

iMeter 6

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 2GB 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 10/100BaseT Ethernet Port and an 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 IPS 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 U, I, Neutral-Earth Voltage (Ung), 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 U @ 1/2 cycle, I, Neutral Current (I4), Power and PF @ 1 cycle

Power Quality

- IEC61000-4-30 Ed. 3 Class S Compliance and EN50160 Report
- Waveform Recording (WFR & DWR) 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
- Disturbance Direction Indicator

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 ULL, ULN & 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

Power Quality Monitor

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, WFR, DWR, 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
- Switching between two TOU schedules according to pre-programmed time and logged as an SOE event

Data Recorder (DR)

- 28 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
- BEC 2018 Compliant Data Recording for 3 years at 15-minute interval



Disturbance Waveform Recorder (DWR)

- 128 entries
- Simultaneous recording of 3-phase Voltage and Current Inputs
 - Initial Fault: 35 cycles @ 256 samples/cycle
 - Extended Fault: Up to 150 cycles @ 16 samples/cycle
 - Steady State: Up to 360 seconds of 1-cycle absolute peak values
 - Post Fault: 15 cycles @ 256 samples/cycle

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

- Real-time WFC @128 samples/cycle x 4 cycles, Event Waveforms and ITIC/SEMI F47 Curves via Front Panel and Web Interface
- WFR with 128 entries
- Simultaneous capture of 3-phase Voltage and Current Inputs
- 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

iMeter 6

Log Memory

- 2GB on-board memory
- DR Logs, WFR Logs, DWR Logs, IER Logs and Demand Logs

Interval Energy Recorder (IER)

- Support recording of kWh/kvarh Import/Export and kVAh Total
- Programmable Recording Interval from 1 min to 65535 mins
- Max. Recording Depth @ 65535 records
- 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

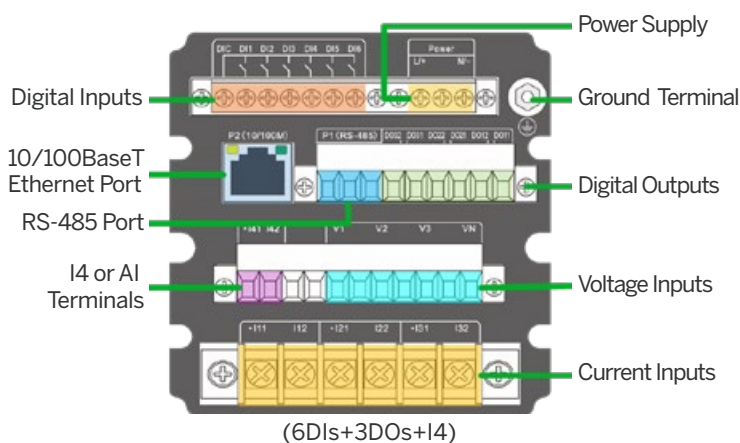
Max./Min. Log

- 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

Terminals Diagram



Digital Outputs

- Up to 3 channels Form A Mechanical Relays for alarming and control
- 5A @250VAC/30VDC

Analog Input (Optional)

- Optional 1xAI, 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)
- Time Sync. via Modbus RTU/TCP, SNTP, GPS and IRIG-B

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, FTPS, SNMP, BACnet/IP#, IEC61850

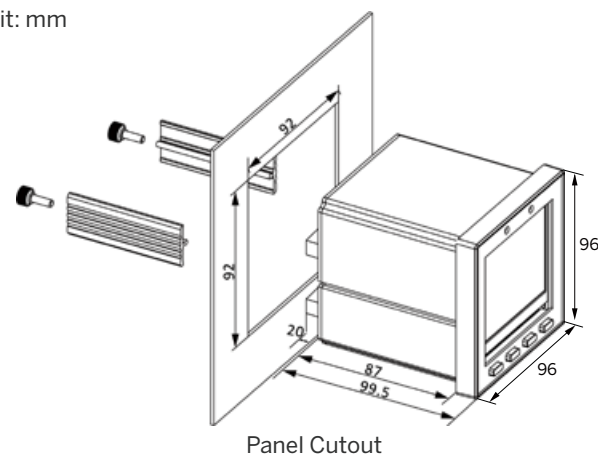
#Supported Object Type: Device Object, Analog Input Object, Analog Value Object, Binary Input Object, Binary Output Object, Network Port Object and Large Analog Value Object

System Integration

- Supported by CET's PecStar® iEMS
- Easy integration into Automation, SCADA or BMS Systems via Modbus, IEC61850 and BACnet/IP 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

