High-end power management performance

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, volt-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.
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.

Features of IQ 100 Electronic Power Meters

<table>
<thead>
<tr>
<th>Features</th>
<th>IQ 130</th>
<th>IQ 140</th>
<th>IQ 150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrumentation</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Current, per phase</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Current demand</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Calculated neutral current</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Voltage, per phase (L–L, L–N)</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Min./max. readings, I, V</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Min./max. readings, I, V, P, F, W, VAR, VA</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Power

Real, reactive and apparent power, total (W, VAR, VA)

Power factor, total

Real, reactive and apparent power demand

Demand Methods

Block interval (sliding, fixed)

Energy

Real, reactive and apparent energy, total (Wh, VAR, VAh)

Communications

RS-485, Modbus RTU, Modbus ASCII, KYZ output

RJ45, Modbus TCP, KYZ Output

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

IQ 100 Meter (Rear View)

RJ45 Rear View

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 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 100 Meter Dimensions

IQ 100 Meter Ordering Information

<table>
<thead>
<tr>
<th>Model Series</th>
<th>Meter Type</th>
<th>Frequency</th>
<th>Current Input</th>
<th>Power Supply</th>
<th>Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>130 = Volts/amps</td>
<td>M = Meter (with integral display)</td>
<td>5 = 50 Hz system</td>
<td>1 = 1A secondary</td>
<td>1 = 90-265 Vac/dc</td>
<td>0 = None</td>
</tr>
<tr>
<td>140 = Power</td>
<td>T = Transducer only (no display)</td>
<td>6 = 60 Hz system</td>
<td>5 = 5A secondary</td>
<td>4 = 24-48 Vdc</td>
<td>1 = Modbus and KYZ Output (RS485)</td>
</tr>
<tr>
<td>150 = Energy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 = Modbus TCP and KYZ Output (RJ45)</td>
</tr>
</tbody>
</table>
# IQ 100 Electronic Power Meter Technical Information

## Current Inputs

<table>
<thead>
<tr>
<th>Class 10</th>
<th>5A nominal, 10A max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 2</td>
<td>1A nominal, 2A max.</td>
</tr>
</tbody>
</table>

### Fault Current Withstand

<table>
<thead>
<tr>
<th>Current</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>100A</td>
<td>10 seconds</td>
</tr>
<tr>
<td>300A</td>
<td>3 seconds</td>
</tr>
<tr>
<td>500A</td>
<td>1 second</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line-to-neutral</td>
<td>20–416 Vac</td>
</tr>
<tr>
<td>Line-to-line</td>
<td>20–721 Vac</td>
</tr>
</tbody>
</table>

Programmable 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 mm²)

## 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

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: 1 uA
- Opto-isolation: 3750 Vdc

## 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 6187: 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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