

Overview

The new HP Data Center Environmental Edge technology helps you address one of the most critical issues in today's data centers - power and cooling. HP Data Center Environmental Edge is an affordable approach to monitoring your data center environment, resulting in optimal use of data center capacity and a reduction in energy costs. HP Data Center Environmental Edge measures, analyzes and visualizes data center environmental parameters, ensuring complete confidence that you're running a much more efficient data center.

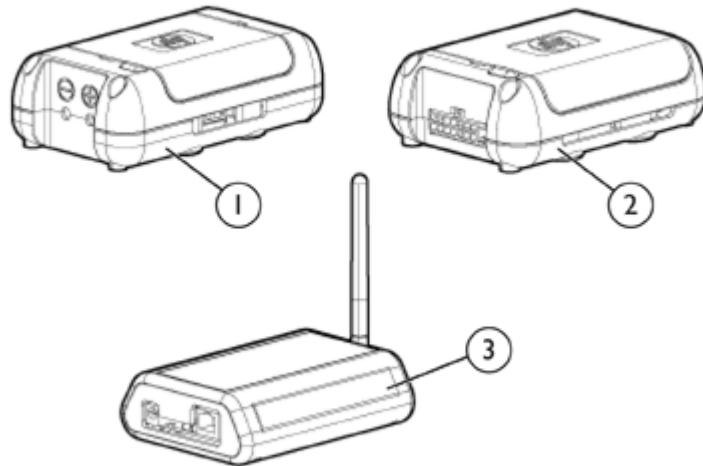
Why HP Data Center Environmental Edge?

- Resiliency: Real-time feedback on environmental changes in your data center through data center environmental visualization and customer defined alarms
- Energy savings: Reduces data center cooling energy up to 18% by enabling customers' data center optimization
 - Provides insight into data center infrastructure over-provisioning
 - Supports higher rack operating temperature and chilled water temperature through the data center environmental measurements
- Increased Flexibility: Adapt /upgrade the HP Data Center Environmental Edge hardware and HP Insight Environmental Observer software to meet the changing needs of your data center

HP Data Center Environmental Edge bridges the gap between IT and facilities. HP Data Center Environmental Edge enables both facilities and IT manager's deeper insight into their current data center environment.

For additional information, please visit: www.hp.com/go/edge

HP Data Center Environmental Edge Base Stations



1. Air Pressure Base Station
2. Environmental Base Station
3. Base Station Gateway

Standard Features

Wireless Network and Network and Network Security

HP Data Center Environmental Edge sensor and networking devices use 802.15.4 based radios that operate in the 2.4 GHz industrial and scientific and medical (ISM) unlicensed band. The HP Data Center Environmental Edge wireless communications low bandwidth will not interfere with other wireless communications. The HP Data Center Environmental Edge wireless communications uses a mesh network topology to transfer information.

HP Data Center Environmental Edge wireless systems achieve security at multiple levels: First HP Data Center Environmental Edge wireless communications are not IP-enabled; they therefore are not susceptible to external IP-based passive and active attacks. Second, HP Data Center Environmental Edge network stack uses 128bit-AES cryptograph to provide authentication and data encryption, thereby providing security against rogue admissions and snooping.

HP Insight Environmental Observer S/W

HP Insight Environmental Observer S/W key features include: data center environmental visualization; metrics tracking, alarming and historical information, including 1 year of 24x7 Technical Support and Updates.

HP Data Center Environmental Edge Environmental Base Station

HP Data Center Environmental Edge Environmental Base Stations are attached to individual racks or CRAH units and collect temperature and humidity data. The HP Data Center Environmental Edge Environmental Base Station is battery powered and reports temperature and humidity information either once every minute or up to once every 5 minutes based on user desired preferences. Environmental Base Stations are simple to mount or attach within the data center environment with a couple of different Mounting Options techniques, and include a one year parts only warranty (excluding batteries).

Server Racks

- Environmental Base stations will be combined with the HP Data Center Environmental Edge Rack Sensor Array
- Environmental Base Stations and Rack Sensor Array can be mounted either inside the rack on outside the rack. The Rack Sensor Array is mounted down the center of both the front and rear of the rack
- The minimum recommended configuration is to install the base stations once every third rack. Customers can install the base station on every other rack or every rack for increased granularity of data

CRAH/CRAC (Computer Room Air Handlers / Computer Room Air Conditioning)

- One Environmental Base Station and the Plenum Rated Sensor Array will be installed in each CRAH unit
- Environmental Base Stations do not require the customers' CRAH/CRAC units to be modified

Other Locations

- Environmental Base Stations can be located anywhere that the customers wants to gain insight into a specific locations' temperature and humidity



Standard Features

HP Data Center Environmental Edge Rack Sensor Array HP Data Center Environmental Edge Rack Sensor Array contains 3 thermistors to measure rack intake and 3 thermistors to measure rack exhaust.

