



Rack-Level Data Center

Xubus Edge



A data center is a physical facility that someone use to house their critical applications and data. A data center's design is based on computing and storage resources that enable the delivery of shared applications and data.

It generally includes backup components and infrastructure for power supply, data communication connections, environmental controls (e.g. air conditioning, fire suppression) and various security devices.)

What is the rack-level data center solution



Quick deployment for complex services without specific needs for safe space



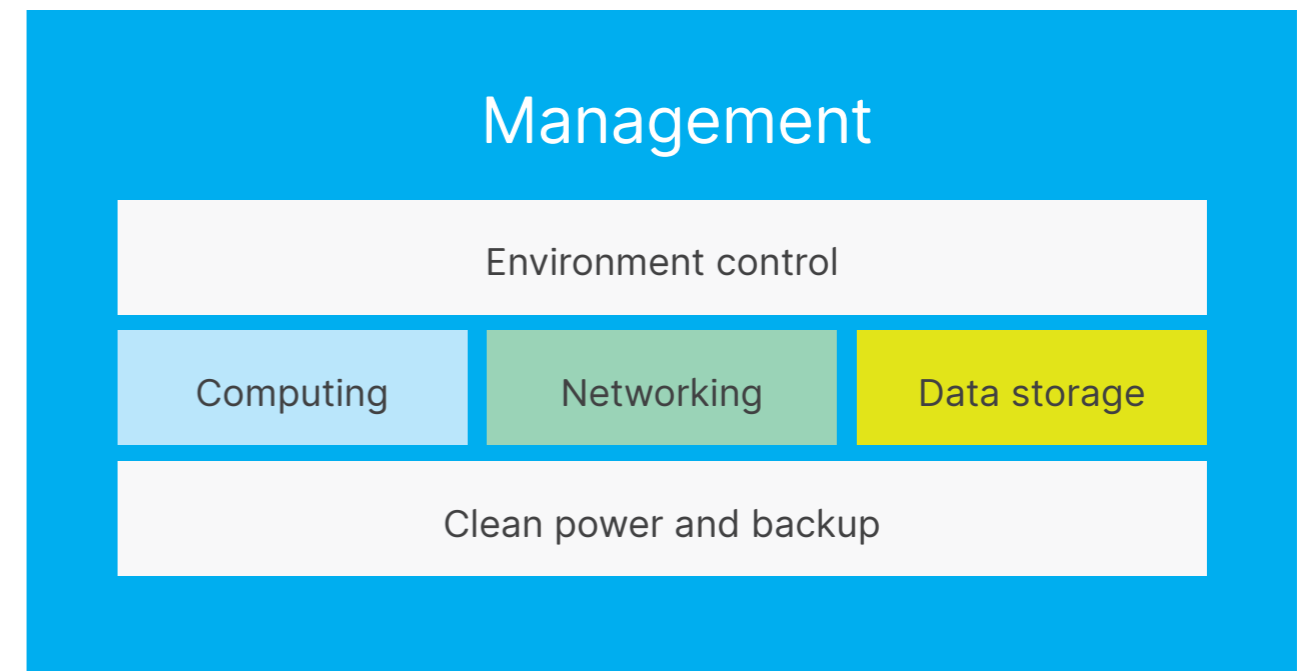
Pre-designed, pre-tested for quick deployment and it is very easy to replicate



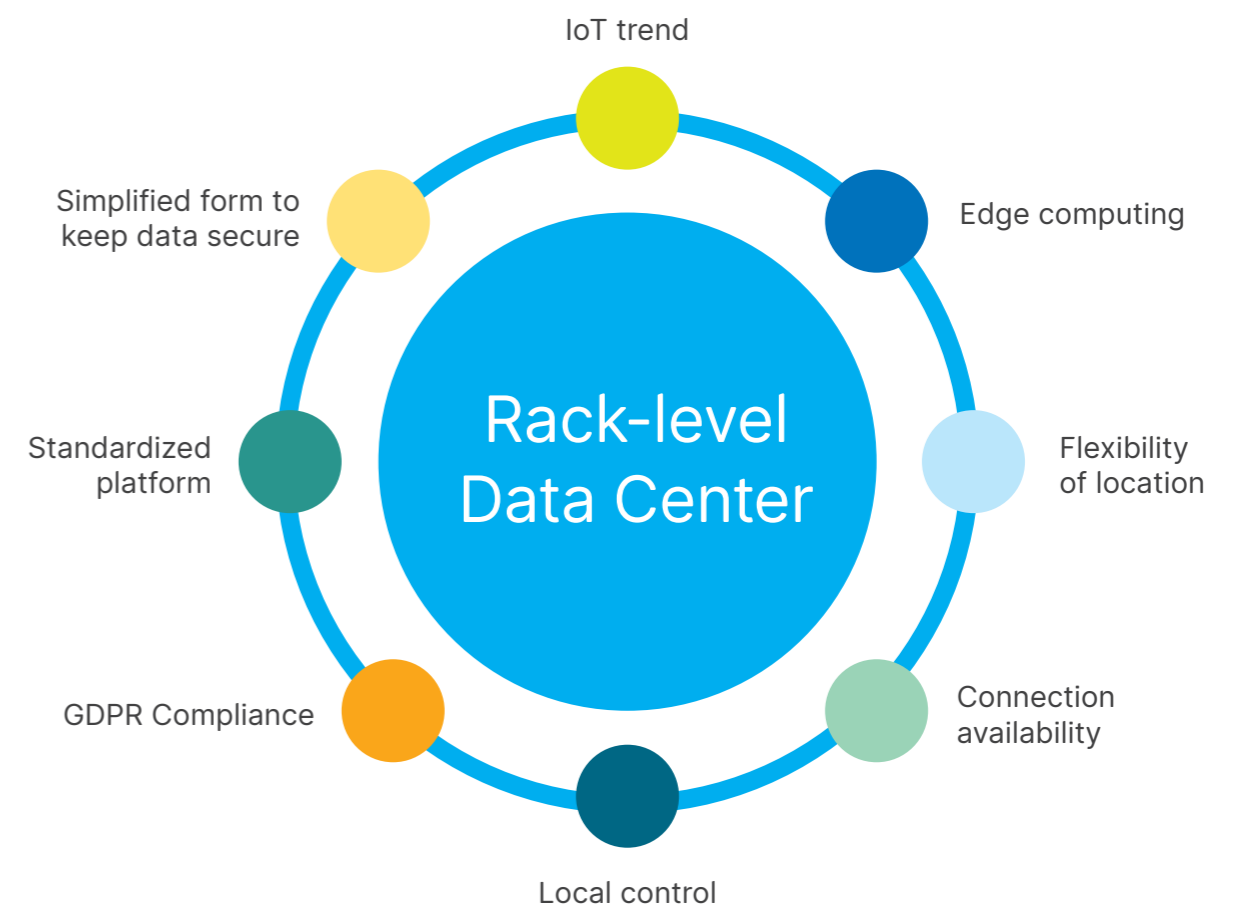
Quick deployment and pre-testing result in costs saving and flexibility



