



GC80/85 Expanded MK2 User Manual

ENGLISH

Document history

Rev. 001	First issue.
Rev. 002	Added trademark section, disclaimer, and copyright section. Added section about Master compass power switch.
Rev. 003	BAM conn. extension cables, added notes, optional equipment, updates to Alarm code list.

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1 PREFACE

1.1 Compliance statement

Navico declare under our sole responsibility that the GC80/85 conform with the requirements of:

- The European Council Directive 2014/90/EU on Marine Equipment modified by Commission Implementing Regulation (EU) 2019/1397 - Wheelmark.

All compliance documents are available in the product's section at the following website: www.navico-commercial.com

1.2 Disclaimer

As Navico is continuously improving this product, we retain the right to make changes to the product at any time which may not be reflected in this version of the manual.

Please contact your nearest distributor if you require any further assistance. It is the owner's sole responsibility to install and use the equipment in a manner that will not cause accidents, personal injury or property damage. The user of this product is solely responsible for observing maritime safety practices.

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This manual represents the product as at the time of printing. Navico Holding AS and its subsidiaries, branches and affiliates reserve the right to make changes to specifications without notice.

Governing language

This statement, any instruction manuals, user guides and other information relating to the product (Documentation) may be translated to, or has been translated from, another language (Translation). In the event of any conflict between any Translation of the Documentation, the English language version of the Documentation will be the official version of the Documentation.

1.3 Copyright

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1.4 Trademarks

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1.5 About this manual

Intended audience

This manual is intended as a reference guide for installing, operating and maintaining the Simrad GC80/85 Expanded MK2 Gyro compass.

The manual assumes that the operator is a qualified ship officer, or is under supervision of a qualified person.

Important text conventions

In this manual, references to buttons on the operator panels are written in boldface, but in a different text style (e.g. **SET** button, **DISP** button, **GYRO** button).

Important text that requires special attention from the reader is emphasized as follows:

Note!

Used to draw the reader's attention to a comment or some important information.

Caution

Used to warn the reader that a risk of damage to the equipment exists if care is not exercised.

WARNING

Used when it is necessary to warn personnel that a risk of injury or death exists if care is not exercised.

This manual is divided into the following sections:

1. Preface

2. System overview

An overview of the GC80/85 Expanded Gyro system and its components.

3. User interface

An overview of GC80/85 Expanded MK2 Control unit and the user interface.

4. Operation

Main operating procedures for using the GC80/85 Expanded MK2 Gyro compass.

5. Maintenance

Simple maintenance procedures that should be performed by the system operator, together with a complete procedure for how to replace the Sensitive element and fuses.

6. Installation

Mechanical installation, cable connection, and software configuration for the GC80/85 Expanded Gyro system.

7. Advanced settings

A description of parameters that can be entered or changed in the Extension menu.

8. Technical specifications

Specifications for the system and for all separate units in the GC80/85 Expanded Gyro system.

9. Drawings

Dimensional drawings and wiring diagrams for the GC80/85 Expanded Gyro system.

10. Part list

List of all standard and optional units that are used in the GC80 and GC85 Expanded Gyro systems.

11. Terminal layout

List of all terminal pins and terminal labelling with details on GTERM-A board in the GC80/85 Expanded MK2 Control unit.

12. DIP switch settings

Drawings and references of jumpers and DIP switches for the different printed circuits boards in the Expanded MK2 Control unit.

13. Alarm messages and corrective actions

A description of how system errors are indicated and corrective actions that can be performed by the operator.

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2 SYSTEM OVERVIEW

This section provides an overview of the GC80/85 Expanded MK2 Gyro compass and its components.

2.1 Introduction

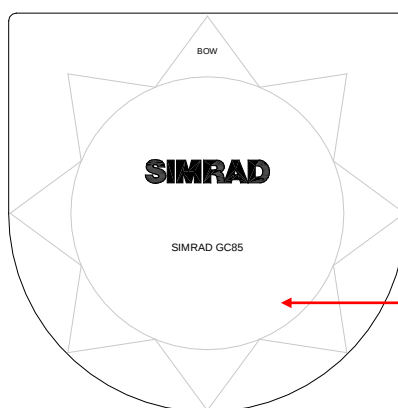
GC80/85 Expanded MK2 Gyro compass has been designed for any size of vessels to enhance the navigational capabilities and reliability. The Gyro compass eliminates the inconvenience and limitations of magnetic compasses, and provides a variety of electrical outputs to supply accurate and consistent heading information to other navigational equipment.

GC80 standard and GC85 high speed Expanded Gyro systems have different Sensitive elements, but use the same GC80/85 Expanded MK2 Control unit. The systems are identified with divergent DIP switch settings in Master compass and in the Control unit.

Note!

A GC80 or GC85 system is identified by the labelling on top of the Master compass' case as shown in the figure below.

The labelling on the Control unit is identical for both Gyro systems.



2.2 Precautions in use

The GC80/85 Expanded MK2 Gyro compass displays and outputs bearing information. Although the system continually checks for faults while the system is running, failures or malfunctions may occur.

Any errors in input information will generate an alarm. These errors may also cause large jumps in the output bearing from the Gyro compass. If this happens, any external equipment depending on the bearing output from GC80/85 should be operated manually or switched to other bearing sensors.

To assure long time safe operation, the following precautions should be taken:

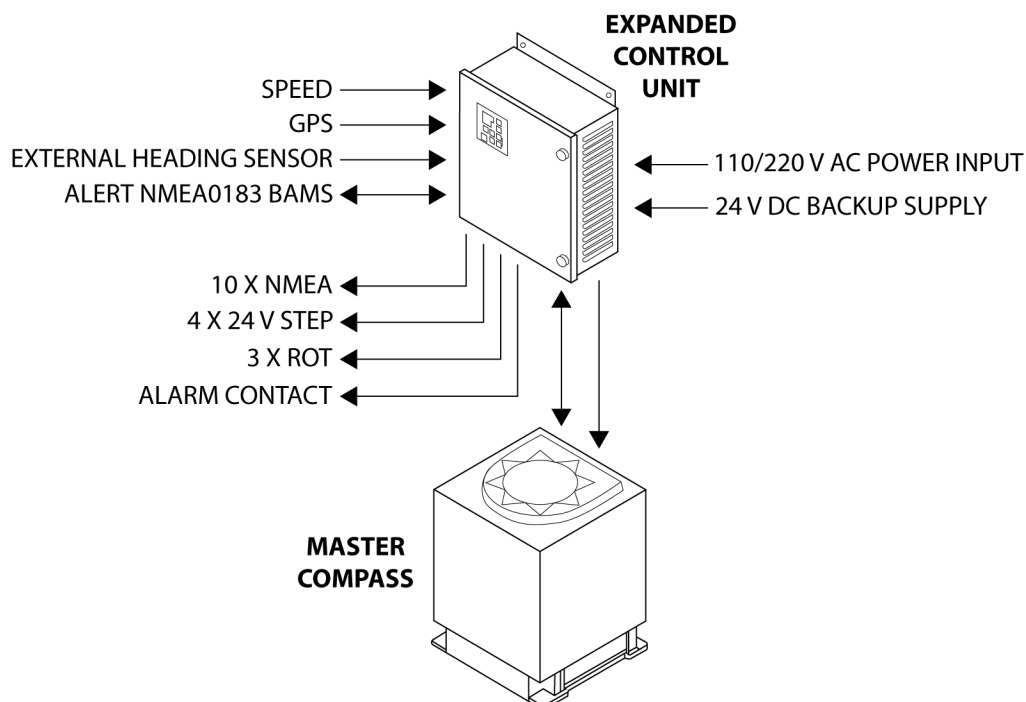
- Assure that the operator is familiar with the use of the Gyro compass.
- Perform daily checks to maintain normal system operation. Refer **MAINTENANCE**, page 32 onwards.

- If any unusual behavior is observed during daily inspections, the cause should be found and corrected. If necessary, the local Simrad dealer should be contacted.
- If any alarm is generated, verify the reason for the alarm.

2.3 System components

A GC80/85 Expanded Gyro compass includes the following units:

- Master compass with Sensitive element
- Expanded MK2 Control unit



Note!

For details, refer **TECHNICAL SPECIFICATIONS**, page 73.

2.4 Bearing repeaters

GC80 and GC85 output step and serial signals used for repeaters. Even when the emergency power supply is used, the connected repeaters will be powered by the repeater backup function included in GC80/85.

The following serial signals may be selected:

- Lo speed: IEC61162-1 ed.4 (4800 and 38400 baud possible)
- High speed: IEC61162-2 ed.1 (38400 baud possible)

Note!

A proprietary Tokimec serial signal may also be available, but this is normally not used.

These signals may be set separately for each circuit.

For connection of repeaters, refer to the wiring diagrams from page 81 onwards.

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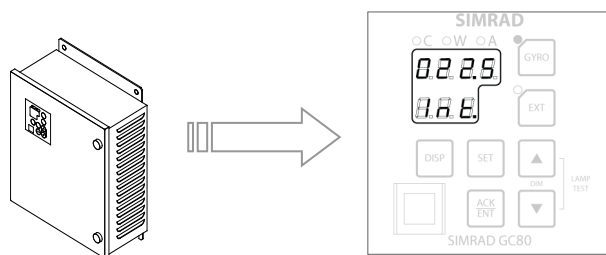
3 USER INTERFACE

This section gives an overview of the GC80/85 Expanded MK2 Control unit and the user interface.

3.1 GC80/85 Expanded MK2 Control unit

The Control unit includes the Control panel for the Gyro compass.

A flush mount kit (part number 27101757) may be ordered from Simrad for remote installation of the Control panel. Refer *Flush mounting the Control panel*, page 45.



POWER button

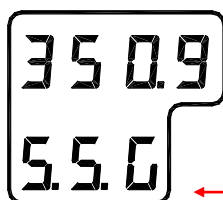


Used to turn the Gyro system ON. The button is lit to indicate that power is supplied to the system. Refer

System Start-up and Shut-down, page 20.

Display

The LCD displays data in 2 rows: the upper row shows data and the lower row shows active mode.



- The Data indicator consists of 4 7-segment red LEDs. The indicator is used to display the vessel's bearing, latitude and speed. Refer *Displaying present settings*, page 22. The Data indicator is also used for displaying alarm codes as described from page 28 onwards.
- The Mode indicator consists of 3 7-segment green LEDs. The Mode indicator displays codes used for identifying input type for bearing, latitude and speed.

GYRO button



Used to select the Gyro compass as the active heading reference source. The status lamp is lit to indicate that the Gyro system is active.

Refer *Selecting active compass*, page 22.

EXT button



Used to select the external heading source as the heading reference. The status lamp is lit to indicate that the external heading reference source is active.

Refer *Selecting active compass*, page 22.



DISP button

Used to display data on the LCD. Refer *Displaying present settings*, page 22.



SET button

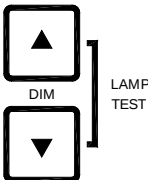
Used to change data and input sources. Refer *System start-up and software configuration*, page 59 onwards.



ACK/ENT button

Used to confirm a change in data and input sources. Refer *System start-up and software configuration*, page 59 onwards.

The button is also used to acknowledge an alarm as described in *Acknowledging an alarm*, page 30.



ARROW buttons

Used to increase or decrease a parameter value. Refer *System start-up and software configuration*, page 59 onwards

Also used for lamp test and to set the display illumination as described on page 22.



Alarm indicators

Used to indicate an alarm situation. Refer *Alarm messages*, page 29.

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4 OPERATION

This section describes the main operating procedures used when operating the GC80/85 Expanded MK2 Gyro compass.

4.1 System Start-up and Shut-down

A GC80/85 Expanded Gyro system is usually left with power ON. If the system has to be shut down and restarted, follow the procedures described in the following sections.

Start-Up

Caution

Before the Gyro compass is turned into normal operation, it has to be configured according to the description in System start-up and software configuration, page 59 onwards.

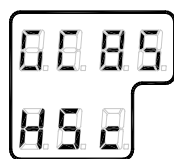


- 1 Turn ON the Gyro system by pressing the **POWER** button on the Control panel. Follow the start-up sequence.
- 2 Control unit type (GC80 Std, or GC85 HSc), software version for Control unit and for Master compass is displayed in rapid succession. Examples of display text are shown below:

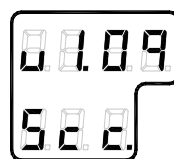


GC80 CONTROL
UNIT
STD VERSION

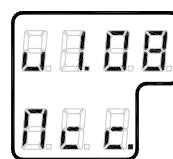
OR



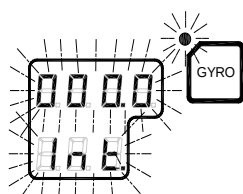
GC85 CONTROL
UNIT
HIGH SPEED
VERSION



SOFTWARE VERSION
CONTROL UNIT

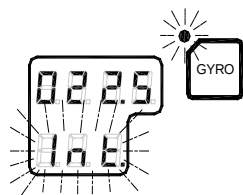


SOFTWARE VERSION
MASTER COMPASS

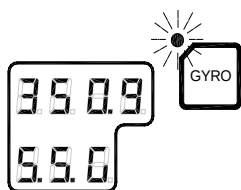


- 3 If the rotor is not completely stopped when the **POWER** button is pressed, a rotor break function will be activated to stop the rotor.
Active rotor break is indicated with flashing display.

- 4 When the turning stops, the Sensitive element starts rising horizontally and the compass rotates 360° clockwise. The display shows decreasing bearing as the compass is turning.



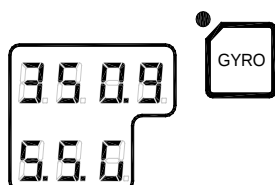
- 5 When the compass has rotated 360°, start bearing is indicated with flashing text in the display. The start bearing will be the same as active bearing when the compass was turned OFF.



- 6 The indicated start bearing is accepted by pressing the **ACK/ENT** button, or increased/decreased by using the **ARROW** buttons and then pressing the **ACK/ENT** button. If no action is taken within 3 minutes, the start-up process will continue with the indicated start bearing.

The bearing indication stops flashing when the start bearing is accepted, while the lamp and the S.S.G. (mode) continues to flash.

- 7 The rotor will now start rotating, and reaches full speed after maximum 30 minutes.



- 8 When the rotor has reached full speed, the compass starts the north seeking function. The display will now change to show the compass' actual heading, and from now on bearing output will be available.

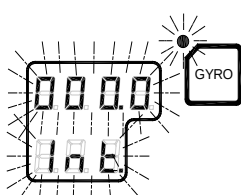
The lamp near the **GYRO** button changes from flashing to steady light, but the S.S.G. (mode) continues to flash for 3 hours.

The GC80/85 will be settled within 3 hours when started with a deviation angle less than 5°. With a larger deviation angle, the compass will be settled within 4 hours.

Turning the Gyro compass OFF



- 1 Press the **POWER** button on the Control panel. The light in the **POWER** button will be switched off.



- 2 Re-press the **POWER** button to activate the rotor break function. The light in the **POWER** button will be lit again.

Active rotor break is indicated by:

- flashing display
- a soft clicking sound heard from the Gyro compass

The rotor break function will be active for maximum 4 minutes.

Caution

It is very important that the rotor break is activated to stop the rotor rotation to prevent any possible damage by ship's movement!



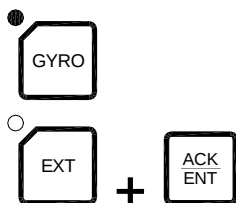
- 3 Press the **POWER** button again to shut down the Gyro compass when both the data and the dot in the display change from flashing to steady light.

The light in the **POWER** button will now be turned OFF.

4.2 Selecting active compass

If an external heading sensor is connected to GC80/85, it is possible to toggle between Gyro and external heading sensor as active steering sensor.

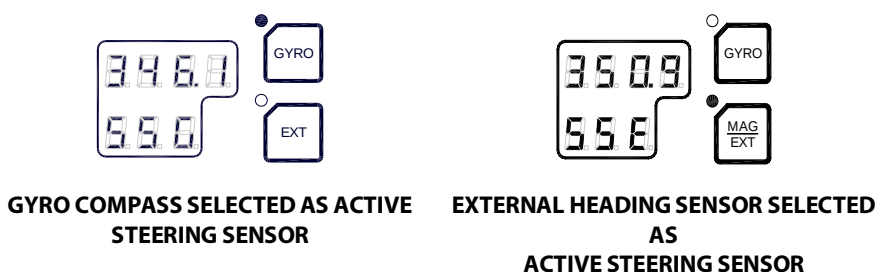
The Gyro system will normally be used with the Gyro compass selected as active compass. An external heading sensor should only be used as active compass when the Gyro compass is not working properly.



By pressing the **GYRO** or the **EXT** and the **ACK/ENT** buttons simultaneously, the GC80/85 will toggle between using the Gyro compass or an external sensor as active sensor.

When the active sensor is changed, an audible alarm will sound 3 times.

Active compass is identified with light in the button's indicator lamp, and with active compass type in the LCD as shown in the figures below.



WARNING

Changing active compass may result in large change of true bearing. No changes should therefore be made when the system is operating.

4.3 Adjusting dimming level



The display illumination and the light intensity in the indicator lamps can be increased or decreased in 5 steps by pressing the **ARROW** buttons.

When the illumination is set to the lowest level, a faint light is still present in the display, Alarm indicator, status lamp and **POWER** button.

Panel lamps and display segments may be tested by pressing both **ARROW** buttons simultaneously. All lamps and display segments will be lit, and a short audible alarm will be activated.

4.4 Displaying present settings



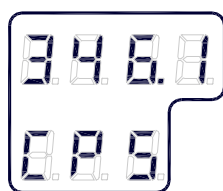
When pressing the **DISP** button on the GC80/85 Control unit, the system loops through a display sequence showing present settings for the system.

The sequence depends on whether an external compass is connected. When an external compass is connected, the readout depends on active compass.

The following sections; *Displaying settings with no external sensor connected* and *Displaying settings with external sensor connected*,

show examples of how the present settings are presented by pressing the **DISP** button.

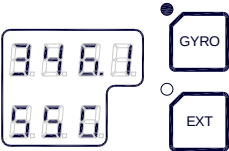
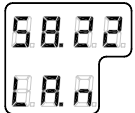
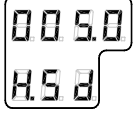
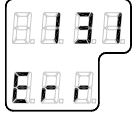
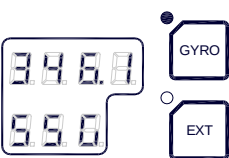
The display is used as follows:



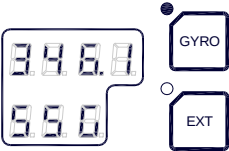
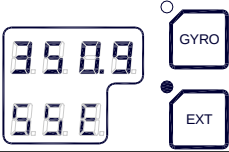
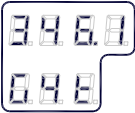
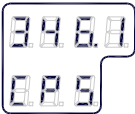
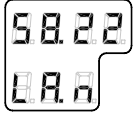
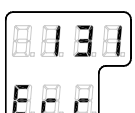
- The first row in the display shows the value.

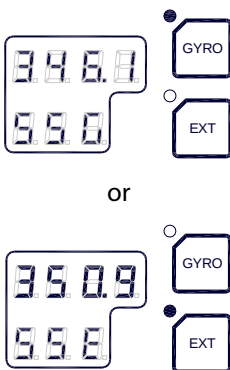
- The second row displays code used for identification.

Displaying settings with no external sensor connected

Display state	Display	Description
Normal operation		- True output bearing - Active compass
 1 st press on DISP button		- Gyro compass bearing without correction - Active speed input source indication (GPS, Manual, Log or Serial Log)
 2 nd press on DISP button		- Latitude - Latitude indication: north (LA.n) or south (LA.s)
 3 rd press on DISP button		- Vessel speed - Speed input indication (GPS, Manual, Log or Serial Log)
 4 th press on DISP button		- Rate of turn in °/min - Rate of turn indication
 5 th press on DISP button		- Error codes (up to 4) - Error indication
 6 th press on DISP button Normal operation		- True output bearing - Active compass

Displaying settings with external sensor connected

Display state	Display	Description
Normal operation	 or 	- True output bearing - Active compass The compass indication equals the sensor selected as active compass (Gyro or external)
 1 st press on DISP button	 or 	- Bearing - Passive compass
 2 nd press on DISP button		- Gyro compass bearing without correction - Active speed input source indication (GPS, Manual, Log or Serial Log)
 3 rd press on DISP button		- Latitude - Latitude indication: north (LA.n) or south (LA.s)
 4 th press on DISP button		- Vessel speed - Speed input indication (GPS, Manual, Log or Serial Log)
 5 th press on DISP button		- Rate of turn in °/min - Rate of turn indication
 6 th press on DISP button		- Error codes (up to 4) - Error indication

Display state	Display	Description
 7 th press on DISP button Normal operation		- True output bearing - Active compass

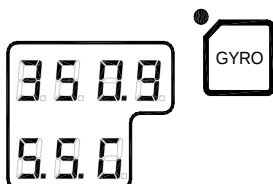
4.5 Confirming present settings

After the GC80/85 is configured according to the *System start-up and software configuration*, described on page 59 onwards, it should not be necessary to adjust any settings when operating the Gyro compass.

However, if an error is reported in any of the input sources, it may be necessary to switch to a different input source.

True bearing

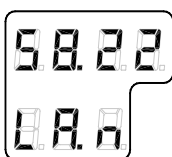
Make sure that the Gyro compass is selected as active compass. Refer *Selecting active compass*, page 22.



Confirm that the Gyro compass' displayed true bearing is according to a known target or astronomical observation.

If there is any difference, adjust the bearing according to *Adjusting True heading*, page 63.

Latitude



Press the **DISP** button until the vessel's latitude is displayed.

The displayed latitude value is calculated based on the vessel's true bearing and the vessel's actual speed. Refer *Setting the Latitude input source* and *If GYRO is selected you* need to verify that GPS connection is set to Non in extension menu A-2, 2.9.G.

Setting the Speed input source, page 61 onwards.

- If GPS is selected as latitude input source, the latitude obtained from the GPS is displayed on the LCD. Confirm that the displayed latitude is the same as indicated on the GPS indicator.
- If GYRO (manual setting of latitude) is selected as latitude input source and other than MANUAL selected as the vessel's speed input source, the latitude will be automatically updated. In this case, the indicated latitude should be confirmed every 4th hour when the vessel is in harbor. If there is any significant difference between the

displayed value and the vessel's actual latitude, the value should be adjusted according to ***Setting the Latitude input source***, page 61.

Note!

*When **GYRO** is selected as latitude input source and **MANUAL** is selected as the speed input source, the indicated latitude value will not be updated and hence an error may occur.*

Speed

The GC80/85 Gyro compass calculates bearing based on the speed and latitude information that is input to the Gyro as speed source. Any error in speed input will therefore cause incorrect true bearing.



Press the **DISP** button until the vessel's speed information is displayed.

Confirm every 4th hour that the displayed speed is the same as the vessel's actual speed.

Any discrepancy between displayed speed and actual speed is corrected as described in ***If GYRO is selected you*** need to verify that GPS connection is set to Non in extension menu A-2, 2.9.G.

Setting the Speed input source, page 62.

Speed error correction

All Gyro compasses will generate a heading error caused by the vessel's speed and earth rotation. GC80/85 calculates this error based on latitude and speed input information, and automatically corrects the bearing signal output. If no speed information is available, the Gyro compass will output a heading error either westwards or eastwards depending on the vessel's course.

If speed information is unavailable, the figure on the next page may be used to manually calculate the heading error.

