



VariconPower™

Rack Power Distribution Units



Power is a business critical component of every server room and data centre. Any power disruption, even the smallest one, can have a massive impact on carefully built customer relations or internal processes. Risks concerning power disruption can however be managed. Processes and UPS equipment can be helpful in preventing power failures, but these are merely a part of a bigger picture. What you really need on top of that is an energy management overview and concrete tools to adjust and improve the server room infrastructure.

Intelligent Energy Management Systems for Data Centres and Server Rooms

To fully meet these requirements a thorough and detailed insight into the energy usage of a data centre or server room is a prerequisite. This means one will have to monitor the energy being consumed at different spots in a data centre. The more detailed the better. Several studies carried out by leading bodies like The Green Grid, ASHRAE and Uptime Institute underline the importance of energy monitoring. By doing that, total management control can be obtained over the uptime of a server room having management tools available to further improve the efficiency of the premises.

Energy monitoring will yield management information to:

- Identify hotspots
- Proportionally spread energy loads
- Prevent server rooms from energy overloads
- Improve the uptime of a server room
- Proactively identify trends and act upon it
- Guard SLA's (Service Level Agreements) with clients
- Determine and manage the Power Usage Effectiveness (PUE)
- Create (cost and energy) efficiency in server room operations

VARICONPOWER PDU'S, FULLY CUSTOMIZED

Minkels is a leading manufacturer of total solutions for data centre infrastructure and also a contributor to the EU Code of Conduct for Data Centres. The Code of Conduct provides EU guidelines for server room design and stresses the need for energy monitoring. Energy monitoring therefore plays an important role within the broad range of Minkels products and solutions.

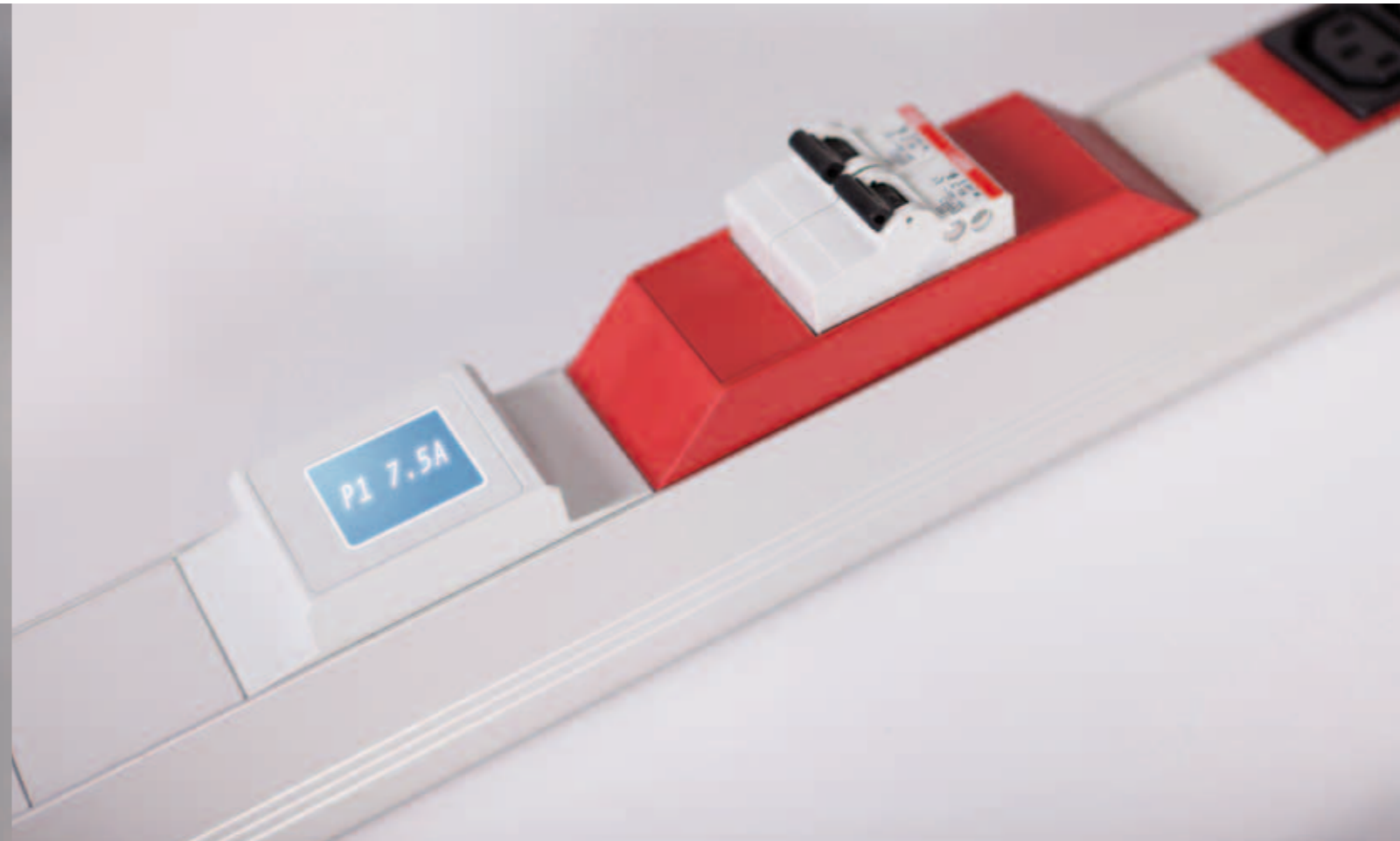
The VariconPower product line offers energy monitoring solutions, whether or not preassembled in data centre racks. This includes power distribution units (PDU's) equipped with intelligent functionality, which enable a detailed monitoring and management - also remote - of energy consumption in server racks. In addition more traditional and thus basic product versions are also available. Elaborating on the Minkels philosophy of (mass) customization VariconPower PDU's are modular solutions that can be customized to the fullest, offering each and every client a PDU solution completely adapted to their specific infrastructural needs.

