



# Integrated Navigation System



**simple • scalable • safe**

# Integrated Navigation System

## Synopsis Intelligent Bridge Control

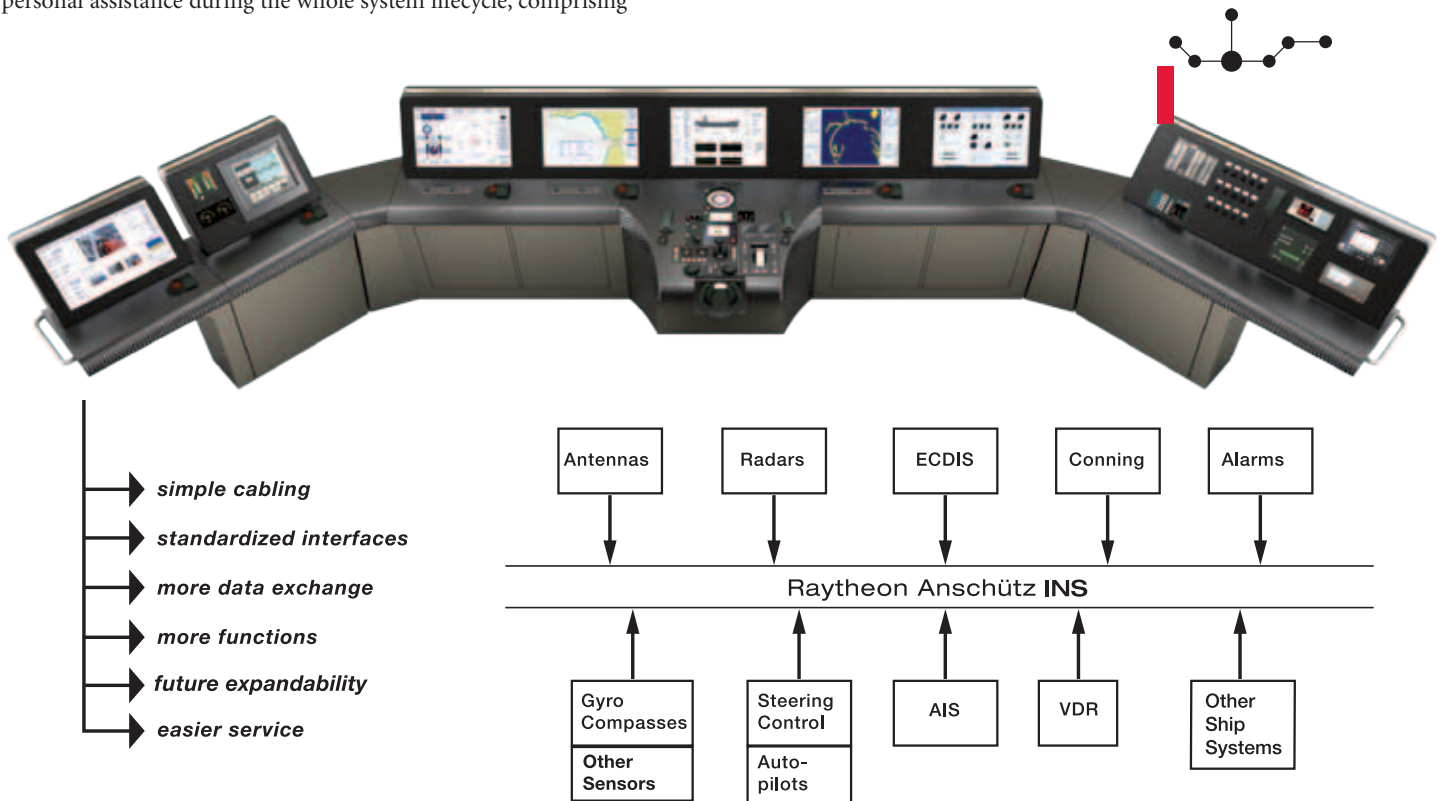
*The Raytheon Anschütz Integrated Navigation System (INS) is a professional navigation solution, which has been proven throughout the years in more than 650 commercial installations around the world.*

Synopsis Intelligent Bridge Control is the latest generation of INS. It combines the broad palette of individual navigation components in one seamlessly developed navigation and bridge system. The INS covers full workstations with Radar, ECDIS and Conning, various sensors for target detection, heading, position and further navigation data as well as steering control systems with standardized user interfaces. The INS is based on the Anschütz know-how of navigation systems which are well-known for their outstanding precision and reliable design.

