

Answering the demand of large datacenters with the next generation UPS

DPS series UPS
600kVA-1.2MVA

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Growing Data Traffic

The world's increasing digitization expands the global need for compute and storage.



Datacenter Infrastructure is the backbone behind applications people and companies use in life and business. New applications and business opportunities including Internet of Things (IoT), will require even more from data centers and communication lines.



Data Center Consolidation



Enterprise-owned data centers



Small scale
< 1 MW

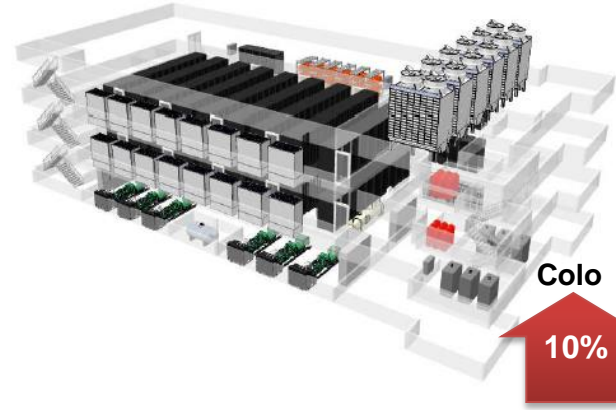


Medium scale
1-5 MW

*Outsourcing
IT asset and/or
management*



Colocation and Cloud-Service Providers



Colo
10%

Cloud
20%+

Annual revenue growth

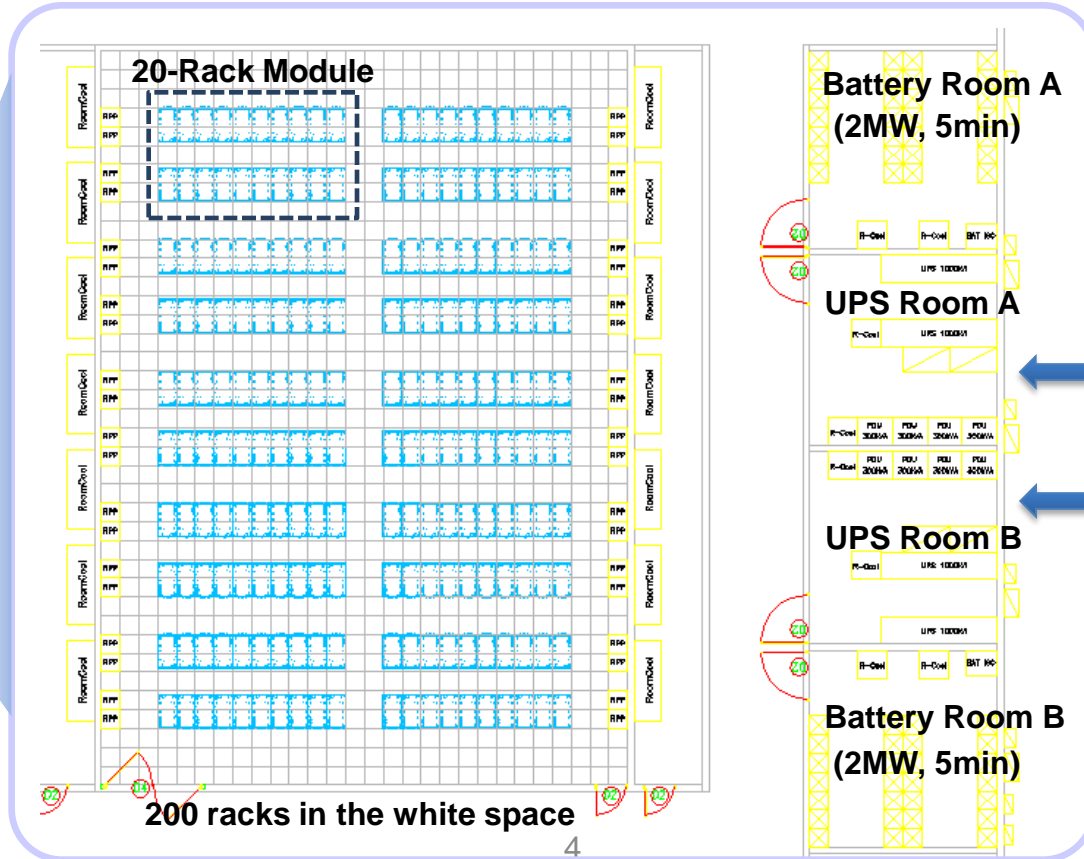
The data center market is shifting toward
“fewer but larger” data centers.

