HITACHI ABB

Tropos TRO600 Series

Hitachi ABB Power Grids Tropos TRO600 hybrid wireless portfolio for mining

- ‘Always-on’, high availability architecture
- Reduced CAPEX through hybrid connectivity
- Robust applications for critical mining communications

TRO600 Hybrid Wireless Portfolio

No single communication technology meets every operational need.

Some reach long distances yet provide very low bitrate. Others can only deliver broadband speeds at short distances. Large public networks provide non-dedicated capacity. Dedicated private networks may not be economical to future-proof coverage and capacity.

In mining operating environments, a growing range of applications (such as autonomous vehicle control) require both time-critical and bandwidth-intensive capabilities. While there are increasing communication demands, the number of devices requiring connectivity grows exponentially. Mine operators need to maintain high reliability and resilience for mission-critical operations, expand their networks and add ever-increasing numbers of devices and applications.

Public cellular networks
Public mobile network operators provide mining facilities with rapid time to market, ready-to-use infrastructure and a fast track to new generation technologies. Public cellular networks have a superior geographical reach with minimal investments from mining customers, and charge based on usage. In remote mining locations however, public cellular access may still be subject to geographical coverage challenges. Despite large spectrum utilisation, mobile networks are shared and often subject to congestion and sometimes outages, which are unsuitable for mission critical services.

Private cellular networks
Private LTE networks offer fully self-owned and operated, dedicated infrastructure with a forward-looking Industrial IoT approach. They can be deployed in both licensed and unlicensed spectrum, which may present capacity challenges. Private LTE networks in licensed spectrum are CAPEX-intensive due to spectrum cost. As a result, bandwidth is often insufficient to serve the growing number of applications needed in mining operations. Unlicensed LTE spectrum, on the other hand, can be subject to contention and power restrictions, challenging the reliability of the architecture.

Mesh networks
Advanced mesh networks provide robust self-optimising, self-healing and self-organising architectures. Fully dedicated and private, mesh networks utilise unlicensed spectrum to deliver high-reliability communications, ensuring critical communication-grade latency and performance. Due to power restrictions and high contention, unlicensed spectrum may present a distance challenge, rendering mesh networks expensive in large geographical deployments.

Tropos TRO600 hybrid portfolio for mining applications
The TRO600 architecture delivers an ‘always-on’, high-availability, high-performance wireless network, specifically designed for critical mining operational applications. By leveraging multiple communication technologies, a ‘hybrid’ network leverages the optimal performance characteristics of cellular and broadband mesh networks, whilst mitigating their weaknesses.

The Hitachi ABB Power Grids TRO600 series delivers a solution that can take advantage of long-haul cellular links, thus reducing intensive CAPEX.

Through its signature broadband mesh capability, the TRO600 continues delivering a high-bandwidth/low-latency backhaul option, circumventing cellular disruptions to ensure key communications remain reliable and resilient. Where underground or nomadic mining assets fall outside cellular coverage, the TRO600 can economically provide a localised service extension, leveraging the nearest wired or wireless backhaul interconnect.

In addition to the hybrid wireless architecture, Hitachi ABB Power Grids’ TRO600 series provides a robust mission critical wired backhaul through a selection of gigabit Ethernet and fiber interfaces.