NOTE: One year parts only warranty.

NOTE: Must be combined with AT516A Environmental Base Station

HP Data Center Environmental Edge Plenum Rate Sensor Array HP Data Center Environmental Edge Plenum Rated Sensor Array contains 2 plenum rated thermistors and plenum rated wiring.

NOTE: One year parts only warranty.

NOTE: Must be combined with AT516A Environmental Base Station

HP Data Center Environmental Edge Air Pressure Base Station HP Data Center Environmental Edge Air Pressure Base Station assesses the air pressure differential in raised floor environments. HP recommends one Air Pressure Base Station per 50 m² / 500 ft² of data center floor space.

NOTE: One year parts only warranty (excluding batteries).

HP Data Center Environmental Edge Base Station Gateway HP Data Center Environmental Edge Base Station Gateway provides the wireless communication with the HP Data Center Environmental Edge Base Stations and transmits the data to the HP Data Center Environmental Edge server. HP recommends at least two Base Station Gateways per solution. One Base Station Gateway pair supports up to 200 base stations. Multiple Base Station Gateway pairs can co-exist in one data center.

NOTE: One year parts only warranty (excluding batteries).

NOTE: Regional SKU exists

Recommended Base Configuration **NOTE:** The installation of the HP Data Center Environmental Edge recommended base configuration does not require any data center downtime to implement.

- One HP Data Center Environmental Edge Server or server with minimum 4 GB of memory and 250GB of RAID 1 storage
 - One HP Insight Environmental Observer S/W
 - One Base Station Gateways per 200 base stations, N+1 configuration
 - One Environmental Base Station and Plenum Rated Sensor Array per CRAH/CRAC
 - One Environmental Base Station and Rack Sensor Array per three racks
 - One Air Pressure Base Station per 500 ft²/50 m² of data center floor space
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Standard Features

HP Data Center Environmental Edge Optional Base Stations

HP Data Center Environmental Edge Energy Base Station

HP Data Center Environmental Edge Energy Base Station measures kWh (Kilowatt Hours) consumed, Power, Power Factor, Voltage, Current, THD on each electrical line where installed. Two variants of the energy meter exist, 208v or 277/480v version with either 200A or 600A split core CTs.

NOTE: One year parts only warranty (excluding batteries).

NOTE: Energy Base Stations must be installed by a local licensed electrician.

HP Data Center Environmental Edge Water Leak Detection Base Station

HP Data Center Environmental Edge Water Leak Detection Base Station detects liquid leakage.

NOTE: One year parts only warranty (excluding batteries).

HP Data Center Environmental Edge Chilled Water Energy Base Station

HP Data Center Environmental Edge Chilled Water Energy Base Station measures chilled water flow rate and temperature of both the supply and return lines

NOTE: One year parts only warranty (excluding batteries).



Configuration Information

HP Data Center Environmental Edge Configuration

NOTE: This solution is available through limited points of sale. Please contact HP for order assistance.

Step 1: Determine base quantity needed for the base recommended configuration:

- One HP Data Center Environmental Edge Server
- One HP Insight Environmental Observer S/W
- Two HP Base Station Gateways minimum, one per 200 base stations, N+1 configuration
- One Environmental Base Station and Plenum Rated Sensor Array per CRAH/CRAC
- One Environmental Base Station and Rack Sensor Array per three racks
- One Air Pressure Base Station per 500 ft²/50 m² of data center floor space
- One HP Data Center Edge Installer kit per 10,000 ft²/1000 m²

Step 2: Determine extra base stations required for increased granularity

Step 3: Determine optional base stations

HP Data Center Environmental Edge Base SKUs

Models	HP Data Center Environmental Edge Server NOTE: Includes HP ProLiant DL180 G6, 6 GB Memory, Microsoft Server 2008 standard. NOTE: HP Data Center Environmental Edge Server can manage several Base Station gateway networks, deployment license based on installed floor space. NOTE: For additional information on the HP ProLiant DL180 G6, please see the following: http://h18000.www1.hp.com/products/quickspecs/13248_na/13248_na.html	AV865A
	HP Insight Environmental Observer S/W NOTE: Includes 1 year of 24x7 SW Technical Support and Updates.	AT515A
	HP Data Center Environmental Edge Environmental Base Station	AT516A
	HP Data Center Environmental Edge Rack Sensor Array	AT517A
	HP Data Center Environmental Edge Air Pressure Base Station	AT518A
	HP Data Center Environmental Edge Base Station Gateway	AT519A
	HP Data Center Environmental Edge Installer Kit	AT533A

HP Data Center Environmental Edge Optional SKUs	HP Data Center Environmental Edge Plenum Rated Sensor Array	AT526A
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Support & Service

Service and Support Offerings (HP Care Pack Services)

NOTE: The HP Care Pack service part numbers below for the HP Data Center Environmental Edge system, cover the server blade and all HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the server.