Source: ANALYST INSIGHT: INTRODUCTION TO EDGE DATA CENTERS, IHS Markit, 2016



Large UPS for Large Datacenter

An application example :



1.2MW UPS



Colo/Cloud Providers' Top Concerns on UPS System



Huge revenue and business credit loss upon **power downtime**



High **energy consumption** increases OPEX



Monitoring and management tools help to handle issues as quickly as possible





New Generation of Large UPS

Features Ideally for Large data Colocation/Cloud Applications



Proactive Reliability



**Optimized Power Performance
and Efficiency**



Sophisticated Management





Wide family for proper sizing

Important high power density and smallest footprint



600 kW



800 kW



1000/1200 kW



Complete power rating coverage
for **MW datacenter** applications

High power small footprint.

Key Feature Highlight



Ultimate Availability

- **Redundant design** to avoid single point of failure
- Intelligent **battery health diagnosis**
- **Failure prediction** of key components
- Advanced event analysis



Excellent Performance

- **high power density** and **smallest footprint**
- Unity output power factor (**kVA=kW**)
- On line mode efficiency up to **96.5%** ; ECO mode 99%



Sophisticated Management

- User-friendly 10" color touch panel and remote management
- Environment management system
- Battery management system



Redundant Design System Level



Parallel expansion up to 8 units allows for N+X parallel redundancy, capacity expansion and reliability enhancement.

System 1



System 2



***Parallel expansion
up to 8 units***

System 8



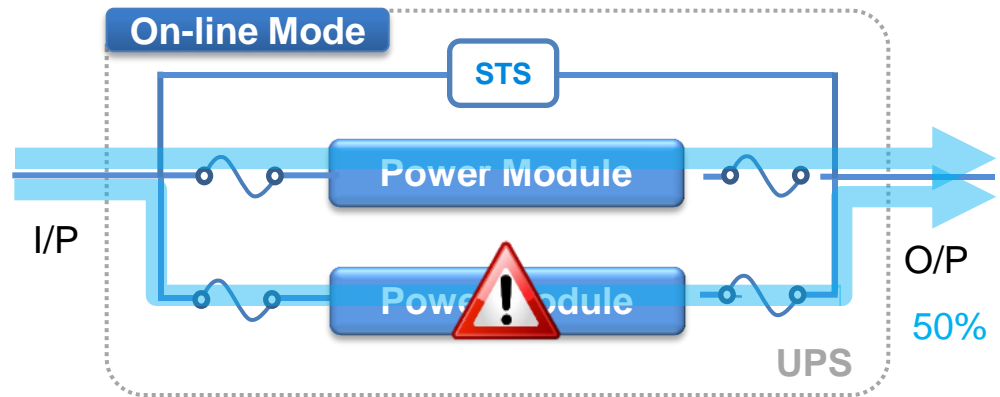
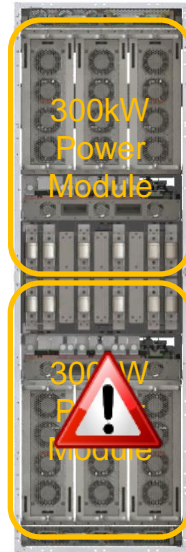
**9.6
MW**

Redundant Design

Power Module Level



Interior modularized architecture supports power module internal redundancy.
When one PM is failed, the rest of healthy PM will continue to supply power to the load.

