SCHLEIFENBAUER

WHITEPAPER

EnerTree

PDU 5.0 & EnerTree DCEM Software

SCHLEIFENBAUER PDU 5.0

Designed to your IT Infrastructure

Your Starting Point for Every PDU Requirement

Schleifenbauer delivers PDU and Inline Meter configurations tailored to your project needs. We build your custom PDU to specification, in any quantity, at no extra cost. Simply share your requirements!

EnerTree DCEM Software

PDU 5.0 includes free Data Centre Energy Management software, enabling full PDU intelligence for monitoring and management, gaters power, energy and environmental data from your intelligent PDUs. Seamless BMS/DCIM integration supports HTTP/HTTPS, REST API, MODBUS/TCP, SNMP (v1/v2c/v3), IPv4/IPv6, and more. Built with strong security, including user roles, Active Directory®, LDAP/S, AES 256-bit encryption, SSH, and SSL/TLS 1.3.

Gateway Module: EnerTree Platform (Virtual Machine)
Controller Module: EnerTree Lite (Embedded)

3 Different Hot Swappable Controller Modules

Easily upgrade your PDU's monitoring capabilities with three module options:

Gateway: Advanced monitoring, management, analytics, software-driven and centrlised PDU intelligence via EnerTree DCEM software platform.
Controller: Conventional monitoring with EnerTree Lite. WEB GUI for independent management and direct integration with any DCIM software.
Daisy Chain: Secure data relay to a Gateway or Controller, enabling a cost-effective, hardware-secured PDU network ring in a daisy chain setup.

PDU Outlet Control

Quickly resolve issues or extend critical device runtime during power failures with outlet-level control. The PDU features N-ZVS and bi-stable latching relays for reliable switching and energy efficiency during power events.

Versatile & Secure Power Outlets

Our CX combination outlet C13/C15/C19/C21 allows flexible connections for C14, C16, C20, and C22 plugs in a single socket. Prevent accidental disconnections with IEC Lock from Scolmore. Explore our other high-density outlets, fully compatible with V-lock cables. Custom outlet combinations, load balancing, and layouts are available on request to fit your needs.

Surge protection Type 3 by Dehn

Choose a Dehn surge protector in your rack PDU for protection against voltage spikes and optimal operational continuity. Type 3 provides direct protection for IT hardware, in addition to Type 1 and 2. It complies with EN 50600-2-2 and NEN-EN-IEC 62305 and follows the "10-meter rule" for maximum safety. Prevent downtime with trip alarming, smart protection and preventive maintenance.

Residual Current Sensor (RCS)

Select an RCS in your PDU to enhance electrical safety by detecting leakage currents, reducing the risk of electrical faults, and protecting connected equipment from potential damage.

External Earthing

The PDU's earthing complies with CE standards. An optional external earthing provision is available on request for installations with specific grounding requirements to reduce potential differences.

Environmental Monitoring

Supports maximal 32 sensors per PDU via dual USB. Proactively monitor environmental conditions within your cabinet to ensure optimal performance. A range of sensors are available to suit your needs, including temperature, humidity and digital input for airflow, door position, flood detection sensors and more.

LED Status Ring and Remote Display via NFC

No fixed display required, use the display app on your smart device, such as a tablet or smartphone, to create a fully functional PDU display. Simply connect to the PDU via NFC for easy, on-the-go PDU insight and monitoring time stamp.

Your logo

Our PDU concept allows for customization with your logo. If desired, we can add your logo to the PDU, or you can opt for an OEM partnership for further branding opportunities.

Scalable and Intelligent Network Integration

Daisy-chain up to 100 devices on a single IP address and access real-time PDU data streams without polling delays. With zero-touch provisioning, downstream devices configure automatically, reducing setup time and simplifying deployment.

Remote Connectivity

Dual 1 Gbps Ethernet (Ethernet & USB) enables once per second data transfer, allowing remote access to the rack PDU via network or serial connection. Monitor power consumption and set custom alerts to prevent downtime.

