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PMC-53A-E
Ethernet Multifunction Meter

- IEC 62053-22 Class 0.5S
- True RMS Measurements
- THD with 31 Ind. Harmonics
- K-Factor, Crest Factor and TDD
- Unbalance & Phase Angles
- Demands and Peak Demands
- Multi-Tariff TOU
- Max/Min Log with Timestamp
- 4MB Non-volatile Log Memory
- Freeze Logs, DR Logs and SOE Log
- 15-min. recording for 1250 days
- Large, Backlit Dot-Matrix LCD
- 1-Cycle Real-time WF display
- 100BaseT Ethernet & RS-485
- Modbus TCP/RTU, BACnet MS/TP, DNP3.0
- 4xDI, 2xDO, 1xI4, 1xIr and 1xAI
- IP65 Enclosure with No Openings
- Standard Tropicalization
- Industrial Grade Components
- Extended Temperature
- Extended Warranty

Designed For Reliability *Manufactured To Last*

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The 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.

Typical Applications

- Industrial, Commercial and Utility Substation Metering
- Building, Factory and Process Automation
- Sub-metering and Cost Allocation
- Energy Management and Power Quality Monitoring

Features Summary

Basic Measurements

- VLN, VLL per phase and Average
- Current per phase and Average
- kW, kvar, kVA, 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)
- Neutral Current I4 measurement
- Residual Current Ir 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 31st
- Current TDD, TDD Odd, TDD Even, K-Factor and Crest Factor
- U and I Unbalance and Phase Angles
- Displacement PF
- Fundamental U, I and kW per phase
- Total Fundamental kW & Total Harmonic kW
- U and I Symmetrical Components
- kvarh Q1-Q4
- Interval Energy for kWh/kvarh Imp/Exp and kVAh
- Demands, Predicted Demands and Peak Demands for kW/kvar/kVA Total and per phase Current with Timestamp for This Month (or Since Last Reset) and Last Month (or Before Last Reset)
- 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, each providing the following information
        - 3-Phase Total and Per-phase kWh/kvarh Imp./Exp., kVAh
        - kW/kvar/kVA Max. Demands

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 PMC Setup 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, DI status changes and DO operations

Max/Min Log

- Max/Min Log with Timestamp for real-time measurements 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 Before/Since Last Reset

Freeze Logs

- 60 Daily Freeze Logs for kWh/kvarh/kVAh Total and kW/kvar/kVA Peak Demands
- 36 Monthly Freeze Logs for kWh/kvarh/kVAh Total and kW/kvar/kVA Peak 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 1250 days at 15-minute interval for 1 Data Recorder with 6 parameters

Diagnostics

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

Communications

- One 100BaseT Ethernet Port with RJ45 connector, supporting Modbus TCP, HTTP, SMTP, SNTP and TFTP
- One optically isolated RS485 port at max. 38,400 bps, supporting selectable protocol for Modbus RTU, BACnet MS/TP, DNP 3.0 and Ethernet Gateway

Real-time clock

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

System Integration

- Supported by CET's PecStar® iEMS
- Easy integration into Building Automation Systems with BACnet MS/TP 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

Inputs and Outputs

Digital Inputs (Optional)

- 4 channels, volts 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)

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

Pulse Outputs (Optional)

- 2 Form A Soild 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

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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
Ir (measurement)	±0.5%	0.001A
kW, kvar, kVA	±0.5%	0.001k
kWh, kVAh	IEC 62053-22 Class 0.5S	0.1kXh
kvarh	IEC 62053-23 Class 2	0.1kvarh
P.F.	±0.5%	0.001
Frequency	±0.02 Hz	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°

Technical Specifications

Voltage Inputs (V1, V2, V3, VN)	
Standard Un	400VLN/690VLL
Range	10V to 1.2Un
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)	
In	Standard 5A (5A/1A Auto-Scale), 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 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
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
Max. Load Voltage	80V
Max. Forward Current	50mA
Optional I4 Input (I41, I42)	
In	5A (5A/1A Auto-Scale)
Range	0.1% to 200% 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
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
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
Mechanical Characteristics	
Panel Cutout	92x92 mm (3.62”x3.62”)
Unit Dimensions	96x96x88 mm
IP Rating	65

