



# GC80/85 Dual MK2 User Manual

ENGLISH

## Document history

|          |                                                                                                                 |
|----------|-----------------------------------------------------------------------------------------------------------------|
| Rev. 001 | First issue.                                                                                                    |
| Rev. 002 | Added trademark section, disclaimer, and copyright section.<br>Added section about Master compass power switch. |
| Rev. 003 | Updates to extension cables, optional equipment, notes added,<br>updates to alarm list, other minor changes.    |

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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](http://www.navico-commercial.com)

## 1.2 Disclaimer

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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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## Governing language

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## 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!          | <i>Used to draw the reader's attention to a comment or some important information.</i>                             |
| Caution!       | <i>Used for warning the reader that a risk of damage to the equipment exists if care is not exercised.</i>         |
| <b>WARNING</b> | <b>Used when it is necessary to warn personnel that a risk of injury or death exists if care is not exercised.</b> |

This manual is divided into the following sections:

## **1. Preface**

## **2. System overview**

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

## **3. User interface**

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

## **4. Operation**

*Main operating procedures for using the GC80/85 Dual 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 Dual 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 Dual Gyro system.*

## **9. Drawings**

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

## **10. Part list**

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

## **11. Terminal layout**

*List of all terminal pins and terminal labelling with details on the GTERM-A board, the DTERM-A board, the CTERM board and the BTERM board in the GC80/85 Dual MK2 Control unit.*

## **12. DIP switch settings**

*Drawings and references of jumpers and DIP switches for the different printed circuits boards in the Dual 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 Dual Gyro systems and their components.

### 2.1 Introduction

GC80/85 Dual Gyro systems have been designed for any size of vessels which require more than 1 Gyro system. The system includes 1 common Control unit, from which each Gyro system may be operated individually or as 1 Dual system.

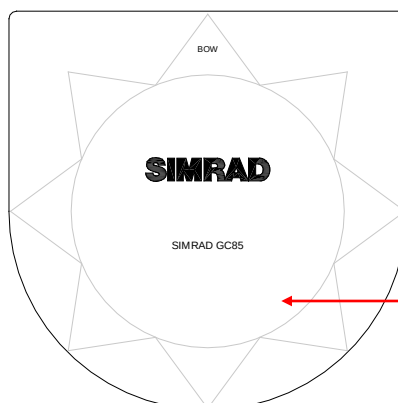
A GC80/85 Dual Gyro system enhances the navigational capabilities and reliability. It eliminates the inconvenience and limitations of magnetic compasses, and provides a variety of electrical outputs to supply accurate and consistent heading information to other navigational equipment.

GC80 standard and GC85 high speed Dual Gyro systems have different Sensitive elements, but use the same GC80/85 Dual MK2 Control unit. The systems are identified by 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 Dual Gyro system 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.

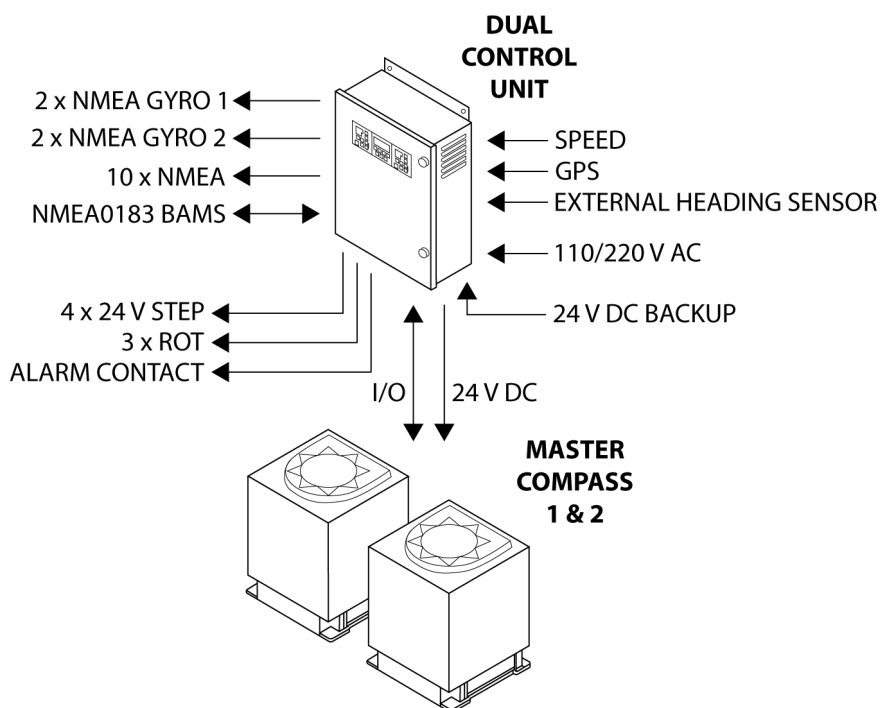
To assure long time safe operation, the following precautions should be taken:

- Assure that the operator is familiar with the use of the Gyro compass.
- Perform daily checks to maintain normal system operation. Refer **MAINTENANCE**, page 38 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 Dual Gyro system includes the following units:

- Master compass 1 & 2 with Sensitive elements
- Dual MK2 Control unit



Note!

For details, refer **TECHNICAL SPECIFICATIONS**, page 86.

## 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 94 onwards.

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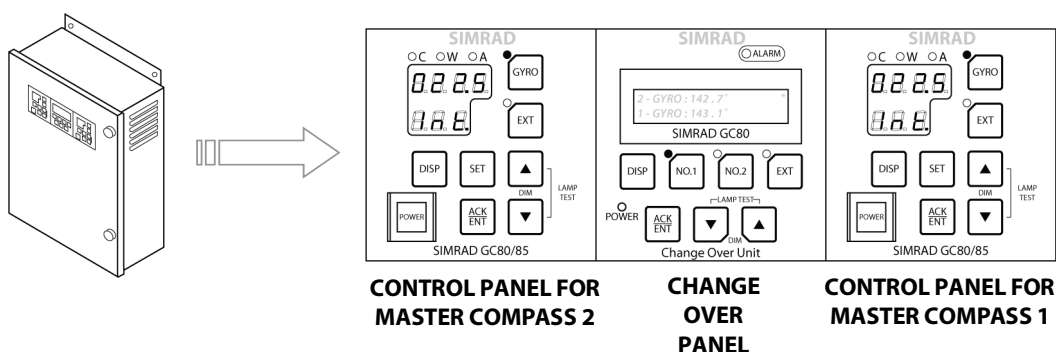
### 3 USER INTERFACE

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

#### 3.1 General

The Dual MK2 Control unit includes 3 Control panels: 1 for each Gyro compass, and 1 Change over panel used to display and control the Dual Gyro system.

From the Dual MK2 Control unit, each Gyro compass may be operated individually, or the system may be operated as 1 Dual system.



#### 3.2 Master compass control panels

The Control panels for each of the 2 Master compasses are identical. They are used to control each Master compass individually, and include the buttons described on the following pages.

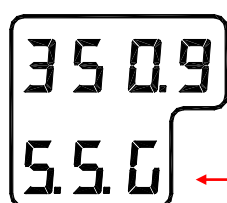


##### POWER button

Used to turn the Gyro system ON. The button is lit to indicate that power is supplied to this Gyro compass. Refer *System Start-up and Shut-down*, page 22.

##### 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 *Display present settings for each compass*, page 27. The Data indicator is also used for displaying alarm codes as described from page 34 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 33.



### 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 33.



### DISP button

Used to display data on the LCD. Refer *Display present settings for each compass*, page 27.



### SET button

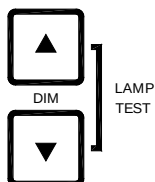
Used to change data and input sources. Refer *System start-up and software configuration*, page 70 onwards.



### ACK/ENT button

Used to confirm a change in data and input sources. Refer *System start-up and software configuration*, page 70 onwards.

The button is also used to acknowledge an alarm as described in *Acknowledging an alarm*, page 35.



### ARROW buttons

Used to increase or decrease a parameter value. Refer *System start-up and software configuration*, page 70 onwards.

Also used for lamp test and to set the display illumination as described on page 25.



### Alarm indicators

Used to indicate an alarm situation. Refer *Alarm messages*, page 34.

### 3.3 Change over panel

This panel is used to toggle between available compasses, to display bearing for the Gyro compasses, and to display alarm information. The panel is also used to set the alarm difference limit.

The panel includes the buttons described on the following pages.



#### POWER button

Used to turn the Dual control panel ON.

The button is recessed into the front panel, and a pen or a blunt tool must be used to activate the button.

#### Display

The LCD displays data in 2 rows, where each row has 16 characters available. The figure below shows the display after the start-up procedure is completed.

**1-GYRO:142.7° \*A**  
**2-GYRO:142.7°**

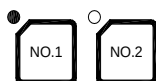
When pressing the **DISP** button, the display will page through available data and eventually alarm lines as shown below:

| DISPLAYED TEXT    | DESCRIPTION                                                                                                    |                                                                                             |
|-------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| 1-GYRO:142.7° SA* | Heading for Gyro number 1.                                                                                     | S = Less than 2 hours since the Gyro was started<br>A = For internal use<br>* = Active Gyro |
| 2-GYRO:142.7° SA* | Heading for Gyro number 2.                                                                                     |                                                                                             |
| E-SENS:141.9      | Heading for external sensor. Only visible when an external sensor is connected.                                |                                                                                             |
| HDM SET:05.0°     | Setting for heading difference alarm.                                                                          |                                                                                             |
| - PARAMETER SET - | Used for entering the parameter setup submenu                                                                  |                                                                                             |
| < ALARMS >        | Visible if 1 or more alarms are generated. Refer to <i>Alarm messages on the Change over panel</i> on page 35. |                                                                                             |



### DISP button

Used to display data on the LCD. Refer *Display present settings for each compass*, onwards.



### GYRO no.1 and no.2 buttons

Used to select Master compass no.1 or no.2 as the active heading reference source.

Active compass source is selected by pressing 1 of these buttons and the **ACK/ENT** button simultaneously. The status lamp is lit to indicate which Master compass is active.

Refer *Selecting active compass*, page 33.



### EXT button

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

Refer *Selecting active compass*, page 33.



### ACK/ENT Button

Used to confirm a selection.

The button is also used to acknowledge an alarm as described in *Acknowledging an alarm*, page 35.



### ARROW Buttons

Used to increase or decrease a parameter value. Refer *System start-up and software configuration*, page 70 onwards.

Also used for lamp test and to set the display illumination as described on page 25.



### Alarm Indicator

Used to indicate an alarm situation. Refer *Alarm messages*, page 34.

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## 4 OPERATION

This section describes the main operating procedures used when operating the GC80/85 Dual Gyro system.

### 4.1 General

In GC80/85 Dual systems, both Gyro compasses may be operated individually as single Gyro systems. Gyro 1 and Gyro 2 is operated by **NO.1** panel and **NO.2** panel on the Dual MK2 Control unit.

**Note!** *The start-up procedure and configuration is identical for each Gyro, and has to be performed for both Gyro compasses before the Dual function can be started. The start-up procedure may be performed simultaneously for both compasses.*

**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 70 onwards.*

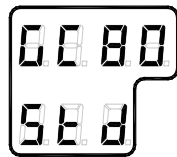
### 4.2 System Start-up and Shut-down

A GC80/85 Gyro compass 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 procedure for each Gyro compass

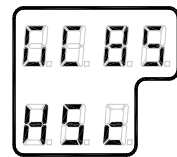


- 1 Turn ON each Gyro compass by pressing the **POWER** button on the Control panel. Follow the start-up sequence.
- 2 Control unit type (GC80 Std, or GC85 HSc), software version for Control unit and for Master compass is displayed in rapid succession. Examples of display text are shown below:

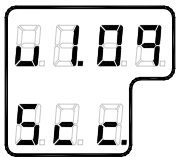


GC80 CONTROL  
UNIT  
STD VERSION

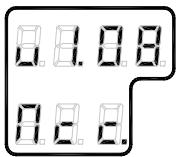
OR



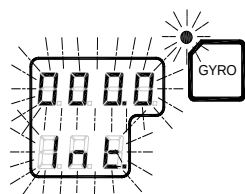
GC85 CONTROL  
UNIT  
HIGH SPEED  
VERSION



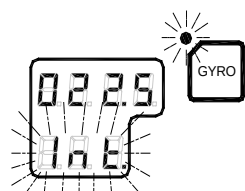
SOFTWARE VERSION  
CONTROL UNIT



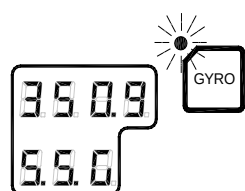
SOFTWARE VERSION  
MASTER COMPASS



- 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.

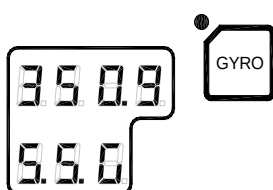


- 5 When the compass has rotated 360°, start bearing is indicated with flashing text in the display. The start bearing will be the same as active bearing when the compass was turned OFF.

- 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.

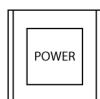


- 8 When the rotor has reached full speed, the compass starts the north seeking function. The display will now change to show the compass' actual heading, and from now on bearing output will be available.

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 Gyro 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 a Gyro compass OFF



- 1 Press the **POWER** button on the Control panel of the master system that is to be turned OFF. 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.

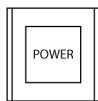
Active rotor break is indicated by:

- 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.

## Starting and stopping the Dual function

When each Gyro compass is started and configured, the Dual function may be started.



- 1 Press the **POWER** button to turn ON the Change over panel.  
The button is recessed into the front panel, and a pen or a blunt tool must be used to activate the button.  
The display will show product name and software version for PCC and SCOIF boards:

**HDM220**  
**P:V1.02 C:V1.02**

followed by:

**HDM220**  
**by Simrad**

and then show heading for Gyro compass no.1 and no.2.

**1-GYRO:123.4° A\***  
**2-GYRO:123.4°**

- 2 Verify that heading 1 and heading 2 are in accordance with the heading displayed on the Gyro compass' control panel.

The Dual function is stopped by re-pressing the **POWER** button.



## 4.3 Adjusting display illumination and contrast

### Display illumination in control panels



The display illumination and the light intensity in the indicator lamps are set separately for each panel, and are 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.

*Note that the small power button on the Change over panel is not illuminated!*

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

### Display contrast in Change over panel



- 1 Press the **DISP** button on the Change over panel until - *PARAMETER SET* -: is displayed in the display's upper line.

-PARAMETER SET:



- 2 Press the **ACK/ENT** button. The display will change to:

SET=ENT ESC=DISP  
LCD CONTRAST

- 3 Press the **ACK/ENT** button again to activate the contrast setting display:

SET=ENT ESC=DISP  
CONT.: ■■■■



- 4 Use the **ARROW** buttons to increase or decrease the contrast setting.



- 5 Confirm the entry by pressing the **ACK/ENT** button.

## Automatically turn OFF the light in the Change over panel

The back light in the Change over panel can be turned OFF automatically after a set time.



- 1 Press the **DISP** button on the Change over panel until  
- *PARAMETER SET* -: is displayed in the display's upper line.

**-PARAMETER SET:**



- 2 Press the **ACK/ENT** button. The display will change to:

**SET=ENT ESC=DISP  
LCD CONTRAST**



- 3 Press the **ARROW UP** button. The display changes to:

**SET=ENT ESC=DISP  
LIGHT OFF TIME**

- 4 Press the **ACK/ENT** button again to activate the illumination setting display:

**SET=ENT ESC=DISP  
TIME: 01.0(min):**



- 5 Use the **ARROW** buttons to increase or decrease the time setting.  
Range: 0 - 10 minutes.

If the value is set to **0**, the back light is not turned OFF.



- 6 Confirm the entry by pressing the **ACK/ENT** button.

## 4.4 Display present settings for each compass

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

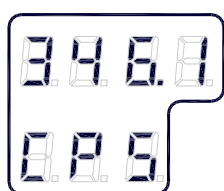
The sequence depends on whether an external compass is connected. When an external compass is connected, the readout depends on active compass.



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.

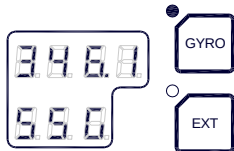
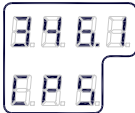
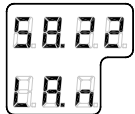
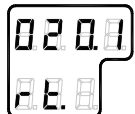
The display is used as follows:

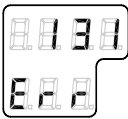
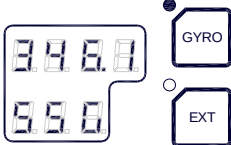


- The first row in the display shows the value.

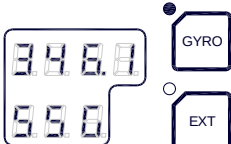
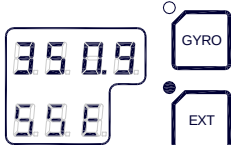
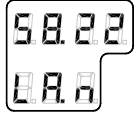
- The second row displays code used for identification.

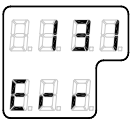
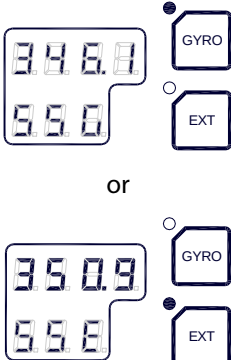
### Displaying settings with no external sensor connected

| Display state                                                                                                                      | Display                                                                             | Description                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Normal operation                                                                                                                   |  | <ul style="list-style-type: none"> <li>- True output bearing</li> <li>- Active compass</li> </ul>                                                                                          |
| <br>1 <sup>st</sup> press on <b>DISP</b> button |  | <ul style="list-style-type: none"> <li>- Gyro compass bearing without correction</li> <li>- Active speed input source indication (<b>GPS, Manual, Log</b> or <b>Serial Log</b>)</li> </ul> |
| <br>2 <sup>nd</sup> press on <b>DISP</b> button |  | <ul style="list-style-type: none"> <li>- Latitude</li> <li>- Latitude indication: north (<b>LA.n</b>) or south (<b>LA.s</b>)</li> </ul>                                                    |
| <br>3 <sup>rd</sup> press on <b>DISP</b> button |  | <ul style="list-style-type: none"> <li>- Vessel speed</li> <li>- Speed input indication (<b>GPS, Manual, Log</b> or <b>Serial Log</b>)</li> </ul>                                          |
| <br>4 <sup>th</sup> press on <b>DISP</b> button |  | <ul style="list-style-type: none"> <li>- Rate of turn in °/min</li> <li>- Rate of turn indication</li> </ul>                                                                               |

| Display state                                                                                                                                        | Display                                                                           | Description                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <br>5 <sup>th</sup> press on <b>DISP</b> button                     |  | <ul style="list-style-type: none"> <li>- Error codes (up to 4)</li> <li>- Error indication</li> </ul> |
| <br>6 <sup>th</sup> press on <b>DISP</b> button<br>Normal operation |  | <ul style="list-style-type: none"> <li>- True output bearing</li> <li>- Active compass</li> </ul>     |

### Displaying settings with external sensor connected

| Display state                                                                                                                      | Display                                                                                                                                                                          | Description                                                                                                                                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Normal operation                                                                                                                   | <br>or<br>  | <ul style="list-style-type: none"> <li>- True output bearing</li> <li>- Active compass</li> </ul> <p>The compass indication equals the sensor selected as active compass (Gyro or external)</p>          |
| <br>1 <sup>st</sup> press on <b>DISP</b> button | <br>or<br> | <ul style="list-style-type: none"> <li>- Bearing</li> <li>- Passive compass</li> </ul>                                                                                                                   |
| <br>2 <sup>nd</sup> press on <b>DISP</b> button |                                                                                               | <ul style="list-style-type: none"> <li>- Gyro compass bearing without correction</li> <li>- Active speed input source indication (<b>GPS</b>, <b>Manual</b>, <b>Log</b> or <b>Serial Log</b>)</li> </ul> |
| <br>3 <sup>rd</sup> press on <b>DISP</b> button |                                                                                               | <ul style="list-style-type: none"> <li>- Latitude</li> <li>- Latitude indication: north (<b>LA.n</b>) or south (<b>LA.s</b>)</li> </ul>                                                                  |
| <br>Normal operation                            |                                                                                               | <ul style="list-style-type: none"> <li>- Vessel speed</li> <li>- Speed input indication (<b>GPS</b>, <b>Manual</b>, <b>Log</b> or <b>Serial Log</b>)</li> </ul>                                          |

| Display state                                                                                                                                        | Display                                                                            | Description                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| 4 <sup>th</sup> press on <b>DISP</b> button                                                                                                          |                                                                                    |                                                                                                              |
| <br>5 <sup>th</sup> press on <b>DISP</b> button                     |   | <ul style="list-style-type: none"> <li>- Rate of turn in °/min</li> <li>- Rate of turn indication</li> </ul> |
| <br>6 <sup>th</sup> press on <b>DISP</b> button                     |   | <ul style="list-style-type: none"> <li>- Error codes (up to 4)</li> <li>- Error indication</li> </ul>        |
| <br>7 <sup>th</sup> press on <b>DISP</b> button<br>Normal operation |  | <ul style="list-style-type: none"> <li>- True output bearing</li> <li>- Active compass</li> </ul>            |

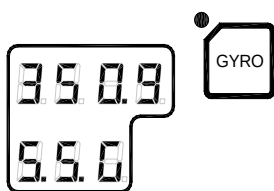
## 4.5 Confirming present settings for each compass

After the GC80/85 is configured according to the *System start-up and software configuration*, described on page 70 onwards, it should not be necessary to adjust any settings when operating the Gyro compass.

However, if an error occurs 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 33.

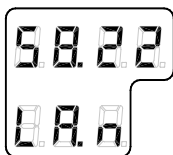


Confirm that the Gyro compass' displayed true bearing is according to a known target or astronomical observation.

If there is any difference, adjust the bearing according to *Adjusting True heading*, page 74.

### 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 72 onwards.

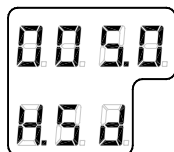
- If GPS is selected as latitude input source, the latitude obtained from the GPS is displayed on the LCD. Confirm that the displayed latitude is the same as indicated on the GPS indicator.
- If GYRO (manual setting of latitude) is selected as latitude input source and other than MANUAL selected as the 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 72.

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 4<sup>th</sup> 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 73.

## 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 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°

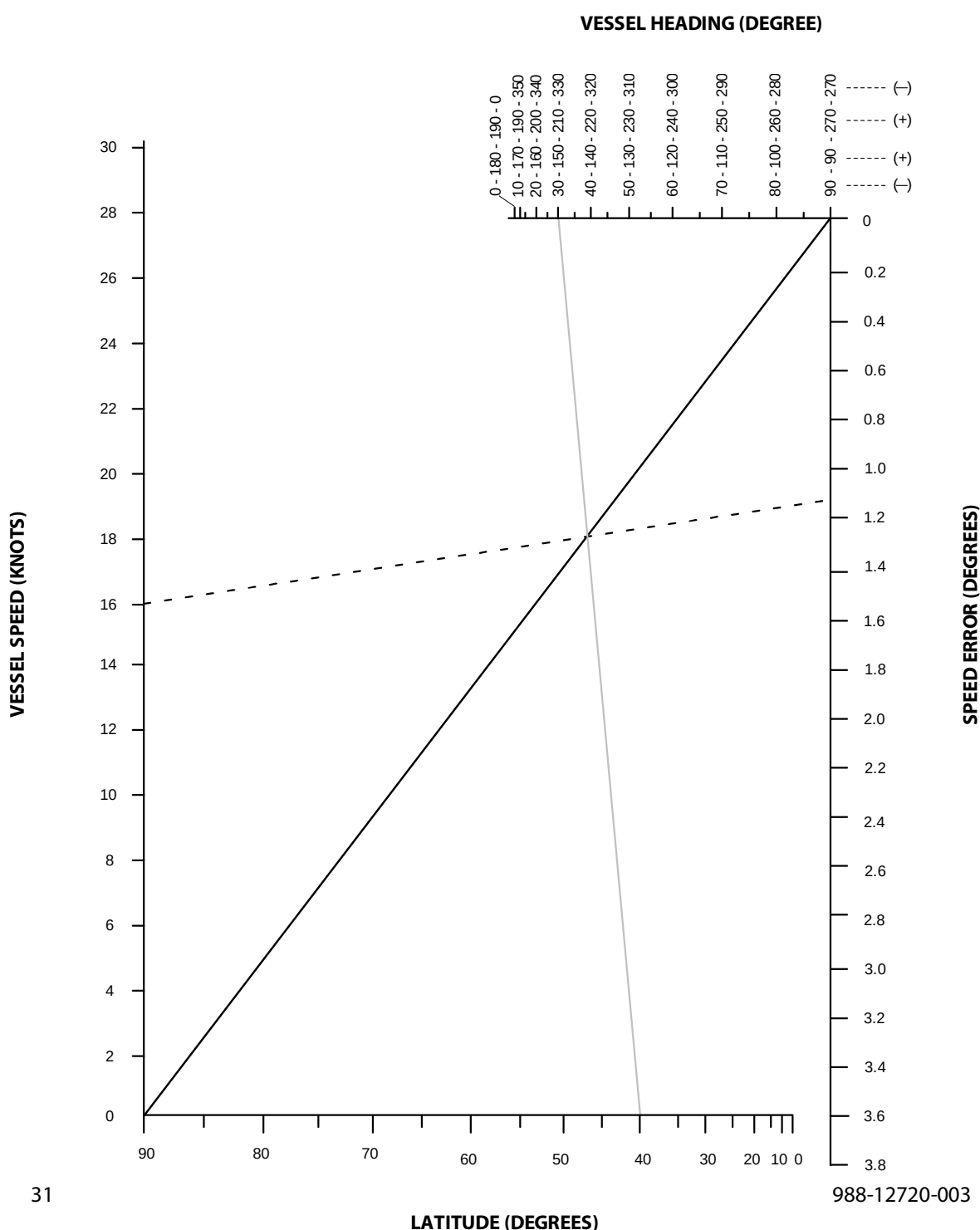
The heading error is found by:

- 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  $270^\circ - 0^\circ - 90^\circ$ , true heading is found by subtracting the speed error from the compass heading.  
If the course is within  $90^\circ - 180^\circ - 270^\circ$ , 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°.

