

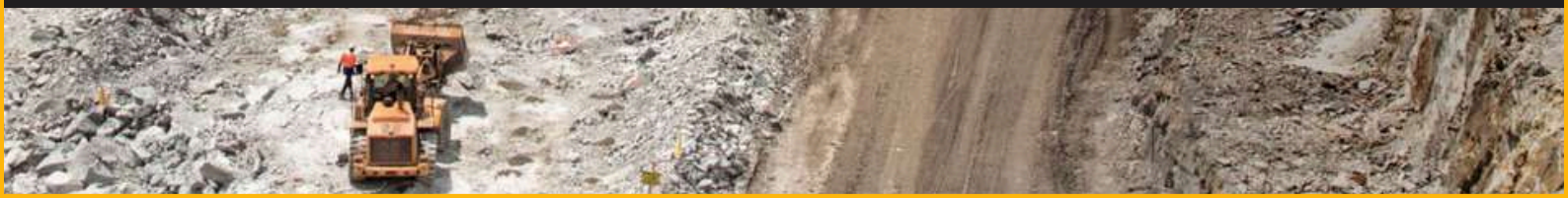


MINE SAFE

PRODUCT CATALOGUE

A GLOBAL LEADER IN MINE SAFETY TECHNOLOGY SOLUTIONS

· SAFER MINES · SMARTER OPERATIONS · TECHNOLOGY YOU CAN TRUST



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ABOUT MINE SAFE GLOBAL

THE CORE SAFETY SYSTEMS MINING OPERATIONS RELY ON

Our solutions include an integrated range of technologies engineered to safeguard operators, infrastructure, and pedestrian personnel.

Our expertise is built on years of hands-on experience across diverse mining environments. We work closely with each client to understand their unique site conditions, challenges, and objectives. This collaborative approach allows us to deliver tailored, intelligent solutions that safeguard your workforce, protect your assets, and enhance operational performance.

THE PRINCIPLES THAT GUIDE US

We listen, adapt, and respond with solutions shaped around your operational goals.

PEOPLE

We believe people matter, and what we do is grounded in relationships that foster trust and respect.

INTEGRITY

We operate with transparency, accountability, and honesty in everything we do.

INNOVATION

We continuously develop new technologies that keep our clients ahead of emerging risks.

RESPECT

We treat every individual and partner with dignity and professionalism.

EXCELLENCE

We deliver quality solutions that meet the strictest standards of performance and safety.

COLLABORATION

We work hand-in-hand with our clients and relevant industry leaders to understand their needs and deliver tailored outcomes.

All of our collision avoidance solutions are proudly designed and developed in South Africa, reflecting our commitment to local innovation and proven reliability.

CORE COLLISION PREVENTION SYSTEMS

OVERVIEW

These systems form the foundation of Mine Safe Global's safety technology, providing automated collision prevention with active machine control to protect both operators and equipment.

01. CxD LEVEL 9 COLLISION PREVENTION TECHNOLOGY®

Level 9 automatically initiates machine intervention to prevent collisions before they occur where operator reaction time alone is insufficient to avoid an incident. It is ISO 21815-compliant and fully compatible with both modern and legacy equipment, ensuring seamless integration and reliable performance.

02. MINE SAFE MI MACHINE CONTROLLER INTERFACE

Enables seamless Level 9 integration between any CxD system and any machine, including older non-intelligent legacy equipment and LDVs. This allows operations to upgrade entire fleets to Level 9 safety standards without replacing existing machines.

03. LEVEL 8 COLLISION AVOIDANCE SYSTEM

Provides cost-effective machine-to-machine and machine-to-pedestrian collision avoidance with real-time alerts. Available as permanent or temporary installation, ideal for flexible deployment or as complementary protection alongside Level 9 systems.



1. CxD LEVEL 9 COLLISION PREVENTION TECHNOLOGY®

OVERVIEW

The CxD Level 9 is the most advanced collision prevention system available, featuring fully automated machine intervention.

When a potential collision is detected and human reaction time alone is insufficient to avoid the resulting incident, the system automatically initiates machine intervention to prevent the collision.



KEY FEATURES & BENEFITS

SEAMLESS L9 INTEGRATION

Fully compliant Level 9 operational readiness engineered for seamless integration with your fleet—delivering compliance without requiring additional hardware upgrades.

GPS & RTLS LOCATION TECHNOLOGY

Multi-sensor fusion ensures high-precision detection in open-pit and plant environments, enabling accurate real-time positioning.

ADVANCED GIS INTEGRATION

Enhanced situational awareness through a full GIS background layer on the in-cab controller, giving operators clear, real-time visibility.

COMPREHENSIVE GEOFENCING CAPABILITY

Prevents unauthorised access and ensures strict adherence to site traffic management plans and safety zones.



UNMATCHED SAFETY & PRECISION

- ✓ **Level 9 Operational Readiness:** The system is fully compliant and engineered for seamless integration with your fleet, ensuring readiness for Level 9 intervention control.
- ✓ **Multi-Sensory Alarms:** Effective visual and audio alerts enhance awareness and response times.
- ✓ **Advanced GIS Integration:** Enhanced situational awareness through a full GIS background layer on the in-cab controller.
- ✓ **Intelligent Zoning:** Dynamic zoning for optimal safety at all speeds and under varying traffic conditions.
- ✓ **GPS & RTLS Location Technology:** Multi-sensor fusion ensures high-precision detection in open-pit and plant areas.