System integration from Raytheon Anschütz is customer orientated performance at the highest level and maximum flexibility according to individual needs and classification requirements. We provide personal assistance during the whole system lifecycle, comprising

equipment and project engineering as well as logistics, supervision of installation, commissioning, crew training and after sales service. All solutions are backed up with qualified worldwide service around the clock to ensure reliable operation and maximum availability of the vessel.

The Raytheon Anschütz INS fulfills basic IMO requirements as well as highest class notations for one-man bridges. The use of standard hardware and software allows the configuration of modular system solutions, from the tanker or containership through the offshore supply ship and the mega yacht to the cruise ship. Synopsis Intelligent Bridge Control allows for integration of further ship system data and its operation.



## Benefits

### Improved Safety

- Health Monitoring of system status and performance
- Data quality and sensor selection management (CCRS)
- Intelligent alert management

### Simplified Watchkeeping

- Standardized HMI
- Central and local change of colors and brightness
- Enhanced Conning display

### Increased Efficiency

- Multifunction Workstations:  
Any function at any place
- Integration of further ship system data and operation
- Consistent data available at each workplace

### Cost Savings

- Simple to install and upgrade due to open architecture
- Standardized hardware improves logistics of spares
- Standardized software eases configuration and service

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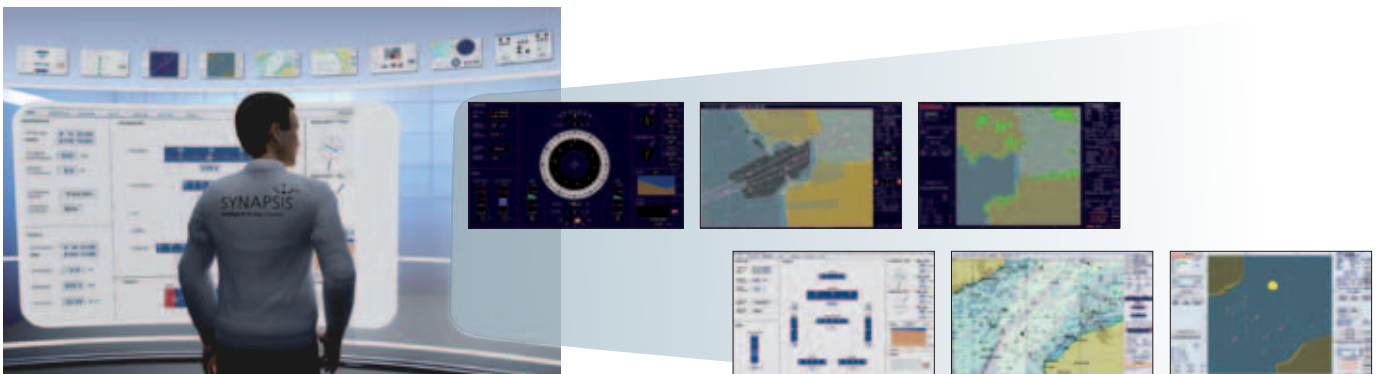
## Intelligent Technology for Safe and Simple Operation

### Multifunctional Workstations

New Synapsis Workstations are tailored to integrate the nautical functions of (Chart-) Radar, ECDIS, Conning and AIS data in any desired combination to allow full control and full data access at a dedicated workplace. Possible configurations are ranging from a stand-alone Radar or ECDIS workplace to a full integrated Multifunctional Workstation.

