PMC-53A

Intelligent Multifunction Meter

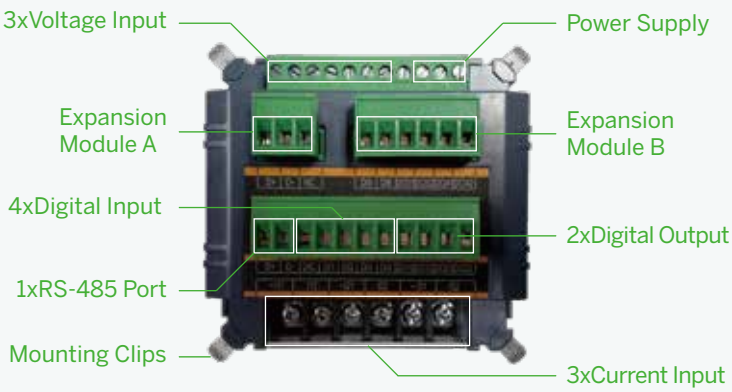
High Performance

PMC-53A Intelligent Multifunction Meter is CET's latest offer for the low-cost digital power/energy metering market. The PMC-53A features quality construction, multifunction measurements and a large, backlit, Dot-Matrix LCD display that is easy to navigate and user friendly. Housed in a standard DIN form factor measuring 96x96x83.6mm, it is perfectly suited for industrial, commercial and utility applications. Compliance with the IEC 62053-22 Class 0.2S/0.5S, ANSI C12.1 Class 0.2 and EN 50470-1/3 Class C, it is a cost-effective replacement for analog instrumentation and is capable of displaying 4 measurements at once. It optionally provides I4 input for Neutral Current measurement, a second RS-485 port, up to six Digital Inputs for status monitoring, pulse counting or Tariff switching, up to four Relay Outputs for control and alarm applications, up to two Solid State Relays for energy pulsing as well as other I/O options for different applications.

Typical Applications

- Industrial, Commercial and Utility Substation Metering
- Building, Factory and Process Automation
- Sub-metering and Cost Allocation
- Energy Management and Power Quality Monitoring
- Retrofit applications with Split-Core Current Transformers and Rogowski Coils

At-A-Glance



Features Summary

Basic Measurements

- ULN, ULL per Phase and Average with calculated Neutral-to-Ground Voltage (Ung)
- Current per Phase and Average with calculated Neutral
- Current Loading Factor per Phase and Average
- P, Q, S, 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 63rd
- Current TDD, TDD Odd, TDD Even, K-Factor and Crest Factor
- U and I Phase Angle
- U Over/Under Deviation and Frequency Deviation
- Displacement PF
- Fundamental U, I and P per Phase
- Total Fundamental P & Total Harmonic P
- U and I Unbalance and Sequence
- kvarh Q1-Q4
- Interval Energy for kWh/kvarh Imp/Exp and kVAh
- Demands, Predicted Demands and Max. Demands for P/Q/S Total, I per Phase and Average as well as ULL Average with Timestamp for This Month & Last Month (or Since Last Reset & Before Last Reset)
- Two TOU schedules, each providing
  - 12 Seasons
  - 20 Daily Profiles, each with 12 Periods
  - 90 Holidays or Alternate Days
  - 8 Tariffs, each providing the following information
    - Total and 3-phase kWh/kvarh Import/Export, kVAh
    - P/Q/S Max. Demands
- 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

Ease of use

- Large, backlit, Dot-Matrix LCD display with wide viewing angle
- Intuitive user interface
- LED indicators for Energy Pulsing and Communication activities
- Password-protected setup via Front Panel or free configuration software
- Easy installation with mounting clips, no tools required

Setpoints

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

SOE Log

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

Max./Min. Log

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

PMC-53A

Freeze Logs (Optional)

- 60 Daily Freeze Logs for kWh/kvarh/kVAh Total and P/Q/S Max. Demands
- 36 Monthly Freeze Logs for kWh/kvarh/kVAh Total and P/Q/S Max. Demands with Timestamp

Data Recorder Log (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 max. of 100 days at 15-minute interval

Carbon Emission Metering

- Carbon Emission measurements for This Month & This Year & Total Cumulative
- Configurable Carbon Emission Factor and Associated kWh Imp./Exp. for both Transmission & Distribution Lines and Load-side Power Generation Equipment
- Storage of up to 12 monthly and 12 annual historical Carbon Emission logs

