

Adaptive power distribution in the data center

A step towards the future with Emerson Network Power



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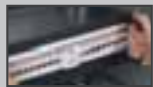
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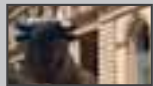
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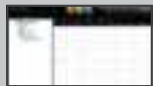
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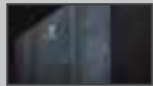
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Emerson Network Power

Business-Critical Continuity™- so your success continues!

Core competencies:

- AC Power
- Connectivity
- DC Power
- Embedded Computing
- Embedded Power
- Infrastructure Management & Monitoring
- Outside Plant
- Power Switching & Controls
- Precision Cooling
- **Racks & Solutions**
- Services
- Surge Protection

No company, no matter how big it is, can afford business-critical system failures.

Over the years we at Emerson Network Power have acquired unique know-how, and with our name we represent reliable rack systems, power supply, precision cooling, connectivity and integrated solutions. We can consequently ensure that you generate optimum benefits from your technology investments.

Thanks to Emerson Network Power's technology range and expansive competencies, the entire bandwidth of company-wide solutions is supported for today's critical business requirements.

Customers all over the world build on our support for future-proof investments, because they know that we offer globally specific innovations and optimized solutions from one single source – supported by reliable local service and support.

We can ensure the stable operation of your network infrastructure – regardless of whether voice, data or multimedia content are transmitted.

This is based on a proven, comprehensive portfolio of products, services and systems which supports a multitude of computing, telecommunications, health care and industrial applications. This creates a foundation of trust that is only possible with a partnership with Emerson Network Power.

Our assignment is to prepare you for the unknown and the unexpected. We show you the way against the background of dynamic changes in your business environment.

And we help you to master the requirements this entails and avail of the greatest possible benefits from your technology investments. This is what we mean by Business-Critical Continuity.



Safe, efficient and economical: Rack PDUs from Emerson Network Power

Reliable power distribution in a server rack is extremely important! Emerson Network Power's "Power Distribution Units (PDU)" provide immense **security and availability** with a robust electro-mechanical setup.




The rack PDUs ensure a sound **economical benefit**. The Liebert MPX™'s modularity also enables requirements-oriented and constantly compatible expansion.

The rack PDUs provide the perfect economical solution for every specific requirement and exceptional efficiency with numerous technical features.



Interacting with rack PDUs, rack monitoring systems and cooling systems, Liebert NFORM guarantees the monitoring and controlling of all relevant infrastructure parameters in server rooms and data centers, alarms as required, and even intercepts controlling to prevent damages.

PDU product series overview:

BASIC	 <p>Features:</p> <ul style="list-style-type: none"> ■ High stability and torsional strength provided with closed sheet steel extrusions and perfected integration into Knürr rack systems. ■ Best possible conductivity: continuous brass busbars with many models. ■ Double spring contacts for shock hazard-proof and low contact resistance.
MANAGED	 <p>Additional features:</p> <ul style="list-style-type: none"> ■ Highest possible security and availability with an operating temperature of max. 55°C. ■ Extensive measurement functions (power, current, voltage and energy), with high measurement accuracy of up to ± 1%. ■ Remote-switchable outputs with many models. ■ Same communication cards as with Liebert MPX™ used, which means same software interface as with administration. ■ Up to 4 Liebert MPX™/MPH™ can be controlled via one IP address. ■ External sensors and a display can also be addressed.
ADAPTIVE	 <p>Additional features:</p> <ul style="list-style-type: none"> ■ The Liebert MPX™ is a modular PDU; input modules and output modules can be flexibly equipped as required. ■ Additional wiring between the modules is not required; a fixed databus is integrated on a continuous busbar. ■ Highest power density up to max. 3 x 63 A per bar possible. ■ Possible failures can be detected early on with additional monitoring (N-conductor, apparent power, crest factor and power factor). ■ Depending on the output module measuring and remote switching is possible up to output level, which allows each server to be monitored individually. ■ The output modules can be changed during running operation; there are no downtimes.

Emerson Network Power Rack PDUs Europe – product series overview

	From page 22			From page 16		From page 8			
	Knürr DI-STRIP Basic Rack PDU®			Liebert MPH™ MANAGED Rack PDU		Liebert MPX™ ADAPTIVE Rack PDU			
Features	Knürr DI-STRIP® Elementary	Knürr DI-STRIP M®	Knürr DI-STRIP RM®	Liebert MPH™ Branch Monitored	Liebert MPH™ controlled	Liebert MPX™ Elementary	Liebert MPX™ Elementary Phase monitored	Liebert MPX™ Branch monitored	Liebert MPX™ Receptacle managed
Power distribution	x	x	x	x	x	x	x	x	x
Modular						x	x	x	x
Display		Fixed	Fixed	Modular	Modular		Modular	Modular	Modular
Remote interface			x	x	x		x	x	x
Measuring at input level		x	x	x	x		x	x	x
Measuring per group				x	x			x	x
Measuring per output									x
Switching per output					x				x
Measurement parameters		A	A	A,V,W,KWh, Hz	A,V,W,KWh, Hz		A,V,W,KWh, Hz	A,V,W,KWh, VA, Hz, Power factor	A,V,W,KWh, VA, Hz, Power factor, crest factor
Input power	1ph + 3ph max 32A	1ph + 3ph max 32A	1ph + 3ph max 32A	1ph + 3ph max 32A	1ph + 3ph max 32A	1ph + 3ph max 63A	1ph + 3ph max 63A	1ph + 3ph max 63A	1ph + 3ph max 63A
Outputs	IECC13&C19 Schuko Switzerland France	IECC13&C19 Schuko Switzerland France	IECC13&C19 Schuko Switzerland France	IECC13&C19	IECC13&C19	IECC13&C19 Schuko	IECC13&C19 Schuko	IECC13&C19 Schuko	IECC13&C19 Schuko
Connection option for different sensors				x	x		x	x	x

The Liebert MPX™ and Liebert MPH™ accessories are largely identical, which simplifies administration!

INFO

You will find further details and order numbers in our product catalog:

www.EmersonNetworkPower.eu



reddot design award
winner 2011

Liebert MPX™

Adaptive Rack PDU: Respond requirement-oriented to every change!

The Liebert MPX™ modular rack PDU system™ impressively scores points with maximum flexibility, highest possible availability and low operating costs. With Liebert MPX™ users can react quickly and specifically to new requirements for rack power supply and management.

Liebert MPX™ enables users to dimension their rack PDU system so that current requirements are met first. The system can be flexibly adjusted when requirements change later on. Liebert MPX™ builds on a design based on a power supply/communication bus and input/output modules.



Status display (RPC-BDM)
Can be easily positioned at the optimum spot for the individual rack; also functions outside the rack. This connected display can be mounted just as the user wishes.

Highest possible security and availability with:

- Redundant power supply for control electronics (with redundant tapping of different phases in the Power Entry Module).
- Fixed databus on the busbar (making cable breaks a thing of the past).
- Complete data tapping on the PEM (without additional external monitoring devices).
- Additional neutral conductor measurement.
- Crest factor measurement (network quality rating, which means network component failures can be identified early on).

Maximum flexibility and scalability with:

- Configuration of all modules according to their requirements (patented quick fixing for safe installation).
- One busbar for different networks and power levels – input module can be freely address.
- All other components are "hot swappable" in running operation.
- Mobile display for reading all MPX™ data on the rack.

- Optical slot space display (easy server slot space identification at the push of a button).

Highest possible power levels in all areas with:

- Power illustration up to 28 kVA per bar and 55°C ambient temperature.
- Only one IP address for up to 4 bars with 24 modules.
- Plug&Play for numerous sensors.
- Extensive monitoring with a measuring accuracy of +/- 1% up to output level.
- Module and sensor auto-detect function with operating software.
- Lowest possible Liebert MPX™ system power loss.

Ideal for blade servers and changing environments

Data centers work more and more with blade servers and require more processor power on low rack space; cabling must be simplified; power consumption must be reduced.

With the Liebert MPX™ the data center can quickly react to changes, which is why our product is the right choice for you infrastructure's administration.



INPUT POWER

- Configurable: 20 to 60 A (USA); 16 to 63 A (EU);
- Single-phase and three-phase
- Cable routing from above and below



OUTPUT DISTRIBUTOR

- Scalable, combination-compatible and swappable during operation
- Single-phase NEMA 5-20R, IEC-C13, IEC-C19, Schuko
- Load balance



MODULARITY

- Input modules
- Output modules
- External display
- External sensors



MONITORING

- Different levels: Input level, module level, output level
- Temperature and humidity
- Door contacts and floating break input contacts



REMOTE SOCKET CONTROL

- Socket level



LOCAL MONITORING

- Display for user
- Can also be mounted outside the rack



REMOTE MONITORING

- Secure web and SNMP interfaces
- Liebert Nform
- Avocent DSView



OVERLOAD PROTECTION

- Physically and electrically insulated circuit breakers for every socket module



RACK PDU ARRAY™

- One IP for up to 4 rack PDUs
- Liebert MPX™ and Liebert MPH™ in the same private network



FORM FACTOR

- Vertical mounting (0 U)
- Fits into trade standard 23/42 U racks and/or 800 mm wide racks



Do you like to be one step ahead of the next requirement? Liebert MPX™ lets you.



Liebert MPX™: Four equipment models for different requirements

The Liebert MPX™ modular rack PDU consists of various modules. The foundation stone is a busbar, which is responsible for the power and communication distribution to the individual modules. The input power is routed via the Liebert MPX™ Power Entry Module (Liebert MPX™ PEM) to the Liebert MPX™ system. Different output modules (Liebert MPX™ Branch Receptacle Modules, Liebert MPX™ BRM) are available according to requirements. Four different variants can be set up depending on the equipment:

1. Liebert MPX™ Elementary

Modular basic power distribution without measurement and control function. An upgrade to another equipment model is no problem!

2. Liebert MPX™ Elementary Phase monitored

Modular power distribution with measurement on the input. An upgrade to the next higher line is possible by equipping with the respective output modules.

3. Liebert MPX™ Branch monitored

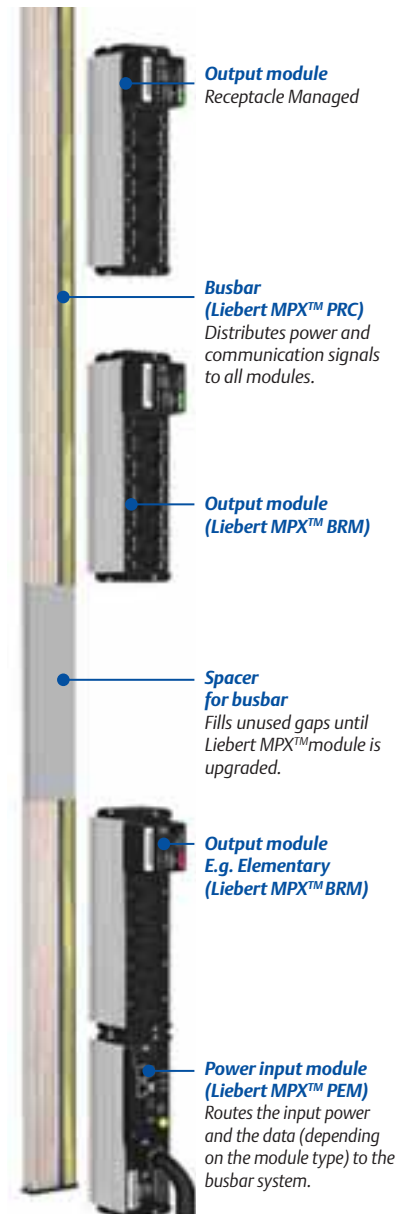
Modular power distribution with measurement on the input per output module.

An upgrade or downgrade to another line is possible by equipping with the respective output modules.

4. Liebert MPX™ Receptacle managed

Modular power distribution with measurement on the input per output module and per output. The individual outputs can also be switched on and off remotely. A downgrade to another line is possible by equipping with the respective output modules.

A combination of the "Elementary Phase monitored", "Branch monitored" and "Receptacle managed" lines on a shared busbar is also possible and is one of the exceptional features of the Liebert MPX™. Interfaces for the network communication, the sensors and/or the local display are provided by the Liebert Rack PDU Card (Liebert RPC) in the MPX™ PEM. The Liebert RPC Card enables connection to an optional RPC Basic Display Module (RPC BDM) to display the local status and alarms.



Liebert MPX™, equipment models in Europe

			Four equipment models			
		Order number	Liebert MPX™ Elementary	Liebert MPX™ Elementary Phase monitored	Liebert MPX™ Branch monitored	Liebert MPX™ Receptacle managed
Busbar	Length 1035	MPXPRC-V1035XXX	x	x	x	x
	Length 1880	MPXPRC-V1880XXX	x	x	x	x
Input modules	1ph 32A fixed *	MPXPPEM-EHAEXQ30	x			
		MPXPPEM-EHAAXQ30		x	x	x
	3ph 16A fixed	MPXPPEM-EHAEXT30	x			
		MPXPPEM-EHAAXT30		x	x	x
	3ph 32A fixed	MPXPPEM-EHAEXR30	x			
		MPXPPEM-EHAAXR30		x	x	x
3ph 63A fixed	MPXPPEM-EHBEXZ30	x				
	MPXPPEM-EHBAXZ30		x	x	x	
Output modules Elementary	IEC-C13 L1	MPXB RM-EEBC7N1N	x	x		
	IEC-C13 L2	MPXB RM-EEBC7N2N	x	x		
	IEC-C13 L3	MPXB RM-EEBC7N3N	x	x		
	IEC-C19 L1	MPXB RM-EEBC4O1N	x	x		
	IEC-C19 L2	MPXB RM-EEBC4O2N	x	x		
	IEC-C19 L3	MPXB RM-EEBC4O3N	x	x		
	Schuko L1	MPXB RM-EEBC3P1N	x	x		
	Schuko L2	MPXB RM-EEBC3P2N	x	x		
Schuko L3	MPXB RM-EEBC3P3N	x	x			
Output modules Branch monitored	IEC-C13 L1	MPXB RM-EBBC6N1N			x	
	IEC-C13 L2	MPXB RM-EBBC6N2N			x	
	IEC-C13 L3	MPXB RM-EBBC6N3N			x	
	IEC-C19 L1	MPXB RM-EBBC4O1N			x	
	IEC-C19 L2	MPXB RM-EBBC4O2N			x	
	IEC-C19 L3	MPXB RM-EBBC4O3N			x	
	Schuko L1	MPXB RM-EBBC3P1N			x	
	Schuko L2	MPXB RM-EBBC3P2N			x	
Schuko L3	MPXB RM-EBBC3P3N			x		
Output modules Receptacle managed	IEC-C13 L1	MPXB RM-ERBC6N1N				x
	IEC-C13 L2	MPXB RM-ERBC6N2N				x
	IEC-C13 L3	MPXB RM-ERBC6N3N				x
	IEC-C19 L1	MPXB RM-ERBC4O1N				x
	IEC-C19 L2	MPXB RM-ERBC4O2N				x
	IEC-C19 L3	MPXB RM-ERBC4O3N				x
	Schuko L1	MPXB RM-ERBC3P1N				x
	Schuko L2	MPXB RM-ERBC3P2N				x
Schuko L3	MPXB RM-ERBC3P3N				x	
Sensors	1xTemp.	SN-Z01		x	x	x
	3xTemp.	SN-Z02		x	x	x
	3xT. + 1xHum	SN-Z03		x	x	x
	1xTemp. Mod.	SN-T		x	x	x
	Temp/Hum Mod.	SN-TH		x	x	x
	2xDoor Mod.	SN-2D		x	x	x
	3xInput Mod.	SN-3C		x	x	x
Display ext.		RPCBDM-1000		x	x	x

Upgrade possible!