In this figure, the following values are used as examples:

- Latitude: 40°
- Vessel speed: 16 knots
- Vessel heading: 30°

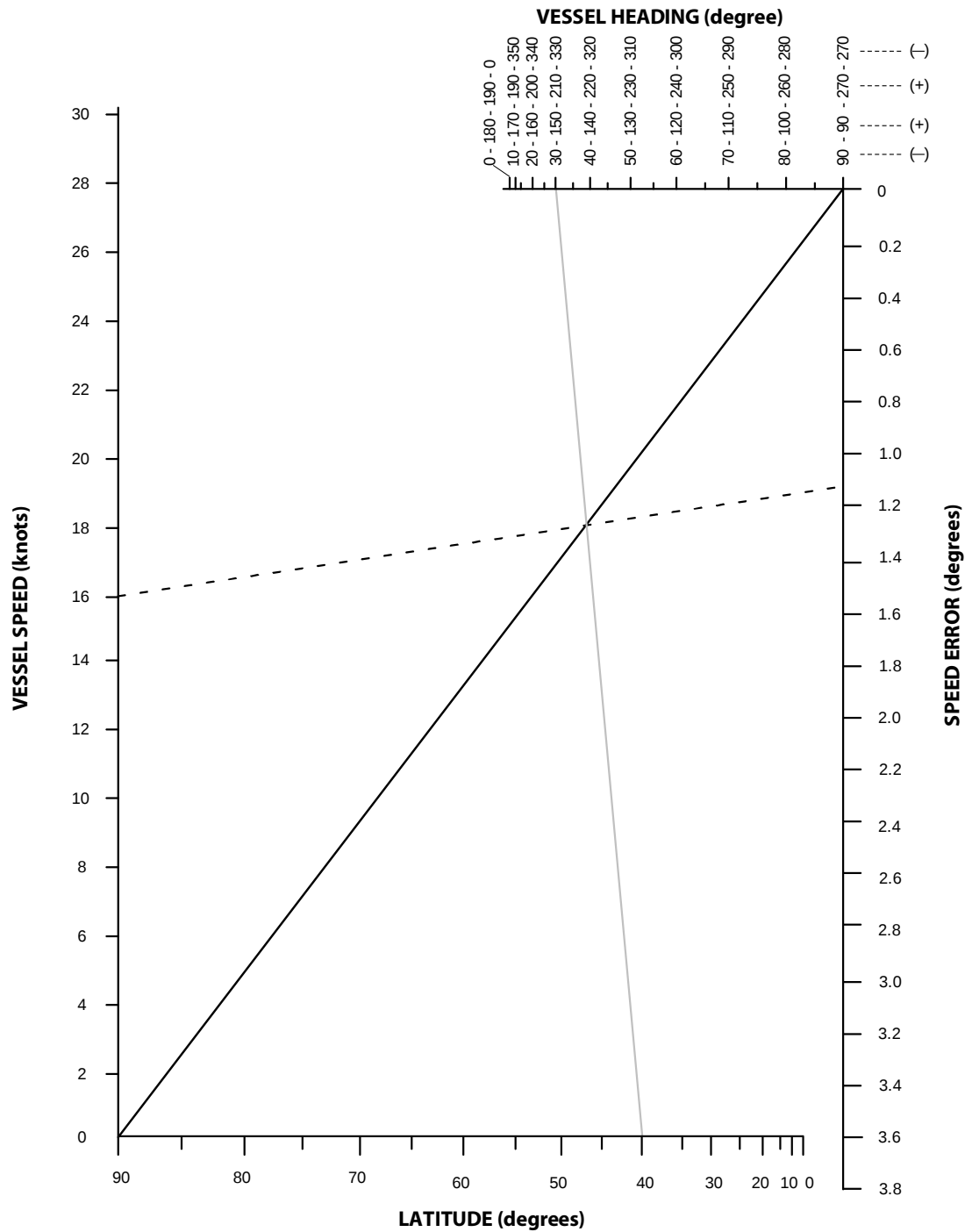
The heading error is found by:

- 1** Drawing a line between the latitude and the vessel's heading (shown with gray line in the figure).
- 2** Drawing a straight line (broken line in the figure) between the vessel's speed and the point where the latitude/heading line intersects with the solid black line in the figure.

In the example above, the figure shows a speed error of appr. 1.1° and the true bearing should then be $30^\circ - 1.1^\circ = 28.9^\circ$.

Note!

*When the course is within 270° - 0° - 90°, true heading is found by subtracting the speed error from the compass heading.
If the course is within 90° - 180° - 270°, true heading is found by adding the speed error to the compass heading.*



4.6 Pendulum function

GC80/85 software includes a pendulum function that enables the heading to be changed by 180°.

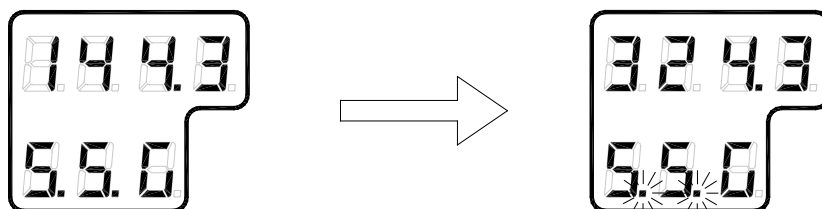
The heading change is activated by closing a potential free contact connected between TB1-3, pin 71 and 72 on the GTERM-A board in GC80/85 MK2 Control unit.

Note!

*To enable the function, S2-4 on the SCC board has to be set to ON. Refer **DIP switch settings on SCC board**, page 102 onwards.*

When the switch is set to activate the function, the following functions are obtained:

- The compass heading and repeaters change by 180° from the heading.
- An acoustic alarm sounds 5 times.
- The dots in the indicator field in the display start flashing. These will remain flashing for as long as the pendulum function is active.



Normal compass operation is resumed by opening the closed potential free contact. The function is indicated by the same acoustic alarm, and the flashing dots return to fixed illuminated dots.

Note!

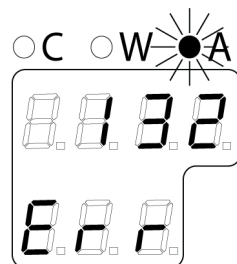
*When this pendulum function input is activated, the external buzzer stop input will not be available. Refer **DIP SWITCH SETTINGS**, page 99 onwards.*

4.7 Alarm messages

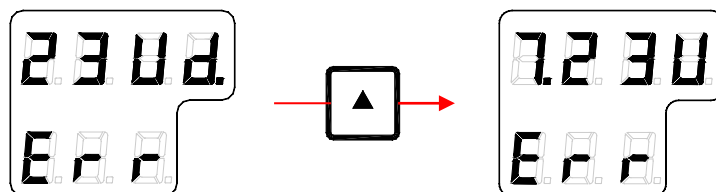
The GC80/85 system will continually check for faults while the system is running.

If a fault occurs, an alarm code will be displayed in the LCD, the Alarm lamp will be flashing, and an audible alarm will be activated.

Up to 4 alarm codes may be displayed in the LCD at the same time to indicate that several alarm situations are present. The last activated alarm will be displayed on the right side of the display. The figure shows that alarm codes 1, 3 and 2 were generated in that order.



If more than 4 alarms are active, this will be indicated with a dot behind the last number as shown in the figure below. Further alarm codes may then be displayed by pressing the “**ARROW UP**” button.



The example shows that alarm codes 2, 3, U, d and 7 were activated.

Caution

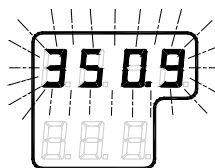
When an alarm is generated, bearing information from the GC80/85 may not be present or may have large error. Any equipment using bearing information from the Gyro compass should therefore immediately be operated according to the equipment's emergency operating procedure.

Acknowledging an alarm



An alarm is acknowledged by pressing the **ACK/ENT** button.

- The audible alarm will be silenced.
- If the alarm situation has disappeared, the alarm lamp will be switched off and the alarm code will be removed from the LCD.
- If the alarm situation continues, the alarm lamp will switch from flashing to steady light. The LCD will return to show true bearing with flashing numbers to indicate that the bearing may have large errors.



An alarm code for an active error may be recalled by pressing the **DISP** button until the alarm code is shown on the display. It is possible to recall any alarm code in the LCD as long as the alarm situation is present.

The **Complete alarm code list** section, page 119, has a complete list of alarm codes.

Internal buzzer silence only

By installing an external acknowledging switch, it is possible to silence the buzzer while the alarm code remains in the display.

Install the switch to the Control unit according to the Wiring diagrams on page 81 onwards.

Note!

Could only be used if no pendulum switch is installed!

External buzzer silence output

By using an internal output contact, it is possible to silence an external buzzer when alarm ack. is operated.

Ref. Wiring diagrams on page 81 onwards.

Note!

Could only be used when RUNNING contact is not required.

Central Alarm Panel

On some installations, it is required to connect the Gyro to an external bridge alarm panel. In these types of installations, the functions mentioned above and the alarm contact output are used to fulfil this requirement.

BAMS

It is possible to connect to a BAM system via serial connection, ref. **BAMS complete alarm code list** on page 121 onwards.

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5 MAINTENANCE

This section describes maintenance procedures that should be performed by the system operator.

The section also includes a detailed description of how to replace the Sensitive element and the fuses.

5.1 General

All units in the GC80 system are designed for optimum safety and reliability. However, a limited amount of preventive maintenance should be performed to verify safe operation and durability.

If any strange motion, smell, sound or heat is generated from any unit, please contact a Simrad dealer.

5.2 Precautions

Touching internal parts may cause electric shock if power is connected to the system, even if the **POWER** button is turned OFF. Do not touch any terminal board or power supply unit while maintaining and checking the system. If necessary, disconnect the power cable from the Control unit.

Electrostatic charges may damage components on the circuit boards inside the units. Always wear a correctly connected earthing strap when opening the units.

5.3 Cleaning the operator panels and the cabinet surface

Use a vacuum cleaner with a soft brush to avoid damaging the buttons and the panel. If required, clean the buttons and panel with a non-abrasive cloth moistened with mild soap solution.

5.4 Checking the connectors

The connectors should be checked by visual inspection only. Push the connector plugs into the connector. If the connector plugs are equipped with a lock, ensure that this is in the correct position.

5.5 Checking mechanical installation

Vibration and shock may cause mechanical parts to loosen. All fastening screws should therefore be checked regularly and eventually tightened.

5.6 Preventive maintenance intervals

Local evaluations should be made to determine site-specific maintenance intervals.

ACTION	INTERVAL RECOMMENDED
Confirm that the value of each repeater synchronizes with the displayed true bearing on the Operator panel.	Daily
Confirm that the displayed latitude and speed are according to the vessel's actual latitude and speed.	Daily
Check connectors	Every 6 months
Tighten fastening screws	Every 6 months
Clean panels and cabinet	Once a year or as required
Clean slip rings and brushes. Lightly apply "WD40 oil".	Every 2 nd year
Replace sensitive element	MTBF (Mean Time Before Failure) is 35000 hours (4 years). On vessels in critical operations we recommend 4-5 years. On vessels in non-critical operation (can operate with backup) we recommend 6-8 years or when it fails.

5.7 Replacing the Sensitive element

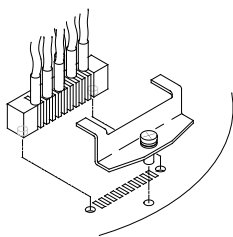
Caution *The Sensitive element should only be replaced by authorized Simrad personnel.*

Note! *A special tool (Simrad part no. 44174449) is required when installing the Sensitive element. This tool is delivered together with the Gyro, and the Sensitive element should not be installed without using this tool.*

Mechanical installation

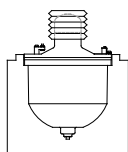
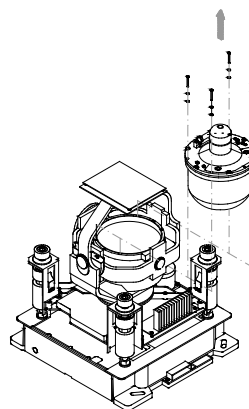
Caution *Use extreme caution when handling the Sensitive element! Do not tilt the element. It is filled with oil and the top includes a ventilation opening.*

- 1 Ensure that the power is disconnected from the Control unit.
- 2 Remove the 4 screws securing the compass case, and carefully lift the case upwards and away.

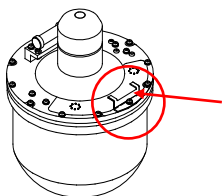


- 3** Loosen the screw on the plug-holder on the Sensitive element, and disconnect the plug.

- 4** Remove the 4 screws securing the Sensitive element. Tilt the Horizontal ring to the side where the plug is located, and carefully remove the element from the compass.



- 5** Place the defective Sensitive element in its original packaging, and put the rubber tube on top of the element.

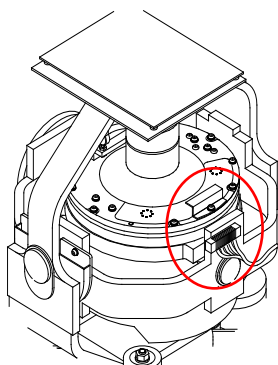


- 6** Fasten the screw on the plug holder on the defective Sensitive element.

- 7** Carefully lift the new element carefully from its packaging, and remove the rubber tube on top of the element.

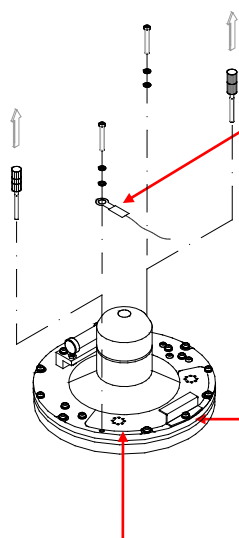
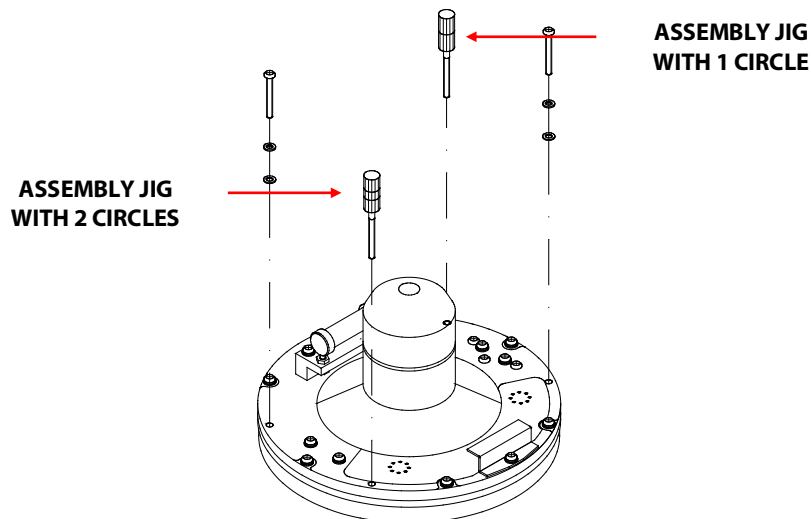
Note!

The packaging and the rubber tube should be kept for re-use if the Sensitive element has to be sent to factory for service!



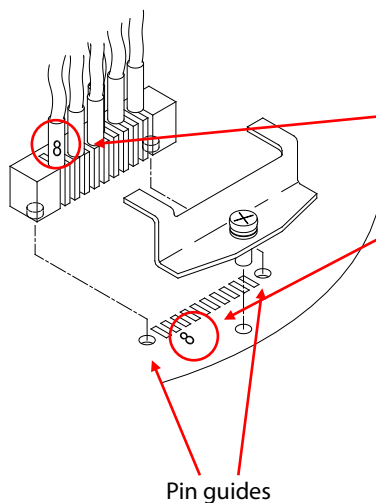
- 8** Tilt the Horizontal ring to the side where the plug is located, and carefully put the Sensitive element into the ring.
- The socket on the Sensitive element should be located right above the plug attached to the Horizontal ring.

- 9** Position the Sensitive element on the Horizontal ring by putting the assembly jigs into the holes as indicated in the figure below. Observe the rings on the jigs to ensure proper positioning. Insert and fasten the 2 screws in the other holes.



Ground wire connection

- 10** Replace the assembly jigs with the 2 remaining screws after placing the ground wire as shown in the figure.
- 11** Loosen the screw on the plug-holder on the Sensitive element, and lift the holder 2-3 mm upwards.
- 12** Connect the plug to the connectors on the Sensitive element's PCB according to the labelling on the PCB and on the wires. Make sure that the pin guides on the plug are properly entered, and that the wires are not twisted.
- 13** Firmly tighten the screw on the holder.



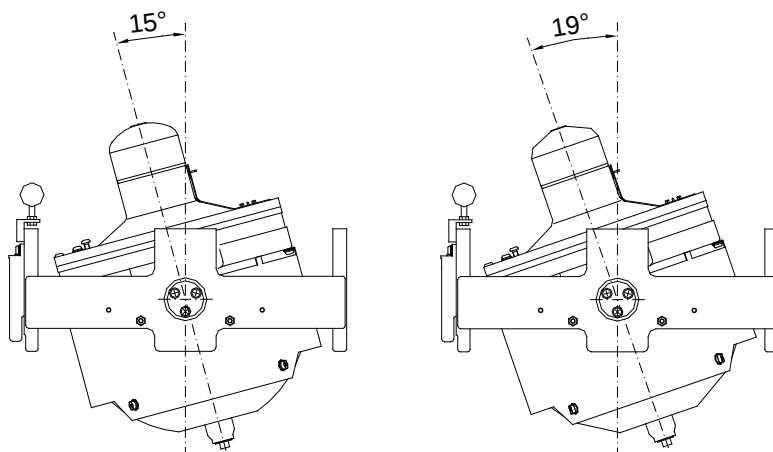
Pin guides

Verifying the element's tilt angle

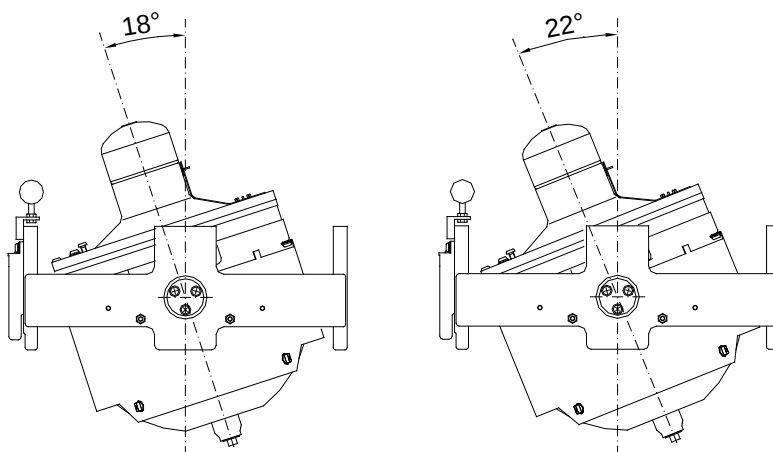
1 Tilt the Sensitive element by hand towards the reference level tool on the Horizontal ring and keep it tilted for approximately 1 minute. Remove the pressure and observe that the tilt angle remains at:

- GC80: 15° to 19°
- GC85: 18° to 22°

The tilt angle is indicated in the figures below.



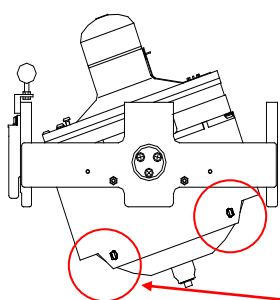
Max and min tilt angle for GC80 std system



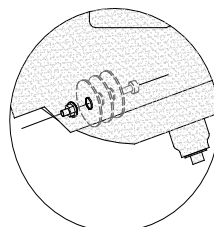
Max and min tilt angle for GC85 High Speed system

Note!

The tilt angles shown above are correct for cold conditions. The angles may change when the element has reached normal operational temperature!



- 2 If the tilt angle is incorrect, weight disks must be adjusted by moving weights from 1 side to the other. After adjustments, wait for 2 minutes for the oil to set before the tilt angle verification is repeated.



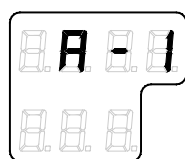
Caution

The Sensitive element must have equal number of weight disks on both weight points on the tilting side (north and south sides)!

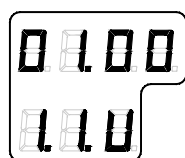
- 3 Carefully rotate the Horizontal ring at least 1 complete rotation. Verify that all movable parts will rotate without making mechanical or electrical contact with any item or component.

Parameter updates

When a Sensitive element is replaced, parameters for the new element have to be loaded into the GC80/85 Control unit before the Gyro compass is turned ON. This is done from the Extension menu as described below.



- 1 Enter the Extension menu by pressing and holding the **SET** button and the **ACK/ENT** button simultaneously for appr. 3 seconds.
 - Main category **A-1** will be displayed.



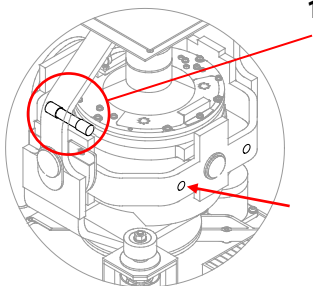
- 2 Press the **SET** button to enter the sub-category loop. Sub-category **1.1.U** and its parameter values will be displayed.
- 3 Use the **ARROW** buttons to increase or decrease the parameter value until the value is according to the table supplied with the new Sensitive element.
- 4 Confirm the entry by pressing the **ACK/ENT** button. The display will return to sub-category **1.1.U**, and the data will be transferred to the Gyro immediately.
- 5 Press the **DISP** button again to select sub-category **1.6.t**, and use the **ARROW** buttons to increase or decrease the parameter value until the value corresponds with the parameter for the new Sensitive element. Confirm the entry by pressing the **ACK/ENT** button.
- 6 Exit the sub-category by pressing the **SET** button, and then exit the Extension main category by pressing and holding the **SET** and **ACK/ENT** buttons simultaneously for appr. 3 seconds.

For more information about the Extension menu, see **ADVANCED SETTINGS**, page 66 onwards.

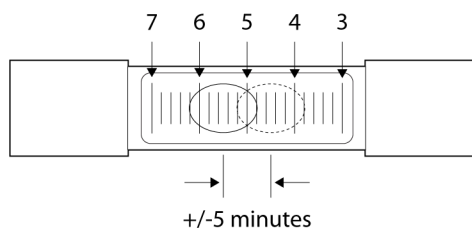
Balancing the Horizontal ring

After the Sensitive element has been replaced, the Gyro compass should be turned ON as described on page 20.

When the compass has been running continuously for at least 2 hours, the Horizontal ring should be adjusted.



- 1** Locate the reference level tool on the Horizontal ring, and check that the level bubble is within ± 5 minutes from the center. Each division equals 2 minutes.



- 2** If the level bubble is not within this limit, add or remove weights from the Horizontal ring until it is level.

Note!

It is important that there are as few weights as possible on the Horizontal ring.

- 3** Let the compass run for at least 20 minutes before the level is rechecked and eventually confirmed.

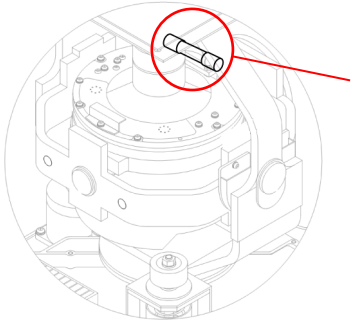
WARNING

If the Horizontal ring is tilted more than $\pm 5'$, a bearing error will be generated!

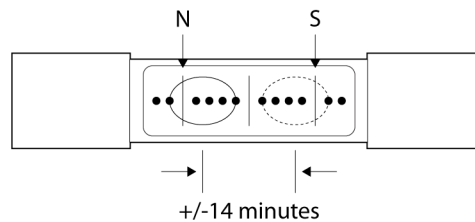
Adjusting the Rotor balance

After replacing a Sensitive element, it is very important to verify the rotor balance. If necessary, adjust the rotor balance. On the Sensitive element, the reference level tool is mounted on the opposite side of the blue plug.

When the compass has been running continuously for at least 3 hours, the balancing process can start.



- 1 The reference center of the rotor level depends on the latitude, ref. graph on next page.
- 2 The rotor level can only be balanced/adjusted using the "Theta Offset" parameter (1.6.t in the extension menu A-1). The Bubble will react when the value is changed. However, it will take at least 1 hour before it is stabilized. The Bubble level should be checked again after 24 hours and adjusted if needed. The rotor level must be within ± 14 minutes from the reference center.



