

Data Centre Monitoring Made Easy



Packet Power provides the easiest, most cost effective way to capture detailed power and temperature information for both single site and large multi-facility operations.

Gain insight into what is driving growth in energy consumption by viewing usage based criteria such as application, end customer, circuit, power phase, etc. Easily see hot spots and show power usage mapped across a facility in real time. Set alerts on power or temperature triggers.



Most products can be installed without an electrician or the need to remove existing equipment. All monitoring devices utilise a self-configuring wireless network to communicate instantly with each other, keeping the need for IP addresses to just one per Ethernet Gateway. Use the Packet Power software or integrate the power and temperature data into existing operations management systems. You can easily start small and grow over time.

Features & Benefits

- Map facility heat and power usage in real time.
- Monitor power at any combination of device and circuit level for thousands of devices in multiple facilities.
- Measure temperature, pressure and relative humidity.
- Export data via SNMP, Modbus or use Packet Power applications.
- Deploy quickly and at a fraction of the cost of smart PDUs or branch circuit monitoring.
- Extend the useful life of power constrained data centres.
- Quantify energy efficiency savings.
- Correctly allocate energy costs.
- Avoid power and temperature related outages.
- Provides a cross-vendor monitoring system.

The Packet Power Solution

Seamlessly integrates monitoring hardware, wireless network, data analysis and reporting.

Wireless Monitoring Devices

- **Smart Power Cables** - incorporate precise power and temperature monitoring into a power cord format.
- **DC Monitoring** - an easy and cost effective way to monitor power on DC circuits.
- **Panel-Based Monitoring** - provides main and branch circuit monitoring at the PDU.
- **Environmental Nodes** - track temperature at multiple points per cabinet, relative humidity, differential pressure and dry contact switch status.
- Uses a secure 900Mhz wireless mesh network optimised for the challenging wireless conditions within data centres.

Application Software

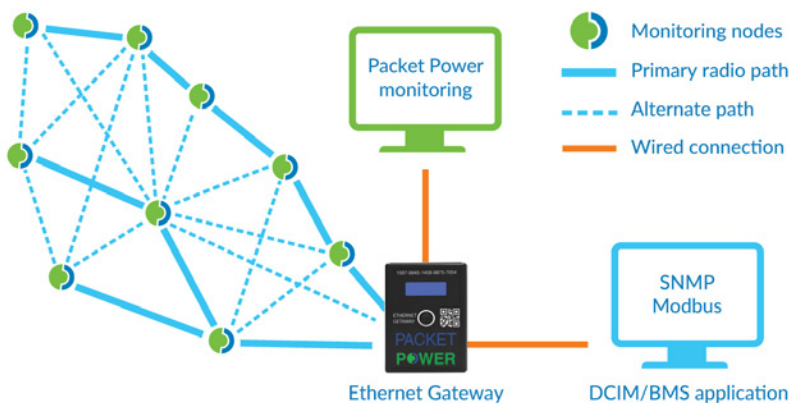
- **EMX Energy Portal** - makes monitoring information easily accessible by providing access from any Web browser to extensive real time data and easily customised analytical reports. With a local application that makes it easy to map the monitoring devices to your data centre, to show real time power and heat maps.

Ethernet Gateways collect monitoring data from Packet Power wireless monitoring devices and make it accessible over your data network. Gateways are simple to install, easy to use, secure and scalable. Ethernet Gateways are self-configuring, and self-optimize the network which makes adding monitors easy.



Key Features

- Uses a purpose-built wireless protocol to maximise security.
- Standard unit supports up to 150 Packet Power environmental and power monitors per Gateway, with limited version supporting 30 devices.
- Automatically adapts when monitoring units are added or removed.
- Multiple Gateways can be added to increase network capacity and provide redundancy.
- Automatically balances loads when new Gateways are added.
- Advanced Modbus integration supports thousands of monitors per site.
- Virtual IP address capability simplifies SNMP integration.
- "Master" capability simplifies integration in multi-Gateway installations by making all data accessible from one Gateway.
- "Monitor" mode allows data to be shared selectively across two completely isolated Ethernet networks.
- Provides a sophisticated panel circuit mapping tool.
- Supports wireless firmware updates to all monitoring devices.
- Includes bracket for standalone mounting or the use of standard DIN rail, cable ties or adhesive pads.



