Eaton Energy Management System Upgrade Kit

Extend sophisticated branch circuit monitoring to existing equipment

Product snapshot

Monitoring:	42 circuits (one panel) or 84 circuits (two panels)
Rating:	208/120V, 380/220V, 400/230V, 415/240V
Configuration:	Wall-mounted, standalone unit

Feature list

- Extends the branch circuit monitoring capabilities of the Eaton® Energy Management System (EMS) to legacy and third-party power distribution equipment
- Monitors power conditions on individual breakers, panels or at the equipment level—three tiers of visibility within one unit
- Provides remote monitoring via the Power Xpert® Gateway Card, which links Eaton and non-Eaton equipment to the local area network or the Internet
- Tracks and records more energy parameters and provides more standard features than alternative branch circuit monitoring systems from other vendors
- Delivers real-time and historical information for precision analysis, troubleshooting, power management, billing and energy planning
- Streamlines and unifies the management of diverse, multi-vendor power distribution systems

Millions of dollars a year are invested in power protection systems such as UPSs and generators, but problems can still occur at the branch circuit level due to improper loading or inadequate monitoring. You might not be able to see trouble coming until a circuit breaker trips, and that's too late. Systems go down. Valuable data is lost, and business comes to a standstill. It can take hours to recover.

The Energy Management System continuously measures the current on all breaker levels and warns you of impending trouble, so you can take proactive steps. Armed with these insights, data center and facility managers can more effectively balance loads, prevent overload conditions, plan for future capacity needs and, where applicable, allocate energy cost among internal departments.

Extending the reach of the EMS

The EMS has always integrated with Eaton's latest generation of power distribution racks, power distribution units and remote power panels. Now a new Eaton EMS Upgrade Kit is available to extend these branch circuit monitoring capabilities to existing equipment, from Eaton or other vendors.

With the EMS Upgrade Kit, you bring the entire power distribution system under the support of the EMS. Even if you have a mix of older equipment from other vendors, you get the insights to effectively manage the edge of the power distribution system. You will be able to track and analyze:

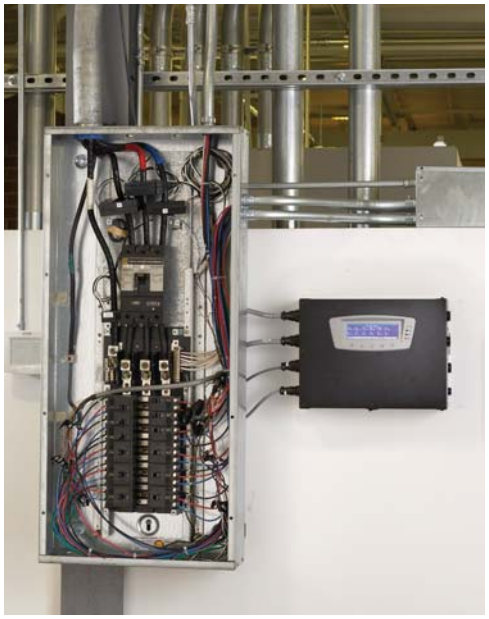
- Time-stamped metering, alarm, event and statistical information
- Peak loads, along with current, power and frequency minimums and maximums
- Voltage and power, monitored all the way down to the branch breaker level
- Power quality metrics, such as total harmonic distortion (THD) and power factor (PF)
- Load profiling to make the best decisions for energy planning

This information is shown for individual circuits, each panelboard and at the equipment level—equipment such as a power distribution unit (PDU) or remote power panel (RPP)—to provide visibility at all levels in one system.

Powering Business Worldwide

A practical, affordable solution for precision power management

The EMS Upgrade Kit includes an enclosure that can be mounted on existing power distribution equipment or on a wall with the provided mounting kit. The enclosure supports one or two panels and an optional LCD. A single-panel unit monitors up to 42 circuits; a two-panel unit monitors up to 84 circuits in a standard, three-phase panelboard. Current transformers (CTs) monitor branch circuits in connected panelboards—measuring and storing energy parameters for each individual circuit—so you can manage power with greater precision.



Easy to deploy and use

The EMS Upgrade Kit is a packaged, pre-tested, standalone solution. It is designed for upgrade into existing Eaton and third party PDUs, RPPs, panelboards or other equipment. The unit comes with its own bracket for wall-mounting and can be installed without disconnecting the branch circuit wiring to the loads. An easy-to-use software tool is included to configure start-up settings and options. No preventive maintenance or annual calibration is required. You gain new insight into power distribution without adding complexity to the infrastructure.

Visibility and control from anywhere

A Power Xpert Gateway Card installed in an X-Slot® communication bay enables remote monitoring over an Ethernet network. You can view detailed power parameters using a Web browser, an SNMP-compatible network management system or a Modbus TCP-compatible building management system. The system can even be configured to e-mail event notifications when alarm conditions arise.