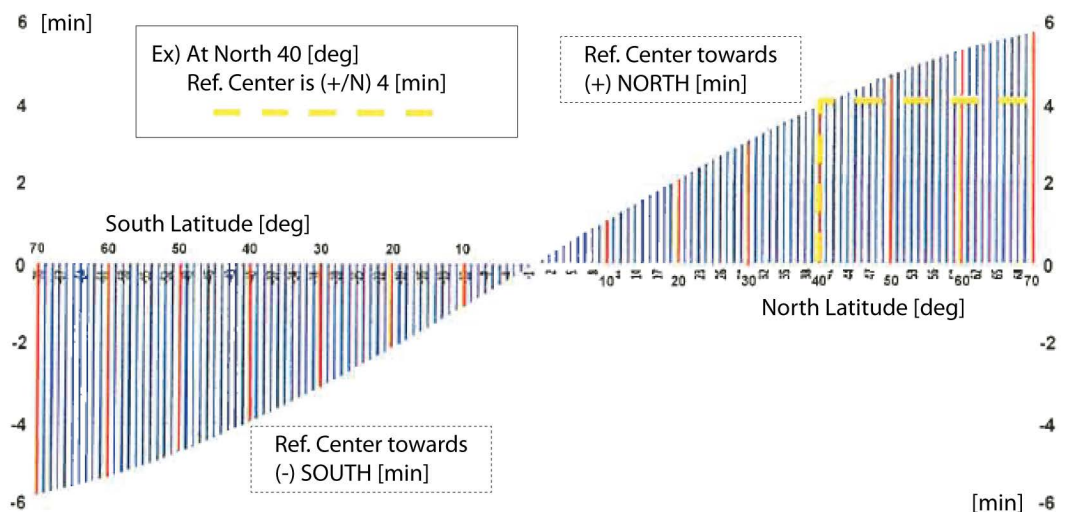
Increase Theta Offset = Bubble towards NORTH

Decrease Theta Offset = Bubble towards SOUTH

Note!

The Theta Offset should not be changed more than ± 0.1 from the element's original parameter value.

- 3 If the rotor level bubble still touches the end of the reference level tool after 3 hours, even if the Theta Offset value is correct according to parameter list/label, the Sensitive element is damaged and must be replaced.



5.8 Replacing the Fuses

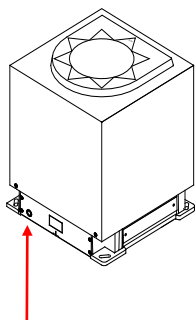
WARNING

Before a fuse is replaced, disconnect the respective power for the damaged fuse.

Use the procedures described on the following pages when replacing the fuses.

Master compass

Fuse F1 is located inside the fuse holder in the front of the Master compass.



F1 (12 A)

- 1** Open the fuse holder by pressing and turning the fuse holder edge counter-clockwise with a screwdriver.
- 2** Replace fuse F1, and close the holder by turning it clockwise.

GC80/85 Expanded MK2 Control unit

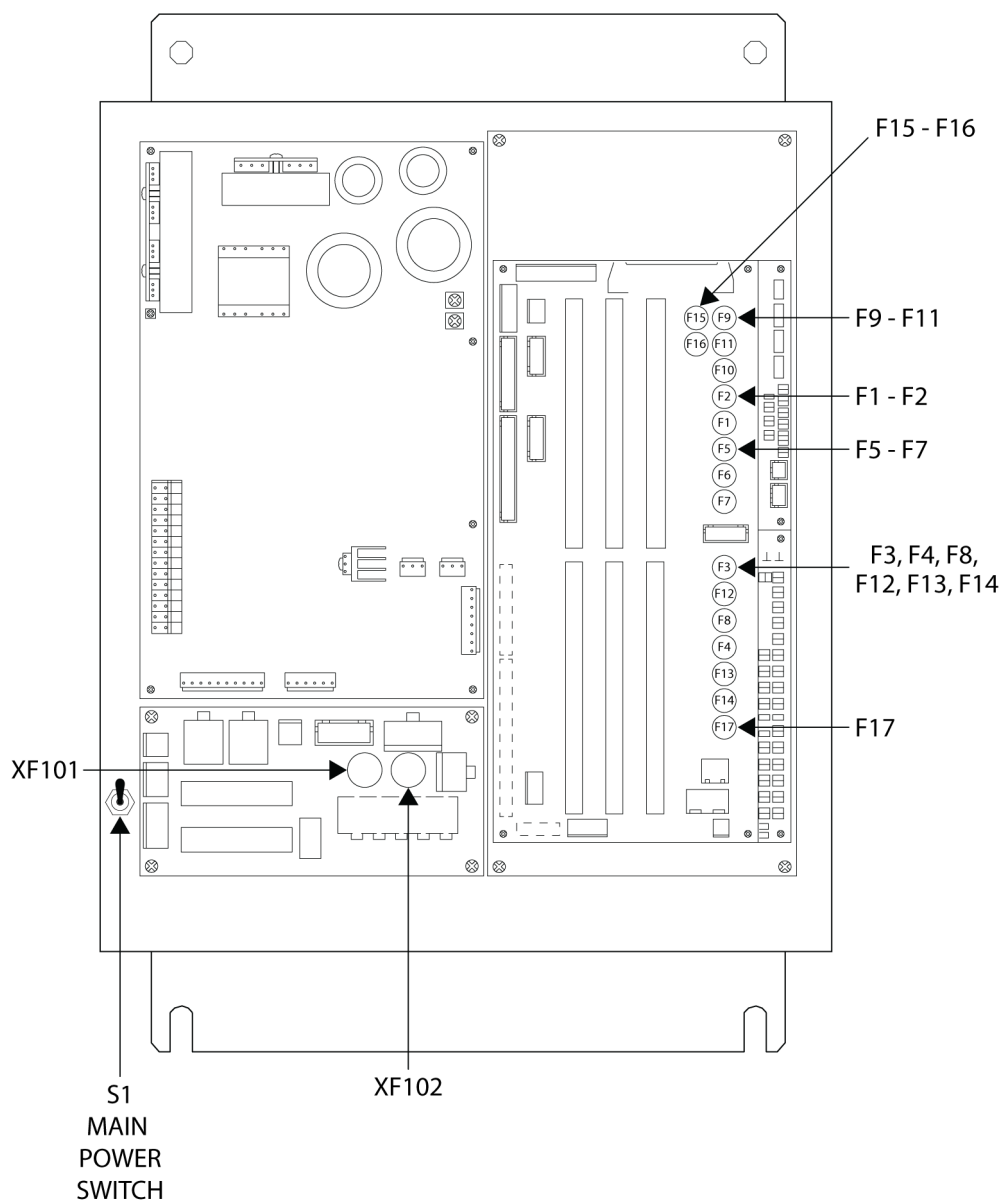
For location of the fuses, refer to the drawing on the next page.

GTERM-A board

FUSE NO	CAPACITY	TB-NO	SIGNAL	DESCRIPTION
F1	1 A	TB2-1 5	1R24+	Power supply for ch.1 serial repeater
F2		TB2-1 10	2R24+	Power supply for ch.2 serial repeater
F3		TB2-1 15	3R24+	Power supply for ch.3 serial repeater
F4		TB2-1 20	4R24+	Power supply for ch.4 serial repeater
F5		TB2-2 29	5R24+	Power supply for ch.5 serial repeater
F6		TB2-2 34	6R24+	Power supply for ch.6 serial repeater
F7		TB2-2 39	7R24+	Power supply for ch.7 serial repeater
F8		TB2-2 44	8R24+	Power supply for ch.8 serial repeater
F9		TB1-2 31	9R24+	Power supply for ch.9 serial repeater
F10		TB1-2 36	10R24+	Power supply for ch.10 serial repeater
F11		TB2-3 61	ST15	Power supply for ch.1 step motor repeater
F12		TB2-3 66	ST25	Power supply for ch.2 step motor repeater
F13		TB2-3 71	ST35	Power supply for ch.3 step motor repeater
F14		TB2-1 24	ST45	Power supply for ch.4 step motor repeater
F15	10 A	TB2-1 10		Repeater power supply (24 V DC)
F16	3.15 A			Power supply for Control unit (24 V DC)
F17				Not used

CTERM board

FUSE NO	CAPACITY	TB-NO	SIGNAL	DESCRIPTION
XF101	6.3 A	TB101		Main power supply (AC100/220 V)
XF102	10 A	TB101		Battery power supply (24 V DC)



WARNING

Make sure that the main power switch S1 is turned OFF before any fuse is replaced!

Note!

The fuses in the Expanded MK2 Control unit are open glass type and may be damaged if handled with force.

- 1** Pull the damaged fuse up from the holder.
- 2** Re-install a new fuse by carefully pushing it into the holder. When located correctly, it should be fixed 1-2 mm above and parallel to the mounting level.

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6 INSTALLATION

This section is a reference guide to correctly install and configure the GC80/85 Gyro compass.

6.1 Unpacking and handling

A GC80/85 Gyro compass consists of the following units:

- Master compass
- Sensitive element
- Expanded MK2 Control unit
- Spare part kit
- Mounting jigs
- Documentation

The Sensitive element is shipped from the factory packaged separately in a carton box to protect it from excessive shock and vibration. The final assembly of the Sensitive element into the Master compass has to be done when the Master compass is mounted onboard the vessel. Refer page 55.

Note!

It is strongly recommended to keep the Sensitive element's packaging material. This original packaging should be used if the element is sent to the factory for overhaul or repair.

Care should be taken when unpacking and handling the equipment. A visual inspection should be made to see that the equipment has not been damaged during shipment and that all components and parts are included.

6.2 Mechanical installation

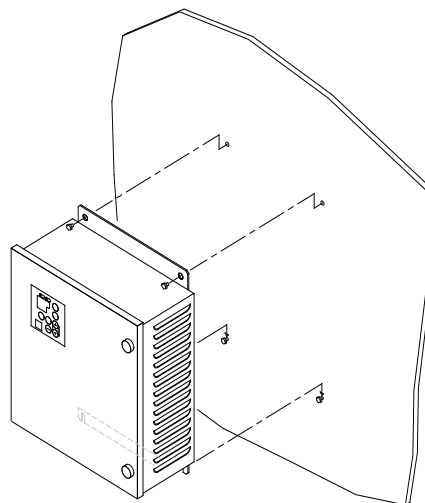
The units included in the GC80/85 system should be mounted with special regard to the units' environmental protection, temperature range and cable length. Refer **TECHNICAL SPECIFICATIONS**, page 73 onwards.

Note!

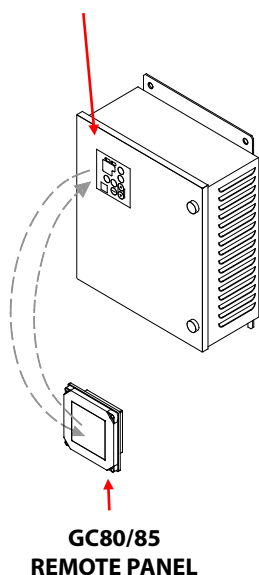
A special tool (Simrad part no. 44174449) is required when installing the Sensitive element. This tool is included in the Gyro packaging, and the Sensitive element should not be installed without using this tool.

Control unit

The Control unit is bulkhead mounted by using 4 bolts as shown in the illustration.



**CONTROL
PANEL**



Flush mounting the Control panel

The Control panel may be removed from the Control unit and mounted in a remote location by using the optional flush mounting kit (part number 27101757).

The flush mounting kit includes:

- 1 flush mounting panel
- 4 corners
- 4 mounting screws
- 1 blind cover

In addition to this kit, two optional Control panel cables can be ordered.

Mandatory cable (GPANNEL-A J1 - SCC J1) available in 3 different lengths:

- 5 m (part no. 44170736)
- 10 m (part no. 44170744)
- 15 m (part no. 44170751)

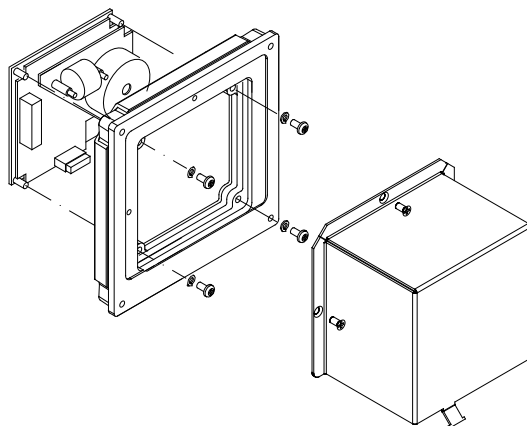
Optional cable (GPANNEL-A J10 - CTERM J10), if BAM communications is used, available in 3 different lengths:

- 5 m BAM (part no. 000-15835-001)
- 10 m BAM (part no. 000-15836-001)
- 15 m BAM (part no. 000-15837-001)

Use the following procedure when remotely mounting the Control panel:

- 1** Open the Control unit and remove the wiring strips holding the Control panel's cables.
- 2** Disconnect the cable's grounding wires (labelled FG) from the Control panel and from the SCC board in the Control unit.

- 3 Disconnect the plugs and remove the Control panel's cable(s).
- 4 Loosen the 4 nuts holding the Control panel and remove the panel. These nuts are to be re-used when fastening the Control panel to the flush mounting panel.
- 5 Insert the Control panel in the flush-mounting kit from the front as shown in the figure. Fasten the panel using the 4 nuts.

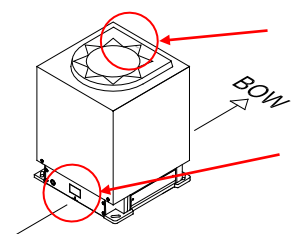


- 6 Insert the plug(s) on the optional Control panel cable and connect the grounding wire.
- 7 Mount the cover on the back side.
- 8 Fasten the cable(s) to the cover using a wire strip.
- 9 Slide the Control panel cable through the cable inlet, insert the plug(s) in the SCC board and connect the grounding wire. Secure the cable(s) to the Control unit using a wire strip.
- 10 Insert the blind cover in the Control unit by using the 4 bolts included in the kit.

Master compass

Select a mounting location where the deck is horizontal, flat and with little vibration, and where the pitch/roll motion is minimal.

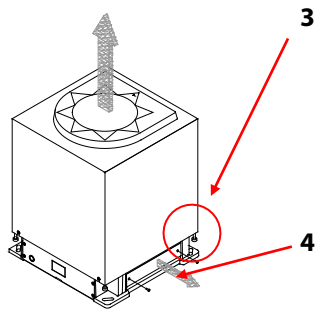
It is also important to select a mounting location with sufficient space for installation and service. Refer dimensional drawing, page 83.



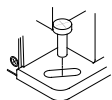
- 1 Place the compass on or parallel to the vessel's horizontal centerline, with the bow indication on the top of the case pointing towards the vessel's bow.
- 2 Use the datum line at the front and the back of the compass to line up the unit.
 - It is possible to compensate for a small mounting offset by using the heading offset feature as described in ***Adjusting True heading***, page 63
 - It is also possible to mount the master Gyro with a 180 degree offset. The S1-7 on the MCC board must then be set to ON.

WARNING

The Master Gyro must never be mounted with 90 degree offset.



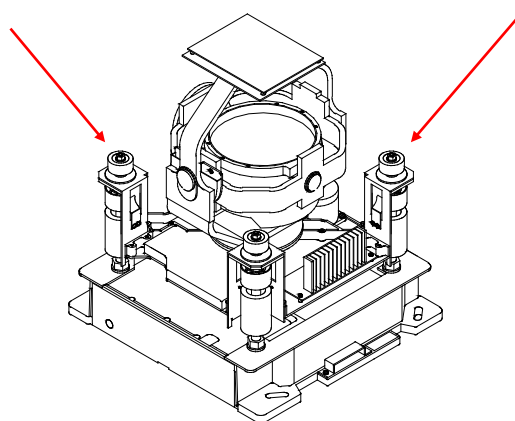
3 Remove the 4 screws holding the compass case and carefully lift the case up and away.



4 Remove the cable inlet cover.

5 Fasten the compass to the deck using 4 bolts. The bolts should be located at the center of the trails in order to later be able to adjust the compass direction when the heading is tuned in. Refer ***Adjusting True heading***, page 63.

6 Remove strips and foam rubber from the shock absorbers, together with all strips used to secure moving parts during transportation.



Note!

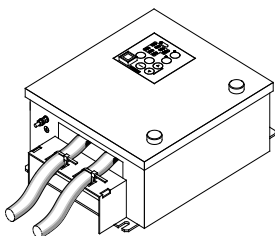
The foam rubber should be kept for re-use if the Master compass has to be sent to factory for service!

6.3 Cabling

Note!

No cables are included when the Gyro system is delivered from factory.

The wiring diagrams on page 81 onwards include cable specifications for all cables.



Connect power and signal cables according to the wiring diagrams on page 81 onwards.

To avoid cables to loosen due to vibration, the cables could be fastened to the fixing device using wire strips as illustrated in the figure.

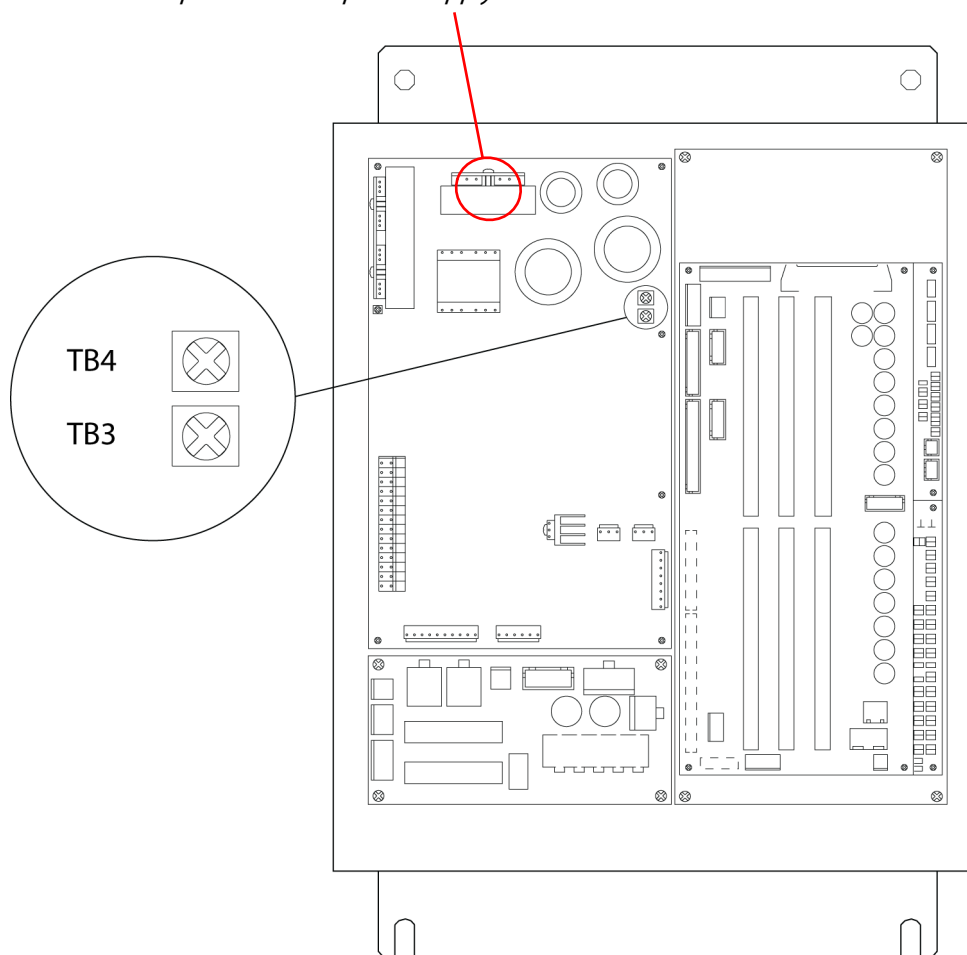
Power supply

GC80/85 is supplied with 110 or 220 V AC.

When delivered from factory, the system is set up for 220 V AC. If the system is to be supplied with 110 V AC, a strap on the GPOWER board has to be added as shown in the figure and the table below.

Note!

Replace the 220 V AC label with a 110 V AC indication if the compass is set up for 110 V AC power supply!

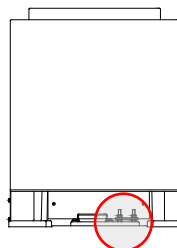


TB3-TB4	VOLTAGE
Open	220 V AC (default)
Short	100/110/115 V AC

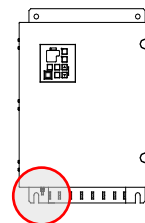
6.4 Grounding the units

All units in the GC80/85 system should have a proper ground connection from the unit's ground terminal.

The wires should be as short as possible and have a cross section of at least AWG13 (2.5 mm²).



MASTER COMPASS



EXPANDED MK2 CONTROL UNIT

6.5 DIP switch and jumper settings

GC80 and GC85 Gyro systems include several DIP switches and jumpers. With the exception of 2 switches on the SCC board in the Control unit, no switches have to be set when installing the system. These 2 switches are set to configure the Control unit to match the type of Gyro system (GC80 or GC85), and to activate an external heading sensor.

Note!

All DIP switch settings are read when the system is started. Any changes made while the system is running will therefore not take effect until the system is restarted.

For a complete list of DIP switch settings, refer to **DIP SWITCH SETTINGS**, page 99.

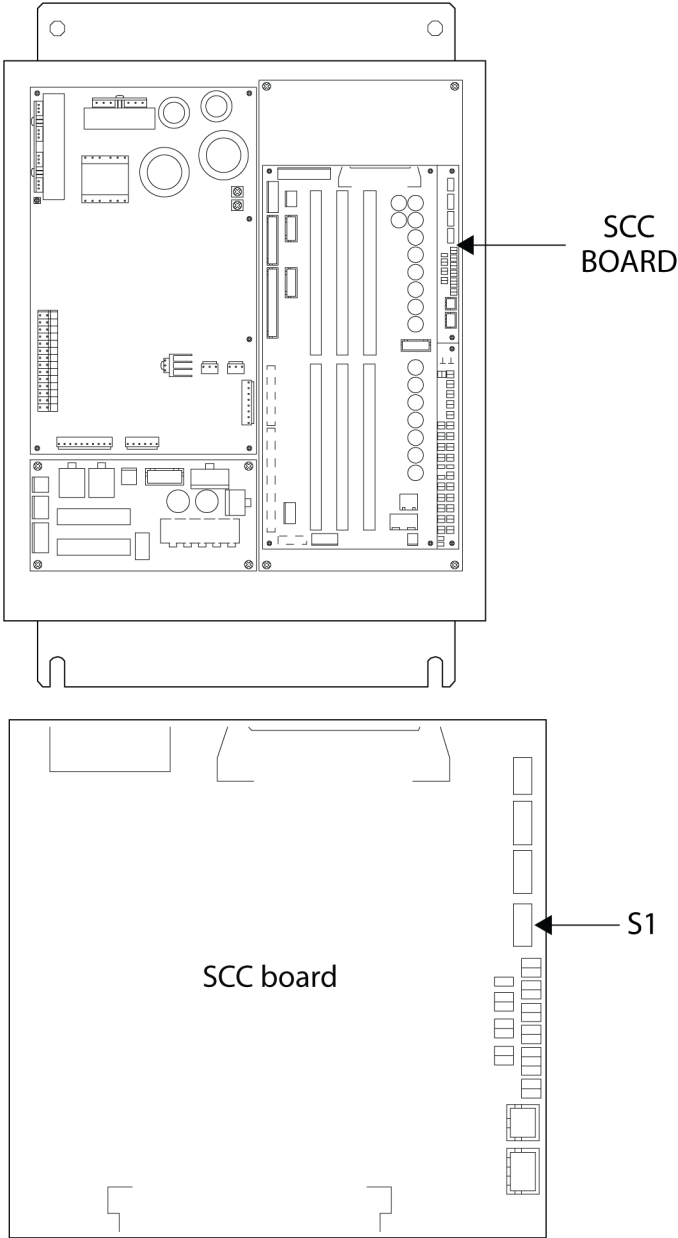
Activating the GC80 or GC85 Control unit

When the Gyro system is shipped from factory, all DIP switches in the Control unit are set as standard GC80 system.

Before the system is started, the switch settings described below have to be changed to match a GC85 system.

DIP switch no.2 on S1 on the SCC board identifies the Gyro as a GC80 or GC85 system.

The SCC board is located underneath the GTERM-A board.



GC80 system	GC85 system
 S1	 S1

All outputs are selectable for 1, 5, 10 or 50 Hz.

Refer **DIP SWITCH SETTINGS** on page 99 onwards.

Note!

