@Lock – solutions for racks
Access control for data centers and technical rooms

Data centers are broken into on a regular basis. In many cases, the intention is simply to steal high-quality IT equipment. However, breaking in may only be a pretense for stealing data and/or putting in place a man-in-the-middle infrastructure.

On 28 February 2011 for example, an important data center belonging to a global telecommunications service provider was paralyzed by intruders. Only a few weeks previously, a DC service provider working on behalf of a major health care company became the victim of an attempted break-in, which resulted in the entire security concept undergoing a TÜV audit. Generally speaking, attacks of this kind go undetected. Data centers are security areas and therefore need to be secured through various measures. An important part of this is controlling access to and in the data center.

Controlling access to the data center is usually achieved through a combination of organizational measures, e.g., gates and turnstiles, besides a building access control system.

Working with various partners, Vertiv has developed system concepts which not only improve physical security through access controls within the data center but also simplify operative processes, making them less susceptible to errors. These concepts are known as "@Lock".


@lock solution with MLR handles in a co-location datacenter

Option 1: Transponder card system
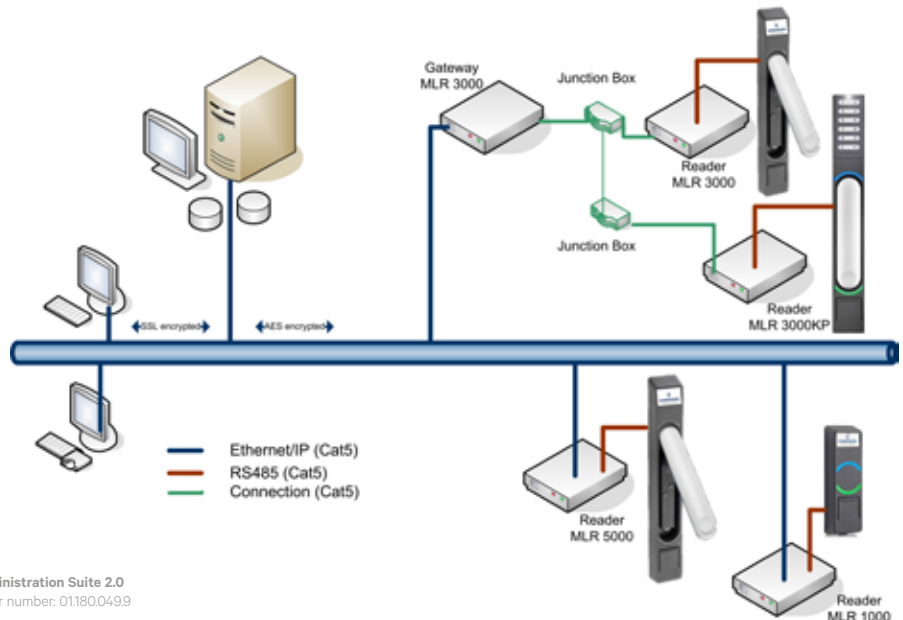### @Lock "transponder card system" concept

This system concept can be applied throughout – from the DC and cold aisle doors to the individual cabinets. In addition to the card readers and handles, the extensive "Administration Suite" management software is a key part of the system.

Thanks to its modular design and open infrastructure architecture, the new Administration Suite can be expanded as required and can also be implemented for third party providers.

- Encrypted data communication between the hardware, server and client.
- Runs on Windows 2000, Windows XP, Windows Vista, Windows Server 2003, Windows Server 2008, Citrix.
- Allows administration of various users with different types of authorization.
- Client/server capability.
- Web client-capable, SNMP alarming.
- Record changes made to the system by users.
- Straightforward user guidance in spite of extensive tools.
- Wide range of alarm messages.
- Automatic alarm notification via e-mail.
- Centralized locking plans and access management.
- Freely selectable four-eyes-principle.
- Support for the most common transponder types.
- Central management of various systems.

- Records all actions in "Log Events".
- Free replacement of the lock system if the authorizing medium is lost.
- Real-time visualization of the swing handle stations.
- Configuration of special days with different locking regimes.
- Allocation of time profiles for access.
- Able to export "Log Events".
- Multilingual software.
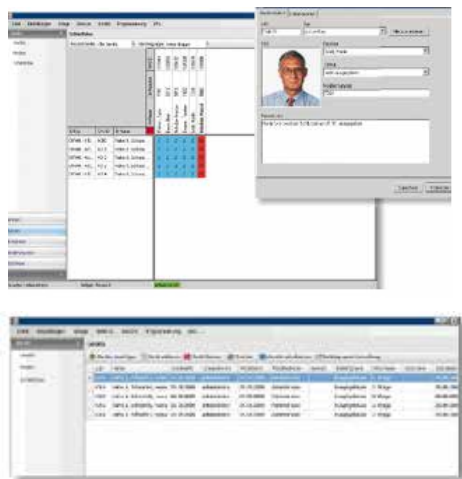
Administration Suite 2.0
Order number: 01.180.049.9

MLR 3000 and MLR 5000 handles are suitable for linking server or network cabinets to the transporter card system. The E-LINE, by Dirak mechatronic swing handles and the Administration Suite software, provide a convenient, reliable way of monitoring access to your data or server cabinet. With the Administration Suite software, security officers can conveniently monitor and manage access directly from a PC.