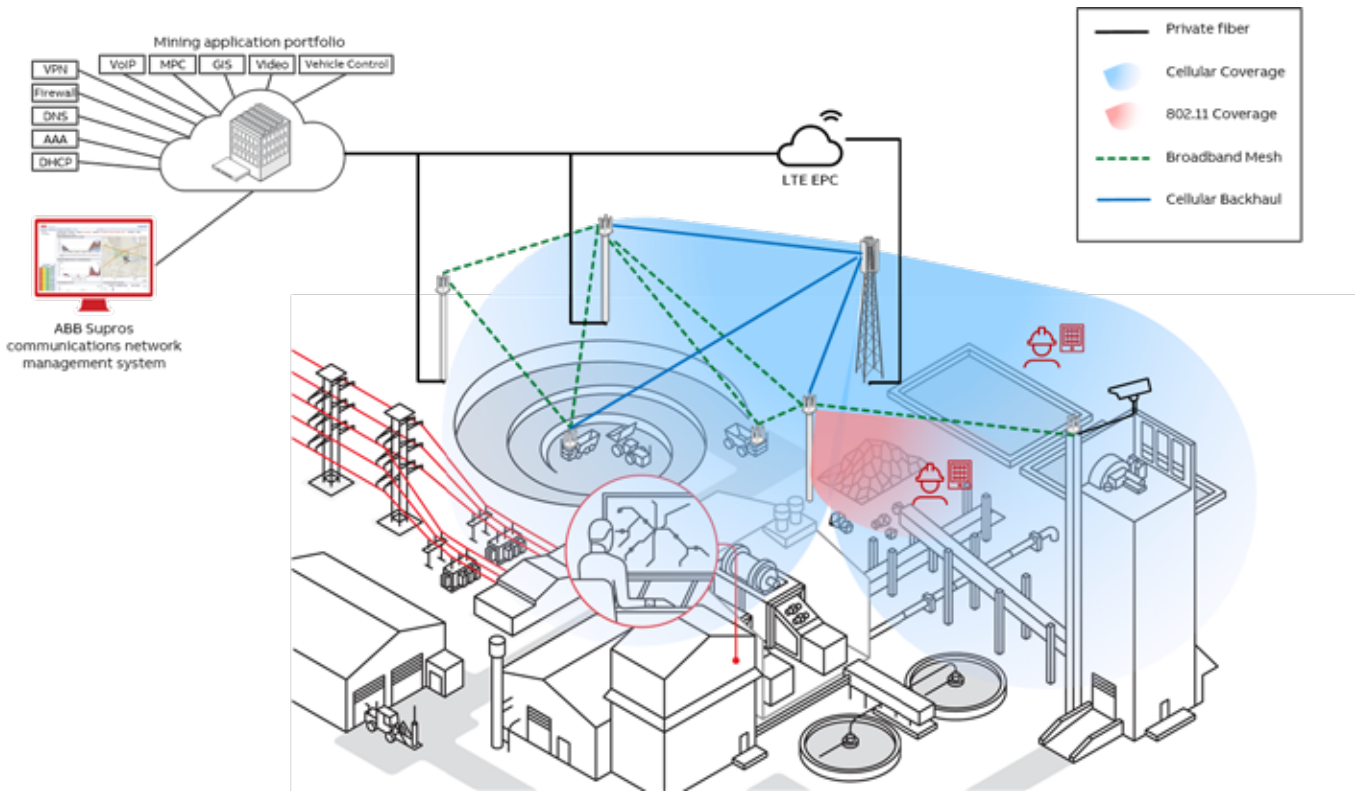
For mobile mining applications, Hitachi ABB Power Grids provides robust dual-band fast-roaming functionality, ensuring a seamless hand-off between mobile and fixed portions of the network.

Hitachi ABB Power Grids Wireless remains committed to backwards compatibility and providing connectivity to legacy devices within a mining network by offering a range of serial and contact interfaces. For harsh environments, TRO600 offers an IP67, corrosion-resistant ruggedized option and an ATEX Zone 2 certification for explosive atmospheres.

To avoid non-essential communication and allow for future distributed compute requirements, the TRO600 family offers an edge compute platform, ready to host third-party applications. By bringing decision making closer to the network edge, the volume of data traversing a network is reduced, thus reducing operating costs and contention end to end.

Through Supros, the Hitachi ABB Power Grids Wireless specialised network management system, networks can be configured, monitored and managed throughout the deployment and operations lifecycle. Whether a router is purely mesh, purely cellular or carries the more robust hybrid capability, Supros provides deployment support for scalable Hitachi ABB Power Grids wireless networks.

TRO600 solution overview



VoIP voice over internet protocol; **MPC** mining production and control; **GIS** geographic information system; **VPN** virtual private network; **AAA** authentication authorization and accounting; **DHCP** dynamic host control protocol; **IDS** intrusion detection system; **PTMP** point to multi point; **FCI** faulted circuit indicator; **DNS** domain name system; **LTEEPC** long term evolution evolved packet core

TRO670

- Outdoor router, removable antennas
- Highest environmental options
- AC and DC power options
- Optional integrated battery backup
- Dual-band Tropos mesh, LTE and target platform for third-party gateway radio integrations

TRO640

- In-vehicle installations, rolling stock, vibration resistant
- Fast roaming
- Dual-band Tropos mesh and LTE
- Seamless handover mesh <> LTE (future)

SUPROS CARRIER CLASS NETWORK MANAGEMENT SYSTEM

TRO660

- Outdoor router, integrated antennas
- Ease of deployment; lightweight
- Dual-band Tropos mesh, LTE

TRO620

- DIN rail cabinet/indoor installations
- Integrated solutions
- Dual-band Tropos mesh, LTE and target platform for third-party endpoint radio integration
- Richness of interfaces and connectivity
- Adaptable to mobile and outdoor applications with available accessories

OPERATORS CAN CHOOSE FROM A VARIETY OF CELLULAR AND BROADBAND MESH OPTIONS SEAMLESSLY INTEGRATED IN EACH ROUTER.

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