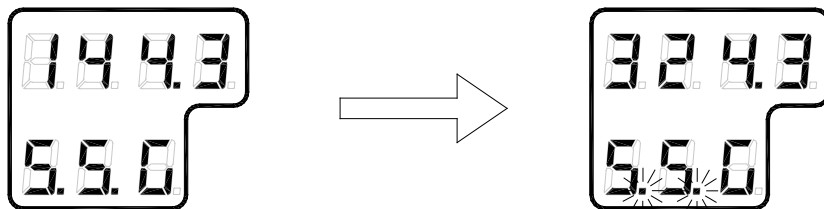
The heading change is activated by closing a potential free contact connected between TB1, pin 71 and 72 on the GTERM-A board in GC80/85 Control unit.

Note!

*To enable the function, S2-4 on the SCC boards has to be set to ON. Refer **DIP switch settings on SCC boards**, page 120 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 on SCC boards**, page 120 onwards.*



4.7     **Selecting active compass**

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

Active compass may be selected from both compass control panels and from the Dual control panel. The switching is done from each panel as shown in the table below:

| ACTIVE COMPASS  | FROM OPERATING PANEL FOR GYRO NO.1 | FROM OPERATING PANEL FOR GYRO NO.2 | FROM SWITCH OVER PANEL |
|-----------------|------------------------------------|------------------------------------|------------------------|
| Gyro no.1       | Yes                                | No                                 | Yes                    |
| Gyro no.2       | No                                 | Yes                                | Yes                    |
| External sensor | Yes                                | Yes                                | Yes                    |



On the Gyro control panels, the switching is done by pressing the **GYRO** or the **EXT** and the **ACK/ENT** buttons simultaneously.



On the Change over panel, active compass is selected by pressing the appropriate compass button (**NO.1**, **NO.2** or **EXT**) and the **ACK/ENT** button simultaneously.

When the active sensor is changed, an audible alarm will sound 5 times.  
Active compass is identified with light in the button's indicator lamp, and with active compass labeled with an asterisk in the Change over panel.

**WARNING**

**Changing between Gyro compass and external heading sensor may result in large change of true bearing. No changes should therefore be made when the system is in operation.**

## 4.8 Alarm messages

Both of the Dual systems at each separate Gyro will continually check for faults while the system is running.

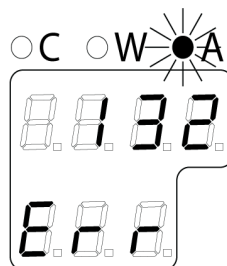
If a fault occurs, an alarm code will be displayed in the LCD, the Alarm lamp will be flashing, and an audible alarm will be activated.

### Caution!

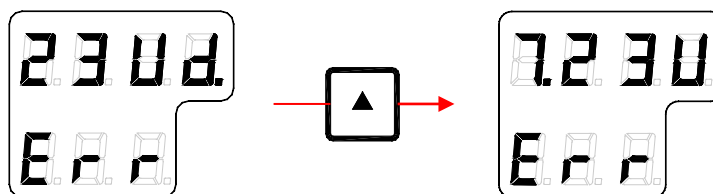
*When an alarm is generated, bearing information from the GC80/85 may not be present or may have large error. Any equipment using bearing information from the Gyro compass should therefore immediately be operated according to the equipment's emergency operating procedure.*

### Alarm messages on the compass control panels

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 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.*

## Alarm messages on the Change over panel

The alarm codes for the Dual system will be displayed 1 at a time in the Change over panel's display. The alarm codes will be displayed after the data lines when the **ARROW DOWN** button is pressed, and will only be available as long as the alarm situation is present.

**G1 ALARM 01/05**  
**GPS Com Alarm**

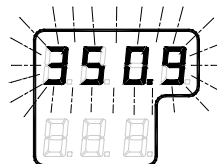
In the example above, the system received a GPS communication alarm on Gyro number 1. The indication shows that this is the first of 5 alarm codes.

## 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 for as long as the alarm situation is present.

The **ALARM MESSAGES AND CORRECTIVE ACTIONS** section, page 137, 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 94 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 94 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 146 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 GC80/85 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 <sup>nd</sup> year                                                                                                                                                                                                                       |
| Replace sensitive element                                                                                   | <p>MTBF (Mean Time Before Failure) is 35000 hours (4 years).</p> <p>On vessels in critical operations we recommend 4-5 years.</p> <p>On vessels in non-critical operation (can operate with backup) we recommend 6-8 years or when it fails.</p> |

## 5.7 Replacing the Sensitive element

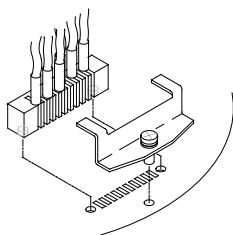
**Caution!** *The Sensitive element should only be replaced by authorized Simrad personnel.*

**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

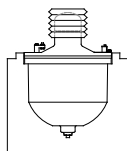
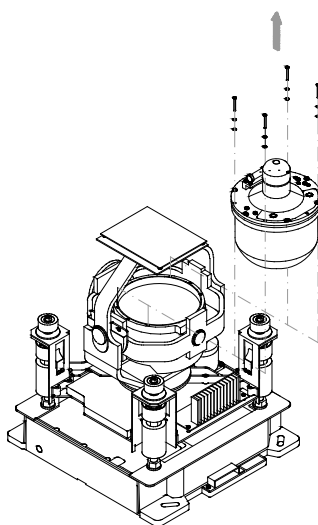
**Caution!** *Use extreme caution when handling the Sensitive element! Do not tilt the element. It is filled with oil and the top includes a ventilation opening.*

- 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.

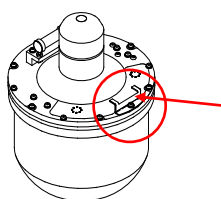


- 3** Loosen the screw on the plug-holder on the Sensitive element, and disconnect the plug.

- 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.



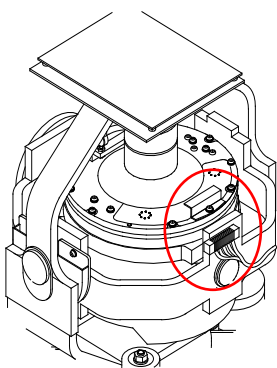
- 6** Fasten the screw on the plug holder on the defective Sensitive element.

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

**Note!**

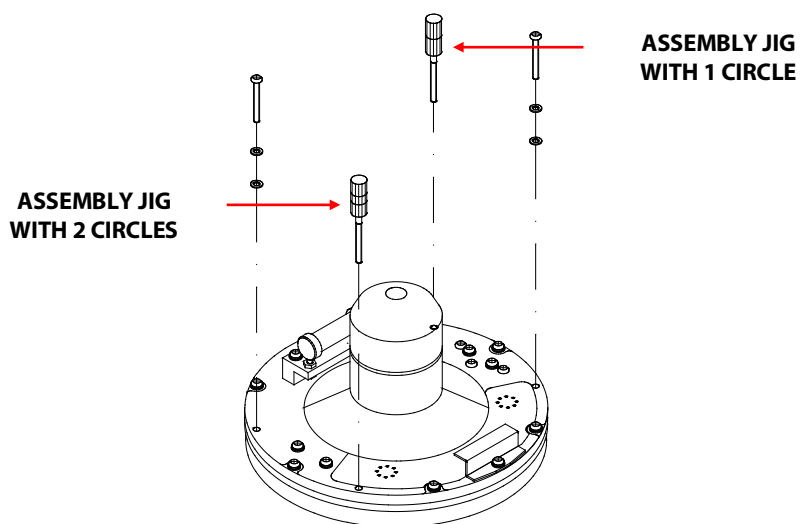
*The packaging and the rubber tube should be kept for re-use if the Sensitive element has to be sent to factory for service!*

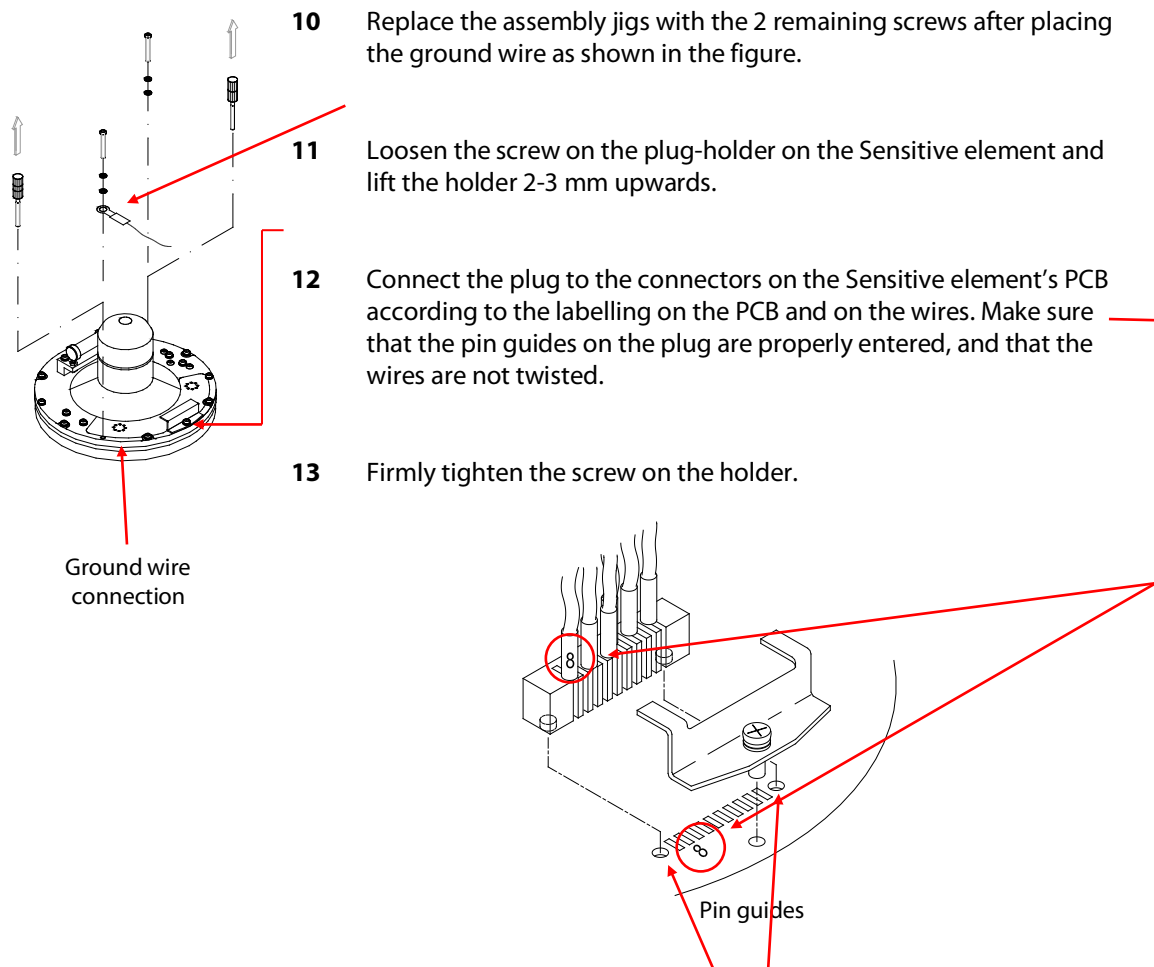




- 8** Tilt the Horizontal ring to the side where the plug is located, and carefully put the Sensitive element into the ring.
- The socket on the Sensitive element should be located right above the plug attached to the Horizontal ring.

- 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.

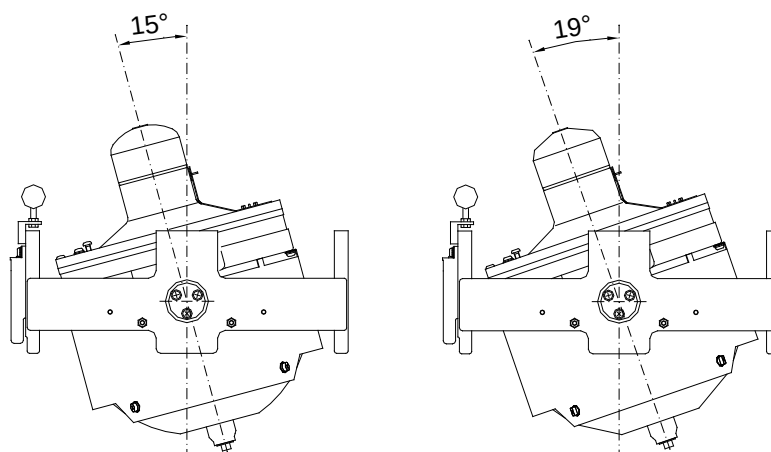




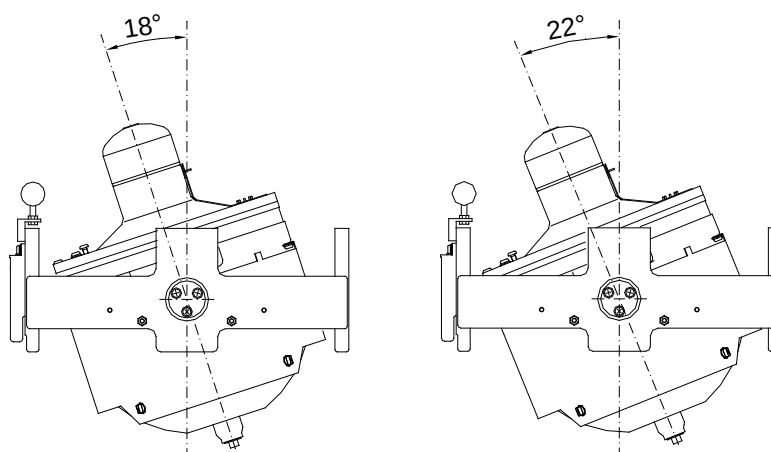
## Verifying the element's tilt angle

- 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.



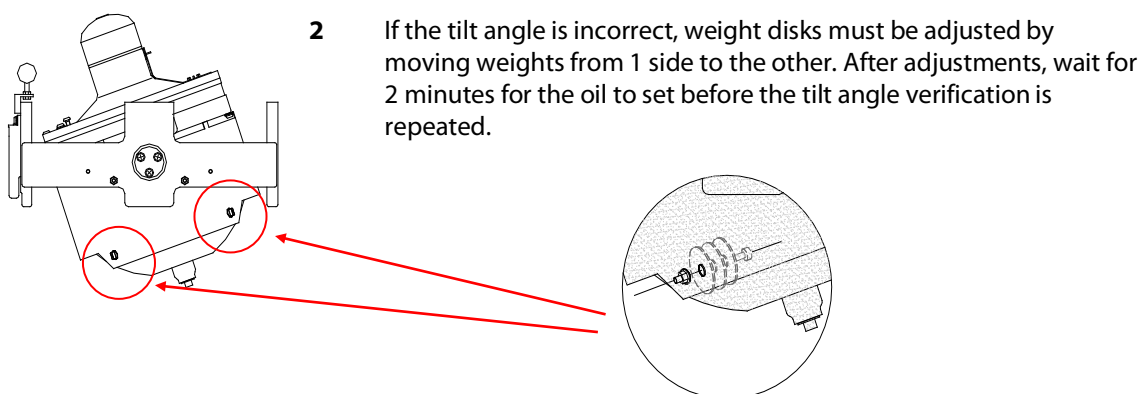
**Max and min tilt angle for GC80 std system**



**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.

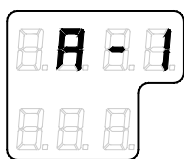
**Caution!**

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

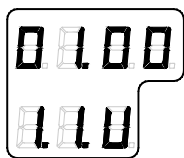
- 3 Carefully rotate the Horizontal ring at least 1 complete rotation. Verify that all movable parts will rotate without making mechanical or electrical contact with any item or component.

### Parameter updates

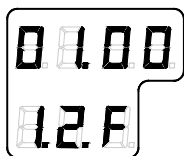
When a Sensitive element is replaced, parameters for the new element have to be loaded into the GC80/85 Control unit before the Gyro compass is turned ON. This is done from the Extension menu as described below.



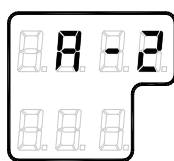
- 1 Enter the Extension menu by pressing and holding the **SET** button and the **ACK/ENT** button simultaneously for appr. 3 seconds.
  - Main category **A-1** will be displayed.



- 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.

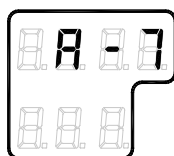


- 4 Confirm the entry by pressing the **ACK/ENT** button. The display will return to sub-category **1.1.U**, and the data will be transferred to the Gyro immediately.
- 5 Press the **DISP** button again to select sub-category **1.2.F**, and use the **ARROW** buttons to increase or decrease the parameter 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 value for **2.1.o** and **2.3.h** as described above.



- 9 Press the **SET** button again to return to main category **A2**, and then press the **DISP** button until main category **A7** is displayed.

- 10 Press the **SET** button, and enter the value for **7.3.u** as described above.

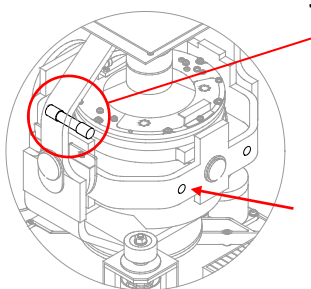
- 11 Exit the sub-category by pressing the **SET** button, and then exit the Extension main category by pressing and holding the **SET** and **ACK/ENT** buttons simultaneously for appr. 3 seconds.

For more information about the Extension menu, see **ADVANCED SETTINGS**, page 79 onwards.

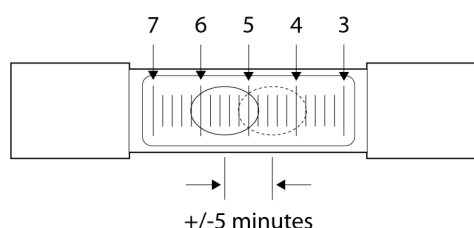
## Balancing the Horizontal ring

After the Sensitive element has been replaced, the Gyro compass should be turned ON as described on page 22.

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  $\pm 5$  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

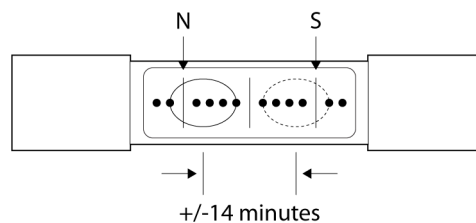
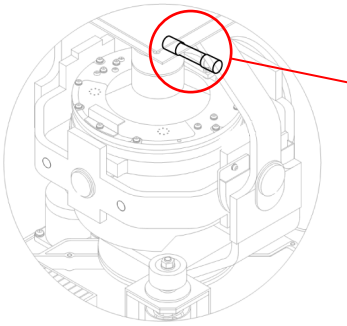
**If the Horizontal ring is tilted more than  $\pm 5'$ , a bearing error will be generated!**

## 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  $\pm 14$  minutes from the reference center.



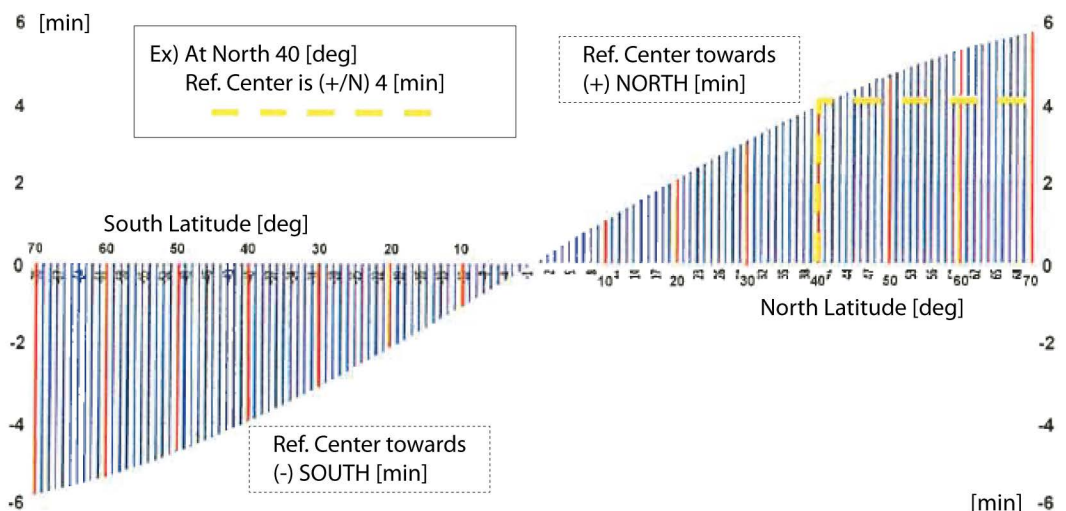
Increase Theta Offset = Bubble towards NORTH

Decrease Theta Offset = Bubble towards SOUTH

Note!