Different combinations possible!

* When using 1ph input modules then only L1 output modules can be equipped.



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Liebert MPX™ input module/power supply

Elementary and Monitored type:

- The MPX PEM is fixed on the MPX PRC and provides the connection to the power supply.
- Cable is connected fixed, 3 m long
- With IEC60309 plug, 1Ph/N/PE 6h blue, 3Ph/N/PE 6h red.

Monitored type:

- The MPX PEM provides the connection to the databus for the data communication.
- Integrated Liebert RPC-1000 communication card enables remote monitoring and maintenance of MPX units.
- Provides the following measured values of the phase inputs: effective power, current, voltage, frequency and consumption.
- Power alarm functions for the individual phases and their operating status are also supported.
- Further important features: three displays inform the user about the current status of each individual input. An acoustic alarm is activated with specific overload conditions.
- The communication card centralizes the Liebert MPX's local and remote administration.
- There is administration via web and SNMP for systems connected to the Ethernet.
- Also serves as the connection point for versatile support options and devices, such as the display module (RPC BDM), various sensors and connection to other Liebert MPX™ or Liebert MPH™ systems, for example.
- Has RJ-45 ports for all connections and does not require any special cabling.
- Supports 10 and 100 MBit Ethernet and provides on-site firmware upgrade.

Technical data

Interfaces:

- RJ-45 LAN port (10/100 MBit) – for connecting to the local network (LAN) via an Ethernet cable.

- Expansion/administration port for local configuration using a computer/laptop, for setting up a link-up of several PDUs (Liebert MPX™ or MPH™).
- Display port for connecting the RPC BDM (display module).
- External sensor port for connecting optional sensors.

Supported technologies:

- Web support, provides Liebert MPX™ control and management. Authorized users can view status information on their network.
- SNMP support, provides Liebert MPX™ SNMP management.
- Easy integration into Liebert Nform, Avocent DSView and Nagios.

Material/finish

Housing: Aluminum
Cover: Sheet steel
Power contacts: Silvered
Databus contacts: Gilded (only Monitored type)

Dimensions

Width: 75 mm
Height: 65 mm
Cable: 3 m

Color

Housing: Aluminum/RAL7021 dark gray

Approvals


- CE Symbol in accordance with Low Voltage Directive, 2006/95/EC
- EMC Directive 2004/108/EC
- BV GS

Supply schedule

1 MPX PEM power input module
incl. connection cable
incl. RPC-1000 communication card (only Monitored type)

L	W	H	U	Feed	Load rating	Type	Order no.	UP
220	75	65		Fixed	230VAC, max 32A	Elementary	MPXPPEM-EHAEXQ30	1 unit
220	75	65		Fixed	230/400VAC, max 16A	Elementary	MPXPPEM-EHAEXT30	1 unit
220	75	65		Fixed	230/400VAC, max 32A	Elementary	MPXPPEM-EHAEXR30	1 unit
266	75	65		Fixed	230/400VAC, max 63A	Elementary	MPXPPEM-EHBEXZ30	1 unit
220	75	65		Fixed	230VAC, max 32A	Monitored	MPXPPEM-EHAAXQ30	1 unit
220	75	65		Fixed	230/400VAC, max 16A	Monitored	MPXPPEM-EHAAXT30	1 unit
220	75	65		Fixed	230/400VAC, max 32A	Monitored	MPXPPEM-EHAAXR30	1 unit
266	75	65		Fixed	230/400VAC, max 63A	Monitored	MPXPPEM-EHBAXZ30	1 unit

Dimensions in mm: L = Length, W = Width, H = Height, S = Switch, n = Number of sockets, F1 = Standard side, F2 = Design side, 19" = Suitable for 19" installation, Safe = Child-safe, U = Standard height unit, UP = Unit of packaging.

 = Express item

Conversion: 1 mm = 0.03937 inch 1 kg = 2.2046 pound

Replace .x with the number of your color combination:
.1 = RAL 7035, .6 RAL 7035/RAL 2003



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Liebert MPX™ BRM Output Module

- The MPX BRM takes care of the power distribution to the individual consumers.
- Each module taps a phase; this is color-identified on the module.
- All modules are protected against overload with a 20A circuit breaker.
- Changing the modules during operation enables a user-defined installation, without having to shut down the Liebert MPX™.
- Up to 3 BRM output modules can be installed on a 1,035 mm long PRC busbar, and up to 6 can be installed on a 1,880 mm long PRC busbar.
- The MPX BRMs have an LED-ID indicator, which clearly identifies every module with a number.
- The modules are administered in the software.
- Provide the following measured values: voltage, power, current, apparent power, kWh, frequency, power factor and crest factor.
- Power alarm functions and the operating status are supported.
- The individual outputs can be switched on and off remotely.

Type E - Elementary:

- Module for power distribution via respective outputs.

Type B – Branch monitored:

- Module for power distribution via respective outputs with measurement function on module level.
- The MPX BRMs have an LED-ID indicator, which clearly identifies every module with a number.
- The modules are administered in the software
- Provide the following measured values: voltage, power, current, apparent power, kWh and power factor.
- Power alarm functions and the operating status are supported.

Type R – Receptacle managed:

- Module for power distribution via respective outputs with measurement function on Module level and output level.

Material/finish

Housing: Aluminum
Cover: Sheet steel
Power contacts: Silvered
Databus contacts: Gilded (type B and R only)

Dimensions

Width: 75 mm
Height: 65 mm

Color

Housing: Aluminum/RAL7021 dark gray

Approvals

- CE label in accordance with Low Voltage Directive 2006/95/EC
- EMC Directive 2004/108/EC
- BV GS

Supply schedule

1 MPX™ BRM Output Module

L	n	Outputs	Load rating per output	Phase tapping	Type	Order no.	UP
266	7	IEC320 C13	10A	L1	E	MPXBRM-EEBC7N1N	1 unit
266	7	IEC320 C13	10A	L2	E	MPXBRM-EEBC7N2N	1 unit
266	7	IEC320 C13	10A	L3	E	MPXBRM-EEBC7N3N	1 unit
266	4	IEC320 C19	16A	L1	E	MPXBRM-EEBC4O1N	1 unit
266	4	IEC320 C19	16A	L2	E	MPXBRM-EEBC4O2N	1 unit
266	4	IEC320 C19	16A	L3	E	MPXBRM-EEBC4O3N	1 unit
266	3	Schuko CEE 7/4	16A	L1	E	MPXBRM-EEBC3P1N	1 unit
266	3	Schuko CEE 7/4	16A	L2	E	MPXBRM-EEBC3P2N	1 unit
266	3	Schuko CEE 7/4	16A	L3	E	MPXBRM-EEBC3P3N	1 unit
266	6	IEC320 C13	10A	L1	B	MPXBRM-EBBC6N1N	1 unit
266	6	IEC320 C13	10A	L2	B	MPXBRM-EBBC6N2N	1 unit
266	6	IEC320 C13	10A	L3	B	MPXBRM-EBBC6N3N	1 unit
266	4	IEC320 C19	16A	L1	B	MPXBRM-EBBC4O1N	1 unit
266	4	IEC320 C19	16A	L2	B	MPXBRM-EBBC4O2N	1 unit
266	4	IEC320 C19	16A	L3	B	MPXBRM-EBBC4O3N	1 unit
266	3	Schuko CEE 7/4	16A	L1	B	MPXBRM-EBBC3P1N	1 unit
266	3	Schuko CEE 7/4	16A	L2	B	MPXBRM-EBBC3P2N	1 unit
266	3	Schuko CEE 7/4	16A	L3	B	MPXBRM-EBBC3P3N	1 unit
266	6	IEC320 C13	10A	L1	R	MPXBRM-ERBC6N1N	1 unit
266	6	IEC320 C13	10A	L2	R	MPXBRM-ERBC6N2N	1 unit
266	6	IEC320 C13	10A	L3	R	MPXBRM-ERBC6N3N	1 unit
266	4	IEC320 C19	16A	L1	R	MPXBRM-ERBC4O1N	1 unit
266	4	IEC320 C19	16A	L2	R	MPXBRM-ERBC4O2N	1 unit
266	4	IEC320 C19	16A	L3	R	MPXBRM-ERBC4O3N	1 unit
266	3	Schuko CEE 7/4	16A	L1	R	MPXBRM-ERBC3P1N	1 unit
266	3	Schuko CEE 7/4	16A	L2	R	MPXBRM-ERBC3P2N	1 unit
266	3	Schuko CEE 7/4	16A	L3	R	MPXBRM-ERBC3P3N	1 unit



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Liebert MPX™ PRC - Power Distribution Unit/Communication Bus

- The MPX PRC is the foundation stone of the Liebert MPX PDU.
- Power and data transfer buses are integrated fixed over the entire length of the MPX PRC.
- The MPX BRMs (output modules) and the MPX PEM (Power Entry Module) are fixed on the MPX PRC and depending on the type take care of the modules' power feed, output, monitoring and management.

Material/finish
 Busbar housing: Aluminum
 Busbars: Copper
 Databus: Gilded

Dimensions
 Width: 68 mm
 Height: 24 mm

Color
 Housing: Aluminum


Approvals
 - CE Symbol in accordance with Low Voltage Directive, 2006/95/EC
 - EMC Directive 2004/108/EC
 - BV GS

Load rating
 Max. current intensity: 3 x 63 A
 Nominal voltage (L-N / L-L): 230 / 400 VAC

Supply schedule
 1 MPX PRC - Power Distribution Unit/
 Communication Bus
 1 mounting set

L	W	H	U	Model	Order no.	UP
1035	68	24	23	1 PEM (220mm) + 3 BRM	MPXPRC-V1035XXX	1 unit
1880	68	24	42	1 PEM (220/266mm) + 6 BRM	MPXPRC-V1880XXX	1 unit

Dimensions in mm: L = Length, W = Width, H = Height, S = Switch,
 n = Number of sockets, F1 = Standard side, F2 = Design side, 19" = Suitable
 for 19" installation, Safe = Child-safe, U = Standard height unit, UP = Unit of
 packaging.

 = Express item

Conversion: 1 mm = 0.03937 inch 1 kg = 2.2046 pound

Replace .x with the number of your color combination:
 .1 = RAL 7035, .6 = RAL 7035/RAL 2003



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Liebert MPX™/MPH™ - Sensors

- The sensors are designed for tool-less installation in a Knürr Miracel Rack, but they can also be installed in any other rack.
- "Fixed" type sensors are fixed to a cable.
- "Modular" type sensors can be connected with the delivered cable.
- Are affixed to the RPC-1000 communication card.
- Several sensors can be connected in rows (max. length: 20 m).
- Are automatically displayed in the Liebert MPX™/MPH™ software.
- Temperature measuring range: 5-55°C
- Accuracy: +/- 5%
- Humidity measuring range: 10 – 95%
- Accuracy: +/- 3.5%

Note

The sensors are not required for operating the Liebert MPX™ or MPH™, but they require the Liebert RPC-1000 (communication card)

Supply schedule

1 sensor with connection cable

Cable length	Type	Model	Order no.	UP
3660	Fixed	Single temp. sensor	SN-Z01	1 unit
5180	Fixed	Triple temp. sensor	SN-Z02	1 unit
5180	Fixed	Triple temp. sensor + single humidity	SN-Z03	1 unit
2000	Modular	Single temp. sensor	SN-T	1 unit
2000	Modular	Triple temp. sensor + single humidity	SN-TH	1 unit
2000	Modular	2 x door contact - input module*	SN-2D	1 unit
2000	Modular	3 x digital input	SN-3C	1 unit

* Suitable door contact switch: Order no.: 06.108.115.9



DOS20153

Liebert RPC BDM - 1000 Display Module

- Provides the local display of the monitored data for all connected Liebert MPX™ and Liebert MPH™ systems.
- Operated with the aid of a navigation switch.
- Connected via a cable with the Liebert RPC, which provides the user the option of placing the displays where they can be easily read in accordance with the local space conditions.
- An individual display can be used for up to four the Liebert MPX™ Liebert MPH™ PDUs, which are connected to a PDU array.

Note

The Display Module is not required for operating the Liebert MPX™ or MPH™, but it requires the Liebert RPC-1000 (communication card).

Supply schedule

1 RPCBDM-1000 Display Module
1 connection cable, 2 m
1 mounting set

L	W	H	U	Model	Order no.	UP
					RPCBDM-1000	1 unit



Liebert MPH™ Managed Rack PDU: Systems monitoring and control

Liebert MPH™ Managed Rack PDU is a power supply system with monitoring and control functions. The housing consists of a robust sheet steel enclosure, so that the PDU can be easily installed in a Knürr rack, or even into other enclosure systems.

The Liebert MPH™ can be installed vertically or horizontally (19"), depending on the type. The PDU is delivered pre-installed with the same communication card (RPC-1000) as the Liebert MPX™. All Liebert MPX™ external modules can therefore be connected (e.g. sensors, display module). Up to four Liebert MPX™/MPH™ can be connected as rack PDU array to consolidate the user's IP connection and the device monitoring.

Liebert MPH™ is available in two equipment models:

1: Liebert MPH™ Type RM

The Liebert MPH™ Type RM is a monitored PDU that monitors the phase inputs. Measured per phase are: power, current, voltage and consumption. The current is also monitored per group (only 32A model). Different threshold values enable detailed alarm signals.

2: Liebert MPH™ Type C

The Liebert MPH™ Type C can also switch the individual outputs on and off remotely.

Highest possible security and availability with:

- Power illustration up to 22 kVA per PDU and 55°C ambient temperature.
- N-conductor current display with 3-phase feed, which prevents an overload on the feed cable.
- Overload protection can be extended per group with all 32A models, minimizes danger with cascaded PDU overload.
- Setting alarm threshold values, which means possible failures are already identified early on.