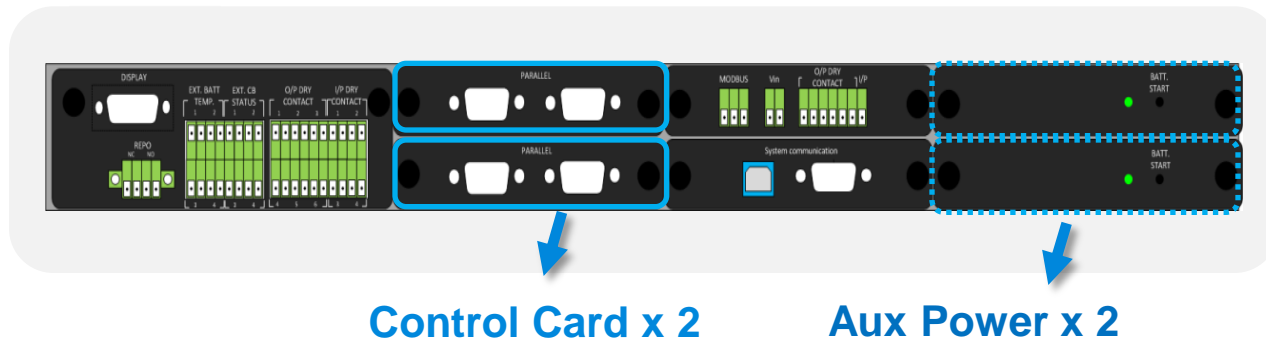


Redundant Design

Control Function Level



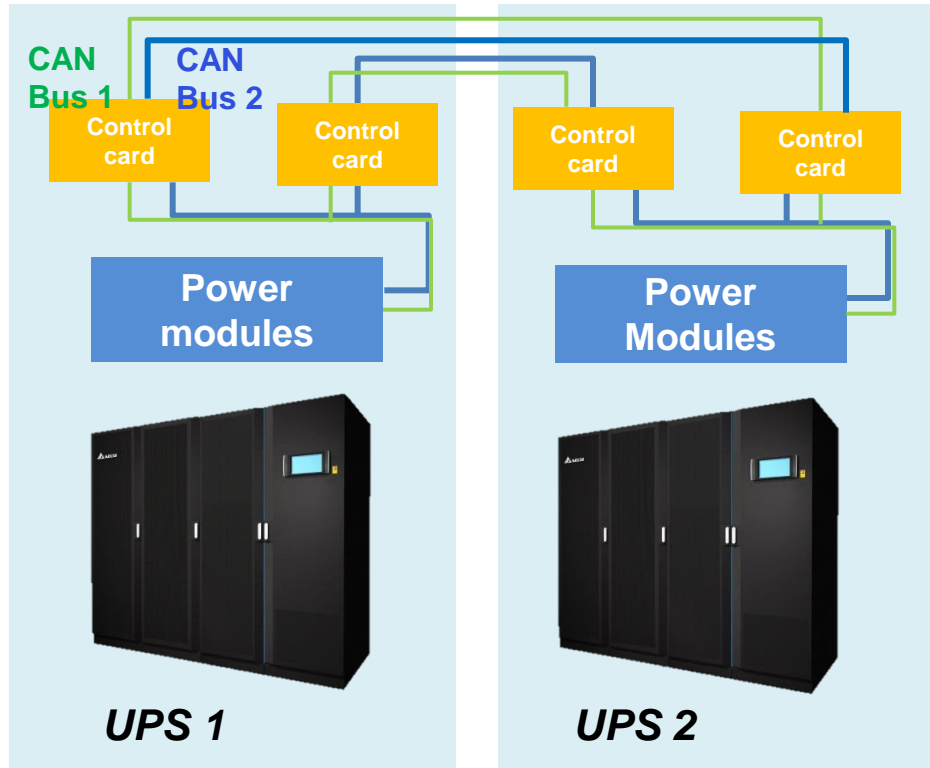
Redundant controller and auxiliary power ensure high system availability and avoid single point of failure.



Controller provides communication sharing, parallel, and synchronization

Redundant Design

Signal Level



In-between UPSs
communication bus redundancy

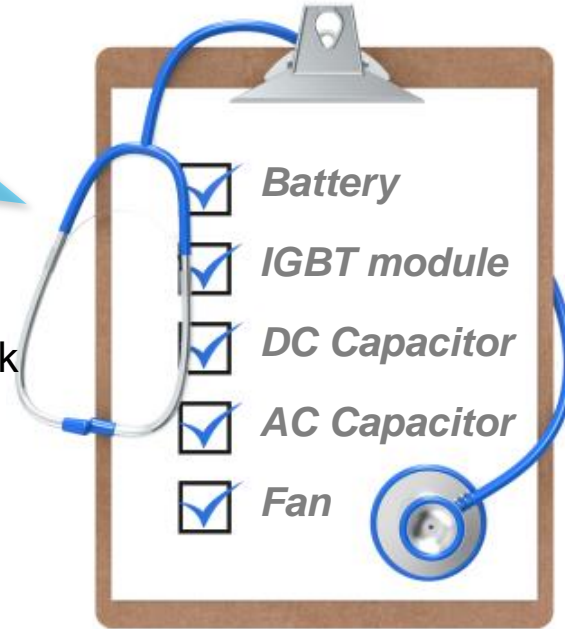
Inside UPS
communication bus redundancy

Dual CAN Bus Design can prevent single point of failure in single & parallel mode to achieve high reliability.