ROBUST CONNECTIVITY & CONTROL

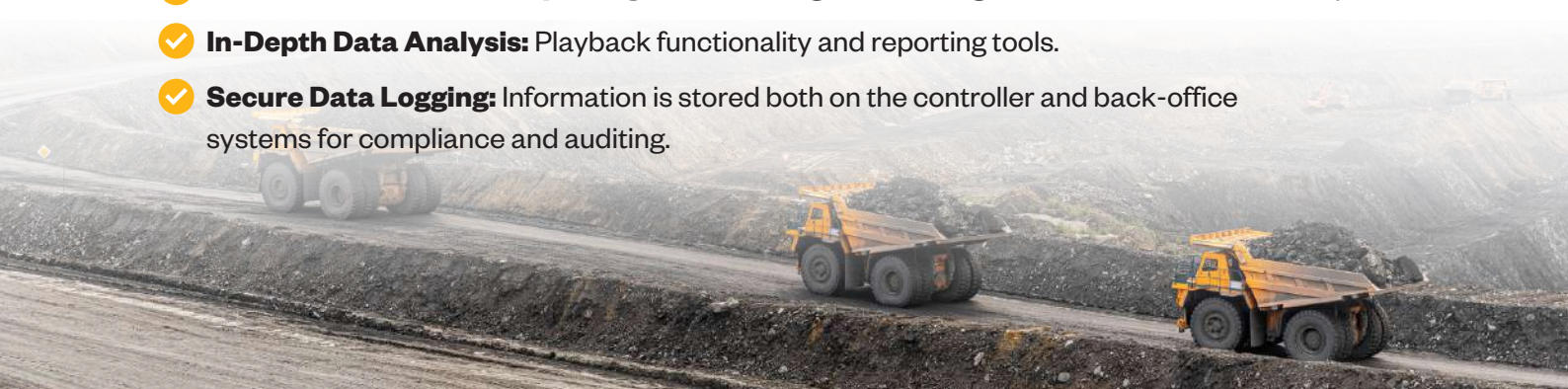
- ✓ **Mesh Radio Network:** Enables real-time data transmission between machines and the central Mine Safe Global TrackPro back-end database.
- ✓ **Self-Diagnostics & Health Monitoring:** Continuous system checks and fail-to-safe operation.

USER-CENTRIC DESIGN & CUSTOMISATION

- ✓ **Configurable Parameters:** Tailor system configuration to meet site-specific operational needs.
- ✓ **Integrated Workforce and Machine Management:** Supports iButton access and electronic pre-shift checklists.
- ✓ **Plug-and-Play:** Simplified deployment with strain-relief and tamper-proof mechanisms.
- ✓ **Smart Operational Modes:** Includes loading mode, intelligent crawl mode, various smart and fail-to-safe override modes, and pairing with pedestrian units to minimise false alarms.

ADVANCED DATA & REPORTING TOOLS

- ✓ **Cloud-Based Data Log Storage:** Transfer data to a local or cloud database using the Mine Safe Global TrackPro back-end network, which operates independently of WiFi or cellular networks. The system can also use existing on-site networks for data transmission.
- ✓ **Mine Safe Global Live Reporting:** Gain live insights to manage and enhance on-site safety.
- ✓ **In-Depth Data Analysis:** Playback functionality and reporting tools.
- ✓ **Secure Data Logging:** Information is stored both on the controller and back-office systems for compliance and auditing.



2. MINE SAFE MI MACHINE CONTROLLER INTERFACE

OVERVIEW

Enables seamless Level 9 integration between any CxD and any machine, including older non-intelligent legacy machines.

The Mine Safe MI Machine Controller Interface is the critical link between the Level 9 Collision Prevention System and machine control systems, enabling seamless Level 9 integrated operation across intelligent and legacy machinery.



KEY FEATURES & BENEFITS

INTELLIGENT COLLISION AVOIDANCE INTEGRATION

- ✓ **CxD and Machine agnostic:** The Mine Safe MI Machine Controller Interface can be integrated with any CxD system and any machine.
- ✓ **Intelligent machines:** All intelligent machines can be controlled through existing OEM machine control mechanisms.
- ✓ **Legacy Machine Integration:** Extends L9 intervention controls to non-intelligent machines through the fitment of various Mine Safe Global machine control mechanisms.

SEAMLESS COLLISION AVOIDANCE INTEGRATION

- ✓ **Cost-Effective Level 9 Interface Solution:** Reduces costs while maintaining safety and reliability of your Level 9 integrated fleet.
- ✓ **Modular & Adaptable Design:** Enables integration with all machine makes and models.

INDUSTRY COMPLIANCE & RELIABILITY

- ✓ **ISO 21815:2-2021 Compliant:** Meets the highest industry safety standards.
- ✓ **Comprehensive Data Logging:** Securely records operational data for compliance and optimisation.
- ✓ **Durable & Rugged Construction:** Engineered to withstand harsh operational environments.



3. LEVEL 8 COLLISION AVOIDANCE SYSTEM

OVERVIEW

Level 8 machine-to-machine and machine-to-pedestrian collision avoidance is available as a cost-effective option to deploy collision avoidance technology on site.

Our state-of-the-art Level 8 collision avoidance system offers permanent or temporary installation options, ensuring flexible deployment in diverse environments.



KEY FEATURES & BENEFITS

TRUSTED LEVEL 8 PROTECTION

Reliably safeguards mining operations with a cost-efficient collision prevention solution designed for consistent performance in high-risk environments.

EFFECTIVE WARNINGS

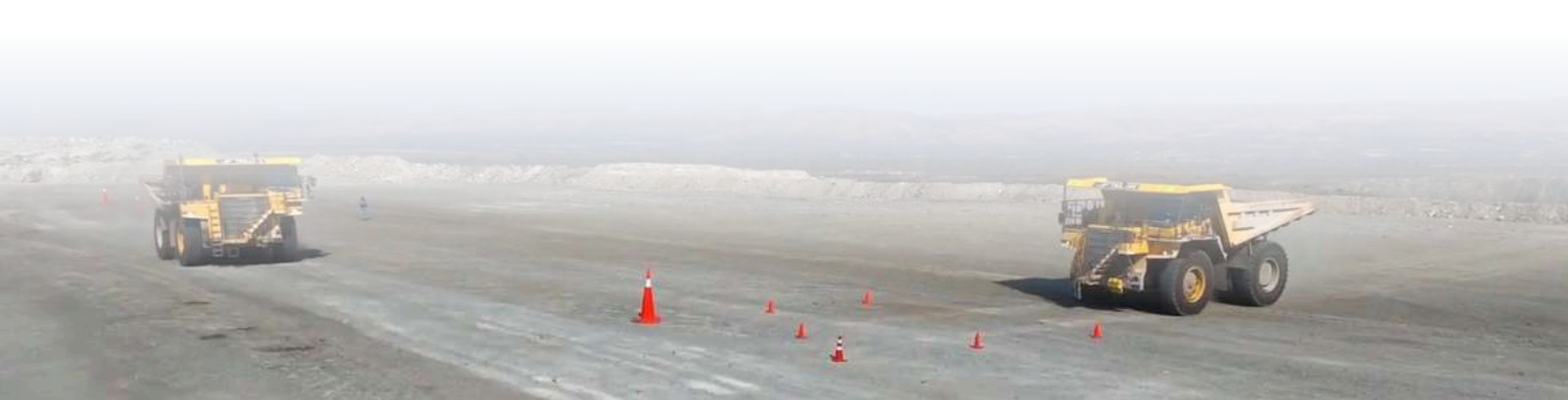
Provides clear audio and visual warnings of potential risks, enhanced by multi-sensory alarms to improve operator awareness and response times.