Diagnostics

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

Communications

- Optically isolated RS-485 port at max. 38,400 bps
- Selectable Modbus RTU, BACnet MS/TP, Metasys N2 and DNP 3.0
- Optional 2nd comm. port with RS-485 Modbus RTU at max. 115,200 bps/PROFIBUS DP at max. 1,500 kbps support

Real-Time Clock

- Battery-backed Real-time Clock with 25ppm accuracy (<2s per day)

System Integration

- Supported by CET's PecStar® iEMS and iEEM
- Easy integration into Johnson Controls Metasys with N2 or other Building Automation Systems with BACnet MS/TP or Modbus RTU
- DNP 3.0 for Utility Substation Automation

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

Expansion Modules

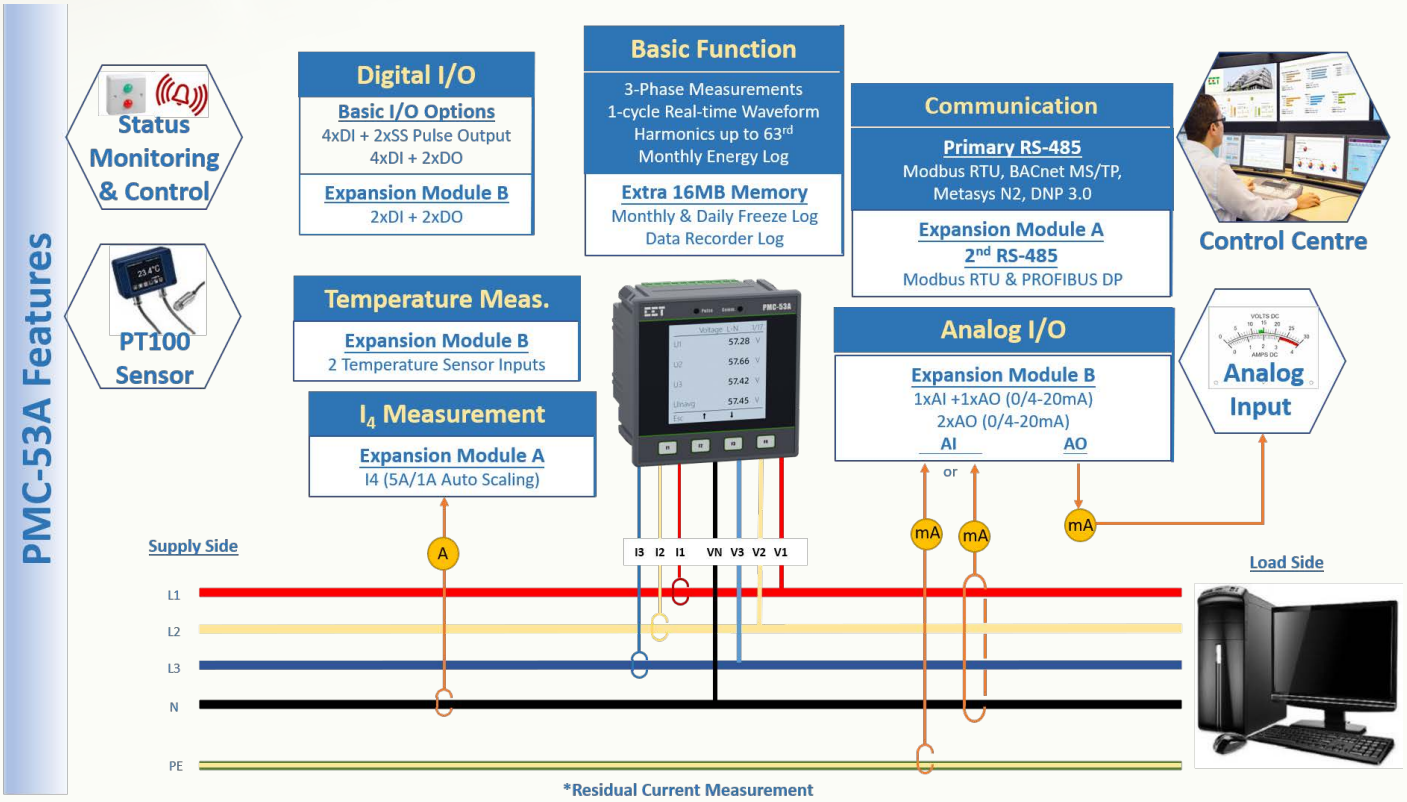
Expansion Module A Options

- I4 Input
- 2nd comm. port with optical isolation, supporting Modbus RTU at max. 115,200 bps/PROFIBUS DP at max. 1,500 kbps