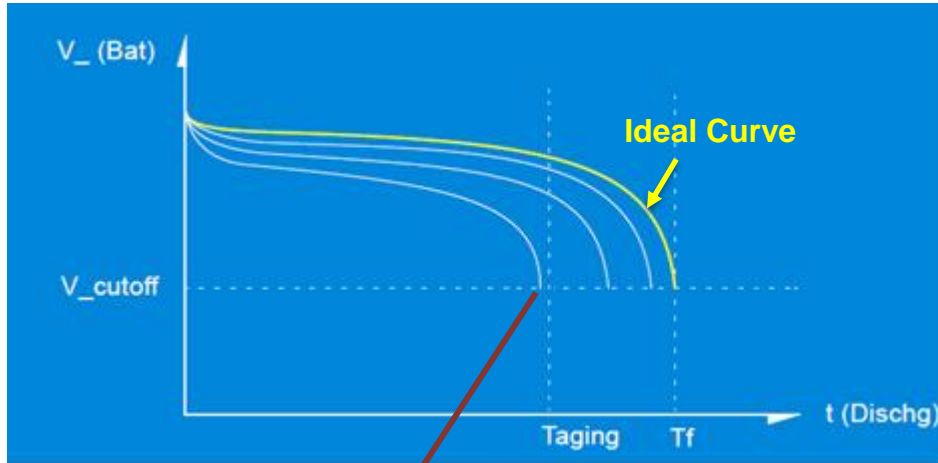
“*Prevention is better than cure*”

- **Preventive actions** minimizes downtime risk
- **Self diagnosis, evaluation** and **aging detection** are key elements for planned preventive and corrective actions.





Battery Aging Prediction



Need to change batteries.

The Battery Health Check

- ☒ Battery Missing
- ☒ Battery Test
- ☒ Capacity Detection
- ☒ Aging Prediction

- Compare the discharge curve with the ideal curve to detect the battery health status.
- Alarm when batteries are aging.



DC Fan



IGBT Module



AC/DC CAP



Failure prediction
Alarm !!




Network



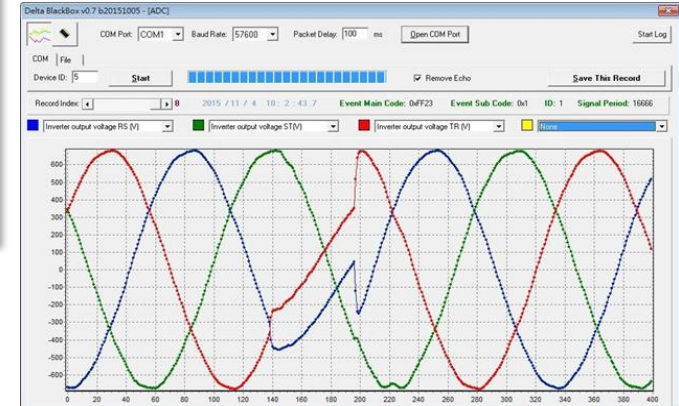


5000+ event logs are accessible via LCD display or Ethernet.