The integrated LEDs display alarm messages and types of authorization on the handle itself. As a result, technicians on site are given the same information that the Administration Suite software sends to the headquarters. LEDs at the top and bottom of the handle offer permanently high luminosity with low power consumption. As a result, the lock status can be determined quickly, even from a distance of several meters.
The top LED can indicate various statuses, such as that the handle is ready to be opened or locked. The bottom LED displays whether the handle is within or

outside the temperature range for the cabinet selected by the customer. As a result, irregularities may be identified quickly, leaving enough time for appropriate action to be taken.
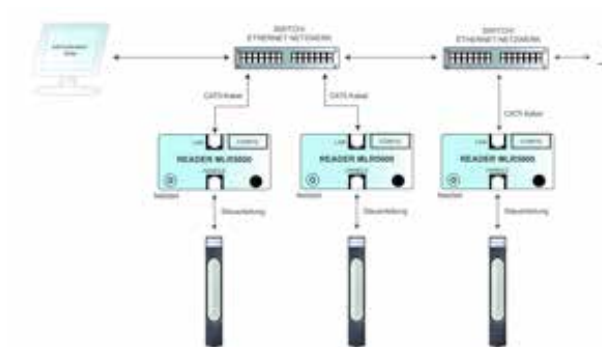
The information display integrated into the handle is backlit and allows customer-specific information, such as the cabinet row, cabinet number etc., to be added for extra clarity.

Handles are also available with integrated Keypad (MLR5000KP). They can be used with either keycard, keypad or both (two-factor-authentification).

@LockMLR3000
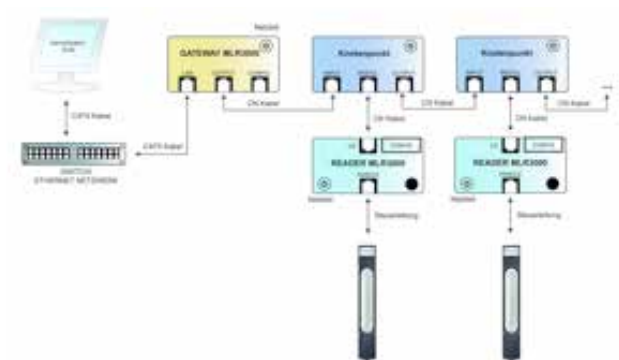
@LockMLR5000

Technical data – @Lock MLR3000/5000

Handle electronics	
Two-part hardware design	Swing handle and reader unit
Visualization	Multicolored status LED
Reader	For 125 kHz transponders (HID 26 bit system), alternatively 13.56 MHz (MIFARE)
Reader	
Housing	Reader unit in plastic housing can be fixed with screws or self-adhesive pad
Power supply	12 V ± 10 % (DC) via low voltage socket
Standby current (system ready)	40 mA (DC)
Max. current consumption (with connector tightening)	440 mA (DC)
RS232 interface for MLR3000	RS232 cable (RXD, TXD, GND, Reader present, PC present), 38,400 baud
Current increase for MLR5000 via Ethernet interface	125 mA (DC)
TCP/IP interface	Ethernet, 10100 Autosense, up to 100 Mbaud
Connecting cable (reader - handle electronics)	8-pole, 350 cm, UL stranded wire AWG 26, one side with gated RJ45 plug, one side with crimped JST ZH connector ZHR-8
Relay output (via screw clamps)	2.5 mm2, can be screwed in from plug side, relay contact: 12 V, 3 A, 60 W, 120
Door contact input (via screw clamps)	2.5 mm2, can be screwed in from plug side, terminals 1 and 2
RS485 interface	RS485 cable to the E-LINE by DIRAK Gateway, (+/A, -/B), 38,400 baud
Memory capacity for transponder cards	2000 + 1 master transponder
Memory capacity for events	500 (ring memory)
Memory capacity for time profiles	30
Integrated real-time clock	With buffering of up to 60 min at 25 °C
Temperature range	-20°C – +70°C

Type	Model	Order No.	UP
@LockMLR3000	for Miracel and DCM front door	**01.180.226.9**	1 unit
@LockMLR3000	for twin door (e.g. DCM rear door)	**01.180.227.9**	1 unit
@LockMLR5000	for Miracel and DCM front door	**01.180.228.9**	1 unit
@LockMLR5000	for twin door (e.g. DCM rear door)	**01.180.229.9**	1 unit
@LockMLR5000KP	for Miracel and DCM front door	**01.180.240.9**	1 unit
@LockMLR5000KP	for twin door (e.g. DCM rear door)	**01.180.241.9**	1 unit

Accessories		Bestell-Nr.	UP
Door contact		**06.108.115.9**	1 unit
HID transponder card		**01.180.040.9**	1 unit
Desktop reader for the initial reading of transponder cards		**01.180.128.9**	1 unit
MLR3000 Gateway		**01.180.111.9**	1 unit
Plug-in power supply (Europe)		**01.180.035.9**	1 unit

Other plug-in power supplies on request

Technical data – MLU3000/5000

MLU card readers can be used to connect a room door with existing electromechanical locking or motorized cold aisle door (Coolfex):

