



# SCHLEIFENBAUER

WHITEPAPER

PDU 5.0



EnerTree



PDU 5.0 & EnerTree DCEM Software

### One-Stop Shop

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, gates 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 centralised 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.

### Minimal Ecological Footprint

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: A Scalable Monitoring Concept for Data Centres

Each Schleifenbauer PDU 5.0 collects detailed energy and outlet-level data via a communication module, either a **Gateway Module** or a **Controller Module**. In setups using a **Gateway Module**, all data is transmitted to the **EnerTree platform** software, which runs as a virtual machine on a local server or desktop. This approach shifts the intelligence as data processing away from the PDU, enabling centralised monitoring across multiple devices with minimal load on the rack hardware. Alternatively, if the use of external software is not preferred, the **Controller Module** offers a conventional solution. It includes embedded **EnerTree Lite** software, enabling onboard intelligence and visualisation directly via the PDU's web interface. This makes it suitable for standalone installations or environments requiring self-contained monitoring without reliance on external systems.

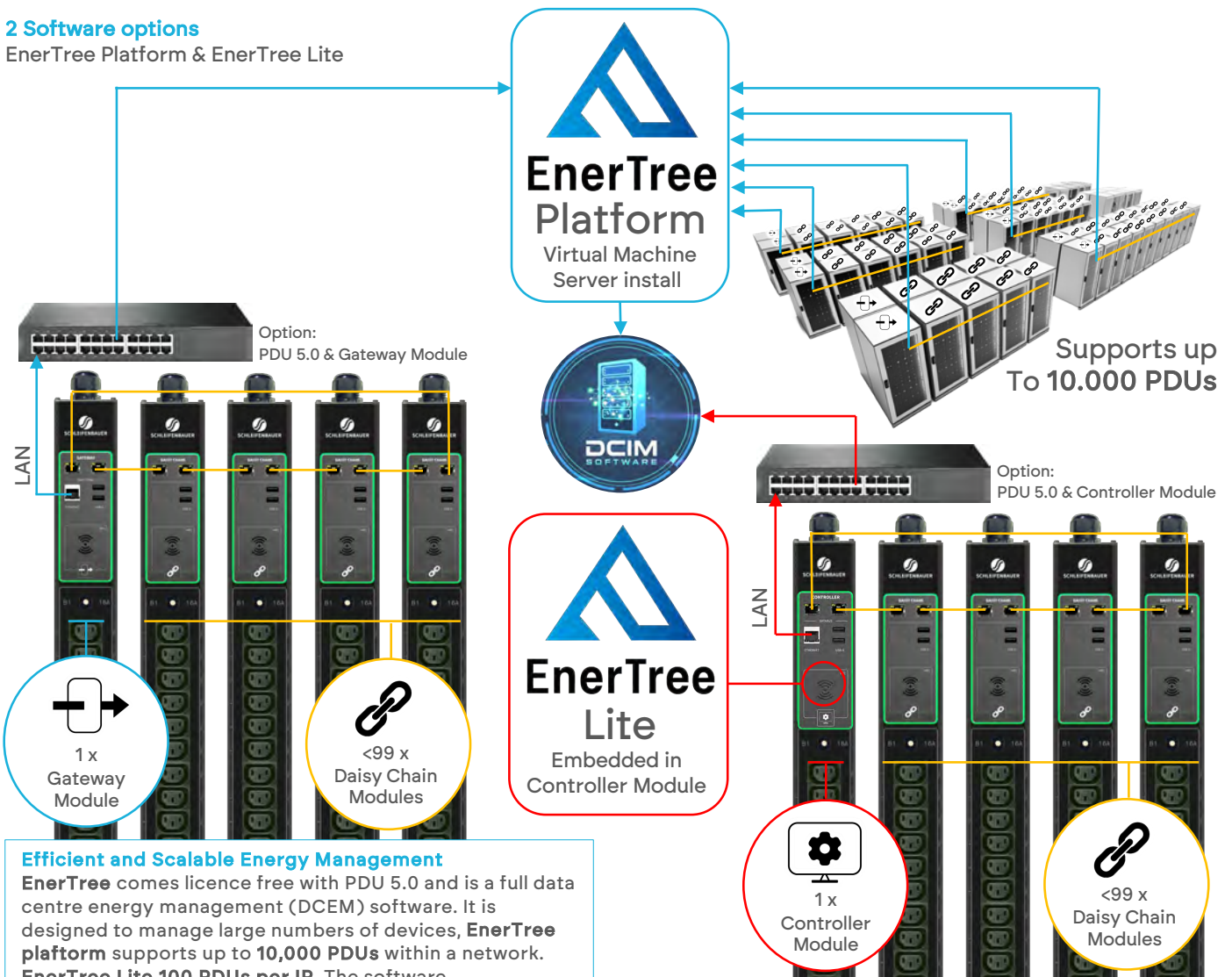


### Centralising PDU Intelligence

Traditional intelligent PDUs rely on embedded processors within each unit, increasing hardware complexity, cost, and dependency. Schleifenbauer takes a different approach with **PDU 5.0** and the **EnerTree platform**: by relocating intelligence to a central server or desktop via a **Gateway Module**, the PDU itself is optimised purely for **precise and reliable power measurement**. This architecture not only simplifies the hardware at rack level, but it also unlocks the benefits of **high-performance, server-based virtual machine software**. The **EnerTree software** enables advanced analysis, fast data handling, seamless monitoring of large PDU deployments, helping data centres extract maximum value and control from their power infrastructure.

