MGC® R3 SB50

KONGSBERG

GYRO COMPASS AND INS

A new family of products with motion sensing and gyro compass functionality is introduced. The first product in this family is the MGC R3 which includes three Ring Laser Gyros and three linear accelerometers. The MGC R3 is now available in a subsea bottle depth rated to 50 meters (SB50).

Typical applications
The MGC R3 SB50 is designed for portable seabed mapping systems where the MGC is to be mounted on the multibeam transducer head. With input of data from a GNSS system, the MGC R3 SB50 is a fully inertial navigation system (INS). It can output heading, roll, pitch, heave and position. Acceleration and velocity of linear motions, as well as angular rates, are output from the unit. The MGC product outputs both processed and raw (gyro and accelerometer) sensor data.

The proven PFreeHeave® algorithms are part of the navigation algorithms that enable down to 2 cm accuracy in delayed heave output and 5 cm accuracy in real-time heave output. The linear position and velocity measurements can be output in up to four different points on the vessel.

Function
The MGC can operate in Gyrocompass mode and Integrated Navigation mode. In the Gyrocompass mode, only input of speed is required. In this mode the product will output heading, roll, pitch and heave accurately. In the Integrated Navigation mode, input of speed, position and PPS from a GNSS system is required (VTG, GGA, ZDA). In this mode the product will output heading, roll, pitch, heave and position.

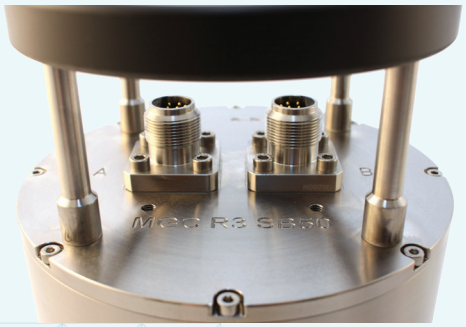
The unit is delivered with Windows based configuration and data presentation software, the MRC+. In this software vector arms from where the MGC is mounted to the center of gravity (CG) and two individually configurable monitoring points (MPs) can be defined. The heave measurements can be output in four different locations (the MGC itself, CG, MP1 and MP2) simultaneously on serial lines or Ethernet ports. A typical monitoring point is the echo sounder transducer head.

Variables output
The MGC outputs heading, roll and pitch and corresponding angular rate vectors. The unit outputs relative (dynamic) heave position, velocity and acceleration. In the Integrated Navigation mode it also outputs absolute position in north and east direction in addition to height above the ellipsoid.

Digital I/O protocols
MGC data is available through both Ethernet interface and serial lines enabling easy distribution of data to multiple users on board the vessel. Output protocols for commonly used survey equipment are available on two individually configurable serial lines and Ethernet/UDP.

FEATURES

- 0.01° roll and pitch accuracy
- 0.04° heading accuracy GNSS aided
- Includes INS capability
- Delivered in titanium housing, depth rated to 50 metres
- Outputs on RS-422 and Ethernet
- High output data rate (200 Hz)
- Precise heave at long wave periods by use of PFreeHeave® algorithms
- Lever arm compensation to two individually configurable monitoring points
- Small size and low power consumption
- Each MGC delivered with a Calibration Certificate
- Selectable communication protocols in the Windows based configuration software



TECHNICAL SPECIFICATIONS

MGC R3 SB50

ORIENTATION OUTPUT

Angular orientation range	±180°
Resolution in all axes	0.001°
Accuracy roll, pitch	0.01° RMS
Accuracy heading	0.08° RMS sec.lat
Accuracy heading (GNSS aided)	0.04° RMS sec.lat
Heading settling time to data available	<5 min from start-up
Heading settling time to full accuracy (typical)	17 min from start-up

GYRO OUTPUT

Angular rate range	±149°/s
Angular rate noise	0.010°/s RMS
Bias stability (absolute bias)	0.008°/h RMS
Angle Random Walk	0.008°/ √h
Scale factor error	0.001 % RMS

ACCELERATION OUTPUT

Acceleration range (all axes)	±45 m/s2
Bias stability (absolute bias)	80 µg RMS
Acceleration noise	0.0002 m/s2 RMS
Velocity Random Walk	3.3 µg/√Hz
Scale factor error	0.008% RMS

HEAVE OUTPUT

Output range	±50 m, adjustable
Periods (real-time)	0 to 25 s
Periods (delayed)	0 to 50 s
Heave accuracy (real-time)	5 cm or 5% whichever is highest
Heave accuracy (delayed)	2 cm or 2% whichever is highest

POSITION OUTPUT

Free inertial	5 nm/h

ELECTRICAL

Voltage input	24 V DC nominal (18 to 32 V DC)
Power consumption	Max 12 W (typical 11 W)
Serial ports:	
Com1	Bidirectional RS-422
Com2	Output only, RS-422
Com3 & Com4	Input only, user configurable RS-232, RS-422
Analog channels (junction box)	# 4, ±10 V, 14 bit resolution
Ethernet output ports	5
Ethernet UPD/IP	10/100 Mbps
Digital output variables	24 (max), Serial or Ethernet
Data output rate (max)	200 Hz
Timing	< 1 ms

INPUT FORMATS

NMEA 0183, incl. GGA, VBW, VTG, ZDA or MRU Normal format

OUTPUT FORMATS

- MRU normal	- Sounder
- NMEA 0183 proprietary	- EM3000
- Atlas Fansweep	- TSS1
- Seapath binary 23, 25, 26	- PFreeHeave®
- KM binary	- MDL Trim Cube
- RDI ADCP	- Tokimec PTVG
- NMEA GGA, GLL, HDT, THS, ROT, VTG, GST, VER, HCR	

OTHER DATA

MTBF (computed)	50000 h
MTBF (service history based)	100000 h
Material	Titanium
Connector	2 8-pin Seacon 5506-1508 (male)

WEIGHTS AND DIMENSIONS

Dry weight	10.5 kg
Submerged weight	5.5 kg
Dimensions (HxLxW)	275 x 184 x 184 mm

ENVIRONMENTAL SPECIFICATIONS

Operational temperature range	-15 °C to +55 °C
Storage temperature range	-25 °C to +70 °C
Enclosure protection	IP68
Vibration	IEC 60945/EN 60945

ELECTROMAGNETIC COMPATIBILITY

Compliance to EMCD, immunity/emission	IEC 60945/EN 60945

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Specifications subject to change without any further notice.

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