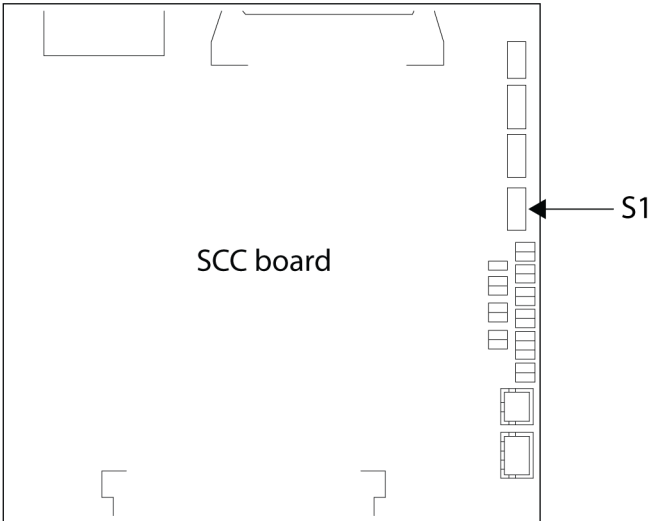
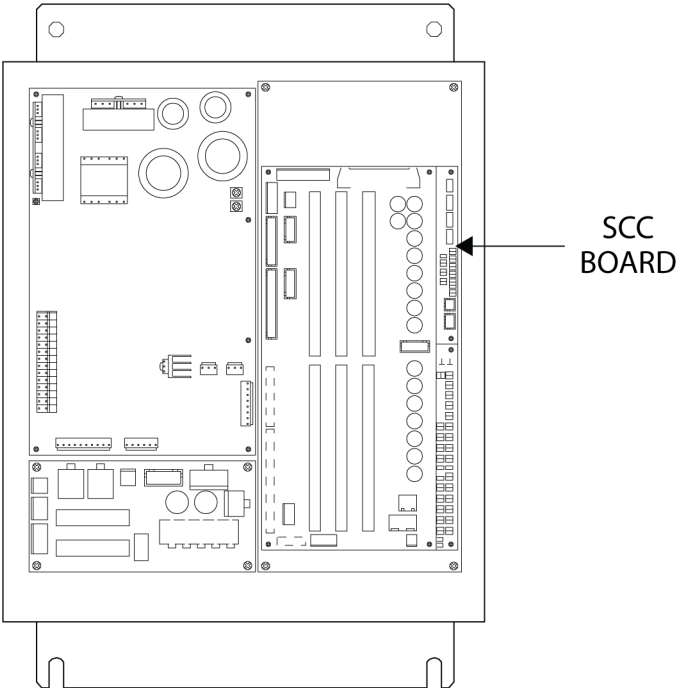
A GC85 system is recommended to be set for 50 Hz output!

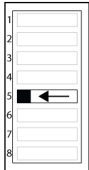
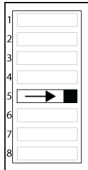
Note!

50 Hz will automatically be selected when the output is set for 38400 baud.

Activating an external heading sensor

If an external heading sensor is connected to the GC80/85 system, DIP switch no.5 on S1 on the SCC board has to be set to enable the external heading sensor.



No external sensor	Active external sensor
 ON S1	 ON S1

The external heading sensor data received must be THS, HDT or HDG (with magnetic corrections). If output is set to THS, the input from the external sensor must be THS as well. The same goes for HDT. When powered ON, the Gyro will automatically detect the external sensor's baud-rate.

HDT/THS

Selecting HDT/THS heading output data from the Gyro

The serial data output can be set as HDT or THS using DIP switch no.5 on S4 on the SCC board.

THS is disabled = HDT output	THS is enabled = THS output
	

To output HDT and THS at the same time, S2-5 and S4-5 must both be set to ON and S2-6 must be set to OFF. When outputting both at the same time, the only available output frequency is 1 Hz.

Selection of PTKM and ROT output

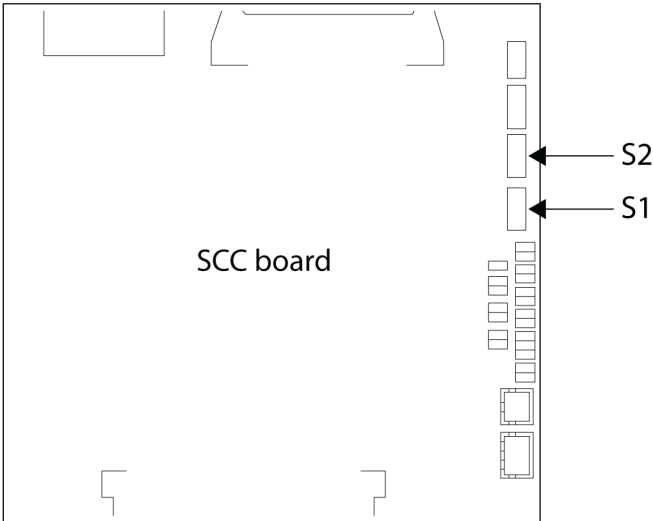
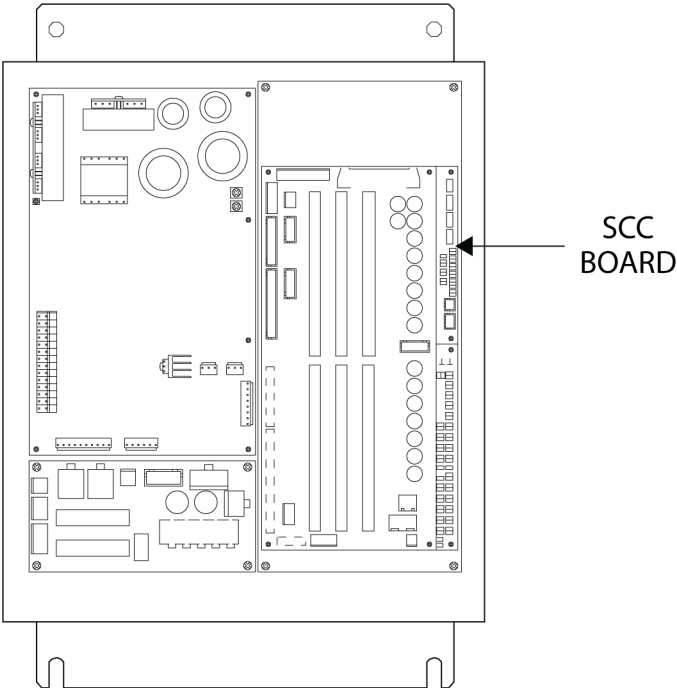
It is possible to set the sentences PTKM and ROT to output at the same time as the heading data.

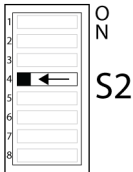
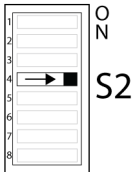
To do so, use the extension menu A-2:

2.G.P	PTKM sentence output	bE = ON/send Non = OFF/not send
2.H.r	ROT sentence output	bE = ON/send Non = OFF/not send

Activating the pendulum function

If an external switch is connected to the GC80/85 system to operate the pendulum function, DIP switch no.4 on S2 on the SCC board has to be set to activate the pendulum function.



Pendulum switch disabled	Pendulum switch enabled
	

Activating external/internal reset of external/internal buzzer alarm

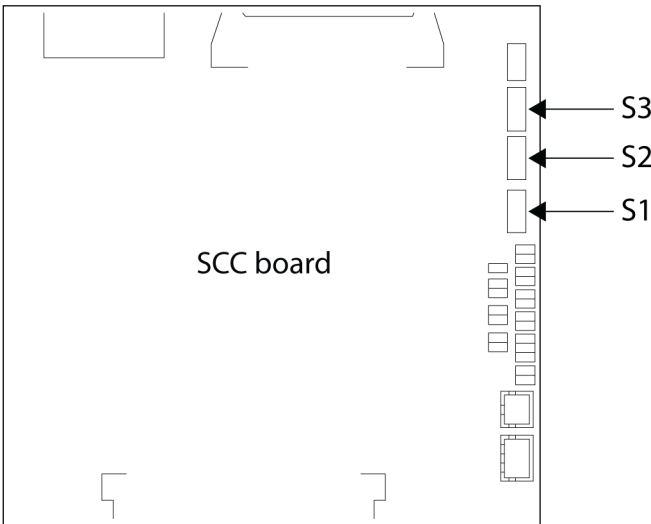
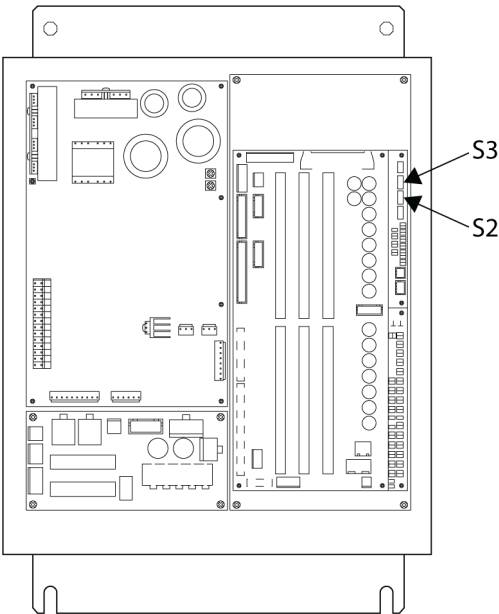
In some installations, it is required to have the Gyro system connected to an external alarm panel (central bridge alarm panel). To have the right handshake available from GC80/85 systems, some DIP switches must be set.

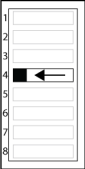
The external buzzer reset uses the same input as pendulum function. That means the pendulum function must be disabled. DIP switch no.4 on S2 on the SCC board has to be set to OFF to activate the EXTERNAL BUZZER STOP input.

The external buzzer stop output is the same as used as RUNNING CONTACT (Gyro 1) output. To use output as external buzzer stop to external alarm panel, DIP switch no.8 on S3 on the SCC board must be set to ON to activate EXTERNAL BUZZER STOP output function.

For a complete list of DIP switch settings, refer to *DIP SWITCH SETTINGS* on page 99.

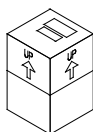
For location of the board, refer the figure on page 99.



External buzzer stop enabled (Pendulum switch disabled)	Pendulum switch enabled
	

External buzzer stop disabled (Gyro Running cont. enabled)	External buzzer stop enabled
	

6.6 Installing the Sensitive element



The Sensitive element is shipped from the factory in a separate package. The element has to be installed in the Master compass according to the description below.

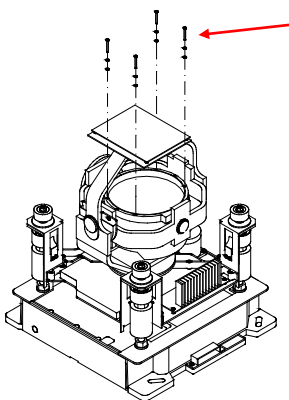
Note!

A special tool (part no. 44174449) is required when installing the Sensitive element. This tool is included in the Gyro packaging, and the Sensitive element should not be installed without using this tool.

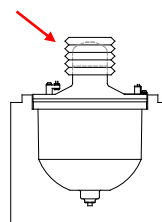
Caution

Use extreme caution when handling the Sensitive element! Do not tilt the element. It is filled with oil and the top includes a ventilation opening.

- 1 Make sure that the Master compass is installed and cables connected according to the description on page 46 onwards.

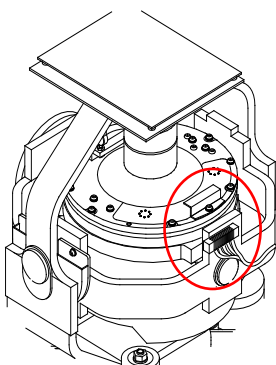


- 2 Remove the 4 screws on the Horizontal ring.
- 3 Carefully lift the Sensitive element from its packaging, and remove the rubber tube on top of the element.



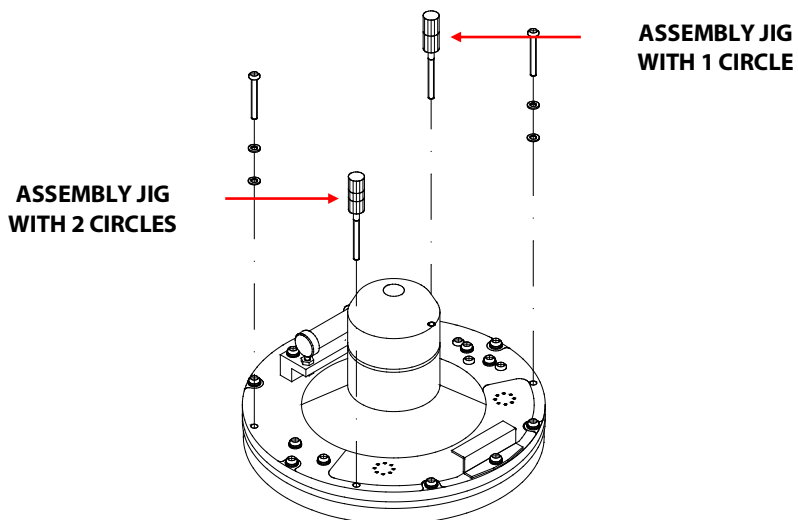
Note!

The packaging and the rubber tube should be kept for re-use if the Sensitive element has to be sent to factory for service!

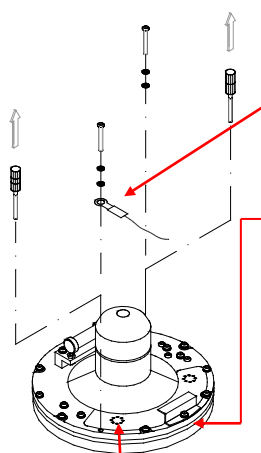


- 4 Tilt the Horizontal ring to the side where the plug is located, and carefully put the Sensitive element into the ring.
- The socket on the Sensitive element should be located right above the plug attached to the Horizontal ring.

- 5 Position the Sensitive element on the Horizontal ring by putting the assembly jigs into the holes as indicated in the figure below. Observe the labelling and the diameter on the jigs. Fasten 2 screws in the other 2 holes.



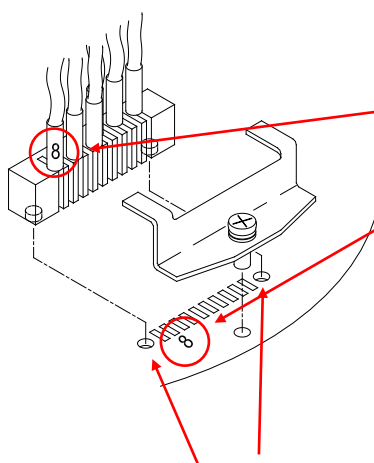
- 6 Replace the assembly jigs with the 2 remaining screws. Locate the ground wire on 1 of the screws as shown in the figure.



- 7 Loosen the screw on the plug-holder on the Sensitive element and lift the holder 2-3 mm upwards.

- 8 Connect the plug to the connectors on the Sensitive element's PCB according to the labelling on the PCB and on the wires. Make sure that the pin guides on the plug are properly entered, and that the wires are not twisted.

- 9 Firmly tighten the screw on the holder.

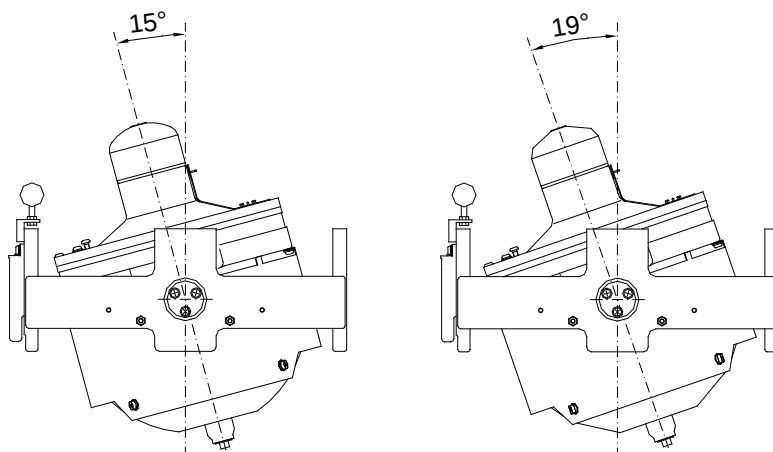


Verifying the element's tilt angle

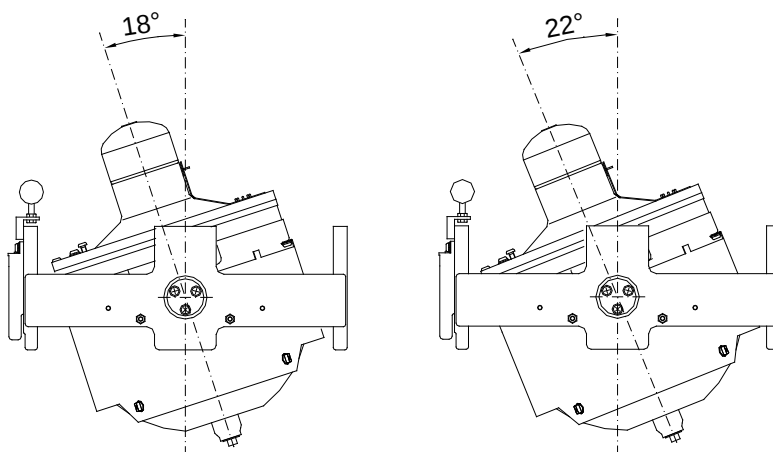
- 1 Tilt the Sensitive element by hand towards the level tool on the Horizontal ring and keep it tilted for approximately 1 minute. Remove the pressure and observe that the tilt angle remains at:

- GC80: 15° to 19°
- GC85: 18° to 22°

The tilt angle is indicated in the figures below.



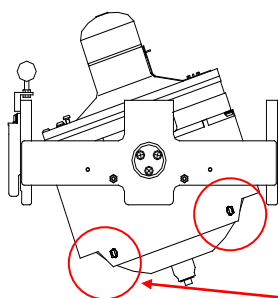
Max and min tilt angle for GC80 std system



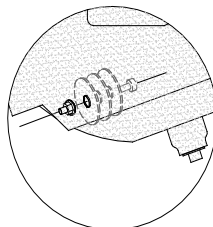
Max and min tilt angle for GC85 High Speed system

Note!

The tilt angles shown above are correct for cold conditions. The angles may change when the element has reached normal operational temperature!



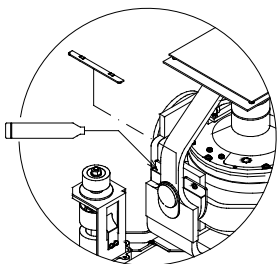
- 2** If the tilt angle is incorrect, weight disks must be adjusted by moving weights from 1 side to the other. After adjustments, wait for 2 minutes for the oil to set before the tilt angle verification is repeated.



Caution

The Sensitive element must have equal number of weight disks on both weight points on the tilting side (north and south sides)!

- 3** Carefully rotate the Horizontal ring at least 1 complete rotation. Verify that all movable parts will turn around without making any contact with mechanical or electrical components.



- 4** Lift the lid from the damper oil case, and fill the container with the supplied damper oil. The oil has high viscosity, and care should be exercised when pouring the damper oil into the container to avoid spill. Reinstall the lid on the damper oil case.

Any oil spilled on the outside should be cleaned.

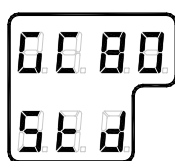
6.7 System start-up and software configuration

When all GC80/85 units are installed and the cables connected according to the procedures described in previous chapters, the system is ready for the first time start-up procedure.

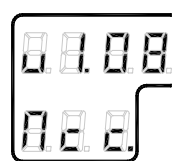
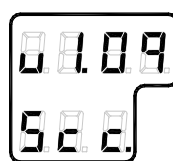
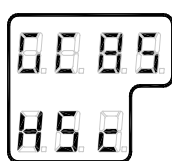
System Start-up



- 1 Turn ON the Gyro system by pressing the **POWER** button on the Control panel. Follow the start-up sequence.
 - Control unit type (GC80 Std, or GC85 HSc), software version for Control unit and for Master compass is displayed in rapid succession. Examples of display texts are shown below:



OR

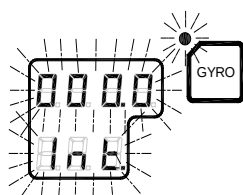


**GC80 CONTROL
UNIT
STD VERSION**

**GC85 CONTROL
UNIT
HIGH SPEED
VERSION**

**SOFTWARE VERSION
CONTROL UNIT**

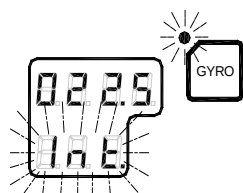
**SOFTWARE VERSION
MASTER COMPASS**



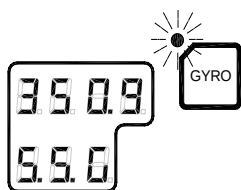
The Sensitive element starts rising horizontally, and the compass turns 360° clockwise. The display shows decreasing bearing as the compass is turning.

If the Gyro has been turned ON and OFF again, but the rotor still rotating when the **POWER** button is pressed for new start, a rotor break function will be activated to completely stop the rotor.

Active rotor break is indicated with flashing display.



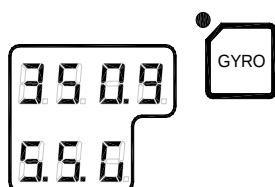
When the rotor rotation has stopped, start bearing is indicated with flashing text in the display. The start bearing will be the same as active bearing when the compass was turned OFF.



The indicated start bearing is accepted by pressing the **ACK/ENT** button, or increased/decreased by using the **ARROW** buttons and then pressing the **ACK/ENT** button. If no action is taken within 3 minutes, the start-up process will continue with the indicated start bearing.

The bearing indication stops flashing when the start bearing is accepted, while the lamp and S.S.G. (mode) remain flashing.

The rotor starts spinning, and reaches full speed after maximum 30 minutes.



When the rotor has reached full speed, the compass starts the north seeking function. The display will now change to show the compass' actual heading, and from now on bearing output will be available.

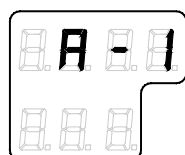
The lamp next to the **GYRO** button changes from flashing to steady light, but the S.S.G. (mode) continues to flash for 3 hours.

The GC80/85 will be settled within 3 hours when started with a deviation angle less than 5°. With a larger deviation angle, the compass will be settled within 4 hours.

Configuring the Gyro system

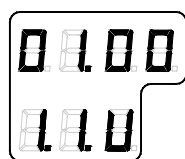
Each Sensitive element is tuned to its Master compass before it is shipped from the factory. This tuning is reflected in a set of parameters specific for this Gyro compass. These parameters are included in the Sensitive element's packaging, and they have to be entered into the Control unit as part of the Gyro compass' installation procedure.

The parameters are loaded into the Control unit from the Extension menu as described below:



- 1 Access the Extension menu by pressing and holding the **SET** button and the **ACK/ENT** button simultaneously for appr. 3 seconds.

Main category **A-1** will be displayed.



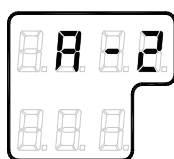
- 2 Press the SET button to access the sub-category loop. Sub-category 1.1.U and its parameter values will be displayed.
- 3 Use the ARROW buttons to increase or decrease the parameter value until the value is according to value in the table included with the Sensitive element.

- 4 Confirm the entry by pressing the ACK/ENT button. The display will return to sub-category 1.1.U, and the data will be transferred to the Gyro immediately.



- 5 Press the DISP button again to select sub-category 1.2.F, and use the ARROW buttons to increase or decrease the parameter value until the value corresponds with the parameter for the new Sensitive element. Confirm the entry by pressing the ACK/ENT button.

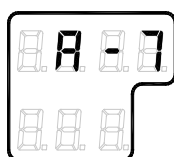
- 6 Repeat step 5 for sub-category 1.3.S, 1.4.u, 1.5.L and 1.6.t.



- 7 Press the SET button again to return to main category A1, and then press the DISP button to go to A2 main category.
- 8 Press the SET button, and enter values for 2.1.o and 2.3.h as described above.
- 9 While still in **A2** main category, enter values for **2.5.y** (Year), **2.6.N** (Month and Day), **2.7.t** (Hour and Minute) and **2.8.d** (total days of operation). This value should be reset after installation).

Note!

All time parameters should preferably be in CET (Central European Time) or, if not possible, in local time.

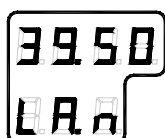


- 10 Press the SET button again to return to main category A2, and then press the DISP button until main category A7 is displayed.
- 11 Exit the sub-category by pressing the **SET** button, and then exit the Extension main category by pressing and holding the **SET** and **ACK/ENT** buttons simultaneously for appr. 3 seconds.

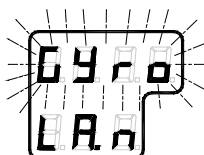
For more information about the Extension menu, see **ADVANCED SETTINGS**, page 66 onwards.