## 2 Software options

EnerTree Platform & EnerTree Lite



### Efficient and Scalable Energy Management

**EnerTree** comes licence free with PDU 5.0 and is a full data centre energy management (DCEM) software. It is designed to manage large numbers of devices, **EnerTree platform** supports up to **10,000 PDUs** within a network. **EnerTree Lite** **100 PDUs per IP**. The software automatically generates an overview of all connected PDUs, allowing easy mapping of the physical data centre environment. It can be further specified at the **rack level**. The software is intuitive, user-friendly, with dashboards automatically generated based on the implemented infrastructure, eliminating the need for user manuals.

### Cascading

Combine a single PDU with **Gateway or Controller Module** with multiple PDUs equipped with **Daisy Chain Modules**, you create a **scalable and cost-effective ring configuration of 100 PDUs per IP address**. This ensures fast data transmission and efficient, secure management.

### 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 Chain module to a single PDU with Gateway or Controller PDU for efficient, fast and hardware secured scalable monitoring.



Category	EnerTree feature	Platform	Lite
<b>Communication</b>	Module type	Gateway	Controller
<b>Performance</b>	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
<b>Device management</b>	Auto discovery of new added PDUs in system	✓	✓
	Mass configuration	✓	✓
	Grouping of devices and aggregation of measurements	✓	
	Supports Schleifenbauer generation 2 and 3 devices	✓	
<b>User management</b>	Customizable roles and permissions, group management, etc.	✓	✓
<b>Control &amp; alerts</b>	Group switching	✓	
	Configurable thresholds for all measurements (warnings/alerts)	✓	
<b>Data</b>	Dashboarding	advanced	basic
	Creation of reports	advanced	basic
	Scheduling of reports	✓	
	Export of data to files or databases	✓	✓
<b>Security</b>	Logging and auditing	advanced	basic
	Updating & Back-up (configuration, log files)	✓	✓



### 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:

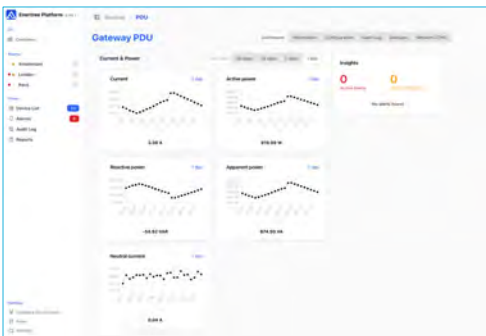
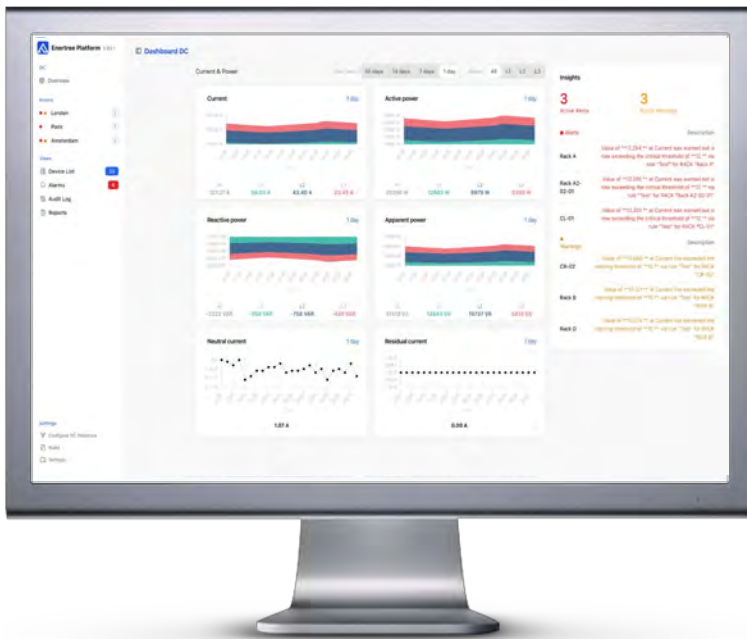
- MS SQL
- MySQL
- MariaDB