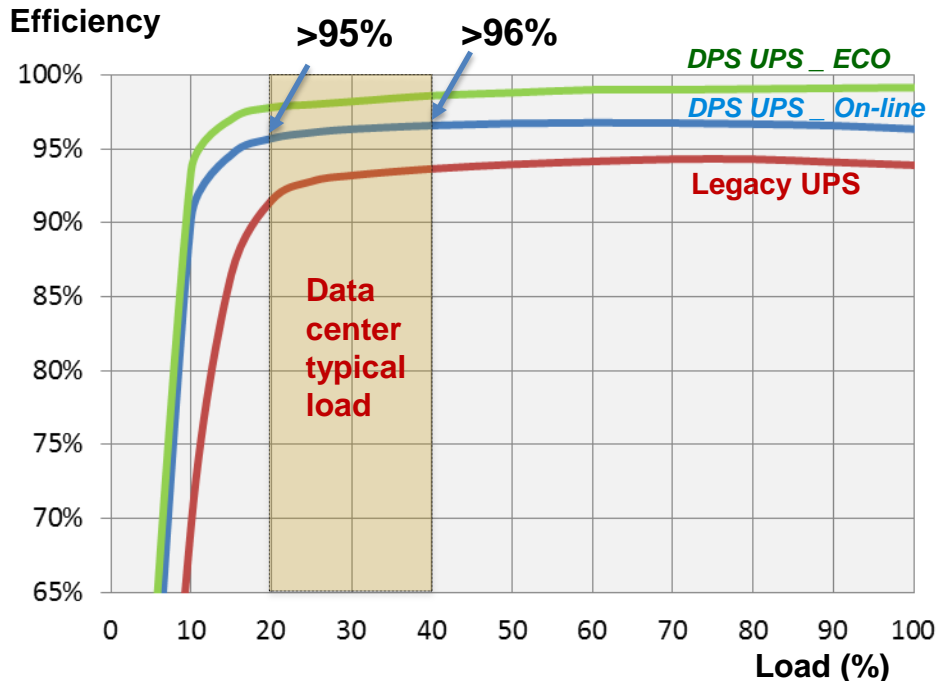
No.	Start Date	Code	Location	Log
19	2017-01-03 20:32:02	1203-01	STS	INV Volt Abnormal - T
18	2017-01-03 20:30:02	1201-01	STS	INV Volt Abnormal - R
17	2017-01-03 20:29:02	1200-01	STS	INV Volt Abnormal
16	2017-01-03 19:28:02	1108-01	STS	Bypass To INV Asynchronous Transfer
15	2017-01-03 19:27:02	1107-01	STS	Output Overload Shutdown - T
14	2017-01-03 19:26:02	1106-01	STS	Output Overload Warning - T
13	2017-01-03 19:25:02	1105-01	STS	Output Overload Shutdown - S
12	2017-01-03 19:24:02	1104-01	STS	Output Overload Warning - S

Key parameters and waveform record support advanced event analysis and diagnosis.

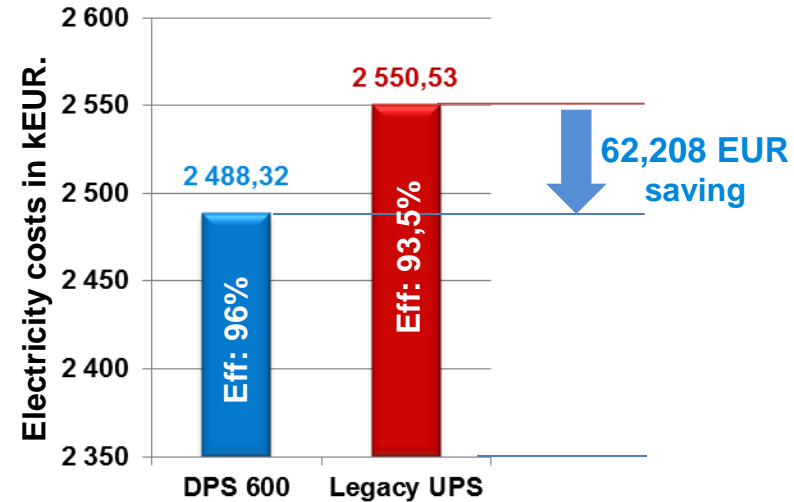




- On-line mode efficiency up to **96.5%**, ECO mode efficiency 99%
- Efficiency up to 95% **at light load**.
- Supports ECO mode in parallel.

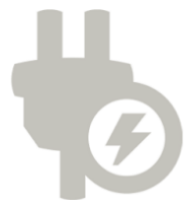


Lifetime Electricity cost



Conditions:

Load 40% of ups capacity, equal 24 hours per day.
 Efficiency difference 2,5% between DPS 600/Legacy UPS.
 Energy cost 0,15 EUR/kWh. Cooling cost saving excluded.



