

iMeter 6



The **iMeter 6** is CET's latest offer for the advanced Power Quality Monitoring of Incomers and Critical Feeders for Utilities, Data Centers, High-Tech Manufacturing Facilities and Heavy Industries. Housed in an industry-standard DIN form factor measuring 96x96x119.5mm, the iMeter 6's compact size is perfectly suited for today's space restricting environment. The iMeter 6 features quality construction with metal enclosure, advanced Power Quality and Revenue-Accurate Measurements, High-Resolution Waveform Recording Capabilities, comprehensive Data Logging with 1GB memory, extensive I/O and a user friendly, IPS Color Dot-Matrix Display @ 320x240. It also provides either an I4 Input for Neutral Current Measurement or a 0/4-20mA Analog Input for measuring external transducer signal such as Residual or Leakage Current. With a standard 100BaseT Ethernet Port and a RS-485 port supporting multiple protocols, the iMeter 6 becomes a vital component of an intelligent Power Quality Monitoring System.

Typical Applications

- Class 0.2S Revenue Metering
- Power Quality Monitoring of Main Incomer or Critical Feeder
- Utility, Industrial and Commercial Metering
- Substation, Building and Factory Automation
- Low, Medium and High Voltage Applications
- Neutral (I4) and Residual Current (Ir) Monitoring

Ease of Use

- Large, Backlit, Color Dot-Matrix display with wide viewing angle
- Password protected setup via Front Panel and on-board Web Server
- Easy installation with mounting slide bar, no tools required

Basic Measurements (1 second update)

- 3-phase Voltage, Current and Power Measurements
- Neutral Current (I4), Calculated Residual Current (Ir) and Frequency
- kWh, kvarh Import/Export/Net/Total, kVAh Total and kvarh Q1-Q4
- Interval Energy
- Voltage and Current Phase Angle
- Device Operating Time (Running Hours)
- DI Pulse Counters
- Optional AI Measurement

High-Speed Measurements

- 3-phase Voltage @ 1 cycle
- 3-phase Current and Neutral Current (I4) @ 1 cycle
- 3-phase Power and Power Factor @ 1 cycle

Power Quality

- IEC61000-4-30 Ed. 3 Class S Compliance
- Waveform Recording at 256 samples/cycle in COMTRADE format
- Fundamental U, I, I4, P, Q, S and Displacement PF
- U and I Unbalance, Sequence Components, Voltage and Freq. Deviation
- THD, TOHD, TEHD, Crest Factor, K-Factor and TDD
- Individual harmonics up to 63rd
- Dips/Swells/Interruptions Detection and Transients Capture

Power Quality Monitor

Demands

- Present and Predicted Demands for 3-phase U, I, P, Q, S, PF, as well as I4, Frequency, U and I Unbalance and THD
- Max. Demands with Timestamp for ULN, ULL & Current per phase and average as well as Power of This Month & Last Month (or Since Last Reset & Before Last Reset)
- Max./Min. values per Demand Interval
- Demand synchronization with DI

Setpoints

- 16 Standard (1s) and 8 High-Speed (1 cycle) Setpoints
- Extensive monitoring sources including U, I, P, Q, S, PF, Current Demands, THD, Unbalance, Sequence Components, Phase Loss/Reversal, etc.
- Configurable thresholds and time delays
- 6 Logical Modules supporting AND/OR/NAND/NOR operations
- SOE, WF Recording, Data Recorder, DO and Email Alarm trigger

Multi-Tariff TOU Capability

- Two independent sets of TOU Schedules
 - Up to 12 Seasons
 - 90 Holidays or Alternate Days
 - 20 Daily Profiles, each with 12 Periods at min. 15-min interval
 - 8 Tariffs, each providing kWh/kvarh Import/Export and kVAh
- Switch between two TOU schedules according to pre-programmed time and logged as an SOE event



Waveform Recorder

- 2 independent groups of Waveform Recorders with 128 entries for each group
- Simultaneous capture of 3-phase Voltage and Current signals
- Programmable formats and pre-fault cycles from 256x20 to 16x320
- Support FIFO Recording Mode
- Scheduled WFR with max. repetition of 10000 times and programmable schedule from 1 to 960 hours
- COMTRADE file format, downloadable from the on-board Web/FTP Server

Log Memory

- 1GB on-board memory
- DR Logs, WFR Logs, IER Logs and Demand Logs

Data Recorder (DR)

- 12 Standard DR Logs and 4 High-Speed DR Logs
- Recording Interval from 1s to 40 days for Standard DR Log and 1 to 60 cycles for High-Speed DR Log
- Up to 16 parameters for each DR Log with programmable sources including most Real-time Measurements, Demands, Energy, Harmonics, Unbalance and Modbus Slaves' Real-time measurements
- Configurable Depth and Recording Offset
- Support FIFO or Stop-When-Full Recording Mode

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Interval Energy Recorder (IER)

- Support recording of kWh/kvarh Import/Export and kVAh Total
- Programmable Recording Interval from 1 min to 65535 mins
- Support FIFO or Stop-When-Full Recording Mode