This broad integration ensures:

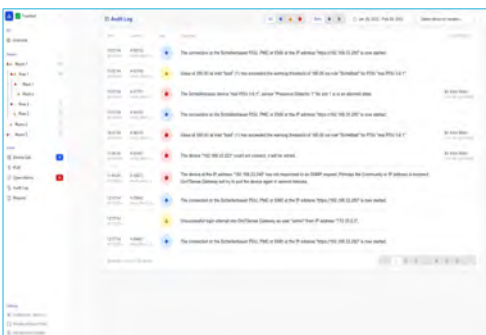
- ✓ Reliable real-time communication
- ✓ Streamlined monitoring
- ✓ Efficient power management

### 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



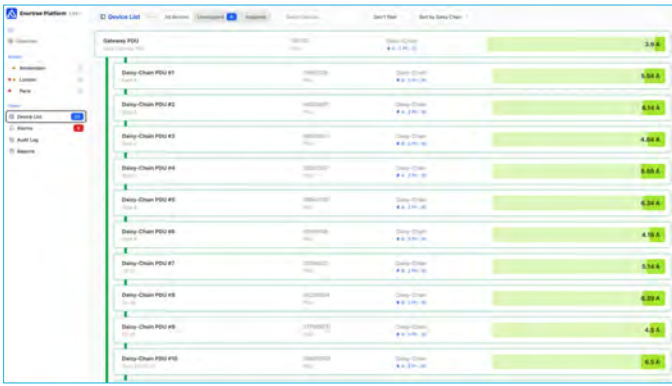
Audit log

### Advanced Functionalities

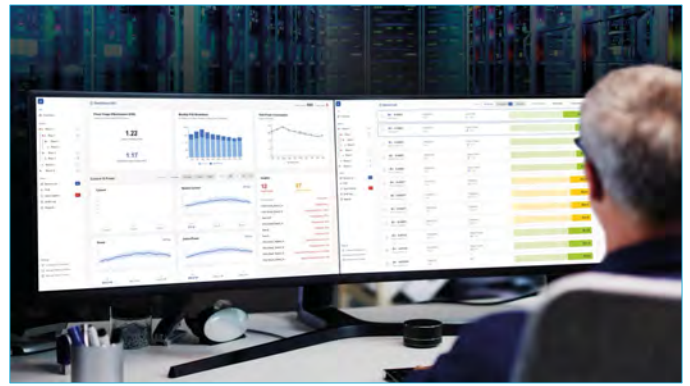
**EnerTree** provides extensive energy management features, including:

- **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.
- **Filtering options:** Display only relevant warnings and incidents to streamline management.
- **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.
- **Backwards compatible:** Previous generations of Schleifenbauer PDUs are fully supported by EnerTree.

Intelligent energy management tailored to modern data centres.