Flexibility with:

- Connection option for an external display, which can be easily mounted and also combined with the Liebert MPX™.
- Connection option for external sensors, which means temperatures and humidity can be monitored.

- Doors and alarm contacts can also be monitored and displayed via external input address.
- Versatile installation in the rack as 19" or space-saving vertical installation.
- Same, compatible monitoring platform for Liebert MPH™ and Liebert MPX™.

Low operating costs:

- Rack PDU array setup, which means up to 4 MPH/MPX can be controlled with one IP address; the installation is quicker and easier.
- Extensive energy and power measurement, which provides data that is required for maximizing the power and cooling infrastructure.
- Special switching technology of the individual sockets, which reduces the rack PDU's power loss.
- Data interface with http and https protocol; no external software required for configuration and monitoring. The PDU can, however, also be integrated via SNMP into other management addresses.

**INPUT POWER**

- 20 to 30 A (USA);
- 16 to 32 A (EU);
- Single-phase and three-phase

**OUTPUT DISTRIBUTOR**

- NEMA 5-20R single-phase,
- IEC-C13 and IEC-C19;
- combination systems

**MODULARITY**

- Communication card
- External display
- External sensors

**MONITORING**

- Input level
- Group level depending on type
- Temperature and humidity
- Door contacts and floating break input contacts

**REMOTE SOCKET CONTROL**

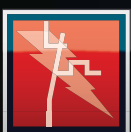
- Socket level

**LOCAL MONITORING**

- Display for user
- Can also be mounted outside the rack

**REMOTE MONITORING**

- Secure web and SNMP interfaces
- Liebert Nform
- Avocent DSView

**OVERLOAD PROTECTION**

- Circuit breakers for every group

**RACK PDU ARRAY™**

- One IP for up to 4 rack PDUs
- Liebert MPX™ and Liebert MPH™ in the same private network

**FORM FACTOR**

- Vertical mounting (0 U)
- Rack installation
- Slimline 0 U form factor for positioning two PDUs in just one rack



Liebert MPH™ Managed Rack PDU is used for easy monitoring and controlling of the power supply in server racks.



DOS20153

Liebert MPH™ Rack PDU

- The Liebert MPH™ Type RM is a monitored PDU that monitors the phase inputs. Measured per phase are: power, current, voltage and consumption. The current per group is also monitored (only 32 A version).
- The Liebert MPH™ Type C can also switch the individual outputs on and off remotely.
- Integrated Liebert RPC-1000 communication card enables remote monitoring and maintenance of MPH units.
- The RPC-1000 enables the interconnection of several MPH or MPX units and the connection of Liebert MPH™ with the Liebert MPX™ units for monitoring and administration.
- The Liebert MPH™ can be monitored directly on-site with the RPC BDM-1000, an optional display module that is connected directly with the communication card.
- The monitoring unit can be flexibly mounted on the rack.

Material/finish

Housing: Sheet steel extrusion

Dimensions

Width: 50 mm (vertical), 483 mm (19")
Height: 80 mm (vertical), 44 mm (19")
Cable: 3 m

Color

Housing: RAL7021 dark gray

Approvals

- CE Symbol in accordance with Low Voltage Directive, 2006/95/EC
- EMC Directive 2004/108/EC
- GS

Supply schedule

1 Liebert MPH™ Socket Strip (PDU)
1 mounting brackets
incl. RPC-1000 communication card

L	Type	Input values	Input plug	Outputs IEC320	Order no.	UP
438*	RM	230Vac, 16A	IEC320-Sheet I	9xC13	MPH-EBR09NXXO30	1 unit
438*	RM	230Vac, 32A	IEC60309 1ph/N/PE 6h	9xC13	MPH-EBR09NXXQ30	1 unit
1730	RM	230Vac, 16A	IEC320-Sheet I	27xC13	MPH-EBV27NXXO30	1 unit
1730	RM	230Vac, 16A	IEC320-Sheet I	21xC13/6xC19	MPH-EBV27NOXO30	1 unit
1730	RM	230Vac, 32A	IEC60309 1ph/N/PE 6h	21xC13/6xC19	MPH-EBV27NOXQ30	1 unit
1730	RM	230Vac, 32A	IEC60309 1ph/N/PE 6h	27xC13	MPH-EBV27NXXQ30	1 unit
1730	RM	230/400Vac, 16A	IEC60309 3ph/N/PE 6h	27xC13	MPH-EBV27NXXT30	1 unit
1730	RM	230/400Vac, 16A	IEC60309 3ph/N/PE 6h	21xC13/6xC19	MPH-EBV27NOXT30	1 unit
1730	RM	230/400Vac, 32A	IEC60309 3ph/N/PE 6h	27xC13	MPH-EBV27NXXR30	1 unit
1730	RM	230/400Vac, 32A	IEC60309 3ph/N/PE 6h	21xC13/6xC19	MPH-EBV27NOXR30	1 unit
438*	C	230Vac, 16A	IEC320-Sheet I	9xC13	MPH-ECR09NXXO30	1 unit
438*	C	230Vac, 32A	IEC60309 1ph/N/PE 6h	9xC13	MPH-ECR09NXXQ30	1 unit
1730	C	230Vac, 16A	IEC320-Sheet I	27xC13	MPH-ECV27NXXO30	1 unit
1730	C	230Vac, 16A	IEC320-Sheet I	21xC13/6xC19	MPH-ECV27NOXO30	1 unit
1730	C	230Vac, 32A	IEC60309 1ph/N/PE 6h	21xC13/6xC19	MPH-ECV27NOXQ30	1 unit
1730	C	230Vac, 32A	IEC60309 1ph/N/PE 6h	27xC13	MPH-ECV27NXXQ30	1 unit
1730	C	230/400Vac, 16A	IEC60309 3ph/N/PE 6h	27xC13	MPH-ECV27NXXT30	1 unit
1730	C	230/400Vac, 16A	IEC60309 3ph/N/PE 6h	21xC13/6xC19	MPH-ECV27NOXT30	1 unit
1730	C	230/400Vac, 32A	IEC60309 3ph/N/PE 6h	27xC13	MPH-ECV27NXXR30	1 unit
1730	C	230/400Vac, 32A	IEC60309 3ph/N/PE 6h	21xC13/6xC19	MPH-ECV27NOXR30	1 unit

*(19")

Dimensions in mm: L = Length, W = Width, H = Height, S = Switch,
n = Number of sockets, F1 = Standard side, F2 = Design side, 19" = Suitable
for 19" installation, Safe = Child-safe, U = Standard height unit, UP = Unit of
packaging.



= Express item

Conversion: 1 mm = 0.03937 inch 1 kg = 2.2046 pound

Replace .x with the number of your color combination:
.1 = RAL 7035, .6 RAL 7035/RAL 2003



DOS20153

Liebert MPX™/MPH™ - Sensors

- The sensors are designed for tool-less installation in a Knürr Miracel Rack, but they can also be installed in any other rack.
- "Fixed" type sensors are fixed to a cable.
- "Modular" type sensors can be connected with the delivered cable.
- Are affixed to the RPC-1000 communication card.
- Several sensors can be connected in rows (max. length: 20 m).
- Are automatically displayed in the Liebert MPX™/MPH™ software.
- Temperature measuring range: 5-55°C
- Accuracy: +/- 5%
- Humidity measuring range: 10 – 95%
- Accuracy: +/- 3.5%

Note

The sensors are not required for operating the Liebert MPX™ or MPH™, but they require the Liebert RPC-1000 (communication card)

Supply schedule

1 sensor with connection cable
Operating instructions

Cable length	Type	Model	Order no.	UP
3660	Fixed	Single temp. sensor	SN-Z01	1 unit
5180	Fixed	Triple temp. sensor	SN-Z02	1 unit
5180	Fixed	Triple temp. sensor + single humidity	SN-Z03	1 unit
2000	Modular	Single temp. sensor	SN-T	1 unit
2000	Modular	Triple temp. sensor + single humidity	SN-TH	1 unit
2000	Modular	2 x door contact - input module*	SN-2D	1 unit
2000	Modular	3 x digital input	SN-3C	1 unit

* Suitable door contact switch: Order no.: 06.108.115.9



DOS20153

Liebert RPC BDM - 1000 Display Module

- Provides the local display of the monitored data for all connected Liebert MPX™ and Liebert MPH™ systems.
- Operated with the aid of a navigation switch.
- Connected via a cable with the Liebert RPC, which provides the user the option of placing the displays where they can be easily read in accordance with the local space.
- An individual display can be used for up to four the Liebert MPX™ Liebert MPH™ PDUs, which are connected to a PDU array.

Note

The Display Module is not required for operating the Liebert MPX™ or MPH™, but it requires the Liebert RPC-1000 (communication card)

Supply schedule

1 RPCBDM-1000 Display Module
1 connection cable, 2 m
1 mounting set
Operating instructions

L	W	H	U	Model	Order no.	UP
					RPCBDM-1000	1 unit

Accessories and software application, Liebert MPX™ and Liebert MPH™

Infrastructure management



Secure web and SNMP interfaces

- User-configured alarm threshold (3 threshold values per measuring point).
- Socket status and delayed switching.
- Electrical measurement: V, A, kW and kW/h, power factor, Hz, Crest factor.
- Rack PDU array: equipment consolidation.
- PDU Explorer: intuitive hierarchical interface.
- PDU status display according to strip or socket.
- Device Explorer: search according to user-defined device names.
- Environment monitoring: temperature and humidity, floating contacts.



Liebert Nform

- Control technology for Liebert devices in the LAN.
- E-mail alarm and local notifications.
- Scalable software solution for the IT environment.



Avocent Rack Power Manager

- Alarm and incident administration of all equipment at the site.
- Control technology in real-time.
- Individually adjustable user interface.
- Trend and alarm reports.



Web-based monitoring

- PDU parameters monitoring via the web browser.
- No application-specific software required.
- Simultaneous display of up to 4 PDUs.



Network management system

- Open standard solution.
- For all SNMP devices.
- Scalable software solution for all company sizes.

Optional hardware



Local display module – RPC-BDM

- Electrical and ambient parameters.
- 1 RPC-BDM for up to 4 PDUs in the array.
- PDU Explorer.
- Device Explorer.

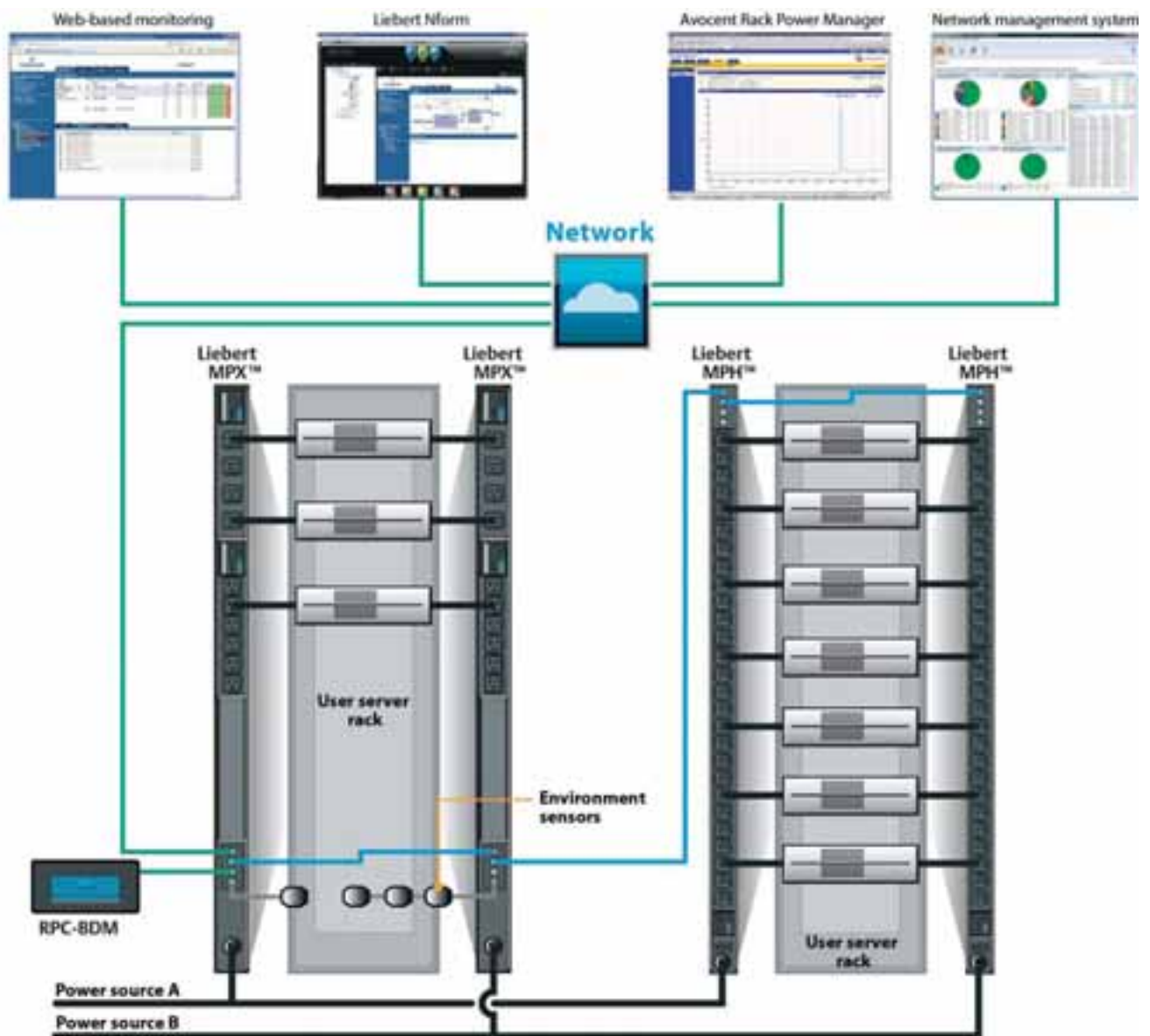


Liebert SN product family: Rack Sensors

- Temperature measurement with single or multiple sensors.
- Temperature and humidity measurement with multiple sensors.
- Door contact sensors and floating input contacts.

Flexible power distribution

Easy integration of the rack PDUs into new or existing management platforms



Rack PDU array (up to four systems)



Knürr DI-STRIP®

Basic Rack PDU: Robust PDUs with helpful equipment features

Knürr's Basic Rack PDUs are the solution for every data center looking for robust, economical and flexible rack concepts.

For power distribution the Knürr DI-STRIP® product family meets the requirements of numerous IT applications and other areas. Specially configured for the growing number of electronic components in network switching racks of server racks. Available with different accessories, such as circuit breakers, surge protection, mains filter, master-slave function, emergency off button, fault current circuit breaker, local and remote power measurement, for example.

