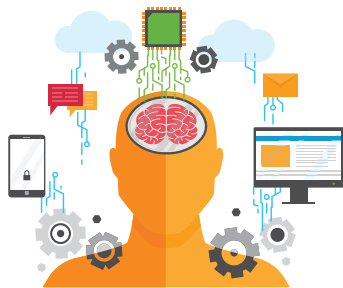




## Providing Unmatched Protection and Reliability for Critical Equipment

# VERTIV IN MANUFACTURING

### WELCOME TO MANUFACTURING 4.0



#### AI takes Center Stage

- To improve manufacturing processes, manufacturers are increasingly eyeing investments in automation such as robotics and machine learning.
- PWC's 2017 Global Digital IQ survey revealed that over half of respondents are already making substantial investments in AI.
- A key benefit in automation is that it reduces risks especially in industrial sites such as those using heavy machinery or those in dangerous operating environments.



#### A Leaner Supply Chain System

- To stay above the competition, an organization's supply chain needs to be optimized to deliver greater value to customers.
- Aside from pricing and stock availability, manufacturers will increasingly focus on simplifying supply chain management to be able to operate more efficiently, manage stocks better and reduce operational cost.
- Many will digitize their supply chains through the use of RFID, business intelligence, as well as tools to improve logistics, optimize network and inventory, and procurement.



#### Predictive Maintenance Gain Traction

- There is growing adoption of predictive maintenance technologies that could not only reduce a company's maintenance cost, but also avert unplanned outages and extend equipment life.
- The use of predictive maintenance tools to monitor equipment performance, as well as the integration of IoT and automation, could save manufacturers valuable time, money and resources.



Emerging Trends, Constant Challenges

- Growing customer demands and expectations are putting pressure on manufacturers to make sure they meet or even exceed production schedules.
- There is no room for downtime in a manufacturing facility as downtime means financial loss, damaged reputation and can ruin contractual obligations.
- Manufacturing facilities require continuous, clean and reliable power source to prevent downtime in the production process.
- They require solutions that are robust and rugged, designed to withstand harsh, contaminated environments. This means standardized UPS and power protection solutions are not enough.
- Critical manufacturing equipment require precise and heavy duty cooling and ordinary comfort room-cooling solutions are not enough. Special cooling units are needed to ensure equipment is protected against high heat and to avoid any condensation and humidity issues.



Protecting the IT Backbone

- Digitization and automation are increasingly being adopted by manufacturers to improve efficiency and overall operations.
- Manufacturers must be able to come up with ways to seamlessly integrate technology into everyday manufacturing operations.
- Equipment should be optimized and designed to accommodate technology integration through the use of predictive tools as well as power availability.
- IT infrastructure becomes all the more critical in the age of automation and IoT, and IT managers must have the right infrastructure in place not only to support the uptick in compute requirements, but also to manage the entire manufacturing facility better and smarter.



Real-Time Information for Real-Time Response

- As they strive to create a leaner, more efficient supply chain systems, manufacturers need to be aware of key supply and demand information in real time, right up to the shop floor – to be able to adjust production SKUs and schedules.
- A facility or IT manager will need to be able to see a problem before it becomes a problem – and be able to do something about it.
- Predictive monitoring tools can aid in having a smarter supply chain network. These tools must be able to predict, diagnose and provide action on all areas of the manufacturing network (from the environment, equipment or IT network) to ensure process continuity at all times.