Redundant Databus

Simplifies intelligent rack PDU connectivity and ensures continuous data reporting, even if there is a disruption in the network chain.

Low Profile Breakers

Compact hydraulic magnetic circuit breakers designed to maintain a streamlined PDU layout. Choose from a variety of circuit breakers, including thermal fuses, MCBs, and glass fuses. We offer free customization of your PDU with your preferred breakers, regardless of order quantity.

Power Monitoring with 0.5% Accuracy

Enables data center managers to monitor input and outlet-level power usage with 0.5% accuracy for precise and reliable energy tracking.

High Temperature Grade

Designed for environments with working temperatures exceeding 60°C, offering reliable performance in high-temperature conditions.

Input Options

We place the power input exactly where you need it (top/bottom, aligning it with the power source in your data centre. Available in 1-phase and 3-phase configurations with options for 10A, 16A, 32A, and 63A to simplify IT power infrastructure. You have also flexibility in cable length and plug type.

European sovereignty at rack level

Proudly designed and manufactured in the Netherlands, our products are built to order with fast delivery and free customization options, ensuring minimal environmental impact while meeting your specific needs.

PDU 5.0 & EnerTree - One platform. Two deployment models.

Each Schleifenbauer PDU 5.0 collects detailed input, branch and outlet-level data via a communication module: either a Gateway Module or a Controller Module. With the Gateway Module, intelligence is centralised in the EnerTree platform, running as a virtual machine. The PDU functions as a real-time data provider, while processing, analysis and control take place centrally. This enables scalable monitoring across large deployments with minimal hardware load at rack level. With the Controller Module, intelligence remains embedded. EnerTree Lite runs directly on the PDU, providing onboard monitoring and visualisation via the integrated web interface. This approach is ideal for standalone installations or environments where a separate platform is not required.

Centralising Intelligence

Traditional intelligent PDUs embed processing power within every unit. Schleifenbauer takes a different approach. By shifting intelligence to the EnerTree platform via the Gateway Module, PDU 5.0 is optimised purely for precise and reliable power measurement. The result:

- Reduced hardware complexity at rack level
- Centralised configuration and firmware management
- High-performance virtual machine software
- Scalable monitoring for hyperscale and enterprise environments

This architecture enables data centres to manage up to 10,000 PDUs within a single EnerTree environment..