Highest possible security and availability with:

- Closed sheet steel extrusion, which means high stability and torsional strength.
- Extensive certification in acc. with international standard.
- Double spring contacts for shock hazard-proof and low contact resistance.
- Unbalanced load monitoring with 3-phase feed prevents overload on the feed cable (only DI-STRIP versions M and RM).
- Optimum load monitoring with installation of the servers (only DI-STRIP versions M and RM).
- Individual outputs backup with the DI-STRIP BladePower and Pizza Power.

Maximum flexibility with:

- Configurations and options with international compatibility.

- 2.5 m or 4 m long mains cable for more spatial flexibility.
- Rotating display in 90° steps (only DI-STRIP versions M and RM).
- Tool-less installation, which means quick and easy extension in the rack (only DI-STRIP HighPower).

Extremely low operating costs with:

- Quick and easy installation on the rack requires minimum space and shorter installation time.
- Automatic background light reduction extends the display's service life and reduces the rack PDU power loss (only DI-STRIP models M and RM).
- Especially flat housing extrusion, providing full accessibility to the 19" level with 600 mm wide server racks.



All DI-STRIP M / RM with display rotation for better reading.



INPUT POWER

- Single-phase or three-phase
- Up to 22 kVa
- Easy input supply



OUTPUT DISTRIBUTOR

- NEMA 5-20R single-phase, IEC-C13 and C19, combination systems
- Schuko, France, Switzerland



MODULARITY

- More connectivity with expansion unit for Basic Rack PDU GST18-PDUs



FORM FACTOR

- Vertical mounting (0 U)
- Rack installation



LOCAL MONITORING

- Fixed display



REMOTE MONITORING

- Secure web and SNMP interfaces Liebert Nform



OVERLOAD PROTECTION

- Circuit breakers/fuses per branching cable/output as required



Knürr DI-STRIP® – equipped for operational reliability with all certificates.

Knürr DI-STRIP®:

Three equipment models for precisely your requirements

Knürr DI-STRIP® Elementary: Basic Rack PDU, Knürr DI-Strip Elementary® for simple power distribution requirements. The PDUs are available in different structures, depending on the rack installation requirements. Additional functions such as surge protection, mains filter, master-slave function, emergency off button and fault current circuit breaker are also possible.



All DI-STRIP HighPower are equipped with especially flat housing extrusions and side cable entry. This enables installation without any loss of usable height units and cable entry from above and below. Full accessibility to the 19" level with 600 mm wide server racks is also a given.

Knürr DI-STRIP M® – local metered: Basic Rack PDU Knürr DI-STRIP M® for simple power distribution requirements and local power measurement for your data center. Available in single and three-phase versions up to 22 kVa, with and without power measurement. Local power measurement module features:

Local power measurement features:

- M = power measurement (local).
- Tried, tested and proven DI-STRIP® PDU with integrated local power measurement module.
- Large transparent LCD display.
- Meets the strictest EMC requirements with radiation and irradiation interference.
- Integrated unbalanced load monitoring with three-phase feed.
- Rotatable displays in 90° steps.
- Automatic background light reduction.
- Optimum load monitoring with installation of the servers.

Knürr DI-STRIP RM® – remote metered: Basic Rack PDU Knürr DI-STRIP RM® for simple power distribution requirements and remote power measurement for your data center. Available in single and three-phase versions up to 22 kVa, with local and remote power measurement. Knürr DI-STRIP RM® provides safe and reliable power supply in a robust, extruded enclosure.

Remote power measurement module features:

- RM = power measurement (remote)
- Tried, tested and proven DI-STRIP® PDU with integrated power measurement module with remote monitoring.
- Large transparent LCD display.
- Meets the highest EMC requirements with radiation and irradiation interference.
- Can be set for up to 3 threshold values and unbalanced load monitoring.
- Rotatable displays in 90° steps.
- Automatic background light reduction.
- Protocols: HTTP, SNMP, Syslog.

Knürr DI-Strip[®], equipment models in Europe

Full overview:



Example: Model



Example: Model



Example: Model

Full overview:			Knürr DI-STRIP [®] - Equipment models		
Options	Input power	Outputs	Knürr DI-Strip Elementary [®]	Knürr DI-Strip M [®] local metered	Knürr DI-Strip RM [®] remote metered
1 Euro Plug System IEC 320	1x16A up to 3.68kVA	IEC60320 C13 & C19	x	x	x
1 Classic	1x16A up to 3.68kVA	Schuko, France, Switzerland	x		
1 Compact	1x16A up to 3.68kVA	Schuko, France, Switzerland	x	x	x
1 Protector FI	1x16A up to 3.68kVA	Schuko, France, Switzerland	x		
1 Protector LS	1x16A up to 3.68kVA	Schuko, France, Switzerland	x		
1 Protector FI / LS	1x16A up to 3.68kVA	Schuko, France, Switzerland	x		
1 Protector Emergency STOP	1x16A up to 3.68kVA	Schuko, France	x		
1 Protector Emergency STOP FI/LS	1x16A up to 3.68kVA	Schuko, France	x		
1 Power Cleaner	1x16A up to 3.68kVA	Schuko, France	x		
1 Safety Basic	1x16A up to 3.68kVA	Schuko, France, Switzerland	x		
1 Safety Standard	1x16A up to 3.68kVA	Schuko, France, Switzerland	x		
1 Master Slave	1x16A up to 3.68kVA	Schuko, France	x		
1 Combi	1x16A up to 3.68kVA	Schuko, France	x		
1 GST18 Plug System	1x16A, 3x16A up to 11kVA	Schuko, France IEC60320	x	x	x
1 TriplePower	3x16A up to 11kVA	IEC60320 C13 & C19 Schuko	x	x	x
2 BladePower	1x32A, 3x32A up to 22kVA	IEC60320 C13 & C19	x		
2 PizzaPower	1x32A, 3x32A up to 22kVA	IEC60320 C13 & C19 Schuko	x	x	x
3 HighPower	1x32A, 3x32A up to 22kVA	IEC60320 C13 & C19	x		x

Knürr DI-Strip® – for server applications



DOS20153

Knürr DI-STRIP® HighPower

- Flat design provides access to the 19" level, even with 600 mm wide racks.
- Individual backup for outputs (groups with 10 A).
- Outputs divided into groups with max. 20 A per group.
- Modular expansion in the rack with tool-less PDU installation.

Additional function for HighPower RM type (remote metered).

- With big transparent LCD display.
- Effective value display of alternating power input.
- LCD display rotation in 90° steps.
- Display can be switched bright or dark.
- Load changes signaling.
- Automatic background light reduction.
- Technical description for data interface (see DI-STRIP RM).

Material/finish

Housing: Sheet steel, zinc-passivated, powder-coated

Dimensions

Width: 134 mm
Height: 47 mm
Cable: 3 m

Color

Housing: RAL 9005 black

Approvals


- CE Symbol in accordance with Low Voltage Directive 2006/95/EC
- EMC Directive 2004/108/EC
- GS

Supply schedule

- 1 socket strip (PDU)
- 1 integrated remote ampere meter (only HighPower RM)
- 2 mounting brackets
- Operating instructions

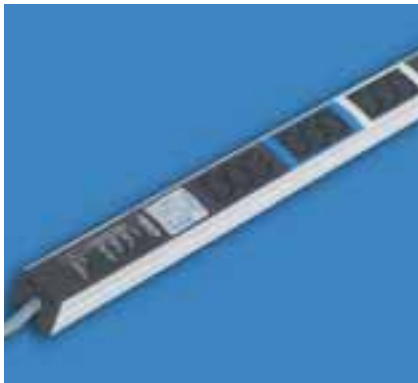
L	Type	Input values	Input plug	Outputs IEC60320			Order no.	UP
				C13	C19	Schuko		
540	DI-STRIP® HighPower	230Vac, 32A	IEC60309 1ph/N/PE 6h	20	4		03.632.100.8	1 unit
850	DI-STRIP® HighPower	230/400Vac, 32A	IEC60309 3ph/N/PE 6h	6	12		03.632.102.8	1 unit
850	DI-STRIP® HighPower	230/400Vac, 32A	IEC60309 3ph/N/PE 6h	18	6		03.632.103.8	1 unit
540	DI-STRIP® HighPower RM	230Vac, 32A	IEC60309 1ph/N/PE 6h	20	4		03.632.200.8	1 unit
850	DI-STRIP® HighPower RM	230/400Vac, 32A	IEC60309 3ph/N/PE 6h	6	12		03.632.202.8	1 unit
850	DI-STRIP® HighPower RM	230/400Vac, 32A	IEC60309 3ph/N/PE 6h	18	6		03.632.203.8	1 unit

Dimensions in mm: L = Length, W = Width, H = Height, S = Switch,
n = Number of sockets, F1 = Standard side, F2 = Design side, 19" = Suitable
for 19" installation, Safe = Child-safe, U = Standard height unit, UP = Unit of
packaging.

 = Express item

Conversion: 1 mm = 0.03937 inch 1 kg = 2.2046 pound

Replace .x with the number of your color combination:
.1 = RAL 7035, .6 = RAL 7035/RAL 2003



DOS20126

DI-STRIP® TriplePower® Euro Socket System IEC 320 with cable

- Cable: H05VV-F 3G 2.5 mm².
- Cable: 2.5 m (optional with IEC60309 plug, 3Ph/N/PE 6h).
- Easy mounting on the rack extrusion.
- 3x16A feed as standard.
- Ideal for providing redundancies (e. g. 96 A with redundant feed).
- Unmistakable phase assignment color-coding.
- Optimum distribution over the entire rack height (23 U or 41 U).
- Alternative to 3-phase GST18 system (see page 170).

Material/finish
Housing: Closed sheet steel extrusion, zinc-passivated, powder-coated texture
Plastic parts: Vampamid 6 0024 VO (UL94), recyclable

Dimensions
Height: 45.5 mm
Housing width: 44.4 mm (= 1 U)

Approvals/certificates
- CE label in accordance with Low Voltage Directive 2006/95/EC
- EMC Directive 2004/108/EC
- BV GS, CSA NRTL/C, CB-scheme

Color
Housing: RAL7035 light gray
Plastic parts: RAL7021 dark gray

Load rating
100-240/173-415 Vac
Input: 3x 16 A
Output: 10A (C13)
Output: 16 A (C19)

Approval symbols for IEC 320 3-way Euro combinations
VDE, UR, CSA

Supply schedule
1 socket strip
2 mounting brackets

L	S	n	F1	19"	Input values	Input plug	Outputs IEC60320		Order no.	UP
							C13	C19		
1033	24	•			230/400Vac, 16A	Open end	24		03.600.024.1	1 unit
1833	48	•			230/400Vac, 16A	Open end	48		03.600.048.1	1 unit
1033	24	•			230/400Vac, 16A	IEC60309 3ph/N/PE 6h	24		03.600.824.1	1 unit
1833	48	•			230/400Vac, 16A	IEC60309 3ph/N/PE 6h	48		03.600.848.1	1 unit
1133	24	•			230/400Vac, 16A	IEC60309 3ph/N/PE 6h	18	6	03.600.524.1	1 unit
1733	42	•			230/400Vac, 16A	IEC60309 3ph/N/PE 6h	36	6	03.600.542.1	1 unit
483	6	•	•		230/400Vac, 16A	IEC60309 3ph/N/PE 6h		6	03.600.506.1	1 unit



DOS20153

Knürr DI-STRIP® BladePower® Technical data

- EC 320 sockets (10 A and 16 A).
- Individually fused via thermal circuit breaker that can be reset in acc. with IEC60934.
- Cable: H05VV-F 3G 4 mm².
- Cable: 4 m.
- With IEC60309 plug, 1Ph/N/PE 6h blue, 3Ph/N/PE 6h red.

Material / Surface
Housing: Sheet steel, zinc-passivated, powder-coated

Dimensions
Height: approx. 60 mm
Housing width: 84 mm

Color
Housing: RAL 9005 black

Approvals
- CE label in accordance with Low Voltage Directive 2006/95/EC
- EMC Directive 2004/108/EC
- Innova GS
- CSA NRTL/C (only without plug)

Load rating
100-240 / 173-415 Vac
Input: 1x32 A oder 3x32 A
Output: 10 A / 16 A

Supply schedule
1 socket strip (PDU)
2 mounting brackets
1 19" mounting bracket (additional with 19 installation option)
Operating instructions



DOS20155

L	S	n	F1	19"	Plug	Model	Order no.	UP
375		5	•	•	•	BladePower® PDU 1x 32 A	03.630.005.1	1 unit
740		15	•	•		BladePower® PDU 3x 32 A	03.630.015.1	1 unit
375		5	•	•		BladePower® PDU 1x 32 A	03.630.805.1	1 unit
740		15	•			BladePower® PDU 3x 32 A	03.630.815.1	1 unit

Knürr DI-Strip® – for server applications



DOS20158



DOS20159

Knürr DI-STRIP® PizzaPower® Technical data

- Individually fused via thermal circuit breaker that can be reset in acc. with IEC60934.
- Cable: H05VV-F 3G 4 mm².
- Cable: 4 m.

Material/finish

Housing: Sheet steel, zinc-passivated, powder-coated

Dimension

Height: approx. 60 mm
Housing width: 84 mm
Height with cable: approx. 176 mm

Color

Housing: RAL 9005 black

Approvals



- CE Symbol in accordance with Low Voltage Directive, 2006/95/EC
- EMC Directive 2004/108/EC
- BV GS
- CSA NRTL/C (only without plug)

Load rating


100-240 / 173-415 Vac
Input: 1x32 A or 3x32 A
Output: 10A (C13)
Output: 16 A (C19)

Supply schedule

- 1 socket strip (PDU)
- 2 mounting brackets
- 1 19" mounting bracket (additional with 19 installation option)
- Operating instructions

L	S	n	F1	19"	Input values	Input plug	Outputs IEC60320		Order no.	UP
							C13	C19		
400		7	●		230Vac, 32A	IEC60309 1ph/N/PE 6h	7		03.631.007.1	 1 unit
400		7	●		230Vac, 32A	Open end	7		03.631.807.1	1 unit
720		16	●		230Vac, 32A	IEC60309 1ph/N/PE 6h	12	4	03.631.124.1	1 unit
960		24	●		230Vac, 32A	IEC60309 1ph/N/PE 6h	24		03.631.240.1	1 unit
1017		25	●		230Vac, 32A	IEC60309 1ph/N/PE 6h	21	4	03.631.214.1	1 unit
933		21	●		230/400Vac, 32A	IEC60309 3ph/N/PE 6h	21		03.631.021.1	 1 unit
933		21	●		230/400Vac, 32A	Open end	21		03.631.821.1	1 unit
408		6	●		230/400Vac, 32A	IEC60309 3ph/N/PE 6h		6	03.631.006.1	1 unit
939		21	●		230/400Vac, 32A	IEC60309 3ph/N/PE 6h	9	12	03.631.912.1	1 unit
1362		36	●		230/400Vac, 32A	IEC60309 3ph/N/PE 6h	36		03.631.360.1	1 unit
1002		24	●		230/400Vac, 32A	IEC60309 3ph/N/PE 6h	18	6	03.631.186.1	1 unit

Dimensions in mm: L = Length, W = Width, H = Height, S = Switch,
n = Number of sockets, F1 = Standard side, F2 = Design side, 19" = Suitable
for 19" installation, Safe = Child-safe, U = Standard height unit, UP = Unit of
packaging.