Customized industrial UPS solutions, engineered to meet your needs



**Liebert® RG**  
Ensures reliable, trouble-free operation of CNC machines



**Liebert® Hipulse S**  
Maximized the availability of critical loads for protection against power failures



**Chloride FP50z**  
Digital, industrial UPS for optimal power protection



**Chloride FP60z**  
Compatible with the harshest industrial power grids



**Liebert® ITA2 (5-20kVA)**  
Compact, Efficient & Robust UPS For Critical Applications




**Liebert® AF2**  
Reduces current harmonics and improves power factor



**Surge Protection Device**  
Defending power, voice and data against grid irregularities




**Liebert® LPC**  
Precise cooling for labs and testing facilities




**SmartAisle™**

- Pre-configured, rapidly deployable integrated IT infrastructure for core deployments
- Replaces traditional bricks-and-mortar design with flexible, efficient solutions




**SmartRow™ Plus**

- Rapidly deployable IT infrastructure for core or branch deployments
- Integrated with full suite of power, cooling and monitoring solutions for maximum efficiency and availability
- Expandable and flexible depending on IT requirements




**SmartCabinet™**


- Integrated, pre-configured infrastructure that brings “plug-and-play” convenience to small spaces and edge locations
- Offers high efficiency and availability with the Liebert ITA2 UPS and integrated Thermal Management solution
- Comes with intelligent monitoring capabilities through the Liebert RDU software




**Liebert® Trinergy Cube**  
Highest efficiency and reliability for enterprise data centers




**Liebert® AHU**  
Delivering efficient, cost-reliable management of heat in large data centers




**Liebert® CRV+DX™**  
Row based Efficient Cooling for High Density Data center




**Liebert® EXM™**  
Efficient and Flexible Power-Optimized For Medium-Size UPS Applications



**Avocent® HMX**  
Providing seamless access to multiple computing resources

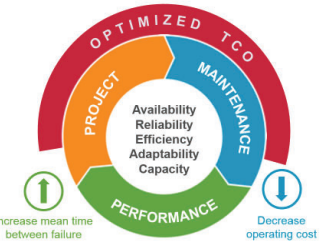


**Liebert® RDU-A G2**  
Insight into environmental conditions ie. Temperature, humidity, smoke, leak and vibrations



**Geist PDU**  
Reliable power distribution helps manage power capacity and increase functionality

**Global Service**  
A complete life-cycle approach to service, from project launch to ongoing maintenance and performance optimization



Services ensure that your vital applications stay up and running. We do this through our vast array of project, maintenance and performance capabilities, supporting you in making better decisions to operate more efficiently and reduce complexity.



