

Navigation Systems for Offshore & Research Vessels





Decades of experience in offshore navigation

Working with the natural forces at sea requires reliable, precise and safe navigation systems.

Raytheon Anschütz has many decades of experience in providing navigational solutions which meet these demands. Anschütz gyro compasses, autopilots and steering control systems are well-known for superior precision and reliability even under harshest environmental conditions. Customized solutions for front and aft bridge workstations, based on cutting-edge redundant network architecture, combine rock-solid systems with the highest level of integration that is needed to fulfil the demanding requirements of vessels in offshore or research operations.

Raytheon Anschütz offers tailor-made navigation equipment from heading sensors, steering control systems and (Chart-) Radars up to multifunctional workstations and integrated bridge and navigation systems – dedicated project management included. Being compliant to the demanding DNV notations, our navigation systems provide maximum safety at sea.

During operation, our customers can rely on a huge worldwide service network with high-qualified technicians and prompt spare parts availability.

Your Benefit

Why should you decide for Raytheon Anschütz?

- Reliable project processing with years of experience in integration of customer-specific solutions
- Intimate know-how of offshore specific requirements
- Individual support from system layout through whole project stage

What can you expect from our supply?

- Well-proven reliability and accuracy even under harshest environmental conditions
- Standardized HMI with integrated data and central alert management
- Maximum flexibility for upgrades / extensions with regards to redundancy and safety

How do I benefit from Raytheon Anschütz navigation systems?

- Precise heading sensor for safe DP operation
- Multifunctional Workstations allow full navigation data control at any workplace
- Bridge Integration Platform enables individual configurations for fore and aft bridge

Do you need support beyond delivery?

- Customer-orientated after sales management
- Operator training on ship or in factory
- Worldwide qualified service network
- Proven worldwide spare part supply chain
- Full lifecycle support with comprehensive advisory services for retrofits and upgrades






SYNAPSIS
 Intelligent Bridge Control

Features of the Integrated Navigation System (INS)

Comfortable Operation

- Multifunctional Workstations provide any function at any place
- Integration of further ship system data and operation
- Consistent data available all over the INS

Improved Safety

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

Simplified Watchkeeping

- Standardized HMI with central and local change of colors and brightness
- Enhanced Conning display
- Intelligent alert management

Flexibility and Efficiency

- Open architecture simplifies installation and upgrade
- Standardized hardware improves logistics of spares
- Standardized software eases configuration and service

Synapsis Intelligent Bridge Control

Synapsis Bridge Control is the brand new generation of Raytheon Anschutz Integrated Navigation System (INS). It is designed to ease installation, maintenance and service, to simplify operation for users, and to make navigation more efficient and, above all, safe.

The INS features new wide-screen Multifunctional Workstations with standardized human-machine interfaces. Possible configurations are ranging from a stand-alone Radar or ECDIS workplace to a fully integrated workstation that provides access to all nautical tasks such as route monitoring, grounding avoidance, collision avoidance, navigation control, status and data display or alarm monitoring. A newly developed Bridge Integration Platform also allows integration of additional applications and data, such as Dynamic Positioning System, CCTV, or Automation into the bridge workstations.

Various sensors for target detection, heading, position and further navigation data, and steering control systems with standardized user interfaces provide all necessary data for the core navigation system. A dual Ethernet Bus distributes the data to the navigation workstations, where all information is stored independently. Synapsis' advanced data distribution features a Consistent Common Reference System (CCRS) that automatically controls the availability and quality of all sensors to process the most reliable set of data.

Using standard hardware and software, the workstations allows for full scalability and future expandability. Within the INS, new workstations receive their configuration and all data from the network automatically. Central switch-over of colors and central dimming is possible from any workplace on the bridge.

Synapsis Radar and Chart Radar

Latest technology combines efficient collision avoidance with increased situation awareness to achieve highest standards of safety during voyage or operation at sea.

With its Synapsis (Chart-) Radars, Raytheon Anschütz presents one of the most sensitive Radars even under rough weather conditions, supported by a patented anti-clutter function. The tracker even detects tiny targets such as wooden stakes or small buoys.

Brilliant performance goes hand in hand with ease of use. The intelligent functionality of Synapsis Radars exceeds the IMO standards and provides effective support in collision avoidance. Apart from conventional Radar features such as automatic tracking, echo expansions, target trails and storage of user settings, advanced functions are available to efficiently assist the crew in their collision avoidance task.