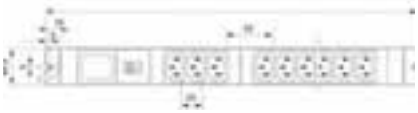
 = Express item

Conversion: 1 mm = 0.03937 inch 1 kg = 2.2046 pound

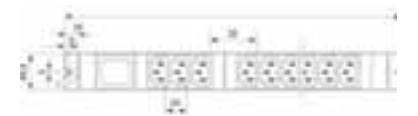
Replace .x with the number of your color combination:
.1 = RAL 7035, .6 = RAL 7035/RAL 2003



DOS20062



DOS00498



DOS20042

Knürr DI-STRIP® Euro Socket System, IEC 320 with cable and right angle plug

- Optionally with lit switch, 2-pole switching.
- 19" installation option.
- With Euro combinations of IEC 320 sockets .
- Cable: H05VV-F 3G 1.5 mm².
- Cable: 2.5 m.
- Without fusing.

Material/finish

Housing: Closed sheet steel extrusion, zinc-passivated, powder-coated texture
Plastic parts: Vampamid 6 0024 VO (UL94), recyclable

Dimensions

Height: 45.5 mm
Housing width: 44.4 mm (= 1 U)

Approvals/certificates

- CE label in accordance with Low Voltage Directive 2006/95/EC

- EMC Directive 2004/108/EC
- Innova-GS
- CB-scheme

Color

Housing: RAL 7035 light gray
Plastic parts: RAL 7021 dark gray

Load rating

250 Vac/10 A, Sheet F
250 Vac/16 A, Sheet J

Approval symbols for IEC 320 3-way Euro combinations

VDE, UR, CSA

Supply schedule

1 socket strip
2 mounting brackets

L	S	n	F1	19"	Input values	Input plug	Output Sheet F	Sheet J	Order no.	UP
333		6	•		230Vac, 16A	Schuko CEE7	6		03.600.006.1	1 unit
383	•	9	•	•	230Vac, 16A	Schuko CEE7	9		03.602.009.1	1 unit
483		12	•	•	230Vac, 10A	ICE60320 Sheet E	12		03.600.312.1	1 unit
783		18	•		230Vac, 16A	ICE60320 Sheet I	15	3	03.600.418.1	1 unit
783		18	•		230Vac, 16A	ICE60309 1ph/N/PE 6h	15	3	03.600.518.1	1 unit

Knürr DI-Strip® – for server applications



DOS80002

Knürr DI-STRIP® M

- With big transparent LCD display.
- Effective value display of alternating currents per phase (1-phase or 3-phase, depending on model).
- LCD display rotation in 90° steps.
- Display can be switched bright or dark.
- Unbalanced-load warning display with 3-phase model.
- Load changes signaling.
- Automatic background light reduction.
- Cable: 4m H05VV-F 5 G 4mm (PizzaPower M).
- Cable: 2.5m H05VV-F 5 G 2.5mm (TriplePower M).
- Cable: 2.5m H05VV-F 3G 1.5mm (DI-STRIP Compact M, DI-STRIP IEC320 M).

Material/finish

PizzaPower® model:
Housing: Sheet steel, zinc-passivated, powder-coated
Other models:
Housing: Closed sheet steel extrusion, zinc-passivated, powder-coated texture
Plastic parts: Vampamid 6 0024 VO (UL94), recyclable

Approvals

- CE label in accordance with Low Voltage Directive 2006/95/EC
- EMC Directive 2004/108/EC
- GS

Color

PizzaPower M model:
Housing: RAL 9005 black
Other models:
Housing: RAL 7035 light gray
Plastic parts: RAL 7021 dark gray

Supply schedule


1 socket strip with ampere meter
2 mounting brackets
2 19" mounting brackets (with 19" installation option)

Note

- Other models (e.g. Sheet J outputs) on request

L	Type	Input values	Input plug	Outputs IEC60320			Order no.	UP
				C13	C19	Schuko		
483	DI-STRIP® PizzaPower® M	230Vac, 32A	IEC60309 1ph/N/PE 6h	7			03.636.007.1	1 unit
933	DI-STRIP® PizzaPower® M	230/400Vac, 32A	IEC60309 3ph/N/PE 6h	21			03.636.021.1	1 unit
1033	DI-STRIP® TriplePower® M	230/400Vac, 16A	IEC60309 3ph/N/PE 6h	21			03.606.821.1	1 unit
1833	DI-STRIP® TriplePower® M	230/400Vac, 16A	IEC60309 3ph/N/PE 6h	45			03.606.845.1	1 unit
1133	DI-STRIP® TriplePower® M	230/400Vac, 16A	IEC60309 3ph/N/PE 6h	18	6		03.606.824.1	1 unit
1733	DI-STRIP® TriplePower® M	230/400Vac, 16A	IEC60309 3ph/N/PE 6h	36	6		03.606.842.1	1 unit
483	DI-STRIP® Compact M	230Vac, 16A	Schuko			6	03.306.006.1	1 unit
483	DI-STRIP® IEC320 M	230/400Vac, 16A	Schuko	9			03.606.009.1	1 unit
233	DI-STRIP® Ampermeter	230/400Vac, 16A	GST18				03.606.200.1	1 unit

Dimensions in mm: L = Length, W = Width, H = Height, S = Switch,
n = Number of sockets, F1 = Standard side, F2 = Design side, 19" = Suitable
for 19" installation, Safe = Child-safe, U = Standard height unit, UP = Unit of
packaging.

 = Express item

Conversion: 1 mm = 0.03937 inch 1 kg = 2.2046 pound

Replace .x with the number of your color combination:
.1 = RAL 7035, .6 = RAL 7035/RAL 2003



DOS80002

Knürr DI-STRIP® RM

- Real RMS value display for the alternating current per phase.
- LCD display rotation in 90° steps.
- Display bright/dark switchover.
- Warning display for unbalanced load.
- Load changes signaling.
- Automatic background light dimming.

Data interface:

- The plug strip can be integrated into the network via an RJ45 plug.
- Access is possible without special software via a remote browser.
- Three variable limit values and a warning for unbalanced loads can be specified.
- The module enables access for up to 5 users or administrators; access is password-protected.
- The software displays the name and place of the PDU; this information can be entered by an administrator.
- The user can specify a static IP address or access using DHCP.
- Firmware updates can be made via a browser.
- Supported protocols: HTTP, SNMP (Traps, SET, GET), Syslog.

Material/finish

- PizzaPower model:
Housing: Sheet steel, zinc-passivated, powder-coated
- Other models:
Housing: Closed sheet steel extrusion, zinc-passivated, powder-coated texture
Plastic parts: Vampamid 6 0024 VO (UL94), recyclable

Dimensions

- Width: 84 mm (PizzaPower), 44.4 mm (other)
- Height: 60 mm (PizzaPower), 44.4 mm (other)

Color

- PizzaPower model:
Housing: RAL 9005 black
- Other models:
Housing: RAL 7035 light gray
Plastic parts: RAL 7021 dark gray

Approvals

- CE label in accordance with Low Voltage Directive 2006/95/EC
- EMC Directive 2004/108/EC
- GS

Supply schedule

- 1 socket strip (PDU) with remote ampere meter
- 1 mounting brackets
- Operating instructions

L	Type	Input values	Input plug	Outputs IEC60320			Order no.	UP
				C13	C19	Schuko		
733	DI-STRIP® Compact RM 8	230Vac, 16A	Schuko CEE 7/4			8	03.307.008.1	1 unit
1183	DI-STRIP® Compact RM 17	230Vac, 16A	Schuko CEE 7/4			17	03.307.017.1	1 unit
633	IEC320 RM9	230Vac, 16A	Schuko CEE 7/4	9			03.607.009.1	1 unit
933	IEC320 RM18	230Vac, 16A	Schuko CEE 7/4	18			03.607.018.1	1 unit
1133	DI-STRIP® TriplePower RM	230/400Vac, 16A	IEC60309 3ph/N/PE 6h	24			03.607.825.1	1 unit
1833	DI-STRIP® TriplePower RM	230/400Vac, 16A	IEC60309 3ph/N/PE 6h	45			03.607.845.1	1 unit
1233	DI-STRIP® TriplePower RM	230/400Vac, 16A	IEC60309 3ph/N/PE 6h	18	6		03.607.824.1	1 unit
1833	DI-STRIP® TriplePower RM	230/400Vac, 16A	IEC60309 3ph/N/PE 6h	36	6		03.607.842.1	1 unit
1111	DI-STRIP® PizzaPower® RM	230Vac, 32A	IEC60309 1ph/N/PE 6h	24			03.637.023.1	1 unit
871	DI-STRIP® PizzaPower® RM	230Vac, 32A	IEC60309 1ph/N/PE 6h	12	4		03.637.016.1	1 unit
1168	DI-STRIP® PizzaPower® RM	230Vac, 32A	IEC60309 1ph/N/PE 6h	21	4		03.637.025.1	1 unit
563	DI-STRIP® PizzaPower® RM	230/400Vac, 32A	IEC60309 3ph/N/PE 6h		6		03.637.006.1	1 unit
995	DI-STRIP® PizzaPower® RM	230/400Vac, 32A	IEC60309 3ph/N/PE 6h	6	12		03.637.018.1	1 unit
1022	DI-STRIP® PizzaPower® RM	230/400Vac, 32A	IEC60309 3ph/N/PE 6h	21			03.637.021.1	1 unit
1157	DI-STRIP® PizzaPower® RM	230/400Vac, 32A	IEC60309 3ph/N/PE 6h	18	6		03.637.024.1	1 unit
1751	DI-STRIP® PizzaPower® RM	230/400Vac, 32A	IEC60309 3ph/N/PE 6h	36	6		03.637.042.1	1 unit

Inline Metering System (IMS) – Optimum upgrade solution for existing installations

Monitoring is already part of the every-day routine in most data centers when it comes to system availability. For this reason you decide with new systems for socket strips/PDUs with integrated monitoring (Managed PDUs or Adaptive PDUs). But what do you do with existing systems in which socket strips/PDUs are usually installed without measuring functions?

Emerson Network Power's solution for this is called IMS (Inline Metering System). These modules allow existing racks with installed basic power distributors to be upgraded accordingly. As almost all server racks are supplied with an A and a B-feed, **later installation is possible without interruption**. The IMS modules can also be installed space-savingly inside or outside the rack, e.g. in false floor. The Inline Metering Systems (IMS) are divided into **three different product groups, with different features**.

Emerson Network Power Inline Metering Systems (IMS) benefits:

- Existing rack PDUs do not have to be swapped out, as the modules can be upgraded.
- All consumers (where possible) can be integrated into the monitoring system, as numerous plug systems are provided (1ph – 3ph, max 63A per phase).
- Flexible installation inside or outside the rack (e.g. in the false floor).

Inline Metering System (IMS)

IMS model series overview:

Knürr DI-STRIP IMS

Features:

- Fast installation and easy data recording with graphic and numerical power consumption overview; can be retrieved via web interface.
- The power value can be read directly on the rack, as a local display is installed in every module.
- An N-conductor overload with 3-phase systems can be prevented, as the phase symmetry is monitored.
- Alarm signal when incidents occur, as the threshold values (phase symmetry, bottom limit, pre-warning and alarm) can be set flexibly.



Liebert MPX IMS

Features:

- Liebert Rack PDUs familiar software interface, as the same communication card as with Liebert MPX™/MPH™ is used.
- Highest possible security and availability with an operating temperature of max. 55°C.
- Extensive measurement functions (power, current, voltage and energy), with high measurement accuracy of up to ± -1%.
- An N-conductor overload with 3-phase systems can be prevented, as the N-conductor current is monitored.
- Easy connection of up to 4 Liebert MPX IMS / MPH™ / MPX™ on the network with only 1 IP address.
- External sensors and a display can also be connected.



Knürr MODULAR IMS

Features:

- Extensive measurement functions (power, current, voltage, energy and power factor), with higher measurement accuracy of up to 0.17% referring to the end value.
- Very high input currents can be measured (up to 999A per phase via external transducer).
- The modular setup means the solution can be adjusted customer-specific (e.g. up to 4 in-feeds per module with different input plugs or even fixed in-feed are possible).
- Up to 75 modules can be controlled via one IP address.
- Saving in external databases possible without additional software.





INPUT POWER

- Single-phase or three-phase
- 16A up to 63A



OUTPUT DISTRIBUTOR

- Single-phase or three-phase
- 16A up to 63A



MODULARITY

- Depending on the type of communication card, external displays or external sensors



MONITORING

- Input level



LOCAL MONITORING

- Display for user (MPX IMS and DI-STRIP IMS)



REMOTE MONITORING

- Secure web and SNMP interface



RACK PDU ARRAY™

- One IP address, up to 4 rack PDUs (MPX IMS)
- Liebert MPX™, Liebert MPH™ and Liebert IMS in the same private network



Existing power distribution upgrade: Inline Metering System from Emerson Network Power.