Packet Power's self-configuring mesh network makes installation simple. Adding new monitors and gateways is easy as the system automatically configures and manages itself. Because the system determines the optimal path for every transmission, performance stays consistent even as the network grows.

The unique wireless monitoring protocol is different than WiFi or Zigbee and was purpose-built for data centres. It uses 900 MHz and 2.4 GHz frequencies that can only be used for monitoring. It allows for a complete separation of the wireless monitoring network from the wired data network, supports full encryption and is certified for use worldwide. The resulting mesh network is more resilient and secure than other systems.

PACKETPOWER Hubs



Packet Power Hubs provide a means of taking data from third party monitoring devices and placing the data on Packet Power's EMX Portal. This allows companies using EMX to gain insights into the energy usage from nearly any device that can support standard SNMP or Modbus protocols.

Once installed, the Hub securely gathers data from specified monitoring units that are on the same network as the Hub. Data mapping tools and services are available to support a wide range of devices.

Features & Benefits

- Easily gather data from nearly any device that supports SNMP or Modbus protocols.
- Supports local or cloud-based EMX systems.
- Gather data from thousands of monitoring points per site.
- Data mapping tools and services are available to support new or customised devices.
- One button setup of IP addresses.
- Small size with low energy usage.
- Local display.



Modbus & SNMP Connectivity

Packet Power Hubs and Ethernet Gateways are available to support either Modbus or SNMP connectivity. Ethernet Gateways collect data from Packet Power wireless monitoring nodes and aggregate the data for transmission by SNMP or Modbus TCP/IP, whilst simultaneously serving data to the EMX portal. This provides the convenience of viewing data in the EMX portal, whilst still supplying data for DCIM or BMS applications. EMX only Gateways are also available.



Key Features

- Precisely measures power and temperature from just a few or thousands of cables.
- Captures detailed, time stamped data on: Amps, volts, watts, watt-hours, volt-amps reactive, power factor and frequency.
- Incorporates advanced network security features throughout the system.
- Maintains key data during power and communications disruptions.
- Fail-safe design will not disrupt the flow of power.
- Packet Power applications provides flexible, web based reporting and alerts.
- Interfaces to other monitoring applications via SNMP or Modbus TCP/IP.
- High power systems (up to 2000A) with split core CTs available.
- Certified for use in North America, the European Union, and many other countries world wide.

Smart AC Power Cables

Packet Power Smart Power Cables provide an easy wireless system to gather power and energy consumption data from any cabled device.

Smart Power Cables feature the same power monitoring components found in many smart meters packaged in a unique power cord format. Self powered by the line voltage, the cables wirelessly transmit detailed power information and self configure with other nearby Smart Power Cables to form a wireless network. Add or remove a smart power cable, and the network automatically adapts. Information is centrally routed to a Gateway module providing the information in an open protocol for use in most third party applications or Packet Power's EMX cloud portal monitoring system. This makes it possible to quickly deploy an advanced power monitoring infrastructure with minimal disruption and limited need for IT resources and expertise.

Standard Connector Types

IEC 60320 208-240V

- C13 / C14
- C19 / C20
- 60309 Commando
- Schuko / C13

Summary

- Simple plug and play installation.
- Models from 10A to 63A capacity, with panel based monitoring up to 2,000A.
- Ideal for rack PDUs, high capacity IT devices (SANs & switches), underfloor cables and busway tap-off boxes and all critical loads.
- Scalable from a few devices to thousands just by adding Gateways.
- Cables form a self-configuring wireless mesh network for ultra reliable communication.

Wireless DC Power Monitoring

An easy and cost effective way to monitor power on DC circuits. Compact power monitors use Packet Power's unique self-configuring wireless mesh network allowing for rapid deployment of a few or a few thousand monitors.

Capture energy usage on circuits ranging from 20 to 3,000 Amps on 5-24V, 48V and 200-380V DC systems.