*The Theta Offset should not be changed more than  $\pm 0.1$  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

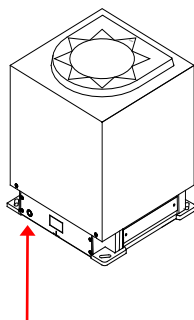
### WARNING

**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 Dual MK2 Control unit

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

#### CTERM No.1

| FUSE NO | CAPACITY | TB-NO   | SIGNAL | DESCRIPTION                                |
|---------|----------|---------|--------|--------------------------------------------|
| XF101   | 6.3 A    | TB101-1 |        | Gyro no.1 Main power supply (AC100/220 V)  |
| XF102   | 10 A     | TB101-3 |        | Gyro no.1 Emergency power supply (24 V DC) |

#### CTERM No.2

| FUSE NO | CAPACITY | TB-NO   | SIGNAL | DESCRIPTION                                |
|---------|----------|---------|--------|--------------------------------------------|
| XF101   | 6.3 A    | TB101-1 |        | Gyro no.2 Main power supply (AC100/220 V)  |
| XF102   | 10 A     | TB101-3 |        | Gyro no.2 Emergency power supply (24 V DC) |

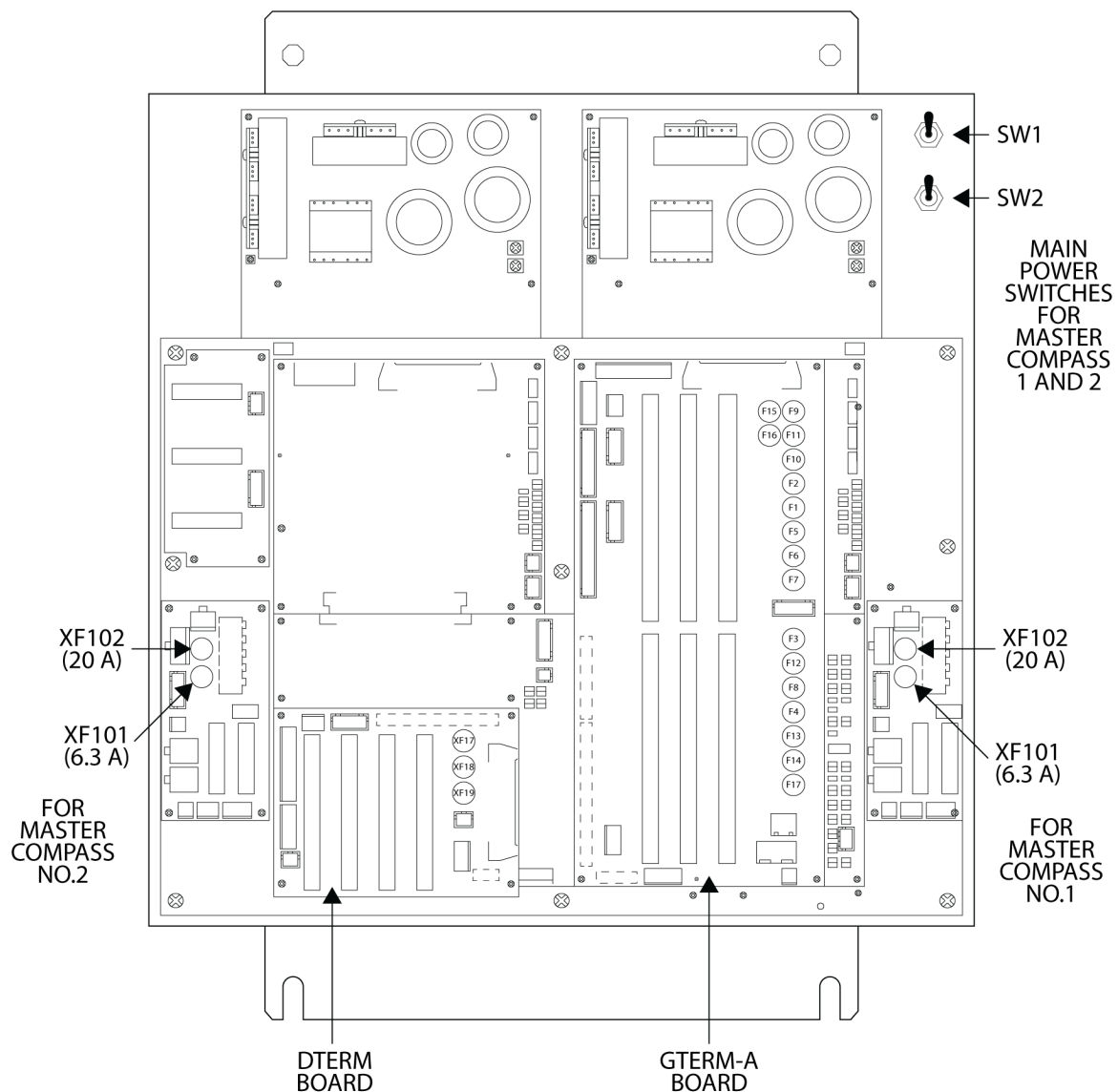
**GTERM-A board**

| 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     |          |        | Repeater power supply (Main 24 V DC) No.1    |
| F16     | 3.15 A   |          |        | Power supply for control unit (24 V DC) No.1 |
| F17     |          |          |        | Not used                                     |

**DTERM-A board**

| FUSE NO | CAPACITY | TB-NO | SIGNAL | DESCRIPTION                                  |
|---------|----------|-------|--------|----------------------------------------------|
| XF17    | 10 A     |       |        | Repeater power supply (Main 24 V DC) No.2    |
| XF18    | 3.15 A   |       |        | Power supply for control unit (24 V DC) No.2 |
| XF19    | 3.15 A   |       |        | Power supply for Gyro monitor (24 V DC)      |





## WARNING

**Make sure that the main power switches S1 and S2 are turned OFF before any fuse is replaced!**

Note!

*The fuses in the Dual 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 Dual Gyro compass consists of the following units:

- 2 Master compasses
- 2 Sensitive elements
- Dual 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 66.

Note!

*It is strongly recommended to keep the Sensitive elements' packaging material. These original packagings 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

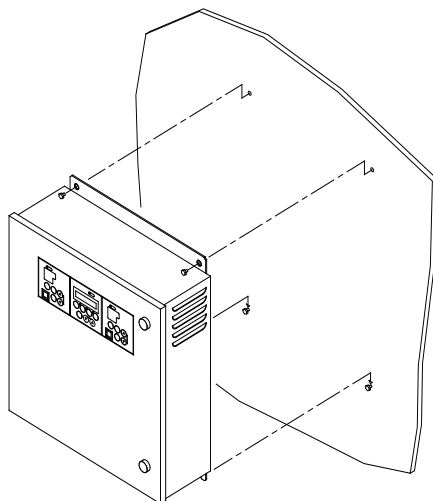
The units included in the GC80/85 system should be mounted with special regard to the units' environmental protection, temperature range and cable length. Refer **TECHNICAL SPECIFICATIONS**, page 86 onwards.

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 using 4 bolts as shown in the illustration.



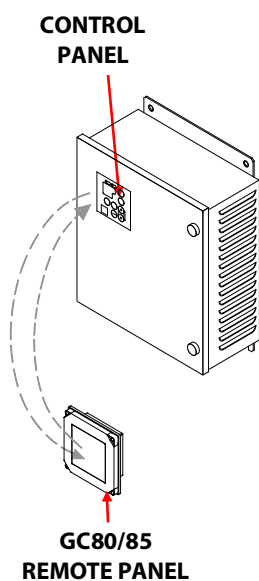
## Flush mounting the Control panels

The control panels for Master compass no.1 and no.2 and the Dual Change over panel may be removed from the control unit. They can be mounted in a remote location 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

For external control panel mounting one kit is required for each panel.



In addition to this kit optional control panel cables can be ordered. The cables for Master compass control unit no.1 and no.2 and for the Dual control panel are available in 3 different lengths.

For Master compass control unit no.1 and no.2:

*2 cables are needed, one for each control unit (GPANEL-A J1 – SCC J1)!*

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

Note!

For remote mounting of the Dual Change over panel two cables are required:

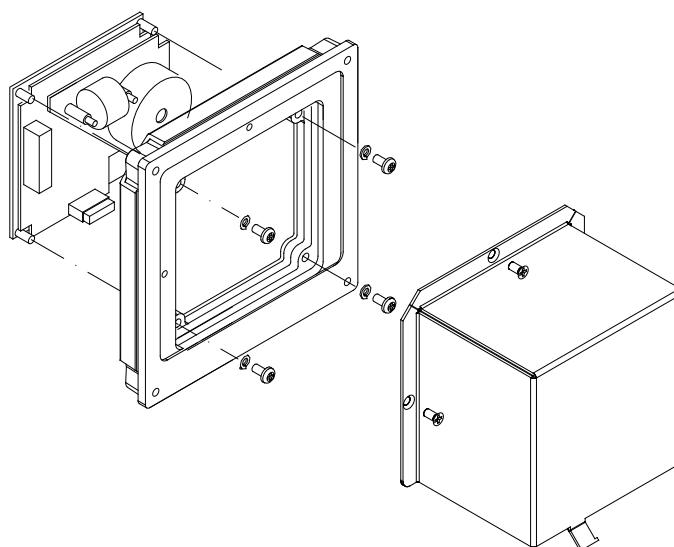
(Cable NO:1 PCC J7 – SCOIF J7)

(Cable NO:2 PCC J10 – BTERM J10)

- 5m Cable NO:1 Dual Control MK2 (000-15838-001)
- 5m Cable NO:2 Dual Control MK2 (000-15839-001)
  
- 10m Cable NO:1 Dual Control MK2 (000-15840-001)
- 10m Cable NO:2 Dual Control MK2 (000-15841-001)
  
- 15m Cable NO:1 Dual Control MK2 (000-15842-001)
- 15m Cable NO:2 Dual Control MK2 (000-15843-001)

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 cable.
- 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.



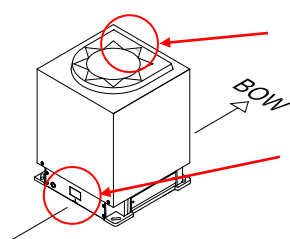
- 6** Insert the plug(s) on the optional control panel cable and connect the grounding wire.
- 7** Mount the cover on the back side.

- 8 Fasten the cable(s) to the cover using a wire strip.
- 9 Slide the Control panel cable through the cable inlet and insert the plug(s) in the SCC board (J1 – where the internal wires for the Control panel have been removed). Connect the grounding wire and secure the cable to the Control unit using a wire strip.
- 10 Insert the blind cover in the Control unit 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.

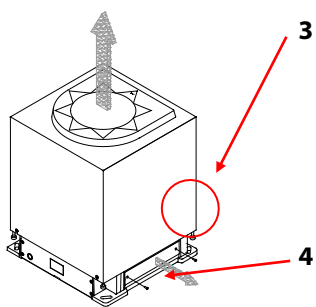
It is also important to select a mounting location with sufficient space for installation and service. Refer dimensional drawing, page 94 onwards.



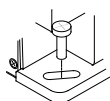
- 1 Place the compass on or parallel to the vessel's horizontal centerline, with the bow indication on the top of the case pointing towards the vessel's bow.
- 2 Use the datum line at the front and the back of the compass to line up the unit.
  - It is possible to compensate for a small mounting offset by using the heading offset feature as described in *Adjusting True heading*, page 74.
  - 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.**

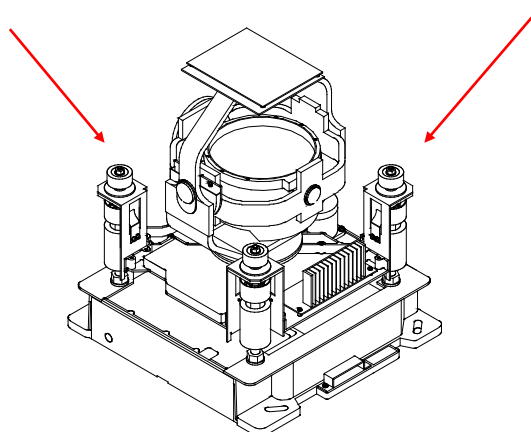


- 3 Remove the 4 screws holding the compass case and carefully lift the case up and away.
- 4 Remove the cable inlet cover.



- 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 74.

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



Note!

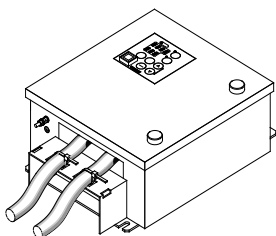
*The foam rubber should be kept for re-use if the Master compass has to be sent to factory for service!*

### 6.3 Cabling

Note!

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

The wiring diagrams on page 94 onwards include cable specifications for all cables.



Connect power and signal cables according to the wiring diagrams on page 94 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.

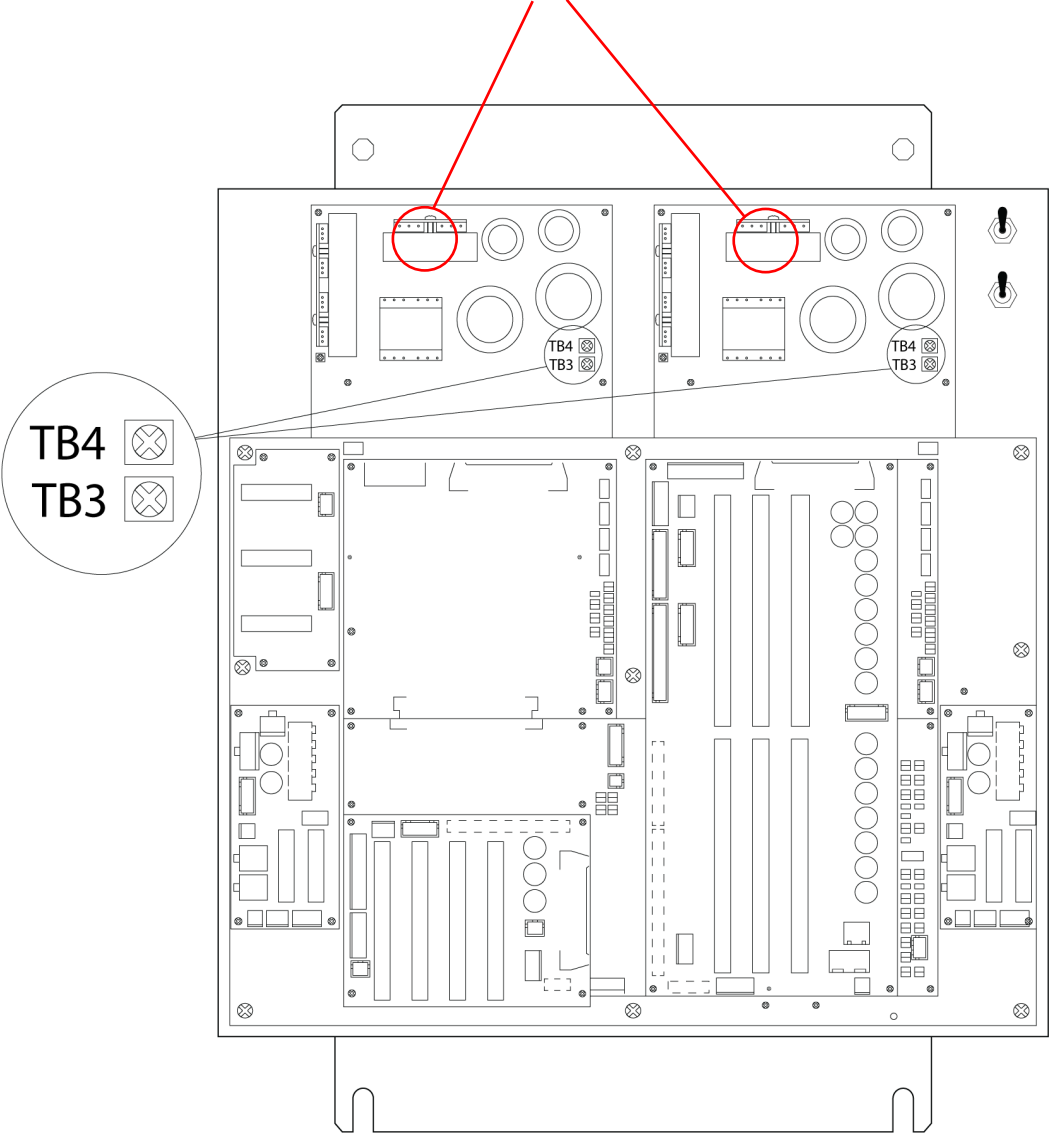
Power supply

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 both GPOWER boards has to be set according to the figure and the table below.

Note!

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



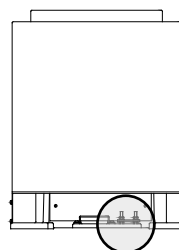
| TB3 - TB4 | VOLTAGE            |
|-----------|--------------------|
| Open      | 220 V AC (default) |
| Short     | 100/110/115 V AC   |



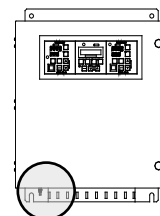
## 6.4 Grounding the units

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 mm<sup>2</sup>).



MASTER COMPASS



DUAL MK2 CONTROL UNIT

## 6.5 DIP switch and jumper settings

GC80 and GC85 Gyro systems include several DIP switches and jumpers. Most of these are factory set and should not be altered by the user.

5 switches in the Control unit must however be set when installing the GC80/85 system. 2 switches have to be set to configure the Control panels to match type of Gyro system (GC80 or GC85). In addition, 3 switches have to be set if an external heading sensor is connected to the system.

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.*

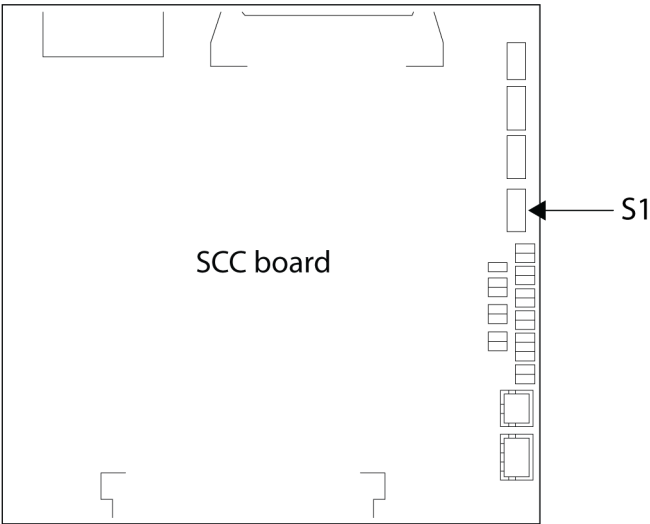
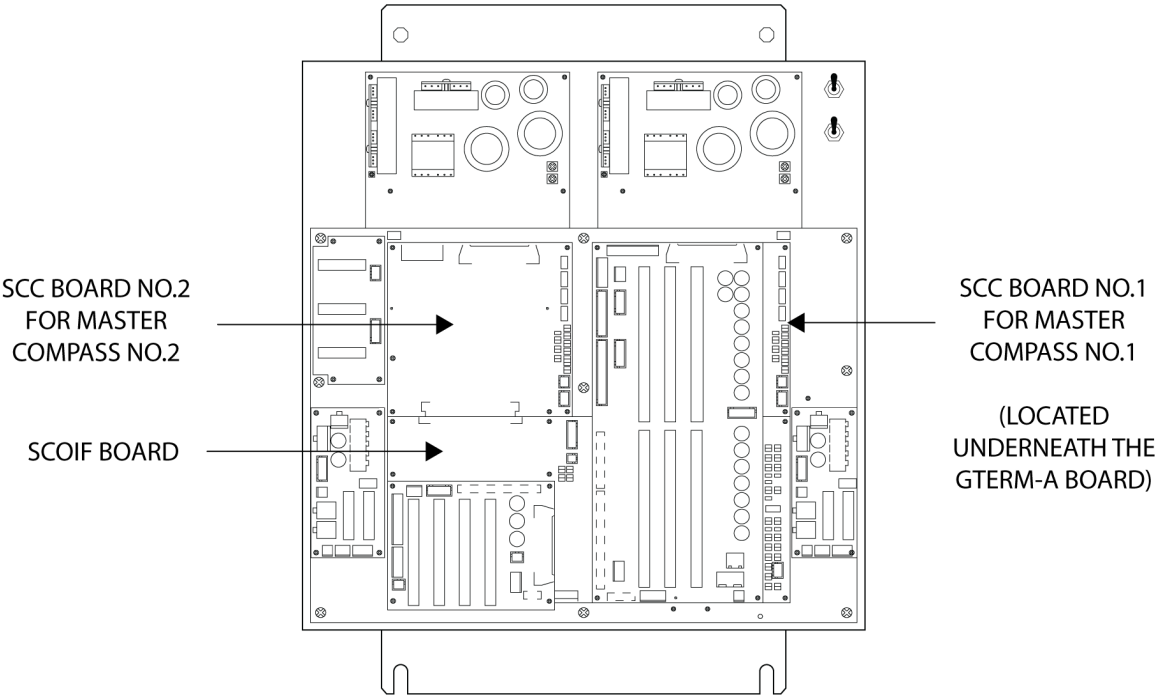
For a complete list of DIP switch settings, refer to **DIP SWITCH SETTINGS**, page 117.

### Activating the GC80 or GC85 Control unit

When the Gyro system is shipped from factory, all DIP switches in both Master compass Control panels are set as a standard GC80 system.

The GC80/85 Dual system includes 2 SCC boards, 1 for each Master compass. The boards are located as shown in the figure on the next page.

If the system is a high speed system (GC85), DIP switch no.2 on S1 on both SCC boards has to be set to identify the system as a GC85 system.



| GC80 system                                                                                          | GC85 system                                                                                            |
|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
|  <p>ON<br/>S1</p> |  <p>ON<br/>S1</p> |

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

Refer **DIP SWITCH SETTINGS** on page 117 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

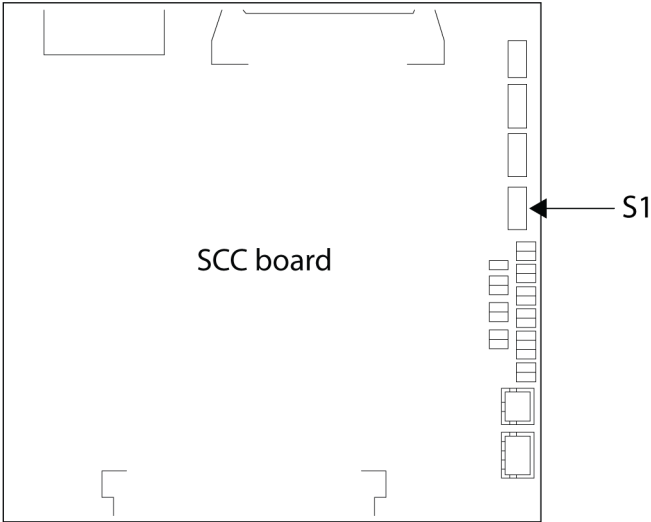
If an external heading sensor is connected to the GC80/85 system, the following switches have to be set to enable the external heading sensor:

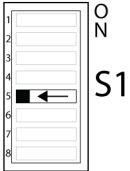
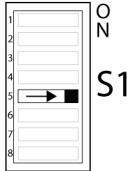
- DIP switch no.5 on S1 on both SCC boards.
- DIP switch no.1 (and 2) on S1 on the SCOIF board.
- DIP switch no.3 (and 4) on S1 on the PCC board (on the back side of the Dual MK2 control panel).

For a complete list of DIP switch settings, refer to *DIP SWITCH SETTINGS*, page 117.