SEAMLESS SYSTEM INTEGRATION

Integrates effortlessly with the Mine Safe Global Collision Prevention eco-system, ensuring a unified and scalable safety solution.

FLEXIBLE DEPLOYMENT

Ideal for both permanent and temporary installations, including visitor vehicles, ensuring safety compliance across all site operations.



ADVANCED DATA & REPORTING TOOLS

- ✔ **Mine Safe Global Live Reporting:** Empower proactive safety management with real-time insights and monitoring.
- ✔ **Comprehensive Data Analysis:** Advanced playback and reporting tools enable precise incident investigation.
- ✔ **Reliable Data Logging:** Securely stores critical information from controllers and back-end systems for investigations, auditing, and compliance.
- ✔ **Cloud-Based Data Log Storage:** Transfer data to a local or cloud database using the Mine Safe Global TrackPro back-end network, which operates independently of WiFi or cellular networks.

DATA-DRIVEN DECISION MAKING

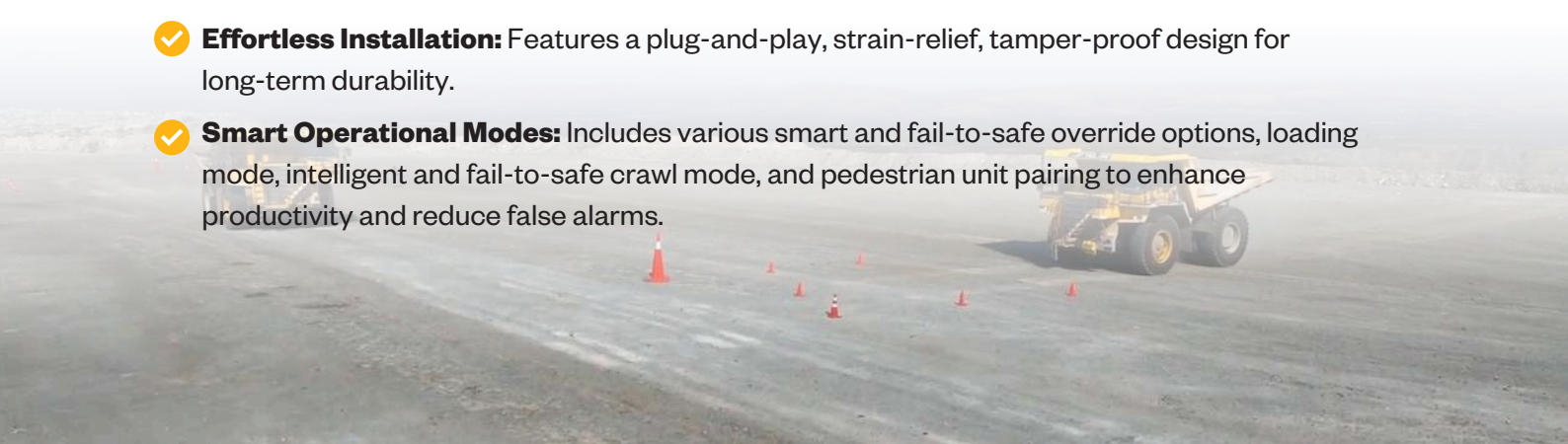
- ✔ **Data Analysis & Playback Tools:** Enables effective incident review and optimisation.
- ✔ **Configurable Alert Thresholds:** Tailor warning parameters to site-specific risk profiles, enabling supervisors to make proactive decisions based on operational data.
- ✔ **Configurable Operating Parameters:** Customisable configuration to adapt to your site-specific requirements.

INTELLIGENT SAFETY & TRACKING

- ✔ **GPS & RTLS Location Technology:** Delivers high-precision tracking for enhanced safety in open-pit and plant environments with multi-sensor fusion.
- ✔ **Mesh Radio Network:** Facilitates real-time data exchange between machines and the Mine Safe Global TrackPro back-end system.
- ✔ **Intelligent Zoning:** Adapts dynamically to speed and traffic conditions, ensuring optimal safety at all times.
- ✔ **Multi-Sensory Alerts:** Integrated visual and audio signals enhance situational awareness and accelerate response times.

SEAMLESS IMPLEMENTATION & USABILITY

- ✔ **Internal Diagnostics:** Ensures fail-to-safe operation with continuous system monitoring.
- ✔ **Effortless Installation:** Features a plug-and-play, strain-relief, tamper-proof design for long-term durability.
- ✔ **Smart Operational Modes:** Includes various smart and fail-to-safe override options, loading mode, intelligent and fail-to-safe crawl mode, and pedestrian unit pairing to enhance productivity and reduce false alarms.



PEDESTRIAN & VISITOR PROTECTION SYSTEMS

OVERVIEW

Designed to ensure every person on site is visible and protected, these systems create a comprehensive safety net for all personnel in mining environments.

04. PTU PEDESTRIAN TAG

Wearable safety device that makes every pedestrian visible to all vehicles and machines on site. Actively communicates with equipped vehicles, triggering alerts when pedestrians enter hazardous zones, even in poor visibility or around blind corners.

05. RF PAIRING UNIT

Pairs PTU pedestrian tags to machines or site infrastructure such as restricted zones and access points, creating a dynamic safety network that ensures pedestrians are detected and protected based on their location.

06. LEVEL 7 VISITOR UNIT

Battery-powered collision avoidance solution for temporary site access. Allows visitors and contractors to be protected by the same technology as permanent staff without infrastructure modifications, providing immediate protection upon site entry.



4. PTU PEDESTRIAN TAG

OVERVIEW

The PTU wearable pedestrian tag that ensures machines and vehicles fitted with Mine Safe technology will receive effective warnings for pedestrians that are at risk.

