High-end power management performance

IQ 100 Electronic Power Meter

Introduction

With energy costs skyrocketing, you need the ability to verify the accuracy of utility billing and allocation of energy costs among business units, different manufacturing areas or facilities, and tenants. Production equipment and IT systems are vulnerable to power anomalies; therefore, you must ensure that power is always up to specifications. If your infrastructure is an established facility, you may have addressed these concerns in the past by deploying a variety of analog gauges and meters—one for volts, one for amperes and so on, with separate meters for each measurement.

If you're planning an upgrade or new power infrastructure, no doubt you would like to capitalize on the latest technology to improve upon that cumbersome architecture and its patchwork view.

Typical applications

- Utility and commercial metering
- Substations, industrial facilities, power generation sites and campuses
- Submetering
- Load studies and voltage recording
- Analog meter replacement

Features and benefits

- Measure and display real-time information about critical power parameters with a sampling rate of 400 samples per cycle
- Monitor power utilization and quality with ANSI C12.20 accuracy (0.5 percent)
- Verify meter accuracy with optional test pulse self-certification capabilities
- Available as transducer only or with display
- Optional Modbus® RTU or Modbus TCP communications
- Prepared for the future—the meters are designed to accommodate firmware upgrades and capabilities
- Integrate into Eaton's Power Xpert® Architecture for a holistic system-level view

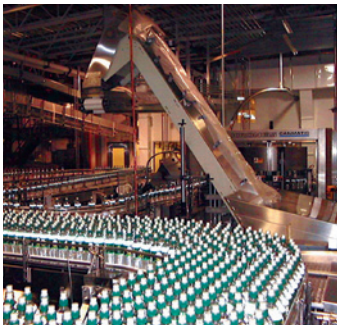
High-end capabilities you would not expect from an ultra-compact meter

Providing the first line of defense against costly power problems, Eaton's IQ 100 electronic power meters can perform the work of an entire wall of legacy metering equipment utilizing today's technology. Eaton's IQ 100 meters use 24-bit AD converters that sample at more than 400 samples per cycle and meet ANSI C12.20 standards for accuracy of 0.5 percent. With such high-performance measurement capability, these meters can be confidently used for primary revenue metering and submetering applications.

Eaton's IQ 100 meters provide direct-reading metered values for the most critical power aspects, such as watts, watt demand, watthours, voltage-amperes (VA), VA-hours, vars, varhours and power factor. They have high sampling speed and accuracy.

Is the utility company billing accurately? The IQ 100 models provide a traceable watthour test pulse (used with a watthour pulse recorder or totalizer), so you can verify the accuracy of your meter and, in turn, the accuracy of billing from the utility company and to internal customers.

The meters are designed to integrate into Eaton's Power Xpert Architecture for end-to-end management of your entire power system, giving you a holistic system-level view.



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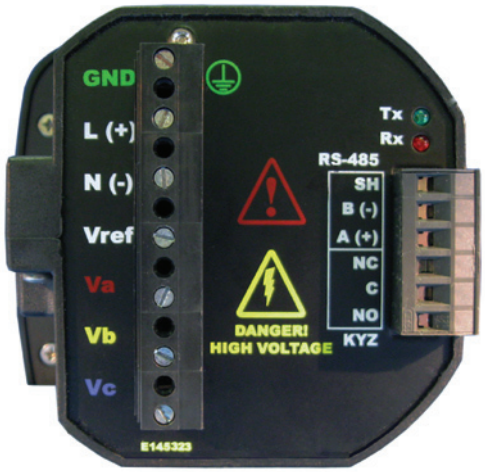
Features of IQ 100 Electronic Power Meters

Features	IQ 130	IQ 140	IQ 150
Instrumentation			
Current, per phase	X	X	X
Current demand	X	X	X
Calculated neutral current	X	X	X
Voltage, per phase (L–L, L–N)	X	X	X
Min./max. readings, I, V	X	X	X
Min./max. readings, I, V, PF, F, W, VAR, VA		X	X
Frequency		X	X
Power			
Real, reactive and apparent power, total (W, VAR, VA)		X	X
Power factor, total		X	X
Real, reactive and apparent power demand		X	X
Demand Methods			
Block interval (sliding, fixed)		X	X
Energy			
Real, reactive and apparent energy, total (Wh, VAR, VAh)			X
Communications			
RS-485, Modbus RTU, Modbus ASCII, KYZ output	Opt	Opt	Opt
RJ45, Modbus TCP, KYZ Output	Opt	Opt	Opt



