

iMeter 5

Advanced Modular Power Quality Analyzer

iMeter 5



iMeter 5 is one of CET's latest Advanced Modular PQ Analyzer designed for the compliance monitoring market as it offers unsurpassed functionality by combining Class 0.2S Accuracy and advanced PQ Features in an industry-standard compact DIN96 form factor with a stunning, high resolution, color IPS LCD display and highly sensitive touch buttons. The iMeter 5 complies with such standards as IEC 62053-22: 2020 Class 0.2S, IEC 62052-31: 2015, IEC 61000-4-30 Ed. 3.1 Class S / Class A Certified, IEC 61000-4-15, IEC 61000-4-7, EN 50160-2022, IEEE Std 519-2022. Furthermore, the iMeter 5 offers up to 4GB memory, 4xDI, 2xDO, dual 10Base-T/100Base-TX Daisy Chain Ethernet ports, an RS-485 port and an RJ45 port for modular I/O expansion. It can be easily integrated into Building Management Systems, Power Quality Monitoring Systems as well as Substation Automation Systems with Modbus TCP/RTU, BACnet/IP, SNMP, IEC 61850, IEC 60870-5-104 and other protocols. These features make the iMeter 5 a vital component of various systems for different applications.

Typical Applications

- Class 0.2S Revenue Metering
- PQ monitoring for Mains and Critical Feeders
- HV, MV and LV Applications
- Data Centers, Semiconductor Fabs, Heavy Industries, Renewable Energy Applications
- 7x24 Automated Manufacturing Facilities
- IEC 61850 support for Substation Automation and Smart Grid
- Retrofit applications with optional Class 0.5S Split-Core Current Probes

Basic Features

- IEC 62053-22 Class 0.2S kWh metering with Multi-Tariff TOU
- True RMS @ 512 samples/cycle sampling
- 512MB (Classic Model), 2GB (Class S Model) or 4GB (Class A Model) on-board log memory
- Industrial-grade, 3.5" High-Resolution Color IPS LCD @ 320x240
- Device Operating Time (Running Hours)
- Time Sync. via NTP, IRIG-B, or GPS 1PPS output
- 32 Programmable Setpoints
- Dual 10Base-T/100Base-TX Daisy Chain Ethernet (up to 16 devices) and 1xRS-485 ports as well as 1xRJ45 port for modular I/O expansion

Panel Display and Web Interface

- True RMS Real-time, Harmonics, Power and Energy Measurements
- Phasor Diagram, Harmonics & Interharmonics Histogram
- Real-time WFC of 3-phase U & I @ 128 samples/cycle x 4 cycles
- Event WF Display @ max. 512 samples/cycle & ITIC/SEMI F47 Curves
- Trend Curves for Daily/Monthly Energy Consumption, DR & SDR Log
- 3-Phase Total and Per-Phase AER & IER Logs
- Max. & Min. Logs
- Deviation, Sequence Components & Unbalance
- Demands and Multi-Tariff TOU
- Device and SOE Logs, PQ Counters and I/O Status
- Device Configuration and Diagnostics

Power Quality Features

- Optional IEC 61000-4-30 Ed. 3.1 Class S/Class A certified
- EN 50160-2022 and IEEE Std 519-2022 Reporting
- Dips, Swells, Interruptions, Transients, Rapid Voltage Change, Inrush Current, Mains Signalling Voltage and Flicker monitoring
- Real-time Waveform Capture (WFC), Waveform Recording (WFR) & Disturbance Waveform Recording (DWR) in COMTRADE File format
- Disturbance Direction Indicator for Dips, Swells and Interruptions
- Statistical Data Recording and ½ cycle RMS Recording

Advanced Modular

Power Quality Metering

PQ Parameters as per IEC 61000-4-30 Ed. 3.1 Class S/Class A Certified

- Power Frequency
- Magnitude of the Supply Voltage
- Flicker
- Supply Voltage Interruptions, Dips and Swells
- Supply Voltage Unbalance
- Voltage Harmonics and Interharmonics
- Mains Signalling Voltage on the Supply Voltage
- Rapid Voltage Change (RVC)
- Flagging
- Measurement of Over Deviation and Under Deviation Parameters
- Magnitude of Current
- Harmonic and Interharmonic Currents
- Current Unbalance

Harmonic and Interharmonic Measurements

- U and I THD, TOHD, TEHD, TIHD, TOIHD, TEIHD and TH (RMS)
- Current TDD, TDD Odd and TDD Even
- U and I Individual Harmonics (%HD and RMS) from 2nd to 63rd #
- K-Factor for Current, Crest Factor for Current and Voltage
- U and I Individual Interharmonics (%IHD and RMS) from 1st to 63rd #
- Fundamental U, I, P, Q, S Phase Angle and Displacement PF
- Harmonic Phase Angle from 2nd to 63rd
- U and I DC Components

%HD and %IHD can be configured as % of Fundamental, % of U/I nominal or % of RMS

Sequence and Unbalance

- Zero, Positive and Negative Sequence Components
- U and I Unbalance based on Zero and Negative Sequence Components

Dips, Swells, Interruptions Recording

- Dips, Swells and Interruptions detection @ 10ms (1/2 cycle at 50Hz)
- Trigger for DO, SOE Log, DR, WFR, DWR, RMSR, iTrigger and Alarm Email
- Configurable DO trigger for the Start or End of a PQ disturbance
- Display of Event specific WFR, DWR and/or RMSR as well as the associated ITIC/SEMI F47 plot on the Front Panel and Web Interface
- ITIC/SEMI F47 Alarm trigger for DO and iTrigger upon the detection of PQ disturbances that are outside of the respective tolerance curves

Transients Recording

- Transients capture as short as 40us for sub-cycle disturbances such as capacitor switching and resonance phenomena
- Trigger for DO, SOE Log, WFR, DWR, RMSR, iTrigger and Alarm Email
- Display of Event specific WFR, DWR and/or RMSR on the Front Panel and Web Interface

Rapid Voltage Change (RVC)

- Detection of a quick transition in RMS Voltage between two steady-states

Inrush Current Monitoring

- Monitoring of the 1/2 cycle RMS Current and capturing of the Current waveforms associated with events such as motor starting and transformer being energized

Disturbance Direction Indicator

- Determine if a PQ Event is located upstream or downstream
- Pinpoint if the cause of the event is external or internal

