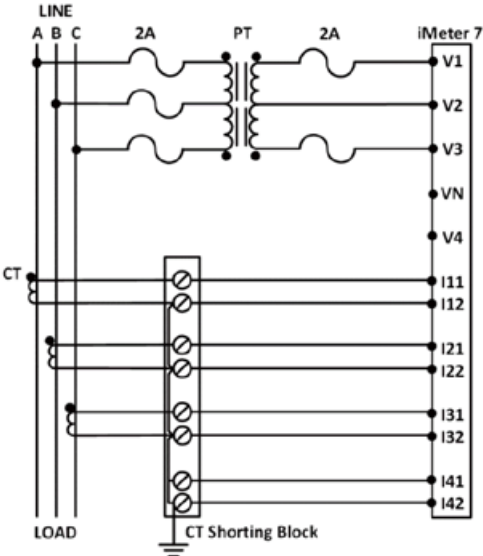
Unit: mm



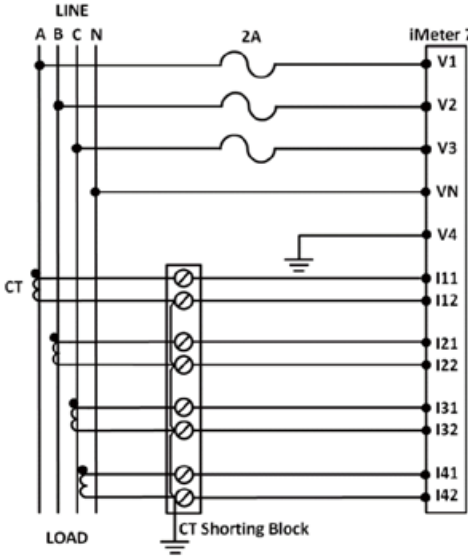
Wiring Diagrams



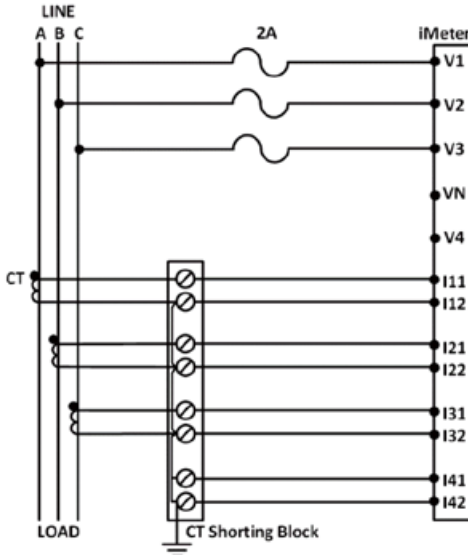
3P4W Wye with 3PTs, 4CTs



3P3W Open Delta with 2PTs, 3CTs



3P4W Wye Direct Connection with 4CTs



3P3W Direct Connections with 3CTs

iMeter 8

Advanced Power Quality Monitor



- ✓ 8GB On-board Memory
- ✓ IEC 62053-22 Class 0.2S kWh metering
- ✓ DIN form factor measuring @ 192x192x182.4 mm
- ✓ 7" High-Resolution Color Dot-Matrix Display @ 800x480
- ✓ Dual 100BaseT Ethernet and two RS-485 Ports
- ✓ IEC 61000-4-30 Ed.3 Class A Compliant
- ✓ EN 50160 and IEC61850

Features Summary

General	
Class (kWh)	0.2S
Dimensions (mm)	192(W)x192(H)x182.4(D)
Display (Backlit)	Color TFT 800x480(Backlit)
True RMS Sampling Rate	1024
Battery-backed Real-time Clock	✓
Operating Temperature (°C)	-25 to 70

Communications	
Protocol	Modbus RTU, Modbus TCP, HTTPS, SNTP, SMTP, FTP, Ethernet Gateway, IEC61850
RS-485 Port	2
Ethernet	2
Web Server	✓

Power Quality	
THD Voltage & Current	✓
TOHD Voltage & Current	✓
TEHD Voltage & Current	✓
K-Factor	✓
Individual Harmonics	2 nd - 63 rd
Voltage/Current Unbalance	✓
Waveform Capture on Screen	✓
Waveform Recording	✓
Dip Swell Detection	✓
Transient Detection	✓
IEC 61000-4-30	Ed.3 Class A Compliant
2-150kHz Conducted Emission	Compliant

I/O	
Digital Input (DI)	8 (16 Opt.)
Pulse Counter	✓
Mechanical Digital Output (DO)/Solid State Output (SS)	4DO+4SS or (8 Opt.)DO+4SS
Analog Input (AI), 0/4-20mA	(2 Opt.)
Analog Output (AO), 0/4-20mA	(1 Opt.)
kWh & kvarh Pulse Output (LED)	✓
kWh & kvarh Pulse Output	4
IRIG-B (GPS)	✓

(Opt.)-Optional (Meas./Calc.)-Measured Value/Calculated Value

Main Features

Metering

Basic Measurements (1-second update)

- 3-Phase U, I, P, Q, S and PF as well as U4, I4 and I5
- kWh, kvarh Import/Export/Net/Total and kVAh Total
- Frequency

High-Speed Measurements

- 3-Phase U, I, P, Q, S and PF as well as U4, I4 and I5 @ ½ cycle
- Frequency @ 1 cycle

Demands

- Present and Predicted Demand for 3-phase U, I, P, Q, S and PF as well as U4, I4, I5, Frequency
- Present Demand of 4-phase U & I THD/TOHD/TEHD, 4-phase Current K-Factor, U/I Unbalance, Over and Under Deviation of Voltage and Frequency, 4-phase Fundamental Current
- Max./Min. values per Demand Interval
- Maximum Demands for This Month & Last Month (or Since Last Reset & Before Last Reset)
- Demand Synchronization with DI

Multi-Tariff TOU Capability

- Two independent sets of TOU Schedules, each supporting
 - Up to 12 Seasons
 - 90 Holidays or Alternate Days and 3 Weekdays
 - 20 Daily Profiles, each with 12 Periods in 15-minute intervals
 - 8 Tariffs, each providing the following information:
 - kWh/kvarh Import/Export and kVAh
 - P & Q Import/Export Maximum Demands time-stamped
 - Register rollover at 100,000,000,000.000 kWh
- 12 Historical Logs for Energy and Maximum Demand

Data and Event Recorders

- 8GB on-board non-volatile Memory

Data Recorder (DR) Log

- 8 Standard DR Logs
- Recording Interval from 1s to 40 days for Standard DR Log
- Up to 32 Parameters for each DR Log with program-mable sources such as Real-time Measurements, Harmonics, Unbalance and Demand Measurements
- Configurable Depth and Recording Offset
- Support FIFO or Stop-When-Full recording modes

Interval Energy Recorder (IER) and Accumulative Energy Recorder (AER)

- Both IER Log and AER Log support the recording of Total RMS kWh, kvarh Import/Export/Total/Net and kVAh, Total Fundamental and Total Harmonic kWh, kvarh Import/Export
- Recording interval from 1 minute to 65535 minutes

- Maximum Recording Depth @ 65535 records
- Support FIFO and Stop-When-Full modes

Statistical Data Recorder (SDR)

- 16 SDR Logs of maximum 64 parameters each
- Recording of the Max., Min., Avg. and 95th percentile for Real-time Measurements including U, I, P, Q, S, PF, Freq., Power, PF, Harmonics, Deviations and Unbalances
- Recording interval from 0 minute to 60 minutes
- 30 days @ 1-minute, 300 days @ 10-minute, 450-day @ 15-minute
- PQDIF file format, downloadable from the on-board FTP Server
- Support FIFO or Stop-When-Full mode

Max./Min. Recorder (MMR)

- 4 Max./Min. Recorders of 20 parameters each
- RMS/Fundamental/Harmonic/Interharmonic Measurements, Demands, Deviations, Unbalances and Flicker
- Two transfer modes:
 - Manual: Max./Min. Since Last Reset & Before Last Reset
 - Auto: Max./Min. of This Month & Last Month

SOE Log

- 1024 FIFO events time-stamped to ±1ms resolution
- Setpoint events, I/O operations, Dips, Swells, Interruptions, Transients, Rapid Voltage Changes, Inrush Current, Mains Signalling Voltages, etc.
- Record the time and characteristic data of the Setpoint and PQ event

Device Log

- 1024 FIFO entries time-stamped to ±1ms resolution
- Power On/Off Records, Setup changes, Time Sync., Device Operations and Self-diagnostics

Inputs and Outputs

Digital Inputs

- Standard 8 or optional 16 channels
- Standard volt free dry contact with 24VDC Internal Excitation
- Optional 110VAC/DC or 220VAC/DC External Excitation
- 1000Hz sampling for status monitoring with program-mable debounce
- Pulse counting with programmable weight for each channel for collecting WAGES (Water, Air, Gas, Electricity, Steam) information
- Demand Synchronization and Tariff Switch based on DI Status

Digital Outputs

- Standard 4 or optional 8 channels Mechanical Relays for general purpose control or alarming
- Standard 4 SS Relays for Energy pulsing applications

Analog Inputs (Optional)

- Two channels 0/4-20mA DC input with programmable zero and full scales that can be used to measure external transducer signal

Analog Output (Optional)

- One channel 0/4-20mA DC output with programmable zero and full scales

Communications

Ethernet Ports (P1, P2)

- Dual 10/100BaseT Ethernet Ports with RJ45 connector
- Protocols supported: Modbus TCP, HTTPS, SNTP, SMTP, FTP, IEC61850
- Built-in password protected Web Server for easy data viewing, setup configuration and firmware upgrade
- Simultaneous client connections for 12xModbus TCP & 12x IEC61850

RS-485

- Dual optically isolated RS-485 port with baud rate from 1.2 to 38.4 kbps
- Support Modbus RTU and Ethernet Gateway

Setpoints

PQ Setpoints

- Transients
- Dips, Swells, Interruptions
- Rapid Voltage Changes
- Inrush Current
- Trigger DO, SOE Log, WFR, DWR, RMSR or Alarm Email

Control Setpoints

- 256 standard and 16 High-Speed Setpoints
- Extensive monitoring sources including U, I, P, Q, S, Demand, Harmonics, Unbalances, Deviations, Flickers, Phase Reversal/Loss, AI, etc.
- Configurable thresholds and time delays
- Trigger DO, SOE Log, WFR, DWR, RMSR or Alarm Email

Digital Input Setpoints

- Provides control output actions in response to changes in Digital Input status
- Trigger DO, SOE Log, WFR, DWR, RMSR or Alarm Email

Power Quality Metering

IEC 61000-4-30 Ed.3 Compliant

- Power Frequency
- Magnitude of the Supply Voltage and Current
- Flicker
- Transients, Dips/Swells and Interruptions
- Supply Voltage Unbalance and Current Unbalance
- Mains Signalling Voltage on the Supply Voltage
- Rapid Voltage Changes
- Measurement of Over and Under Deviation Parameters

- Harmonic and Interharmonic Measurements for Voltage and Current
- 2 kHz to 150 kHz Conducted Emission Measurements

Harmonic and Interharmonic Measurements

- K-Factor for Current, Crest Factor for Current and Voltage
 - U and I THD, TOHD, TEHD, TIHD, TOIHD, TEIHD and TH (RMS)
 - U and I Individual Harmonics (%HD and RMS) from 2nd to 63rd #
 - U and I Individual Interharmonics (%IHD and RMS) from 1st to 63rd #
 - Total Harmonic P, Q, S and PF
 - Harmonic P, Q, S and PF from 2nd to 63rd in RMS
 - Harmonic Phase Angle from 2nd to 63rd
 - U and I DC Components
 - Total Harmonic kWh, kvarh Import/Export from 2nd to 63rd
- # %HD and %IHD can be configured as % of Fundamental, % of U/I nominal or % of RMS

Conducted Emissions in the 2kHz to 150kHz Range

- Real-time amplitude (150/180-Cycle) and the Max., Min., Avg. and 95th percentile (in 1-minute interval) for a total of 106 frequency segments for the 2-9kHz and 9-150kHz range are available via the Web Interface

Sequence and Unbalance

- Zero, Positive and Negative Sequence Components
- U and I Unbalance based on Zero and Negative Sequence Components

Dips, Swells, Interruptions and Transients Recording

- Transients capture as short as 20µs at 1024 samples @ 50Hz for sub-cycle disturbance such as capacitor switching and resonance phenomena
- Dips, Swells & Interruptions detection @ 10ms (½ cycle at 50Hz)
- Trigger for DO, SOE Log, WF Recording, Disturbance Waveform Recording, RMS Recording and Alarm Email
- Display of ITIC or SEMI F47 plot as well as the Event Waveform on the Front Panel and Web Interface

Rapid Voltage Changes (RVC)

- Detection of a quick transition in RMS voltage between two steady-states Voltage conditions

Inrush Current Monitoring

- Monitoring of the ½ cycle RMS Current and capturing of the Current waveforms associated with events such as motor starting and transformer being energized

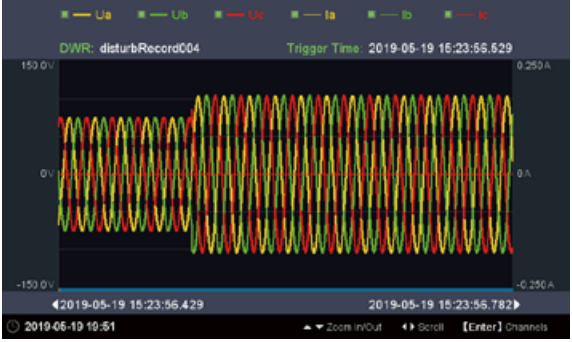
Disturbance Direction Indicator

- Determine if a Dip Event is located upstream or downstream
- Pinpoint if the cause of the event is external or internal

Real-Time Waveform Capture (WFC) and Waveform Recorder (WFR)

- Real-time WFC @ 128 samples/cycle x 4 cycles via Front Panel and Web Interface
- WFR with maximum 128 entries
- Simultaneous capture of 3-phase Voltage and Current Inputs
- Scheduled WFR with maximum repetition of 10,000 times and programmable schedule from 1 to 1440 mins
- COMTRADE file format, downloadable from the on-board Web Server or FTP Server

Meter Interface



Disturbance Waveform Recorder (DWR) iMeter 8

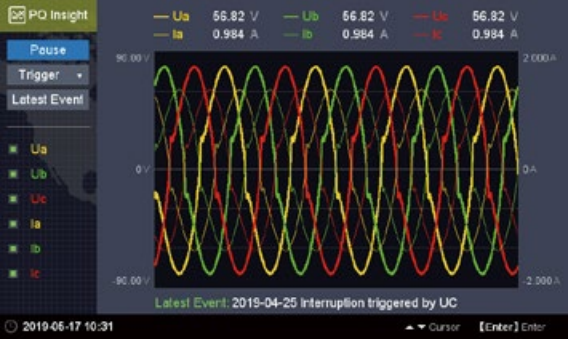
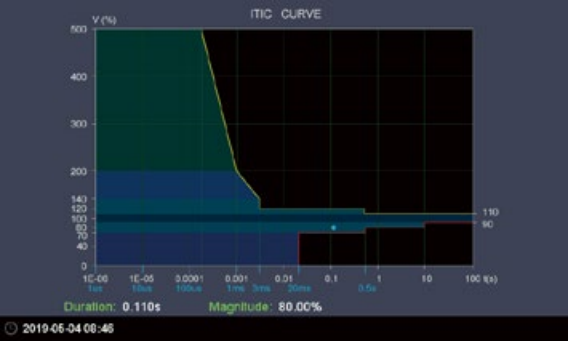
- 128 entries
- Simultaneous recording of all Voltage (U1-U4) and Current (I1-I5) Inputs

RMS Recorder (RMSR)

- 128 entries
- 8 channels maximum, selectable U, I, P, Q, S, PF, Frequency, Freq. Deviation
- Recording Interval from 0.5 to 60 cycles
- 72 seconds of ½ cycle RMS recording @ 50Hz or 60 seconds @ 60Hz

PQ Event Counters

- Dips, Swells, Interruptions, Transients, Rapid Voltage Changes, Inrush Current, Mains Signalling Voltages and Total PQ Event Counters



Accuracy

Parameters	Accuracy	Resolution
Voltage (U)	± 0.1%	0.001V
I1, I2, I3	± 0.1%	0.001A
	SCCPA Option: ± 0.1% + Error of SCCP	
I4	± 0.1%	0.001A
I5	± 0.5%	
P, Q, S	± 0.2%	0.001kX
	SCCPA Option: ± 0.5%	
kWh, kVAh	IEC 62053-22 Class 0.2S	0.1kXh
	SCCPA Option: IEC 62053-21 Class 1	
kvarh	IEC 62053-24 Class 0.5S	0.1kvarh
	SCCPA Option: IEC 62053-24 Class 1	
PF	± 0.2%	0.001
	SCCPA Option: ± 0.5%	
Phase Angle	± 0.2	0.1°
	SCCPA Option: ± 0.2 + Phase Error of SCCP	
Frequency	± 0.003Hz	0.001Hz
Harmonics	IEC 61000-4-7 Class A	0.001
K-Factor	IEC 61000-4-7 Class A	0.001
Voltage Unbalance	± 0.1%	0.01%
Current Unbalance	± 0.5%	0.01%
Pst, Plt	± 5%	0.01%

Technical Specifications

Voltage Inputs (V1, V2, V3, VN, V4, V4N)

Standard (Un)		400ULN/690ULL +20%
Range		1% to 200% Un for 400ULN nominal
Overload		2xUn continuous, 4xUn for 1s
Burden		< 0.5VA/per phase
PT Ratio	Primary	1-1,000,000V
	Secondary	1-1,500V
	V4 Primary	1-1,000,000V
	V4 Secondary	1-1,500V
Frequency		40Hz-60Hz @ 50Hz, 48Hz-72Hz @ 60Hz

Current Inputs (I11, I12, I21, I22, I31, I32, I41, I42, I51, I52)

Standard (In)		5A (Standard), 1A (Optional)
Range		1% to 400% In
Starting Current		0.1% In
Overload		4xIn continuous, 20xIn for 1s
Burden		< 0.5VA/per phase @ 5A
		< 0.1VA/per phase @ 1A
SCCP Options	SCCP-50A-500mV	5A/50A (In/Imax), maximum 500mV Output
	SCCP-200A-200mV	20A/200A (In/Imax), maximum 200mV Output
	SCCP-500A-500mV	500A Imax, maximum 500mV Output
	SCCP-5000A-500mV	Selectable 500A/5000A (Imax) Rogowski Coil, maximum 500mV Output
CT Ratio	Primary	1-30,000V
	Secondary	1-50A
	I4 Primary	1-30,000V
	I4 Secondary	1-50A

Power Supply (L+, N-)

Standard	95-250VAC/VDC ±10%, 47-440Hz
Burden	< 12W
Overvoltage Category	CATIII 300V

Digital Inputs (DIC, DI1 to DI8 or optional DI1 to DI16)

Standard	Dry contact, 24VDC internally wetted
Optional	110V/220V AC/DC externally wetted
Sampling	1000Hz
Hysteresis	1ms minimum

Digital Outputs-Form A Relay (DO1 to DO3 or optional DO1 to DO7)

Type	Form A Mechanical Relay
Loading	5A @ 250VAC/30VDC

Digital Outputs-Form C Relay (Alarm 1, 2, 3)

Type	Form C Mechanical Relay
Loading	8A @ 250VAC/24VDC

Pulse Outputs (E1+, E1-, E2+, E2-, E3+, E3-, E4+, E4-)

Type	Form A Solid State Relay
Isolation	Optical
Maximum Load Voltage	30 VDC
Maximum Forward Current	100mA

Optional Analog Input (AI1+, AI1-, AI2+, AI2-)

Type	0-20/4-20 mA DC
Overload	24 mA maximum

Optional Analog Output (AO+, AO-)

Type	0-20/4-20 mA
Loading	500Ω maximum
Overload	24 mA maximum

Environmental Conditions

Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	5% to 95% non-condensing
Atmospheric Pressure	63 kPa to 110 kPa
Pollution Degree	2
Measurement Category	1000V CAT III

Mechanical Characteristics

Panel Cutout	186x186 mm
Unit Dimensions	192x192x182.4 mm
IP Rating	52

Ordering Information

Product Code												Description																						
iMeter 8 Advanced Power Quality Analyzer																																		
Basic Function		A											1024 samples/cycle, 8GB On-Board Memory																					
		B*~											1024 samples/cycle, 8GB On-Board Memory, IEC 61000-4-30 Ed.3 Class A Compliant with 2-150kHz Measurement																					
Input Current		5											5A																					
		1											1A																					
Input Voltage		SCCPA^												SCCP Option for use with CT Clamps with maximum 500mV output																				
		9											400ULN/690ULL+20%																					
Power Supply						2											95-250VAC/DC ± 10%, 47-440Hz																	
						3											20-60VDC (Future Consideration)																	
System Frequency								5											50Hz															
								6											60Hz															
I/O								A											8xDI + 4xDO + 4xSS Pulse Outputs															
								B*											8xDI + 4xDO + 2xAI + 1xAO + 4xSS Pulse Outputs															
								C*											16xDI + 8xDO + 4xSS Pulse Outputs															
DI Excitation								N											Dry Contact (@24VDC Self-Excitation)															
								1											110V AC/DC External Excitation															
								2											220V AC/DC External Excitation															
Communications										A											2x100BaseT + 2xRS-485													
Time Sync.											A											GPS, IRIG-B												
Display Language												E											English											
iMeter 8		-	A	5	9	2	5	A	N	A	A	E	iMeter 8-A5925ANAAE (Standard Model)																					

* Additional charges apply
~ This option does not support I/O option B (8xDI + 4xDO + 2xAI + 1xAO + 4xSS Pulse Outputs)
^ SCCPA option does not come with any Current Clamp. Please refer to the "Optional SCCPs" section for more information

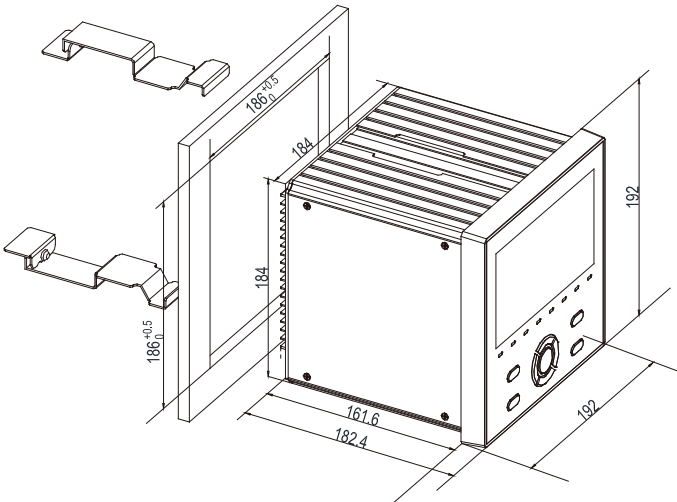
Optional SCCPs

Model No.	PMC-SCCP-50A-500mV-B-A-B	PMC-SCCP-200A-200mV-B-B-B	PMC-SCCP-500A-500mV-B-B-B	PMC-SCCP-5kA-500mV-B-C-C-371/254/150/100
Measurement Range	5A (50A Imax)	20A/200A (200A Imax)	500A (500A Imax)	500A/5000A Rogowski Coil (10,000A Imax)
Max. Allowable Current	50A	260A	500A	10,000A
Output Voltage	AC 10mV/A (Maximum 500mV)	AC 10mV/A @ 20A AC 1mV/A @ 200A (Maximum 200mV)	AC 1mV/A (Maximum 500mV)	AC 1mV/A @ 500A AC 0.1mV/A @ 5000A (Maximum 500mV)
Accuracy	±0.3% rdg. ±0.02% f.s.	±0.3% rdg. ±0.02% f.s.	±0.5% rdg. ±0.02% f.s.	±2.0% rdg. ±1.5mV
Protection	CAT III 300V	CAT III 600V	CAT III 600V	CAT III 1000V CAT IV 600V
Diameter	15mm	24mm	50mm	371/254/150/100 (mm)
Cable Length	3m	3m	3m	3m
Termination	BNC	BNC	BNC	BNC

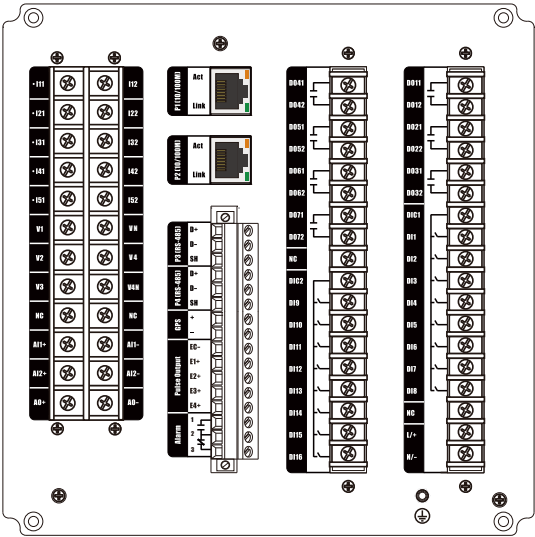
* The Rogowski Coil SCCP comes with an external Universal Power Supply and an integrator