**More
Wattage**

**Higher capacity.
More available power.**

O/P PF

1

**Longer
Life**

**Higher design margin helps
prolong component life**



**Leading
Power
Factor
Capability**

**Capacity to handle
leading PF of servers**

**Better
Thermal
Mgm't**

**Higher design margin.
Less heat generation.**





Better Space Utilization & Flexibility



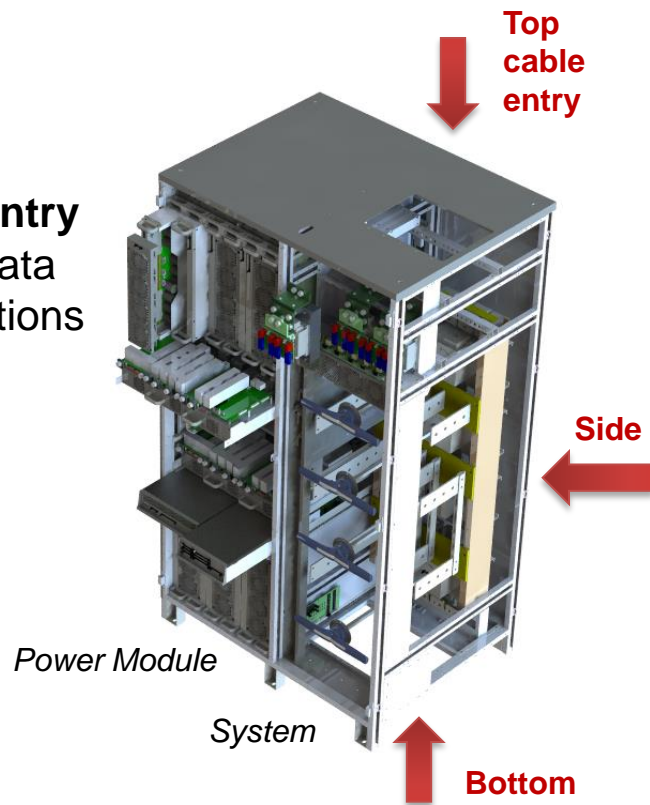
Smallest dimension for space saving and easy parallel configuration



Flexible cable entry
adapts various data center site conditions



Back to Back
installation



Sophisticated Manageability



Monitor the UPS at your fingertips.



UPS-1.1

MEASUREMENT
EMS

SETUP

MAINTENANCE

LOG IN
User

WARNING

19:24
Feb 23, 2017

On-Line

EMS

ID 0-7

Normal Warning Alarm

ID	Title	Temperature	Humidity	DI1	DI2	DI3	DI4
0	UPS	25.0 °C	51 %	Security	Leakage	Fire	Smoke
1	Battery Cabinet	25.0 °C	51 %	Security	Leakage		
2	Delta Bus ID2	25.0 °C	51 %	Security	Leakage	Fire	
3	Delta Bus ID3	25.0 °C	51 %	Security	Leakage	Fire	

10" color LCD touch panel



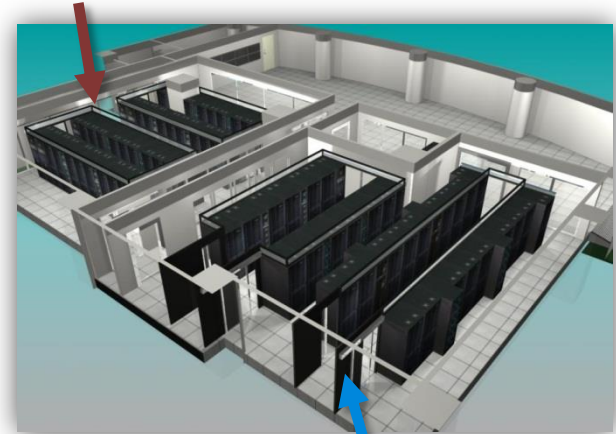
Benefit for facility manager

Remote and local monitoring power room's environment conditions such as security, water, fire and temperature directly from UPS screen.

EMS							
ID 0-7				Normal Warning Alarm			
ID	Title	Temperature	Humidity	DI1	DI2	DI3	DI4
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1	Battery Cabinet	25.0 °C	51 %	Security	Leakage		
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3	Delta Bus ID3	25.0 °C	51 %	Security	Leakage	Fire	



Power room: UPS+Battery+PDC



White Space





Benefit for facility manager

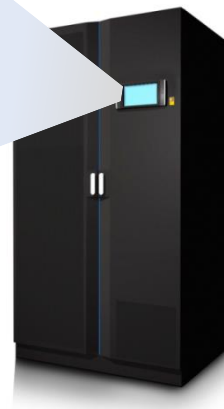
To monitor battery condition in datacenter's power room for prediction of battery failure.