PQ Event Counters

- Dips, Swells, Interruptions, Transients, Rapid Voltage Change, Inrush Currents, Mains Signalling Voltages and Total PQ Event Counters

Metering

Basic Measurements (1-second update)

- 3-phase U, I, P, Q, S and PF as well as I4 (Measured Neutral Current), In (Calculated Neutral Current), Ung (Neutral-to-Ground Voltage), Frequency and IR (Calculated Residual Current)

High-Speed Measurements

- 3-phase U, I, P, Q, S and PF as well as I4 @ 1/2 cycle

Energy

- Per-phase kWh, kvarh Import/Export/Net/Total and kVAh Total
- Total RMS kWh, kvarh Import/Export/Net/Total and kVAh Total
- Total Fundamental kWh, kvarh Import/Export/Net/Total
- Total Harmonic kWh, kvarh Import/Export/Net/Total and Harmonic kWh, kvarh Import/Export from 2nd to 63rd

Demands

- Present and Predicted Demands for 3-phase U, U Avg., I, I Avg., I Fund., P, Q, S, PF as well as I4, I4 Fund.
- Max. Demands for 3-phase I, I Fund., UII & I Avg., as well as Power of This Month & Last Month (or Since Last Reset & Before Last Reset)
- Demand Synchronization with DI
- Max./Min. per Demand Interval

Multi-Tariff TOU Capability

- Two independent sets of TOU Schedule
 - Up to 12 Seasons
 - 90 Holidays or Alternate Days and 3 Weekdays
 - 20 Daily Profiles, each with 12 Periods
 - 8 Tariffs, each providing the following information:
 - kWh/kvarh Import/Export and kVAh
 - P & Q Import/Export Max. Demands
- Switching between two TOU schedules manually or according to pre-programmed time
- 12 Historical Logs for Energy and Max. Demand



Power Quality Analyzer

Data and Event Recorders

Non-Volatile Log Memory

- Up to 4GB on-board Log memory

SOE Log

- 512 FIFO events time-stamped to $\pm 1\text{ms}$ resolution
- Setpoint event, I/O operation, Dip, Swell, Interruption, Transient, Rapid Voltage Change, Inrush Current, Mains Signalling Voltage, iTrigger, etc.
- Record the characteristic data for Setpoint events as well as WFR, DWR, RMSR, ITIC and SEMI F47 Curve for PQ events

Device Log

- 512 FIFO entries time-stamped to $\pm 1\text{ms}$ resolution
- Power On/Off, Setup changes, Time Sync., Device Operations and Self-diagnostics

Statistical Data Recorder (SDR)

- 4 SDR Logs of max. 64 parameters each
- Recording of the Max., Min., Avg. and 95th percentile values for real-time measurements including U, I, P, Q, S, PF, Freq., Harmonics, Deviations and Unbalances
- Recording Interval from 1 to 60 minutes
- Configurable depths for recording up to 450 days at 15-min interval
- Downloadable via free software
- Support FIFO or Stop-When-Full mode

Data Recorder (DR)

- 8 DR Logs of max. 32 parameters each
- RMS/Fundamental/Harmonic/Interharmonic Measurements, Demands, Deviations, MSV, Unbalances and Flicker
- Configurable Recording Offset and Interval from 1s to 40 days
- Configurable Recording Depth with 65,535 (Group 1-7) & 120,000 (Group 8) records
- Support FIFO or Stop-When-Full mode
- BEC 2021 Compliant Data Recording for 3 years at 15-minute interval

Trend Curve for SDR and DR

- Trend display of recorded SDR and DR parameters at selectable interval via built-in web server
- Ability to export the recorded logs in tabular form via the web server

Max./Min. Recorder (MMR)

- 4 Max./Min. Recorders of max. 20 programmable parameters each
- RMS/Fundamental/Harmonic/Interharmonic Measurements, Demands, Deviations, Unbalances and Flicker
- Two transfer modes:
 - Manual: Max./Min. Since Last Reset & Before Last Reset
 - Auto: Max./Min. of This Month & Last Month

Interval Energy Recorder (IER) and Accumulative Energy Recorder (AER)

- Both IER Log and AER Log support the recording of per-phase and Total RMS kWh, kvarh Import/Export/Total/Net and kVAh Total, Total Fundamental and Total Harmonic kWh, kvarh Import/Export
- Recording Interval from 1 minute to 65535 minutes
- Max. Recording Depth @ 65535 records for each group
- Support FIFO and Stop-When-Full mode
- Support to read and export the IER/AER logs via built-in web server[#]

[#] Feature supported in Firmware V1.50.01 and later

* Features may vary by model. Please refer to the Feature Differences table on Page 7

Daily/Monthly Energy Consumption Trend Curve

- 36 Monthly and 31 Daily Energy Consumption Trend Display for kWh, kvarh Import/Export and kVAh Total on Front Panel and Web Interface
- Ability to export the Energy Log in tabular form via the web server
- FIFO Recording Mode

Disturbance Waveform Recorder (DWR)

- 128 entries
- Simultaneous recording of all Voltage (U1-U3) and Current (I1-I4) Inputs
 - Initial Fault: 35 cycles @ 512 samples/cycle
 - Extended Fault: Up to 150 cycles @ 16 samples/cycle
 - Steady State: Up to 360s of 1-cycle absolute peak values
 - Post Fault: 15 cycles @ 512 samples/cycle

Real-Time Waveform Capture (WFC) and Waveform Recorder (WFR)

- Real-time WF Capture @ 128 samples/cycle
- WFR with max. 128 entries
- Simultaneous capture of 3-phase Voltage and 4-phase Current Inputs
- Programmable formats and pre-fault cycles including 640 x 16, 320 x 32, 160 x 64, 80 x 128, 40 x 256, 20 x 512 (No. of Cycles x Samples/Cycle)
- Scheduled WFR with max. repetition of 10,000 times and programmable schedule from 1 to 1440 minutes
- COMTRADE file format, downloadable from the on-board Web Server or FTPS Server

RMS Recorder (RMSR)

- 128 entries
- 8 channels max., selectable U, I, P, Q, S, PF, Frequency, Freq. Deviation
- Recording Interval from 0.5 to 60 cycles
- Recording Width @ 7200 samples per parameter
- Configurable pre-fault samples from 100 to 500
- 72 seconds of $\frac{1}{2}$ cycle RMS recording @ 50Hz or 60 seconds @ 60Hz

iTrigger

- Cross trigger DO, SOE Log, WFR, DWR, RMSR and Alarm Email with other iMeter devices within the same local area network (LAN)
- Group ID and MAC Address provided as the trigger source

IEEE Std 519-2022 Report

- 365 Daily Reports for statistical evaluations on Voltage and Current Harmonics based on 99th percentile very short time (3 s) values
- 52 Weekly Reports for statistical evaluations on Voltage Harmonics (95th percentile) and Current Harmonics (95th and 99th percentile) short time (10 min) values
- Programmable settings for Report Mode, PCC Voltage, Max. Short Circuit Current, etc.

