Welcome

MPI Company and PDS / CPS System Overview

Vehicles

Proximity Awareness and Detection Solutions for surface & underground

Pedestrians

Personal Protection Systems (PPS) for pedestrian proximity detection around vehicles

Objects

Object detection and alerts for driver environmental awareness

Safety

MPI is “Saving Lives” by putting safety top of mind in everything we do

MPI's World-Class Collision Avoidance and Technology Solutions

Inspired by our passion of protecting the gift of life, MPI is extremely excited to present its integrated one-stop-shop Collision Avoidance, Fatigue Management and Fleet Optimization solutions.

MPI Company Overview

MISSION

To build long term relationships with our customers by providing exceptional customer experiences through innovation and technology

VISION

Global solutions-based company

PURPOSE

"Saving Lives" by putting safety first whilst ensuring efficient operations

PHILOSOPHY

As we strengthen our faith to overcome our fears, we will rise to greater heights

Corporate Identity

People-led customer-profit strategy

Our culture is led by an investment to people who can be their best self whilst concurrently making a difference and having fun.

We encourage our teams to become outstanding leaders by consistently utilizing their strengths and recognizing their core values.

Through an investment in our people, customers and profits for all stakeholders are sure to follow.

Product and Technology Development Timeline

2015

Basic Level 7 and Level 8 PDS roll-out

GNSS-based systems

Visual, Audible & Advisory

2015

Basic Pedestrian System (PPS) roll-out

GNSS-based system

Visual & Audible

2016

Radar and Mobile Level 7 PDS system roll-out

Radar for object detection (Level 8) and GNSS-based L7 visitor's units

2016

Manual and Auto Test Stations

Test stations for vehicles and PPS

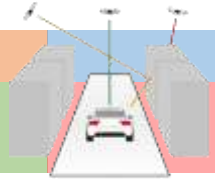
2017

Access Control for vehicles and pedestrians

Integration of boom gates and turnstiles with PDS and PPS

Data retrieved manually via USB and laptop from the vehicle

GNSS-BASED TECHNOLOGY



Data retrieved via Wifi

UDR TECHNOLOGY

Product and Technology Development Timeline

2018

Under-roof technology augmented with GNSS

RTLS for under-roof environments

2018

Integrated RTLS with pedestrian PPS systems

Sensor fusion to allow for seamless transition between GNSS and RTLS

2018

Integrated RTLS with existing PDS systems

Sensor fusion to allow for seamless transition between GNSS and RTLS

2018

J1939 CANbus interface and ISO21815 protocol

Security protocol in accordance with Section 21 of the MHSA

2018

Advanced Collision Detection Module (CDM)

GNSS, RTLS and Calculated Complex Algorithms

Data retrieved via Wifi

SENSOR FUSION (GNSS + RTLS) TECHNOLOGY

GNSS + RTLS + COMPLEX ALGORITHMS (CDM)

Product and Technology Development Timeline

2018

Level 9 Lab Scale and live on-site testing

Completed lab scale and live on-site testing with University of Pretoria

2019

Level 9 commercial roll-out & OEM Integration

Commercial launch of Level 9 VDS and OEM integration (first with Bell)

2019

Online Tracking Platform integration with PDS/CAS

Provides tracking, reporting, live alerts, geofencing, speed zones, etc

2019

Level 9 integration with Fatigue Monitoring system

Introduced fatigue integration for increased monitoring and safety

2020

Integrated GSM with pedestrian PPS systems

Added a panic button feature for safety in remote working areas

Data retrieved via Wifi

GNSS + RTLS + COMPLEX ALGORITHMS (CDM)

WIFI AND CLOUD ANALYTICS

Data retrieved via GSM

GSM

Product and Technology Development Timeline

2020

Underground PDS system development

Testing and roll-out of underground PDS systems, starting in India 2021

2023

Vehicle / PDS integration with Multiple AI Cameras

VIS (Visual Identification System) for identifying pedestrians through AI

2023

Centralised repository reporting dashboards

Effective consolidated dashboard reports via web app / online logging

2024

Production optimisation for mining operation

AI-based machine learning and load sensors for production efficiencies

2025

Full Mine Management roll-out & implementation

Full scope coverage of surface and underground mining

Data retrieved via GSM

Data retrieved via LoRA/SigFox

RTLS AND LIDAR

ARTIFICIAL INTELLIGENCE

GNSS + RTLS + COMPLEX ALGORITHMS (CDM) + GSM + LIDAR + AI

MPI Core Offering

L7 PDS	L8 PDS	L9 CAS	PPS	Fatigue	Tracking	Reports	Cameras	Radar
Proximity Detection for LDVs	Proximity Detection for HDVs	Collision Avoidance for HDVs / LHDs	Personal Protection Systems	Fatigue Monitoring and Alerts	Geofencing, Speed Zones & Monitoring	Analytics, Reporting and Driver ID	Dual, Quad, 360°, Dash Cams & DVR	Object and Environment Detection



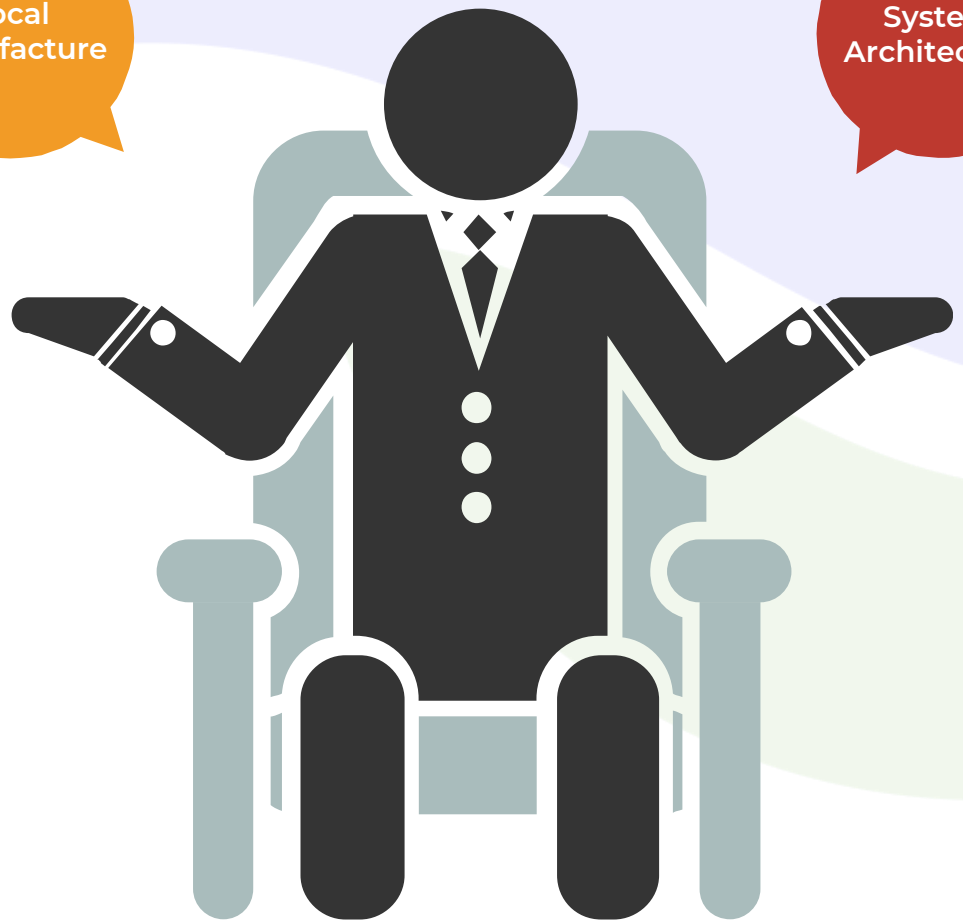






Why Choose MPI?

A brief overview of our differentiation



Local Manufacture

System Architecture

Value-Based Modular Solutions

Swift Turnkey Operations

Concurrent Technologies

Integration with value added solutions

WHY MPI?

Concurrent Technologies

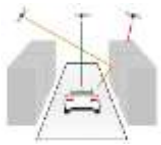
and automated health checks to minimize downtime

Canbus radars

can be integrated with the PDS system (up to 8x per vehicle)

UDR

(untethered dead reckoning) to further facilitate data accuracy



Sensor fusion

between GNSS and RTLS for under-roof environments

Self Diagnostics

can be performed by the PDS system by utilizing CAN 2.0

Multiple Satellites

GPS compliments GLONASS to ensure accurate positioning

Live health checks

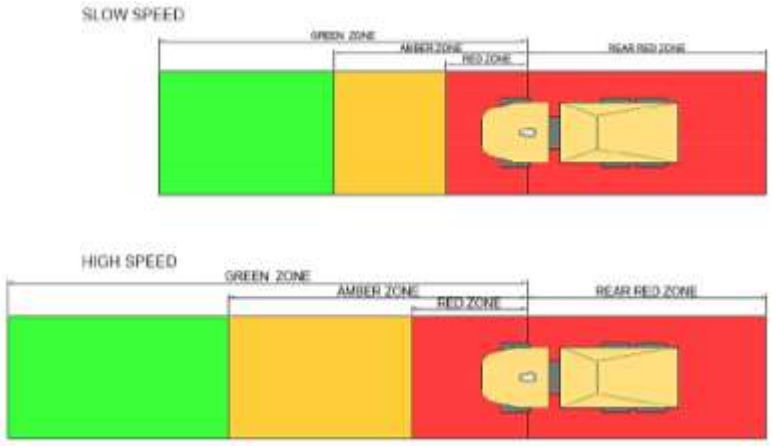
on digital platforms alert the control room of down vehicles

WHY MPI?

Interaction Safety Zones

STATIC SAFETY ZONES

Static safety zones or 'bubble zones' are typically used for slow moving and stationery/loading vehicles, pedestrians and demarcated objects



DYNAMIC SAFETY ZONES

Dynamic safety zones make use of variable speed data to determine zone sizes, allowing the driver more reaction time at higher speeds for safe derating

TIME TO COLLISION

Time to Collision makes use of advanced algorithms, taking vehicle braking performance, load and surface conditions into account

WHY MPI?

