



Vertiv in rail transport

Securing your
rail infrastructure

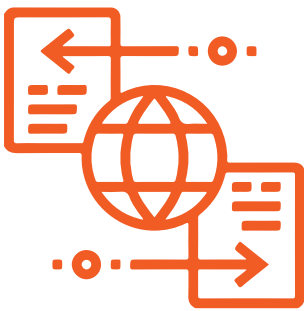


Vertiv Rail Solutions - Designed & Approved for Rail Applications

For more than two decades, Vertiv has been the supplier of choice with the UK's largest transport infrastructure customers, supporting critical infrastructure across all major national rail routes from Anglia to the West Coast Mainline.

With over 1,200 critical assets supplied and supported across all major networks, you can trust Vertiv to leverage our extensive experience in infrastructure support, guaranteeing your passengers a safe journey, a smarter experience and a future-proof service.

Compliance & Approvals: EN: 50121-5, 50171 / LU: S1222, Assessed in accordance with 1-085



Personalised Mobility

- There is a growing focus on enhancing customer experience with the goal of enabling passengers to stay connected before, during, and after their commute.
- Passengers are now able to access real-time information on train routes and travel times and be alerted of any incidents to make their commute more convenient and comfortable.
- Integration of e-commerce features on some train stations, allowing passengers to do their shopping online and pick up their items at the nearest train stations.



Sustainability for Growth

- As the rail system becomes digital, there is also a shift towards a more sustainable transport model.
- Operators continuously seek innovative technologies that increase efficiency and resiliency while strengthening the overall rail infrastructure.
- The goal is to be able to harness technologies while lowering operating costs and ensuring the safety and availability of the entire rail network.



Protecting the Digital Rail System

- With increased reliance on technology and customer experience, operators need to ensure that all personal data and information collected from passengers remain protected at all times.
- At the same time, operators must also ensure that their equipment is optimized and protected against sudden breakdowns and outages.
- There is a need for a two-pronged approach to security: physical and digital.

Infrastructure Challenges



Managing Costs While Enhancing Infrastructure Performance

- Rail operators must be able to guarantee a more efficient and resilient system, while minimizing operating and maintenance costs
- The challenge is to integrate new technologies and systems into the existing network to enhance overall performance and introduce automation
- At the same time, existing equipment should also be designed to meet the environmental demands of rail networks

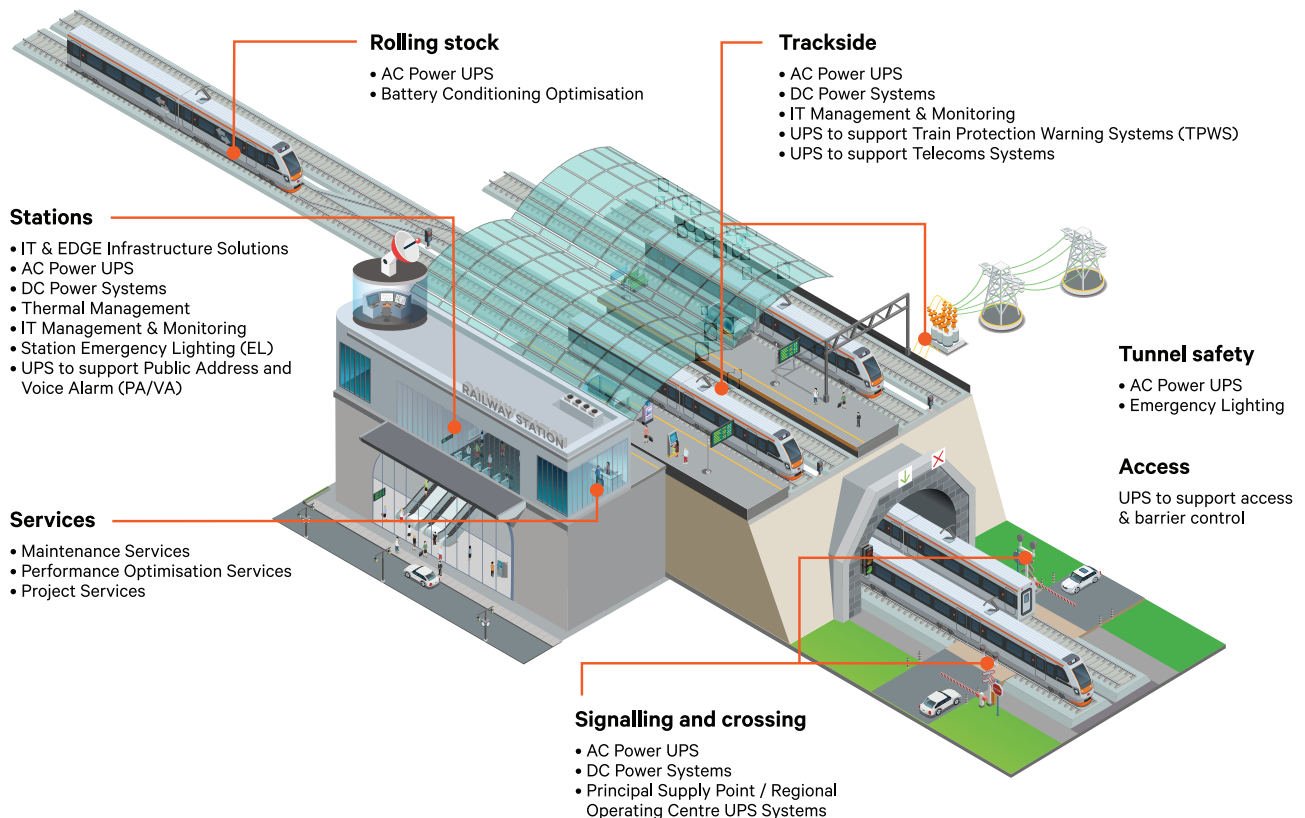
Enabling a Smart Transport Network From Core to Edge

