

# PMC-53A-E

*Ethernet Multifunction Meter*



# Ethernet

**PMC-53A-E** Ethernet Multifunction Meter is CET's latest offer for the digital power/energy metering market. Housed in a standard DIN form factor measuring 96x96x88mm, it is perfectly suited for industrial, commercial and utility applications requiring direct Ethernet connectivity. The PMC-53A-E features quality construction, multifunction measurements and a large, backlit, Dot-Matrix LCD that is easy to navigate and user friendly. Compliance with the IEC 62053-22 Class 0.5S Standard, it is a cost-effective replacement for analog instrumentation and capable of displaying 4 measurements at once. It also optionally provides an I4 input for Neutral Current Measurement, one 0/4-20mA Analog Input for measuring external transducers signal as well as an Ir Input for Residual Current Measurement. With a standard 100BaseT Ethernet Port and a RS-485 port with multi protocols support, the PMC-53A-E can be easily integrated into Energy Management Systems as well as Building and Utility Automation Systems. The on-board password protected Web Server provides user-friendly access to its data and supports the configuration for most of the Setup parameters via a standard web browser.

## Typical Applications

- Industrial, Commercial and Utility Substation Metering
- Building, Factory and Process Automation
- Sub-metering and Cost Allocation
- Retrofit applications with optional Class 0.5 Split-Core CTs

## Features Summary

### 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
- 3-Phase Total and per-phase kWh, kvarh Import/Export/Net/Total and kVAh Total
- Frequency
- Device Operating Time (Running Hours)
- Optional Neutral and Residual Current Measurement

### Advanced Measurements

- 1-cycle Real-time U & I Waveform Display @ 1s update rate
- U and I THD, TOHD, TEHD and Individual Harmonics up to 31<sup>st</sup>
- Current TDD, TDD Odd, TDD Even, K-Factor and Crest Factor
- U and I Unbalance and Phase Angles, 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 Imp./Exp. and kVAh
- 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)
- Two TOU schedules, each providing 8 Tariffs for Per-Phase and Total Energy as well as Max. Demand recording, 12 Seasons, 20 Daily Profiles (each with 12 periods in 15-minute interval) and 90 Holidays or Alternate Days

## Event and Data Recording

### SOE Logs

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

### Max/Min Log

- Max/Min Log with Timestamp for parameters such as Voltage, Current, In, I4, Ir, Freq., P, Q, S, PF, Unbalance, K-factor, Crest Factor and THD
- Configurable for This Month/Last Month or Before/Since Last Reset

### Freeze Logs

- 60 Daily Freeze Logs for kWh/kvarh/kVAh Total and P, Q, S Maximum Demands with Timestamps
- 36 Monthly Freeze Logs for kWh/kvarh/kVAh Total and P, Q, S Maximum Demands with Timestamps

### Data Recorder (DR)

- 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

## 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 (CT not included)
- 0/4-20mA DC input with programmable zero and full scales

## Diagnostics

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

## Real-Time Clock

- Battery-backed Real-Time Clock with 6ppm accuracy (<0.5s per day)

## System Integration

- Supported by CET's PecStar® iEMS
- Easy integration into Building Automation Systems with BACnet MSTP or Modbus RTU and Utility Substation Automation with DNP 3.0
- The on-board password protected Web Server allows complete access to its data and supports the configuration for most of the Setup parameters via a standard web browser



