[CA]

[20221537]

INSTRUCTION MANUAL

SIMRAD GC80/85 DUAL

Gyro Compass

20221537C English

Document revisions

Rev	Date	Written by	Checked by	Approved by
A	13.02.04			
B	15.03.05			
C	05.12.05			

Document history

Rev. A	First issue.
Rev. B	Updated according to new software release (Master compass: V.1.03, Control unit: V.1.04).
Rev. C	New procedure for how to adjust true heading, updated dimensions for remote panel, other minor updates to text throughout the manual.

About this manual

This manual is intended as a reference guide for installing, operating and maintaining Simrad GC80 and GC85 Dual Gyro compasses.

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

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

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

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

This manual is divided in the following sections:

1. System overview

An overview of the GC80/GC85 Dual gyro system and it's components.

2. User interface

Overview of GC80 Dual Control unit and the user interface.

3. Operation

Main operating procedures for using the GC80/GC85 Dual Gyro compass.

4. 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.

5. Installation

Mechanical installation, cable connection, and software configuration for the GC80/GC85 Dual gyro system.

6. Advanced settings

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

7. Technical specifications

Specifications for the system and for all separate units in the GC80/GC85 Dual gyro system.

8. Drawings

Outline drawings and wiring diagrams for the GC80/GC85 Dual gyro system.

9. Spare part list

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

10. Terminal layout

List of all terminal pins and terminal labelling with details on GTERM and DTERM boards in the GC80 Control unit.

11. Dip switch settings

Drawings and references of jumpers and dip switches for the different printed circuits boards in the Dual Control unit.

12. Alarm listing

A listing of alarm codes, a short description, and the possible cause for the alarm message.

Contents

1 SYSTEM OVERVIEW

This section provides an overview of GC80 and GC85 Dual Gyro systems and their components.

1.1 Introduction

GC80 and GC85 Dual Gyro systems have been designated for any size of vessels which requires more than one gyro system. The system includes one common control unit, from which each gyro system may be operated individually or as one dual system.

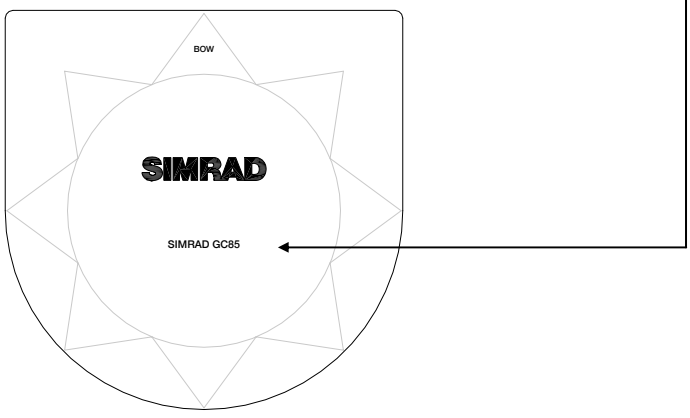
A GC80/85 gyro system enhances the navigation capabilities and reliability. It eliminates the inconvenience and limitations of magnetic compasses, and provides a variety of electrical outputs to supply accurate and consistent heading information to other navigational equipment.

- A GC80 Dual gyro system is designed for vessels with speed up to 30 knots. The system complies with IMO A.424 (11) and Wheel Mark Specifications.
- A GC85 Dual gyro system is suitable for high speed vessels with speed up to 70 knots. It complies with IMO A.821 (19) HSC.

GC80 standard and GC85 High Speed Dual gyro systems have different sensitive elements, but use identical GC80 Dual control unit. The systems are identified with divergent dip switch settings in Master compass and in the control unit.

Note!

A GC80 or GC85 system is identified by the labelling on top of the Master compass' case as shown on the figure below. The labelling on the control unit is identical for both gyro systems.



1.2 Precaution in use

The GC80/GC85 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/GC85 should be operated manually or switched to other bearing sensors.

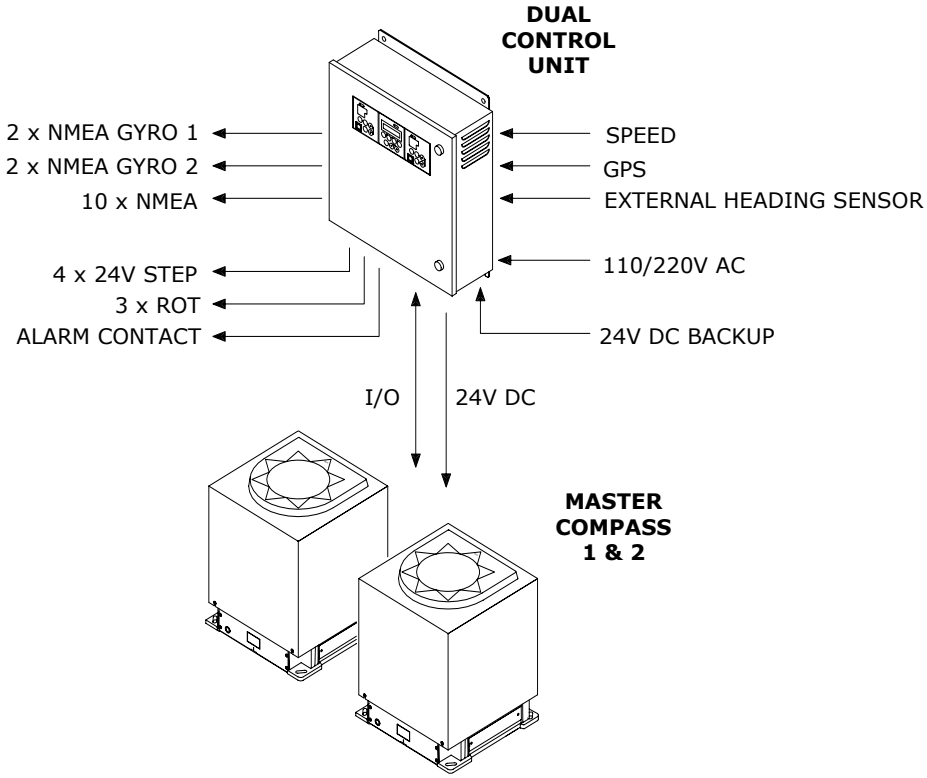
To assure long time safe operation, the following precautions should be taken:

- Assure that the operator is familiar with the use of the gyro compass
- Perform daily check to maintain normal system operation. Refer ***MAINTENANCE***, page 29 onwards
- If any unusual behavior is observed during daily inspection, 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

1.3 System components

A GC80/GC85 Dual Gyro system includes the following units:

- Master Compass 1 & 2 with Sensitive Elements
- Dual Control unit



Note! *For details, refer TECHNICAL SPECIFICATION, page 75.*

1.4 Bearing repeaters

GC80 and GC85 outputs step and serial signals used for repeaters. Even when the gyro compasses are supplied by the emergency power supply, the connected repeaters will be driven by the repeater backup function included in GC80/GC85.

If the serial output signal not is used for repeaters, the following serial signal may be output:

- IEC61162-1 ed.2, close in comparison with NMEA0183 version 2.30 (4800 baud)
- IEC61162-2, based upon NMEA0183 version 2.30 (38400 baud, 9600 baud possible)

These signals may be set separately for each circuit.

For connection of repeaters, refer to wiring diagrams, page 86 onwards.

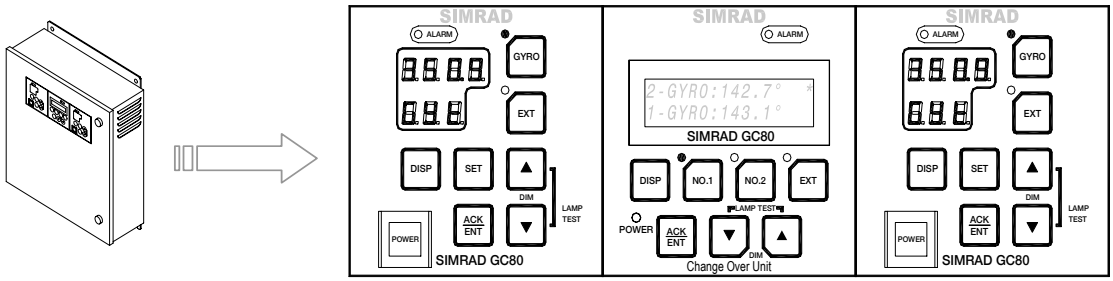
2 USER INTERFACE

This section gives an overview of the control panels in the GC80 Dual Control unit.

2.1 General

The Dual Control unit includes 3 control panels: one for each gyro compass, and one change over panel used for displaying and controlling the dual gyro system.

From the Dual control unit each gyro compass may be operated individually, or the system may be operated as one dual system.



CONTROL PANEL FOR MASTER COMPASS 2 | **CHANGE OVER PANEL** | **CONTROL PANEL FOR MASTER COMPASS 1**

2.2 Master compass control panels

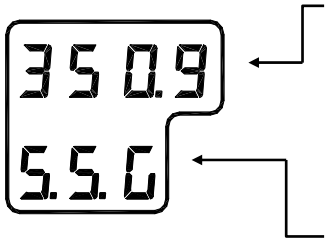
The control panels for each of the two master compasses are identical. They are used for controlling each master compass individually, and include the buttons described in the following pages.

POWER button

Used for switching the gyro system ON. The button will be lit to indicate that power is applied to this gyro compass. Refer ***System Start-up and Shut-down***, page 12.

Display

The LCD displays data in two rows: the Data indicator row and the Mode indicator row.



- The Data indicator consists of four 7-segments red LEDs. The indicator is used for displaying the vessel's bearing, latitude and speed. Refer ***Displaying present settings for each compass***, page 18.
  The Data indicator is also used for displaying alarm codes as described from page 25 onwards.
- The Mode indicator consists of three 7-segments green LEDs. The Mode indicator displays codes used for identifying input type for bearing, latitude and speed.

GYRO button

Used for selecting the gyro compass as the active heading reference system. The status lamp is lit to indicate that the gyro system is active.

Refer ***Selecting active compass***, page 24.

EXT button

Used for selecting the external heading system as the heading reference. The status lamp will be lit to indicate that the external heading reference system is active.

Refer ***Selecting active compass***, page 24.

DISP button

Used for displaying data on the LCD. ***Displaying present settings for each compass***, page 18.

SET button

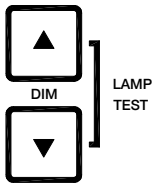
Used for changing data and input systems. Refer ***System start-up and software configuration***, page 58 onwards.

ACK/ENT button

Used for confirming a change in data and input systems. Refer ***System start-up and software configuration***, page 58 onwards.

The button is also used for acknowledging an alarm as described in ***Acknowledging an alarm,*** page 26.

Arrow buttons



Used for increasing or decreasing a parameter value. Refer ***System start-up and software configuration***, page 58 onwards

Also used for lamp test and for setting the display illumination as described in page 15.

Alarm indicator

Used for indicating an alarm situation. Refer ***Alarm messages***, page 25.

2.3 Change over panel

This panel is used for switching between available compasses, for displaying bearing for the gyro compasses, and alarm information. The panel is also used for setting the alarm difference limit.

The panel includes the buttons described in the following pages.

Power button

Used for switching the dual control panel ON.

