



HELIX

Tracking **Solutions**

Discover how integrated tracking can enhance safety and productivity in your mine.

A Komatsu technology brand

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HELIX Tracking Solutions:

Greater safety and efficiency across mining operations.

MST's Tracking solutions deliver real-time visibility of personnel, vehicles, and critical assets across underground mining operations. Built on the AXON communication network and managed through HELIX, the system transforms location data into actionable intelligence that enhances safety, improves operational awareness, and increases productivity throughout the mine.

Designed specifically for the challenges of underground environments, the solution provides continuous tracking and monitoring during everyday operations and critical events such as shift changes, blasting, incident response, and emergency evacuations. Personnel can be tracked using wearable tags, integrated cap lamps, MinePhones, vehicles, mobile equipment, or fixed infrastructure, creating complete visibility across the operation.

As part of the scalable AXON ecosystem, the platform can be expanded with Situational Awareness capabilities that convert real-time location information into proactive alerts, helping prevent incidents before they occur. Combined with the intrinsically safe AXON IS infrastructure, HELIX delivers reliable tracking and communications even in hazardous underground environments, enabling safer, smarter, and more efficient mining operations.



HELIX 3D CONNECT:

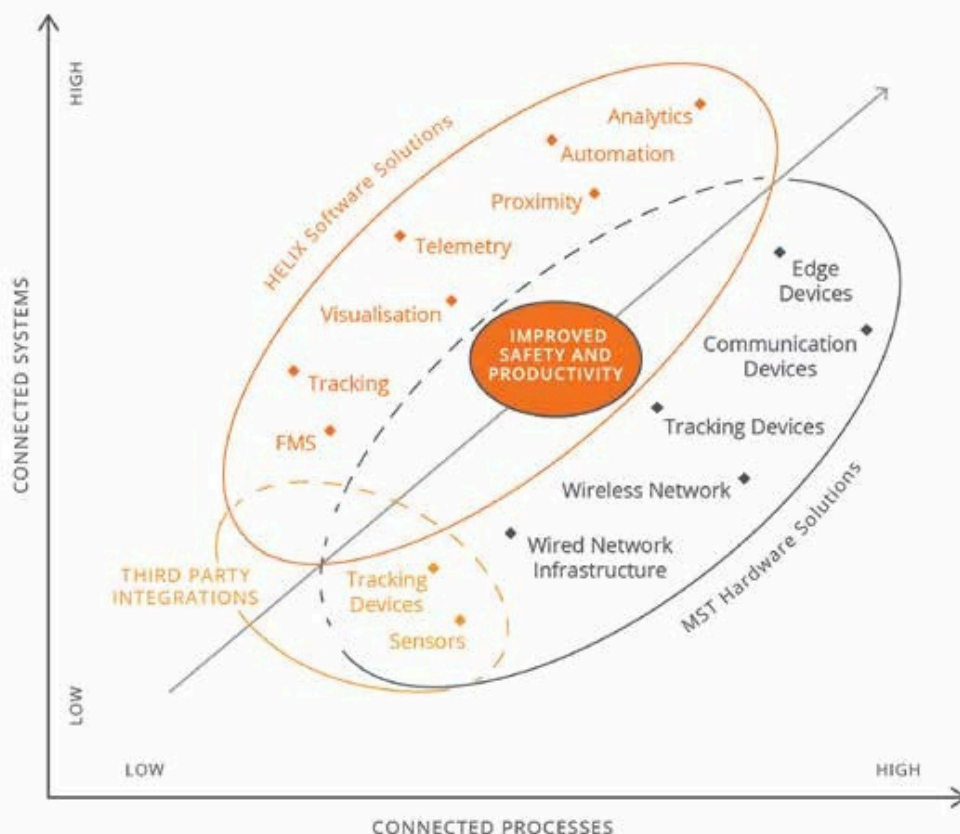
Real-time tracking and location system with geospatial digital twin representation.