Setting the Latitude input source

When the system is configured as described in *Configuring the Gyro system* on page 60 onwards, the latitude input source can be changed as described below:

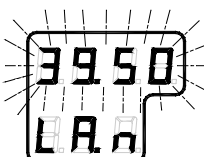


- 1 Press the **DISP** button until the display shows latitude value.



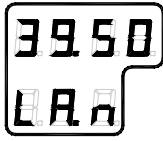
- 2 Press the SET button once, and the upper line in the display starts flashing.

- 3 Use the ARROW buttons to select Gyro or GPS as the latitude input source, and confirm the entry by pressing the ACK/ENT button.



- If **Gyro** is selected, the display will change to flashing numbers
 - If **GPS** is selected, the display will show the latitude value read from the GPS
- 4 When Gyro is selected and the numbers are flashing, press the ARROW buttons to increase/decrease the latitude value and confirm the entry with the ACK/ENT button.
 - This entered latitude value is used, together with speed and

bearing information, to calculate the vessel's current latitude.



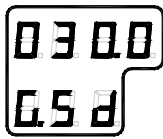
Note!

- 5 The display will return to show latitude value without flashing.

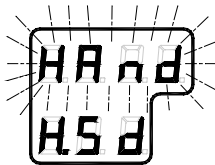
If GYRO is selected you need to verify that GPS connection is set to Non in extension menu A-2, 2.9.G.

Setting the Speed input source

When the system is configured as described in *Configuring the Gyro system* on page 60 onwards, the speed input source can be changed as described below:



- 1 Press the **DISP** button until the display shows speed value and speed input source.



- 2 Press the SET button once, and the upper line in the display starts flashing.

- 3 Use the ARROW buttons to toggle between available speed input sources:

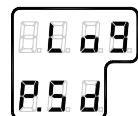
Manual



GPS



LOG (pulse)



LOG (serial)



- 4 Select active speed input source and confirm the selection by pressing the ACK/ENT button.
- 5 If Manual input source is selected, the display will change to show flashing numerical values.
- 6 Use the ARROW buttons to enter the speed value, and confirm the input by pressing the ACK/ENT button.





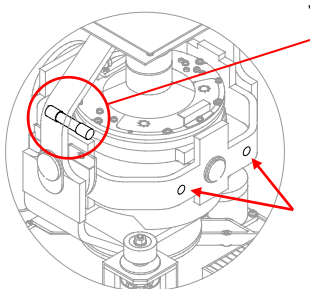
- 7 The display will return to show speed value and speed input source without flashing.

Note!

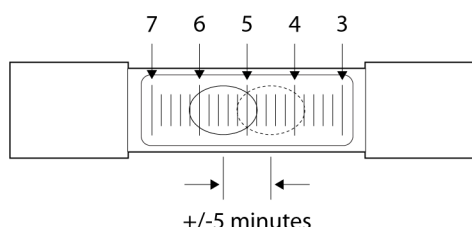
If Manual or GPS is selected (used) and no pulse or serial data for speed is connected you need to verify that LOG connections is set to Non in extension menu A-2, 2.A.L and 2.b.S.

6.8 Balancing the Horizontal ring

After the compass has been running continuously for at least 2 hours, the Horizontal ring should be adjusted.



- 1 Locate the reference level tool on the Horizontal ring, and check that the level bubble is within ± 5 minutes from the center. Each division equals 2 minutes.



- 2 If the level bubble is not within this limit, add or remove weights from the Horizontal ring until it is leveled.

Note!

It is important that there are as few weights as possible on the Horizontal ring.

- 3 Let the compass run for at least 20 minutes before the level is rechecked and eventually confirmed.

WARNING

If the Horizontal ring is tilted more than $\pm 5'$, a bearing error will be generated!

Adjusting True heading

After the GC80/85 is settled, the Gyro compass has to be calibrated against an external reference, e.g.:

- a known target
- astronomical observation
- the heading of the pier or quay the vessel is moored to
- 2 fixed points on the chart that the vessel is sailing between

The observation period for the heading difference should be as long as possible.

If there is any difference between the Gyro bearing and the confirmed external reference that cannot be corrected by adjusting the mechanical

location of the Master compass, an offset value may be inserted in the GC80. This value is entered by using the Extension menu as follows:

- 1** Activate the Extension menu by pressing and holding the **SET** button and the **ACK/ENT** button simultaneously for at least 3 seconds.
 - Main category **A-1** will be displayed
- 2** Press the **DISP** button once to display main category **A-2**.
- 3** Press the **SET** button to enter the sub-category **2.1.o**.
- 4** Use the **ARROW** buttons to increase or decrease the offset parameter value.

Note!

*To correct for +1.5°, press the **ARROW UP** button until the display shows 1.5°.*

*To correct for -1.5°, press the **ARROW DOWN** button until the display shows 358.5°!*

- 5** Confirm the new value by pressing the **ACK/ENT** button, or reject the changes by pressing the **SET** button. The display will return to sub-category **2.1.o**.
- 6** Exit the Extension menu by pressing and holding the **SET** and **ACK/ENT** buttons simultaneously for at least 3 seconds.

For further information about the Extension menu, refer *Using the Extension menu* from page 66 onwards.

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7 ADVANCED SETTINGS

This section gives an overview of the Extension menu: how to enter the menu and how to change parameter values.

7.1 General

The Extension menu holds internal parameters and communication parameters required to achieve the best possible heading accuracy on the GC80/85 Gyro compass.

The Extension menu is grouped in 8 main categories, named A-1 through A-8. Each of these main categories has several sub-categories where parameter values may be set.

All values in the Extension menu are stored in the nonvolatile memory of the compass.

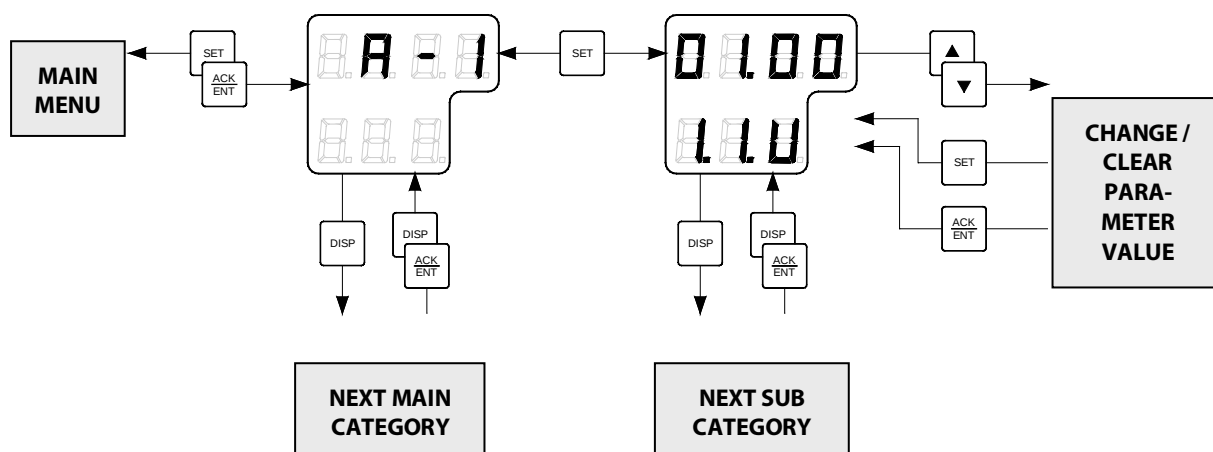
7.2 Using the Extension menu

Caution

The Extension menu should not be accessed by unauthorized personnel. Incorrect parameters may result in irregular operation of the GC80/85 Gyro compass!

The extension menu can be accessed when any display is shown in the LCD.

- 1** Activate the menu by pressing and holding the **SET** button and the **ACK/ENT** button simultaneously for at least 3 seconds.
 - Main category **A-1** will be displayed.
- 2** Page through the main categories to the selected category by pressing the **DISP** button. Pressing the **DISP** and **ACK/ENT** buttons simultaneously will display the main category loop in reversed order.
- 3** Press the **SET** button to enter the sub-category loop, and use the **DISP** button to select the sub-category that holds the parameter to be changed.
 - Use the **ARROW** buttons to increase or decrease the parameter value.
- 5** Confirm the new value by pressing the **ACK/ENT** button, or reject the changes by pressing the **SET** button. The display will return to selected sub-category.
- 6** Exit the Extension menu by pressing and holding the **SET** and **ACK/ENT** buttons simultaneously for at least 3 seconds.



7.3 The Extension menu overview

Main Category	Sub Category	Parameter/description	Default value	Range
A-1	1.1.U	Damping gain Determines the damping (damping operation in north-seeking motion = half cycle attenuation) and represents a coefficient (ratio) to the standard value stored in the software.	1.00	0.00 - 2.00
	1.2.F	Bearing servo gain Determines the gain of the bearing servo loop where phi Φ signal (deviation signal around rotor's vertical axis) is calculated, drives the azimuth step motor and has the Sensitive element follow to the Gyro-sphere vertical axis (around azimuth axis) rotation. Presents a coefficient (ratio) to the standard value stored in software.	1.00	0.00 - 2.00
	1.3.S	Horizontal servo gain Determines the gain of the horizontal servo loop where theta θ signal (rotor tilting angle signal) is calculated, drives the horizontal DST and has the Sensitive element follow to the Gyro-sphere tilting angle (rotor tilting angle). Presents a coefficient (ration) to the standard value stored in software.	1.00	0.00 - 2.00
	1.4.u	Leveling servo gain Leveling motion (Sensitive element erection motion) calculates X signal (equivalent inclination angle) which is output from the Sensitive element and relative inclination angle signal from HRZC board controls to have the Sensitive element keep horizontal. The value determines this control loop gain. Presents a coefficient (ratio) to the standard value stored in the software.	1.00	0.00 - 2.00

Main Category	Sub Category	Parameter/description	Default value	Range
A-1	1.5.L	(ϕ) Phi offset (°) Offset value (°) around the vertical axis of Gyro-sphere (rotor axis) and the Sensitive element.	0.00	-3.00 - 3.00
	1.6.t	(θ) Theta offset (°) Offset value (°) around the horizontal axis of gyro-sphere (rotor axis) and the Sensitive element.	0.00	-3.00 - 3.00
	1.7.G	X signal pickup gain (v/°) Distance of the Sensitive element share and the rotor axis direction. Inclination angle around horizontal axis is obtained equivalently by monitoring this signal. For example, when north side of the rotor axis rises, the Sensitive element follows to rise its north side and then Gyro-sphere suspended by the suspension wire moves to south side. X signal represents this amount of movement (v/°). This parameter is only used for GC85.	2.32	0.00 - 5.00
	1.8.c	Ks/H Suspension wire twist torque. Fixed value.	1.477	1.000 - 2.000
	1.9.r	Maximum rate of turn (°/sec) Maximum rate of turn in the turn rates which the bearing servo system followed up to this moment (°/sec). <u>NOTE:</u> The maximum is measured after 3 hours from system start. <u>NOTE:</u> Reset this data after completion of installation!	0.00	-
	1.A.F	Maximum deviation of bearing servo (°) Maximum deviation value in the bearing servo loop that occurred up to this moment (°). <u>NOTE:</u> The maximum is measured after 3 hours from system start. <u>NOTE:</u> Reset this data after completion of installation!	0.00	-
	1.b.S	Maximum deviation of horizontal servo (°) Maximum deviation value in the horizontal servo loop that occurred up to this moment (°). <u>NOTE:</u> The maximum is measured after 3 hours from system start. <u>NOTE:</u> Reset this data after completion of installation!	0.00	-

Main Category	Sub Category	Parameter/description	Default value	Range
A-2	2.1.o	Bearing offset A (°) Offset value included in the “master bearing” and used for correction of fixed error (°). If the Master compass cannot be mounted parallel to the vessel’s fore-aft line, this parameter is used to compensate for a small mounting error.	0.0	0.0 - 359.9
	2.2.O	Bearing offset B (°) Value for general bearing error correction to enter to Master compass bearing. It is used to correct the bearing if the bearing for some reason deviates from correct heading. This value is cleared when it passes the zero-cross pin or when power is switched OFF.	0.0	0.0 - 359.9
	2.3.h	Zero-cross bearing (°) Absolute bearing set for MCU board when zero-cross pin was passed during start-up sequence (last azimuth operation) and normal running operation. Zero-cross bearing can be set in this menu, but is normally set up by measuring position (angle) of the zero-cross pin in the Master compass by the test mode A.	345.3	0.0 - 359.9
	2.4.E	Zero-cross error allowance (°) Zero-cross alarm limit. The compass will generate a zero cross alarm when the difference between the zero-cross bearing and the relative bearing exceeds this zero cross value. This value should be set every time the zero-cross pin is detected.	2.0	0.0 - 5.0
	2.5.y	Year Used to set current year.	-	2000 - 2099
	2.6.N	Month and Day Used to set month and date.	-	-
	2.7.t	Hour and Minute Used to set current hour and minute.	-	-
	2.8.d	Total days of operation This value should be reset after the installation is completed.	-	-

Main Category	Sub Category	Parameter/description	Default value	Range
A-2	2.9.G	Display/setting of GPS connection The following abbreviations are used: bE: GPS connected Non: No GPS connected <i><u>NOTE:</u> When this value is set to "Non", GPS cannot be selected as the vessel's input for speed and latitude.</i>	-	bE or Non
	2.A.L	Display/setting of LOG connection The following abbreviations are used: bE: with Log (contact) Non: No Log (contact) <i><u>NOTE:</u> When this value is set to "Non", LOG cannot be selected as the vessel's speed input.</i>	-	bE or Non
	2.b.S	Display/setting of LOG (serial) connection The following abbreviations are used: bE: with Log (serial) Non: No Log (serial) <i><u>NOTE:</u> When this value is set to "Non", SLOG cannot be selected as the vessel's speed input.</i>	-	bE or Non
	2.c.t	Display/setting of GPS performance index data check The following abbreviations are used: bE: Check performance index Non: Do not check performance index	-	bE or Non
	2.d.o	Analogue signal output offset for ROT (°) Offset value for analogue signal output of Rate Of Turn. Entered value is +/-5% of maximum output ROT.	0.00	0.0 - 16 ¹
	2.e.F	Filter time constant for rate of turn (sec)	2.00	0.5 - 10.0
	2.F.G	Analog output gain for rate of turn	1.00	0.90 - 1.00
	2.G.P	PTKM sentence output	-	bE or Non
	2.H.r	ROT sentence output	-	bE or Non
A-3	3.1.E	Alarm (error)	-	-
	3.2.n	Occurred number of zero-cross errors	-	-
	3.3.H	Maximum zero-cross errors	-	-
	3.4.y	Occurred year of zero-cross errors	-	-

¹ The maximum value is 5% of the maximum analog output for rate of turn.(32 deg./min: 1.6deg./min., 130deg./min: 6.5deg./min., 320deg./min: 16.0deg./min.)

Main Category	Sub Category	Parameter/description	Default value	Range
	3.5.N	Occurred month/day of zero-cross errors	-	-
A-3	3.6.t	Occurred hour/minute of zero-cross errors	-	-
	3.7.n	Occurred number of encoder errors	-	-
	3.8.r	Occurred number of reset with WATCH DOC TIMER	-	-
A-4	4.1.C	GPS serial data character length	8	8 or 7
	4.2.P	GPS serial data parity bit	Non	Non, Even, Odd
	4.3.S	GPS serial data stop bits	1	1 or 2
A-5	5.1.C	LOG serial data character length	8	8 or 7
	5.2.P	LOG serial data parity bit	Non	Non, Even, Odd
	5.3.S	LOG serial data stop bits	1	1 or 2
A-6	6.1.C	External sensor (standard) serial data character length	8	8 or 7
	6.2.P	External sensor (standard) serial data parity bit	Non	Non, Even, Odd
	6.3.S	External sensor (standard) serial data stop bits	1	1 or 2
A-7	7.1.t	Master compass type	Std	Std or Hsc
	7.2.u	SCC software version number	-	-
	7.3.u	MCC software version number	-	-
A-8	8.1.t	For confirmation of extension menu	-	-
	8.2.S	Filter of speed error correction	On	On or Off

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8 TECHNICAL SPECIFICATIONS

This section lists all specifications for the GC80/85 Gyro compass.

8.1 Accuracy

Settling time:..... within 3 hours
(If startup heading is within $\pm 5^\circ$ of actual heading)
Settle point error:..... less than $\pm 0.3^\circ$
RMS value of the difference:..... less than 0.1°
Repeatability of settle point error:..... less than $\pm 0.2^\circ$
Roll and pitch error:..... less than $\pm 0.5^\circ$
Static error:..... less than $\pm 0.1^\circ$
Settle point error under general conditions: less than $\pm 0.5^\circ$

GC85

Speed and acceleration error: less than $\pm 2.0^\circ$

Maximum acceleration must not exceed 2 m/sec^2 .

Note!

Accuracy at equator. For other latitudes, accuracy to be multiplied by $(1/\cos f)$, where $f = \text{Latitude}$.*

8.2 General specifications

Follow-up speed (follow-up system):..... $> 75^\circ/\text{sec}$
Gimbal freedom: for both roll and pitch: $\pm 45^\circ$
Range of speed correction:
GC80:..... 0 - 50 knots / latitude ($0^\circ - +70^\circ$)
GC85:..... 0 - 70 knots / latitude ($0^\circ - +70^\circ$)
Main power supply:..... 100/110/115/200 V AC, 50/60 Hz
Power supply for alarm and back-up: 24 V DC, 70 W
Voltage fluctuation:..... AC $\pm 10\%$
DC -20% - +30%
Power consumption:
Start (Master):..... within 140 VA
Ordinary (Master):..... within 70 VA
Repeater:..... within 150 VA
Repeater type:..... 24 V DC - 6 step/ $^\circ$
Number of step repeater connections:..... 4
Number of NMEA connections: 10
Repeater back-up circuits:..... 4+10
Pendulum function: refer page 28

8.3 Input specifications

Serial input signal (GPS)

Circuits:..... 1
 Electrical:..... RS422/ NMEA0183
 Baud rate:..... 4800 bps
 Data bits:..... 8 bits
 Parity:..... None
 Stop bits:..... 1
 Transmit freq.:..... 1 - 5 Hz

Input format:

\$ - GGA, x, xx.x, N, xx.x, E, x, ~*hh<CR><LF> *
 \$ - GLL, xxxx.x, N, xxxx.x, E~*hh<CR><LF>
 \$ - VTG, xx, T, xx, M, xx.x, N, xx, K*hh<CR><LF>
 \$ - ZDA, xxxxxx.x, xx, xx, xxxx, xx, xx*hh<CR><LF>

* Priority

Serial input signal (External heading)

Circuits:..... 1
 Electrical:..... RS422/NMEA0183
 Baud rate:..... 4800/38400 bps
 Data bits:..... 8 bits
 Parity:..... None
 Stop bits:..... 1
 Transmit freq.:..... 1 - 50 Hz/20 - 50 Hz

Input format:

\$ - HDT, xxx.x, T*hh<CR><LF>
 \$ - THS, xxx.x, a*hh<CR><LF>
 \$ - ROT, x.x, a*hh<CR><LF>
 \$ - HDG, xxx.x, xx.x, a, xx.x, a*hh<CR><LF>

Input data format must be the same as selected output data format from the Control unit (HDT/THS). When powered ON, the Gyro will automatically detect the external sensor's baud-rate.

Serial input signal (LOG)

Circuits:..... 1
 Electrical:..... RS422/NMEA0183
 Baud rate:..... 4800 bps
 Data bits:..... 8 bits
 Parity:..... None
 Stop bits:..... 1
 Transmit freq.:..... 1 - 50 Hz

Input format:

\$ - VBW, x.x, x.x, A, x.x, x.x, A~*hh<CR><LF>

INS (BAMS)

Circuits:..... 1
 Electrical: RS422/ NMEA0183
 Baud rate: 4800 bps
 Data bits: 8 bits
 Parity: None
 Stop bits: 1
 Transmit freq.: INDETERMINATELY
 Input format:
 \$ - -ACN, xxxxxx.xx, aaa, x.x, x.x, a, C*hh<CR><LF>
 \$ - -ACK, xxx*hh<CR><LF>
 \$ - -HBT, x.x, a, x*hh<CR><LF>

PULSE signal (LOG)

Circuits:..... 1
 Electrical: 200/400 p.p.n.m., dry contact
 Voltage/Current: 5 V/5 mA

Heading sensor select

Circuits:..... 2
 Voltage/Current: 32 V/20 mA

Alarm ACK

Circuits:..... 1
 Voltage/Current: 5 V/5 mA

Buzzer stop

Circuits:..... 1
 Voltage/Current: 5 V/5 mA

8.4 Output specifications

Serial output signal 1

When Gyro is selected

Circuits:..... 10
 Electrical:..... RS422/485
 Baud rate:
 GC80:.....4800/38400 bps
 GC85:.....38400 bps

Note!

*Baud Rate for GC85, refer **Jumper settings on SCC board**, output serial signal selection, page 102.*

Data bits:..... 8 bits
 Parity:..... None
 Stop bits:..... 1
 Transmit freq.:
 GC80:..... 1, 5, 10, 50 Hz
 GC85:..... 1, 5, 10, 50 Hz

Output format:

Data no.1
 \$ - HEHDT, xxx.x, T*hh<CR><LF>
 Data no.2
 \$ - HETHS, xxx.x, a*hh<CR><LF>
 Data no.3
 \$ - HEROT, -xxx.x, a*hh<CR><LF>
 Data no.5
 \$ - PTKM, HEALM, xxxx, x, xx*hh<CR><LF>

Serial output signal 2 *1

When External heading sensor is selected

Circuits:..... 10
 Electrical:..... RS422/485
 Baud rate:
 GC80:..... 4800 bps
 GC85:.....38400 bps
 Data bits:..... 8 bits
 Parity:..... None
 Stop bits:..... 1
 Transmit freq.:
 GC80:..... 1, 5, 10, 50 Hz
 GC85:..... 1, 5, 10, 50 Hz

Output format:

Data no.1
 \$ - HDT, xxx.x, T*hh<CR><LF>
 Data no.2
 \$ - THS, xxx.x, a*hh<CR><LF>
 Data no.3
 \$ - HDG, xxx.x, xx.x, a, xx.x, a*hh<CR><LF>
 Data no.4
 \$ - ROT, -xxx.x, a*hh<CR><LF>

\$- -PTKM, - -ALM, xxxx, x, xx*hh<CR><LF>

INS (BAMS)

Circuits:..... 1

Electrical:.....RS422/NMEA0183

Baud rate:..... 4800 bps

Data bits: 8 bits

Parity: None

Stop bits: 1

Transmit freq.: _____

Data no.1, 4:..... 30 s

Data no.2, 3:..... INDETERMINATELY

Output format:

Data no.1

\$- -HEALC, x, x, x, x.x, aaa, x.x, x.x, x.x...

```
...*hh<CR><LF>
```

Data no.2

```
$- -HEALF, x, x, x, xxxxxx.xx, a, a, a, aaa, x.x, x.x,
```

x.x, a---a*hh<CR><LF>

Data no.3

\$- -HEARC,xxxxxx,aaa,x.x,x.x,a*hh<CR><LF>

Data no.5

```
$- -HEHBT,x.x,a,x*hh<CR><LF
```

STEP signal

Circuits: 4

Electrical: 24 V DC - 6 step/°

RATE OF TURN signal

Circuits: 3

Electrical:..... +/-10 V (+/-120°) (default)

 $\pm 10\text{ V } (\pm 30^\circ)$ $\pm 10\text{ V } (\pm 300^\circ)$ $\pm 5 \text{ V } (\pm 120^\circ)$ $\pm 5^\circ \text{ V } (\pm 300^\circ)$ $\pm 5^\circ \text{ V } (\pm 30^\circ)$

Note! Refer Rate of Turn scale DIP switch settings, page 103, and to the separate

Refer Rate of Turn scale DIP switch settings, page 103, and to the separate manual delivered for Rate of Turn Instrument.

Running

Circuits: 1

Voltage/Current: 24 V/1 A

All alarms

Circuits: 1

Voltage/Current: 24 V/1 A

Refer **Jumper settings on SCC board**, page 104.