Support Plus

Support Plus 24, 1 Year

HA110A1

Support Plus 24, 3 Years

HA110A3

Installation & Startup

HP Installation & Startup Service for HP Data Center Environmental Edge

HA114A1

NOTE: Provides for an integrated hardware and software implementation that includes remote service planning, onsite deployment of hardware and software, installation verification testing and customer orientation. Hardware deployment covers the installation of a single HP Data Center Environmental Edge server, Ethernet network interconnect, and specified sensor options. Software deployment covers the installation and configuration of sensors in the HP Data Center Environmental Edge Software.



Technical Specifications

Wireless RF Specifications	Band	2.4 GHz, ISM unlicensed band IEEE 802.14.5 MAC
	Data rate maximum	250 Kbps
	Maximum RF output power	0dBm +0 dBi omni-directional antenna
	Base Station Gateway Antenna	+2.2dBi
	Node to Node Distance	Typical 15m/ 50ft
	Regulatory Notices	FCC Part 15, Subpart C, 15.247 U62-SRS100 and U62-THERM Industry Canada 7265A-SRS100 and 7265A-THERM CE Marking EN 300 328; V1.7.1 (2006-05) and EN 300 440-2 V1.1.2 (2004-07)
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HP Data Center Environmental Edge Environmental Base Station	Housing	ABS plastic L 3.6" x W 2.5" x H 1.2" (L 91.5mm x W 63.5mm x H 30.5mm)
	Mounting Options	Zip Tie: (4 holes) Accommodates up to 0.18" (4.6mm) width 3M Command Strips Screws: (4 holes) 1.25" x 1.7" (31.75mm x 43.2mm) - - fits up to #6 Machine Screws
	Connectors	HP 14 position I/O connector for use with HP Data Center Environmental Edge Rack Sensor Array
	Power Requirements	4 Approved Batteries (see Approved Batteries Technical Spec) Typical Life @ 5 min Sample Rate: 5 to 7 years
	Internal Sensed Data: Dew Point	Operating Range: 50°F-95°F (10°C - 35°C), 20%RH - 80%RH Accuracy: Nominal +0.86°F -0.82°F (+0.48°C - 0.46°C) Accuracy over time: After 1 year +0.92°F - -0.88°F (0.51°C - -0.49°C) After 2 years +0.99°F - -0.94°F (.055°C - -0.52°C) After 3 years +1.06°F - -0.99°F (0.59°C - -0.55°C)
	Internal Sensed Data: Temperature Sensor	Accuracy: ±0.5°F (±0.3°C) Stability: Negligible Operating Range: 32°F to 122°F (0°C to 50°C) Time Constant: 231sec moving air (typical)C5
	Environmental	Operating: 32 to 104degF (0 to 40degC) Storage: 14°F to 140°F (-10°C to 60°C)On-board AC/DC Operating Temperature: 32°F to 122°F (0°C to 50°C) Storage Temperature: 14°F to 140°F (-10°C to 60°C)
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Technical Specifications

HP Data Center Environmental Edge Base Station Gateway	Connectors	RJ45 Ethernet Connection; 2.1x5.5mm 5.0VDC Jack RPSMA Antenna connector
	Power requirements	Gateway node requires 5.0VDC ($\pm 5\%$) via supplied power adapter requiring 110-240VAC (50~60Hz) power source (<2W) Supplied with 2 approved batteries (See Approved Battery Technical Spec) for battery backup during 5V power loss.
	Ethernet	RJ45 Ethernet 10Base-T or 100Base-TX (auto-sensing) Ethernet Network Security:SSL v3, SSH2, Rijndael 256-bit encryption, password protection, IP address filtering, locking features, hardened OS and stack
	Environmental	Operating: 32 to 104°F (0 to 40°C) Storage: 14°F to 140°F (-10°C to 60°C)