Key Features

- Integrates with any manufacturers busway; easy retrofit or new installation options.
- Monitors form a self-configuring network for simple installation with automatic recognition of new devices.
- Only one IP address needed to monitor hundreds of end feeds and tap-offs.
- Integrated local display.
- SNMP or Modbus TCP/IP output enables integration with third party BMS and DCIMs.
- Web based or local monitoring option immediately available after deployment.
- Ultra secure wireless network; not accessible by other commercial networks.

Packet Power’s wireless monitoring is the only true plug and play monitoring system for busway, avoiding the constraints and complexity of wired monitoring systems. Monitors are automatically recognised and instantly added to the network once energised. There are no difficult set-up requirements and the system is easy to install on new or existing busway from any manufacturer.

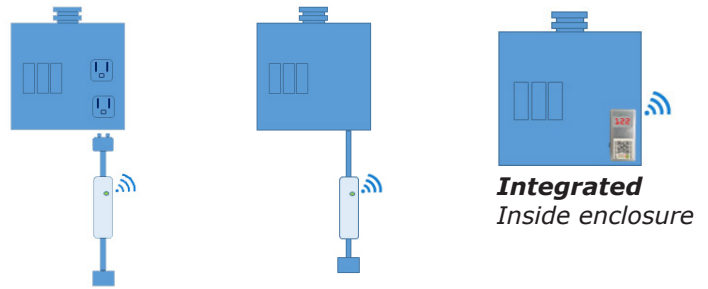
Combining a self configuring wireless mesh network with high accuracy ($\pm 1\%$ and better) compact power monitors, Packet Power offers the most secure, reliable and robust network architecture, eliminating all complexities associated with wireless networks and adding the convenience of wireless.

Monitoring your busway is easy with all information centralised at a Gateway module with a single IP address. Data is available in SNMP or Modbus TCP/IP protocols for easy integration with any third party monitoring system.

Using Packet Power’s EMX portal, you can instantly see all monitored devices, set alarm thresholds, examine usage trends across time and more. EMX also simplifies energy cost allocation and reporting with an array of standard and customisable reports; available as a cloud service or local installation.

Installation Options

Tap-Off



Smart Cable
Plug and receptacle

Smart Cable
Hard wired

Integrated
Inside enclosure

End Feed



Integrated
Inside enclosure

Externally Mounted
Installed in adjacent enclosure in separate casing



Packet Power's compact wireless Environmental Monitors make it easy and affordable to monitor all environmental conditions in your facility.

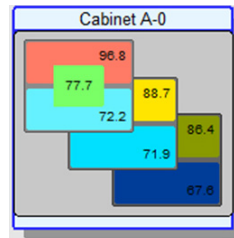
The highly flexible system lets you gather temperature data from 1 to 12 points per cabinet. Increase the number of points per cabinet to gain detailed insight into high-heat cabinets and scale it back to lower monitoring costs in low-heat areas. Customise the length of the temperature probes to perfectly match your monitoring strategy or use pre-configured probe kits to maximise ease of installation; and add relative humidity and differential pressure monitoring just where you need it.

Packet Power makes it easy to manage your monitoring network. The Ethernet Gateway automatically detects any new monitoring devices, seamlessly adding them to the network. The monitors communicate via a mesh network routing traffic through any nearby monitors to find the optimal path to a Gateway.

Viewing and analysing environmental data is simplified with real time facility wide thermal maps made possible by the EMX Energy Management console.

Features

- Measure up to 12 temperature points per monitor.
- Low cost per monitoring point.
- Each monitor can cover 1 to 12 cabinets based on your needs.
- Monitors temperature, differential pressure and humidity.
- High precision measurement.
- AC or battery powered.
- Enables real-time facility heat maps.
- Scalable to thousands of monitoring points per facility.
- Minimises IT resource requirements.
- Isolates monitoring devices from primary data networks.
- Instant access to data locally or using the Packet Power cloud service.
- Easy integration with third party BMS and DCIM systems.
- Built on wireless technology proven to work in critical facilities.