8.5 Physical dimensions

GC80/85 Master compass

Height:.....438 mm (17.2")
Width:.....340 mm (13.4")
Depth:.....340 mm (13.4")
Weight:.....23 kg (51 lbs)

GC80/85 Expanded MK2 Control unit

Height:.....495 mm (19.5")
Width:.....364 mm (14.3")
Depth:.....182 mm (7.2")
Weight:.....14 kg (31 lbs)

8.6 Power

GC80/85 Master compass

Voltage input: Supplied from Control unit

GC80/85 Expanded MK2 Control unit

Voltage input: 110/220 V AC
Backup voltage:.....24 V DC
Power consumption, including Master compass:
 Starting:..... 1.5 A at 100 V AC
 Running:..... 1.2 A at 100 V AC

8.7 Environmental specifications

GC80/85 Master compass

Enclosure material:..... Aluminum
Color:.....Black
Temperature range:
 Operating:.....-10 - 50°C (14 - 122°F)
 Storage: -25 - 70°C (-13 - 158°F)
Angular freedom of gimbal:±45° for roll and pitch

GC80/85 Expanded MK2 Control unit

Enclosure material:..... Aluminum

Environmental protection:..... IP22

Color:Black

Temperature range:

Operating:.....-10 - 50°C (14 - 122°F)

Storage: -25 - 70°C (-13 - 158°F)

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9 DRAWINGS

This section contains dimensional drawings that show mechanical dimensions of the different GC80/85 units, together with wiring diagrams of the Gyro system.

9.1 Drawings included

The following mechanical drawings are enclosed:

Name	Drw. no	Rev.
GC80/85 Expanded MK2 Control unit, dimensions	N3-710186	A
GC80/85 Master compass, dimensions	N3-710179	A
GC80/85 Remote panel, dimensions	D4-710208	B

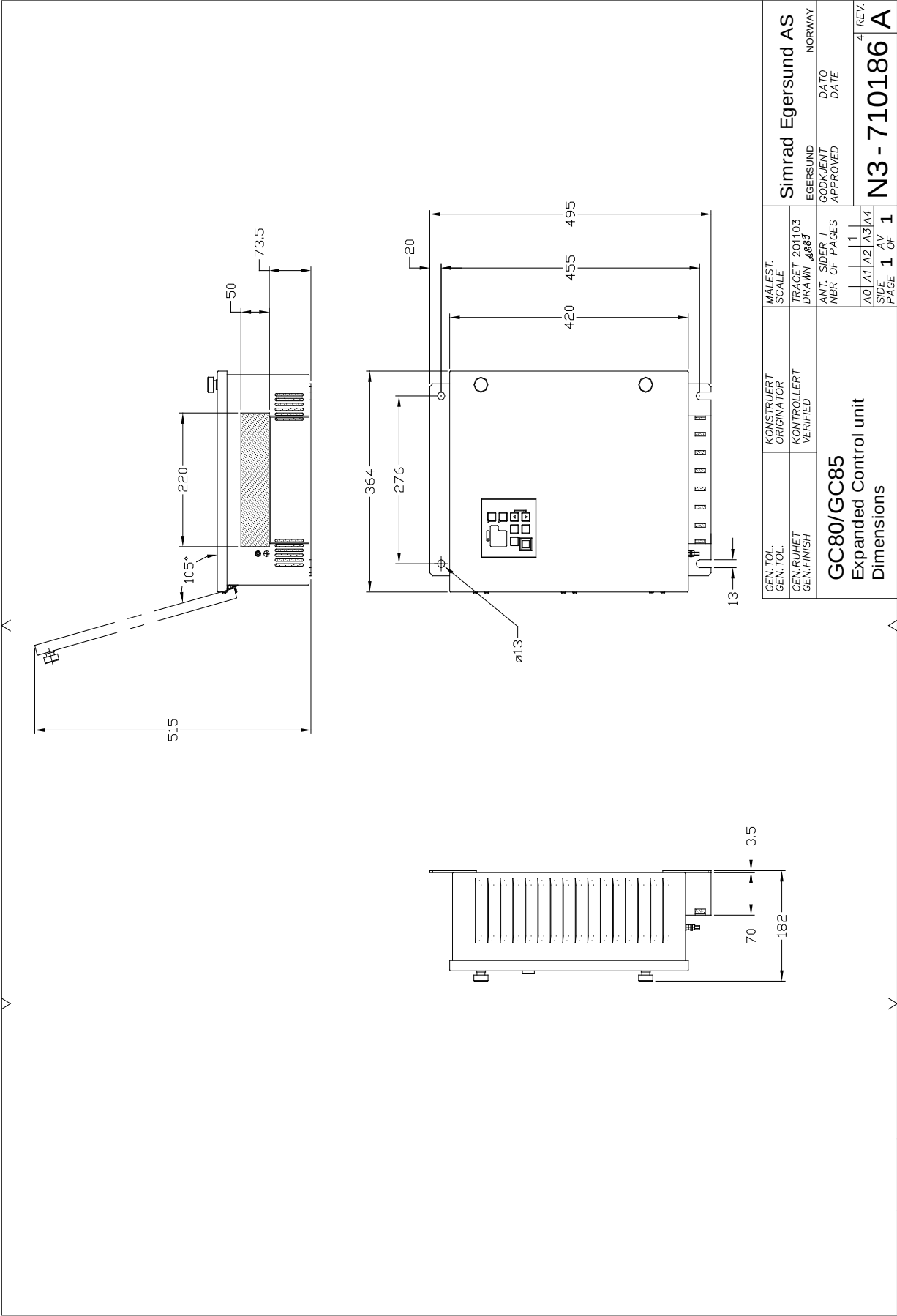
Dimensional drawings are available upon request.

The following wiring diagrams are enclosed:

Name
GC80/85 Gyro Compass, Expanded system. Wiring diagrams (page 1 and 2).

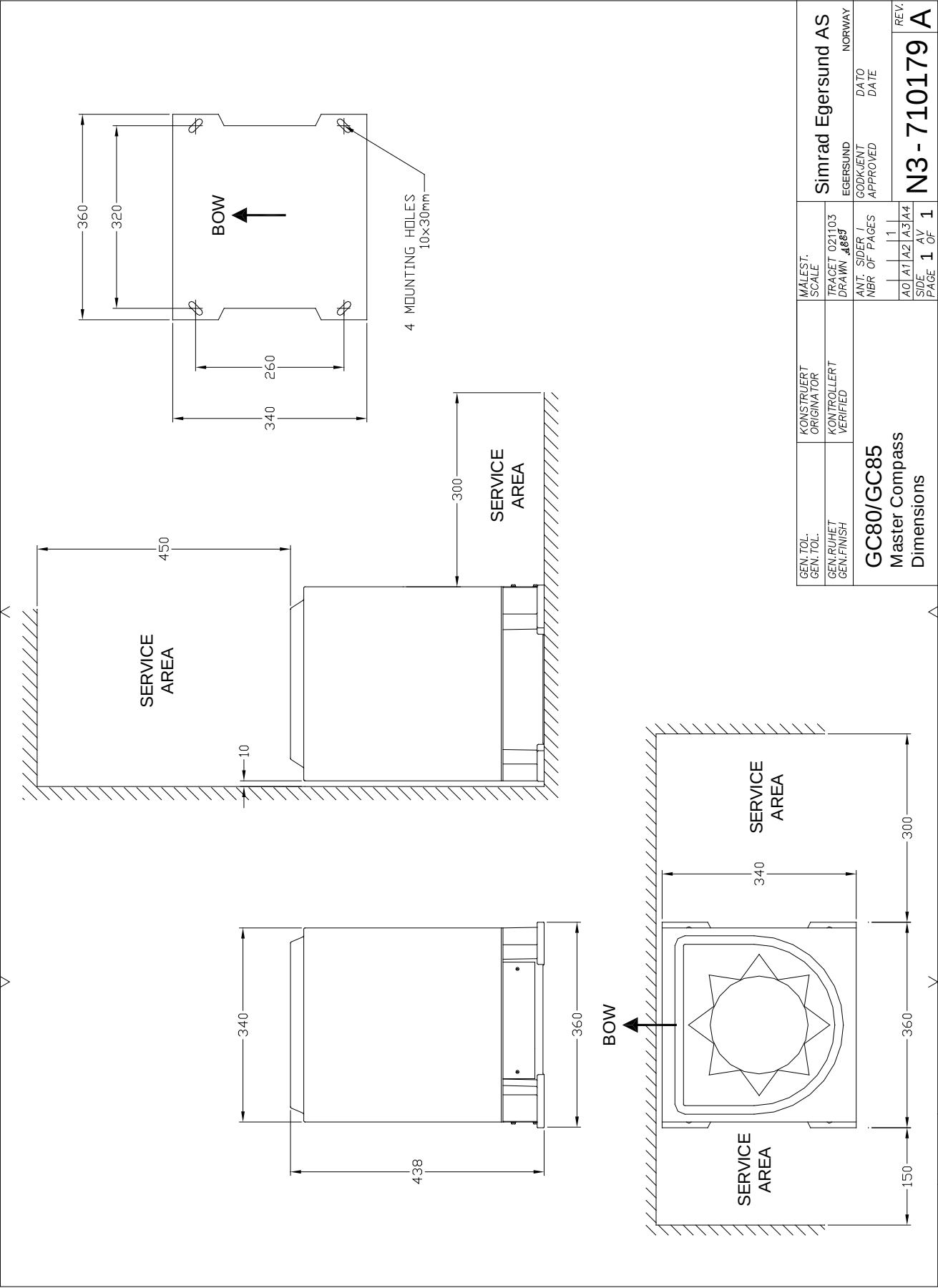
Note!

The original signed drawings are recorded at Simrad Egersund.

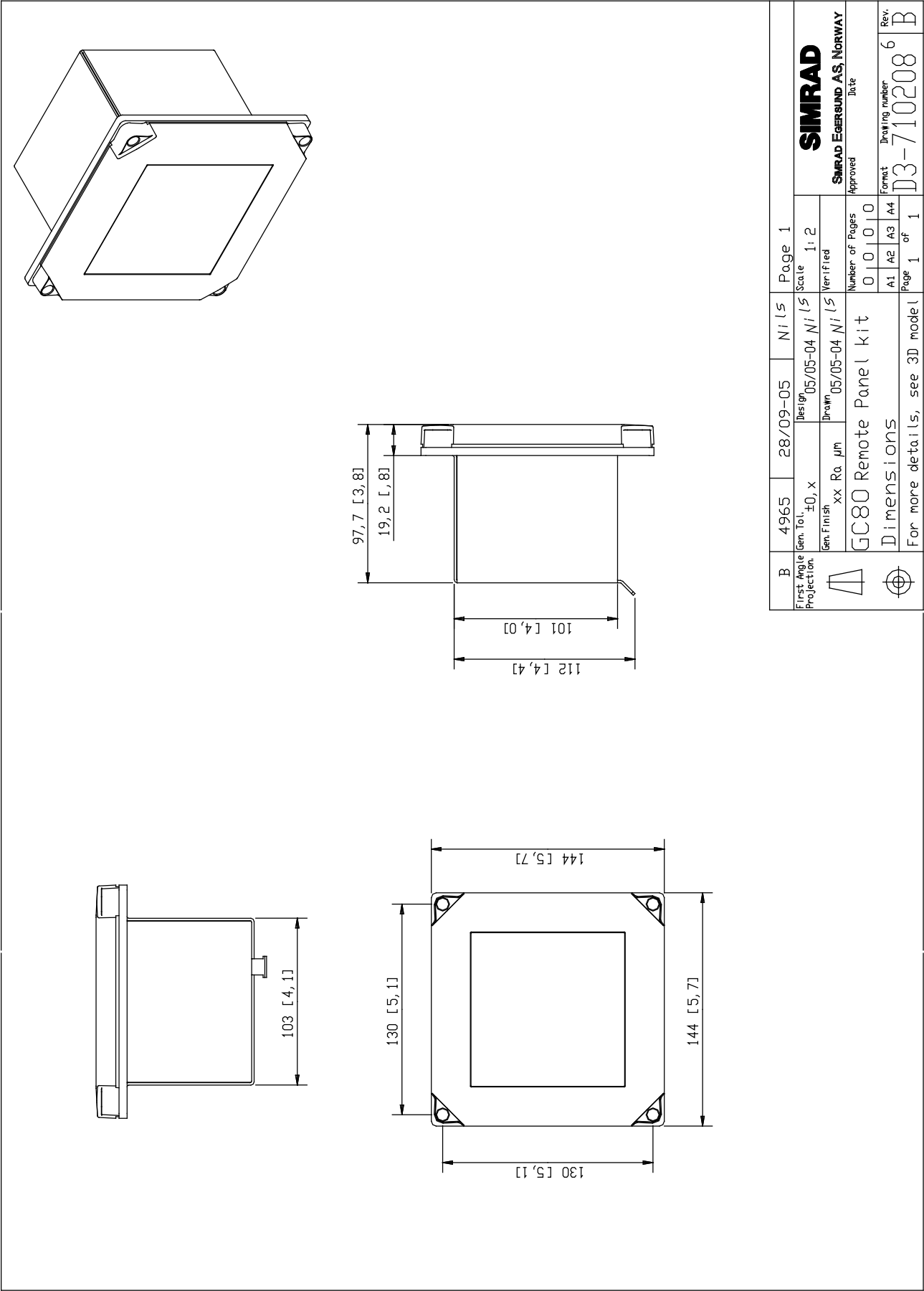


GEN. TOL. GEN. TOL.		KONSTRUERT ORIGINATOR	MALEST. SCALE	Simrad Egersund AS				
GEN. RUHET GEN. FINISH		KONTROLLER VERIFIED	TRACET 20103 DRAWN 4889	EGERSUND	GODKJENT APPROVED	DATO DATE	NORWAY	
GC80/GC85 Expanded Control unit Dimensions				ANT. SIDE 1	NBR OF PAGES	REV.		
				AO1	A1	A2	A3	A4
				SIDE	1	AV	1	1
				PAGE	1	OF	1	1
N3 - 710186 A								

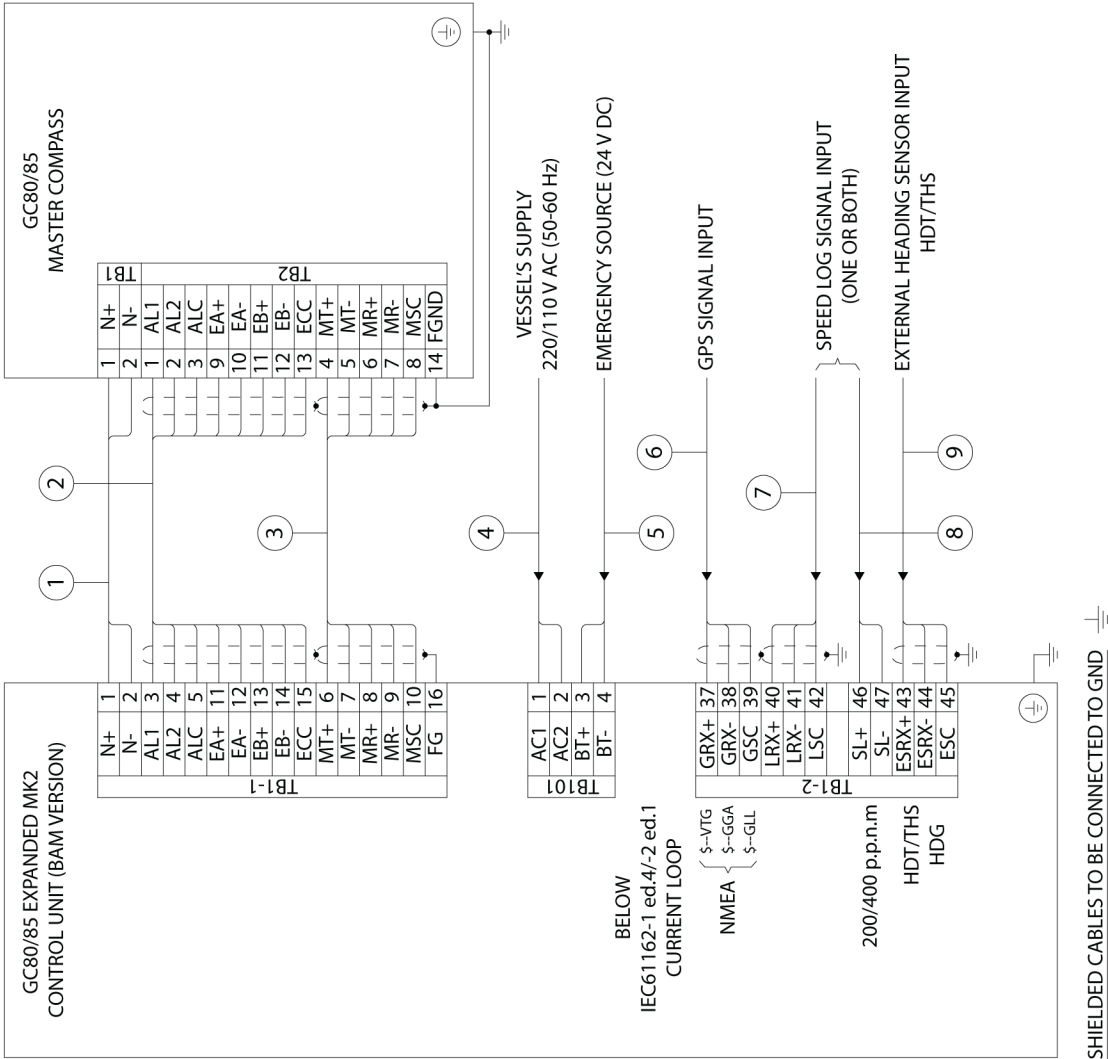
N3 - 710186 A



GEN. TOL. GEN. TOL. GEN. RUHET GEN. FINISH		KONSTRUIERT ORIGINATOR KONTROLLER VERIFIED	MALEST. SCALE TRACET 021103 DRAWN 4889	Simrad Egersund AS		EGERSUND CODKJENT APPROVED	NORWAY DATO DATE	REV. N3-710179 A
GC80/GC85 Master Compass Dimensions				ANT. SIDER 1 NBR OF PAGES		1		
				A0 A1 A2 A3 A4		1		
				SIDE 1 PAGE 1		OF 1		

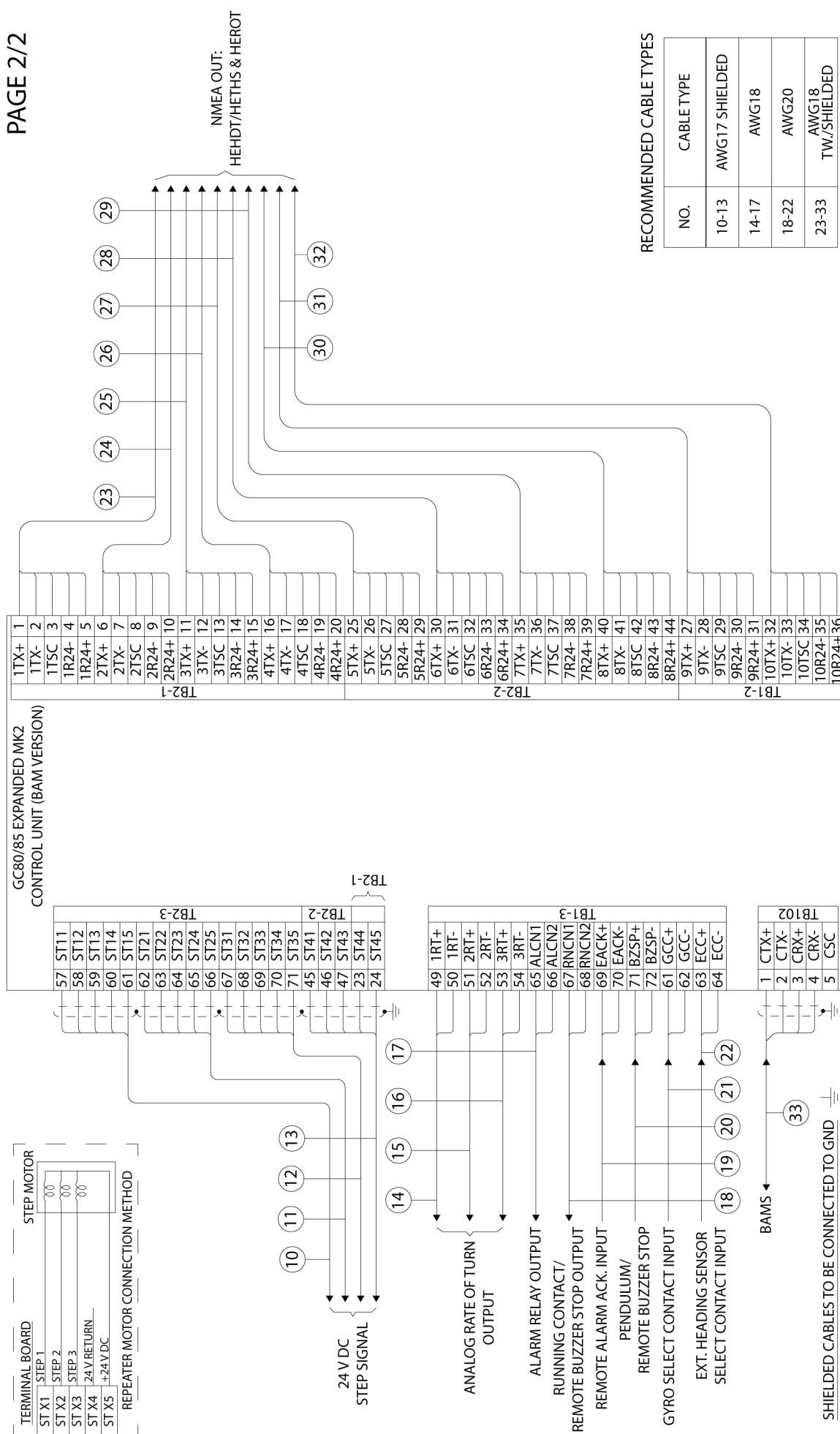


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First Angle Projection	Gen. Tol. ±0, x	Design 05/05-04	Nil	Nil	Verified	Number of Pages	0 0 0 0	SIMRAD EGERUND AS, NORWAY
	Gen. Finish xx Ra µm	Drawn 05/05-04	Nil	Nil	Approved	Format	D3-710208	
	GC80 Remote Panel kit					Drinking number	6	Rev.
	Dimensions					Page 1 of 1		
	For more details, see 3D model							



RECOMMENDED CABLE TYPES

NO.	CABLE TYPE
1	AWG14
2-3	AWG17 SHIELDED
4-5	AWG14
6-7	AWG18 TW/SHIELDED
8	AWG18
9	AWG18 TW/SHIELDED

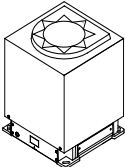


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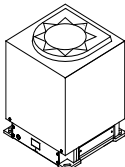
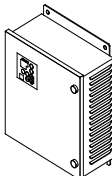
10 PART LIST

This section includes part numbers for all standard and optional units that may be included in a GC80 and GC85 Gyro system.

10.1 GC80 Expanded Gyro system

PART NO		DESCRIPTION
27101674		GC80 Master compass
44174027		GC80 Sensitive element
000-15037-001		GC80/85 Expanded MK2 Control unit
988-12719-00x		GC80/85 Expanded MK2 Gyro compass User manual
44174449		Special tool required when installing the Sensitive element

10.2 GC85 Expanded Gyro system

PART NO		DESCRIPTION
27101682		GC85 Master compass
44170728		GC85 Sensitive element
000-15037-001		GC80/85 Expanded MK2 Control unit
988-12719-00x		GC80/85 Expanded MK2 Gyro compass User manual
44174449		Special tool required when installing the Sensitive element

10.3 GC80/85 Optional equipment, Expanded system

PART NO		DESCRIPTION
27101757		GC80 Flush mounting kit in Simrad design for remote installation of operating panel
44170736		GC80 Extension cable 5 m for remote installation of operating panel normally mounted in Control unit
44170744		GC80 Extension cable 10 m for remote installation of operating panel normally mounted in Control unit
44170751		GC80 Extension cable 15 m for remote installation of operating panel normally mounted in Control unit
000-15835-001		Extension cable 5 m MK2 BAM, compact and expanded
000-15836-001		Extension cable 10 m MK2 BAM, compact and expanded
000-15837-001		Extension cable 15 m MK2 BAM, compact and expanded

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11 TERMINAL LAYOUT

This section includes tables that list all terminal pins and terminal labelling on the GTERM-A board in the GC80/85 Expanded MK2 Control unit. The tables include detailed descriptions of each terminal.