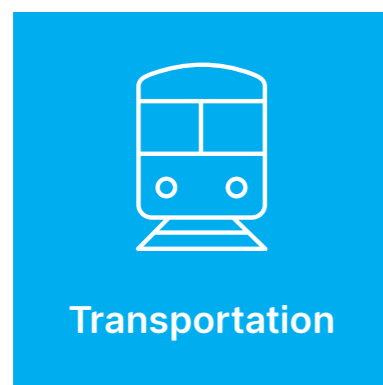
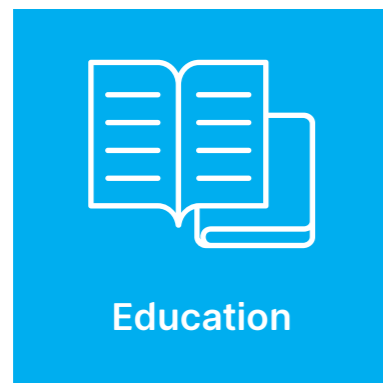
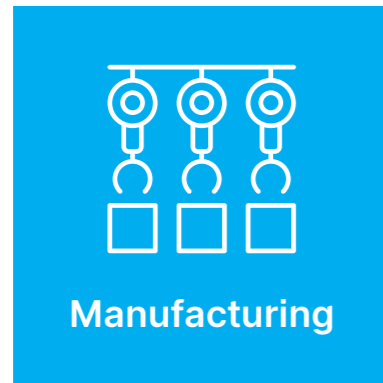
Safe space, environmentally controlled with HW and SW for power conditioning and backup, power distribution, environmental management (cooling), security monitoring, data computing, data switching (optional), data storing



Driving factor of rack-level data center



Ideally solutions in different verticals



Application by verticals

Industry

- Manufacturing control
- Edge computing for utilities
 - Collect data and Control Power distribution
 - Collect data and Water distribution
 - Collect data and Gas distribution
- Transportation – truck control, goods control
- Data center for Small enterprises

Government

- Data processing regional agencies and authorities
- Data processing and storage for schools
- Railway control and ticketing
- Army – local Data centers and application Data centers
- Police – regional offices, different applications
- Municipality – local Data centers, local agendas

BFSI

- Banks - Branch computing centers
- Insurance companies – regional computing centers

