



AURA ROADWAY WORKER PROTECTION SYSTEM

The First UWB-Based Worker Protection System

Operates in all Environments

Fully Customizable Platform



For More Information, Visit: metrom-rail.com/AURA-RWPS



AURA ROADWAY WORKER PROTECTION SYSTEM

The Metrom Rail AURA Roadway Worker Protection System (RWPS) provides either a portable or zone-based approach to give warning to workers and operators of on-track equipment. The RWPS is the first worker warning system to utilize the advantages of ultra-wide band RF technology, guaranteeing a reliable and precise speed and distance-based platform that can intelligently incorporate existing agency operating standards.

The AURA RWPS can operate as a stand-alone system or as an integral part of the AURA Train Control System. As a stand-alone system, portable wayside nodes are used to define configurable work zones. As part of a networked system, permanently installed nodes create overlapping work zones. In either configuration, operators and workers receive alarms that must be confirmed when a train approaches an active work zone. The WPS is the ideal tool for both transit and freight agencies seeking to enhance existing safety standards.

AURA ROADWAY WORKER PROTECTION SYSTEM CORE TECHNOLOGIES

Advanced RF Technologies

- Ultra-Wide Band (UWB) RF technology allows the RWPS to provide accurate ranging between equipment and on-track personnel without being affected by the same multi-path distortion effects that limit traditional 900 Mhz or 2.4 Ghz systems.
- The AURA RWPS system ensures accuracy and reliability by deploying state-of-the-art RF emission and filtering technologies.
- UWB technology is enhanced in tunnels or dense metropolitan environments thanks to a natural amplification of UWB RF emissions in these environments.
- Metrom Rail is the exclusive supplier of UWB technology to the railway industry.
- Personnel Vests are integrated with UWB technology, minimizing concerns about wearable warning systems. Antennae on both sides of the vest maximize the communication path from a worker to a train.
- UWB baseline of operations is 15 seconds of advanced warning at 60 mph - this can be modified to meet any agency operational procedures.

QUICK SYSTEM FACTS

- AURA RWPS can be utilized as a passive system to provide only alarm information, or as an active tool to assert braking in the case where operators or workers fail to take action as prompted. As part of the AURA system, UWB modules can be utilized to integrate with signaling or other wayside elements.
- AURA RWPS provides alerts for both the equipment operator as well as all workers within a customer configurable distance.
- Offers portability and simple configuration, providing seamless operation in any environment.
- All AURA RWPS modules contain flexible data recorders for training and event recreation
- Wayside Ultra-Wide band RF units provide an innovative method for initiating warnings within a work zone.
- System can either be integrated or work independently of CBTC-based train systems

AURA ROADWAY WORKER PROTECTION SUMMARY

- Use of Ultra-Wide Band allows for operation in all environments, regardless of extreme conditions, with an effective communication range of over 4,000 ft. between trains and wayside modules in standard conditions.
- All modules utilize integrated data recorders. These data recorders can provide vital data for the use of training or event re-creation, such as equipment speed, operator position and alarm confirmation times.
- The RWPS is available in two configurations:
 - > Portable Wayside Modules which can be moved to accommodate changing working conditions/locations
 - > Permanently installed, zone-based Wayside Modules which automatically identify the presence of a worker
- All modules are designed and tested to applicable railway and Mil-Std specifications.

SYSTEM MODULES



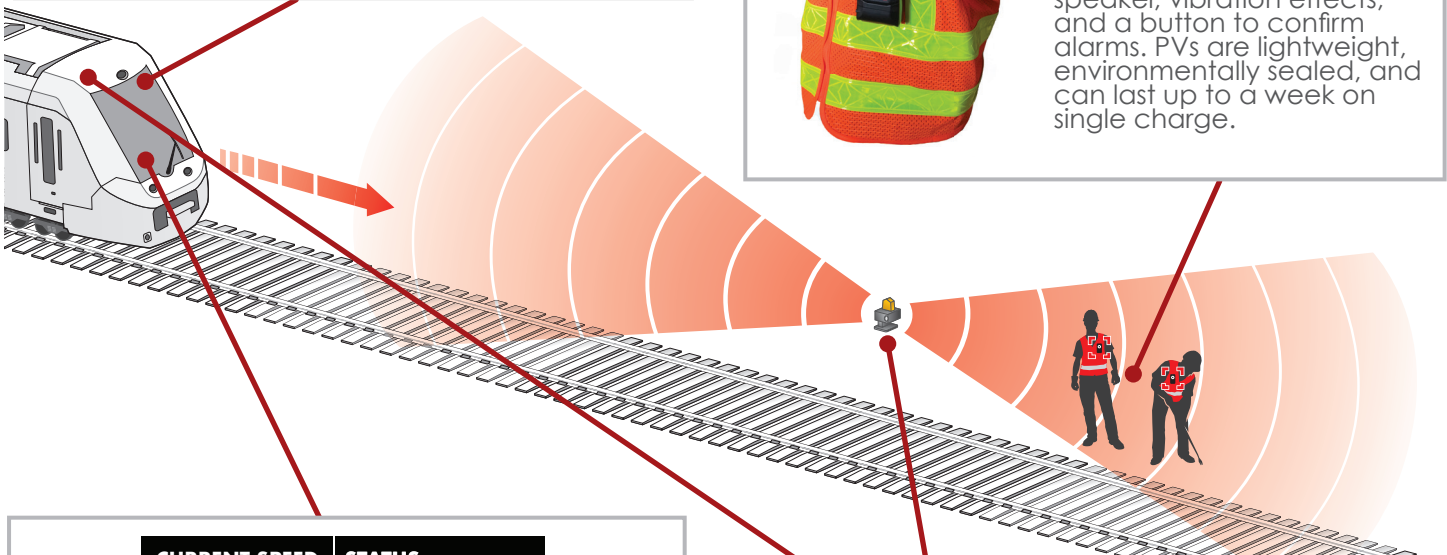
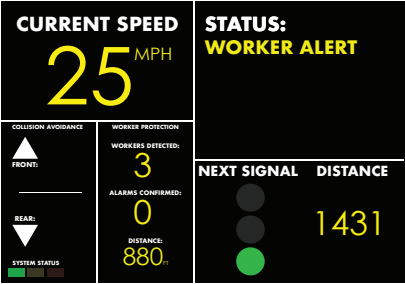
Control Module