IQ 100 Meter (Rear View) with Connection and Communication Ports

RJ45 Rear View

Industry-standard communication protocols

IQ 100 meters use the optional Modbus protocol. This industry-standard protocol provides serial communications with Eaton or third-party platforms, such as a building-management system, power-management system or Eaton's Power Xpert Gateway for Web-based monitoring as part of Eaton's Power Xpert Architecture.

Integrated with Eaton's Power Xpert Architecture

IQ 100 meters integrate into Eaton's Power Xpert Architecture, where meters, gateways and monitoring devices collaborate to create a unified, centralized view of the end-to-end power and facility infrastructure.

When used in this architecture and in conjunction with Eaton's Power Xpert Gateway, IQ 100 meters with the Modbus RTU option can provide Web-based graphics of current power conditions. Simply connect your meter to a Power Xpert Gateway to translate Modbus-based information from the meter into HTML-based Web pages that are accessible from any standard Web browser. If you select a model with the RJ45 option, the meter can easily be monitored remotely via Power Xpert Software or another third-party monitoring system. With access to accurate, real-time information from IQ 100 meters, the Power Xpert Architecture can transform your power system into an integrated, agile system, and an easily managed entity that performs better and costs less.

Designed for the user

When space is at a premium, yet you need ANSI C12.20 accuracy, Eaton IQ 100 meters fit the bill. These ultra-compact meters are ideal for electrical equipment assemblies, machine control panels (such as panelboard and switchboard mains and feeders), low voltage metal-enclosed switchgear feeders and motor control centers. Requiring far less space than other meters with similar functionality, IQ 100 meters fit into a standard ANSI or IEC cutout on a panelboard or other electrical equipment and, therefore, fit easily into retrofit applications.

Most meters in this class have small or dark displays that can be hard to see, especially from a distance. Eaton's IQ 100 meters have a large, bright red, three-line LED display, each line more than a half-inch tall. This display is very easy to read, even if the meter is installed at a height or distance. Using the keypad and menus on the local display, users can display a variety of electrical system values or program the meter (see **IQ 100 Meter Faceplate Display on page 3**). The IQ 100 meters can also be configured remotely using the Eaton configuration software provided with the meter.

In addition, the meters are available with or without the display module. You might choose to forego the display for applications where there is no need to configure or read the meter locally. This option reduces costs, especially where many meters will be monitored from a central operations system.

The Reading Type indicator shows what type of information you're viewing, such as minimum/maximum.

These lights show how loaded the circuit is, from 10 to 100 percent, relative to the programmed maximum.

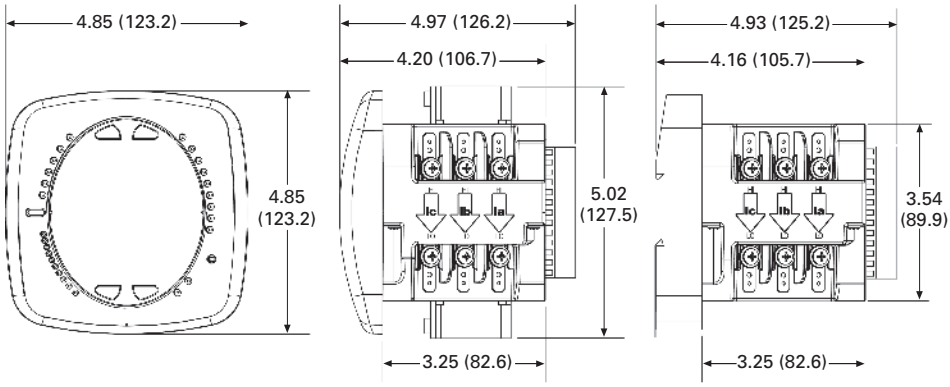
The scaling factor shows the scale of the displayed value, which varies between low- and high-voltage applications.