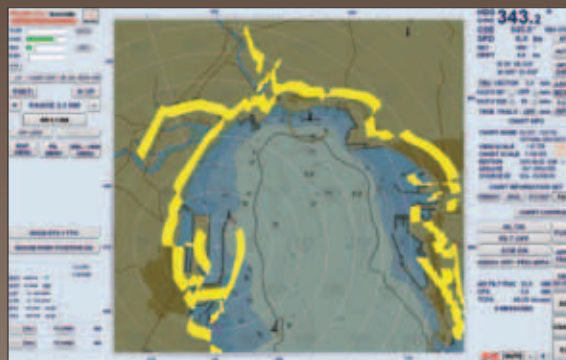
Synapsis ECDIS

Being the central part of the grounding avoidance system, the ECDIS features intelligent functions for voyage planning, optimization and route monitoring.

The advanced Synapsis ECDIS provides all needed information for comfortable planning and safe monitoring of routes. It features a clear display design, easy-to-operate menu structures and comfortable server functionalities. The comprehensive and intuitive handling is supported by the use of the well-known menu structure of Windows applications.

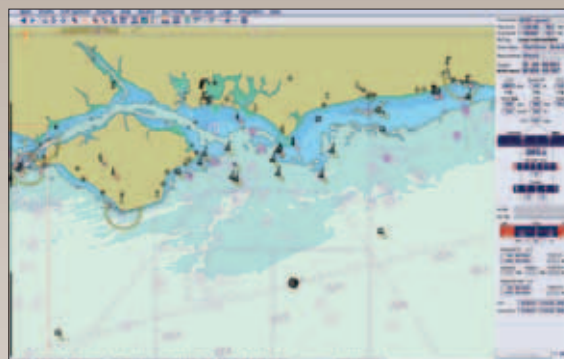
Synapsis ECDIS is capable to process three chart standards (ENC, C-Map and BA-ARCS). In double ECDIS installation, all routes and charts are duplicated automatically. The system architecture further enables the integration of weather data and weather forecast symbols.

Synapsis ECDIS offers, in interaction with other bridge navigation systems, effective support for the ship's safe navigation. Its intelligent functionality outruns IMO requirements.



- High Performance Radar Tracker
- Patented RainRate[®] anti-clutter function
- Radar video merging
- AIS target integration on Radar screen
- SeaScout anti-collision function to further increase safety
- Chart Radar to increase situational awareness

- Automatic Route Planning creates safe routes with a handful of clicks
- High precise Track Control System (Cat. B/C) with Synapsis ECDIS and Anschütz autopilot
- Curved heading line display and remote control of Anschütz autopilot
- Integration of NAVTEX messages on the ECDIS screen
- AIS operation and messaging on the ECDIS screen
- Online updating service of charts





Multifunctional Workstations

Highest degree of integration allows full control at any workplace.

In addition to stand-alone solutions for (Chart-)Radar, ECDIS and Conning, Synopsis Multifunctional Workstations are available to integrate the nautical functions of (Chart-) Radar, ECDIS, Conning and AIS data in any desired combination. All solutions efficiently assist the crew in their tasks of collision avoidance, route planning and track control. As an option, further ship systems such as CCTV, Engine Automation or the DP system can be controlled on the workstations and share data with the entire system.

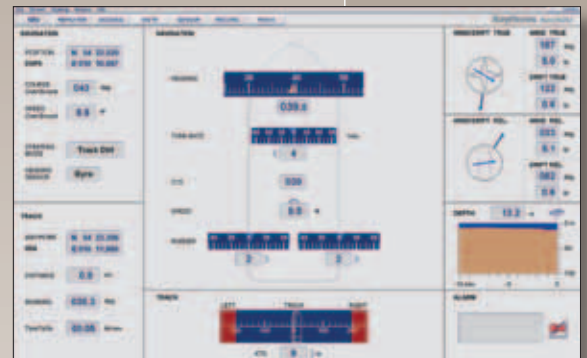
Synopsis Conning

Enhanced Situational Awareness – Simpler Watch Keeping

Synopsis Conning is the centralized navigation data display for the ship's command. It presents all bridge navigation and machine status data easily at a glance and hence contributes to efficient and safe navigation in accordance with operation philosophy. The combination of different instruments and indications at central display pages increases situation awareness even in the critical situations of manoeuvring and docking.