SCC boards

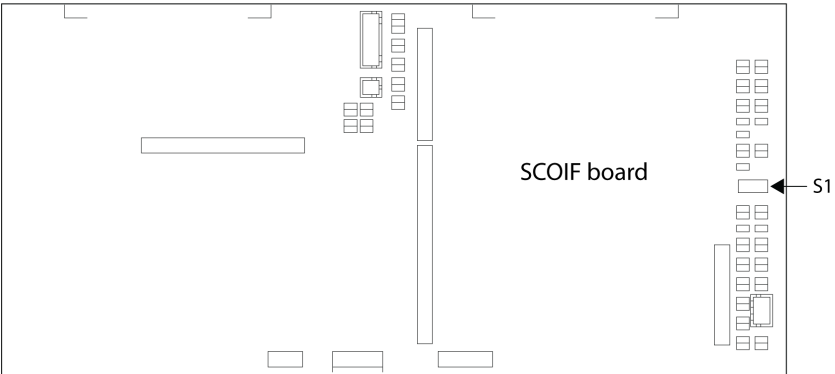
For location of the boards, refer the figure on the previous page.



| No external sensor                                                                  | Active external sensor                                                                |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |

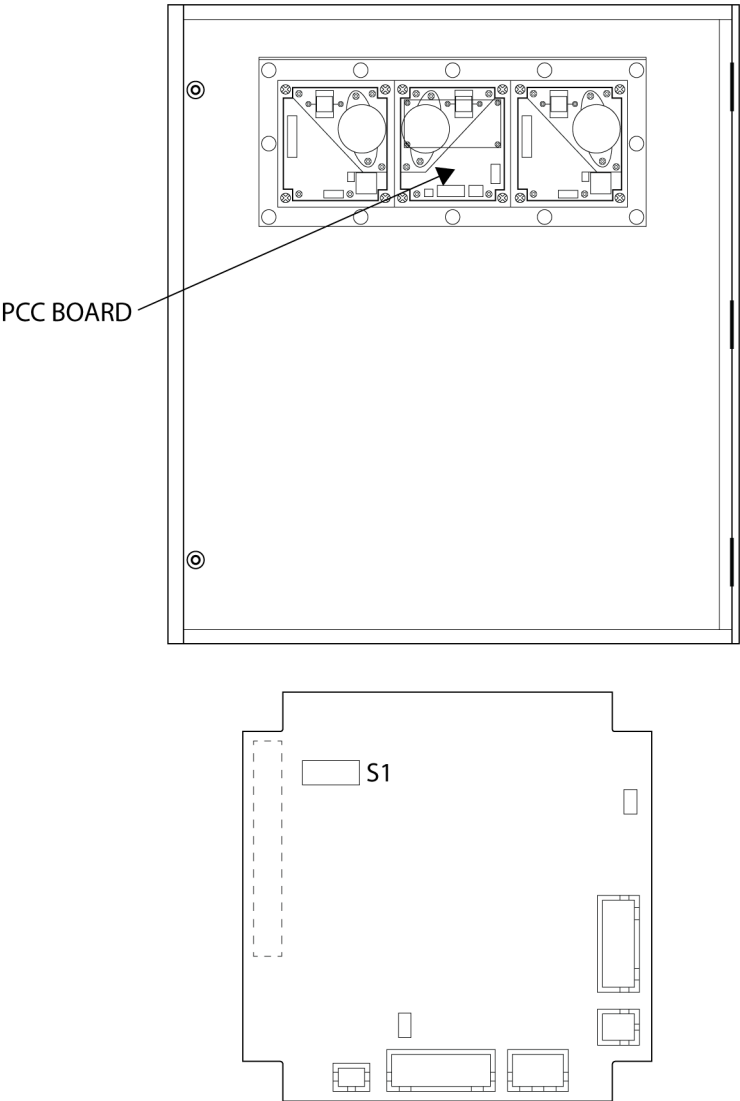
**SCOIF board**

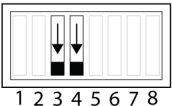
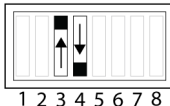
For location of the board, refer the figure on previous pages.



| No external sensor                                                                                                                                                                                                                                                                   | Active external sensor                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div><div>ON</div><div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div></div><div>12345678</div></div><div>S1</div></div> | <div><div>ON</div><div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div></div><div>12345678</div></div><div>S1</div></div> |

PCC board

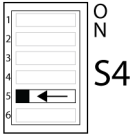
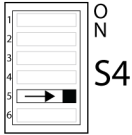


| No external sensor                                                                                                                  | Active external sensor                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <div><div>ON</div><div></div><div>S1</div></div> | <div><div>ON</div><div></div><div>S1</div></div> |

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 both of the SCC boards.

| 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

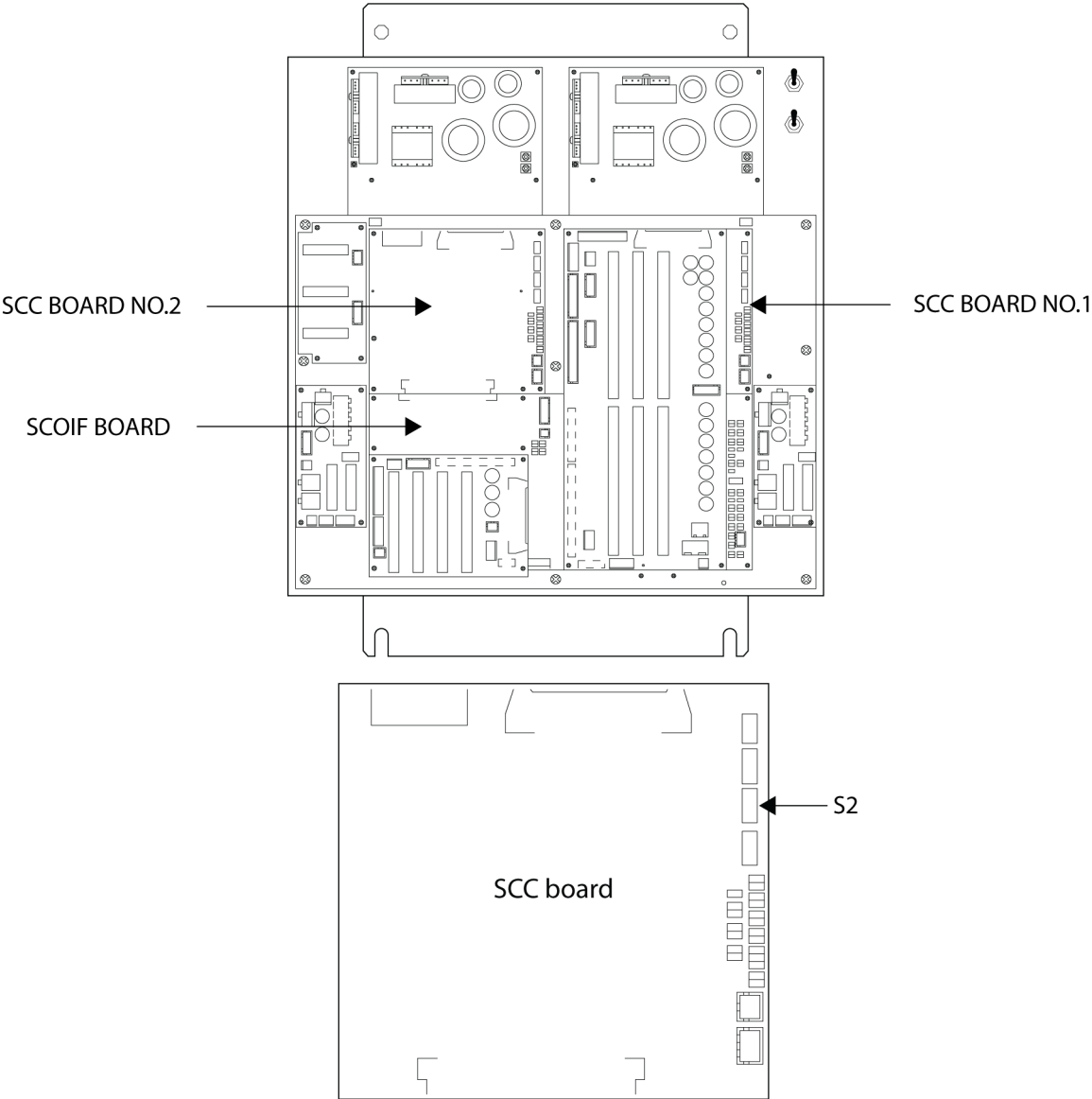
It is possible to set the sentences PTKM and ROT to output at the same time as the heading data.

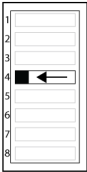
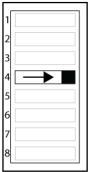
To do so, use the extension menu A-2:

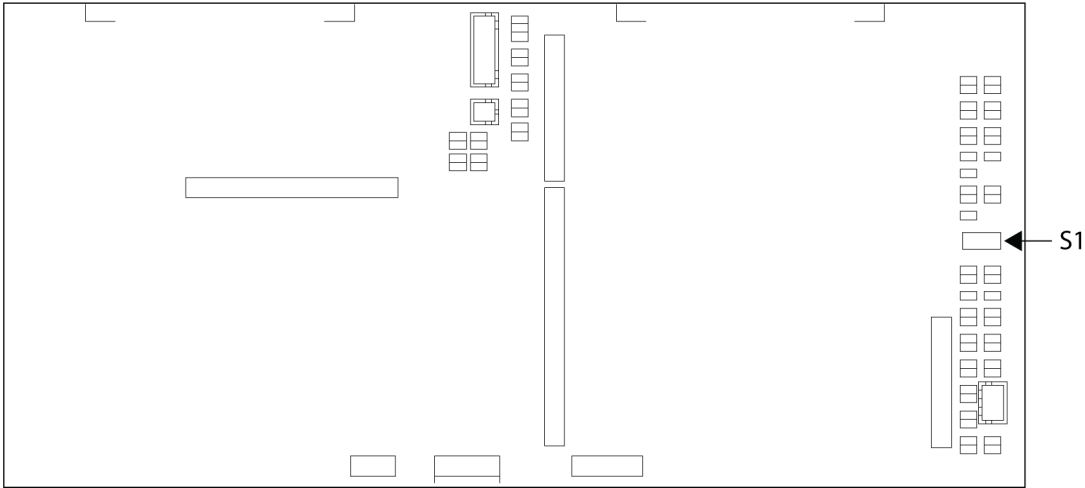
|       |                      |                                    |
|-------|----------------------|------------------------------------|
| 2.G.P | PTKM sentence output | bE = ON/send<br>Non = OFF/not send |
| 2.H.r | ROT sentence output  | bE = ON/send<br>Non = OFF/not send |

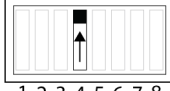
Activating the pendulum function

If an external switch is connected to the GC80/85 system to operate the pendulum function, DIP switch no.4 on S2 on both of the SSC boards and DIP switch no.4 on S1 on the SCOIF board have to be set to activate the pendulum function.



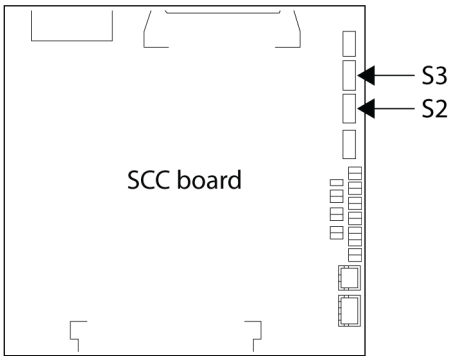
| Pendulum switch disabled                                                            | Pendulum switch enabled                                                               |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |



| Pendulum switch disabled                                                                                                                                                                                                                                       | Pendulum switch enabled                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div><div>ON</div><div>A diagram of a pendulum switch with 8 vertical slots numbered 1 to 8. A black arrow points down to slot 4. The label 'S1' is to the right.</div></div> | <div><div>ON</div><div>A diagram of a pendulum switch with 8 vertical slots numbered 1 to 8. A black arrow points up to slot 4. The label 'S1' is to the right.</div></div> |



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 both of the SCC boards 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 remote buzzer stop to external alarm panel, DIP switch no.8 on S3 on both of the SCC boards must be set to ON to activate EXTERNAL BUZZER STOP output function.

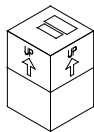
For a complete list of DIP switch settings, refer *DIP SWITCH SETTINGS* on page 117 onwards.

For location of the board, refer the figure on page 117.

| External buzzer stop enabled<br>(Pendulum switch disabled)    | Pendulum switch enabled      |
|---------------------------------------------------------------|------------------------------|
| <p>S2</p>                                                     | <p>S2</p>                    |
| External buzzer stop disabled<br>(Gyro Running cont. enabled) | External buzzer stop enabled |
| <p>S3</p>                                                     | <p>S3</p>                    |

For a complete list of DIP switch settings, refer to *DIP SWITCH SETTINGS*, page 117.

## 6.6 Installing the Sensitive elements



The Sensitive elements are shipped from the factory packaged separately. The elements have to be installed in the Master compasses according to the description below.

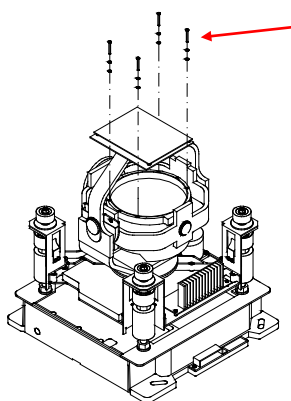
**Note!**

*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.*

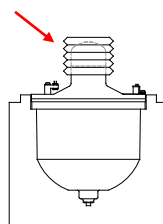
**Caution!**

***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 compasses are installed and cables connected according to the description on page 47 onwards.

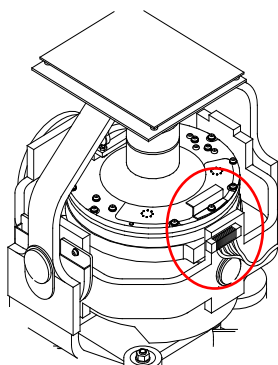


- 2 Remove the 4 screws on the Horizontal ring.
- 3 Carefully lift the Sensitive element from its packaging, and remove the rubber tube on top of the element.



**Note!**

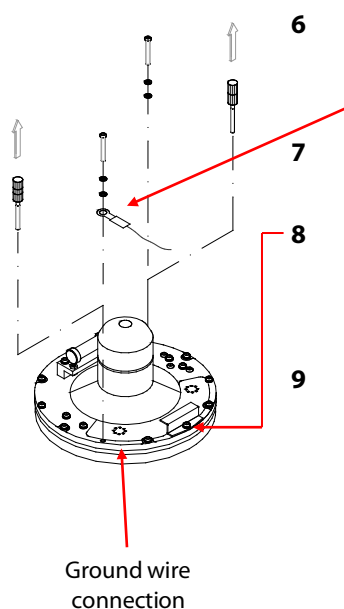
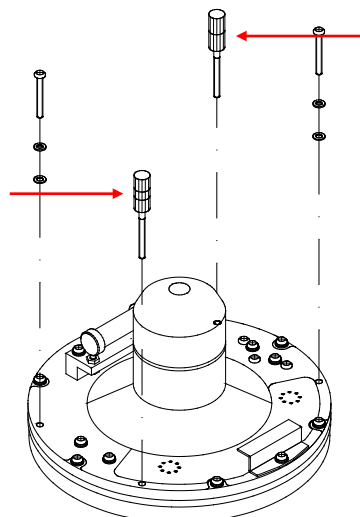
*The packaging and the rubber tube should be kept for re-use if the Sensitive element has to be sent to factory for service!*



- 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.

ASSEMBLY JIG  
WITH 2 CIRCLES

ASSEMBLY JIG  
WITH 1 CIRCLE

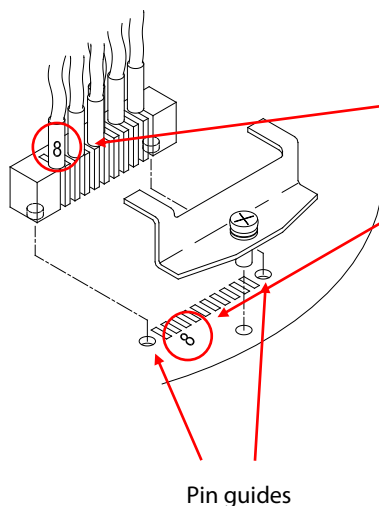


6 Replace the assembly jigs with the 2 remaining screws. Locate the ground wire on 1 of the screws as shown in the figure.

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.

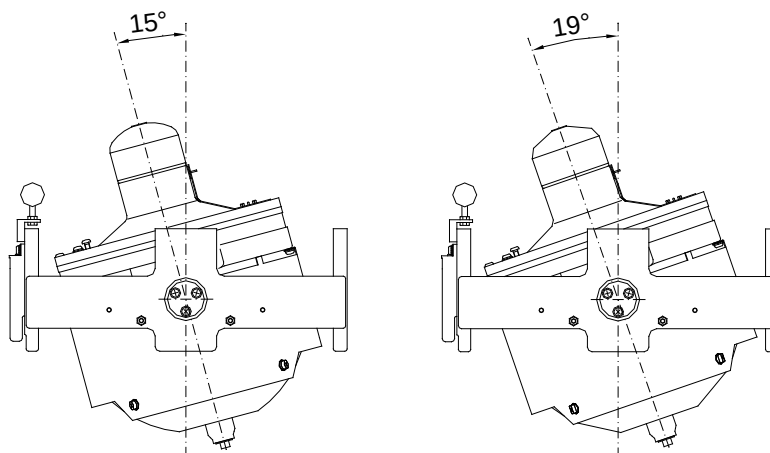
9 Firmly tighten the screw on the holder.



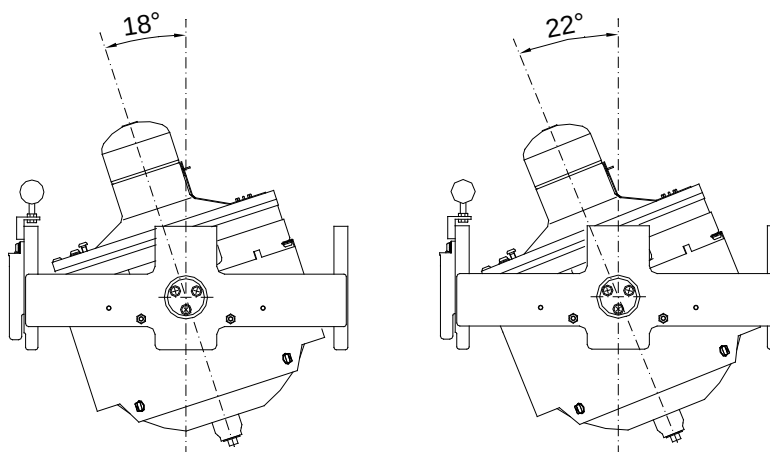
## Verifying the element's tilt angle

- 1 Tilt the Sensitive element by hand towards the 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.



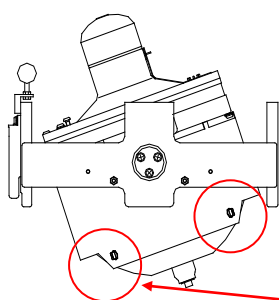
**Max and min tilt angle for GC80 std system**



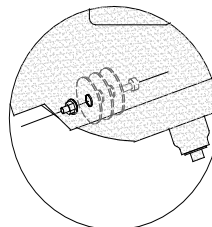
**Max and min tilt angle for GC85 High Speed system**

Note!

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



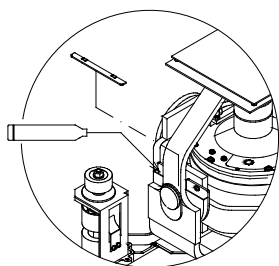
- 2** If the tilt angle is incorrect, weight disks must be adjusted by moving weights from 1 side to the other. After adjustments, wait for 2 minutes for the oil to set before the tilt angle verification is repeated.



**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 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.

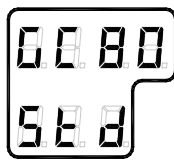
Note!

*The start-up procedure and configuration is identical for each Gyro, and has to be performed for both Gyro compasses before the Dual function can be started. The start-up procedure may be performed simultaneously for both compasses.*

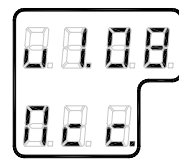
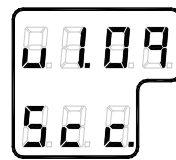
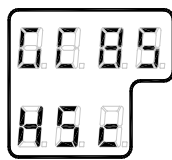
### System Start-up for each Gyro compass



- 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

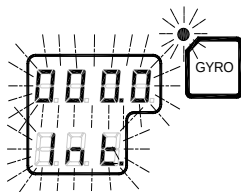


GC80 CONTROL  
UNIT  
STD VERSION

GC85 CONTROL  
UNIT  
HIGH SPEED  
VERSION

SOFTWARE VERSION  
CONTROL UNIT

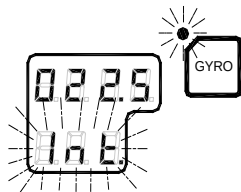
SOFTWARE VERSION  
MASTER COMPASS



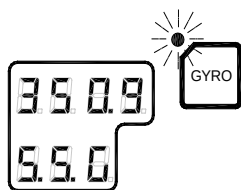
- 2 The Sensitive element starts rising horizontally, and the compass turns 360° clockwise. The display shows decreasing bearing as the compass is turning.

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

- 4 Active rotor break is indicated with flashing display.



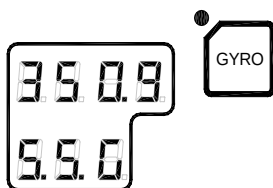
- 5 When the rotor rotation has stopped, start bearing is indicated with flashing text in the display. The start bearing will be the same as active bearing when the compass was turned OFF.



- 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 S.S.G. (mode) remain flashing.

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



- 7 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.

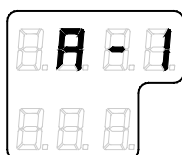
The GC80/85 will be settled within 3 hours when started with a deviation angle less than 5°. With a larger deviation angle, the compass will be settled within 4 hours.

### Configuring the Sensitive elements

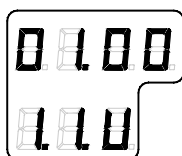
Each Sensitive element is tuned to its Master compass before it is shipped from the factory. This tuning is reflected in a set of parameters specific for this Gyro compass. These parameters are included in the Sensitive element's packaging, and they have to be entered into the Control unit as part of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

Parameters used for time settings should also be entered. These parameters are essential when monitoring the occurrence of alarms.

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

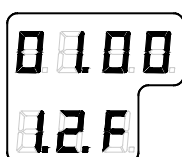


- 1 Access the Extension menu by pressing and holding the **SET** button and the **ACK/ENT** button simultaneously for appr. 3 seconds.  
Main category **A-1** will be displayed.



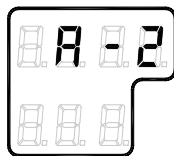
- 2 Press the **SET** button to access the sub-category loop. Sub-category **1.1.U** and its parameter values will be displayed.
- 3 Use the **ARROW** buttons to increase or decrease the parameter value until the value is according to value in the table included with the Sensitive element.

- 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**.



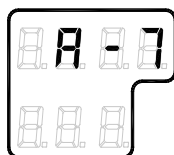
- 7 Press the **SET** button again to return to main category **A1**, and then press the **DISP** button to go to **A2** main category.

- 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.*



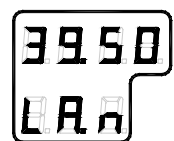
- 10 Press the **SET** button again to return to main category **A2**, and then press the **DISP** button until main category **A7** is displayed.

- 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.

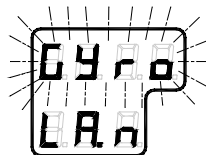
For more information about the Extension menu, see **ADVANCED SETTINGS**, page 79 onwards.

### Setting the Latitude input source

When the system is configured as described in *Configuring the Sensitive element* page 71 onwards, the latitude input source can be changed as described below:

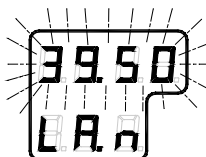


- 1 Press the **DISP** button until the display shows latitude value.



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

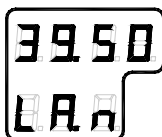
- 3 Use the **ARROW** buttons to select **Gyro** or **GPS** as the latitude input source, and confirm the entry by pressing the **ACK/ENT** button.



- 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.



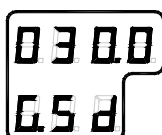
- 5 The display will return to show latitude value without flashing.

Note!

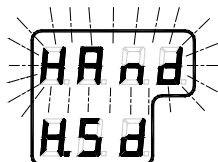
*If GYRO is selected you need to verify that GPS connection is set to Non in extension menu A-2, 2.9.G.*

### Setting the Speed input source

When the system is configured as described in *Configuring the Sensitive element* page 71 onwards, the speed input source can be changed as described below:



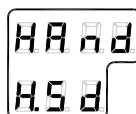
- 1 Press the **DISP** button until the display shows speed value and speed input source.



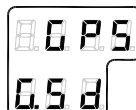
- 2 Press the **SET** button once, and the upper line in the display starts flashing.

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

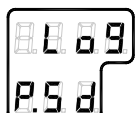
*Manual*



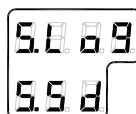
*GPS*



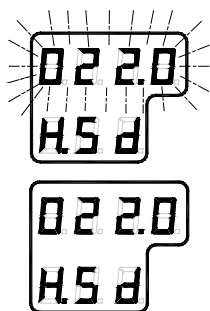
*LOG (pulse)*



*LOG (serial)*



- 4 Select active speed input source and confirm the selection by pressing the **ACK/ENT** button.



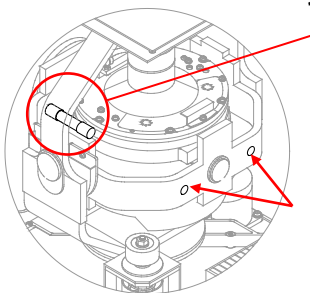
- 5 If Manual input source is selected, the display will change to show flashing numerical values.
- 6 Use the **ARROW** buttons to enter the speed value, and confirm the input by pressing the **ACK/ENT** button.
- 7 The display will return to show speed value and speed input source without flashing.

Note!

