THE DTC DIFFERENCE IN THE MINING INDUSTRY

As pioneers in the creation of wireless RF solutions, we have the experience and capabilities to assist the digitalization of the Mining Industry. Our radios are developed in the US and Europe by a 60 strong engineering team with combined expertise in RF, IP, PCB Design and video and data encoding.

DTC's COFDM technology provides unbeatable and secure communications, repeatedly demonstrating NLOS performance superior to competing solutions. With a comprehensive product portfolio along with our Software Defined Radio Systems, DTC has a solution to meet every communications, security and autonomous need.
DTC is famous for our innovative approach to delivering world class spectrum efficiency, bandwidth, data rates and exceptionally low latency.

IP MESH

- Fluid self-healing Mesh, optimised for mobile applications
- Excellent range and NLOS capability
- Up to 20 nodes on a single frequency network
- Up to 32Mbps throughput
- Each node acts as a repeater and source of video, audio and generic IP data
- No central node, as each node is equal
- Seamlessly links different Mesh networks over third party bearers
- Transparent IP network allows connection of any general IP device
- Auto adaptive modulation maintains connectivity in mobile applications
- Range of power outputs, mounting options and environmental housings
- Optional end-to-end encryption
- Ability to build groups of Mesh to create a network
- Multipath IP Mesh nodes can provide an independent secure network and integrate to other technology sensor networks such as SCADA / LORAWAN and Sigfox used within the mining environment

MARINE MINING

Marine mining vessels incorporate significant IT infrastructure and critical security video and situational awareness information. These systems link to shore-side networks via SATCOM systems, limit available bandwidth and add significant latency. This leads to very high OPEX airtime costs and maintenance headaches. Codan | DTC COFDM technology is proven in long range offshore environments and with appropriate shore-side infrastructure, provides a secure, high capacity, terrestrial-based alternative to SATCOM systems. Operating ranges in excess of 100km are readily achievable with bi-directional data rates of 10Mbps+ and multiple vessels supported from a single base station. Codan | DTC Mesh systems can be deployed with transportable shore-side infrastructure to support ad-hoc shallow water dredge mining operations with additional Mesh nodes on shore to relay data to the nearest fixed network access point. Codan | DTC technology means that 'out to sea' does not have to mean 'off the grid'.

AUTONOMOUS AND AUTOMATED HAULAGE SYSTEMS (AHS)

Transporting minerals from the mine to the dumping point is capital intensive and time-consuming. Providing a safe work environment in hazardous mines is also a major challenge. With the changing economics of mining, repeatable and predictable cycle times are critical to increasing productivity and profitability.
AHS provide continuous hauling cycles, increased productivity, reduced maintenance costs, lower fuel consumption and enhanced operator safety. Mine sites that use AHS technologies can increase efficiency up to 25%. Codan | DTC leads the way for the secure, reliable transfer of video, audio, data and general IP network traffic in real-time. Our systems address issues of latency, range extension and reliability. These low latency communication solutions allow mining operations to control remote and autonomous systems to improve the efficiency and safety of AHS operations.


SOL8SDR-C


SOL8SDR-R


NETNode 4R 5W


NETNode 5RM


NETNode 5R

INNOVATIVE COMMUNICATIONS FOR DIGITAL MINING ENVIROMENTS

CODAN | DOMO TACTICAL COMMUNICATIONS

DMX-2023-06

CODAN COMMUNICATIONS | DTC

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WHEN YOU NEED TO TALK

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COMMERCIAL UNMANNED SYSTEMS
TELEMETRY CONTROL, VIDEO, DATA AND IP

The mining industry is facing a number of challenges that have mandated a need to reduce costs, focus on safety and improve productivity, efficiency and profitability. Evolving technologies have a major part to play in achieving these goals.

CHALLENGES FACED BY THE MINING INDUSTRY

- Productivity challenges – worldwide mining productivity has declined
- 3.5% a year over the past decade
- Higher extraction costs and the need to drive efficiencies through
- Automation
- Shortage of skilled labor is forcing a change in working practices
- Employee safety concerns
- Security and high value asset protection.

Trends in Digital Mining

The mining industry is responding rapidly to these challenges with innovative technologies that focus on the full value chain. Trends across the industry include:

- A shift to 'Open Pit Mining' and new economical 'Extraction Methods'
- Machinery optimization
- Increased productivity methods
- Implementing human and vehicle safety systems
- Adoption of systems that drive the digital mining transformation process and are key for Mine Management entities to implement new extraction processes
- Mining automation, autonomous hauling, drilling, underground LHD loaders and tunnelling equipment
- Implementation of RF communications and Mesh MANET networks to retrieve all sensor data and have coordinated operational communications between workers, autonomous systems and operations centers/ headquarters
- Utilization of data and big data analytics provides deeper, continuous, up-to-date understanding of the resource base
- Upgrading mobile video surveillance and security.