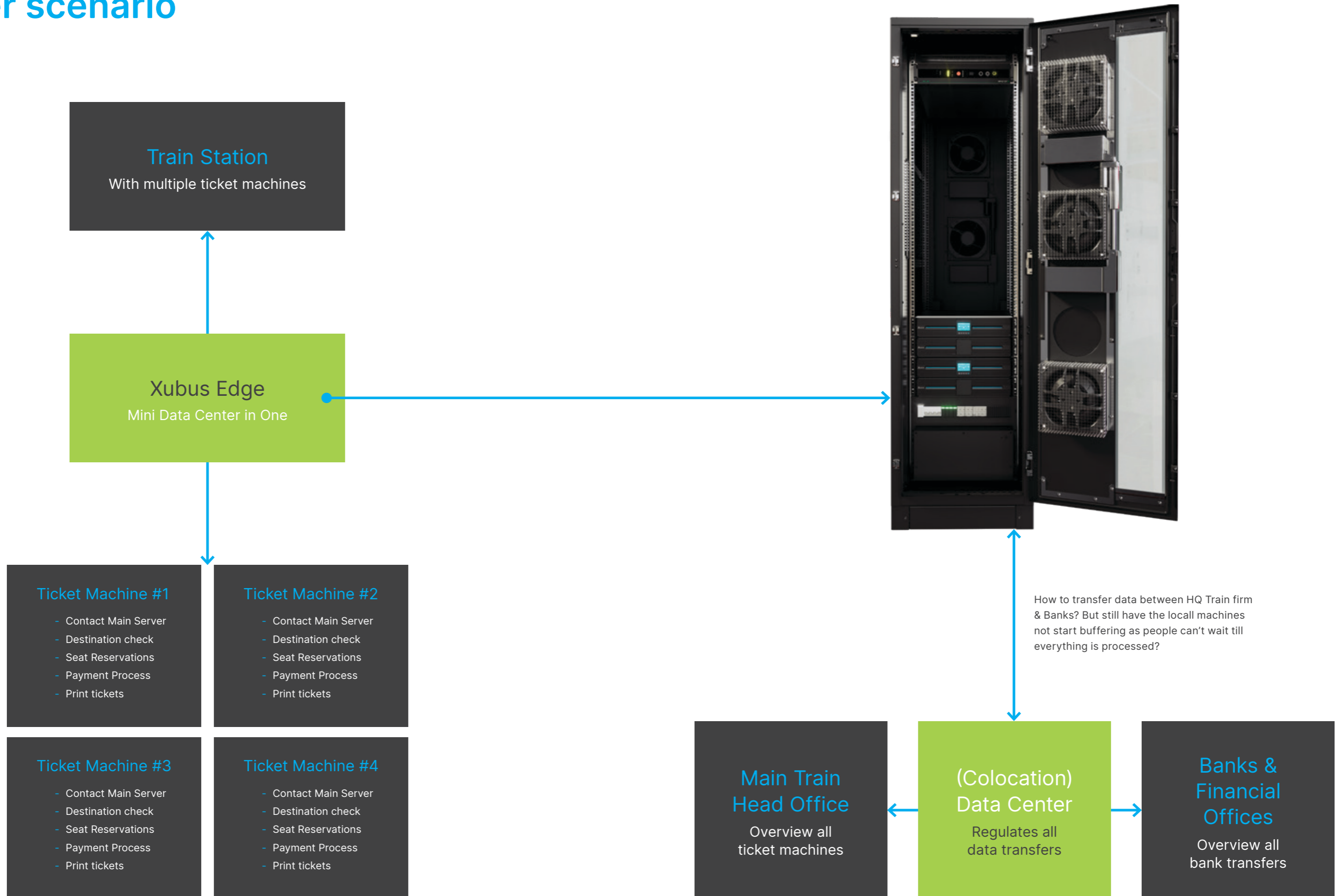
Retail & shops

- Supermarket control
- Cashdesk management and control

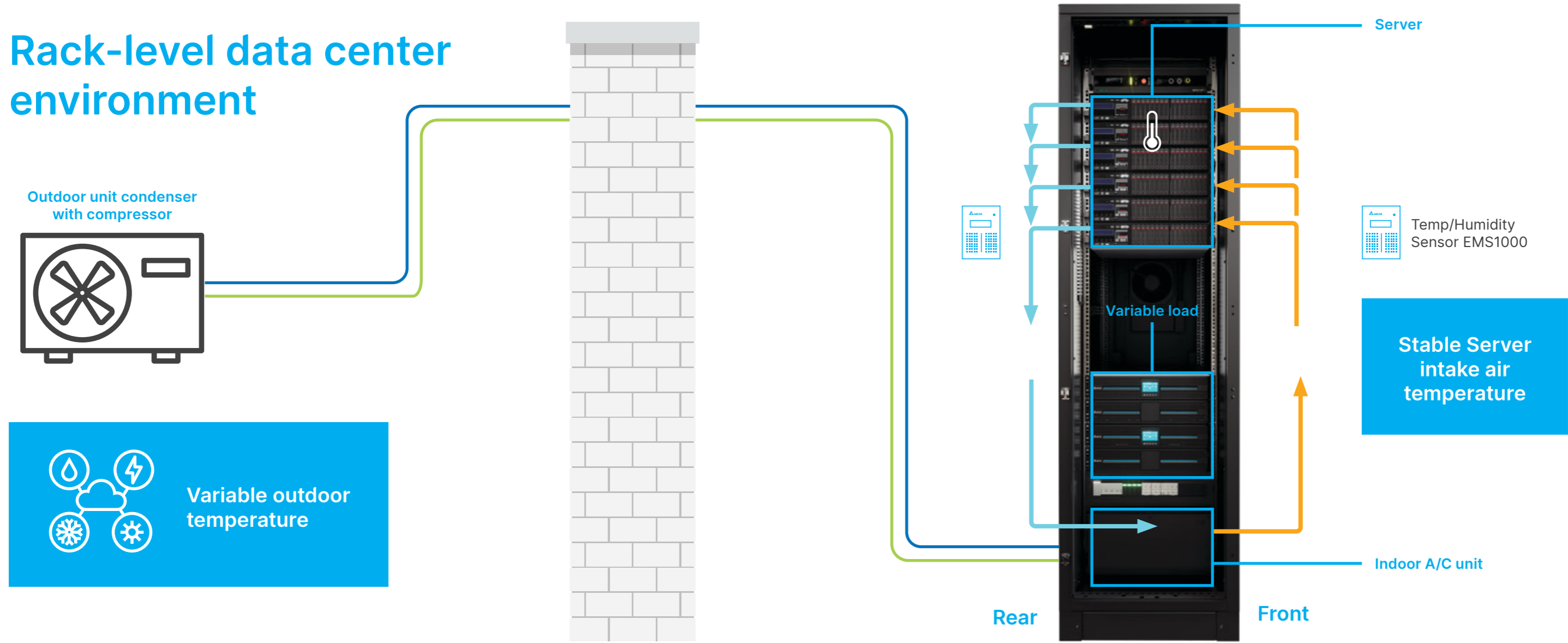
Small and medium enterprises

- Healthcare
- Client data and diagnosis
- Lawyers
- Client data, contracts...
- Local media
- Production data centers
- Broadcasting control

