Technical Data **TD02601019E** December 2011

IQ 150S/250S Self-Enclosed Electronic Meters

Typical applications

- Industrial and commercial buildings metering and submetering
- Government facilities and military
- Universities and airports
- Load studies and voltage recording

Features and benefits

- Self-enclosed, these meters are an ideal solution for surface mounting next to a selected piece of equipment for energy monitoring.
- NEMA 12 enclosure with a large, easy-to-read faceplate, consistent with other Eaton meter models, designed with 'knockouts' for easy installation
- Ethernet communications option for either wired or wireless setup allowing for additional ease of installation and integration into existing networks
- Available data and alarm recording for historical records/trending
- Integrate into Eaton's Power Xpert® Architecture for a holistic system-level view

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 not currently have metering or may have addressed these concerns 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.

Wireless and high-end capabilities you would not expect from self enclosed, compact meter

Providing the first line of defense against costly power problems, Eaton's IQ 150S/250S electronic self-enclosed meters can perform the work of an entire wall of legacy metering equipment utilizing today's secure wireless technology. Eaton's IQ 150S/250S meters use 24-bit AD converters that sample at more than 400 samples per cycle and meet IEC 687 (0.2% Accuracy) and ANSI C12.20 (0.2% Accuracy) standards. With such high-performance measurement capability, these meters can be confidently used for primary revenue metering and submetering applications.

Either model will help you monitor energy demand, while the IQ 250S provides the extra benefit of also monitoring and recording the changes in the characteristics of your power.

Eaton's IQ 150S/250S 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.

These meters are self-enclosed in a NEMA 12 enclosure with "knock-outs" on the bottom for communication and power providing for an easy installation.

Perhaps you don't have network drops in all the right places. No problem. The IQ 150S/250S offers a wireless communications option. The transmissions are encrypted using 128-bit Wired Equivalent Privacy (WEP) for security.

Powering Business Worldwide

Industry-standard communication protocols

Standard Modbus RS485 Communication

Standard communication includes an RS485 output speaking Modbus protocol. This allows the unit to be connected to any serial RS485 bus using the Modbus interface. The unit communicates easily with most building automation, Power Xpert Software, or other software systems. Baud rates are up to 57.6K baud to provide fast update times.

WiFi or Land Based Ethernet

The unit offers an Ethernet option — configured either as an RJ45 or WiFi connection. The WiFi configuration allows the 150S/250S to be used on standard WiFi base stations. The unit is assigned an IP address; it communicates Modbus protocol over Ethernet TCP/IP. Wireless Ethernet is reliable and easy to integrate, making it the superior solution for mass meter deployment.

KYZ Pulse

For applications in which a pulse is needed, the unit also provides a KYZ output which pulses proportional to the amount of energy consumed. This feature is used for pulse counting applications into building management systems where serial or Ethernet protocol is not available.

Verify energy bills

The IQ 150S/250S 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 your utility company and to internal customers.

Integrated with Eaton's Power Xpert Architecture

IQ 150S/250S 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, either with a Power Xpert Gateway or directly via Ethernet, the 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 Ethernet 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 150S/250S meters, 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 150S/250S meters fit the bill. These ultra-compact meters are ideal for surface mounting next to a selected piece of equipment for energy monitoring. Requiring far less space than other meters with similar functionality, and offering a NEMA 12 enclosure and a large, easy-to-read faceplate, consistent with other Eaton meter models, these meters are designed with 'knockouts' for easy retrofit installation.

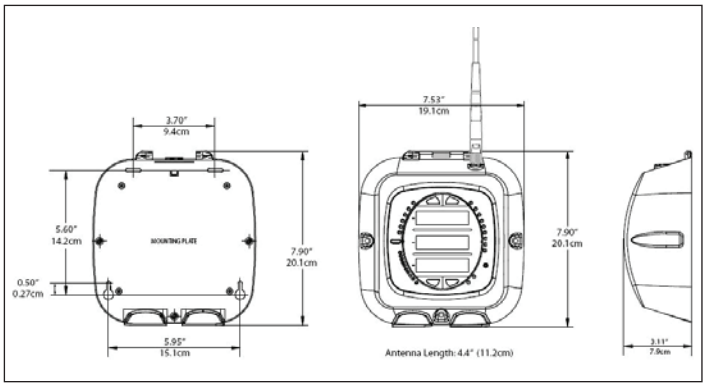
Most meters in this class have small or dark displays that can be hard to see, especially from a distance. Eaton's IQ 150S/250S meters have a large, bright red, three-line LED display, each line more than a half-inch tall. This display is very easy to read, even if the meter is installed at a height or distance. Using the keypad and menus on the local display, users can display a variety of electrical system values or program the meter.