Emerson Network Power IMS product series

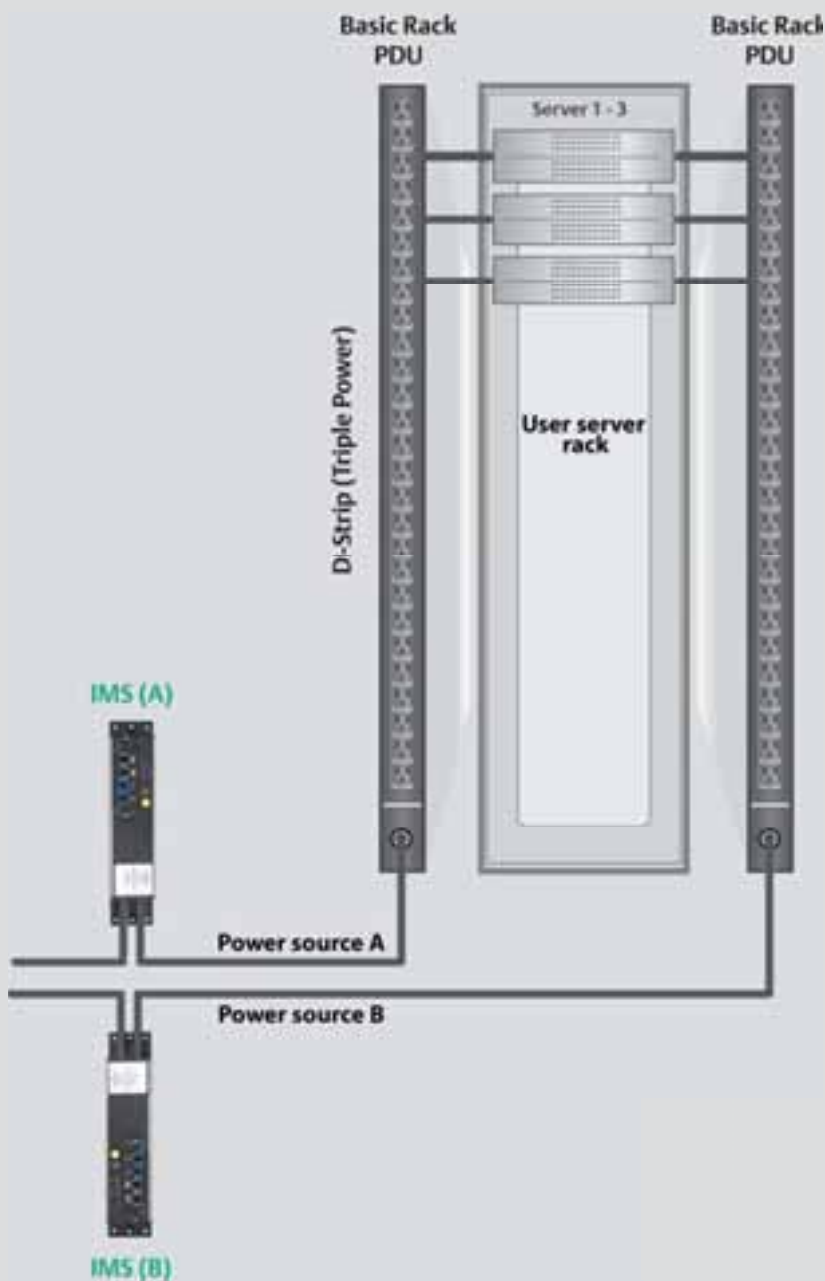
Features	Knürr DI-STRIP® IMS	Liebert MPX™ IMS	Knürr Modular IMS
Measurement module	x	x	x
Modular			x
Display	Fixed	External	
Remote interface	x	x	x
Measuring at input level	x	x	x
Measurement modules per IP address	1	4	75
Max. measurement points per IP address	1	4	300
Visualization at PDU level	x	x	x
Visualization at rack level		x	x
Visualization at room level	Only with additional software Liebert Nform	Only with additional software Liebert Nform	x
Measurement parameters	A	A,V,W,kWh	A,V,W,VA, Var, kWh, cosphi.
Phase asymmetry analysis	x	x	x
Connection option external sensors		x	x
Input power	1ph + 3ph max 32A	1ph + 3ph max 32A	1ph + 3ph, max 63A (max 4 feeds), max. 3ph 999A (via external transducer)
Connection option	IEC 60309, IEC60320, Schuko	IEC 60309	IEC 60309, GST18, fixed connection
Protocols	HTTP, SNMP, Syslog	HTTP, HTTPS, SNMP, Telnet	HTTP, HTTPS, SNMP v3,
Saving in external database	With additional software Liebert Nform	With additional Liebert Nform or Avocent DSView software	Oracle, MySQL, MSSQL

Order numbers:

Order number 1 ph. 16 A	036072001	MPXIMS-EHBAXS30	030145118
Order number 1 ph. 32 A	036072011	MPXIMS-EHBAXQ30	030145128
Order number 3 ph. 16 A	036072021	MPXIMS-EHBAXT30	030145138
Order number 3 ph. 32 A	036072031	MPXIMS-EHBAXR30	030145148
Control unit	Not required	Not required	030145108



Easy upgrade from basic power distributor to measurement-enabled power distributor



Knürr PowerTrans® Power Distribution Rack

Knürr PowerTrans®

... forms the interface between the low voltage feed and the PDUs of the DI-STRIP® product family and other components for supplying servers and other IT equipment. The rack's basis: to connect Knürr Mirace!® with the existing PowerTrans® 19" slot-in units the elements are simply slotted in and fixed at a free spot. The electrical connection to the rack is set up immediately. The power distribution is performed in the individual slot-in units and therefore no longer has to be installed fixed in the building.

Up to 8 slot-ins can be integrated. Each slot-in is supplied with an A and B feed (redundancy). With max. 250 A per phase one single rack can provide loads of up to 346 kVA. Plug & Play: only the main feed on the rack must be installed by an electrician.

The individual slot-in units and the PDUs can be connected per Plug & Play installation, making later extensions cost-effective. Slot-in units with measurement function are also available. This slot-in unit allows you to measure and moni-

tor the electrical measured variables at the early main distributor stage. This slot-in unit will replace standard analog volt and ampere meters and measuring devices for power outputs and power factor.

The required measured variables can be "customized" in six display panels. The system can also be connected to an LAN. The measured values are then displayed and saved on a PC in the LAN or on the Internet.

- Clear and transparent displays.
- Customized setting of measured variables for standard displays.
- Wide range of application with flexible adjustment of input variables.
- Connection error detection with installation.
- Communication with LAN enables integration into energy management.
- Easy reading and display of measured data with MS Excel allows the user to flexibly configure their own solutions.



Equipping and installation

The outputs of the slot-in units can be flexibly equipped as the customer wishes with the most diverse features: different CEE and GST18 type plug connections (e. g. Adaptive, Managed and Basic PDUs and flexible power distribution with the GST18i5 distributor block, 3-phase).



Measurement slot-in unit with extensive measurement functions (local or remote)
Can be integrated into various management programs.



INPUT POWER

- Max. 250 A per phase
- 1 ph. or 3 ph. Feed
- Max. 2 feeds per rack



OUTPUT DISTRIBUTOR

- 230/400V - 32A via IEC 60309 socket
- 230/400V - 16A via GST 18 socket
- 230V - 32A via IEC 60309 socket



MODULARITY

- Output distributors can be modularly equipped during running operation.



MONITORING

- Power Trans Rack complete and each individual slot-in and output.



LOCAL MONITORING

- Display for user
- Display at rack level and at slot-in level/output level



REMOTE MONITORING

- Secure web and SNMP interface



OVERLOAD PROTECTION

- Circuit breakers for every output



Knürr PowerTrans® for professional power distribution in the data center.

References:

Secure, stable and highest possible measurement accuracy

Several renowned companies quickly opted for the Liebert MPX™ modular power supply. We not only consider the individual servers that the PDUs are connected to – together with the customer we also keep a keen eye on the complete solution.

Every customer has different challenges and requires a solution harmonized with their needs. The following examples show how different the customer's individual requirements are and how these have been met with our solutions.

Automotive manufacturer

"A standardized system on which different solutions can be set up is important for us. As the same busbar is always used, we don't have to think about possible requirements in the preliminary stage.

We have racks with which it is only the overall consumption we are interested in. On the other hand there are servers with which we also have to note the exact consumption. The ability to select the different modules allows us to equip the busbars as required.

Existing racks in the data center will also be integrated into the management system. With the "IMS Liebert MPX" Inline Metering System we can easily integrate these racks into the existing management platform, as the same communication card as with the MPH/MPX is installed in this product. This

allows all features to be used together (e.g. external sensors, rack PDU array, external display)."

Stock exchange trading

"The power values of each individual server have to be measured – and with the highest possible accuracy. This is why we equip the busbars with the "Receptacle Managed" output modules, which have an individual port measurement with an industry-wide highest measurement accuracy of +/-1%.

The data interface to the outside must communicate with an "open" protocol, so that the PDU can be integrated into the existing management software.

Ready to use plug-ins also allow the PDU to be integrated into open management platforms, such as Nagios, for example."



*Modular power supply in data centers
in stock exchange trading ensures reliability.*

References:

Space-saving and standardized system

University data center manager

"We operate a cluster computer here, and we provide its computing performance to various third level education institutes. For us the most important thing is to get as much computing power as possible for as little money as possible, and nevertheless ensure a secure operation."

As we have to distribute the computer's operational costs among the individual institutes, we use socket strips with measurement modules that we can retrieve via the network.

Recently there have been more and more failures here due to the high temperatures at the back of the racks. For a couple of months now we have been using the MPH from Liebert, which is significantly more temperature-stable than other products on the market – and now there are no problems. Plus the price is right and the measurement accuracy is first class."

DC infrastructure manager of a large housing/collocation provider

"When we set up the infrastructure in a DC module we don't know yet what equipment our customers are going to bring into the equation."

This isn't a problem for the server racks; the installation dimensions are standardized – we can use standard racks any time and are therefore ready for everything.

It's not the same with power distributor strips however; there are too many different connector plugs. Until now we were always obliged to swap out complete distributor strips whenever a customer brought in new equipment.

This always entailed very high costs because the entire power cabling had to be laid again right up to the busbars.

We have now decided for Liebert MPX so that we can adjust the power distribution in the rack to the respective requirements by simply changing the output modules.

We were also really impressed here by the fact that the busbars and housings are made of very robust aluminum and easily survive numerous swap-outs undamaged.

Another important aspect for us is the exceptional accuracy of the power measurement, as we invoice the power costs individually to our customers."

State IT center (modular IMS)

"Electrical data has to be recorded in the data centers with up to 4 feeds. The data has to be collected and analyzed centrally in databases. Existing comprehensive management platforms must also be able to access the data."

Alarms have to be signaled to the existing alarm management.

400 racks are currently distributed over 3 sites. Current, voltage, power and temperature per rack have to be recorded. The feed is flexible, from 16A 1ph to 63A 3ph.

An open protocol (SNMP) and floating contacts must be provided to the outside so that the data and alarms can be processed. We are constantly growing, so the installation has to be set up extremely flexible and modular.

The Knürr IMS modular system is the best solution for our applications, as our business is very dynamic. Modularity and flexibility are therefore very important for us."



SmartAisle™ from Emerson Network Power – Cold aisle containment at the highest possible technical level in the modern data center.

System solutions

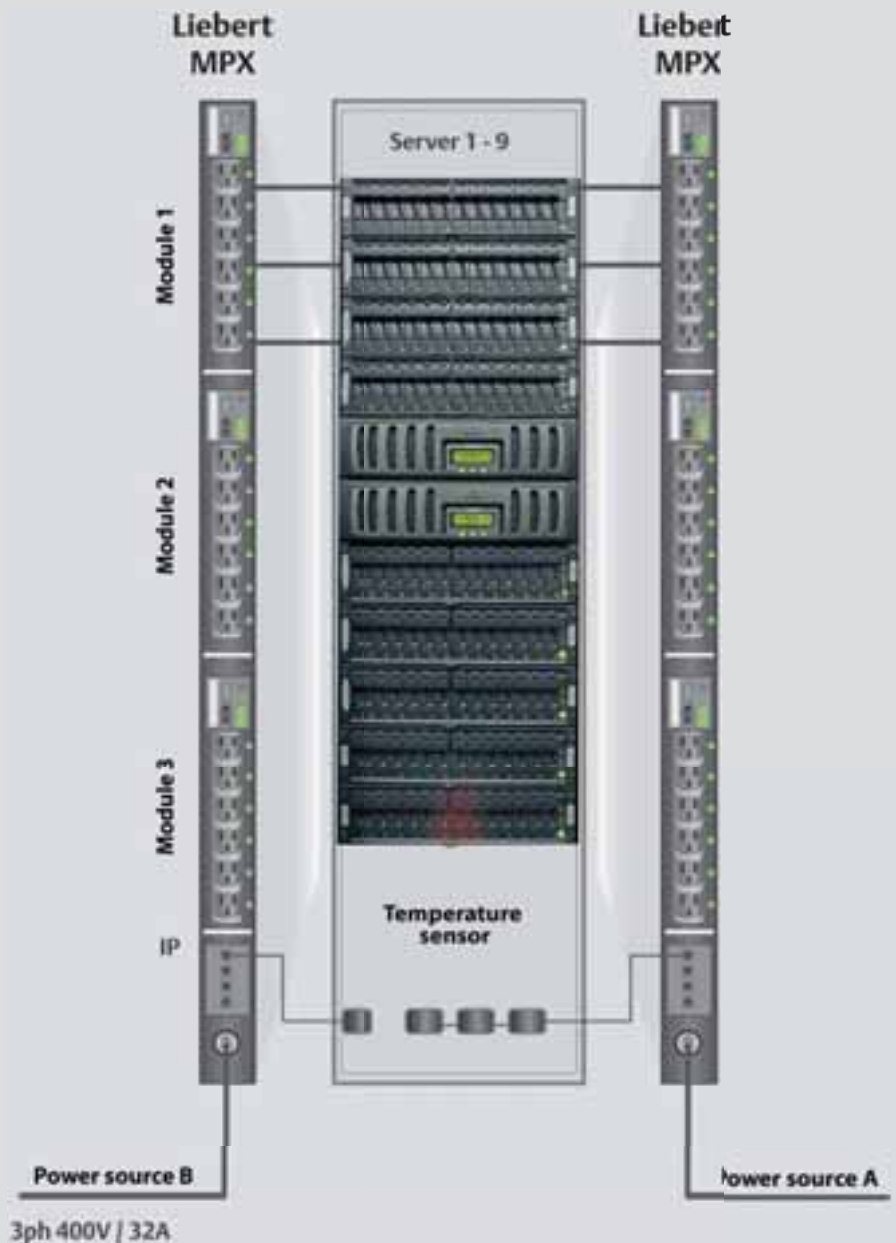
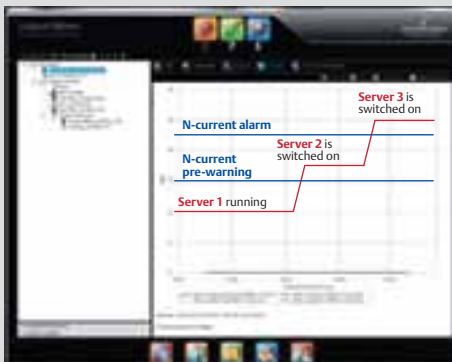
1. MONITOR – Early failure detection for more security

Identify faults early on with comprehensive and early-detection monitoring of numerous measured values (N-conductor current, crest factor, power factor, apparent power)

N-conductor current monitoring example:

The supply in the rack is 3-phase. With unbalanced load the N-conductor is stressed. An unbalanced load occurs when at least one phase is loaded more than the others. If an unbalanced load is too high the connection cable can heat up, as the N-conductor is not configured higher than the other wires in the cable. To prevent this the standard software of the Liebert MPX™ has two threshold values for the current in the N-conductor.

When server 2 is switched on the "N-current pre-warning" limit value is exceeded; a signal is sent. When the third server is switched on the "N-current alarm" limit value is exceeded; a signal is sent. All signals are shown on the web interface and also forwarded to the management software.