Efficient and Scalable Energy Management

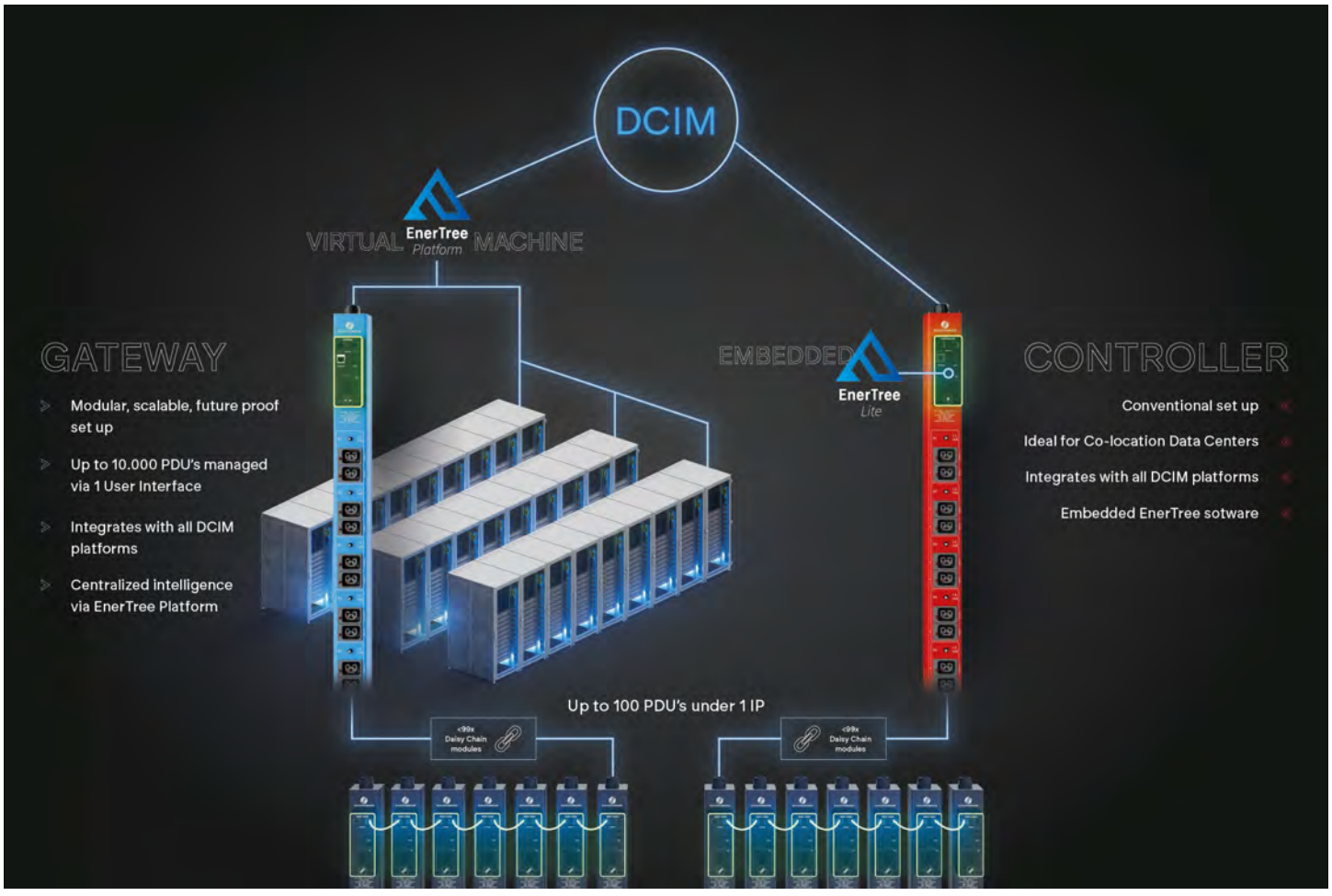
EnerTree is licence-free and included with PDU 5.0. The full EnerTree platform supports up to 10,000 PDUs, while EnerTree Lite manages up to 100 PDUs per IP address.

The software automatically detects and maps connected PDUs, delivering rack-level visibility through intuitive, auto-generated dashboards — no complex configuration required.

Cascading

One Gateway or Controller PDU can connect up to 99 additional Daisy Chain PDUs within the rack. PDUs equipped with a Daisy Chain Module operate without their own Ethernet connection, reducing the attack surface and increasing rack-level security.

Alternatively, multiple Gateway or Controller PDUs can be logically grouped within EnerTree, forming a structured and scalable topology across racks or rows.



Communication Modules

Choose the communication setup that fits your data centre. Each module can be switched or upgraded at any time, transforming the functionality of the PDU without needing to replace it. All modules stream real-time data for live monitoring of power usage and environmental factors. The integrated LED ring instantly shows system status and alerts, helping administrators respond quickly and effectively.

The module is ESD safe and Toolless Hot-swappable. No fixed display required. Monitor PDU data directly in the rack via a secure NFC connection using the Rack PDU Display app on your smartphone or tablet.

When to Choose a Gateway Module

Connects securely to the network and works with the **EnerTree platform** as a virtual machine for advanced, centralised monitoring via server or desktop. **Best for:** Data centres that want to centralise intelligence for maximum processing power and reporting flexibility.

When to Choose a Controller Module

Includes embedded **EnerTree Lite** software and web interface in the module itself and connects directly via LAN, offering onboard intelligence and real-time data access without external systems. **Best for:** Data centres that prefer device-level control in a traditional, decentralised setup, with direct access through DCIM software.