EN 50160: 2022 Report

- 52 Weekly Reports for statistical evaluations on Continuous Phenomena (Power Frequency, Supply Voltage Variations, Rapid Voltage Changes, Flicker Severity, Voltage Unbalance, Harmonic, Interharmonic and Mains Signalling Voltages) and Voltage Events (Interruptions of the Supply Voltage, Dips, Swells and Transient Overvoltages) of PQ parameters
- The EN 50160 Report can be accessed through the Web interface or via communications. If there are more than 52 reports, the newest report will replace the oldest on a FIFO basis

iMeter 5

Inputs and Outputs

Digital Inputs

- 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
- Demand Synchronization
- Tariff switching based on DI status

Digital Outputs

- Standard 2 channels Form A Mechanical Relays for general purpose control and alarming
- Optional 2 SS Relays for Energy pulsing applications

Modular I/O Expansion

- RJ45 connector for modular I/O expansion such as AI, AO, DI, DO, Residual Current (Ir) and Temperature (TC) Inputs

Communications

Ethernet Port (P1, P2)

- Dual 10Base-T/100Base-TX Daisy Chain (up to 16 devices) Ethernet Ports with RJ45 connector
- Selectable IP Addressing Mode—DHCP and Static
- White List for Client Access Control
- Protocols supported: Modbus TCP, HTTP/HTTPS, NTP, SMTP, SNMP, FTP/FTPS, RSTP, MQTT, BACnet/IP, IEC 61850 and IEC 60870-5-104
- Built-in password protected Web Server with multiple user accounts and pre-defined roles for easy data viewing, setup configuration and firmware upgrade
- Simultaneous client connections for 5xModbus TCP and 5xIEC 61850

RS-485 (P3)

- One optically isolated RS-485 port with Baud Rate from 1.2 to 38.4 kbps
- Support Modbus RTU, Ethernet Gateway and Modbus Master[#]
- Support up to 31 downstream Modbus Slave Devices[#]

[#] Modbus Master is supported in Firmware V1.50.01 and later

Setpoints

PQ Setpoint

- Transients, Dips, Swells, Interruptions, ITIC Alarm, SEMI F47 Alarm, Rapid Voltage Change, Inrush Current
- Trigger DO, DR, SOE Log, WFR, DWR, RMSR, iTrigger and Alarm Email

Control Setpoint

- 32 Control Setpoints can be configured with extensive monitoring sources including U, I, Freq., P, Q, S, PF, Demands, Harmonics, Unbalances, Deviations, Flickers, Phase Reversal/Loss, TC and AI, etc.
- Configurable thresholds and time delays
- Trigger DO, DR, SOE Log, WFR, DWR, RMSR, iTrigger and Alarm Email

Digital Input Setpoint

- Provides Control Output Actions in response to changes in DI status
- Trigger DO, DR, SOE Log, WFR, DWR, RMSR, iTrigger and Alarm Email

Time Synchronization

- Battery-backed Real-time clock @ 6ppm ($\leq 0.5s/day$)
- Time Sync. with auto-selection among Modbus RTU, NTP, GPS 1PPS and IRIG-B

System Integration

PecStar® iEMS

- The iMeter 5 is supported by CET's PecStar® iEMS

On-board Web/FTPS Server

- The on-board, password protected Web Server provides user-friendly access to its data and supports the configuration for most Setup parameters via a web browser without the use of proprietary software
- The on-board, password protected FTPS Server allows the Excel files for the logged C.E. Measurement data, IEEE Std 519-2022 Daily and Weekly reports, EN 50160 Weekly reports, and the COMTRADE files for the waveform records to be downloaded without any special software. The downloaded files can be subsequently viewed using software that supports these industry standard file formats

iPQ Explore

- Compact, password protected free software for simultaneous connection with multiple iMeter series Analyzers
- Support configurations for all Setup parameters
- Display of Real-time Measurements, PQ Events and Waveforms
- Ability to export the IER, AER, DR and SDR Logs as well as EN 50160 and IEEE Std 519-2022 Reports

3rd Party System Integration

- Easy integration into Substation Automation, Utility SCADA or BMS systems via Modbus, IEC 61850, IEC 60870-5-104 and BACnet/IP protocols

Expansion Modules

Optional PMC-KPWR Module

- Power Supply: 95V-277VAC/DC $\pm 10\%$, 47-440Hz, optional 20-60VDC
- Communication: RJ45 Ethernet Port

Optional PMC-KDIO Module

- 6xDI + 4xDO
- DI Excitation: Dry Contact (@24VDC Self-Excitation)

Optional PMC-KAIO Module

- 6xAI + 2xAO
- Supports both 4~20mA current signal and 0-10V voltage signal

Optional PMC-KTMP Module

- 1xResidual Current + 5xTemperature Monitoring (NTC or PT100)

Tech. Spec. - Main Unit

Voltage Inputs (V1, V2, V3, VN)

Standard (Un)	400VLN/690VLL +20%	
Range	4-800V L-N / 7-1380V L-L	
Overload	2xUn continuous, 4xUn for 1s	
Burden	< 0.5VA/per phase	
PT Ratio	Primary	1-1,000,000V
	Secondary	1-1,500V
Measurement Category	CAT III 600V	
Frequency	40Hz-72Hz	

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

Standard (In)	5A	
Optional (In)	1A	
Range	0.1% to 200% In	
Starting Current	0.1% In	
Overload	2xIn continuous, 4xIn for 10s, 20xIn for 1s	
Burden	< 0.5VA/per phase @ 5A	
	< 0.1VA/per phase @ 1A	
CT Ratio	Primary	1-30,000A
	Secondary	1-50A
	I4 Primary	1-30,000A
	I4 Secondary	1-50A
SCCP Options SCCP-50A-500mV SCCP-200A-200mV SCCP-500A-500mV SCCP-5000A-500mV	Split-Core Current Probe Input @ max. 500mV 5A/50A (In/Imax), max. 500mV Output 20A/200A (In/Imax), max. 200mV Output 500A Imax, max. 500mV Output Selectable 500A/5000A (Imax) Rogowski Coil, max. 500mV Output	