SOE Log

- 512 events time-stamped to ± 1 ms resolution
- Setup changes, Setpoint events and I/O operations

PQ Log

- 512 entries time-stamped to ± 1 ms resolution
- Dips/Swells/Interruptions and Transients detection

Max./Min. Log

- Logging of Max./Min. values for measurements such as Voltage, Current, Frequency, P, Q, S, PF, Unbalance, K-Factor and THD with Timestamp for This Month & Last Month (or Since Last Reset & Before Last Reset)

Digital Inputs

- 6 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
- Demand Synchronization
- Tariff switching based on DI status

Digital Outputs

- Up to 3 channels Form A Mechanical Relays for alarming and control

Analog Input (Optional)

- 0/4-20mA DC input with programmable zero and full scales
- Can be used to measure external transducer signal such as Residual or Leakage Current

Real-Time Clock

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

Communications

RS-485 (P1)

- Optically isolated RS-485 ports, baud rate from 1,200 to 38,400bps
- Modbus RTU, Ethernet Gateway and Modbus Master
- Supports up to 31 downstream Modbus Slave Devices

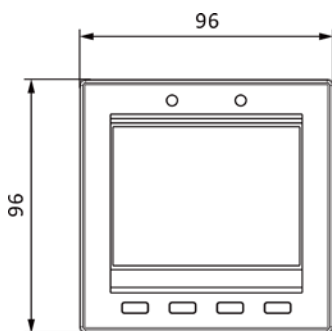
Ethernet (P2)

- 10/100BaseT Ethernet Port with RJ45 connector
- Built-in Web Server for easy data viewing and setup configuration
- Modbus TCP, HTTPS, SMTPS, SNTP, SFTP, SNMP, IEC 61850, BACnet IP and DNP 3.0 over Ethernet

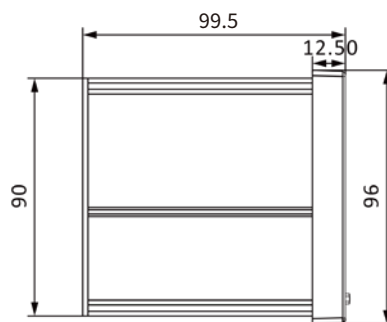
System Integration

- Supported by CET's PecStar® iEMS
- Easy integration into other Automation or SCADA systems via Modbus RTU and Modbus TCP protocols
- 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

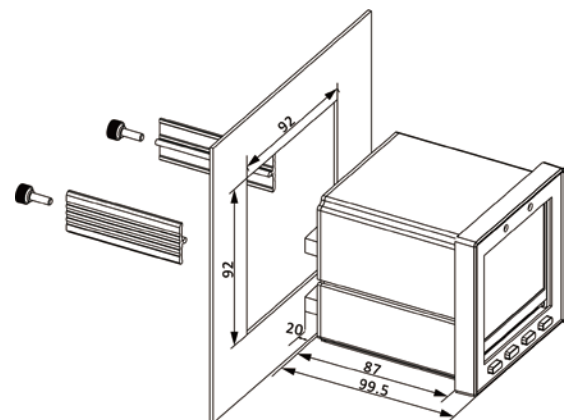
Device View and Dimensions



Front view



Side view



Unit: mm

Accuracy

Parameters	Accuracy	Resolution
Voltage	±0.1%	0.01V
Current	±0.1%	0.001A
I4 Measured	±0.1%	0.001A
kW, kvar, kVA	±0.2%	0.001kX
kWh, kVAh	IEC62053-22 Class 0.2S ANSI C12.20 Class 0.2	0.1kXh
kvarh	IEC62053-24 Class 0.5S	0.1kvarh
PF	±0.2%	0.001
Frequency	±0.01Hz	0.01Hz
Harmonics	IEC61000-4-7 Class A	0.01%
K-Factor	IEC61000-4-7 Class A	0.01
Phase Angle	±1°	0.1°
AI	±0.5%	-

Technical Specifications

Voltage Inputs (V1, V2, V3, VN)	
Standard (Un)	240ULN/415ULL
Optional (Un)	69ULN/120ULL, 400ULN/690ULL
Range	10% to 120% Un
PT Ratio	1-10,000
Overload	1.2xUn continuous, 2xUn for 10s
Burden	<0.5VA @ 240V
Frequency	45-65Hz

Current Inputs (I11, I12, I21, I22, I31, I32, I41, I42)	
Standard (In/Imax)	5A/10A
Optional (In/Imax)	1A/2A
Range	0.1% to 200% In
CT Ratio (I1-I3)	1-6,000 (5A) or 1-30,000 (1A)
I4 Ratio	1-10,000
Overload	2xIn continuous, 20xIn for 1s
Burden	<0.25VA @ 5A

Power Supply (L+, N-)	
Standard	95-277VAC L-N/415VAC L-L, 45-65Hz 90-300VDC
Burden	<10VA/6W @ 240V

Digital Inputs (DI1, DI2, DI3, DI4, DI5, DI6, DIC)	
Type	Dry contact, 24VDC internally wetted
Sampling	1000Hz
Hysteresis	1-1,000ms programmable

