CET Electric Technology

PMC-352
3-Phase LoRa DIN Energy Meter

The PMC-352 3-Phase LoRa DIN Energy Meter is CET's latest offer for the wireless IoT energy monitoring market using the LoRa technology for its wireless communication capability. Designed in a compact DIN form factor measuring 36x65x90mm, it is perfect for energy and condition monitoring applications in space-limited power distribution board. The PMC-352 comes standard with 4xNTC Inputs for temperature monitoring and 3xDI for status monitoring. With standard RS-485 and optionally LoRa supporting the Modbus RTU protocol and IEC 62053-21 Class 1 compliance, the PMC-352 becomes a vital component of an intelligent, distributed and wireless IoT based EMS or Condition Monitoring System.

Typical Applications

- Industrial, Commercial and Utility Substation Monitoring
- Sub-metering and Cost Allocation
- Wireless Energy & Condition Monitoring of Busbar or Machines
- Building, Factory and Process Automation
- Energy Management and Power Quality Monitoring
- Production Line Energy Management Refinement

Features Summary

Ease of use

- Easy installation with DIN Rail mounting, no tools required
- Simple commissioning and low-deployment cost with Split-Core CT and wireless IoT communication

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)

Enhanced Measurements

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

Setpoints

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

SOE Log

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

Standard I/O

- 3xDI for Status Monitoring or Utility Pulse Counting
- 4xNTC Inputs for Temperature Monitoring (sensor not included)

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 1200 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

System Integration

- Supported by our PecStar® iEMS and EasyConfig Software
- Easy integration into other Automation or SCADA systems via Modbus RTU protocol

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

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 1500VDC	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 62053-21: 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
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 ≤16A	EN 61000-3-2: 2014
Limitation of Voltage Fluctuations and Flicker in Low-Voltage Supply Systems for Equipment with Rated Current ≤16A	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

Designed For Reliability *Manufactured To Last*

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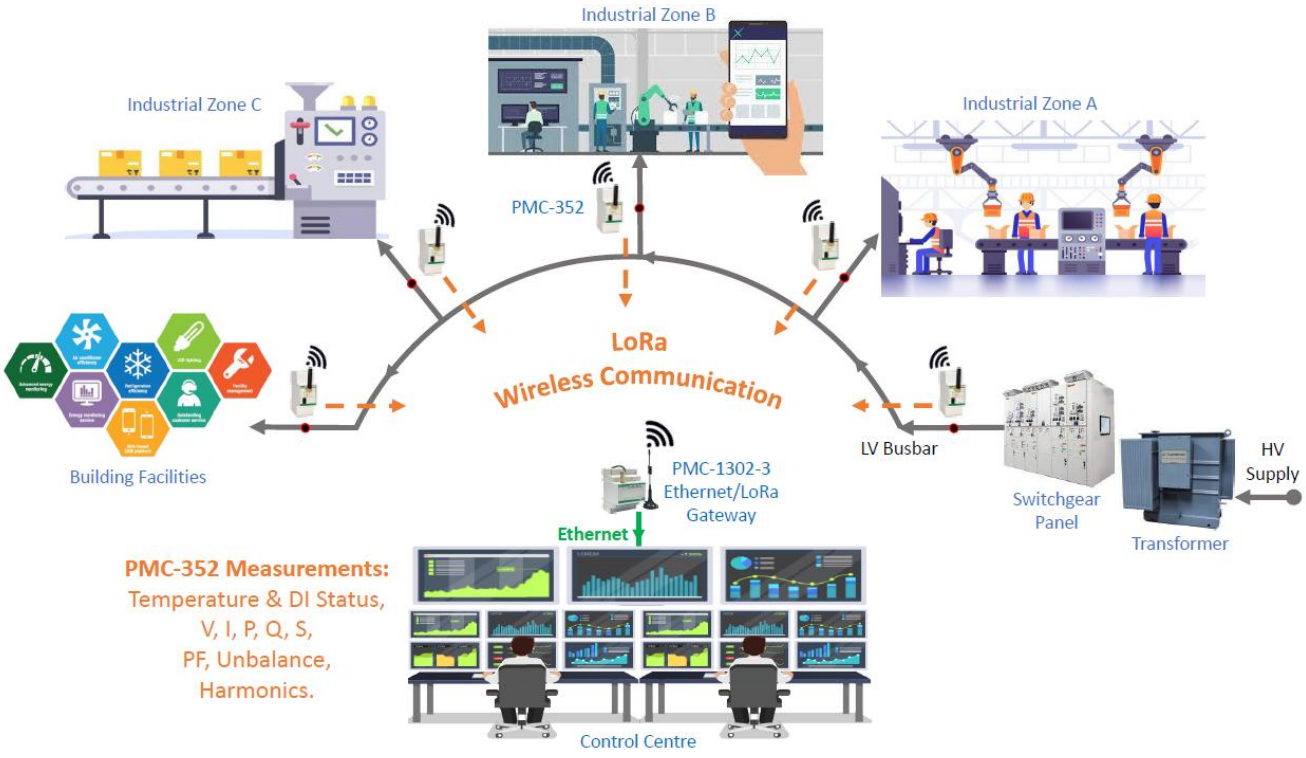
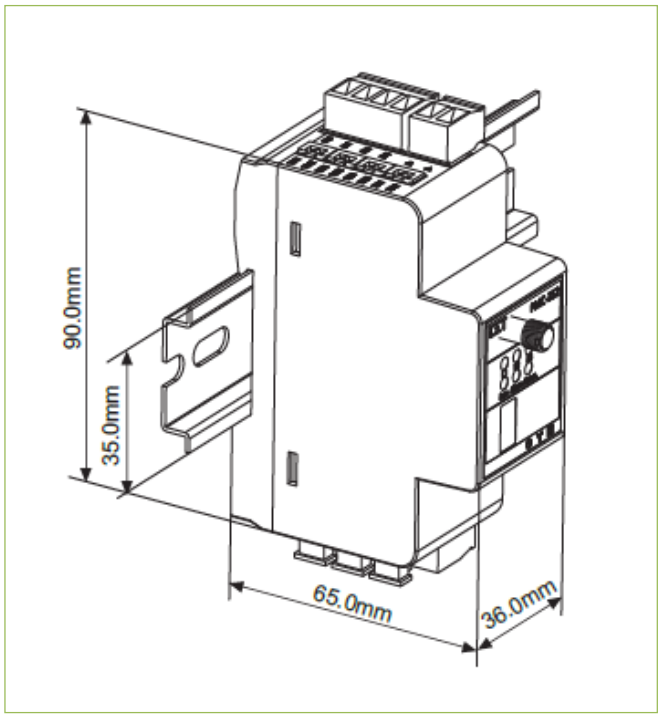
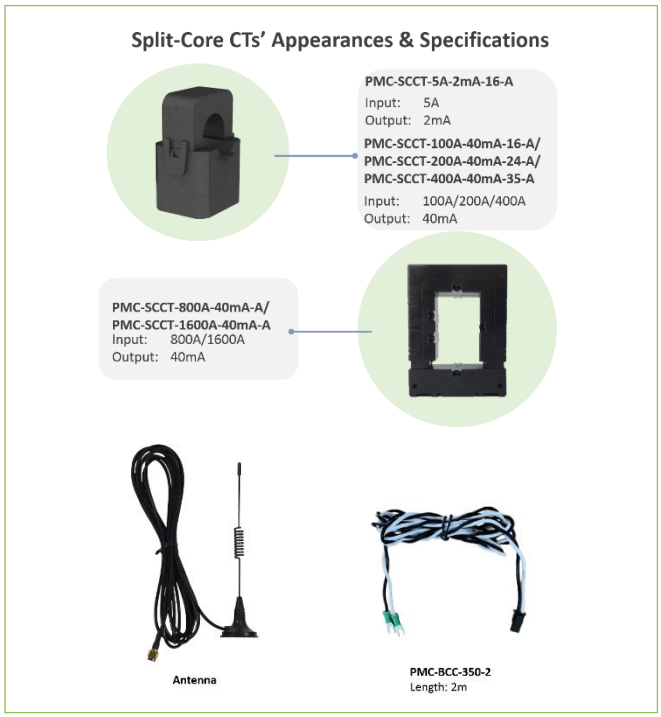
Application Diagram