Power Supply (L/+, N/-)

Standard	95-277VAC/VDC $\pm 10\%$, 47-440Hz
Optional	20-60VDC
Burden	< 12 VA / 6W @ 95-277VAC, < 6W @ 24VDC
Overvoltage Category*	OVC III 300V

Digital Inputs (DIC, DI1, DI2, DI3, DI4)

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

Digital Outputs (DO11, DO12, DO21, DO22)

Type	Form A Mechanical Relay
Loading	5A @ 250VAC/30VDC

Optional Solid State Pulse Outputs (E1+, E1-, E2+, E2-)

Type	Form A Solid State Relay
Isolation	Optical
Max. Load Voltage	30VDC
Max. Forward Current	100mA

Terminals Max. Torque

U Inputs & Power Supply	0.44 N·m
I Inputs	1.17 N·m
DI, DO & RS-485	0.49 N·m

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
Altitude	3000m
Pollution Degree	2

Mechanical Characteristics

Panel Cutout	92x92 mm
Unit Dimensions	96x96x85 mm
IP Rating	IP54

* The Overvoltage Category differs according to the two power supply options mentioned above, with the low-voltage DC one having a specification of OVC III 150V.

Tech. Spec. - Expansion Modules

Optional PMC-KPWR-E2A Module

Input	95-277V AC/DC $\pm 10\%$, 47Hz-440Hz
Output	24V DC (RJ45 Connector)
Burden	$\geq 10W$
Overvoltage Category	OVC III 300V

Optional PMC-KPWR-E3A Module

Input	20-60V DC
Output	24V DC (RJ45 Connector)
Burden	$\geq 10W$
Overvoltage Category	OVC III 150V

Optional PMC-KDIO E6DI4DON Module

Digital Input (DIC, DI1, DI2, DI3, DI4, DI5, DI6)	
Type	Dry contact, 24VDC Self-Excitation
Sampling	1000Hz
Hysteresis	1ms minimum
Digital Output (DO11, DO12, DO13, DO21, DO22, DO3, DO4)	
Type	Form A Mechanical Relay
Loading	5A @ 250VAC/24VDC

Optional PMC-KAIO E6AI2AO Module

Analog Input (AI1+, AI1-, AI2+, AI2-, AI3+, AI3-, AI4+, AI4-, AI5+, AI5-, AI6+, AI6-, NC)	
Type	0-20 / 4-20 mA DC, 0-10VDC Compatible
Overload	24mA DC / 10VDC maximum
Analog Output (AO1+, AO1-, AO2+, AO2-)	
Type	0-20 / 4-20 mA DC
Loading	500 Ω maximum
Overload	24mA DC maximum

Optional PMC-KTMP E1R5TA Module

Residual Current Transducer PMC-MIR (-IR, IR)	
In	0.5mA
Range	0-1mA
CT Type	Split-Core Residual CT
Temperature Input (TC1+, TC1-, TC1N, TC2+, TC2-, TC2N, TC3+, TC3-, TC3N, TC4+, TC4-, TC4N, TC5+, TC5-, TC5N)	
RTD Type	NTC
Range	0°C to 200°C, $\pm 1^\circ\text{C}$
Accuracy	0 to 80°C: $\pm 1^\circ\text{C}$; 80 to 200°C: $\pm 2^\circ\text{C}$

Optional PMC-KTMP E1R5TB Module

Residual Current Transducer PMC-MIR (-IR, IR)	
In	0.5mA
Range	0-1mA
CT Type	Split-Core Residual CT
Temperature Input (TC1+, TC1-, TC1N, TC2+, TC2-, TC2N, TC3+, TC3-, TC3N, TC4+, TC4-, TC4N, TC5+, TC5-, TC5N)	
RTD Type	Platinum Resistor PT100
Range	0°C to 200°C, $\pm 1^\circ\text{C}$
Accuracy	0 to 80°C: $\pm 1^\circ\text{C}$; 80 to 200°C: $\pm 2^\circ\text{C}$

Notes:

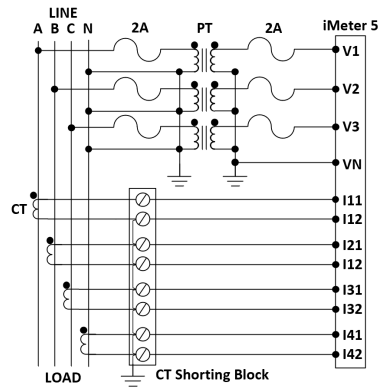
1. The iMeter 5 supports up to 2 expansion modules per type, with a maximum of 4 modules in total.
2. If an expansion module is connected to the iMeter 5, a power module must be paired with each iMeter 5. And the input of the power module matches that of the iMeter 5 Main Unit.

Feature Differences

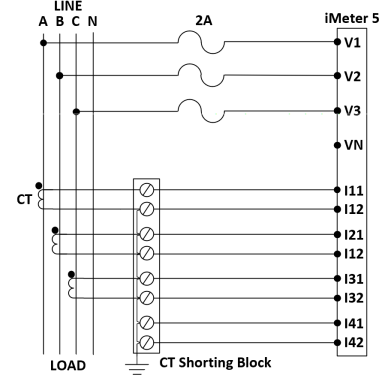
Features/Model	Classic (PQA)	Class S (PQI-S)	Class A (PQI-A)
Memory Size	512MB	2GB	4GB
IEC 61000-4-30 Compliant	--	Class S	Class A
Interharmonics	--	■	■
Flicker (Pst, Plt)	--	■	■
Rapid Voltage Change	--	■	■
Transient	--	■	■
Inrush Current	--	■	■
Mains Signalling Voltage	--	--	■
2kHz-9kHz C. E.	--	--	■
Individual Harm. Energy	--	--	■
U & I DC Component	--	■	■
EN 50160 Report	--	■	■
IEEE 519-2022 Report	--	■	■
Statistical Data Recording	--	■	■
IEC 61850	--	■	■
GPS & IRIG-B Time Sync.	--	■	■
iTrigger	--	■	■
DWR	--	--	■