Expansion Module B Options

- 2xDigital Input and 2xRelay Output
- 2xRTD Input (PT100 sensors not included)
- 1xAI and 1xAO (0/4-20mA)
- 2xAO (0/4-20mA)

Typical Application



Multiple Protocols

Accuracy

Parameters	Accuracy			Resolution
	5A/1A Input		SCCT/Rogowski Coil	
	Class 0.2S	Class 0.5S		
Voltage	±0.1%	±0.2%	±0.5%	0.001V
Current	±0.1%	±0.2%	±0.5%	0.001A
I4 (Measurement)	±0.1%	±0.2%	±0.5%	0.001A
P, Q, S	±0.2%	±0.5%	±1%	0.001kX
kWh, kVAh	IEC 62053-22 Class 0.2S IEC 62053-22 Class 0.5S ANSI C12.1 Class 0.2 EN 50470-1/3: 2006 Class C		IEC 62053-21 Class 1	0.1kXh
kvarh	IEC 62053-24 Class 0.5S IEC 62053-23 Class 2		IEC 62053-24 Class 1 IEC 62053-23 Class 2	0.1kvarh
PF	±0.2%	±0.5%	±1%	0.001
Frequency	±0.01Hz	±0.02Hz	±0.02Hz	0.01Hz
THD	IEC 61000-4-7 Class II			0.01%
K-Factor	IEC 61000-4-7 Class II			0.001
Phase Angle	±1°			0.1°

Technical Specifications

Voltage Inputs (V1, V2, V3, VN)

Standard Un	400VLN/690VLL
Range	10V to 2xUn
Overload	2xUn continuous, 5xUn for 1s
Burden	<0.02VA per phase
Measurement Category	CAT III 600V
Frequency	45-65Hz

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

Standard In		5A (Optional 1A)
Range		0.1% to 200% In
Starting Current		0.1% In
Overload		2xIn continuous, 20xIn for 1s
Burden		<0.15VA per phase @ 5A
CT Options	SCCT	100A/200A/400A/800A/1600A to 40mA
	Rogowski Coils	400A/1200A/2500A/5000A to 40mA

Power Supply (L/+, N/-)

Standard	60-250VAC ±10%, 47-440Hz 24-250VDC ±10%
Burden	<6W
Overvoltage Category	OVC III up to 300VLN

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

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

Digital Outputs* (DO11, DO12, DO21, DO22, DO31, DO32, DO41, DO42)

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

Analog Input* (AI+, AI-)

Type	0/4-20 mA
Overload	24mA

* Optional I/O options

Pulse Outputs* (E1+, E1-, E2+, E2-)

Type	Form A Solid State Relay
Isolation	Optical
Load Type	Resistive
Output	Optocoupler output as ON-OFF
Max. Load Voltage	50VDC
Max. Forward Current	50mA

Analog Outputs* (AO+, AO- or AO1+, AO1-, AO2+, AO2-)

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

RTD Inputs* (TC11, TC12, TC21, TC22)

Type	Platinum Resistor PT100 (Sensor Not Included)
Range	-50°C to 200°C
Cable Length	3000mm
Protective Tube Length	30mm

Tightening Installation Torque

Current Inputs	7.1 kgf.cm/6.28 lb-in/0.7 N.m/M3.5
Power Supply, Voltage Inputs, RS-485 and I/O	4 kgf.cm/3.54 lb-in/0.4 N.m/M3

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
Altitude	< 2000m
Location/Mounting	For indoor use only
Pollution Degree	2

Mechanical Characteristics

Panel Cutout	92x92mm (3.62"x3.62")
Unit Dimensions	96x96x83.6mm
IP Rating	IP65

Safety Standards

Safety Requirements

CE LVD 2014/35/EU	EN 61010-1: 2010+A1: 2019 EN IEC 61010-2-030: 2021+A11: 2021
cULus Listed	UL 61010-1, Ed.3, Rev 06/06/2023 CAN/CSA C22.2 NO. 61010-1, Ed.3 UL 61010-2-030, Ed.2 CSA C22.2 NO. 61010-2-030: 18, Ed.2
MID per 2014/32/EU	EN 50470-1: 2006 EN 50470-3: 2006
Electrical Safety in Low Voltage Distribution Systems up to 1000 Vac and 1500 Vdc	IEC 61557-12: 2021 (PMD)
Insulation AC Voltage: 3.6kV @ 1 minute Insulation Resistance: >100MΩ Impulse Voltage: 6kV, 1.2/50µs	EN 61010-1: 2010+A1: 2019 IEC 62052-31: 2015