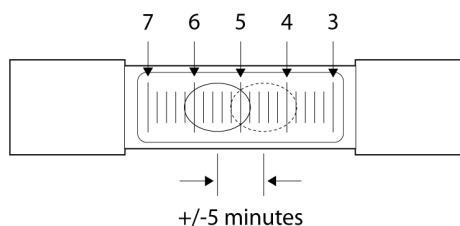
*If Manual or GPS is selected (used) and no pulse or serial data for speed is connected you need to verify that LOG connections is set to Non in extension menu A-2, 2.A.L and 2.b.S.*

## 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  $\pm 5$  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 GC80/85. 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 79 onwards.

## 6.9 Configuring the Dual function

When each Gyro compass is started and configured according to the description on the previous pages, the Dual function should be configured.

○  
POWER

- 1 Start the function by pressing the **POWER** button on the Change over panel.

The button is recessed into the front panel, and a pen or a blunt tool must be used to activate the button.

The display shows product name and software version for PCC and SCOIF boards:

**HDM220**  
**P:V1.02 C:V1.02**

followed by:

## HDM220 by Simrad

and then heading for Gyro compass no.1 and no.2.

The example below (left) shows a display where the Gyros are not settled (runtime less than 3 hours, indicated with an S). In the example to the right, the Gyros have run for more than 3 hours.

*1-GYRO:123.4° SA\**  
*2-GYRO:123.4° S*

*1-GYRO:123.4° A\**  
*2-GYRO:123.4°*

- 2 Verify that heading 1 and heading 2 are in accordance with the heading displayed on the Gyro compass' Control panel.

## Setting the heading difference alarm

The heading difference alarm is generated when the difference between Gyro no.1 and Gyro no.2 exceeds the heading difference value.



- 1 Press the **DISP** button twice on the Change over panel until **HDM SET:** is displayed in the display's upper line.

**HDM SET:10.0**  
**-PARAMETER SET-**



- 2 Press the **ACK/ENT** button. The display will change to:

**SET=ENT ESC=DISP**  
**HDM THRESHOLD**

- 3 Press the **ACK/ENT** button again to activate the alarm setting display:

**SET=ENT ESC=DISP**  
**HDM SET:010.0°**



- 4 Use the **ARROW** buttons to increase or decrease the alarm difference value. Range: 5° - 15°.



- 5** Confirm the entry by pressing the **ACK/ENT** button.

The Dual system is now ready for operation. Refer *Selecting active compass*, page 33.

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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.

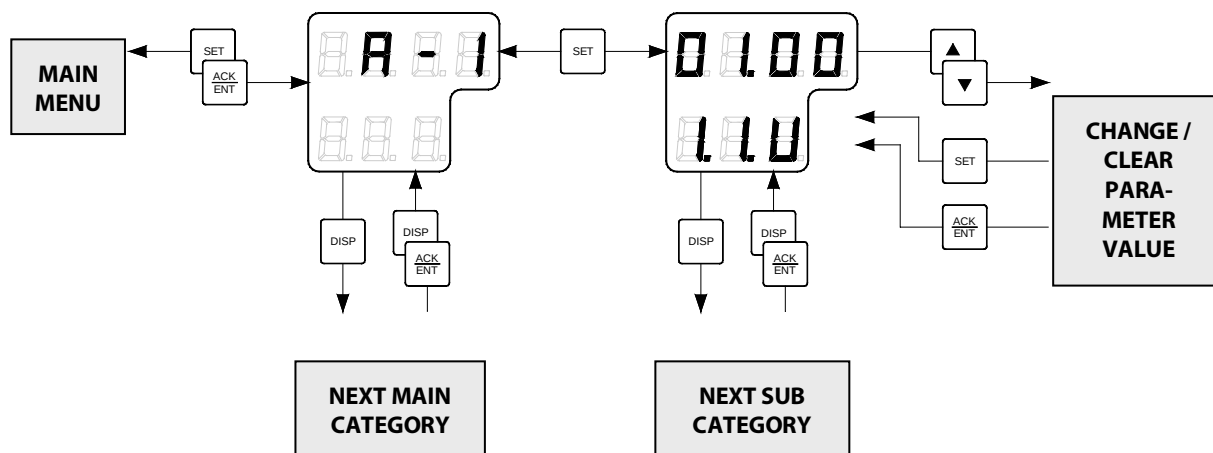
### 7.2 Using the Extension menu

**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       |
|---------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------|
| <b>A-1</b>    | 1.1.U        | Damping gain<br>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<br>Determines the gain of the bearing servo loop where phi $\Phi$ 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<br>Determines the gain of the horizontal servo loop where theta $\theta$ 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 (ratio) to the standard value stored in software.                                                                | 1.00          | 0.00 - 2.00 |
|               | 1.4.u        | Leveling servo gain<br>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         |
|---------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| <b>A-1</b>    | 1.5.L        | ( $\phi$ ) Phi offset (°)<br>Offset value (°) around the vertical axis of Gyro-sphere (rotor axis) and the Sensitive element.                                                                                                                                                                                                                                                                                                                                                      | 0.00          | -3.00 - 3.00  |
|               | 1.6.t        | ( $\theta$ ) Theta offset (°)<br>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/°)<br>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/°).<br>This parameter is only used for GC85. | 2.32          | 0.00 - 5.00   |
|               | 1.8.c        | Ks/H<br>Suspension wire twist torque. Fixed value.                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1.477         | 1.000 - 2.000 |
|               | 1.9.r        | Maximum rate of turn (°/sec)<br>Maximum rate of turn in the turn rates which the bearing servo system followed up to this moment (°/sec).<br><u>NOTE:</u> The maximum is measured after 3 hours from system start.<br><u>NOTE:</u> Reset this data after completion of installation!                                                                                                                                                                                               | 0.00          | -             |
|               | 1.A.F        | Maximum deviation of bearing servo (°)<br>Maximum deviation value in the bearing servo loop that occurred up to this moment (°).<br><u>NOTE:</u> The maximum is measured after 3 hours from system start.<br><u>NOTE:</u> Reset this data after completion of installation!                                                                                                                                                                                                        | 0.00          | -             |
|               | 1.b.S        | Maximum deviation of horizontal servo (°)<br>Maximum deviation value in the horizontal servo loop that occurred up to this moment (°).<br><u>NOTE:</u> The maximum is measured after 3 hours from system start.<br><u>NOTE:</u> Reset this data after completion of installation!                                                                                                                                                                                                  | 0.00          | -             |

| Main Category | Sub Category | Parameter/description                                                                                                                                                                                                                                                                                                                                   | Default value | Range       |
|---------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------|
| <b>A-2</b>    | 2.1.o        | Bearing offset A (°)<br><br>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 (°) <sup>1</sup><br><br>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.<br><br>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 (°)<br><br>Absolute bearing set for MCU board when zero-cross pin was passed during start-up sequence (last azimuth operation) and normal running operation.<br><br>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 (°)<br><br>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.<br><br>This value should be set every time the zero-cross pin is detected.                                                        | 2.0           | 0.0 - 5.0   |
|               | 2.5.y        | Year<br><br>Used to set current year.                                                                                                                                                                                                                                                                                                                   | -             | 2000 - 2099 |
|               | 2.6.N        | Month and Day<br><br>Used to set current month and date.                                                                                                                                                                                                                                                                                                | -             | -           |
|               | 2.7.t        | Hour and Minute<br><br>Used to set current hour and minute.                                                                                                                                                                                                                                                                                             | -             | -           |
|               | 2.8.d        | Total days of operation<br><br>This value should be reset after the installation is completed.                                                                                                                                                                                                                                                          | -             | -           |

<sup>1</sup> This value is cleared at the time of zero crossing pin passage and a power supply OFF.

| Main Category | Sub Category | Parameter/description                                                                                                                                                                                                                                 | Default value | Range                 |
|---------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------|
| A-2           | 2.9.G        | Display/setting of GPS connection<br>The following abbreviations are used:<br>bE: GPS connected<br>Non: No GPS connected<br><i><b>NOTE:</b> 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<br>The following abbreviations are used:<br>bE: with Log (contact)<br>Non: No Log (contact)<br><i><b>NOTE:</b> 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<br>The following abbreviations are used:<br>bE: with Log (serial)<br>Non: No Log (serial)<br><i><b>NOTE:</b> When this value is set to "Non", LOG cannot be selected as the vessel's speed input.</i>      | -             | bE or Non             |
|               | 2.c.t        | Display/setting of GPS performance index data check<br>The following abbreviations are used:<br>bE: Check performance index<br>Non: Do not check performance index                                                                                    | -             | bE or Non             |
|               | 2.d.o        | Analogue signal output offset for ROT (°)<br>Offset value for analogue signal output of Rate Of Turn. Entered value is +/-5% of maximum output ROT.                                                                                                   | 0.00          | 0.0 - 16 <sup>2</sup> |
|               | 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                                                                                                                                                                                                                    | -             | -                     |
|               | 3.5.N        | Occurred month/day of zero-cross errors                                                                                                                                                                                                               | -             | -                     |
|               | 3.6.t        | Occurred hour/minute of zero-cross errors                                                                                                                                                                                                             | -             | -                     |

<sup>2</sup> 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          |
|---------------|--------------|---------------------------------------------------------|---------------|----------------|
|               | 3.7.n        | Occurred number of encoder errors                       | -             | -              |
|               | 3.8.r        | Occurred number of reset with WATCH DOC TIMER           | -             | -              |
| <b>A-4</b>    | 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         |
| <b>A-5</b>    | 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         |
| <b>A-6</b>    | 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         |
| <b>A-7</b>    | 7.1.t        | Master compass type                                     | Std           | Std or Hsc     |
|               | 7.2.u        | SCC software version number                             | -             | -              |
|               | 7.3.u        | MCC software version number                             | -             | -              |
| <b>A-8</b>    | 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  $0.1^\circ$   
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  $2 \text{ m/sec}^2$ .

Note!

*Accuracy at equator. For other latitudes, accuracy to be multiplied by  $1/\cos f$ , where  $f$  = 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 32

## 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,xx,N,xxxx,xx,E~\*hh<CR><LF>  
 \$--VTG,xx,T,xx,M,xx,x,N,xx,K\*hh<CR><LF>  
 \$--ZDA,xxxxxx,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.: ..... 1-5 0 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,xx,x,x,A,xx,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,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: ..... 1  
 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 boards**, output serial signal selection, page 122.*

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>

90

Circuits: ..... 3  
Voltage/Current: ..... 24 V/1 A

All alarms

Circuits:..... 4

Voltage/Current: .....24 V/1 A

*Refer Jumper settings on SCC boards, page 122.*

## 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 Dual MK2 Control unit

Height:.....561 mm (22.1")

Width:.....467 mm (18.4")

Depth:..... 182 mm (7.2")

Weight:..... 23 kg (51 lbs)

## 8.6 Power

### GC80/85 Master compass

Voltage input: ..... Supplied from Control unit

### GC80/85 Dual MK2 Control unit

Voltage input: ..... 110/220 V AC

Backup voltage:.....24 V DC

Power consumption per Master compass (incl. 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 Dual 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 Dual MK2 Control unit, dimensions | N3-710189 | A    |
| GC80/85 Master compass, dimensions        | N3-710179 | A    |
| GC80/85 Remote panel, dimensions          | D4-710208 | B    |

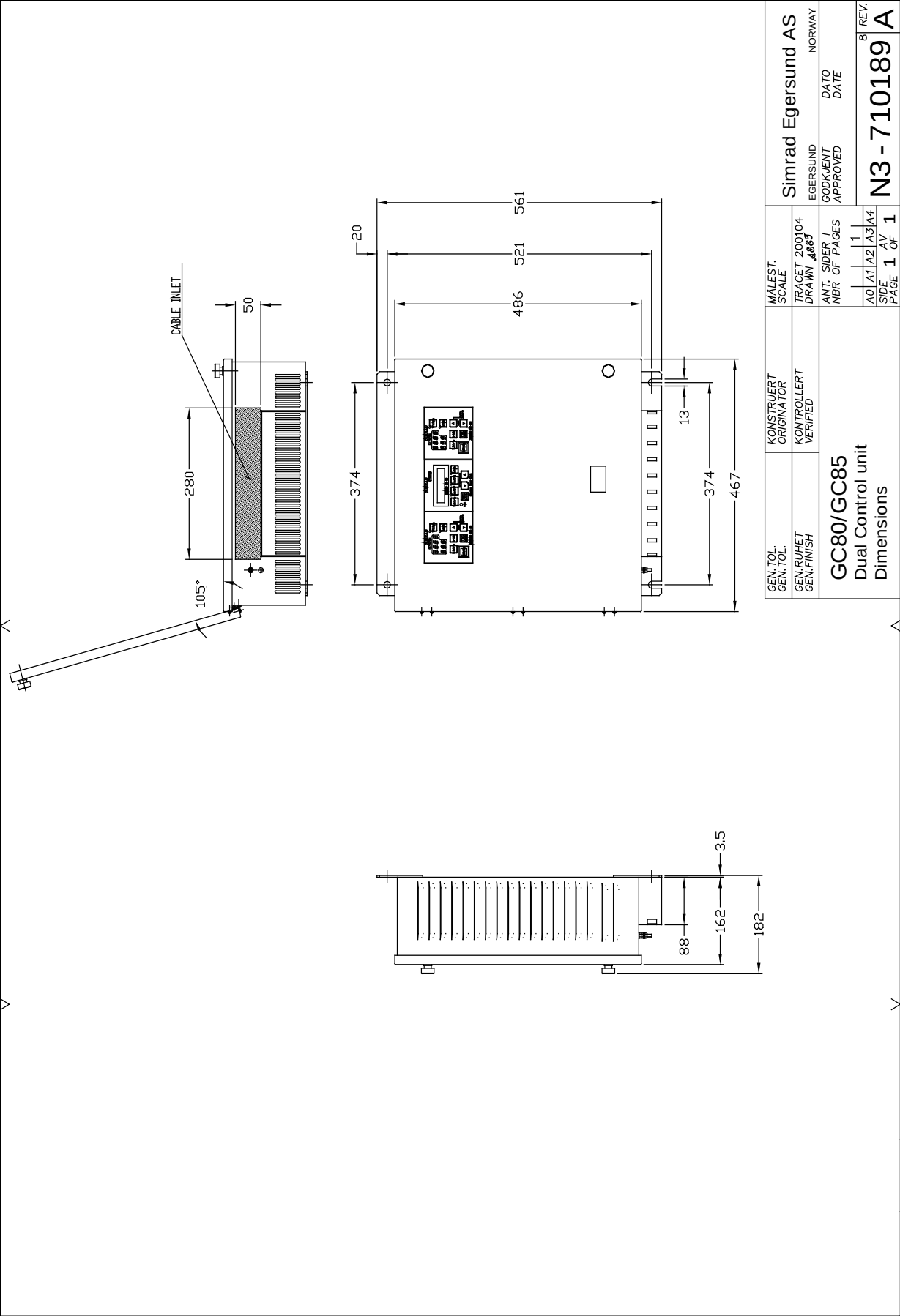
Dimensional drawings are available upon request.

The following wiring diagrams are enclosed:

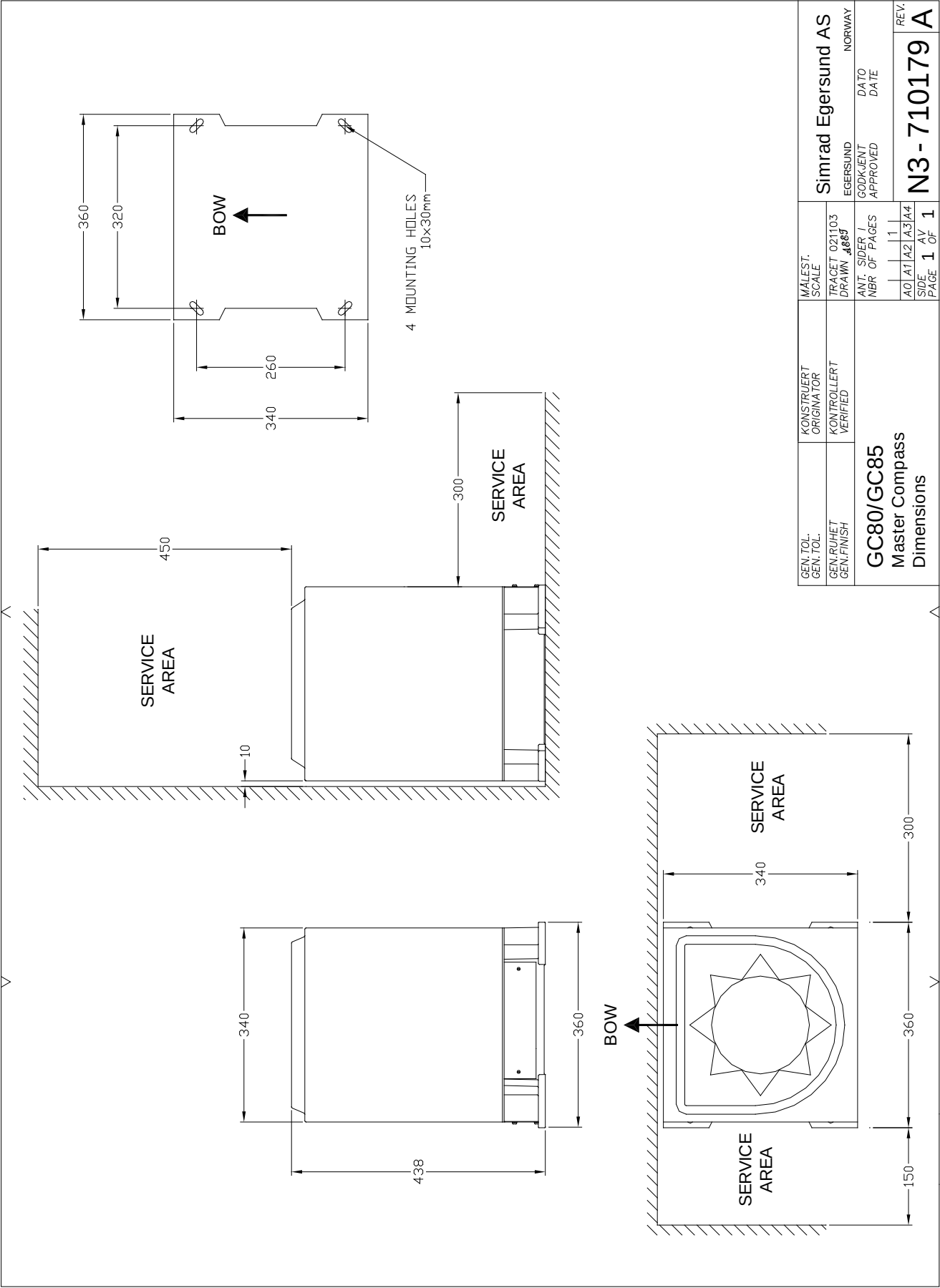
| Name                                                                     |
|--------------------------------------------------------------------------|
| GC80/85 Gyro Compass, Dual system.<br>Wiring diagrams (page 1, 2 and 3). |

Note!

*The original signed drawings are recorded at Simrad Egersund.*

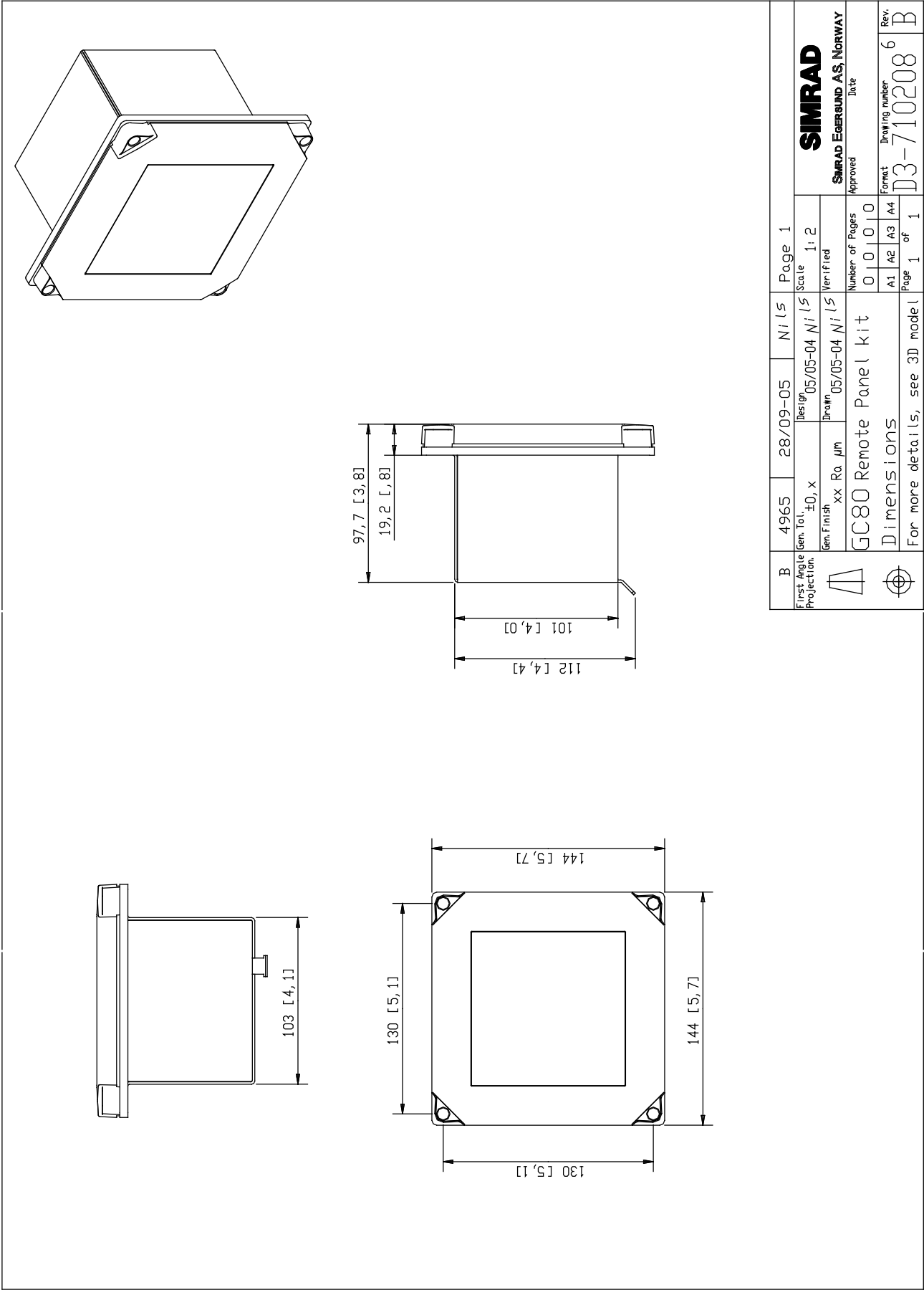


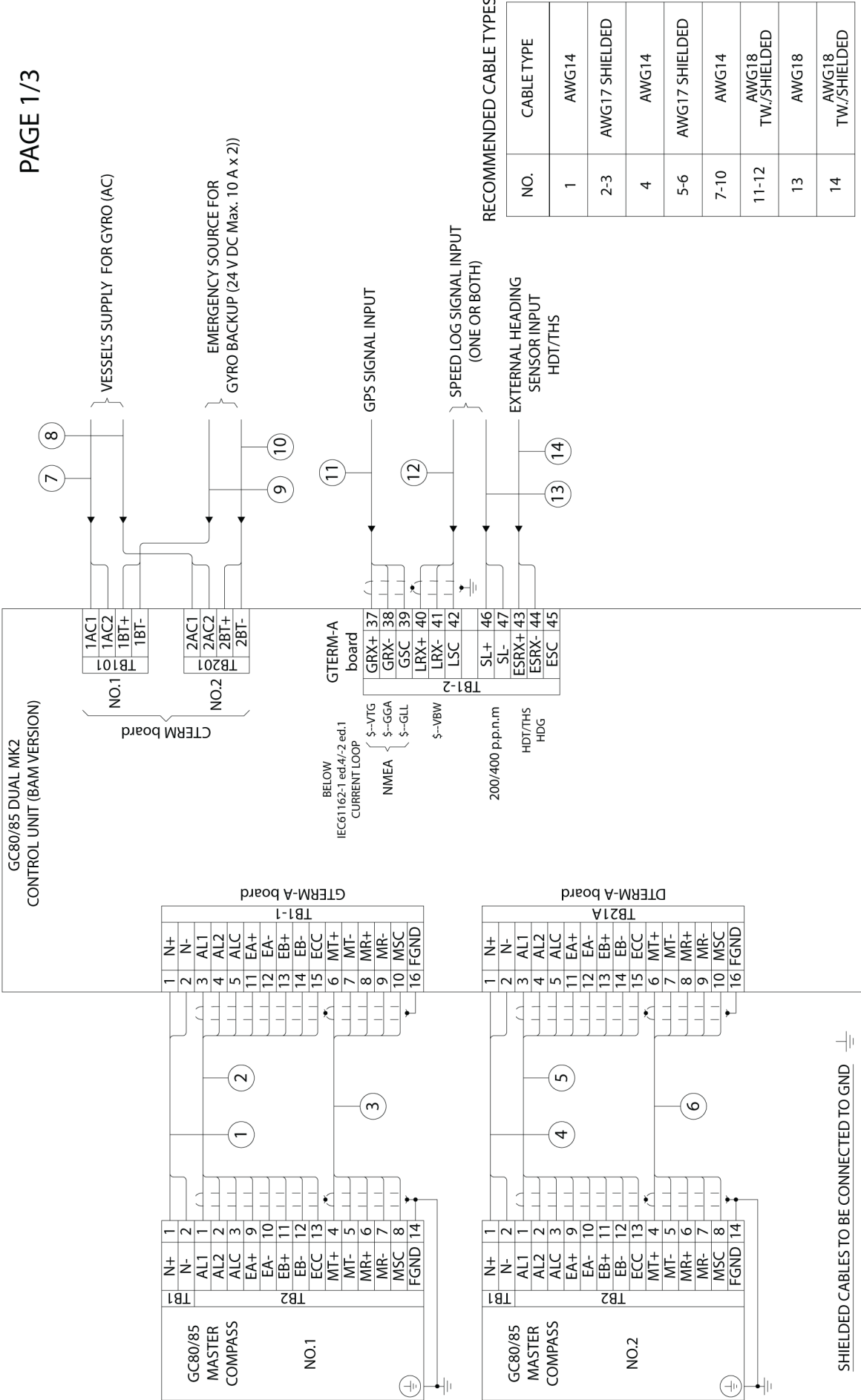
|                                              |                          |                             |                      |              |
|----------------------------------------------|--------------------------|-----------------------------|----------------------|--------------|
| GEN. TOL.<br>GEN. TOL.                       | KONSTRUERT<br>ORIGINATOR | MALEST.<br>SCALE            | Simrad Egersund AS   |              |
| GEN. RUHET<br>GEN. FINISH                    | KONTROLLERT<br>VERIFIED  | TRACET 200104<br>DRAWN 4885 | EGERSUND<br>NORWAY   |              |
| GC80/GC85<br>Dual Control unit<br>Dimensions |                          | ANT. SIDE 1<br>NBR OF PAGES | GODKJENT<br>APPROVED | DATO<br>DATE |
|                                              |                          | A0/A1/A2/A3/A4              |                      |              |
|                                              |                          | SIDE 1 OF 1<br>PAGE 1 OF 1  |                      |              |
| N3 - 710189                                  |                          |                             |                      | 8 REV.<br>A  |