The Minkels VariconPower products are high quality and energy-efficient PDU solutions using sustainable technologies and materials intended for long service life and unflinching performance. In order to maintain a high quality level, VariconPower products are subjected to endurance tests and comprehensive electronic and functional checks.

MANAGEMENT OVERVIEW: INTEGRATION WITH MINKELS VARICONTROL® DCIM

To be included in the overall management picture of a server room or data centre, VariconPower solutions can easily be integrated with Minkels VariControl. This is a fully integrated, brand-independent and easy to use Data Centre Information Management (DCIM) system, which employs sensors to monitor, analyse and manage a broader spectrum of Key Performance Indicators (KPIs), including temperature, air humidity, air flows, PUE, access and fire detection.

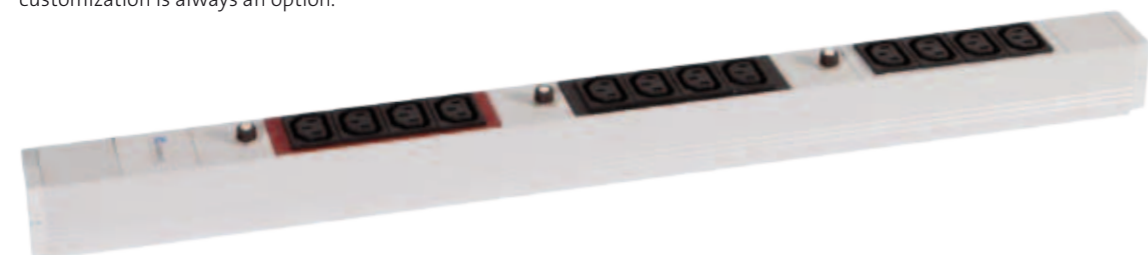




VARICONPOWER BASIC PDU

The Basic PDU is a product version that is most commonly used in an existing data centre environment. It is a traditional solution, which can be combined with CT sensors for measurement and a Data Centre Infrastructural Management (DCIM) system like Minkels Varicontrol. Although without the broad functionality of an intelligent PDU, it could be an effective and cost-efficient tool for monitoring the power consumption of a server room, and making infrastructural adjustments were necessary.

Basic PDU's have a range of choices, such as 16A or 32A for a single-phase option as well as three-phase. For outlet connections, the Basic PDU has international standards (C13 and C19) available as well as all the different national connection types that are common in specific countries. Next to the modular options customization is always an option.



