BACHMANN

Technologies for Data Centres

BluNet

Efficient Power Management

BlueNet at a glance

// PHILOSOPHY

A passion for innovation

Thanks to BlueNet, modern energy management in data centres is now a reality. The new generation of BlueNet products from BACHMANN enables you to structure, control, and monitor your power network in detail.

Little characterises our industrial progress more than information technology. High-performance data centres form the core of any business.

The power network plays a significant role in ensuring high-availability and resource-conserving operations. Those wishing to meet the highest data centre standards must pay equal attention to structuring, management and monitoring. At BACHMANN, this approach is deeply rooted in the company philosophy.

We support your business with intelligent solutions for modern energy management and we do everything to ensure that you will continue to use the latest and most advanced technologies in future. To do this, we develop standardised and customised products and systems. Professional engineering and modern process management combine to meet this goal. Judge us by our results.

The new BlueNet generation

An excellent example is the new generation of our BlueNet products. Whether you're using Power Distribution Units (PDUs) that can be cascaded via modbus, integrated AC/DC-sensitive residual current monitoring, command line tools, or a rotating OLED display - these BlueNet features are pure high-tech. And there's more: Our features represent safety and efficiency; and can be integrated with DCIM systems. From a single workstation, you can monitor and control your data centre's complex power network locally or remotely.

Join BACHMANN on this journey to a future of low resource consumption, minimum downtime and reduced operating costs.


BlueNet
P 263.0 W
I 1.20 A
V 218.9 V
f 50.00 Hz
BlueNet

// ENERGY MANAGEMENT

The latest in efficiency

With intelligent functionality, the PDUs contribute to higher system availability and lower energy consumption. Whether by means of data to optimise power usage effectiveness or high package density, efficiency is paramount at BlueNet.

A term like "efficiency" is open to interpretation. At BACHMANN, we made no compromises when we developed the BlueNet series.

With its intelligent functionality, it contributes to higher availability and lower energy consumption. It provides essential data for optimising power usage effectiveness (PUE).

Thanks to the technology used in the PDUs, the BlueNet series impresses with very low energy consumption during ongoing operations is very impressive.

The series is also highly efficient in its optimum economy of space. Modern data centres and racks are increasingly optimised in terms of space. BACHMANN's compact power distribution sets a good example in this area, as the modular design of the BlueNet PDUs ensures maximum packing density. This provides more space in the rack for cables and air conditioning. Where many other data centres collapse under ever greater complexity, we provide a simple and compact solution with BlueNet PDUs.

Effective cost reductions

Racks, air conditioning and cooling no longer need to lead to high energy costs. With the new transparency provided by BlueNet, you can effectively assess and optimise energy efficiency and costs, documenting peak loads and more effectively planning capacity. In short. you can now optimise the use of your resources. All of this applies equally for existing and new data centres.


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// HIGH AVAILABILITY

Seamless and systematic security

With AC/DC-sensitive residual current monitoring from BlueNet, you can proactively avoid data loss or even network downtimes. BlueNet PDUs provide a systematic control mechanism and therefore maximum security.