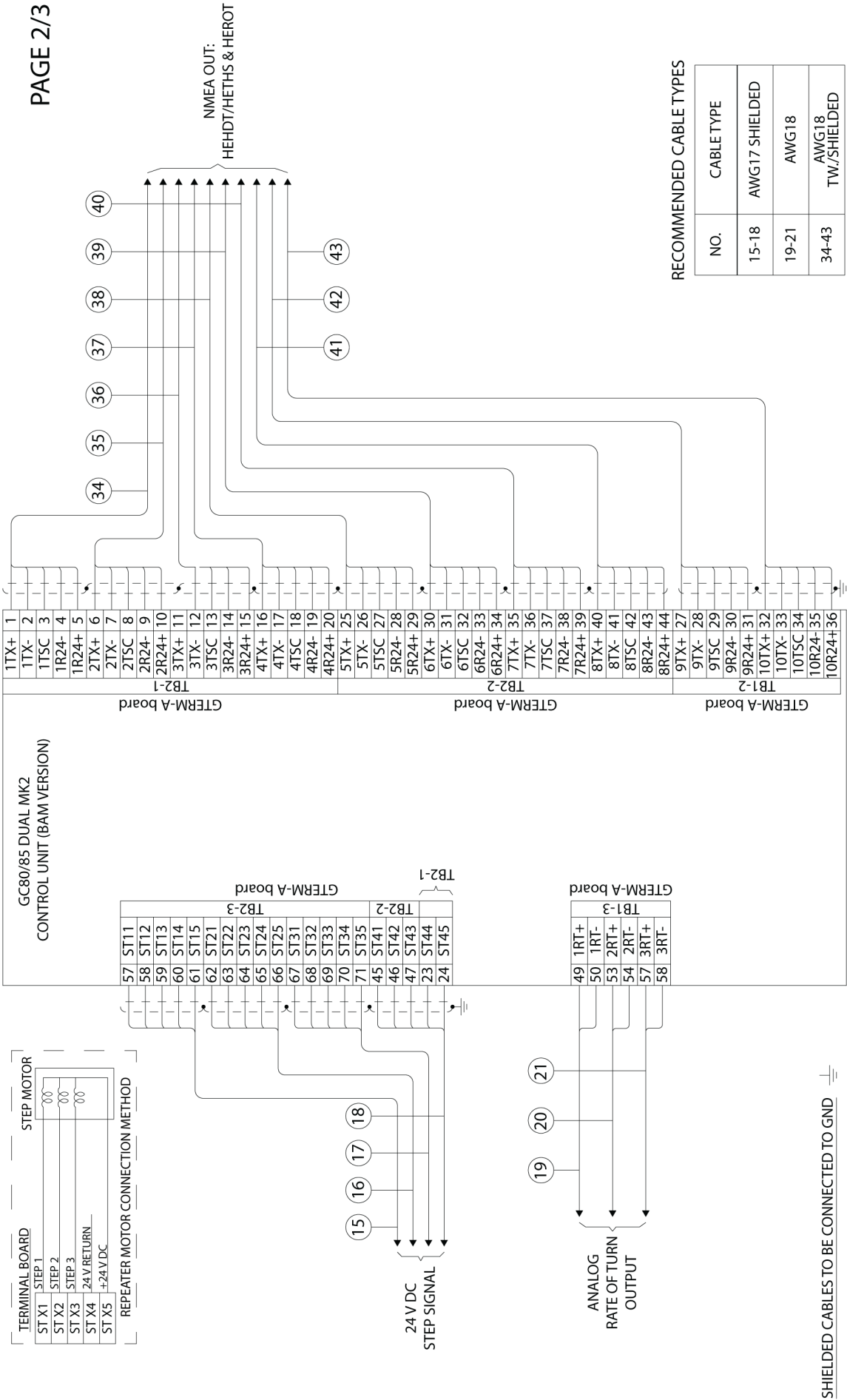


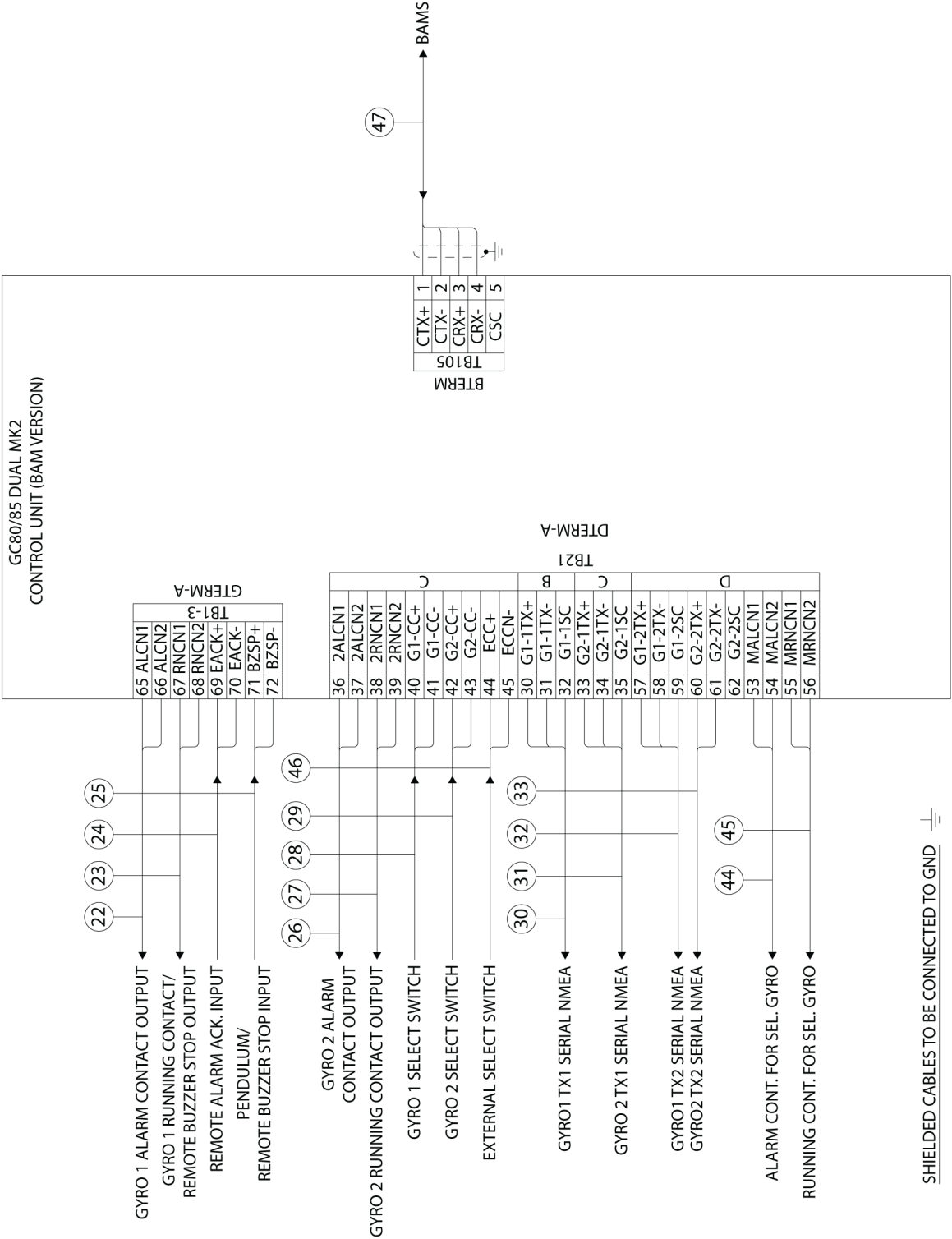
|                                           |                                                     |                                                 |                                                                        |                        |
|-------------------------------------------|-----------------------------------------------------|-------------------------------------------------|------------------------------------------------------------------------|------------------------|
| GEN. TOL.<br>GEN. TOL.<br>GEN. FINISH     | KONSTRUERT<br>ORIGINATOR<br>KONTROLLERT<br>VERIFIED | MALEST.<br>SCALE<br>TRACET 021103<br>DRAWN 4885 | Simrad Egersund AS<br>EGERSUND<br>GODKJENT<br>APPROVED<br>DATO<br>DATE | REV.<br>N3-710179<br>A |
| GC80/GC85<br>Master Compass<br>Dimensions |                                                     | ANT. SIDER<br>NBR OF PAGES<br>11                |                                                                        |                        |
|                                           |                                                     | A0 A1 A2 A3 A4<br>SIDE 1 AV<br>PAGE 1 OF 1      |                                                                        |                        |











RECOMMENDED CABLE TYPES

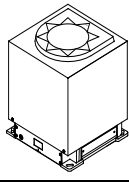
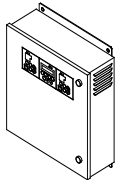
| NO.   | CABLE TYPE        |
|-------|-------------------|
| 22-29 | AWG18             |
| 30-33 | AWG18 TW/SHIELDED |
| 44-46 | AWG18             |
| 47    | AWG18 TW/SHIELDED |

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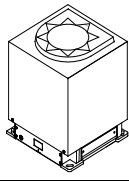
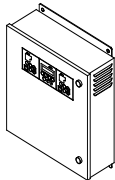
## 10 PART LIST

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 Dual Gyro system

| PART NO       |                                                                                    | DESCRIPTION                                                 |
|---------------|------------------------------------------------------------------------------------|-------------------------------------------------------------|
| 27101674      |   | GC80 Master compass                                         |
| 44174027      |   | GC80 Sensitive element                                      |
| 000-15038-001 |  | GC80/85 Dual MK2 Control unit                               |
| 988-12720-00x |                                                                                    | GC80/85 Dual MK2 Gyro compass User manual                   |
| 44174449      |                                                                                    | Special tool required when installing the Sensitive element |

### 10.2 GC85 Dual Gyro system

| PART NO       |                                                                                     | DESCRIPTION                                                 |
|---------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------|
| 27101682      |  | GC85 Master compass                                         |
| 44170728      |  | GC85 Sensitive element                                      |
| 000-15038-001 |  | GC80/85 Dual MK2 Control unit                               |
| 988-12720-00x |                                                                                     | GC80/85 Dual MK2 Gyro compass User manual                   |
| 44174449      |                                                                                     | Special tool required when installing the Sensitive element |

### 10.3 GC80/85 Optional equipment, Dual 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                                                    |
| 000-15838-001 |                                                                                   | 5 m Cable NO:1 Dual Control MK2                                                                       |
| 000-15839-001 |                                                                                   | 5 m Cable NO:2 Dual Control MK2                                                                       |
| 000-15840-001 |                                                                                   | 10 m Cable NO:1 Dual Control MK2                                                                      |
| 000-15841-001 |                                                                                   | 10 m Cable NO:2 Dual Control MK2                                                                      |
| 000-15842-001 |                                                                                   | 15 m Cable NO:1 Dual Control MK2                                                                      |
| 000-15843-001 |                                                                                   | 15 m Cable NO:2 Dual Control MK2                                                                      |

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# 11 TERMINAL LAYOUT

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

## 11.1 GTERM-A board

### TB1

#### TB1-1

| PIN NO | NAME | DETAILS                                           |
|--------|------|---------------------------------------------------|
| 1      | N+   | No.2 Master compass power supply (24 V DC)        |
| 2      | N-   | No.2 Master compass power supply (24 V DC GND)    |
| 3      | AL1  | No.2 Master compass inverter alarm (over current) |
| 4      | AL2  | No.2 Master compass inverter alarm (over voltage) |
| 5      | ALC  | No.2 Master compass inverter alarm (GND)          |
| 6      | MT+  | No.2 Control unit - Master compass serial signal  |
| 7      | MT-  |                                                   |
| 8      | MR+  | No.2 Master compass - Control unit serial signal  |
| 9      | MR-  |                                                   |
| 10     | MSC  | No.2 Serial signal GND                            |
| 11     | EA+  | No.2 Master compass encoder signal (A phase +)    |
| 12     | EA-  | No.2 Master compass encoder signal (A phase -)    |
| 13     | EB+  | No.2 Master compass encoder signal (B phase +)    |
| 14     | EB-  | No.2 Master compass encoder signal (B phase -)    |
| 15     | ECC  | No.2 Master compass encoder signal (GND)          |
| 16     | FGND | Earth                                             |
| 17     | 24R+ | Ext. power supply input (no connection)           |
| 18     | 24R- |                                                   |
| 19     | 24B+ |                                                   |
| 20     | 24B- |                                                   |
| 21     | PF   | Ext. power supply alarm input (no connection)     |
| 22     | POC  |                                                   |
| 23     | POV  |                                                   |
| 24     | PC   |                                                   |

**TB1-2**

| PIN NO | NAME   | DETAILS                                        |
|--------|--------|------------------------------------------------|
| 25     | 24M+   | Ext. power supply input (no connection)        |
| 26     | 24M-   |                                                |
| 27     | 9TX+   | Serial signal output (IEC61162-1 ed.4/-2 ed.1) |
| 28     | 9TX-   |                                                |
| 29     | 9TSC   | Serial signal GND                              |
| 30     | 9R24-  | Serial repeater power supply, -24 V DC         |
| 31     | 9R24+  | Serial repeater power supply, +24 V DC         |
| 32     | 10TX+  | Serial signal output (IEC61162-1 ed.4/-2 ed.1) |
| 33     | 10TX-  |                                                |
| 34     | 10TSC  | Serial signal GND                              |
| 35     | 10R24- | Serial repeater power supply, -24 V DC         |
| 36     | 10R24+ | Serial repeater power supply, +24 V DC         |
| 37     | GRX+   | GPS serial signal input                        |
| 38     | GRX-   |                                                |
| 39     | GSC    | GPS serial signal GND                          |
| 40     | LRX+   | LOG serial signal input                        |
| 41     | LRX-   |                                                |
| 42     | LSC    | LOG serial signal GND                          |
| 43     | ESRX+  | External heading sensor serial signal input    |
| 44     | ESRX-  |                                                |
| 45     | ESC    | External heading sensor serial signal GND      |
| 46     | SL+    | LOG contact signal input                       |
| 47     | SL-    |                                                |
| 48     | SW+    | External power supply switch (Not used)        |

**TB1-3**

| PIN NO | NAME  | DETAILS                                                         |
|--------|-------|-----------------------------------------------------------------|
| 49     | 1RT+  | Rate of turn analog signal output                               |
| 50     | 1RT-  | Rate of turn analog signal GND                                  |
| 51     | 2RT+  | Rate of turn analog signal output                               |
| 52     | 2RT-  | Rate of turn analog signal GND                                  |
| 53     | 3RT+  | Rate of turn analog signal output                               |
| 54     | 3RT-  | Rate of turn analog signal GND                                  |
| 55     | ST51  | Step signal *1                                                  |
| 56     | ST52  | Step signal *2                                                  |
| 57     | ST53  | Step signal *3                                                  |
| 58     | LOST+ | Input dry contact for abnormal signal                           |
| 59     | LOST- |                                                                 |
| 60     | 3SO-  | GND                                                             |
| 61     | GCC+  | Change over sensor of contact signal input (Gyro)<br>(Not used) |
| 62     | GCC-  |                                                                 |
| 63     | ECC+  | Change over sensor of contact signal input (Ext)<br>(Not used)  |
| 64     | ECC-  |                                                                 |
| 65     | ALCN1 | Alarm contact output GYRO 1                                     |
| 66     | ALCN2 |                                                                 |
| 67     | RNCN1 | Running contact GYRO 1/remote buzzer stop<br>output             |
| 68     | RNCN2 |                                                                 |
| 69     | EACK+ | Remote alarm ACK. input contact                                 |
| 70     | EACK- |                                                                 |
| 71     | BZSP+ | Remote buzzer stop/pendulum function contact<br>input           |
| 72     | BZSP- |                                                                 |

**TB2****TB2-1**

| PIN NO | NAME  | DETAILS                                        |
|--------|-------|------------------------------------------------|
| 1      | 1TX+  | Serial signal output (IEC61162-1 ed.4/-2 ed.1) |
| 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 (IEC61162-1 ed.4/-2 ed.1) |
| 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 (IEC61162-1 ed.4/-2 ed.1) |
| 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 (IEC61162-1 ed.4/-2 ed.1) |
| 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+ | TK format internal signal (TX) : DGC-80        |
| 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 (IEC61162-1 ed.4/-2 ed.1) |
| 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 (IEC61162-1 ed.4/-2 ed.1) |
| 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 (IEC61162-1 ed.4/-2 ed.1) |
| 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 (IEC61162-1 ed.4/-2 ed.1) |
| 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/OPRX+ | Not used                          |
| 50     | ST2/OPRX- |                                   |
| 51     | ST3/OPSC  |                                   |
| 52     | OPMC+     |                                   |
| 53     | OPMC-     |                                   |
| 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                          |

## 11.2 DTERM-A board

### TB21A

| PIN NO | NAME | DETAILS                                            |
|--------|------|----------------------------------------------------|
| 1      | N+   | No. 2 Master compass power supply (24 V DC)        |
| 2      | N-   | No. 2 Master compass power supply (24 V DC GND)    |
| 3      | AL1  | No. 2 Master compass inverter alarm (over current) |
| 4      | AL2  | No. 2 Master compass inverter alarm (over voltage) |
| 5      | ALC  | No. 2 Master compass inverter alarm (GND)          |
| 6      | MT+  | No. 2 Control unit - Master compass serial signal  |
| 7      | MT-  |                                                    |
| 8      | MR+  | No. 2 Master compass - Control unit serial signal  |
| 9      | MR-  |                                                    |
| 10     | MSC  | No. 2 Serial signal GND                            |
| 11     | EA+  | No. 2 Master compass encoder signal (A phase +)    |
| 12     | EA-  | No. 2 Master compass encoder signal (A phase -)    |
| 13     | EB+  | No. 2 Master compass encoder signal (B phase +)    |
| 14     | EB-  | No. 2 Master compass encoder signal (B phase -)    |
| 15     | ECC  | No. 2 Master compass encoder signal (GND)          |
| 16     | FGND | Earth                                              |

**TB21B**

| PIN NO | NAME    | DETAILS                                                      |
|--------|---------|--------------------------------------------------------------|
| 17     | 24M+    | Ext. power supply input (no connection)                      |
| 18     | 24M-    |                                                              |
| 19     | 24R+    |                                                              |
| 20     | 24R-    |                                                              |
| 21     | 24B+    |                                                              |
| 22     | 24B-    |                                                              |
| 23     | PF      |                                                              |
| 24     | POC     |                                                              |
| 25     | POV     |                                                              |
| 26     | PC      |                                                              |
| 27     | SW+     |                                                              |
| 28     | MDCN+   | Not used                                                     |
| 29     | MDCN-   |                                                              |
| 30     | G1-1TX+ | No. 1 GYRO Serial signal output<br>(IEC61162-1 ed.4/-2 ed.1) |
| 31     | G1-1TX- |                                                              |
| 32     | G1-1SC  | Serial signal GND                                            |

**TB21C**

| PIN NO | NAME    | DETAILS                                                      |
|--------|---------|--------------------------------------------------------------|
| 33     | G2-1TX+ | No. 2 GYRO Serial signal output<br>(IEC61162-1 ed.4/-2 ed.1) |
| 34     | G2-1TX- |                                                              |
| 35     | G2-1SC  | Serial signal GND                                            |
| 36     | 2ALCN1  | No. 2 GYRO alarm contact output                              |
| 37     | 2ALCN2  |                                                              |
| 38     | 2RNCN1  | No. 2 GYRO running contact output                            |
| 39     | 2RNCN2  |                                                              |
| 40     | G1CC+   | Sensor select contact input<br>(no. 1 GYRO select)           |
| 41     | G1CC-   |                                                              |
| 42     | G2CC+   | Sensor select contact input<br>(no. 2 GYRO select)           |
| 43     | G2CC-   |                                                              |
| 44     | ECC+    | Sensor select contact input<br>(External sensor select)      |
| 45     | ECCN-   |                                                              |
| 46     | PRRX+   | Not used                                                     |
| 47     | PRRX-   |                                                              |



| PIN NO | NAME | DETAILS |
|--------|------|---------|
| 48     | PRSC |         |

### TB21D

| PIN NO | NAME    | DETAILS                                                      |
|--------|---------|--------------------------------------------------------------|
| 49     | DFCN1   | Heading difference alarm contact output                      |
| 50     | DFCN2   |                                                              |
| 51     | OCACN1  | Off course alarm contact output (Not used)                   |
| 52     | OCANC2  |                                                              |
| 53     | MALCN1  | Alarm contact for selected Gyro                              |
| 54     | MALCN2  |                                                              |
| 55     | MRNCN1  | Running contact for selected Gyro                            |
| 56     | MRNCN2  |                                                              |
| 57     | G1-2TX+ | No. 1 GYRO Serial signal output<br>(IEC61162-1 ed.4/-2 ed.1) |
| 58     | G1-2TX- |                                                              |
| 59     | G1-2SC  | Serial signal GND                                            |
| 60     | G2-2TX+ | No. 2 GYRO Serial signal output<br>(IEC61162-1 ed.4/-2 ed.1) |
| 61     | G2-2TX- |                                                              |
| 62     | G2-2SC  | Serial signal GND                                            |
| 63     | 24MN+   | Not used                                                     |
| 64     | 24MN-   |                                                              |

## 11.3 CTERM board

### TB101

| PIN NO | NAME | DETAILS                              |
|--------|------|--------------------------------------|
| 1      | AC1  | Input power supply (AC220 V)         |
| 2      | AC2  |                                      |
| 3      | BT+  | Input power supply (Battery 24 V DC) |
| 4      | BT-  | Input power supply (Battery GND)     |
| 5      | FG   | Frame Ground                         |

