

Integrated Navigation

Customized Solutions for Offshore Vessels

Synapsis Intelligent Bridge Control

Individual Project Management

Proven Reliability and Accuracy

Customer Care and Service



SYNAPSIS
Intelligent Bridge Control



Synapsis Integrated Navigation

Ships designed for operation under harshest environmental conditions and within a safety-sensitive environment have always been equipped with reliable, precise and safe navigation systems. The ships typically are built in accordance with highest class notations such as DNV NAUT-OSV or equivalent. These classification rules list specific requirements regarding bridge layout, redundancy and function with a focus on safe and comfortable operation.

Your Benefit[®]

Why should you decide for Raytheon Anschutz?

- Individual support from early system layout to setting in operation
- Reliable project processing with years of experience in integrating customer-specific solutions
- Intimate know-how of offshore specific requirements
- Short ways from project teams to R&D and production

What can you expect from our supply?

- High-level integrated navigation with IMO type approval
- Well-proven reliability, accuracy and safety even under harshest environmental conditions
- Flexibility for customer-specific adaptations with regard to function, integration, redundancy and safety
- Project-specific drawings

How can you benefit from Raytheon Anschutz navigation systems?

- Multifunctional workstations integrate all relevant navigation systems at any workplace
- Standardized HMI of hardware and software throughout the whole system
- Advanced INS functions add safety and simplicity to the bridge system
- Functions moved from separate devices to screens

Do you need support beyond delivery?

- Customer-oriented after sales management
- Global network of certified service stations
- Proven worldwide spare part supply chain
- Full lifecycle support, customized retrofit and upgrades

Raytheon Anschutz has many decades of experience in engineering navigational solutions which are known to provide superior precision and reliability even under harshest environmental conditions. With functional requirements becoming more complex, Raytheon Anschutz now offers a higher degree of integration for modern bridge systems. Synapsis Intelligent Bridge Control is a new generation integrated navigation system (INS) engineered and customized by Raytheon Anschutz which focusses on safety, performance and simplicity. All core products for the INS are developed, manufactured and validated in FAT at our headquarters in Kiel, providing the basis for our high flexibility with regard to individual adaptations.

During operation, our customers can rely on dedicated support through our worldwide subsidiaries and our global service network with highly-qualified technicians and prompt spare parts availability.



Synopsis Intelligent Bridge Control

Synopsis Intelligent Bridge Control is the latest generation of INS and 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, advanced data management, various sensors for target detection, heading, position and further navigation data, and steering control systems with standardized and harmonized user interfaces.

The workstations provide the crew with immediate situation assessment and support them in collision avoidance, route monitoring and anti-grounding control, route planning, navigation data control, alarm monitoring and sensor control. Advanced system functions and the innovative system architecture not only help to increase performance, safety and simplicity through a more intelligent use of resources, redundancies and information in the network, but also offer high flexibility of individual bridge system layouts and system configurations. Synopsis allows for an optional functional integration of further applications such as DP system or engine automation from the most varied suppliers (in accordance with existing hardware requirements).

In this case these systems can be controlled from the bridge workstations, share data with the entire navigation system and have their respective alerts covered by a central alert management display.



Within the INS all necessary data for the core navigation system is provided by a suite of high performance, reliable sensors. An optionally redundant 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.

Synopsis provides high scalability, flexibility for future upgrades and extensions as well as simplified maintenance.

Multifunctional Workstations

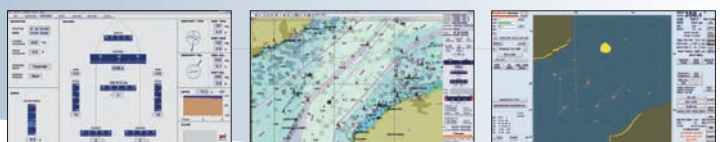
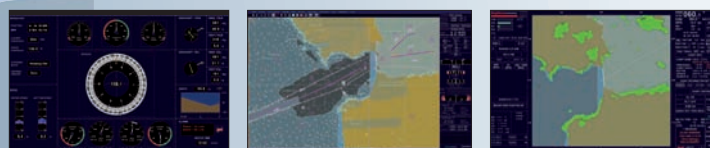
Within the Synopsis Integrated Navigation System, multifunctional workstations provide all information for reliable, safe and easy operation. The workstations are tailored to integrate (chart-) radar, ECDIS, conning and optional further applications at the choice of the ship owner, providing the crew with efficient assistance in their nautical and operational tasks. Thus, various functions which have been previously operated from separate devices are now integrated in the applications on the workstations.

