

Synapsis Intelligent Bridge Control

Integrated Navigation System

INS CERTIFIED



Advanced Technology for
Safe and Simple Operation

Type Approved acc. to IMO
and IEC INS Standards

Professional Project
Management

Worldwide After Sales Service



simple • scalable • safe

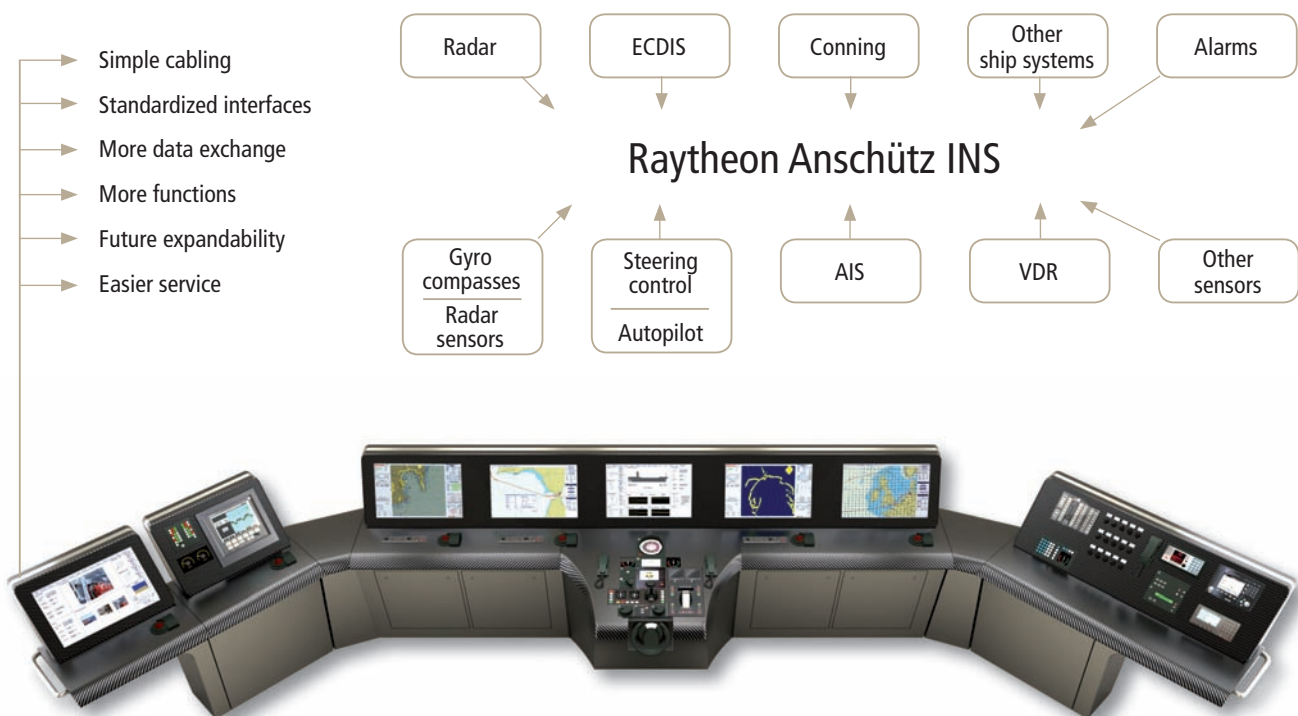
Synapsis Intelligent Bridge Control

Raytheon Anschutz offers customers proven navigation system solutions and expertise in navigation system integration, based on more than 100 years in the navigation business and more than 900 integrated bridge systems supplied. Integrated navigation systems (INS) engineered and customized by Raytheon Anschutz focus on safety, performance and simplicity.

Synapsis Intelligent Bridge Control is the latest generation of INS and is type-approved according to IMO's INS performance standards MSC.252(83)/IEC 61924-2. The INS covers task-oriented workstations providing full access to all nautical functions, intelligent data and alarm management systems, high-performance sensors for target detection, heading, position and further navigation data, advanced steering control systems with standardized and harmonized user interfaces as well as GMDSS radio communication systems.

System integration from Raytheon Anschutz means customer oriented performance and maximum flexibility according to individual needs and classification requirements. We provide personal assistance during the whole system life cycle, including 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, world-wide service around the clock to ensure reliable operation and maximum availability of the vessel.

The Raytheon Anschutz INS fulfills basic IMO requirements as well as highest class notations. 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.