The Parameter Designator shows the parameter being displayed, such as volts, amps, frequency, power or energy.

The watthour test pulse is used to verify the accuracy of the meter.

Configurable Auto Scroll can display all key values in turn or show a fixed display.

IQ 100 Meter Faceplate Display



IQ 100M Front View **IQ 100M Side View** **IQ 100T Side View**

IQ 100 Meter Dimensions

IQ 100 Meter Ordering Information

IQ 150 M A 6 5 1 1

Model Series	Meter Type	Frequency	Current Input	Power Supply	Communication
130 = Volts/amps **140** = Power **150** = Energy	**M** = Meter (with integral display) **T** = Transducer only (no display)	**5** = 50 Hz system **6** = 60 Hz system	**1** = 1A secondary **5** = 5A secondary	**1** = 90–265 Vac/dc **4** = 24–48 Vdc	**0** = None **1** = Modbus and KYZ Output (RS485) **2** = Modbus TCP and KYZ Output (RJ45)

IQ 100 Electronic Power Meter Technical Information

Current Inputs	
Class 10	5A nominal, 10A max.
Class 2	1A nominal, 2A max.
Fault Current Withstand	
100A for:	10 seconds
300A for:	3 seconds
500A for:	1 second
Continuous current withstand	20A for screw-terminated or pass-through connections
Programmable current	Full scale to any CT ratio
Burden	0.005 VA per phase max. at 11A
Pickup current	0.1% of nominal
Class 10	5 mA
Class 2	1 mA
Connections	
Pass-through wire gauge dimension	0.177 inches (4.5 mm)
Quick connect	0.25-inch male tab

Voltage Inputs	
Range	
Line-to-neutral	20–416 Vac
Line-to-line	20–721 Vac
Programmable voltage range	Full scale to any PT ratio
Supported systems	3 element wye, 2.5 element wye, 2 element delta, 4-wire delta systems
Input impedance	1 megohm/phase
Burden	0.36 VA/phase max. at 600V; 0.014 VA at 120V
Connection	7-pin, 0.400-inch pluggable terminal block, AWG #12–26 (0.129–3.31 mm^2)

Isolation
All inputs and outputs are galvanically isolated to 2500V

Environmental Ratings	
Operating temperature	–20°C to +70°C
Storage temperature	–20°C to +70°C
Operating humidity	To 95% RH noncondensing
Faceplate rating	NEMA® 12 water-resistant mounting gasket included

Sensing Method	
Voltage, current	True rms
Power	Sampling at over 400 samples per cycle on all channels

Update Rate	
Watts, VAR and VA	100 msec at 60 Hz
All other parameters	1 second at 60 Hz

Power Supply	
AC/DC voltage option	90–265 Vac at 50/60 Hz or 100–370 Vdc, universal AC/DC supply
DC voltage option	18–60 Vdc
Burden	10 VA max.

Optional Communications Format	
Connection type	RS-485 or RJ45 (through back plate)
Com. port baud rate	9600–57,600 Bauds
Com. port address	01–247
Data format	8-bit, no parity
Protocols	Modbus ASCII, RTU, TCP

Optional KYZ Pulse	
Contacts	1 Form A
On resistance, max.	35 ohms
Peak switching voltage	350 Vdc
Continuous load current	350 mA (10 ms)
Off-state leakage current at 350 Vdc	1 uA
Opto-isolation	3750 Vac

Dimensions and Shipping	
Weight	2 lbs
Basic unit	H 5.00 x W 4.90 x L 5.00 inches
IQ 100	Mounts in 92 mm DIN and ANSI C39.1 round cut-outs
Shipping container dimensions	6-inch cube
Tolerance	+/–0.1 inches (2.54 mm)

Compliance	
IEC 687	0.5% accuracy
ANSI C12.20	0.5% accuracy
ANSI C62.41	Burst
UL®/cUL®/CE	Electrical and electronic measuring and test equipment 22CZ

Note: Specifications are subject to change without notice and represent the maximum capabilities of the product with all options installed. This is not a complete feature list. Features and functionality may vary depending on selected options, firmware version and product model. Please refer to User Manual for detailed specifications.

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EATON
Powering Business Worldwide

Printed in USA
Publication No. PA02601008E / TN
September 2011