Features of IQ 150S/250S Electronic Power Meters

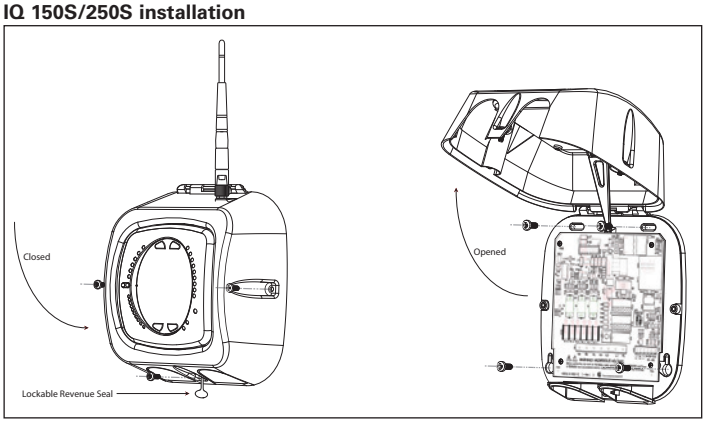
Features	IQ 150S	IQ 250S
Instrumentation		
Current, per phase	X	X
Calculated neutral current	X	X
Voltage, per phase (L-L, L-N)	X	X
Frequency	X	X
Min./max readings, I*, V*, PF, F, W, VAR, VA	Total	Total & per phase
Power		
Real, reactive and apparent power (W, VAR, VA)	Total	Total & per phase
Power factor	Average	Average & per phase
Demand Methods		
Block interval (fixed, sliding)	X	X
Current demand	X	X
Real, reactive and apparent power demand	Total	Total & per phase
Energy		
Real, reactive and apparent energy (Wh, VARh, VAh)	Total	Total & per phase
Real and reactive, net & positive & negative (Wh, VARh)	Total	Total & per phase
I/O		
Pulse output	X	X
Communications		
RS-485, Modbus RTU, DNP 3.0	X	X
RJ-45 or 802.11b, Modbus TCP**	Opt	Opt
Data Logging		
2 MB for data logging		X
Alarming		
Set point driven alarm		X

* Per phase only
** If configured for Ethernet, RS485 not available

IQ 150S/250S Meter dimensions



IQ 150S/250S installation



IQ 150S/250S Electronic Meter Technical Information

Current Inputs	
Class 10	5A nominal, 10A max.
Class 2	1A nominal, 2A max.
Fault Current Withstand	
20A for:	10 seconds
60A for:	3 seconds
100A for:	1 second
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	
Screw terminal	#6-32 screws

Voltage Inputs	
Range	
Line-to-neutral	20–416 Vac (IQ150S), 20–576 Vac (IQ250S)
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 screw 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	–20ºC to +70°C
Storage temperature	–20ºC to +70°C
Operating humidity	To 95% RH noncondensing
Faceplate rating	NEMA® 12

Sensing Method	
Voltage, current	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	90–400 Vac at 50/60 Hz or 100–370 Vdc, universal AC/DC supply
Burden	16 VA max.

Standard Serial Communications Format	
Connection type	RS-485
Com. port baud rate	9600–57,600 Bauds
Com. port address	01–247
Data format	8-bit, no parity
Protocols	Modbus ASCII, RTU, DNP 3.0

Optional Ethernet Communications Format	
Connection type	RJ45 or 802.11b (wireless)
Protocols	Modbus TCP