The button is recessed into the front panel, and a pen or a blunt tool must be used for activating 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°
```

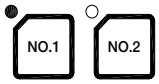
When pressing the **DISP** button, the display will page through available data and eventually alarm lines as shown below:

DISPLAYED TEXT	DESCPRIPTION	
1-GYRO:142.7° SA*	Heading for gyro number 1.	S = Less than 2 hours since the gyro was started A = For internal use * = Active gyro
2-GYRO:142.7° SA*	Heading for gyro number 2.	
E-SENS:1401.9	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 one or more alarms are generated. Refer ***Alarm messages on the change over panel***, page 26.	

DISP button

Used for paging through available data lines on the LCD.

GYRO no.1 and no.2 buttons



Used for selecting master compass no.1 or no.2 as the active heading reference system.

Active compass system is selected by pressing one of these buttons and the **ACK/ENT** buttons simultaneously. The status lamp is lit to indicate which master compass that is active.

Refer ***Selecting active compass***, page 24.

EXT button

Used for selecting an external heading system as heading reference. The status lamp will be lit to indicate that the external heading reference system is active.

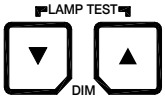
Refer ***Selecting active compass***, page 24.

ACK/ENT Button

Used for confirming a selection.

The button is also used for acknowledging an alarm as described in ***Acknowledging an alarm,*** page 26.

Arrow Buttons



Used for increasing or decreasing a parameter value. Refer ***System start-up and software configuration***, page 58 onwards

Also used for lamp test and for setting the display illumination as described in page 15.

Alarm Indicator

Used for indicating an alarm situation. Refer ***Alarm messages***, page 25.

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3 OPERATION

This section describes the main operating procedure used when operating the GC80/GC85 Dual Gyro system.

3.1 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 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 58 onwards.***

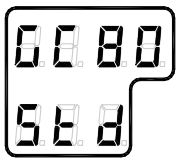
3.2 System Start-up and Shut-down

A GC80/GC85 gyro compass is usually left with power on. If the compass has to be shut down and restarted, the procedures in the following sections should be followed.

Start-Up procedure for each gyro compass

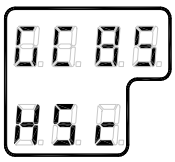
Turn ON each gyro compass by pressing the **POWER** button on the Control panel. The following start-up sequence will be run:

1 Control unit type (GC80 Std, or GC80 HSc), SW version for Control panel and for Master compass is displayed in rapid succession. Examples of display text are shown below:

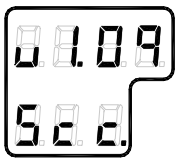


GC80 CONTROL PANEL STD VERSION

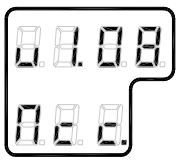
OR



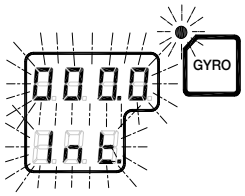
GC80 CONTROL PANEL HIGH SPEED VERSION



SW VERSION CONTROL PANEL



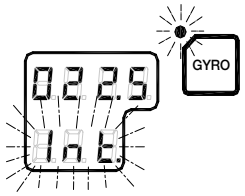
SW. VERSION MASTER COMPASS



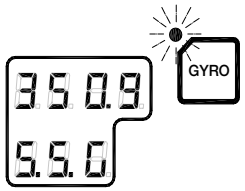
2 If the rotor not was completely stopped when the **POWER** button was pressed, a rotor break function will be activated to stop the rotor.

Active rotor break is indicated with flashing display.

3 The sensitive element starts rising horizontally, and the compass rotates 360° clockwise. The display shows decreasing bearing as the compass is rotating.



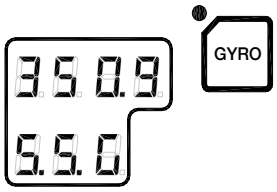
4 When the rotation is stopped, start bearing is indicated with flashing text in the display. The start bearing will be the same as active bearing when the compass was turned OFF.



5 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 remains flashing.

6 The rotor will now start rotating, and reaches pre-described number of revolutions after maximum 30 minutes.



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

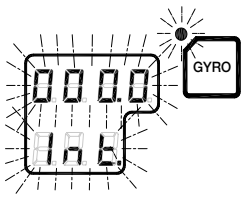
The lamp beside the **GYRO** button change from flashing to steady light.

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 for the master system that is to be turned OFF. The light in the **POWER** button will be switched off.

2 Repress 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 as shown on the figure
- a soft clicking sound heard from the gyrocompass

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. If not, the sensitive element may be damaged!***

3 Press the **POWER** button again to shut down the gyrocompass 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 for activating 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 showing 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 is in according with the heading displayed on the gyro compass' control panel.

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

3.3 Adjusting display illumination and contrast

Display illumination on control panels

The display illumination and the light intensity in the indicator lamps are set separately for each panel, and is increased or decreased in 5 steps by pressing the arrow buttons.

When the illumination is set to 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 will be lit, and a short audible alarm will be activated.

Display contrast on 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 Then 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 turning OFF the light in Change over panel

The back light in the change over panel may be automatically turned OFF after a set time when it has been used.

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 light setting display:

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

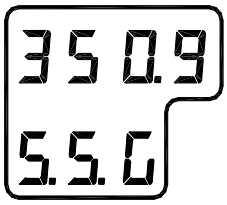
5 Use the arrow buttons to increase or decrease the time setting. Range: 0 – 10 minutes.

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

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

3.4 Displaying present settings for each compass

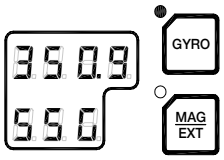
When pressing the **DISP** button on the control panel for one of the master compasses, the system will loop through a display sequence showing present settings for this master compass.



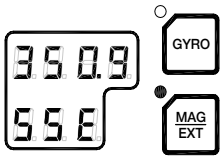
- The first row in the display will show the value

- The second row displays code used for identification

True output bearing from active compass

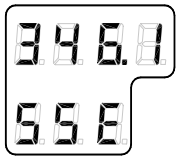


GYRO COMPASS SELECTED AS ACTIVE STEERING SENSOR

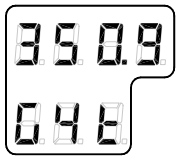


EXTERNAL HEADING SENSOR SELECTED AS ACTIVE STEERING SENSOR

Bearing from passive sensor



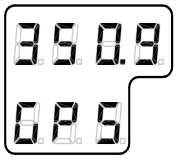
EXTERNAL HEADING SENSOR IS PASSIVE STEERING SENSOR



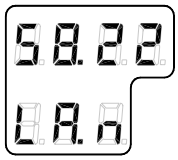
GYRO COMPASS IS PASSIVE STEERING SENSOR

Note! *This display is only available when an external sensor is connected to the GC80/GC85.*

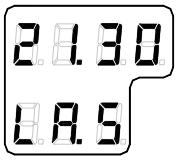
Gyro compass bearing without correction, together with active speed input system indication (**GPS**, **Manual**, **Log** or **Serial Log)**



Latitude for the vessel's current position. Value indicated as North (**n**) or South (**s**) latitude

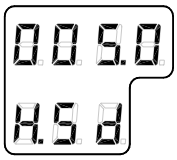


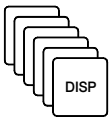
NORTH LATITUDE



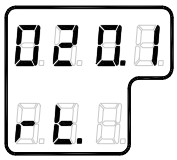
SOUR LATITUDE

Vessel speed. **GPS**, **Manual**, **Log** or **Serial Log** may be selected as speed input system

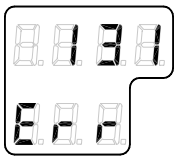




Rate of turn in °/min.



Error codes (up to 4), and error indication.



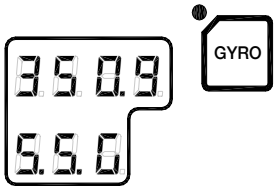
3.5 Confirming present settings for each compass

After the GC80/GC85 is configured according to the ***System start-up and software configuration***, described in page 58 onwards, it should not be necessary to adjust any settings when operating the gyro compass.

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

True bearing

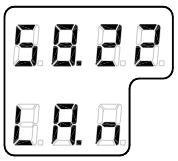
Make sure that the gyro compass is selected as active compass. Refer ***Selecting active compass***, page 24.



Confirm that the gyro compass's displayed true bearing is the same as a known target or astronomical observation.

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

Latitude



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

The displayed latitude value is calculated based on the vessel's true bearing and the vessel's actual speed. Refer setting the latitude input system and speed input system, page 61 onwards.

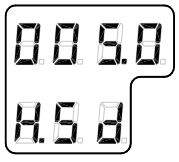
- If GPS is selected as latitude input system, the latitude obtained from the GPS is displayed on the LCD. Confirm that the displayed latitude is the same as indicated on the GPS indicator.
- If GYRO is selected as latitude input system and other than MANUAL selected as the vessel's speed input system, the latitude will be automatically updated. In this case, the indicated latitude should be confirmed every 4ht hour when the vessel is in harbor. If there is any difference between the displayed value and the vessel's actual latitude, the value should be adjusted according to ***Setting the Latitude input system***, page 61.

Note!

*When **GYRO** is selected as latitude input system and **MANUAL** is selected as the speed input system, the indicated latitude value will not be updated.*

Speed

The GC80/GC85 gyro compass calculates bearing based on the speed and latitude information that is input to the gyro system. Any errors in speed input will therefore cause incorrect true bearing from the gyro compass.



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

Confirm in 4 hours intervals 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 ***Setting the Speed input system***, page 62.

Speed error correction

Any gyro compass will generate a heading error caused by vessel speed and the earth rotation. GC80/GC85 calculates this error based on latitude and speed input information, and corrects automatically 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 could be used for manually calculating the heading error.

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

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

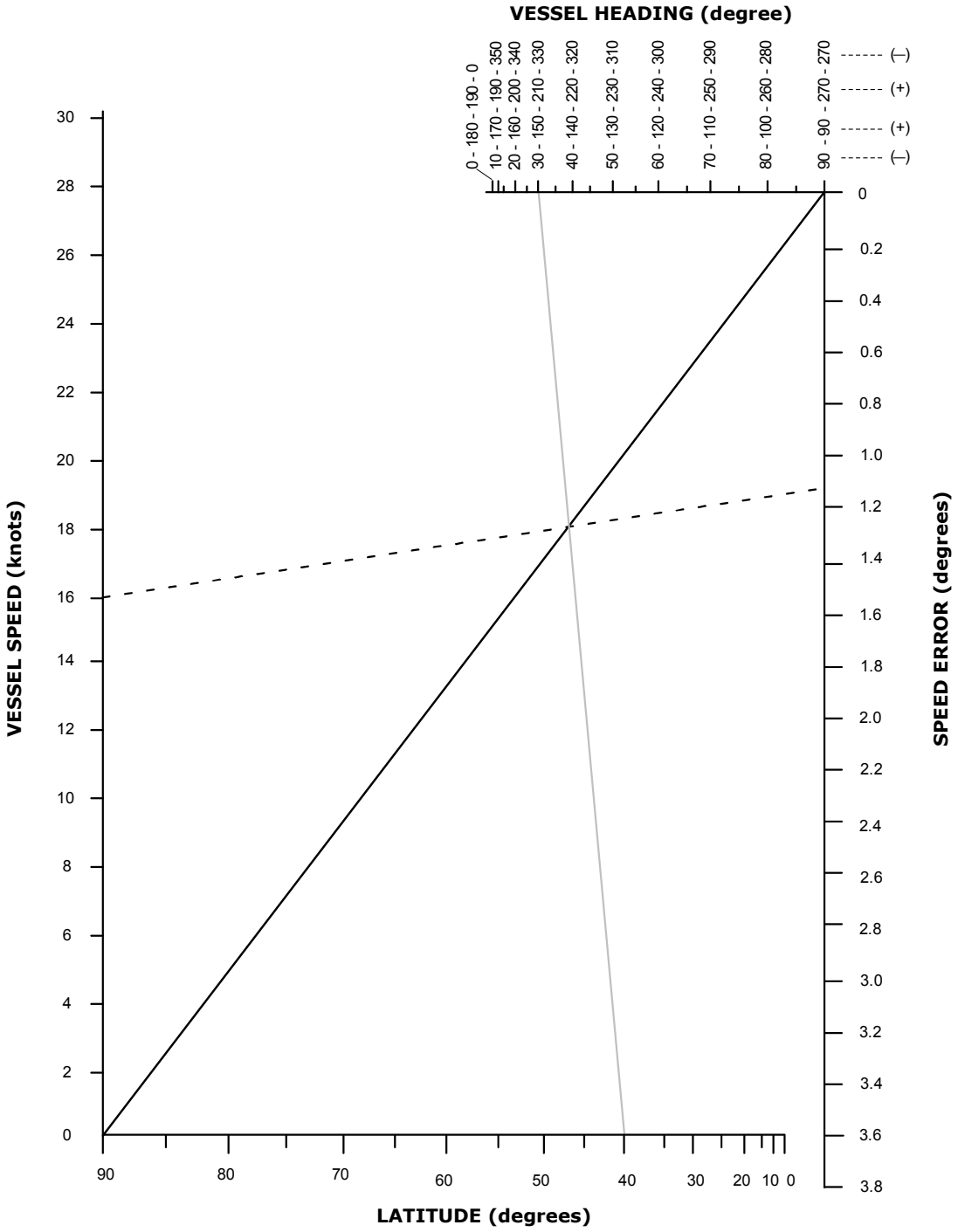
The heading error is found by:

1 Drawing a line between the latitude and the vessel heading (shown with gray line on the figure)

2 Drawing a straight line (broken line in the figure) between the vessel 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°-1.1° = 28.9°.

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


VESSEL HEADING (degree)
0 - 180 - 190 - 0
10 - 170 - 190 - 350
20 - 160 - 200 - 340
30 - 150 - 210 - 330
40 - 140 - 220 - 320
50 - 130 - 230 - 310
60 - 120 - 240 - 300
70 - 110 - 250 - 290
80 - 100 - 260 - 280
90 - 90 - 270 - 270
------ (–)
------ (+)
------ (+)
------ (–)
VESSEL SPEED (knots)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
SPEED ERROR (degrees)
0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
2.2
2.4
2.6
2.8
3.0
3.2
3.4
3.6
3.8
90
80
70
60
50
40
30
20
10
0
LATITUDE (degrees)

3.6 Pendulum function

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

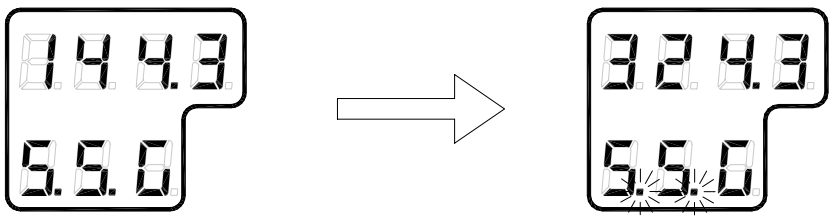
The heading change is activated by closing a potential free contact connected between TB1, pin 71 and 72 on the GTERM board in GC80/85 control unit.

Note!

*To identify the function, S2-4 on the SCC boards has to be set to ON. Refer **DIP switch settings on SCC boards**, page 105 onwards.*

When the switch is activated, the following actions are performed:

- The compass heading and repeaters start to change towards the new 180° shifted heading
- An acoustic alarm sounds 5 times
- The dots in the indicator field in the display starts 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 returns to fixed illuminated dots.

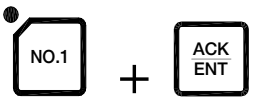
3.7 Selecting active compass

If an external heading sensor is connected to GC80/GC85, it is possible to switch between gyro and external heading sensor as active steering sensor. The gyro system will normally be used with the gyro compass selected as active compass. An external heading sensor should only be used as active compass when the gyro compass not is working properly.