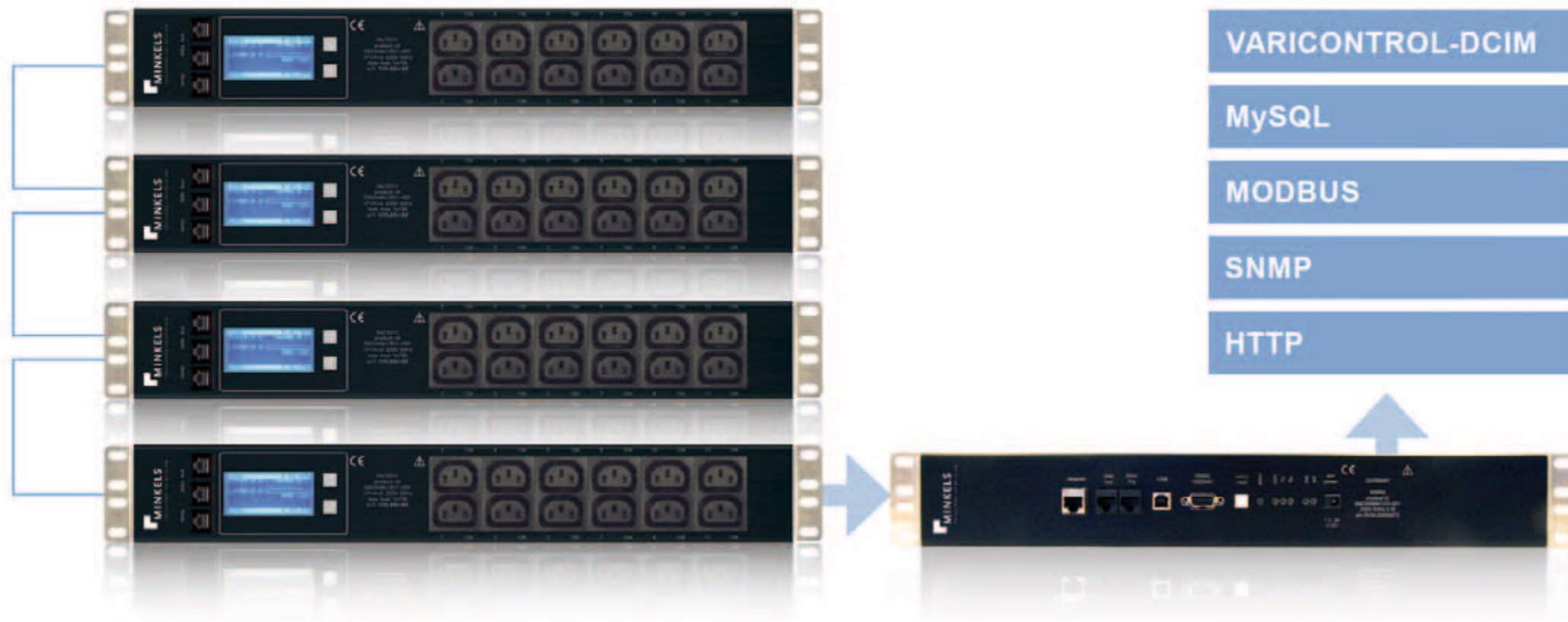
VARICONPOWER METERED PDU

The Metered PDU is a product version that has all the options of a Basic PDU. On top of that it has a display built in, with which it is possible to read out live the inlet current of a server rack. This product version doesn't have the full range of intelligent functionalities. For example, a Metered PDU will provide a snapshot and not an overview over time. Also, it is not possible with this version to have remote access and proactively manage the PDU.

Metered PDU's however could be part of a first step in the creation of (energy) efficiency awareness within an organization and the need for an energy efficient server room design. As with the other product versions customization is always an option.



THE VARICONPOWER PRODUCT RANGE



In the 'Code of Conduct on Data Centres Energy Efficiency' of the European Commission, the importance of energy saving in data centres is discussed at length and general principles for achieving savings are reviewed. As endorser of the Code of Conduct Minkels can advise you regarding energy efficiency in your data centre environment. An important first step for improving the efficiency is measurement of your current energy consumption, for example with intelligent PDU's.

VARICONPOWER MONITORED PDU

The Monitored (remote) PDU has all the options of a Basic PDU plus a broad range of intelligent functionality, far more than the Metered PDU. With this product version it is possible to collect detailed information on energy use. Measurement can either be done by an inline module or a monitored PDU. The inline module measures in between the incoming feed and a passive PDU. An alternative to the traditional inline module is the Definilink module, that separates the electrotechnical measurement components from the actual passive power supply. This provides the option to add the measurement modules at a later stage and prevents interruption of the power in the unlikely event of failure

of the measurement components. In addition to measuring inlet current, a Monitored PDU also provides measurement of current per outlet and read out of a range of parameters including ampere, voltage, kilowatt hours and power factor. Included are a databus device and a gateway. Through this - easy to use and flexible - solution all the monitoring equipment can be connected to a LAN network, so the monitoring data will remotely become available to operators and managers. Up to 500 PDU's can be connected to one gateway.

With this product version you can proactively manage the energy use and energy loads from a distance. It will also be an option for example to generate alarm messages through e-mail or SNMP in case of emergencies. The functionality of a Monitored PDU broadens the scope to ensure safety in a server room and prevent server racks from suffering an energy overload. Connection to a DCIM system like Minkels VariControl will expand the management functionality even further, with the possibility to perform management analysis, make comparisons and calculations and generate management reporting. As with the other product versions customization is always an option.

VARICONPOWER MONITORED AND SWITCHED PDU

The Monitored and Switched PDU has all the features of a Monitored PDU and on top of that the switching functionality to remotely turn equipment on and off. This product version is most commonly used in organizational environments where there is complete control over the entire chain of data centre infrastructure, as is the case within Corporate organizations.

A Monitored and Switched PDU has advantages over a Monitored PDU when it comes to power outages. With this product version it is possible to reboot servers from a distance. There is also a sequential starter option included which provides a time delay between the different outlets, to prevent a server room from reaching its peak power again in case of a collective reboot after an outage. Above that, a Monitored and Switched PDU enhances the control over data centre management by preventing users from connecting equipment random. As with the other product versions customization is always an option.



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