Value-Based Modular

Upgradable PDS Solutions

World Class

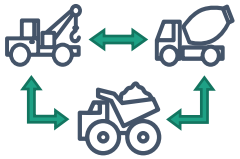
Scalable Value Offering

Upgradable

Level 8 PDS to Level 9 CAS

Tailoring

Solutions to suit client needs



Communication

Across all PDS from Level 7 to 9

Modular

Re-deployable components

Predictive

Industry-leading algorithms

WHY MPI?

Proven Capability at Level 7 - 9

EMESRT

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

- Level 9 Lab Scale Tests
- Level 9 Single and Multi Machine Tests

Single & Multiple Machine Test Results

Scenario	Interaction Type	CMS Scope (Capability)								
		Speed (km/h)								
		Reverse				MI	Forward			
		REV4	REV3	REV2	REV1		FWD1	FWD2	FWD3	FWD4
		REV:	REV:	REV:	REV:5	MI:0	FWD:5	FWD:10	FWD:20	FWD:
L1-Head-on	V-V	-	-	-	-		9	9	9	
L2-Reverse-on	V-V	-	-		9		-	-	-	-
L3-Backup	V-V	-	-		9		-	-	-	-
L4-Dovetailing	V-V	-	-	-	-		9	9	9	
L5-Passing Head-on	V-V	-	-	-	-	-	9	9	9	
L6-Passing Reverse-on	V-V	-	-		9	-	-	-	-	-
L7-Overtaking	V-V	-	-	-	-	-	9	9	9	
L8-Blind Approach	V-V	-	-	-	-		9	9	9	
T1-Merge	V-V	-	-	-	-					
T2-Crossover	V-V	-	-	-	-	9	9	9		
T3-Junction	V-V	-	-	-	-	9	9	9		
T4-Intersection	V-V	-	-	-	-	9	9	9		
O1-Obstacle	V-E									
P1-Person (direct)	V-P					9	9	9	9	
V1-Void	V-E	-	-		9		9	9	9	
V4-Loss of Control	LoC	-	-		9		9	9	9	

ISO

Braking in accordance with ISO 3450 standard

MHSC

Mine Health and Safety Council

Compliant with Section 21 of the MHSA

Technical file approved by the DMR

Complies to ISO 21815 protocol

WHY MPI?

OEM Integration Status

BELL

COMPLETE

BELAZ

Rolls Royce Engines

AC/AC and AC/DC machines, similar to Hitachi

COMPLETE

nerospec OSCON

COMPLETE

MPI / Third-Party integration for non-CANBus machines

CAT

COMPLETE

KOMATSU

COMPLETE

HITACHI

NDA COMPLETE

Require data submission to Hitachi
Awaiting feedback from factory in Japan

MPI

LEVEL 9 BRAKING (LDV)

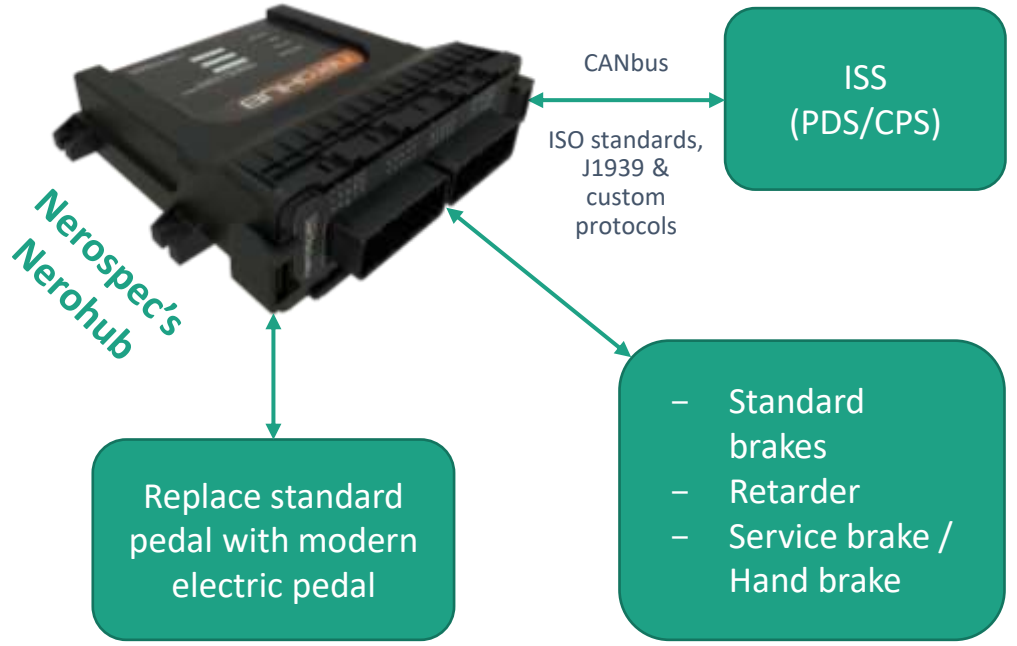
Mechanical Braking Solution / grandfather clause with MPI Mic

WHY MPI?

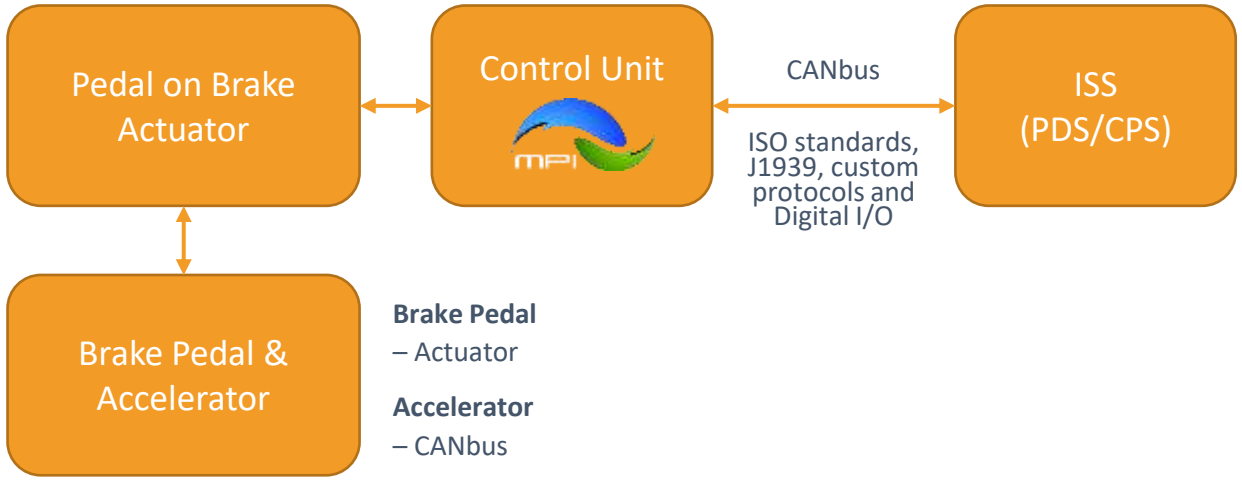
Integration with CANbus and Legacy-type machines

CANbus integration for Heavy Duty Vehicles (HDV)

Legacy integration for Heavy Duty Vehicles (HDV)



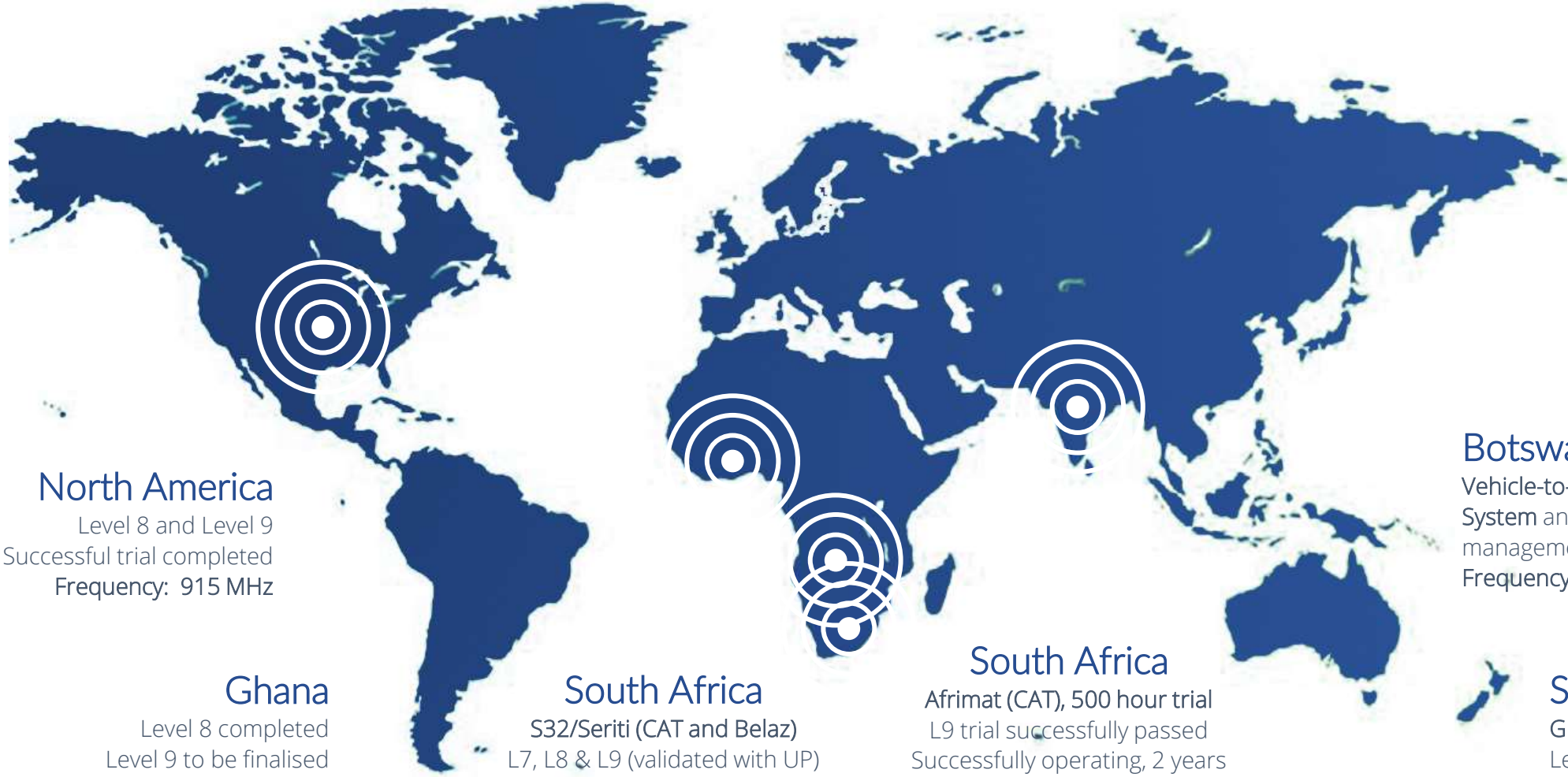
Legacy integration for Light Duty Vehicles (LDV)



WHY MPI?