When to Choose a Daisy Chain Module

Acts as a data relay in a ring network. No Ethernet port for improving security while reducing installation cost and complexity. **Best for:** Connecting to 99 PDUs with Daisy Chan module to a single PDU with Gateway or Controller PDU for efficient, fast and hardware secured scalable monitoring.

Category	EnerTree feature	Platform	Lite
Communication	Module type	Gateway	Controller
Performance	Maximum number of PDUs in system	10.000	100
	Maximum number of rings supported	100	1
	Maximum number of PDUs in 1 ring (single IP address)	100	100
	Measurements refresh rate	once/s	once/5s
Device management	Auto discovery of new added PDUs in system	✓	✓
	Mass configuration	✓	✓
	Grouping of devices and aggregation of measurements	✓	
	Supports Schleifenbauer generation 2 and 3 devices	✓	
User management	Customizable roles and permissions, group management, etc.	✓	✓
Control & alerts	Group switching	✓	
	Configurable thresholds for all measurements (warnings/alerts)	✓	
Data	Dashboarding	advanced	basic
	Creation of reports	advanced	basic
	Scheduling of reports	✓	
	Export of data to files or databases	✓	✓
Security	Logging and auditing	advanced	basic
	Updating & Back-up (configuration, log files)	✓	✓

EnerTree functionalities

- **Comprehensive energy monitoring:** Real-time tracking of energy consumption, voltage, temperature, power quality, and harmonics.
- **Advanced alerts and notifications:** Automated alerts for threshold breaches, redundant failover detection, and tailored email notifications.
- **Intuitive rule creator:** Effortless threshold configuration with customisable rules.
- **Incident manager:** Identifies faults and supports predictive maintenance for proactive issue resolution.
- **Environmental monitoring:** Sensors for temperature, humidity, and other critical parameters.
- **Hierarchical view:** Clear representation of infrastructure for real-time visualisation and efficient monitoring.
- **Data analysis and reporting:** Historical data assessment, automated custom reports, and calculation.
- **Automated backups and updates:** Ensures system continuity and keeps firmware up to date.
- **PUE calculation:** Advanced Power Usage Effectiveness (PUE) metrics for optimising energy efficiency.

Intelligent energy management tailored to modern data centres.

High-performance software

Developed to monitor and manage PDUs in data centres. With its powerful capabilities, **EnerTree** provides real-time insights and complete control over your rack power distribution infrastructure.

Integration

EnerTree Platform and **EnerTree Lite** seamlessly integrate with virtually any DCIM or power management system, ensuring full compatibility with modern data centre environments.

Supported Protocols & Interfaces:

- HTTP/HTTPS
- REST API
- MODBUS/TCP
- SNMP (v1, v2c, v3)
- SNMP Traps
- IPv4/IPv6
- SMTP
- Syslog
- Command Line Interface

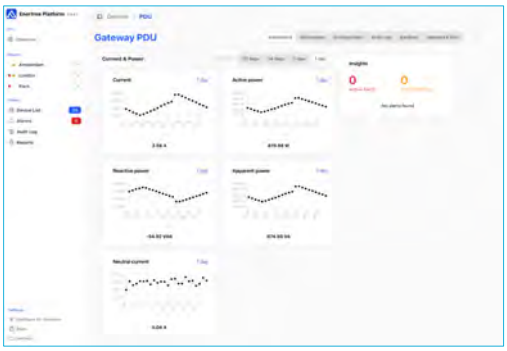
Data Export Capabilities:

- MS SQL
- MySQL
- MariaDB

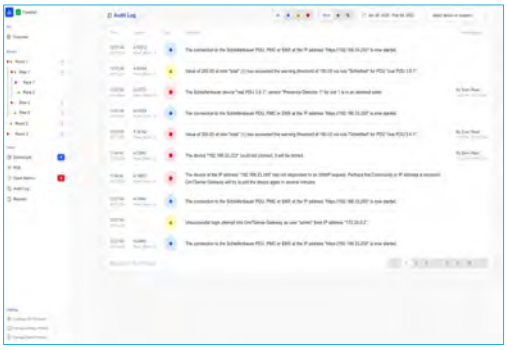
This broad integration ensures:
✓ Reliable real-time communication
✓ Streamlined monitoring
✓ Efficient power management