- Three-part hardware design MLU3000 set comprising: external MLU reader, network reader unit and MLU1000 lock.
  Visualization on MLU reader: 2 x multicolored status LEDs and 1 x backlit information display.
  Antenna for 125 kHz transponders (HID 26 bit system).
- **Optional MLU1000 lock**
  – Die-cast zinc (GDZn), color: matt chrome.
  – 4 m control cable.
  – Power supply 24 V DC +/- 10 % 100 mA.
  – Proximity sensor status contact.
  – Wall/sheeting thickness independent.
  – Electronic opening by interrupting the power supply.
- **MLU3000/MLU5000 network reader**
  – Housing reader unit in plastic housing can be fixed with screws or a self-adhesive pad.
  – Nominal input voltage 12/24/48 V ± 10 % (DC) depending on the electronic lock connected.
  – Standby current (system ready) 40 mA (DC).
  – Max. current consumption RJ12 (LOCK) 1.5 A (DC).
  – Max. current consumption via relay clamp 3.0 A (DC), clamps 10-11.
  – RS232 interface RS 232 cable (RXD, TXD, GND, Reader present, PC present), 38,400 baud.
  – Connecting cable (reader - external MLU antenna) 8-pole, 350 cm, UL stranded wire AWG 26, one side with gated RJ45 plug, one side with crimped JST ZH connector ZHR-8.
  – Relay output (via screw clamps) 2.5 mm, can be screwed on from plug side, relay contact: 12 V, 3 A, 60 W, 120 VA, terminals 3 - 5.
  – Door contact input (via screw clamps) 2.5 mm2 can be screwed from plug side, terminals 1 and 2.
  – RS485 - RS485 interface - cable to the E-LINE by DIRAK Gateway, (+/A, -/B), 38,400 baud (MLU3000).
  – TCP/IP Ethernet interface, 10/100 Autosense, up to 100 MBit/s (MLU5000).
  – Power off when open/closed: depending on the electronic lock connected, this is configured in the Administration Suite Config Tool.
  – Memory capacity for transponder cards 2000: + 1 master transponder.
  – Memory capacity for events: 500 (ring memory).
  – Memory capacity for time profiles: 30.
  – Integrated real-time clock with buffering of up to 60 min at 25 °C.
  – Temperature range -20°C – +70°C.

Type	Order No.	UP
MLU 3000	**01.180.231.9**	1 unit
MLU 5000	**01.180.232.9**	1 unit

Option 2: Potential-free contacts
@Lock "potential-free contacts" system concept

Swing handles from the @Lock MLR1000 range are suitable for connecting electromechanical swing handles to existing building management systems or local identification systems, in addition to complementing @LockBlueID or rack monitoring systems.

The handle can be opened as soon as its potential-free contacts are activated or a voltage of 12-24 V DC is supplied. Following activation, the MLR1000 switches to ready-to-open status.

During this period, the user can open the MLR1000 by pressing a button. The LED at the top of the handle offers permanently high luminosity with a low power consumption. As a result, the lock status can be determined quickly, even from a distance of several meters.

The information display integrated into the handle is backlit and allows customer-specific information such as the cabinet row, cabinet number etc., to be added for further clarity.

Technical data – @LockMLR1000

Handle electronics	
Two-part hardware design	MLR1000 and MLR1000 Box
Visualization	Status LED
MLR1000 Box	
Housing	Interface unit, plastic housing can be fixed with screws or self-adhesive pad
Power supply	12 V DC ± 10 % via screw clamps
Standby current (system ready)	40 mA (DC)
Max. current consumption (with connector tightening)	410 mA (DC)
Operating mode	100 % ED
Relay control	12V DC
Operating time	Max. 3 seconds
Contact output	250 V AC, 2 A
Installation position	Vertical
Connection type	Screw clamps, 2.5mm^2
Connecting cable (reader - handle electronics)	8-pole, 350 cm, UL stranded wire AWG 26, one side with gated RJ45 plug, one side with crimped JST ZH connector ZHR-8
Temperature range	-20°C – +70°C

	@Lock MLR5000	@Lock MLR3000	@Lock MLR1000	@Lock BlueID
Software necessary	Admin Suite	Admin Suite	Custom	Web browser, Mobile phone app
E-Line Administration	Yes	Yes	No	No
Suite Software	Yes	Yes	Yes	No
External emergency	Transponder card	Transponder card	Dependent on customer's equipment and software	BlueID
power supply connector	Yes	Gateway	No	Optional
Identification	Yes (in combination w. Administration Suite)	Yes (in combination w. Administration Suite)	Dependent on customer's equipment and software	Optional
IP support	Yes (in combination w. Administration Suite)	Yes (in combination w. Administration Suite)	Dependent on customer's equipment and software	No
Log files	Yes (in combination w. Administration Suite)	Yes (in combination w. Administration Suite)	Dependent on customer's equipment and software	Yes
User profiles	No	No	No	Yes
Four-eyes-principle	Eline by Dirak	Eline by Dirak	Eline by Dirak	BlueID by Baimos Technologies
Off-line mode				
Technology partner				

Type	Model	Order No.	UP
@LockMLR1000	for Miracel and DCM front door	**01.180.224.9**	1 unit
@LockMLR1000	for twin doors (e.g. DCM rear door)	**01.180.225.9**	1 unit

Vertiv™ Knürr® RMS Compact II®
Constant Reliability with Remote Monitoring

The advantages of Vertiv Knürr's modern rack monitoring system:

- Guarantees fault-free operation.
- Early disturbance detection.
- Incident logging.
- Automatic monitoring simplifies maintenance.
- Activates countermeasures in the event of a malfunction.
- Central status control of: filters, paper, toner, meter readings, inspection intervals, and much more.
- Up to 12 sensors can be connected in any arrangement.