-- Not Applicable ■ Supported

Typical Wiring Diagram



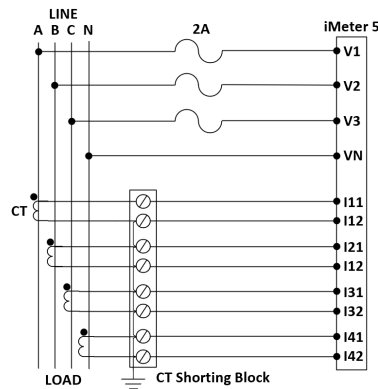
3P4W Wye with 3PTs, 4CTs



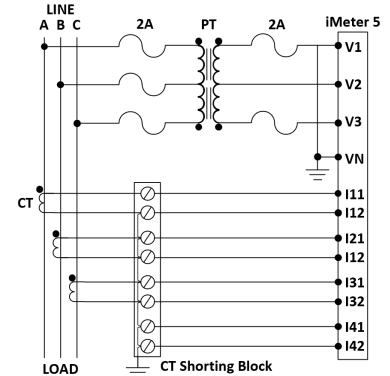
3P3W Delta with no PT, 3CTs

Accuracy

Parameters	Accuracy	Resolution
Voltage (U)	±0.1%	0.001V
I1, I2, I3, I4	5A/1A ±0.1%	0.001A
	SCCPA ±0.1% + Error of SCCP	
P, Q, S	5A/1A ±0.2%	0.001K
	SCCPA ±0.5%	
kWh, kVAh	5A/1A IEC 62053-22 Class 0.2S	0.01kXh
	SCCPA IEC 62053-21 Class 1	
kvarh	5A/1A IEC 62053-24 Class 0.5S IEC 62053-23 Class 2	0.01kvarh
	SCCPA IEC 62053-24 Class 1 IEC 62053-23 Class 2	
PF	5A/1A ±0.2%	0.001
	SCCPA ±0.5%	
Phase Angle	±1°	0.1°
Frequency, Freq. Deviation	±0.003Hz	0.001Hz
Voltage Deviation	±0.1%	0.001V
Harmonics, Interharmonics	IEC 61000-4-7 Class I	0.01%
U Unbalance	±0.1%	0.01%
I Unbalance	±0.5%	0.01%
Pst, Plt	IEC 61000-4-15 Class F1	0.001



3P4W Wye, no PTs, 4CTs

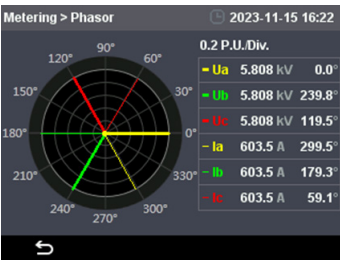


3P3W Delta, 2PTs, 3CTs

Note:

iMeter 5 supports the monitoring of 3P4W, 3P3W, 1P3W, 1P2W L-N and 1P2W L-L power systems. Please refer to Quick Start Guide or User Manual for detailed information.

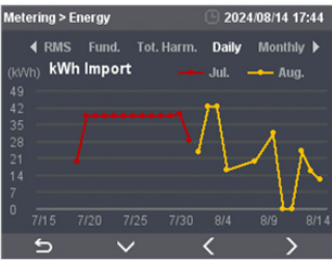
Front Panel Display



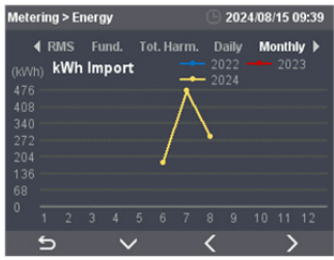
Phasor



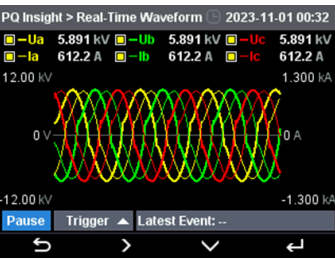
Reactive Power



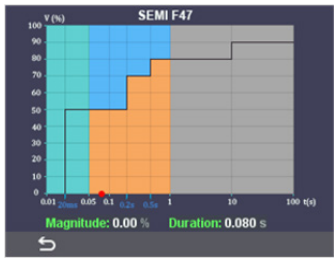
Daily Energy Consum. Curve



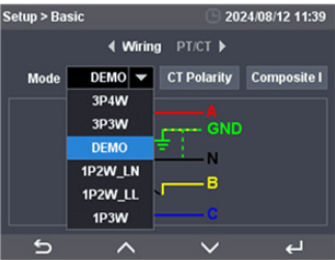
Monthly Energy Consum. Curve



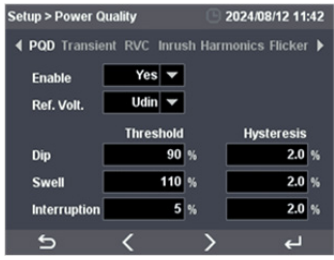
Real-Time Waveform



SEMI F47 Curve



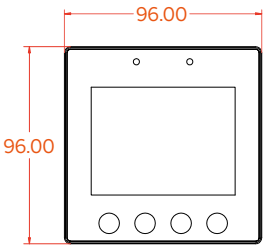
Wiring Setup



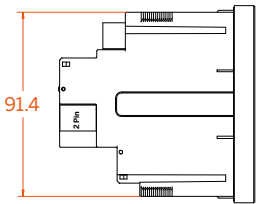
PQ Disturbance Setup

Dimensions and Installation

(Unit: mm)