User Experience

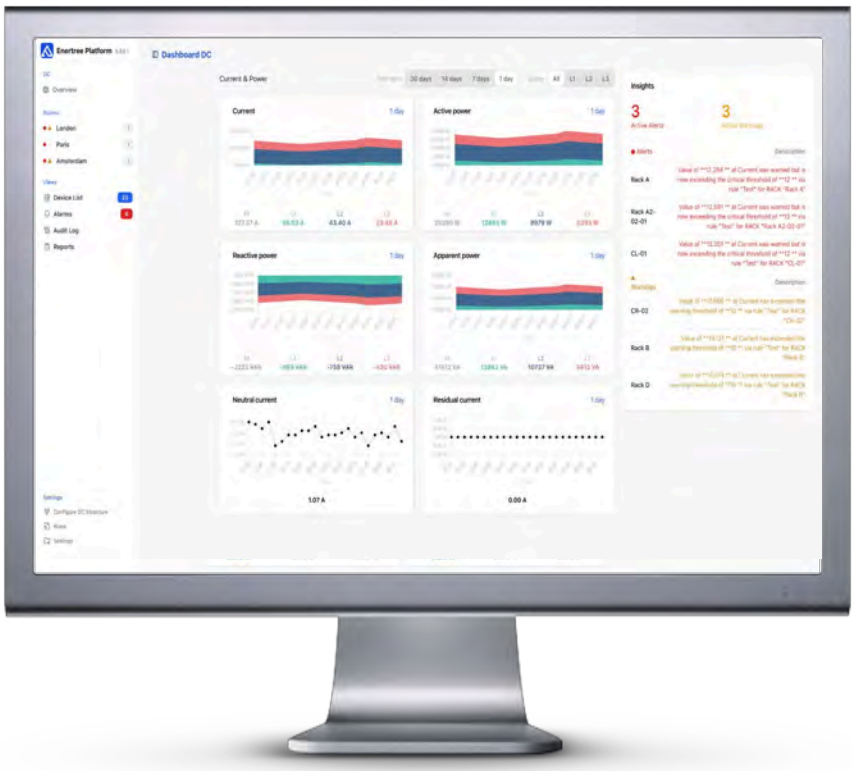
Thanks to its intuitive interface and optimised UX, the system can be fully deployed independently, without the need for external support. This makes **EnerTree** a future-proof solution for efficient and intelligent energy management in data centres.



Rack dashboard



Audit log

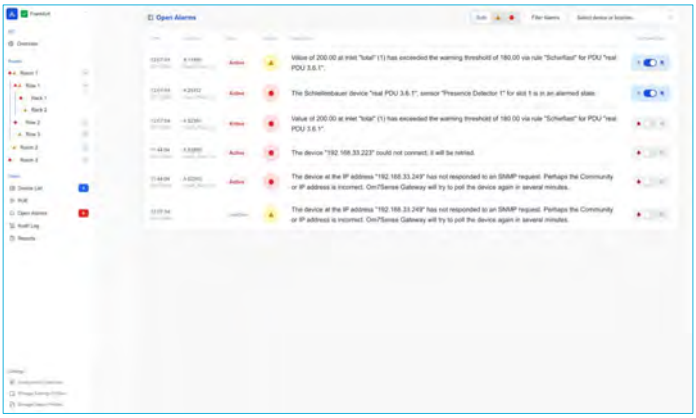


Capacity management

Reports: PDUs, firmware, PUE, events and backups

EnerTree Overview

- Scalable for all data centre sizes
- Centralised management
- Secure data storage and protection
- Real-time analysis and visualisation
- Automatic PDU detection
- Customisable alerts and reports
- Automated firmware update reports
- Mass updates for efficient PDU management
- Full sensor support
- Secure PDU swaps
- Real-time daisy chain communication
- Automated backups and updates
- Fastest measurement refresh rate



Open alarm administration

Management & Security

EnerTree offers advanced monitoring and security features for seamless data centre management.

