

MGC maintenance & recalibration



KONGSBERG



When to service the MGC

The MGC (Motion Sensor & Gyro Compass) is maintenance free when operated as an IMO type approved gyro compass and no field maintenance is required. However, if the MGC is used as a roll and pitch sensor in addition to being a heading device, the need for a recalibration of the MGC should be considered. This is based on the use and operation mode of the sensor unit.

Recalibration

The need for recalibration of the MGC sensor unit depends on the application and the operation mode which the unit has been set up to operate in.

AHRS mode

In this mode input of speed and latitude is required to obtain full accuracy. For speed input NMEA VTG or VBW can be used. For position input NMEA GLL or GGA can be used. External time input, NMEA ZDA, is also required to correctly time tag alerts from the gyro compass. In this mode the sensor unit will output accurate heading, roll, pitch and heave. This is the default mode for the sensor unit.

Inertial navigation mode

In this mode input of latitude, longitude, height and time from a GNSS receiver, is required. Input of NMEA VTG, GGA and ZDA at 1 Hz rate is required. This mode requires that the MGC is time synchronized with the external input source by a PPS signal from the GNSS receiver or by using an NTP server. In this mode the sensor unit will output accurate heading, roll, pitch, heave, position and velocity.

No recalibration is necessary if the sensor unit is operated in inertial navigation mode. When operating in inertial navigation mode, the sensor unit will calculate the drift in the accelerometers over time and correct for its influence.

If the sensor unit is not operated in inertial navigation mode, the accelerometer bias drift is not calculated. This will mainly result in a possible static roll/pitch error. The heading accuracy will not be significantly affected, except at high latitudes. If high performance roll/pitch accuracy is not required for the application, no recalibration is necessary when operating in AHRS mode

The table to the right, shows an estimate of the total static attitude accuracy over time. The "L" in the table is the latitude.

MGC R1 unaided

	2 years	4 years	6 years
Roll/pitch	0.05°	0.15°	0.30°
Heading	$1/\cos(L)*0.25°$	$1/\cos(L)*0.25° + 1/\tan(L)*0.15°$	$1/\cos(L)*0.25° + 1/\tan(L)*0.30°$

MGC R2 unaided

	2 years	4 years	6 years
Roll/pitch	0.02°	0.05°	0.09°
Heading	$1/\cos(L)*0.15°$	$1/\cos(L)*0.15° + 1/\tan(L)*0.05°$	$1/\cos(L)*0.15° + 1/\tan(L)*0.09°$

MGC R3 unaided

	2 years	4 years	6 years
Roll/pitch	0.01°	0.02°	0.03°
Heading	$1/\cos(L)*0.08°$	$1/\cos(L)*0.08° + 1/\tan(L)*0.02°$	$1/\cos(L)*0.08° + 1/\tan(L)*0.03°$

MGC R4 unaided

	3 years	6 years	9 years
Roll/pitch	0.008°	0.015°	0.020°
Heading	$1/\cos(L)*0.04°$	$1/\cos(L)*0.04° + 1/\tan(L)*0.015°$	$1/\cos(L)*0.04° + 1/\tan(L)*0.020°$

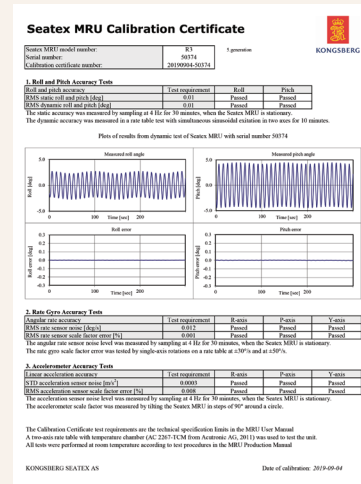
MGC R5 unaided

	3 years	6 years	9 years
Roll/pitch	0.008°	0.015°	0.020°
Heading	$1/\cos(L)*0.02°$	$1/\cos(L)*0.02° + 1/\tan(L)*0.015°$	$1/\cos(L)*0.02° + 1/\tan(L)*0.020°$

Validity of MGC calibration certificate

An individual Calibration Certificate is generated for each manufactured MGC. The certificate confirms performance for the MGC compared with test requirements valid for the specific type of MGC. The calibration date is printed on the Calibration Certificate. The certificate does not include an expiry date as the MGC will still be working even if there has been a long time since the last calibration. However, the uncertainty whether the MGC is within its specifications, will increase over the years without a recalibration.

A recalibration of the MGC is recommended due to changes in the characteristics of the internal sensors over time, and is therefore necessary in order to achieve the specified performance. Exactly when a recalibration is required, will depend on the user application (use of the unit, i.e. thermal cycling, vibration and shock).



MGC dispatch procedure

If a recalibration of an MGC is required, please follow these steps to ensure an efficient and smooth recalibration process:

1. Contact the Customer Support department at Kongsberg Discovery by phone to +47 33 03 24 07 or by e-mail to km.support.seatex@km.kongsberg.com and ask for an RMA (Return Material Authorization). If you need a spare MGC during recalibration, please ask for a quote.
2. You will receive an RMA (Return Material Authorization) number. This number should follow your shipment.
3. Place the MGC in its original transportation box, or similar hardshell quality box, to secure safe transportation. Contact local authorities to check if you will need an export license

MGC recalibration turnaround time

- In general, the turnaround time for MGC calibration service are two weeks after reception of the unit.
- The calibration may uncover the need for service that does not appear during static testing on arrival and thus delays should be expected. The unit must then undergo service followed by a new calibration cycle. The delivery time will be extended accordingly.

Specifications subject to change without any further notice.