Level 9 Sites / Successful Trials Completed

across the World on multiple frequencies



North America

Level 8 and Level 9
Successful trial completed
Frequency: 915 MHz

Ghana

Level 8 completed
Level 9 to be finalised
Frequency: 433 MHz

South Africa

S32/Seriti (CAT and Belaz)
L7, L8 & L9 (validated with UP)
Frequency: 868 MHz

South Africa

Afrimat (CAT), 500 hour trial
L9 trial successfully passed
Successfully operating, 2 years
Frequency: 868 MHz

India

Underground Trial
L8 trial successfully passed
Frequency: 3.9 – 6.4 GHz

Botswana

Vehicle-to-Pedestrian Accountability System and Location-based people management system (Jwaneng & Orapa)
Frequency: 868 MHz

South Africa

Glencore (Bell & Komatsu)
Level 9 (validated with UP)
Frequency: 868 MHz

MPI branches in South Africa

Gauteng Head Office

Unit 10, The Stewards Industrial Park, c/o Main Reef road & Beryl street, Benoni, Gauteng

Mpumalanga

Unit 3, Midway Park, November street, Middelburg, Mpumalanga

Northern Cape

13 Ian Flemming road, Industrial area, Kathu, Northern Cape

Western Cape

9 Tedric avenue, Stikland, Cape Town, Western Cape

KwaZulu-Natal

Unit 2, Hillclimb road, Westmead, Durban, KZN

MPI Head Office (Johannesburg)

Technical Centre

Come see our R&D Facility where you can view a physical demonstration of hardware.

Warehouse

Come take a tour through the facility where our stock is safely kept and monitored

Control Room

Our authorized on-site personnel can host a live login session into an active mining site (Tracking & ISS), as well as online FMS demo

Workshop

View our facility for fitting mine spec vehicles for safety compliance, along with harness preparation for on-site ISS installations.

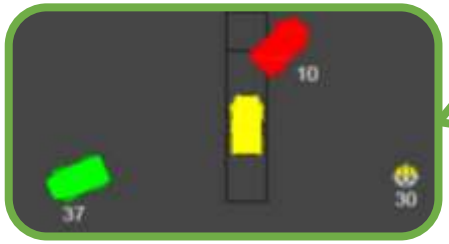
Level 7 Functionality / Features Overview

Level 7 PDS (ISS) both provide 360-degree visibility combined with visual alerts, audible alarms and advisory controls to the operator via an interactive LCD display unit and includes load-mode function for vehicle loading events. The Level 9 system includes automatic machine intervention for gradual derating and stopping, taking terrain, slope/grade, environmental conditions and load capacity into account.

360° visibility, green/amber/red visuals and icon differentiations

Load-mode module function for loading events

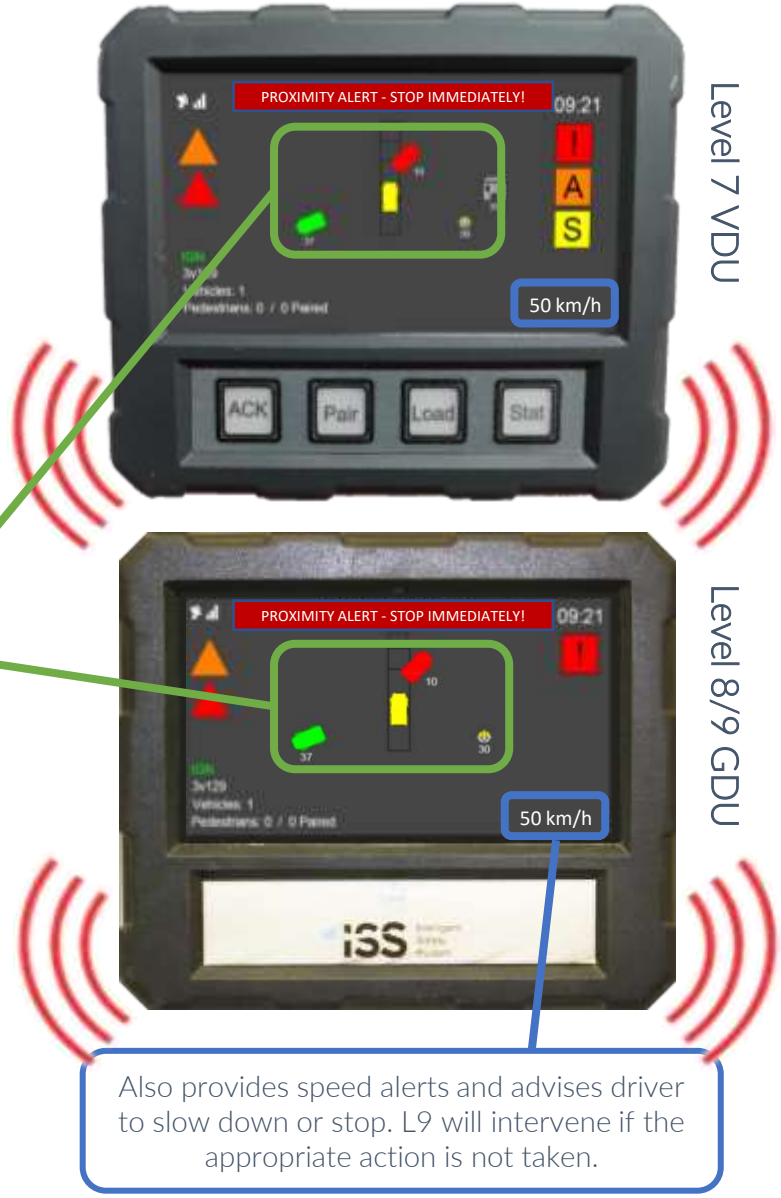
Provides type by icon, exact position and distance of vehicle / pedestrian



Self-diagnostics & live reporting health checks

Dynamic radar solutions for object detection

GNSS augmented with RTLS (GPS drift / under-roof)



LEVEL 7 COMPACT PDS SOLUTION COMPONENT OVERVIEW

Integrated

The RCM antenna is placed on the roof of the vehicle to best connect to GNSS satellites and relay vehicle positioning.

The RTD's (Real-Time Detection) primary role is to initiate RTLS protocol in order to further enhancing the Geo-Coordinates.

The RTD for Level 7 units is built-in to the RCM.

Integrated

The Visual Display Unit (VDU) is a 4.3 Inch full colour display which shows a 360° top view of vehicle and surroundings.

The Tracking module determines the object's coordinates and transfer them via the GSM network.

The optional Handset can be used by the operator to communicate or interact with the ISS system if required.

The Level 7 & Level 8 Compact PDS systems can be ordered as mobile units for temporary contractors / delivery vehicles.

LEVEL 8 PROXIMITY DETECTION SOLUTION COMPONENT OVERVIEW

Integrated

The RCM antenna is placed on the bracket with stabilizing arm provided to ensure the visibility for GNSS signal.

The RTD's (Real-Time Detection) primary role is to initiate RTLS protocol in order to further enhancing the Geo-Coordinates. The RTD for Level 7 units is built-in to the RCM.

Additional RTD added for Dual RTD solution.

Integrated

The Graphic Display Unit (GDU) is a 4.3 Inch full colour display which shows a 360° top view of vehicle and surroundings.

The Tracking module determines the object's coordinates and transfer them via the GSM network

The Handset is used by the operator to communicate or interact with the ISS system.

The CCU is an input output expansion module that allows extra peripherals and other inputs required, to be wired to one point. All power to other IMS equipment is supplied from the IMS-CCU.

A single Radar is mounted to the rear of the vehicle for reverse object detection.

LEVEL 9 COLLISION AVOIDANCE COMPONENT OVERVIEW

Integrated

The RCM antenna is placed on the bracket with stabilizing arm provided to ensure the visibility for GNSS signal.

The RTD's (Real-Time Detection) primary role is to initiate RTLS protocol in order to further enhancing the Geo-Coordinates. The RTD for Level 7 units is built-in to the RCM.

Additional RTD added for Dual RTD solution.

Integrated

The Graphic Display Unit (GDU) is a 4.3 Inch full colour display which shows a 360° top view of vehicle and surroundings.

The Tracking module determines the object's coordinates and transfer them via the GSM network

The Handset is used by the operator to communicate or interact with the ISS system.

The CCU is an input output expansion module that allows extra peripherals and other inputs required, to be wired to one point. All power to other IMS equipment is supplied from the IMS-CCU.