Important power information at a glance

A large, local LCD—eight lines by 40 characters (many times larger than competitors' offerings)—is a popular option. This display delivers a rich array of information about status, events and alarms at any level. Navigate easily through system functions using buttons and contextual menus that are organized into logical categories.

Menu	What it does
Events	Displays lists of active or historical system events
Meter	Displays detailed input and output parameters and status for any branch circuit or panel
Profile	Displays a load profile for the previous 23 months and real-time values for the current month
Setup	Makes it easy to set up system options (such as time/date) and clear the history log or load profile

1 **ON** This green LED shows power is on and connected equipment is working normally

2 **O/L** This yellow Overload LED notifies local users of an overload condition on any phase

3 **AL** A flashing or solid red LED alerts users to alarm conditions

Customize for your unique needs

Available options for the EMS Upgrade Kit:

- Single panel (42 circuits) or dual panel (84 circuits)
- 208/120V, 380/220V, 400/230V, 415/240V rating
- LCD for local indication of energy consumption
- Conduit box for enhanced wiring harness protection
- Main input monitoring rated up to 400A
- Subfeed breaker monitoring
- 100A optional branch CTs, (standard 75A CTs are included)
- Temperature and humidity monitoring with the optional Eaton Environmental Monitoring Probe (EMP)

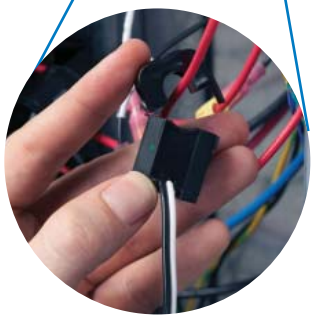
Cost-effective insurance against tripped circuits and unplanned shutdowns

Branch circuit monitoring technology has been field-proven for years. Recent advances in technology and design have made these capabilities more affordable than ever. When comparing features and technical specifications of different systems, you will quickly see that the EMS provides more all-in-one functionality than other vendors' offerings. It has the most standard features and the broadest list of measured and reported parameters.

With the EMS Upgrade Kit, now you can extend this extra layer of visibility and control to distribution equipment that was never designed to include those capabilities. Find out more about how the Eaton EMS and its Upgrade Kit can unify the management of your diverse, multi-vendor power distribution system.

Contact us at **1.800.356.5794** or visit us on the Web at **www.eaton.com/powerware**.

Split core CTs allow branch circuit current monitoring without having to disconnect critical loads.



Clamp-on voltage sensors attach to existing branch circuits and monitor voltage while powering the electronics module.

Technical specifications[1]

Dimensions	H x W x D inches, (mm)	Weight, lb (kg)
Electronics module (without display, with mounting bracket)	11.30 x 15.24 x 4.45 (287 x 387 x 113)	17.0 (7.7)
Mounting bracket	–	3.4 (1.5)
Conduit box (each side)	11.30 x 5.04 x 4.45 (287 x 128 x 113)	3.6 (1.6)
Split-core CTs (each)		
Branch circuit, 75A	1.50 x 1.02 x 1.02 (38 x 26 x 26)	0.145 (0.068)
Branch circuit 100A	2.00 x 1.57 x 1.18 (51 x 40 x 30)	0.22 (0.1)
Main input, neutral subfeed, 400A	3.94 x 3.78 x 1.81 (100 x 96 x 46)	1.56 (0.71)
Input ground, 100A	2.76 x 2.60 x 1.30 (70 x 66 x 33)	1.13 (0.51)

General characteristics	
Up to 84 branch circuits (two panels) monitored on a single display	
Nominal voltage	380/220V, 400/230V, 415/240V – international 208/120V – domestic
Nominal frequency (range)	50/60 Hz (45–65 Hz)
Input voltage configuration	Panel 1: 3 wire + N + GND Panel 2: 3 wire + N

System monitoring

Meters and load profiling points:

Input1 V12 min/max	Input2 V23 min/max
Input1 V23 min/max	Input2 V31 min/max
Input1 V31 min/max	Input2 ACUV total time
Input1 ACUV total time	Input2 I1 min/max (with optional Main CTs installed)
Input1 I1 min/max (with optional Main CTs installed)	Input2 I2 min/max (with optional Main CTs installed)
Input1 I2 min/max (with optional Main CTs installed)	Input2 I3 min/max (with optional Main CTs installed)
Input1 I3 min/max (with optional Main CTs installed)	Input2 V12 THD max
Input1 V12 THD max	Input2 V23 THD max
Input1 V23 THD max	Input2 V31 THD max
Input1 V31 THD max	Input2 frequency min/max
Input1 frequency min/max	Input2 kVA min/max (with optional Main CTs installed)
Input1 kVA min/max (with optional Main CTs installed)	Input2 PF min/max (with optional Main CTs installed)
Input1 PF min/max (with optional Main CTs installed)	GND I min/max
Input2 V12 min/max	NEU I min/max