Dimensions and Installation



Split-Core CTs, Antenna and Connecting Cable



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Technical Specifications

Voltage Inputs (V1, V2, V3, VN)		
Voltage (Un)	277VLN/480VLL	
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 200A/40mA 400A/40mA 800A/40mA 1600A/40mA	5A/2mA
Power Supply (L+, N-, GND)		
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	
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	
Unit Dimensions	36x65x90mm	
IP Rating	IP30	

Your Local Representative

Ordering Information

CET Electric Technology — *Version 20200611*

Product Code	Description
PMC-352 3-Phase LoRa DIN 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	277VLN/480VLL ±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	3xDI
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

CET Electric Technology — *Version 20200603*

PMC-352 Accessories

Split-Core CTs for PMC-352

Model #	Specification	Accuracy	Aperture (mm)	Cable Length
PMC-SCCT-100A-40mA-16-A	100A, 1-phase Split-Core CT with Pluggable Connector	0.5	ϕ16	2m
PMC-SCCT-200A-40mA-24-A	200A, 1-phase Split-Core CT with Pluggable Connector	0.5	ϕ24	2m
PMC-SCCT-400A-40mA-35-A	400A, 1-phase Split-Core CT with Pluggable Connector	0.5	ϕ35	2m
PMC-SCCT-800A-40mA-A	800A, 1-phase Split-Core CT	0.5	80x50	Note 2
PMC-SCCT-1600A-40mA-A	1600A, 1-phase Split-Core CT	0.5	130x55	Note 2
PMC-SCCT-5A-2mA-16-A	5A/2mA, 1-phase Split-core CT with Pluggable Connector	2.0	ϕ16	2m

1) Please refer to Cable Length for details and contact the factory in advance for special requirements.
2) 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.
3) Each PMC-352 may be equipped with 3 pcs of SCCT.

NTC Thermistors

PMC-352 Accessories

NTC Thermistors

Model #	Specification
NTC -104	1xThermistor Sensor with a 0.3m Cable and 2-pin Connector
NTC-1043	3xThermistor Sensor (Yellow, Green & Red) with 2m Cables and 2-pin Connectors
NTC-1044	4xThermistor Sensor (Yellow, Green, Red & Black) with 2m Cables and 2-pin Connectors
NTC-103M4	1xThermistor Sensor (ϕ4mm Ring Connector) with a 2m Cable and 2-pin Connector
NTC-103M10	1xThermistor Sensor (ϕ10mm Ring Connector) with a 2m Cable and 2-pin Connector
NTC-104M10	1xThermistor Sensor (ϕ10mm Ring Connector) with a 1m Cable and 2-pin Connector

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