Dual Radar – Single Radar mounted to the rear and Single Radar mounted to the front of the vehicle. *Recommended.*

Tracking Features and Platform Functionality

Online Tracking and Reporting Platform

Real-time tracking and reporting solution provides dynamic support and optimizes mining fleet management processes through customizable dashboards and reports, geofencing, speed zones, driver ID integration and behaviour monitoring, and much more

Geofencing

Heat Maps

Online Reports

Live Event Alerts

Driver Behaviour Analysis

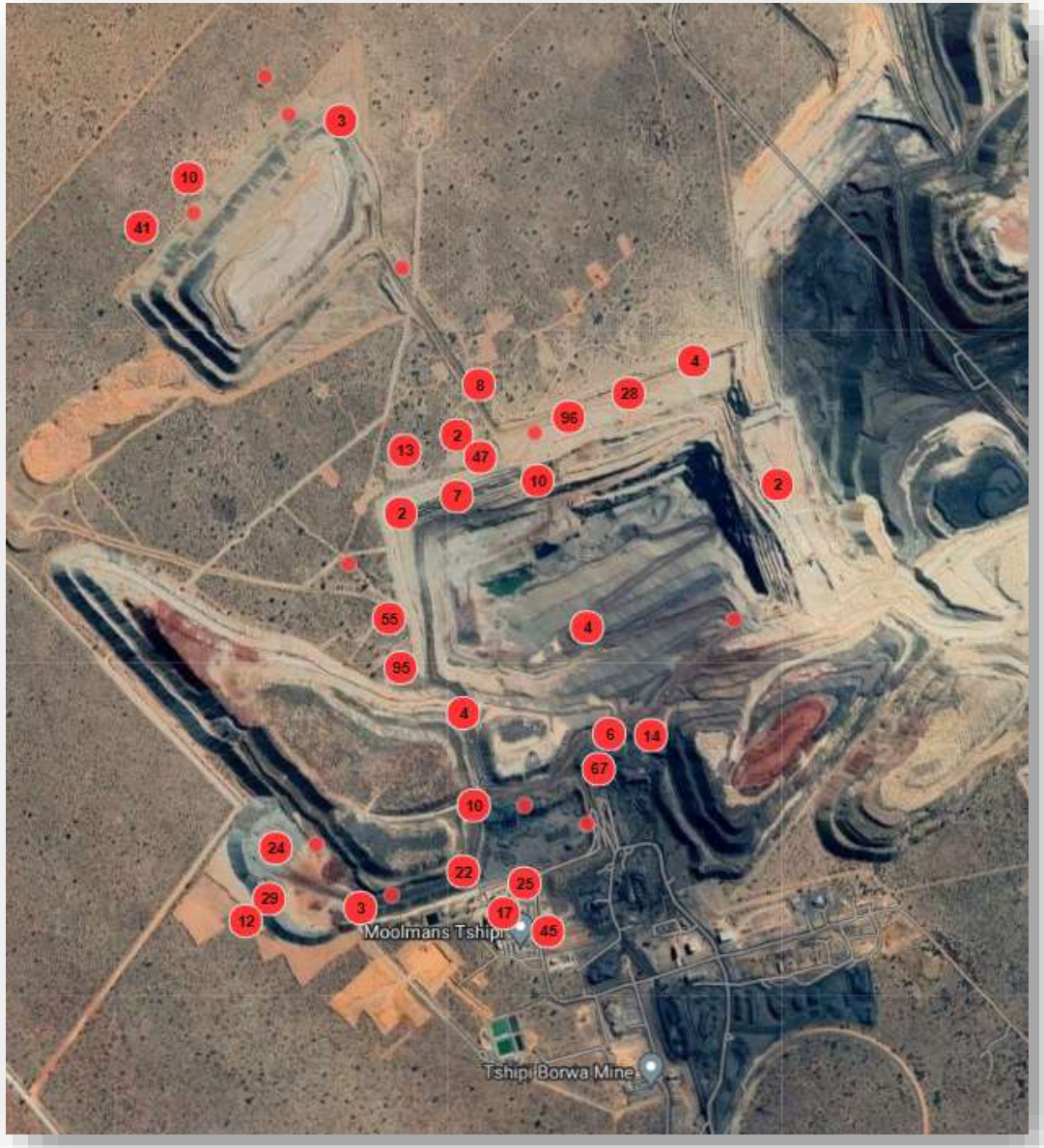
Customizable Dashboards

Working vs Idling hours

Detailed Trip Replays

Interaction Data

- Heatmaps generated on time period
- Drill down into hotspot area
- Assist traffic management review



Example of Incident Report using Data logs

Example: 2x vehicles were travelling along their usual route when one suddenly turned around short of his target destination. The following report was compiled for the client.

Video Evidence

Play Video

Examples of Vehicle Data logs

Level 7 PDS

Level 7 records 16000 downloadable data logs

Level 8 VDS

Level 8 records up to 3 years of downloadable data logs

Level 9 CAS

Level 9 records up to 3 years of downloadable data logs

Vehicle Position Log Example

Event Code	Date	Time	Latitude	Longitude	Heading	Speed	Nearest Vehicle ID	Nearest Vehicle Distance	Nearest Vehicle Type
0: Interval	10-Oct-20	7:44:31 AM	-25,9412606	29,5212202	144	16 km/h	130577	>150	Dump Truck
0: Interval	10-Oct-20	7:44:32 AM	-25,9412956	29,5212479	144	17 km/h	130577	>150	Dump Truck
0: Interval	10-Oct-20	7:44:33 AM	-25,9413337	29,5212775	144	19 km/h	130577	>150	Dump Truck
0: Interval	10-Oct-20	7:44:34 AM	-25,9413747	29,5213086	146	19 km/h	130577	>150	Dump Truck
0: Interval	10-Oct-20	7:44:35 AM	-25,9414151	29,5213389	146	18 km/h	130577	>150	Dump Truck
0: Interval	10-Oct-20	7:44:36 AM	-25,9414537	29,5213677	146	17 km/h	130577	>150	Dump Truck
0: Interval	10-Oct-20	7:44:37 AM	-25,9414901	29,5213942	148	16 km/h	130577	>150	Dump Truck
0: Interval	10-Oct-20	7:44:38 AM	-25,9415224	29,5214177	146	15 km/h	130577	>150	Dump Truck

Note: Heading is calculated in 360 degrees, with 0° being North and 180 ° being South