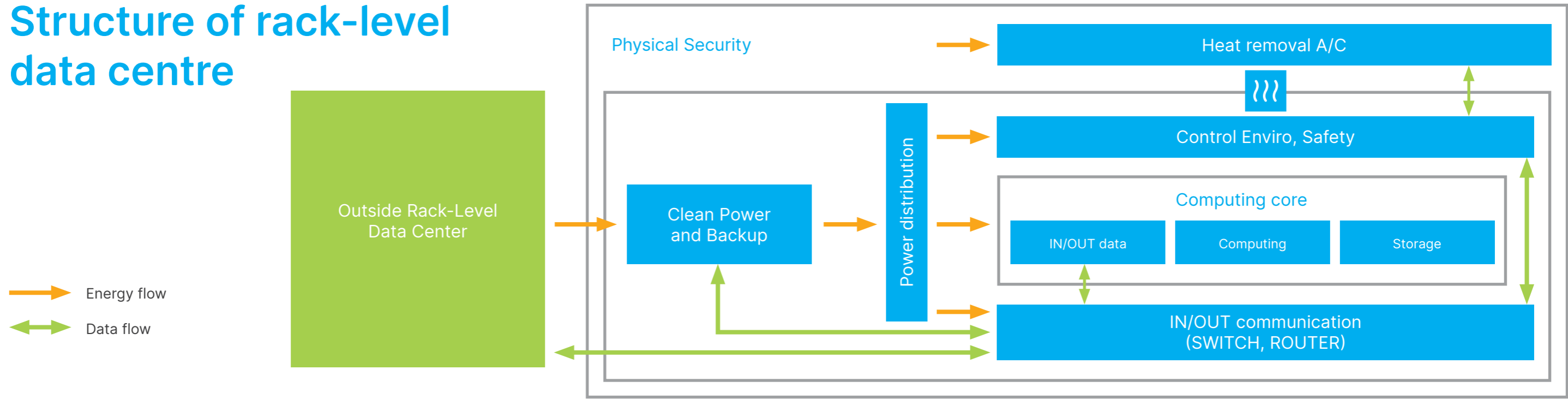
User scenario



Rack-level data center environment



Structure of rack-level data centre



Data Center Rack Solution



3.5kW with Backup Cooling

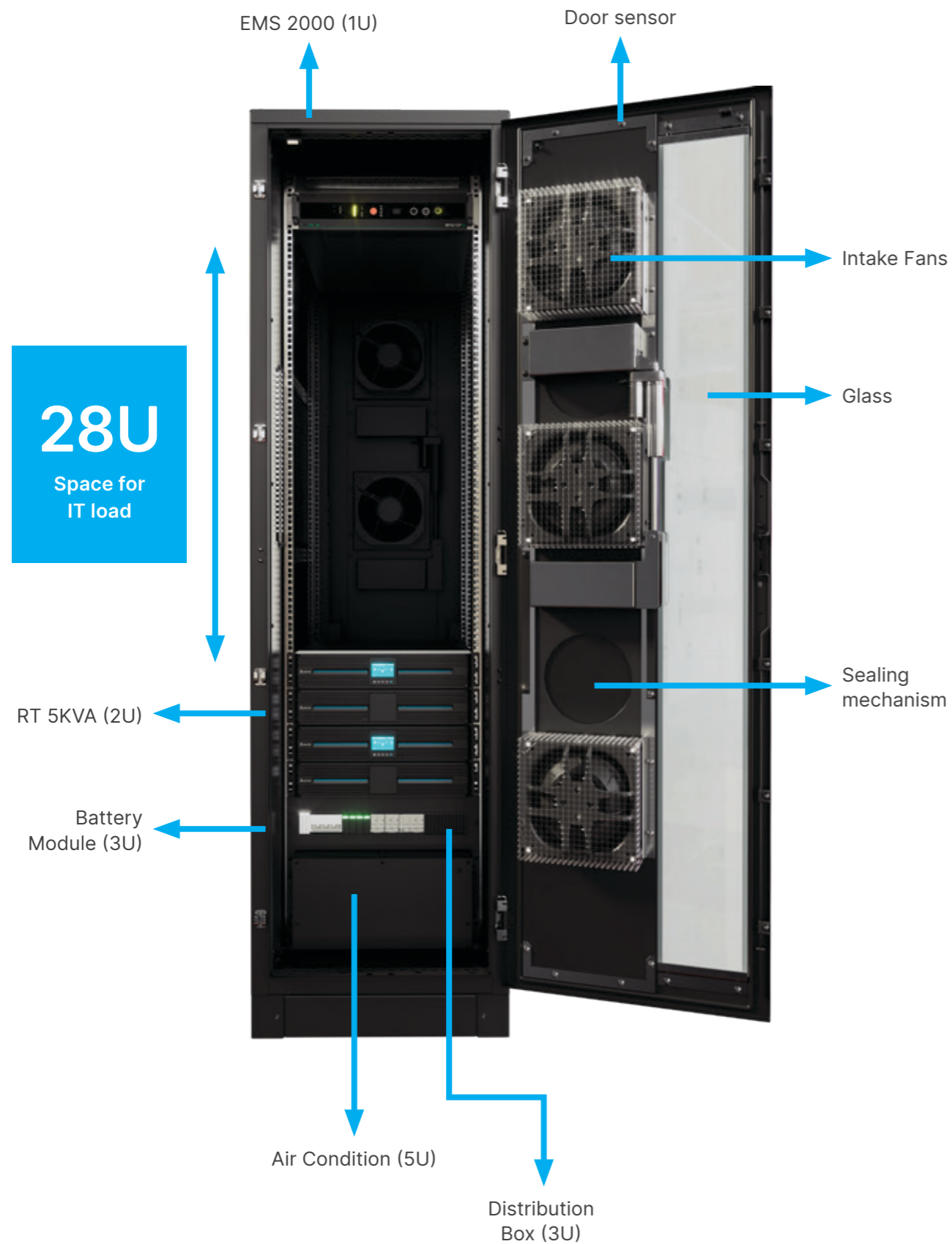
Key Features

- Front & rear door with locks
- Inbuilt split cooling unit 3,5kW capacity
- Backup Free Cooling 3,5kW, 7degree over ambient T, with one fan failed
- Backup Free Cooling used during mains failure and A/C failure
- Top/Bottom access
- Inbuilt UPS 5kVA & battery 10 min (extension optional)
- Power distribution rPDU
- UPS and PDU redundancy option
- Front to back Data Cable channels
- Vertical cable management
- Power and data cables separated
- Environmental control unit
- Alarms & Fault indications
- Real time notification
- Fire protection system optional