Digital Outputs (DO11, DO12, DO21, DO22, DO31, DO32)	
Type	Form A Mechanical Relay
Loading	5A @ 250VAC/30VDC

LED Pulse Outputs (kWh, kvarh)	
Type	Optical
Pulse Constant	1000/3200/5000/6400/12800 imp/kxh

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

Standards of Compliance

Safety Requirements	
CE LVD Directive 2014/35/EU	EN61010-1: 2010 EN61010-2-030: 2010
Electrical Safety in Low Voltage Distribution Systems up to 1000Vac and 1500 Vdc	IEC61557-12: 2018 (PMD)
Insulation AC Voltage: 2kV @ 1 minute Insulation Resistance: >100MΩ Impulse Voltage: 6kV, 1.2/50μs	IEC62052-11: 2003 IEC62053-22: 2003

EMC Compatibility

CE EMC Directive 2014/30/EU (EN61326: 2013)

Immunity Tests	
Electrostatic Discharge	EN61000-4-2: 2009
Radiated Fields	EN61000-4-3: 2006 +A1: 2008 +A2: 2010
Fast Transients	EN61000-4-4: 2012
Surges	EN61000-4-5: 2014 +A1: 2017
Conducted Disturbances	EN61000-4-6: 2014
Magnetic Fields	EN61000-4-8: 2010
Voltage Dips and Interruptions	EN61000-4-11: 2004 +A1: 2017
Ring Wave	IEC61000-4-12: 2017

Emission Tests	
Limits and Methods of Measurement of Electromagnetic Disturbance Characteristics of Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment	EN55011: 2016
Electromagnetic Compatibility of Multimedia Equipment-Emission Requirements	EN55032: 2015
Limits for Harmonic Current Emissions for Equipment with Rated Current ≤16A	EN61000-3-2: 2014
Limitation of Voltage Fluctuations and Flicker in Low-Voltage Supply Systems for Equipment with Rated Current ≤16A	EN61000-3-3: 2013
Emission Standard for Residential, Commercial and Light-Industrial Environments	EN61000-6-4: 2007 +A1: 2011

Power Quality	
Testing and Measurement Techniques-Power Quality Measurement Methods	IEC61000-4-30 Ed. 3 Class S Compliance
Power Quality Measurement in Power Supply Systems-Part 2: Functional Tests and Uncertainty Requirements	IEC62586-2 Ed. 2

Mechanical Tests	
Spring Hammer Test	IEC62052-11: 2003
Vibration Test	IEC62052-11: 2003
Shock Test	IEC62052-11: 2003

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
Altitude	< 2000m
Pollution Degree	2
Measurement Category	CAT III

Mechanical Characteristics	
Enclosure	Aluminum Alloy
Panel Cutout	92x92 mm
Unit Dimensions	96x96x119.5 mm
Shipping Dimensions	170x140x160 mm (6.69"x5.51"x6.30")
IP Rating	54
Shipping Weight	1.18 kg

Ordering Guide

Product Code	Description
iMeter 6 Advanced Power Quality Monitor	
Basic Function	
256 samples per cycle, Class 0.2S Compliant, 3-Phase Metering, Demands, Maximum Demands, Max./Min., SOE Log, Ind. Harm. to 63 rd , 1GB Log Memory, 16 Data Recorders, High-Speed Recording, WF Recording, Sags/Swells/Interruptions and Transients Detections	
Display Screen	
B	Color Dot-Matrix LCD Display (320x240 Resolution)
Input Current (I1, I2, I3, I4*)	
5	5A
1	1A
Input Voltage (V1, V2, V3)	
1	69V/120V
3	240V/415V
9*	400V/690V
Power Supply	
2	95-277VAC L-N/415VAC L-L 45-65Hz, 90-300VDC
System Frequency	
5	45Hz-65Hz
DI/DO	
A	6DI + 3DO
AI	
X	None
A*	1 Analog Input (0-20mA or 4-20mA DC)#
Communications	
D	1x10/100BaseT Ethernet port + 1xRS-485 port
Display Language	
E	English
iMeter 6 - B 5 3 2 5 A X D E	iMeter 6-B5325AXDE (Standard Model)

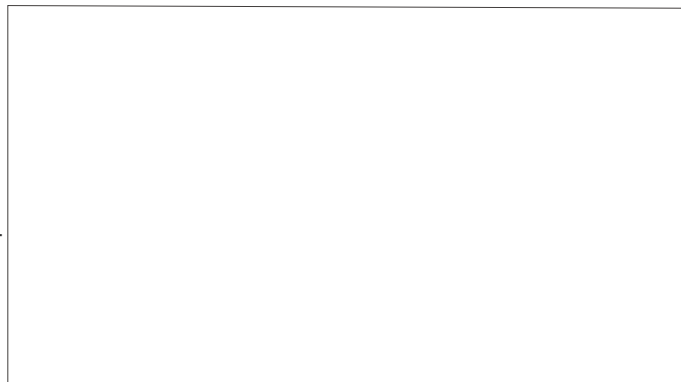
*Additional charges apply

#With AI option "A", I4 is not available

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