The Mine Safe PTU is an advanced pedestrian safety solution designed for personnel operating in high-risk environments where interaction with machines and vehicles creates risk.



KEY FEATURES & BENEFITS

COMPLETE PERSONNEL SAFETY

- ✓ **Comprehensive Safety Alerts:** Personnel receive effective visual and audio warnings of impending danger.
- ✓ **Seamless Access Control:** Integrates with on-site T&A systems to restrict access for personnel without a functional unit.
- ✓ **Reliable 12-Hour Battery:** Provides uninterrupted protection throughout the entire shift.

ADVANCED SAFETY & TRACKING

- ✓ **GPS & RTLS Location Technology:** Ensures real-time tracking in surface mining and plant areas.

ROBUST SYSTEM CONTROL & DIAGNOSTICS

- ✓ **Continuous Self-Diagnostics & Health Monitoring:** Ensures fail-to-safe operation.
- ✓ **Configurable Parameters:** Fully adjustable to meet your site-specific safety and operational requirements.

DATA-DRIVEN PERFORMANCE OPTIMISATION

- ✓ **Extensive Data Logging:** Extensive data log for compliance and analysis.
- ✓ **Advanced Incident Playback & Analysis Tools:** Facilitates effective optimisation and incident investigation.



5. RF PAIRING UNIT

OVERVIEW

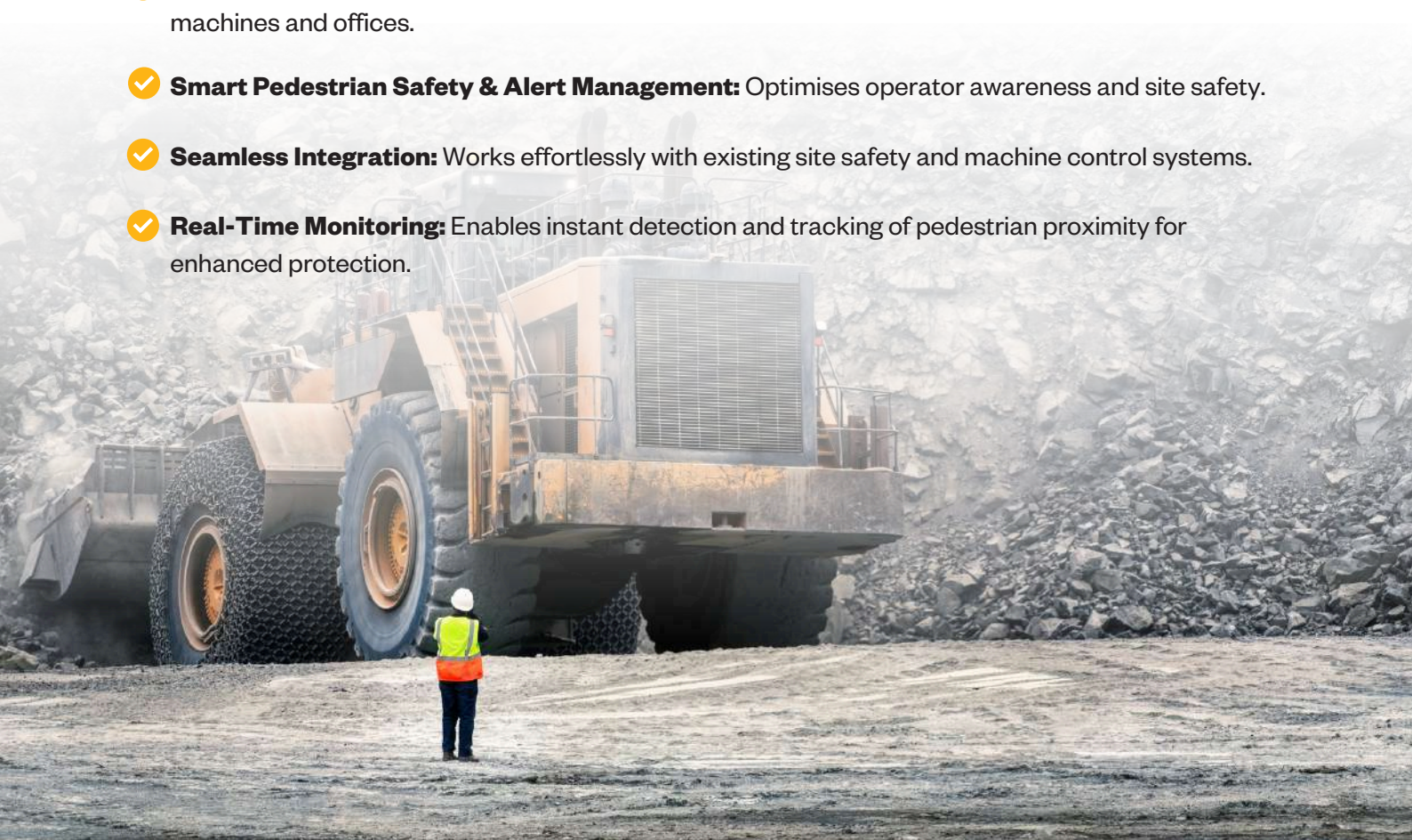
The RF pairing unit pairs PTU pedestrian tags to machines or site infrastructure such as offices.



KEY FEATURES & BENEFITS

PROACTIVE PEDESTRIAN ALERT SYSTEM

- ✓ **Accurate Pairing:** Effectively pairs the PTU pedestrian tag to the relevant machine, vehicle, or office.
- ✓ **Reduce False Alerts:** Prevent nuisance- and false positive alarms related to pedestrians in machines and offices.
- ✓ **Smart Pedestrian Safety & Alert Management:** Optimises operator awareness and site safety.
- ✓ **Seamless Integration:** Works effortlessly with existing site safety and machine control systems.
- ✓ **Real-Time Monitoring:** Enables instant detection and tracking of pedestrian proximity for enhanced protection.



6. LEVEL 7 VISITOR UNIT

OVERVIEW

A battery-powered solution that allows visitors to access the site while being protected by a collision-avoidance device during their time on site.

The Mine Safe Level 7 Mobile Unit is an innovative, battery-operated safety solution designed for temporary access to restricted areas, ensuring seamless integration of visitor vehicles into the on-site collision avoidance system.