Synopsis Conning offers various functions that can be activated and configured by the operator as needed. Conning provides full flexibility for individual display pages.

- Different display modes for different manoeuvring situations, e.g.: Track control, docking, navigation, alert monitoring
- Display and acknowledgement of alerts from any display page
- Automatic and manual selection of navigation sensors (CCRS operator interface)
- Integration and operation of CCTV / IP camera
- Status indication for all devices and functions
- Recorder (heading, rudder angle, rate-of-turn, depth)
- Watch Alarm and Alarm Transfer System



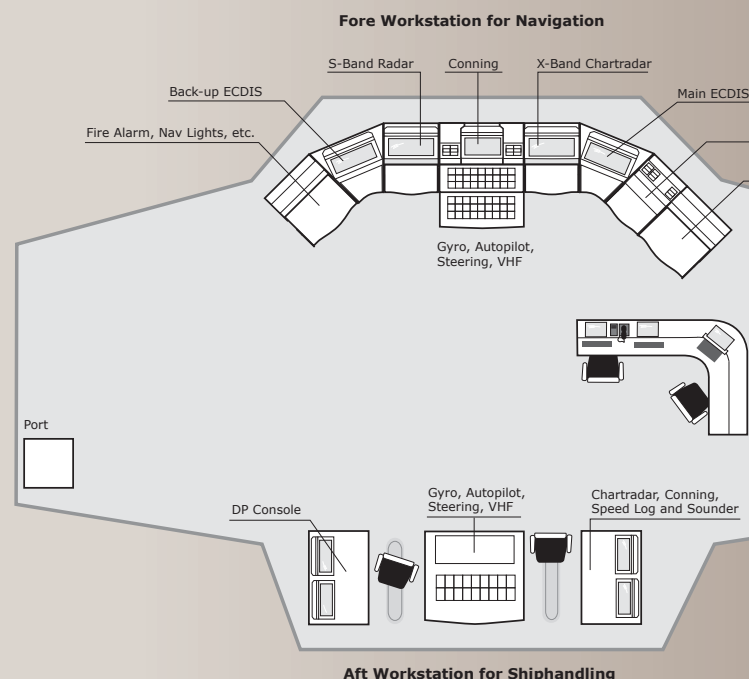
NautoSteer® Advanced Steering Control

Proven Anschütz steering performance with built-in reliability

NautoSteer AS is the latest generation of Anschütz steering control. All important components such as follow-up amplifiers, autopilots, interface units and alarm monitoring units are connected via redundant CAN-bus systems, providing most secure data communication throughout the whole system.

- Fail-to-safe principle with integrated steering failure and wire-break monitoring
- Integrated data integrity monitoring
- Comfortable operation with take-over or give-over of steering positions
- User-friendly intuitive and standardized design of all controls
- Central alarm reset and central dimming
- Ease of installation with simplified wiring and computer-based commissioning

NautoSteer AS is available in customized configurations for single and double rudder with follow-up and non-follow-up controls. The flexible design also allows for integration of further steering controls such as joystick or DP systems as well as for complex steering controls with fore and aft bridge configurations.



Anschütz Autopilot series

Anschütz autopilots are well known in the market for their excellent steering performance, accuracy and reliability.

The brand-new adaptive Anschütz NautoPilot® 5000 comes as an integral part of the new generation steering control NautoSteer AS. Apart from providing highest accuracy, most advanced functions for safe steering and comfortable operation are included. Economic navigation and reduction in fuel consumption can be achieved by the using the ECO-Mode of the autopilot, which provides the automatic adaptation to the current sea-state and weather. Further outstanding features are:

- 5.7" TFT colour display for intuitive touch screen operation
- Heading Control, Course Control and Track Control System (Cat. B/C)
- High Precision Controller
- Integrated Heading and Rudder Plot for simple adjustments of parameters
- Actual Rudder Indication (can serve as a back-up rudder angle indication)
- Position Monitoring

As a basic solution for medium sized vessels the Anschütz PilotStar D autopilot is available to offer precise and safe automatic steering. It can easily be adapted manually or by predefined parameter sets to the current weather or ship condition. A constant rudder trim can be defined to compensate for drift (e.g. while towing).