Serves as the data control, intelligence, and diagnostic center for the AURA PTCS. The CM's small size allows for easy installation inside of most train cabs.



Personnel Vest


Fully equipped with both front and rear battery-powered UWB antennae, the Personnel Vest is the first UWB-based wearable technology compatible with the AURA System. The PV will alarm when a train enters an agency-specific distance / speed from a work zone. The PV deploys a multi-color LED beacon, programmable speaker, vibration effects, and a button to confirm alarms. PVs are lightweight, environmentally sealed, and can last up to a week on single charge.

User Interface

The User Interface provides a full range of information to train operators, including real-time information about nearby workers (such as distance and confirmation status) as well as any other customer - specified requirement. Operators must confirm their own alarms on the UIM when prompted, and will be informed of any automatic braking / propulsion

CURRENT SPEED		STATUS:	
25 ^{MPH}		WORKER ALERT	
COLLISION AVOIDANCE	WORKER PROTECTION	NEXT SIGNAL	DISTANCE
FRONT: ▲	WORKERS DETECTED: 3	●	1431
REAR: ▼	ALARMS CONFIRMED: 0	●	
SYSTEM STATUS: ●	DISTANCE: 880	●	



UWB Modules

Train and Wayside-based Modules communicate via Ultra-Wide Band RF. At a specified speed & distance, the Wayside Module initiates an alarm on all Personnel Modules within the work zone. The Wayside Module can be placed anywhere near the center of the work zone or can be permanently installed, depending on configuration.

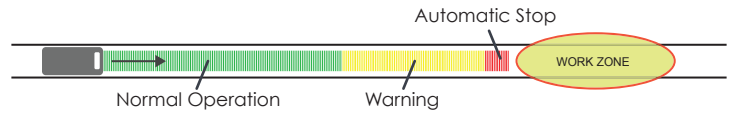


AURA ROADWAY WORKER PROTECTION SYSTEM

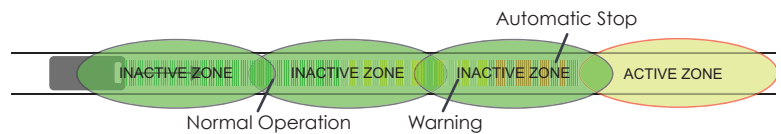
AURA RWPS Configurations

RWPS can be deployed as a stand-alone portable system, or as a zone-based solution:

Portable Nodes will define temporary work zones that are automatically detected by approaching trains, and will use a speed / distance calculation to identify the time to entry of the zone and will alarm correspondingly. If utilized, the train will stop automatically before violating the zone without confirmation.



Zone Nodes are installed along the wayside at regular overlapping intervals (typically 600-1,000 ft.). As workers wearing Personnel Vests enter a zone, it becomes an occupied zone and will communicate an active work zone status to any oncoming trains. If utilized, the train will stop automatically before violating the zone without confirmation.



AURA RWPS User Interface

In the cab, the User Interface informs the operator of the distance to the closest work zone, the quantity of workers detected, & if they have confirmed their alarm by pressing a button on the Personnel Vest.

The UIM prompts the operator to confirm the cab alarm. If configured to do so, the AURA PTCS will slow or stop the train prior to entering the work zone if the operator fails to take action as prompted by the UIM, or if workers fail to confirm alarms on the track. Additionally, speed limits can be built into the system to ensure that a train cannot enter a work zone above a posted limit even with all alarms confirmed.

CURRENT SPEED		STATUS:	
25 ^{MPH}		WORKER ALARM	
COLLISION AVOIDANCE	WORKER PROTECTION	NEXT SIGNAL	
FRONT: ▲	WORKERS DETECTED: 2	●	
REAR: ▼	ALARMS CONFIRMED: 1	●	
SYSTEM STATUS	DISTANCE: 650 ^{FT}	●	