- **Real-time Alerts & Reporting** – An open alarm list with status updates ensures immediate issue detection. Automated reports provide detailed insights into energy consumption.
- **User Management** – Assign PDUs to specific users with granular access control.
- **Data Integration & Export** – MySQL database integration supports in-depth analysis, while an embedded SNMP agent enables seamless energy data export to external software.
- **Robust Security** – Features include configurable strong passwords, user roles and permissions, Active Directory® and LDAP/S integration, 256-bit AES encryption, secure boot, SSH, SSL/TLS 1.3, and HTTPS.

EnerTree offers:

- **Comprehensive audit logs** to track all actions performed on PDUs
- **LDAP integration** for seamless user management within existing Active Directory environments
- **Detection of unused equipment** for fast adoption in the system
- **Automated backups** for enhanced security

System Requirements

EnerTree is compatible with modern data centre environments and can be deployed across various IT infrastructures:

- **Virtual systems:** VMware ESX(i) 4.1 or higher / Docker 18.03 or higher
- **Memory:** Minimum 4 GB RAM
- **Storage:** Minimum 32 GB

SENSORS

150770
Digital input (2x) sensor

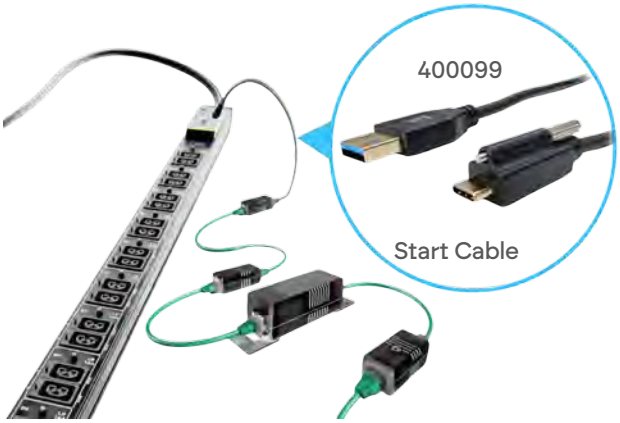
150750
Temperature sensor

Each PDU supports up to 16 Daisy Chained sensors per USB port

The order of connected sensors is flexible, and use of both USB ports is optional

150780
Digital input (4x) output (2x) sensor

150760
Temp / Humidity sensor



Temperature Sensor
- 2x RJ45 connector
- 1x USB-C (with single screw lock)
- Dual color status Led

Temperature & Humidity Sensor
- 2x RJ45 connector
- 1x USB-C (with single screw lock)
- Dual color status Led

Digital input (2 x) sensor
- 2x RJ45 connector
- 1x USB-C (with single screw lock)
- 2x digital input (connector 4 pins)
- Non-isolating (contact closure), Ground switching (Internal Pull-Up)
- Dual color status Led

150780 Digital input (4x) output (2x) sensor
- 2x RJ45 connector
- 1x USB-C (with single screw lock)
- 4x digital input (connector 8 pins)
- Non-isolating (contact closure), Ground switching (Internal Pull-Up)
- 2x relay 12V Power In, 2 dry contacts outputs
- Dual color status Led

Start Cable
- USB-A High Retention + startkabel (USB-C Lock)

YourPDU

Fully Configurable PDUs – At No Extra Cost or Delay

Schleifenbauer does not work with fixed catalogue models. Every PDU is built to order and configured directly from your tender text or project specification. You define the requirements; we design and produce the exact-fit solution.

Whether you require:
- Specific cable lengths or connector types
- Custom outlet layouts (type, quantity, position or colour)
- Integrated metering and monitoring functionality
- Controller positioning or interface adjustments
- Unique identification (labelling, barcodes or colour coding)
- Mechanical adaptations for specific rack or mounting environments

Because engineering and production are fully integrated in-house, even complex configurations are delivered quickly, without compromise and without additional configuration charges.

