



B&R Enclosures Pty Ltd

The Benefits of Intelligent PDUs

White Paper



INTRODUCTION

Data centres use every precaution to ensure problems are managed before causing an incident. One of the last lines of defence in a data centre is a Power Distribution Unit, or PDU.

The traditional role of a PDU is to deliver stable, reliable power to connected devices. However, with various levels of protection offered by different PDUs, it is important to define the additional features a PDU must monitor.

This paper will discuss common challenges facing data centres, and the benefits of Intelligent PDUs, or iPDUs. Acting as a brain within a data rack, iPDUs actively track and measure individual events and give advanced warning before problems escalate to failure.

By monitoring power and energy consumption, and the surrounding environment, Intelligent PDUs help ensure data centres are run as efficiently as possible. Delivering data in real-time, and allowing staff to remotely manage the iPDU further solidifies the Intelligent PDUs role as a data centre essential.

DEFINITIONS

Power Distribution Unit (PDU): A device designed to distribute power to multiple servers and networking equipment within a data rack.

Intelligent PDU (iPDU): Has the same functionality as a basic PDU, but is able to monitor additional factors in a data centre environment. An iPDU will track current draw and power usage, both at the inlet and outlet levels, and can monitor environmental data. An iPDU can also remotely alert staff to any potential issues in real-time, allowing staff to remedy problems before they escalate.¹



Internet of Things: an iPDU is your connected device for each rack in your data centre; providing real time visibility and monitoring of performance, as well as critical operational control when you need it most.

CHALLENGES FACING DATA CENTRES

The need for energy efficient data centres has grown steadily, and is only likely to continue increasing into the future. Companies all over the globe have digitised their knowledge base, and rely on data centres to provide uninterrupted access to their data. It is therefore essential to put contingencies in place to monitor, and hopefully prevent, any issues arising.

From power disruptions to equipment failure, data centres face issues every day. To manage issues that arise on a smaller scale, such as individual equipment failure or isolated overheating, data centres look to Intelligent PDUs.

Acting as a brain for each individual data rack, iPDUs manage and publish power and energy consumption, as well as any environmental changes, to authorised users in real-time.

Real-time Remote Management and Monitoring

Power, energy, and environmental issues can cause catastrophic problems in a data centre in a very short amount of time. As such, it is essential that information is visible to relevant personnel at all times.

Intelligent PDUs offer real-time visibility of all information. As soon as equipment starts drawing too much power, or running hotter than it should, an iPDU can set off an alarm, and notify staff.

Many iPDUs are also able to remotely turn switches off or on at an outlet level, for example, to reboot a server. The freedom to remotely control and monitor equipment can reduce downtime, as well as the costs of site visits. Users are able to address issues immediately, instead of needing to be at the data centre.

Greater security within a data centre is possible with remote control and monitoring of equipment. Users are not required to enter the centre whenever there is an issue, lowering the potential of a security breach.

With real-time remote management and monitoring, intelligent PDUs deliver essential information as it is generated. This gives data centres greater control, and the security that the centre is being run as securely and efficiently as possible.

Environmental Monitoring

Variations in temperature or humidity can lead to significant damage in a data centre. As such, many data centre managers run HVAC (Heating, Ventilation and Air Conditioning) at low temperatures, ensuring there is less likelihood of equipment overheating or humidity rising. Although effective in preventing equipment error, this technique increases energy bills and makes the centre less environmentally friendly.

Intelligent PDUs can monitor environmental conditions in a data centre, including temperature, humidity, dry contact and water leaks.

Environmental monitoring reduces the need for data centres to run HVAC at lower temperatures, as they are able to monitor the temperature around equipment accurately, and in real time.

Temperature monitoring also identifies hot-spots which could put equipment at risk. Locating these areas highlights where additional insulation, such as baffles or segregation panels, would have the greatest impact.

Monitoring temperature and humidity in real time brings potential environmental hazards to light, and allows data centres to manage issues accordingly. Environmental monitoring is therefore essential to maintaining a healthy data centre.



With every one degree Celsius the temperature of an air-conditioner is increased, up to 6% can be saved on an energy bill.²

Power Metering and Energy Management

From occupational costs to power usage, data centres aim to minimise cost while maximising productivity. By installing iPDUs to monitor the energy usage of equipment, data centres are able to increase their running efficiency.

Intelligent PDUs monitor energy use at the inlet and outlet levels, detecting power supply issues coming to the inlet, and monitoring which equipment is drawing more or less power than expected from the outlet. By tracking this information, identifying underutilised or inefficient equipment becomes a simple task. Data centre managers can then remove or consolidate servers where necessary, thereby cutting unnecessary costs.

This information can also highlight potential issues before they arise. Operating equipment in over- or under-voltage conditions can cause serious damage, whether to stored data or to the equipment itself.

Intelligent PDUs ensure that multi-tenant data centres are able to accurately charge back to clients. Monitoring all power being drawn from individual outlets, data centres can accurately monitor where and how much data is being drawn, and use that information to ensure their clients are fairly charged.

PDUs are designed to ensure that PDU or device plugs can only be connected to the appropriate receptacle. This protects equipment from being exposed to under- or over-voltage, as devices designed for certain voltages can only be connected to the correct plug. A PDU also “locks” a plug in place so that the cord is unable to be removed accidentally, reducing the risk of power disruptions.

All energy levels coming into and being drawn from an Intelligent PDU can be monitored in real-time. This ensures that data centres have greater control when managing power usage, and can take steps to reduce the volume of underutilised or inefficient equipment. They will then be able to ensure their data centre is run at maximum capacity and, with an iPDU also monitoring all factors in real-time, know immediately when and where an issue arises.



Power metering from individual outlets ensures data centres can accurately monitor where and how much data is being drawn.

CONCLUSION

The PDU is a vital part of the data centre energy supply chain; IT equipment cannot function without it. A relatively small component in a much larger purchasing decision for both IT and facilities, PDUs are often overlooked.

Intelligent PDUs are an essential accessory in any data centre, sitting within a data rack actively controlling and monitoring the data centre environment. Intelligent PDUs continually look for threats from electrical circuit overloads, and any physical and environmental conditions which might place critical IT computing loads at risk.

Intelligent PDUs provide comprehensive, accurate energy measurement data that is needed to efficiently utilise power resources and make informed capacity planning decisions. These units also help to improve security and uptime, measure power usage effectiveness, and drive green data centre initiatives that could save energy and money.

HOW CAN B&R HELP?

Making the right choice in a Intelligent PDU is critical to solving your specific rack management needs.

Combine a B&R data cabinet with an intelligent power distribution unit and you have a smart rack system capable of providing the information and control you require.

B&R Enclosures offer a range of intelligent PDUs to provide complete solutions. B&R can pre-configure your smart rack by wiring sensors and pre-installing accessories as required.

All B&R's data cabinets are fully configurable to suit any application. Our technical sales team are available to assist when deciding what PDU is required to ensure protection of your equipment and facility.

Call 1300 ENCLOSURES (1300 362 567) to talk to our team of experts, or visit brenclosures.com.au for more information.



References

¹ Hwaiyu Geng, P.E., 2015. Data center handbook. 1st ed. New Jersey: John Wiley & Sons, Inc.

² Gartner, Inc., 2013. Top 10 Techniques to Improve Data Centre Cooling Efficiency.

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