KEY FEATURES & BENEFITS

PLUG-AND-PLAY VEHICLE UNITS

- ✓ **Vehicle-Mounted Convenience:** The unit is fitted to the vehicle at the site entry points and tested at the vehicle test gate.
- ✓ **Removal & Recharge:** Once the vehicle exits the site, the unit is removed and recharged.
- ✓ **Plug-and-Play Installation:** Simplified setup for quick deployment.

ADVANCED COLLISION AVOIDANCE & SAFETY

- ✓ **Level 7 Machine-to-Machine & Machine-to-Pedestrian Collision Avoidance:** Enhanced safety for personnel and vehicles.
- ✓ **Multi-Sensory Alerts:** Effective visual and audio alarms ensure effective hazard awareness.
- ✓ **Dynamic Zoning:** Dynamic zoning for optimal protection in high-risk areas at any vehicle speed.

SEAMLESS DATA LOGGING & DIAGNOSTICS

- ✓ **Comprehensive Data Logging:** Secure storage of operational data for compliance and analysis.
- ✓ **Continuous Self-Diagnostics & Health Checks:** Ensures fail-to-safe operation with system integrity and reliability.
- ✓ **Configurable Operating Parameters:** Tailor configuration to meet specific site requirements.



MONITORING & REPORTING SYSTEMS

OVERVIEW

These systems provide live data upload, monitoring, and analysis to identify risks before they become incidents and thereby optimise safety performance across operations.

07. ADVANCED FATIGUE MONITORING SYSTEM

Continuously monitors operator alertness using advanced sensors to detect drowsiness, distraction, or impairment. Provides real-time alerts and triggers intervention protocols to ensure operators remain alert throughout shifts.

08. HOTWORKS SYSTEM

Real-time temperature monitoring for smelting and processing operations. Continuously tracks temperatures in critical areas, providing early warning of thermal hazards in operations involving molten materials, furnaces, or high-temperature processes.

09. TRACKPRO: LIVE TRACKING & REPORTING

Comprehensive platform delivering live violation reporting, data analysis, and actionable safety insights. Collects data from all connected systems, enabling proactive safety management based on real data rather than reactive responses.



7. ADVANCED FATIGUE MONITORING SYSTEM

OVERVIEW

Continuously monitors operator fatigue to help prevent accidents caused by fatigue or distracted operators. Mine Safe's Advanced Fatigue Monitoring System continuously monitors operator alertness and behaviour using cutting-edge fatigue-detection technology.



KEY FEATURES & BENEFITS

SMART FATIGUE MONITORING & SAFETY ALERTS

- ✓ **Advanced Fatigue Detection:** Detects early signs of fatigue, including eye closure micro-expressions and yawning, enabling proactive incident prevention.
- ✓ **Proactive Safety Alerts:** Provides progressively stronger warnings to help operators respond appropriately to potential hazards.
- ✓ **Rugged Mining-Ready Design:** Built to withstand the harsh conditions of mining environments, including extreme temperatures, dust, vibration, and low- or high-light zones, ensuring reliable performance day after day.
- ✓ **AI-Enhanced Detection:** AI-powered full-face monitoring delivers real-time alerts and warnings to operators and the control room.
- ✓ **Real-Time Data and Reports:** Detection data is continuously collected, organised, and centralised for immediate access, analysis, and reporting.
- ✓ **Low-Light Capability:** Effectively detects operator fatigue in all lighting conditions, including low-light and infrared environments, ensuring continuous safety coverage.
- ✓ **Audit-Eligible Reports:** Complete detection-to-logging traceability, generating reports suitable for executive review and compliance audits.

8. HOTWORKS SYSTEM

OVERVIEW

Provides real-time temperature monitoring for hot-work activities in smelting operations.

The Mine Safe Global HotWorks Monitor is a cutting-edge safety system designed for machines operating in slag and metal runners at steel smelters. It actively warns operators and plant supervisors of unsafe operating conditions, ensuring a safer and more productive work environment.



KEY FEATURES & BENEFITS

REAL-TIME HAZARD DETECTION

Continuously monitors operational and machine temperatures, enabling early detection of potential thermal hazards.

OPTIMISED PRODUCTION & SAFETY

Configurable system settings enhance operational efficiency while maintaining the highest safety standards.

SEAMLESS INTEGRATION

Easily integrates with front-end loaders, trucks, and other machinery operating in extreme heat environments.

SAFETY OPTIMISATION

Combines real-time monitoring with intelligent alerts to proactively reduce risk and improve overall operational safety.

EFFECTIVE ON-BOARD AND BACK-END WARNINGS

Proactive warnings regarding temperature trends and values are provided for operators, on-site personnel, and control room operators.