- With increased reliance on automation, rail operators must be able to manage multiple applications within the network, from the main data center to various train hubs across a particular region
- It is important to ensure seamless integration of all applications across the system for effective implementation of new technologies
- Different infrastructure requirements for both core and edge computing applications

Maintaining Reliability and Safety

- Immediate access to data to address critical issues instantly
- Data security to maintain a reliable communication network
- Protection against power disruption and disturbances across every location

Vertiv End-to-End Critical Infrastructure



Vertiv Core to Edge Solutions

Vertiv™ Liebert® EXS

10 kVA - 80 kVA | 400V, 3 Phase Input / 230V, 1 Phase Output (10-20kVA) 400V, 3 Phase Input / 400V, 3 Phase Output

- High efficiency, Input PF >.99, THDi <3%
- Compact footprint
- Parallel operation & load bus sharing capability
- Integrated input/output and bypass switchgear
- Touch screen display showing unit status and metering
- Advanced configurable communication options available
- Flexible battery combinations (VRLA / Li-Ion), Internal and external configurations



Network Rail Product Approved (30-80kVA PAD Cert.: PA05/07717 Issue 1) / Compliant with EN 50121-5 (10-60kVA)

Vertiv™ Liebert® EXM2

100 kVA - 250 kVA | 400V, 3 Phase Input / 400V, 3 Phase Output

- High efficiency, Input PF >.99, THDi <3%
- Compact footprint
- Smart paralleling & load bus sharing capability
- Integrated input/output and bypass switchgear
- Large touch screen display showing unit status and metering
- Advanced configurable communication options available
- Flexible battery combinations (VRLA / Li-Ion)



Vertiv™ Liebert® APM2

30 kVA - 600 kVA | 400V, 3 Phase Input / 400V, 3 Phase Output

- Modular, scalable, hotswappable architecture
- High efficiency, Input PF >.99, THDi <3%
- Compact footprint
- Smart paralleling & load bus sharing capability
- Integrated input/output and bypass switchgear
- Large touch screen display showing unit status and metering
- Advanced configurable communication options available
- Flexible battery combinations (VRLA / Li-Ion), Internal and external configurations



Vertiv™ Liebert® EXL & EXL TR

30kVA - 160kVA | EXL: 400V, 3 Phase Input / 400V, 3 Phase Output | EXL TR: 400V, 3 Phase Input (DNO) + 400V, 1 Phase Input (OLE) / 400V, 3 Phase Output

- High efficiency, Input PF >.99, THDi <3%
- Compact footprint
- EXL: Smart paralleling & load bus sharing capability
- Integrated input/output and bypass switchgear
- Large touch screen display showing unit status and metering
- EXL: Advanced configurable communication options available
- EXL: Flexible battery combinations (VRLA / Li-Ion)
- EXL TR: Independent dual rectifier system, with user selectable source priority
- Network Rail Product Approved (30-160kVA PAD Cert.: PA05/04932 Issue 6)



Vertiv™ ELSX

25kVA - 125kVA | 400V, 3 Phase Input / 400V, 3 Phase Output

- Modular, scalable, hotswappable architecture
- High efficiency, Input PF >.99, THDi <3%
- Compact footprint
- High fault clearance & recharge capability
- Test timer to simulate mains failure
- Smart paralleling & load bus sharing capability
- Integrated input/output and bypass switchgear
- Large touch screen display showing unit status and metering
- Advanced configurable communication options available
- Flexible battery combinations



Compliant with BS EN 50171 Designed for Life Safety
Manufactured in the UK

Vertiv™ SPSX

5 kVA - 20 kVA | 400V, 3 Phase Input / 230V, 1 Phase Output | 230V, 1 Phase Input / 230V, 1 Phase Output

- Modular, scalable, hotswappable architecture
- Integrated input/output and bypass switchgear
- Internal and external battery configurations
- Advanced configurable communication options available
- Ingress Protection - IP20 to IP54
- Flexible battery combinations



Network Rail Product Approved
(PAD Cert.: PA05/06826 Issue 2)