Vehicle Event Log Example

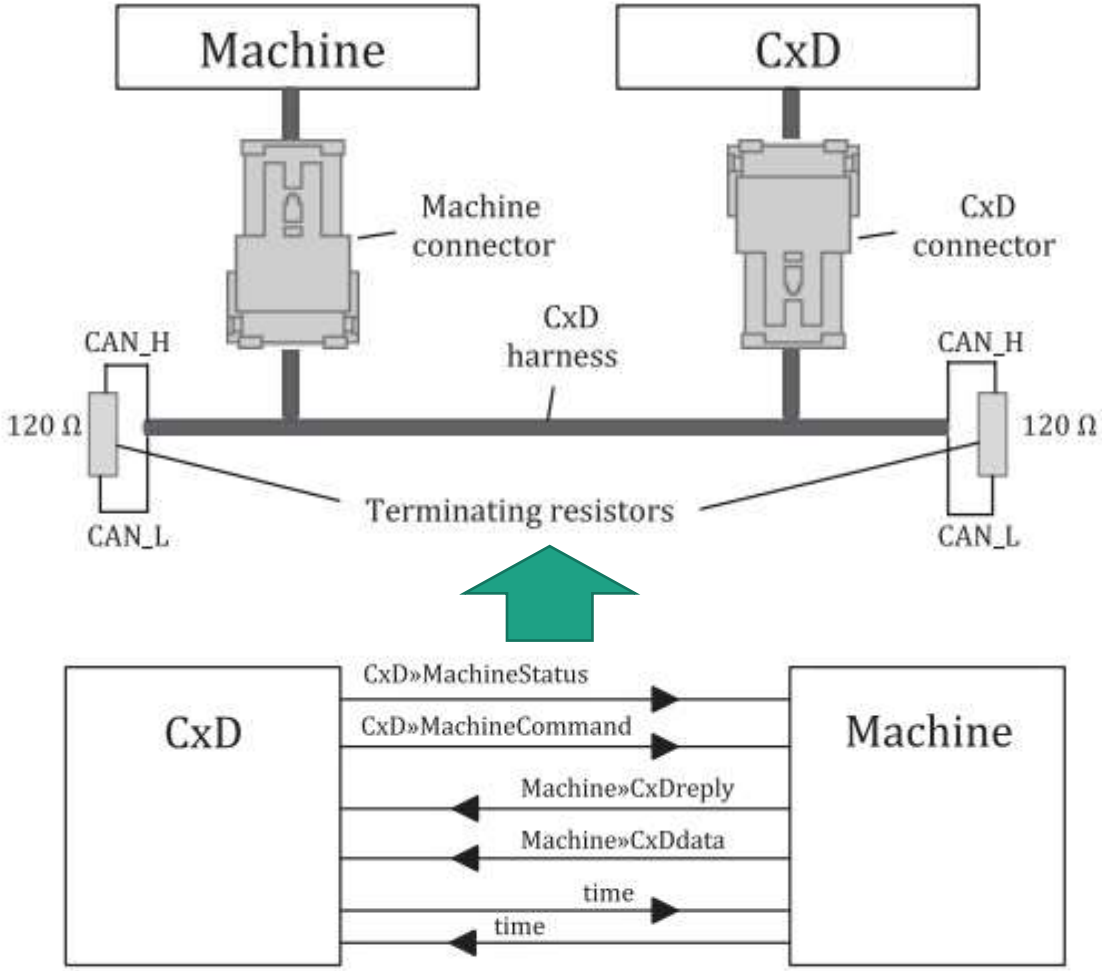
Nearest vehicle info

Event Code	Date	Time	Latitude	Longitude	Event Info	Speed	Nearest Vehicle ID	Nearest Vehicle Distance	Nearest Vehicle Type
25: Invasion	10-Oct-20	7:55:53 AM	-25,9654941	29,5115452	3	24 km/h	130651	43	Grader
25: Invasion	10-Oct-20	7:55:54 AM	-25,965534	29,5115182	Amber Warning	24 km/h	130651	39	Grader
25: Invasion	10-Oct-20	7:55:57 AM	-25,9657089	29,5113993	Red Warning	25 km/h	130651	25	Grader
25: Invasion	10-Oct-20	7:59:18 AM	-25,9676018	29,5079305	Red Warning	0 km/h	130561	18	Dump Truck
25: Invasion	10-Oct-20	8:00:11 AM	-25,9672662	29,5077337	3	9 km/h	130563	28	Loader
25: Invasion	10-Oct-20	8:00:23 AM	-25,9671738	29,5078978	Red Warning	0 km/h	130563	24	Loader
25: Invasion	10-Oct-20	8:00:45 AM	-25,9672385	29,5078306	Red Warning	0 km/h	130563	27	Loader
25: Invasion	10-Oct-20	8:00:51 AM	-25,9672095	29,5077492	Red Warning	8 km/h	130563	22	Loader
25: Invasion	10-Oct-20	8:01:51 AM	-25,966997	29,5076392	Red Warning	0 km/h	130563	18	Loader
25: Invasion	10-Oct-20	8:11:46 AM	-25,9618504	29,5217177	3	51 km/h	130561	>150	Dump Truck
25: Invasion	10-Oct-20	8:11:46 AM	-25,961819	29,5217096	Amber Warning	51 km/h	130561	>150	Dump Truck
25: Invasion	10-Oct-20	8:19:50 AM	-25,9487716	29,5184721	3	36 km/h	130553	79	Dump Truck
25: Invasion	10-Oct-20	8:19:52 AM	-25,9489308	29,5185005	Amber Warning	36 km/h	130553	38	Dump Truck
25: Invasion	10-Oct-20	8:44:07 AM	-25,9675527	29,5078914	Red Warning	0 km/h	130561	20	Dump Truck
25: Invasion	10-Oct-20	8:44:46 AM	-25,9672734	29,507709	3	9 km/h	130563	27	Loader
25: Invasion	10-Oct-20	8:44:49 AM	-25,9672125	29,5077021	Red Warning	8 km/h	130563	20	Loader

Vehicle Event Plotted on Map

Description of Level 9 CAS System Functionality

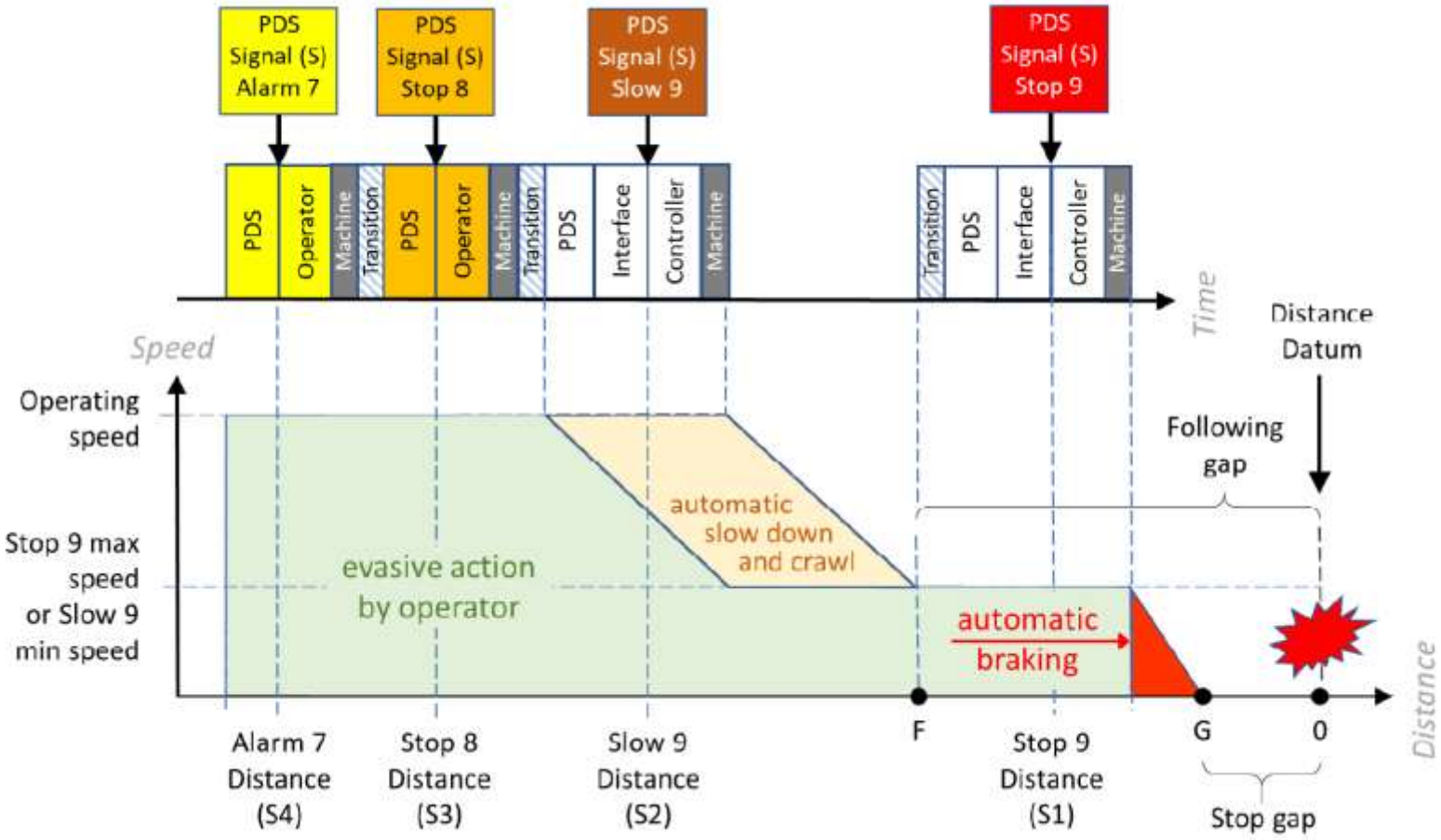
Level 9 OEM Integration



Key Highlights

- Based on J1939 standards
- ISO 21815; 2017; 2019
- Custom OEM protocols
- Communication@ 100ms

Latencies and Delays

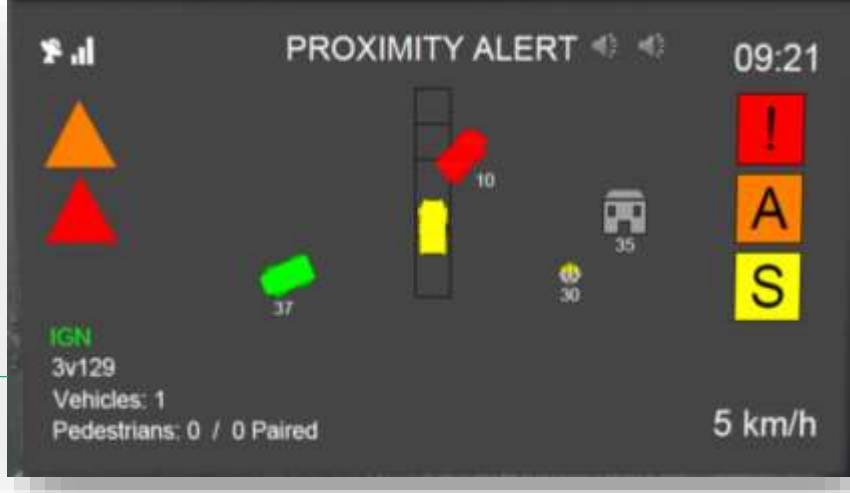


The measurable distances corresponding to the PDS signal (S) for Alarm 7, Stop 8, Slow 9 and Stop 9 are shown on the bottom axis the graph below.

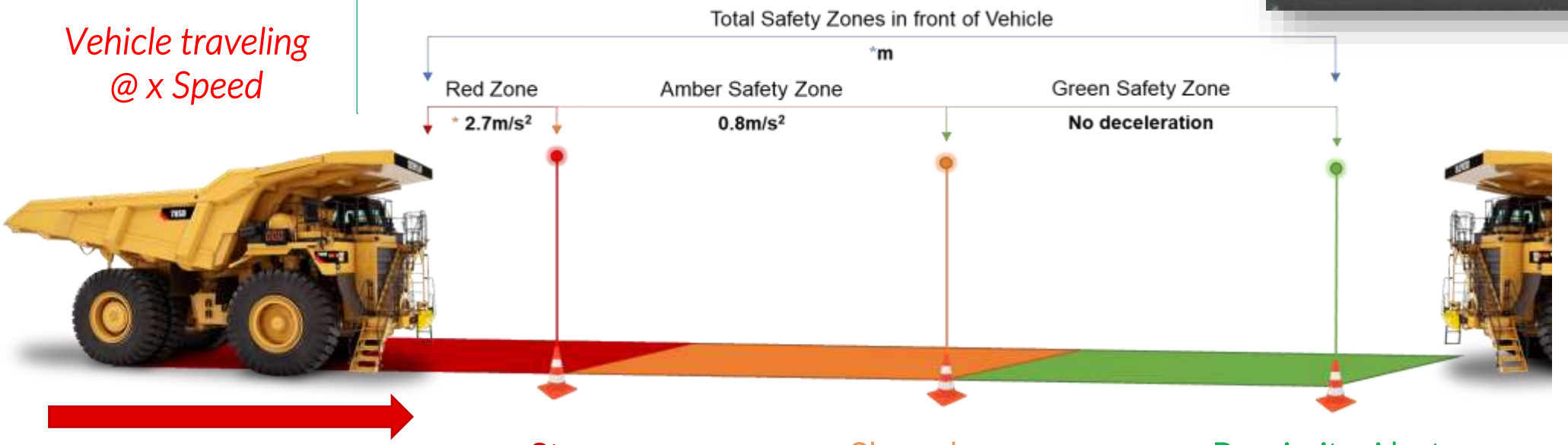
All distances are measured from the point of impact of the LO with a stationary RO including the Stop Gap (G), or with a moving RO including the Following Gap (F).