CODAN | CODAN | DTC: YOUR MINING SOLUTIONS PARTNER

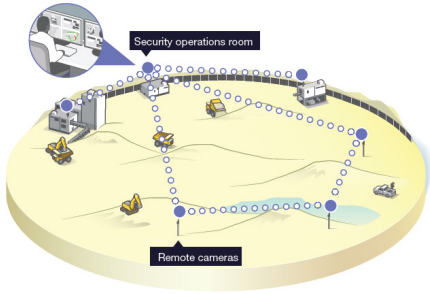
Codan | DTC is the leader in the mobile video surveillance, data transfer, autonomous systems and remote communications markets. We engineer the most secure and reliable systems for the transfer of video, audio, data and general IP network traffic in real-time environments. Our systems have been engineered to address the issues of latency, range extension and reliability, that are key within an operationally critical mining environment.
Our customers utilise our mission proven point-topoint COFDM technology for extreme low latency applications or our marketleading high-capacity wireless IP Mesh technology where reliable, high capacity data networks are needed. The Codan | DTC Mesh offering is a true game changer in RF communications, offering high capacity IP connectivity with secure seamless exchange of data. Its robust, self-healing, self-forming network capabilities make it an ideal communication solution for use in harsh environmental conditions where flexibility, mobility and reliability are key. The Codan | DTC Mesh offers a private, cost-effective communication infrastructure which acts as a key enabler for technology applications within the digital mining environment. This includes:

- Live streaming of mobile and static video and security system data to secure the mine area and perimeter.
- Autonomous and automated plant connectivity to allow the command, control and monitoring of remotely operated machinery that improves the safety, efficiency and productivity of mining operations.
- Wireless network connectivity for Surface and Sub Surface operations to extend existing networks for operational sensor data monitoring and safety to the work force in a dynamic mining environment.
- Site wide data communication networks that connect all aspects of technology within the digital mining environment and allow a connected workforce to operate efficiently and safely.

APPLICATIONS

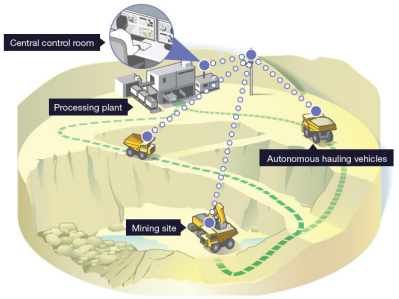
SECURITY - MOBILE VIDEO SURVEILLANCE AND HIGH VALUE ASSET RETENTION

Security is a key concern, especially in the gem industry where the mined product is extremely valuable and easily concealed. Fixed CCTV systems are part of the solution but wired infrastructure cannot keep pace with mining operations and is easily damaged, both accidentally and in a deliberate attempt to circumvent security.
Codan | DTC P2P COFDM systems have been implemented in gold and diamond mine covert security solutions where 'normal' RF systems couldn't be used. Mesh and Point to Point COFDM camera systems, overt or covert, can readily be deployed to cover areas of concern. This could be at the sharp end of the mining operation, covering the haulage of raw product or discouraging 'private mining' of spoil heaps and unmined product-rich territory. Cameras can rapidly be relocated in a dynamic surveillance environment while the Codan | DTC Mesh Network ensures video routing back to the security operations room.



AUTONOMOUS AND AUTOMATED PLANT CONNECTIVITY

Our Codan | DTC IP Mesh provides stable, high-speed data links in difficult communication environments. This enables the control, monitoring and visualization of autonomous and automated machinery.
The IP Mesh Network provides low latency Non-Line-of-Site (NLOS) communications in both Surface and Sub Surface environments, enabling vital connections between mine decision makers, the autonomous equipment they monitor, operators and the sensors throughout the site.
More than 200 Codan | DTC Mesh systems have been sold for integrated connectivity solutions within Africa, South America and Europe.



WIRELESS NETWORK CONNECTIVITY AND NETWORK EXTENSION

Achieving reliable communications through deep mine shafts and galleries offers communication challenges. Traditional wired systems are expensive, inflexible and prone to damage, requiring constant reconfiguration to keep pace with movement of the mining face. Codan | DTC IP Mesh technology is uniquely suited to solve the communication challenges of working in a Sub Surface mining environment where the requirement for reliable, high bandwidth communication links is critical. Codan | DTC Tactical COFDM waveforms utilise multipath reflections to enable superior NLOS communication performance to achieve reliable communications in dynamic mining scenarios.

Due to the superior RF propagation performance of COFDM when utilised within a tunnel environment both RF performance and range is greatly extended. Live trials in numerous mines and Tunnels have recorded in excess of 8Km node to node. Codan | DTC Mesh can form a seamless, selfforming, self-healing network that allows dynamic deployment of additional nodes to increase range deep into side tunnels and round multiple bends. The Mesh can act as a standalone private RF network for operational sensor data and monitoring or as an extension to existing communications networks by creating an integrated flat IP architecture.

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