### TB102

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

### TB103

| PIN NO | NAME  | DETAILS  |
|--------|-------|----------|
| 1      | ORX+  | Not used |
| 2      | ORX-  |          |
| 3      | OSC   |          |
| 4      | CIN+  |          |
| 5      | CIN-  |          |
| 6      | COUT1 |          |
| 7      | COUT2 |          |

## 11.4 BTERM board

### TB105

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

### TB106

| PIN NO | NAME  | DETAILS  |
|--------|-------|----------|
| 1      | ORX+  | Not used |
| 2      | ORX-  |          |
| 3      | OSC   |          |
| 4      | CIN+  |          |
| 5      | CIN-  |          |
| 6      | COUT1 |          |
| 7      | COUT2 |          |

### TB107

| PIN NO | NAME | DETAILS  |
|--------|------|----------|
| 1      | AUX1 | Not used |
| 2      | AUX2 |          |
| 3      | AUX3 |          |
| 4      | AUX4 |          |
| 5      | AUX5 |          |
| 6      | AUX6 |          |
| 7      | AUX7 |          |

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## 12 DIP SWITCH SETTINGS

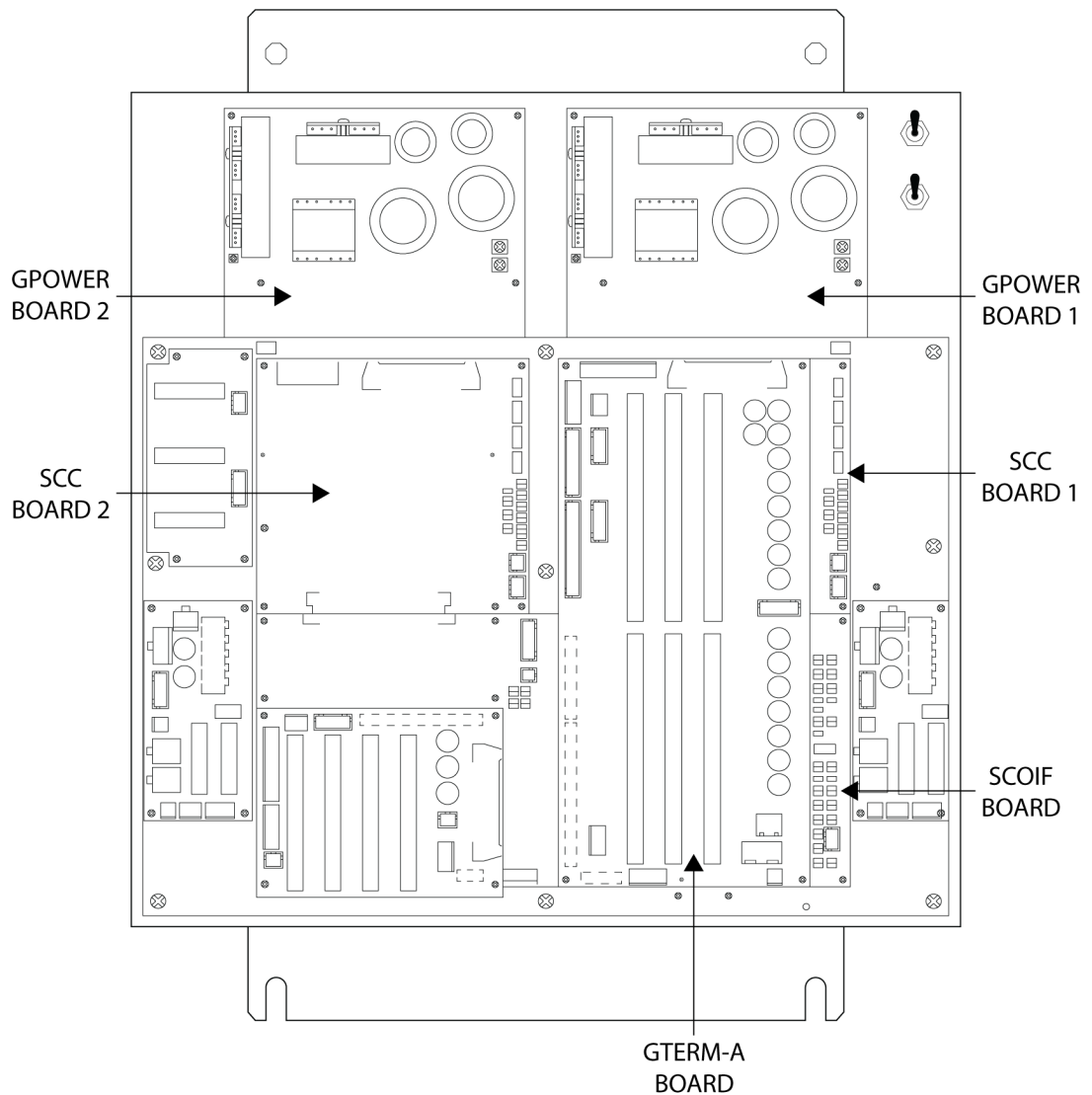
This section includes drawings of the different printed circuits boards in the Control unit that include jumpers and DIP switches.

### 12.1 General

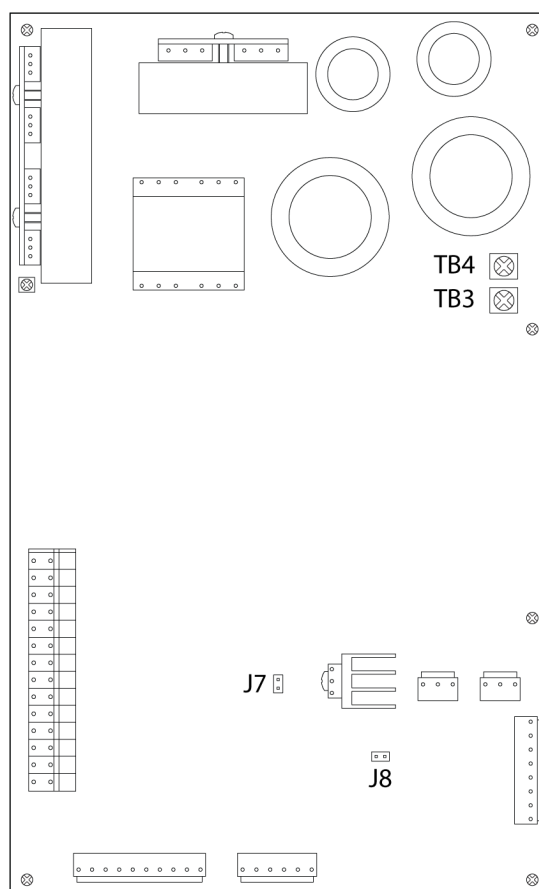
7 different boards in the Dual MK2 Control unit have jumpers and/or DIP switches that are used to configure the GC80/85 system.

Only a few of these jumpers/DIP switches are used in installation and pre-running procedures for the Gyro compass. Refer ***Power supply***, page 56, and ***DIP switch and jumper settings***, page 57.

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



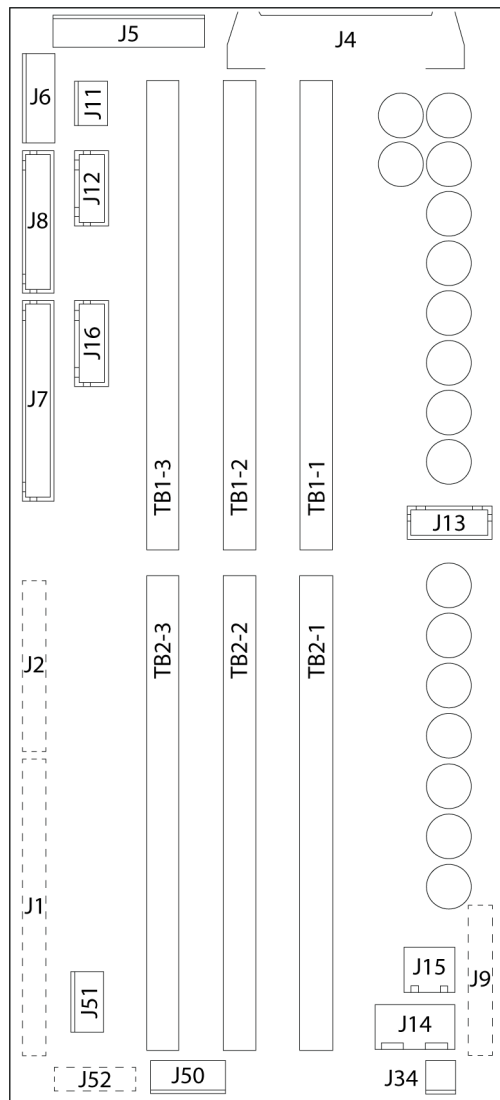
## 12.2 GPOWER board 1 and 2



### Jumper settings on GPOWER boards

| 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.<br><i><b>NOTE:</b> Should not be changed!</i> |
| J8        | Open          | Over-current limit change time | Used for inspection at a factory.<br><i><b>NOTE:</b> Should not be changed!</i>                           |
| TB3 - TB4 | Open          | Main power supply setting      | Open = 220 V AC<br>Short = 100/110/115 V AC                                                               |

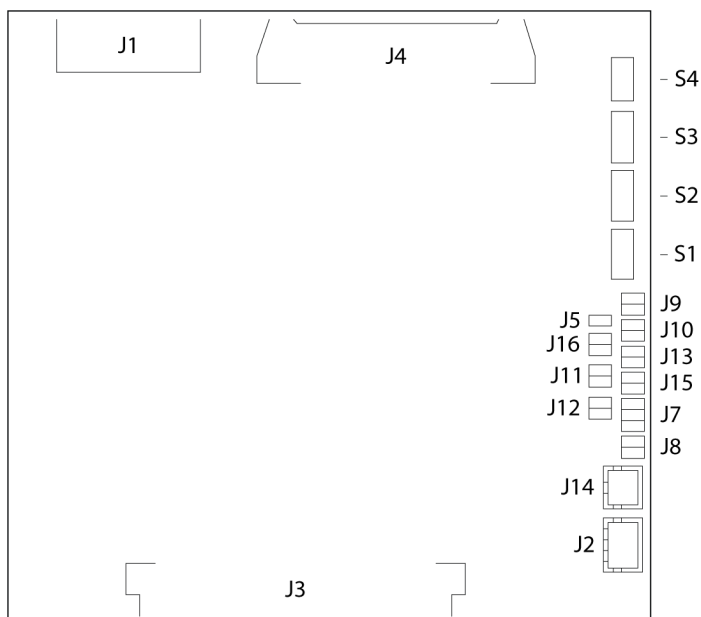
## 12.3 GTERM-A board



### Jumper settings on GTERM-A board

| JUMPER | DEFAULT | FUNCTION    | DESCRIPTION                                    |
|--------|---------|-------------|------------------------------------------------|
| J34    | Open    | Gyro system | Open = 2 Gyro systems<br>Short = 1 Gyro system |

## 12.4 SCC board 1 and 2



### DIP switch settings on SCC boards

| SWITCH            | DEFAULT | FUNCTION                   | DESCRIPTION                                                                      |                             |
|-------------------|---------|----------------------------|----------------------------------------------------------------------------------|-----------------------------|
| S1-1              | OFF     | Power unit                 | OFF = Yes                                                                        | ON = No                     |
| S1-2              | OFF     | Master compass type        | OFF = Standard                                                                   | ON = High Speed             |
| S1-3              | ON      | Single or dual system      | OFF = Single                                                                     | ON = Dual                   |
| S1-4 <sup>3</sup> | OFF     | Dual Gyro system           | <u>NOTE:</u>                                                                     |                             |
| S1-4 <sup>4</sup> | ON      |                            | <i>Different settings for SSC board 1 and SSC board 2! Refer footnote below.</i> |                             |
| S1-5              | OFF     | External sensor connection | SW1-5 OFF                                                                        | = No external sensor        |
|                   |         |                            | SW1-6 OFF                                                                        |                             |
|                   |         |                            | SW1-5 OFF                                                                        | = Not used                  |
|                   |         |                            | SW1-6 ON                                                                         |                             |
| S1-6              | OFF     |                            | SW1-5 ON                                                                         | = External sensor connected |
|                   |         |                            | SW1-6 OFF                                                                        |                             |
|                   |         |                            | SW1-5 ON                                                                         | = Not used                  |
|                   |         |                            | SW1-6 ON                                                                         |                             |

<sup>3</sup> SSC board 1 (for Gyro 1): OFF

<sup>4</sup> SSC board 2 (for Gyro 2): ON



| SWITCH | DEFAULT | FUNCTION                                               | DESCRIPTION                                                                                   |                    |
|--------|---------|--------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------|
| S1-7   | OFF     | Serial signal format                                   | OFF = IEC61162-2 ed.1 (NMEA0183, ref. page 14)<br>ON = Tokimec                                |                    |
| S1-8   | OFF     | Alarm output setup                                     | OFF = All alarms<br>ON = Only power failures                                                  |                    |
| S2-1   | OFF     | For debugging<br>(Do not touch)                        | -                                                                                             |                    |
| S2-2   | OFF     |                                                        |                                                                                               |                    |
| S2-3   | ON      | Operating panel type                                   | OFF = GPANEL (NOT FOR BAM)<br>ON = GPANEL-A (FOR BAM)                                         |                    |
| S2-4   | OFF     | Pendulum ferry                                         | OFF = Not connected/Buzzer stop enabled<br>ON = Pendulum function in use/Buzzer stop disabled |                    |
| S2-5   | OFF     | Serial signal transmit<br>frequency IEC61162-1<br>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<br>information contact                   | OFF = No                      ON = Yes                                                        |                    |
| S3-1   | OFF     | Timer startup                                          | OFF = No                      ON = Yes                                                        |                    |
| S3-2   | OFF     | Talker ID of "ROT"<br>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                                                                                      |                    |

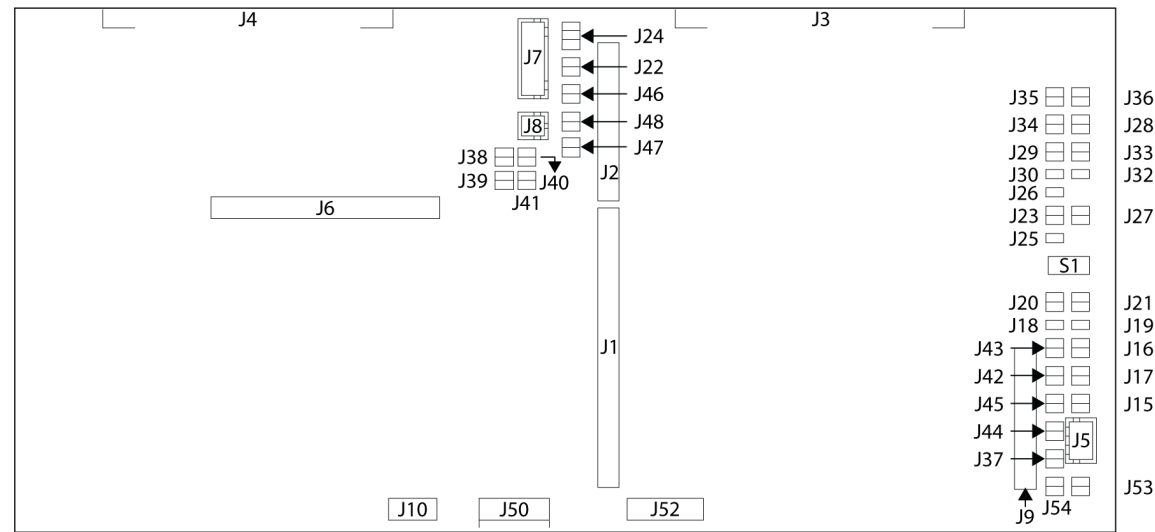
| SWITCH | DEFAULT | FUNCTION                                     | DESCRIPTION                                                                                              |
|--------|---------|----------------------------------------------|----------------------------------------------------------------------------------------------------------|
| S3-5   | OFF     | Ban or permission of a "ROT" sentence output | Valid at the time of external sensor (standard) selection.<br>OFF = Disabled      ON = Enabled           |
| S3-6   | ON      | For Simrad use                               | OFF = Not used<br>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     | Gyro running/remote buzzer stop output       | OFF = Gyro running<br>ON = Remote buzzer stop                                                            |
| S4-1   | OFF     | Not used                                     | -                                                                                                        |
| S4-2   | OFF     | Not used                                     | -                                                                                                        |
| S4-3   | OFF     | Not used                                     | -                                                                                                        |
| S4-4   | OFF     | Alarm detection time                         | OFF = 300 ms<br>ON = 2 sec                                                                               |
| S4-5   | ON      | Enable/disable THS                           | OFF = HDT<br>ON = THS                                                                                    |
| S4-6   | OFF     | Not used                                     | -                                                                                                        |

### Jumper settings on SCC boards

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

| JUMPER         | DEFAULT                | FUNCTION                     | DESCRIPTION                                                                                                                                                                                  |
|----------------|------------------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| J8<br>(2TX)    | 3-4 short              | Serial signal output setting | Output port: GTERM-A board, "2TX"<br>1-2 Short = IEC61162-2 ed.1<br>3-4 Short = IEC61162-1 ed.4<br>Ref. page 14.<br><i><b>NOTE:</b> Never use both jumpers at the same time!</i>             |
| J9<br>(ALCN)   | 1-2 short              | Alarm contact setting        | Output port: GTERM-A board, "ALCN"<br>1-2 Short = Normal "CLOSES" Alarm "OPEN"<br>3-4 Short = Normal "OPEN" Alarm "CLOSES"<br><i><b>NOTE:</b> Never use both jumpers at the same time!</i>   |
| J10<br>(RNCN)  | 1-2 short              | Running contact setting      | Output port: GTERM-A board, "RNCN"<br>1-2 Short = Running "CLOSES", Stop "OPEN"<br>3-4 Short = Running "OPEN", Stop "CLOSES"<br><i><b>NOTE:</b> Never use both jumpers at the same time!</i> |
| J11<br>(OPCN1) | 1-2 short              | Not used                     | Not used                                                                                                                                                                                     |
| J12<br>(OPCN2) | 1-2 short              |                              |                                                                                                                                                                                              |
| J13<br>(ENC)   | 1-2 short<br>3-4 short | Encoder signal setting       | Encoder signal (GC80/85)                                                                                                                                                                     |
| J15<br>(FOG)   | 1-2 open<br>3-4 open   | Encoder signal setting       | Encoder signal (GC80/85)                                                                                                                                                                     |
| J16<br>(R3SEL) | 1-2 short              | Not used                     | Not used                                                                                                                                                                                     |

## 12.5 SCOIF board



### DIP switch settings on SCOIF board

| SWITCH | DEFAULT | FUNCTION                   | DESCRIPTION            |                           |
|--------|---------|----------------------------|------------------------|---------------------------|
| S1-1   | OFF     | External sensor connection | SW1-1 OFF<br>SW1-2 OFF | No external sensor        |
|        |         |                            | SW1-1 OFF<br>SW1-2 ON  | Not used                  |
| S1-2   | OFF     |                            | SW1-1 ON<br>SW1-2 OFF  | External sensor connected |
|        |         |                            | SW1-1 ON<br>SW1-2 ON   | Not used                  |
| S1-3   | OFF     | Not used                   | -                      |                           |
| S1-4   | OFF     | Pendulum ferry             | OFF = NO<br>ON = YES   |                           |
| S1-5   | OFF     | Not used                   | -                      |                           |
| S1-6   | OFF     | Not used                   | -                      |                           |
| S1-7   | OFF     | Not used                   | -                      |                           |
| S1-8   | OFF     | Not used                   | -                      |                           |

### Jumper settings on SCOIF board

| JUMPER        | DEFAULT   | FUNCTION                     | DESCRIPTION                                                                                                                                                                                                                                                                                |
|---------------|-----------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| J15<br>(3TX)  | 3-4 short | Serial signal output setting | Output port: GTERM-A board, TB2-1: "3TX"<br><br>1-2 short = IEC61162-2 ed.1 or TOKIMEC version<br><br>3-4 short = IEC61162-1 ed.4 (ref. page 14)<br><br><i><u>NOTE:</u> Never use both jumpers at the same time!</i>                                                                       |
| J16<br>(4TX)  | 3-4 short |                              | Output port: GTERM-A board, TB2-1: "4TX"<br><br>1-2 short = IEC61162-2 ed.1 or TOKIMEC version<br><br>3-4 short = IEC61162-1 ed.4 (ref. page 14)<br><br><i><u>NOTE:</u> Never use both jumpers at the same time!</i>                                                                       |
| J17<br>(5TX)  | 3-4 short |                              | Output port: GTERM-A board, TB2-2: "5TX"<br><br>1-2 short = IEC61162-2 or TOKIMEC version<br><br>3-4 short = IEC61162-1 ed.4 (ref. page 14)<br><br><i><u>NOTE:</u> Never use both jumpers at the same time!</i>                                                                            |
| J18<br>(IEC2) | 1-2 short | Type setting                 | 1-2 short = Standard specification<br><br>Open = With an external heading sensor (with HDM or EHS unit)<br><br><i><u>NOTE:</u> For Tokio Keiki use only!</i>                                                                                                                               |
| J19<br>(IEC1) |           |                              |                                                                                                                                                                                                                                                                                            |
| J20<br>(G1TX) | 3-4 short | Serial signal output setting | Output port: DTERM-A board, TB21B: "G1-1TX" and TB21D: "G1-2TX"<br><br>1-2 short = IEC61162-2 or TOKIMEC version<br><br>3-4 short = IEC61162-1 ed.4 (ref. page 14)<br><br><i><u>NOTE:</u> The true heading information on "NO.1 Gyro compass" is output regardless of a system change.</i> |

| JUMPER           | DEFAULT   | FUNCTION                                   | DESCRIPTION                                                                                                                                                                                                                                                                                                |
|------------------|-----------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| J21<br>(G2TX)    | 3-4 short | Serial signal output setting               | <p>Output port: DTERM-A board, TB21C: "G2-1TX" and TB21D: "G2-2TX"</p> <p>1-2 short = IEC61162-2 or TOKIMEC version</p> <p>3-4 short = IEC61162-1 ed.4 (ref. page 14)</p> <p><b>NOTE:</b> <i>True heading information on "NO.2 Gyro compass" is output regardless of a system change.</i></p>              |
| J22<br>(GPSPOL)  | 1-2 short | Polarity of the "GPS" signal setting       | <p>Input port: GTERM-A board, TB1-2: "GRX"</p> <p>1-2 short = Standard</p> <p>3-4 short = Polarity is carried out reversely.</p> <p><b>NOTE:</b> <i>Never use both jumpers at the same time!</i></p> <p><b>NOTE:</b> <i>When a signal cannot be received by "1-2 short", it is set as "3-4 short".</i></p> |
| J23<br>(LOGPOL)  | 1-2 short | Polarity of "LOG" signal setting           | <p>Input port: GTERM board-A, TB1-2: "LRX"</p> <p>1-2 short = Standard</p> <p>3-4 short = Polarity is carried out reversely.</p> <p><b>NOTE:</b> <i>Never use both jumpers at the same time!</i></p> <p><b>NOTE:</b> <i>When a signal cannot be received by "1-2 short", it is set as "3-4 short".</i></p> |
| J24<br>(RXD3SEL) | 1-2 short | Setting receiving port of CPU on SCC board | <p>1-2 short = An optional serial signal is received.</p> <p>3-4 short = The serial signal output from SCOIF board received.</p> <p><b>NOTE:</b> <i>Never use both jumpers at the same time!</i></p>                                                                                                       |