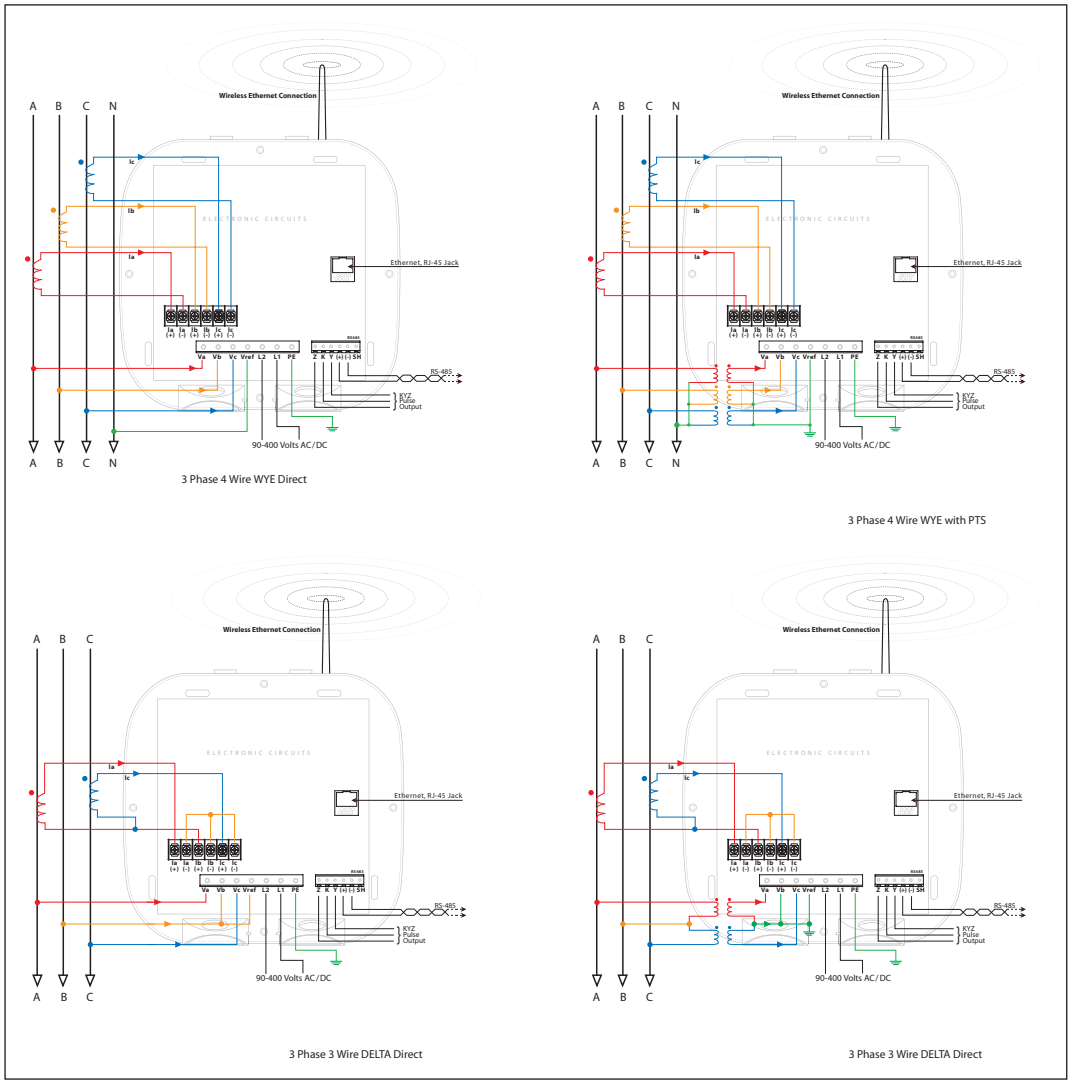
KYZ Pulse	
Contacts	1 Form A
On resistance, max.	35 ohms
Peak switching voltage	350 Vdc
Continuous load current	120mA
Peak load current	350 mA (10 ms)
Off-state leakage current at 350 Vdc	1 uA
Opto-isolation	3750 Vac

Dimensions and Shipping	
Weight	4 lbs
Basic unit	H 7.90 x W 7.50 x D 3.1 inches

Compliance	
IEC 687	0.2% accuracy
ANSI C12.20	0.2% accuracy
ANSI C62.41	Burst
ANSI (IEEE) C37.90.1	Surge withstand
UL®/cUL®	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.

IQ 150S/250S Wiring



Ordering information

Table 1. IQ 150S/250S Meter catalog numbering system

IQ 150 S A 6 5 1 1

Model Series	Meter Type	Frequency	Current Input	Power Supply	Communication
150 = Energy **250** = Energy Plus	**S** = Self Enclosed Meter	**5** = 50 Hz system **6** = 60 Hz system	**1** = 1A secondary **5** = 5A secondary	**1** = 90–400 Vac/dc	**1** = Modbus RTU (RS485) **2** = Modbus RTU (RS485) or TCP - (RJ45) or 802.11b (WiFi)

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