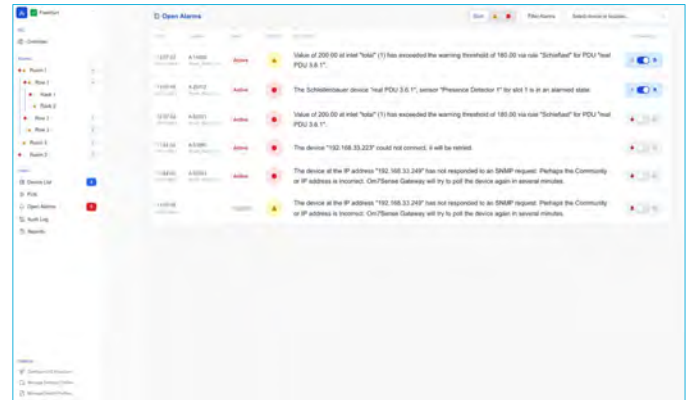


Capacity management



### 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.



Reports: PDUs, firmware, PUE, events and backups



### 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



## Fully Configurable PDUs – At No Extra Cost or Delay

Every Schleifenbauer PDU is assembled to order and fully tailored to your specifications. You define exactly what you need, at no additional cost, with no minimum order quantity, and without affecting lead times.

Whether you require:

- Specific cable lengths or connector types
- Custom outlet layouts (type, number, position, and colour)
- Integrated measurement and monitoring features
- Controller positioning or control interface adjustments
- Unique identification (labelling, barcodes, colour coding)
- Mechanical adaptations for specific rack or mounting situations

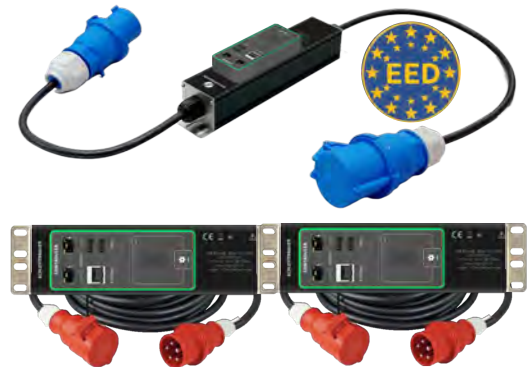
We ensure your PDU fits seamlessly into your infrastructure and operational workflow. Our efficient production process guarantees fast delivery regardless of the configuration.

With Schleifenbauer, there is no need to compromise on design or planning. You get precisely what your project requires—quickly, reliably, and without hidden costs.

Find all the detailed customisation 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



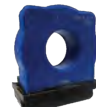
**Protection**  
Dehn Surge protection  
External Earthing



**Chassis colours**  
Red  
Blue  
Green  
Yellow  
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 - Where Possibility Takes Shape

A power distribution unit is more than a technical component, it's the silent backbone of your infrastructure. At Schleifenbauer, we believe it should reflect the way *you* think, work and build. What you see here is not a product range, it's a canvas of possibilities.







Every line, every outlet, every angle is the result of a choice. **Your choice.**  
Because true reliability isn't just built, it's designed, together.

This is the freedom to create  
This is power, redefined  
This is Schleifenbauer





Submit a tender text or use this form to specify your PDU request and send it to [sales@schleifenbauer.eu](mailto:sales@schleifenbauer.eu)