Engine Automation

Chart Table

Workstation
GMDSS A3/ A4

STB

Wing Workstation
for rescue and berthing
with multifunctional display



Anschütz Standard 22 Gyro Compass System

Standard 22 has proven its reliability throughout 10,000 installations

The Standard 22 Gyro Compass is the world's most popular gyro compass and 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.

Up to three Standard 22 Gyro Compasses can be connected to a system. The system allows for integration of additional heading sensors, for example magnetic or satellite compasses. Features like heading monitoring or automatic switch over are standard functions of the system. Furthermore, the Standard 22 is equipped with a distribution unit, which is enhanced by an independent transmitting magnetic compass (TMC) path.

For vessels in offshore and research operations, a redundant system is offered. 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.

The new individual speed error correction mode allows to input speed and latitude information directly into each Standard 22 sensor. The benefit is that in case of a speed or latitude error the speed error correction of only one single Standard 22 is affected. Subsequent heading data receivers such as Dynamic Positioning Systems are able to detect a resulting heading error at an early stage, resulting in increased safety during DP operation.

Standard 22 has proven its performance and reliability in the harsh offshore and deep sea environment. By combining proven technology and long maintenance intervals, the Standard 22 Gyro Compass is a secure and lasting investment in your ship.



1st Standard 22, 2003



5,000 th Standard 22, 2008



10,000 th Standard 22, 2011

Photo courtesy: Ulstein Group/Fugatefella, ArntStaberg

Customer Care and Services

We offer extensive know-how and personal support for newbuilding and retrofit programs. We support vessel and equipment wherever navigation is taking place!

Raytheon Anschütz has a long tradition in providing latest technology and knowledge in navigation system integration. Installations on board of more than 30,000 ships worldwide prove our expertise to customize and service navigation solutions for any type of ship.

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 offer operator training and care for obsolescence management, spare parts supply as well as for worldwide maintenance and repair during operation.

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

Global Presence

More than 20 experienced service points alongside the Norwegian coastline ensure a quick and competent reaction in case of a service together with immediate spare parts availability for all vessels operating in this area. To make best customer service also available at the most busiest areas for offshore and research activities, Raytheon Anschütz has established own subsidiaries in Singapore and Houston with large spare depots. In addition, for newbuilds in the active Asian markets ship owners can rely on competent supervision on site.

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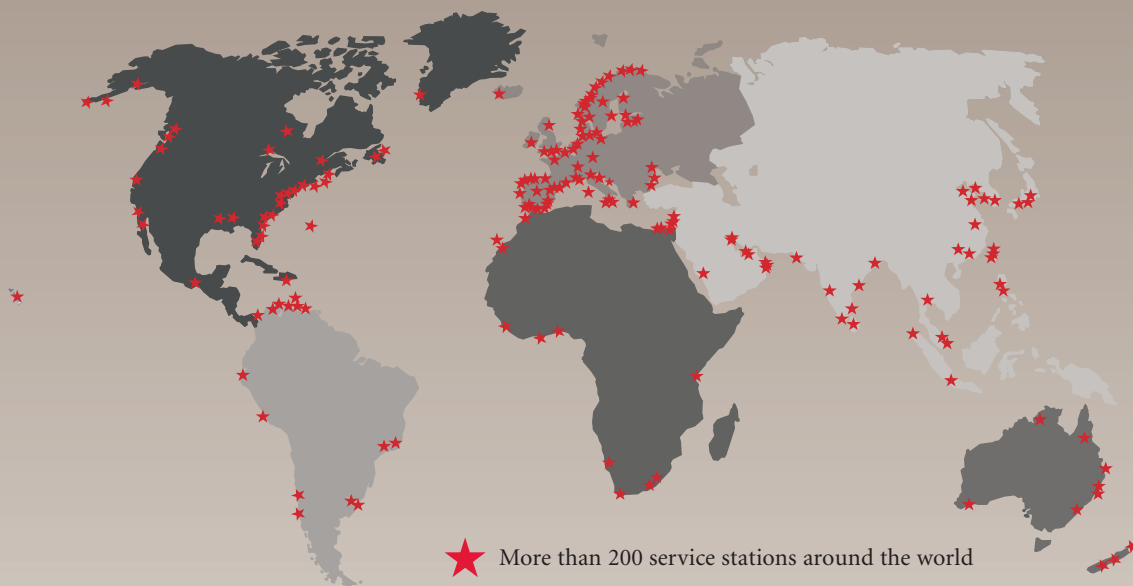
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