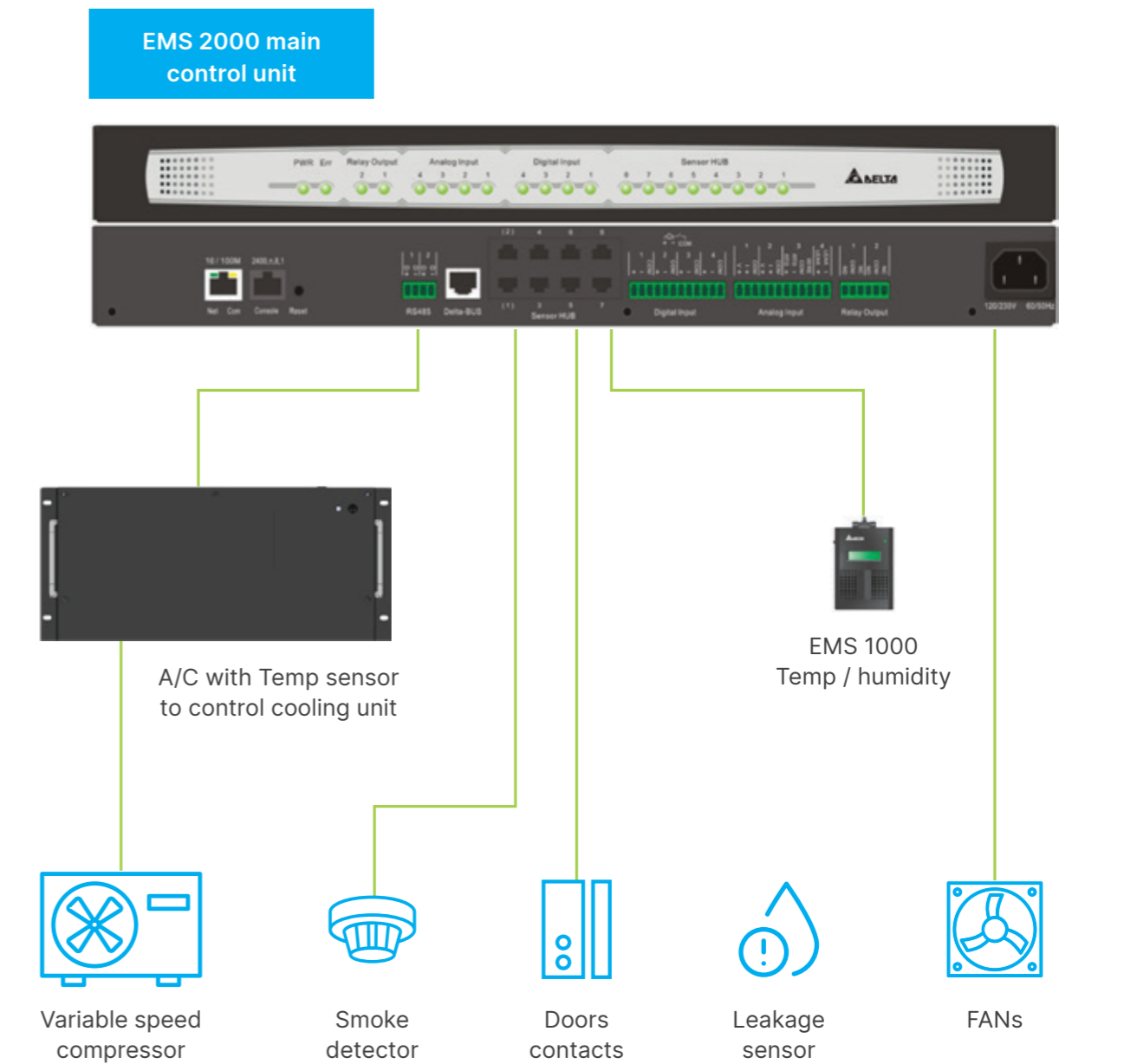
3,5kW with backup cooling

MODULE	DESCRIPTION	SPECIFICATION
System power capacity	IT and supporting systems	3,5kW
UPS	Model Name	RT 5 kVA standard
	Redundancy Socket level	Optional PDU
	UPS Qty	1 (Redundancy opt.)
Battery	Battery Capacity	20×9Ah
	Back up time	>10 Minute
	Battery Pack Qty	1
Air condition Backup Fan cooling	Cooling Capacity	4.1kW 35L/35L
	Power consumption at L35/L35	1120W/7A
	Backup free cooling	> 3,5kW 6C Over Ambient T
Communication	External	SNMP
	Internal	EMS2000/RS485
Monitoring	Temperature/Humidity	EMS2000/EMS1000
	Door Sensors	Front/Rear doors
Security	Lock	3 Point
	Smoke Detection	Implemented
Other sensors	Event Alert, Email notification	SNMP
Notifications	rPDU	Metered
Power distribution	No of Sockets	24 X C13 & 4 X C19
	W*D*H mm	600*1250*2100
Loading capacity	kg	1100
Customer space	Free U Space	28
Environmental	Operating Temperature IND/OUTD	0~30°C/-15~+48°C

3,5kW with backup cooling



Cooling and system control



Standard operation:

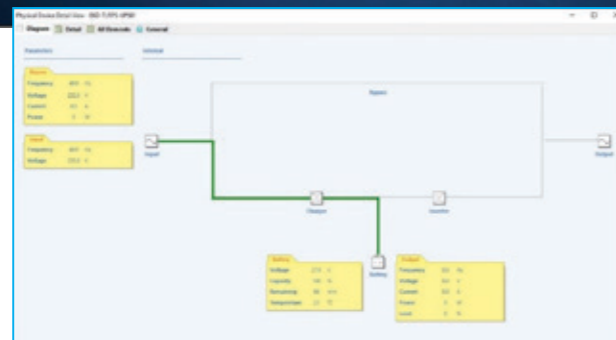
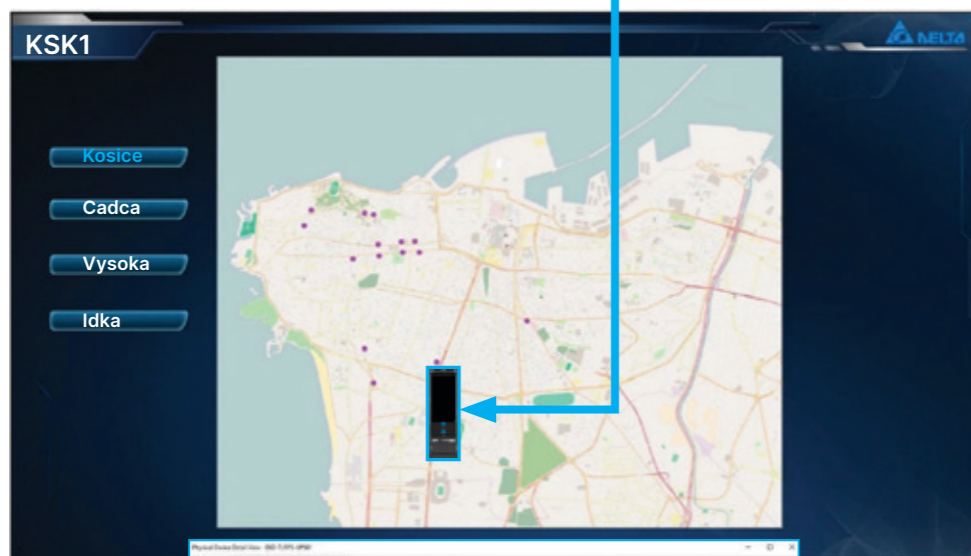
- A/C ON cooling capacity controlled based on A/C Temp sensor
- FANs OFF