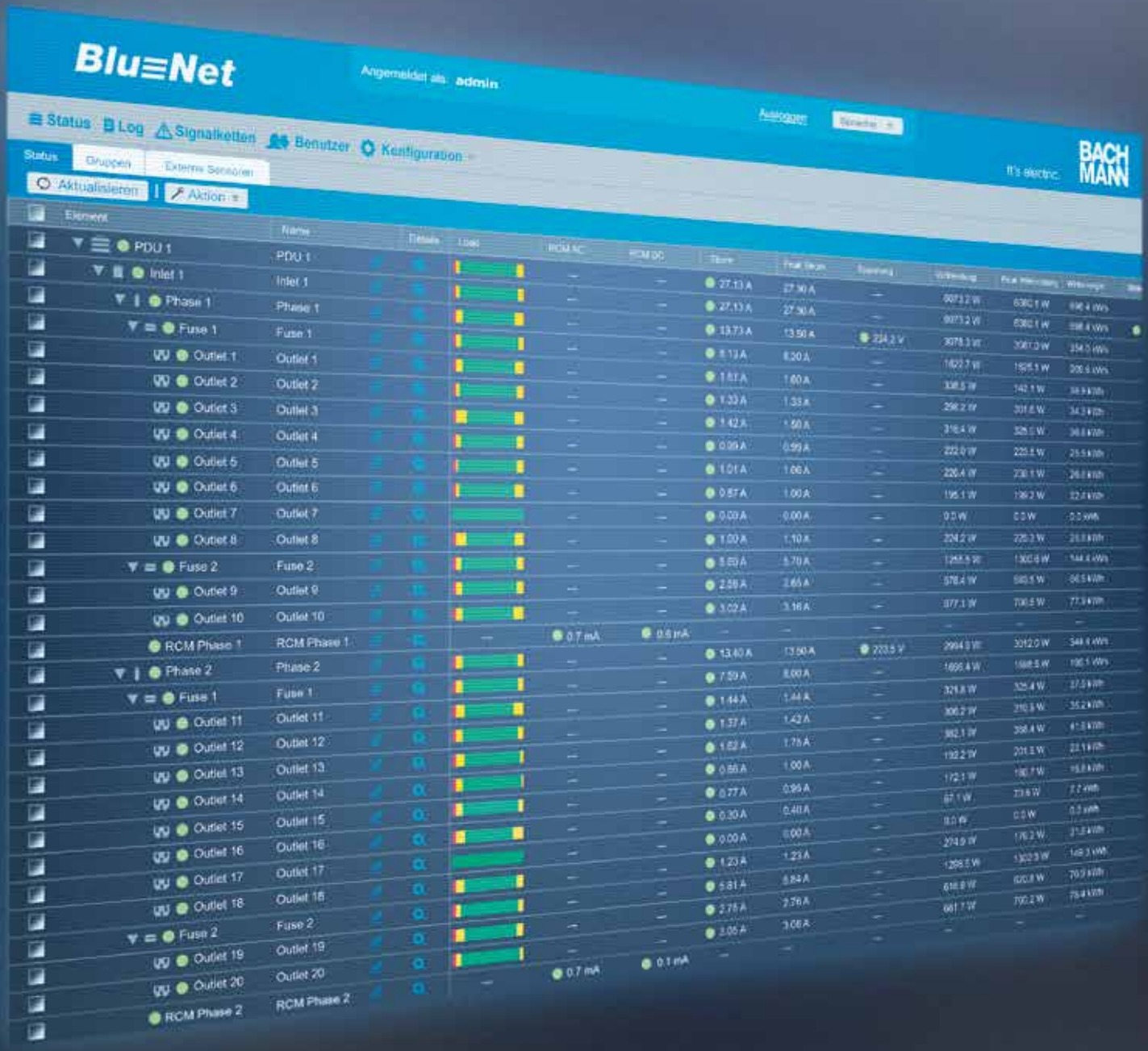
If you constantly monitor residual currents, it is possible to detect changes to the isolation level of a power supply early enough to proactively avoid data loss or even network downtimes.

Even insulation faults for new installations can be detected immediately and you can spot fire-hazardous fault currents during ongoing operations just as they are formed.

Type B AC/DC-sensitive residual current monitoring ensures the safety of persons, operations and equipment in your IT data centre, making it a reliable, high-availability system.
The BlueNet PDU does not just measure power centrally at supply, but can also do so directly at each output, as required. This makes it possible to detect residual currents from 5 mA. You can set your own response values in the BlueNet Web interface. TN-S systems can also be monitored for unwanted N-PE bridges.