SEAMLESS DATA LOGGING & DIAGNOSTICS

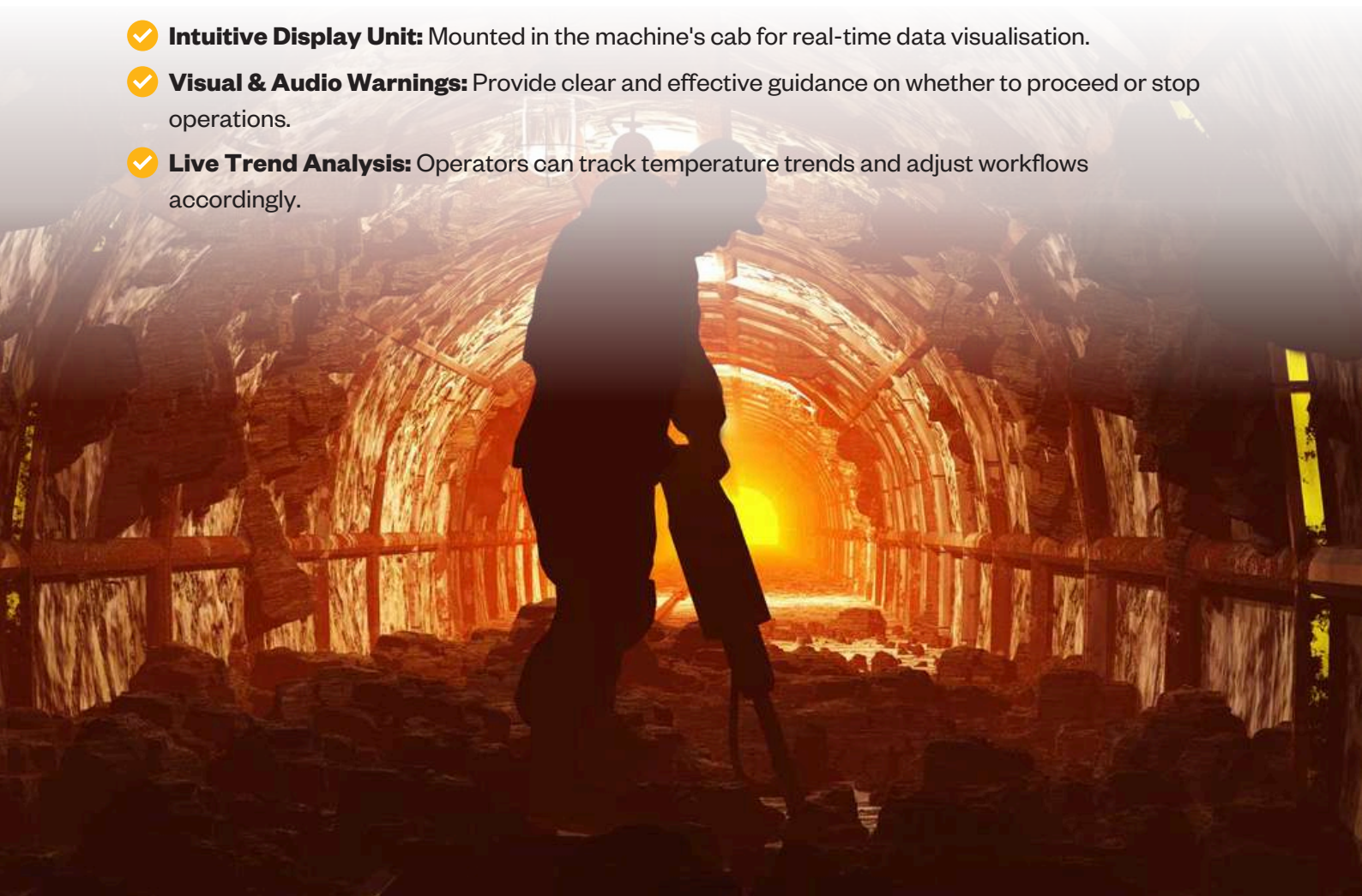
- ✔ **Multi-Sensor System:** Measures temperature at multiple points, including the material in the runner, floor beneath the loader, and machine components.
- ✔ **Custom Alarm Thresholds:** Configurable green, amber, and red alarm levels for site-specific safety parameters.
- ✔ **Automated Alerts:** Warnings are sent directly to operators and the control room when unsafe temperatures are detected.

CLOUD-ENABLED DATA LOGGING & REPORTING

- ✔ **Automated Data Upload:** All measured values are securely logged and uploaded to the cloud for reporting and compliance.
- ✔ **Comprehensive Reporting Options:** Generate temperature history reports for safety audits and operational reviews.
- ✔ **Non-Intrusive System Design:** Ensures easy implementation without disrupting machine functionality.

USER-FRIENDLY INTERFACE & ALERTS

- ✔ **Intuitive Display Unit:** Mounted in the machine's cab for real-time data visualisation.
- ✔ **Visual & Audio Warnings:** Provide clear and effective guidance on whether to proceed or stop operations.
- ✔ **Live Trend Analysis:** Operators can track temperature trends and adjust workflows accordingly.



9. TRACKPRO: LIVE TRACKING & REPORTING

OVERVIEW

TrackPro delivers live violation reporting, data analysis, and actionable insights for mining safety.

The Mine Safe Global TrackPro is an advanced solution that provides live data to on-site control rooms, offering visibility into critical violations and operational trends.



KEY FEATURES & BENEFITS

REAL-TIME DATA INSIGHTS

Delivers up-to-date insights on safety violations and operational trends, providing full visibility across your site and enabling timely, informed decision-making to enhance overall mining safety.

ENHANCED SITE MONITORING

Notifies control room personnel of violations and trends in near real-time, enabling proactive and informed safety management.

SEAMLESS DATA ANALYTICS

Integrates with the Mine Safe Global Data Analysis Application for in-depth safety insights and operational reporting.

REAL-TIME SAFETY MONITORING & ANALYTICS

Combines live data, intelligent alerts, and advanced analytics to drive proactive decision-making and continuous safety improvement.



RELIABLE DATA TRANSMISSION

- ✓ **Secure Data Transfer:** Data is transferred from the Mine Safe vehicle systems to the TrackPro back-end database via the Mine Safe radio network.
- ✓ **Independent Connectivity:** The Mine Safe Global radio network operates without reliance on cellular or WiFi networks, ensuring uninterrupted performance in all environments.
- ✓ **Comprehensive Equipment Monitoring:** The system tracks key parameters, including location, speed, direction, remote object identification, machine status, fleet number, and more.
- ✓ **Optimise On-Site Traffic Management Plan:** Analysis of operator behaviour provides opportunities to optimise operations on site.

ADVANCED REPORTING & ANALYSIS TOOLS

- ✓ **Live Incident Alerts:** Live notifications enable quick responses to critical violations which result in proactive prevention of incidents.
- ✓ **Historical Data Analysis:** Review past safety and performance data.
- ✓ **Replay & Heat Maps:** Provides visual analysis tools for identifying high-risk areas.
- ✓ **Customisable Reports:** Generate reports by fleet number, fleet type, or area to suit specific operational needs.
- ✓ **Histogram & Tabulated Reports:** Enables in-depth review of operational patterns and anomalies.
- ✓ **Automated Reporting & Distribution:** Streamlines compliance reporting for efficient operational management.



COMPLIANCE & WORKFORCE SAFETY SYSTEMS

OVERVIEW

These systems ensure regulatory compliance and complete personnel accountability, meeting stringent mining safety standards while eliminating human error in critical safety processes.

10. MINE SAFE SURFACE MISSING PERSON LOCATOR SYSTEM

Ensures compliance with Section 16.7 of the Mine Health and Safety Act through real-time personnel tracking.



10. MINE SAFE SURFACE MISSING PERSON LOCATOR SYSTEM

OVERVIEW

Rapidly locates missing personnel on surface mining operations through advanced RF tracking technology, ensuring swift emergency response and personnel accountability.

