



AURA™ Collision Avoidance System



A WORK SAFETY AND PRODUCTIVITY TOOL

The Metrom Rail AURA™ System is designed to safeguard railway work equipment and operators by detecting spacing of work vehicles to a resolution measured in inches. The system offers the flexibility of operator-defined detection and alarm criteria with integrated, expandable hardware options and the ability to function in all environments and terrain—even tunnels.

AURA™ also offers several productivity tool options such as location tracking, key machine function monitoring and remote data reporting (spreadsheet or custom database) capabilities.

The system is designed for installation into current legacy equipment and also into new vehicles from the production floor.





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SYSTEM QUICK FACTS

THE AURA™ SYSTEM:

- Designed to work in all geographic conditions—around curves, in mountainous areas and inside tunnels of any shape.
- Designed to function in even the most extreme environment with communication capabilities in excess of 800 ft. Typical ranges in open areas extend to 2,500 feet or more.
- Introduces adaptive spacing limits determined by performing a vehicle stopping test. The result of the test is then used to determine safe following distances.
- Utilizes speed-specific warning levels to reduce false alarms and determine normal operating procedures. If desired, alarms can be programmed to remain silent at lower speeds with minimal closing rates.
- Can easily be adapted to any rail vehicle including hi-rail, passenger and freight varieties.
- Incorporates a built-in data recorder with internal accelerometer that retains data for normal review and in the event of an incident. Recorder can retain data on speed, direction and severity of collision measured in “G’s.”
- Features customizable control limits, warnings, alarm types, displayed information and other communications data.

AURA™ CORE TECHNOLOGIES:

ULTRA WIDEBAND RANGING SYSTEM (UWB)

- UWB technology is military-based, originally designed to maintain radio and spacing links between military assets. This technology translates “time of flight” of a radio wave from antenna to antenna into a precise distance measurement. UWB technology is not affected by the multi-path distortion effects of standard radio distance measurements.
- UWB avoids the multi path distortion issues by simultaneously broadcasting over a wide range of frequencies and then filtering the returns to accurately determine the distance between transmission and reception.
- In severe geographic conditions such as canyons, cliffs, and tunnels, UWB performance actually improves as these features act as waveguides which improve reception.
- Each UWB ranging system unit has a unique identifier which is used to track and identify multiple vehicles on track.

WAAS GPS (Wide Area Augmentation System)

- GPS provides ground speed information for speed dependent warning levels.
- GPS provides location information if Ultra Wide Band (UWB) ranging system is out of range.

2.4 GHz radio

- Serves as inter-vehicle communication link for network coordination of multiple vehicles.



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MAIN SYSTEM COMPONENTS



- **USER INTERFACE (UIM)** – features a 2 x 16 alpha numeric display for messages and programming, numeric displays of following distances both front and rear, variable audio feedback for alarms, indicator lights for alarm conditions, tactile feedback control panel, contained within an aluminum housing.



- **CONTROL ELECTRONICS MODULE (CEM)** – Utilizing sealed automotive grade connectors, the UIM, TSM and 2.4 GHz radio interface in this main control module is mounted in the cab of the vehicle. This module also has expansion ports allowing connection to work vehicle sensor inputs which can be used for productivity measurements.



- **TRANSMITTER / SENSOR MODULE (TSM)** – Located on the roof of the work vehicle, this module contains the Ultra Wide Band (UWB) radio system and GPS modules. Constructed of aluminum and specific molded Radome materials, this module is installed on a modular base which accommodates all vehicles and mounting locations.



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SYSTEM SPECIFICATIONS

Metrom Rail Part Number	FA-1043
Display UIM	FA-1060
Control Electronics Module	FA-1072
Transmitter/Sensor Module	FA-1073
Input Voltage	12-24 VDC
Operating Current	3 Amps
System Weight	22 Lbs.
Operating Temperature	-30C to +75C
Storage Temperature	-40C to +85C
Alarm Range	Adjustable, optional external interfaces
Indicator Brightness	Adjustable, optional external interfaces
UWB operating frequency	3.1 GHz to 5.6 GHz
System Range	1200-2500 feet dependent upon environment
CEM Interfaces	TSM, UIM, Power, (2) CAN inputs, (2) digital inputs, (2) relay outputs, (2) analog inputs
Data Event Recorder Limits	30 minutes continuous looping
Standard Installation Includes:	UIM module, CEM Module, TSM Module, 2.4GHz magnetic mount antenna, 18' power hook-up cable, crimp-on power connectors, bulkhead connectors, 24 ft. antenna cable, TSM mounting base, mounting base hardware, UIM-to-CEM harness, CEM-to-TSM harness
Additional Options:	<ul style="list-style-type: none">• Supervisor productivity package which tracks vehicles, specific machine functions and stores data in remote, user-accessible database• Mast extensions for mounting TSM Module above obstructions• Knock-down mast assemblies for transporting low clearance vehicles• Custom mounting brackets for non-standard UIM or TSM mounting Modules for connection of UIM warnings to external devices such as speakers or visual indicators• Full touch screen user interface or a fully custom interface