PMC-350-C
3-Phase LoRaWAN DIN Energy Meter

The PMC-350-C 3-Phase DIN Energy Meter is CET's latest offer for the wireless IoT energy metering market using the LoRaWAN technology for its Long-Range wireless communication capability. Housed in a standard DIN form factor measuring 72x70x95mm, it is perfectly suited for extremely space restricting environment. With a standard RS-485 port and Modbus RTU protocol support, IEC 62053-21 Class 1 compliance as well as optional support for LoRaWAN AS923-1/2/3/4, KR920 or EU868, it becomes a vital component of an intelligent, distributed and IoT based EMS. The PMC-350-C optionally provides 4xDI for Status Monitoring, 2xRO for Control and Alarming or 2xSS Pulse Outputs for Energy Pulsing as well as 4xRTD and 1xIresidual Inputs for Temperature and Leakage Current measurements, respectively.

Typical Applications

- Industrial, Commercial and Utility Substation Metering
- Building, Factory and Process Automation
- Sub-metering and Cost Allocation
- Energy Management and Power Quality Monitoring
- LoRaWAN Class A/C at AS923-1/2/3/4, KR920 or EU868

Features Summary

Ease of use

- Easy installation with DIN rail mounting, no tools required
- Support LoRaWAN Class C Node that offers the lowest latency for Server to End-Node communication
- Simple commissioning and low-deployment cost with Split-Core CT and wireless IoT communication

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
- Device Operating Time (Running Hours)
- Optional Temperature and Residual Current measurements
- Optional DI for Status Monitoring and Utility Pulse Counting

Enhanced 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 Angles
- Fundamental kW and PF
- kvarh Q1-Q4
- Demands, Predicted Demands and Max. Demands for kW/kvar/kVA Total and per phase Current with Timestamp for This Month and Last Month (or Since Last Reset and Before Last Reset)

Setpoints

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

Multi-Tariff TOU

- 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
    - kWh/kvarh Import/Export, kVAh
    - kW/kvar/kVA Max. Demands

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 Before/Since Last Reset

SOE Log

- 100 events time-stamped to ±1ms resolution
- Setup changes, Setpoint, DI status changes, DO operations, Clear Actions, Iresidual and Temperature Alarm, etc.

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

Daily/Monthly Freeze Log

- Daily/Monthly Log with Timestamps for kWh, kvarh, kVAh Total and Max. Demands for kW, kvar, kVA Total
- Available through Modbus and LoRaWAN communications for 60 Daily Freeze records (2 months) and 36 Monthly Freeze records (3 years)

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

Diagnostics

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

Communications

- Optically isolated RS-485 port at 1,200 to 38,400 bps
- Modbus RTU protocol
- Optional LoRaWAN support at AS923-1/2/3/4, KR920 or EU868

Autonomous Data Push with the LoRaWAN option

- DevEUI (End-Device Identifier), AppEUI (Application Identifier) and AppKey (AES-128 key) for OTAA activation
- User selectable Auto-Push Data Packages of Real-time measurements, Energy, Demands, Harmonics, Max./Min. Logs, Freeze Logs, I/O and Setpoint status can be autonomously pushed to the LoRaWAN Network Server in configurable interval

*Not all measurements are available via the wireless LoRaWAN option.

System Integration

- Supported by our PecStar® iEMS and PMC Setup
- Easy integration into other Automation or SCADA systems via Modbus RTU protocol or IoT based Energy Management System via LoRaWAN

I/O Options

- 4xDI + 2xDO (Mechanical Relay)
- 4xDI + 2xSS Pulse Output
- 4xRTD + 1xIresidual Inputs (PT100 sensor & Residual CT not included)

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 62053-21:2003 Class 1	0.01kWh
kvarh	IEC 62053-23:2003 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

Designed For Reliability ***Manufactured To Last***

PMC-350-C
3-Phase LoRaWAN DIN Energy Meter

Technical Specifications

Voltage Inputs (V1, V2, V3, VN)		
Voltage (Un)	277ULN/480ULL	
Range	90V to 1.2 Un	
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 200A/40mA 400A/40mA 800A/40mA 1600A/40mA	5A/2mA
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	-40-200°C	
Alarm Range	45-140°C	
Optional Residual Current Inputs (·IR, IR)		
Range	20mA-2000mA	
Optional Solid State Energy Pulse Output (E1+, E1-, E2+, E2-) Selectable kWh/kvarh		
Pulse Constant	10/100/1000/3200 imp/kxh	
Isolation	Optical	
Max. Load Voltage	80V	
Max. Forward Current	50mA	
Pulse Width	80±20ms	
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 (Optional)	Applicable to the following regions:	
AS923-1	Australia, New Zealand, Malaysia, Hong Kong, Singapore, Taiwan, Thailand, Cambodia, etc.	
AS923-2	Vietnam, Indonesia	
AS923-3	Denmark, Norway, Saudi Arabia, etc.	
AS923-4	Israel	
EU868	Europe, United Arab Emirates, etc.	
KR920	South Korea	
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	
Mechanical Characteristics		
Mounting	DIN Rail or optional Panel Mount	
Unit Dimensions	72x70x95mm	
Panel Cutout	78x67mm	
IP Rating	IP30	