Device View and Dimensions

Unit: mm



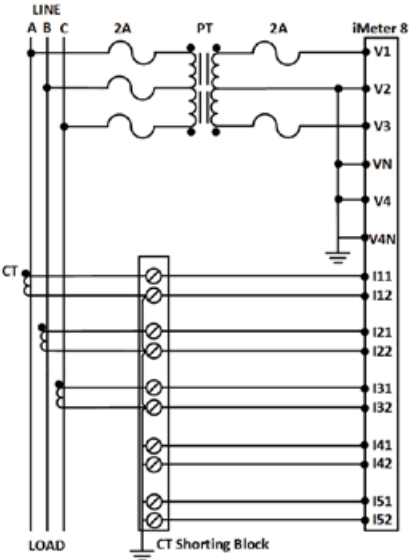
Panel Cutout



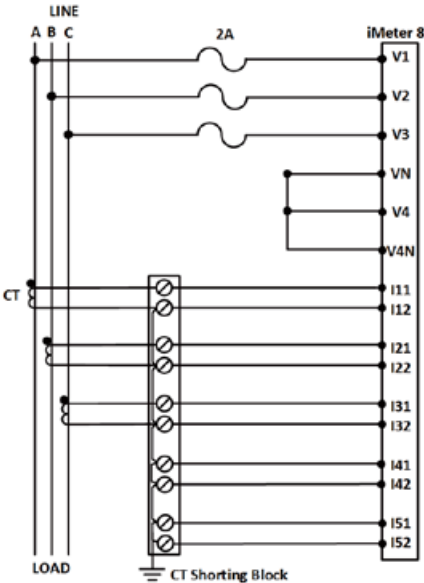
Rear Panel

iMeter 8

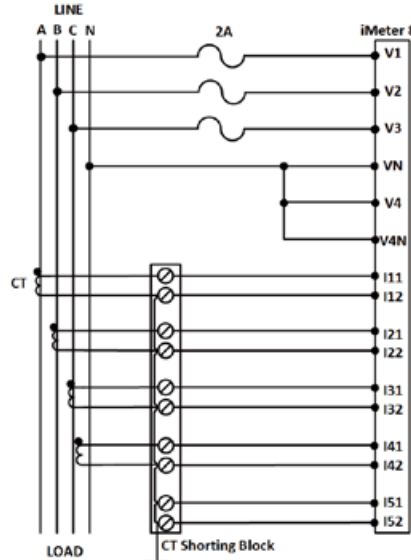
Wiring Diagrams



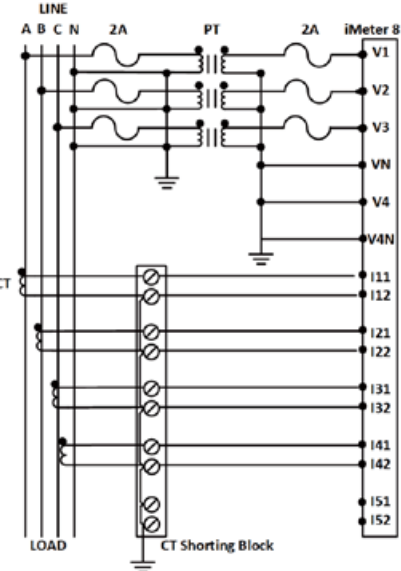
3P3W Delta with 2PTs, 3CTs



3P3W Direct Connections with 3CTs



3P4W Wye Direct Connection with 4CTs



3P4W Wye with 3PTs, 4CTs

iMeter D7

DIN Rail Advanced Power Quality Monitor



- ✓ 4GB of On-board Memory
- ✓ IEC 62053-22 Class 0.2S
- ✓ DIN Rail mount housing @ 145x124x77 mm
- ✓ High-Resolution, Color IPS Dot-Matrix LCD Display
- ✓ IEC 61000-4-30 Ed.3 Class A
- ✓ EN 50160 & IEC61850

Features Summary

General	
Class (kWh)	0.2S
Dimensions (mm)	145(W)x124(H)x77(D)
Display (Backlit)	Color IPS 320x240(Backlit)
True RMS Sampling Rate	1024
Battery-backed Real-time Clock	✓
Operating Temperature (°C)	-25 to 70

Communications	
Protocol	Modbus RTU, Modbus TCP, HTTPS, SNTP, SMTP, FTP, MQTT, Ethernet Gateway, IEC61850
RS-485 Port	1
Ethernet	2
Web Server	✓

Power Quality	
THD Voltage & Current	✓
TOHD Voltage & Current	✓
TEHD Voltage & Current	✓
K-Factor	✓
Individual Harmonics	2 nd - 63 rd
Voltage/Current Unbalance	✓
Waveform Capture on Screen	✓
Waveform Recording	✓
Dip Swell Detection	✓
Transient Detection	✓
IEC 61000-4-30 Ed.3 Class A Compliant	
2-150kHz Conducted Emission	Compliant

I/O	
Digital Input (DI)	4
Pulse Counter	✓
Mechanical Digital Output (DO)/Solid State Output (SS)	3DO or (3 Opt.)SS
Analog Input (AI), 0/4-20mA	(2 Opt.)
Analog Output (AO), 0/4-20mA	-
kWh & kvarh Pulse Output (LED)	✓
kWh & kvarh Pulse Output	3
IRIG-B (GPS)	✓

(Opt.)-Optional (Meas./Calc.)-Measured Value/Calculated Value

Main Features

Metering

Basic Measurements (1-second update)

- 3-Phase U, I, P, Q, S, and PF as well as U4, I4, Frequency and Ir
- kWh, kvarh Import/Export/Net/Total and kVAh Total

High-Speed Measurements

- 3-Phase U, I, P, Q, S, and PF as well as U4, I4 @ ½ cycle
- Frequency @ 5 cycle

Demands

- Present and Predicted Demand for 3-phase U, I, P, Q, S, PF as well as U4, I4, Frequency
- Present Demand of 4-phase U & I THD/TOHD/TEHD, 4-phase Current K-Factor, U & I Unbalance, Over and Under Deviation of Voltage and Frequency, 4-phase Fundamental Current
- Maximum Demands for This Month & Last Month (or Since Last Reset & Before Last Reset)
- Max./Min. values per Demand Interval
- Demand Synchronization with DI

Multi-Tariff TOU Capability

- Two independent sets of TOU Schedules
 - Up to 12 Seasons
 - 90 Holidays or Alternate Days and 3 Weekdays
 - 20 Daily Profiles, each with 12 Periods in 15-minute Interval
 - 8 Tariffs, each providing the following information:
 - kWh/kvarh Import/Export and kVAh
 - P & Q Import/Export Maximum Demands
 - Register rollover at 100,000,000,000.000 kXh
- Switching between two TOU schedules manually or according to pre-programmed time
- 12 Historical Logs for Energy and Maximum Demand

Data and Event Recorders

- 4GB on-board non-volatile Memory

Interval Energy Recorder (IER) and Accumulative Energy Recorder (AER)

- Both IER Log and AER Log support the recording of Total RMS kWh, kvarh Import/Export/Total/Net and kVAh, Total Fundamental and Total Harmonic kWh, kvarh Import/Export
- Recording Interval from 1 minute to 65535 minutes
- Max. Recording Depth @ 65535 records
- Support FIFO and Stop-When-Full mode

Statistical Data Recorder (SDR)

- 8 SDR Logs of maximum 64 parameters each
- Recording of the Max., Min., Avg. and CP95 values for Real-time Measurements including U, I, P, Q, S, PF, Freq., Harmonics, Deviations and Unbalances
- Recording interval from 1 to 60 minutes

Measurements	
ULN per Phase & Avg.	✓
ULL per Phase & Avg.	✓
Current per Phase & Avg.	✓
Neutral Current (Meas./Calc.)	✓
Frequency	✓
kW per Phase & Total	✓
kvar per Phase & Total	✓
kVA per Phase & Total	✓
PF per Phase & Total	✓
kWh Import/Export	✓
kvarh Import/Export	✓
kVAh Total	✓
Demands & TOU	✓
Maximum Demands	✓
Setpoints	✓

Logs

SOE Log	1024 entries
PQ Log	1024 entries
Energy Log	✓
Max./Min. Log	✓
On-board Log Memory	4GB

- 90 days @ 3-minute, 300 days @ 10-minute, 450-day @ 15-minute
- Downloadable via Free DiagSys software
- Support FIFO or Stop-When-Full mode

Max./Min. Recorder (MMR)

- 4 Max./Min. Recorders of 20 parameters each
- RMS/Fundamental/Harmonic/Interharmonic measurements, Demands, Deviations, Unbalances and Flicker
- Two transfer modes:
 - Manual: Max./Min. Since Last Reset & Before Last Reset
 - Auto: Max./Min. of This Month & Last Month

SOE Log

- 1024 FIFO events time-stamped to ±1ms resolution
- Setpoint events, I/O operations, Dips, Swells, Interruptions, Transients, Rapid Voltage Changes, Inrush Current, Mains Signalling Voltage, etc.
- Record the characteristic data for Setpoint events as well as Waveform, ITIC and SEMI F47 Curve for PQ events

Device Log

- 1024 FIFO entries time-stamped to ±1ms resolution
- Power On/Off, Setup changes, Time Sync., Device Operations and Self-diagnostics

Inputs and Outputs

Digital Inputs

- Standard 4 channels, volt free dry contact, 24VDC Internal Excitation
- 1000Hz sampling for status monitoring with programmable debounce
- Pulse counting with programmable weight for each channel for collecting WAGES (Water, Air, Gas, Electricity, Steam) information
- Demand Synchronization and Tariff Switching based on DI Status

Digital Outputs

- Standard 2 channels Form A and 1 channel Form C Mechanical Relays for general purpose control or alarming
- Optional 3 SS Relays for Energy pulsing applications

Analog Inputs (Optional)

- Optional 2xAI, 0/4-20mA DC input with programmable zero and full scales that can be used to measure external transducer signal
- Optional 1xResidual Input for Leakage Current & 1xRTD for Temperature measurements (Residual Current Transducer and PT100 Sensor not included)

Communications

Ethernet Ports (P1, P2)

- Dual 10/100BaseT Ethernet Ports with RJ45 connector and built-in switch
- Protocols supported: Modbus TCP, HTTPS, SNTP, SMTP, FTP, MQTT, IEC61850
- Accounts and pre-defined roles for easy data viewing, setup configuration and firmware upgrade
- Built-in password protected Web Server with multiple user accounts and pre-defined roles for easy data viewing, setup configuration and firmware upgrade
- Simultaneous client connections for 8x Modbus TCP and 4x IEC61850

RS-485

- One optically isolated RS-485 port with baud rate from 1.2 to 38.4 kbps
- Support Modbus RTU and Ethernet Gateway

4G (Optional)

- One Optional 4G connection with the following Frequency Bands supported.
GSM: EGSM 900MHz/DCS 1800MHz
CDMA2000/EVDO: BCO
WCDMA: BAND1/BAND8
TD-SCDMA: TD-SCDMA 1.9G/TD-SCDMA 2G
LTE-FDD: LTE-FDD B1/B3/B8
LTE-TDD: LTE TDD B38/B39/B40/B41

Setpoints

PQ Setpoints

- Transients, Dips, Swells, Interruptions
- Rapid Voltage Changes, Inrush Current
- Trigger DO, SOE Log, WFR, DWR, RMSR and Alarm Email

Control Setpoints

- 40 Control Setpoints can be configured as standard or High-Speed
- Extensive monitoring sources including U, I, P, Q, S, Demands, Harmonics, Unbalances, Deviations, Flickers, Phase Reversal/Loss, Ir and AI, etc.
- Configurable thresholds and time delays
- Trigger DO, SOE Log, WFR, DWR, RMSR and Alarm Email

Digital Input Setpoints

- Provides control output actions in response to changes in Digital Input status
- Trigger DO, SOE Log, WFR, DWR, RMSR and Alarm Email

Power Quality Metering

IEC 61000-4-30 Ed.3 Class A Compliant

- Power Frequency
- Magnitude of the Supply Voltage
- Flicker
- Supply Voltage Dips/Swells
- Voltage Interruptions
- Transient Voltages
- Supply Voltage Unbalance

- Voltage Harmonics and Interharmonics
- Mains Signalling Voltage on the Supply Voltage
- Rapid Voltage Changes
- Measurement of Over and Under Deviation Parameters
- Magnitude of Current
- Current Harmonics and Interharmonics
- Current Unbalance
- 2kHz to 150kHz Conducted Emission Measurements

Harmonic and Interharmonic Measurements

- K-Factor for Current, Crest Factor for Current and Voltage
- U and I THD, TOHD, TEHD, TIHD, TOIHD, TEIHD and TH (RMS)
- U and I Individual Harmonics (%HD and RMS) from 2nd to 63rd #
- U and I Individual Interharmonics (%IHD and RMS) from 1st to 63rd #
- Total Harmonic P, Q, S and PF
- Harmonic P, Q, S and PF from 2nd to 63rd in RMS
- Fundamental U, I, P, Q, S, Phase Angle and Displacement PF
- Harmonic Phase Angle from 2nd to 63rd
- U and I DC Components
- Fundamental kWh, kvarh Import/Export/Net/Total
- Total Harmonic kWh, kvarh Import/Export/Net/Total
- Total Harmonic kWh, kvarh Import/Export from 2nd to 63rd
%HD and %IHD can be configured as % of Fundamental, % of U/I nominal or % of RMS

Conducted Emissions in the 2kHz to 150kHz Range

- Real-time amplitude (150/180-Cycle) and the Max., Min., Avg. and 95th percentile (in 1-minute interval) for a total of 106 frequency segments for the 2-9kHz and 9-150kHz range are available via the Web Interface
- Display of the Daily Heat Map for the Max., Min., Avg. and 95th percentile on the Web Interface

Sequence and Unbalance

- Zero, Positive and Negative Sequence Components
- U and I Unbalance based on Zero and Negative Sequence Components

Dips, Swells, Interruptions and Transients Recording

- Dips, Swells and Interruptions detection @ 10ms (½ cycle at 50Hz)
- Transients capture as short as 40µs at 512 samples @ 50Hz for sub-cycle disturbances such as capacitor switching and resonance phenomena
- Trigger for DO, SOE Log, WFR, DWR, RMS Recording and Alarm Email
- Display of Event WFR or DWR on the Front Panel and Web Interface

Rapid Voltage Changes (RVC)

- Detection of a quick transition in RMS voltage between two steady-states

Inrush Current Monitoring

- Monitoring of the ½ cycle RMS Current and capturing of the Current waveforms associated with events such as motor starting and transformer being energized

Disturbance Direction Indicator

- Determine if a Dip Event is located upstream or downstream
- Pinpoint if the cause of the event is external or internal

PQ Event Counters

- Dips, Swells, Interruptions, Transients, Rapid Voltage Changes, Inrush Current, Mains Signalling Voltages and Total PQ Event Counters

Real-Time Waveform Capture (WFC) and Waveform Recorder (WFR)

- Real-time WF Capture @ 128 samples/cycle x 4 cycles via Front Panel and Web interface
- WFR with maximum 128 entries
- Simultaneous capture of 3-phase Voltage and Current Inputs
- (Range of cycles) x samples/cycle with programmable pre-fault cycles between 2-6 cycles: (20-250) x1024, (20-500) x512, (20-1000) x256, (20-2000) x128

iMeter D7

- Scheduled WFR with maximum repetition of 10,000 times and programmable schedule from 1 to 960 hours
- COMTRADE file format, downloadable from the on-board Web Server or FTP Server

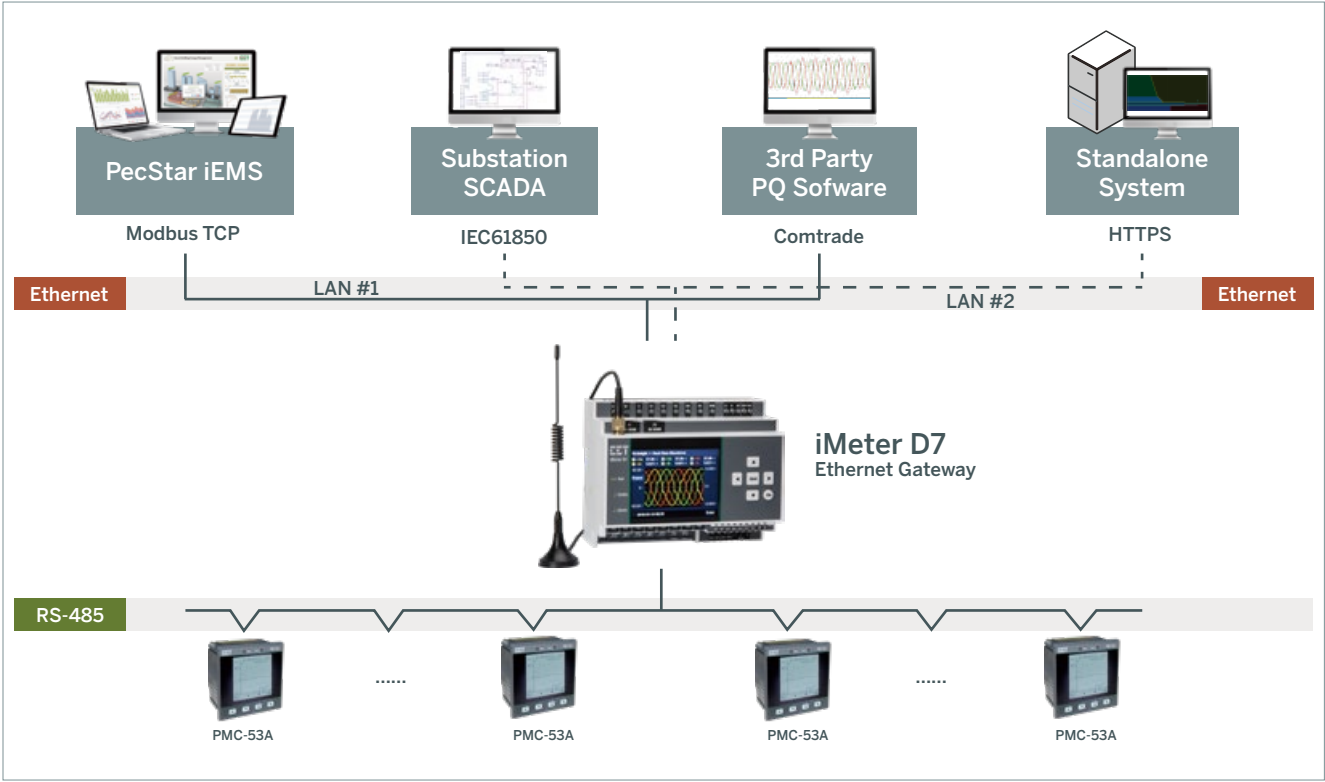
Disturbance Waveform Recorder (DWR)

- 128 entries
- Simultaneous recording of all Voltage (U1-U4) and Current (I1-I4) Inputs
 - Initial Fault: 35 cycles @ 512 samples/cycle
 - Extended Fault: Up to 150 cycles @ 16 samples/cycle
 - Steady State: Up to 360s of 1-cycle absolute peak values
 - Post Fault: 15 cycles @ 512 samples/cycle

RMS Recorder (RMSR)

- 128 entries
- 8 channels maximum, selectable U, I, P, Q, S, PF, Freq., Freq. Deviation
- Recording Interval from 0.5 to 60 cycles
- Recording Width @ 7200 samples per parameter
- Configurable pre-fault samples from 100 to 500
- 72 seconds of ½ cycle RMS recording @ 50Hz or 60 seconds @ 60Hz

Typical Application



Power Quality Analyzer

Accuracy

Parameters

	Accuracy		Resolution
Voltage (U)	± 0.1%		0.001V
I1, I2, I3, I4	5A/1A	± 0.1%	0.001A
	SCCT/SCCTA	± 0.1%+Error of SCCT	
	SCCPA	± 0.1%+Error of SCCP	
P, Q, S	5A/1A	± 0.2%	0.001kX
	SCCT/SCCTA	± 0.5%	
	SCCPA	± 0.5%	
kWh, kVAh	5A/1A	IEC 62053-22 Class 0.2S	0.1kXh
	SCCT/SCCTA	IEC 62053-22 Class 1	
	SCCPA	IEC 62053-21 Class 1	
kvarh	5A/1A	IEC 62053-24 Class 0.5S IEC 62053-23 Class 2	0.1kvarh
	SCCT/SCCTA	IEC 62053-24 Class 1 IEC 62053-23 Class 2	
	SCCPA	IEC 62053-24 Class 1 IEC 62053-23 Class 2	
PF	5A/1A	± 0.2%	0.001
	SCCT/SCCTA	± 0.5%	
	SCCPA	± 0.5%	
Phase Angle	5A/1A	± 0.2%	0.1°
	SCCT/SCCTA	± 0.2°+Phase Error of SCCT	
	SCCPA	± 0.2°+Phase Error of SCCP	
Frequency	± 0.003Hz		0.001Hz
Harmonics	IEC 61000-4-7 Class A		0.01%
K-Factor	IEC 61000-4-7 Class A		0.01
U Unbalance	± 0.1%		0.01%
I Unbalance	± 0.5%		0.01%
Pst, Plt	± 5%		0.001

Technical Specifications

Voltage Inputs (V1, V2, V3, VN, V4, V4N)

Standard (Un)	400ULN/690ULL+ 20%	
Range	5V to 200% Un for 400ULN nominal	
Overload	2xUn continuous, 4xUn for 1s	
Burden	< 0.5VA/per phase @ 5A	
	< 0.1VA/per phase @ 1A	
PT Ratio	Primary	1-1,000,000V
	Secondary	1-1,500V
	V4 Primary	1-1,000,000V
	V4 Secondary	1-1,500V
Frequency	40Hz-60Hz @ 50Hz, 48Hz-72Hz @ 60Hz	

Power Supply (L+, N-, G)

Standard	95-250VAC/VDC ±10%, 47-440Hz
Burden	< 10W

Digital Inputs (DIC, DI1, DI2, DI3, DI4)

Standard	Dry contact, 24VDC internally wetted
Sampling	1000Hz
Hysteresis	1ms minimum

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iMeter D7

Current Inputs (I11, I12, I21, I22, I31, I32, I41, I42)

Standard (In)	5A (Standard), 1A (Optional)	
Range	0.1% to 400% In	
Starting Current	0.1% In	
Overload	4xIn continuous, 10xIn for 1s	
Burden	< 0.5VA/per phase @ 5A	
	< 0.1VA/per phase @ 1A	
CT Ratio	Primary	1-30,000A
	Secondary	1-50A
	I4 Primary	1-30,000A
	I4 Secondary	1-50A
SCCPA Options	Split-Core Current Probe Input @ 500mV (Options: 5/50A, 20/200A, 500A, 500/5000A)	
SCCT Options	Class 0.5 Split-Core CT Input @ 40mA (Options: 100A, 200A, 400A, 800A, 1600A)	
SCCTA Option	Class 1 Split-Core CT Input @ 2mA (Option: 5A only)	

Digital Outputs - Form A Relay (DO11, DO12, DO21, DO22)

Type	Form A Mechanical Relay
Loading	5A @ 250VAC or 30VDC

Digital Outputs - Form C Relay (Alarm 1, 2, 3)

Type	Form C Mechanical Relay
Loading	8A @ 250VAC or 24VDC

Optional Pulse Outputs (E1+, E1-, E2+, E2-, E3+, E3-)

Type	Form A Solid State Relay
Isolation	Optical
Maximum Load Voltage	30VDC
Maximum Forward Current	100mA

Optional Analog Input (AI1+, AI1-, AI2+, AI2-)

Type	0-20/4-20 mA DC
Overload	24 mA maximum

Optional Residual Current Input (-IR, IR)

In	0.5mA
Range	2-200%In

Optional RTD Temperature Inputs (TC11, TC12)

RTD Type	2-Wire PT100 (sensor not included)
Range	-40°C to +200°C

Environmental Conditions

Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	5% to 95% non-condensing
Atmospheric Pressure	63 kPa to 110 kPa
Pollution Degree	2
Measurement Category	CAT III 600V

Mechanical Characteristics

Panel Cutout	35 mm DIN Rail
Unit Dimensions	145x124x77 mm
IP Rating	30

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Power Quality Analyzer

Ordering Information

Product Code										Description				
iMeter D7 DIN Rail Advanced Power Quality Analyzer														
Basic Function	A						IEC 61000-4-30 Ed.3 Class A Compliance							
	B*						IEC 61000-4-30 Ed.3 Class A Compliance with 2-150kHz C.E. Measurements							
Input Current		5						5A						
		1						1A						
		SCCT						For use with 100A/200A/400A/800A/1600A to 40mA SCCTs (SCCTs not included)						
		SCCTA						2mA Input for use with 5A/2mA SCCT (SCCTs not included)						
		SCCPA ^						SCCP Option for use with CT Clamps with Max. 500mV Output						
Input Voltage			9						400ULN/690ULL+20%					
Power Supply				2						95-250VAC/DC ± 10%, 47-440Hz				
System Frequency					5						50Hz			
					6						60Hz			
I/O						A						4xDI + 3xDO (Mechanical Relay)		
						B						4xDI + 3xSS Pulse Outputs		
Analog Inputs							X						None	
							A*						2xAI	
							B*						1xIr + 1xRTD	
Communications								A				2x100BaseT + 1xRS-485		
								B*				2x100BaseT + 1xRS-485 + 4G		
Display Language									E				English	
iMeter D7	A	5	9	2	5	A	X	A	E				iMeter D7-A5925AXAE (Standard Model)	

* Additional charges apply
^ The SCCPA option is compatible with the SCCPs listed in the "Optional SCCPs" section. This option does not come with any Current Clamp
Please refer to the "Optional SCCPs" section for more information

Optional SCCPs

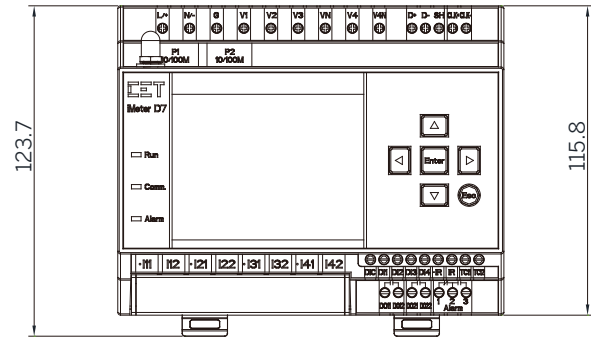
				
Model No.	PMC-SCCP-50A-500mV-B-A-B	PMC-SCCP-200A-200mV-B-B-B	PMC-SCCP-500A-500mV-B-B-B	PMC-SCCP-5kA-500mV-B-C-C-371/254/150/100
Measurement Range	5A (50A I _{max})	20A/200A (200A I _{max})	500A (500A I _{max})	500A/5000A Rogowski Coil (10,000A I _{max})
Max. Allowable Current	50A	260A	500A	10,000A
Output Voltage	AC 10mV/A (Maximum 500mV)	AC 10mV/A @ 20A AC 1mV/A @ 200A (Maximum 200mV)	AC 1mV/A (Maximum 500mV)	AC 1mV/A @ 500A AC 0.1mV/A @ 5000A (Maximum 500mV)
Accuracy	±0.3% rdg. ±0.02% f.s.	±0.3% rdg. ±0.02% f.s.	±0.5% rdg. ±0.02% f.s.	±2.0% rdg. ±1.5mV
Protection	CAT III 300V	CAT III 600V	CAT III 600V	CAT III 1000V CAT IV 600V
Diameter	15mm	24mm	50mm	371/254/150/100 (mm)
Cable Length	3m	3m	3m	3m
Termination	BNC	BNC	BNC	BNC