Electromagnetic Compatibility

CE EMC Directive 2014/30/EU (EN IEC 61326: 2021)

Immunity Tests

Electrostatic Discharge	EN 61000-4-2: 2009
Radiated Fields	EN IEC 61000-4-3: 2020
Fast Transients	EN 61000-4-4: 2012
Surges	EN 61000-4-5: 2014+A1: 2017
Conducted Disturbances	EN 61000-4-6: 2014+AC: 2015
Magnetic Fields	EN 61000-4-8: 2010
Voltage Dips and Interruptions	EN IEC 61000-4-11: 2020
Ring Wave	EN 61000-4-12: 2017

Emission Tests

Limits and Methods of Measurement of Electromagnetic Disturbance Characteristics of Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment	EN 55011: 2016+A1: 2017+ A11: 2020+A2: 2021
Electromagnetic Compatibility of Multimedia Equipment-Emission Requirements	EN 55032: 2015+ A11: 2020+A1: 2020
Limits for Harmonic Current Emissions for Equipment with Rated Current ⩽16 A	EN IEC 61000-3-2: 2019+A1: 2021
Limitation of Voltage Fluctuations and Flicker in Low-Voltage Supply Systems for Equipment with Rated Current ⩽16 A	EN 61000-3-3: 2013+ A1: 2019+A2: 2021
Emission Standard for Industrial Environments	EN IEC 61000-6-4: 2019
Radiated Emissions	FCC 47CFR Part 15 Subpart B Class B ANSI C63.4: 2014
Conducted Emissions	FCC 47CFR Part 15 Subpart B Class B ANSI C63.4: 2014

Mechanical Tests

Spring Hammer Test	IEC 62052-31: 2015
Vibration Test	IEC 62052-11: 2020
Shock Test	IEC 62052-11: 2020

Revenue Metering Type Test Approval

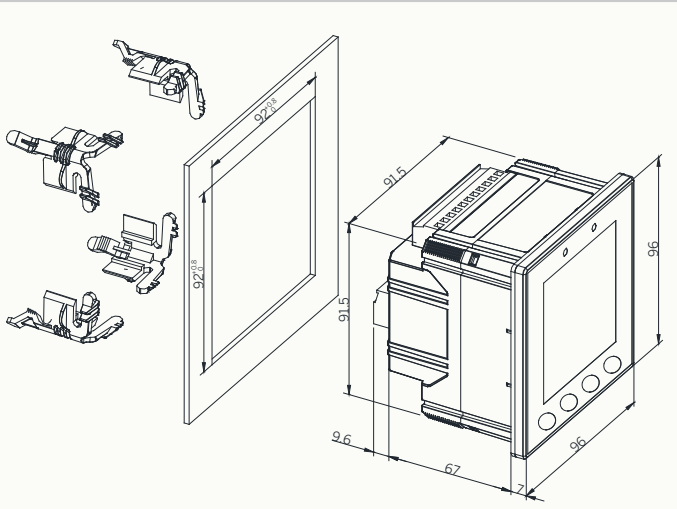
MID per EU Directive 2014/32/EU	Certificate No.: 0120/SGS0427
NMIM of Malaysia per OIML R46	Approval No.: ATS-0026-20

BACnet Conformance Certificate

BTL Listing	Certificate No.: BTL-31239

Device View and Dimensions

Unit: mm



Installation

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, 16MB 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, 16MB Memory
Input Current			5											5A (5A/1A Auto-Scaling)
			1											1A
			4											For use with 100A, 200A, 400A, 800A, 1600A to 40mA Split-Core CTs and 400A, 1200A, 2500A, 5000A to 40mA Rogowski Coils
Input Voltage				9										400VLN/690VLL
Power Supply					2									60-250 VAC ±10%, 47-440Hz, 24-250 VDC ±10%
Frequency						5								45Hz-65Hz
Language							E							English
Expansion A*								A1						1xRS-485/1xPROFIBUS DP
								A2^						I4
Expansion B*									B1					2xDI + 2xDO (Mechanical Relay)
									B2					2xRTD (PT100 sensors not included)
									B3					1xAI + 1xAO (0/4-20mA)
									B5					2xAO
Accuracy												2*		Class 0,2S for Active Energy
												""		Class 0,5S for Active Energy
PMC-53A	-	1	5	9	2	5	E	-		-		-	2	PMC-53A-15925E-2 (Class 0,2S Standard Model)
PMC-53A	-	1	5	9	2	5	E	-		-		-		PMC-53A-15925E (Class 0,5S Standard Model)