Active compass may be selected both from compass control panels and from the dual control panel. The switching may be 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**, **NO2** or **EXT**) and the **ACK/ENT** buttons 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.**

3.8 Alarm messages

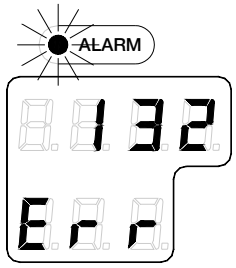
Both the dual system at each separate gyro will continually check for faults while the system is running.

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.

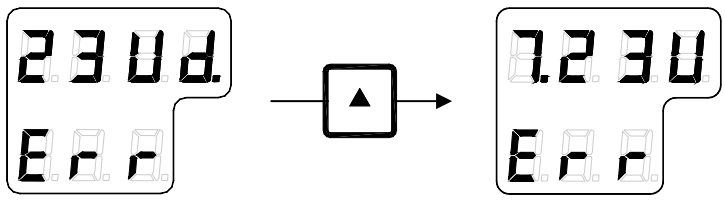
Caution! ***When an alarm is generated, bearing information from the GC80/GC85 may not be present or may have large error. Any equipment using bearing information from the gyro compass should therefore immediately be operated according to the equipment's emergency operating procedure.***

Alarm messages on the compass control panels

Up to 4 alarm codes may be displayed in the LCD 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 with code 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 on the figure below. Further alarm codes may then be displayed by pressing the "arrow up" button.



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

Alarm messages on the change over panel

The alarm codes for the dual system will be displayed one 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.

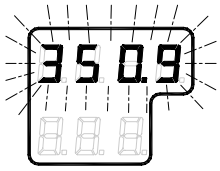
```
G1 ALARM 01/05
GPS Com Alarm
```

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 on the control panel, or on an external acknowledge button if this is installed.

- 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.

The ***ALARM LISTING*** section, page 121, has a complete list of alarm codes.

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 diagram on page 86 onwards.

Note! *Could only be used if no pendulum switch is installed!*

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4 MAINTENANCE

This section holds descriptions for maintenance procedures that should be performed by the system operator.

The section also includes a detailed description for how to replace the sensitive element and the fuses.

4.1 General

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

If any strange motion, smell, sound or heat is generated from any unit, a Simrad dealer shall be contacted.

4.2 Precautions

Touching internal parts may cause electric chock 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 when 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.

4.3 Cleaning the operator panels and the cabinet surface

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

4.4 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 correct position.

4.5 Checking mechanical installation

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

4.6 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 is according to the vessel's actual latitude and speed.	Daily
Check connectors	Every six month
Tighten fastening screws	Every six month
Clean panels and cabinet	Once a year or as required

4.7 Replacing the Sensitive element

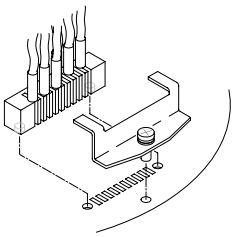
Caution! ***The Sensitive element should only be replaced by authorized Simrad personnel.***

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

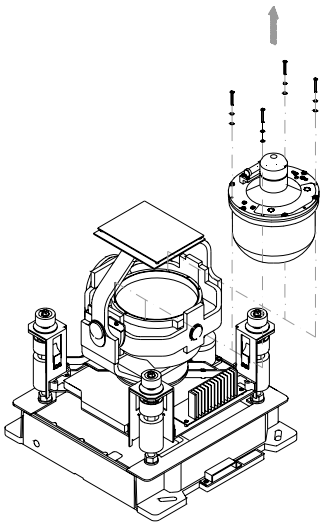
Caution! ***Use extreme caution when handling the Sensitive element! Do not tilt the element. It is filled with oil and the top is open.***

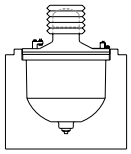
1. Ensure that the power is disconnected from the Control unit.
2. Remove the four screws securing the compass case, and lift the case carefully upwards and away.



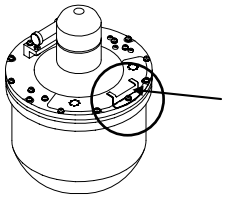
3. Loosen the screw on the plug-holder on the Sensitive element, and disconnect the plug.

4. Remove the four 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.





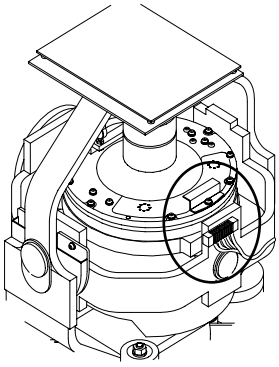
5. Place the defective Sensitive element in its original package, and put the rubber tube on top of the element.



6. Re-install the plug-holder on the defective Sensitive element.

7. Lift the new element carefully from its package, and remove the rubber tube on top of the element.

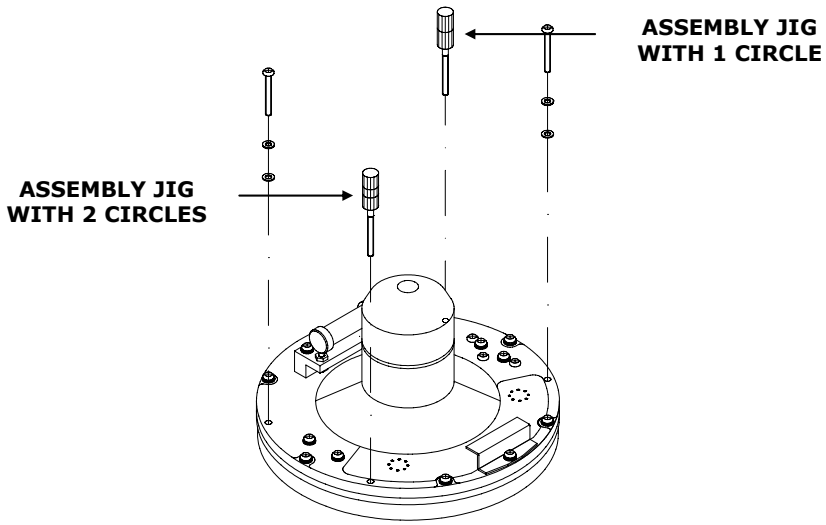
Note! *The package and the rubber tube should be kept for re-use if the Sensitive element has to be sent to factory for service!*

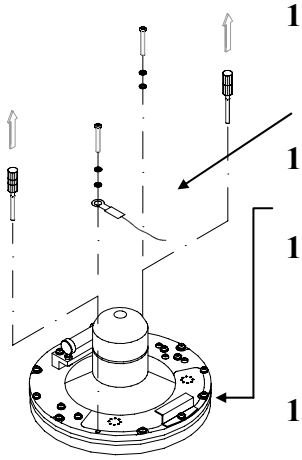


8. Tilt the Horizontal ring to the side where the plug is located, and carefully put the sensitive element into the ring.

- 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 on the figure below. Observe the rings on the jigs to ensure proper positioning. Insert and fasten the two screws in the other holes.



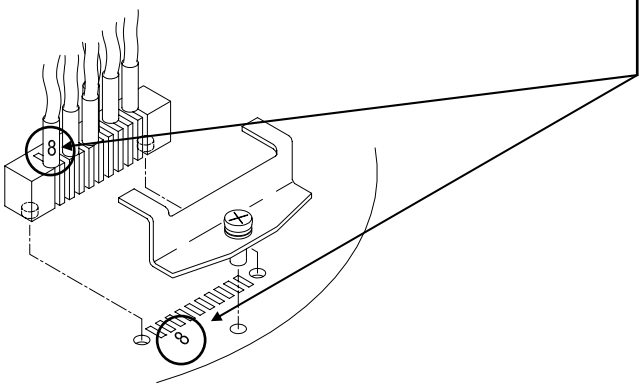


10. Replace the assembly jigs with the two remaining screws after placing the ground wire as shown on the figure.

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

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

13. Firmly tighten the screw on the holder.

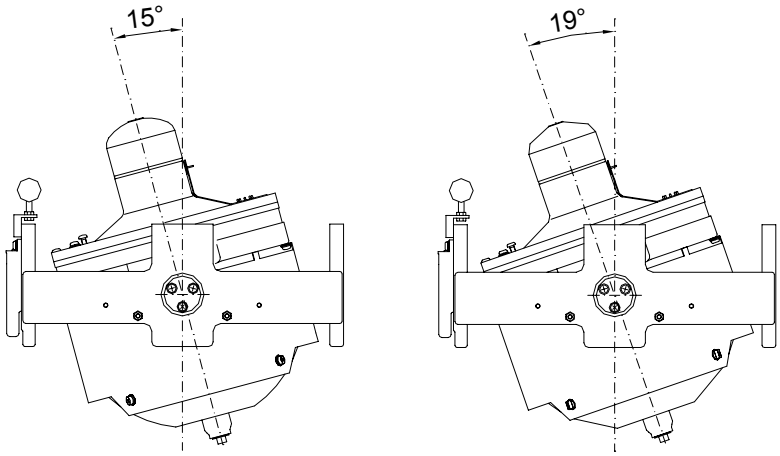


Verifying the element's tilt angle

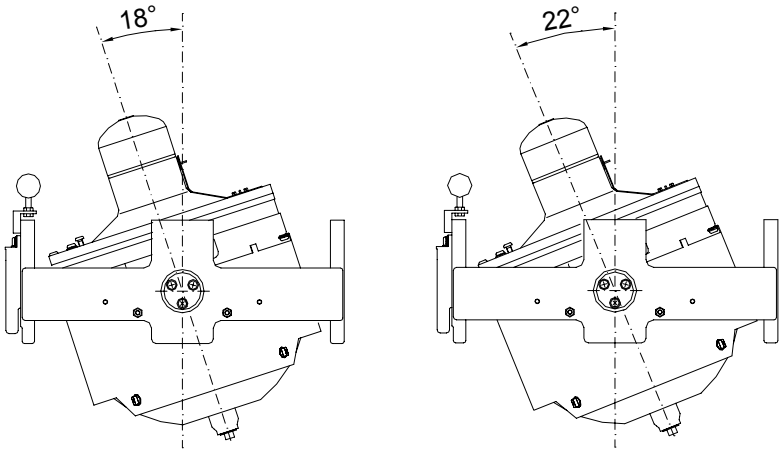
1. Tilt the Sensitive element by hand towards the level tool on the Horizontal ring and keep it tilted for approximately 1 minute. Remove the pressure and observe that the tilt angle remains at:

- GC80: 15° to 19°
- GC85: 18° to 22°

The tilt angle is indicated on the figures below.

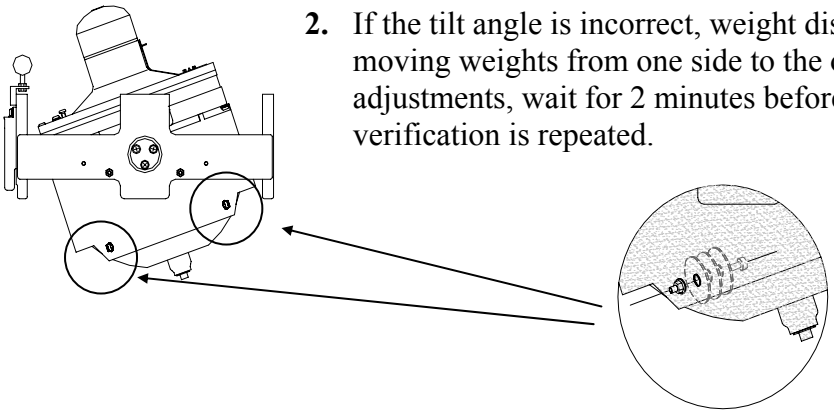


Max and min tilt angle for GC80 std system



Max and min tilt angle for GC85 High Speed system

Note! *The tilt angle shown above is correct for cold condition. The angle 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 one side to the other. After adjustments, wait for 2 minutes before the tilt angle verification is repeated.

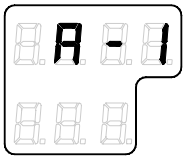
Caution!

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

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

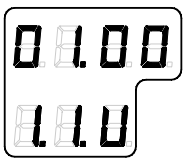
Parameter updates

When a sensitive element is replaced, parameters for the new element have to be loaded into the GC80 Control unit before the gyro compass is started. 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** buttons simultaneously for at least 3 seconds.

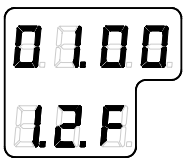
- Main category **A-1** will be displayed.



2. Press the **SET** button to enter the sub-category loop. Sub-category **1.1.U** and its parameter values will be displayed.

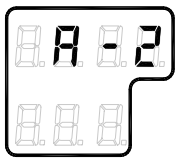
3. Use the arrow buttons to increase or decrease the parameter value until the value is according to the labelling for the new sensitive element.

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.



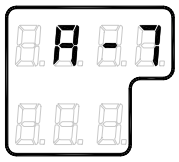
5. Press the **DISP** button again to select sub-category **1.2.F**, and use the arrow buttons to increase or decrease the parameter value until the value corresponds with the parameter for the new sensitive element. Confirm the entry by pressing the **ACK/ENT** button.

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 values 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.

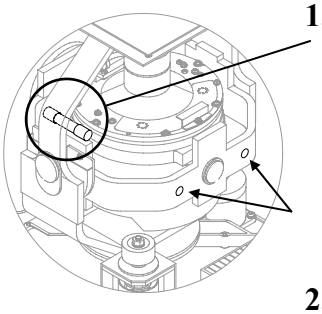
11. Exit the sub-category by pressing the **SET** button, and then exit the Extension main category by pressing and holding the **SET** and **ACK/ENT** buttons simultaneously for at least 3 seconds.

For more information about the Extension menu, see ***ADVANCED SETTINGS***, page 67 onwards.

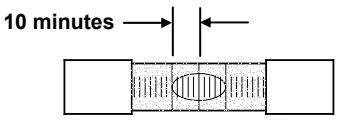
Balancing the Horizontal ring

After the Sensitive element has been replaced, the gyro compass should be started as described on page 12.

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 +/-10 minutes from the center. Each division equals 2 minutes.



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

Note! *It is important that the total number of weights on the horizontal ring are as few as possible.*

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

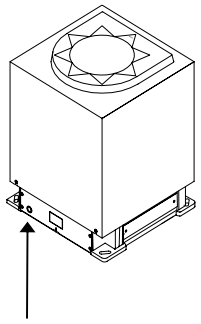
WARNING **If the horizontal ring is tilted more than +/-10', a bearing error will be generated!**

4.8 Replacing the Fuses

WARNING **Before a fuse is replaced, ensure that both the main power and the emergency power is disconnected from the unit.**

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

Master Compass



F1 (12A)

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

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

Dual Control unit

Main fuses

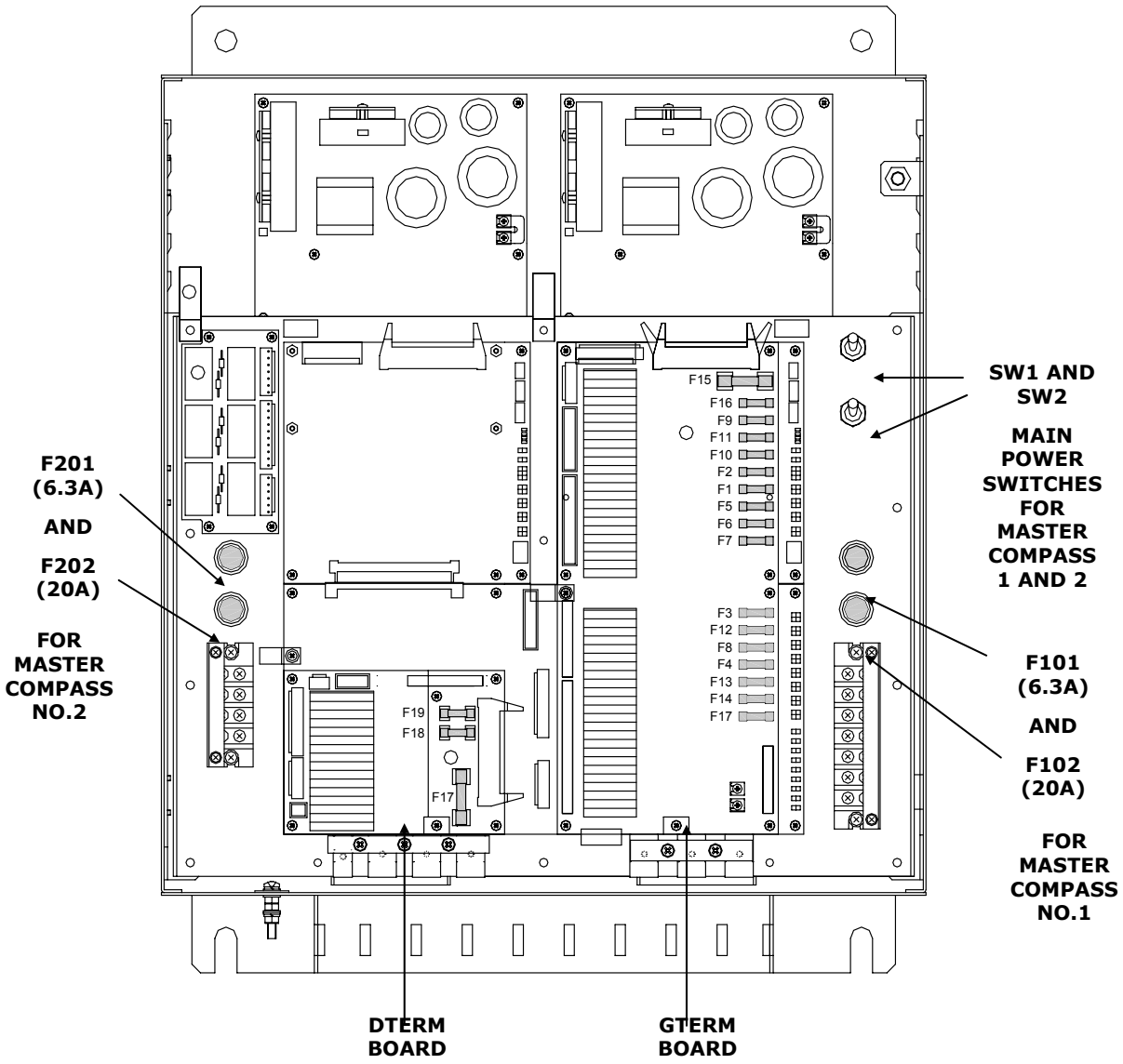
FUSE NO	CAPACITY	TB-NO	SIGNAL	DESCRIPTION
F101	6.3A	TB101		Gyro no.1 Main power supply
F102	20A	TB101		Gyro no.1 Emergency power supply
F201	6.3A	TB201		Gyro no.2 Main power supply
F202	20A	TB201		Gyro no.2 Emergency power supply

GTERM board

FUSE NO	CAPACITY	TB-NO	SIGNAL	DESCRIPTION
F1	1A	TB2-5	1R24+	Power supply for ch.1 serial repeater
F2		TB2-10	2R24+	Power supply for ch.2 serial repeater
F3		TB2-15	3R24+	Power supply for ch.3 serial repeater
F4		TB2-20	4R24+	Power supply for ch.4 serial repeater
F5		TB2-29	5R24+	Power supply for ch.5 serial repeater
F6		TB2-34	6R24+	Power supply for ch.6 serial repeater
F7		TB2-39	7R24+	Power supply for ch.7 serial repeater
F8		TB2-44	8R24+	Power supply for ch.8 serial repeater
F9		TB1-31	9R24+	Power supply for ch.9 serial repeater
F10		TB1-36	10R24+	Power supply for ch.10 serial repeater
F11		TB2-61		Power supply for ch.1 step motor repeater
F12		TB2-66		Power supply for ch.2 step motor repeater
F13		TB2-71		Power supply for ch.3 step motor repeater
F14		TB2-24		Power supply for ch.4 step motor repeater
F15		J9, 1-6		Repeater power supply
F16		J4, 23-27		Power supply for SCC and SIFC boards
F17		J9, 15-16		Power supply for HDM part

DTERM board

FUSE NO	CAPACITY	TB-NO	SIGNAL	DESCRIPTION
F17	15A	J7		Power supply for repeaters (gyro no.2)
F18	3.15A	J7		Power supply for SSC or SCOIF board (E5V) for gyro no.2
F19	3.15A	TB21		Power supply for HDM part, and for SCOIF board



WARNING **Make sure that the main power switches SW1 and SW2 is turned OFF before any fuses are replaced!**

Note! *The fuses in the Control unit are open glass type and may be damaged if handles with force.*

1 Pull the broken fuse up from the holder.

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

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5 INSTALLATION

This section is a reference guide for correctly installing and configuring the GC80/85 Gyro Compasses.

5.1 Unpacking and handling

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

- 2 Master compasses
- 2 Sensitive elements
- Dual control unit
- Spare part kit
- Mounting jigs
- Documentation

The sensitive elements are shipped from the factory packed separately in foaming phenylethene to protect it from shock and vibration. The final assembly of the sensitive element into the Master compass have to be done when the Master compass is mounted onboard the vessel. Refer page 52.

Note! *It is recommended to keep the packing material for the Sensitive elements. These original packing should be used if the element is sent to the factory for service 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 present.

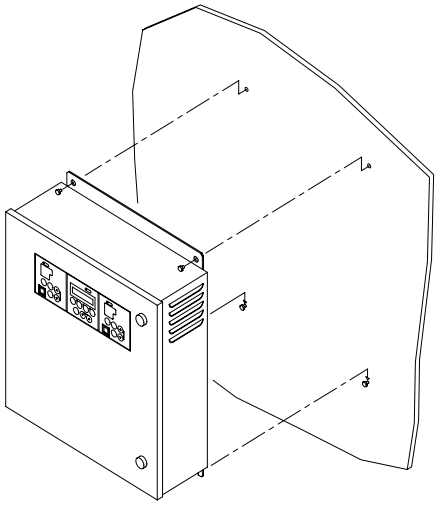
5.2 Mechanical installation

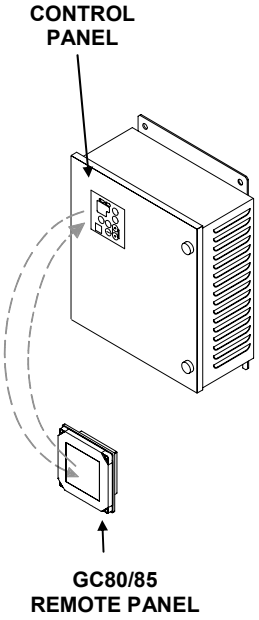
The units included in the GC80/GC85 system should be mounted with special regard to the units' environmental protection, temperature range and cable length. Refer Technical specifications, page 75 onwards.

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.*

Control unit

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





Flush mounting the control panels

The control panels for master compass no 1 and 2 may be removed from the Control unit and mounted in a remote location by using the optional flush mounting kit (part number 27101757).

The flush mounting kit includes:

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

In addition to this kit, optional control panel cables must be ordered. The cables are available in three different lengths:

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

Use the following procedure when remotely mounting the control panel:

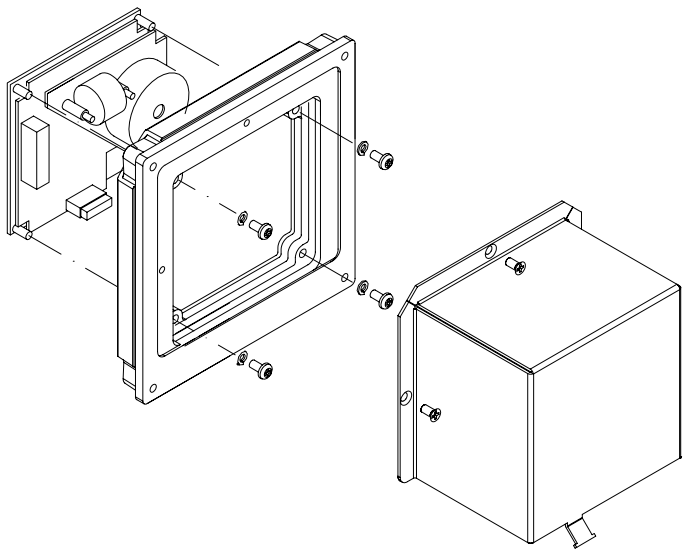
1 Open the control unit, and remove the wiring strips holding the control panel's cable.

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.

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 side as shown on the figure. Fasten the panel with the 4 nuts.



6 Insert the plug on the optional control panel cable, and connect the grounding wire.

7 Mount the cover on the back side.

8 Fasten the cable to the cover by a wire strip.

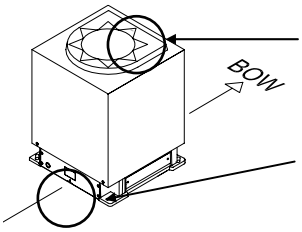
9 Slide the control panel cable through the cable inlet, insert the plug in SCC board and connect the grounding wire. Secure the cable to the control unit by a wire strip.

10 Insert the blind cover in the Control unit by using the 4 bolts included in the kit.

Master compass

Select a mounting location where the deck is horizontally, flat and with little vibration, and where the pitch/roll motion is as small as possible.

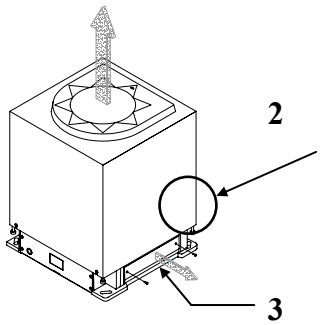
It is also important to select a mounting location with sufficient space for installation and service. Refer dimensional drawing, page 84.



1 Locate 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.

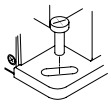
Use the datum line in the front and back to of the compass to line up the unit.

- It is possible to compensate for a small mounting offset by using the heading offset feature as described in ***Adjusting True heading***, page 63.



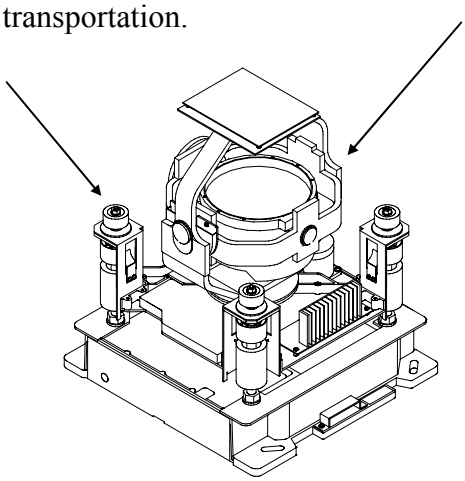
2 Remove the four screws holding the compass case, and lift the case carefully upwards and away.

3 Remove the cable inlet cover.



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

5 Remove strips and foam rubber from the chock absorbers, together with all strips used for securing moving parts during transportation.

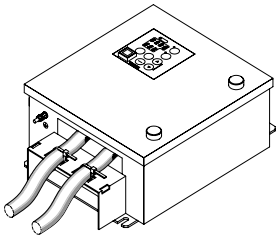


Note! *The foam rubber should be kept for re-use if the Master compass has to be sent to factory for service!*

5.3 Cabling

Note! *No cables are included when the gyro system is delivered from factory.*

The wiring diagram on page 86 onwards includes cable specification for all cables that is to be used.



Connect power and signal cables according to the wiring diagram on page 86 onwards.

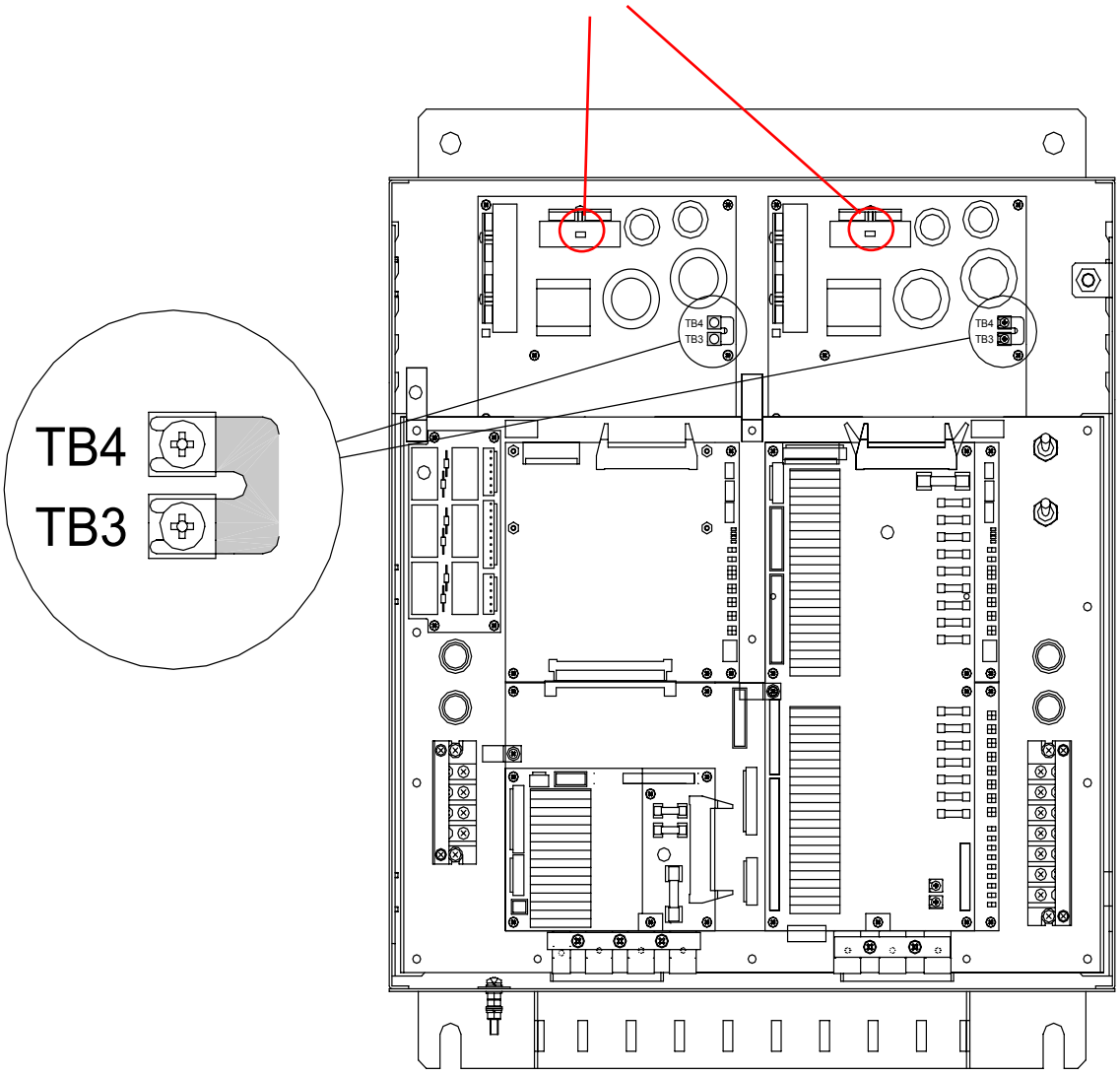
To avoid that vibration should cause the cables to loose connection, the cables could be fastened to the fixing device by using wire straps as illustrated on the figure.

Power supply

GC80/GC85 has to be supplied with 110 or 220V AC.

When delivered from factory, the system is set up for 220V AC. If the system is to be supplied with 110V AC, a strap on both GPOWER boards has to be set according to the figure and the table below.

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

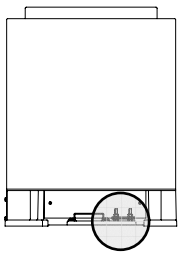


TB3 – TB4	VOLTAGE
Open	220V AC (default)
Short	100/110/115V AC

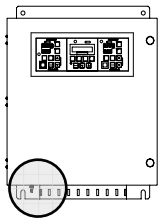
5.4 Grounding the units

All units in the GC80/GC85 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 16mm^2 (gauge).



MASTER COMPASS



DUAL CONTROL UNIT

5.5 Dip-switch settings

GC80 and GC85 gyro systems include several dip switches. Most of these are factory set and should not be alternated 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 for configuring the Control panels to match type of gyro system (GC80 or GC85), while 3 switches have to be set if an external heading sensor is connected to the system.

Note! *These dip switch settings are read when the system is started. Any changes when the system is running will therefore not take affect before the system is restarted.*

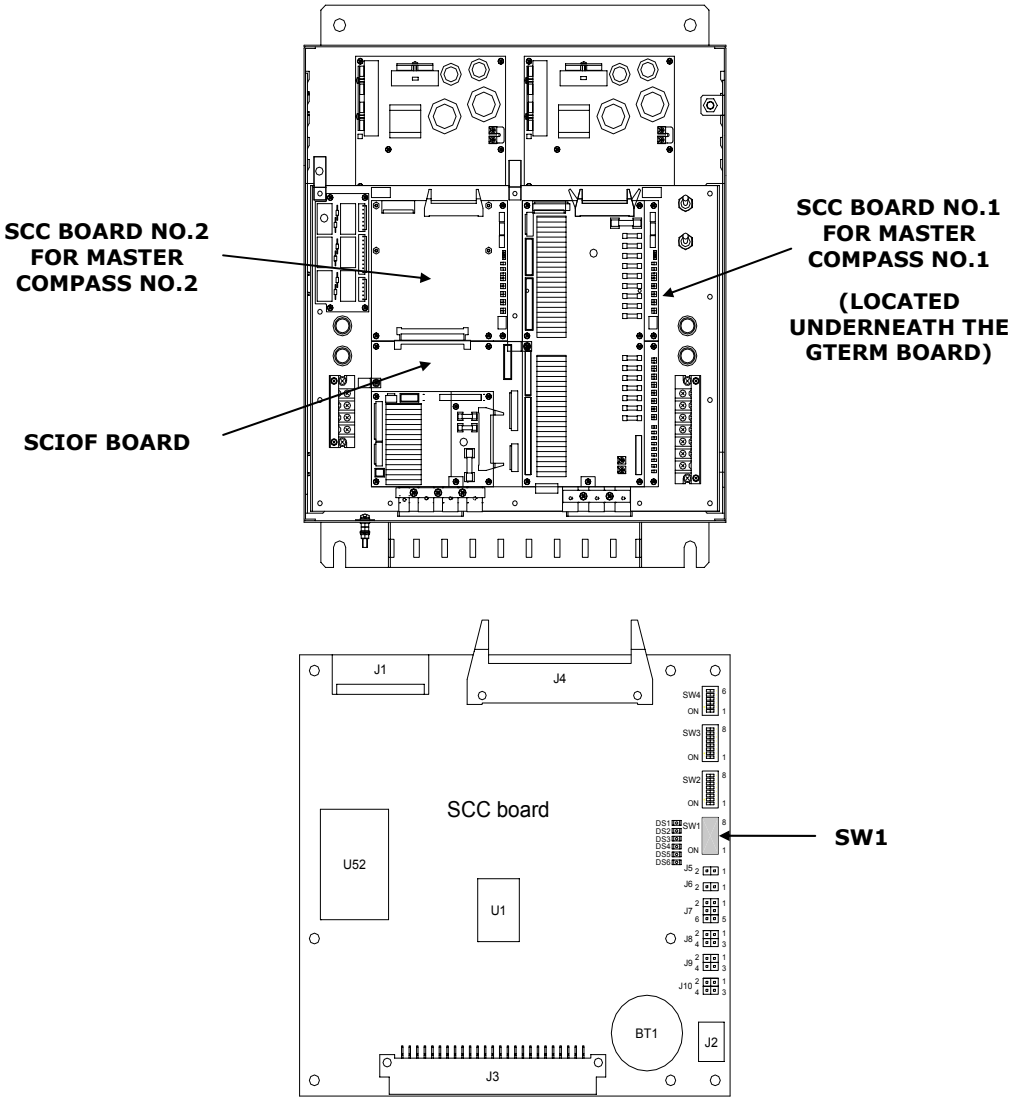
For a complete list of dip switch settings, refer to ***DIP SWITCH SETTINGS***, page 101.

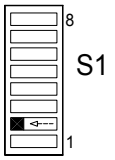
Configuring the control panels

When the gyro system is shipped from factory, all dip switches in both master compass control panels are set as for a standard GC80 system.

The GC80/85 Dual system includes 2 SCC boards, one for each master compass. The boards are located as shown on the figure on page 49.

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



GC80 system	GC85 system
	

Activating an external heading sensor

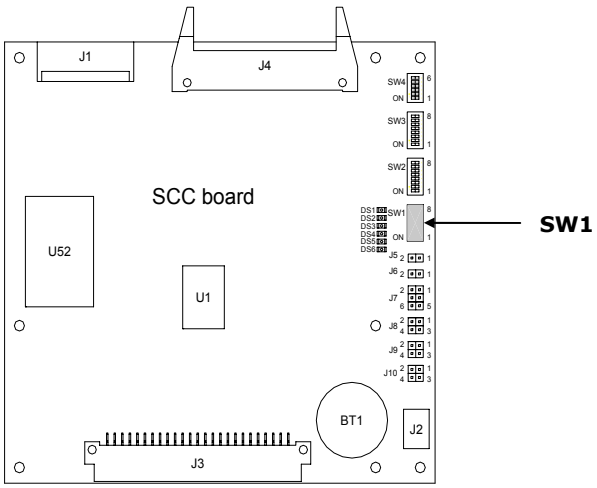
If an external heading sensor is connected to the GC80/GC85, the following switches have to be set:

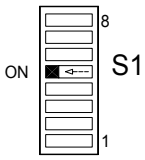
- dip switch no.5 on S1 on both SCC boards
- switch no 1 (and 2) on S1 on the SCOIF board
- switch no.3 (and 4) on S1 on the PCC board (on the back side of the Dual control panel)

For a complete list of dip switch settings, refer to ***DIP SWITCH SETTINGS***, page 101.

SCC boards

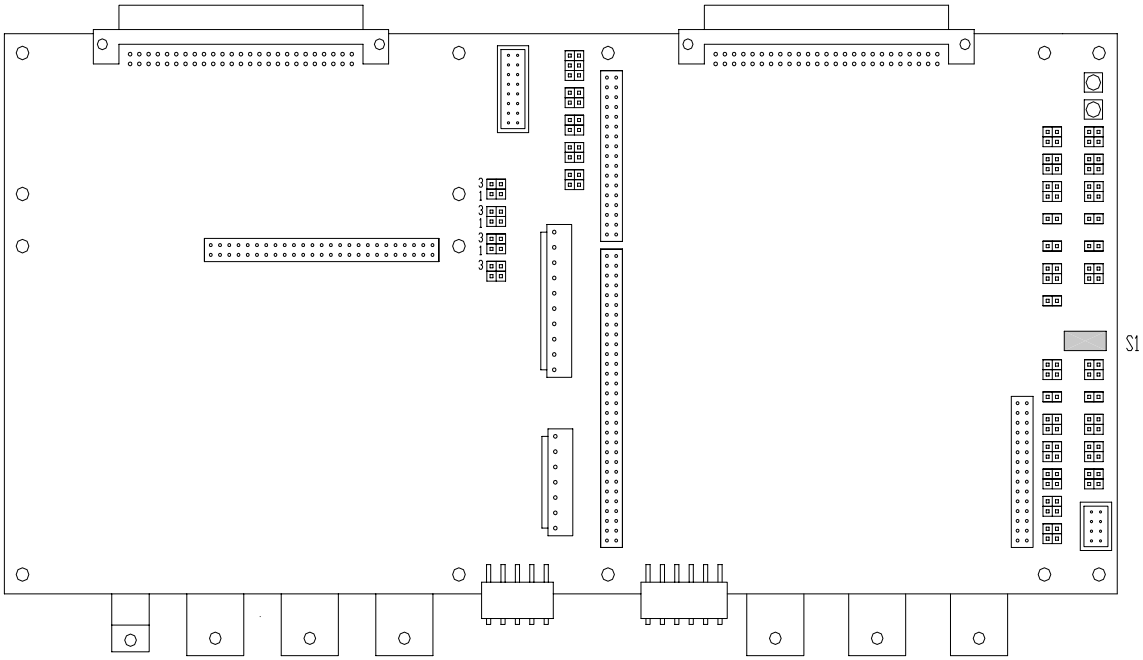
For location of the board, refer the figure on page 49.

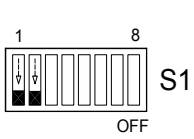
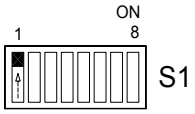


No external sensor	Active external sensor
	

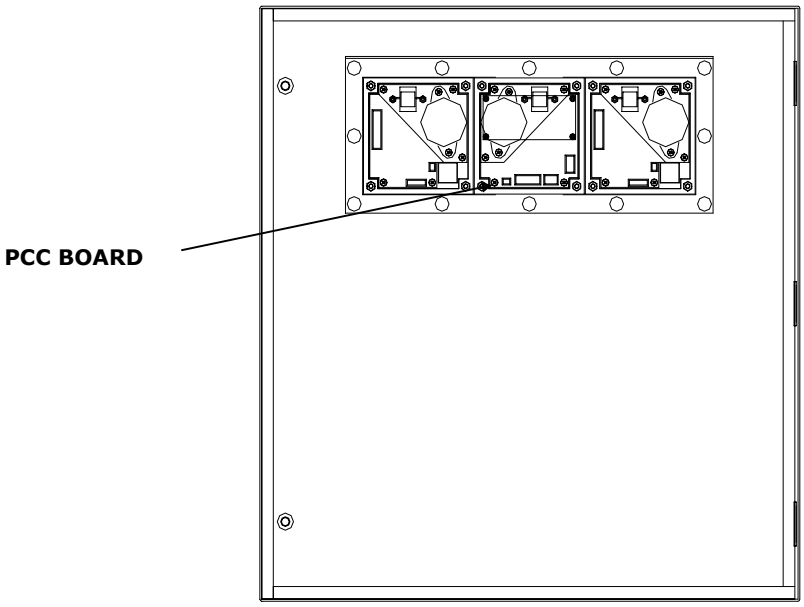
SCOIF board

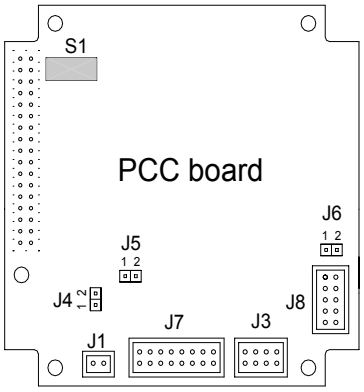
For location of the board, refer the figure on page 49.

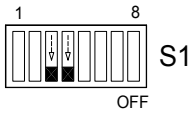
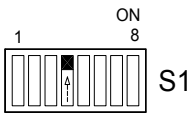


No external sensor	Active external sensor
	

PCC board

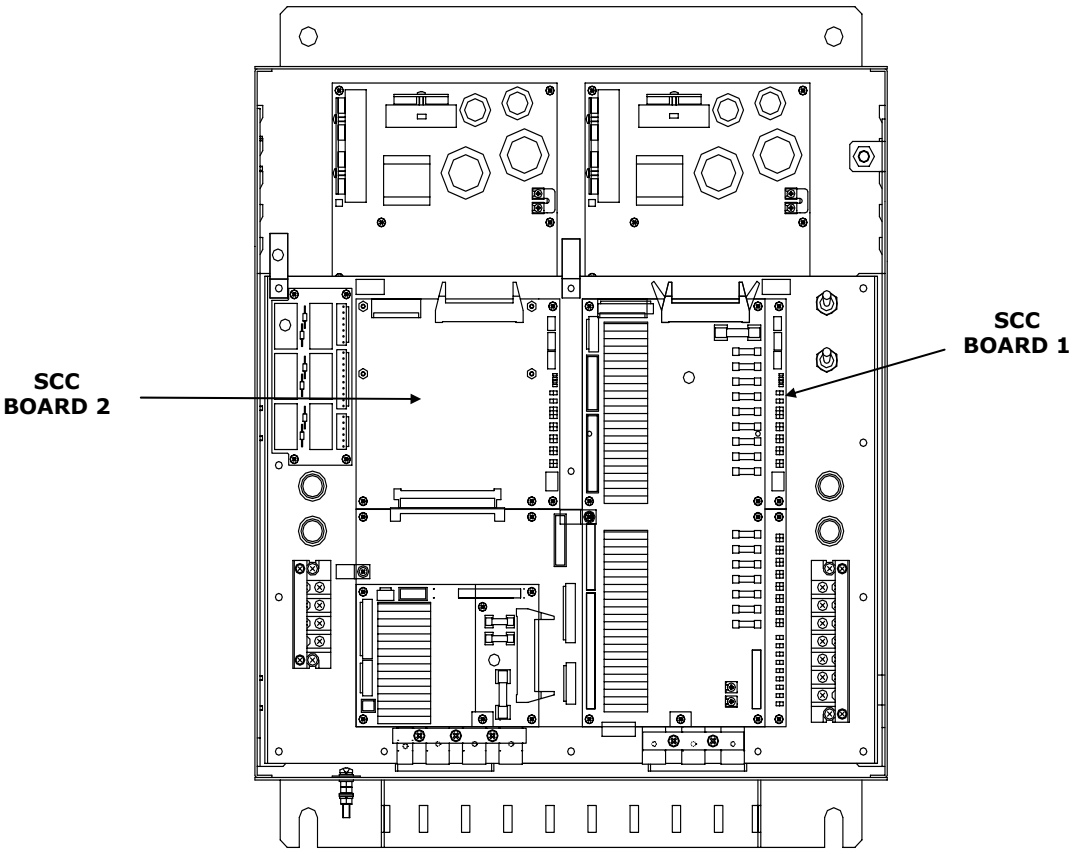


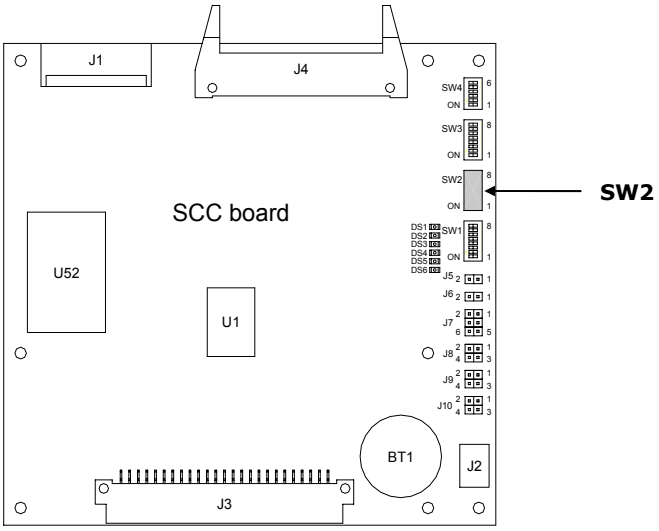


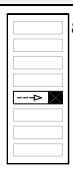
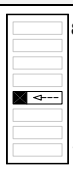
No external sensor	Active external sensor
	

Activating the pendulum function

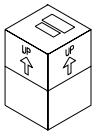
If an external switch is connected to GC80/85 to operate the pendulum function, dip switch no.4 on S2 on the SSC boards has to be set to activate the pendulum function.





Pendulum function disabled	Pendulum switch enabled
	

5.6 Installing the Sensitive elements

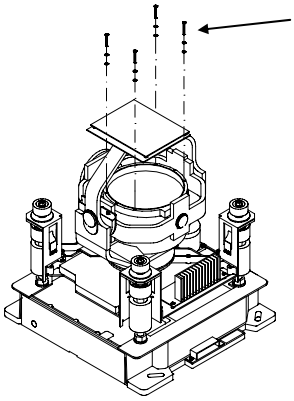


The Sensitive elements are shipped from the factory packed separately, and the elements have to be installed in the Master compasses according to the description below.

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

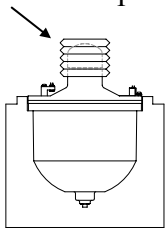
Caution! ***Use extreme caution when handling the Sensitive element! Do not tilt the element. It is filled with oil and the top is open.***

1 Make sure that the master compasses are installed and cables connect according to the description on page 45 onwards.

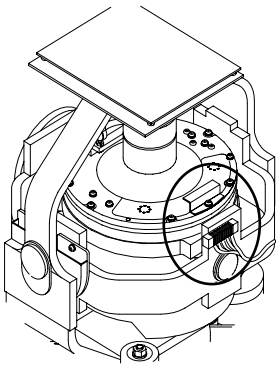


2 Remove the four screws on the Horizontal ring.

3 Lift the sensitive element carefully from its package, and remove the rubber tube on top of the element.



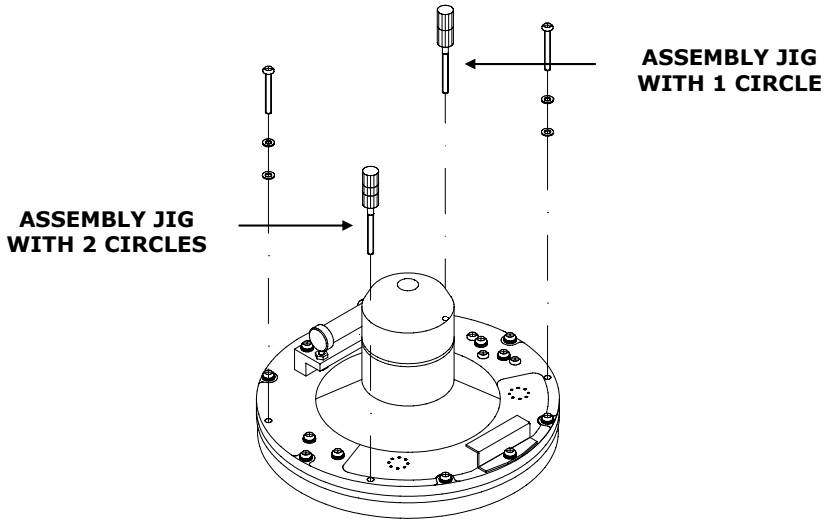
Note! *The package and the rubber tube should be kept for re-use if the Sensitive element has to be sent to factory for service!*

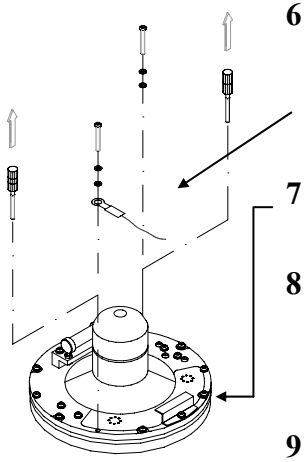


4 Tilt the Horizontal ring to the side where the plug is located, and carefully put the sensitive element into the ring.

- 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 on the figure below. Observe the labelling and the diameter on the jigs. Fasten two screws in the other two holes.



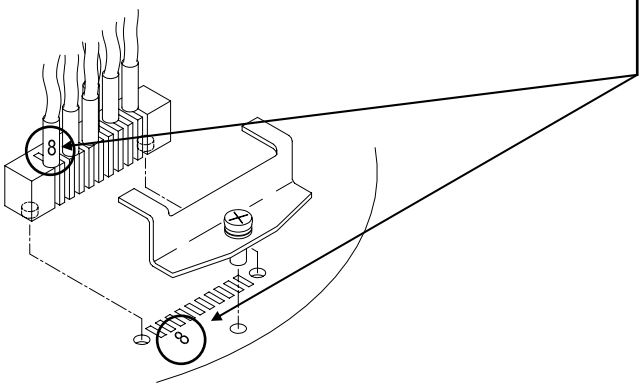


6 Replace the assembly jigs with the two remaining screws. Locate the ground wire on one of the screws as shown on the figure.

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 not are twisted.

9 Firmly tighten the screw on the holder.

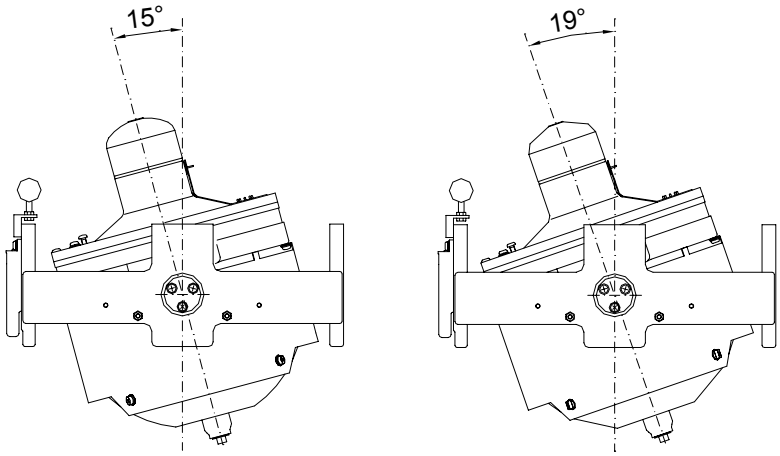


Verifying the element's tilt angle

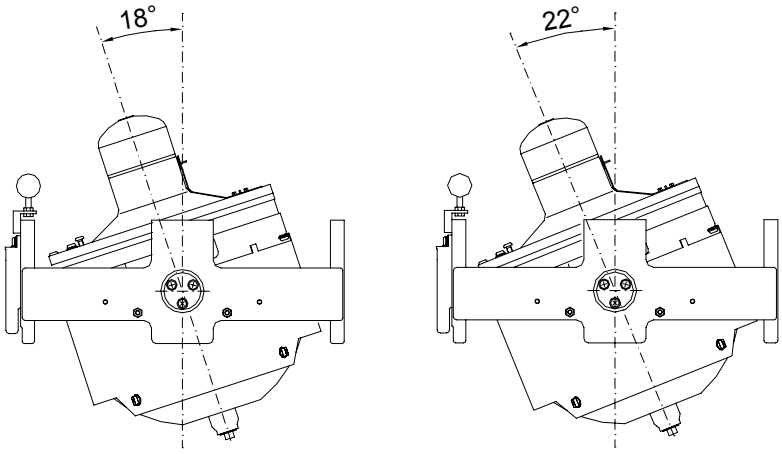
1 Tilt the Sensitive element by hand towards the level tool on the Horizontal ring and keep it tilted for approximately 1 minute. Remove the pressure and observe that the tilt angle remains at:

- GC80: 15° to 19°
- GC85: 18° to 22°

The tilt angle is indicated on the figures below.

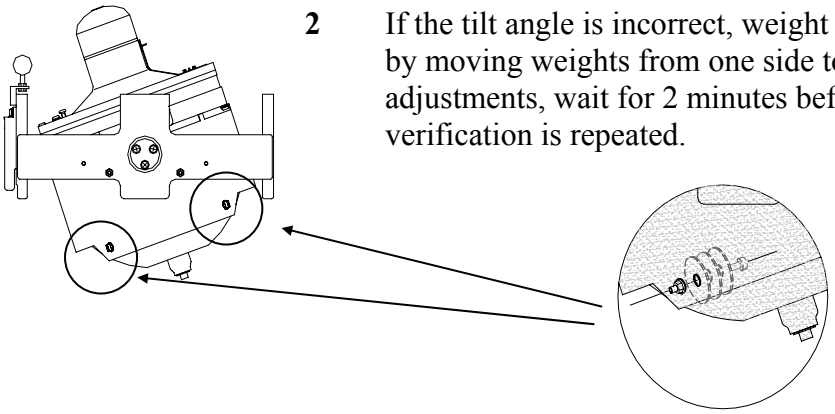


Max and min tilt angle for GC80 std system



Max and min tilt angle for GC85 High Speed system

Note! *The tilt angle shown above is correct for cold condition. The angle may change when the element has reached normal operational temperature!*

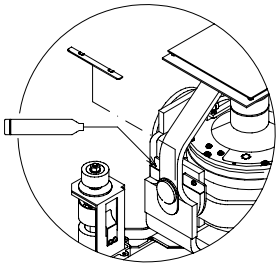


2 If the tilt angle is incorrect, weight disks must be adjusted by moving weights from one side to the other. After adjustments, wait for 2 minutes before the tilt angle verification is repeated.

Caution!

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

3 Carefully rotate the Horizontal ring at least one complete rotation. Verify that all movable parts will rotate 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 taken 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 wiped up.

5.7 System start-up and software configuration

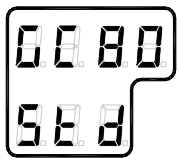
When all GC80/85 units are installed and the cables connected according to the procedures described in previous chapters, the system is ready for the first time start-up procedure.

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

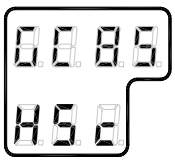
Turn ON the gyro system by pressing the **POWER** button on the Control panel. The following start-up sequence will be run:

1 Control unit type (GC80 Std, or GC80 HSc), SW version for Control unit and for Master compass is displayed in rapid succession. Examples of display text are shown below:

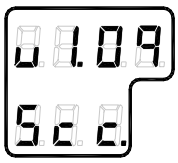


GC80 CONTROL UNIT STD VERSION

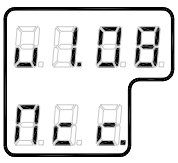
OR



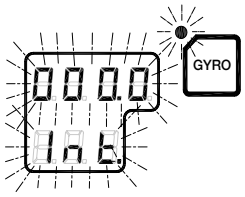
GC80 CONTROL UNIT HIGH SPEED VERSION



SW VERSION CONTROL UNIT



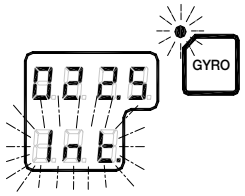
SW. VERSION MASTER COMPASS



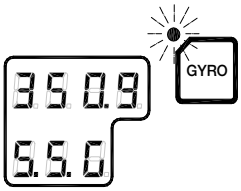
2 The sensitive element starts rising horizontally, and the compass rotates 360° clockwise. The display shows decreasing bearing as the compass is rotating.

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

4 Active rotor break is indicated with flashing display.



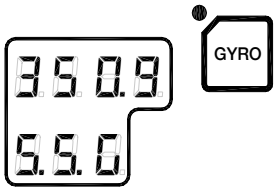
5 When the rotation is stopped, start bearing is indicated with flashing text in the display. The start bearing will be the same as active bearing when the compass was turned OFF.



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 remains flashing.

The rotor starts rotating, and reaches pre-described number of revolutions after maximum 30 minutes.



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

The lamp beside the **GYRO** button change from flashing to steady light.

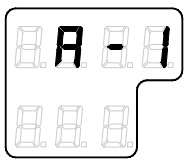
The GC80/GC85 will be settled within 3 hours when started with a deviation angle less than 5°. With a larger deviation angle, the compass will be settled within 4 hours.

Configuring the sensitive element

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 package, and they have to be entered into the Control panel as part of the gyro compass' installation procedure.

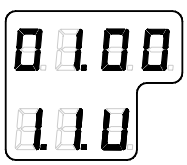
Parameters used for time settings should also be entered. These parameters are essential when monitoring the occurrence of alarms.

The parameters are loaded into the Control panel from the Extension menu as described below.



1 Enter the Extension menu by pressing and holding the **SET** button and the **ACK/ENT** buttons simultaneously for at least 3 seconds.

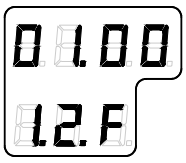
Main category **A-1** will be displayed.



2 Press the **SET** button to enter the sub-category loop. Sub-category **1.1.U** and its parameter values will be displayed.

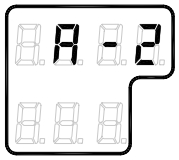
3 Use the arrow buttons to increase or decrease the parameter value until the value is according to the labelling for the sensitive element.

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.**

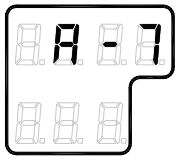


7 Press the **SET** button again to return to main category **A1**, and then press the **DISP** button to go to **A2** main category.

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 be in CET (Central European Time) or 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.

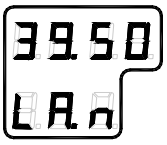
11 Press the **SET** button, and enter the value for **7.3.u** as described above.

12 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 at least 3 seconds.

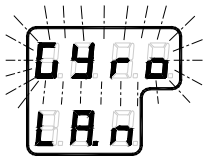