| JUMPER           | DEFAULT   | FUNCTION                                                            | DESCRIPTION                                                                                                                                                                                                                                        |
|------------------|-----------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| J25<br>(1WR/EXT) | Short     | Software install or internal communication with "NO.1 Gyro compass" | Short: Internal communication with "NO.1 Gyro compass"<br>Open: Software is installed in SCC board<br><i><b>NOTE:</b> Circuit is damaged if software is installed while this jumper is short.</i>                                                  |
| J26<br>(2WR/EXT) | Short     | Software install or internal communication with "NO.2 Gyro compass" | Short: Internal communication with "NO.2 Gyro compass"<br>Open: Software is installed in SCC board<br><i><b>NOTE:</b> A damage will be given to a circuit if software is installed while this jumper has been short.</i>                           |
| J27<br>(LOG)     | 1-2 short | LOG contact signal selection                                        | Input port : GTERM-A board, TB1-2: "SL"<br>1-2 short = 200p.p.n.m.<br>3-4 short = 400p.p.n.m.<br><i><b>NOTE:</b> Never use both jumpers at the same time!</i>                                                                                      |
| J28<br>(ROT)     | 1-2 short | "Rate of turn" Analog signal level selection                        | Output port: GTERM-A board, TB1-3: "1RT~3RT"<br>1-2 short = Output voltage 0v to $\pm 5v$ DC or 0v to $\pm 10v$ DC<br>3-4 short = Output voltage 0v to $+5v$ DC or 0v to $+10v$ DC<br><i><b>NOTE:</b> Never use both jumpers at the same time!</i> |

| JUMPER           | DEFAULT   | FUNCTION                                                    | DESCRIPTION                                                                                                                                                                                                                                                                                   |
|------------------|-----------|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| J29<br>(ESPOL)   | 1-2 short | Setting of polarity for "external heading sensor" signal    | <p>Input port: GTERM-A board, TB1-2: "ESRX"</p> <p>1-2 short = Standard</p> <p>3-4 short = Polarity is carried out reversely.</p> <p><b>NOTE:</b> When a signal cannot be received by "1-2 short", it is set as "3-4 short".</p> <p><b>NOTE:</b> Never use both jumpers at the same time!</p> |
| J30<br>(MWR/EXT) | Short     | Software install or internal communication with SCOIF board | <p>Short = Internal communication with External heading sensor</p> <p>Open = Software is installed in SCOIF board</p> <p><b>NOTE:</b> A damage will be given to a circuit if software is installed while this jumper has been short.</p>                                                      |
| J31              | Short     | Software installation                                       | <p>Open = Software is installed in SCOIF board</p> <p><b>NOTE:</b> A damage will be given to a circuit if software is installed while this jumper has been short.</p>                                                                                                                         |
| J32<br>(RESET)   | Open      | CPU reset                                                   | This jumper is used when resetting "CPU."                                                                                                                                                                                                                                                     |
| J33<br>(ESSEL1)  | 1-2 short | Selection of output serial signal                           | 1-2 short = Standard (The serial signal of a standard external direction sensor is received, and the signal is sent to "NO.1 Gyro compass").                                                                                                                                                  |
| J34<br>(ESSEL2)  | 1-2 short |                                                             | 1-2 short = Standard (The serial signal of a standard external direction sensor is received, and the signal is sent to "NO.2 Gyro compass").                                                                                                                                                  |



| JUMPER          | DEFAULT   | FUNCTION                          | DESCRIPTION                                                                                                                                                                                                      |
|-----------------|-----------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| J35<br>(ESSEL3) | 1-2 short |                                   | 1-2 short = Standard (The serial signal of a standard external direction sensor is received, and the signal is receive from "external heading sensor").                                                          |
| J36<br>(ESSEL4) | 1-2 short | Selection of output serial signal | 1-2 short = Standard (The serial signal of a standard external direction sensor is received, and the signal is receive from "external heading sensor").                                                          |
| J37<br>(6TX)    | 3-4 short | Selection of output serial signal | Output port : GTERM-A board, TB2-2: "6TX"<br>1-2 short = IEC61162-2 or TOKIMEC version<br>3-4 short = IEC61162-1 ed.4 (ref. page 14)<br><b><i>NOTE:</i></b> <i>Never use both jumpers at the same time!</i>      |
| J38<br>(7TX)    | 3-4 short |                                   | Output port : GTERM-A board, TB2-2: "7TX"<br>1-2 short = IEC61162-2 ed.1 or TOKIMEC version<br>3-4 short = IEC61162-1 ed.4 (ref. page 14)<br><b><i>NOTE:</i></b> <i>Never use both jumpers at the same time!</i> |
| J39<br>(8TX)    | 3-4 short |                                   | Output port : GTERM-A board, TB2-2: "8TX"<br>1-2 short = IEC61162-2 ed.1 or TOKIMEC version<br>3-4 short = IEC61162-1 ed.4 (ref. page 14)<br><b><i>NOTE:</i></b> <i>Never use both jumpers at the same time!</i> |

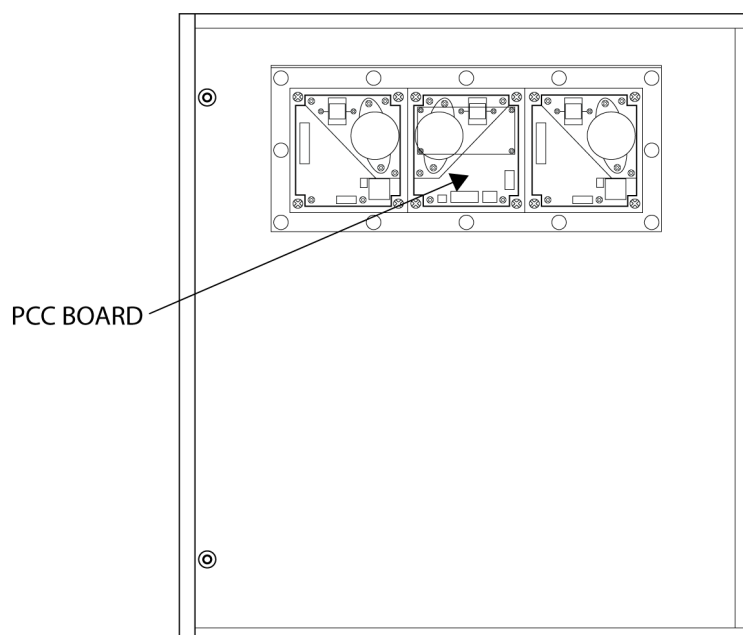
| JUMPER         | DEFAULT   | FUNCTION                                                              | DESCRIPTION                                                                                                                                                                                                                                |
|----------------|-----------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| J40<br>(9TX)   | 3-4 short |                                                                       | Output port : GTERM-A board, TB1-2:<br>"9TX"<br>1-2 short = IEC61162-2 ed.1 or<br>TOKIMEC version<br>3-4 short = IEC61162-1 ed.4 (ref.<br>page 14)<br><i><b>NOTE:</b> Never use both jumpers at<br/>           the same time!</i>          |
| J41<br>(10TX)  | 3-4 short |                                                                       | Output port: GTERM-A board, TB1-2:<br>"10TX"<br>1-2 short = IEC61162-2 ed.1 or<br>TOKIMEC version<br>3-4 short = IEC61162-1 ed.4 (ref.<br>page 14)<br><i><b>NOTE:</b> Never use both jumpers at<br/>           the same time!</i>          |
| J42<br>(MALCN) | 3-4 short | Alarm contact output for<br>Control panel<br>(or Change Over panel)   | Output port: DTERM-A board. TB21D:<br>" MALCN"<br>1-2 short = Normal "CLOSES"<br>Alarm "OPEN"<br>3-4 short = Normal "OPEN" Alarm<br>"CLOSES"<br><i><b>NOTE:</b> Never use both<br/>           jumpers at the same<br/>           time!</i> |
| J43<br>(MRNCN) | 1-2 short | Running contact output<br>for Control panel<br>(or Change Over panel) | Output port: DTERM-A board. TB21D:<br>" MRNCN"<br>1-2 short = Running "CLOSES" Stop<br>"OPEN"<br>3-4 short = Running "OPEN" Stop<br>"CLOSES"<br><i><b>NOTE:</b> Never use both<br/>           jumpers at the same<br/>           time!</i> |

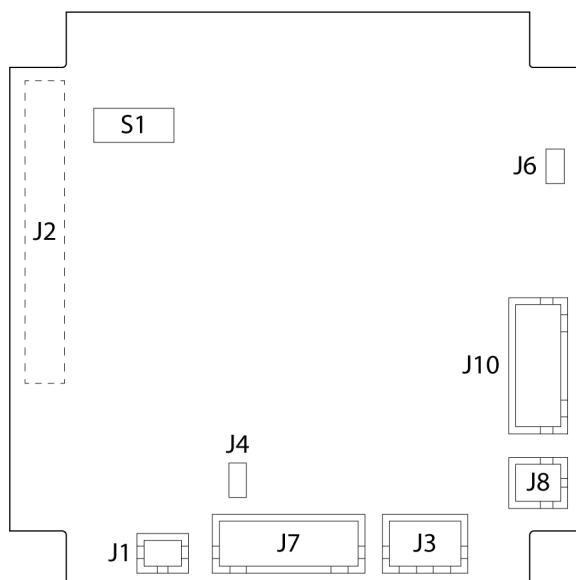
| JUMPER         | DEFAULT   | FUNCTION                                                                 | DESCRIPTION                                                                                                                                                                                                                                                             |
|----------------|-----------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| J44<br>(DFCN)  | 3-4 short | Difference alarm contact output for Control panel (or Change Over panel) | <p>Output port: DTERM-A board. TB21D: "DFCN"</p> <p>1-2 short = Normal "CLOSES" Alarm "OPEN"</p> <p>3-4 short = Normal "OPEN" Alarm "CLOSES"</p> <p><b>NOTE:</b> <i>Never use both jumpers at the same time!</i></p>                                                    |
| J45<br>(OCACN) | 3-4 short | Off course alarm contact output (Not used)                               | <p>Output port: DTERM-A board. TB21D: "OCACN"</p> <p>1-2 short = Normal "CLOSES" Alarm "OPEN"</p> <p>3-4 short = Normal "OPEN" Alarm "CLOSES"</p> <p><b>NOTE:</b> <i>Never use both jumpers at the same time!</i></p>                                                   |
| J46*<br>(ST1)  | 1-2 short | Output port setup for GTERM board                                        | <p>Output port: GTERM-A board. TB2-3: "ST1/OPRX+"</p> <p>1-2 short = The step signal for "Step signal type repeater" is output (ST1).</p> <p>3-4 short = Serial signal receive (OPTION) (OPRX+)</p> <p><b>NOTE:</b> <i>Never use both jumpers at the same time!</i></p> |
| J47 *<br>(ST2) | 1-2 short | Output port setup for GTERM board                                        | <p>Output port: GTERM-A board. TB2-3: "ST2/OPRX-"</p> <p>1-2 short = The step signal for "Step signal type repeater" is output (ST2).</p> <p>3-4 short = Serial signal receive (OPTION) (OPRX-)</p> <p><b>NOTE:</b> <i>Never use both jumpers at the same time!</i></p> |

| JUMPER         | DEFAULT   | FUNCTION           | DESCRIPTION                                                                                                                                                                                                                                                                             |
|----------------|-----------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| J48 *<br>(ST3) | 1-2 short |                    | Output port: GTERM-A board. TB2-3:<br>"ST2/OPRXC"<br><br>1-2 short = The step signal for<br>"Step signal type<br>repeater" is output<br>(ST3).<br><br>3-4 short = Serial signal receive<br>(OPTION) (OPRXC)<br><br><i><b>NOTE:</b> Never use both<br/>jumpers at the same<br/>time!</i> |
| J53<br>(SSEL1) | 1-2 short | Rate of turn scale | Standard rate of turn scale over signal<br>(1RSOL)                                                                                                                                                                                                                                      |
| J54<br>(SSEL2) | 1-2 short | Rate of turn scale | Standard rate of turn scale over signal<br>(2RSOL)                                                                                                                                                                                                                                      |

\*: All 3 jumpers should be changed simultaneously.

## 12.6 PCC board





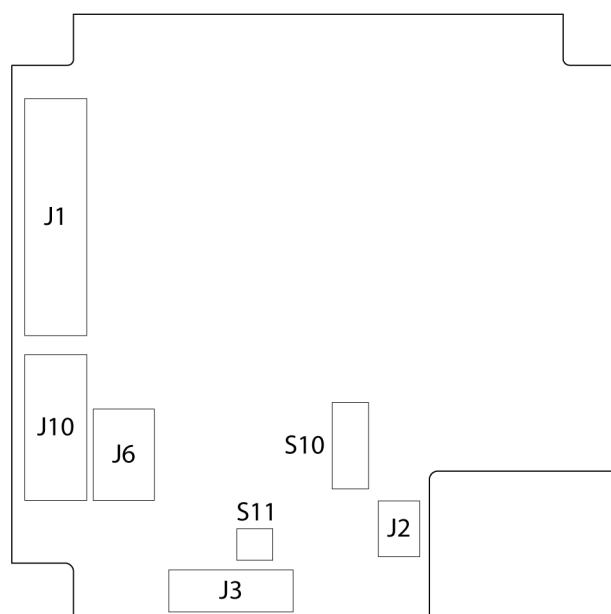
### DIP switch settings on PCC board

| SWITCH | DEFAULT | FUNCTION                           | DESCRIPTION                         |                              |
|--------|---------|------------------------------------|-------------------------------------|------------------------------|
| S1-1   | OFF     | HDM function                       | OFF = Yes                           | ON = No                      |
| S1-2   | OFF     | OCA function                       | OFF = No                            | ON = Yes                     |
| S1-3   | OFF     | External sensor configuration      | SW1-3 OFF<br>SW1-4 OFF              | No external sensor connected |
|        |         |                                    | SW1-3 OFF<br>SW1-4 ON               | Not used                     |
| S1-4   | OFF     |                                    | SW1-3 ON<br>SW1-4 OFF               | External sensor connected    |
|        |         |                                    | SW1-3 ON<br>SW1-4 ON                | Not used                     |
| S1-5   | ON      | Input of steering mode information | OFF = Serial signal<br>ON = Contact |                              |
| S1-6   | ON      | SIMRAD / Tokimec                   | ON = Simrad,                        | OFF = Tokimec                |
| S1-7   | OFF     | Not used                           |                                     |                              |
| S1-8   | OFF     |                                    |                                     |                              |

**Jumper settings on PCC board**

| JUMPER | DEFAULT | FUNCTION              | DESCRIPTION                                                                                                                                                      |
|--------|---------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| J4     | Open    | CPU reset             | This jumper is used when resetting "CPU."                                                                                                                        |
| J5     | Short   | Software installation | Open: Software is installed in SCC PWB<br><br><i><u>NOTE:</u> A damage will be given to a circuit if software is installed while this jumper has been short.</i> |
| J6     | Open    | "Power supply" switch | Short: Power "ON" (Power supply switch pass.)                                                                                                                    |

## 12.7 GPANEL-A board



### DIP switch settings on GPANEL-A board

| SWITCH | DEFAULT | FUNCTION       | DESCRIPTION |                 |
|--------|---------|----------------|-------------|-----------------|
| S1-1   | ON      | For SIMRAD use | OFF = No    | ON = For SIMRAD |
| S1-2   | OFF     | Do not touch   | -           |                 |
| S1-3   |         |                |             |                 |
| S1-4   |         |                |             |                 |
| S1-5   |         |                |             |                 |
| S1-6   |         |                |             |                 |
| S1-7   |         |                |             |                 |
| S1-8   |         |                |             |                 |

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## 13 ALARM MESSAGES AND CORRECTIVE ACTIONS

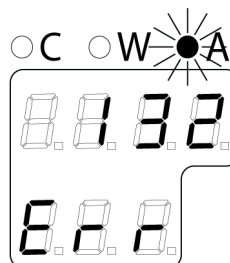
This section provides a description of system errors and corrective actions that should be performed by the system operator.

### 13.1 The alarm system

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

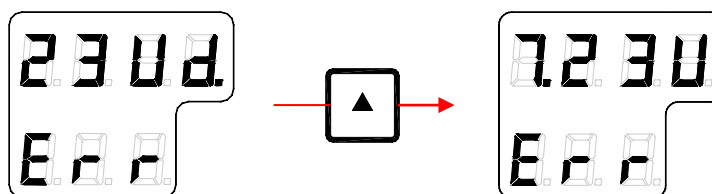
If a fault occurs an alarm code will be displayed in the LCD, the Alarm lamp will be flashing, and an audible alarm will be activated.

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 143Error! Bookmark not defined. 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

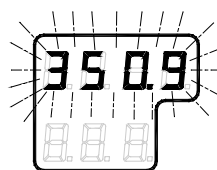
*When an alarm is generated, bearing information from the GC80/85 may not be present or may have large error. Any equipment using bearing information from the Gyro compass should therefore immediately be operated according to the equipment's emergency operating procedure.*

## 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 94 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 23 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 47 onwards.

## Internal power failure in Control unit



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

- 2 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 22.

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.

- 3 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 22.

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 143 **Error! Bookmark not defined.** onwards.

## Zero cross failure

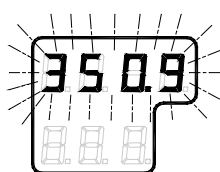


This alarm is generated when the reference angle for the compass bearing cannot be detected, or if there is an error in the bearing calculation.

- 4 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.

- 5 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 22.

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.*

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

If the GPS has an error, change the input source as described on page 72 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, page 73.

**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 (L), or when an error is detected in this serial signal (A).

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 (P), or when an error is detected in the serial signal from the LOG (U).

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.*

**7** 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, page 73.

### Repeater failure

#### No output on single repeaters

**8** 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 47 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 47 onwards.

### Failure when powering ON the Gyro compass

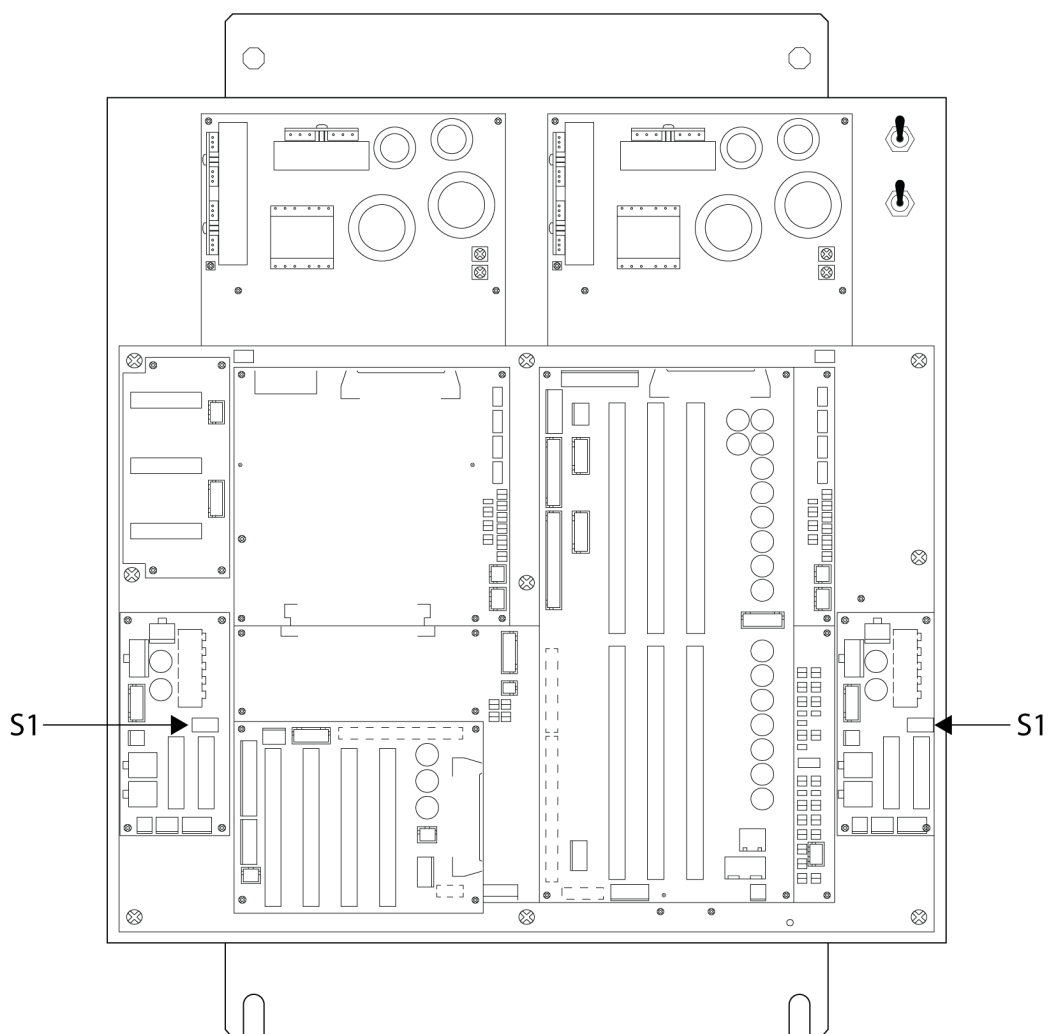
If alarm codes **E** and **A** are generated simultaneously when the GC80 system is turned ON, the following procedure should be used to correct the alarm situation:

- 9** 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 47 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 is 15 sec).                                      |
| E-d        | GPS data abnormal                         | 26            | GPS latitude data abnormal (timeout is 17 sec).                                                                  |
|            |                                           | 27            | GPS speed data abnormal (timeout is 17 sec).                                                                     |
| E-E        | MAG/EHS communication off                 | 32            | MAG/EHS system is stopped or serial signal from GPS is cut (timeout is 15 sec).                                  |
| E-F        | MAG/EHS data abnormal                     | 33            | EHS data abnormal (timeout is 17 sec).                                                                           |
| E-L        | EXT. sensor communication off             | 30            | EXT. sensor system is stopped or serial signal from EXT. sensor is cut (timeout is 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) system is stopped or serial signal from LOG (serial) is cut (timeout is 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.<br>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.<br>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 customer.



### Alarms generated by the Dual system

| Alarm code         | Alarm content                            | Possible cause                                                                                                 |
|--------------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Main Power Fail    | Main power is abnormal                   | Main power from GYRO 1 or GYRO 2 is lost.                                                                      |
| HDG. Difference    | Heading difference                       | Heading difference between GYRO 1 and GYRO 2 true bearing exceed the predefined heading difference alarm.      |
| Auto Switch Fail   | Auto switch is abnormal                  | Abnormalities in the "system automatic switch" processing part.                                                |
| No1 GYRO Comm.     | GYRO 1 / GYRO 2 communication off        | GYRO 1/GYRO 2 has stopped or serial signal from the indicated Gyro is lost (timeout 15 sec).                   |
| No2 GYRO Comm.     |                                          |                                                                                                                |
| No1 GYRO Data      | GYRO 1 / GYRO 2 data abnormal            | GYRO 1 / GYRO 2 data abnormal (timeout 17 sec).                                                                |
| No2 GYRO Data      |                                          |                                                                                                                |
| EXT. Com Alarm     | EXT communication off                    | External sensor has stopped or serial signal from external sensor is lost (timeout 15 sec).                    |
| EXT. Data Alarm    | EXT data abnormal                        | External sensor data abnormal (timeout 17 sec).                                                                |
| PLT. Com Alarm     | Auto pilot communication off             | Automatic steering system has stopped or serial signal from automatic steering system is lost (timeout 15 sec) |
| PLT. Data Alarm    | Auto pilot data abnormal                 | Automatic steering system data abnormal (timeout 17 sec).                                                      |
| MSIF Comm. (Rcv)   | System internal receive abnormality      | Serial signal from a control panel to an I/O signal processing part is lost (timeout 15 sec).                  |
| MSIF Comm. (Trans) | System internal transmission abnormality |                                                                                                                |

**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<br>C   | B<br>-   | ※1      |
| d          | 10311                                 | GNSS DATA       | W<br>C   | B<br>-   | ※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<br>C   | B<br>-   | ※2      |
| r          | 10318                                 | E5V FAIL        | W        | B        |         |
| U          | 10313                                 | LOG DATA        | W<br>C   | B<br>-   | ※2      |
| u          | 10330                                 | PLOG ERROR      | W<br>C   | B<br>-   | ※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<br>(Alarm)   | Alarm requires immediate attention and action.<br><br>(The operator should switch to manual steering because the automatic steering may be unavailable).                                                                             | Red              | 3 short beeps. Repeated every 7 seconds until the <b>ACK</b> button is pressed.  |
| Middle         | W<br>(Warning) | Alarm requires immediate attention, but not immediate action.<br><br>(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 <b>ACK</b> button is pressed. |
| Low            | C<br>(Caution) | Alarms not categorized as High (A) priority or Middle (W) priority.<br><br>(The alarm does not influence the current steering. Recover it before switching from manual to automatic steering mode.)                                  | Yellow           | None                                                                             |

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

※5: The description of Categories.

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

Note! *This equipment has no Category A alarm.*