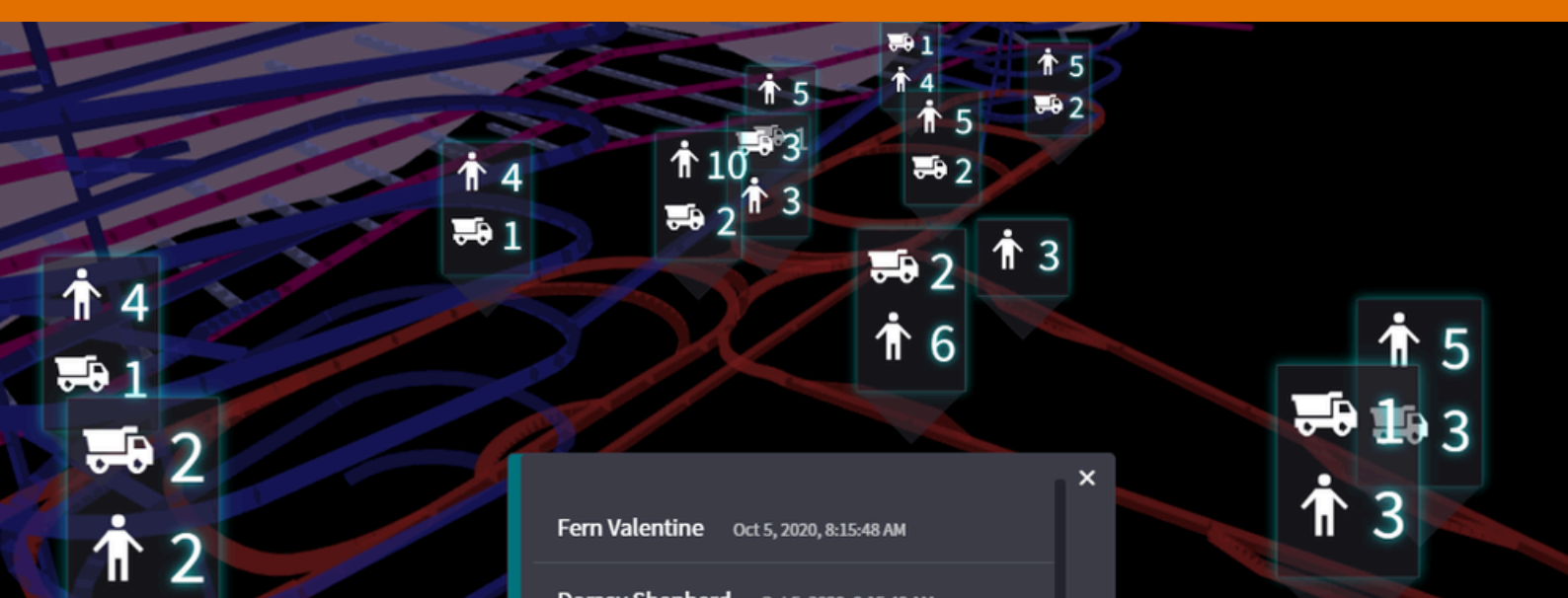
HELIX is MST's advanced digital platform that transforms underground mining operations into a connected, intelligent, and fully visible environment. By combining real-time tracking, 3D geospatial visualization, automation, and operational analytics, HELIX provides a complete digital view of the mine, enabling safer decisions, greater productivity, and improved operational control.

Built on real-time location data from personnel, vehicles, and equipment, HELIX creates a dynamic digital twin of the underground operation, allowing users to monitor activities, optimize workflows, and respond quickly to changing conditions. Through seamless integration with MST and third-party technologies, the platform connects multiple systems into a single operational environment, turning data into actionable insights that improve safety and performance.

Designed to grow with your operation, HELIX provides configurable dashboards, interactive 3D visualization, historical replay, automated event management, and Dynamic Position Monitoring (DPM) to analyse movement, equipment utilization, workforce deployment, and productivity. Combined with powerful personnel accountability and emergency response capabilities, HELIX delivers the intelligence needed to operate a safer, smarter, and more efficient digital mine.

GEOSPATIAL DIGITAL-TWIN





HELIX **sentinel**:

Real-Time Workforce Intelligence for permanent and temporary shift management.

HELIX Sentinel is MST's intelligent digital tag-board solution, providing real-time visibility of underground personnel through intuitive dashboards and strategically located displays.

- More than a tracking system, Sentinel transforms workforce data into operational intelligence, enabling mines to effectively manage personnel, contractors, travel time, productive hours, and rest periods from a single platform.
- By combining real-time and historical information, Sentinel improves workforce accountability, enhances operational efficiency, and provides immediate visibility during routine activities and critical situations.
- Automated alerts and intuitive visual tools help operators respond faster to potential risks, strengthening personnel safety while improving control across the entire underground operation.