Standards of Compliance

Safety Requirements	
CE LVD 2014 / 35 / EU	EN61010-1: 2010 EN61010-2-030: 2010
Electrical safety in low voltage distribution systems up to 1000Vac and 1500 Vdc	IEC 61557-12: 2008 (PMD)
Insulation AC Voltage: 2.5kV @ 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
Conducted disturbances	EN 61000-4-6: 2009
Magnetic Fields	EN 61000-4-8: 2010
V Dips, Interruptions & Variations	EN 61000-4-11:2004
Oscillatory waves	EN 61000-4-12: 2006
Radio Disturbances	CISPR 22:2006, Level B
Emission Tests	
Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment	EN 55011: 2009 + A1: 2010 (CISPR 11)
Limits and methods of measurement of radio disturbance characteristics of information technology equipment	EN 55022: 2010+AC: 2011 (CISPR 22)
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
Testing and measurement techniques - Ring wave immunity test.	EN 61000-4-12: 2006
Mechanical Tests	
Spring Hammer Test	IEC 62052-11: 2003
Vibration Test	IEC 62052-11: 2003
Shock Test	IEC 62052-11: 2003

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Ordering Information

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Version 20180906

Product Code	Description
PMC-53A-E Ethernet Multifunction Meter	
Basic Funciton	
E	Dot-Matrix LCD, Monthly & Daily Freeze Log, Data Recorder Log, 4MB Memory, 1x100BaseT Ethernet Port and 1xRS-485 (Modbus RTU, BACnet MSTP 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)
Input Voltage	
9	400VLN/690VLL
Power Supply	
2	95-250 VAC/DC, 47-440Hz
3*	20-60VDC
Frequency	
5	45Hz-65Hz
I/O	
A	4xDI + 2xRO (Relay Output)
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

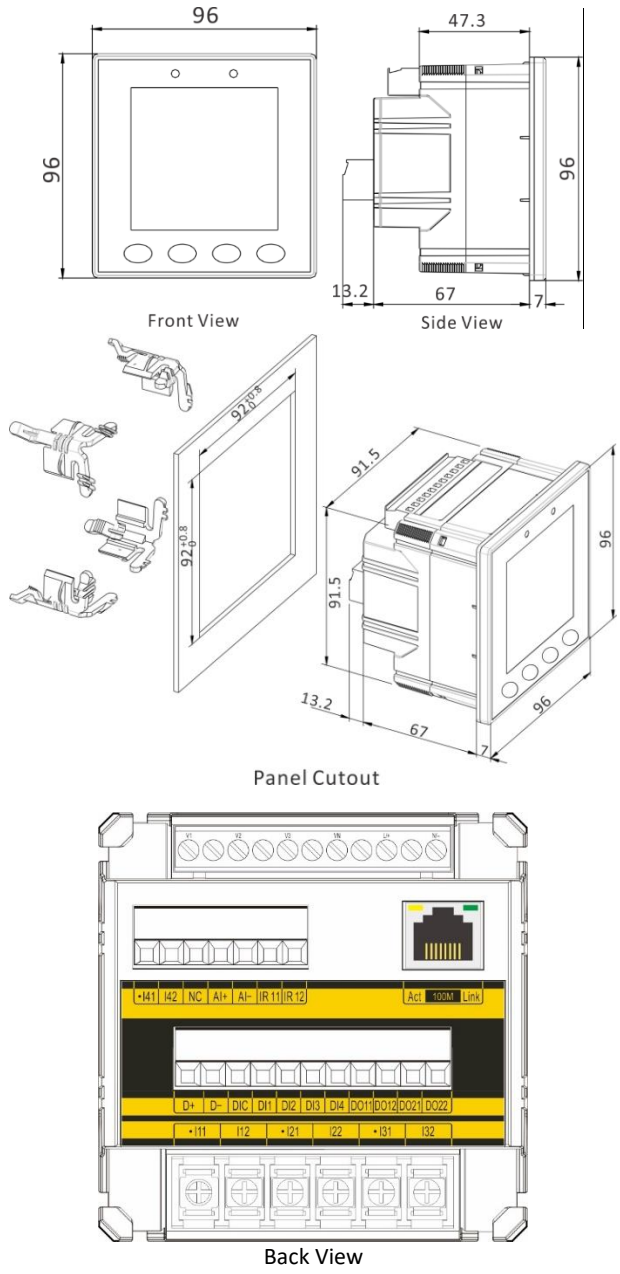
PMC-53A	-	E	5	9	2	5	A	X	E	PMC-53A-E5925AXE (Standard Model)

* Additional charges apply

Accessories

Residual Current CT	
Load Current (Solid Core)	160A (CT517203, Ø=46mm) 400A (CT517403, Ø=80mm) 630A (CT519703, 220x50mm) 1000A (CT517603, Ø=120mm)
Load Current (Split Core)	160A (CT553203, Ø=48mm) 225A (CT553303, Ø=68mm)
Primary Input	1A (Residual Current)
Secondary Output	0.5mA
Range	2-200%
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)
RTD Temperature Sensor	
Type	2-Wire PT100
Range	-50°C to 200°C
Accuracy	IEC 60751 Class B
Cable Length	3m, 5m or 8m
Protective Tube Length	300mm

Device View and Dimensions



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