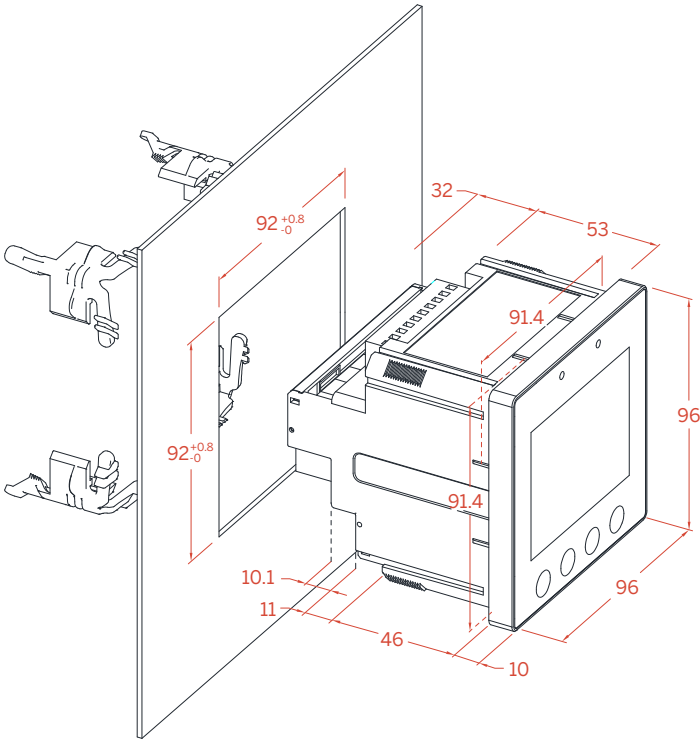


Front View

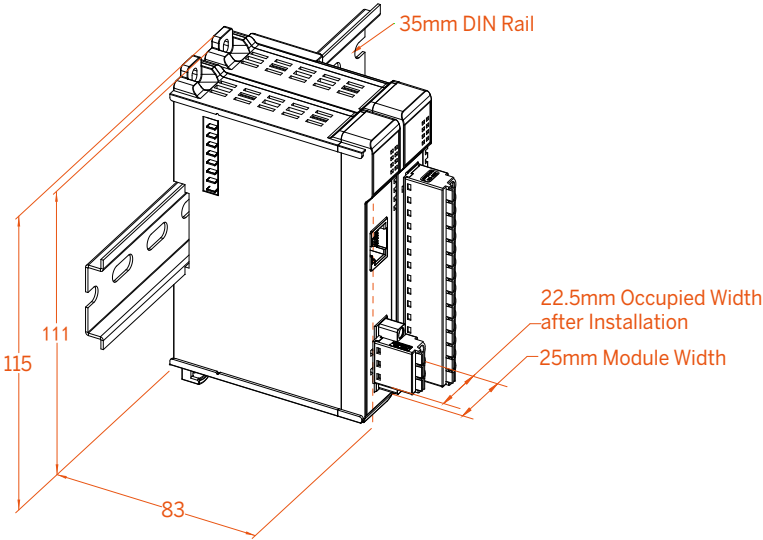


Side View

iMeter 5 Main Unit's Dimensions



Installation of iMeter 5 Main Unit



DIN-Rail Installation of Expansion Module

Standards of Compliance

Safety Requirements

CE LVD Directive 2014/35/EU	EN 61010-1: 2010 + A1: 2019 BS EN 61010-1: 2010 + A1: 2019 EN IEC 61010-2-030: 2021 BS EN IEC 61010-2-030: 2021 + A11: 2021
Electrical Safety in Low Voltage Distribution Systems up to 1000Vac and 1500 Vdc	IEC 61557-12: 2021 (PMD)
Insulation	IEC 62052-31: 2015 EN 61010-1: 2010 + A1: 2019
AC Voltage Insulation Resistance Impulse Voltage	2kV @ 1 minute >100MΩ 6kV, 1.2/50μs

Power Quality

Voltage Characteristics of Electricity supplied by Public Distribution Systems	EN 50160: 2022
General Guide on Harmonic and Interharmonic Measurements and Instrumentation, for Power Supply Systems and Equipment Connected Thereto	IEC 61000-4-7: 2009
Flickermeter - Functional and Design Specifications	IEC 61000-4-15: 2010
Testing and Measurement Techniques - Power Quality Measurement Methods	IEC 61000-4-30: 2021 Ed. 3.1
Power Quality Measurement in Power Supply Systems - Part 2: Functional Tests and Uncertainty Requirements	IEC 62586-2: 2021 Ed. 2.1

EMC Compatibility

CE EMC Directive 2014/30/EU

(EN IEC 61326-1: 2021 + EN IEC 61326-2-3: 2021)

BS EN IEC 61326-1: 2021 + BS EN IEC 61326-2-3: 2021)

Immunity (EN50082-2)

Electrostatic Discharge	EN 61000-4-2: 2009 BS EN 61000-4-2: 2009
Radiated Fields	EN IEC 61000-4-3: 2020 BS EN IEC 61000-4-3: 2020
Fast Transients	EN 61000-4-4: 2012 BS EN 61000-4-4: 2012
Surges	EN 61000-4-5: 2014 + A1: 2017 BS EN 61000-4-5: 2014 + A1: 2017
Conducted Disturbances	EN 61000-4-6: 2014 + AC: 2015 BS EN 61000-4-6: 2014
Power Frequency Magnetic Fields	EN 61000-4-8: 2010 BS EN 61000-4-8: 2010
Pulsed Magnetic Fields	EN 61000-4-9: 2016
Damped Oscillatory Magnetic Fields	EN 61000-4-10: 2017
Voltage Dips and Interruptions	EN IEC 61000-4-11: 2020 BS EN IEC 61000-4-11: 2020
Ripple on DC Input Power Port	EN 61000-4-17: 1999 + A2: 2009
Damped Oscillatory Wave	EN IEC 61000-4-18: 2019
Immunity Standard for Industrial Environments	EN IEC 61000-6-2: 2019 BS EN IEC 61000-6-2: 2019

Emission (EN50081-2)