 **Your Benefit[®]**

Improved safety

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

Increased efficiency

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

Simplified watchkeeping

- Standardized HMI
- Central and local change of colors and brightness
- Advanced user setting management

Cost savings

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

Advanced Technology for Safe and Simple Operation

The Synopsis INS is based on task-oriented multifunctional workstations which offer data access and control in accordance with the requirements of the individual vessel. Possible workplace configurations can range from a stand-alone radar or ECDIS workplace to a full integrated multifunctional workstation providing control of all nautical operation tasks. All workstations use a standardized HMI, provide central and local change of colors and dimming and share individual user settings.

The wide-screen TFT monitors of the multifunctional workstations increase space for the presentation of radar video, electronic sea charts, and sensor data, allowing for a clear arrangement of all control functions and status indications. The workstations can also integrate data and operation of other navigation systems such as autopilot control, AIS or NAVTEX.

Depending on their prevalent nautical task, the crew has available all needed information at a glance, benefits from immediate situation awareness and can take over control from any bridge workplace with a single action only.

- IMO-certified integrated navigation system
- Full navigation control through “any function, any place”
- Advanced function of the INS and individual applications
- Implemented redundancy for additional safety
- Innovative system architecture for high flexibility
- Standard hardware for efficient logistics
- Seamless integration of Anschutz heading and radar sensors, steering control and track keeping systems

Optionally, further applications such as DP system or engine automation from the most varied suppliers (in accordance with existing hardware requirements) can be integrated.





Advanced Synopsis NX Architecture

Synopsis NX introduces an innovative and advanced system architecture. It offers high scalability, flexibility for future upgrades and extensions as well as easy installation simplified maintenance.

Network architecture

All necessary data for the core navigation system is provided by a suite of high performance, reliable sensors. An ethernet network distributes data of the navigational sensors, radar, ECDIS and other systems to the navigation workstations, where all information is stored independently in order to maintain highest availability of information and flexibility in the bridge system layout.

Being the heart of each workstation, the newly developed Synopsis Integration Platform improves the operation of the ship through intelligent and modular integration of all data from sensors and selected ship systems. All central services and tasks of the integrated navigation system such as navigation control data processing, target management, data storage and distribution, health monitoring, redundancy and backup management, alarm monitoring and data display are concentrated and simultaneously processed on the platform. Depending on the required task and display, the data is bundled, shared throughout the network and presented by the end user applications.

Streamlined sensor collection and distribution

With the new NautoPlex serial (+status) to LAN converters all serial sensor data as well as status information is collected in the place to be converted to network data for distribution throughout the system. The result: reduced cabling effort and enhanced flexibility.

Standardized long-life computer

Synopsis Intelligent Bridge Control uses standardized hardware and software components to prevent rapid obsolescence and to simplify logistics of spares for the customer, thus further shortening service times and decreasing service costs. The new standardized, ultra-compact Synopsis Small Marine Computer with solid-state disk and passive cooling were designed to increase reliability. Featuring a compact design as well as powerful processing capabilities, the new computer is ready for universal use on various ship types.

Intelligent alert management

The intelligent alert management directs attention to the essential alarms on the bridge.

- 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 alarms

Data integrity and sensor management

The consistent common reference system (CCRS) ensures safe operation by an intelligent use of redundancies.

- Collection and monitoring of sensors
- Validity, plausibility, integrity check and marking
- System-wide sensor and source selection by quality indicator
- Sensor health indication

System health monitoring

The integrated health monitoring automatically observes the performance and status of all workstations and sensors connected to the INS. The operator gets all information about the total navigation system configuration and its "health status" available at a glance.

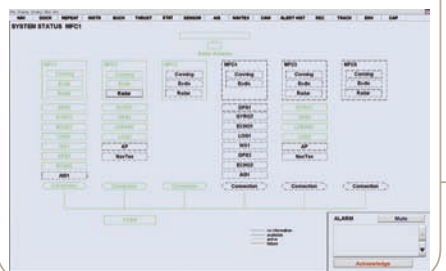
Alert management



Integrated sensor management



System health monitoring



Professional Project Management

Project management is the main point of contact during the project stage. Experienced engineers bear 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, quality management, project engineering and service coordination centralized at the Raytheon Anschütz headquarters in Kiel, Germany, makes it possible to realize individual requirements at a high quality, but also cost-efficient level.