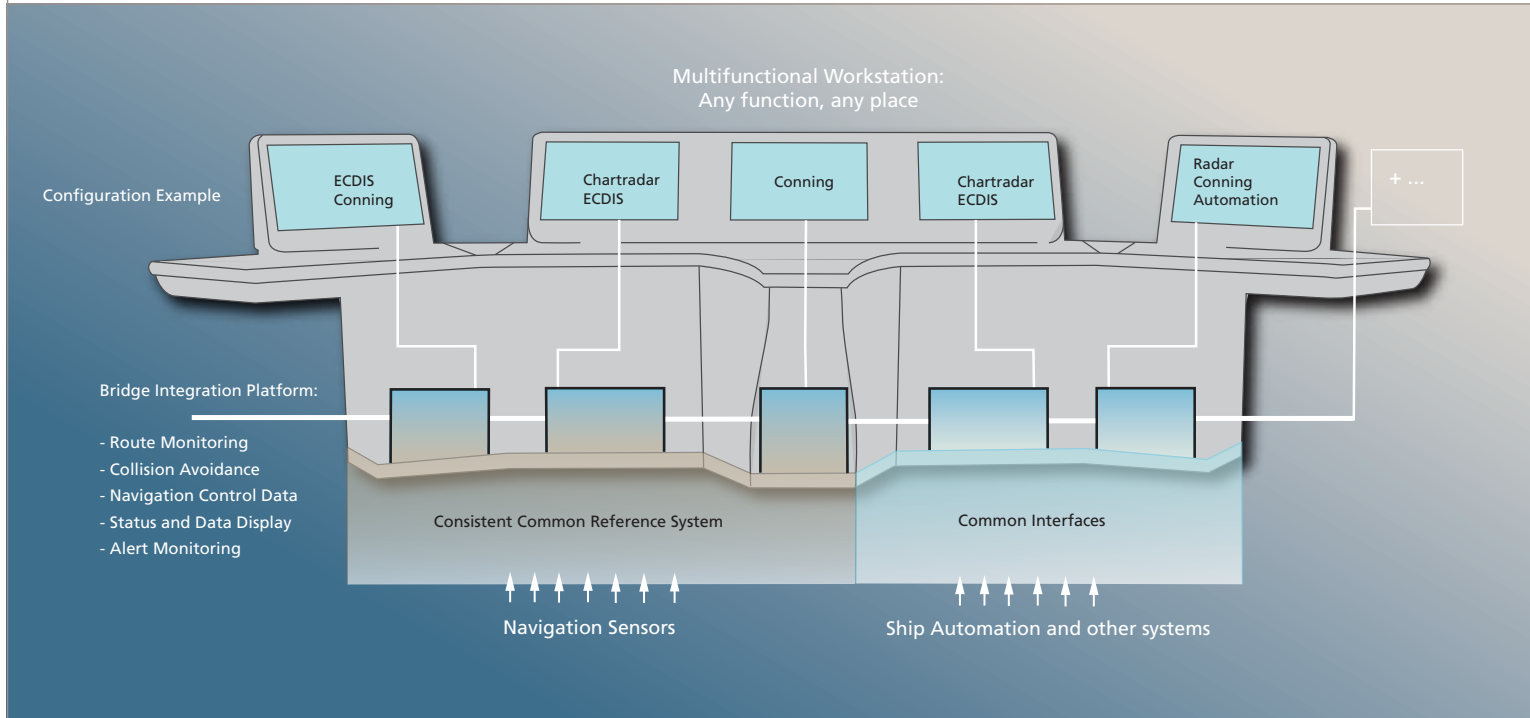
- Full navigation data control at any workstation simplifies watch keeping
- Easy operation through common operating philosophy (“look and feel”)
- Redundancy of equipment leads to additional safety
- Efficiency in spare parts logistics through standardized hardware
- Integration of Anschütz steering control and track keeping system

Optional applications such as CCTV, Engine Automation or DP system from the most varied partners can be controlled on the workstations and share data with the entire system.



## Network Architecture

All necessary data for the core navigation system are provided by a complete suite of high performance and reliable sensors (e.g. Anschutz gyro compass). A double Ethernet Bus distributes the data of (Chart-) Radar, ECDIS, Conning, AIS and sensors to the navigation workstations, where all information is stored independently to maintain highest flexibility in bridge system layout. New workstations receive their configuration and all data from the network automatically.



The Bridge Integration Platform improves the operation of the ship through intelligent and modular integration of all data from sensors and selected ship systems. It allows for full scalability, future expandability, and quick repair and maintenance during operation. The integrated Health Monitoring automatically observes the performance and status of all workstations of the INS.

### Standardized Long-life PC

Synopsis Bridge Control uses standardized hardware and software components to prevent from rapid obsolescence and to simplify logistics of spares for the customer, thus further fastening service times and decreasing service costs.

The new standardized, ultra-compact Synopsis PC with solid-state disk and passive cooling instead of a fan was designed to increase reliability. Featuring a compact design as well as powerful processing capabilities, the new PCs are ready for universal use on various ship types.