	Recording of Test Results
Alarm 7 Stop 8	The actual PDS Signal (S) including Stop Gap (G)
Slow 9 Stop 9	The actual Stop Gap (G) between the machine (LO) and the RO after the machine (LO) has stopped or Following Gap (F) for LO & RO moving in same direction)

Warning & Intervention



Vehicle traveling @ x Speed



Automatic deceleration only applicable for Level 9 PDS

Stop

OW escalates further L9 – Slow down command to OEM

Slow-down

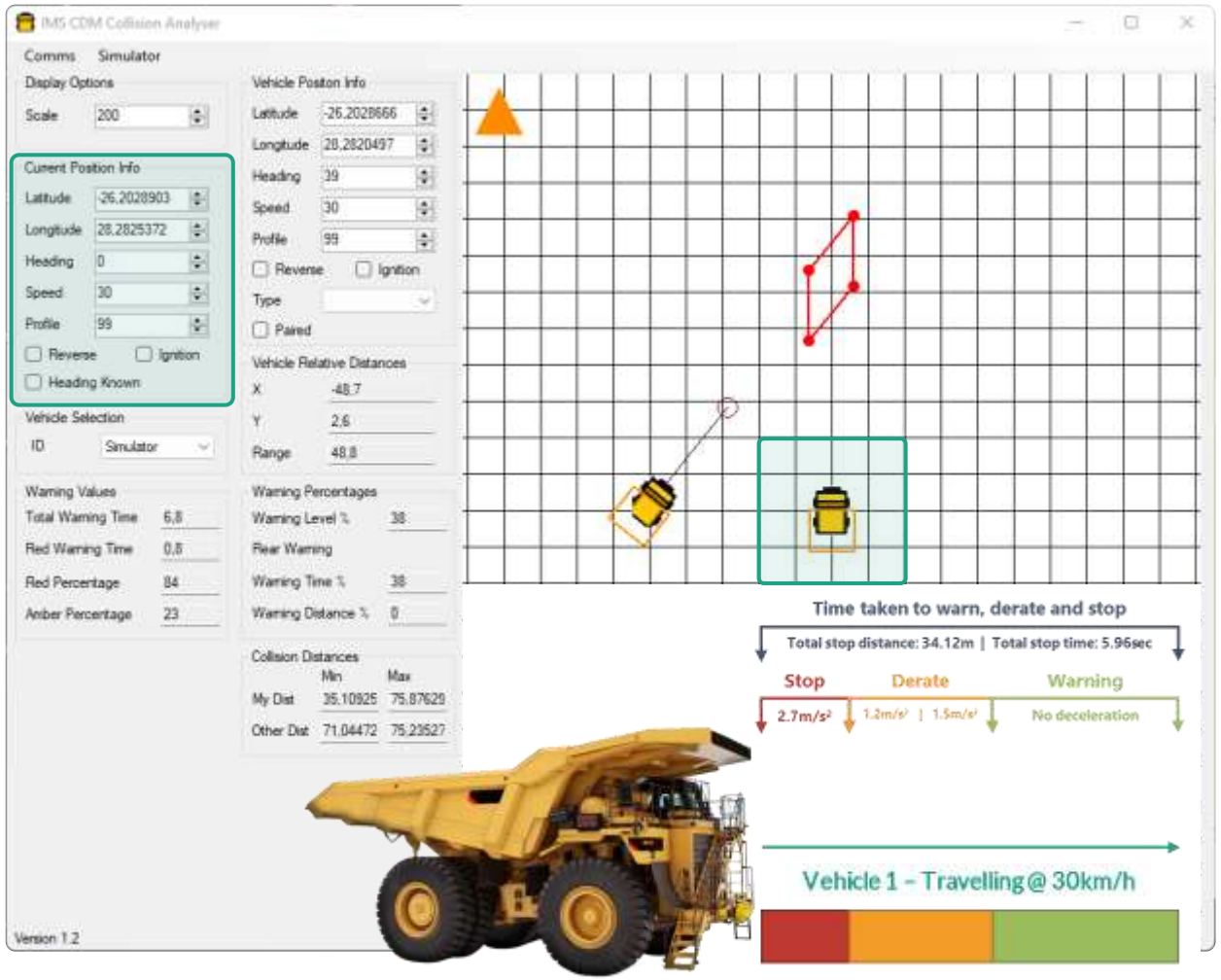
OW escalate L9 – Slow down command to OEM

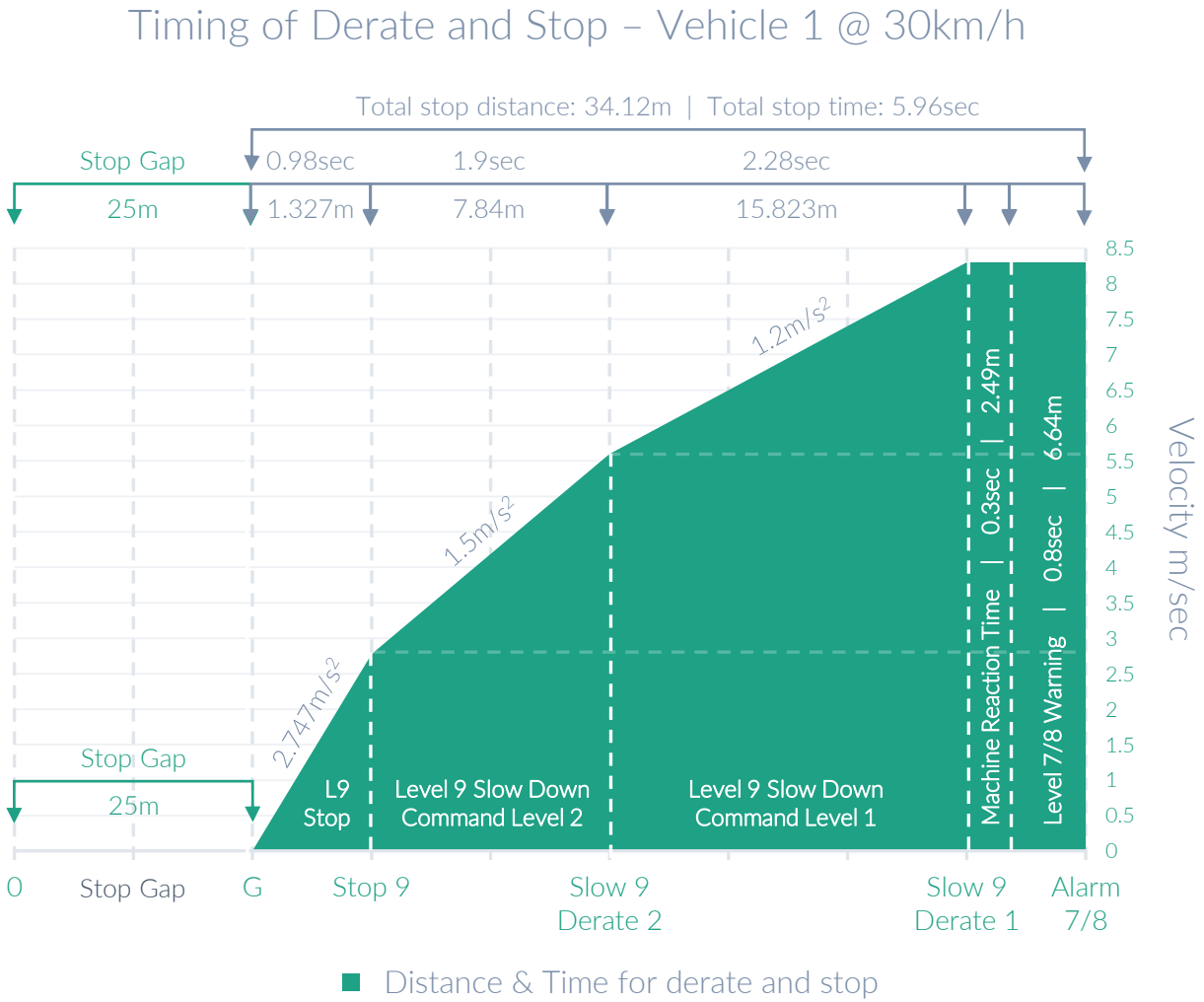
Proximity Alert

Operator warning 2.5 (OW) s before slow-down

Level 9 CPS/CAS

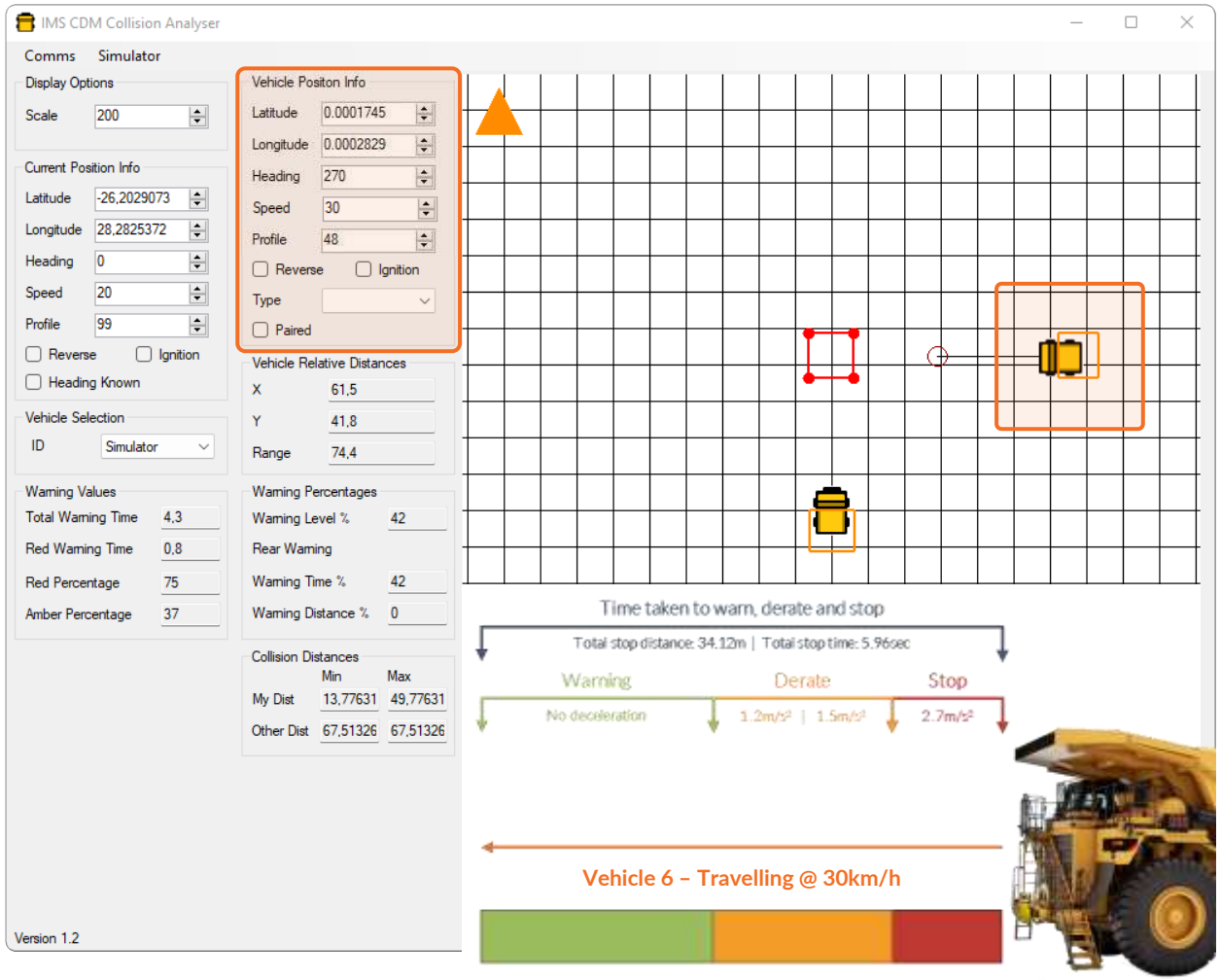
Example: Y-Merge Collision Prediction, Vehicle 1 Data