HP Data Center Environmental Edge Rack Sensor Array	Connectors	HP 14 position I/O connector for use with HP Data Center Environmental Edge Rack Sensor Array
	Mounting Options	Rack Sensor Array: 3M Command strips to front and rear rack doors. If no doors then side of rack Three Point Sensor Array: 3M Command strips to attach where the customer needs temperature and humidity visualization
	External Temperature Sensors	Rack Sensor Array: 6 external thermistors Three Point Sensor Array: 3 external thermistors Temperature Range: 32°F to 122°F (0°C to 50°C) Temperature Accuracy 10 to 43°C: $\pm 0.5^\circ\text{F}$ ($\pm 0.3^\circ\text{C}$) Temperature Accuracy 0 to 10 and 43 to 50°C: $\pm 1.2^\circ\text{F}$ ($\pm 0.7^\circ\text{C}$) Time Constant: 30sec moving air; 60sec static air (typical) Resolution: $\pm 0.02^\circ\text{F}$ at 77°F ($\pm 0.01^\circ\text{C}$ at 25°C) Stability: Typically $\pm 0.0056^\circ\text{F}$ (0.0031°C) over 5 years Thermistors: 10k ohm, Type J Curve Thermistor Time Constant: 60sec static air; 30sec moving air (typical)

HP Data Center Environmental Edge Plenum Rated Sensor Array	Connectors	HP 14 position I/O connector for use with HP Data Center Environmental Edge Rack Sensor Array
	Mounting Options	3M Command strips to front and rear rack doors. If no doors then side of rack
	External Temperature Sensors	2 plenum rated thermistors attached to plenum rated wire Temperature Range: 32°F to 122°F (0°C to 50°C) Temperature Accuracy 10 to 43°C: $\pm 0.5^\circ\text{F}$ ($\pm 0.3^\circ\text{C}$) Temperature Accuracy 0 to 10 and 43 to 50°C: $\pm 1.2^\circ\text{F}$ ($\pm 0.7^\circ\text{C}$) Time Constant: 30sec moving air; 60sec static air (typical) Resolution: $\pm 0.02^\circ\text{F}$ at 77°F ($\pm 0.01^\circ\text{C}$ at 25°C) Stability: Typically $\pm 0.0056^\circ\text{F}$ (0.0031°C) over 5 years Thermistors: 10k ohm, Type J Curve Thermistor Time Constant: 60sec static air; 30sec moving air (typical)



Technical Specifications

HP Data Center Environmental Edge Air Pressure Base Station	Housing	ABS plastic L 4.5" x W 2.6" x H 1.4" (L 114.3mm x W 66.1mm x H 35.6mm)
	Mounting Options	Screw: (4 holes) 1.7" x 1.3" (43.2mm x 33.1mm) - fits up to #6 Machine Screws Zip Tie: (4 holes) Accommodates up to 0.18" width 3M Command Strips
	Connectors	1/8" Barbed Hose Fitting for High and Low Pressure Differential connections
	Power Requirements	4 Approved Batteries (see Approved Batteries Technical Spec) Typical battery life @ 5 min Sample Rate: 5 to 7 years Typical battery Life @ 1 min Sample Rate: 4 years
	Sensed Data Pressure Sensor Performance	Internal 0 to 0.5 in-H ₂ O Air Pressure Differential (room vs. plenum)
	Sensed Data High and Low Pressure Ports	Differential Pressure Range: 0 to 0.5" H ₂ O (0 to 125 Pa) Zero point accuracy: 0.002" H ₂ O (0.5Pa) Span Accuracy: ±3.0% of reading Resolution: ±0.001"H ₂ O (±0.25 Pa) Offset Stability: <0.1 Pa per year 0.170 inch inner diameter tubing; use with up to 6 feet of tubing, cut to length as required during installation (supplied with node; plenum rated UL94V2 tubing). Longer tubing length is allowable, but sensor accuracy and response time may increase; use pressure diffuser tip to prevent foreign contaminates entering sensor (supplied with node)
	Environmental	Operating: 32 to 104°F (0 to 40°C) Storage: 14°F to 140°F (-10°C to 60°C)

HP Data Center Environmental Edge Universal Base Station	Housing	ABS plastic L 3.6" x W 2.5" x H 1.2" (L 91.5mm x W 63.5mm x H 30.5mm)
	Mounting Options	Screws: (4 holes) 1.25" x 1.7" (31.75mm x 43.2mm) - fits up to #6 Machine Screws
	Power Requirements	Zip Tie: (4 holes) Accommodates up to 0.18" width 3M Command Strips 4 Approved Batteries (see Approved Batteries Technical Spec)
	Analog inputs	Typical Battery Life @ 5 min Sample Rate: 5 to 7 years Typical Battery Life @ 1 min Sample Rate: 4 years 4-20mA: Accuracy: ±1.15% Full Scale Resolution 0.03%v 0-10V: Accuracy: ±1.53% Full Scale Resolution 0.03%



