CIR Gen2

High resolution 360° imaging radar

Sensing that drives automation

Designed to solve industrial challenges where high-resolution data is required to facilitate automation and autonomous vehicles, the CIR Gen2 is a significant update to Navtech's flagship imaging radar sensor, the CIR.

A market-leading, millimetre-wave radar with a 360° field of view that provides best-in-class high-resolution radar images, the CIR Gen2 works in all weather, light and environmental conditions delivering unrivalled outdoor sensing for automation with zero compromise.

Features of CIR Gen2

- All weather performance with zero downtime through dust, rain, fog and snow.
- Long range with an instrumented range of up to 600m.
- 360° field of view with consistent scanning performance.
- Best-in-class high-resolution radar images with access to full spectrum.
- Antenna options for different beam profiles.
- Compatible with Navtech's other radar solutions - Terran360 and Safeguard

New 8Hz refresh mode for rapid updates.

New precision time protocol (PTP) functionality for time synchronisation.

New ruggedised features:

- 10mm thick radome for increased impact resistance.
- Ruggedised rotating assembly for high shock and vibration environments.
- Ultra-robust D38999 Mil spec connectors for power and data.

Benefits of using CIR Gen2

Increased uptime

Unrivalled availability, able to perform whatever the conditions.

Improved safety

Designed for mission-critical applications where safety is essential.

High quality

Built and designed in Oxford by radar experts for the past 20 years.

Easy to install

Compact design with Software Development Kit for quick integration.

Robust design

Designed for long-term automation projects in the harshest environments.

CIR Gen2 Industries

Mining | Ports | Marine | Logistics | Agriculture | Construction

CIR Gen2: Technical specifications

Performance

Operating Frequency	76 - 77 GHz	**Instrumented Range**	330m | 600m
Range Resolution	0.044m |0.175cm	**Antenna Options (code)**	A | E | X
Azimuth Beamwidth (by code)	1.8° | 1.8° | 1.8°	**Elevation Beamwidth (by code)**	3.6° | 1.8° | [1]1.8°
Field of View	360°		

Output and Integration

Data Format	Timestamped azimuth with FFT	**Measurement Rate per rotation**	400 | 800
Update Rate	4Hz | 8 Hz	**Time Synchronisation**	NTP | PTP
Data Connection	TCP over gigabit ethernet		

Physical

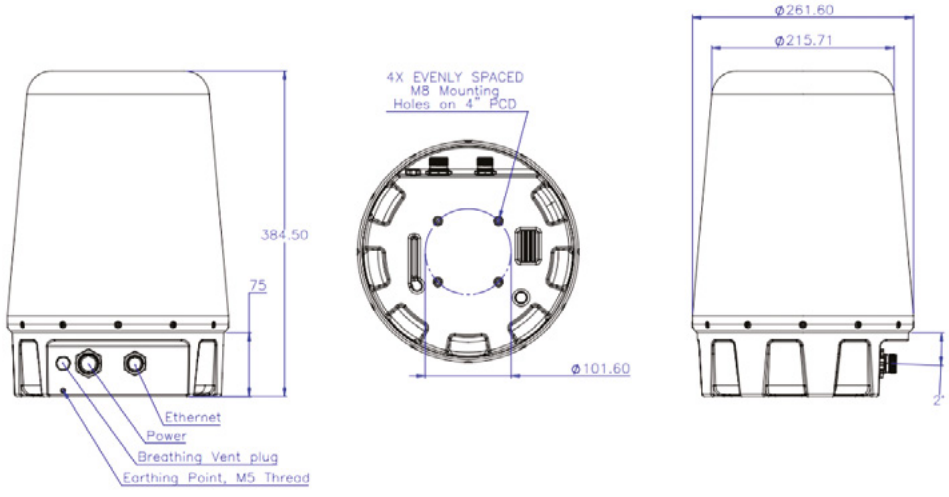
Dimensions	Diameter - 262mm Height - 385mm	**Weight (without cables)**	7.5Kg
Mounting	4x M8 mounting holes on 101.6mm equally spaced PCD	**Operating Voltage**	24V DC
Power Consumption	[2]24W	**Ingress Protection Rating**	IP66, UL50/50E Type 4x
Operating Temperature	[3]-20 + 60°C	**Shock**	[4]500 m/s2 amplitude, 11 ms duration
Vibration	[4]5 Hz to 1,000 Hz, 3 Grms	**Connector Options**	F | G
Power Connector (by code)	D38999 | M12	**Data Connector (by code)**	D38999 | M12 X-Code

Compliance

Compliance	EMC Directive -2014/30/EU Low Voltage Directive - 2014/35/EU Radio Equipment Directive - 2014/53/EU ROHS

1. Includes cosec feature that directs portion of main beam energy down to create infill minimising blind spot when the radar is placed at height
2. When heater is used this can increase power consumption up to 50W, for more information please contact industrial.automation@navtechradar.com
3. For applications in environments outside of operating temperature range, please contact industrial.automation@navtechradar.com
4. DEF STAN 00-035, Part 3, issue 5, Chapter 2-01, Test M1 - General Purpose Vibration Test, Environmental Test, Criteria for the Acceptability of Mine Instrumentation

Dimensions



For more information and the opportunity to order, please contact:

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OEMSensors

SafeGuard

Integrated Smart Sensor for Collision Avoidance and Obstacle Detection

SafeGuard is a stand-alone, smart sensing solution for challenging obstacle detection and collision avoidance applications. SafeGuard combines the high-resolution Navtech Radar CIR sensor with embedded radar processing and control software, all accessible over a simple web interface.

Safety is everything.