Transparency as a success factor

All readings and any overruns are reported directly via the monitoring. A display in the PDU also provides information locally about all important measured values. This solution meets all legal requirements, because it corresponds to DIN VDE 0100-410 for final circuits up to 20A without the use of a residual current device (RCD). Just avoiding operating errors contributes to the economic, secure and cost-saving operation of your data centre. This continuous monitoring also minimises the workload for statutory periodic tests, as accident prevention regulations (DGUV rule 3, formerly BGV A3) stipulate that inspection deadlines for isolation measurement can be adjusted to reflect conditions in practice when using permanent residual current monitoring.
Another benefit for security and high availability is the fact that BlueNet PDUs can be operated in the rack and even at high temperature will not fail.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Angemeldet als: admin
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Log
Signalketten
Benutzer
Konfiguration
Abmelden
Speichern
BACHMANN
It's electric.
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Gruppen
Externe Sensoren
Aktualisieren
Aktion
Element
Name
Details
Load
RCM AC
RCM DC
Store
PDU 1
Inlet 1
Phase 1
Fuse 1
Outlet 1
Outlet 2
Outlet 3
Outlet 4
Outlet 5
Outlet 6
Outlet 7
Outlet 8
Fuse 2
Outlet 9
Outlet 10
RCM Phase 1
Phase 2
Fuse 1
Outlet 11
Outlet 12
Outlet 13
Outlet 14
Outlet 15
Outlet 16
Outlet 17
Outlet 18
Fuse 2
Outlet 19
Outlet 20
RCM Phase 2

// ACCURATE MEASUREMENT AND BILLING

Quality of measurable precision

Precise measurements and transparency for correct allocation of power consumption support you in the analysis and identification of heavy consumers.
A holistic appraisal of your data centre enables you to initiate optimisation measures quickly.

Power consumption and the attendant costs can only be accurately assigned with precise measurements and transparency.

Maximum energy efficiency and communication within your company are an important first step towards satisfying all connected areas.

The second decisive step is to clearly assign precise measurements to the respective consumers. Accurate data, in-depth analysis and comprehensive information enable you to identify heavy consumers and possible countermeasures, where feasible.

High billing grade accuracy

An important quality feature of the BlueNet series is just this high measuring accuracy of the PDUs and the software used. The PDUs have an accuracy of ±1% across the entire measuring range. This means that even for power measurements at 32 A, measurements can vary by a maximum of 320 mA. This is called "billing grade accuracy", i.e. a level of accuracy acceptable for billing purposes. You will receive all measured power consumption data in digital form and can bill this to your business or departmental areas. This significantly conserves your budget as an internal data centre service provider.

However, monitoring and measurements also extend to load, neutral connectors, fuses, as well as the detailed energy and temperature status. As a result, among other things, you can precisely and accurately evaluate the entire circuit load along the entire measured period. This is another example of the BACHMANN holistic approach to data centre monitoring using precise measurements to identify possible areas for optimisation.


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// CUSTOM PDUS

Your needs are our standard

For all situations where standard PDUs are insufficient, the BlueNet Custom Built PDU area provides units that go far beyond the standard range. Custom PDUs can be produced even as a one off.

If the standard is not enough, you shouldn't have to look for your own solution. A professional and homogeneous data centre power supply requires PDUs that adapt to your needs and not vice versa,

even if those requirements do not seem that difficult to meet.

For these situations, the BlueNet Custom Built PDU area provides units that go far beyond the standard range.

After all, data centre equipment is often as varied as the many requirements behind it. Some racks, therefore, need a variety of sockets but very little power. Others, however, need a great deal of power and additional safety equipment, but fewer sockets. Furthermore, power supply sockets may be required right next to sockets for cold appliances. And because BlueNet Custom Built units are created based on your requirements, we provide custom PDUs even for a one off.

Custom configuration

Whether you need overvoltage protection or power and frequency filters, we can integrate these and many more modules individually with your custom PDUs with completely customised plug configuration and connection numbers.