Standards of Compliance

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
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
Limits and Methods of measurement of Radio Disturbance Characteristics of Information Technology Equipment	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 Residential, Commercial and Light-Industrial Environments	EN 61000-6-4: 2007+A1: 2011
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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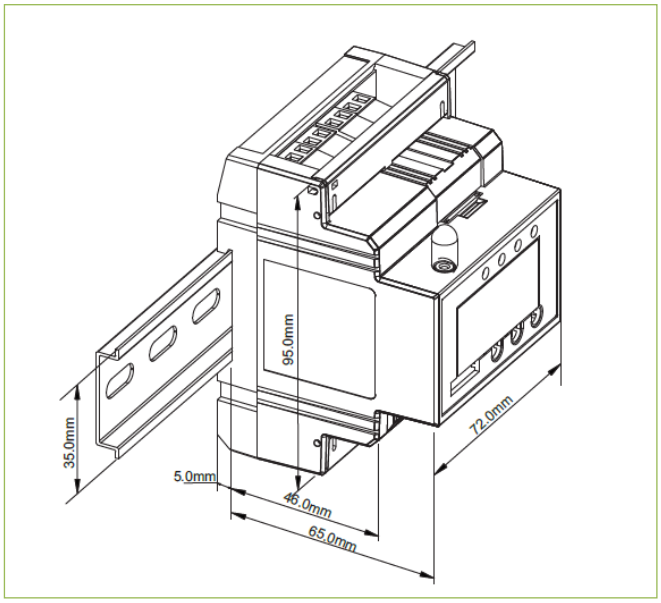
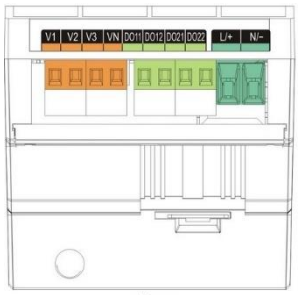
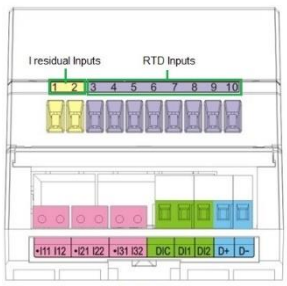
Dimensions and DIN-Rail Installation



Terminal Diagram

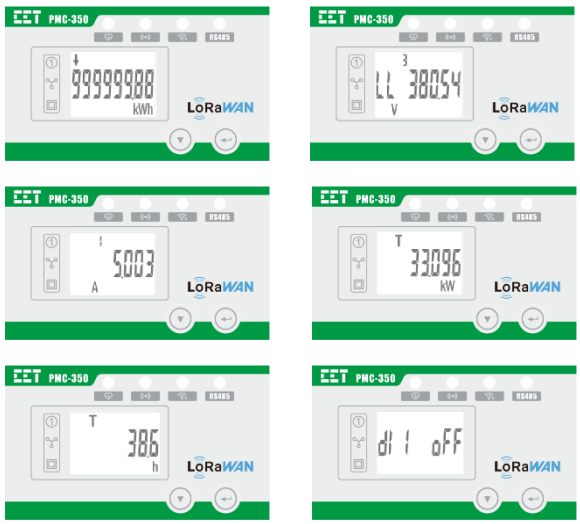


Top



Bottom

Front Panel Display



Ordering Information

Version 20220913

Product Code	Description
PMC-350 3-Phase LoRaWAN DIN Energy Meter	
Basic Funciton	
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 Outputs
Expansion 2*	
N	None
T	4xRTD + 1xIresidual Inputs
Expansion Communication*	
N	None
1	LoRaWAN @ **EU868** with External Antenna
6	LoRaWAN @ **AS923-1/2/3/4** with Internal Antenna
7	LoRaWAN @ **AS923-1/2/3/4** with External Antenna
9	LoRaWAN @ **KR920** 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

Version 20211220

PMC-350-C Accessories

External Split-Core CT

Model #	Specification	Accuracy	Dimension (mm)	Cable Length
PMC-SCCT-100A-40mA-16-A	100A, 1-Phase Split-Core CT with 2m Cable & Pluggable Connector	0.5	Round hole, ϕ16	2m
PMC-SCCT-200A-40mA-24-A	200A, 1-Phase Split-Core CT with 2m Cable & Pluggable Connector	0.5	Round hole, ϕ24	2m
PMC-SCCT-400A-40mA-35-A	400A, 1-Phase Split-Core CT with 2m Cable & Pluggable Connector	0.5	Round hole, ϕ35	2m
PMC-SCCT-800A-40mA-A	800A, 1-Phase Split-Core CT with PMC-BCC-350-2	0.5	Square hole 80x50mm	2m
PMC-SCCT-1600A-40mA-A	1600A, 1-Phase Split-Core CT with PMC-BCC-350-2	0.5	Square hole 130x55mm	2m
PMC-SCCT-5A-2mA-16-A	5A/2mA, 1-Phase Split-Core CT with 2m Cable & Pluggable Connector	2	Round hole, ϕ16	2m

Cable for 800A/1600A Split-Core CT

Model #	Specification
PMC-BCC-350-2	2m with 2-Pin Black Pluggable Connector for 800A and 1600A SCCTs

DIN Panel Mounting Adapter

Model #	Specification
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.
3) "**PMC-PMA-4**" is only applicable for the PMC-350-C with Internal Antenna.

Contact us

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Revision Date: September 22, 2022

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