For more information about the Extension menu, see ***ADVANCED SETTINGS***, page 67 onwards.

Setting the Latitude input system

The latitude input system may be changed during the settling process of the start-up procedure from item 7 onwards.

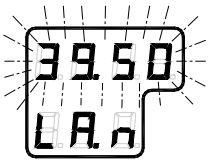


1 Press the **DISP** button until the display shows latitude value.



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

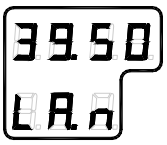
3 Use the arrow buttons for selecting **Gyro** or **GPS** as the latitude input system, and confirm the entry with the **ACK/ENT** button.



4 The display will change to flashing number.

5 Press the arrow buttons for increasing/decreasing the latitude value, and confirm the entry with the **ACK/ENT** button.

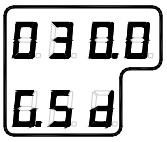
- This entered latitude value will now be used, together with speed and bearing information, for calculating the vessel's current latitude.



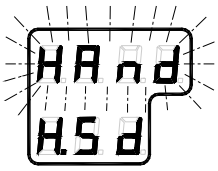
6 The display will return to show latitude value without flashing.

Setting the Speed input system

The latitude input system may be changed during the settling process of the start-up procedure from item 7 onwards.



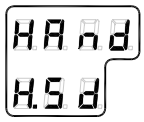
1 Press the **DISP** button until the display shows speed value and speed input system.



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

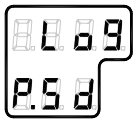
3 Use the arrow buttons for toggling between available speed input systems:

Manual



GPS

LOG (pulse)

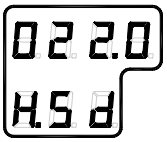


LOG (serial)

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

5 If Manual input system is selected, the display will change to show flashing numerical values.

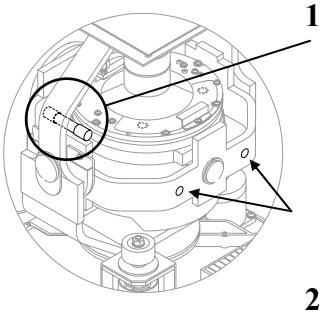
6 Use the arrow buttons for entering the speed value, and confirm the input by the **ACK/ENT** button.



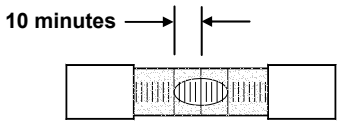
7 The display will return to shown speed value and speed input system without flashing.

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 +/-10 minutes from the center. Each division equals 2 minutes.



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

Note! *It is important that the total number of weights on the horizontal ring are as few as possible.*

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

Caution! ***If the horizontal ring is tilted more than +/-10', a bearing error will be generated.***

Adjusting True heading

After the GC50 is settled, the gyrocompass 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
- two 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 not can be corrected by adjusting the mechanical location of the master compass, an offset value may be inserted in the GC80. This value is entered by using the Extension menu as follows:

1. Activate the Extension menu by pressing and holding the **SET** button and the **ACK/ENT** buttons 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***, page 68 onwards.

5.8 Configuring the dual function

When each gyro compass is started and configured according to the description in the previous pages, the dual function should be configured.

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 for activating 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 by heading for gyro compass no.1 and no.2.

The example to right below shows a display where the gyros not are settled (runtime less than 3 hours, indicated with an S). In the example to left, both gyros have run more that 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 is in according 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 alarm 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 24.

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6 ADVANCED SETTINGS

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

6.1 General

The Extension menu holds internal parameters and communication parameters required to achieve the best possible heading accuracy on the GC80/GC85 Gyro compass.

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

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

6.2 Using the Extension menu

Caution! ***The Extension menu should not be entered by unauthorized personnel. Incorrect parameters may result in irregular operation of the GC80/GC85 gyro compass!***

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

1 Activate the menu by pressing and holding the **SET** button and the **ACK/ENT** buttons simultaneously for at least 3 seconds.

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

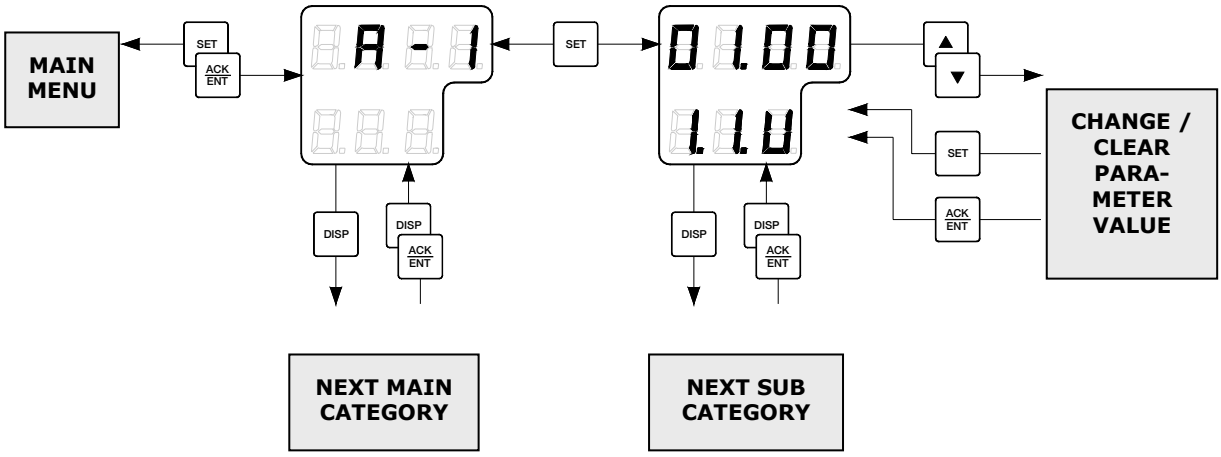
2 Page through the main categories to the selected category by pressing the **DISP** button. Pressing the **DISP** and **ACK/ENT** buttons simultaneously will display the main category loop in reversed order.

3 Press the **SET** button to enter the sub-category loop, and use the **DISP** button to select sub-category that holds the parameter to be changed.

4 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.



6.3 The Extension menu overview

Main Category	Sub Category	Parameter/description	Default value	Range
A-1	1.1.U	Damping gain Determines the damping (damping operation in north-seeking motion = half cycle attenuation) and actually represents a coefficient (ratio) to the standard value stored in the software.	1.00	0.00 – 2.00
	1.2.F	Bearing servo gain Determines the gain of the bearing servo loop where phi Φ signal (deviation signal around rotor's vertical axis) is calculated, drives the azimuth step motor and has the sensitive element follow to the gyro-sphere vertical axis (around azimuth axis) rotation. Presents a coefficient (ratio) to the standard value stored in software.	1.00	0.00 – 2.00
	1.3.S	Horizontal servo gain Determines the gain of the horizontal servo loop where theta θ signal (rotor tilting angle signal) is calculated, drives the horizontal DST and has the sensitive element follow to the gyro sphere tilting angle (rotor tilting angle). Present a coefficient (ration) to the standard value stored in software.	1.00	0.00 – 2.00
	1.4.u	Leveling servo gain Leveling motion (sensitive element erection motion) calculates X signal (equivalent inclination angle) which is output from the sensitive element and relative inclination angle signal from HRZC board, controls to have the sensitive element keep horizontal. The value determines this control loop gain. Presents a coefficient (ratio) to the standard value stored in the software.	1.00	0.00 – 2.00
A-1 cont.	1.5.L	(φ) Phi offset (°) Offset value (°) around the vertical axis of gyro sphere (rotor axis) and the sensitive element.	0.00	-3.00 – 3.00

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

Main Category	Sub Category	Parameter/description	Default value	Range
A-2	2.1.o	Bearing offset A (°) Offset value included in the "master bearing" and used for correction of fixed error (°). If the master compass not can be mounted parallel to the vessel's fore-after line, this parameter is used to compensate for a small mounting error.	0.0	0.0 – 359.9
	2.2.O	Bearing offset B (°)[1] Value for general bearing error correction to enter to master compass bearing. It is used to correct the bearing if the bearing for some reason deviates from correct heading. This value is cleared when it passes the zero-cross pin or when power is switched OFF.	0.0	0.0 – 359.9
	2.3.h	Zero-cross bearing (°) Absolute bearing set for MCU board when zero-cross pin was passed during start-up sequence (last azimuth operation) and normal running operation. Zero-cross bearing can be set in this menu, but is normally set up be measuring position (angle) of the zero-cross pin in the master compass by the test mode A.	345.3	0.0 – 359.9
	2.4.E	Zero-cross error allowance (°) Zero-cross alarm limit. The compass will generate a zero cross alarm when the difference between the zero-cross bearing and the relative bearing exceeds this zero cross value. This value should be set every time the zero-cross pin is detected.	2.0	0.0 – 5.0
	2.5.y	Year Used for setting current year.	-	2000 - 2099
	2.6.N	Month and Day Used for setting current month and date.	-	-
	2.7.t	Hour and Minute Used for setting current hour and minute.	-	-
	2.8.d	Total days of operation This value should be reset after the installation is completed.	-	-

[1] 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 cont.	2.9.G	Display/setting of GPS connection The following abbreviations are used: bE: GPS connected Non: No GPS connected *NOTE: When this value is set to "Non", GPS can not be selected as the vessel's input for speed and latitude.*	-	bE or Non
	2.A.L	Display/setting of LOG connection The following abbreviations are used: bE: with Log (contact) Non: No Log (contact) *NOTE: When this value is set to "Non", LOG can not be selected as the vessel's speed input.*	-	bE or Non
	2.b.S	Display/setting of LOG (serial) connection The following abbreviations are used: bE: with Log (serial) Non: No Log (serial) *NOTE: When this value is set to "Non", SLOG can not be selected as the vessel's speed input.*	-	bE or Non
	2.c.t	Display/setting of GPS performance index data check The following abbreviations are used: bE: Check performance index Non: Not check performance index	-	bE or Non
	2.d.o	Analogue signal output offset for ROT (°) Offset value for analogue signal output of Rate Of Turn. Entered value is +/-5% of maximum output ROT.	0.00	0.0 – 16[2]
	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
A-3	3.1.E	Alarm (error)	-	-
	3.2.n	Occurred number of zero-cross error	-	-
	3.3.H	Maximum zero-cross error	-	-
	3.4.y	Occurred year of zero-cross error	-	-
	3.5.N	Occurred month/day of zero-cross error	-	-
	3.6.t	Occurred hour/minute of zero-cross error	-	-
	3.7.n	Occurred number of encoder error	-	-
	3.8.r	Occurred number of reset with WATCH DOC TIMER	-	-

[2] 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
A-4	4.1.C	GPS serial data character length	8	8 or 7
	4.2.P	GPS serial data parity bit	Non	Non, Even, Odd
	4.3.S	GPS serial data stop bits	1	1 or 2
A-5	5.1.C	LOG serial data character length	8	8 or 7
	5.2.P	LOG serial data parity bit	Non	Non, Even, Odd
	5.3.S	LOG serial data stop bits	1	1 or 2
A-6	6.1.C	External sensor (standard) serial data character length	8	8 or 7
	6.2.P	External sensor (standard) serial data parity bit	Non	Non, Even, Odd
	6.3.S	External sensor (standard) serial data stop bits	1	1 or 2
A-7	7.1.t	Master compass type	Std	Std or Hsc
	7.2.u	SCC software version number	-	-
	7.3.u	MCC software version number	-	-
A-8	8.1.t	For confirmation of extension menu	-	-
	8.2.S	Filter of speed error correction	On	On or Off

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7 TECHNICAL SPECIFICATION

This section lists all specifications for GC80/85 gyro compass.

7.1 Accuracy

Settling time: ..... within 3 hours
(if startup heading is within +/-5° of actual heading)

Settle point error: ..... less than ±0.1º

RMS value of the difference: ..... less than 0.1º

Repeatability of settle point error: ..... less than ±0.1°

Roll and pitch error: ..... less than ±0.4°

Static error: ..... less than ±0.1°

Settle point error under general conditions: ..... less than ±0.4°

Note! *Accuracy at equator. For other latitudes, accuracy to be multiplied by *(1/COS f), where f = Latitude.*

7.2 General specification

Follow-up speed ..... > 75°/sec

Gimbal freedom ..... for both roll and pitch: ±45°

Range of speed correction:

GC80 ..... 0-50 knots / latitude (0° - +70°)
GC85 ..... 0-70 knots / latitude (0° - +70°)

Main power supply: ..... 100/110/115/200V AC, 50/60Hz

Power supply for alarm and back-up: ..... 24V DC, 70W

Voltage fluctuation: ..... AC ±10%
DC -20% - +30%

Frequency variation: ..... ±5%

Power consumption:

Start: ..... within 140VA
Ordinary: ..... within 70VA
Repeater: ..... within 17VA

Repeater type: ..... 24V DC – 6 step/°

Number of step repeater connections: 4

Number of NMEA connections: 10

Repeater back-up circuits: ..... 4+10

Pendulum function ..... refer page 23

7.3 Input specification

Serial input signal (GPS)

Circuits: 1
Electrical: ..... RS422/MNEA0183/Current loop
Baud rate: ..... 4800 bps
Data bits: ..... 8 bits
Parity: ..... None
Stop bits: 1
Transmit freq.: ..... 1 – 5Hz
Input format:

```
$--GGA,x,xxxx.xx,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>
```

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 - 50Hz/20 – 50Hz
Input format:

```
$--HDT,xxx.x*hh<CR><LF>
$--HDG,xxx.x*hh<CR><LF>
```

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 - 50Hz
Input format:

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

PULSE signal (LOG)

Circuits: 1
Electrical: ..... 200/400 p.p.n.m., dry contact

7.4 Output specification

When Gyro is selected

Serial output signal 1

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 ..... 10Hz
GC85: 50Hz
Output format:
Data no.1

```
$ HEHDT,xxx.x,T*hh<CR><LF>
```

Data no.2

```
$ HEROT,-xxx.xx,A*hh<CR><LF>
```

Data no.3

```
$ PCICM,HEALM,xxxx,x,xx*hh<CR><LF>
```

When External heading sensor is selected

Serial output signal 2 *1

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 ..... 10Hz
GC85: 50Hz
Output format:
Data no.1

```
$ HEHDT,xxx.x,T*hh<CR><LF>
```

Data no.2

```
$ PTICM,--xxxx,x,xx,*hh<CR><LF>
```

STEP signal

Circuits: 4
Electrical: ..... 24V DC – 6 step/°

RATE OF TURN signal

Circuits 1
Electrical: ..... +/-10V (+/-120°) (default),
+/-10V (+/-30°),
+/-10V (+/-300°),
+/-5V (+/-120°),
+/-5V (+/-300°),
+/-5V (+/-30°)

Note! *Refer Rate of Turn scale dip switch settings, page 106, and to the separate manual delivered for Rate of Turn Instrument.*

Alarm output

Potential free ..... NO/NC

Running contact

Potential free ..... NO/NC

Refer Jumper settings on SCC board, page 107.

7.5 Physical Dimensions

GC80/GC85 Master Compass

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

GC80 Dual Control Unit

Height: ..... 561 mm (22.1”)
Width: ..... 467 mm (18.4”)
Depth: ..... 182 mm (7.2”)
Weight: 23kg (51lbs)

7.6 Power

GC80/GC85 Master Compass

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

GC80 Dual Control Unit

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

Backup voltage: ..... 24V DC

Power consumption per Master compass (incl. Master compass):

Starting..... 1.5A at 100V AC

Running:..... 1.2A at 100V AC

7.7 Environmental Specification

GC80/GC85 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 Dual 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)

8 DRAWINGS

This section contains outline drawings showing mechanical dimensions of the different GC80/GC85 units, together with wiring diagrams for the gyro system.

8.1 Drawings included

The following mechanical drawings are enclosed:

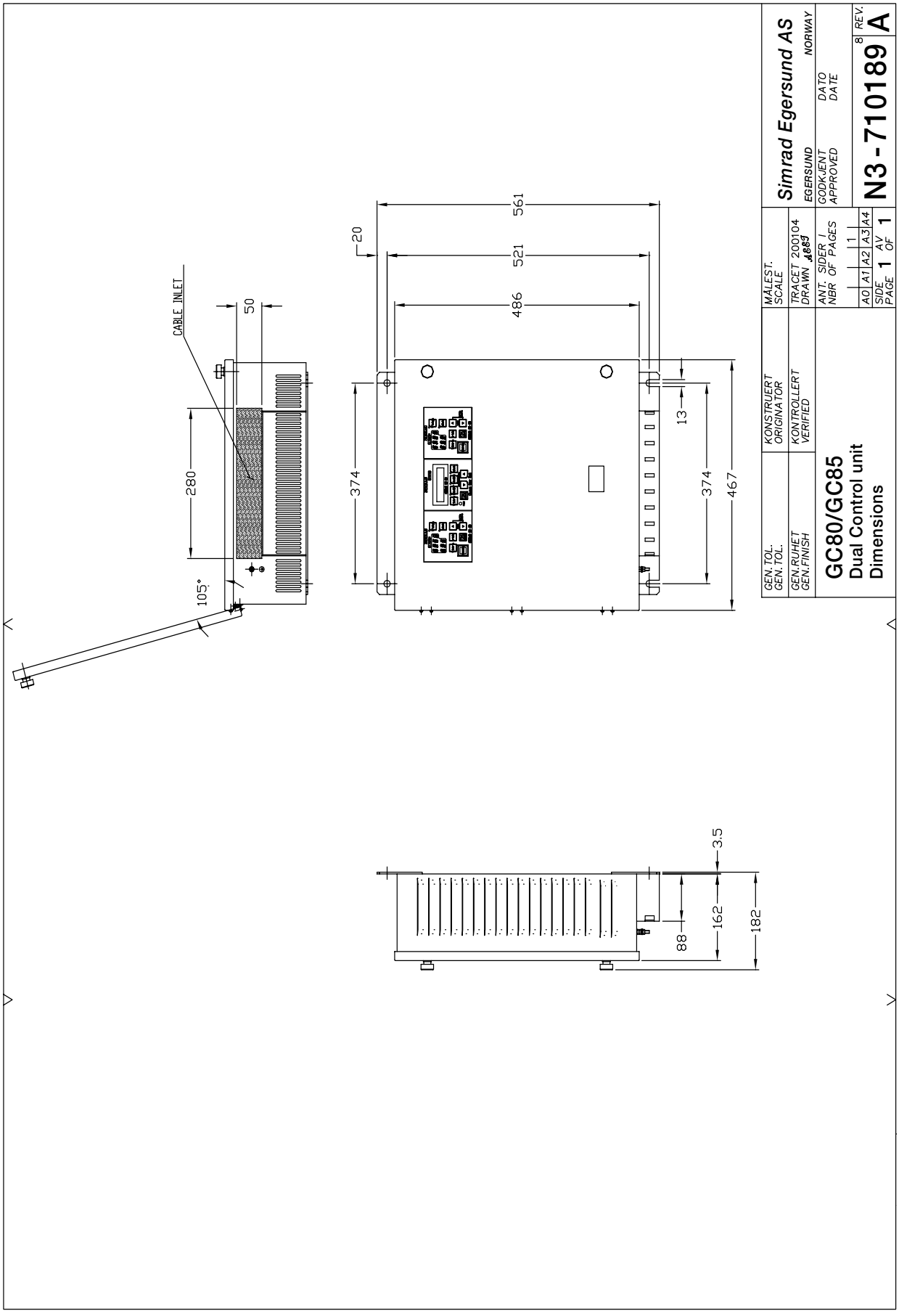
Name	Drw. no	Rev.
GC80 Dual Control unit, dimensions	N3-710189	A
GC80/85 Master Compass, dimensions	N3-710179	A
GC80/85 Remote panel, dimensions	D4-710208	B

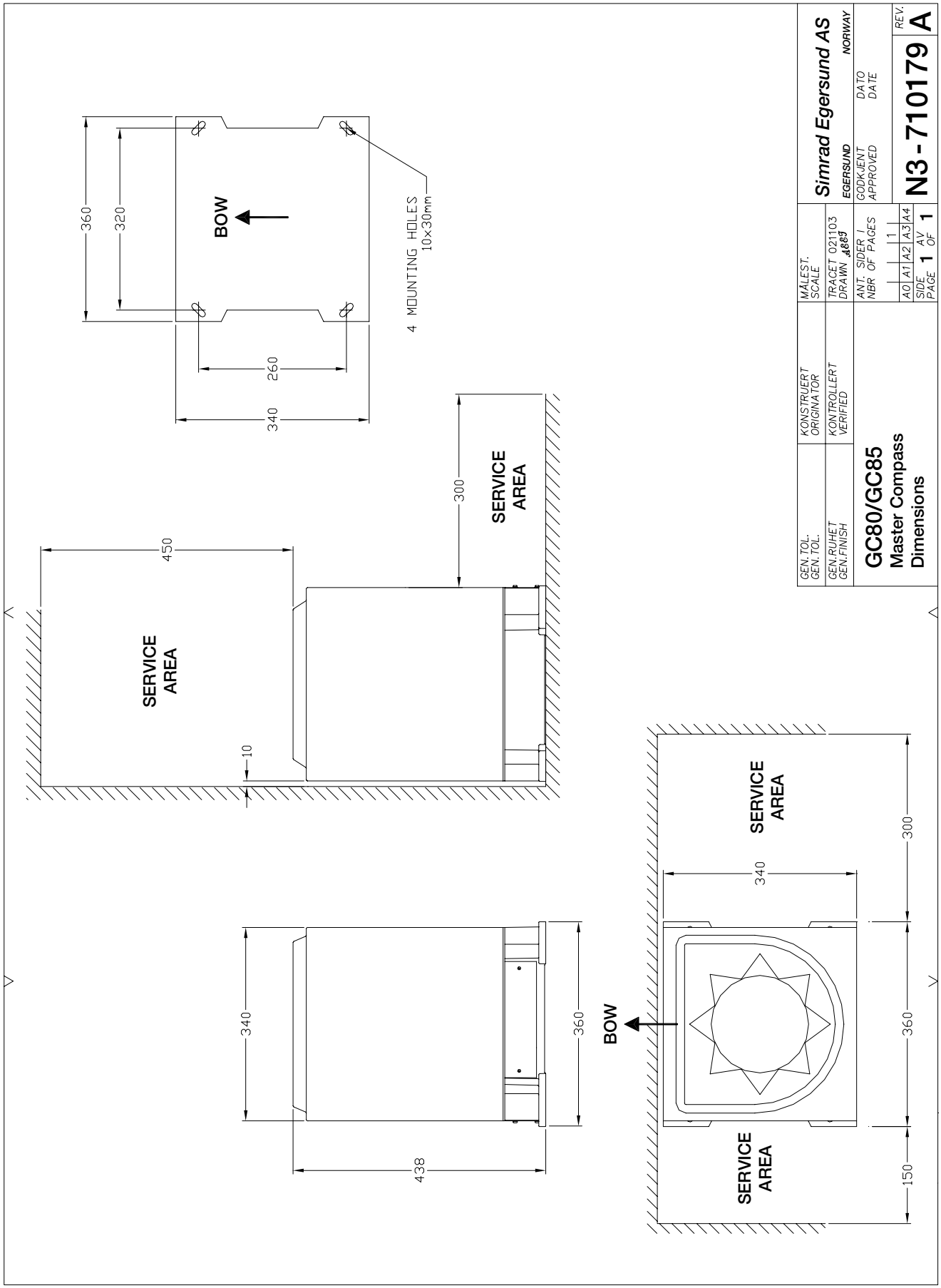
To scale drawings are available upon request.

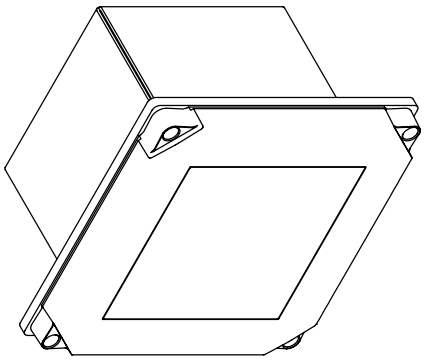
The following wiring diagrams are enclosed:

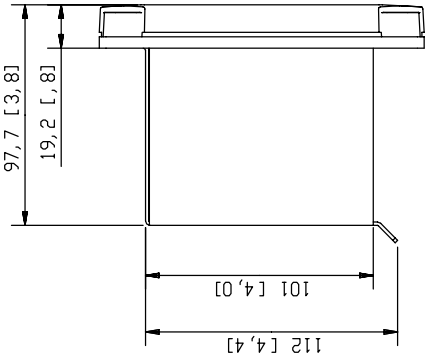
Name	Drw. no	Rev.
GC80/85 Gyro Compass, Dual system. Wiring diagram (page 1 and 2)	N3-710188	B

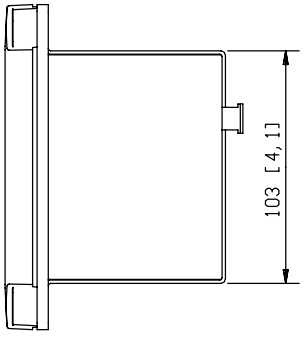
Note! *The original signed drawings are recorded at Simrad Egersund.*

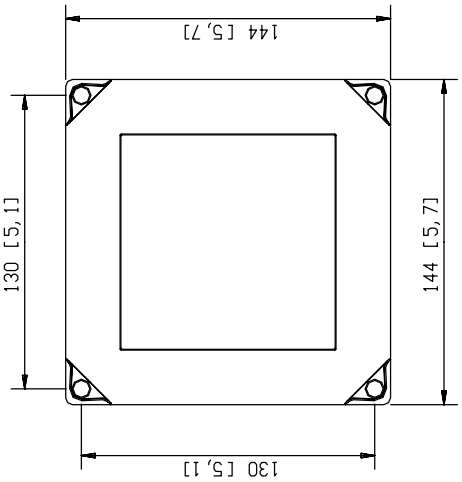

CABLE INLET
50
280
105°
20
561
521
486
374
13
374
467
3.5
88
162
182
Simrad Egersund AS
EGERSUND
NORWAY
GC80/GC85
Dual Control unit
Dimensions
N3 - 710189
A


BOW
4 MOUNTING HOLES 10x30mm
360
320
260
340
SERVICE AREA
300
450
10
SERVICE AREA
340
360
438
BOW
SERVICE AREA
340
300
360
150
SERVICE AREA
Simrad Egersund AS
EGERSUND NORWAY
GC80/GC85
Master Compass
Dimensions
N3 - 710179 A
REV.
DRAWN J&BG
TRACET 021103
ANT. SIDER I NBR OF PAGES 1
SIDE PAGE 1 AV 1
A0 A1 A2 A3 A4

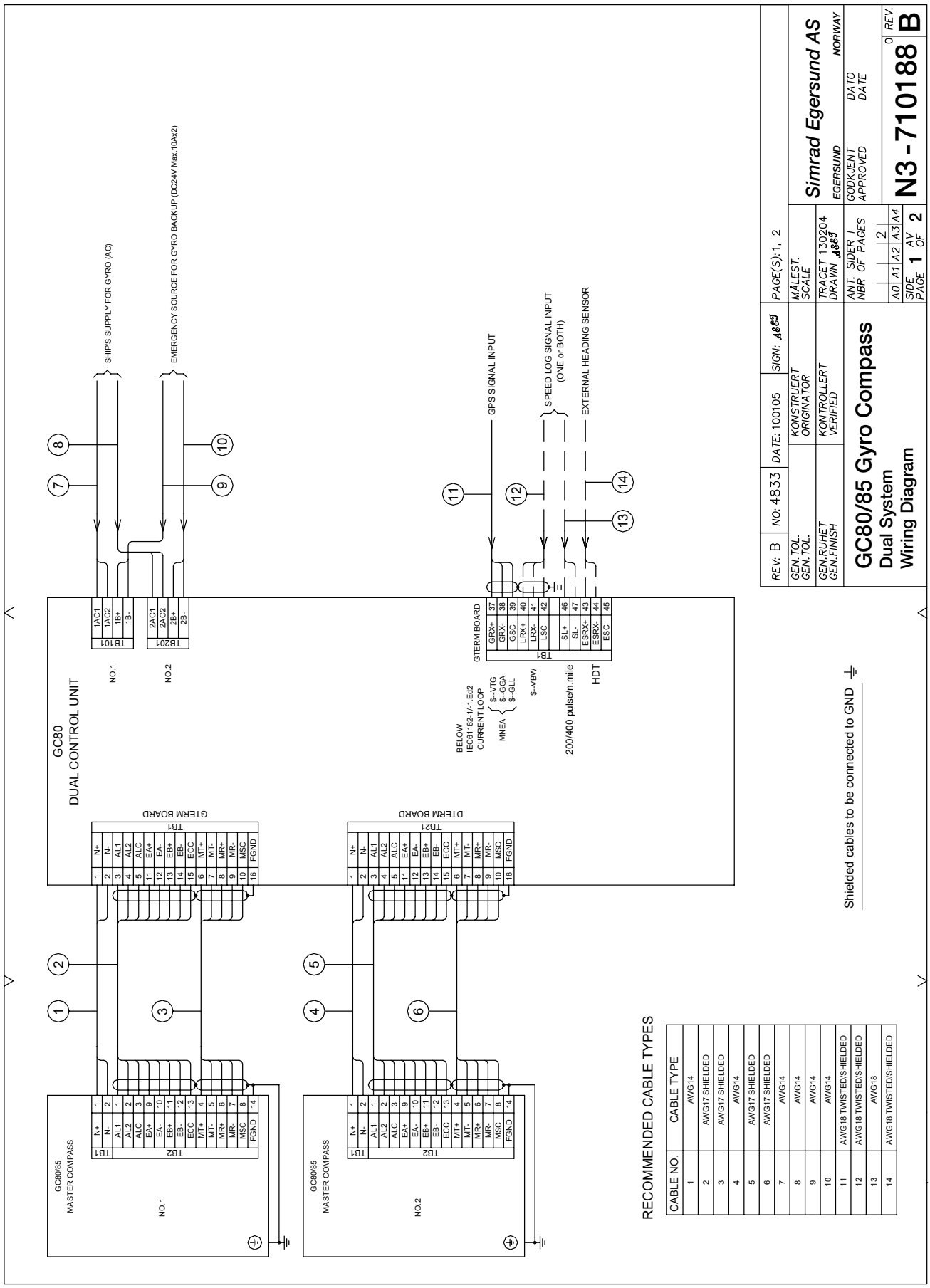


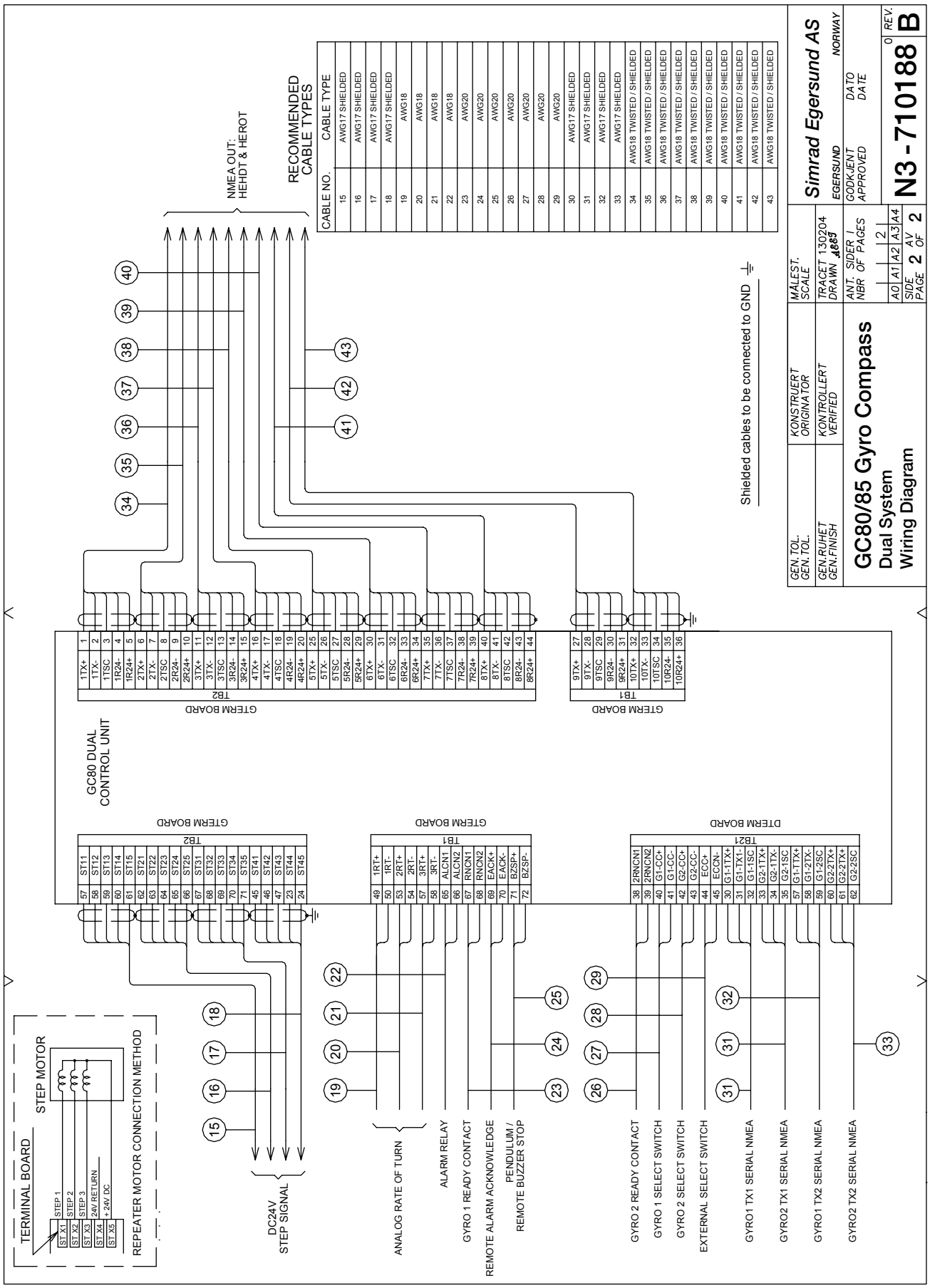






B	4965	28/09-05	Nils	Page 1			
First Angle Projection	Gen. Tol. ±0,x	Design 05/05-04 Nils	Scale 1:2	SIMRAD			
	Gen. Finish xx Ra µm	Drawn 05/05-04 Nils	Verified	SIMRAD EGERSUND AS, NORWAY			
	GC80 Remote Panel kit		Number of Pages 0 0 0 0	Approved	Date	Format A1 A2 A3 A4	Drawing number D3-710208 6	Rev. B
	Dimensions		Page 1 of 1	For more details, see 3D model				


GC80/85 Gyro Compass
Dual System
Wiring Diagram
Simrad Egersund AS
EGERSUND NORWAY
N3 - 710188 B
REV: B
NO: 4833
DATE: 100105
SIGN: 4683
PAGE(S): 1, 2
GC80
DUAL CONTROL UNIT
SHIPS SUPPLY FOR GYRO (AC)
EMERGENCY SOURCE FOR GYRO BACKUP (DC24V Max.10Ax2)
GPS SIGNAL INPUT
SPEED LOG SIGNAL INPUT
(ONE or BOTH)
EXTERNAL HEADING SENSOR
GTERM BOARD
DTERM BOARD
BELOW
IEC61162-1/-1:Ed2
CURRENT LOOP
MNEA
$--VTG
$--GGA
$--GLL
$--VBW
200/400 pulse/n.mile
HDT
NO.1
NO.2
GC80/85
MASTER COMPASS
Shielded cables to be connected to GND
RECOMMENDED CABLE TYPES
CABLE NO. CABLE TYPE
1 AWG14
2 AWG17 SHIELDED
3 AWG17 SHIELDED
4 AWG14
5 AWG17 SHIELDED
6 AWG17 SHIELDED
7 AWG14
8 AWG14
9 AWG14
10 AWG14
11 AWG18 TWISTED/SHIELDED
12 AWG18 TWISTED/SHIELDED
13 AWG18
14 AWG18 TWISTED/SHIELDED


GC80/85 Gyro Compass
Dual System
Wiring Diagram
N3 - 710188 B
Simrad Egersund AS
EGERSUND NORWAY
GC80 DUAL CONTROL UNIT
GTERM BOARD
DTERM BOARD
TERMINAL BOARD
STEP MOTOR
REPEATER MOTOR CONNECTION METHOD
RECOMMENDED CABLE TYPES
NMEA OUT: HEHDT & HEROT
Shielded cables to be connected to GND
DC24V STEP SIGNAL
ANALOG RATE OF TURN
ALARM RELAY
GYRO 1 READY CONTACT
REMOTE ALARM ACKNOWLEDGE
PENDULUM / REMOTE BUZZER STOP
GYRO 2 READY CONTACT
GYRO 1 SELECT SWITCH
GYRO 2 SELECT SWITCH
EXTERNAL SELECT SWITCH
GYRO1 TX1 SERIAL NMEA
GYRO2 TX1 SERIAL NMEA
GYRO1 TX2 SERIAL NMEA
GYRO2 TX2 SERIAL NMEA

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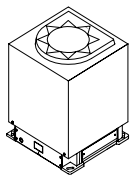
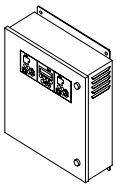
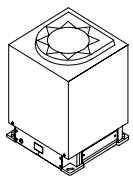
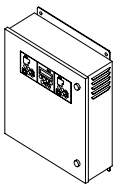
9 SPARE PART LIST

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

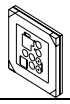
9.1 GC80 Dual Gyro system

PART NO		DESCRIPTION
27101674		GC80 Master compass
44174027		GC80 Sensitive element
27101708		GC80 Dual Control unit
20221537		GC80/GC85 Dual gyro compass Instruction manual
44174449		Special tool required when installing the Sensitive element

9.2 GC85 Dual Gyro system

PART NO		DESCRIPTION
27101682		GC85 Master compass
44170728		GC85 Sensitive element
27101708		GC80 Dual Control unit
20221537		GC80/GC85 Dual gyro compass Instruction manual
44174449		Special tool required when installing the Sensitive element

9.3 Optional equipment, GC80/85 Dual system

PART NO		DESCRIPTION
27101757		GC80 Flush mounting kit in Simrad design for remote installation of operating panel
44170736		GC80 Extension cable 5 meter for remote installation of operating panel normally mounted in Control unit
44170744		GC80 Extension cable 10 meter for remote installation of operating panel normally mounted in Control unit