MAINS Failure or A/C failure

- A/C OFF
- FANs ON/OFF switching controlled based on EMS1000

Remote monitoring & alarms

- Device Master – main layout
- Rack Monitoring per region/Location
- Individual data per technology



Remote environment monitoring

Environmental data and site control

EMS1000 & EMS2000



EMS 2000 interface

EMS1000							
ID	Title	Temperature	Humidity	DI1	DI2	DI3	DI4
0	Delta BUS ID0	38.9 °C	38 %	Normal	Normal	Normal	Normal
1	Delta BUS ID1	38.6 °C	38 %	Normal	Normal	Normal	Normal

EMS2000							
ID	Title	Temperature	Humidity	DI1	DI2	DI3	DI4
0	Delta BUS ID0	38.1 °C	38 %	Normal	Normal	Normal	Normal
1	Delta BUS ID1	38.7 °C	38 %	Normal	Normal	Normal	Normal

System Status
 Serial # Y3310400158AVD
 Location
 SNMP Firmware Ver: 01.12.33
 Internal Communication Error
 Short Circuit Protection
 Over Current Protection
 Over Voltage Protection

Digital Input
 1 Off Front Door
 2 Off Rear Door
 3 Alarm Leakage sensor
 4 Off Configuration...

Analog Input
 1 Off A1 Title 0
 2 Off A2 Title 0.0
 3 Off -23.3 C
 4 Off 1022
 Configuration...

Relay Output
 1 Normal DO1 Title
 2 Normal DO2 Title
 Configuration...

Sensor HUB
 1 Off Beacon
 2 Off Door Access lock
 3 Off Smoke Detector
 4 Off
 5 Off
 6 Off
 7 Off
 8 Off
 Configuration...

Delta Bus
 EMS1000
 ID 0 Warning Delta BUS ID0 ID 1 Warning Delta BUS ID1
 Detail...

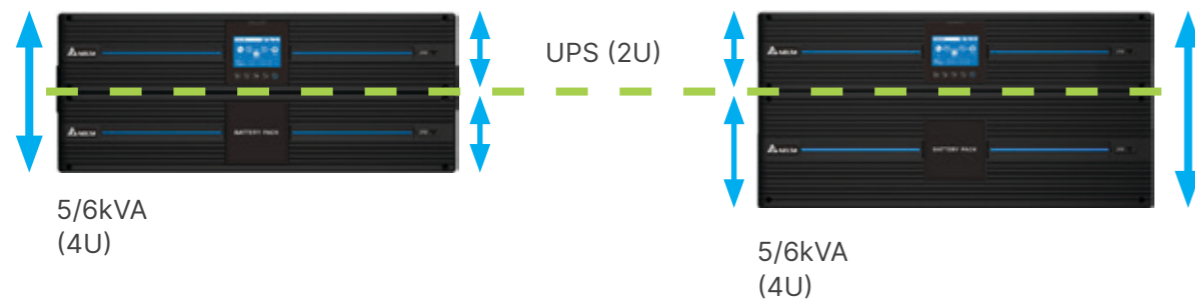
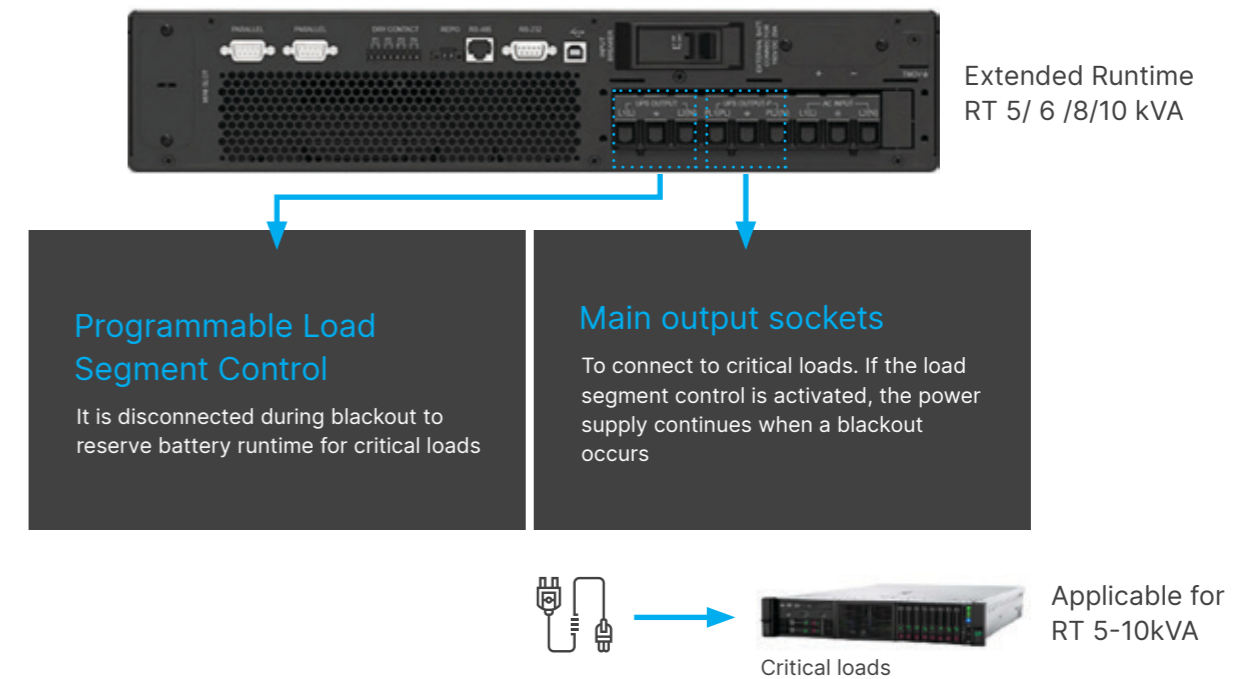
RS485
 RS485 - 1
 ID2 Alarm ID1 Alarm
 RS485 - 2
 ID1 Warning
 Detail...