- 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
- Meticulous product and system testing, including factory acceptance test
- Class approvals
- Exchange of documents via FTP



Scope of Supply

Navigation workstations

Multifunctional workstations
Radar / Chartradar
ECDIS
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 Multifunctional Workstations

Within the Synapsis INS wide-screen multifunctional workstations provide all information for reliable, safe and easy operation. The workstations are tailored to integrate (chart-) radar, ECDIS and conning at the choice of the ship owner, providing the crew with full functionality and efficient assistance. Depending on navigational needs and the respective situation at sea, on anchorage or while berthing, operators can get central access to the required application by simply using the task switcher on the screen.

Collision avoidance with Synapsis (Chart-) Radar (incl. NautoScan NX transceivers and SeaScout function)

The Synapsis Radar features the newly developed NautoScan NX radar transceivers, which use state-of-the-art network technology to share the raw video throughout the network to combine excellent target detection with unlimited flexibility. New electronic and mechanical components have been developed to offer highest reliability and significant longer lifetime. A sensitive tracker, anti-clutter technology and advanced radar functions such as the enhanced integrated target management, the intuitive and unique SeaScout collision avoidance function, or chart radar function further increase efficiency in watch keeping and support optimal situation assessment in any traffic situation and under any weather or sea state conditions.

Route monitoring with Synapsis ECDIS

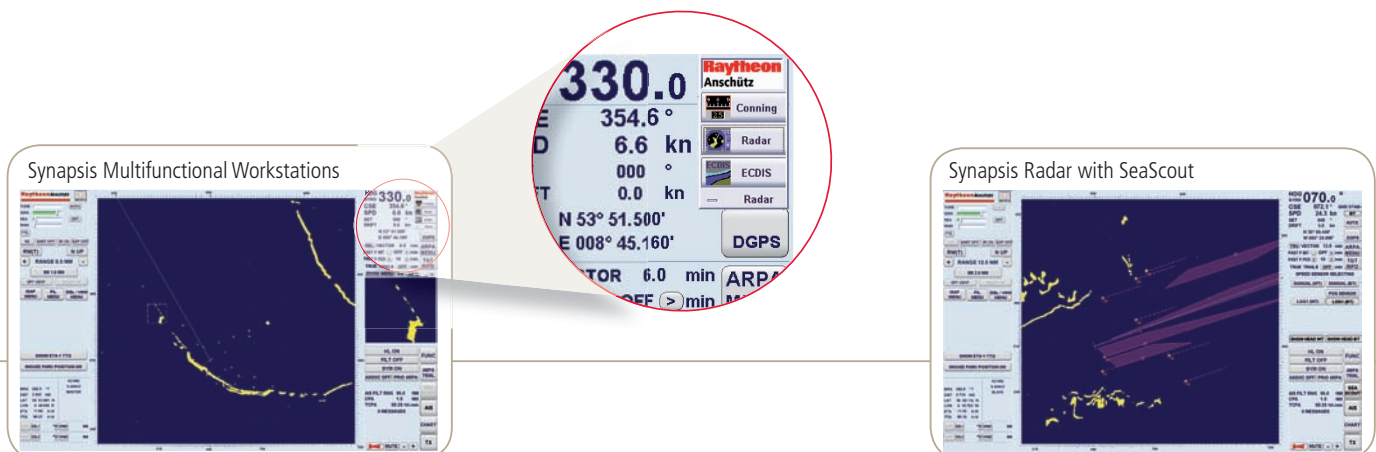
Synapsis ECDIS offers a clear presentation of all information needed for safe route monitoring and anti-grounding control. The ECDIS features intelligent functions such as weather data and forecast symbol overlay, radar video overlay, autopilot remote control with curved heading line display, AIS operation and text messaging and NAVTEX data integration.

Route planning with Synapsis ECDIS

Route planning has become easy with Synapsis ECDIS. The automatic route planning allows creating any route within the shortest time. Only a handful of clicks are needed to get a safe route at a glance, starting with any place of departure and ending with any desired destination. Individual settings such as included sea areas can always be considered. Before and during the voyage the ECDIS offers a simplified display and calculation of ETA for different waypoints as defined by the operator.

Navigation data control and INS operations with Synapsis Conning

The Synapsis 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 maneuvering and docking and provides the operator with efficient help in decision making. The conning also provides the central HMI for advanced INS functions such as automatic and manual selection of sensors, intelligent alert monitoring and the system-wide health monitoring.