Environmental Monitor Models



47-E306-H000

- Up to 6 temperature probes.
- Relative humidity.
- Dry contact status.
- AC powered or PoE with splitter.



47-E306-P000

- Up to 6 temperature probes.
- Differential Pressure.
- Dry contact status.
- AC powered or PoE with splitter.



47-E312-H000

- Up to 12 temperature probes.
- 2 Year battery life.
- Battery status reporting.
- Optional AC Power.
- Relative humidity (optional).



Temperature Probes

- Use easy to install pre-built kits.
- Individual probes in lengths up to 15m.



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Most recent readings

Power cables

Table with columns for Monitoring node, % max by phase, % max by phase, % max by phase, % max by phase, % max by phase, % max by phase, Power factor by phase, and PF1. It lists various monitoring nodes and their corresponding power and phase data.

Wireless network

Active node summary

Table with columns for Activity period, Active, and Node. It shows active nodes for the Past 1 hour, Past 24 hours, and Node.



Newly active nodes (last 24 hours)

Table with columns for Monitoring node and Type.

Newly silent nodes (over 15 minutes)

Table with columns for Monitoring node and Type.

Environmental monitors

Table with columns for Monitoring node, Humid (%), Temp (°C), Temp (°C), Temp (°C), Temp (°C), Temp (°C), Temp (°C), Humid (%), Humid (%), Humid (%), Humid (%).

Key Features

- Real-time power & environmental information from facility wide to device resolution.
Ready to run - no costly commissioning and integration expenses.
Supports thousands of monitoring points across multiple facilities.
Multi-company support; separate access to information for different parts of your company or customer sets.
Use as-is or customise reports, dashboards, languages and alerts.
Accessible from any web browser.
Cloud based or locally installed.
Proven globally in enterprise and co-location environments.
Set policies and receive alerts via e-mail or SMS.
Create custom dashboards viewable as web pages.
3D thermal maps.
Detailed reporting capabilities.
Dynamic charting and trending functions of real time and historical data.
Export data in universal formats.
Track energy usage, costing and CO2 emissions.
Create realistic data centre diagrams and view information from a facility to device level.

The EMX energy portal makes it easy to access detailed power and environmental information. Using any web browser, you can quickly see your top level or detailed power and environmental data, available power infrastructure, examine usage trends across time and more. EMX also simplifies energy cost allocation and reporting with an array of standard and customisable reports.

Packet Power provides a true end to end plug and play experience with a self configuring wireless network that effortlessly integrates with the EMX monitoring system. From the moment you energise monitors the EMX portal will automatically recognise new devices and make the data available.

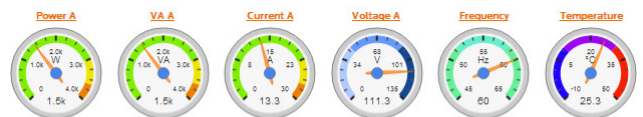
EMX can be online and commissioned in a fraction of the time and cost of conventional BMS and DCIMs while still delivering the critical information you need to operate and optimise your data centre. EMX can run as a cloud application or locally as well as operate simultaneously with conventional building management systems.

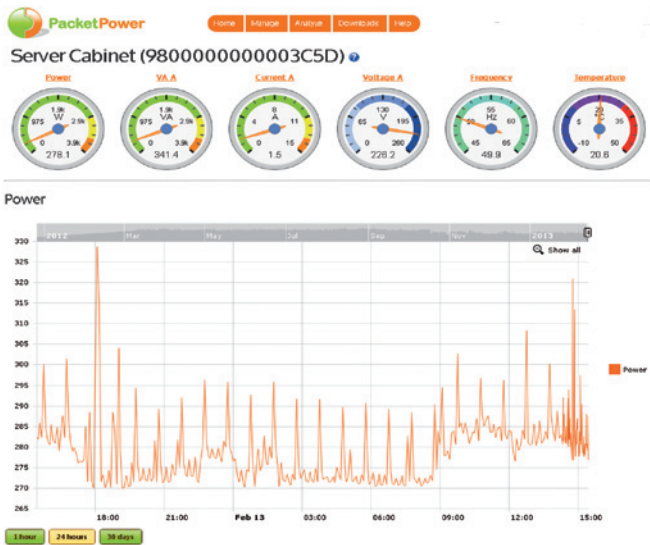


Mission control Home Manage Analyze Downloads Help

ENERGY USAGE BY DEVICE

Table showing energy usage by device for various nodes like Alan Spec Sheet, 1800000000000244, 320000000000003D, etc., with columns for Energy and kWh values for different periods.