Event logging

Input1 AC over voltage
Input1 AC under voltage
Input1 under or over frequency
Input2 AC over voltage
Input2 AC under voltage
Input2 under or over frequency
Building alarm 1
Building alarm 2
Building alarm 3
Building alarm 4
Input1 overload (four levels per phase, with optional Main CTs installed)
Input2 overload (four levels per phase, with optional Main CTs installed)
Input1 phase rotation error
Input2 phase rotation error
Configuration Error
ALM High_Input 1_THD (per phase alarm) current or voltage
ALM High_Input 2_THD (per phase alarm) current or voltage
ALM Neutral_overload_warning (per panel)
Neutral_overload (per panel)
Ground_Current_Warning (per panel)
Ground_Current_Overload (per panel)

DSP, LCD and Power Xpert Gateway 1000 card firmware are user-upgradeable

Individual panel monitoring	
The following parameters are configurable:	
Panel number	
Panel name	
Nominal input voltage	
Nominal input frequency	
System kVA	
CTs present	
L-L or L-N input setting	
Main CT ratios	
Calibration of input, output	
Ground and neutral CTs	
Calibration of voltage	
Breaker rating	
Breaker warning level	
Breaker type	
Monitored parameters:	
RMS:	V1, V2, V3, V12, V23, V13, I1, I2, I3
Average:	Vavg, kW, kVA, PF
Load:	Monthly kWh, yearly kWh, total kWh
Percentage:	I1%, I2%, I3% I3%, Itotal% (percent load)
Max:	Vmax, Imax
Main panel board metering alarms	
Panel or subfeed breaker OL warning, panel or subfeed breaker OL alarm	

Branch circuit or subfeed breaker monitoring–up to 42 per panel

User can easily add panel breakers	
Individual branch circuit configurables	
Breaker number, breaker rating, breaker warning level, breaker overload level, breaker type	
Monitored parameters	
Current:	RMS and percentage
Average:	kW, kVA, PF
Load:	Monthly kWh, yearly kWh, total kWh
Max:	Amperage, kW
Min:	PF
Individual branch circuit alarms (for each breaker)	
Breaker current warning	
Breaker current overload	

Environmental parameters (available via Eaton Power Xpert Gateway 1000 communication card)

Ambient temperature calculated in metric or standard (ºF and ºC)
Ambient humidity (%)

User interfaces

Eight-line by 40-character LCD with five soft keys for menu navigation
Four indicator lamps and alarm horn

Communications

Power Xpert Gateway 1000 communications card
Built-in Web and SMTP server
Supports ModbusTCP, SNMP and NTP protocols
(2) Isolated RJ-45 Ethernet ports for redundancy
DB-9 serial connection for Software Configuration Tool

Environmental and safety

Operating temperature	0°C to 40°C (32°F to 104°F)
Non-operating temperature	-55°C to 85°C (-67°F to 185°F)
Relative humidity	0–95% non-condensing
Operating altitude	Up to 6,600 ft. (2,000m) above mean sea level
Non-operating altitude	Up to 40,000 ft. (12,200m) above mean sea level
Audible noise	<40 dBA, excluding alarms
EMI	FCC 47, part 15 for Class A devices; CISPR 22/EN 55022 Class A
Electrostatic discharge (ESD)	IEC 61000-4-2 up to 8 kV pulse without damage and no adverse effect to critical load
Agency marking	UL 61010-1, CSA C22.2 No. 61010-1, CE Mark, IEC 61010-1:2001-02

1. Due to continuing product improvement programs, specifications are subject to change without notice.

PowerChain Management®

UNITED STATES
8609 Six Forks Road
Raleigh, NC 27615 U.S.A.
Toll Free: 1.800.356.5794

www.eaton.com/powerquality

CANADA
Ontario: 416.798.0112
Toll free: 1.800.461.9166

LATIN AMERICA
Argentina: 54.11.4124.4000
Brazil: 55.11.3616.8500
México: 52.55.9000.5252
Portugal: 55.11.3616.8500

EUROPE/MIDDLE EAST/AFRICA
Denmark: 45.3686.7910
Finland: 358.94.52.661
France: 33.1.6012.7400
Germany: 49.0.7841.604.0
Italy: 39.02.66.04.05.40
Norway: 47.23.03.65.50
Sweden: 46.8.598.940.00
United Kingdom: 44.1753.608.700

ASIA PACIFIC
Australia: 61.2.9693.9366
New Zealand: 64.0.3.343.3314
China: 86.21.6361.5599
HK/Korea/Taiwan: 852.2745.6682
India: 91.11.2649.9414 to 18
Singapore/SEA: 65.6825.1668

Printed in USA
EMS01FXA
December 2008

EATON
Powering Business Worldwide