* The Rogowski Coil SCCP comes with an external Universal Power Supply and an integrator

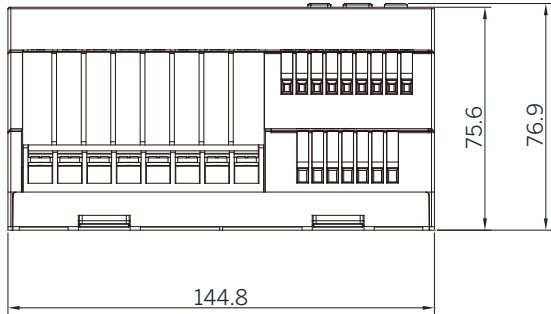
Device View and Dimensions

Unit: mm

iMeter D7

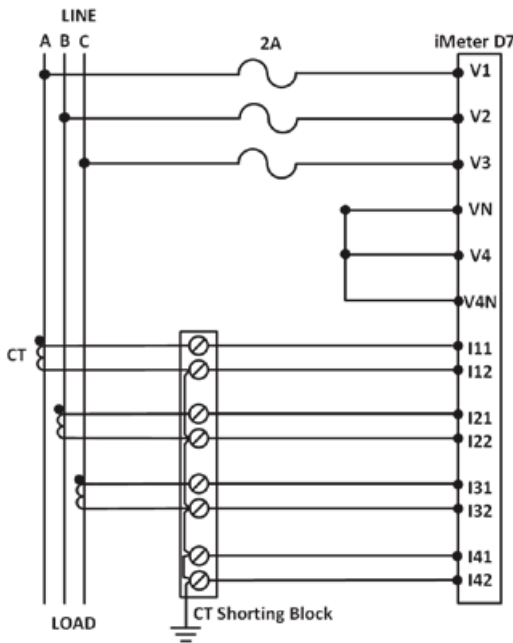


Front View

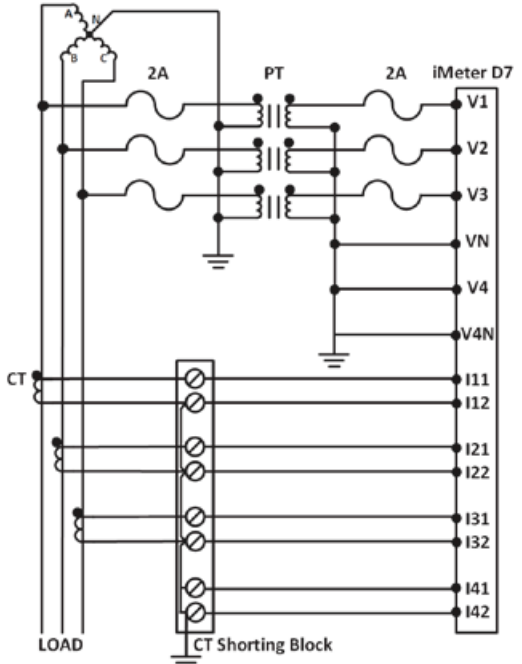


Bottom View

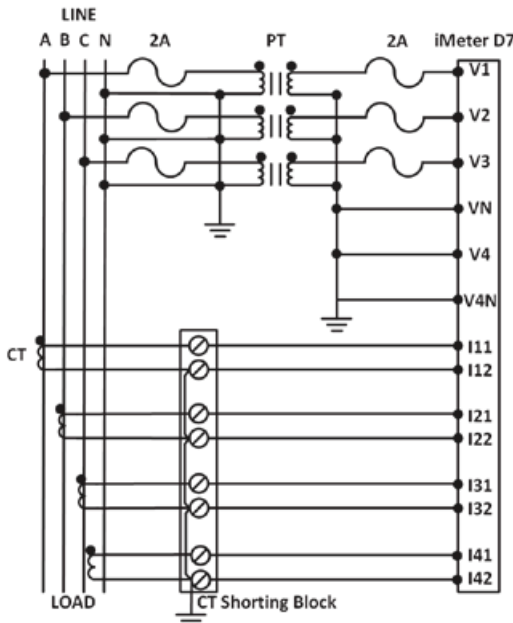
Wiring Diagrams



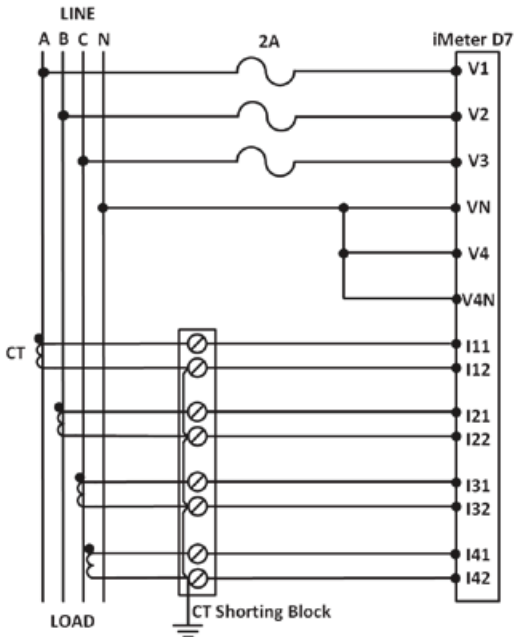
3P3W, no PTs, 3CTs



3-Wire Grounded Wye, 3PTs, 3CTs



4-Wire Wye, 3PTs, 4CTs



4-Wire Wye, no PTs, 4CTs

PMC-660

Advanced Power Quality Monitor



- ✓ 4MB On-board Memory
- ✓ IEC 62053-22 Class 0.2S Compliant
- ✓ DIN form factor measuring @ 96x96x125 mm
- ✓ Backlit LCD Display
- ✓ Optional Ethernet Port & Two RS-485 Ports

Features Summary

General

Class (kWh)	0.2S
Dimensions (mm)	96(W)x96(H)x125(D)
Display (Backlit)	B&W(Backlit)
True RMS Sampling Rate	256
Battery-backed Real-time Clock	✓
Operating Temperature (°C)	-25 to 70

Communications

Protocol	Modbus RTU Optional TCP/IP, Modbus TCP, Ethernet Gateway, HTTP, SNTP, SMTP
RS-485 Port	1 or (2 Opt.)
Ethernet	(1 Opt.)
Web Server	✓

Measurements

ULN per Phase & Avg.	✓
ULL per Phase & Avg.	✓
Current per Phase & Avg.	✓
Neutral Current (Meas./Calc.)	✓
Frequency	✓
kW per Phase & Total	✓
kvar per Phase & Total	✓
kVA per Phase & Total	✓
PF per Phase & Total	✓
kWh Import/Export	✓
kvarh Import/Export	✓
kVAh Total	✓
Demands & TOU	✓
Maximum Demands	✓
Setpoints	✓

Power Quality

THD Voltage & Current	✓
TOHD Voltage & Current	✓
TEHD Voltage & Current	✓
K-Factor	✓
Individual Harmonics	2 nd - 63 rd
Voltage/Current Unbalance	✓
Waveform Capture on Screen	-
Waveform Recording	✓
Dip Swell Detection	✓
Transient Detection	✓
IEC 61000-4-30	-
2-150kHz Conducted Emission	-

I/O

Digital Input (DI)	6
Pulse Counter	✓
Mechanical Digital Output (DO)/Solid State Output (SS)	3DO
Analog Input (AI), 0/4-20mA	(1 Opt.)
Analog Output (AO), 0/4-20mA	(1 Opt.)
kWh & kvarh Pulse Output (LED)	✓
kWh & kvarh Pulse Output	-
IRIG-B (GPS)	-

(Opt.)-Optional (Meas./Calc.)-Measured Value/Calculated Value

Main Features

Metering

Basic Measurements (1 second update)

- 3-Phase Voltage, Current and Power Measurements
- Neutral current (I4), Calculated Residual Current (Ir) and Frequency
- kWh, kvarh Import/Export/Net/Total and kVAh Total
- kvarh Q1-Q4
- Interval Energy
- Voltage and Current Phase Angle
- Device Operating Time (Running Hours)

High-Speed Measurements

- 3-Phase Voltage @ ½ cycle
- 3-Phase Current and Neutral Current (I4) @ 1 cycle
- 3-Phase Power and Power Factor @ 1 cycle

Demands

- Demands and Predicted Demands for 3-phase Voltage, Current, Power, PF, I4, Frequency, U and I Unbalance and THD
- Maximum Demands with Timestamp for This Month & Last Month (or Since Last Reset & Before Last Reset)
- Max./Min. values per demand interval
- Demand synchronization with DI

Multi-Tariff TOU Capability

- Up to 12 Seasons
- 90 Holidays or Alternate Days
- 20 Daily Profiles, each with 12 Periods at minimum 15-minute interval
- 8 Tariffs, each providing information of kWh/kvarh Import/Export and kVAh

Data and Event Recorders

- 4MB on-board Memory

Data Recorder and High-Speed (HS) Data Recorder

- 4 High-Speed Data Recorders (1 to 60 cycles interval) and 12 Standard Data Recorders

- Capable of recording 16 parameters each

Interval Energy Recorder (IER)

- kWh/kvarh Import/Export and kVAh Total

PQ Log

- Store up to 1000 PQ events
- Capture Dips, Swells and Transients at 1ms resolution

Max./Min. Recorder (MMR)

- Max./Min. Log with Timestamp
- Two transfer modes:
 - Manual: Max./Min. Since Last Reset & Before Last Reset
 - Auto: Max./Min. of This Month & Last Month

SOE Log

- Store up to 512 events
- Such as Power-on, Power-off, Setpoint actions, Relay actions, Digital Input status changes and setup changes

Inputs and Outputs

Digital Inputs

- Up to 6xDIs, volt free dry contact, 24VDC internally wetted

Digital Outputs

- Up to 3xDOs, Form A mechanical relays for alarming and general purpose control

Analog Input

- Optional AI (0/4-20mA), DC input, Programmable zero and full scales

Analog Output

- Optional AO (0/4-20mA), DC output, Programmable zero and full scales

Communications

RS-485 (P1, P2)

- Two RS-485 ports, optically isolated, baud rate from 1.2 to 38.4 kbps, support Modbus RTU protocol and DNP 3.0

Optional Ethernet Port (P2)

- Optional 10/100BaseT Ethernet with RJ45 connection
- Support Modbus RTU over TCP/IP, Modbus TCP, Ethernet Gateway, HTTP, SMTP, SNTP

Setpoints

- 16 standard setpoints with extensive list of monitoring parameters including Voltage, Current, Power, Demands and THD, etc.
- 8 High-Speed Setpoints with High-Speed Measurements and DI
- Configurable thresholds and time delays
- 6 Logical Modules supporting AND/OR/NAND/NOR operations
- WF Recording, Data Recorder, DO and Email Alarm trigger

Power Quality Metering

- Waveform Recording at 256 samples/cycle
- Fundamental RMS measurements for 3-phase Voltage, Current, Power, PF and I4
- Voltage and Current Unbalance and Symmetrical Components
- Voltage and Frequency Deviation
- THD, TOHD, TEHD, K-Factor and Displacement PF
- Individual harmonics up to 63rd
- Dips/Swells Detection and Transients Capture
- PQ Log with 1000 entries

Waveform Recorder (WFR)

- 2 independent WFR with a combined total of 32 entries
- Simultaneously capture 3-phase Voltage and Current waveform at a maximum of 256 samples/cycle

Accuracy

Parameters	Accuracy	Resolution
Voltage	±0.1%	0.001V
Current	±0.1%	0.001A
P, Q, S	±0.2%	0.001kX
kWh, kVAh	IEC 62053-22: 2003 Class 0.2S	0.01kXh
kvarh	IEC 62053-24: 2003 Class 0.5S	0.01kvarh
PF	±0.2%	0.001
Frequency	±0.01Hz	0.01Hz
Harmonics	IEC 61000-4-7 Class A	0.01%
K-Factor	IEC 61000-4-7 Class A	0.1
Phase Angle	±1°	0.1°
AI	±0.5% F.S.	-
AO	±0.5% F.S.	-

Technical Specifications

Voltage Inputs (V1, V2, V3, VN)

Standard (Un)	240ULN/415ULL
Optional (Un)	69ULN/120ULL, 400ULN/690ULL
Range	10% to 120% Un
PT Ratio	1-10,000
Overload	1.2xUn continuous, 2xUn for 10s
Burden	<0.5VA @ 240V
Frequency	45-65Hz

Current Inputs (I11, I12, I21, I22, I31, I32, I41, I42)

Standard (In/Imax)	5A/10A
Optional (In/Imax)	1A/2A
Range	0.1% to 200% In
CT Ratio (I1-I3)	1-6,000 (5A) or 1-30,000 (1A)
I4 Ratio	1-10,000
Overload	2xIn continuous, 20xIn for 1s
Burden	<0.25VA @ 5A

Power Supply (L+, N-)

Standard	95-415VAC/VDC ±10%, 47-440Hz
Burden	<6W

Digital Inputs (DI1, DI2, DI3, DI4, DI5, DI6, DIC)

Type	Dry contact, 24VDC internally wetted
Sampling	1000Hz
Hysteresis	1-1,000ms programmable

Digital Outputs (DO11, DO12, DO21, DO22, DO31, DO32)

Type	Form A Mechanical Relay
Loading	8A@250VAC/8A@24VDC for DO1 5A@250VAC/5A@30VDC for DO2 and DO3

LED Pulse Outputs (kWh, kvarh)

Type	Optical
Pulse Constant	1000/3200/5000/6400/12800 imp/kXh

Optional Analog Input

Type	0-20/4-20 mA
Overload	24 mA maximum

Optional Analog Output (AO+, AO-)

Type	0-20/4-20 mA
Loading	500 Ω maximum
Overload	24 mA maximum

Environmental Conditions

Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	5% to 95% non-condensing
Atmospheric Pressure	70 kPa to 106 kPa
Pollution Degree	2
Measurement Category	CAT III

Mechanical Characteristics

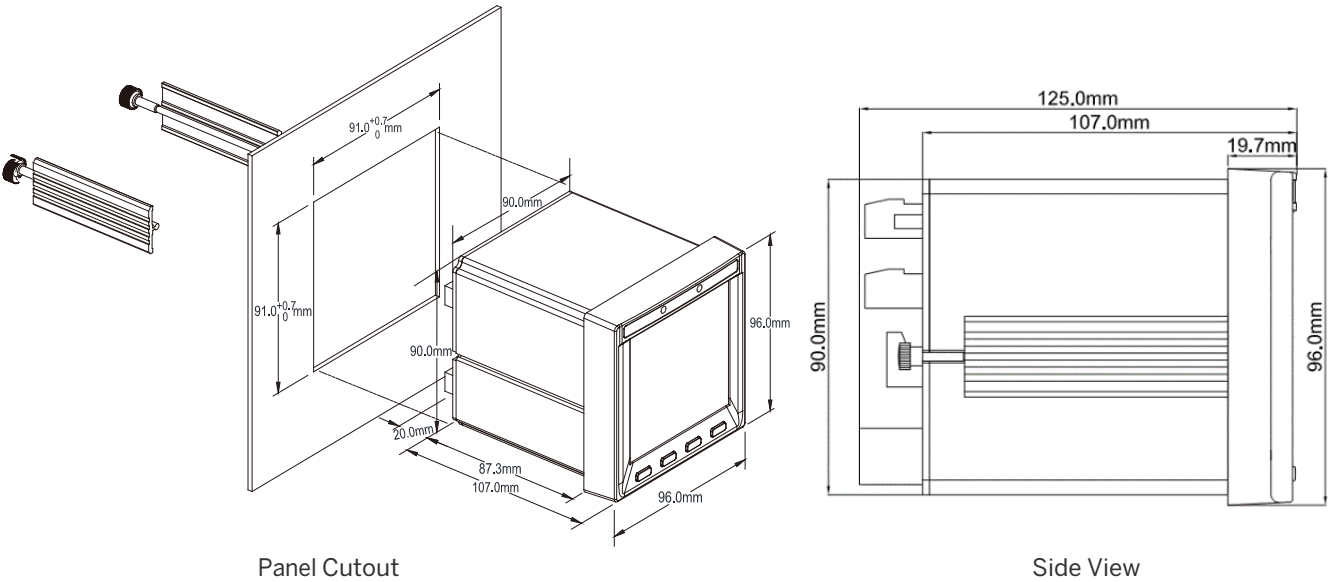
Enclosure	Aluminum Alloy
Panel Cutout	92x92 mm (3.62"x3.62")
Unit Dimensions	96x96x125 mm (3.78"x3.78"x4.92")
Shipping Dimensions	170x140x160 mm (6.69"x5.51"x6.30")
IP Rating	52
Shipping Weight	1.1 kg

Ordering Guide

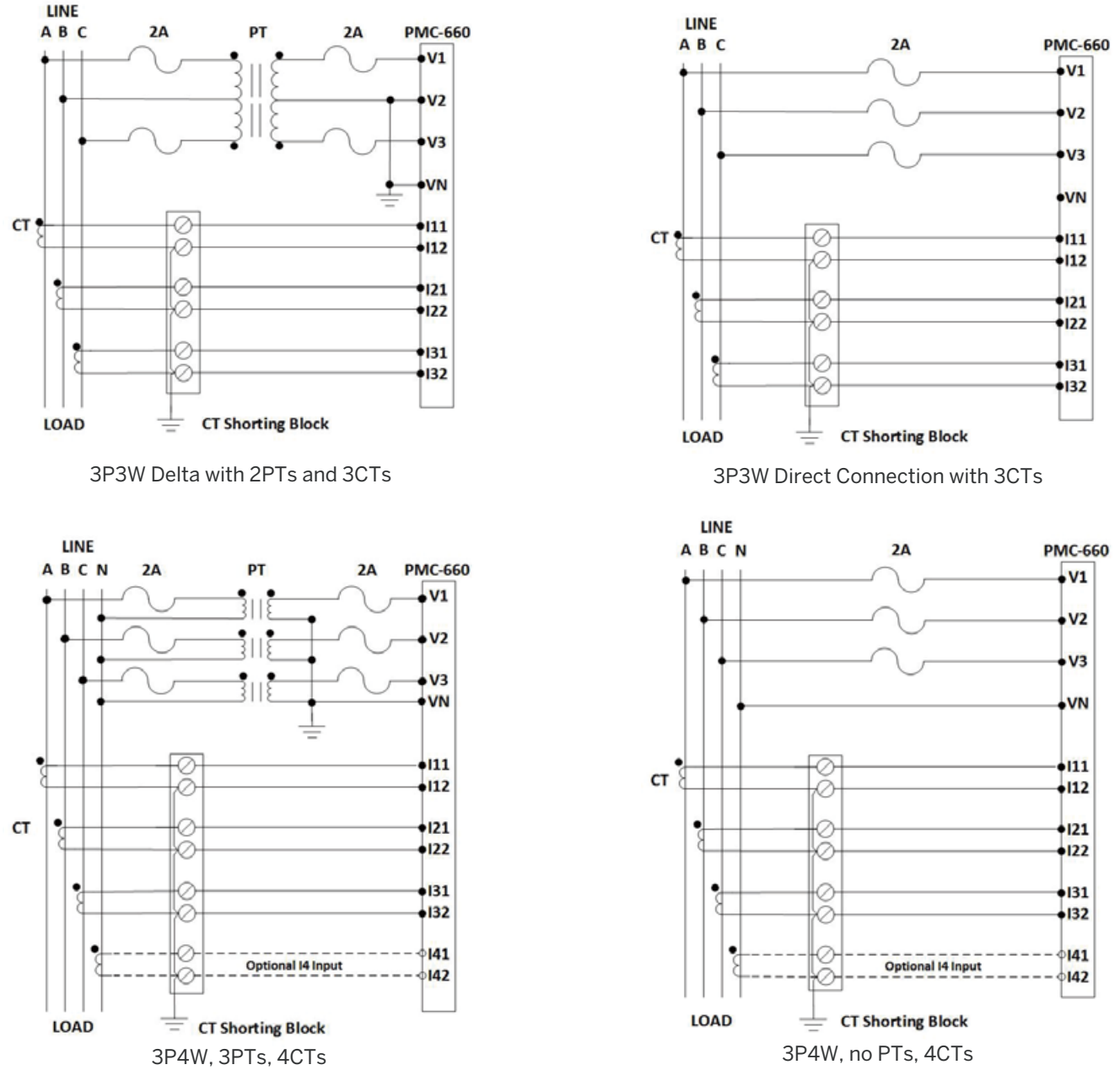
Product Code											Description	
PMC-660 Power Quality Monitor												
Basic Function												
256 samples/cycle, Class 0.2S Compliant, 3-phase Metering, Demands, Maximum Demands, Max./Min., SOE Log, Ind. Harmonics to 63 rd , 4MB Log Memory, 16 Data Recorders, High-Speed Recording, WF Recording, Dips/Swells and Transients Detection												
Display Screen	A									Integrated LCD Screen		
Input Current (I1, I2, I3, I4 [#])		5								5A		
		1								1A		
Input Voltage (V1, V2, V3)			1								69V/120V	
			3								240V/415V	
			9*								400V/690V	
Power Supply				2						95-415VAC/DC, 47-440Hz		
System Frequency						5					50Hz	
						6					60Hz	
DI/DO/AO							A				6xDI + 3xDO	
							B*				6xDI + 2xDO + 1xAO (0-20mA or 4-20mA)	
AI								X			None	
								A*			1xAI (0-20mA or 4-20mA) [#]	
Communications									B		2xRS-485 ports	
									D*		1x10/100BaseT Ethernet port + 1xRS-485 port	
Display Language										E	English	
PMC-660	-	A	5	3	2	5	A	X	B	E	PMC-660-A5325AXBE (Standard Model)	

* Additional charges apply
#I4 is not available with AI Option "A"

Device View and Dimensions



Wiring Diagrams



PMC-670
Advanced C & I Power Quality Analyzer



- ✓ 2GB On-board Log Memory
- ✓ IEC 62053-22 Class 0.2S kWh metering
- ✓ DIN form factor measuring @ 144x144x129 mm
- ✓ High-Resolution, Color TFT LCD Display
- ✓ Standard 100BaseT Ethernet and two RS-485 Ports
- ✓ IEC 61000-4-30 Class A, IEC61850

Features Summary

General

Class (kWh)	0.2S
Dimensions (mm)	144(W)x144(H)x129(D)
Display (Backlit)	Color TFT 640x480(Backlit)
True RMS Sampling Rate	512
Battery-backed Real-time Clock	✓
Operating Temperature (°C)	-25 to 70

Communications

Protocol	Modbus RTU, Modbus TCP, HTTP, SNMP, SMTP, FTP, Ethernet Gateway, (IEC61850 Opt.)
RS-485 Port	2
Ethernet	1
Web Server	✓

Measurements

ULN per Phase & Avg.	✓
ULL per Phase & Avg.	✓
Current per Phase & Avg.	✓
Neutral Current (Meas./Calc.)	✓
Frequency	✓
kW per Phase & Total	✓
kvar per Phase & Total	✓
kVA per Phase & Total	✓
PF per Phase & Total	✓
kWh Import/Export	✓
kvarh Import/Export	✓
kVAh Total	✓
Demands & TOU	✓
Maximum Demands	✓
Setpoints	✓

I/O

Digital Input (DI)	8
Pulse Counter	✓
Mechanical Digital Output (DO)/Solid State Output (SS)	4DO+2SS
Analog Input (AI), 0/4-20mA	-
Analog Output (AO), 0/4-20mA	-
kWh & kvarh Pulse Output (LED)	✓
kWh & kvarh Pulse Output	2
IRIG-B (GPS)	✓

Power Quality

THD Voltage & Current	✓
TOHD Voltage & Current	✓
TEHD Voltage & Current	✓
K-Factor	✓
Individual Harmonics	2 nd - 63 rd
Voltage/Current Unbalance	✓
Waveform Capture on Screen	✓
Waveform Recording	✓
Dip Swell Detection	✓
Transient Detection	✓
IEC 61000-4-30	Ed.2 Class A Certified
2-150kHz Conducted Emission	-

Logs

SOE Log	1024 entries
PQ Log	1024 entries
Energy Log	✓
Max./Min. Log	✓
On-board Log Memory	2GB

(Opt.)-Optional (Meas./Calc.)-Measured Value/Calculated Value

Main Features

Metering

Basic Measurements (1-second update)

- 3-Phase Voltage, Current, Power, PF and Phase Angle
- kWh, kvarh Import/Export/Net/Total and kVAh Total
- U4, I4, Frequency

High-Speed Measurements for Event Detection

- 4-Phase Voltage, Current, Power, PF @ ½ cycle
- Frequency @ 5 cycles

Demands

- Present and Predicted Demand for 3-phase Voltage, Current, Power, PF, U4, I4, Frequency
- Present Demand of 4-phase U & I THD/TOHD/TEH-D/HD 2nd to HD 63rd, and 4-phase Current K-Factor
- Max./Min. values per Demand Interval
- Maximum Demands for This Month & Last Month (or Since Last Reset & Before Last Reset)
- Demand synchronization with DI

Multi-Tariff TOU Capability

- Two independent sets of TOU Schedules
 - Up to 12 Seasons
 - 90 Holidays or Alternate Days and 3 Weekdays
 - 20 Daily Profiles, each with 12 Periods in 15-minute interval
- 8 Tariffs with Energy and Demand information

Data and Event Recorders

- 2GB on-board log Memory

Interval Energy Recorder (IER)

- kWh, kvarh Import/Export and kVAh Total
- Programmable recording interval from 5 minutes to 60 minutes
- Support FIFO and Stop-When-Full mode

Data Recorder and High-Speed (HS) Data Recorder

- 16 Data Recorders and 4 HS Data Recorders of 16 parameters each
- Recording interval from 1s to 40 days for Data Recorder and from 1/2 to 60 cycles for HS Data Recorder
- Programmable Sources
- Configurable Depths and Recording Offsets, maximum depths @ 65535
- Support FIFO or Stop-When-Full mode

Max./Min. Recorder (MMR)

- Logging of Max./Min. values for Real-time Measurements such as U, I, kW, kvar, kVA, PF, Freq., Unbalance, K-Factor, THD
- Two transfer modes:
 - Manual: Max./Min. Since Last Reset & Before Last Reset
 - Auto: Max./Min. of This Month & Last Month