With Schleifenbauer, your PDU starts with your infrastructure, not with a predefined model. Explore all configuration options on our website:
https://www.schleifenbauer.eu/en/configurable-pdu/

Inline Meters – Retrofit Your Existing Installed Base

Schleifenbauer Inline Meters offer input-level energy measurement for existing PDUs, making them ideal for retrofitting systems with outdated or basic intelligence. Installed between the power feed and the PDU, they provide accurate phase metering and integrate with EnerTree software for unified monitoring and reporting. This helps organisations meet EED requirements for energy measurement and reporting without replacing their PDUs.

Measurement
Per Phase
Per Breaker
Per Outlet

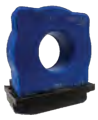
Remote Switching
Outlet switching delay
Near Zero Voltage Switching
Bi-stable relays

Modules
Gateway Module
Controller module
Daisy chain Module

Protection
Dehn Surge protection
External Earthing

Chassis colours
Red
Blue
Green
Yello
Orange
Gray

Cable & Plug
Input position
Cable length
Plug type



Sensor
RCS Residual
current sensor

Specials
LED per outlet
Frequency filter
On-off toggle switch

Engraving
Company Logo
Your item code
A or B Feed mark

Mounting
Type of brackets
Custom made brackets

Circuit Breaker
Hydraulic Magnetic
MCB
Thermal fuse
Melt fuse

Outlets
Type & Amount
Alternating phase outlets

Schleifenbauer

Built Around Your Infrastructure

A PDU is not a catalogue product. It is a critical part of your data centre architecture.

At Schleifenbauer, every PDU starts with your specification, not with a predefined model. We design and build each configuration to match your rack infrastructure exactly, without compromise, without delay, and without additional configuration costs.

Our scalable platform combines hardware and licence-free energy management software into one integrated ecosystem. From single racks to hyperscale environments, intelligence can be embedded or centralised, always built for control, reliability and long-term continuity.

Developed and manufactured in the Netherlands, engineered for data centres across Europe.

Schleifenbauer.
The starting point for every PDU requirement.

Inquiries : sales@schleifenbauer.eu
Orders : orders@schleifenbauer.eu

SCHLEIFENBAUER
Your PDU® *Request form*

Submit a tender text or use this form to specify your PDU request and send it to **sales@schleifenbauer.eu**

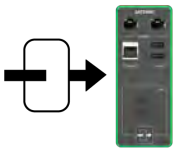
Infra

PDU orientation	[ ] Vertical 0U [ ] Horizontal 19" [ ] Horizontal 21"
Phase	[ ] Single-phase 1P [ ] Three-Phase 3P
Current rating	[ ] 10A [ ] 16A [ ] 32A [ ] 63A

Intelligence

Basic PDU non-metered	[ ] Yes [ ] No
Input energy metering	[ ] Yes [ ] No
Branch-level energy metering	[ ] Yes [ ] No
Outlet-level energy metering	[ ] Yes [ ] No
Remote outlet switching	[ ] Yes [ ] No

Communication Module

Gateway Module Choose this module for advanced energy management with the included EnerTree Platform DCEM software. EnerTree offers comprehensive monitoring, risk management, historical analysis, and seamless DCIM integration. By externalising PDU intelligence, it maximises computing power, scalability, and software-driven capacity—eliminating the need for costly internal PDU hardware. Supports up to 10,000 PDUs in system. Measurement refresh rate: once a second.	[ ] Yes [ ] No 
Controller Module Choose this module for a standalone PDU solution with a built-in web interface, offering a familiar and conventional approach to PDU management. Ideal for data centres that prefer independent PDU control without relying on an external software platform. The EnerTree Lite embedded software provides a direct, user-friendly interface within the module itself, fully compatible with any existing DCIM software. Supports up to 100 PDUs in system. Measurement refresh rate: once per 5 seconds.	[ ] Yes [ ] No
Daisy Chain Module Choose this module to securely and efficiently connect multiple PDUs without an Ethernet port, providing hardware-level security. As a Data Relay module, it enables centralised management of up to 100 PDUs using a single IP address. Ideal for large-scale installations with a ring topology, where one PDU with a Gateway or Controller module handles network communication, while up to 99 PDUs with Daisy Chain modules collect and transmit PDU measurement data.	[ ] Yes [ ] No