BATTERY STATUS

String: 2 ▼

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Voltage/Pcs (V)				Impedance/Pcs (mΩ)			
01 12.1	13 12.1	25 12.1	37 12.1	01 2.5	13 2.5	25 2.5	37 2.4
02 12.2	14 12.2	26 12.1	38 12.2	02 2.2	14 2.2	26 2.2	38 2.2
03 12.0	15 12.0	27 12.2	39 12.0	03 2.4	15 2.4	27 2.4	39 2.5
04 12.1	16 12.1	28 12.0	40 12.1	04 2.3	16 2.3	28 2.3	40 2.2
05 12.2	17 12.1	29 12.1		05 2.4	17 2.4	29 2.4	
06 12.0	18 12.2	30 12.2		06 2.2	18 2.2	30 2.2	
07 12.2	19 12.0	31 12.0		07 2.5	19 2.5	31 2.4	
08 12.0	20 12.1	32 12.1		08 2.2	20 2.2	32 2.2	
09 12.1	21 12.2	33 12.0		09 2.4	21 2.4	33 2.5	
10 12.1	22 12.0	34 12.2		10 2.3	22 2.3	34 2.2	
11 12.2	23 12.2	35 12.0		11 2.4	23 2.4	35 2.4	
12 12.0	24 12.0	36 12.1		12 2.2	24 2.2	36 2.3	



Data collection

- ✓ Battery current
- ✓ Battery voltage
- ✓ Battery resistance
- ✓ Battery temperature



The utmost reliable UPS solution for cloud/colocation datacenters



500/600 kW



800 kW



1000/1200 kW



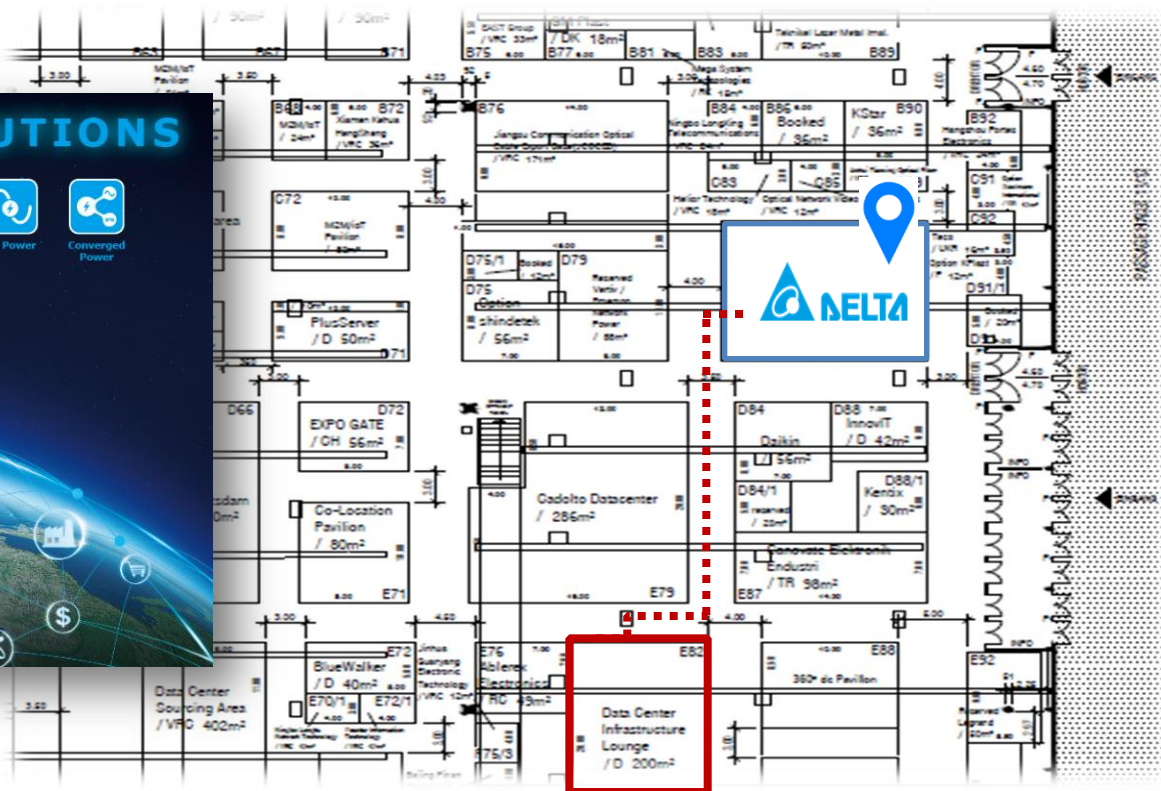
Ultimate
Availability



Excellent
Performance



High
Manageability



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