RT series UPS 5-10kVA

PRODUCT SNAPSHOT	
Power rating	5/6/8/10 kVA
Voltage	Input: 175 ~ 280 Vac (full load) Output: 200/208(default)/220/230/240 Vac
Frequency	Input: 40 ~ 70 Hz Output: 50/60 Hz (auto selectable)
Output power factor	Unity
Efficiency	AC-AC mode: up to 95.5% ECO mode: up to 99%
Battery Volt.	144, 192-264Vdc
Form Factor	2U

Load segment control

The output sockets can be programmed to do load segment control and we use extended runtime model for Rack-Level Data Center Solution.



Extended Runtime Model



External Battery Cabinet

UPS

VRLA EBC*



* EBC: External Battery Cabinet, PDB: Power Distribution Box, MBB: Maintenance Bypass Breaker

Hot Swappable Battery & Plug-and-Play Connector



Key Features

- Hot swappable battery
 - For continuous operation even when batteries are being replaced
- Front access for battery replacement
- Battery string design with plastic case
- Plug-and-play external battery pack connector
 - For easy and fast connect external battery pack

Rack power distribution unit



IEC309 1 phase

IEC309 3 phase

Providing optimal power distribution for devices to make equipped data centers more energy-efficient.

Metered PDU

- Tool-less installation
- Branch circuit breaker protection (for load group)
- LED current display (rms value)
- Optional SNMP card for remote monitoring
- Upgradable firmware for maintaining optimal function

Basic PDU

- Tool-less installation
- Both single and three phase input voltage are available
- Branch circuit breaker protection

PDU Models

Model		PDU5113	PDU5213	PDU5315	PDU7111	PDU7211	PDU7311	PDU7425
Input Vac	1ph	110/120	208/220	220/230/240	110/120	208/220	220/230/240	
	3ph							220/380,230/400 (Y)
Input plug	NEMA	L5-30P	L6-30P		L5-20P	L6-20P		309-32A-5W
	IEC			309-32A-3W			309-16A-3W	
Output V	100-120Vac	●			●			
	200-240Vac		●	●		●	●	● 1ph
Output outlet	NEMA	5-15/20R (24)				5-15/20R (8)		
	IEC		320 C13 (24)	320 C13 (24) 320 C19 (4)	320 C19 (4)		320 C13 (12)	320 C19 (6)

Basic

Model		PDU1113	PDU1213	PDU1311	PDU1315	PDU1425	PDU2421	PDU2525
Input Vac	1 ph	110/120	208/220	230/240	230/240			
	3ph					220/380 230/400 (Y)	220/380 230/400 (Y)	208/220 (D)
Input plug	NEMA	L5-30P	L6-30P					
	IEC			309-16A-3W	309-32A-3W	309-32A-5W	309-16A-5W	
	CS							8365C
Output V	100-120Vac	●						
	200-240Vac		●	●	●	● 1ph	● 1ph	● 1ph
Output outlet	NEMA	5-15/20R (24)						
	IEC		320 C13 (24)	320 C13 (24) 320 C19 (3)	320 C13 (24)	320 C13 (3) 320 C19 (9)	320 C13 (36) 320 C19 (3)	320 C13 (36)

- In solutions we use PDU1315 model

Metered

Cooling capacity



Outdoor Temperature °C	Cooling capacity in kW at 35°C hot zone	Cooling capacity in kW at 30°C hot zone
35	4,1	3,1
40	3,9	2,9
45	3,2	2,5
48	3,0	2,3

Key Features

- Rack DC is closed system, any heat generated inside must be removed (Even UPS and EMS2000 generates heat and must be considered)
- Cooling capacity depends on outdoor conditions
- Rack DC use split cooling system
- Sensible Cooling capacity 4.1kW (35oC Inside 35oC Outside)
- Server intake air approx. 10 oC below hot zone

Sensible cooling capacity=cooling only (without condensation of humidity)

Cooling unit

Key Features

- Split system Indoor + Outdoor units
- Indoor unit 19IN
- DC variable speed compressor, dynamic cooling, step less cooling capacity adjustment
- Split type takes high efficiency electronic expansion valve to control refrigerant flow accurately
- High reliability: lifetime >10 years, with minimum maintenance
- RS485 interface with MODBUS protocol to achieve remote monitoring
- Environmental friendly – R410a
- Copper tube fin condenser: high corrosion resistance and reliability

Cooling unit parameters

Parameter		Specification	
		Indoor Unit	Outdoor Unit
Physical parameters	Unit		
External Dimensions (H x W x D)	mm	176*439*87	617*856*296
Weight	Kg	26	48
Mounting Method		Rack-mounted	Floor Standing
Application		Indoor	Outdoor

Environmental Parameters & Performance			
Working Temperature Range	Deg. °C		-15 ~ +45
Working Temperature Range with Winter kit	Deg. °C		-35 ~ +45
Refrigerant		R410a	R410a
Cooling/Heating Capacity			
Cooling Capacity@L35/L35	W	4100	4100
Internal Airflow	m³/h	750	

Electrical parameters			
Power Consumption@L35/L35	W	1630	
Input voltage, Frequency	2230/230 VAC, 50Hz		