Infra	<b>PDU orientation</b>	<input type="checkbox"/> Vertical 0U <input type="checkbox"/> Horizontal 19" <input type="checkbox"/> Horizontal 21"
	<b>Phase</b>	<input type="checkbox"/> Single-phase 1P <input type="checkbox"/> Three-Phase 3P
	<b>Current rating</b>	<input type="checkbox"/> 10A <input type="checkbox"/> 16A <input type="checkbox"/> 32A <input type="checkbox"/> 63A
Intelligence	<b>Basic PDU non-metered</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<b>Input energy metering</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<b>Branch-level energy metering</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<b>Outlet-level energy metering</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<b>Remote outlet switching</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
Communication Module	<b>Gateway Module</b> 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.	<input type="checkbox"/> Yes <input type="checkbox"/> No  
	<b>Controller Module</b> 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.	<input type="checkbox"/> Yes <input type="checkbox"/> No  
	<b>Daisy Chain Module</b> 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.	<input type="checkbox"/> Yes <input type="checkbox"/> No  
Options	<b>Fuse type</b> (Mandatory on 32A and 63A PDUs)	<input type="checkbox"/> Hydraulic magnetic <input type="checkbox"/> Thermal <input type="checkbox"/> MCB <input type="checkbox"/> Glass fuse <input type="checkbox"/> No fuse
	<b>Outlet type</b>	<input type="checkbox"/> IEC Lock Combi (CX: C13/C15/C19/C21) <input type="checkbox"/> IEC Lock C13 <input type="checkbox"/> IEC Lock C19 <input type="checkbox"/> IEC320 C13 <input type="checkbox"/> IEC320 C19 <input type="checkbox"/> CEE 7/3 (Schuko) <input type="checkbox"/> CEE 7/5 (UTE) <input type="checkbox"/> BS 1363 <input type="checkbox"/> GST 1813 <input type="checkbox"/> T13 <input type="checkbox"/> T23 <input type="checkbox"/> IEC60309 16A 250V 1P+N+PE <input type="checkbox"/> exit lead w/ IEC60309 1P+N+PE 6hr) <input type="checkbox"/> exit lead w/ IEC60309 3P+N+PE 6hr)
	<b>Outlet quantity</b> (Specify quantity per outlet type)	
	<b>Cable length cable in cm</b> (Standard 3-meter, custom lengths available. Specify in commence)	<input type="checkbox"/> Standard 3 Meter <input type="checkbox"/> Custom length
	<b>Connector plug</b> (standard CEE IEC60309) Options per PDU type: <b>1P 16A PDU;</b> IEC60309 1P+N+PE 6hr., CEE 7/4 Schuko, C14, C20, BS 1363, Wieland GST1813, T13, T23, Terminal connection, Phoenix QPD, C14 Chassis, C20 chassis <b>1P 32A PDU;</b> IEC60309 1P+N+PE 6hr, Terminal connection, Phoenix QPD <b>3P 16A PDU;</b> IEC60309 3P+N+PE 6hr, Wieland GST1815, Terminal connection, Phoenix QPD <b>3P 32A PDU;</b> IEC60309 3P+N+PE 6hr, Terminal connection, Phoenix QPD <b>3P 63A PDU;</b> IEC60309 3P+N+PE 6hr)	<input type="checkbox"/> CEE IEC60309 1P+N+PE 6hr <input type="checkbox"/> CEE IEC60309 3P+N+PE 6hr <input type="checkbox"/> CEE 7/4 Schuko <input type="checkbox"/> C14 plug <input type="checkbox"/> C20 plug <input type="checkbox"/> BS 1363 <input type="checkbox"/> Wieland GST1813 <input type="checkbox"/> Wieland GST1815 <input type="checkbox"/> T13 <input type="checkbox"/> T23 <input type="checkbox"/> C14 chassis <input type="checkbox"/> C20 chassis <input type="checkbox"/> Terminal connection <input type="checkbox"/> Phoenix QPD connection
	<b>Cable entry</b> (standard side cover top)	<input type="checkbox"/> Side cover top <input type="checkbox"/> Side cover bottom <input type="checkbox"/> Front top <input type="checkbox"/> Front bottom <input type="checkbox"/> Rear top <input type="checkbox"/> Rear bottom <input type="checkbox"/> Rear left <input type="checkbox"/> Rear right
	<b>Housing colour</b>	<input type="checkbox"/> Black <input type="checkbox"/> Red <input type="checkbox"/> Blue <input type="checkbox"/> Yellow <input type="checkbox"/> Orange <input type="checkbox"/> Green <input type="checkbox"/> Silver
	<b>PDU Length</b> (standard 3 meter or specific length. Specify in commence)	<input type="checkbox"/> Standard <input type="checkbox"/> Specific length
	<b>Dehn overvoltage protector Type 3</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<b>Residual current sensor</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<b>Extra external earthing provision on PDU</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<b>Mounting options</b>	<input type="checkbox"/> Toolless Mount <input type="checkbox"/> Table Mount <input type="checkbox"/> Custom Bracket
	<b>Separate temperature humidity sensor</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>PDU quantities</b>		
<b>Additional Notes / Custom Requests:</b>		

# SALES TEAM



**Jos Janssen**  
Sales Director



**Stuart Edmonds**  
Sales Manager UK/IR



**Steven Lataire**  
Sales Manager BE/LU/FR



**Bastiaan de Haan**  
Account Manager NL



**Amanda Wagenaar**  
Team Lead Sales



**Anneke van Aken**  
Account Manager DACH



**Danisha Schepers**  
Inside Sales



**Dami Munter**  
Marketing Manager

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



PDU 5.0 Video



PDU Display App



PDU 5.0 User Manual 1.07



EnerTree User Manual 1.12



Catalogue PDU 5.0



Bracket Catalogue



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