Due to the high level of integration, you also have the option in a custom-built version to control and connect your cost-intensive network ports centrally via BlueNet. All Custom Built PDUs are equally compact.

// CASCADING

A secure and cost-effective control chain

The BlueNet Master PDUs are impressive with their central intelligence for systems with many network ports installed for distribution. In this way, a BlueNet Master PDU can communicate with up to nine BlueNet Slave PDUs via modbus connection while saving space and costs.

When an intelligent brain thinks and controls, you can be sure of efficiency throughout. This is the principle behind the BlueNet Master PDU concept.

Central intelligence is especially important when
many distributed network ports are installed. Precise, secure and reliable control of a wide range of ports can only be achieved with a stable system.

BlueNet Master PDUs are the first choice here. This is not least because BACHMANN's entire control expertise went into in the development of this central PDU.

Smart master-slave concept

In this way, BlueNet Master PDUs can communicate with up to nine BlueNet Slave PDUs via modbus connection, thereby saving space and costs. The PDUs are connected via a standard CAT5e network cable. This makes the use of special cables a thing of the past. It is possible to make the connection very lean and to create it in the rack row with no patch panel cabling.

The data for all connected Slave PDUs are easy to display and read via the IP address of the Master PDU. No special configuration of the network switch is required.

The master-slave concept therefore also ensures the necessary and very detailed transparency of consumption, load and relevant statuses.

```cpp
/**
* @file Reset.cpp
*
* Project/Library: CommandLine
*
* @brief CommandLine
* @author Andreas
*
* Copyright (C) by Bachmann Technology GmbH & Co. KG
*/

#include "FactoryReset.hpp"

#include <base/btglog.h>
#include <boost/program_options/variables_map.hpp>
#include <dataTypes/SensorIdentifier.hpp>
#include <stdlib.h> // system()
#include <unistd.h> // access()
#include <cerrno>
#include <csetjmp>
#include <iostream>
#include <map>

#include "../model/Configuration.hpp"
#include "../model/Database.hpp"
#include "../model/dbusAccess.hpp"
#include "CommandException.hpp"

namespace command {

static const char * const RESET_COMMAND = "/usr/sbin/factory_reset.sh";
static const char * const EXE_MISSING = "Factory reset executable is missing";
static const char * const Exe_ERROR = "Factory reset process returned with error";

bool FactoryReset::initialized = registerCommand(getName(), &create);

log4cpp::Category& FactoryReset::log(std::Logger::getInstance().getCategory("cli.command.Reset"));

int FactoryReset::run(boost::program_options::variables_map options) {

        int result = 0;

        bool confirmed = options.count("confirm");
        if (!confirmed) {
                if (!isatty(fileno(stdin))) {
                        throw CommandException("no terminal, need --confirm option");
                }

                std::cout << "Are you sure to reset to factory settings? Only answer 'yes' proceed: ";
                std::string answer;
                std::getline(std::cin, answer);
                if (answer != "yes") {
                        throw CommandException("confirmation missing, factory reset aborted by user");
                        return -1;
                }
        }

        if (access(RESET_COMMAND, X_OK) != 0) {
                log.error("command %s not found: %s", RESET_COMMAND, strerror(errno));
                if (model::Configuration::getVerbose()) {
                        std::cerr << EXE_MISSING << RESET_COMMAND << std::endl;
                }
                throw CommandException(EXE_MISSING);
        }

        std::cerr << "factory reset starting..." << std::endl;

        if (int error = system(RESET_COMMAND) != 0) {
                log.error("command %s not successful: %s", RESET_COMMAND, strerror(errno));
                if (model::Configuration::getVerbose()) {
                        std::cerr << "executable " << RESET_COMMAND << " returned with error " << error << std::endl;
                }
                throw CommandException(Exe_ERROR);
        }
        return result;
}

} // namespace command
```

// COMMAND LINE INTERFACE

Speed as a success factor

The multi-functional command line interface enables you to save time and money. You can read data via SNMP, run commands on the PDU via encrypted SSH connections, set thresholds or alerts, and much more.