11.1 CTERM board

TB101

PIN NO	NAME	DETAILS
1	AC1	Main power supply input (AC)
2	AC2	
3	BT+	Backup power supply (Battery 24 V DC)
4	BT-	Backup power supply (Battery GND)
5	FG	Frame Ground

TB102

PIN NO	NAME	DETAILS
1	CTX+	Serial signal output to BAMS (alert)
2	CTX-	
3	CRX+	Serial signal input from BAMS (alert)
4	CRX-	
5	CSC	Serial signal output (GND)
6	OTX+	Not used
7	OTX-	

TB103

PIN NO	NAME	DETAILS
1	ORX+	Not used
2	ORX-	
3	ORC	
4	CIN+	
5	CIN-	
6	COU1	
7	COU2	

11.2 GTERM-A board

TB1

TB1-1

PIN NO	NAME	DETAILS
1	N+	Master compass power supply (24 V DC)
2	N-	Master compass power supply (24 V DC GND)
3	AL1	Master compass inverter alarm (over current)
4	AL2	Master compass inverter alarm (over voltage)
5	ALC	Inverter abnormal (GND)
6	MT+	Control unit - Master compass serial signal
7	MT-	
8	MR+	Master compass - Control unit serial signal
9	MR-	
10	MSC	Serial signal output (GND)
11	EA+	Master compass encoder signal (Phase A)
12	EA-	
13	EB+	Master compass encoder signal (Phase B)
14	EB-	
15	ECC	Serial signal output (GND)
16	FGND	Frame Ground
17	24R+	(Double Gyro power (+))*
18	24R-	(Double Gyro power (-))*
19	24B+	Not used
20	24B-	
21	PF	
22	POC	
23	POV	
24	PC	

* Refer to Double Gyro User Manual. Not to be used in single installations.

TB1-2

PIN NO	NAME	DETAILS
25	24M+	Not used
26	24M-	
27	9TX+	Serial signal output (+)
28	9TX-	Serial signal output (-)
29	9TSC	Serial signal output (GND)
30	9R24-	Serial repeater power supply (24 V DC GND)
31	9R24+	Serial repeater power supply (24 V DC)
32	10TX+	Serial signal output (+)
33	10TX-	Serial signal output (-)
34	10TSC	Serial signal output (GND)
35	10R24-	Serial repeater power supply (24 V DC GND)
36	10R24+	Serial repeater power supply (24 V DC)
37	GRX+	GPS serial signal input
38	GRX-	
39	GSC	Serial signal input (GND)
40	LRX+	Speed Log serial signal input
41	LRX-	
42	LSC	Serial signal input (GND)
43	ESRX+	External sensor serial signal input (Internal serial signal (RX Double system))
44	ESRX-	
45	ESC	Serial signal input (GND)
46	SL+	Input dry contact of Speed Log 200/400 p.p.n.m
47	SL-	
48	SW+	Not used

TB1-3

PIN NO	NAME	DETAILS
49	1RT+	Rate of turn analog signal output
50	1RT-	Rate of turn signal (GND)
51	2RT+	Rate of turn analog signal output
52	2RT-	Rate of turn signal (GND)
53	3RT+	Rate of turn analog signal output
54	3RT-	Rate of turn signal (GND)
55	ST51	Step signal (open drain signal)
56	ST52	
57	ST53	
58	LOST+	Input dry contact for abnormal signal
59	LOST-	
60	3SO-	GND
61	GCC+	Sensor select signal input (Gyro select)
62	GCC-	
63	ECC+	Sensor select signal input (Ext. sensor select)
64	ECC-	
65	ALCN1	Alarm contact signal output (Internal signal output for Double system)
66	ALCN2	
67	RNCN1	Running/Remote buzzer stop signal contact output (Internal signal output for Double system)
68	RNCN2	
69	EACK+	External acknowledge signal input
70	EACK-	
71	BZSP+	Buzzer stop signal input/Pendulum
72	BZSP-	

TB2

TB2-1

PIN NO	NAME	DETAILS
1	1TX+	Serial signal output
2	1TX-	
3	1TSC	Serial signal GND
4	1R24-	Serial repeater power supply, -24 V DC
5	1R24+	Serial repeater power supply, +24 V DC
6	2TX+	Serial signal output
7	2TX-	
8	2TSC	Serial signal GND
9	2R24-	Serial repeater power supply, -24 V DC
10	2R24+	Serial repeater power supply, +24 V DC
11	3TX+	Serial signal output
12	3TX-	
13	3TSC	Serial signal GND
14	3R24-	Serial repeater power supply, -24 V DC
15	3R24+	Serial repeater power supply, +24 V DC
16	4TX+	Serial signal output
17	4TX-	
18	4TSC	Serial signal GND
19	4R24-	Serial repeater power supply, -24 V DC
20	4R24+	Serial repeater power supply, +24 V DC
21	ESTX+	Internal serial signal (TX) Double system
22	ESTX-	
23	ST44	-24 V DC for step signal output 4
24	ST45	+24 V DC for step signal output 4

TB2-2

PIN NO	NAME	DETAILS
25	5TX+	Serial signal output
26	5TX-	
27	5TSC	Serial signal GND
28	5R24-	Serial repeater power supply, -24 V DC
29	5R24+	Serial repeater power supply, +24 V DC
30	6TX+	Serial signal output
31	6TX-	
32	6TSC	Serial signal GND
33	6R24-	Serial repeater power supply, -24 V DC
34	6R24+	Serial repeater power supply, +24 V DC
35	7TX+	Serial signal output
36	7TX-	
37	7TSC	Serial signal GND
38	7R24-	Serial repeater power supply, -24 V DC
39	7R24+	Serial repeater power supply, +24 V DC
40	8TX+	Serial signal output
41	8TX-	
42	8TSC	Serial signal GND
43	8R24-	Serial repeater power supply, -24 V DC
44	8R24+	Serial repeater power supply, +24 V DC
45	ST41	Step signal (open drain signal)
46	ST42	
47	ST43	
48	OCACN1	Not used

TB2-3

PIN NO	NAME	DETAILS
49	ST1	Not used
50	ST2	
51	ST3	
52	OPCN+	
53	OPCN-	
54	GTX+	
55	GXT-	
56	GTSC	
57	ST11	Step signal (open drain signal)
58	ST12	
59	ST13	
60	ST14	-24 V DC for step signal output 1
61	ST15	+24 V DC for step signal output 1
62	ST21	Step signal (open drain signal)
63	ST22	
64	ST23	
65	ST24	-24 V DC for step signal output 2
66	ST25	+24 V DC for step signal output 2
67	ST31	Step signal (open drain signal)
68	ST32	
69	ST33	
70	ST34	-24 V DC for step signal output 3
71	ST35	+24 V DC for step signal output 3
72	OCACN2	Not used

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12 DIP SWITCH SETTINGS

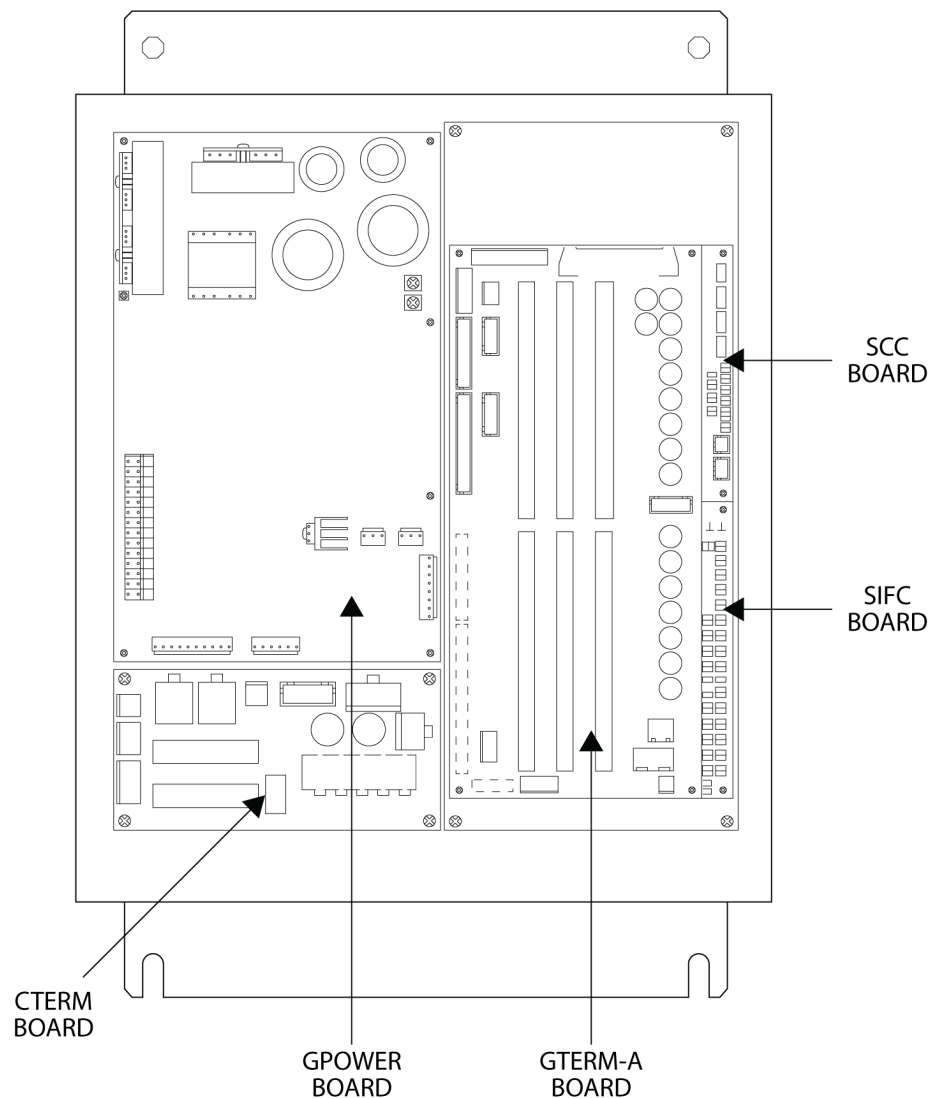
This section includes drawings of the different printed circuits boards in the Control unit that include jumpers and DIP switches.

12.1 Expanded MK2 Control unit

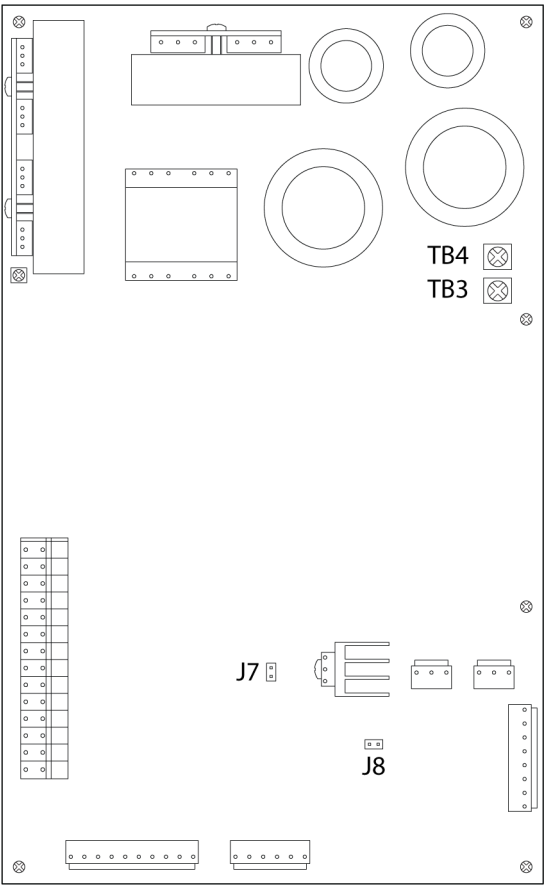
3 different boards in the Expanded MK2 Control unit have jumpers and/or DIP switches that may be used to configure the GC80/85 system.

Only a few of these jumpers/DIP switches are used in installation and pre-running procedures for the Gyro compass. Refer **Power supply**, page 48, and **DIP switch and jumper settings**, page 49.

The following pages include drawings that show the location of jumpers and/or DIP switches, together with a short description of the different settings.

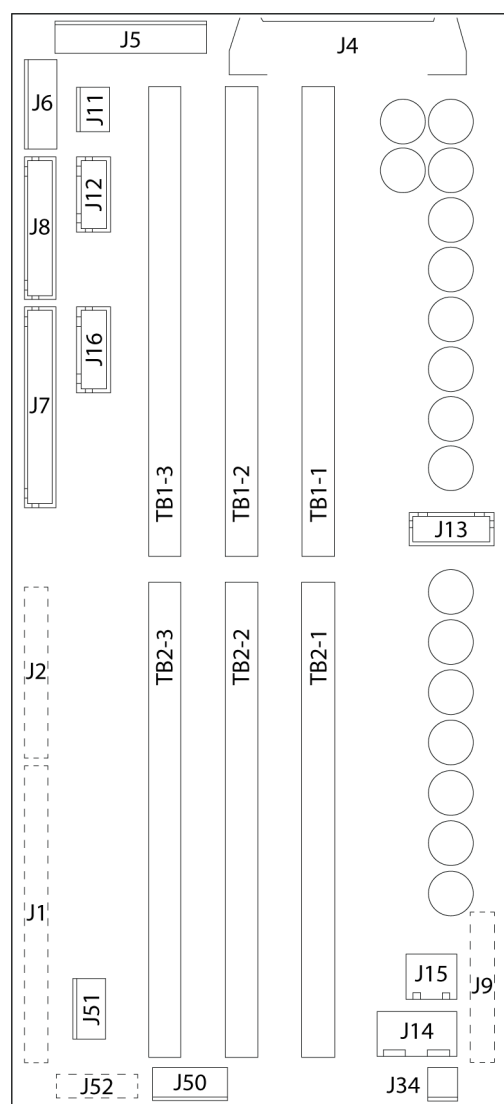


GPOWER board



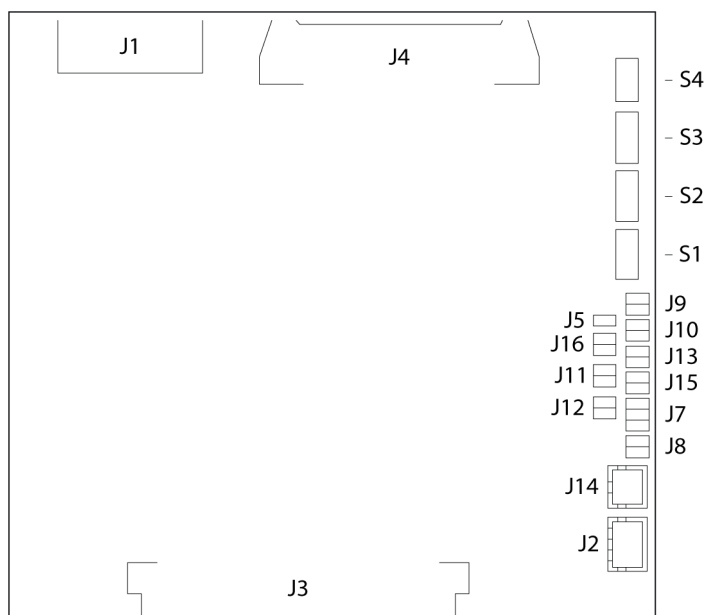
Jumper settings on GPOWER board

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J7	Open or Short	Over-current limit set	Over-current value of 24 V DC for Master compass is set up. <i>NOTE: Should not be changed.</i>
J8	Open	Over-current limit change time	Used for inspection at a factory. <i>NOTE: Should not be changed.</i>
TB3 - TB4	Open	Main power supply setting	Open = 220 V AC Short = 100/110/115 V AC

GTERM-A board**Jumper settings on GTERM-A board**

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J34	Short	Gyro system	Open = 2 Gyro systems Short = 1 Gyro system

SCC board



DIP switch settings on SCC board

SWITCH	DEFAULT	FUNCTION	DESCRIPTION	
S1-1	OFF	Control unit type	OFF = Expanded	ON = Compact
S1-2	OFF	Master compass type	OFF = Standard	ON = High Speed
S1-3	OFF	2 Gyros used	OFF = Single	ON = Dual
S1-4	OFF	Active Gyro system	OFF = System No.1	ON = System No.2
S1-5	OFF	External sensor connection	SW1-5 OFF	= No external sensor
			SW1-6 OFF	
			SW1-5 OFF	= Magnetic system connected (back-up)
			SW1-6 ON	
S1-6	OFF		SW1-5 ON	= External sensor connected
			SW1-6 OFF	
			SW1-5 ON	= External system connected (back-up)
			SW1-6 ON	
S1-7	OFF	Serial signal format	OFF = IEC61162-2 ed.1 (NMEA0183, ref. page 14) ON = Tokimec	
S1-8	OFF	Alarm output setup	OFF = All alarms ON = Only power failures	

Note! When used in Double Gyro system: Gyro 1. Set S1-3 = ON and S1-4 = OFF

Gyro 2. Set S1-3 = ON and S1-4 = ON

SWITCH	DEFAULT	FUNCTION	DESCRIPTION	
S2-1	OFF	Data output for record (Not used)	SW2-1 OFF	No output
			SW2-2 OFF	
			SW2-1 OFF	Output for old monitor
			SW2-2 ON	
S2-2	OFF		SW2-1 ON	Output for new monitor
			SW2-2 OFF	
			SW2-1 ON	No output
			SW2-2 ON	
S2-3	ON	Operating panel type	OFF = GPANEL (NOT FOR BAMS) ON = GPANEL-A (FOR BAMS)	
S2-4	OFF	Pendulum ferry	OFF = Not connected/Buzzer stop enabled ON = Pendulum function in use/Buzzer stop disabled	
S2-5	OFF	Serial signal transmit frequency IEC61162-1 ed.4	SW2-5 OFF	= 1 sec (1 Hz)
			SW2-6 OFF	
			SW2-5 OFF	= 100 msec (10 Hz)
			SW2-6 ON	
S2-6	ON		SW2-5 ON	= 200 msec (5 Hz)
			SW2-6 OFF	
			SW2-5 ON	= Invalid
			SW2-6 ON	
S2-7	OFF	Not used		
S2-8	OFF	System select information contact	OFF = No	ON = Yes
S3-1	OFF	Timer startup	OFF = No	ON = Yes
S3-2	OFF	Talker ID of “ROT” sentence	OFF = “HE”	ON = “TI”
S3-3	ON	Rate of turn scale	SW3-3 OFF	Max 30.0 °/min.
			SW3-4 OFF	
			SW3-3 OFF	Max 300.0 °/min.
			SW3-4 ON	
S3-4	OFF		SW3-3 ON	Max 120.0 °/min.
			SW3-4 OFF	
			SW3-3 ON	Invalid
			SW3-4 ON	

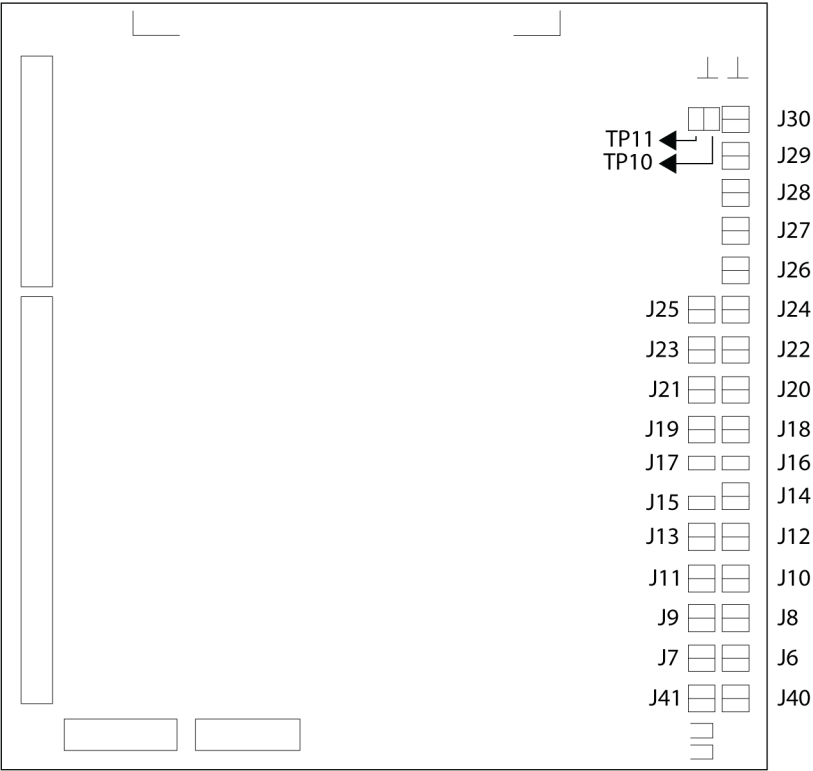
SWITCH	DEFAULT	FUNCTION	DESCRIPTION
S3-5	OFF	Ban or permission of a "ROT" sentence output	Valid at the time of external sensor (standard) selection. OFF = Disabled ON = Enabled
S3-6	ON	For Simrad use	OFF = Not used ON = Simrad GC type (80 or 85) shown in display at start-up according to S1-2 setting.
S3-7	OFF	Not used	
S3-8	OFF	Buzzer stop output/ Running contact output	OFF = Running contact enabled ON = Buzzer stop enabled
S4-1	OFF	Not used	
S4-2	OFF	T.K. only	
S4-3	OFF	Not used	
S4-4	OFF	Alarm detection time	OFF = 300 ms ON = 2 sec
S4-5	ON (THS)	Enable/disable THS	OFF = HDT ON = THS
S4-6	OFF	Not used	

Jumper settings on SCC board

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J5 (RESET)	Open	CPU reset	Used to reset the CPU
J7 (1TX)	3-4 short (38400 baud)	Serial signal output setting	Output port: GTERM-A board, "1TX" 1-2 Short = Not used. 3-4 Short = IEC61162-2 ed.1 or TOKIMEC version 5-6 Short = IEC61162-1 ed.4 Ref. page 14. <i>NOTE: Never use both jumpers at the same time!</i>

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J8 (2TX)	3-4 short	Serial signal output setting	Output port: GTERM-A board, "2TX" 1-2 Short = IEC61162-2 ed.1 3-4 Short = IEC61162-1 ed.4 <i>NOTE: Never use both jumpers at the same time!</i>
J9 (ALCN)	1-2 short	Alarm contact setting	Output port: GTERM-A board, "ALCN" 1-2 Short = Normal "CLOSES", Alarm "OPEN" 3-4 Short = Normal "OPEN", Alarm "CLOSES" <i>NOTE: Never use both jumpers at the same time!</i>
J10 (RNCN)	1-2 short	Running contact setting	Output port: GTERM-A board, "RNCN" 1-2 Short = Running "CLOSES", Stop "OPEN" 3-4 Short = Running "OPEN", Stop "CLOSES" <i>NOTE: Never use both jumpers at the same time!</i>
J11 (OPCN1)	1-2 short	Not used	Not used
J12 (OPCN2)	1-2 short		
J13 (ENC)	1-2 short 3-4 short	Encoder signal setting	Encoder signal (GC80/85)
J15 (FOG)	1-2 open 3-4 open	Encoder signal setting	Encoder signal (GC80/85)
J16 (R3SEL)	1-2 short	Not used	Not used

SIFC board



Jumper settings on SIFC board

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J6 (3TX)	3-4 short	Serial signal output setting	Output port: GTERM-A board, "3TX" 1-2 short = IEC61162-2 ed.1 or TOKIMEC version 3-4 short = IEC61162-1 ed.4 Ref. page 14. <i><u>NOTE:</u> Never use both jumpers at the same time!</i>
J7 (4TX)	3-4 short		Output port: GTERM-A board, "4TX" 1-2 short = IEC61162-2 ed.1 or TOKIMEC version 3-4 short = IEC61162-1 ed.4 Ref. page 14. <i><u>NOTE:</u> Never use both jumpers at the same time!</i>