Depending on navigational needs and the respective situation at sea such as transit and maneuvering, during DP or deck operations, or while berthing, operators can get central access to the required application by simply using the task switcher on the screen. All workstations use a standardized HMI and provide central and local modes for change of colors and dimming for all nautical functions.

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. 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.

The Synopsis multifunctional workstations feature:

- Full navigation control through “any function, any place”
- Optional integration of further ship systems
- Common "look and feel" throughout the whole navigation system
- Functions moved from panels and separate devices to displays
- Centralized intelligent alert management
- Integrated sensor performance monitoring
- System health monitoring and status display
- Radar with central target management and SeaScout collision avoidance function
- Chart radar function
- Advanced ECDIS route monitoring and anti-grounding with integrated AIS and NAVTEX data operation, and integrated conning panels and weather overlays
- Simplified ECDIS automatic route planning and ETA calculator
- Integrated autopilot remote control with curved heading line display
- Track control cat. C with Anschütz autopilot
- Seamless integration of Anschütz heading and radar sensors





Integrated Sensor Data Management

Onboard offshore vessels, the reliability and accuracy of sensor data is most important to ensure safe operation. A continuous monitoring of sensor quality and performance not only helps to provide the entire navigation system with best sensor data, but also to use existing redundancies in sensor systems in a more intelligent way. The consistent common reference system (CCRS) includes:

- Collection and monitoring of sensors
- Validity, plausibility, integrity check and marking
- Systemwide sensor and source selection by quality indicator (sensor health indication)
- Automatic and manual sensor selection modes

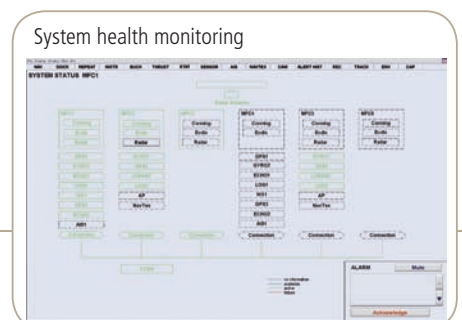
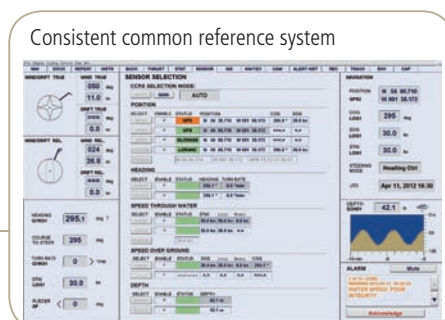
Health Monitoring Display

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

Central Intelligent Alert Management

The intelligent alert management collects alerts in the network and provides an intelligent classification of alerts with regard to system status. Benefits:

- Reduction of actually arising alerts
- Attention directed to the really essential alarms
- Stress reduction due to less beeping and blinking
- Central handling and presentation of alarms
- Upgradeable to a system-wide alarm display



Collision Avoidance

The Synopsis Radar features a sensitive tracker, anti-clutter technology and advanced radar functions such as the enhanced integrated system-wide target management or the intuitive and unique SeaScout collision avoidance function. Chart radar further increases efficiency in watch keeping and supports optimal situation assessment in any operational situation and under any weather or sea state conditions.

Route Monitoring

Synopsis ECDIS provides 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.

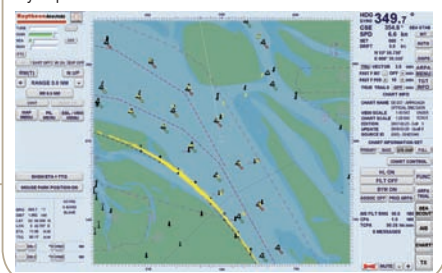
Route Planning

Synopsis ECDIS includes an automatic route planning function to create 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 can always be considered. Before and during the voyage the ECDIS features a simplified calculation of ETA for different waypoints as defined by the operator.