NAVTECH RADAR

SafeGuard

Smart sensing for the toughest applications

Overview

SafeGuard combines the high-resolution Navtech Radar CIR sensor with embedded radar processing and control software, all accessible over a simple web interface.

Radar provides accurate range and angle measurements of objects within its field of view. Due to the characteristics of radar, it works in all weather, lighting and environmental conditions, offering significant advantages in challenging operating environments.

The SafeGuard smart sensor processes the radar measurement data and can be configured to activate an output when a detected object is within a defined field. These fields are user programmable over the simple web interface.

For example, a detection area can be set up so that an alarm is triggered if any object comes within 20 metres of a moving gantry or piece of machinery. Up to six independent zones can be configured to any shape or size, within the field of view of the radar, easily created using the simple user interface.

SafeGuard is a low power solution with a 1Gb ethernet interface for communication and alarm activation. The system interfaces with industry standard relay modules, providing flexible integration to third-party equipment. In addition, the system includes advanced features to help reduce the false alarm rate.

Typical Applications

The SafeGuard smart sensor is ideal for applications in challenging environments, where the use of other sensing technology may not be appropriate due to its limited performance in adverse conditions (e.g. ports, mines, harbours, and bridges). Typical applications include:

- Collision avoidance with multi-layered warning zones to control the movement speed of equipment.
- Intelligent process automation where detection of an object within a zone will activate specific actions e.g. opening or closing a safety gate.
- Proximity warning e.g. when a person or vehicle goes near machinery, an alarm will be triggered.
- Ship height detection for safety of bridges.
- Detecting whether an object or vehicle has moved from a safe location.

Ports & Harbours

Mining

Bridges

Radar Sensing Technology

Compact Industrial Radar (CIR) sensor

Navtech Radar's industrial grade, high-resolution CIR sensor works in all weather, lighting and environmental conditions, overcoming some of the fundamental limitations of other sensing technologies.

Engineered to withstand extreme vibration and temperatures, the Navtech radar is the most reliable sensor for use in automation applications where adverse conditions are common. Operating with unrivalled availability, the sensor provides critical data when it's needed most.

The CIR sensor is a compact, rugged radar that has been specifically designed for use in challenging industrial environments. The high-resolution, 360° long-range, radar provides high accuracy measurement data. The sensor can be mounted at any angle for optimum performance and outputs range and bearing information, which is processed by the embedded software.

Easy to install with low power requirements and built to be maintenance free for 10 years, it's a sensor you can rely on.

OEMSensors

Smart Sensing

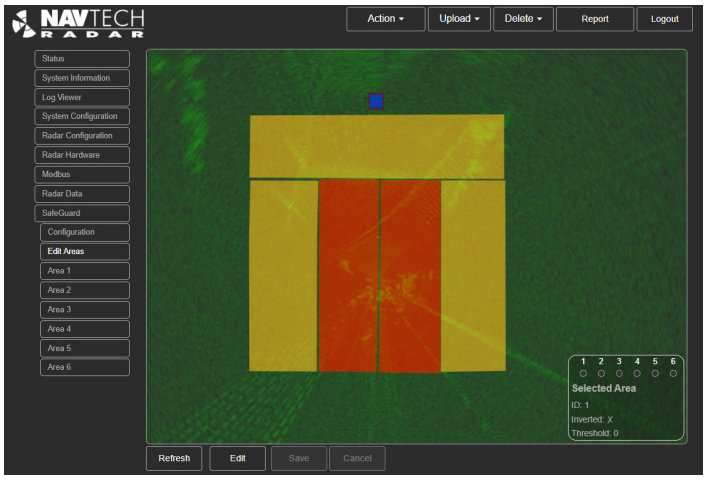
Embedded software for a smart sensing solution

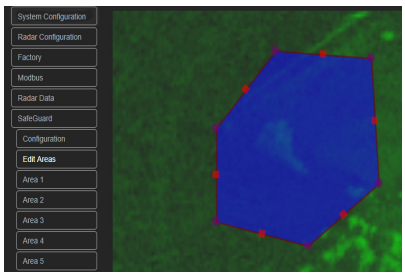
SafeGuard has embedded software that allows you to quickly implement a smart sensing solution.

Using the software, up to six areas can be created as detection zones, and each can be configured separately. This allows for independent warning zones, high-risk alarm zones and fail-safe zones. Within each area, the user can configure key parameters to optimise detection and reduce false alarm rates, such as break allowance, threshold data and allowance decrement.

A fail-safe function is also available that will trigger an alarm if an object is not seen when it is expected to be seen.

All zones can activate an industry standard ethernet I/O module (i.e. ADAM relay module) allowing youto choose what action should be taken, for example to prevent a potential collision or trigger an audible and visual alarm.





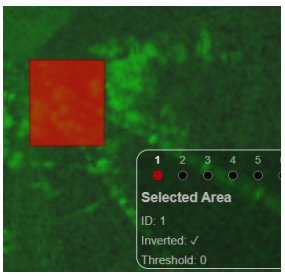


Fig1. (clockwise) Configurable detection areas; Fig2. Fail-safe function; Fig3. Editing configurable areas

Benefits

- **Relay alarm outputs**
  Software activates up to six relay alarm outputs.
- **Easily configurable**
  Up to six zones can be easily configured through the user interface.
- **Stand alone solution**
  No external processing required.
- **Fail-Safe function**
  Can be configured to indicate a system failure.
- **Low false alarm**
  Advanced features to help reduce false alarm rate.
- **Web based user interface**
  Simple to use, configuration tool.
- **Modbus Integration**
  Through integration with Modbus, master alarms are passed to third-party systems.

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