**Truly Global Geographical Coverage and Capacity**  
Largest Customers Engineers workforce



**Knowledge, Reputation and Experience**  
Technology, R&D access, Field knowledge

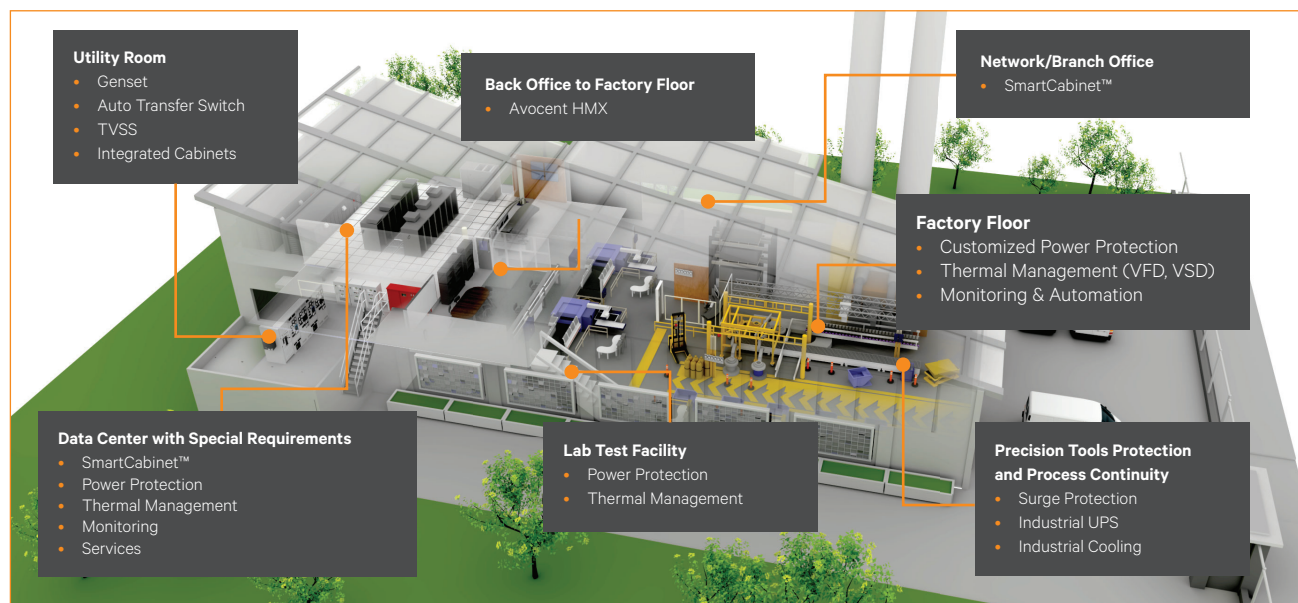


**Consistent Service Delivery and Offering**  
Offering diversity, Breadth of technologies



**Single Service Partner and System Level Expert**  
Reliability – we are the trusted partner





## GLOBAL AUTOMOTIVE MANUFACTURER



### Overview

As part of its modernization efforts and to improve business processes, the customer set out to build a new office server room to handle business demands. The customer was looking for an innovative solution that would allow them to be ahead of the competition, while addressing their IT and infrastructure demands. Vertiv's SmartRow™ solution was deemed the best fit for the customer's new server room compared to a conventional infrastructure build with its integrated solution combining power, thermal and infrastructure management.

### Vertiv Solution

- SmartRow™
- Liebert® UPS
- Liebert® Thermal Management

## GLOBAL TECHNOLOGY FIRM



### Overview

The customer underwent a major data center reorganization in 2015. The relocation of its IT equipment offshore presented significant challenges to the existing power and thermal infrastructure supporting the new reduced IT load in their Sydney data center. One of the challenges facing the firm was to determine the inefficiencies caused by relocation of its IT assets. At the same time, it wanted to reassess the capabilities of its three 63KW CRAC (computer room air conditioning) units that were approaching end of life. By applying Vertiv's eCap™ Energy Optimization Service, the customer was able to reduce total data center energy consumption by as much as 33%.

### Vertiv Solution

- eCap™ Energy Optimization Service

## PHILIPPINE-BASED SEMICONDUCTOR FIRM



### Overview

To support its growing business, the customer set out to expand its regional manufacturing site. In its expansion, the customer needed reliable equipment, support and services to support its new facility, which will be used for assembling and testing chips for computers, aerospace, telecommunications and automotive industries. Vertiv's UPS, battery monitoring solutions and 24x7 services helped the customer in its facility upgrade, providing the reliability and availability it needed.

### Vertiv Solution

- Liebert® UPS
- Liebert® Thermal Management 60TR single unit
- Maintenance Services
- Battery Monitoring

### Remote & Site Monitoring Services

System-wide monitoring solutions

- 24 hour help desk support by expert engineers
- Remote preventive maintenance for proactive identification of anomalies
- Remote battery testing
- Alarm management
- Field incident resolution
- Equipment optimization advice
- 24/7 customer access via internet
- Third party equipment integration
- Customized reports
- Integration with high level platforms via SNMP

### LIFE™ Remote Monitoring & Diagnostics

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

- 24 hour monitoring and service delivery by expert engineers
- Monitoring and trending of system data
- Diagnosis through expert data analysis allowing effective proactive maintenance and prevention of future anomalies
- Prompt alarm identification and resolution
- Alarm notification
- On-site corrective maintenance dispatching
- Third party equipment integration
- Customer reporting

### Vertiv Data Center Optimization Services

Complete infrastructure audits maximize system availability and enhance data center efficiency

- Airflow, heat and power assessments
- Temperature measurements
- Floor plan layout
- Reporting
- Recommendation
- EC fans enhance energy savings on installed equipment
- iCOM Control enables modern communication capabilities of multiple units

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