# PMC-53A-E

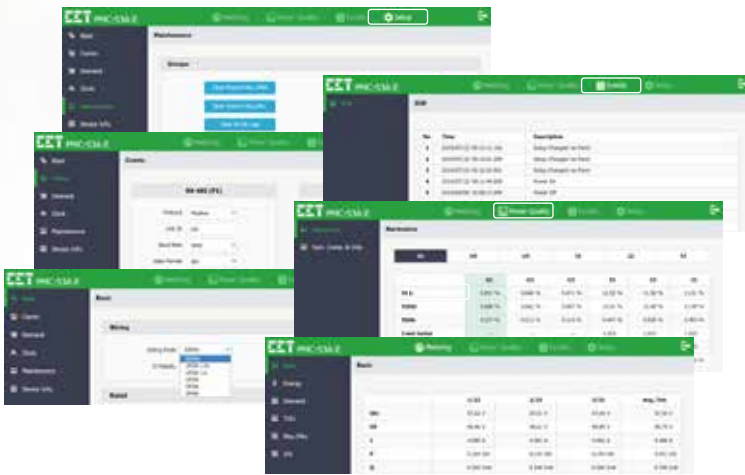
## Communications

- One 100BaseT Ethernet Port with RJ45 connector
- One optically isolated RS485 port with baud rate from 1.2kbps to 38.4kbps
- Built-in Web Server for easy data viewing and setup configurations
- Protocol supported: Modbus TCP/RTU, BACnet MSTP, DNP 3.0, HTTP, SMTP, SNMP, TFTP and Ethernet Gateway

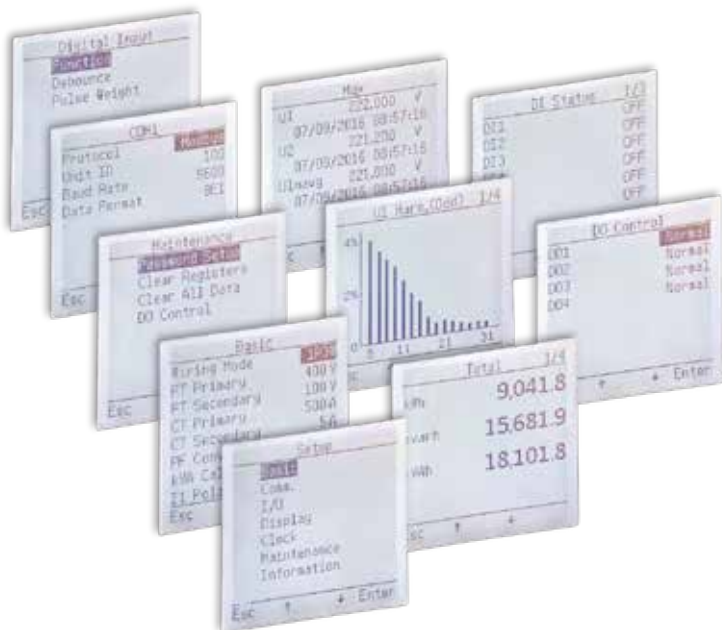
## Setpoints

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

## Web Interface



## Front Panel Display



## Technical Specifications

Voltage Inputs (V1, V2, V3, VN)	
Standard Un	400VLN/690VLL
Range	10V to 1.2xUn
Overload	1.2xUn continuous, 2xUn for 1s
Burden	<0.02VA per phase
Measurement Category	CAT III up to 600VLL
Frequency	45-65Hz

Current Inputs (I11, I12, I21, I22, I31, I32)	
Standard In	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 600VLL
Burden	<0.15VA per phase @ 5A

Power Supply (L+, N-, GND)	
Standard	95-250VAC/DC, ±10%, 47-440Hz
Optional	20-60VDC
Burden	<3W
Overvoltage Category	CAT III up to 300VLN

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
Max. Load Voltage	50VDC
Max. Forward Current	50mA

Optional I4 Input (I41, I42)	
In	5A (5A/1A Auto-Scale)
Range	0.1% to 120% In
Starting Current	0.1% In

Optional Residual Current Input (-IR, IR)	
In	0.5mA
Range	2% to 500% In
CT Type	Solid-Core or Split-Core Residual Current CT

Optional Analog Input (AI+, AI-)	
Type	0-20/4-20 mA
Overload	24 mA maximum

Installation Torque	
Current Inputs	1.3 N.m
Power Supply, Voltage Inputs, RS485 and I/O	0.5 N.m