Vertiv™ MPSX

30kVA - 150kVA (In a single cubicle)

| 400V, 3 Phase Input / 400V, 3 Phase Output

- Highly customisable system, designed for rail applications
- Modular, scalable, hotswappable architecture
- High efficiency, Input PF >.99, THDi <3%, Compact footprint
- Integrated input/output and bypass switchgear
- Large touch screen display showing unit status and metering
- Advanced configurable communication options available
- Low Smoke, Zero Halogen cabling as standard / approved paint finishes
- Ingress Protection - IP20 to IP42+
- Flexible battery combinations



Compliant with BS EN 50171 London Underground Compliant: S1222, Built in accordance with 1-085 Manufactured in the UK

Vertiv OLBI

10kVA - 15kVA | 400V, 3 Phase Input / 400V, 3 Phase Output (Offline) 230V, 1 Phase Output (Mains Failure)

- Offline Battery Inverter
- Bespoke design to support London Underground station lighting
- Designed to monitor DNO & LU supplies
- Capable of being installed into existing OLBI enclosures
- Modular, hotswappable subsection architecture
- Large touch screen display showing unit status and metering
- Low Smoke, Zero Halogen cabling as standard / approved paint finishes
- Ingress Protection - IP32



Compliant with BS EN 50171 London Underground Approved: S1948, Built in accordance with 1-085 Designed for Life Safety
Manufactured in the UK

*Products may differ from image.

DC Power Systems

Vertiv™ NetSure™ 7100 3 kW - 5 kW Rectifier

NetSure™ 7100 systems help reduce your equipment footprint while meeting the higher power demand of your evolving network. These compact systems feature high-power density rectifiers that help minimize operation costs and carbon emissions.



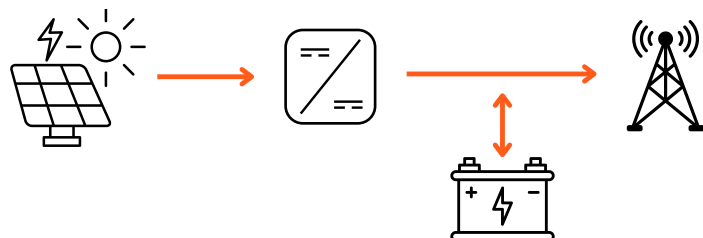
Vertiv™ NetSure™ 5100 Series Rectifier

The NetSure 5100 Series for hybrid applications offers a unified approach to managing multiple energy sources, from generators to solar panels. The system is specifically designed to solve a variety of site challenges, including:

- Solar/Hybrid Capability – Reduce your dependency on the grid and diesel fuel with the ability to leverage solar panels and other renewable energy sources
- ECO Mode – Optimize power efficiency at any load condition
- Reducing the cost of expensive electrical utility bills with on-grid solar
- Extending battery life for bad-grid locations
- Managing generator-fuel and battery life in off-grid locations.



Solar Energy Applications



Vertiv™ MPSR 24 / 48 / 110 / 220VDC

The Vertiv™ MPSR is an industrial rectifier - battery charger offering the latest modular switch-mode technology and bringing compactness and high reliability. Customisable for project applications.

Vertiv™ NetSure™ Inverter Systems

Free up floor space by powering your AC and DC loads from a single system with a common battery bank. Add a stand-alone NetSure™ Inverter cassette to existing sites or use Vertiv™ NetSure™ 7100 Converged systems with Vertiv™ eSure™ Inverters for new deployments. Customisable for project applications.



Vertiv™ NetSure™ M Series

A robust and energy-efficient outdoor enclosure solution for radio and IT edge equipment that delivers hours of battery backup. Increase cooling capacity with patent-pending humidity control supported by energy-efficient fan filter solutions, improved battery ventilation, and compatibility with lithium-ion batteries.



IT Management & Monitoring

Managing and monitoring critical environments at multiple sites around the clock 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.

Services

We Sell more than Product - We Design, Deliver & Support Solutions

Whether you're contemplating design concepts for a new facility or strategizing an upgrade, our trusted experts are readily available to assist you in finding an efficient and resilient system, along with a service package tailored to your needs. Additionally, we offer specialised support for battery reconditioning and optimisation for rolling stock - Ni-CAD batteries.



Planning, Installation & Commissioning

At Vertiv, we accompany you through every stage of your project. Our dedicated research and development team is equipped to analyze and devise solutions for diverse edge system needs.



Monitoring & Analytical Tests

Vertiv conducts a comprehensive series of analytical tests and remote monitoring to ensure heightened efficiency and uninterrupted operation of your systems.



Repair & Spare Parts

All spare parts provided by Vertiv are original, thoroughly tested, and guaranteed to fully comply with Vertiv solutions.



Maintenance

Preventative maintenance guarantees uninterrupted operations and optimised system efficiency.



Batteries & Battery Testing

Batteries have a limited lifespan, making proper maintenance crucial for ensuring the guaranteed efficiency of UPS systems and avoiding potential failures. Vertiv provides high-quality batteries to ensure smooth operations.



Training

Our training courses provide a cost-effective way to ensure your workforce is capable of performing tasks safely and at the highest level of efficiency. We also assist in ensuring compliance with the latest regulatory requirements, while optimizing process and equipment knowledge.