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 and offers advanced functions such as integrated single action take-over function, wire break monitoring and steering failure monitoring.

Comfortable autopilot operation

The NautoPilot® 5000 is based on 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 Synopsis ECDIS and Anschütz autopilots

In combination with Anschütz NautoPilot 5000, Synopsis ECDIS is approved for track control category C to offer highest precision in automatic steering.

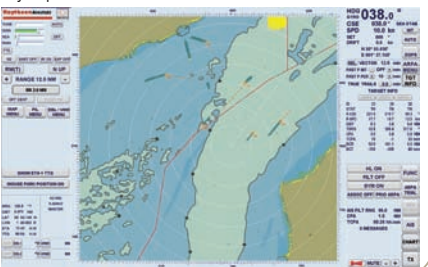
Anschütz NautoPilot® 5000



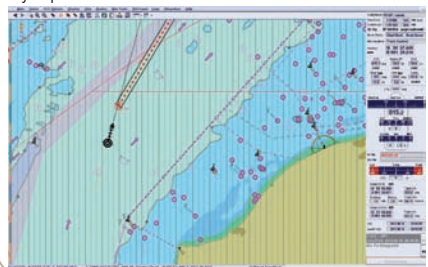
Track control with Anschütz autopilot and ECDIS



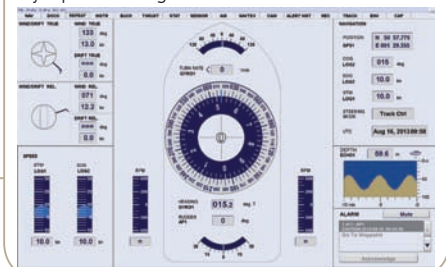
Synopsis Chart Radar



Synopsis ECDIS



Synopsis Conning



Worldwide After Sales Service

As one of the largest maritime service providers, Raytheon Anschutz takes care of navigation 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 coordination: One service point for all products delivered by Raytheon Anschutz
- Worldwide network of qualified service partners along the world's most important shipping routes provides 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
- Customized maintenance and service contracts

We support vessel and equipment wherever navigation is taking place – ship owners can rely on predictable, reliable and safe operation while being released from additional administrative workloads.

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One call and you get the fix!
Worldwide.
The full life cycle.

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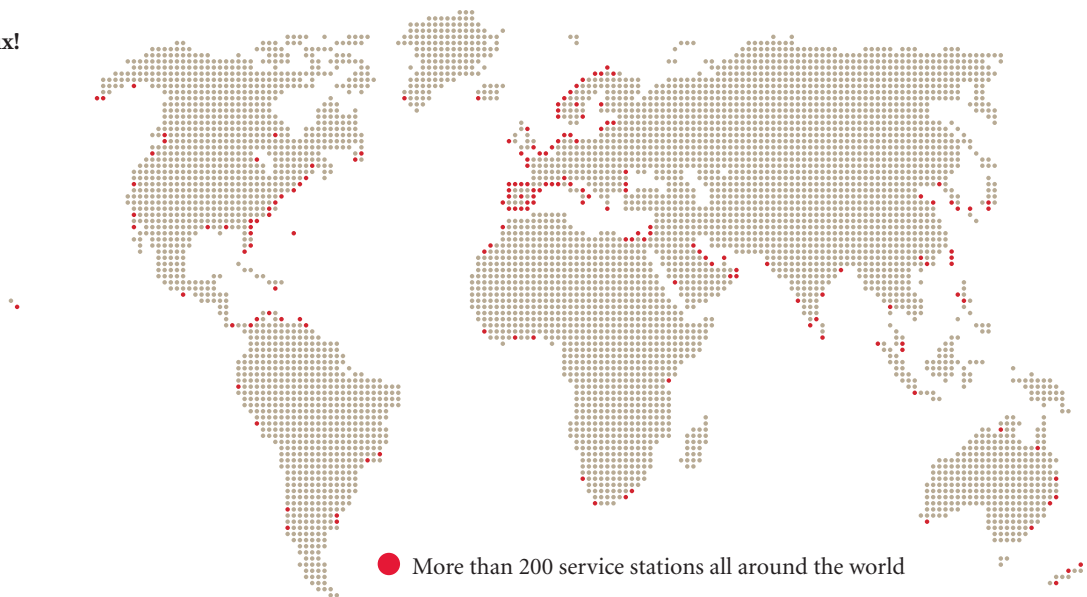
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