PQ Log

- 1024 FIFO entries time-stamped to ±1ms resolution

- Transients, Dips/Swells, Disturbance Direction, Interruptions, Rapid Voltage Changes, Mains Signalling Voltages, etc.
- Record the time and characteristic data of the captured PQ event

SOE Log

- 1024 FIFO events time-stamped to ±1ms resolution
- Setup changes, System events, Setpoint events and I/O operations

Inputs and Outputs

Digital Inputs

- 8 channels, volt free dry contact, 24VDC internally wetted
- 1000Hz sampling
- External status monitoring with programmable debounce
- Pulse counting with programmable weight for each channel for collecting WAGES (Water, Air, Gas, Electricity, Steam) information
- Demand Synchronization
- Time-Sync via GPS's 1PPS output

Digital Outputs

- Standard 6 channels for control, alarming and pulsing applications
- RO1-RO4: Form A Mechanical Relay
- DO1-DO2: Optically Isolated Solid State Relay

Communications

RS-485 (P1, P2)

- Optically isolated RS-485 port with baud rate from 1.2 to 38.4 kbps
- Modbus RTU protocol
- Time Sync. via P1 with GPS 1PPS or IRIG-B outputs

Ethernet Port (P3)

- 1x10/100BaseT with RJ45 connector
- Modbus TCP, HTTP, SNTP, FTP, SMTP
- Ethernet Gateway
- Optional IEC61850

Setpoints

PQ Setpoints

- Provides control output actions in response to Transients, Dips/Swells, Rapid Voltage Changes and Harmonics
- Trigger RO, SOE Log, Data Recording, WFR or DWR

Control Setpoints

- 24 control setpoints with programmable Combinational Logic
- 8 High-Speed Setpoints
- Extensive monitoring sources
- Configurable thresholds and time delays
- Trigger RO, SOE Log, Data Recorder, High-Speed Data Recorder, Waveform Recorder and Alarm Email

Digital Input Setpoints

- Provides control output actions in response to changes in Digital Input status
- Demand synchronization
- Trigger RO, SOE Log, Data Recording, High-Speed Data Recording, WFR, optional DWR and Alarm Email

Power Quality Metering

PQ Parameters as per IEC 61000-4-30

- Power Frequency
- Magnitude of the Supply Voltage
- Flicker
- Supply Voltage Dips and Swells
- Voltage Interruptions
- Transient Voltages
- Supply Voltage Unbalance
- Voltage Harmonics and Interharmonics
- Mains Signalling Voltage on the Supply Voltage
- Rapid Voltage Changes
- Measurement of Over and Under Deviation Parameters

Harmonic and Interharmonic Measurements

- K-Factor for Current
- U and I THD, TOHD, TEHD
- U and I Individual Harmonics (%HD) from 2nd to 63rd#
- U and I Individual Interharmonics (%IHD) from 0 to 63rd#
- Fundamental U, I, kW, kvar, kVA and PF
- Fundamental kWh, kvarh Import/Export
- Total Harmonic kWh, kvarh Import/Export
- Total Harmonic kWh, Harmonic kvarh Import/Export from 2nd to 63rd

%HD and %IHD can be configured as % of Fundamental or % of RMS

Symmetrical Components and Unbalances

- Zero, Positive and Negative Sequence Components
- U and I Unbalance based on Zero and Negative Sequence Components

Dips, Swells, Interruptions and Transients Recording

- Transients capture as short as 40µs at 512 samples @ 50Hz for sub-cycle disturbances such as capacitor switching and resonance phenomena
- Dips and Swells detection @ 10ms (½ cycle at 50Hz)
- Trigger for RO, Data Recording, High-Speed Data Recording, WF Recording, optional Disturbance Waveform Recording and Alarm Email
- Display of ITIC or SEMI F47 plot as well as the event waveform on the Front Panel and Web Interface

Rapid Voltage Changes (RVC)

- Detection of a quick transition in RMS voltage between two steady-states conditions

Optional Disturbance Direction Indicator

- Determine if a Dip Event is located upstream or downstream
- Pinpoint if the cause of the event is external or internal

Waveform Capture (WFC) and Waveform Recorder (WFR)

- Real-time WF Capture @ 128 samples/cycle via Front Panel display
- 2 independent WF Recorders with a combined total of 128 entries
- Simultaneous capture of 4-phase Voltage and Current Inputs
- # of Cycles x Samples/Cycle (# of pre-fault cycles)
 - 20x512 (6), 40x256 (12), 80x128 (24) 160x64 (48), 320x32 (96), 640x16 (192)
- COMTRADE file format, downloadable from the on-board FTP Server

Disturbance Waveform Recording (DWR)

- Disturbance recording of all Voltage (U1-U4) and Current (I1-I4) Inputs

PQ Event Counters

- Transients, Dips, Swells, Interruptions, Rapid Voltage Changes, Mains Signalling Voltages and Total PQ Event Counters

Accuracy

Parameters	Accuracy	Resolution
Voltage	± 0.1%	0.01V
Current	± 0.1%	0.001A
kW, kVA	IEC 62053-22 Class 0.2S	0.001kX
kvar	± 0.2%	0.001kvar
kWh, kVAh	IEC 62053-22 Class 0.2S	0.001kXh
kvarh	IEC 62053-23 Class 2	0.001kvarh
PF	± 0.5%	0.0001
Frequency	± 0.005Hz	0.001Hz
Harmonics	IEC 61000-4-7 Class A	0.001%
Phase Angle	± 1°	0.1°
Voltage Deviation	± 0.1%	0.01%
Voltage Unbalance	± 0.1%	0.01%
Current Unbalance	± 0.5%	0.01%

Technical Specifications

Voltage Inputs (V1, V2, V3, V4, VN)

Standard (Un)		400ULN/690ULL
Range		10% to 120% Un
Overload		1.2xUn continuous, 4xUn for 1s
Burden		<0.1VA per phase
PT Ratio	Primary	1-1,000,000V
	Secondary	100-690V
	V4 Primary	1-1,000,000V
	V4 Secondary	1-400V
Frequency		42Hz-58Hz@ 50Hz 50Hz-70Hz@ 60Hz

Current Inputs (I11, I12, I21, I22, I31, I32, I41, I42)

Standard (In)		5A
Optional (In)		1A
Range		0.1% to 400% In
Starting Current		0.1% In
Overload		4xIn continuous, 10xIn for 1s
Burden		<0.5VA per phase
CT Ratio	Primary	1-30000A
	Secondary	1-5A
	I4 Primary	1-30000A
	I4 Secondary	1-5A

Power Supply (L+, N-, G)

Standard	95-250VAC/VDC ±10%, 47-440Hz
Optional	20-60VDC
Burden	<8W

Digital Inputs (DIC, DI1 to DI8)

Standard	Dry contact, 24VDC internally wetted
Optional	1000Hz
Hysteresis	1ms minimum

Digital Outputs (RO1, RO2, RO3, RO4)

Type	Form A Mechanical Relay
Loading	5A @ 250VAC/DC

GPS/IRIG-B

Hardware Interface	D+, D-, SH
--------------------	------------

Pulse Outputs (DO1+, DO1-, DO2+, DO2-)

Type	Form A Solid State Relay
Isolation	Optical
Maximum Load Voltage	80V
Maximum Forward Current	50mA

LCD Display

Type	Color TFT LCD, Industrial Grade
Resolution	640x480
Viewing Area	115x86 mm

Environmental Conditions

Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	5% to 95% non-condensing
Atmospheric Pressure	70 kPa to 106kPa
Pollution Degree	2
Measurement Category	CAT III

Mechanical Characteristics

Panel Cutout	138x138 mm
Unit Dimensions	144x144x129 mm
IP Rating	52

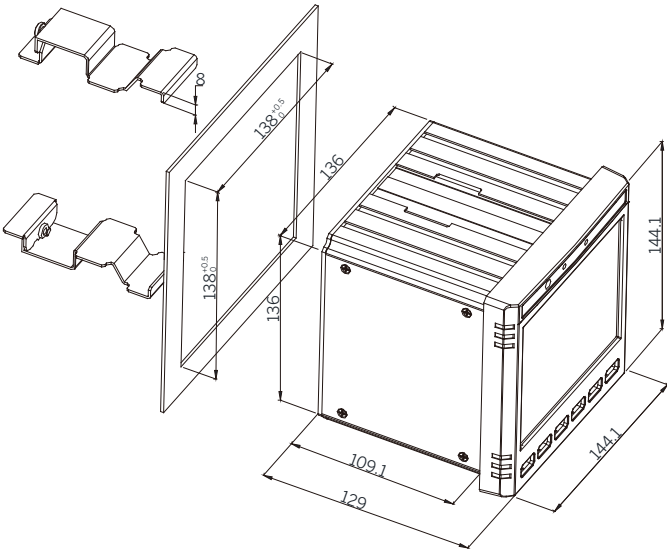
Ordering Information

Product Code										Description			
PMC-670 C & I Advanced Power Quality Monitor													
Input Current	5							5A					
	1							1A					
Input Voltage		3							400ULN/690ULL				
Power Supply			2							95-250VAC/DC, 47-440Hz			
			3							20-60VDC			
System Frequency				5							50Hz		
				6							60Hz		
I/O						A					8xDI + 4xRO + 2xDO		
Communications							A				1xEthernet port + 2xRS-485 ports		
IEC61850								X		None			
								A*		Support IEC61850 Protocol			
Display Language									E	English			
PMC-670	-	5	3	2	5	A	A	X	E	PMC-670-A5325AAXE (Standard Model)			

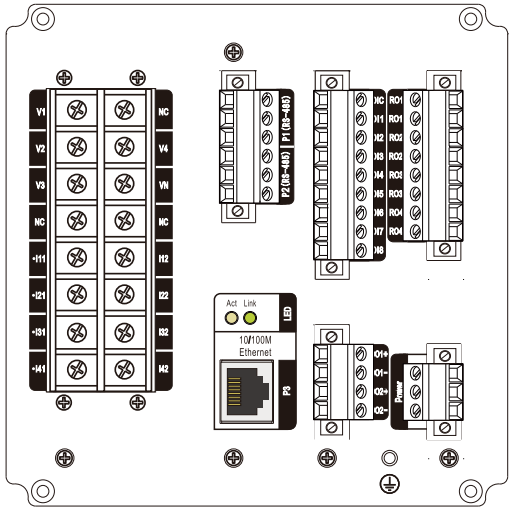
* Additional charges apply

Device View and Dimensions

Unit: mm

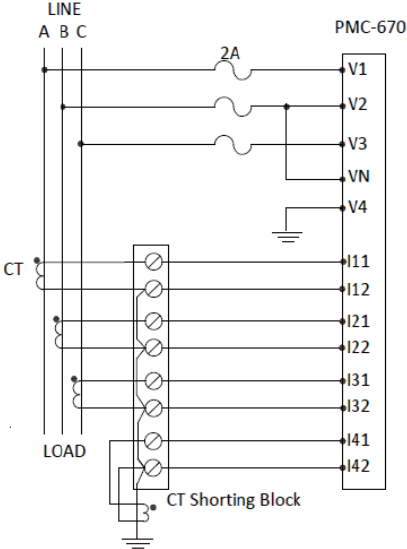


Panel Cutout

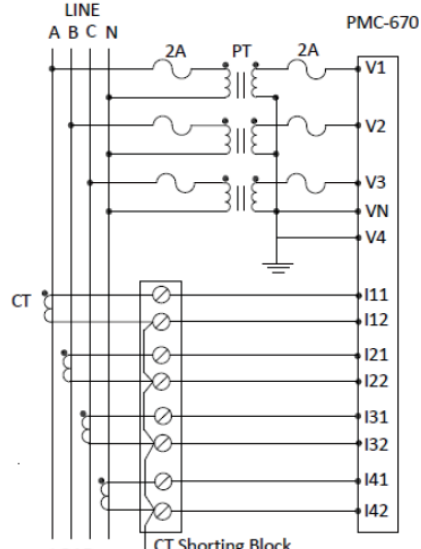


Rear Panel

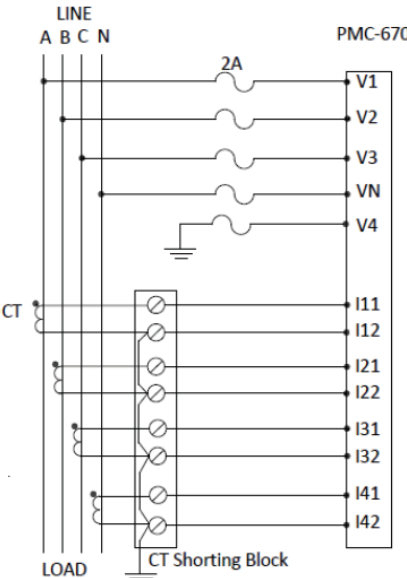
Wiring Diagrams



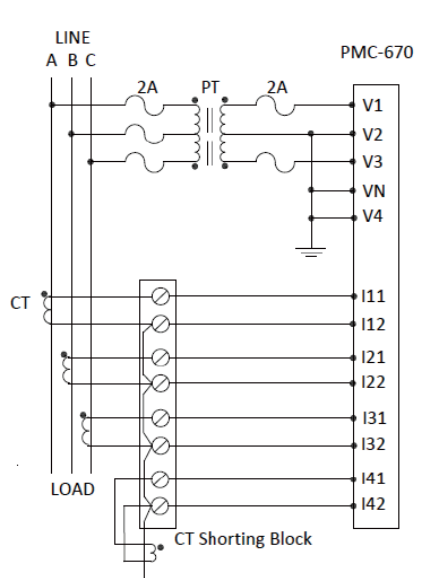
3P3W Direct Connections with 3CTs



3P4W Wye with 3PTs, 4CTs



3P4W Wye Direct Connection with 4CTs



3P3W Delta with 2PTs, 3CTs

PMC-680i
Advanced Utility Power Quality Analyzer



- ✓ 4GB of On-board Log Memory (Optional 8GB)
- ✓ IEC 62053-22 Class 0.2S kWh metering
- ✓ DIN form factor measuring @ 96x96x88 mm
- ✓ Backlit, Color TFT LCD Display
- ✓ Dual Ethernet and two RS-485 Ports
- ✓ IEC 61000-4-30 Class A
- ✓ EN 50160 and optional IEC61850

Features Summary

General

Class (kWh)	0.2S
Dimensions (mm)	192(W)x192(H)x187(D)
Display (Backlit)	Color TFT 640x480(Backlit)
True RMS Sampling Rate	512 or (1024 Opt.)
Battery-backed Real-time Clock	✓
Operating Temperature (°C)	-25 to 70

Communications

Protocol	Modbus RTU, Modbus TCP, HTTP, SNMP, SMTP, FTP, Ethernet Gateway, (IEC61850 Opt.)
RS-485 Port	(2 Opt.)
Ethernet	2
Web Server	✓

Measurements

ULN per Phase & Avg.	✓
ULL per Phase & Avg.	✓
Current per Phase & Avg.	✓
Neutral Current (Meas./Calc.)	✓
Frequency	✓
kW per Phase & Total	✓
kvar per Phase & Total	✓
kVA per Phase & Total	✓
PF per Phase & Total	✓
kWh Import/Export	✓
kvarh Import/Export	✓
kVAh Total	✓
Demands & TOU	✓
Maximum Demands	✓
Setpoints	✓

I/O

Digital Input (DI)	8
Pulse Counter	✓
Mechanical Digital Output (DO)/Solid State Output (SS)	4DO+4SS
Analog Input (AI), 0/4-20mA	-
Analog Output (AO), 0/4-20mA	-
kWh & kvarh Pulse Output (LED)	✓
kWh & kvarh Pulse Output	4
IRIG-B (GPS)	✓

Power Quality

THD Voltage & Current	✓
TOHD Voltage & Current	✓
TEHD Voltage & Current	✓
K-Factor	✓
Individual Harmonics	2 nd - 63 rd
Voltage/Current Unbalance	✓
Waveform Capture on Screen	✓
Waveform Recording	✓
Dip Swell Detection	✓
Transient Detection	✓
IEC 61000-4-30	Ed.2 Class A Certified
2-150kHz Conducted Emission	-

Logs

SOE Log	1024 entries
PQ Log	1024 entries
Energy Log	✓
Max./Min. Log	✓
On-board Log Memory	4GB or (8GB Opt.)

(Opt.)-Optional (Meas./Calc.)-Measured Value/Calculated Value

Main Features

Metering

Basic Measurements (1-second update)

- 3-Phase Voltage, Current, Power, PF and Phase Angle
- kWh, kvarh Import/Export/Net/Total and kVAh Total
- U4, I4, I5, Frequency
- Configurable timestamped measurements include 10/12-cycle, 1-second, 3-second, 10-minute and 2-hour

High-Speed Measurements

- 3-Phase Voltages and Currents, U4, I4, I5, Power, PF @ ½ cycle
- Frequency @ 1 cycle

Demands

- Present and Predicted Demand for 3-phase Voltage, Current, Power, PF, U4, I4, I5, Frequency
- Present Demand of 4-phase U & I THD/TOHD/TEHD/HD 2nd to HD 63rd, and 4-phase Current K-Factor
- Max./Min. values per Demand Interval
- Maximum Demands for This Month & Last Month (or Since Last Reset & Before Last Reset)
- Demand Synchronization with DI

Multi-Tariff TOU Capability

- Two independent sets of TOU Schedules, each supporting
 - Up to 12 Seasons
 - 90 Holidays or Alternate Days and 3 Weekdays
 - 20 Daily Profiles, each with 12 Periods in 1-minute interval
 - 8 Tariffs, each providing energy and Demand information

Data and Event Recorders

- 4GB on-board non-volatile Log Memory (Optional 8GB)

Interval Energy Recorder (IER)

- kWh, kvarh Import/Export and kVAh Total RMS, Total Fundamental and Total Harmonic kWh, kvarh Import/Export
- Programmable recording interval from 1 minute to 65535 minutes

Data Recorder and High-Speed (HS) Data Recorder

- 8 Data Recorders of 32 parameters each and 4 HS Data Recorders of 16 parameters each
- Recording interval from 1s to 40 days for Data Recorder and from 1/2 cycle to 60 cycles for HS Data Recorder

Statistical Data Recorder (SDR)

- Recording of the Max., Min., Avg. and 95th percentile for Real-time measurements including U, I, Freq., Flicker, Harmonics and Unbalances in 16 different recorders
- Recording interval from 1 minute to 60 minutes
- PQDIF file format, downloadable from the on-board FTP Server

Max./Min. Recorder (MMR)

- Logging of Max./Min. values for Real-time measurements such as U, I, kW, kvar, kVA, PF, Freq., Unbalance, K-Factor, THD
- Two transfer modes:
 - Manual: Max./Min. Since Last Reset & Before Last Reset
 - Auto: Max./Min. of This Month & Last Month

PQ Log

- 1024 FIFO entries time-stamped to ±1ms resolution
- Transients, Dips/Swells, Disturbance Direction, Interruptions, Rapid Voltage Changes, Mains Signalling Voltages, etc.
- Record the time and characteristic data of the captured PQ event

SOE Log

- 1024 FIFO events time-stamped to ±1ms resolution
- Setup changes, System events, Setpoint events and I/O operations

Inputs and Outputs

Digital Inputs

- 8 channels, volt free dry contact, 24VDC internally wetted
- 1000Hz sampling

Digital Outputs

- 8 channels for control, alarming and pulsing applications

Communications

Ethernet Ports (P1, P2)

- Dual 10/100BaseT TCP/IP Ethernet Ports with RJ45 connector
- Simultaneous client connections for 10xModbus TCP and 12x IEC61850
- Modbus TCP, HTTP, SNTP, SMTP, FTP
- Ethernet Gateway
- Optional IEC61850

RS-485 (P3, P4)

- Optically isolated RS-485 port with baud rate from 1.2 to 115.2 kbps
- Modbus RTU protocol

Setpoints

PQ Setpoints

- Provides control output actions in response to Transients, Dips/Swells, Rapid Voltage Changes, Inrush Current and Harmonics
- Trigger RO, SOE Log, Data Recording, WFR or DWR

Control Setpoints

- 256 Control Setpoints and 16 High-Speed Setpoints
- Extensive monitoring sources
- Configurable thresholds and time delays
- Trigger RO, SOE Log, Data Recorder, High-Speed Data Recorder, Waveform Recorder and Alarm Email

Digital Input Setpoints

- Provides control output actions in response to changes in Digital Input status
- Demand Synchronization and TOU Rate Change
- Trigger RO, Data Recording, High-Speed Data Recording, WFR, DWR and Alarm Email

Power Quality Metering

IEC 61000-4-30 (Class A Certified)

- Power Frequency
- Magnitude of the Supply Voltage
- Flicker
- Supply Voltage Dips and Swells
- Voltage Interruptions
- Transient Voltages
- Supply Voltage Unbalance
- Voltage Harmonics and Interharmonics
- Mains Signalling Voltage on the Supply Voltage
- Rapid Voltage Changes
- Measurement of Over and Under Deviation

Harmonic and Interharmonic Measurements

- K-Factor for Current, Crest Factor for Current and Voltage
- U and I THD, TOHD, TEHD
- U and I Individual Harmonics (%HD) from 2nd to 63rd#
- U and I Individual Interharmonics (%IHD) from 0 to 63rd#
- Harmonic kW, kvar, kVA and PF from 2nd to 63rd in RMS
- Fundamental U, I, kW, kvar, kVA and Displacement
- Fundamental kWh, kvarh Import/Export/Net/Total
- Total harmonic kWh, kvarh Import/Export/Net/Total
- Total Harmonic kWh, kvarh Import/Export from 2nd to 63rd
(#%HD and %IHD can be configured as % of Fundamental, % of U/I nominal or % of RMS)

Symmetrical Components and Unbalances

- Zero, Positive and Negative Sequence Components
- U and I Unbalance based on Zero and Negative Sequence Components

Dips, Swells, Interruptions and Transients Recording

- Transients capture as short as 40µs at 512 samples or 20µs at 1024 samples @ 50Hz for sub-cycle disturbances such as capacitor switching and resonance phenomena
- Dips and Swells detection @ 10ms (½ cycle at 50Hz)

PMC-680i

- Trigger for RO, Data Recording and High-Speed Data Recording, WF Recording, Disturbance Waveform Recording and Alarm Email
- Display of ITIC or SEMI F47 plot as well as the event waveform on the Front Panel and Web Interface

Rapid Voltage Changes (RVC)

- Detection of a quick transition in RMS voltage between two steady-states Voltage conditions

Inrush Current Monitoring

- Monitoring of the ½ cycle RMS Current and capturing of the Current waveforms associated with events such as motor starting and transformer being energized

Disturbance Direction Indicator

- Determine if a Dip Event is located upstream or downstream
- Pinpoint if the cause of the event is external or internal

Waveform Capture (WFC) and Waveform Recorder (WFR)

- Real-time WF Capture @ 128 samples/cycle via Front Panel display
- WF Recorder with 128 entries
- Simultaneous capture of 3-phase Voltage and Current inputs
- # of Cycles x Samples/Cycle with programmable # of pre-fault cycles
 - 10x1024*, 20x512, 40x256, 80x128, 160x64, 320x32, 640x16
- Extended recording for up to a maximum of 7 consecutive captures
- COMTRADE file format, downloadable from the on-board FTP Server

* Only available for the 1024 sampling option

Disturbance Waveform Recorder (DWR)

- Disturbance recording of all Voltage (U1-U4) and Current (I1-I5) Inputs

PQ Event Counters

- Transients, Dips, Swells, Interruptions, Rapid Voltage Changes, Mains Signalling Voltages and Total PQ Event Counters

Accuracy

Parameters	Accuracy	Resolution
Voltage (U)	± 0.1%	0.01V
I1, I2, I3	± 0.1%, (SCCPA Option: ± 0.1%+Error of SCCP)	0.001A
I4, I5	± 0.2%, (SCCPA Option: ± 0.2%+Error of SCCP)	0.001A
P, Q, S	± 0.2%, (SCCPA Option: ± 0.5%)	0.001kX
kWh, kVAh	IEC 62053-22 Class 0.2S, (SCCPA Option: IEC 62053-21 Class 1)	0.1kXh
kvarh	IEC 62053-23 Class 2	0.1kvarh
PF	± 0.2%, (SCCPA Option: ± 0.5%)	0.001
Frequency	± 0.005Hz	0.001Hz
Harmonics	IEC 61000-4-7 Class A	0.01
K-Factor	IEC 61000-4-7 Class A	0.01
Phase Angle	± 0.2°, (SCCPA Option: ± 0.2°+ Error of SCCP)	0.1°
Symm. Components	± 0.1%	0.01V/0.001A
Voltage Unbalance	± 0.1%	0.01%
Current Unbalance	± 0.5%	0.01%
Pst, Plt	± 5%	0.001

Technical Specifications

Voltage Inputs (V1, V2, V3, V4, VN)

Standard (Un)		240ULN/415ULL
Optional (Un)		400ULN/690ULL
Range		1V to 150% Un for 240V standard 1V to 200% Un for 400V option
Overload		2xUn continuous, 4xUn for 1s
Burden		< 0.1VA/per phase
PT Ratio	Primary	1-1,000,000V
	Secondary	100-690V
	V4 Primary	1-1,000,000V
	V4 Secondary	100-690V
Frequency		42Hz-58Hz @ 50Hz, 50Hz-70Hz @ 60Hz

Current Inputs (I11, I12, I21, I22, I31, I32, I41, I42, I51, I52)

Standard (In)		5A (Standard), 1A (Optional)
Range	5A Option	0.1% to 600% In (I1-I3), 0.1%-300% In (I4-I5)
	1A Option	0.1% to 1000% In (I1-I3), 0.1%-1500% In (I4-I5)
Starting Current		0.1% In
Overload		4xIn continuous, 20xIn for 1s
Burden		< 0.5VA/per phase @ 5A
Optional SCCP	SCCP-50A-500mV	5A/50A (In/Imax), maximum 500mV Output
	SCCP-200A-200mV	20A/200A (In/Imax), maximum 200mV Output
	SCCP-500A-500mV	500A Imax, maximum 500mV Output
	SCCP-5000A-500mV	Selectable 500A/5000A (Imax) Rogowski Coil, Max. 500mV Output
CT Ratio	Primary	1-30,000A
	Secondary	1-5A
	I4 Primary	1-30,000A
	I4 Secondary	1-5A

Power Supply (L+, N-, G)

Standard	95-250VAC/VDC ±10%, 47-440Hz
Optional	20-60VDC
Burden	< 10W

Digital Inputs (DIC, DI1 to DI8)