### Advanced Data Management

The Consistent Common Reference System (CCRS) ensures highest reliability in operation.

- Collection and Monitoring of sensors
- Validity, plausibility, integrity check and marking
- System wide sensor and source selection by quality indicator
- Definition of common reference point for all antenna locations

### Intelligent Alert Management

The intelligent alert management directs concentration to the essential alarms.

- Classification of alerts with regard to system status
- Reduction of actually arising alerts
- Stress reduction due to less beeping and blinking
- Central handling and presentation of alerts

## Project Management – Services



### Project Management

It is the main point of contact during project stage. Experienced engineers take responsibility from project outline and specification of systems through project realization to ontime delivery and setting in operation. Having the important processes of research and development, production, project engineering and service coordination centralized at one location makes it possible to realize individual requirements at a high quality, but also cost-efficient level.

### Your benefit

- Coordination and project planning in project-specific engineering teams
- Competent advice with respect to IMO and other regulations
- Technical support with the know-how of a manufacturer
- Requirement engineering and integration of customer-specific equipment
- Total system design incl. wiring-, circuit- and connection diagrams
- Class approvals, setting to work, factory acceptance test
- Exchange of documents via FTP

## Scope of Supply

### Navigation workstations

Collision avoidance / Radar /  
Chartradar  
Route planning / ECDIS  
Data- & Alarm-Management /  
Conning

### Controls

Steering control systems  
Autopilot  
Trackcontrol

### Sensors

Gyro & magnetic compass  
systems  
Rate of turn gyros  
GPS and  
DGPS Position receivers  
Echosounder  
Speedlog  
Automatic Identification  
System (AIS)  
Wind and Weather Sensors  
Watch Alarm System  
Sound Reception

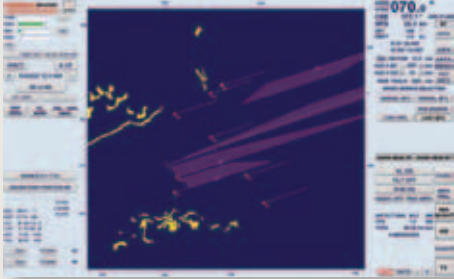
### GMDSS Stations A1 to A4

MF / HF radiotelephone  
VHF radiotelephone  
Inmarsat C  
Navtex  
SSAS  
LRIT  
EPIRB  
SART  
VHF GMDSS handheld

### External communication

Inmarsat Fleet / Broadband

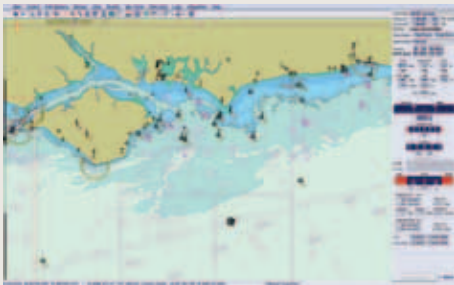
## Optimized System Functionality



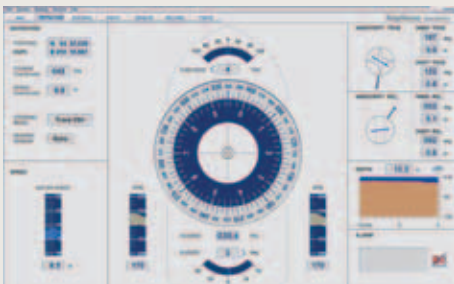
Synapsis Radar with SeaScout



Synapsis Chart Radar



Synapsis ECDIS



Synapsis Conning

### Multifunctional Workstations

Within the Integrated Navigation System, Multifunctional Workstations provide all information for reliable, safe and easy operation. The workstations are tailored to integrate (Chart-) Radar, ECDIS and Conning by choice of the ship owner, providing efficient assistance for the crew with their nautical tasks.

### Collision Avoidance with Synapsis (Chart-) Radar (incl. SeaScout function)

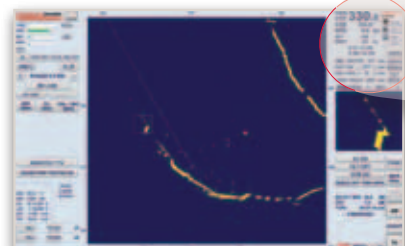
Synapsis Radar features one of the most sensitive trackers for excellent target detection and reliable performance even under rough weather conditions. The unique SeaScout™ collision avoidance function shows the “no go areas”. Through activation of a single softkey, it becomes easy to find the proper course change to avoid danger. Efficiency in watch keeping can further be increased with the Chart Radar function, which includes ECDIS information to indicate where the ship is located with respect to shore lines, shallow water areas and traffic separation zones.