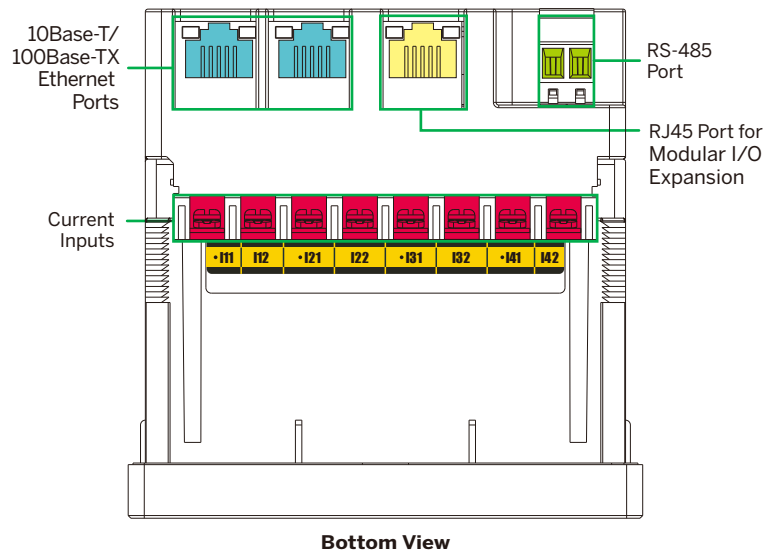
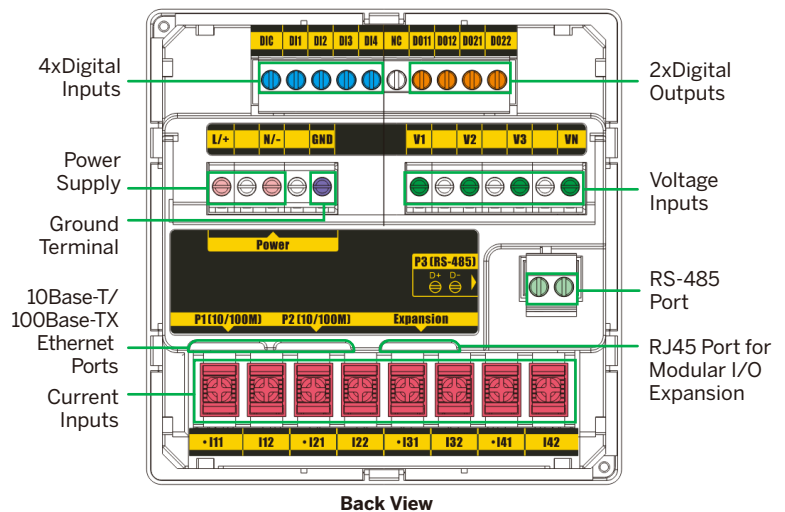
Limits and Methods of Measurement of Electromagnetic Disturbance Characteristics of Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment	EN 55011: 2016 + A1: 2017 + A2: 2021 BS EN 55011: 2016 + A1: 2017 + A11: 2020 + A2: 2021
Electromagnetic Compatibility of Multimedia Equipment - Emission Requirements	EN 55032: 2015 + AC: 2016 + A11: 2020 BS EN 55032: 2015 + AC: 2016 + A11: 2020 + A1: 2020
Limits for Harmonic Current Emissions for Equipment with Rated Current ≤16A	EN IEC 61000-3-2: 2019 + A1: 2021 BS EN IEC 61000-3-2: 2019 + A1: 2021
Limitation of Voltage Fluctuations and Flicker in Low-Voltage Supply Systems for Equipment with Rated Current ≤16A	EN 61000-3-3: 2013 + A1: 2019 + A2: 2021 BS EN 61000-3-3: 2013 + A1: 2019 + A2: 2021
Emission Standard for Industrial Environments	EN IEC 61000-6-4: 2019 BS EN IEC 61000-6-4: 2019

Mechanical Tests

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

Terminal Diagram

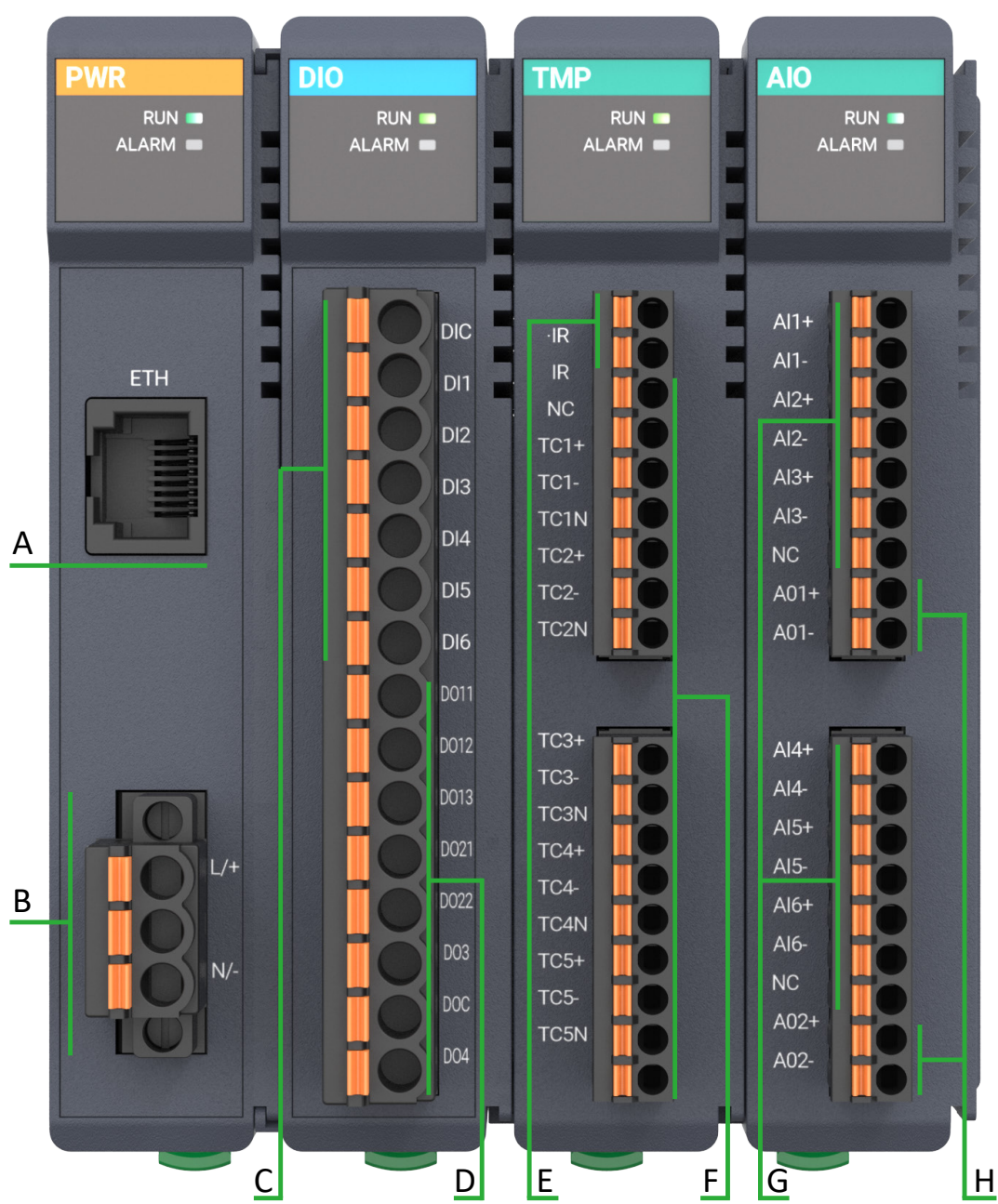
iMeter 5 Main Unit



Bottom View

Terminal Diagram

Expansion Modules



Area	Description	Area	Description
A	1xEthernet Port	E	1xResidual Current
B	Power Supply	F	5xTC Inputs
C	6xDigital Inputs	G	6xAnalog Inputs
D	4xDigital Outputs	H	2xAnalog Outputs