Standard	Dry contact, 24VDC internally wetted
Sampling	1000Hz
Hysteresis	1ms minimum

Digital Outputs - Form A Relay (RO11, RO12, RO21, RO22)

Type	Form A Mechanical Relay
Loading	5A @ 250VAC/30VDC

Digital Outputs - Form C Relay (RO31, RO32, RO33, RO41, RO42, RO43)

Type	Form C Mechanical Relay
Loading	8A @ 250VAC/24VDC

Pulse Outputs (DOC, DO1+, DO2+, DO3+, DO4+)

Type	Form A Solid State Relay
Isolation	Optical
Maximum Load Voltage	30VDC
Maximum Forward Current	50mA

LCD Display

Type	Color TFT LCD, Industrial Grade
Resolution	640x480
Viewing Area	115x86 mm

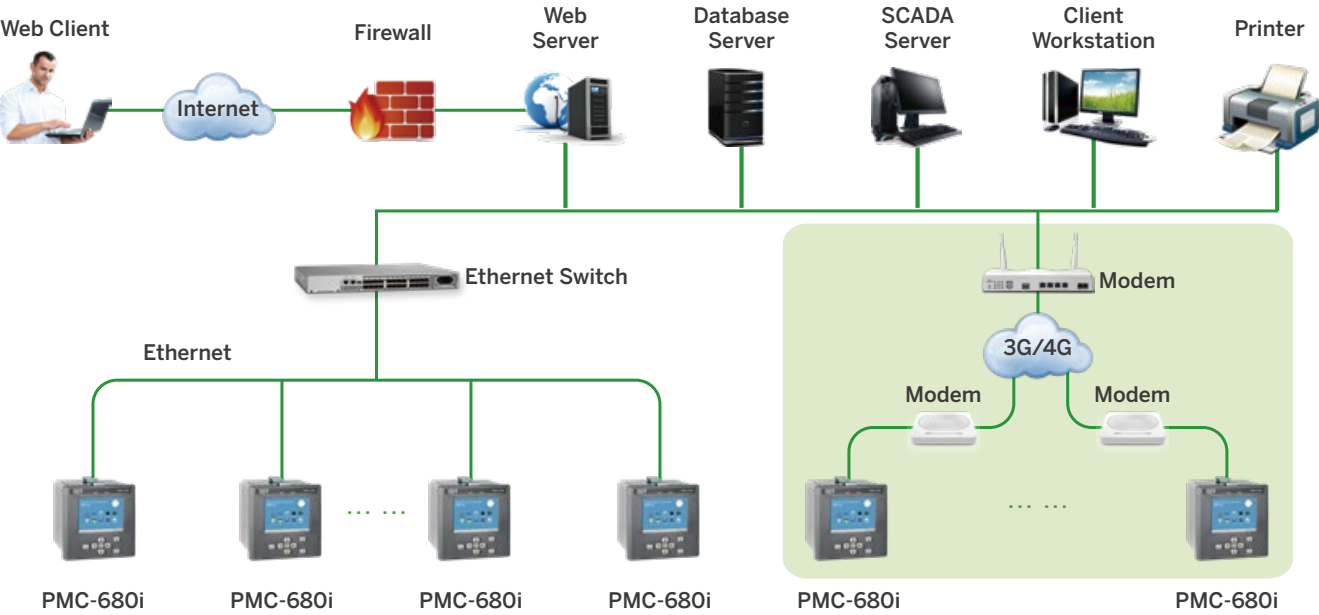
Environmental Conditions

Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	5% to 100% non-condensing
Atmospheric Pressure	70 kPa to 110 kPa
Pollution Degree	2
Measurement Category	CAT IV

Mechanical Characteristics

Panel Cutout	186x186 mm
Unit Dimensions	192x192x187 mm
IP Rating	52

Typical Application



Ordering Information

Product Code												Description
PMC-680i Advanced Power Quality Analyzer												
Sample/Cycle	A											512 samples/cycle
	B*											1024 samples/cycle
On-board Memory	4											4GB
	8*											8GB
Input Current	5											5A
	1											1A
	SCCPA^											SCCP Option for use with CT Clamps with maximum 500mV Output
	SCCPB~											SCCP Option or use with CT Clamps with Max. 5V Output @ 1mV/1mA
Input Voltage	3											240ULN/415ULL (Maximum 347ULN/600ULL+20%)
	9*											400ULN/690ULL
Power Supply	2											95-250AC/DC, 47-440Hz
	3											20-60VDC
System Frequency	5											50Hz
	6											60Hz
I/O	A											8×DI + 4×RO + 4×DO
Communications	A											2x100BaseT
	B*											2x100BaseT + 2xRS-485
	C*#											1x100BaseT + 1x100BaseFx + 2xRS-485
IEC61850	X											None
	A*											IEC61850 Protocol Support
Display Language	E											English
PMC-680i	-	A	4	5	3	2	5	A	A	X	E	PMC-680i- A45325AAXE (Standard Model)

* Additional Charges Apply
Please consult Factory for availability
^ The SCCPA option is compatible with the SCCP models listed in the "Optional SCCPs". This option does not come with any Current Clamp
~ The SCCPB option is compatible with the Universal Technic Clamp Model "M1 UB 1A/1V". This option does not come with any Current Clamp. Please also note that CET is not a re-seller of the Universal Technic Current Clamps

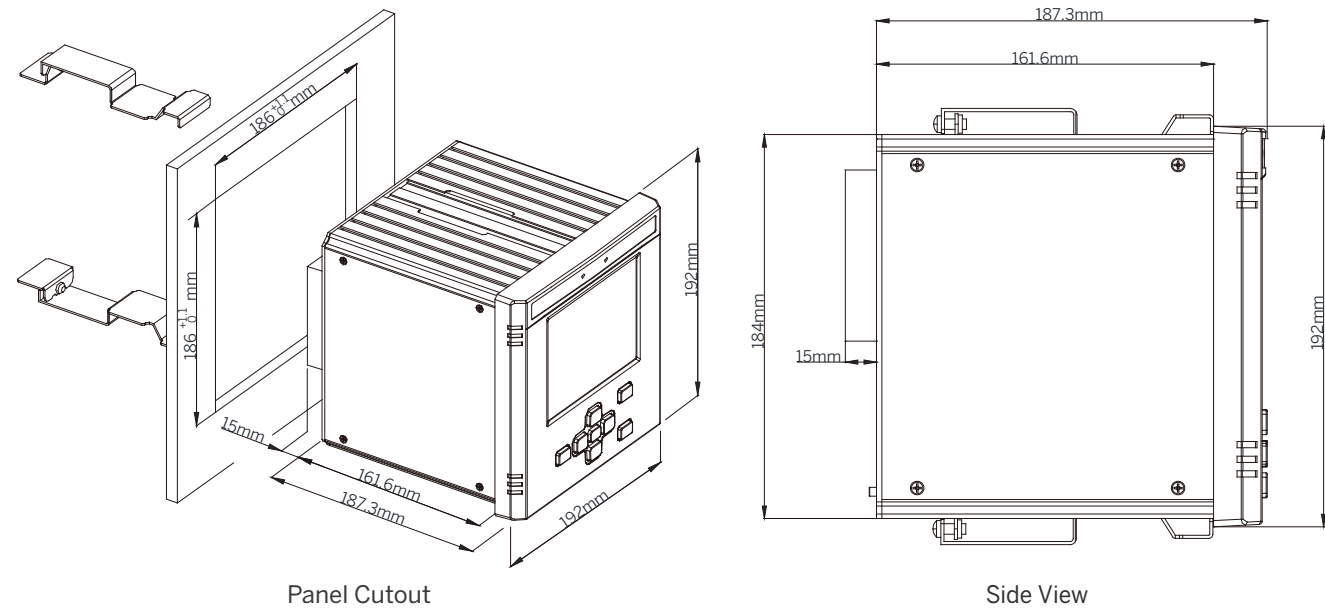
Optional SCCPs

				
Model No.	PMC-SCCP-50A-500mV-B-A-B	PMC-SCCP-200A-200mV-B-B-B	PMC-SCCP-500A-500mV-B-B-B	PMC-SCCP-5kA-500mV-B-C-C-371/254/150/100
Measurement Range	5A (50A Imax)	20A/200A (200A Imax)	500A (500A Imax)	500A/5000A Rogowski Coil (10,000A Imax)
Max. Allowable Current	50A	260A	500A	10,000A
Output Voltage	AC 10mV/A (Maximum 500mV)	AC 10mV/A @ 20A AC 1mV/A @ 200A (Maximum 200mV)	AC 1mV/A (Maximum 500mV)	AC 1mV/A @ 500A AC 0.1mV/A @ 5000A (Maximum 500mV)
Accuracy	±0.3% rdg. ±0.02% f.s.	±0.3% rdg. ±0.02% f.s.	±0.5% rdg. ±0.02% f.s.	±2.0% rdg. ±1.5mV
Protection	CAT III 300V	CAT III 600V	CAT III 600V	CAT III 1000V CAT IV 600V
Diameter	15mm	24mm	50mm	371/254/150/100 (mm)
Cable Length	3m	3m	3m	3m
Termination	BNC	BNC	BNC	BNC

* The Rogowski Coil SCCP comes with an external Universal Power Supply and an integrator

Device View and Dimensions

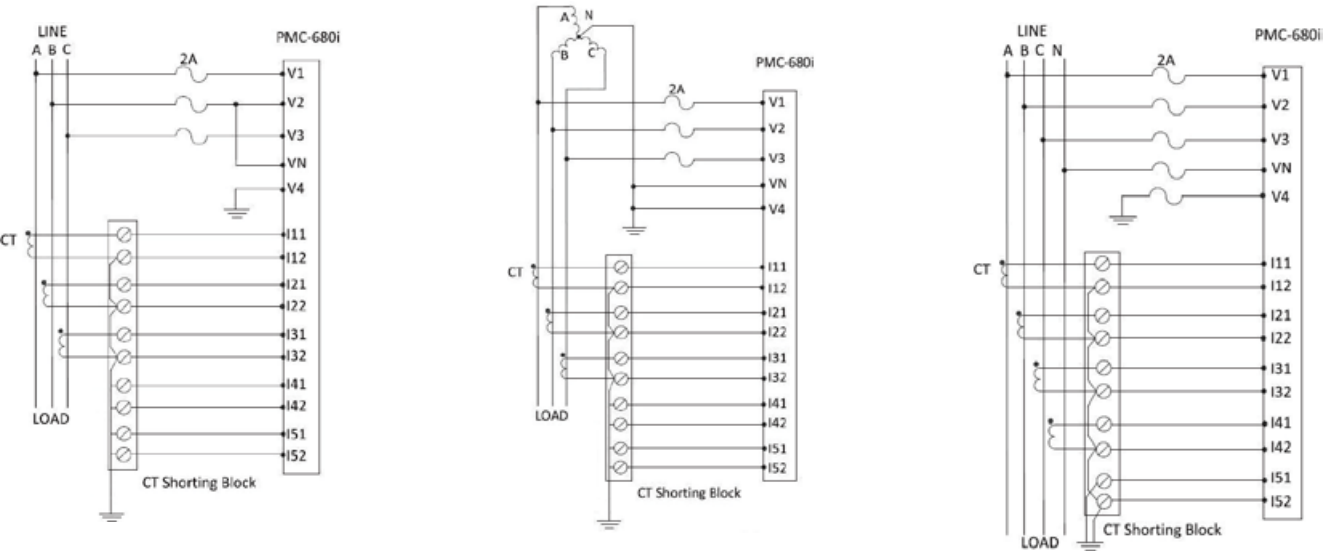
PMC-680i



Panel Cutout

Side View

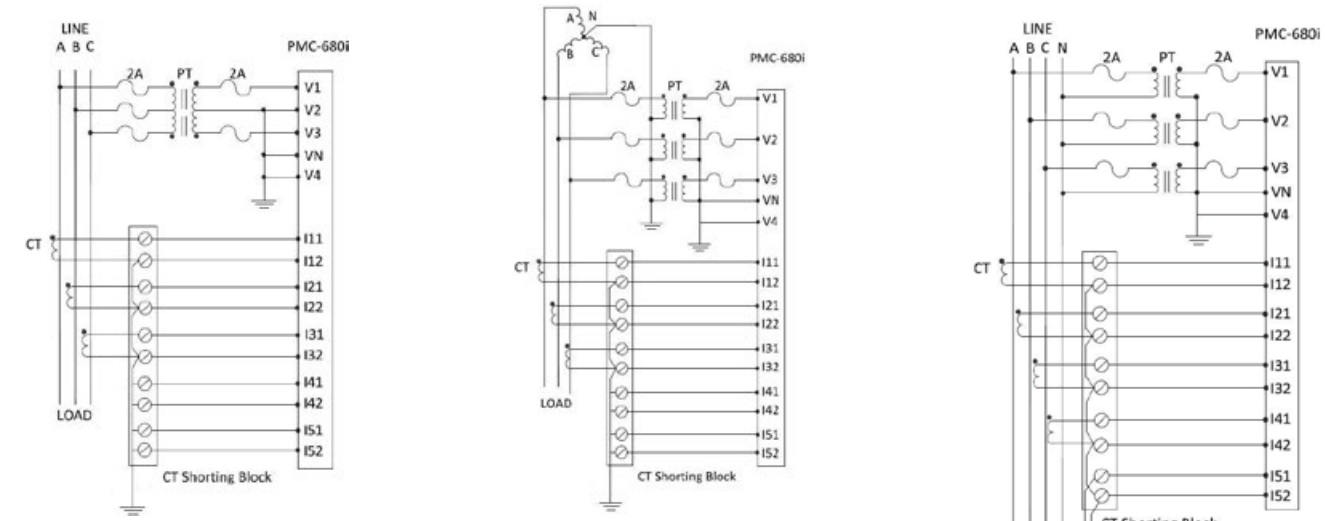
Wiring Diagrams



3-Wire Grounded Delta, no PTs, 3CTs

3-Wire Grounded Wye, Direct Connection, 3CTs

4-Wire Wye, no PTs, 4CTs



3-Wire Delta, 2PTs, 3CTs

3-Wire Grounded Wye, 3PTs, 3CTs

4-Wire Wye, 3PTs, 4CTs

PMC-690

Hand-Held Power Quality Analyzer



- ✓ 16GB Removable SD Card for Storage
- ✓ IEC 62053-22 Class 0.5S
- ✓ Class 0.1 accuracy for U & I Measurements
- ✓ 5.7” Backlit Color TFT LCD Display
- ✓ One Ethernet Port for On-line Communication
- ✓ One USB Port for Data Backup
- ✓ Low power consumption with 8 hours Battery Reserve
- ✓ IEC 61000-4-30 Class A, EN 50160

Features Summary

General

Class (kWh)	0.5S
Dimensions (mm)	252(W)x160(H)x59(D)
Display (Backlit)	Color TFT 640x480(Backlit)
True RMS Sampling Rate	512
Battery-backed Real-time Clock	✓
Operating Temperature (°C)	-10 to 55

Communications

Protocol	Modbus TCP, SNTP & IEC61850
RS-485 Port	-
Ethernet	1
Web Server	-

Measurements

ULN per Phase & Avg.	✓
ULL per Phase & Avg.	✓
Current per Phase & Avg.	✓
Neutral Current (Meas./Calc.)	✓
Frequency	✓
kW per Phase & Total	✓
kvar per Phase & Total	✓
kVA per Phase & Total	✓
PF per Phase & Total	✓
kWh Import/Export	✓
kvarh Import/Export	✓
kVAh Total	✓
Demands & TOU	✓
Maximum Demands	✓
Setpoints	✓

Power Quality

THD Voltage & Current	✓
TOHD Voltage & Current	✓
TEHD Voltage & Current	✓
K-Factor	✓
Individual Harmonics	2 nd - 63 rd
Voltage/Current Unbalance	✓
Waveform Capture on Screen	✓
Waveform Recording	✓
Dip Swell Detection	✓
Transient Detection	✓
IEC 61000-4-30	Ed.2 Class A Compliant
2-150kHz Conducted Emission	-

I/O

Digital Input (DI)	-
Pulse Counter	-
Mechanical Digital Output (DO)/Solid State Output (SS)	-
Analog Input (AI), 0/4-20mA	-
Analog Output (AO), 0/4-20mA	-
kWh & kvarh Pulse Output (LED)	-
kWh & kvarh Pulse Output	-
IRIG-B (GPS)	-

(Meas./Calc.)-Measured Value/Calculated Value

Main Features

Metering

PMC-690 performs basic measurements at 1-second update rate and High-Speed measurements for event detection at ½ cycle update rate

Basic Measurements (1-second update)

- 3-Phase U & I, Power, PF, U4, I4, Frequency and Phase Angle, kWh, kvarh Import/Export/Net/Total and kVAh Total

High-Speed Measurements (½ cycle update)

- 3-Phase Voltages and Currents, U4, I4, Power, PF, Frequency

Data and Event Recorders

Log Memory

- PMC-690 is equipped with a 16GB Removable SD Card for non-volatile storage

Statistical Data Recorder (SDR)

- Recording of the Max., Min., Avg. and 95th percentile of statistical measurements including U, I, Freq., Flicker, Harmonics & Unbalances
- Recording interval from 1 to 60 minutes
- 5 recorders (64 parameters/recorder)
- FIFO mode with configurable depth
- PQDIF file format, downloadable via the USB port

Max./Min. Recorder (MMR)

- 4 records (20 parameters/recorder) with Timestamp
- Logging of Max./Min. values for Real-time measurements such as U, I, kW, kvar, kVA, PF, Freq., Unbalance, K-Factor, THD
- Two log transfer modes:
 - Manual: Max./Min. Since Last Reset & Before Last Reset
 - Auto: Max./Min. of This Month & Last Month

Monitor Log

- 1024 FIFO entries time-stamped to ±1ms resolution
- Transients, Dips/Swells, Interruptions, Rapid Voltage Changes, Inrush Current, Setpoint events

Device Log

- 1024 FIFO events time-stamped to ±1ms resolution
- Setup changes, System events, Setpoint events

Logs

SOE Log	1024 entries
PQ Log	1024 entries
Energy Log	✓
Max./Min. Log	✓
On-board Log Memory	16GB

Communications

Ethernet Port

- 100BaseT TCP/IP Ethernet Ports with RJ45 connector
- Support Modbus TCP & IEC61850 Protocols
- Direct connection to PC with DiagSys for data transfer
- Simultaneous connections for 12xIEC61850 and 10xModbus TCP clients

SD Card

- 16GB Removable SD Card for easy data transfer to PC

USB Port

- Data transfer to USB storage device
- User friendly interface for transferring data/waveform through USB port

DiagSys

- DiagSys is an integrated Power Quality Analysis Software for reading and analyzing the data from PMC-690

Setpoints

PQ Setpoints

- Provides control output actions in response to Transients, Dips/Swells, Rapid Voltage Changes, Inrush Current and Harmonics

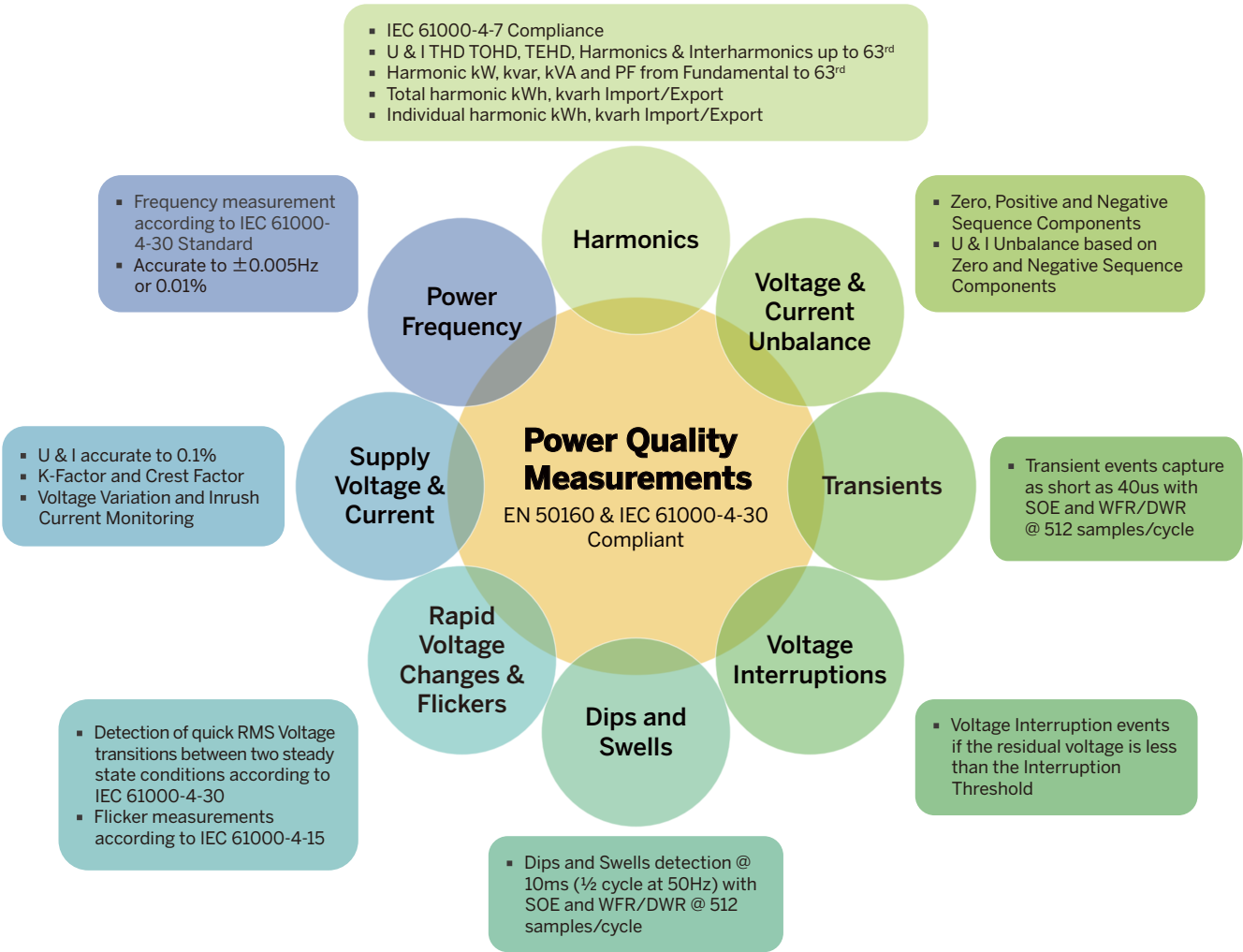
- Trigger SOE Log, RMS Recorder, WFR or DWR

Control Setpoints

- 24 Control Setpoints and 16 High-Speed Setpoints
- Extensive monitoring sources
- Configurable thresholds and time delays
- Trigger SOE Log, RMS Recorder, WFR or DWR

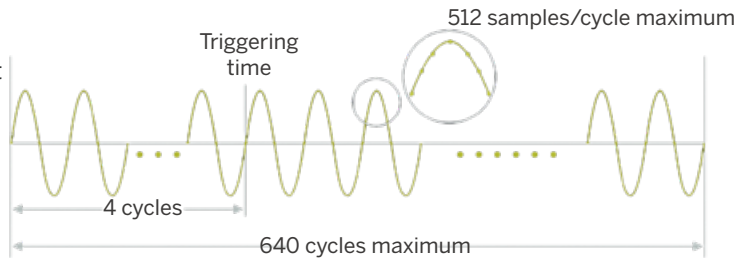
Power Quality Metering

The PMC-690 complies with IEC 61000-4-30 Class A, IEC 61000-4-7, IEC 61000-4-15 and EN 50160



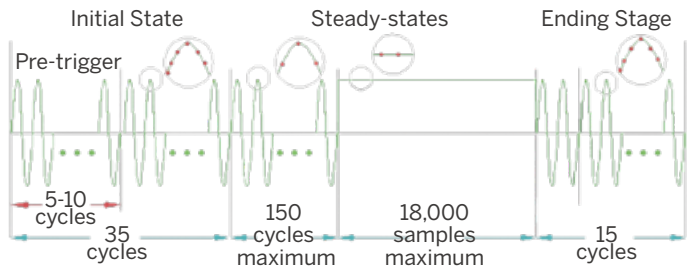
Waveform Capture (WFC) and Waveform Recorder (WFR)

- Real-time Waveform Capture via Front Panel Display
- Waveform Recorder with 500 entries
- Simultaneous capture of 3-phase Voltage and Current inputs
- # of Cycles x Samples/Cycle with programmable #of pre-fault cycles
 - 640x16, 320x32, 160x64
 - 80x128, 40x256, 20x512
- Extended recording for up to a maximum of 4 consecutive captures
- COMTRADE file format, downloadable via SD Card



Disturbance Waveform Recorder (DWR)

- Disturbance recording of all Voltage and Current up to 500 entries
 - Initial State: Up to 35 cycles @ 512 samples/cycle
 - Steady state: 3 to 150 cycles @ 16 samples/cycle, Up to 18,000 cycles @ 1 sample/cycle
 - Ending Stage: Up to 15 cycles @ 512 samples/cycle



Accuracy

Parameters	Accuracy	Resolution
Voltage	$\pm 0.1\%$	0.01V
Current	$\pm 0.1\%$ + CT Clamps Accuracy	0.001A
kW, kVA	$\pm 0.2\%$ + CT Clamps Accuracy	0.001kX
kWh, kVAh	IEC 62053-22 Class 0.5S	0.1kXh
kvar	$\pm 0.2\%$ + CT Clamps Accuracy	0.001kvar
kvarh	IEC 62053-23 Class 2	0.1kvarh
PF	$\pm 0.5\%$	0.001
Frequency	$\pm 0.005\text{Hz}$	0.001Hz
Harmonics	IEC 61000-4-7 Class A	0.01%
K-Factor	IEC 61000-4-7 Class A	0.01
Phase Angle	$\pm 0.2^\circ$	0.1°
Voltage Deviation	$\pm 0.1\%$	0.01%
Voltage Unbalance	$\pm 0.1\%$	0.01%
Current Unbalance	$\pm 0.5\%$	0.01%
Pst, Plt	$\pm 5\%$	0.001

Technical Specifications

Voltage Inputs (CH1, CH2, CH3, CH4)

Voltage Range		5V to 600V
Burden		<0.1VA per phase
PT Ratio	Primary	1-1,000,000V
	Secondary	1-690V
	I4 Primary	1-1,000,000V
	I4 Secondary	1-400V
Frequency		40Hz-60Hz @ 50Hz 48Hz-72Hz @ 60Hz