### Voyage Planning and Route Monitoring with Synapsis ECDIS

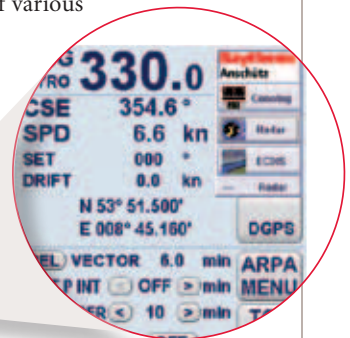
Synapsis ECDIS provides all needed information and offers helpful functions for the planning and the monitoring of routes. The ECDIS features intelligent functions such as automatic route planning, weather overlay, autopilot remote control with curved heading line display, AIS operation, NAVTEX data integration and online updating service.

### Navigation Data Control and Alert Monitoring with Synapsis Conning

The Conning is the centralized data display for the ship's command. The combination of different instruments and indications such as navigation and machine status data at a central display increases situational awareness even in critical situations of manoeuvring and docking and provides efficient help in decision making for the operator. Synapsis Conning features automatic and manual selection of sensors, intelligent alert monitoring, recording of various navigation data, integration of CCTV / IP camera and a Voyage Efficiency Display (navigation, automation and further ship condition data). The configuration of ship-specific display pages is always possible.



Multifunctional Workstations



### Reliable Steering Control System

The latest generation of NautoSteer® is a highly advanced steering control system that can be configured to any steering system with the relevant redundancy requirements. It is based on CAN-bus technology to further improve operational safety such as integral take-over function, wire break monitoring and steering failure monitoring.

### Comfortable Autopilot Operation

The NautoPilot® 5000 is based on the proven Anschütz steering algorithms and provides a multitude of benefits. A large graphical display ensures a clearly arranged presentation of information; all functions are easy to operate via hard keys and touch screen.

### Fuel Saving Capabilities

Anschütz autopilots feature an ECO-mode for continuous, automatic adaptation to the current sea-state and weather without a manual change of autopilot parameters. Subsequently less rudder action is required, which leads to lower levels of speed reduction and thus less fuel consumption.

### Track Control with Synapsis ECDIS and Anschütz Autopilots

In combination with Anschütz NautoPilot 5000, Synapsis ECDIS is approved for Track Control category B/C to offer highest precision in automatic steering.

### Proven Heading Sensor

Being one of the key sensors on board, the Anschütz Standard 22 Gyro Compass ensures highest accuracy in manoeuvring and position keeping. The gyro compass features a unique technical design with a gyro sphere that is completely surrounded by liquid. This results in a high shock and vibration resistance and thus offers highest reliability accuracy of heading information.



Anschütz NautoPilot® 5000



Track Control with Anschütz autopilot and ECDIS

### Standardized Operation

All workstations use a standardized Human-Machine Interface (HMI) and provide central as well as individual change of colour palettes and dimming for all nautical functions. Wide-screen TFT monitors increase space for the presentation of Radar video, charts, and menus, allowing for a clear arrangement of all control functions and status indications.

All controls and indication units of gyro compass and autopilot, the steering inserts and the operation panels for Radar and ECDIS use the same colours, the same fonts and soft keys to simplify operation.

## Customer Service

Being well-known as one of the largest maritime service providers we take care of our products and systems on board over 30,000 ships worldwide. We provide maintenance and repair as well as refit for the whole life cycle of a vessel – our customers get the full benefit of the know-how and experience of our highly skilled coordinators and supporters.

- Central service organisation: one service point for all products delivered by Raytheon Anschutz
- Worldwide network of qualified service partners in more than 200 locations along the world's most important shipping routes for short distances and quick reactions
- Regular service training courses and continuous performance evaluation program for service partners as a standard of quality management by Raytheon Anschutz
- Flexible, reliable and fast supply chain for maximum spare parts availability backed up by continuous inventory check-ups of 16 spare parts depots and own subsidiaries worldwide

We support vessel and equipment wherever navigation is taking place – ship owners can rely on predictable, reliable and safe operation.