System Reliability and Availability
System and network management requirements mean the systems' ambient conditions must be monitored. Compliance with the required ambient parameters is extremely important for successful/continuous operation of high-grade components.

Management Software
Inadmissible fluctuations in temperature or humidity often cause hardware defects. Constant automatic monitoring of these parameters is therefore a basic requirement for safeguarding operability. All the relevant data can be recorded and forwarded directly to a higher-level management system, e.g. Nagios Vertiv Nform™ with the Vertiv Knürr RMS Compact II®.

Alarm Consolidation and Control
Simply recording data does not suffice to ward off damages. When faults occur, short response times are aided by the monitoring system triggering actions automatically (e.g. activating additional fans).

Fast Response
When defined incidents occur, the RMS Compact II can immediately send a message as an "SNMP trap" to the management system or directly as an e-mail to a technician or an SMS gateway.

RMS20013

RMS20015

RMS20047

RMS20048

Vertiv™ Knürr® RMS Compact II®

■ **Description**
- **Compact construction** - Zero unit solution (for mounting outside the 19" installation area).
- 19" installation with adapter bracket.
- Safe clamping of all connected cables with integrated cable clamping bracket.
- Cost-effective orderly installation with Plug & Play concept.
- Convenient cabling with RJ45 sensor connections.
- TCP/IP connection via Ethernet (10/100 Base T).
- Configuration via SNMP and Web-Browser.
- Web access is password-protected and optionally encrypted (https).
- 3 different user levels.
- Freely programmable filter system (Boolean logic) for implementing all alarm conditions.
- Compatible with standard network-management and infrastructure-management systems such as Vertiv Nform™ or Open-Source.
- Sensors for monitoring all relevant environmental influences (optional).
- Internal power supply for sensor equipment (no additional power supply necessary).
- Alarms via LEDs, relay, network management or e-mail (SMTP).
- Support from Modbus/TCP.
- System time balancing with NTP servers.

Technical data
- 12 universally usable sensor inputs for temperature and humidity sensors, digital (on/off) or analog sensors (0…10V).

- 3 digital outputs (2 x relay, max. 3 A at 230 VAC, 1 x 750 mA at 48 VDC).
- Power supply: 100 – 240 VAC.
- Operating voltage: 12 VDC.

Compliance
- CE Marking compliant with
  - 2014/35/EU Low Voltage Directive (LVD)
  - 2014/30/EU Electromagnetic Compatibility Directive (EMC)
- 2011/65/EU RoHS2 Directive.

Color
- RAL 7021, dark-grey.

Scope of delivery
- 1 x Knürr RMS Compact II.
- 1 x power supply unit.
- 2 x 19" mounting brackets.
- 1 x support bracket for power supply unit.
- 1 x CD ROM (with manual, MIB file).

How supplied
- In sets.

| W	H	D	Model	Order No.	UP
350	42	170	RMS Compact II®	**06.108.200.8**	1 set

ECO Temperature Sensor

■ **Quick and easy installation**
– Insensitive to disturbances.
– No additional power supply required.
– The sensor must be recalibrated.

■ **Technical data**
– Temperature measurement range: 0..60°C.
– Accuracy : ± 5 %.

■ **Scope of delivery**
– 1 x sensor.
– 1 x mounting kit.

LUF20069

Model	Order No.	UP
ECO	**06.108.220.9**	1 unit

Humidity Sensor

■ **Avoids dew**
– Insensitive to disturbances.
– Additional power supply required.
– The sensor does not have to be recalibrated.

■ **Technical data**
– Air measurement range 30 – 90 %.
– Accuracy: ± 5 %.

■ **Scope of delivery**
– 1 x sensor with RJ45 port.
– 1 x mounting kit.
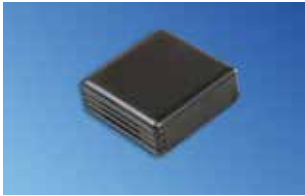
RMS20019   *(similar to picture)*
RMS compact-specific

Order No.	UP
06.108.212.9	1 unit

Water Sensor

■ **Conductive water spot sensor**
– Detects presence of water.

■ **Technical data**
– Operating voltage: max. 24 VDC.

■ **Scope of delivery**
– 1 x sensor with 2 m connection cable.
– 1 x mounting bracket.

RMS20031

Order No.	UP
06.108.217.9	1 unit

Door Contact Sensor

■ **No additional magnet required**
– Magnet bridge sensor works on all magnetic conductive materials (no special mating part required).
– Can also be used for monitoring side panels and roof.
– Standard cable length, 4 m.

■ **Technical data**
– Temperature range: -20° C to +70° C.
– Switching voltage, max. 200 VDC.
– Switching current, max. 500 mA.

■ **Scope of delivery**
– 1 x sensor with 4 m connection cable.
– 1 x mounting kit.

RMS20006

Order No.	UP
06.108.215.9	1 unit

Air Speed Sensor

■ **Fan and filter monitoring**
– No additional power supply.
– Automatic detection as analog sensor.
– Does not have to be recalibrated.
– Offset and alarm parameters can be set in RMS.