Navigation Data Control

The Synopsis 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 near platforms or other offshore assets and provides the operator with efficient help in right decision making.

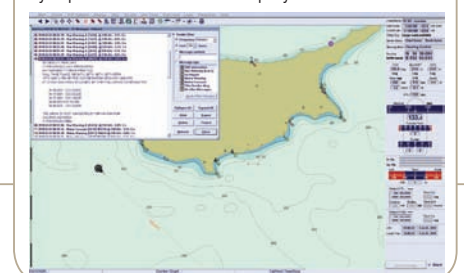
Synopsis Chart Radar



Synopsis ECDIS AIS editing



Synopsis ECDIS NAVTEX display



Sensors and Steering Controls

Anschütz Gyro Compasses

The Standard 22 Gyro Compass is the world's most popular gyro compass and is commonly used on offshore vessels. Its operational safety was dramatically increased due to a patented data transmission technology that completely replaced the use of slip rings. For vessels in offshore and research operations, a redundant system can be installed. This system ensures that neither a failure in a gyro compass nor in the data distribution will cause a loss of heading information to the connected equipment. Meanwhile, Standard 22 has proven its reliability in more than 15,000 installations.

For customers who require a maintenance-free heading sensor, the new Horizon MF is available. Horizon MF uses Hemispherical Resonator Gyros (HRG) to offer outstanding long lifetime without need for maintenance.

Anschütz Radar Sensors

The newly developed NautoScan NX radar transceivers use state-of-the-art network technology and share a raw radar video throughout the network. New electronic and mechanical components have been developed to combine a robust design with highest reliability and significantly longer lifetime. Based on this innovation the Synapsis Radar stands out with excellent target detection and unlimited flexibility for bridge layout and applications.

Anschütz Autopilots

Anschütz autopilots are well known in the market for their excellent steering performance, accuracy and reliability. The adaptive NP 5000 features a 5.7" color touch-screen display for most intuitive operation and includes advanced functions for safe and economical steering. As a basic solution for medium sized vessels the Anschütz PilotStar D autopilot is available for precise and safe automatic steering.



Anschütz Steering Control System

NautoSteer AS is the latest generation of Anschütz steering control. All important components are connected via redundant CAN-bus systems, providing most secure data communication. All controls follow a user-friendly intuitive and standardized design and have comfortable take-over functionality. The flexible design also allows for integration of further steering controls such as joystick or DP systems as well as for complex steering control systems with fore and aft bridge configurations and almost any redundancy requirements.

Common Look and Feel

Whereas the Synapsis system architecture strives to improve efficiency, simplicity and safety by concentrating all nautical information and operation tasks (even those performed on formerly separate devices) on the multifunctional workstations, a remaining requirement has been to provide harmonized user interfaces for the main hardware controls. Raytheon Anschütz can provide customized panel solutions which have a unified surface design for thrusters, azimuth controls or other instruments and controls, with common lighting, colors, and fonts, as well as push buttons for a common surface feel.



Customer Care and Service

We support customers with extensive know-how and personal support for new-building and retrofit programs. We support vessel and equipment wherever navigation is taking place! Our project management takes responsibility from project outline and specification of systems through project realization to on-time delivery and setting in operation. After delivery, we can train operators and care for obsolescence management, spare parts supply as well as for worldwide maintenance and repair during operation. Installations on board of more than 30,000 ships worldwide prove our expertise to customize and service navigation solutions for any type of ship.

- 24/7/365 central service coordination for all products delivered
- Worldwide network of highly qualified service partners in more than 200 locations
- Flexible, reliable and fast supply chain for maximum spare parts availability

Global Presence

Raytheon Anschütz has established a network of own subsidiaries and service partners to make best customer service available around the world and at the busiest areas for offshore and research activities. Our own offices in Rio de Janeiro and San Diego as well as our Asian service and spare parts center in Singapore offer customers dedicated support round the clock. In addition, our Singapore experts together with the team from our Shanghai office can offer ship owners competent supervision and on-site support for their new-buildings in the active Asian markets. Other areas, such as Norway, are supported through long-term, experienced and very specialized service partners to ensure an always quick and competent reaction in case of a service.

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