# Multifunction

## Accuracy

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 SCCT Option, IEC 62053-21 Class 1	0.1kXh
kvarh	5A/1A Option, IEC 62053-24 Class 0.5S SCCT Option, IEC 62053-24 Class 1	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 Angles	±1°	0.1°

## Environmental and Mechanical Specifications

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	92x92mm (3.62"x3.62")
Unit Dimensions	96x96x88mm
IP Rating	IP65 (Front Panel), IP30 (Body)

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

## Safety Standards

Safety Requirements	
CE LVD 2014/35/EU	EN 61010-1: 2010, EN 61010-2-030: 2010
Electrical Safety in Low Voltage Distribution Systems up to 1000Vac and 1500 Vdc	IEC 61557-12: 2018 (PMD)
Insulation AC Voltage: 2kV @ 1 minute Insulation Resistance: >100MΩ Impulse Voltage: 6kV, 1.2/50μs	IEC 62052-11: 2003 IEC 62053-22: 2003

## Electromagnetic Compatibility

CE EMC Directive 2014/30/EU (EN 61326: 2013)

Immunity Tests	
Electrostatic Discharge	EN 61000-4-2: 2009
Radiated Fields	EN 61000-4-3: 2006 +A1: 2008 +A2: 2010
Fast Transients	EN 61000-4-4: 2012
Surges	EN 61000-4-5: 2014 +A1: 2017
Conducted Disturbances	EN 61000-4-6: 2014
Magnetic Fields	EN 61000-4-8: 2010
Voltage Dips and Interruptions	EN 61000-4-11: 2004 +A1: 2017

Emission Tests	
Limits and Methods of Measurement of Electromagnetic Disturbance Characteristics of Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment	EN 55011: 2016
Electromagnetic Compatibility of Multimedia Equipment-Emission Requirements	EN 55032: 2015
Limits for Harmonic Current Emissions for Equipment with Rated Current ≤ 16 A	EN 61000-3-2: 2014
Limitation of Voltage Fluctuations and Flicker in Low-Voltage Supply Systems for Equipment with Rated Current ≤ 16 A	EN 61000-3-3: 2013
Emission Standard for Industrial Environments	EN 61000-6-4: 2007 +A1: 2011

## Ordering Information

Product Code	Description
PMC-53A-E Ethernet Multifunction Meter	
Basic Function	E
Input Current	5 1 4^
Input Voltage	9
Power Supply	2 3
Frequency	5
I/O	A B
Analog Inputs	X A*^
Language	E
PMC-53A -	E 5 9 2 5 A X E


Dot-Matrix LCD, Monthly & Daily Freeze Log, Data Recorder, 8MB Memory, 1x100BaseT Ethernet Port and 1xRS-485 (Modbus RTU, BACnet MSTP and DNP 3.0)  
5A/1A Auto-Scaling (Class 0.5S for 5A and Class 1 for 1A)  
1A (Class 0.5S)  
For use with 100A, 200A, 400A, 800A and 1600A to 40mA Split-Core CTs  
400VLN/690VLL  
95-250 VAC/DC, 47-440Hz  
20-60VDC  
45Hz-65Hz  
4xDI + 2xDO (Mechanical Relay)  
4xDI + 2xSS Pulse Output  
None  
I4 (5A/1A Auto-Scaling) +AI (0/4-20mA) +Ir (0-0.5mA)  
English  
PMC-53A-E-5925AXE (Standard Model)

\*Additional charges apply

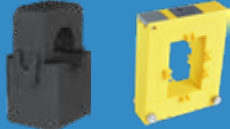
^ The Analog Inputs Option A is not available for the Input Current Option 4