Backing up business-critical IT applications based on technology and experience: Emerson Network Power.

System solutions

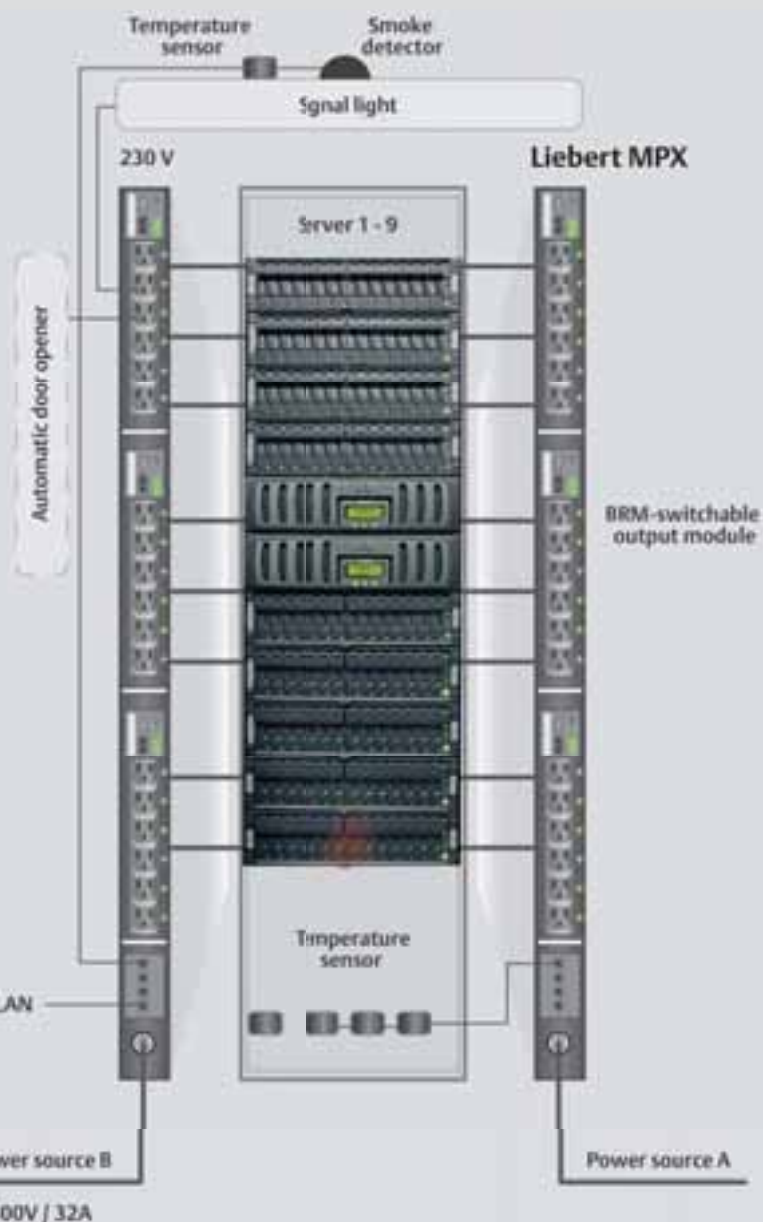
2. CONTROL – Execute control commands at low cost

Execute control commands when specific incidents occur

Different sensors can be connected to the Liebert MPX™. The incidents occurring (e.g. excess temperature, alarm signals from external components, etc.) can be displayed in the software, and also forwarded to the respective management software. Specific control commands can also be executed.

Example: A temperature sensor and a floating input contact can be connected to the Liebert MPX™. With excess temperature a signal is sent so that the thermal management system increases the power. The Liebert Nform management software also forwards a switching command to the Liebert MPX™ to switch on the signal lights.

A floating input contact is connected to a smoke detector. If this goes off the doors are opened automatically and an alarm is forwarded to the management software.



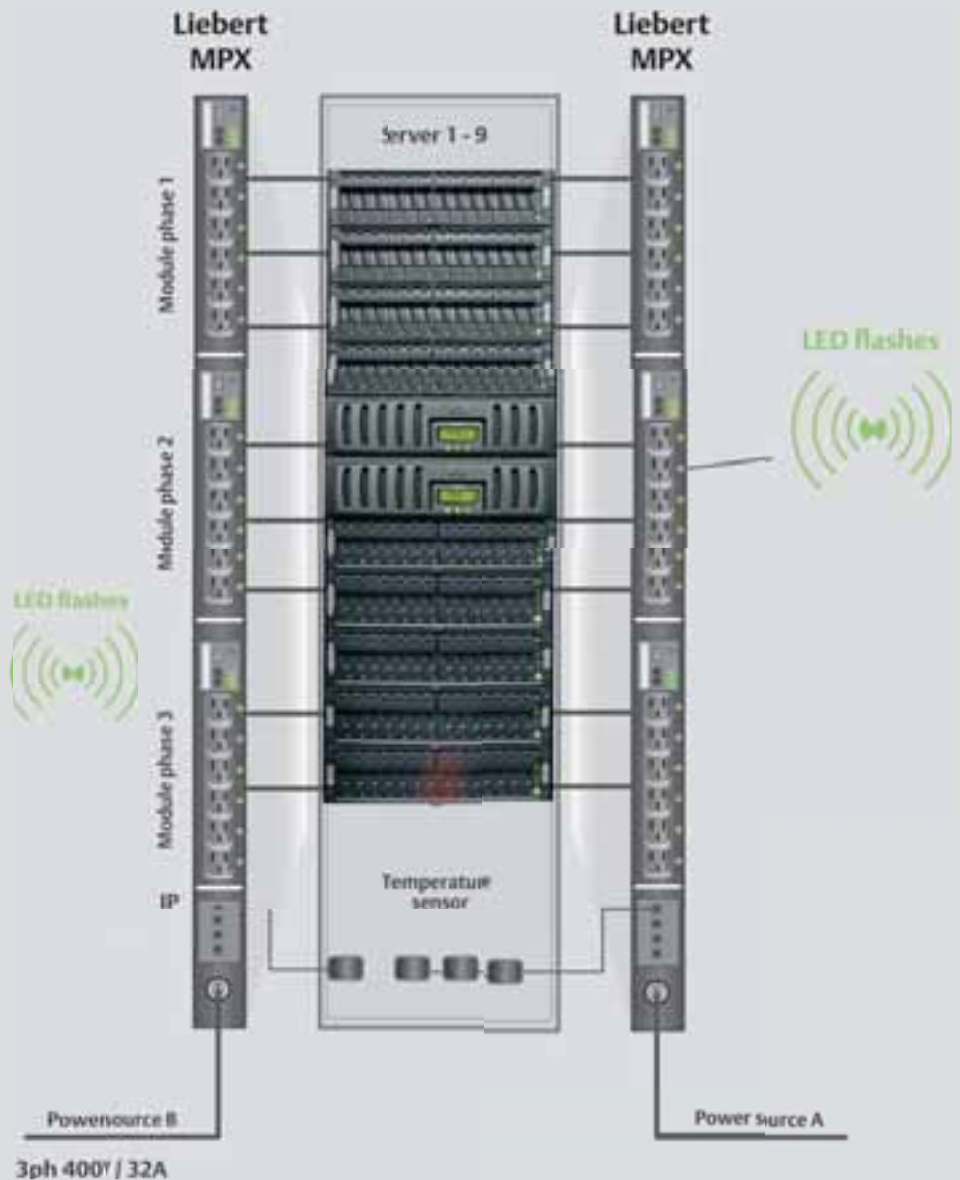


3. SECURE – Guarantee security with a better overview

Guarantee security

With a fully fitted rack (36 servers are fixed per side on the Liebert MPX™) a technician must remove a server and disconnect the mains cable.

Solution: Each individual server is labeled with a name in the Liebert MPX™ software. With a click on the button in the software the respective LED beside the server's mains cable flashes. The technician sees immediately which mains cable they can disconnect.



Trinergy™ from 200 to 1200 kW

A revolutionary high performance UPS with dynamic operating modes, scalability up to 9.6 MW and 99% efficiency. Trinergy™ provides optimum performance and reliability with drastically reduced total operating costs (TCO).

Highest UPS level of efficiency, up to 99 %

- Interface for power feed on the bypass.
- Real-time input power tracking.
- Intelligent algorithm for mode change.

3-dimensional modularity

Thanks to Trinergy™ three-dimensional modularity, companies can always extend their UPS infrastructure whenever changing load requirements demand it. Further power modules are simply added!

Up to 9.6 MW effective power can consequently be reached – an unprecedented power level.

A first in the industry

Trinergy™, the revolutionary UPS architecture is based on the fact that three standard operating configurations are combined for the first time in one single high power UPS:

- **Maximum power control (VFI)**
- **Maximum energy savings (VFD)**
- **High efficiency level and optimum power conditioning (VI)**

The unique Trinergy™ technology mix enables the system to monitor the environment and the network's operating conditions, and to independently select the operating mode that is best suited for the power conditions.

Trinergy™ can determine the most efficient operating mode for the respective network conditions and ensures the consumer supply is optimum at all times.

The system consequently achieves exceptional energy savings, a first class power level and maximum security with power supply.¹

The Trinergy™ high level of flexibility, energy efficiency and adaptability are in harmony with the "Best Practice Strategies" in data centers and another confirmation of its outstanding efficiency.

Features

- Transformer-free system setup.
- Comprehensive IGBT double converter technology.
- Excellent input power
 - PF > 0.99
 - THDi < 3%
- Output PF up to 1.
- Diagram of the output power factor symmetrically referring to zero point.
- Permanent 100 % kVA – no power reduction, regardless of the load (capacitive or inductive).
- Optimum ratio between space requirement and power.
- Automatic output power increase by up to +10 %.
- High conversion efficiency (certified up to 99%).

¹) Class 1 IEC 62040-3) CBEMA



EMERSON
Network Power

Trinergy

Trinergy™ –
Unique architecture and technology.

Emerson Network Power

Centers of Expertise

When you partner with **Emerson Network Power** for your *Business-Critical Continuity™* needs across your enterprise, you benefit from more than products to support and protect your technology infrastructure.

Developing such a wide range of technologies gives us in-depth industry knowledge and a “big-picture” understanding of how all systems must work together within any critical environment. We deliver this knowledge through Emerson Network Power’s Centers of Expertise, distinct areas of world-class products and services that help you determine what you need and where, depending on your application.

All so that you can keep your business moving forward for your customers.

■ AC Power

Sustaining critical operations that simply can’t go down. We deliver a full range of uninterruptible Liebert® and Chloride AC power systems plus STS devices, providing from individual products to integrated power protection solutions, that keep network closets, computer rooms and data centers up and running.

■ Infrastructure Management & Monitoring

Managing and monitoring critical environments at multiple sites around the clock. We make it easy in today’s ROI-driven business environment, with comprehensive infrastructure management and monitoring systems for both IT and facilities. Solutions and services that provide continuous oversight of data centers, computer rooms and network closets, as well as wireless, wireline and enterprise telecom applications.

■ Power Switching & Controls

Safeguarding facilities from operational disruption due to electrical power interruption. We provide ASCO® power-transfer switches, generator paralleling switchgear/power control systems, and touch screen SCADA for monitoring and control of the utility service and on-site backup power generators, helping ensure continuity of supply to essential and mission-critical communications, data-processing, life-safety, and other critical loads. Backed by the largest manufacturers, direct field based project management and service technicians in the industry.



■ Precision Cooling

Maintaining precise temperature for reliable equipment performance. We deliver “rack-to-roof” cooling, the most comprehensive range of Liebert® precision cooling solutions, which protect mission-critical applications from even the slightest increase in temperature, adopting cutting-edge technologies to achieve the highest efficiency.

■ Racks & Solutions

Optimizing technology and performance needs for indoor IT applications. We deliver standard and customized integrated cabinet solutions that meet unique and specific needs, from Knürr and Liebert® rack solutions for computer rooms of all sizes to integrated racks that include self-contained air conditioning, UPS and cable management in a sturdy, lockable cabinet.

■ Surge Protection

Defending power, voice and data moving through the network against grid irregularities and dangerous electrical disturbances. Depending on the application, we offer Liebert® and PowerSure™ AC Power Protection, Islatrol™ Active Tracking Filters and Edco™ data/signal surge protective devices, all of which provide power protection to reduce downtime, saving crucial man-hours and extending equipment life.

■ Services

Delivering assessment, testing and reliability programs backed by the largest global services organization in the industry. We encompass engineering, installation, startup services, project management, training, and total on-site operations management, preventive and predictive maintenance and energy consumption monitoring.

Service

Emerson Network Power supports Business-Critical Continuity™ with the largest global services organization in the industry and a service offering dedicated to entire critical infrastructure, delivering:

- Design, installation and startup
- Warranty service
- Preventive maintenance
- 24/7 remote monitoring
- Emergency service
- Site audits

Service contracts

Regular service of business critical infrastructure provides uptime assurance and reduces the total cost of ownership over the life of equipment. A service contract ensures that infrastructure is regularly maintained in order to avoid unexpected, costly downtime. Emerson Network Power service contracts cover all technologies and can be tailored to suit individual business needs.



LIFE™.net

Maximized system availability via real-time diagnosis and resolution of operating anomalies

- 24-hour real-time monitoring by expert engineers.
- Monitoring and trending of system data.
- Diagnosis through expert data analysis allowing effective proactive maintenance and prevention of future anomalies.
- Alarm notification.
- On-site corrective maintenance dispatching.

Emerson Network Power

Data Center Infrastructure for Large Applications

Precision Cooling



- SmartAisle™**
- Aisle containment.
 - Provides highest energy efficiency.
 - Works with any Liebert® Cooling Unit.
 - Control works with any Liebert® Cooling Unit.



- Liebert PCW/Liebert® HPM**
From 4 kW to 230 kW, DX-Digital Scroll-CW.
- Premium energy efficiency.
 - Eurovent certified performance.
 - Unique control capabilities with iCOM.



- Liebert® HPC Freecooling Chiller**
- Wide range of high-efficiency freecooling chillers from 40 kW to 1600 kW.
- Designed specifically for data center applications and to work with SmartAisle™.
 - Premium energy efficiency version.
 - iCOM control featured.



- Liebert® CRV**
- Row-based high efficiency precision cooling units available in DX or CW versions.
 - Decoupled control for airflow and cooling capacity.
 - Modulating cooling capacity with digital scroll.
 - iCOM control with remote rack sensors.



- Liebert® XD**
- Refrigerant based high density cooling installed close to the server.
 - Hot spot management for up to 30 kW per rack.
 - On-demand upgrade with plug and play.
 - High efficiency and 100% sensible cooling.

AC Power



- Trinergy™**
- Dynamic functioning modes (VFI, VI, VFD) with average working efficiency of 97.9%.
 - Three dimensions of modularity for optimum scalability (up to 9.6 MW).
 - Maximum availability as a result of internal redundancy and concurrent maintainability.