■ **Technical data**
– Measurement range: 0 to 1 m/s.
– Non-linear measurement,
Value table:
< 0 m/s < 1 V
0 m/s 1 V
1 m/s 1.7 V
2 m/s 2.9 V
3 m/s 4.1 V
4 m/s 5 V (6 V max.).

■ **Scope of delivery**
– 1 x sensor with 4 m connection cable.
– 1 x mounting kit.

RMS20032

W	H	D	Order No.	UP
20	39	9	**06.108.218.9**	1 unit

Dimensions in mm:

					Conversion:	
W	= Width	h	= Installation height	U	= Standard rack unit	kg = Weight	1 mm = 0.03937 inch
H	= Height	d	= Insertion depth		(1 U = 44.45 mm)		1 kg = 2.2046 pounds
D	= Depth	L	= Length	UP	= Packaging unit		

Smoke Detector

- **Sends signal to IT Department**
  - Optical smoke detector with VdS approval.
  - For early fire detection with smoke emission.
  - Power supply provided via RMS compact.
  - Standard cable length, 4 m.

- **Technical data**
  - Operates between -20°C and +75°C.

- **Scope of delivery**
  - 1 x sensor with 4 m connection cable.
  - 1 x mounting kit.

W	H		Order No.	UP
Ø 90	75		06.108.211.9	1 unit

Vibration Sensor

- **Protection against vandalism**
  - Detects vibrations.
  - Theft prevention.
  - Reset possible via Viewer software.

- **Scope of delivery**
  - 1 x sensor with 4 m connection cable.

	Order No.	UP
	06.108.213.9	1 unit

Passive Infrared Movement Sensor

- **Security**
  - Room monitoring with state-of-the-art technology.

- **Technical data**
  - VdS approval: Classes A + B.
  - Range of volumetric lens: 2 – 16 m.
  - Long lens range: 29 – 50 m.
  - Curtain lens range: 17 – 30 m.
  - Manipulation monitoring.
  - Digital fault evaluation.
  - Corner or wall mounting.

- **Scope of delivery**
  - 1 x sensor with 4 m connection cable.
  - 1 x mounting kit.

	Order No.	UP
	06.108.214.9	1 unit

Sensor Cable

- **Plug & Play for own sensors**
  (Third party and/or any existing analogue/digital sensor)
  - The 4 m long cable is used for connecting further analog/digital sensors or alarm outputs to the sensor input of the Knürr RMS compact II.
  - One end of the cable has an RJ45 connection while other end is open.
  - The RMS automatically recognizes a sensor that is connected to this cable as an analog sensor.
  - A sensor can be supplied with 12 V voltage using the cable.

- **Technical data**
  - Length: 4 m.

- **Scope of delivery**
  - 1 x cable.
  - 1 x layout overview.

- **How supplied**
  - In sets.

Model	L	Order No.	UP
Analog sensor cable	4000	06.108.225.9	1 unit
Digital sensor cable	4000	06.108.224.9	1 unit

Sensor Extension Cable

- **Flexible positioning of sensors**
  - The cable is used for extending RMS compact II sensors.
  - It consists of a cable with a connected RJ45 plug and an RJ45 connector.

- **Technical data**
  - Length: 3 m and 10 m.

- **Scope of delivery**
  - 1 x cable.

- **How supplied**
  - In sets.

Model	L	Order No.	UP
Sensor extension cable	3000	06.108.223.1	1 unit
Sensor extension cable	10000	06.108.223.5	1 unit

Power over Ethernet (PoE) Update Set

- **Save on cabling**
  - Saves on costly power supply installations (e.g. WLAN access points) or enables centralized UPSs for decentralized equipment (e.g. IP phones).
  - Using the PoE update set, the RMS can therefore support installations with the corresponding UPS concepts and/or non-standard IDF room.

- **Technical data**
  - Input: 48 V DC, 400 mA.
  - Output: 12 V DC (12 W).
  - Operating temperature: 0° to 40° C.
  - Storage temperature: -40° to 70° C.
  - Operating air humidity: 10% to 80% rel. humidity.

- **Dimensions**
  - Length: 81 mm.
  - Width: 52 mm.
  - Height: 28 mm.

- **Approvals**
  - EMI: FCC Part 15 Class B, CE Class B.
  - Safety: UL, TUV.

- **Scope of delivery**
  - 1 x PoE adapter.
  - 1 x mounting bracket for easy attachment to the RMS (similar to the classic power supply unit mounting bracket).

- **How supplied**
  - In sets.

Model		Order No.	UP
PoE update set		06.108.230.8	1 unit

Carbon Monoxide Alarm Sensor

■ **Detects smoke-free gases and triggers an alarm**
– Used for detecting carbon monoxide emitted by burning fire-retardant cables.
– Sends signals carbon monoxide to the RMS and triggers an alarm.
– Standard cable length, 4 m.
– The RMS automatically recognizes this sensor as a digital sensor.

■ **Technical data**
– Operating voltage: 12 VDC (± 20 %).
– Power consumption: approx. 190 mA (idle) approx. 280 mA (alarm).
– Sensitivity: 100 ppm CO.
– Ambient temperature: -15° C to 40° C.
– Piezo alarm: approx. 85 dB(A) at 3 m away.
– Protection rating: IP 20.
– Switching output 12 V DC: Max. 170 mA.
– Relay output: Changeover contact, max. 5 A 230 V DC, max. 5 A 30 V DC.
– Reset: automatic when the gas concentration falls below sensitivity level.