# Accessories

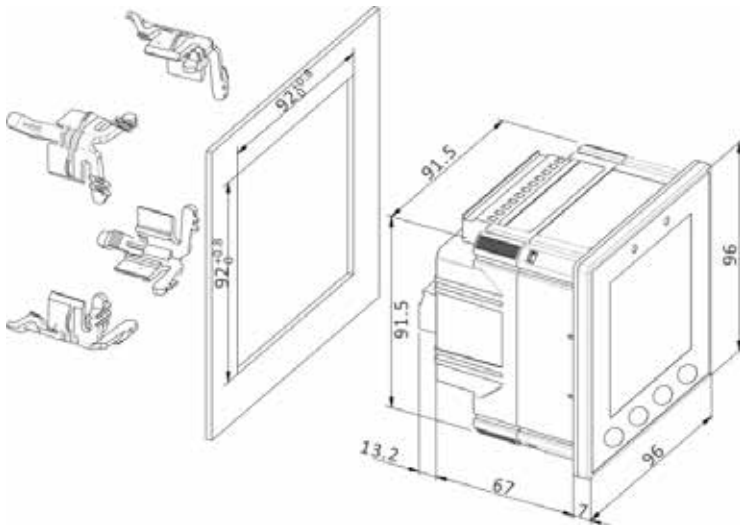
## Residual Current CT

Load Current (Solid-Core)	160A (CT517203, Ø=46mm)	
	400A (CT517403, Ø=80mm)	
	1000A (CT517603, Ø=120mm)	
	630A (CT519703, 220x50mm)	
Load Current (Split-Core)	160A (CT553203, Ø=48mm)	
	225A (CT553303, Ø=68mm)	
Primary Input	1A (Residual Current)	
Secondary Output	0.5mA	
Range	2-500%	
Overload	44A (Residual Current)	
Accuracy	Class 0.5 (Solid Core), Class 3 (Split Core)	
Frequency	50/60Hz	
Dielectric Strength	3kV rms @ 1 minute	
Operating Temperature	-25°C to +70°C (Solid-Core)	
	-12°C to +45°C (Split-Core)	
Storage Temperature	-40°C to +85°C (Solid-Core)	
	-25°C to +70°C (Split-Core)	

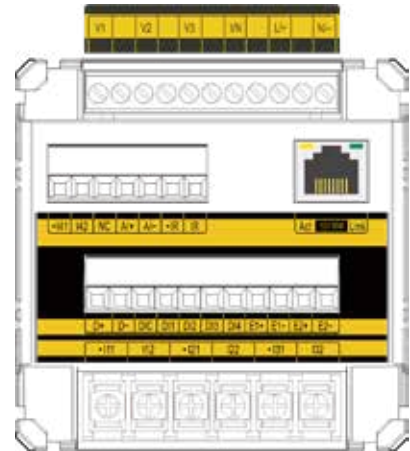
## Split-Core CT

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	
Secondary Output	40mA	
Range	0.15%-120%In	
Accuracy	Class 0.5	
Frequency	50/60Hz	
Operating Temperature	-20°C to +50°C	

## Dimensions

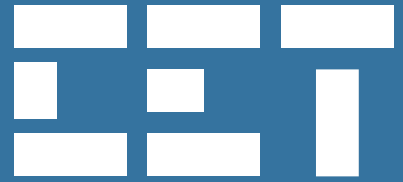


Side View



Back View

# Our Services



CET has a team of dedicated and proficient Engineering Services personnel who are ready to provide expert assistance for your system deployment needs. We are committed in helping our customers create a more secure and reliable, energy conserving and environmentally friendly electrical power system. Our team of experts is prepared to provide customized solutions for your different application needs with timely and efficient services. Please do not hesitate to contact our sales office or your local representative for more information.

Phone: +86.755.8341.5187  
Email: [sales@cet-global.com](mailto:sales@cet-global.com)  
Website: [www.cet-global.com](http://www.cet-global.com)

Copyright © CET Inc. All rights reserved.

Your Local Representative



V.00 20.04.2020