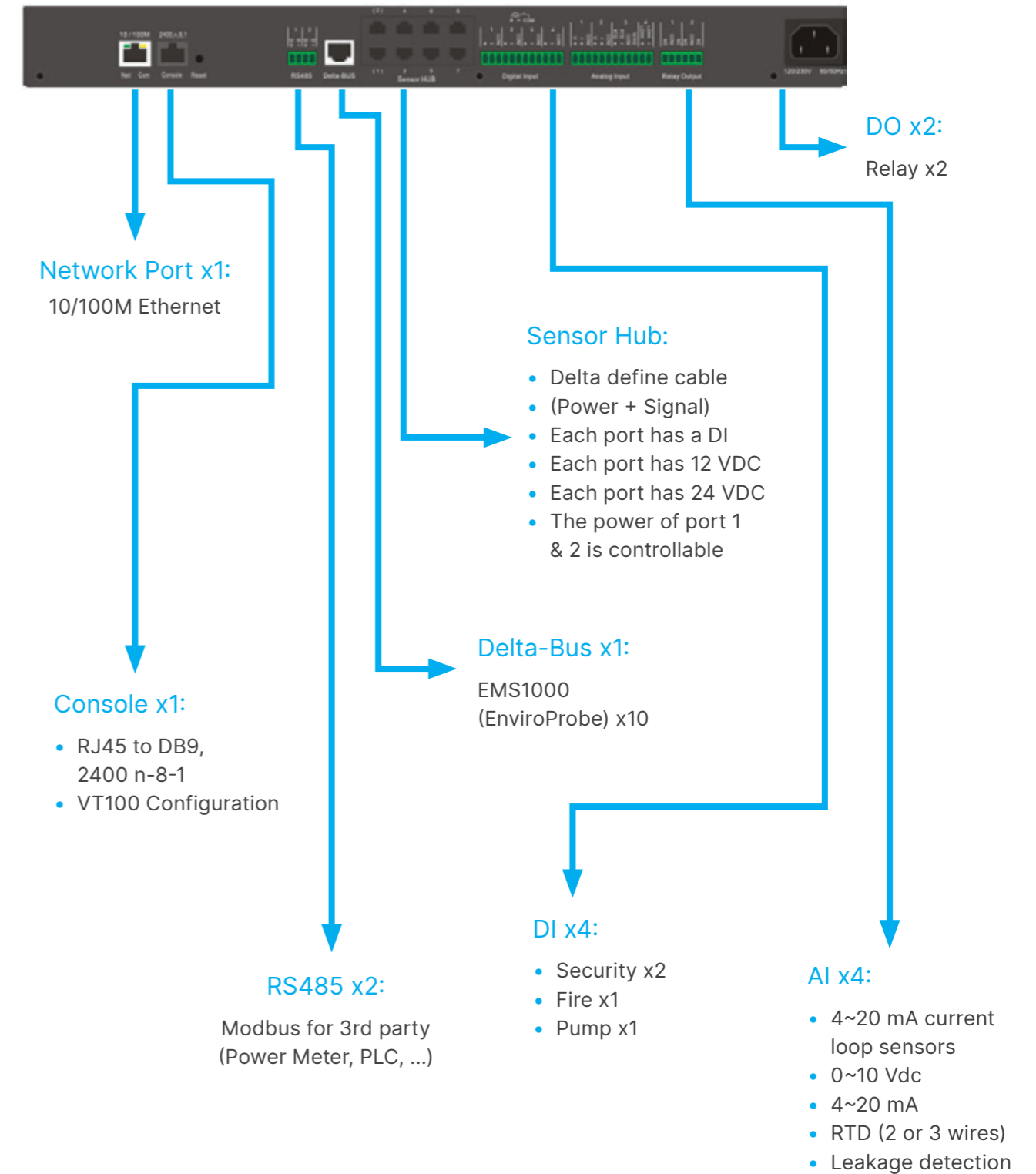
Environment and Control EMS2000



Key Features

- Designed for collecting all of the environment parameters then reply the query through SNMP.
- Web: Provide web interface for monitoring and configuration.
- Security Protocol: Implemented HTTPS, SNMPv3, SSH, SFTP
- Delta-Bus: To provide power and communicate with up to 10~16 EMS1000s. Each EMS1000 consists of temperature, humidity sensors and additional 4 input contacts.
- Sensor-HUB x 8: To detect general digital input sensor devices and provide 12V and 24V DC power supply for the sensor devices
- RS485 x 2: To collect data of the connected general Modbus devices.
- Modbus Protocol: Protocol can be added or edited easily to support 3rd party sensor devices.
- IPMI: Get the server parameters: Temperature, fan speed/status, voltage, current, ...

Control EMS2000 rear view







Delta EMEA Headquarters

Netherlands B.V.

Zandsteen 15, 2132MZ, Hoofddorp
The Netherlands
Tel: +31 (0)20 800 3900

www.delta-emea.com

Delta Telecom Power - EMEA Locations

Czech Republic

Průmyslová 1306 /7, 102 00 Praha 10,
Czech Republic
Tel: +420 272 019 330

Dubai

Gate 7, 3rd Floor, Hamarain Centre,
Dubai, United Arab Emirates
Tel: +971 4 2690148

Finland

Rajatorpantie 8
FI-01600 Vantaa, Finland
Tel: +358 9 849 660

France

Zi Bastillac Nord
65000 Tarbes, France
Tel: +33 562 34 09 30

Germany

Coesterweg 45, D 59494
Soest, Germany
Tel: +49 2921 987 0

Italy

Piazza Grazioli 18 00186
Roma, Italy
Tel: +39 06 69941209

Poland

23 Poleczki Str. 02 822
Warsaw, Poland
Tel: +48 22 335 26 00

Russia

Vereyskaya Plaza II, office 401
Vereyskaya str.17
121357 Moscow, Russia
Tel: +7 495 644 3240

Slovakia - assembly, testing and logistics center EMEA

Priemyselna ulica 4600/1, 018 41
Dubnica nad Vahom, Slovakia
Tel: +421 42 466 1111

South Africa

Tuinhof Office Park, Unit C401, Karee
Building, 265 West Avenue, Centurion,
0157 South Africa
Tel: +27 12 663 2714

Spain

Carretera de Villaverde a Vallecas
265 1ºDcha, Ed. Hormigueras. P.I. de
Vallecas 28031 Madrid - Spain
Tel: + 34 91 223 74 20

Sweden

Annavaägen 3, P.O. Box 3096
SE 350 33, Växjö, Sweden
Tel: +46 470 706 800

Switzerland

Freiburgstrasse 251, 3018 Bern
Bümpliz, Switzerland
Tel: +41 31 998 53 11

Turkey

Serifali Mevkii Barbaros Bulvari
Soylesi Sok. No:19 Y.Dudullu,
Umraniye, Istanbul, Turkey
Tel: +90 216 499 9910

United Kingdom

Hemel Hempstead,
Hertfordshire HP2 7EY
Tel: +44 (0)1442 219355
+44 (0)1442 245894

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