In the event of an emergency or when an individual cannot be accounted for, the system enables rapid location identification through GNSS positioning, dramatically reducing search and rescue response times and potentially saving lives.



KEY FEATURES & BENEFITS

AUTONOMOUS MISSING PERSON DETECTION

Autonomously identifies when personnel may be missing or unaccounted for with high-precision GNSS technology, providing last known location or live current location tracking for rapid emergency response.

REAL-TIME LOCATION VISIBILITY

Web-based user interface delivers real-time pedestrian location visibility with comprehensive data logging, movement replay capability, and integration with site-specific systems for complete operational awareness.

RED ZONE ACCESS CONTROL

Personnel can only access high-risk areas with functional pedestrian tags, with battery charging levels and tag functionality tested prior to red-zone entry ensuring continuous protection.

BEACON ARCHITECTURE & DATA MANAGEMENT

PTU Beacons receive tag location data via M2M/M2P network and upload to cloud database with on-site data caching, multi-SIM bonding routers, and flexible coverage scaling.

PEDESTRIAN TAG TECHNOLOGY

- ✓ **GPS-Equipped Tags:** High-precision GNSS technology provides industry-leading GPS accuracy for reliable personnel tracking across all surface mining environments.
- ✓ **CAS/CPS Data Transmission:** Seamless integration with collision avoidance systems for unified safety infrastructure and comprehensive personnel protection.
- ✓ **Extended Battery Life:** 24-hour+ continuous operation with next-generation tags offering 48+ hours battery capacity for extended shift coverage.
- ✓ **Emergency Call Function:** Next-generation tags include built-in emergency call capability enabling workers to signal distress directly from their tag.
- ✓ **Compact Form Factor:** Small, lightweight, unobtrusive design comfortable for workers to carry throughout their shift without operational hindrance.

SAFETY FEATURES & COMPLIANCE

- ✓ **Real-Time Personnel Tracking:** Continuous monitoring of all personnel locations across the mining site using PTU pedestrian tags.
- ✓ **Integration with Access Control:** Automatically tracks who is on site and their last known location.
- ✓ **Site-Wide Coverage:** The RF network delivers comprehensive coverage across open-pit and plant areas using beacons, without relying on cellular or WiFi networks.
- ✓ **Rapid Emergency Response:** Immediate location identification of missing persons reduces search time.
- ✓ **Legislative Compliance:** Ensures compliance with missing person location legislation requirements and personnel accountability regulations.
- ✓ **Autonomous Missing Person Identification:** System autonomously identifies tags that are not updating their location and alerts control room personnel for immediate action.
- ✓ **Cloud Database Management:** Central cloud database enables real-time access through web user interface from on-site control rooms or off-site workstations.
- ✓ **Movement Replay Analysis:** Complete replay of pedestrian movement patterns enables detailed post-incident analysis and continuous safety improvement.

UNDERGROUND COLLISION PREVENTION SYSTEMS

OVERVIEW

These advanced underground safety systems deliver comprehensive collision prevention and personnel protection specifically engineered for demanding underground mining environments.

11. HALOGUARD: UNDERGROUND COLLISION PREVENTION SYSTEM

Next-generation underground collision prevention system providing 360-degree awareness and automated machine intervention in confined underground spaces.

12. HALOTAG: UNDERGROUND PERSONNEL SAFETY DEVICE

Wearable safety technology that ensures every underground worker is continuously detectable and locatable, integrating cap lamp functionality with advanced pedestrian detection capabilities.



11. HALOGUARD UNDERGROUND COLLISION PREVENTION SYSTEM

OVERVIEW

HaloGuard delivers underground collision prevention and awareness technology for machine-to-machine and pedestrian-to-machine protection in demanding underground environments.

The Mine Safe Global HaloGuard is an advanced solution engineered to meet and exceed ISO 21815, integrating sensing, control, and communication technologies to prevent collisions, enhance operator awareness, and provide auditable safety records.



KEY FEATURES & BENEFITS

COMPREHENSIVE COLLISION PREVENTION

Multi-layer detection combining Prox-D sensors, LiDAR technology, and RF communication for 360-degree awareness with automated machine intervention and real-time alerts.

INTELLIGENT CONTROL ARCHITECTURE

L9 Gen 2 Controller with dual CAN bus channels, Wi-Fi connectivity, and an Access Controller Unit for driver identification and authorised operation, ensuring secure, connected, and intelligent machine control.

ADVANCED SENSOR TECHNOLOGY

Prox-D sensors and LiDAR units work together to deliver high-precision detection of blind spots and pinch points, ensuring comprehensive situational awareness around the machine.

TRAFFIC MANAGEMENT & DATA LOGGING

Beacon Network and Wi-Fi Transfer Station enable intelligent zone management, automatic log synchronisation, and detailed event reconstruction for improved safety oversight and analysis.



COMPLIANCE & DATA MANAGEMENT

- ✓ **ISO 21815 Compliant:** Meets global communication and functional protocol standards for collision avoidance systems and machine control interface integration.
- ✓ **Complete Event Reconstruction:** Comprehensive logging of all detection events, alerts, interventions, and operator responses enables detailed post-incident analysis.

MODULAR SYSTEM COMPONENTS

- ✓ **L9 Gen 2 Controller/Display:** Features dual CAN bus channels for machine and ISO 21815 safety networks, Wi-Fi for over-the-air updates and log synchronisation, and onboard storage for machine and ISO logs.
- ✓ **The Concentrator:** A data aggregation hub featuring dual CAN bus channels for vehicle and ISO networks, USB and RS232 debug ports for maintenance, and redundant log storage for reliability.
- ✓ **Prox-D Sensors:** Utilise Time-of-Flight technology, with multiple sensors strategically placed around each machine to provide full 360-degree coverage.
- ✓ **LIDAR Units:** Precise monitoring of blind spots, pinch points, and static obstacles.
- ✓ **Low-Profile Antenna:** Supports GPS functionality for surface operations and provides RF communication for vehicle-to-vehicle and vehicle-to-pedestrian connectivity underground.
- ✓ **Access Controller Unit (ACU):** Provides driver identification to prevent unauthorised operation, ensuring each ignition cycle is linked to a verified operator ID.
- ✓ **Beacon Network:** Defines traffic management zones throughout underground operations, creating virtual boundaries and controlled areas that integrate with site safety protocols.



