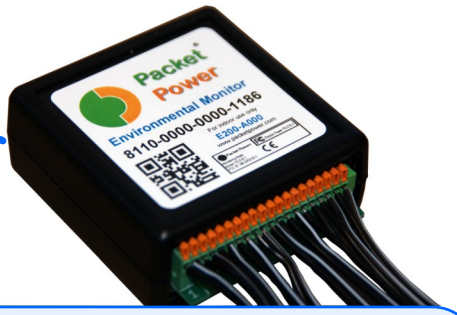
Packet Power®
Environmental Monitor



Product Specification

Introduction
The **Packet Power Environmental Monitor Version 2 (EM)** makes it easy and affordable to monitor temperature, relative humidity, differential pressure and dry contact switches.

Overview
The Packet Power EM is a powerful and versatile monitoring tool. Each unit can gather temperature readings from up to 10 temperature probe cables. These cables can be concentrated to provide multiple data points per rack or spread across as many as five racks to minimize monitoring costs. And the units can be further equipped to also measure humidity or differential pressure.

The Packet Power EM leverages the full capabilities of Packet Power's wireless data collection infrastructure. The Packet Power EM instantly begins sharing information across the wireless network with other EM devices and any Packet Power Smart Power Cables installed in the facility. Information from all monitoring points is then made available for use in local software applications or Packet Power's cloud-based energy analysis service.

Key features
- High precision measurement (±1° C, ±2% RH, 3% pressure)
- Map temperature readings to facility layout diagrams
- Generate alerts if temperature becomes too high or too low
- Track hundreds of monitoring points per facility in single or multiple facilities
- Access information in real time via web portals and facility maps
- Detailed, easily customized reports

Configuration Options
The Packet Power EM can be used in any combination of the following configurations:
- Single Rack: temperature sensors at the top, middle and bottom of the front and top and bottom of the back
- 2-Rack: three temperature sensors in the front and two in the back of each of 2 adjacent racks
- 3-Rack: three temperature sensors in the front of each of 3 adjacent racks and one sensor in the back of the middle rack
- 5-Rack: two sensors in the front of each of 5 adjacent racks
- A humidity or pressure sensor can be added to each EM device

Operating Environment
Indoor use only, powered by a 110—250V AC adapter.

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Summary
- Captures up to eleven temperature readings per monitoring unit in near real time.
- Provides the option to add relative humidity or differential pressure measurement.
- Leverages the Packet Power wireless network for easy deployment
- Scales to hundreds of monitoring points and multiple facilities
- Enables real-time facility heat maps

Overall Solution Components

Smart Power Cables

- Optional Smart Power Cables record detailed power usage in real time (A, V, W, VA, kWh and frequency)
- Fail-safe design ensures continuous power flow
- Wireless design for easy data gathering

Wireless Data Network

- Self-configuring wireless mesh network of monitoring devices
- Ethernet Gateway gathers data from hundreds of power cables or EM devices
- System requires just one Ethernet port and IP address
- Energy usage data is transmitted to analysis application

Monitoring and Analysis

- Complete energy analysis system offers easy access to real-time data and historical reports.
- Packet Power's software can be accessed as a service or installed locally. The monitoring devices can also provide data via SNMP to an existing local monitoring application.

ENVIRONMENTAL MONITOR

TECHNICAL SPECIFICATIONS

Temperature

Temperature Probes

Differential Pressure

COMMUNICATIONS

Operating Frequency	From 860 to 930MHz. The specific portion of the frequency range used varies by region.
Wireless Protocol	Proprietary frequency hopping, self-configuring, load-balancing mesh network
Wired Network Protocol (Gateway only)	TCP/IP (one IP address needed per Gateway), SNMP interface with support for traps
Firmware updates	Wireless over the air
Typical transmission range	10 to 50 meters indoors from any one device to any other
Antenna	Fully enclosed, fixed configuration
Monitoring Unit to Gateway Ratio	Up to 300 monitoring units per gateway
Gateways per site	Unlimited
Multi-site support	Yes
Encryption	Optional 128-bit

OPERATING ENVIRONMENT

Operating Temperature	0 to +40 C (+32 to +104F)
Operating Humidity	10% to 90% non-condensing
Water and dust resistance	Not IP rated, indoor use only
Maximum operating altitude	2,000 meters (6,561 feet)
Mounting	On top of the cabinet

LED INDICATORS

Blue	Powered on
Green/Orange	Wireless communication activity

SIZE AND WEIGHT

Environmental Monitor	65 mm (2.6") x 65 mm (2.6") x 28 cm (1.1"), 90 g (3 oz)
Ethernet Gateway	65 mm (2.6") x 65 mm (2.6") x 28 cm (1.1"), 65 g (3 oz)
Construction	Molded GP ABS plastic (UL94-HB)

MEASUREMENT

Temperature	±1° C at 0.1° C resolution with readings in C or F.
Relative Humidity	From 0 to 100% RH at ±2 % RH at 0.1% resolution
Dry Contact	0.5 sec state switch time. open>500K ohm, closed<2.5K ohm
Differential Pressure	±500 Pa (±2"H_2O), 0.2Pa or ±3% accuracy full span

AVAILABLE CONFIGURATIONS

Monitoring units

Model	Differential Pressure	Relative Humidity	Temperature or Dry Contact
E200-A000	No	No	1 internal temperature and 10 external temperature or dry contact probes
E20H-A000	No	Yes	1 internal temperature and 10 external temperature or dry contact probes
E20P-A000	Yes. Includes 8 feet (2.4m) of flexible tubing	No	1 internal temperature and 10 external temperature or dry contact probes

Temperature probe cables

Model	Front Probes	Rear Probes	Probe Positions from Top of Rack
TP02-05X1	3	2	Front: 1 – 15 cm, 2 – 90 cm, 3 – 180 cm Rear: 1 – 60 cm, 2 – 170 cm
TP02-05X2	3 – 1st rack 3 – 2nd rack	2 – 1st rack 2– 2nd rack	Front: 1 – 15 cm, 2 – 90 cm, 3 – 180 cm Rear: 1 – 60 cm, 2 – 170 cm
TP02-03X3	3 – 1st rack 3 – 2nd rack 3 – 3rd rack	1 – 2nd rack	Front: 1 – 15 cm, 2 – 90 cm, 3 – 180 cm Rear: 1 – 90 cm
TP02-02x5	2 in each of the 5 racks	None	Front: 1 – 60 cm, 2 – 170 cm

POWER

External Power Supply	100- 240VA/C input voltage, 50-60Hz
Dimensions	72mm x 43mm x 29mm
Power Cord	1500mm 18AWG UL1185
Power Supply Efficiency	Energy Star Level V
Safety Standards	EN60950 UL60950 IEC60950
Plug Types	NEMA 5-15, CEE-7 Schuko, AS/NZS 3112 2000, BS 1363A, C14, BS 546A
Power Consumption	Ethernet Gateway: 0.7W Environmental Monitoring: 0.5W
Power over Ethernet	Available. Requires an external PoE splitter on a PoE enabled switch. If the switch does not provide native PoE support, a PoE injector is also required.