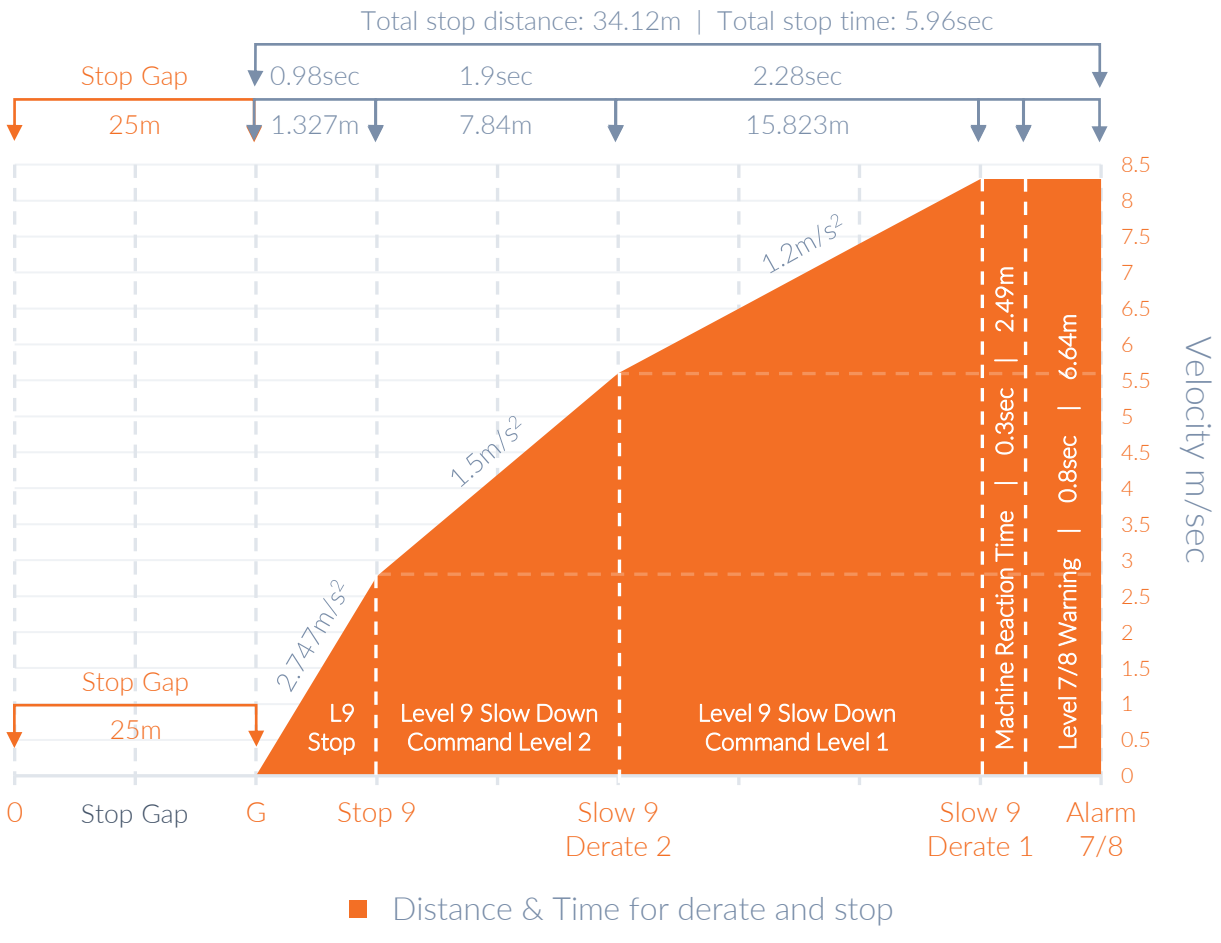




Level 9 CPS/CAS – Scenario 2a

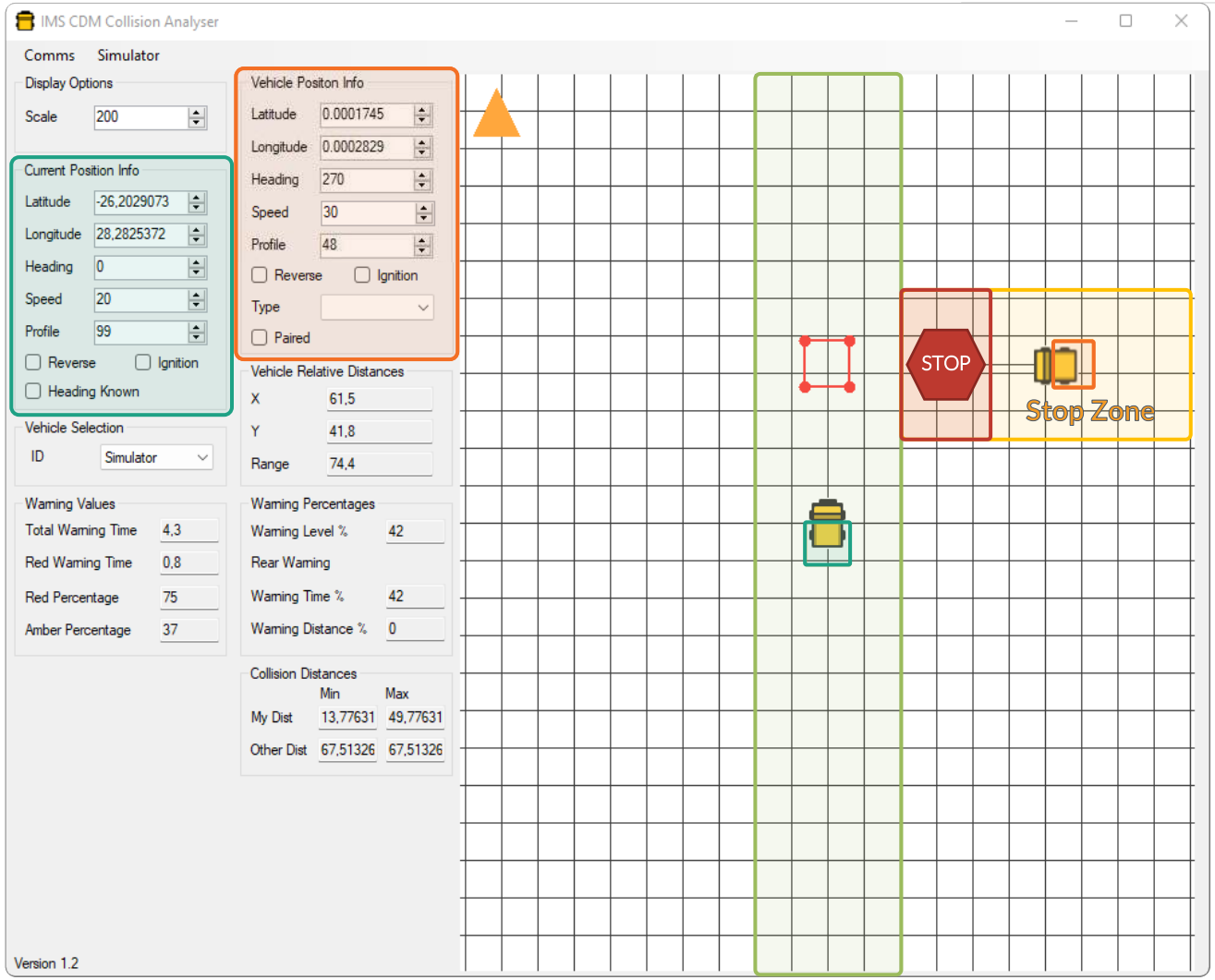
Example: Intersection / T-Junction Collision Prediction, Vehicle 6 Data





Level 9 CPS/CAS – Scenario 2b

Example: Intersection / T-Junction Collision Prediction with Geozones



Scenario Description :

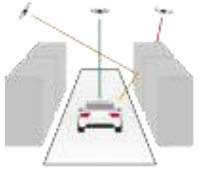
Geozones / geofences can be implemented in selected areas on a mining site to ensure vehicles entering the area from certain directions are automatically brought to a safe stop in order to provide vehicles on an intersecting road to gain priority (such as on haul roads).

Approaching vehicles are stopped automatically and put into “motion inhibit” mode until it is safe for them to cross. Priority vehicles will only be stopped if the stationary vehicle’s motion inhibit function is overridden and it continues forward, or the priority vehicle turns toward the stationary vehicle instead of continuing straight ahead.

Technical Overview of UDR & Sensor Fusion

GPS / GNSS satellites provide information to the system antenna which logs location data, speed, heading, etc.