- Liebert® NXL**
- UPS for critical high power applications.
 - Provides greater power capacity along with superior reliability.
 - Meets power requirements and energy efficiency in high availability data centers.



- Chloride CROSS**
- Ensures redundant power for critical loads, switching between two independent power sources.
 - Solid-state transfer switch available as 2/3/4P versions with full PF range to guarantee compatibility with all load types.
 - Extremely reliable and flexible architecture.

Racks & Solutions



- Knürr CoolTherm® 4-35 KW**
Energy efficient server cabinet technology
- Significant Total Cost of Ownership (TCO) reduction.
 - Autonomous server rack; independent from environmental conditions.
 - Up to 30% improved cooling system energy efficiency.



- Knürr DCD**
Passive chilled water heat exchanger
- Cools up to 30 kW.
 - Neutralizes room heat.
 - Fits to Knürr and third party products.



- Knürr Miracel®/Knürr DCM®**
Global rack platform for data centers, networks and telecommunications
- Lightweight aluminum frame.
 - T-slot system.
 - Simple cable management.
 - Holds up to 1,500 kg.



- Knürr DCL**
Up to 34kW in the row cooling unit
- Design for rack and row cooling.
 - Fail save controller design.



- Knürr Power Distribution Rack**
Central connection unit for power supplies in individual server racks
- Interface between the low voltage feed and PDU.
 - Individual plug-in units.
 - Up to 346 kVA/Rack.



- Rack PDU**
Rack-based power distribution units
- Supports strip-level metering, outlet-level switching and outlet-level metering/switching for remote power management and control.
 - Horizontal and vertical models for a variety of rack configurations in branch and remote offices.

Surge Protection

- Liebert® TVSS**
- Easily connected to UPS, to distribution panels or at the service entrance of facilities.
 - Surge Protective Devices (SPD) designed to protect sensitive equipment from damaging transient voltage surges.

Power Switching & Controls



- ASCO Series 7000 PCS**
Paralleling, synchronization and distribution of on-site Emergency Power
- Integrated touch screen SCADA, redundant PLCs; control & monitor power distribution to critical loads.
 - Historical alarm recording, multi trending, Building Management System communication.

Infrastructure Management & Monitoring



- Avocent® MergePoint Unity™ Appliance**
Secure remote KVM over IP access to servers
- Secure remote access to servers in data centers and branch offices.
 - Using both in-band and out-of-band tools together allows for a more flexible and complete, remote management solution.



- Avocent® Universal Management Gateway Appliance**
Infrastructure management appliance for IT and facilities
- Real-time data collection and integrated monitoring for the Trellis Suite.
 - Access and control of IT equipment using KVM, serial, or embedded technology (auto-sensing ports).



- Avocent® ACS Advanced Console Server**
Secure remote serial over IP access to console devices
- Remotely connect to servers, blades, routers.
 - Built in redundancy and configurable pin-outs for serial ports.



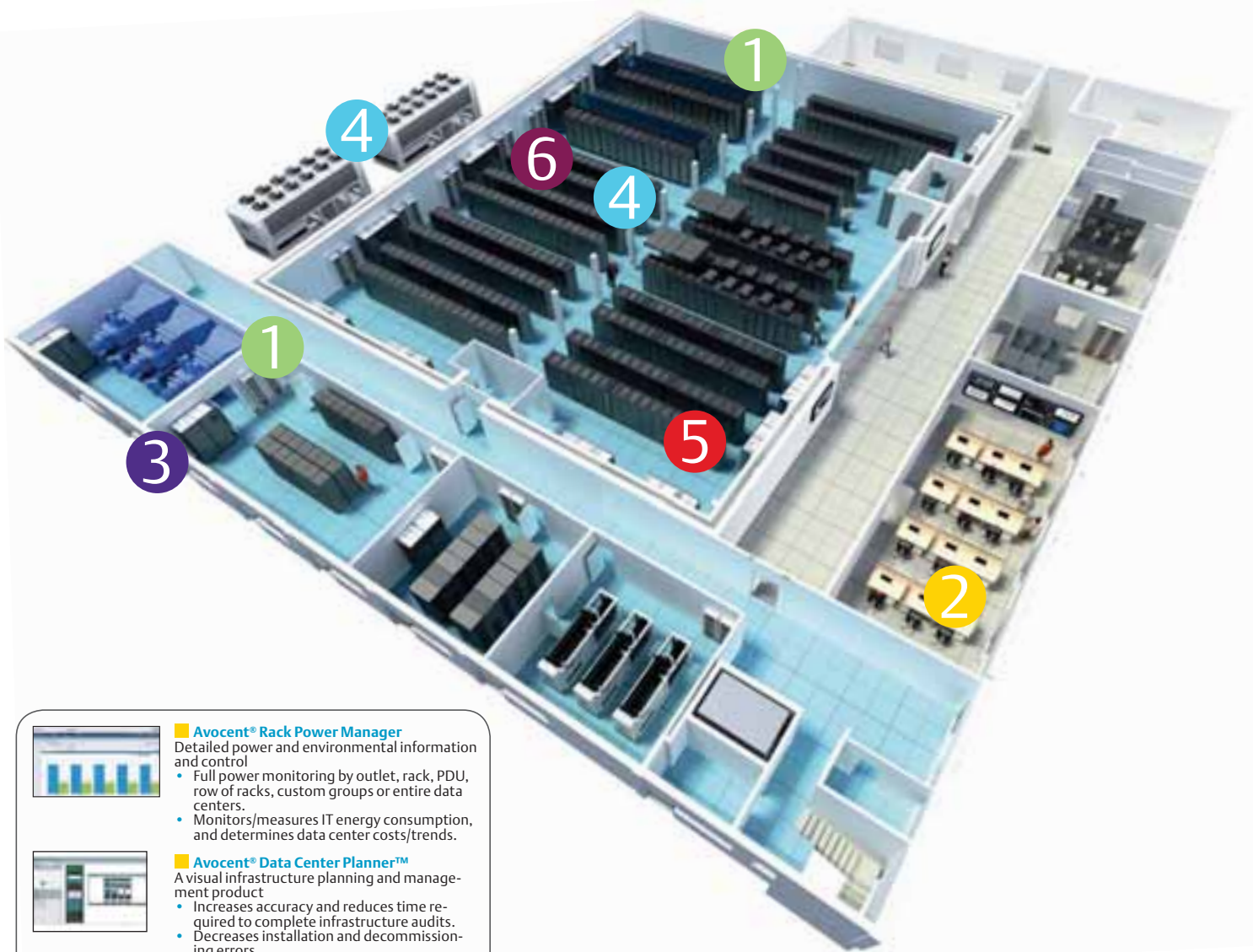
- Alber Battery Monitoring**
Monitors batteries and prevents premature battery failures.
- Internal DC resistance test method to eliminate uncertainty.
 - Much like a battery ultrasound, it enables the user to assess the battery's true condition.



- Knürr Synergy®**
Supports monitoring in any control room with consoles, monitoring walls and mobile charts
- Standards compliance and ergonomics.
 - Manual height selection, even in the basic version.
 - Modular construction.



- Avocent® DSView 4 Management Software**
Centralized data center management
- Remote access and management of all physical and virtual data center assets.
 - Secure, out-of-band, centralized management of all connected IT and network devices in dispersed data centers.



Avocent® Rack Power Manager
Detailed power and environmental information and control

- Full power monitoring by outlet, rack, PDU, row of racks, custom groups or entire data centers.
- Monitors/measures IT energy consumption, and determines data center costs/trends.



Avocent® Data Center Planner™
A visual infrastructure planning and management product

- Increases accuracy and reduces time required to complete infrastructure audits.
- Decreases installation and decommissioning errors.
- Reduces time to provision and install equipment.
- Enables upfront analysis on impact of changes before committing resources.

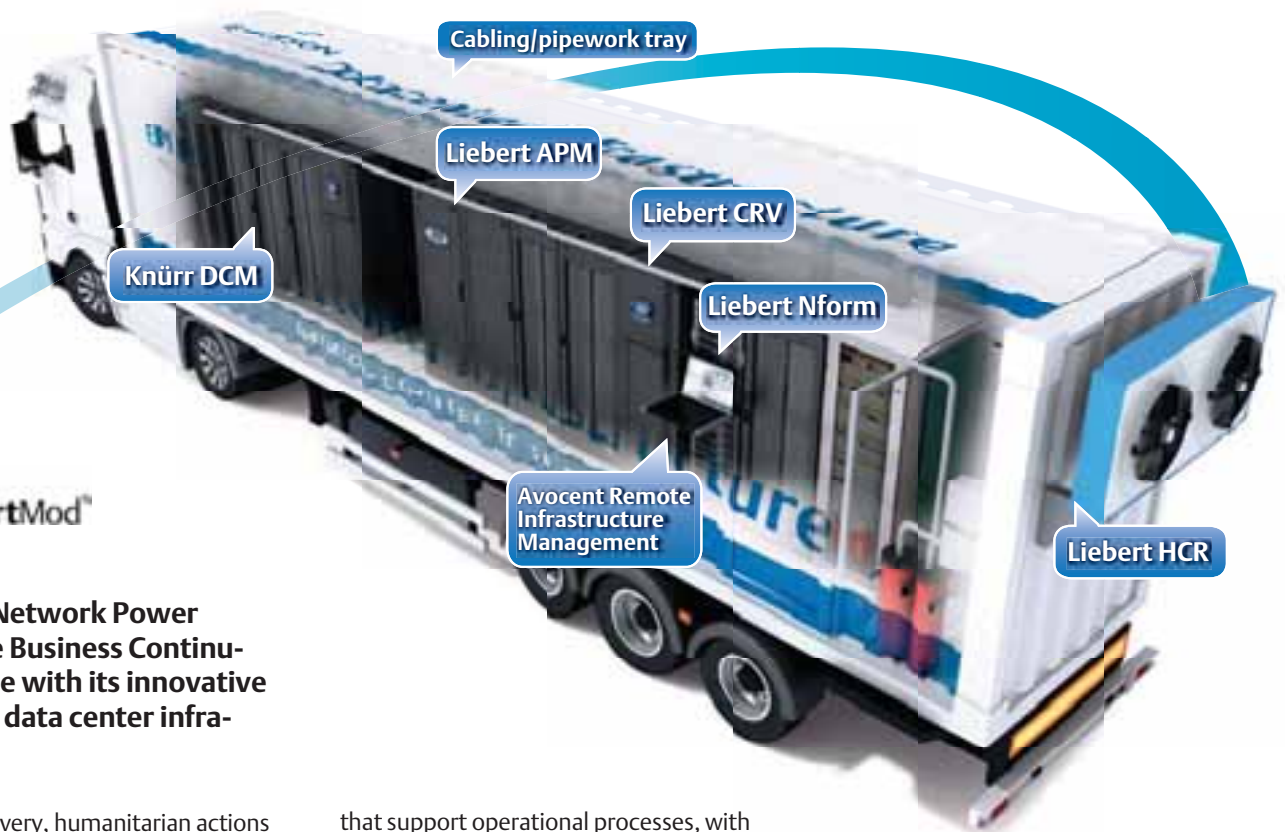


The Trellis™ platform
The Trellis platform unifies facilities and IT infrastructure with real-time data and insights like no other solution on the market

- Manages critical infrastructure in real-time by operating equipment at the optimal threshold and improving energy efficiency.
- Increases operational efficiency across the business.
- Single platform reduces administrative costs and provides faster ROI.
- Defers/eliminates capital expenditures by operating equipment at the optimal threshold without compromising availability.

- | | |
|---|----------------------------|
| 1 AC Power | 4 Precision Cooling |
| 2 Infrastructure Management & Monitoring | 5 Racks & Solutions |
| 3 Power Switching & Controls | 6 Surge Protection |

Emerson Network Power Container data center infrastructure



Emerson Network Power makes the Business Continuity™ mobile with its innovative Container data center infrastructure:

Disaster recovery, humanitarian actions with natural disasters, sports events, film productions or simple data center extensions – all at no construction cost: the Emerson Network Power mobile infrastructure meets all Business-Critical Continuity™ requirements.

Emerson Network Power once again proves that maximum efficiency is possible with this effective "All-in-one" solution for all standard and special situations!

The Container data center infrastructure is mobile and provides complete, efficient protection for IT infrastructures

that support operational processes, with both standard and special requirements.

The Container can be configured for specific customer requirements and transported anywhere to support the efficiency of stationary or temporary operations rooms.

The benefits of data centers designed for fast site relocation are: IT environment protection without impairing computing performance, continuous power management during an emergency situation and provision of a ready-to-operate integrated platform, which can be quickly activated.

The internal infrastructure includes all available innovative solutions: racks from Knürr, UPS units from Liebert and power distribution units and precision cooling units from Emerson Network Power. The layout is supplemented by infrastructure management solutions and monitoring software from Avocent.

For a virtual view of the Container solution go to:

www.datacenterinfrastructure.eu



Emerson Network Power

Innovative technologies that provide our customers clear competitive benefits

IT managers in data centers and companies are faced with constantly growing challenges: increasingly denser IT infrastructures, heterogeneous manufacturer and component landscapes for critical equipment (power supply, cooling, cabling, racks) and rising energy efficiency requirements.

Emerson Network Power provides

integrated and ready-made IT solutions for small and medium-sized enterprises.

Our racks, UPSs, cooling systems, power distribution systems and cable management solutions are supported by reliable monitoring systems and therefore form the ideal solution for setting up future-proof data centers.



Nowadays successful companies depend on adjustable technologies so they can react quickly to new market requirements. Your data center's support infrastructure must be able to support new IT developments such as virtualization and consolidation, and their power supply and cooling requirements. All changes, relocations or extensions of your IT have an effect on the entire support infrastructure. You therefore require products and support that guarantee reliable operation of your IT systems in these environments.

You will find more information online at:
www.EmersonNetworkPower.eu

Emerson Network Power, a business of Emerson (NYSE:EMR), protects and optimizes critical infrastructure for data centers, communications networks, healthcare and industrial facilities.

The company provides new-to-the-world solutions, as well as established expertise and smart innovation in areas including AC and DC power and renewable energy, precision cooling systems, infrastructure management, embedded computing and power, integrated racks and enclosures, power switching and controls, and connectivity. Our solutions are supported globally by local Emerson Network Power service technicians. Learn more about Emerson Network Power products and services at

www.EmersonNetworkPower.com

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Emerson Network Power

The global leader in *Business-Critical Continuity™*.

- AC Power
- Embedded Computing
- Outside Plant
- Racks & Solutions
- Connectivity
- Embedded Power
- Power Switching & Controls
- Services
- DC Power
- Infrastructure Management & Monitoring
- Precision Cooling
- Surge Protection

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