MINS 2
Marine Inertial Navigation System
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The Raytheon Anschütz MINS 2 is a highly accurate inertial navigator for use on board of all kinds of naval vessels such as frigates, corvettes, missile fast patrol boats, offshore patrol vessels and submarines as a main or stand-by system. MINS 2 is based on modern, state-of-the-art strap down ring laser gyro technology, featuring the well proven laser gyro GG 1320. MINS 2 has flexible interfaces to the log and/or GPS receiver and supplies the following own ship’s data:

- Heading, roll, pitch angles
- Heading, roll, pitch angular rates
- Linear velocities
- Linear accelerations
- Position
- Heave, heave rate
- Status

The system is equally suited for both new built and retrofit solutions, since the Interface and Connection Unit (ICU) is free configurable. MINS 2 is the next generation of the well proven MINS 1 with more than 120 MINS 2 systems in service.

**BENEFITS AT A GLANCE**

- High reliability
- Low life cycle costs
- Short settling times (less than 10 minutes at pier, less than 20 minutes at sea)
- Easy to operate and maintain
- High accuracies - high performance
- Customer specific interface configuration

- Various analogue and digital outputs available
- Third generation, low noise digital RLG
- Compatible with first generation system MINS 1
- Family concept with scalable accuracies

**CDU**

- Control and display unit
- Command and control
- Position input
- System configuration
**FEATURES**

**High speed serial output**
Up to 2 HDLC broadcast outputs RS422 supplying configurable data
Update rate 1... 200 Hz:
• Heading, roll, pitch
• Heading, roll, pitch rates
• Status
Update rate 5 Hz:
• Position
• Velocities VX, VY, VZ, VN, VE
• Heave
• Log speed
• Status and accuracy figures

**Network output**
Up to 2 Ethernet outputs UDP (1... 200 Hz update rate) supplying configurable data: see high speed serial output

**Status output**
4 potential-free contacts for 24 V, max. 1 A
• “On”
• “Available”
• “Fault”
• “Simulation”

**Analogue output (synchro)**
90 V line-to-line, ref.-voltage 115 V/400 Hz
Up to 6 configurable outputs:
• Heading, roll, pitch
• Ratio: 1 x, 2 x, 4 x, 6 x, 10 x, 36 x

**Course Bus* output**
Asynchronous serial RS422 output
50 Hz update rate
Heading, roll, pitch, status

**NMEA183 output**
2 asynchronous serial RS422 outputs
Up to 10 Hz update rate
Position, heading, roll, pitch,
Velocities VX, VY, status

**Inputs**
Up to 2 GPS (serial data and 1 PPS)
Up to 2 Log speed (serial, synchro, DC)
Position via CDU

*pro Raytheon Anschütz proprietary bus

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**DRU**
Dynamic reference unit, incorporating the inertial sensor assembly and the navigation processor.

**ISA**
Inertial sensor assembly is based on Honeywell strap down laser gyro technology featuring the well proven laser gyro GG 1320 and the accelerometer QA 2000.

**Compact ICU**
Interface and connection unit, a modular built interface to accommodate ship specific demands and applications such as log, GPS, ship’s mains and others.
TECHNICAL DATA

Supply voltage & power consumption
- 18–32V DC
- 220 V DC
- or 115/230 V AC, 50-400 Hz via UPS
- less than 100 W

Standard Accuracy
- Heading  < 4 arcmin sec(lat) RMS
- Roll < 1.7 arcmin RMS
- Pitch < 1.7 arcmin RMS
- Position < 60 m CEP50 (with SPS GPS)
- Angular rates < 2.7 arcmin/s RMS
* Higher accuracy are available, however export restrictions may apply

Environmental Conditions
Ship’s motion: max. speed 70 kn (log aided)
- Roll/pitch angle +/- 85°
- Heading rate +/- 200 °/s
- Roll/pitch rate +/- 200 °/s

Temperature
- VG 95332
- Mil-Std-810
- Operation -15°C to 55°C
- Storage -40° C to 70°C

Shock
- BR 8470, GradeD
- BV 0430, class A

Vibration
- IEC 60945
- EMC/EMI
- VG 95373

Type of enclosure
- IEC 60529
- IP 54

In accordance with
- IMO A.424(XI), A694(17), MSC.191(79), ISO 8728, IEC 60945,
  IEC 61162, IEC 62288

DRU
Weight: 6.0 kg

Mounting plate for surface vessel application

Compact ICU
Weight: 27.0 kg

CDU
Weight: 7.0 kg