CT Clamps Current Inputs (CH1, CH2, CH3, CH4)

Input Range		550mV maximum
CT Ratio	Primary	1-30,000A
	Secondary	1-50A
	I4 Primary	1-30,000A
	I4 Secondary	1-50A

Power Supply (L+, N-, G)

Power Adapter		100-240VAC $\pm 10\%$, 47-63Hz
Rated Output		12VDC/3A, Eff. >75%
Burden		<2.5W
Battery	Capacity	7.2V, 4400mAh, Lithium
	Battery Life	8 hours (Backlit on) 16 hours (Backlit off)
Charge Time		3.5 hours

LCD Display

Type	Color TFT LCD, Industrial Grade
Resolution	640x480
Viewing Area	115x86 mm

Environmental Conditions

Operating Temperature	-10°C to 55°C
Storage Temperature	-20°C to 60°C
Humidity	5% to 95% non-condensing
Atmospheric Pressure	70kPa to 110kPa
Pollution Degree	2
Measurement Category	CAT IV

Mechanical Characteristics

Unit Dimensions	252x160x59 mm
Unit Weight	1.16kg
IP Rating	51

Optional SCCPs

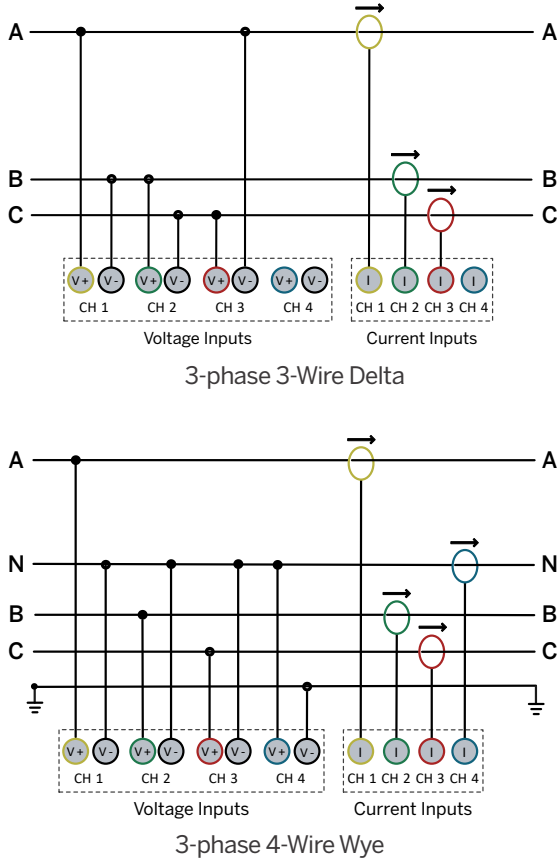
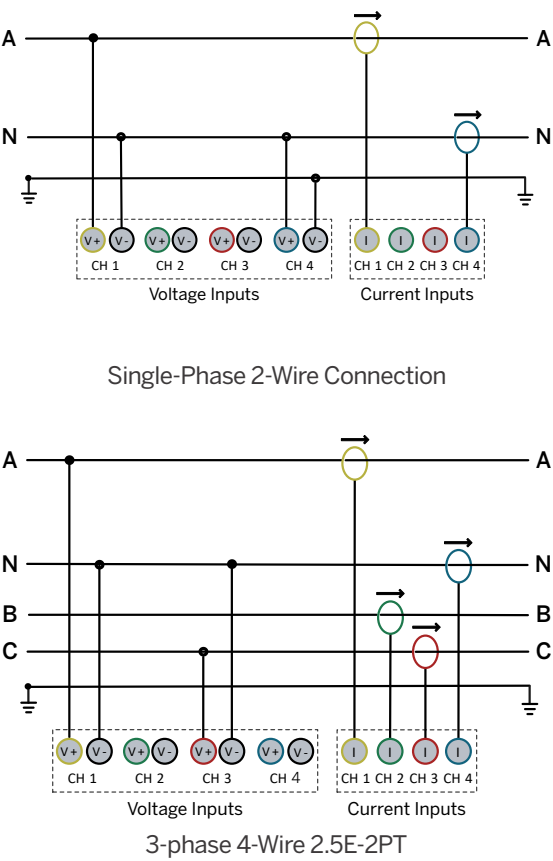
Model No.	PMCC-SCCP-50A-500mV-B-A-B	PMCC-SCCP-200A-200mV-B-B-B	PMCC-SCCP-500A-500mV-B-B-B	PMCC-SCCP-5kA-500mV-B-C-C
Measurement Range	5A (50A I _{max})	20A/200A (200A I _{max})	500A (500A I _{max})	500A/5000A Rogowski Coil (10,000A I _{max})
Max. Allowable Current	50A	260A	500A	10,000A
Output Voltage	AC 10mV/A (Maximum 500mV)	AC 10mV/A @ 20A AC 1mV/A @ 200A (Maximum 200mV)	AC 1mV/A (Maximum 500mV)	AC 1mV/A @ 500A AC 0.1mV/A @ 5000A (Maximum 500mV)
Accuracy	±0.3% rdg. ±0.02% f.s.	±0.3% rdg. ±0.02% f.s.	±0.5% rdg. ±0.02% f.s.	±2.0% rdg. ±1.5mV
Protection	CAT III 300V	CAT III 600V	CAT III 600V	CAT III 1000V CAT IV 600V
Diameter	15 mm	24 mm	50 mm	371/254/150/100 mm
Cable Length	3m	3m	3m	3m
Termination	BNC	BNC	BNC	BNC

* The Rogowski Coil SCCP comes with an external Universal Power Supply and an integrator

Device View and Dimensions

Unit: mm

Wiring Diagrams



PMC-592

Multi-Circuit Power Monitor



- ✓ 1GB Non-Volatile Log Memory
- ✓ IEC 62053-22 Class 0.5S (Mains)
- ✓ IEC 62053-21 Class 1 (Branches)
- ✓ Optional 7” Touch-Screen HMI
- ✓ One Ethernet and dual RS-485 Ports
- ✓ Monitor 2 Mains Circuits and up to 84 Branch Circuits
- ✓ Support 1-Ø, 2-Ø and 3-Ø Sub-Metering
- ✓ PQ Monitoring based on IEC 61000-4-30

Features Summary

General

Class (kWh)	0.5S
Dimensions (mm)	260.5(W)x154(H)x55.5(D)
Display (Backlit)	Optional Color TFT 800x480(Backlit)
True RMS Sampling Rate	64
Battery-backed Real-time Clock	✓
Operating Temperature (°C)	-25 to 70

Communications

Protocol	Modbus RTU, Modbus TCP, HTTP SNMP, SNTp, SMTP
RS-485 Port	2
Ethernet	1
Web Server	✓

Measurements

ULN per Phase & Avg.	✓
ULL per Phase & Avg.	✓
Current per Phase & Avg.	✓
Neutral Current (Meas./Calc.)	✓
Frequency	✓
kW per Phase & Total	✓
kvar per Phase & Total	✓
kVA per Phase & Total	✓
PF per Phase & Total	✓
kWh Import/Export	✓
kvarh Import/Export	✓
kVAh Total	✓
Demands & TOU	✓
Maximum Demands	✓
Setpoints	✓

I/O

Digital Input (DI)	2
Pulse Counter	✓
Mechanical Digital Output (DO)/Solid State Output (SS)	2DO
Analog Input (AI), 0/4-20mA	-
Analog Output (AO), 0/4-20mA	-
kWh & kvarh Pulse Output (LED)	✓
kWh & kvarh Pulse Output	-
IRIG-B (GPS)	-

Power Quality

THD Voltage & Current	✓
TOHD Voltage & Current	✓
TEHD Voltage & Current	✓
K-Factor	✓
Individual Harmonics	2 nd - 31 st
Voltage/Current Unbalance	✓
Waveform Capture on Screen	-
Waveform Recording	✓
Dip Swell Detection	✓
Transient Detection	-
IEC 61000-4-30	-
2-150kHz Conducted Emission	-

Logs

SOE Log	1000 entries
PQ Log	-
Energy Log	✓
Max./Min. Log	✓
On-board Log Memory	1GB

(Meas./Calc.):Measured Value/Calculated Value

Main Features

Metering

The PMC-592 features high-accuracy measurements for two Mains Inputs, each supporting 3 Voltage and 4 Current Inputs with the following measurements

Mains Inputs Measurements

- ULN and ULL per Phase and Average
- I per Phase and Average, measured Neutral Current
- kW, kvar, kVA, PF per Phase and Total
- Frequency
- Loading Factor per Phase and Average
- kWh Import/Export, kvarh Import/Export, kVAh Total
- Dual Tariff energy accumulation

Branch Circuits Measurements

- Current Input provides the following measurements:
- 21, 42, 63 or 84 Branch Current Inputs. Each Branch
 - I, kW, kvar, kVA, PF, Loading Factor, kWh, kvarh, kVAh and Maximum Demand with Timestamp

Flexible Configuration

- PMC-592 is designed to facilitate flexible installation in a compact and high-density environment with program-mable CT Ratio and Polarity, Phase or Line Reference Voltage, 2-Ø and 3-Ø Sub-Meter Grouping, CT Strip Installation Mode and Orientation as well as the follow-ing features to make site installation a breeze.
- Flexible Configuration of CT Ratio and Polarity Facili-tates Site Installation
 - Support common panel arrangements such as Single Panel Mode, Dual Panel Mode and 1-phase 3-Wire configuration
 - A single PMC-592 can be used to monitor two PDUs, each with one Mains and 42 Branch Circuits
 - Any Branch Current Input can be paired with any Phase or Line Voltage
 - Flexible configuration for 2-Ø and 3-Ø Sub-Meter Grouping to eliminate wiring mistakes at site that would cause the complete breakdown of sub-meter calculations due to rigid ordering for 2-Ø and 3-Ø Sub-Meter wiring offered by other competitors

Data and Event Recorders

Data Recorder

- 1GB On-board log Memory
- 10 Recorders of 64 parameters each
- Real-time parameter recording for trend analysis
- Programmable Log Depth: 65535 maximum

Interval Energy Recorder

- Complete energy profiling of two Mains, 1-Ø, 2-Ø and 3-Ø Sub-Meters, Virtual Meters for Tariffs T1 and T2
- Mains: kWh Import/Export, kvarh Import/Export and kVAh
- Sub-Meters and Virtual Meters: kWh Import, kvarh Import and kVAh

- Programmable Interval at 5, 10, 15, 30 or 60 minute Interval
- Fixed Log Depth at 10,000 entries, enough to record:
 - a. 1 month @ 5-minute
 - b. 2 months @ 10-minute
 - c. 3 months @ 15-minute
 - d. 6 months @ 30-minute
 - e. 12 months @ 60-minute

Max./Min. Recorder

- Mains: U, I, Frequency, kW, kvar, kVA, Loading Factor, PF, Unbalance, THD, TOHD, TEHD
- RTD1 and RTD2
- 1-Ø Sub-Meters: I, kW, kvar, kVA, PF, Loading Factor and I THD
- 2-Ø and 3-Ø Sub-Meters: I, kW, kvar, kVA, PF and Loading Factor
- Max./Min. Timestamp for This Month & Last Month (or Since Last Reset & Before Last Reset)

Waveform Recorder (WFR)

- Support up to 16 WFR Log entries
- Record V1-V3 and I1-I3 for both Mains-I and Mains-II
- Programmable resolutions (samples/cycle x # of cycles) at 64x150, 64x75, 32x300, 32x150, 16x600 and 16x300
- Triggered by Dip/Swell and Interruption Setpoints

SOE Log & Alarm Monitoring

- 1000 events time-stamped to ±1ms resolution
- Alarm Summary At-A-Glance
- Global Alarm Output
- 4 Alarm Levels: HH, H, L and LL
- All alarms are recorded in the SOE Log

Inputs and Outputs

The PMC-592 provides Digital I/Os for status monitor-ing, control, alarming as well as temperature monitoring. These signals can also be integrated into BAS for build-ing automation

Digital Inputs

- External status monitoring with programmable debounce
- 2 Channels, volt free dry contact, 24VDC internally wetted

Temperature Monitoring

- 2 Channels for PT100 sensor (sensor not included)
- Range from -40 to 200 °C
- Hot and Cold Aisle monitoring

Digital Outputs

- 2 Channels for external control and alarm
- 5A @ 250VAC/30VDC
- Facilitates Setpoint Control

Communications

P1, P2 (RS-485 ports)

- Optically isolated
- 1200 to 38,400 bps
- Modbus RTU
- Support up to two HMIs simultaneously

P3 (Ethernet Port)

- 10/100BaseT
- Modbus TCP
- HTTP, SMTP, SNTP, SNMP

PQ Metering

Mains Inputs

- U and I Unbalance based on Sequence Components
- THD, TOHD, TEHD and Individual harmonics to 31st
- TDD, Crest Factor and K-Factor
- Dips/Swells and Interruptions Detection with Waveform Recording

Branch Inputs

- Current THD per Branch Circuit

Branch Circuits

- Current THD per Branch Circuit

Mains

- U and I Unbalance based on Sequence Components
- THD, TOHD, TEHD and Individual harmonics to 31st
- TDD, Crest Factor and K-Factor

Waveform Recorder for Mains Inputs

- Programmable resolutions (Samples/ Cycle x # of Cycles) at 64x150, 64x75, 32x300, 32x150, 16x600 and 16x300
- Triggered by the following alarms: Dips, Swells and Interruptions

Typical Application

Base Unit

2xMains Inputs, each with 3-phase Voltages and 4-phase Currents
Up to 4 CT Branches with a maximum 21 CTs per Branch
2xDI, 2xRO, 2xRTD Inputs
1xRS-422/485 & 1xRS-485 with Modbus RTU
1x100BaseT with Modbus TCP and SNMP
Power Supply: 95-277VAC/VDC $\pm 10\%$, 47-440Hz
Burden: <5W

Optional HMI

7" Color Touch-Screen TFT
LCD with LED Backlight
Power Supply: 24VDC $\pm 20\%$
Burden: <10W

Branch Split-Core CT

For retrofit applications
100A, 200A, 400A, 800A and 1600A CTs
Imax: 120% In
Starting Current: 0.2% Imax
Burden: <0.05VA per phase

CT Strip

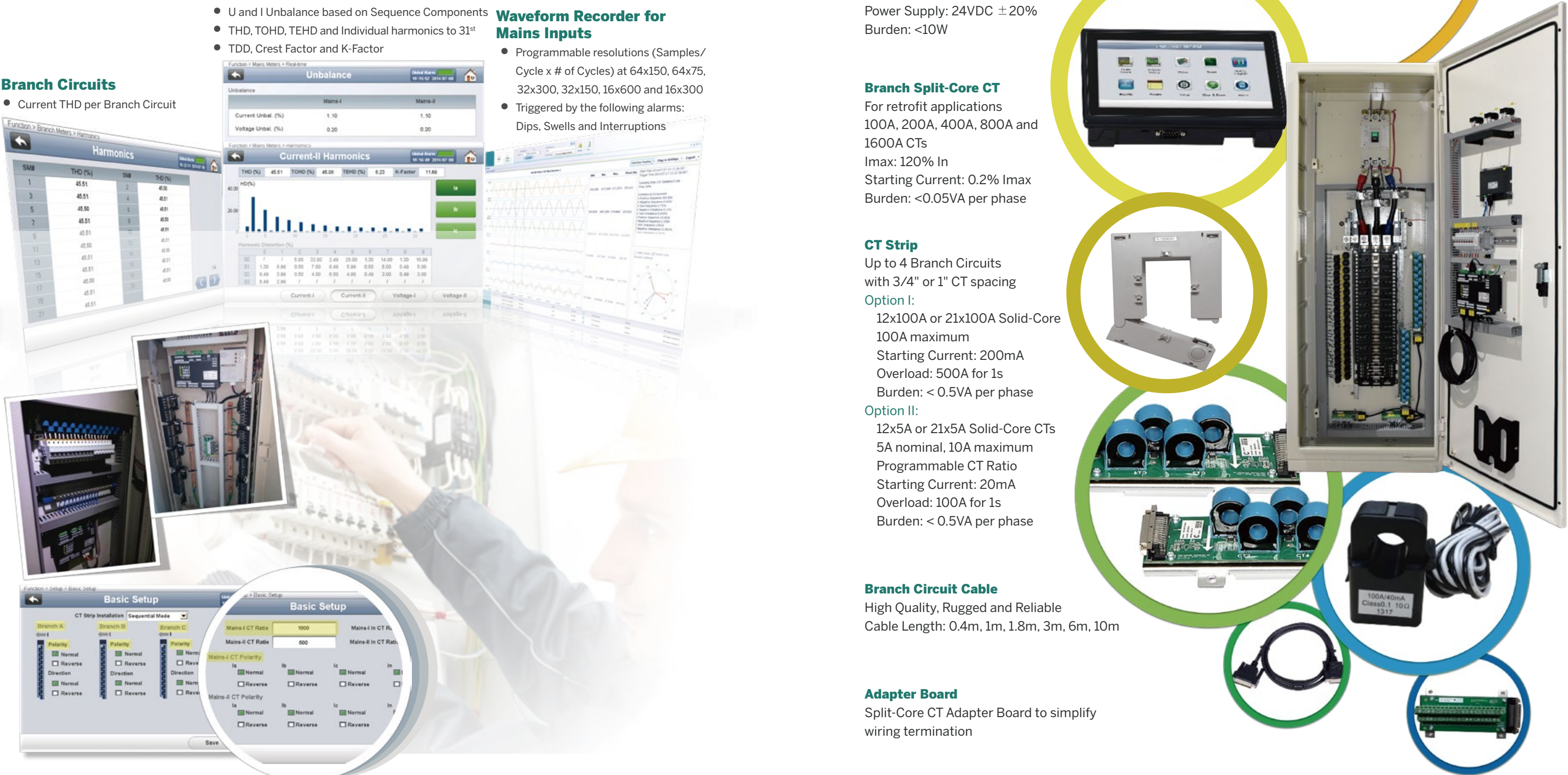
Up to 4 Branch Circuits
with 3/4" or 1" CT spacing
Option I:
12x100A or 21x100A Solid-Core
100A maximum
Starting Current: 200mA
Overload: 500A for 1s
Burden: < 0.5VA per phase
Option II:
12x5A or 21x5A Solid-Core CTs
5A nominal, 10A maximum
Programmable CT Ratio
Starting Current: 20mA
Overload: 100A for 1s
Burden: < 0.5VA per phase

Branch Circuit Cable

High Quality, Rugged and Reliable
Cable Length: 0.4m, 1m, 1.8m, 3m, 6m, 10m

Adapter Board

Split-Core CT Adapter Board to simplify wiring termination



Accuracy

Parameters	Accuracy	Resolution
Mains Voltage	± 0.2%	0.01V
Mains I1-I4	± 0.2%	0.001A
kW, kVA	IEC 62053-22 Class 0.5S for Mains IEC 62053-21 Class 1 for Branches (IEC 61557-12 Compliance)	0.001kX
kWh, kVAh		0.1kXh
kvar, kvarh	IEC 62053-23 Class 2 (IEC 61557-12 Compliance)	0.1kvar/kvarh
PF	1%	0.001
Frequency	± 0.02Hz	0.01Hz
Harmonics	IEC 61000-4-7 Class B	0.01%
K-Factor	IEC 61000-4-7 Class B	0.01
RTD	± 1°	0.1°

Technical Specifications

Main Voltage Inputs (V1, V2, V3, VN)

Standard (Un)		277ULN/480ULL
Range		10% to 120% Un
PT Ratio	Mains I/II-Primary	1-1,000,000V
	Mains I/II-Secondary	1-480V
Overload		2xUn continuous, 4xUn for 1s
Burden		< 0.05VA @ 277ULN per phase
Frequency		45-65Hz

Branch Inputs

CT Ratio		400 maximum
Burden		<0.05VA per phase
Starting Current		0.2% Imax
Solid-Core CT Strip	100A	In=100A, Imax=100A, Range=0.2-100%
	5A	In=5A, Imax=100A, Range=1-100%
Split-Core CT	100A	In=100A, Imax=120A, Range=5-120%
	200A	In=200A, Imax=240A, Range=5-120%
	400A	In=400A, Imax=480A, Range=5-120%
	800A	In=800A, Imax=960A, Range=5-120%
	1600A	In=1.6kA, Imax=1.92kA, Range=5-120%

Mains Current Inputs (I11, I12, I21, I22, I31, I32, I41, I42)

I Nominal (In)	5A/1A (CT rated Input)
Range	1% to 120%
Starting Current	0.3% of In
CT Ratio	6000 maximum for 5A, 30000 maximum for 1A
Overload	1.2xIn continuous, 10xIn for 1s
Burden	<0.3VA per phase

Power Supply for Main Unit (L+, N-)

Standard	95-277VAC/DC, ±10%, 47-440Hz
Burden	<6W

Digital Inputs (DI1, DI2, DIC)

Type	Dry contact, 24VDC internally wetted
Sampling	1000Hz
Debounce	1-9999 ms programmable

Digital Outputs (DO11, DO12, DO21, DO22)

Type	Form A Mechanical Relay
Loading	5A @250VAC/30VDC

RTD Input (TC11, TC12, TC21, TC22)

Type	PT100
Range	-40 to 200 °C

Environmental Conditions

Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	5% to 95% non-condensing
Atmospheric Pressure	70 kPa to 106 kPa
Pollution Degree	II
Overvoltage Category	CAT III

Mechanical Characteristics

Enclosure	Galvanized Steel
Unit Dimensions	260.5x154x55.5 mm
IP Rating	50

Mechanical Tests

Spring Hammer Test	IEC 62052-11: 2003
Vibration Test	IEC 62052-11: 2003
Shock Test	IEC 62052-11: 2003

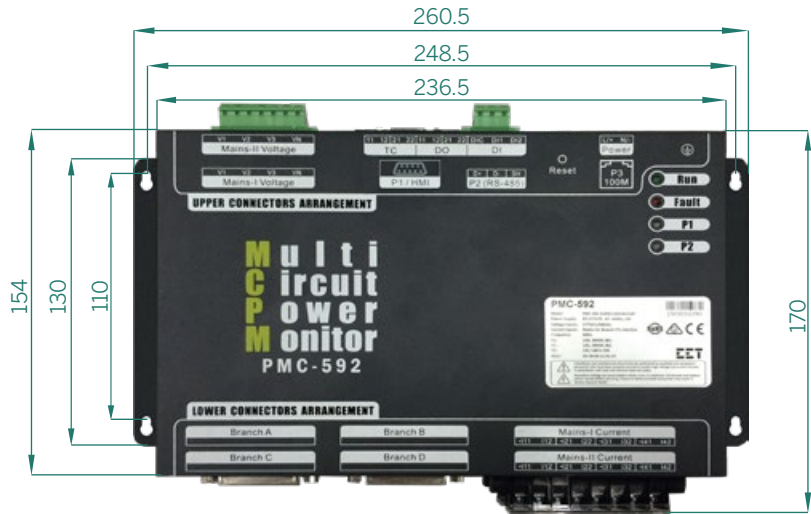
Ordering Information

Product Code										Description					
PMC- 592 Multi Circuit Power Meter															
Functionality		A						The PMC-592 Base Unit comes with 2xMains Inputs, each with 3-phase Voltages and 4-phase Currents, 2xRTD Inputs, 2xDI, 2xDO, 1xRS-422/485 Port (HMI Interface), 1xRS-485 Port and 1x100BaseT Port. It supports up to 4 CT Branches with a maximum 21 CTs per Branch							
Current Rating for the 2 Mains Feeders			5						5A: Standard						
			1						1A						
Voltage Rating for the 2 Mains Feeders				3						277ULN/480ULL					
Control Power Ratings					2						95-277 VAC/DC, 47-440Hz				
Power System Frequency						5						50Hz			
						6						60Hz			
Current Rating for Branch Feeders								100				100A Branch Current Inputs * Select this option for use with 100A Fixed Core CT Strip or with CT Adapter Board and 100A-1600A Branch SCCTs			
									010				10(5)A CT Inputs This option cannot be used with Branch SCCTs		
Language Version for Front Plate									E				English: Standard for International		
PMC-592		-	A	5	3	2	5	100	E				PMC-592-A5325100E (Standard Model)		

- 1) The PT100 sensor for the RTD Input is an optional item
- 2) The PMC-592's HMI with 7" LCD with 24VDC power supply module is an optional item
- 3) Please refer to PMC-592 Accessories for details

Device View and Dimensions

Unit: mm



Accessories

Product Code		Description
PMC-592-HMI		
Basic Function	A	7" TFT LCD, 800x480, 1xRS-422/485 port, a RS-422 cable and an external 24VDC Switching Power Supply
	C	Same as 'A' but supports two PMC-592 (168 feeders)
Interface Language	E	English
PMC-592HMI	- A E	PMC-592-HMI-AE (Standard Model)

* The standard cable length for connecting the HMI to the PMC-592 Main Unit is 3.0m
Please contact the factory in advance for special requirements

Split-Core CT for Mains

Part Number	Rating	Accuracy	Aperture (mm)
PMC-SCCT-400A-1A-A	400A/1A	0.5	50×80
PMC-SCCT-600A-1A-A	600A/1A	0.5	50×80
PMC-SCCT-800A-1A-A	800A/1A	0.5	50×80
PMC-SCCT-1000A-1A-A	1000A/1A	0.5	80×120

Split-Core CT for Branch Circuits

Part Number	Rating	Accuracy	Aperture (mm)
PMC-SCCT-100A-40mA-16-A	100A/40mA	Class 0.5	Ø16
PMC-SCCT-200A-40mA-24-A	200A/40mA	Class 0.5	Ø24
PMC-SCCT-400A-40mA-35-A	400A/40mA	Class 0.5	Ø35
PMC-SCCT-800A-40mA-A	800A/40mA	Class 0.5	80x50
PMC-SCCT-1600A-40mA-A	1600A/40mA	Class 0.5	129x55