■ **Dimensions**
– Length: 140 mm.
– Width: 125 mm.
– Height: 40 mm.

■ **Color**
– White.

■ **Scope of delivery**
– 1 x sensor.
– 1 x sensor connection cable.
– 1 x Mounting kit.
– 1 x Instructions.

■ **How supplied**
– In sets.

Model	Order No.	UP
Carbon monoxide alarm sensor	**06.108.211.8**	1 unit

Dimensions in mm:
W = Width   h = Installation height   U = Standard rack unit   kg = Weight
H = Height   d = Insertion depth   (1 U = 44.45 mm)
D = Depth   L = Length   UP = Packaging unit

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

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Vertiv™ Nform™

## Increases Reliability and Energy Efficiency

Vertiv™ Nform™ helps meet these requirements:

Overview of data center status

- Vertiv Nform is data-center monitoring software especially for Vertiv infrastructure systems with a trend analysis function, alarm management and result notifications.

What does Vertiv Nform offer?

- Vertiv Nform provides a uniform monitoring interface with an overview of the operative status of a large number of devices, such as:
  - PDUs: Liebert MPX®, Liebert MPH®, Knürr DIS Rack PDU® RM.
- Uninterrupted power supplies.
- Water-cooled racks, such as:
  - Vertiv Knürr CoolLoop®, Vertiv Knürr CoolTherm®.
- Thermal management equipment.
- Environmental monitoring systems, such as:
  - Vertiv Knürr RMS Compact II®.
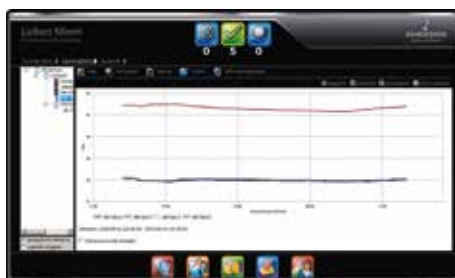
Inline Metering System (IMS)
Optimum Upgrade Solution for Existing Installations

Vertiv Inline Metering System (IMS) benefits:

- Existing rack PDUs can be retrofitted for optimal savings.
- Almost all consumers can be integrated into the monitoring system, since numerous plug systems are provided (1 ph – 3 ph, max. 63 A per phase).
- Flexible installation inside or outside the rack (e.g. on shelf).

Monitoring is already part of the everyday routine in most data centers when it comes to system availability. Consequently, new systems are equipped with socket strips or P**DUs with integrated monitoring** (Managed PDUs or Adaptive PDUs). Yet, what can be done about existing systems containing socket strips
or PDUs that do not provide measuring functions?

Vertiv'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 B-feed, **retrofitting is possible without have to interrupt operation**. The IMS modules can also be installed inside or outside the rack; e.g., on the shelf to save space.

IMS model series overview

VERTIV MPX IMS

Features
- The rack PDU software interface is familiar; communication card is the same as the ones for MPX/ MPH.
- Highest possible reliability and availability with an operating temperature of max. 55°C.
- Comprehensive measurement functions (electricity, current, power and energy) with a high measurement accuracy of up to ± 1%.
- N-conductor overload with 3-phase systems can be prevented as the N-conductor current is monitored.
- Easy connection to the network of up to 4 Liebert MPX IMS / MPH / MPX with only one IP address.
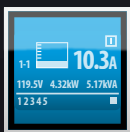- External sensors and a display can also be connected.

INPUT POWER
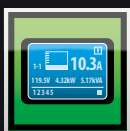■ Single-phase or three-phase
■ 16 A up to max. 63 A

OUTPUT DISTRIBUTOR
■ Single-phase or three-phase
■ 16 A up to max. 63 A

MONITORING
■ Input level.

LOCAL MONITORING
■ Display for user (MPX™ IMS).