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+ 49 (0)171 6510708 (after office hours)

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We are with you.**



### **Raytheon Anschutz Singapore Pte. Ltd.**

51 Bukit Batok Crescent  
#07 - 08 Unity Centre  
Singapore 658077

### **Raytheon Anschutz Shanghai Representative Office**

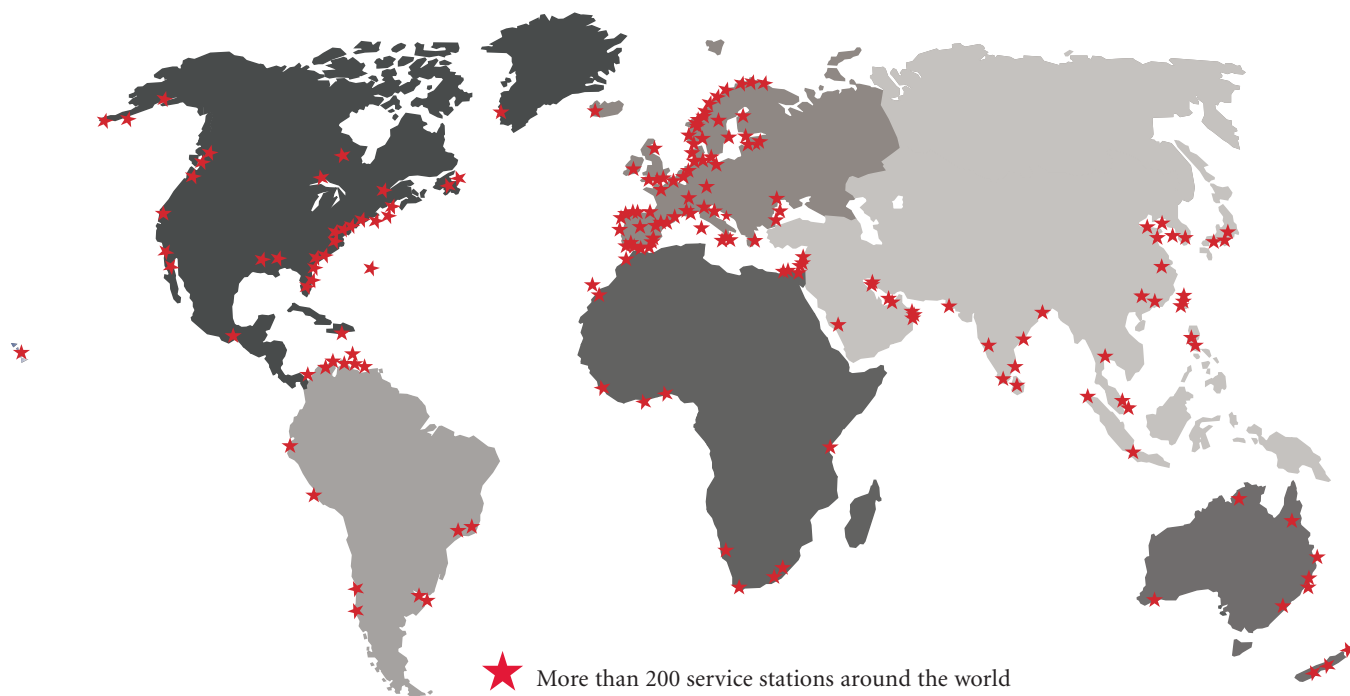
Room 713, Tomson Commercial Building  
710, Dong Fang Road, Pudong, Shanghai 200122, China

### **Raytheon Anschutz Houston Representative Office**

c/o IS Maritime Services Corporation  
2300 Pasadena Freeway, Suite 105  
77506, Pasadena, Texas, USA

### **Raytheon Anschutz Office Portsmouth**

1000 Lakeside, North Harbour, Western Road  
Portsmouth, PO6 3EZ, United Kingdom



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### **Raytheon Anschutz GmbH**

Headquarter  
D-24100 Kiel, Germany  
Tel +49(0)431-3019-0  
Fax +49(0)431-3019-291  
Email [sales-commercial@raykiel.com](mailto:sales-commercial@raykiel.com)  
[www.raytheon-anschutz.com](http://www.raytheon-anschutz.com)