Key Benefits and Advantages:

- **Data-Driven Workforce Management:**
 - Control personnel and contractors using real data on travel, work, and rest times.
- **Improved Productivity and Efficiency:**
 - Optimize workforce utilization based on actual operational performance.
- **Real-Time Personnel Visibility:**
 - Monitor personnel distribution instantly across zones.
- **Enhanced Safety Control:**
 - Detect exposure to hazardous environments and respond immediately.
- **Personnel Accountability and Traceability:**
 - Access complete tracking history and profile information.
- **Digital Tagboard Transformation:**
 - Replace or complement traditional systems with a modern, scalable solution.
- **Zone-Based Monitoring:**
 - Control personnel presence in critical areas.





Benefits of the HELIX Tracking Solution:

Flexible and scalable tracking system to optimize security and decision-making.

In today's complex mining environments, achieving real-time visibility and operational control is critical. HELIX delivers a powerful tracking solution designed to enhance safety, improve efficiency, and enable confident decision-making.

Real-time monitoring and visualisation:

- Gain real-time visibility across multiple mining sites to improve decision-making.
- Experience a three-dimensional representation of your entire mining environment (surface and underground) with support for different geospatial coordinate systems.
- Scalable tracking views from meters to kilometers, to adapt the tracking view to your specific needs / Choose between 2D or 3D visualizations for surface and underground environments.

Visibility on the surface and underground:

- Gain a comprehensive view of equipment and vehicles by including surface maps along with underground activities.

Customisable location, time, and travel information:

- Create custom dashboards and reports with data relevant to the diverse needs of users.

Customisable groups:

- Ability to create tracking groups according to your needs. Such as shifts, maintenance crews, etc.

Multiple positioning technology:

- Use various positioning technologies such as Wi-Fi, UWB, BLE, and GNSS with different quality of performance (QoP) options.

Creating geofences:

- Implement extensive geofencing capabilities to delimit work areas, risk areas, or areas of special attention, allowing you to receive alarms in case of transgression or overexposure.

Reverse tracking capability:

- Is possible to complement real-time monitoring, reconstructing the historical movement of vehicles and equipment outside the coverage of the communication network.

Situational awareness using the same tag:

- increase the safety of your operations by incorporating the "Situational Awareness" solution for machine operators, allowing them to detect the nearby presence of people and other equipment.



MST's Hardware for real-time tracking solutions in underground mines:

MST tags combine RFID technology with 2.4 GHz Wi-Fi to transmit a unique identification signal that propagates efficiently throughout underground environments, delivering accurate and reliable personnel and asset identification.

ICCL Lamp:

- High-performance corded lamp with integrated tracking system.
- Power supply system from the lamp, not requiring internal batteries.

Trak Orb Lamp:

- Cordless mining cap lamp with integrated tracking system.
- Power supply system from the lamp, not requiring internal batteries.

Personal use tag PT33:

- A tag designed so that the user can wear it on their belt or lamp cord.
- Includes a panic button to send an emergency alert via HELIX to the Control Room.
- Ergonomic design with reduced weight for ease of use.
- Long-lasting, replaceable battery.

Location tag:

- Fixed location tags supported by VIP/Sensa Hub, and located in key positions throughout the mine, such as extraction points, routes, etc.
- Its function is to integrate with the "reverse tracking" system to recreate the presence of people, vehicles, and equipment in areas that do not have communication networks.
- Tags are battery powered.





In addition, MST solutions seamlessly support verified third-party tracking devices and smartphones, providing a flexible, interoperable platform with robust intellectual property protection and adaptable tag technologies for a wide range of mining applications:

Vehicle and Equipment tags:

- Tags designed to vehicles and equipment.
- Highly robust to withstand working conditions.
- Power options include independent battery-powered or vehicle/machine powered connection.



MinePhone MST:

- Seamless, real-time communication across your underground operation—delivered safely, reliably, and with full operational visibility.
- MP71 / Optimizes operational communication.
- MP70 / Ensures secure communication in hazardous environments.
- Real-time staff visibility:
 - Integrated tracking improves control.
 - Integrated into the HELIX tracking solution.
- Full Duplex Voice Communications over Wi-Fi (VoIP):
 - Enables natural, real-time two-way conversations, improving coordination and reducing communication delays underground.
- Push-to-Talk (PTT) with 24 Channels:
 - Supports fast group communication and instant broadcast across teams in critical operational scenarios.
- Integrated Text Messaging.
- SIP Protocol Support for Voice and Messaging:
 - Ensures reliable, standards-based communication that integrates easily with existing network infrastructure.





HELIX supports four advanced tracking technologies:

Advanced technologies enabling accurate, scalable and reliable tracking.