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J8 (5TX)	3-4 short	Serial signal output setting, cont.	Output port: GTERM-A board, "5TX" 1-2 short = IEC61162-2 ed.1 or TOKIMEC version 3-4 short = IEC61162-1 ed.4 Ref. page 14. <i>NOTE:</i> <i>Never use both jumpers at the same time!</i>
J9 (6TX)	3-4 short		Output port: GTERM-A board, "6TX" 1-2 short = IEC61162-2 ed.1 or TOKIMEC version 3-4 short = IEC61162-1 ed.4 Ref. page 14. <i>NOTE:</i> <i>Never use both jumpers at the same time!</i>
J10 (7TX)	3-4 short		Output port: GTERM-A board, "7TX" 1-2 short = IEC61162-2 ed.1 or TOKIMEC version 3-4 short = IEC61162-1 ed.4 Ref. page 14. <i>NOTE:</i> <i>Never use both jumpers at the same time!</i>
J11 (8TX)	3-4 short		Output port: GTERM-A board, "8TX" 1-2 short = IEC61162-2 ed.1 or TOKIMEC version 3-4 short = IEC61162-1 ed.4 Ref. page 14. <i>NOTE:</i> <i>Never use both jumpers at the same time!</i>
J12 (9TX)	3-4 short		Output port: GTERM-A board, "9TX" 1-2 short = IEC61162-2 ed.1 or TOKIMEC version 3-4 short = IEC61162-1 ed.4 Ref. page 14. <i>NOTE:</i> <i>Never use both jumpers at the same time!</i>

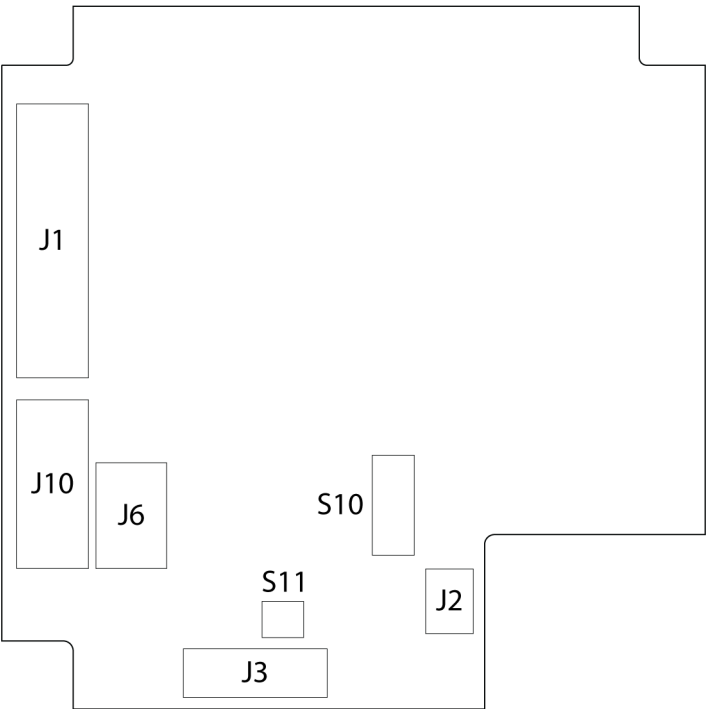
JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J13 (10TX)	3-4 short	Serial signal output setting, cont.	Output port: GTERM-A board, "10TX" 1-2 short = IEC61162-2 ed.1 or TOKIMEC version 3-4 short = IEC-61162-1 ed.4 Ref. page 14. <i>NOTE:</i> <i>Never use both jumpers at the same time!</i>
J14 (GTX)	3-4 short		Output port: GTERM-A board, "GTX" 1-2 short = IEC61162-2 ed.1 or TOKIMEC version 3-4 short = IEC61162-1 ed.4 Ref. page 14. <i>NOTE:</i> <i>The true heading information on "Gyro compass" is output regardless of a system change (with HDM or EHS unit). However, when a "standard external heading sensor" is connected, the true direction of the selected sensor is outputted.</i> <i>NOTE:</i> <i>Never use both jumpers at the same time!</i>
J15 (IEC2)	Short	Type setting	Short = Standard Open = With an external heading sensor (with HDM or EHS unit)
J16 (IEC1)	Short		
J17 (WR/EXT)	Short	Software install or internal	Short = Internal communication with "External heading sensor " Open = Software is installed in SCC board <i>NOTE:</i> <i>Be sure to set "J6" of "SCC board" to "OPEN".</i> <i>NOTE:</i> <i>A damage will be given to a circuit if software is installed while this jumper has been short.</i>

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J18 (ROT)	1-2 short	"Rate of turn" Analog signal level selection	Output port: GTERM-A board, "1RT~3RT" 1-2 short = Output voltage 0 V to ± 5 V DC or 0 V to ± 10 V DC 3-4 short = Output voltage 0 V to +5 V DC or 0 V to +10 V DC NOTE: <i>Never use both jumpers at the same time!</i>
J19 (LOG)	1-2 short	LOG contact signal selection	Input port: GTERM-A board, "SL" 1-2 short = 200 p.p.n.m. 3-4 short = 400 p.p.n.m. NOTE: <i>Never use both jumpers at the same time!</i>
J20 (GPSPOL)	1-2 short	Polarity of "GPS" signal setting	Input port: GTERM-A board, "GRX" 1-2 short = Standard 3-4 short = Polarity is carried out reversely. NOTE: <i>When a signal cannot be received by "1-2 short", it is set as "3-4 short."</i> NOTE: <i>Never use both jumpers at the same time!</i>
J21 (LOGPOL)	1-2 short	Polarity of "LOG" signal setting	Input port: GTERM-A board, "LRX" 1-2 short = Standard 3-4 short = Polarity is carried out reversely. NOTE: <i>When a signal cannot be received by "1-2 short", it is set as "3-4 short."</i> NOTE: <i>Never use both jumpers at the same time!</i>

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J22 (ESPOL)	1-2 short	Polarity of the "external heading sensor" signal setting	Input port: GTERM-A board, "ESRX" 1-2 short = Standard 3-4 short = Polarity is carried out reversely. <i>NOTE: When a signal cannot be received by "1-2 short", it is set as "3-4 short."</i> <i>NOTE: Never use both jumpers at the same time!</i>
J23 (RXD3SEL)	1-2 short	Serial signal setting (Not used)	-
J24 (SSEL)	1-2 short		
J25 (ST1)	1-2 short	Output port setup of "GTERM-A board" (TB2-3 1PIN)	Output port: GTERM-A board, "ST1/OPRX+" 1-2 short = The step signal for "Step signal type repeater" is output. (ST1) 3-4 short = Serial signal receive (OPTION) (OPRX+). <i>NOTE: Never use both jumpers at the same time!</i>
J26 (ST2)	1-2 short	Output port setup of "GTERM-A board" (TB2-3 2PIN)	Output port: GTERM-A board, "ST2/OPRX-" 1-2 short = The step signal for "Step signal type repeater" is output. (ST2) 3-4 short = Serial signal receive (OPTION) (OPRX-). <i>NOTE: Never use both jumpers at the same time!</i>

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J27 (ST3)	1-2 short	Output port setup of "GTERM-A board" (TB2-3 3PIN)	Output port: GTERM-A board, "ST2/OPRXC" 1-2 short = The step signal for "Step signal type repeater" is output. (ST3) 3-4 short = Serial signal receive (OPTION) (OPRXC). <i>NOTE: Never use both jumpers at the same time!</i>
J28 (SSEL1)	3-4 short	Output port setup of "GTERM-A board" (TB1-3 7PIN)	Output port: GTERM-A board, "SSEL1" 1-2 short = Scale over signal output (3RSOH) 3-4 short = Step signal output (step53)
J29 (SSEL2)	3-4 short	Output port setup of "GTERM-A board" (TB1-3 8PIN)	Output port: GTERM-A board, "SSEL2" 1-2 short = Scale over signal output (2RSOH) 3-4 short = Step signal output (step52)
J30 (SSEL3)	3-4 short	Output port setup of "GTERM-A board" (TB1-3 9PIN)	Output port: GTERM-A board, "SSEL3" 1-2 short = Scale over signal output (1RSOH) 3-4 short = Step signal output (step51)
J40 (LOST1)	3-4 short	Rate of turn scale over setting	1-2 open/3-4 short = Standard Rate of turn scale over signal (1RSOL)
J41 (LOST2)	3-4 short		1-2 open/3-4 short = Standard Rate of turn scale over signal (2RSOL)

GPANEL-A board



DIP switch settings on GPANEL-A board

SWITCH	DEFAULT	FUNCTION	DESCRIPTION
S10-1	ON	For Simrad use	OFF = No ON = for Simrad
S10-2	OFF	Do not touch	-
S10-3			
S10-4			
S10-5			
S10-6			
S10-7			

13 ALARM MESSAGES AND CORRECTIVE ACTIONS

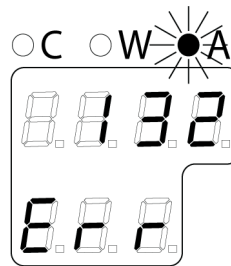
This section provides a description of system errors and corrective actions that should be performed by the system operator.

13.1 The alarm system

The GC80/85 system will continually check for faults while the system is running.

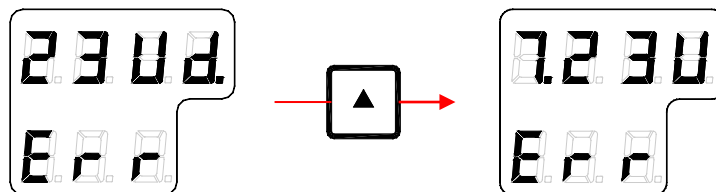
If a fault occurs an alarm code will be displayed in the LCD, the Alarm lamp will be flashing, and an audible alarm will be activated.

Up to 4 alarm codes may be displayed in the LCD to indicate that several alarm situations are present. The last activated alarm will be displayed on the right side of the display. The figure below shows that alarm codes 1, 3 and 2 were generated in that order.



For a complete list of alarm codes and explanation of the alert priority system, refer page 119 onwards.

If more than 4 alarms are active, this will be indicated with a dot behind the last number as shown in the figure below. Further alarm codes may then be displayed by pressing the "ARROW UP" button.



The example above shows that alarm codes 2, 3, U, d and 7 were activated.

Caution

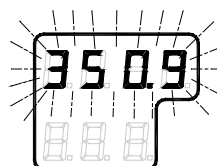
When an alarm is generated, bearing information from the GC80/85 may not be present or may have large error. Any equipment using bearing information from the Gyro compass should therefore immediately be operated according to the equipment's emergency operating procedure.

13.2 Acknowledging an alarm



An alarm is acknowledged by pressing the **ACK/ENT** button.

- The audible alarm will be silenced.
- If the alarm situation has disappeared, the alarm lamp will be switched off, and the alarm code will be removed from the LCD.
- If the alarm situation continues, the alarm lamp will switch from flashing to steady light. The LCD will return to show true bearing with flashing numbers to indicate that the bearing may have large errors.



An alarm code for an active error may be recalled by pressing the **DISP** button until the alarm display is shown. It is possible to recall any alarm code in the LCD for as long as the alarm situation is present.

13.3 Fault finding

When an alarm is generated and not removed by pressing the **ACK/ENT** button, further actions should be taken to correct the alarm situation.

The following pages present an overview of symptoms and corrective actions for errors that may be corrected by the operator. If none of these procedures correct the problem, contact the local Simrad dealer for advice or to request on-board service.

Before any fault-finding procedure is started, the following actions should be performed to verify a system error:

- Shut down and restart the Gyro compass.
- Verify that all cables are properly connected according to the wiring diagrams, page 81 onwards.
- Check the cables from the main power supply to the Control unit.

Main power failure



Alarm generated when the main power supply is lost.

Caution

Turn OFF the power as described on page 21 before checking the main power supply.

- 1 Verify that the main power switch inside the Control unit is switched ON.

Check the input from the power supply to the Control unit:

Terminal board/Terminal:CTERM/TB101, AC1 and AC2

Voltage: 110/220 V AC +/-10%

Check the cables from the main power supply to the Control unit

Remove power to the Control unit and check the fuse:

XF101: 6.3 A

For location and replacement of the fuses, refer to page 40 onwards.

Internal power failure in Control unit



The alarm is generated when the Control unit's power supply is over current or over voltage.

- 1 Turn the power OFF by pressing the **POWER** button. Re-press the **POWER** button after 20 seconds.

If no alarm is activated, continue the start-up procedure as described in *Start-Up*, page 20.

If the alarm continues, contact Simrad's local dealer for assistance.

Inverter malfunction



The alarm is generated if the Inverter in the Master compass is over current or over voltage.

- 1 Turn the power OFF by pressing the **POWER** button. Re-press the **POWER** button after 20 seconds.

If no alarm is activated, continue the start-up procedure as described in *Start-Up*, page 20.

If the alarm continues, turn the power OFF and check the inverter fuse, F1:12 A.

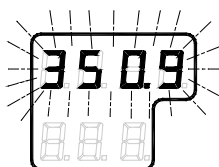
For location and replacement of the fuses, refer to page 40 onwards.

Zero cross failure



This alarm is generated when the reference angle for the compass bearing cannot be detected, or if there is an error in the bearing calculation.

- 1 Press the **DISP** button until the flashing bearing is displayed in the LCD.



Adjust the bearing using the **ARROW** buttons until the bearing corresponds to the vessel's actual bearing. Confirm the entry by pressing the **ACK/ENT** button.

If the bearing input is accepted by the system, the LCD will display current bearing without flashing.

Report the error to Simrad even if the bearing is accepted and the alarm removed.

System communication failure



Alarms generated when there is an error in the communication from the Master compass to the Control unit.

- 1 Turn the power OFF by pressing the **POWER** button. Repress the **POWER** button after 20 seconds.

If no alarm is activated, continue the start-up procedure as described in **Start-Up**, page 20.

If the alarm continues, turn the power OFF and disconnect the power cable from the Control unit.

Confirm the connection between the terminal board in the Master compass and the terminal board in the Control unit as described below:

- GC80 Master compass:
TB2, MR+/-
- GC80/85 Expanded MK2 Control unit:
GTERM-A PWB, TB1-1, MR+/-

GPS communication or data failure



Generated if the communication from GPS has stopped (**C**), or when there is an error in the communication line from the GPS (**D**).

Note!

This alarm is only generated when GPS is selected as the vessel's input system for latitude or speed.

- 1 Verify that the GPS operates according to the GPS documentation.

If the GPS has an error, change the input source as described in **Setting the Latitude input source**, page 61 and **If GYRO is selected you** need to verify that GPS connection is set to Non in extension menu A-2, 2.9.G.

Setting the Speed input source, page 62.

Caution

Any alarm generated by an error in the GPS may cause large errors in the bearing output.

Internal communication failure



Generated when the communication from the external bearing sensor has stopped (**E**), or when an error is detected in the communication (**F**).

Caution

When these alarms are generated, the bearing information from the external bearing sensor may have large error.

Verify that the external bearing sensor operates correctly according to the system documentation.



External bearing sensor failure

Generated when the serial signal from the external bearing sensor has stopped () or when an error is detected in this serial signal ()

Note!

This alarm is only generated when the external bearing sensor is selected as active bearing output system.

Verify that the external bearing sensor operates correctly according to the system documentation.



LOG (serial) communication or data failure

Activated when the serial signal from LOG (serial) has stopped () or when an error is detected in the serial signal from the LOG ()

Note!

This alarm is only generated when GYRO is selected as the active bearing output source, and when LOG (serial) is selected as the vessel's speed input source.

1 Verify that the LOG operates according to the LOG documentation.

If the LOG has an error, change the input system as described in ***If GYRO is selected you*** need to verify that GPS connection is set to Non in extension menu A-2, 2.9.G.

Setting the Speed input source, page 62.

Repeater failure

No output on single repeaters

1 Check that the repeater is connected to the Gyro according to the repeater's documentation.

Each repeater output has a separate fuse in the Control unit. Disconnect the power from the Control unit, and check the fuses:

- Step repeater:

F11 to F14, F5 to F9: 1 A

- Serial repeater:

F1 to F10: 1 A

For location and replacement of the fuses, refer to page 40 onwards.

No output on any repeater

Disconnect the power from the Control unit, and check the following fuse:

F15: 10 A

For location and replacement of the fuses, refer to page 40 onwards.

Failure when powering ON the Gyro compass

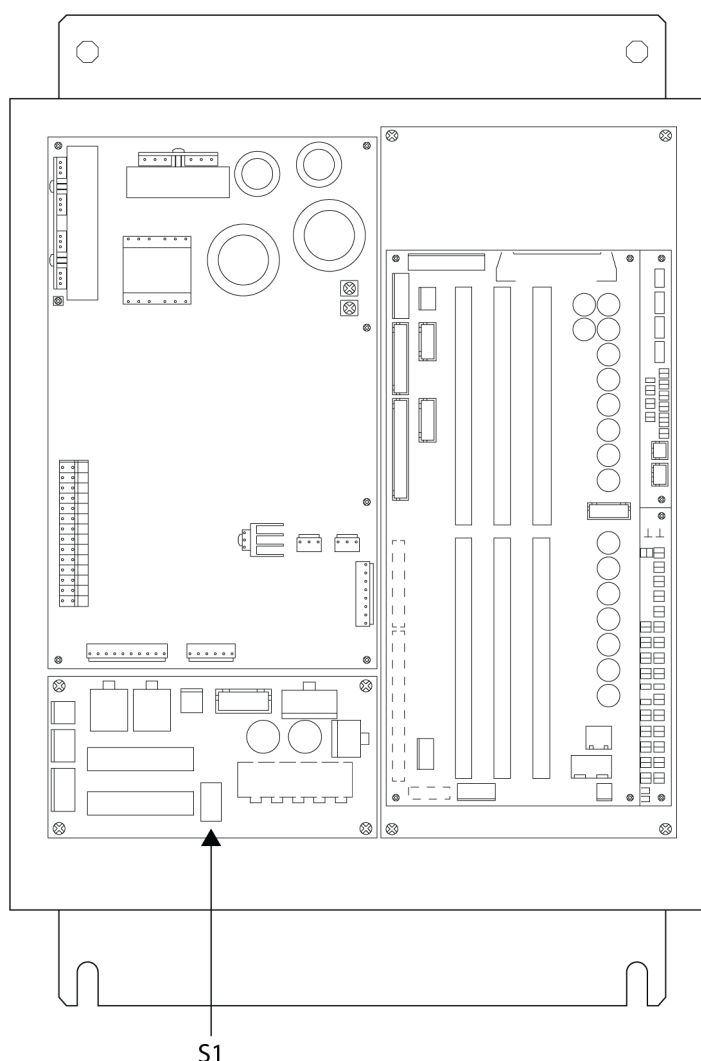
If alarm codes **E** and **A** are generated simultaneously when the GC80 system is turned ON, the following procedure should be used to correct the alarm situation:

- 1 Press the **POWER** button to turn OFF the system. Re-press the button after 1 second.

If the alarm status continues, remove the power from the system and verify the fuse for the inverter.

For location and replacement of the fuses, refer to page 40 onwards.

Master compass running stop function



When any abnormal condition or failure (as E-3/E-A is provided or true heading is unstable) occurs in the Master compass, turn the "Master compass power switch" S1 in the control unit to OFF. It is now possible to stop the Master compass from running and change the output of true

heading information to a connected external heading sensor. This will minimize the loss of heading signal.

Note!

When switch S1 is set to OFF, Gyrocompass heading is unavailable.

13.4 Complete alarm code list

Alarm code	Alarm content	Detailed code	Possible cause
E-1	Main power is abnormal	1	Main power (AC power source) is lost.
E-2	Power is abnormal	2	Power supply unit in the control box becomes over current.
		3	Power supply unit in the control box becomes over voltage.
		4	24R is lost.
E-3	Inverter is abnormal	5	Inverter in the Master compass becomes over current.
		6	Inverter in the Master compass becomes over voltage.
E-4 *1	Control power is abnormal	7	+12.5 V is abnormal.
		8	-12.5 V is abnormal.
		9	+10 V is abnormal.
		10	-10 V is abnormal.
E-5 *1	Rotor current is abnormal	11	Gyro rotor current is abnormal.
E-6	Rotor tilting angle is abnormal	12	Rotor tilting angle is abnormal.
E-7 *1	Servo loop is abnormal	13	Horizontal servo loop is abnormal.
		14	Bearing servo loop is abnormal.
		15	Rate limit is abnormal.
E-8	Zero cross is abnormal	36	Zero cross azimuth angle sensor is abnormal.
E-9 *1	Memory is abnormal	16	Memory is abnormal
		17	
		18	
		19	
		20	
E-A	Communication error (1)	21	Communication error (MCC→SCC).
		23	MCC is reset.
E-b *1	Communication error (2)	22	Communication error (SCC→MCC).
		24	SCC is reset.

Alarm code	Alarm content	Detailed code	Possible cause
E-c	GPS communication off	25	GPS system is stopped or serial signal from GPS is cut (timeout 15 sec).
E-d	GPS data abnormal	26	GPS latitude data abnormal (timeout 17 sec).
		27	GPS speed data abnormal (timeout 17 sec).
E-E	MAG/EHS communication off	32	MAG/EHS system is stopped or serial signal from GPS is cut (timeout 15 sec).
E-F	MAG/EHS data abnormal	33	EHS data abnormal (timeout 17 sec).
E-L	EXT. sensor communication off	30	EXT. sensor system is stopped or serial signal from EXT. sensor is cut (timeout 15 sec).
E-n	EXT. sensor data abnormal	31	EXT. sensor data abnormal (timeout 17 sec).
E-P	LOG(serial) communication off	28	LOG (serial) source is stopped or serial signal from LOG (serial) is cut (timeout 15 sec).
E-U	LOG(serial) data abnormal	29	LOG (serial) data abnormal (timeout 17 sec).
E-r	E5V is lost	34	E5V (power supply of serial signal) is lost.
E-G	Master bearing is abnormal	35	Compensation of the bearing by the encoder signal is not completed.
E-u *1	LOG(contact) data abnormal	37	LOG (contact) is abnormal.
E-t	I/F unit communication abnormal	42	The communication from I/F unit to SCC/ICNT is abnormal. Verify that switch S4-2 is set to OFF on ICNT board.
E-q	SCC/ICNT to GPANEL communication abnormal	-	Communication fail from SCC board to GPANEL-A board. Verify dip switches on GPANEL-A and SCC board.
E-H	GPANEL to SCC/ICNT communication abnormal	40	Communication fail from GPANEL-A to SCC board. Caused by offset out of range (360.0 deg)

*1: This alarm code is not displayed to the customer.

BAMS complete alarm code list

Alarm code	Alarm code to meet BAMS specification	Name	Priority	Category	Remarks
1	10300	MAIN PWR FAIL	W	B	
2	10301	24R PWR FAIL	W	B	
3	10302	INVERTER FAIL	W	B	
4	10303	CONT. PWR FAIL	W	B	
5	10304	ROTOR FAIL	W	B	
6	10305	LEVEL FAIL	W	B	
8	10320	ZERO CROSS	W	B	
A	10308	INNER COMM1	W	B	
b	10309	INNER COMM2	W	B	
c	10310	GNSS COMM	W C	B -	※1
d	10311	GNSS DATA	W C	B -	※1
E	10316	EXT SENSOR COMM	W	B	
F	10317	EXT SENSOR DATA	W	B	
G	10319	STEP ERROR	W	B	
L	10314	EXT UNIT COMM	W	B	
n	10315	EXT UNIT DATA	W	B	
P	10312	LOG COMM	W C	B -	※2
r	10318	E5V FAIL	W	B	
U	10313	LOG DATA	W C	B -	※2
u	10330	PLOG ERROR	W C	B -	※3

※1: Alarm priority is Warning if “c” and/or “d” alarms are activated while GNSS is selected for vessel’s latitude and speed sensor.

※2: Alarm priority is Warning if “P” and/or “U” alarms are activated while Speed Log (serial comm) is selected for vessel’s speed.

※3: Alarm priority is Warning if “u” alarm is activated while Speed Log (contact) is selected for vessel’s speed.

Alarm priority list

Alarm priority		Description	Indication	Buzzer sound
High	A (Alarm)	Alarm requires immediate attention and action. (The operator should switch to manual steering because the automatic steering may be unavailable).	Red	3 short beeps. Repeated every 7 seconds until the ACK button is pressed.
Middle	W (Warning)	Alarm requires immediate attention, but not immediate action. (After acknowledging the alarm, take appropriate action. Some alarms escalate from middle to high priority if they are not acknowledged within a certain time.)	Yellowish orange	2 short beeps. Repeated every 60 seconds until the ACK button is pressed.
Low	C (Caution)	Alarms not categorized as High (A) priority or Middle (W) priority. (The alarm does not influence the current steering. Recover it before switching from manual to automatic steering mode.)	Yellow	N1

Note!

This equipment does not have any High (A) priority alarms.

※5: The description of Categories

Category A	Alarm that can only be acknowledged (ACK button) by operating the system.
Category B	Alarm that can be acknowledged (ACK button) by operating either the system or external equipment (CAM-HMI).

Note!

This equipment has no Category A alarm.