REMOTE MONITORING
■ Secure web and SNMP interfaces

RACK PDU ARRAY™
■ One IP address; up to 4 rack PDUs (MPX IMS)
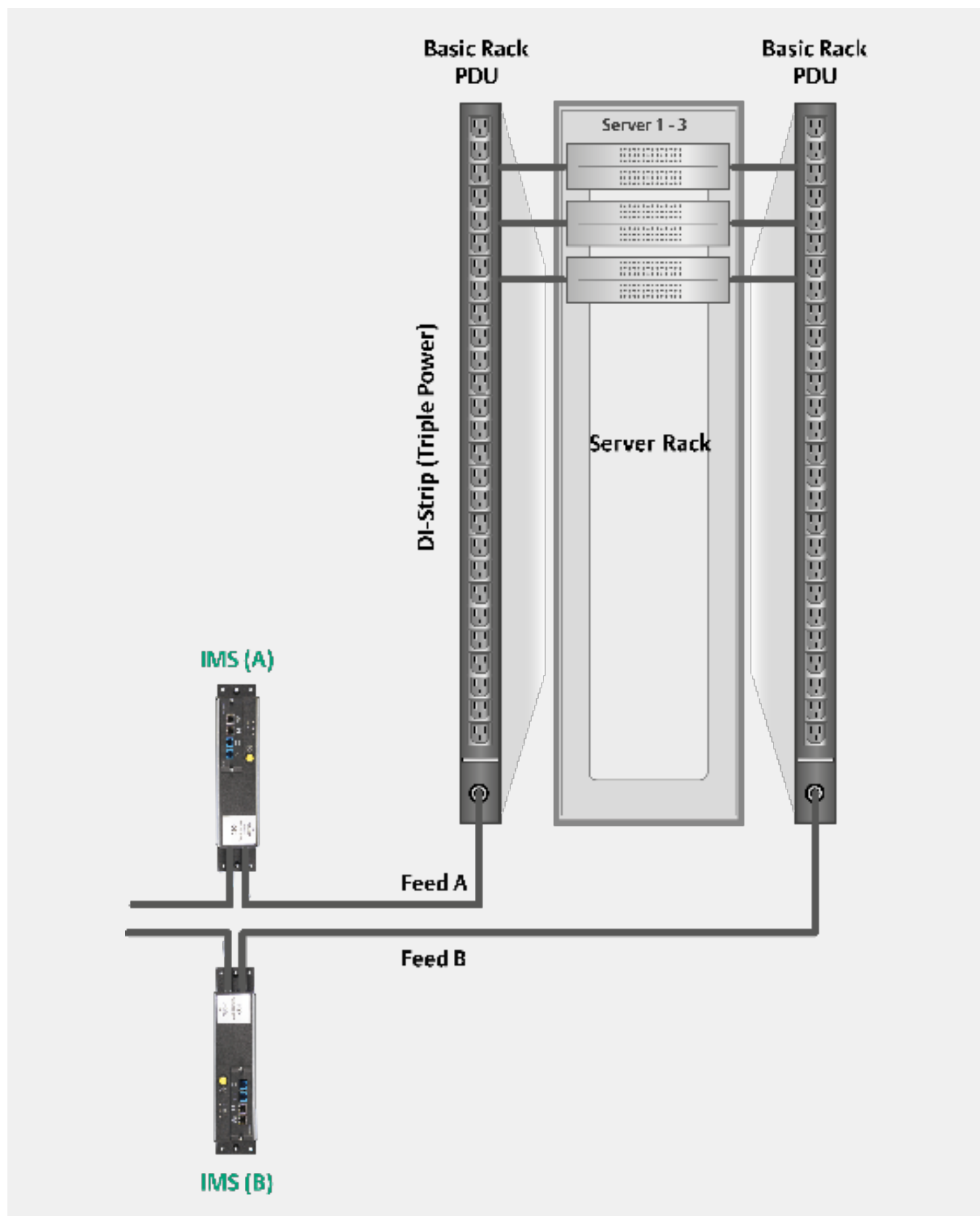■ MPX, MPH™ and IMS in the same private network

Vertiv IMS – product series

Features	Vertiv MPX™ IMS	Knürr Modular IMS
Measurement module	■	■
Modular		■
Display	External	
Remote interface	■	■
Measuring at input level	■	■
Measurement modules per IP address	4	75
Max. measurement points per IP address	4	300
Visualization at PDU level	■	■
Visualization at rack level	■	■
Visualization at room level	Only with additional software: Vertiv Nform or Avocent DSView	■
Measurement parameters	A, V, W, kWh	A, V, W, VA, Var, kWh, cosphi
Phase asymmetry analysis	■	■
External sensor connection options	■	■
Input power	1 ph + 3 ph, max 63 A	1 ph + 3 ph, max. 63 A (max. 4 feeds), max. 3 ph 999 A (via external transducer)
Connection option	IEC 60309	IEC 60309, GST18, fixed connection
Protocols	HTTP, HTTPs, SNMP, Telnet	HTTP, HTTPs, SNMP v3,
Storage in external database	Only with additional software: Vertiv Nform or Avocent DSView	Oracle, MySQL, MSSQL

Order number		
1 ph. 16 A	MPXIMS-EHBBXS30	On request
1 ph. 32 A	MPXIMS-EHBBXQ30	On request
3 ph. 16 A	MPXIMS-EHBBXT30	On request
3 ph. 32 A	MPXIMS-EHBBXR30	On request
3 ph. 63 A	MPXIMS-EHBBXZ30	On request

Easy Upgrade from Basic Power Distributor to Measurement-enabled Power Distributor

Basic Rack
PDU

Basic Rack
PDU

Server 1 - 3

Server Rack

DI-Strip (Triple Power)

IMS (A)

IMS (B)

Feed A

Feed B

IMS_8141

Vertiv™ MPX™ IMS

- Existing rack PDUs do not have to be replaced as the modules can be retrofitted.
- Almost all consumers can be integrated into the monitoring system, since numerous plug systems are provided (1 ph – 3 ph, max. 63 A per phase).
- Flexible installation inside or outside the rack (e.g. on shelf).
- Liebert® Rack PDU software interface is familiar; communication card is the same as the one for Liebert MPX/MPH.
- Highest possible reliability and availability with an operating temperature of max. 55°C.
- Comprehensive measurement functions (electricity, current, power and energy), with high measurement accuracy of up to ± 1%.
- N-conductor overload with 3-phase systems can be prevented since the N-conductor current is monitored.
- Easy connection to the network of up to 4 Liebert MPX IMS / MPH / MPX with only 1 IP address.
- External sensors and a display can also be connected.