Options

Fuse type (Mandatory on 32A and 63A PDUs)	[ ] Hydraulic magnetic [ ] Thermal [ ] MCB [ ] Glass fuse [ ] No fuse
Outlet type	[ ] IEC Lock Combi (CX: C13/C15/C19/C21) [ ] IEC Lock C13 [ ] IEC Lock C19 [ ] IEC320 C13 [ ] IEC320 C19 [ ] CEE 7/3 (Schuko) [ ] CEE 7/5 (UTE) [ ] BS 1363 [ ] GST 18I3 [ ] T13 [ ] T23 [ ] IEC60309 16A 250V 1P+N+PE [ ] exit lead w/ IEC60309 1P+N+PE 6hr) [ ] exit lead w/ IEC60309 3P+N+PE 6hr)
Outlet quantity (Specify quantity per outlet type)	
Cable length cable in cm (Standard 3-meter, custom lengths available. Specify in commence)	[ ] Standard 3 Meter [ ] Custom length
Connector plug (standard CEE IEC60309) Options per PDU type: **1P 16A PDU;** IEC60309 1P+N+PE 6hr , CEE 7/4 Schuko, C14, C20, BS 1363, Wieland GST18I3, T13, T23, Terminal connection, Phoenix QPD, C14 Chassis, C20 chassis **1P 32A PDU;** IEC60309 1P+N+PE 6hr, Terminal connection, Phoenix QPD **3P 16A PDU;** IEC60309 3P+N+PE 6hr, Wieland GST18I5, Terminal connection, Phoenix QPD **3P 32A PDU;** IEC60309 3P+N+PE 6hr, Terminal connection, Phoenix QPD **3P 63A PDU;** IEC60309 3P+N+PE 6hr)	[ ] CEE IEC60309 1P+N+PE 6hr [ ] CEE IEC60309 3P+N+PE 6hr [ ] CEE 7/4 Schuko [ ] C14 plug [ ] C20 plug [ ] BS 1363 [ ] Wieland GST18I3 [ ] Wieland GST18I5 [ ] T13 [ ] T23 [ ] C14 chassis [ ] C20 chassis [ ] Terminal connection [ ] Phoenix QPD connection
Cable entry (standard side cover top)	[ ] Side cover top [ ] Side cover bottom [ ] Front top [ ] Front bottom [ ] Rear top [ ] Rear bottom [ ] Rear left [ ] Rear right
Housing colour	[ ] Black [ ] Red [ ] Blue [ ] Yellow [ ] Orange [ ] Green [ ] Silver
PDU Length (standard 3 meter or specific length. Specify in commence)	[ ] Standard [ ] Specific length
Dehn overvoltage protector Type 3	[ ] Yes [ ] No
Residual current sensor	[ ] Yes [ ] No
Extra external earthing provision on PDU	[ ] Yes [ ] No
Mounting options	[ ] Toolless Mount [ ] Table Mount [ ] Custom Bracket
Separate temperature humidity sensor	[ ] Yes [ ] No

PDU quantities	
Additional Notes / Custom Requests:	

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PDU 5.0 Video — SCAN ME

EnerTree Platform Software — SCAN ME

PDU Display App — SCAN ME

PDU 5.0 User Manual 1.09 — SCAN ME

EnerTree platform User Manual 1.14 — SCAN ME

User manual EnerTree Lite 1.14 — SCAN ME

Catalogue PDU Brackets — SCAN ME

Trust your power distribution needs to the experts
Crafted and perfected in The Netherlands