Unit: mm



Accuracy

Parameters	Accuracy	Resolution
Voltage	±0.1%	0.001V
Current	±0.1%	0.001A
I4 Measured	±0.1%	0.001A
kW, kvar, kVA	±0.2%	0.001k
kWh, kVAh	IEC62053-22 Class 0.2S ANSI C12.20 Class 0.2	0.1kXh
kvarh	IEC62053-24 Class 0.5S IEC62053-23 Class 2	0.1kvarh
PF	±0.2%	0.001
Frequency	±0.01Hz	0.01Hz
Harmonics	IEC61000-4-7 Class I	0.01%
K-Factor	IEC61000-4-7 Class I	0.01
Phase Angle	±1°	0.1°
U Deviation	±0.5%	0.01%
Freq. Deviation	±0.01Hz	0.01Hz
U Unbalance	±0.2%	0.1%
I Unbalance	±1.0%	0.1%
AI	±0.5%	-

Technical Specifications

Voltage Inputs (V1, V2, V3, VN)		
Standard (Un)		400VLN/690VLL +20%
Range		4V to 120%Un
PT Ratio	Primary	1 to 1,000,000
	Secondary	1 to 1,500
Overload		1.2xUn continuous, 2xUn for 10s
Burden		<0.5VA @ 240V
Measurement Category		CAT III 600V
Frequency		42-69Hz

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	Primary	1 to 30,000
	Secondary	1 to 50
Overload		2xIn continuous, 4xIn for 60s, 10xIn for 10s, 20xIn for 1s
Burden		<0.25VA @ 5A

Power Supply (L+, N-)		
Standard		95-277VAC L-N/415VAC L-L, 45-65Hz 90-300VDC
Optional		20-60VDC
Burden		<10VA/6W @ 240VAC/DC, <3.6W @24VDC

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

Optional Analog Input (AI+, AI-)		
Type		0-20/4-20 mA
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
Voltage Dips, Short Interruptions and Voltage Variations on DC Input Power Port	EN61000-4-29: 2000
Damped Oscillatory Wave	EN61000-4-18: 2011

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

Communications	
Communication Networks and Systems in Substations	IEC61850 Ed. 1
A Data Communication Protocol for Building Automation and Control Networks	BACnet ANSI/ASHRAE Standard 135-2020 (B-ASC Device Profile)

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	< 3000m
Pollution Degree	2

Mechanical Characteristics	
Enclosure	Aluminum Alloy
Panel Cutout	92x92 mm
Unit Dimensions	96x96x119.5 mm
Shipping Dimensions	300x220x160 mm
IP Rating	54
Shipping Weight	1.18 kg

Ordering Guide

Product Code	Description
iMeter 6 Advanced Power Quality Monitor	
Basic Function	
IEC62053-22 Class 0.2S Compliant, 3-Phase True RMS Metering, Individual Harmonics to 63 rd , 2GB Log Memory, 32 Data Recorders, IER Log, PQ Log, SOE Log, Dips/Swells/Interruptions and Transients Detections, WF Recording @ 256 samples/cycle, IEC61000-4-30 Class S Compliance and EN50160 Report	
Display Screen	
B	Color Dot-Matrix IPS Display (320x240 Resolution)
Input Current (I1, I2, I3, I4#)	
5	5A
1	1A
Input Voltage (V1, V2, V3)	
9	400VLN/690VLL +20%
Power Supply	
2	95-277VAC L-N/415VAC L-L, 45-65Hz 90-300VDC
3	20-60VDC
System Frequency	
5	42Hz-69Hz
DI/DO	
A	6DI + 3DO
AI	
X	No
A*#	1xAnalog Input (0-20mA or 4-20mA DC)
Communications	
D	1x10/100BaseT Ethernet port + 1xRS-485 port
Display Language	
E	English
iMeter 6 - B 5 9 2 5 A X D E	iMeter 6-B5925AXDE (Standard Model)

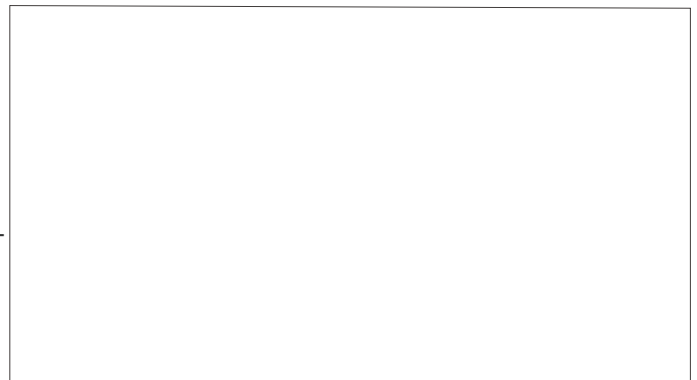
* Additional charges apply

If AI Option A is selected, the I4 Input will be replaced by the 0/4-20mA Analog Input

Email: sales@cet-global.com
 Website: www.cet-global.com

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