Wi-Fi Positioning:

- The AXON Wi-Fi positioning system enables real-time tracking of personnel and equipment.
- By calculating signal strength from strategically located access points combined with LF exciters, it allows us to determine more precise locations, increasing security and operational efficiency.

Bluetooth Low Energy (BLE) positioning:

- The HELIX BLE positioning system uses low-power beacons with long-lasting batteries, making them ideal for continuous use in mining environments.
- By deploying numerous beacons to track personnel and assets, this technology offers a scalable and cost-effective solution.

Global Navigation Satellite Positioning System (GNSS):

- By incorporating auxiliary equipment, the HELIX GNSS positioning system offers precise tracking for vehicles and equipment on the surface.
- Covers large areas and provides accurate position data, making it ideal for integration with fleet management systems.

Ultra Wideband (UWB) Positioning:

- The HELIX UWB positioning system provides high-precision position tracking. This makes it ideal for complex underground environments where traditional tracking methods may suffer.





AXON IS + HELIX: Intrinsically Safe.

Tracking in high-risk underground environments is no longer optional—it is essential:

In underground mining, where hazardous environments demand the highest safety standards, continuous visibility of personnel and assets is essential to protect people, improve emergency response, and maintain operational efficiency.

MST Global combines AXON IS and HELIX to deliver a fully integrated, intrinsically safe tracking solution purpose-built for these demanding conditions.

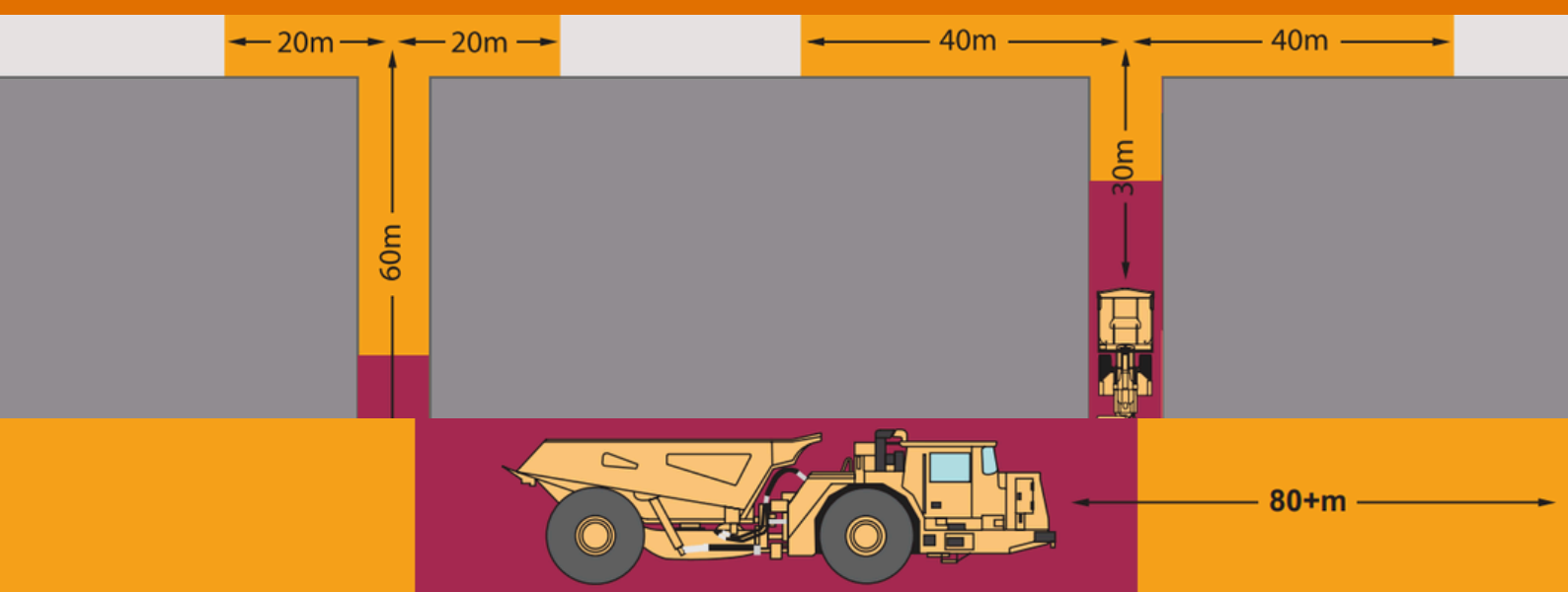
AXON IS provides a high-performance communication infrastructure certified for hazardous areas, while HELIX transforms real-time location data into actionable operational intelligence through advanced visualization, monitoring, and analytics.

