

# VDR24 Vehicle Detection Radar

Two Radars/Four Zones/Intelligent Correspondence Verification



- Accurate vehicle detection for four-quadrant gate crossing warning systems
- Blocked crossing and obstacle detection
- Detects moving and stopped vehicles, all-weather performance
- Non-embedded system mounts above and outside the crossing island
- Multiple, user-configured detection zones cover the entire crossing island
- Full, multiple redundancy – 16 radar beams per sensor cover every square foot of the crossing island
- Continuous, Intelligent Correspondence Verification, Vital architecture, and failsafe operation

**A Non-Embedded, Superior Alternative to Buried Presence Detection Loops**  
**Lower Cost - Longer Life - 100% Redundancy - Proven - Vital Architecture**

## The Island Radar VDR24 Solution to Dynamic Exit Gate Control

The Island Radar provides reliable vehicle detection without the short life, maintenance problems, and train delay consequences of buried loop sensors. It uses SmartSensor™ Rail radar technology from Wavetronix along with AREMA-compliant controller from the Island Radar Company to implement Dynamic Exit Gate Clearance Time in four-quadrant gate-crossing warning systems and blocked crossing detection.



### Exit Gate Control and Blocked Crossing Detection

The Island Radar is specifically designed for detecting vehicles at crossings and influencing exit gate behavior. The system can also detect vehicles that have been stopped, stored, or deliberately placed in the crossing island for longer than a programmable period of time, communicating that urgent information to railroad personnel over any available communication link - cellular, data networks, and even the future PTC wireless infrastructure.

### Non-Roadway Installation - Up to 10 Lanes and 16 Zones

Radar sensors may be mounted on entrance gate masts or on stand-alone poles adjacent to the track right-of-way, at the edge of the Minimum Track Clearance Distance zone. The sensors work together to provide fully redundant vehicle detections, and each unit continuously self-checks and cross-checks the other(s). Each sensor's 90-degree, 140-foot detection range completely covers most crossings, recognizing lanes of traffic and detecting the presence of moving or stopped vehicles in up to ten lanes and up to 16 user-configured detection zones. Each zone can be assigned to any of four output channels that connect to crossing controller or relay circuitry to operate exit gates in Dynamic Mode.

### Intelligent Correspondence Verification, Failsafe Operation

Redundant radar sensors undergo continuous self-check cycles and constantly cross-check each other to verify radar positioning and zone locations. Any radar performance anomaly or loss of correspondence instantly trips Health circuits and reverts the crossing to Timed Mode operation.

### Established Technology - All Weather Performance

Wavetronix is the world leader in radar-based vehicle detection for traffic intersection control and intelligent transportation applications. Proven in thousands of highway and intersection applications worldwide, the Wavetronix technology is unaffected by conditions that interfere with video detection systems, including rain, snow, dust and fog. Highly intuitive configuration tools automatically discover lanes of traffic, stop bars, and crossing island dimensions. Lanes and individual detection zones can be set up in any shape or size, on a configuration screen that shows detected vehicle icons traversing the island in real time.

### Crossing Controller Interfaces

The Island Radar solution features isolated optical and relay interface options for any make, model, or vintage of crossing controllers. Electrical surge protection and isolation meet or exceed the requirements of IEC 61000-4-5 class 4 and AREMA 11.3.3 Class C, respectively.

## Radar Sensor

### Environmental

- Operating frequency: 24.0-24.5GHz (K Band)
- Operating temperature: -40°C to 74°C (-40°F to 165°F), 0 to 95% RH (non-condensing)
- Storage temperature: -49°F to 185°F (-45°C to +85°C)

### Physical

- Weight: 4.2 lbs (1.9 kg)
- Physical dimensions: 13.2 in × 10.6 in × 3.3 in (33.5 cm × 26.9 cm × 8.4 cm)
- Mounting method: 18 to 22 ft height (5.5 m to 6.7 m), on approved mounting bracket, unobstructed by any foreground structures
- Resistant to corrosion, fungus, moisture deterioration, and ultraviolet rays
- Lexan EXL polycarbonate enclosure, outdoor weatherability: UL 746C
- NEMA 250 compliance:
  - Watertight per NEMA 250
  - External icing (clause 5.6), hose down (clause 5.7)
  - 4X corrosion protection (clause 5.10)
  - Gasket (clause 5.14)
  - Withstands 5 ft (1.5 m) drop
  - MIL-C-26482 Connector
  - Rotational backplate for 360° of roll

### Regulatory and Certification Testing, Other

- RFI: FCC part 15.249
- MTBF: Prediction and temperature-based margin analysis per MIL-HDBK-217F, FN2, >10 Years
- Surge Protection: per IEC 61000-4-5 class 4
- Two-year warranty against material and workmanship defects
- Full Extended Warranty options up to five years

## VDR24 Controller

### Electrical

- Input Voltage: 9-30VDC AREMA-Compliant Power Supply (Class C Equipment)
- Power consumption: 30W, includes radar sensor power distribution
- Surge protected RS-485 communication ports to radar sensor

### Environmental

- Operating temperature: -40°F to +158°F (-40°C to +70°C), 0-95% RH, non-condensing per AREMA 11.5.1 Class C
- Storage temperature: -49°F to 185°F (-45°C to +85°C)
- Vibration: per AREMA 11.15.1
- EMI: per AREMA 11.15.1
- Isolation, Protection, and Dielectric Breakdown: per AREMA 11.3.3

### Physical

- Weight: 1.5 lbs (0.7 kg)
- Physical dimensions: 6 in × 8 in × 3 in (15.2 cm × 20.3 cm × 7.6 cm), inclusive of mounting flanges
- Mounting method: flange mounting, four screws, vertically on a wood or other non-conductive back panel surface
- Recommended mounting clearance: 5 in (12.7 cm) minimum on each side, 18 in (45.7 cm) minimum horizontal

### Regulatory and Certification Testing, Other

- MTBF: Prediction and temperature-based margin analysis per MIL-HDBK-217F, FN2, >10 Years
- RFI: FCC part 15C
- Surge Protection: per IEC 61000-4-5 class 4
- Two-year warranty against material and workmanship defects
- Full Extended Warranty options up to five years



Standard Components, Dual-Radar Detection System		
Part Name	Part Number	Typical Quantity
SmartSensor™- Rail Radar Sensor	RAD-0500-00	2
VDR24 Dual Radar Controller	RAD-0101-00	1
Elevated Mounting Bracket	MNT-0104-00	2
Mast Riser Cable, 40-Feet	CAB-0103-00	2
Mast Base Junction Box	ENC-0101-00	2
Home Run Cable, Direct Burial Rated	CAB-0106-00	Up to 600 Feet per Sensor

Parts shown above represent a typical installation utilizing gate mast mounting. Additional options are available for dedicated mast mounting, self-contained cabinets with UPS, and video-enabled remote monitoring and control. Contact Island Radar Company for guidance and recommendations regarding optimum solutions for particular crossings. CAD drawings characterizing various installation and radar siting options may be downloaded from the Island Radar website at [www.islandradar.com/downloads](http://www.islandradar.com/downloads).

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Phone: (816) 256-4499  
 Fax: (816) 256-4454  
 E-mail: [info@islandradar.com](mailto:info@islandradar.com)  
 Website: [www.islandradar.com](http://www.islandradar.com)