* Additional charges apply

Models PMC-53A-X5925E (X=1, 2, 3, A, B) are certified for MID Class C

^ 14 specifications of Expansion A2 are consistent with those of the selected Input Current Option

1) Model No. with no Expansion A or B can be written as PMC-53A-15925E-X (X=2 or Null)

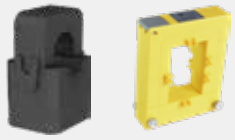
2) Model No. with only one Expansion can be written as PMC-53A-15925E-Ax-X or PMC-53A-15925E-Bx-X (X=2 or Null)

3) Model No. with both Expansions can be written as PMC-53A-15925E-Ax-Bx-X (X=2 or Null)

4) Options B1 for Expansion B are invalid with options 1 and 2 under Basic Function

Accessories

Split-Core CT for Current Input

Models	PMC-SCCT-100A-40mA-16-A (100A/40mA, Ø=16mm)	
	PMC-SCCT-200A-40mA-24-A (200A/40mA, Ø=24mm)	
	PMC-SCCT-400A-40mA-35-A (400A/40mA, Ø=35mm)	
	PMC-SCCT-800A-40mA-A (800A/40mA, 80x50mm)	
	PMC-SCCT-1600A-40mA-A (1600A/40mA, 130x55mm)	
Primary Input	100A/200A/400A/800A/1600A	
Secondary Output	40mA	
Range	0.15%-120%In	
Accuracy	Class 0.5	
Frequency	50Hz/60Hz	
Operating Temperature	-20°C to +50°C	

Rogowski Coil for Current Input

Models	3-Phase Rogowski Coil	PMC-RC-400A-40mA-3P-100-PY-W-F (400A, Ø=100mm)	
		PMC-RC-1200A-40mA-3P-150-PY-W-F (1200A, Ø=150mm)	
		PMC-RC-2500A-40mA-3P-200-PY-W-F (2500A, Ø=200mm)	
		PMC-RC-5000A-40mA-3P-350-PY-W-F (5000A, Ø=350mm)	
	1-Phase Rogowski Coil	PMC-RC-400A-40mA-1P-100-PY-W-N (400A, Ø=100mm)	
		PMC-RC-1200A-40mA-1P-150-PY-W-N (1200A, Ø=150mm)	
		PMC-RC-2500A-40mA-1P-200-PY-W-N (2500A, Ø=200mm)	
		PMC-RC-5000A-40mA-1P-350-PY-W-N (5000A, Ø=350mm)	
Primary Input	400A/1200A/2500A/5000A		
Secondary Output	40mA		
Burden	≤5W		
Accuracy	0.5%, (5%-110%) In @ 25°C		
Power Supply	10-25 VDC		
Storage Temperature	-40°C to +85°C		
Operating Temperature	-25°C to +70°C		
Humidity	≥80% non-condensing		
Frequency	50Hz/60Hz		
Insulation Voltage	5kV		
Overvoltage Category	1000V CAT III, 600V CAT IV		

Optional Extension Cable for Rogowski Coil	Specification	
SP13-F-M-5	5m extension cable with SP13-9 female-to-male connectors connecting 3-phase Rogowski Coil and Convertor	
SP13-F-M-10	10m extension cable with SP13-9 female-to-male connectors connecting 3-phase Rogowski Coil and Convertor	
SP13-4-F-M-5	5m extension cable with SP13-4 female-to-male connectors connecting 1-phase Rogowski Coil and Convertor	
SP13-4-F-M-10	10m extension cable with SP13-4 female-to-male connectors connecting 1-phase Rogowski Coil and Convertor	

Please refer to Cable Length for details and contact the factory in advance for special requirements.

10-25 VDC Power Supply for Rogowski Coil

Email: sales@cet-global.com
Website: www.cet-global.com

Your Local Representative

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