Technical Specifications

HP Data Center Environmental Edge 200A Current Base Station	Accuracy Range Console Display Environmental Installation	$\pm 0.5\%$ (from 1 - 100% FSO) 0 - 200A RMS 2 significant digits for volumetric flow 10°C to 40°C / 20% to 95% RH, non-condensing Licensed electrician, circuit downtime not required
HP Data Center Environmental Edge Flow Meter Base Station	Flow Range Installation Console Display Resolution Console Display Pipe materials Accuracy	0 to 400fps (based on typical industrial pipe applications this equates to no limitation in terms of volumetric flow) Non-intrusive ultrasonic flow measurement Volumetric Flow, range adjusted at installation for min/max Limits 1/3200th of the installed range 0 significant digits for volumetric flow Steel, Copper, Plastic (2-16" diameter) $\pm 2.8\%$
HP Data Center Environmental Edge Water Leak Detection Base Station	Leak Detection Sensor Operating Temperature	Optical sensor detects liquid contacting surface Adjustable Height -13°F to 176°F (-25°C to 80°C)
HP Data Center Environmental Edge Installer kit	Kit Contents	Wire Strippers Plenum Rated Zip Ties Command Strips Cable routing clips Thermistor mounting clips
Battery Technical Information	Approved Battery Battery Life Expectations	ENERGIZER AA LITHIUM, MODEL# L91, 1.5VDC Typical Battery Life @ 5 min Sample Rate: 5 to 7 years Typical Battery Life @ 1 min Sample Rate: 4 years
HP BCMS	Components Mounting and Installation Power Requirements Sensed Data	Includes 42 or 84 Split Core CT's, 60 amp rated each Includes 2 or 4 CT to Ribbon Cable Interface Box Includes 1 data acquisition board Install data acquisition module inside electrical box or in remote electrical box. Voltage connections are routed to data acquisition module. Split Core CT's are connected to Ribbon Cable Interface boxes, which then convert to ribbon cables connected to the data acquisition board. Modbus connection uses Modbus RTU 4wire multi-drop. 110-240VAC, 4 wire Data acquisition board can be powered in parallel or separately. HP EIO software will provide the following data points:



Technical Specifications

- Current per circuit with breaker capacity and warning status
- Power Factor per circuit
- Voltage per phase

Power per circuit, per phase, and total with warning status

Accuracy*

Current (amperage): +/-2%

Voltage (volts): +/-2%

Power (kw): +/-3%

Installation

Local licensed electrician required for installation and *onsite calibration

HP Energy Meter

Components

Includes HP wireless base station, SquareD ION6200 in single HDM enclosure, and 3 Split Core CT's, both UL and CE rated

Mounting and Installation

HDM Dimensions: 11.92"x7.5"x7.88"

Wall mount ION6200 enclosure. Voltage and CT connections are routed from source to HDM enclosure.

Power Requirements

110-480VAC*, 50/60Hz, up to 2400amps per circuit*, 3 or 4 wire, Wye or Delta.

* [Depending on model ordered](#)

Sensed Data

HP EIO software will provide the following data points:

- Current per phase (Wye only)
- Power Factor per phase (Wye only)
- Voltage per phase (Wye L-N and Delta L-L)
- Total Power
- Average Power (period = 5min sampling interval)
- THD

Accuracy*

Current (amperage): +/-1%

Voltage (volts): +/-1%

Power (kw): +/-2%

Installation

Local licensed electrician required for installation and *onsite calibration

HP Chilled Water Energy Meter

Components

Includes HP wireless base station, Ultrasonic Flow Meter with remote transducers, and 2 pipe temperature RTD's

Mounting and Installation

Ultrasonic transducers are clamped directly to the chilled water pipe surface. Pipe temperature RTD's are clamped directly to the chilled water pipe surfaces.

Control box and wireless node mounted remotely.

Power Requirements

110-240VAC, 50/60Hz

Sensed Data

HP EIO software will provide the following data points:

- Supply Volumetric Flow Rate
- Supply Temperature
- Return Temperature
- Accumulated Energy

Accuracy

Volumetric Flow: +/-3%

Temperature: +/-0.2degC

Energy: +/-3%



Technical Specifications

Environment-friendly Products and Approach

End-of-life Management and Recycling

Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: <http://www.hp.com/go/green>. To recycle your product, please go to: <http://www.hp.com/go/green> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/green>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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