GSM / Wi-Fi for data upload



Pin-point precision is achieved by combining UDR along with sensor fusion of RTLS, GNSS, Gyroscope and Accelerometers, and broadcasting the data via two RF frequencies

RF Communication – 868.2 Mhz

supplemented by RTLS for accurate distances – 3.9 Ghz

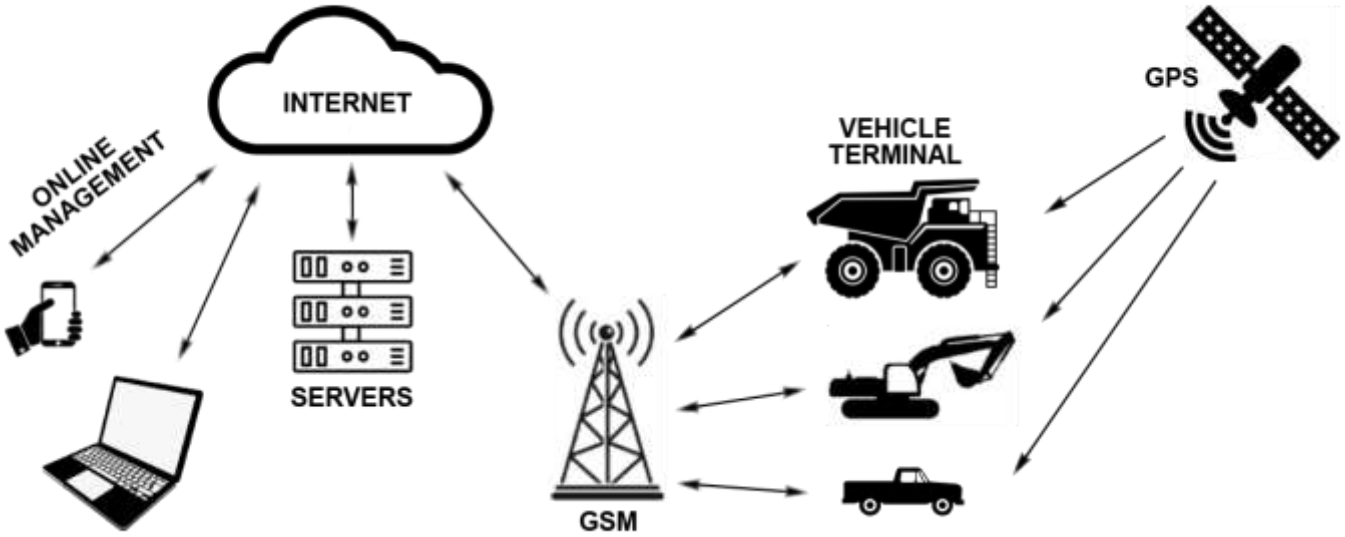
Should the PDS system lose GNSS connection, the UDR will temporarily replace it with the accelerometer for speed and gyroscope for direction, whilst supplementing with RTLS to provide accurate positioning for interactions.

The Collision Detection Module (CDM) utilizes Time to Collision technology to predict the collision path. The system considers velocity, heading, machine profile and ID, providing drivers with audible and visual alerts warning them of the possible collision, advisory slow down and stop commands, as well as Level 9 interventions to ensure safety. In addition, the CDM module allows for machine-specific braking characteristics and latencies to be configured and applied to the braking algorithm on a per-machine type basis.

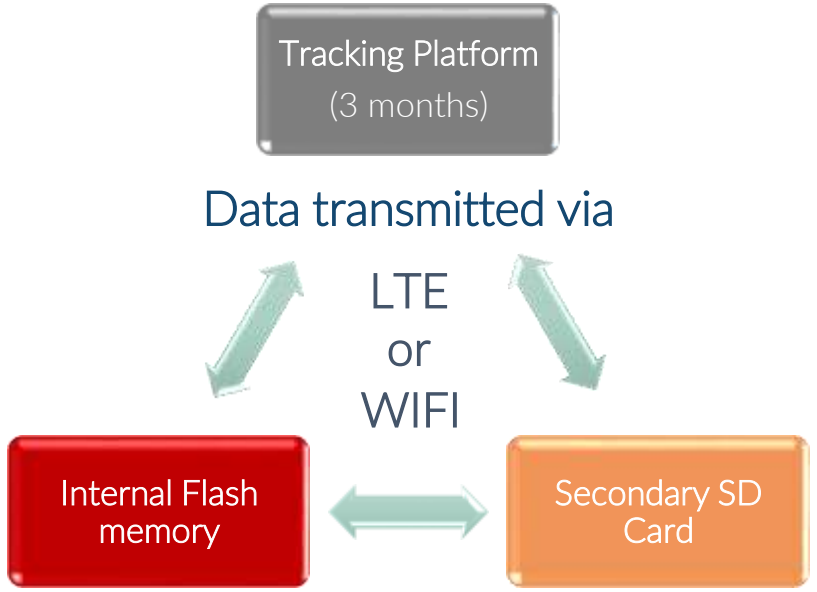
All augmented data is then captured and stored onto onboard memory, SD card data and Cloud services

Data Storage and Communication Overview

Data flow overview



How does the logging system operate?



Vehicle enters a “dead zone” with minimal LTE/GSM coverage, the internal and external logging systems will continue to operate as normal, recording the vehicle’s respective event and position data.

Upon re-entry into network coverage, updating of historical logs will commence to the online platform

Fail-to-Safe

- Automatic test stations will independently validate the system functionality before entering mining operations.
  - Wi-Fi / GSM/ LTE faults will log the fault on the vehicle and will not allow the vehicle to proceed without correction.
  - Module: the test station will log the fault on the vehicle and will not allow the vehicle to proceed without correction.
  - Radio communications: the test station will log the fault on the vehicle and will not allow the vehicle to proceed without correction.
  - All below mention faults, including Display fault, RCM fault, Radar Fault, CCU Fault, Wiring Fault GNSS failure, will be logged by the test station, and the vehicle will not be allowed to proceed without correction.
- System self diagnostics constantly evaluated @ 100ms
- Display, RTLS, Radar, RCM, CCU, GNSS Failure, Communication faults or harness damage:
  - Fault condition will be displayed via a blue screen.
  - A level 9 ISO command “Slow Down” will be communicated to the OEM to bring the vehicle to safe stop, resulting in a “Motion inhibit” state once stationary
  - OEM capability varies

Implementation Method Statement

High Level Overview Tender and Implementation

Client Conducts Risk Assessment

CMS Strategy

Invited PDS providers to tender

PDS/VDS Supplier awarded tender

OEM Alignment and Integration

Phase 1 – Initial Discussions

Phase 2 – Onboarding

Phase 3 – Risk Assessment and Traffic Management Plan

Phase 4 – M.O.C

Phase 5 - Installation

Phase 6 - Training

Phase 7 – Settings and Configurations

Phase 8 – C.O.C Sign-Off

Phase 9 - Commissioning

Traffic Management Plan Example

Assess current traffic management plan with our ISS and tracking solution → Identify deviations (red and amber alerts, near misses, over-speeding) → Analyse accumulated data and identify risk area's (images off risk area's)

Enhancements to traffic management plans using Integrated PDS system

Example:

Geo-zones in accordance to mine speed limits → Geo-zones with max 10Km/h speed limit to minimise nuisance alarms → Load mode function or pairing between loaders and excavators

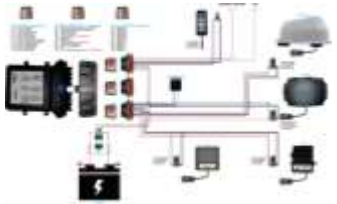
Management of Change process ensures efficient implementation of systems

Critical need or legal requirement arises

Risk assessment

Alignment meeting with stakeholders

Employee representatives and workforce engagement



Redline Drawings

Installation

Training

Testing

Commissioning

Lessons learned

MPI implements the following training plan

Analysis of site-specific needs / requirements

Workforce engagement programme (next slide)

- Workforce engagement training (mass safety meetings)
- MPI introduction
- What is ISS?
- Animated video
- Presentation
- On-site scenario footage
- Workforce feedback (Q&A)

Training material for Level 7, 8 and 9 submitted for approval

Level 7 training can be conducted via online training channels

Level 8 and 9 delivered in a live classroom environment (train the trainer)

MPI assessment and certification of super user

Feedback and lessons learned

Annual retraining due to staff rotation, technical enhancements and refreshers

Workforce knowledge gap analysis

Development of training programmes and materials

Approval of materials

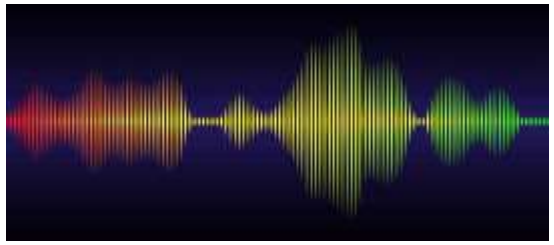
Online / Classroom training

Assessment

Certification

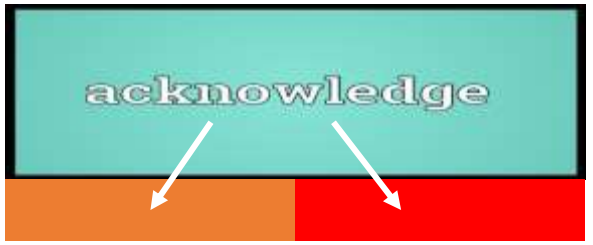
Feedback

Lessons learned resulting in customization



Different tones / sounds for over speed and proximity interactions

Recurring over-speeding alerts at 30 seconds intervals



Additional acknowledgment added for different proximity interactions one for amber zone and one for red zone

Alerts are sent when vehicle leaves specified geo-zones or areas

Daily reports on over speeding report includes duration, location, vehicle id date and time

Ensure optimal network coverage for fatigue systems (if applicable)

Thank You

MPI Company and PDS / CPS System Overview

Vehicles

Proximity Awareness and Detection Solutions for surface & underground

Pedestrians

Personal Protection Systems (PPS) for pedestrian proximity detection around vehicles

Objects

Object detection and alerts for driver environmental awareness

Safety

MPI is “Saving Lives” by putting safety top of mind in everything we do