Ordering Information

iMeter 5 Main Unit

Product Code										Description
iMeter 5 Advanced Modular Power Quality Analyzer										
Basic Function	P				Classic Model (PQA): IEC 62053-22 Class 0.2S Compliant, 512MB Log Memory, 3-phase True RMS Metering, Dips/Swells/Interruptions, PQ Disturbance Direction, Individual Harmonics up to 63 rd , WF Recording @ 512 samples/cycle, Data Recorders, Energy Logs and Event Logs as well as Trending Curves for recorded data					
	S*				Class S Model (PQI-S): Classic Model with 2GB Log Memory + Interharmonics, Flicker and Inrush Current, Transient Detection, Rapid Voltage Changes, Statistical Data Recorders, EN 50160 and IEEE Std 519-2022 Compliance Report, IEC 61000-4-30 Ed. 3.1 Class S Compliant					
	A*				Class A Model (PQI-A): Class S Model with 4GB Memory + Mains Signalling Voltage, 2kHz-9kHz Conducted Emissions, Disturbance Waveform Recording, Individual Harmonic Energy, IEC 61000-4-30 Ed. 3.1 Class A Compliant					
Input Current	5				5A					
	1				1A					
	SCCPA [^]				Optional max. 500mV Input for use with SCCP CT Clamps (SCCPs not included)					
Input Voltage			9		400VLN/690VLL +20% (Applicable to 57-69VLN/100-120VLL, 120VLN/208VLL, 220-240VLN/380-415VLL, 277VLN/480VLL, 347VLN/600VLL and 400VLN/690VLL systems)					
Power Supply	2				95-277VAC/DC ±10%, 47-440Hz					
	3				20-60VDC					
System Frequency				5	40Hz-72Hz					
I/O	A				4xDI + 2xDO (Form A Mechanical Relay)					
	B				4xDI + 2xSS Pulse Output					
Communications					A	2x10Base-T/100Base-TX Daisy Chain Ethernet Port + 1xRS-485 port 1xExpansion Port with RJ45 Connector (for connecting I/O modules)				
Display Language						E	English			
iMeter 5	-	P	5	9	2	5	A	A	E	iMeter 5-P5925AAE (Basic Model)

* Additional charges apply.

[^] The SCCPA option is compatible with the SCCP models listed in the "Optional SCCPs" sheet. This option does not come with any Current Clamp. Please refer to the "Optional SCCPs" for more information and order the desired model and quantity as a separate item.

Optional SCCPs

				
Model No.	PMC-SCCP-50A-500mV-B-A-B	PMC-SCCP-200A-200mV-B-B-B	PMC-SCCP-500A-500mV-B-B-B	* PMC-SCCP-5kA-500mV-B-C-C-371/254/150/100
Measurement Range	5A (50A I _{max})	20A/200A (200A I _{max})	500A (500A I _{max})	500A/5000A Rogowski Coil (5000A I _{max})
Max. Allowable Current	50A	260A	500A	5,000A
Output Voltage	AC 10mV/A (Max. 500mV)	AC 10mV/A @ 20A AC 1mV/A @ 200A (Max. 200mV)	AC 1mV/A (Max. 500mV)	AC 1mV/A @ 500A AC 0.1mV/A @ 5000A (Max. 500mV)
Accuracy	±0.3% rdg. ±0.02% f.s.	±0.3% rdg. ±0.02% f.s.	±0.3% rdg. ±0.02% f.s.	±2.0% rdg. (1% - 200%) I _n
Protection	CAT III 300V	CAT III 600V	CAT III 600V	CAT III 1000V CAT IV 600V
Diameter	15mm	24mm	50mm	371/254/150/100mm
Cable Length	3m	3m	3m	3m
Termination	BNC	BNC	BNC	BNC

* The Rogowski coil & integrator set comes with an external Power Supply.

Ordering Information

PMC-KPWR Module

Product Code		Description	
PMC-KPWR		Power Supply Expansion Module	
Language	E	English	
Power Supply	2	95V-277VAC/DC	
	3	20-60VDC	
RJ45 Comm. Port		A	CAN Communication
PMC-KPWR-	E	2	A PMC-KPWR-E2A (Standard Model)

Notes:

1. The iMeter 5 supports up to 2 expansion modules per type, with a maximum of 4 modules in total.
2. If an expansion module is connected to the iMeter 5, a power module must be paired with each iMeter 5.

PMC-KDIO Module

Product Code		Description	
PMC-KDIO		DI/DO Expansion Module	
Language	E	English	
Configuration		6DI4DO	6DI + 4DO
DI Excitation		N	Dry contact, 24VDC Self-Excitation
PMC-KDIO-	E	6DI4DO	N PMC-KDIO-E6DI4DON (Standard Model)

Notes:

1. The iMeter 5 supports up to 2 expansion modules per type, with a maximum of 4 modules in total.
2. If an expansion module is connected to the iMeter 5, a power module must be paired with each iMeter 5.



PMC-KAIO Module

Product Code		Description	
PMC-KAIO		AI/AO Expansion Module	
Language	E	English	
Configuration		6AI2AO	6AI + 2AO
PMC-KAIO-	E	6AI2AO	PMC-KAIO-E6AI2AO (Standard Model)

Notes:

1. The iMeter 5 supports up to 2 expansion modules per type, with a maximum of 4 modules in total.
2. If an expansion module is connected to the iMeter 5, a power module must be paired with each iMeter 5.

PMC-KTMP Module

Product Code		Description	
PMC-KTMP		Temperature Expansion Module	
Language	E	English	
Configuration		1R5T	1xResidual Current + 5xTemperature Monitoring
Temperature Type		A	NTC
		B	PT100
PMC-KTMP-	E	1R5T	A PMC-KTMP-E1R5TA (Standard Model)

Notes:

1. The iMeter 5 supports up to 2 expansion modules per type, with a maximum of 4 modules in total.
2. If an expansion module is connected to the iMeter 5, a power module must be paired with each iMeter 5.

Email: sales@cet-global.com

Website: www.cet-global.com

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