Together, they provide continuous, accurate tracking and complete operational visibility, enabling mines to strengthen safety, accelerate decision-making, improve personnel accountability, and optimize productivity with confidence.

With AXON IS + HELIX, tracking extends into the most dangerous areas—delivering visibility, safety, and control exactly where they are needed most:

- Intrinsically safe tracking ensures continuous visibility of personnel in explosion-risk zones —areas where traditional systems cannot safely operate.
- Eliminates Visibility Gaps in High-Risk Zones.
- Enables Safe Operation in Explosive Atmospheres.
- Increased confidence in worker protection systems.
- Intrinsic safety ensures that the tracking system itself does not introduce risk. No ignition sources from network or tracking devices.





Maximize your MST Tracking investment: **Situational Awareness:**

MST Situational Awareness leverages the same tags, the same network infrastructure, and the HELIX platform to transform existing tracking data into real-time alerts that prevent incidents before they occur.

Just more value from what you already have:

- 🚧 No additional tags required.
- 🚧 No duplicate systems.
- 🚧 No added complexity.

Situational Awareness unlocks the following benefits:

Proactive safety powered by existing data:

- Prevent vehicle-to-person and vehicle-to-vehicle collisions.
- Eliminate operational blind spots.
- Receive early alerts—even beyond line of sight.

Maximize your existing investment:

- Uses the same tracking tags already deployed.
- No need for additional systems.
- Extends the value of your MST tracking solution.

Fast, low-friction implementation:

- Built on the proven MST system, leveraging its existing network, and fully integrated ecosystem.
- Minimal change management required.

From visibility to real-time action:

- Move from knowing where assets are → to understanding what is happening now.
- Enable faster, safer decisions at critical moments.
- Improve operational awareness at the point of action.

Operational intelligence & continuous improvement:

- Full event and incident tracking / Complete incident reconstruction capability (“black box”)
- Identify risk patterns and optimize operations.

Configurable detection zones:

- Define warning and critical zones to escalate alerts based on proximity.

Integrated with MST Tracking, it functions as a unified ecosystem by integrating:

Automatic proximity detection:

- Vehicles equipped with the Vehicle Intelligence Platform (VIP) detect nearby tags within ranges of up to 60–120 meters.

In-cab real-time alerts:

- Visual and audible alerts notify operators of nearby personnel or equipment before hazards are visible.





Additional benefits of the MST tracking solution: Label assignment and communication system.

User tag assignment systems:

- MST tag systems offer two allocation methods:
 - Permanent assignment to the user, considering the tag as "personal protective equipment" (PPE), therefore it is non-transferable and mandatory for each user to access the portal.
 - Temporary assignment of tags to users via automatic self-assignment kiosks; Sentinel digital tag board
 - The selection of the system to be used will depend on the mine guidelines.



Tracking system integrated into MST's AXON air+ Access Points:

- MST's AXON air+ Access Points have the dual capability of simultaneously integrating Tracking and Communications solutions into a single device.
- In turn, the open Wi-Fi protocol 800.11 a/b/g/n allows a wide range of devices and applications to run from AXON.



Other communication options to support tracking:

- ICCL offers one ways messaging comms
- Mine phone offers two way VoIP comms - calls, alarms, messaging.





Looking for solutions to improve safety, productivity, and operational performance in your mine?

www.mstglobal.com

- Visit the MST Global website to explore innovative technologies designed for underground mining and tunneling.
- Discover integrated solutions for communications, automation, IoT, fleet management, personnel tracking, and digital operations, backed by real-world customer success stories, technical resources, product information, and the latest industry innovations.
- Whether you're evaluating new technologies or planning your next digital transformation project, MST Global provides the insights and expertise to help you make informed decisions.

LinkedIn:

- Stay connected with MST Global on LinkedIn and be the first to discover our latest innovations in underground mining technology.
- Follow us for product updates, customer success stories, industry insights, event highlights, expert perspectives, and the latest advancements in automation, connectivity, safety, and digital transformation.
- Join our community and stay informed about the technologies shaping the future of mining.

YouTube channel:

- Explore MST Global's latest innovations in underground mining technology.
- Discover videos featuring communication networks, automation, fleet management, safety solutions, IoT, real-world customer success stories, product demonstrations, and digital technologies designed to improve mine safety, efficiency, and productivity.

Talk to our experts about how to improve underground safety and productivity with Tracking in your mine.



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