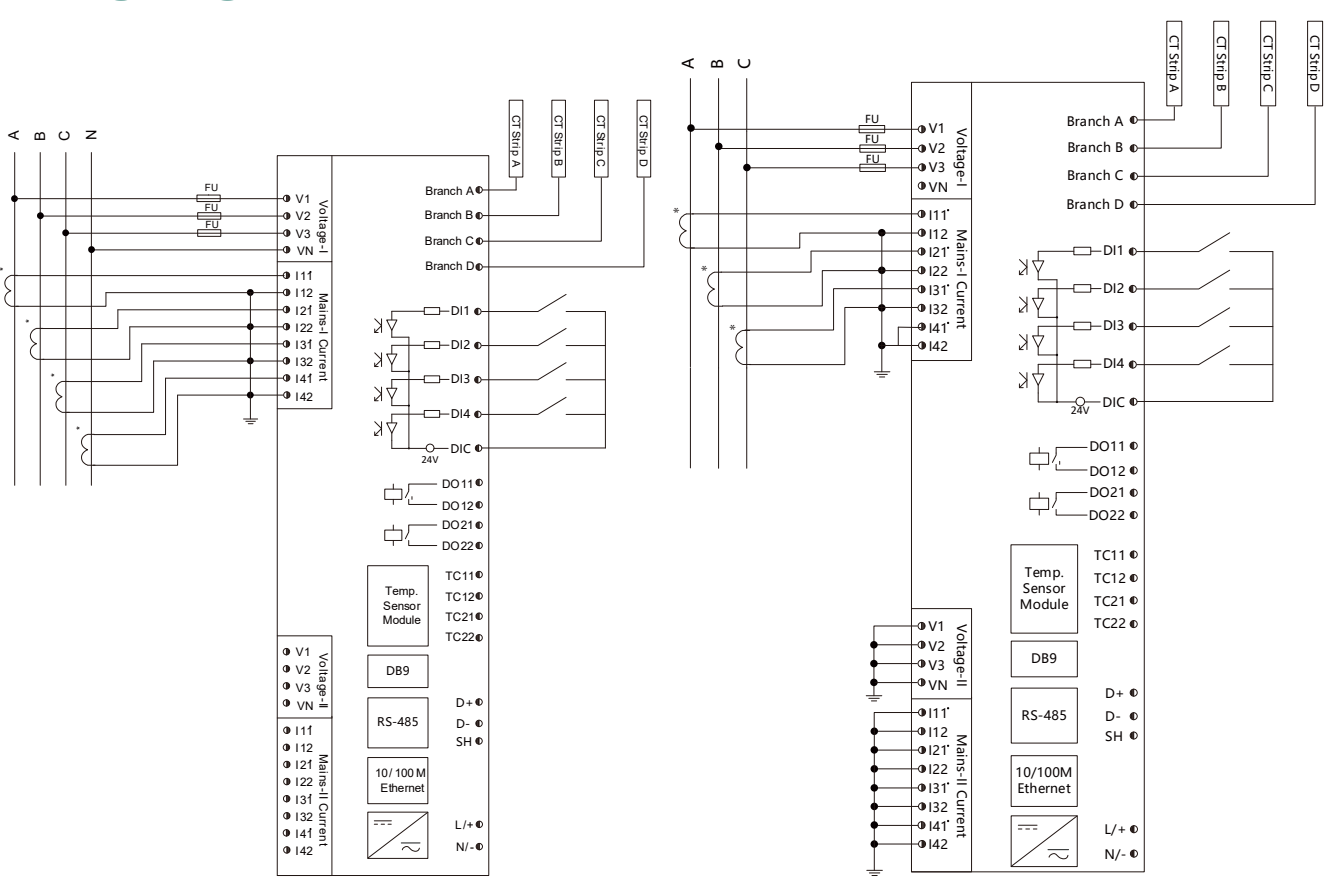
Solid-Core CT for Branch Circuits

Part Number	Rating	Accuracy	Aperture (mm)
PMC-CT-100A-40mA-12-A	100A/40mA	Class 0.2	Ø12
PMC-CT-400A-40mA-A	400A/40mA	Class 0.2	31x24
PMC-CT-800A-40mA-A	800A/40mA	Class 0.2	103x33

Branch CT Strips

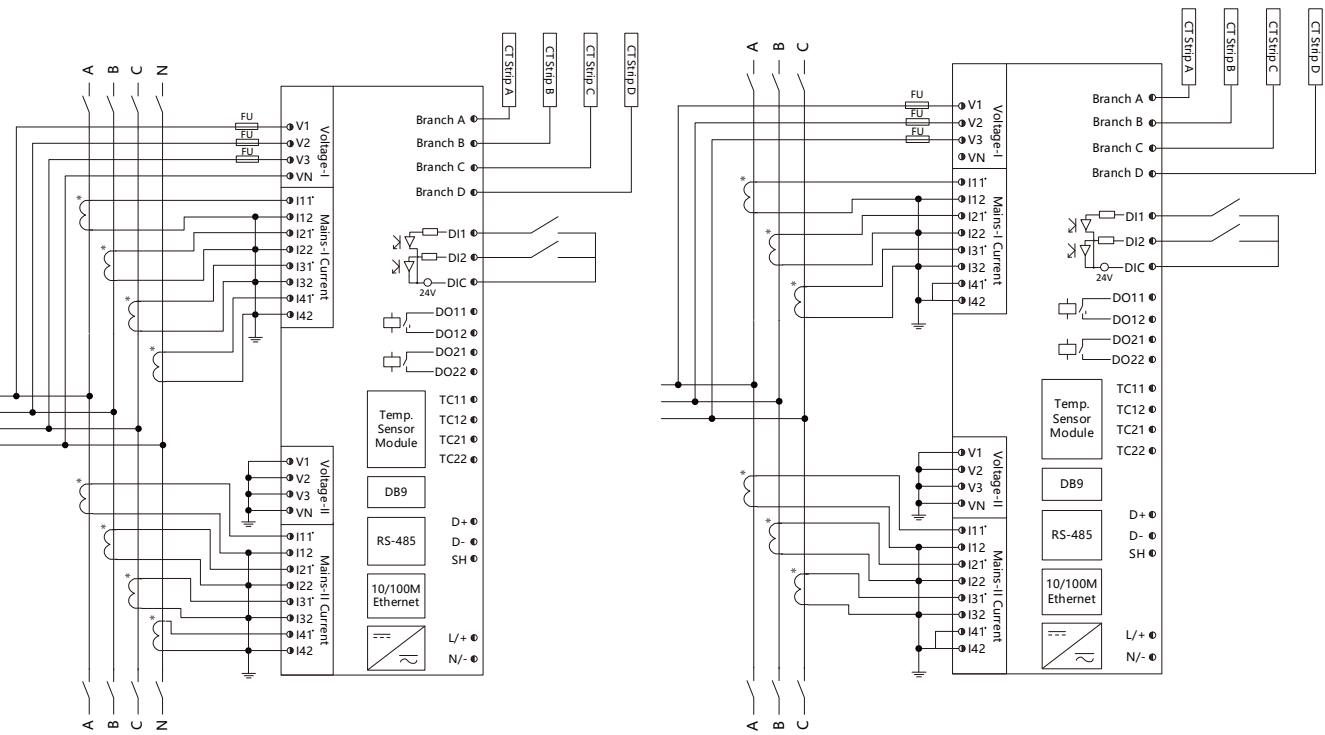
CT Strip Models	Accuracy	Aperture (mm)
CT Strip with ¾" Spacing and 21×100A CTs	0.1	11
CT Strip with 1" Spacing and 21×100A CTs	0.1	11
CT Strip with ¾" Spacing and 12×100A CTs	0.1	11
CT Strip with ¾" Spacing and 12×5A CTs	0.1	11
CT Strip with ¾" Spacing and 21×5A CTs		
SCCT Adapter Board	-	-

Wiring Diagrams



Single Panel Mode with One Mains Only (Wye)

Single Panel Mode with One Mains Only (Delta)



Single Panel Mode with Two Mains (Wye)

Single Panel Mode with Two Mains (Delta)

PMC-512-A

AC Multi-Circuit Power Monitor



- ✓ 4MB Log Memory
- ✓ Class 1 Accuracy for Energy Measurements
- ✓ Optional 7" Touch-Screen HMI
- ✓ DIN Rail Mount Enclosure with LCD Display
- ✓ Dual RS-485 Ports
- ✓ 12x1-Ø or 4x3-Ø Sub-Meters
- ✓ 12xDI, 1xDO, 1xAI for Status Monitoring

Features Summary

General

Class (kWh)	1
Dimensions (mm)	126(W)x90(H)x65(D)
Display (Backlit)	B&W(Backlit)
True RMS Sampling Rate	64
Battery-backed Real-time Clock	✓
Operating Temperature (°C)	-25 to 70

Communications

Protocol	Modbus RTU
RS-485 Port	2
Ethernet	-
Web Server	-

Measurements

ULN per Phase & Avg.	✓
ULL per Phase & Avg.	✓
Current per Phase & Avg.	✓
Neutral Current (Meas./Calc.)	✓
Frequency	✓
kW per Phase & Total	✓
kvar per Phase & Total	✓
kVA per Phase & Total	✓
PF per Phase & Total	✓
kWh Import/Export	✓
kvarh Import/Export	✓
kVAh Total	✓
Demands & TOU	Dmd. Only
Maximum Demands	✓
Setpoints	✓

Logs

SOE Log	512 entries
PQ Log	-
Energy Log	✓
Max./Min. Log	-
On-board Log Memory	4MB

I/O

Digital Input (DI)	12
Pulse Counter	✓
Mechanical Digital Output (DO)/Solid State Output (SS)	1DO
Analog Input (AI), 0/4-20mA	1
Analog Output (AO), 0/4-20mA	-
kWh & kvarh Pulse Output (LED)	✓
kWh & kvarh Pulse Output	-
IRIG-B (GPS)	-

Power Quality

THD Voltage & Current	✓
TOHD Voltage & Current	✓
TEHD Voltage & Current	✓
K-Factor	✓
Individual Harmonics	2 nd - 31 st
Voltage/Current Unbalance	✓
Waveform Capture on Screen	-
Waveform Recording	-
Dip Swell Detection	-
Transient Detection	-
IEC 61000-4-30	-
2-150kHz Conducted Emission	-

(Meas./Calc.)-Measured Value/Calculated Value (Dmd.)-Demand

Main Features

Metering

- Class 1 Accuracy for Energy measurements
- 1-Ø SM: Voltage, Current, Phase Angle, Frequency, Loading Factor, P, Q, S, PF, kWh, kvarh Import/Export, kVAh
- 3-Ø SM: ULN & ULL per Phase and Average, I per Phase and Average, Unbalance, Phase Angle, Frequency, P, Q, S, PF per Phase and total, kWh, kvar Import/Export, kVAh Total

Virtual Meters (VM)

- Up to 4 Virtual Meters for arbitrary aggregation of 1-Ø SMs
- kW/kvar/kVA Total (via communications only)
- kWh/kvarh Import/Export and kVAh Total
- kW/kvar/kVA Total Demand and Maximum Demand with Timestamp (via communications only)

Demand Measurements

- 1-Ø SM: Current, P, Q, S
- 3-Ø SM and VM: P, Q, S Total
- Maximum Demands for This Month & Last Month
- Ability to reset any Maximum Demands

Data and Event Recorders

- 4MB Log Memory

Data Recorder

- Up to 60 parameters @ min. 1-min recording interval for 5,000 logs with Timestamps
- 24 Monthly Energy Logs
- 1-Ø SM, 3-Ø SM and VM: kWh, kvarh Import/Export & kVAh

- 1,000 Daily Freeze Logs
- 1-Ø SM: Current, P, Q, S, kWh, kvarh Import/Export & kVAh
- 3-Ø SM and VM: P, Q, S Total, kWh, kvarh Import/Export & kVAh

SOE Log

- 512 FIFO events time-stamped to ±1ms resolution
- DI/DO changes, Alarms, Setup changes, Self-Diagnosis

Alarm Monitoring

- 4 Alarm Levels for Voltage, Current and AI
- Frequency, Unbalance, DI, Phase Reversal & Phase Loss Alarms
- Programmable Digital Output Trigger
- Facilitate comprehensive monitoring and alarming for Mains & Branch Circuits

Inputs and Outputs

Digital Inputs

- 12xDIs with external excitation @ 48VDC

Digital Output

- 1xDO, mechanical relay @ 250VAC/5A or 30VDC/5A

Analog Input

- 1xAI, 0-20/4-20mA

Communications

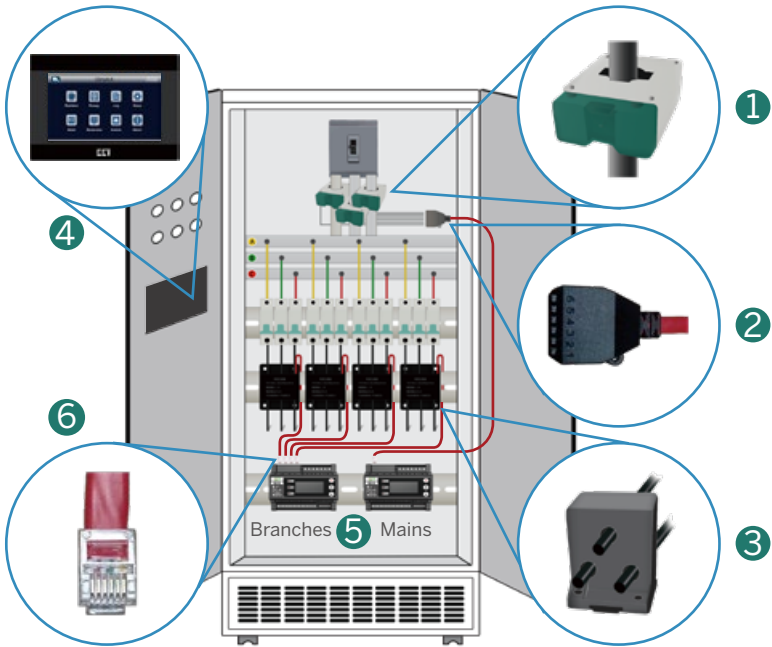
RS-485 (P1, P2)

- 2xRS-485, Modbus RTU protocol
- Baud rate @ 1,200 to 57,600 bps

PQ Metering

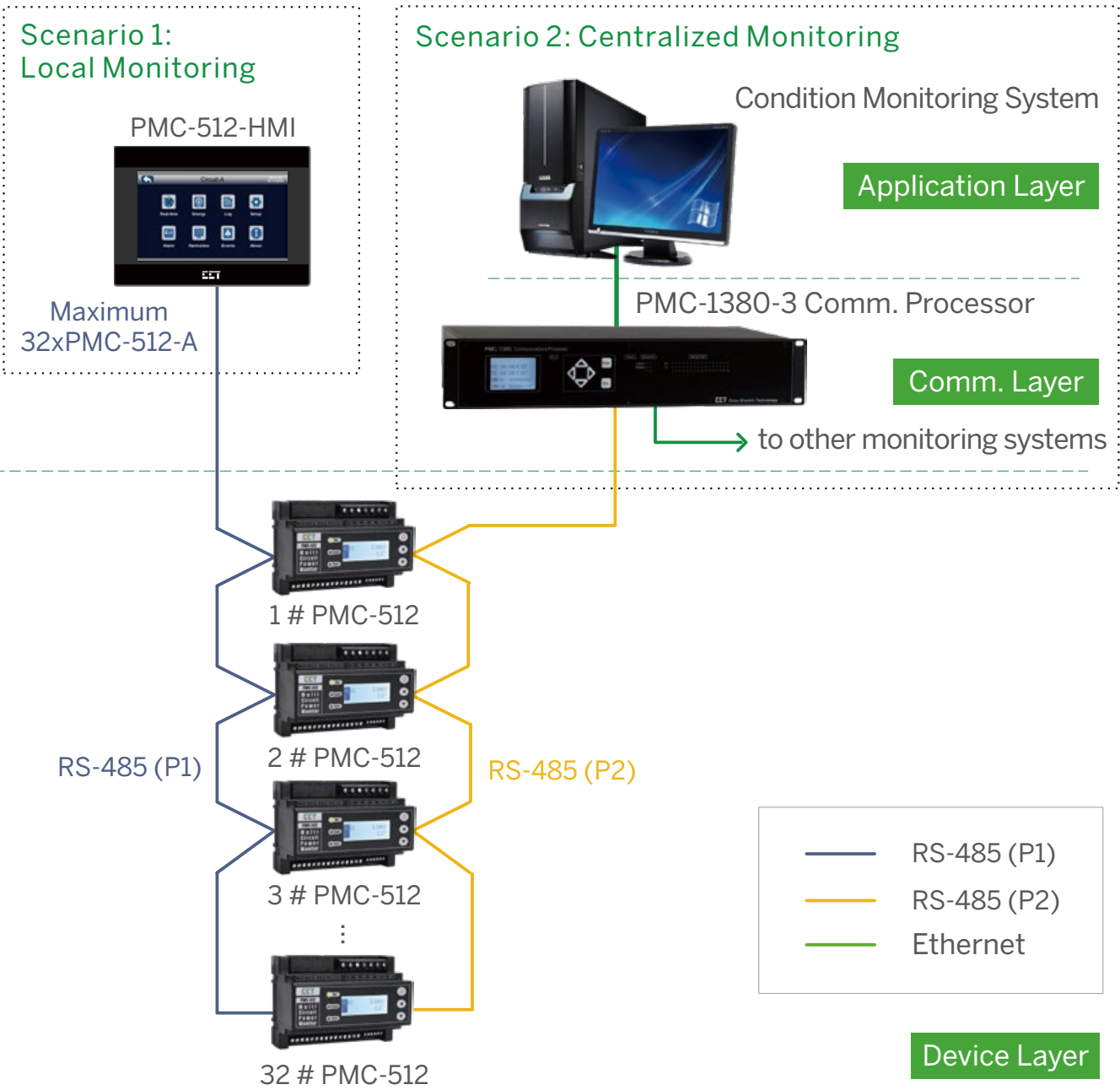
- THD, TOHD, TEHD
- Individual Harmonics up to 31st
- U and I Unbalance

Typical Application



- 1 Mains Solid-Core/Split-Core CTs
1 for each Phase
- 2 6-position CT wiring adapter with RJ12 connector for 1-Ø CT
1 Adapter for 3x1-Ø CTs
- 3 Molded Case 3-Ø CT (Max. 100A)
3x1-Ø Circuits or 1x3-Ø Circuit
- 4 PMC-512-HMI
• 7" TFT Touch-Screen Color LCD Display @ 800x480
• Requires 24VDC Power Supply
• Supports 32xPMC-512-A
- 5 PMC-512-A
- 6 RJ12 connector

Typical Application (Continue)



Accuracy

Voltage/Current	± 0.5%
P, Q, S	± 1.0%
kWh, kVAh	IEC 62053-21: 2003 Class 1
kvarh	IEC 62053-24: 2014 Class 1
PF	± 1.0%
Frequency	± 0.02Hz

Power Supply (L+, N-, GND)

48VDC Power Supply	20-60VDC ± 10%, <2W
240V Power Supply	95-250VAC/DC 47-440Hz, <2W

Voltage Inputs (V1, V2, V3, VN)

PMC-512-A

Standard (Un)	Un	240ULN/415ULL
	Range	10V to 1.2Un
	Start Voltage	10V
	Overload	1.2xUn continuous, 2xUn for 10s
	Burden	<0.05VA per phase
Ung	Range	0~5V
Frequency		45-65Hz

Current Inputs (I11, I12, I21, I22, I31, I32)

In Primary	5A/100A/200A/250A/400A/800A/1600A
In Secondary	1.667mA for 5A
	40mA for 100A/200A/250A/400A/800A/1600A
Range	0.4% to 100% In Primary
Starting Current	0.004In Primary

Digital Inputs (IN1-IN12, COM)

Type	12xDI, 48VDC External Excitation
------	----------------------------------

Digital Outputs (DO+, DO-)

Type	Form A Mechanical Relay
Loading	5A @ 250VAC or 30VDC

Analog Input (AI+, AI-)

Type	0-20 mA/4mA-20mA
Overload	24 mA maximum

Communications (D1+, D1-, D2+, D2-)

RS-485	2xRS-485, Modbus protocol, 1,200-57,600 bps
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Environmental Conditions

Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	5% to 95% non-condensing
Atmospheric Pressure	70 kPa to 106 kPa
Altitude	≤ 2,000m

Installation Torque

Spring Hammer Test	IEC 62052-11: 2003 Level I
Vibration Test	IEC 62052-11: 2003 Level I
Shock Test	IEC 62052-11: 2003 Level I

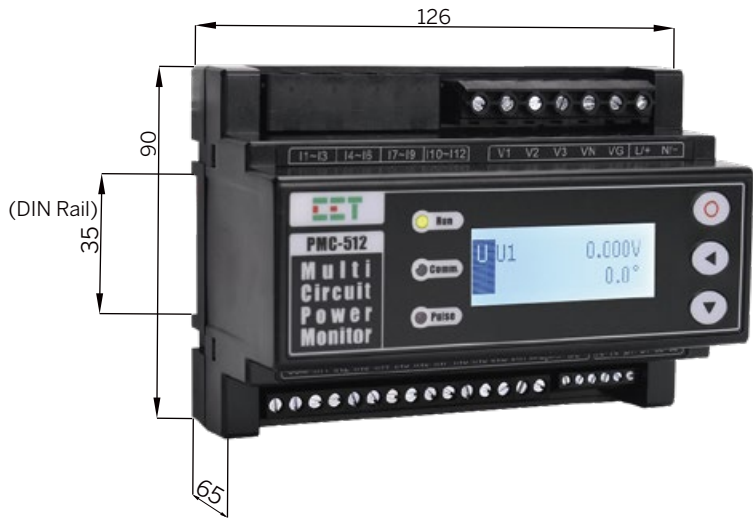
Ordering Information

Product Code										Description
PMC-512 AC Multi-Circuit Power Monitor										AC Multi-Circuit Power Monitor with 3-Ø Voltage & 12xCurrent Inputs for 12x1-Ø or 4x3-Ø Sub-Meters, 4 Virtual Meters, Data Recorder with 4MB Memory, 12xDI, 1xDO, 1xAI and 2xRS-485
Basic Function	A									
Display Screen		L								LCD
Input Current			A							External CT with 100A-1600A Primary and 40mA Secondary
			B							External CT with 5A Primary and 1.667mA Secondary
Input Voltage				3						240VAC (3x240ULN/415ULL)
Power Supply					2					95-250VAC/DC, 47-440Hz
					3					20-60VDC
Frequency						5				45-65Hz
DI							A			12xDI, 48VDC External Excitation
Display Language								E		English
PMC-512	-	A	L	A	3	2	5	A	E	PMC-512-ALA325AE (Standard Model)

- 1) The CTs and cables are not included, please refer to PMC-512-A Accessories for CT options
2) Please refer to PMC-512-HMI for HMI option

Device View and Dimensions

Unit: mm



Accessories

PMC-512-HMI

Basic Function	A		7" TFT Touch Screen LCD @ 800x480 and 24VDC ± 20% Power Supply, supporting up to 32xPMC-512-A	
Switching Power Supply		2	HDR-15-24 Switching Power Supply (Input: 85-264VAC/DC, Output: 24VDC)	
		4	PMC-DP-48V/24V Switching Power Supply (Input: 48VDC, Output: 24VDC)	
Language			E English (Supports both English and Traditional Chinese)	
PMC-512-HMI	A	2	E PMC-512-HMI-A2E (Standard Model)	

- 1) The cables for connecting the HMI to the Switching Power Supply are not included
- 2) The HMI and PMC-512 are using High-Speed communication. It is recommended to use shielded twisted-pair cable with diameter from 0.5 to 1.0mm²
- 3) Please contact the factory in advance for special requirements

Branch CTs

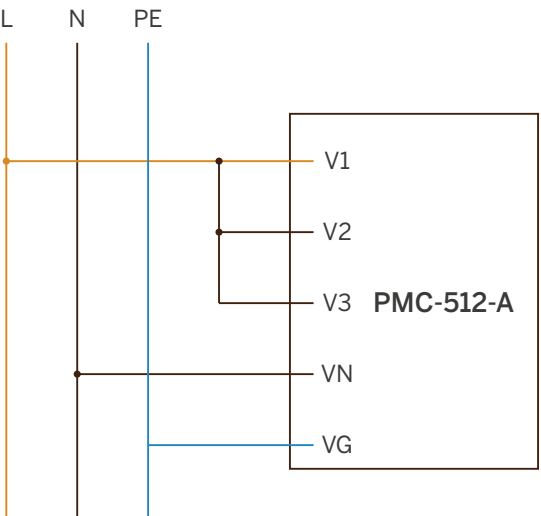
Part Number		Specification	Accuracy	Aperture (mm)	Cable Length	
Split-Core	PMC-SCCT-5A-1.667mA-10-A	10A, 1-Ø Split-Core CT	1.0	Ø10	2m	
	PMC-SCCT-100A-40mA-16-A	100A, 1-Ø Split-Core CT	0.5	Ø16	2m	
	PMC-SCCT-200A-40mA-24-A	200A, 1-Ø Split-Core CT	0.5	Ø24	2m	
	PMC-SCCT-400A-40mA-35-A	400A, 1-Ø Split-Core CT	0.5	Ø35	2m	
	PMC-SCCT-800A-40mA-A	800A, 1-Ø Split-Core CT	0.5	80x50	Not included	
	PMC-SCCT-1600A-40mA-A	1600A, 1-Ø Split-Core CT	0.5	129x55	Not included	
Solid-Core	PMC-CT-100A-40mA-12-A	100A, 1-Ø Solid-Core CT	0.2	Ø12	2m	
	PMC-CT-250A-40mA-A	250A, 1-Ø Solid-Core CT	0.2	31x24	Not included	
	PMC-CT-400A-40mA-A	400A, 1-Ø Solid-Core CT	0.2	31x24	Not included	
	PMC-CT-800A-40mA-A	800A, 1-Ø Solid-Core CT	0.2	103x33	Not included	
	PMC-CT-100A-40mA-3P-A	100A, 3-Ø Molded Case CT	0.1	3xØ10	2m	
	PMC-CT-250A-40mA-3P-A	250A, 3-Ø Molded Case CT	0.2	3xØ20	2m	
	PMC-CT-630A-40mA-3P-A	630A, 3-Ø Molded Case CT	0.2	3xØ40	2m	