12. HALOTAG: UNDERGROUND PERSONNEL SAFETY DEVICE

OVERVIEW

HaloTag delivers continuous personnel detection, location tracking, and emergency response capabilities for underground worker safety in demanding industrial environments.

The Mine Safe Global HaloTag is an advanced cap lamp integrating pedestrian tag technology, ensuring every underground worker is continuously detectable and locatable through advanced detection, communication, and data logging capabilities.



KEY FEATURES & BENEFITS

COMPREHENSIVE SAFETY NETWORK

Continuous detection and identification with real-time location tracking, Wi-Fi Transfer Station integration for seamless monitoring, and complete personnel accountability.

ACTIVE COLLISION PREVENTION

Audible and visual alerts warn both pedestrian and machine operators when mobile machines are nearby, with seamless integration to HaloGuard-equipped vehicles for automated intervention.

MULTI-TECHNOLOGY PLATFORM

Equipped with GPS for surface positioning, Proximity Detection for underground tracking, Radio Frequency for communication, Wi-Fi for data transfer, and Bluetooth for local connectivity.

INTELLIGENT DATA MANAGEMENT

Internal memory logging critical alarms, device status, and interactions with dual-layer backup to Wi-Fi Transfer Stations for pattern analysis and preventive safety measures.



SAFETY & OPERATIONAL FEATURES

- ✓ **Real-Time Battery Status Alerts:** Continuous monitoring ensures personnel are never left without functioning safety equipment, with alerts sent to both user and control room.
- ✓ **Interactive Emergency Buttons:** Dedicated buttons for routine communication and panic or distress mode provide workers with immediate access to help when needed.
- ✓ **Audible and Visual Alerts:** Multi-directional warning system alerts both the pedestrian and nearby machine operators to prevent potential accidents and collisions.
- ✓ **Seamless Lamp Room Integration:** Facilitates easy issuing and testing procedures while offering compatibility with both underground and surface environments for operational flexibility.
- ✓ **Hybrid Operational Capability:** Designed to operate seamlessly in surface mining or underground mining environments, adapting dynamically without manual intervention.
- ✓ **HaloGuard System Integration:** Works directly with HaloGuard-equipped vehicles to trigger automated interventions when personnel enter hazardous zones.

DATA LOGGING & DIAGNOSTICS

- ✓ **Self-Diagnostic Software:** Real-time monitoring and alerting of potential malfunctions maintains continuous operational reliability and optimal device performance throughout service life.
- ✓ **Tracking Beacon Integration:** Enhances ability to track and identify individuals within underground networks, ensuring every person is accounted for and visible at all times.
- ✓ **Internal Memory Storage:** Logs local data, including critical alarms, device status, and interactions, to create comprehensive records for analysing and reconstructing events.
- ✓ **Emergency Event Reconstruction:** Comprehensive data logging allows detailed post-incident analysis to understand what occurred and prevent future incidents.
- ✓ **Dual-Layer Data Management:** Robust solution for maintaining integrity and availability of critical safety information with automatic backup to Wi-Fi Transfer Stations.



FULL TURNKEY SERVICES






DESIGN. MANUFACTURE. INSTALL. SUPPORT.

Mine Safe Global designs, manufactures, installs, and supports collision prevention and avoidance systems for mining environments. Our solutions protect operators, pedestrians, visitors, and assets by combining real-time alerts with automated intervention where human reaction alone is not sufficient. Every service is tailored to match your specific infrastructure, equipment, and safety requirements.



COMPLETE END-TO-END PROJECT DELIVERY

We provide complete end-to-end solutions, handling everything from initial site assessment and system design to installation, testing, commissioning, and handover.

- 
MAINTENANCE
 Regular inspections and servicing to maintain reliability, prevent failures, and ensure ongoing compliance.
- 
TECHNICAL SUPPORT & ASSISTANCE
 Fast-response troubleshooting and technical help to reduce downtime and keep operations running smoothly.
- 
TRAINING
 Practical training to equip operators with the knowledge to safely and confidently use the system.
- 
LEVEL 9 COMPLIANCE AUDITS
 Assesses and verifies that safety systems are operating in full accordance with Level 9 compliance standards.
- 
CONFIGURATIONS
 Systems are installed and configured to match your site requirements, ensuring seamless integration and compliance.

AFFILIATIONS & PARTNERSHIPS



COMPLIANCE & CERTIFICATIONS

Mine Safe Global solutions meet the highest regulatory and technical standards required across the mining sector.



ISO 21815-Compliant

Ensures full compliance with the global communication and functional protocol for Collision Avoidance (CxD) and Machine Control Interface (MCI) integration.



MOSH CPS Blueprints

Aligns with MOSH standards for the design and implementation of collision prevention systems.



EMI & EMC Compliance

Confirms that collision avoidance systems meet all relevant electromagnetic interference and compatibility standards.



ICASA Certification

All products are officially approved by the Independent Communications Authority of South Africa, ensuring legal operation and reliability.



IP Certified

Equipment has been tested to comply to the required standards, ensuring long-term durability and safety compliance.



Chief Inspector Explosives

Our technology complies with the standards set by the Chief Inspector of Explosives, meeting strict regulatory requirements for safe operation around explosive zones.



EMESRT Compliance

Complies with Earth Moving Equipment Safety Round Table (EMESRT) requirements for safe mining operations.



Mine Health & Safety Act

Enables our customers to comply with the South African Mine Health and Safety Act (Act 29 of 1996).



ISERT Certified

Our solutions are certified through ISERT, confirming adherence to strict safety, reliability, and performance requirements across mining.



MTEEx Certified

Our systems are MTEEx certified, ensuring explosion-prevention compliance for safe operation in hazardous areas.

SEAMLESS COMPATIBILITY

Mine Safe Global delivers high-performance solutions compatible with heavy machinery brands, including:



All product and company names are trademarks of their respective holders. Use of them does not imply any official affiliation with or endorsement by them.



CONTACT DETAILS

TALK TO A SAFETY EXPERT. MINE SAFE GLOBAL CAN HELP.

Request a demonstration, and a Mine Safe Global expert will be in touch to provide the right solution for your operation.



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REGIONAL & INTERNATIONAL PRESENCE

We operate across Southern Africa and serve mining operations in strategic international markets around the world.



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