■ **Technical data**
Interfaces:
- RJ-45 LAN port (10/100 MBit) for connecting to local area 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™).
- Serial interface RS232.
- Display port for connecting the RPC BDM (display module).
- External sensor port for connecting optional sensors.
- Remote management: Onboard web interface, CLI, SNMPv1, 2, 3, SSH, Telnet, integratable into Avocent ACS, UMG & MPU, DSView, Rack Power Manager, Vertiv Nform & Vertiv *Trellis* as well as Nagios or other management software programs.
- Authentication: local, remote; active directory, LDAP, TACACS, Radius, Kerberos.
- Encryption: MD5, AES, DES.

■ **Supported technologies:**
- Web support provided by Liebert MPX control and management. Authorized users can view status information via their network.
- SNMP support provided by Liebert MPX SNMP management.
- Easy integration into Vertiv Nform, Avocent DSVIEW3 and Nagios.

■ **Material / Finish**
- Enclosure: aluminum.
- Cover: sheet steel.

■ **Dimensions**
- Height: 81 mm.
- Width: 75 mm.
- Length: 266 mm.
- Input cable length: 3 m.
- Output cable length: 0.5 m.

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

■ **Color**
- Enclosure: aluminum/RAL 7021 dark-gray.

■ **Scope of delivery**
- 1 x MPXIMS-Module/power supply.

■ **How supplied**
- In sets.

Model	L	Input values	Input connector	Output socket	Order No.	UP
Vertiv MPX™ IMS 1 x 16 A	266	230 VAC, 16 A	IEC60309 1ph/N/PE 6h	IEC60309 1ph/N/PE 6h	**MPXIMS-EHBAXS30**	1 unit
Vertiv MPX™ IMS 1 x 32 A	266	230 VAC, 32A	IEC60309 1ph/N/PE 6h	IEC60309 1ph/N/PE 6h	**MPXIMS-EHBAXQ30**	1 unit
Vertiv MPX™ IMS 3 x 16 A	266	230/400 VAC, 16 A	IEC60309 1ph/N/PE 6h	IEC60309 1ph/N/PE 6h	**MPXIMS-EHBAXT30**	1 unit
Vertiv MPX™ IMS 3 x 32 A	266	230/400 VAC, 32 A	IEC60309 1ph/N/PE 6h	IEC60309 1ph/N/PE 6h	**MPXIMS-EHBAXR30**	1 unit
Vertiv MPX™ IMS 3x63A	266	230/400 VAC, 62A	IEC60309 3ph/N/PE 6h	IEC60309 3ph/N/PE 6h	**MPXIMS-EHBBXZ30**	1 unit

IMS_Modular

Vertiv™ Knürr® Modular IMS

– Existing rack PDUs modules can be retrofitted.
– Almost all consumers can be integrated into the monitoring system, since numerous plug systems are provided (1 ph – 3 ph, max. 63 A per phase).
– Flexible installation inside or outside the rack (e.g. in shelf).
– Extensive measurement functions (electricity, current, effective power, apparent power, reactive power, energy and power factor), with high measurement accuracy of up to 0.17 % (referring to the end value of the specific measurement range).
– Very high input currents can be measured (up to 999 A per phase via external transducer).
– The modular setup means the solution can be customized (e.g. up to 4 in-feeds per module with different input plugs or even fixed feed).
– Up to 75 modules can be controlled via one IP address.
– Storage in external databases possible without additional software.

■ **Technical data**
– The measurement modules can only beoperated with a control unit.
– No more than 75 measurement modules can be connected to a single control unit.
– 2 x RJ 45 LAN Port 10/100MBit for local network connection (on the control unit).
– Visualization of all connected measurement modules via WEB.
– Status information visible via WEB.
– Protocols: HTTP, HTTPs, SNMPv3.

– Storage in external data base possible (Oracle, MySQL, MSSQL).
– Integration into building systems also possible via potential-free contacts.
– Temperature sensors can be connected.

■ **Dimensions**
– Length/depth (control unit): 600 mm.
– Length/depth (module): 400 mm.
– Width: 483 mm (19").
– Height: 88.8 mm (2 U).
– Power supply cable: length, 2 m.
– Output: socket fixed on device.

■ **Approvals/certificates**
– CE label in accordance with Low Voltage Directive 2006/95/EC.
– EMC Directive 2004/108/EC.
– FFC.
– GS Certificate.
– CB scheme.

■ **Color**
– RAL 7021, dark-gray.

■ **Scope of delivery**
– 1 x Measurement modules, control unit.

■ **How supplied**
– In sets.

Model	Input values	Input connector	Output socket	Order No.	UP
Knürr Modular IMS 1x16 A	2 x 230 VAC, 16 A	2 x IEC60309 1ph/N/PE 6h	2 x IEC60309 1ph/N/PE 6h	**On request**	1 unit
Knürr Modular IMS 1 x 32 A	2 x 230 VAC, 32 A	2 x IEC60309 1ph/N/PE 6h	2 x IEC60309 1ph/N/PE 6h	**On request**	1 unit
Knürr Modular IMS 3 x 16 A	2 x 230/400 VAC; 16 A	2 x IEC60309 1ph/N/PE 6h	2 x IEC60309 1ph/N/PE 6h	**On request**	1 unit
Knürr Modular IMS 3 x 32 A	2 x 230/400 VAC; 32 A	2 x IEC60309 1ph/N/PE 6h	2 x IEC60309 1ph/N/PE 6h	**On request**	1 unit
Knürr Modular control unit				**On request**	1 unit