CT Adapter

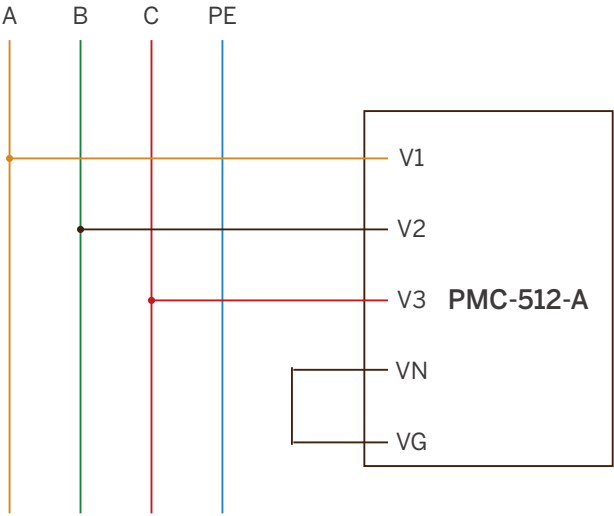
Part Number	Description	Cable Length	
PMC-BCC-3CT	3 single-phase CTs can be connected through one Adapter	0.5m	

- 1) Please refer to Cable Length for details and contact the factory in advance for special requirements
- 2) The PMC-BCC-3CT Adapter must be equipped when using single-phase CTs. The CT cables are not included
The recommended CT cable diameter is 0.5-1.0mm²

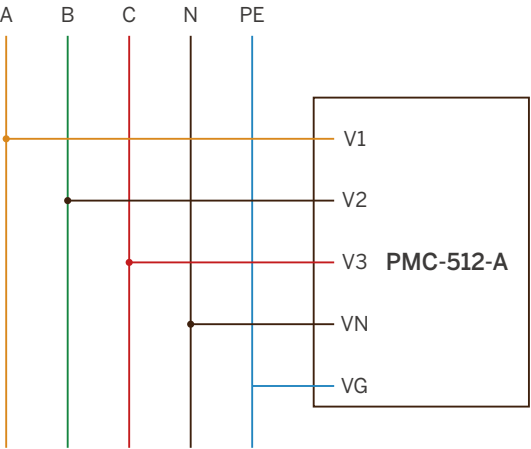
Wiring Diagrams



Single-Phase



3P3W Delta



3P4W Wye

PMC-512-A

PMC-CT, SCCT & SCCP

Current Transformer and Current Probe



- ✓ Designed for CET's Meters and Analyzers
- ✓ Wide Application Range from 5A to 5000A
- ✓ CT & SCCT: RoHS Compliance
- ✓ SCCP: EN 61010-2-032: 2012 Safety Compliance

Caution

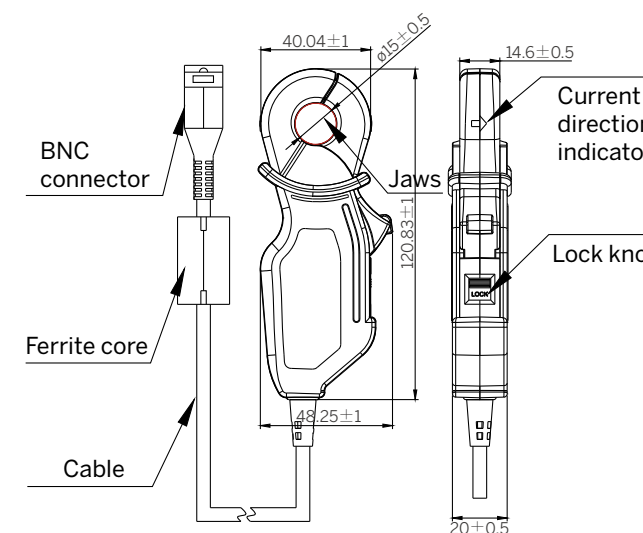
- Avoid using the instrument if it has been exposed to rain or moisture, or if your hands are wet.
- To avoid unexpected injury when performing measurements on live conductors, always put on insulated gloves, boots, safety helmet and other personal protective equipment.
- The instrument should only be connected to the secondary side of a breaker, which is designed to prevent accidents in the event of a short circuit. The product should never be used on the primary side of a breaker because un-restricted current could cause serious accidents if a short circuit occurs.
- To avoid short circuits and potentially life threatening hazards, never attach the instrument to a circuit that operates at a voltage exceeding its rated value.
- Never use the instrument to measure currents that are higher than the rated maximum limit for an extended period of time or it may cause permanent damage to the instrument.
- Do not use the instrument around non-insulated conductors or if the insulation has been damaged.
- The secondary output should be connected to the receiving circuit and should not be left open-circuited before connecting the instrument to a live conductor.
- Dropping the instrument or subjecting it to mechanical shock could cause damage to the contact mechanism and adversely affect its measurement accuracy.



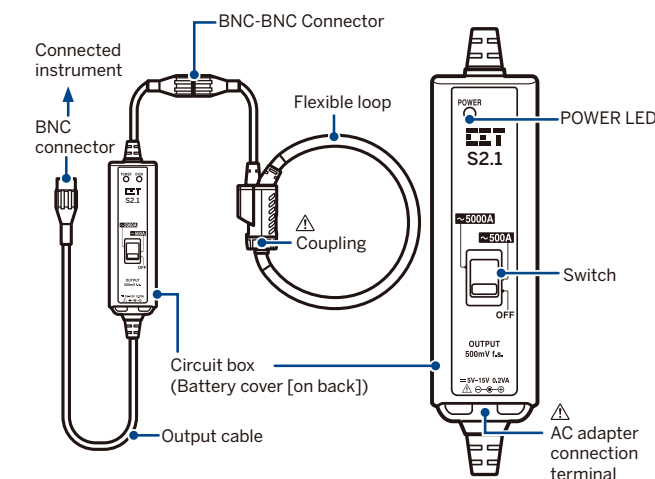
Device View and Dimensions

Unit: mm

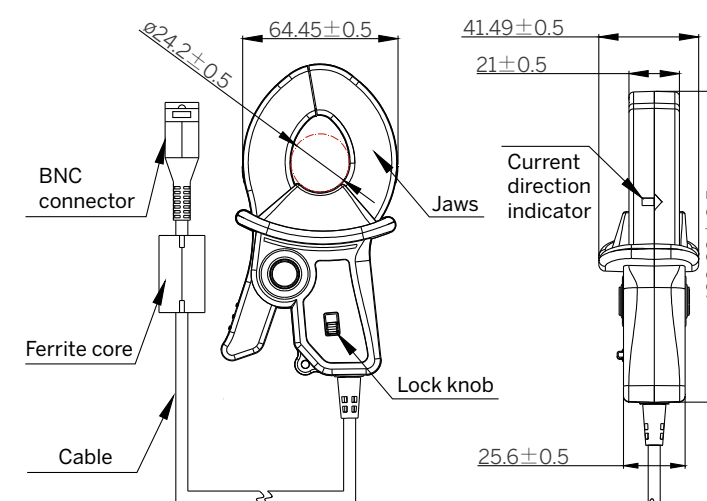
PMC-CT, SCCT & SCCP



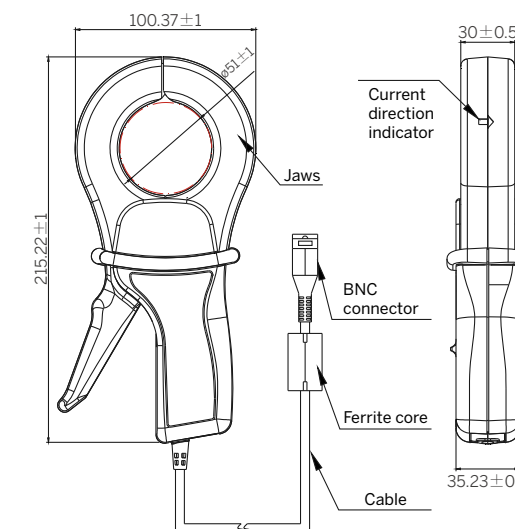
PMC-SCCP-50A-500mV-B-A-B



PMC-SCCP-5kA-500mV-B-C-C



PMC-SCCP-200A-200mV-B-B-B



PMC-SCCP-500A-500mV-B-B-B

Maintenance

- Always keep the clamp closed when it's not being used to prevent dust or exterior objects from accumulating on the contact surfaces inside the clamp jaw for best electrical and mechanical performance.
- Bending, pinching or pulling on the cable could cause permanent damage to the cable's insulation properties.
- Clean the surface of the instrument periodically with a soft cloth dampened with water or mild detergent.
- Do not use abrasive cleaner or solvent such as benzene alcohol, acetone, ether, ketones, thinners or gasoline as they can deform or cause discoloration to the case.
- Do not submerge the instrument in liquid or expose it to moisture or high humidity as these would cause oxidation and degrade its performance.
- Do not expose the instrument to direct sunlight, high temperature, high humidity or condensation for an extended period of time. Doing so may damage its insulation such that it no longer meets its safety specifications.
- Should the instrument appear to malfunction, please contact your local CET representative or distributor for support. Do not attempt to open the instrument as doing so will void the warranty.

PMC-CT Technical Specifications



PMC-CT-100A-40mA-3P



PMC-CT-250A-40mA-3P



PMC-CT-630A-40mA-3P



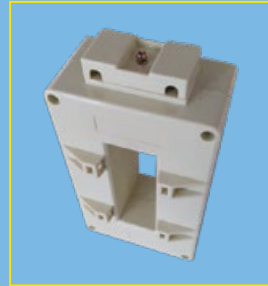
PMC-CT-100A-40mA-12-A



PMC-CT-250A-40mA



PMC-CT-400A-40mA



PMC-CT-800A-40mA

Technical Specifications	Rated Primary Current (In)	100A	250A	630A	100A	250A	400A	800A
	Rated Secondary Current	40mA	40mA	40mA	40mA	40mA	40mA	40mA
	Maximum Current (Imax)	200A, 1s	300A, continuous	756A, continuous	120A, continuous	300A, continuous	480A, continuous	960A, continuous
	Accuracy	Class 0.1 (IEC61869-2)	Class 0.2 (IEC61869-2)	Class 0.2 (IEC61869-2)	Class 0.2 (IEC61869-2)	Class 0.2 (IEC61869-2)	Class 0.2 (IEC61869-2)	Class 0.2 (IEC61869-2)
	Linearity	0.1% (1%In-100%In)	0.2% (5%In-120%In)	0.2% (5%In-120%In)	0.1% (5%In-120%In)	0.2% (5%In-120%In)	0.2% (5%In-120%In)	0.2% (5%In-120%In)
	Magnitude Accuracy (@full load)	± 0.1%	± 0.2%	± 0.2%	± 0.1%	± 0.2%	± 0.2%	± 0.2%
	Phase Accuracy (@full load)	± 10'	± 30'	± 15'	4 ± 4'	± 15'	± 15'	± 15'
	Rated Load	20Ω	50Ω	50Ω	20Ω	20Ω	20Ω	20Ω
	Bandwidth	50-400Hz	40-400Hz	40-400Hz	50-400Hz	50-400Hz	50-400Hz	50-400Hz
	Withstand Voltage (Core to Coil)	4000V/min, 1mA	2500V/min, 1mA	2500V/min, 1mA	2500V/min, 1mA	4000V/min, 1mA	4000V/min, 1mA	4000V/min, 1mA
Mechanical Characteristics	Insulation Resistance	1000MΩ/500VDC, 1min	1000MΩ/500VDC, 1min	1000MΩ/500VDC, 1min	1000MΩ/500VDC, 1min	1000MΩ/500VDC, 1min	1000MΩ/500VDC, 1min	1000MΩ/500VDC, 1min
	Open-Circuit Protection Voltage	Transient Voltage Suppressor: TVS-P6KE6.8CA	Transient Voltage Suppressor: TVS-P6KE6.8CA	Transient Voltage Suppressor: TVS-P6KE6.8CA	Transient Voltage Suppressor: TVS-P6KE6.8CA	Transient Voltage Suppressor: TVS-P6KE6.8CA	Transient Voltage Suppressor: TVS-P6KE6.8CA	Transient Voltage Suppressor: TVS-P6KE6.8CA
	Applicable Meter	PMC-512-A	PMC-512-A	PMC-512-A	PMC-512-A, PMC-592	PMC-512-A, PMC-592	PMC-512-A, PMC-592	PMC-512-A, PMC-592
	RoHS Compliance	✓	✓	✓	✓	✓	✓	✓
	Enclosure	ABS Flame Retardant	ABS Flame Retardant	ABS Flame Retardant	ABS Flame Retardant	ABS Flame Retardant	ABS Flame Retardant	ABS Flame Retardant
	Dimensions (WxHxD mm)	53x62x72	59x79x31	184x78x65	52x40x22	59x79x31	59x79x31	105x191x56
Environmental Conditions	CT Window (mm)	3x Ø10	3x Ø20	3x Ø40	Ø12	31x24	31x24	103x33
	Core Type	3-P Moulded Case	3-P Moulded Case	3-P Moulded Case	Solid-Core	Solid-Core	Solid-Core	Solid-Core
	Secondary Output Cable	2m, 28AWG, 6P6C Dark Red Flat Wire, with RJ12 Connector	2m, 28AWG, 6P6C 3U Red Flat Lead, with RJ12 Connector	2m, 28AWG, 6P6C 3U Red Flat Lead, with RJ12 Connector	2m, 22AWG Black and White Stranded Wire	N/A	N/A	N/A
	Operating Temperature	-40°C to 85°C	-40°C to 75°C	-40°C to 75°C	-40°C to 75°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
	Humidity	≤ 95%	≤ 75%	≤ 75%	≤ 95%	≤ 95%	≤ 95%	≤ 95%
	Atmospheric Pressure	80-110kpa	80-110kpa	80-110kpa	80-110kpa	80-110kpa	80-110kpa	80-110kpa

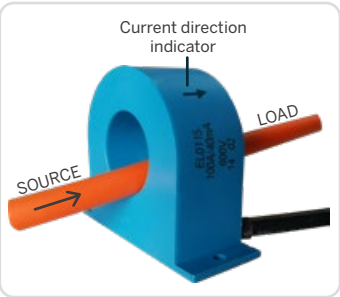
CT Installation Procedure

Connect CT to Circuit:

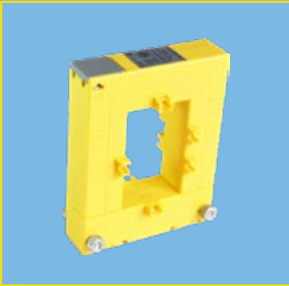
- Completely shut down the power circuit before CT installation.
- Secure CT on board and connect the CT's secondary output to meter terminals.
- The phase conductor being measured should be disconnected at one end and feedthrough the CT opening.
- Verify if the CT is installed in the same current flow direction as marked on CT.
- Reconnect the conductor to the power circuit.
- For personnel safety and device protection. It is very important to maintain a closed circuit on the secondary winding when current is flowing through the primary circuit.
- If meter or device in the secondary circuit need to be serviced. A CT shorting block should be used to maintain a closed circuit on CT secondary.

Disconnect CT from Circuit:

- Completely shut down the power circuit before removing CT.
- Remove the phase conductor from one end. Remove the CT from the conductor and from meter terminals.
- Reconnect the conductor to the power circuit.



PMC-SCCT
Technical
Specifications



		PMC-SCCT-5A-1.667mA	PMC-SCCT-5A-2mA	PMC-SCCT-100A-40mA	PMC-SCCT-200A-40mA	PMC-SCCT-400A-40mA	PMC-SCCT-800A-40mA	PMC-SCCT-1600A-40mA
Technical Specifications	Rated Primary Current	5A	5A	100A	200A	400A	800A	1600A
	Rated Secondary Current	1.667mA	2mA	40mA	40mA	40mA	40mA	40mA
	Maximum Current (Imax)	10A, continuous	20A, continuous	120A, continuous	240A, continuous	480A, continuous	960A, continuous	1920A, continuous
	Accuracy	Class 1 (IEC61869-2)	Class 1 (IEC61869-2)	Class 0.5 (IEC61869-2)	Class 0.5 (IEC61869-2)	Class 0.5 (IEC61869-2)	Class 0.5 (IEC61869-2)	Class 0.5 (IEC61869-2)
	Linearity	1% (5%In-120%In)	1% (5%In-400%In)	0.5% (5%In-120%In)	0.5% (5%In-120%In)	0.5% (5%In-120%In)	0.5% (5%In-120%In)	0.2% (5%In-120%In)
	Magnitude Accuracy (@full load)	± 0.5%	± 0.5%	± 0.5%	± 0.5%	± 0.5%	± 0.5%	± 0.5%
	Phase Accuracy (@full load)	85 ± 15'	70 ± 20'	30 ± 15'	20 ± 10'	10 ± 10'	15 ± 10'	3 ± 5'
	Rated Load	200Ω	226Ω	20Ω	10Ω	10Ω	10Ω	10Ω
	Bandwidth	50-400Hz	50-400Hz	50-400Hz	50-400Hz	50-400Hz	50-60Hz	50-60Hz
	Withstand Voltage (Core to Coil)	4000V/10s, 1mA	4000V/10s, 1mA	4000V/10s, 1mA	4000V/10s, 1mA	4000V/min, 1mA	3000V/min, 1mA	3000V/min, 1mA
	Insulation Resistance	100MΩ/500VDC	100MΩ/500VDC	100MΩ/500VDC	100MΩ/500VDC	100MΩ/500VDC	100MΩ/500VDC, 1min	100MΩ/500VDC, 1min
	Open-Circuit Protection Voltage	6-8V	6-8V	6-8V	6-8V	6-8V	Transient Voltage Suppressor: TVS-P6KE6.8CA	Transient Voltage Suppressor: TVS-P6KE6.8CA
Applicable Meter	PMC-512-A	PMC-350-C, PMC-D726M, PMC-352-C, iMeter D7	PMC-350-C, PMC-352-C, PMC-512-A, PMC-592, PMC-53A-E, iMeter D7	PMC-350-C, PMC-352-C, PMC-512-A, PMC-592, PMC-53A-E, iMeter D7	PMC-350-C, PMC-352-C, PMC-512-A, PMC-592, PMC-53A-E, iMeter D7	PMC-350-C, PMC-352-C, PMC-512-A, PMC-592, PMC-53A-E, iMeter D7	PMC-350-C, PMC-352-C, PMC-512-A, PMC-592, PMC-53A-E, iMeter D7	
Mechanical Characteristics	RoHS Compliance	✓	✓	✓	✓	✓	✓	✓
	Enclosure	Flame Rating 94-V0	Flame Rating 94-V0	Flame Rating 94-V0	Flame Rating 94-V0	Flame Rating 94-V0	Flame Retardant	Flame Retardant
	Dimensions (WxHxD mm)	31x43x29	38x49x34	38x49x34	54x70x40	67x83x43	114x145x32	143x191x49
	CT Window (mm)	Ø10	Ø16	Ø16	Ø24	Ø35	50x80	55x129
	Core Type	Split-Core	Split-Core	Split-Core	Split-Core	Split-Core	Split-Core	Split-Core
	Secondary Output Cable	2m, 22AWG Black and White Stranded Wire	2m, 22AWG Black and White Stranded Wire (with pluggable connector when used with PMC-350-C and PMC-352-C)	2m, 22AWG Black and White Stranded Wire (with pluggable connector when used with PMC-350-C and PMC-352-C)	2m, 22AWG Black and White Stranded Wire (with pluggable connector when used with PMC-350-C and PMC-352-C)	2m, 22AWG Black and White Stranded Wire (with pluggable connector when used with PMC-350-C and PMC-352-C)	2m, 22AWG Black and White Stranded Wire (with pluggable connector when used with PMC-350-C and PMC-352-C)	2m, 22AWG Black and White Stranded Wire (with pluggable connector when used with PMC-350-C and PMC-352-C)
Environmental Conditions	Operating Temperature	-20°C to 50°C	-20°C to 50°C	-20°C to 50°C	-20°C to 50°C	-20°C to 50°C	-15°C to 50°C	-25°C to 70°C
	Humidity	≤ 85%	≤ 85%	≤ 85%	≤ 85%	≤ 85%	≤ 85%	≤ 85%
	Atmospheric Pressure	70-106kpa	70-106kpa	70-106kpa	70-106kpa	70-106kpa	80-110kpa	80-110kpa

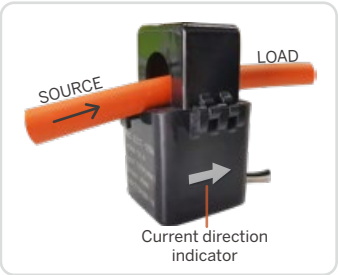
SCCT Installation Procedure

Connect SCCT to Circuit:

- Secure CT on board and connect the CT’s secondary output to meter terminals.
- Open the hinge lock or pull apart the top part of the CT. Install the CT around the conductor to be measured.
- Verify if the CT is installed in the same current flow direction as marked on CT.
- Close the hinge lock or reattach the removable top part of the CT.
- For personnel safety and device protection. It is very important to maintain a closed circuit on the secondary winding when current is flowing through the primary circuit.
- If meter or device in the secondary circuit need to be serviced. A CT shorting block should be used to maintain a closed circuit on CT secondary.

Disconnect SCCT from Circuit:

- Open the hinge lock or pull apart the top part of the CT.
- Remove the CT from the conductor.
- Remove the CT’s secondary wiring from meter terminals.



PMC-SCCP Technical Specifications



PMC-SCCP-50A-500mV-B-A-B



PMC-SCCP-200A-200mV-B-B-B



PMC-SCCP-500A-500mV-B-B-B



PMC-SCCP-5kA-500mV-B-C-C

Technical Specifications	Rated Nominal Current (In)	5A	20A/200A Selectable	500A	5000A
	Maximum Current (Imax)	50A continuous @ 45-66Hz and 25°C	260A continuous @ 45-66Hz and 25°C	500A continuous @ 45-66Hz and 25°C	10000A continuous @ 45-66Hz and 25°C
	Output Voltage	AC 10mV/A (Max. 500mV)	AC 10mV/A @ 20A AC 1mV/A @ 200A (Max. 200mV)	AC 1mV/A (Max. 500mV)	AC 1mV/A @ 500A AC 0.1mV/A @ 5000A (Max. 500mV)
	Amplitude Accuracy	±0.3% rdg. ±0.02% f.s. @ 45Hz-66Hz, at core center	±0.3% rdg. ±0.02% f.s. @ 45Hz-66Hz, at core center	±0.5% rdg. ±0.02% f.s. @ 45Hz-66Hz, at core center	2% typical at 1% to 200% of Rated Current @25°C Linearity: ±0.2% of reading (1% to 200% of range)
	Phase Accuracy	±2° (45Hz to 5kHz)	±0.5° (45Hz to 5kHz)	±0.5° (45Hz to 5kHz)	±1° (45Hz to 5kHz)
	Amplitude Frequency Characteristics	±1% (45Hz - 5kHz), deviation from accuracy	±1% (45Hz - 5kHz), deviation from accuracy	±1% (45Hz - 5kHz), deviation from accuracy	±3dB (10Hz - 20kHz), deviation from accuracy
	Conductor Position	±0.5% (deviation from center)	±0.5% (deviation from center)	±0.5% (deviation from center)	±1% maximum
	External Magnetic Field	≤ 0.1A @ 400A/m	≤ 0.1A @ 400A/m	≤ 0.1A @ 400A/m	≤ 5A (7A max.) @ 400A/m
	Maximum Rated Voltage to Earth	300 Vrms	600 Vrms	600 Vrms	1000 Vrms
Mechanical Characteristics	Clamp Diameter	15mm (max. conductor diameter)	24mm (max. conductor diameter)	50mm (max. conductor diameter)	100mm, 150mm, 254mm, 371mm (Measurable conductor diameter)
	Cable Length	3m	3m	3m	Cord length: 2m (Coil to Integrator), 1m (Integrator to connector)
	Dimensions (WxHxD mm)	48x 120 x 20	64x 130x 26	108x 216x 35	Circuit: 57x 86x 30
	Weight	200g	300g	500g	180g (Coil), 300g (Integrator)
	Power supply	N/A	N/A	N/A	2pcs AA alkaline batteries (not included), Continuous use: 7 days @ 35 mVA. 3.5x1.3mm DC Adaptor included (Input: 100-240VAC, Output: 5V/2A)
Environmental Conditions	Output Terminal	BNC	BNC	BNC	BNC
	Measurement Category	CAT III 300V	CAT III 600V	CAT III 600V	CAT III 1000V
	Pollution Degree	II	II	II	II
	Temperature Coefficient	0.02% rdg. / °C	0.02% rdg. / °C	0.02% rdg. / °C	± 2% rdg. / °C
	Dielectric Strength	3000V AC rms for 15 seconds	3000V AC rms for 15 seconds	3000V AC rms for 15 seconds	6880V AC rms for 15 seconds (between integrator and coil @ 50/60Hz)
	Operating Temp.	0°C to 50°C	0°C to 50°C	0°C to 50°C	-20°C to 70°C
	Storage Temp.	-10°C to 60°C	-10°C to 60°C	-10°C to 60°C	-30°C to 90°C
	Relative Humidity	≤ 80% non-condensing	≤ 80% non-condensing	≤ 80% non-condensing	≤ 80% non-condensing
	Altitude	2000m max.	2000m max.	2000m max.	2000m max.
Standards	Safety/EMC	Safety: EN 61010-2-032: 2012 (CAT III 300V)	Safety: EN 61010-2-032: 2012 (CAT III 600V)	Safety: EN 61010-2-032: 2012 (CAT III 600V)	Safety: 1000V CAT III, 600V CAT IV EMC: EN 61326-1 2006, CE marked

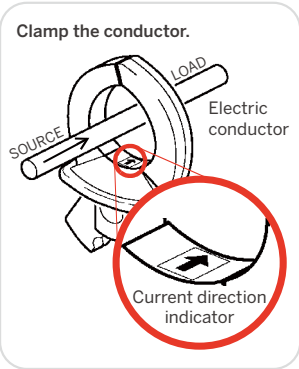
SCCP Installation Procedure

Connect SSCP to Circuit:

- Align the BNC connector grooves with the connector guide of the BNC receptacle. Insert and then turn the connector clockwise to lock the connection in place.
- Pull the locking lever downward to open the clamp jaw.
- Put the clamp around only the live conductor in the center with the Current direction indicator pointing towards the load side.
- Clamp around only the Live conductor for proper measure Clamp multiple wires together single-phase or 3-phase cables will not produce any readings.
- Close the clamp jaw.
- Secure the clamp in place to avoid adding extra weight on conductor.

Disconnect SSCP from Circuit:

- Open the clamp jaw and remove it away from the live conductor.
- Turn the BNC connector counterclockwise to release the lock and pull it from the BNC receptacle.





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