In data centres, time is money. The command line interface takes this completely into account.

On the one hand, you can use the clear Web interface and the SNMP to read all data very quickly. On the other hand, BlueNet also provides the option to run commands on the PDU via an encrypted SSH connection. You can read measured values or make configurations.

This gives you flexible access to the data with very different services, but also enables fast, scripted configuration of the PDUs.

Numerous settings

You can use the command line interface to make any settings for threshold values, network parameters or alerts.
For example, an employee receives the alarm of a threshold value overrun directly on his/her smartphone. The employees can then initiate immediate appropriate measures, if necessary.

Encrypted network protocol SSH connections to the distributed PDUs are an important feature of the BlueNet series. Thanks to this implemented security system, your data is successfully secured and protected. Particularly in multi-client capable data centres, verifiable protection of transmitted data is increasingly important. With BlueNet, your data is always secure.


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// SENSORS

Beyond power data

To gain a complete picture of the overall resource status in your data centre, it is possible to record additional environmental data such as temperature and humidity.

Real-time power data are a critical factor for maintaining an overview of the status of a data centre. But the current power load alone can never provide a complete picture of the entire resource status of a data centre.

It is therefore necessary to correlate further data for comprehensive monitoring and optimised capacity planning. For example, we recommend recording the temperatures of each rack in addition to recording consumption data for the devices.

At BACHMANN, we see power data as just part of an overall structure that can be enriched with additional environmental data. For this reason, our PDUs are designed so that two additional sensors can be connected to each PDU. Different combinations are possible: optional temperature or combination sensors with temperature and humidity measurement.

Sensor values at a glance

All data recorded by the combination of sensors are sent via the network interface to central monitoring with a clear representation on the display.

They can be read there together with the power values. You can also connect remotely via PC and view the graphs. Maximum availability of your data centre is always the result of the optimal conditions that are easy to achieve with BlueNet.

BlueNet feature matrix

	Measurement per phase	Measurement per port	Switch	Ethernet	Modbus RTU / TCP	Sensors	RCM
BN7500	•	•	•	•	•	•	(•)
BN7000	•		•	•	•	•	(•)
BN5000			•	•	•	•	
BN3500	•	•		•	•	•	(•)
BN3000	•			•	•	•	(•)

(•) The indicated feature is optionally available

// BLUENET PROGRAMME

The range for all applications – BN3000 to BN7500

In the feature matrix, you can see at a glance which functions the respective BlueNet series provides. It also indicates the different options for mounting your BlueNet PDU provided in the scope of delivery.

The features of the BlueNet series BN3000 to BN7500 bring the future to your data centre. The matrix enables you to see at a glance which functions or feature combinations you can expect from the respective BlueNet series.

Whether you are measuring per phase and/or port, if you want to set up PDUs that can be cascaded via modbus or also want to connect using the PDU, the standard series covers the most frequently requested features. For example, all options include Ethernet connection, connection of additional environment sensors and a rotating OLED display for scrolling through the measured values by pressing a key.

If you cannot find one or more of your desired functions in the standard, please contact us regarding a custom PDU.

Simple mounting

Due to the many different possible mounting requirements BACHMANN offers a wide range of mounting options so that you can mount BlueNet quickly and easily based on your individual situation. For example, the PDU can be mounted by the side or the back to tracks, depth stays and frame profiles. There are also variants for rack mounting with quick release.
If your own on-site situation is not reflected by any of the delivered mounting options, we will be happy to advise you.

At BACHMANN we always find a way to connect your new BlueNet products in a secure and space-saving manner that ensures full functionality.

BACHMANN World of opportunities

FACILITY SOLUTIONS

KITCHEN SOLUTIONS

IT POWER SOLUTIONS

INSTALLATION

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