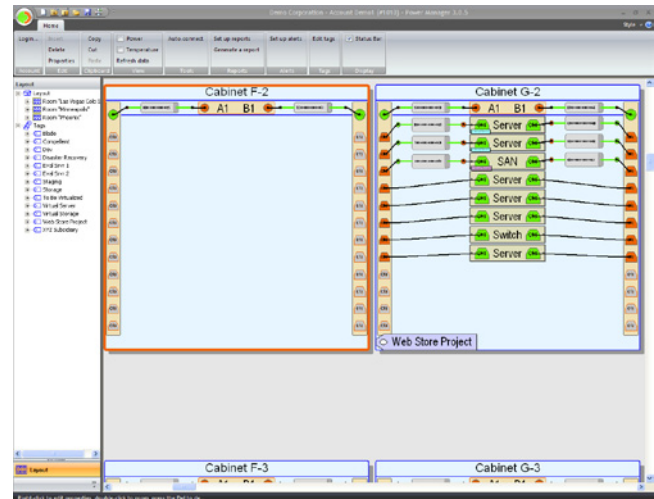
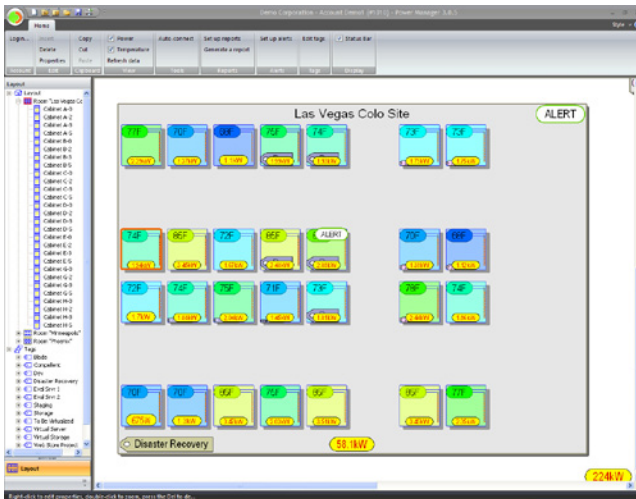


EMX Delivers Real Value Information and Operating Efficiencies:

- Optimise available power per circuit without the risk of tripping circuits.
- Generate energy savings by increasing ambient temperature while safely knowing your peak rack temperature.
- Monitor and optimise airflow using low cost strategically placed pressure sensors.
- Ensure compliance with customer contracts using easy to run reports.
- Maintain uptime by setting policies that ensure safe operating parameters.
- Accurately allocate costing by user and improve billing accuracy.
- Increase PUE resolution to better gauge operating efficiency efforts.
- Automate reporting and time consuming manual measurements.

Packet Power EMX has two components the web based EMX Energy Portal and a PC application, Power Manager, that communicates with the EMX Energy Portal and enables dimension layouts.

Power Manager is used to tailor your monitoring system to your data centre(s). Using its graphical interface, you can quickly map where each power and environmental monitoring device is located. You can leverage the powerful tagging feature to make it easy to aggregate power usage across devices, circuits, cabinets or rooms.



Key Features

- Measures voltage, current, power, volt amps reactive, energy consumed, frequency, temperature, relative humidity and differential pressure.
- Provides an intuitive, easy-to-use interface.
- Displays real-time power and heat maps of a facility.
- Delivers enterprise-level alert management.
- Offers the full functionality of the Packet Power EMX web portal to access real-time and historical data.
- Minimises the need for IP addresses (only one per Gateway).