44170751		GC80 Extension cable 15 meter for remote installation of operating panel normally mounted in Control unit

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10 TERMINAL LAYOUT

This section includes tables which list all terminal pins and terminal labelling on GTERM and DTERM boards in the GC80 Dual Control unit. The tables include detailed description for each terminal.

10.1 GTERM board

TB1

PIN NO	NAME	DETAILS
1	N+	Master compass power supply (24V DC)
2	N-	Master compass power supply (24V DC common)
3	AL1	Master compass inverter alarm (over current)
4	AL2	Master compass inverter alarm (over voltage)
5	ALC	Master compass inverter alarm (common)
6	MT+	Control unit – master compass serial signal
7	MT-	
8	MR+	Master compass – control unit serial signal
9	MR-	
10	MSC	Serial signal common
11	EA+	Master compass encoder signal (A phase +)
12	EA-	Master compass encoder signal (A phase -)
13	EB+	Master compass encoder signal (B phase +)
14	EB-	Master compass encoder signal (B phase -)
15	ECC	Master compass encoder signal (common)
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	
25	24M+	Ext. power supply input (no connection)
26	24M-	
27	9TX+	Serial signal output (IEC61162-1 ed.2/-2)
28	9TX-	
29	9TSC	Serial signal common
30	9R24-	Serial repeater power supply, -24V DC
31	9R24+	Serial repeater power supply, +24V DC
32	10TX+	Serial signal output (IEC61162-1 ed.2/-2)
33	10TX-	

PIN NO	NAME	DETAILS
34	10TSC	Serial signal common
35	10R24-	Serial repeater power supply, -24V DC
36	10R24+	Serial repeater power supply, +24V DC
37	GRX+	GPS serial signal input
38	GRX-	
39	GSC	GPS serial signal common
40	LRX+	LOG serial signal input
41	LRX-	
42	LSC	LOG serial signal common
43	ESRX+	External sensor serial signal input
44	ESRX-	
45	ESC	External sensor serial signal common
46	SL+	LOG contact signal input
47	SL-	
48	SW+	External power supply switch (Not used)
49	1RT+	Rate of turn analog signal output
50	1RT-	Rate of turn signal common
51	1SO+	Rate of turn scale over signal output
52	1SO-	Rate of turn signal common
53	2RT+	Rate of turn analog signal output
54	2RT-	Rate of turn signal common
55	2SO+	Rate of turn scale over signal output
56	2SO-	Rate of turn signal common
57	3RT+	Rate of turn scale over signal output
58	3RT-	Rate of turn signal common
59	3SO+	Rate of turn scale over signal output
60	3SO-	Rate of turn signal common
61	GCC+	Not used
62	GCC-	
63	ECC+	
64	ECC-	
65	ALCN1	Alarm contact signal output
66	ALCN2	
67	RNCN1	Running contact signal output
68	RNCN2	

PIN NO	NAME	DETAILS
69	EACK+	External acknowledge signal input
70	EACK-	
71	BZSP+	Buzzer stop signal input/Pendulum
72	BZSP-	

TB2

PIN NO	NAME	DETAILS
1	1TX+	Serial signal output (IEC61162-1 ed.2/-2)
2	1TX-	
3	1TSC	Serial signal common
4	1R24-	Serial repeater power supply, -24V DC
5	1R24+	Serial repeater power supply, +24V DC
6	2TX+	Serial signal output (IEC61162-1 ed.2/-2)
7	2TX-	
8	2TSC	Serial signal common
9	2R24-	Serial repeater power supply, -24V DC
10	2R24+	Serial repeater power supply, +24V DC
11	3TX+	Serial signal output (IEC61162-1 ed.2/-2)
12	3TX-	
13	3TSC	Serial signal common
14	3R24-	Serial repeater power supply, -24V DC
15	3R24+	Serial repeater power supply, +24V DC
16	4TX+	Serial signal output (IEC61162-1 ed.2/-2)
17	4TX-	
18	4TSC	Serial signal common
19	4R24-	Serial repeater power supply, -24V DC
20	4R24+	Serial repeater power supply, +24V DC
21	DFCN1	Not used
22	DFCN2	
23	ST44	-24V DC for step signal output 4
24	ST45	+24V DC for step signal output 4
25	5TX+	Serial signal output (IEC61162-1 ed.2/-2)
26	5TX-	
27	5TSC	Serial signal common

PIN NO	NAME	DETAILS
28	5R24-	Serial repeater power supply, -24V DC
29	5R24+	Serial repeater power supply, +24V DC
30	6TX+	Serial signal output (IEC61162-1 ed.2/-2)
31	6TX-	
32	6TSC	Serial signal common
33	6R24-	Serial repeater power supply, -24V DC
34	6R24+	Serial repeater power supply, +24V DC
35	7TX+	Serial signal output (IEC61162-1 ed.2/-2)
36	7TX-	
37	7TSC	Serial signal common
38	7R24-	Serial repeater power supply, -24V DC
39	7R24+	Serial repeater power supply, +24V DC
40	8TX+	Serial signal output (IEC61162-1 ed.2/-2)
41	8TX-	
42	8TSC	Serial signal common
43	8R24-	Serial repeater power supply, -24V DC
44	8R24+	Serial repeater power supply, +24V DC
45	ST41	Step signal (open drain signal)
46	ST42	
47	ST43	
48	OCACN1	Not used
49	ST1/OPRX+	
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	-24V DC for step signal output 1
61	ST15	+24V DC for step signal output 1

PIN NO	NAME	DETAILS
62	ST21	Step signal (open drain signal)
63	ST22	
64	ST23	
65	ST24	-24V DC for step signal output 2
66	ST25	+24V DC for step signal output 2
67	ST31	Step signal (open drain signal)
68	ST32	
69	ST33	
70	ST34	-24V DC for step signal output 3
71	ST35	+24V DC for step signal output 3
72	OCACN2	Not used

10.2 DTERM board

TB21

PIN NO	NAME	DETAILS
1	N+	No 2 Master compass power supply (24V DC)
2	N-	No 2 Master compass power supply (24V DC common)
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 (common)
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 common
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 -)

PIN NO	NAME	DETAILS
15	ECC	No 2 Master compass encoder signal (common)
16	FGND	Earth
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 (IEC61162-1 ed.2/-2
31	G1-1TX-	
32	G1-1SC	Serial signal common
33	G2-1TX+	No 2 GYRO Serial signal output (IEC61162-1 ed.2/-2
34	G2-1TX-	
35	G2-1SC	Serial signal common
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 (no 1 GYRO select)
41	G1CC-	
42	G2CC+	Sensor select contact input (no 2 GYRO select)
43	G2CC-	
44	ECC+	Sensor select contact input (External sensor select)
45	ECCN-	
46	PRRX+	Not used
47	PRRX-	
48	PRSC	
49	DFCN1	Heading monitor contact output (Not used)
50	DFCN2	

PIN NO	NAME	DETAILS
51	OCACN1	Off course alarm contact output (Not used)
52	OCANC2	
53	MALCN1	Monitor alarm contact output (Not used)
54	MALCN2	
55	MRNCN1	Monitor running contact output (Not used)
56	MRNCN2	
57	G1-2TX+	No 1 GYRO Serial signal output (IEC61162-1 ed.2/-2
58	G1-2TX-	
59	G1-2SC	Serial signal common
60	G2-2TX+	No 2 GYRO Serial signal output (IEC61162-1 ed.2/-2
61	G2-2TX-	
62	G2-2SC	Serial signal common
63	24MN+	Not used
64	24MN-	

11 DIP SWITCH SETTINGS

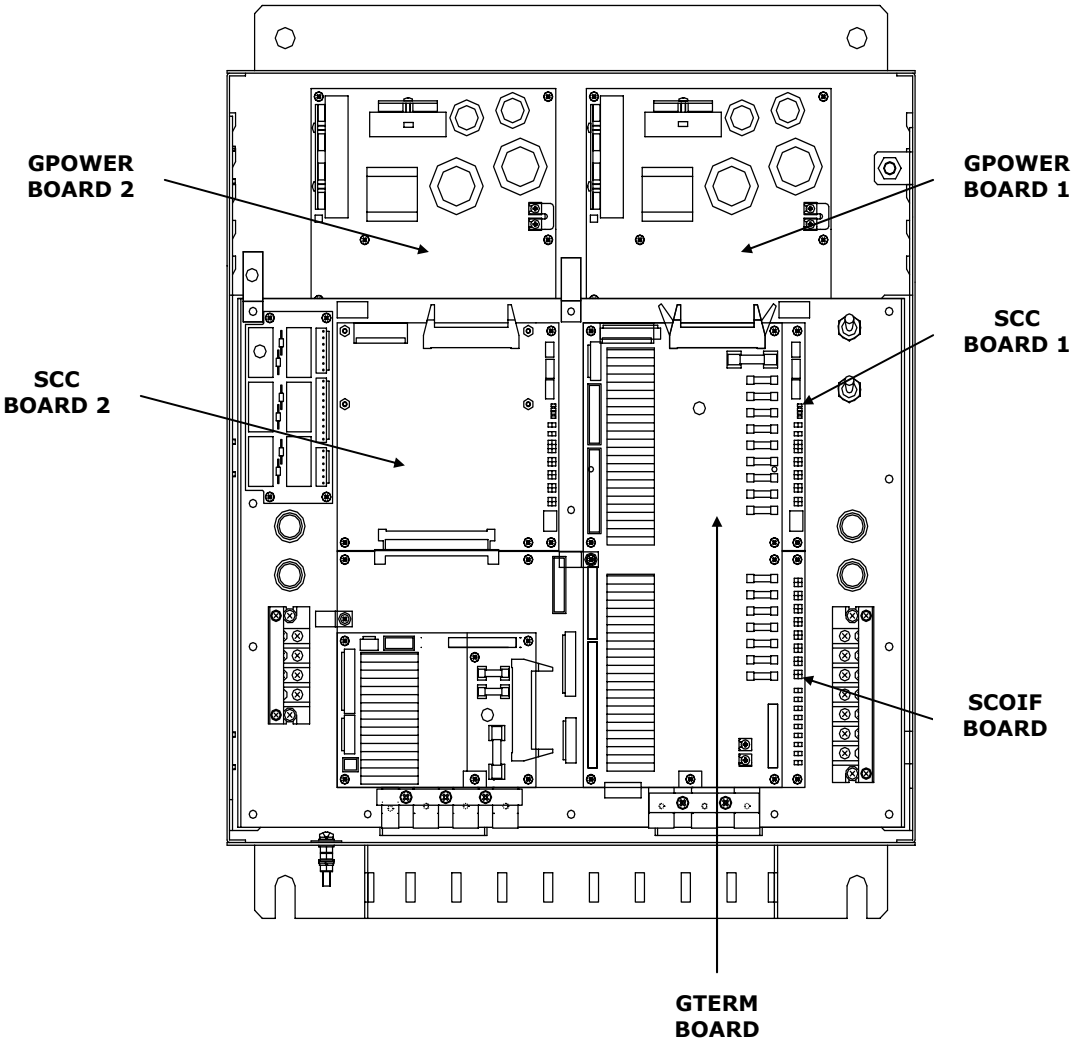
This section includes drawings for the different printed circuits boards in the Control unit that include jumpers and dip switches.

11.1 General

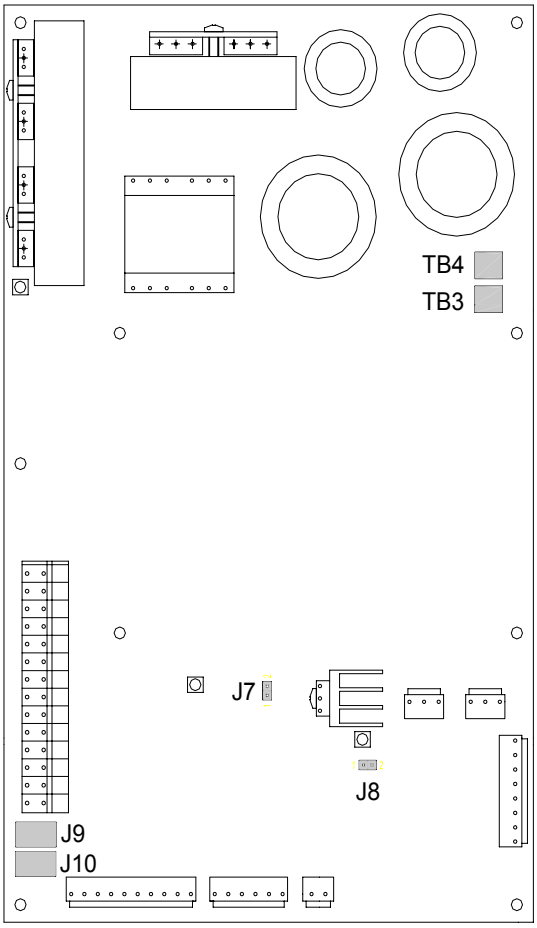
7 different boards in the Dual control unit have jumpers and/or dip switches that is used for configuring the GC80/85 system.

Only a few of these jumpers/dip switches are used in installation and pre-running procedure for the gyro compass. Refer ***Power supply***, page 47, and ***Dip-switch settings***, page 48.

The following pages include drawings showing location of all jumpers and/or dip switches, together with a short description for the different settings.



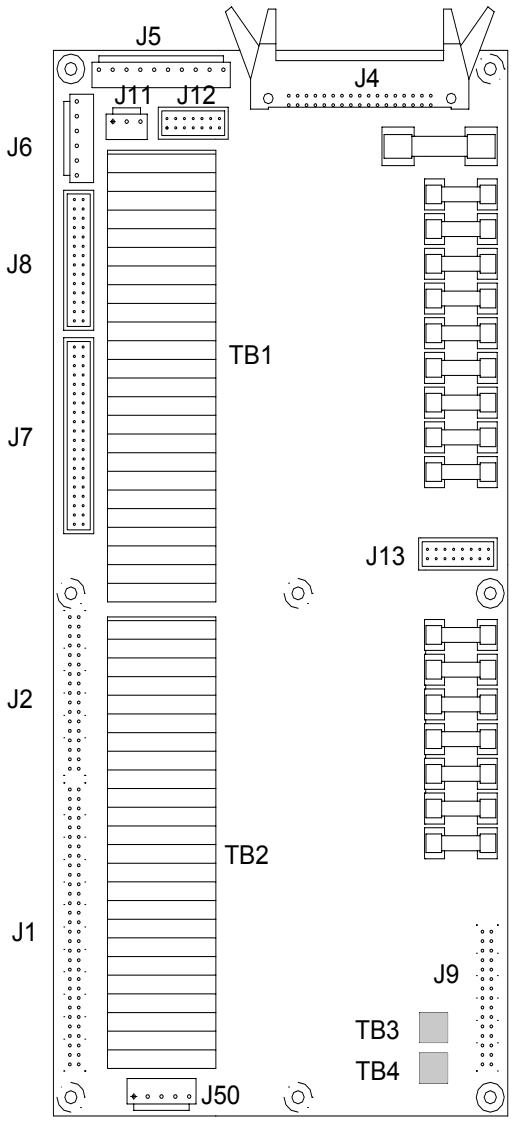
11.2 GPOWER board 1 and 2



Jumper settings on GPOWER boards

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J7	Open or Short	Over-current limit set	Over-current value of dc24v for Master compass is set up. *NOTE: Shall not be changed!*
J8	Open	Over-current limit change time	Used for inspection at a factory. *NOTE: Shall not be changed!*
TB3 – TB4	Open	Main power supply setting	Open = 220V AC Short = 100/110/115V AC

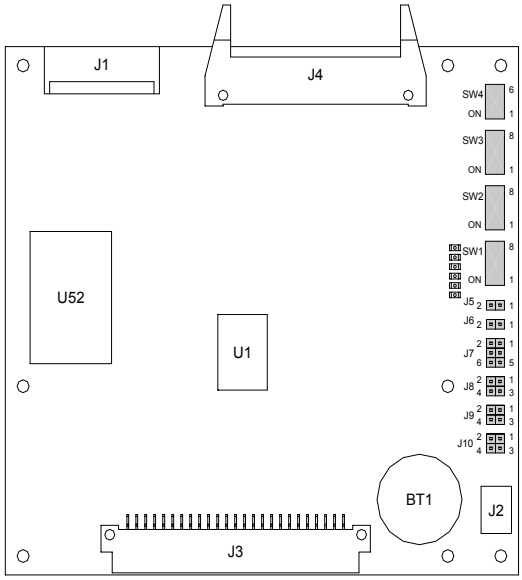
11.3 GTERM board



Jumper settings on GTERM board

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
TB3 – TB4	-	Gyro system	Open = Two gyro systems Short = One gyro system

11.4 SCC board 1 and 2



DIP switch settings on SCC boards

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

SWITCH	DEFAULT	FUNCTION	DESCRIPTION	
S2-1	OFF	Data output for record	SW2-1 OFF SW2-2 OFF	No output
			SW2-1 OFF SW2-2 ON	Output for old monitor
S2-2	OFF		SW2-1 ON SW2-2 OFF	Output for new monitor
			SW2-1 ON SW2-2 ON	No output
S2-3	OFF	Not used.		
S2-4	OFF	Pendulum ferry	OFF = Not connected/Buzzer stop enable ON = Pendulum function in use/Buzzer stop disable	
S2-5	OFF	Serial signal transmit frequency IEC61162-1 ed.2	SW2-5 OFF SW2-6 OFF	= 1sec (1Hz)
			SW2-5 OFF SW2-6 ON	= 100msec (10Hz)
S2-6	ON		SW2-5 ON SW2-6 OFF	= 200msec (50Hz)
			SW2-5 ON SW2-6 ON	= Invalid
S2-7	OFF	Alarm mask setting	OFF = No alarm mask ON = Control power abnormal	
S2-8	OFF	Not used.		
S3-1	OFF	Timer startup	OFF = No, ON = Yes	
S3-2	OFF	Talker ID of “ROT” sentence	OFF = “HE”, ON = “TI”	
S3-3	ON	Rate of turn scale	SW3-3 OFF SW3-4 OFF	Max 30.0 °/min.
			SW3-3 OFF SW3-4 ON	Max 300.0 °/min.
S3-4	OFF		SW3-3 ON SW3-4 OFF	Max 120.0 °/min.
			SW3-3 ON SW3-4 ON	Invalid
S3-5	OFF	Ban or permission of a “ROT” sentence output	Valid at the time of external sensor (standard) selection. OFF = Disabled, ON = Enabled	

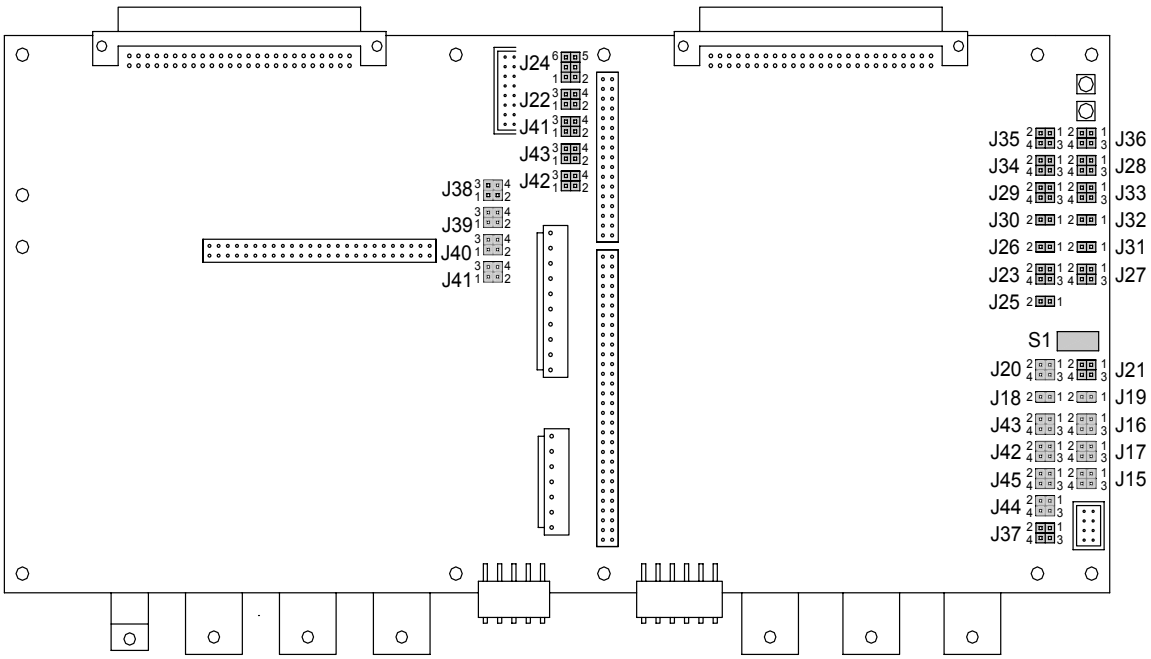
SWITCH	DEFAULT	FUNCTION	DESCRIPTION
S3-6	ON	For Simrad use	OFF = Not used ON = Simrad GC type (80 or 85) shown in display at start-up according to S1-2 setting.
S3-7	OFF	Not used	
S3-8	OFF		
S4-1	OFF	Forward bow rate	38400 bps
S4-2	OFF		9600 bps
S4-3	ON		4800 bps
S4-4	OFF	LOG serial receipt bow rate	38400 bps
S4-5	OFF		9600 bps
S4-6	ON		4800 bps

Jumper settings on SCC board

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J5	Open	CPU reset	Used for resetting the CPU
J6	Short	Software installation	OPEN: Used when installing sw in the CSS board *NOTE: Be sure to also set "J25 and J26" on the SCOIF or MCOIF boards to OPEN.* *NOTE: A damage will be given to a circuit if software is installed while this jumper has been short.*
J7	3-4 short	Serial signal output setting	Output port: GTERM board, TB2 "1TX" 1-2 Short = Not used. 3-4 Short = IEC61162-2 or TOKIMEC version 5-6 Short = IEC61162-1 ed.2 (ref. page 4) *NOTE: Never use both jumpers at the same time!*
J8	3-4 short		Output port: GTERM board, TB2 "2TX" 1-2 Short = IEC61162-2. 3-4 Short = IEC61162-1 ed.2 (ref. page 4) *NOTE: Never use both jumpers at the same time!*

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J9	3-4 short	Alarm contact setting	Output port: GTERM board, TB1 "ALCN" 1-2 Short = Alarm "CLOSES", Normal "OPEN" 3-4 Short = Alarm "OPEN", Normal "CLOSES" *NOTE:* *Never use both jumpers at the same time!*
J10	3-4 short	Running contact setting	Output port: GTERM board, TB1 "RNCN" 1-2 Short = Alarm "CLOSES", Normal "OPEN" 3-4 Short = Alarm "OPEN", Normal "CLOSES" *NOTE:* *Never use both jumpers at the same time!*

11.5 SCOIF board



DIP switch settings on SCOIF board

SWITCH	DEFAULT	FUNCTION	DESCRIPTION	
S1-1	OFF	External sensor connection	SW1-1 OFF SW1-2 OFF	No external sensor
			SW1-1 OFF SW1-2 ON	Magnetic system connected (back-up)
S1-2	OFF		SW1-1 ON SW1-2 OFF	External sensor connected
			SW1-1 ON SW1-2 ON	External system connected (back-up)
S1-3	OFF	Automatic system change	OFF = NO ON = YES	
S1-4	OFF	Not used		
S1-5	OFF			
S1-6	OFF			
S1-7	OFF			
S1-8	OFF			

Jumper settings on SCOIF board

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J15	3-4 short	Serial signal output setting	Output port: GTERM board, TB2: "3TX" 1-2 short = EC61162-2 or TOKIMEC version 3-4 short = IEC61162-1 ed.2 (ref. page 4) *NOTE: Never use both jumpers at the same time!*
J16	3-4 short		Output port: GTERM board, TB2: "4TX" 1-2 short = EC-61162-2 or TOKIMEC version 3-4 short = IEC-61162-1 ed.2 (ref. page 4) *NOTE: Never use both jumpers at the same time!*
J17	3-4 short		Output port: GTERM board, TB2: "5TX" 1-2 short = EC61162-2 or TOKIMEC version 3-4 short = IEC61162-1 ed.2 (ref. page 4) *NOTE: Never use both jumpers at the same time!*
J18	Short	Type setup	Short: Standard Open: With external sensor connected (type M or E)
J19	Short		

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J20	3-4 short	Serial signal output setting	Output port: DTERM board, TB21B: "G1-1TX" and TB21D: "G1-2TX" 1-2 short = EC61162-2 or TOKIMEC version 3-4 short = IEC61162-1 ed.2 (ref. page 4) *NOTE: The true heading information on "NO.1 Gyro-compass" is output regardless of a system change.*
J21	3-4 short		Output port: DTERM board, TB21C: "G2-1TX" and TB21D: "G2-2TX" 1-2 short = EC61162-2 or TOKIMEC version 3-4 short = IEC61162-1 ed.2 (ref. page 4) *NOTE: True heading information on "NO.1 Gyro-compass" is output regardless of a system change.*
J22	1-2 short	Polarity of the "GPS" signal setting	Input port: GTERM board, TB1: "GRX" 1-2 short = Standard 3-4 short = Polarity is carried out reversely. *NOTE: Never use both jumpers at the same time!* NOTE: *When a signal cannot be received by "1-2 short", it is set as "3-4 short."*
J23	1-2 short	Polarity of "LOG" signal setting	Input port: GTERM board, TB1: "LRX" 1-2 short = Standard 3-4 short = Polarity is carried out reversely. *NOTE: Never use both jumpers at the same time!* NOTE: *When a signal cannot be received by "1-2 short", it is set as "3-4 short."*

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J24	1-2 short	Setting receiving port of CPU on SCC board	1-2 short = An optional serial signal is received. 3-4 short = The serial signal output from SCOIF board received. *NOTE: Never use both jumpers at the same time!*
J25	Short	Software install or internal communication with "NO.1 Gyro compass"	Short: Internal communication with "NO.1 Gyro compass" Open: Software is installed in SCC board *NOTE: A damage will be given to a circuit if software is installed while this jumper has been short.*
J26	Short	Software install or internal communication with "NO.2 Gyro compass"	Short: Internal communication with "NO.2 Gyro compass" