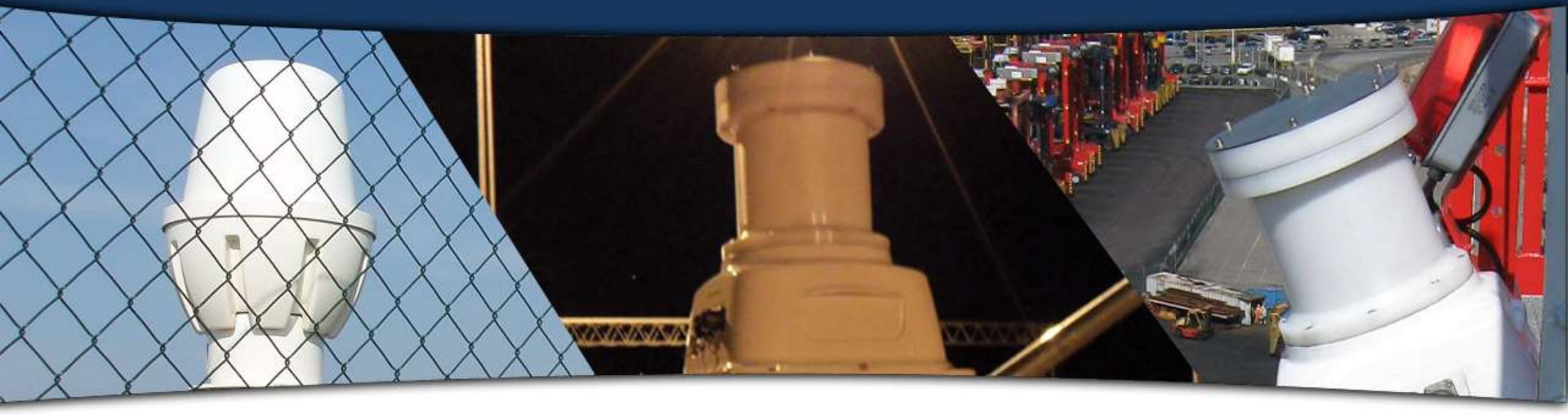
Navradar Asia

Asia Pacific HQ



AdvanceGuard

ClearWay

SafeGuard

NavRadar

Welcome

- Content:
  - History of NavRadar
  - Facilities & Capabilities
  - What do we do?
  - Why Radar Surveillance
  - Different Types of Radars
  - Witness Software
  - Suitable Applications

NavRadar

Company History

- Company founded in 1999 with the sole purpose of developing, manufacturing and supporting cost effective industrial radar sensors and systems.
- Our radar was initially established to provide radar sensors in the industrial automation market
- It was then adapted it’s capabilities into new markets for outdoor commercial applications to meet the demand within the security Industry.
- All hardware design, software design and product manufacturing is conducted in-house at our Oxfordshire, UK headquarters.

NavRadar

Company History

- We offer world leading solutions providing **Area Security Surveillance**, **Automatic Incident Detection** and **Industrial Automation** using Advanced Radar Technologies.

- Millimetre wave radar imaging systems provide a key technology which able to address prevention and protection need.

- Core skills:-
  - Electronic design
  - Embedded software and firmware
  - Radar data processing software systems
  - Radar application engineering
  - Mechanical design

- Singapore – Asia Pacific HQ set up in 2013.

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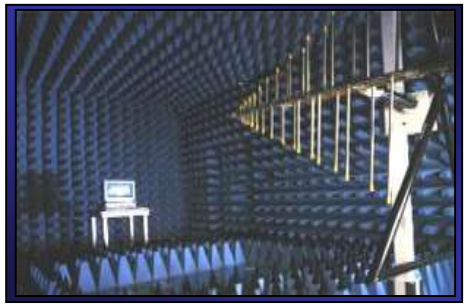
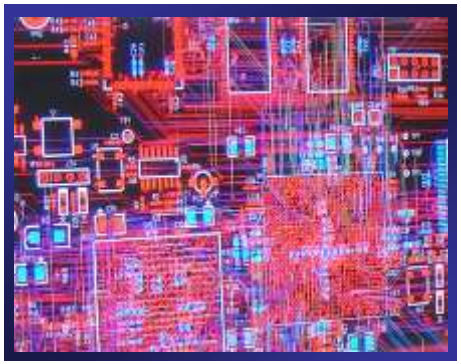
Facilities and Capabilities





- Dedicated design, test and manufacture facilities
- Extensive product test and qualification capabilities
- Substantial investment in electronic CAD, CAE, software as well as RTOS and FPGA development systems

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What do we do?

- Manufacture a range of ‘standard’ 77GHz FMCW radar products
  - Industrial sensors
  - Security/surveillance sensors and Software
- Develop sensors and systems for customer applications including:-
  - Complete sensor design
    - Mechanical *
    - Signal processing
    - RF systems*
    - Antenna systems*
  - Post processing systems
    - E.g. Target tracking, detection, zoning etc.
    - Interface to 3rd party systems

** - developed with partners*

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Why Radar Surveillances?




- **Delivers metre by metre surveillance of an entire site and surrounding area**
- Full situational awareness **– Advanced Warning of Potential Threats**
- Monitor both sides of the fence, 24/7, in all weather conditions, including fog
- Meet potential intruders before they get to the fence
- Determine the size/type of approaching threat i.e. man, vehicles and animals
- Guide security teams to intercept intruders should fence be compromised
- Radar is often much less expensive than other technologies for wide area surveillance
- Quick to deploy, Radar requires less site work and construction
- Low on-going maintenance cost *(NavRadar 3 year service interval)*

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AdvanceGuard
Wide area security surveillance & intruder detection

ClearWay
Highways monitoring & incident detection

SafeGuard
Industrial sensing for collision avoidance & automation

NavRadar

AdvanceGuard

Wide Area & Intruder Detection

- Intruder history analysis and visualization
- Multiple intruders can be tracked simultaneously
- Maintains high accuracy in poor weather
- Visual and audio warnings in advance of perimeter and area violations
- Very low false alarm
- Effective over land and water

- Advance warning of suspicious personnel loitering outside the protected perimeter
- Automatic guided visual from integrated PTZ camera with audio warnings
- Intruder classification of people and vehicles

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ClearWay

Intelligent Transport Detection

- Detects slow moving vehicles or pedestrians
- Stopped vehicles or debris
- Unaffected by changing light levels, rain, fog or dust
- Vehicles counting
- Identify illegal tailgating & lane changing events with high reliability.
- Witness software interprets radar data & intelligently decides when alarms should be raised.
- Provide photographic evidence when a rule is broken
- Uses rules & algorithms which provide human-like assessment of events
- Solution is modular, flexible and scalable. Can work with one or many radar sensors

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SafeGuard

Anti Collision System

- Fully automated surveillance system
- Single operator control operation
- Early detection
- Dependable & Reliable
- Save costs on repair
- Obstacle Tracker
- 24/7 Monitoring
- Operating temperatures: -20°C to 60°C (+70°C option available)
- Low power consumption: 25W
- Interface: 100Mb Ethernet

Unmanned Aerial Vehicle (UAV)



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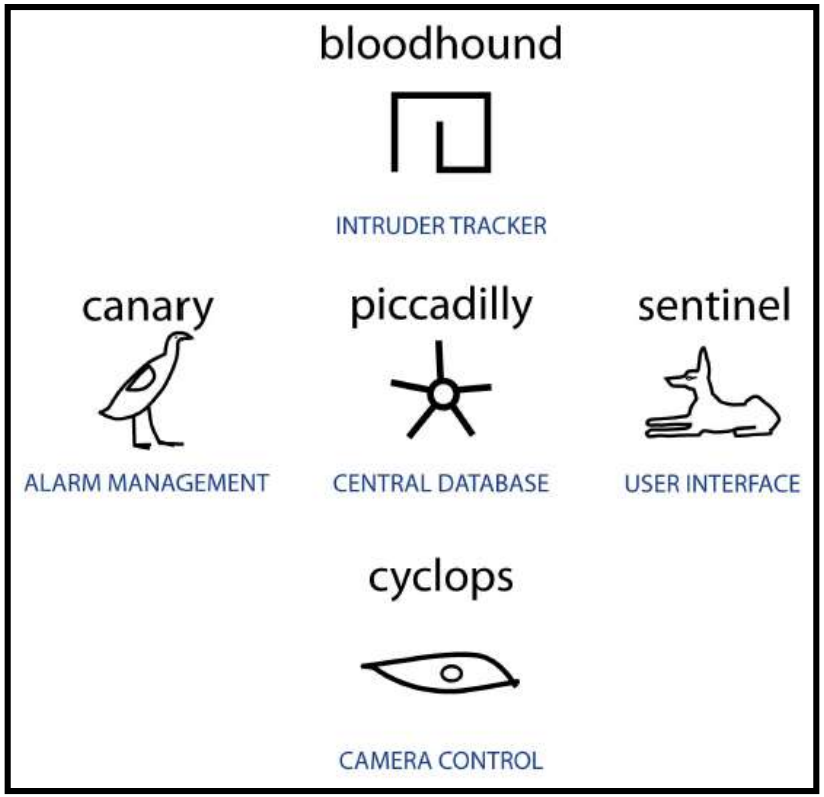
Witness software

Works directly with its essential component **witness**

- Comprising of six integrated modules, **witness** provides a range of crucial system services
- It tracks targets, controls cameras and handles the complex algorithms that analyse a targets behaviour and assign threat levels



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Key features of witness software

- Modular construction, flexible and scalable
- Central control and configuration
- Advanced target tracking
- Powerful behaviour analysis
- Intelligent camera control
- Flexible user interface
- Efficient third-party integration

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Maintenance and Reliability

- MTBF for a Radar is in excess of 75,000 hrs
- Solid state design of transceiver and support electronics
- Transmitted power from each radar ≈ 10mW, Safe and none interfering
- No routine radar cleaning needed, to maintain detection performance

- Radar design life of **20 years**

(In 1999, Radar was installed and still functioning in Brisbane)

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Maintenance and Reliability

- Radar is IP67 sealed

Ingress Protection (IP) Ratings

IP 67

1st Digit	Definition
0	No Protection against contact and ingress of objects
1	Protected against any large surface of the body, such as the back of a hand. Protected against solid objects greater than 50mm in size.
2	Protected against access to hazardous parts by a finger or similar object. Protected against solid objects greater than 12.5mm in size.
3	Protected against access to hazardous parts with a tool or thick wire. Protected against solid objects greater than 2.5mm in size.
4	Protected against access to hazardous parts with a wire, screw, etc. Protected against solid objects greater than 1mm in size.
5	Protected against access to hazardous parts. Dust protected.
6	Protected against access to hazardous parts. Dust-tight.

2nd Digit	Definition
0	No Protection
1	Protected against water drops
2	Protected against water drops at a 15 degree angle
3	Protected against water spray at 60 degree angle
4	Protected against water splashing from any angle
5	Protected against water jets from any angle
6	Protected against water jets and heavy seas
7	Protected against the effects of temporary submersion in water. Test requires 30 minutes at 1 meter depth.
8	Protected against the effects of temporary submersion. Customer specification applies and specific testing may be required.
9K	Protects against high pressures associated with steam cleaning

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Suitable Applications for this Technology

Good Class Bungalows, Prestigious Condo Estates and Heritage Properties

It is a low environmental impact system that avoids erecting physical barriers or digging up the lawn to lay cables. It is unobtrusive to privacy, offering continuous scanning without constant monitoring of CCTV images.

Power Stations & Reservoirs

It does not interfere with other electronic equipment and it works over water where other technologies fail.

Remote Telecommunications Infrastructure

It is an automatic system that can relay alarms and images from remote sites.

Airports & Landing Strips

The ultimate detection range capability of 1600m (new AGS sensor) radius from the sensor in 360° makes it ideal for airfield surveillance. Multiple sensors can be networked back to a single base station and one display.

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Suitable Applications for this Technology

Railway Marshalling Yards and Infrastructure

The excellent range resolution of the sensor and the ability to set detection zones; mean the system is effective to detect intruders in cluttered environments such as railway yards. This is networked back to a single base station and one display.

Tunnels Automation Incident Detection

ClearWay can be applied at critical infrastructure points such as tunnels and bridges, as well as stretches on open stretches of road.

Oil Refineries, Depots & Pipelines

The system can be powered by solar panel or wind turbine and configured with wireless communications. It is highly capable for deployment in flat featureless land as found in the Middle East around critical infrastructure

Ports, Harbours and Jetties

The sensor will achieve detection in rain and fog and across water where other early warning detectors are ineffective.

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Suitable Applications for this Technology

Prison Buildings

The sensor can offer effective detection of escapees and people approaching the perimeter, thus preventing the launch of packages into the courtyard so they cannot be collected by inmates.

Data Centres & Commercial Buildings

NavRadar delivers reliable 24 hour technology solutions for high security commercial sites like data centres. The solutions avoid reliance on manned guarding or physical barriers. References include several implementations in the UK.

Fish Farms

The sensor can offer effective detection over large areas of both land and water where it is not practical to fence.

Solar Farms

The sensor will protect the risk of theft of the solar panels; the security system offers early detection enabling quick response to threats.

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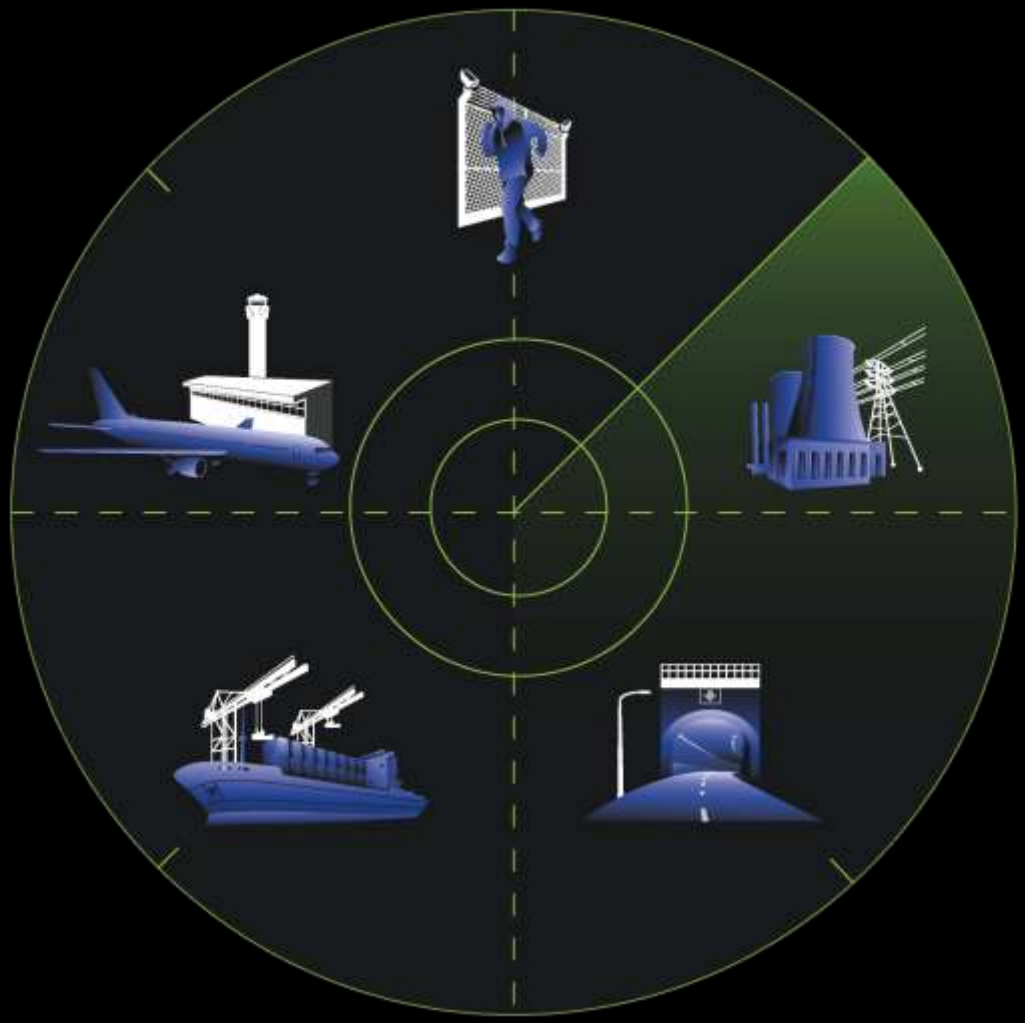

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www.navradar.com

COMMERCIAL RADAR SOLUTIONS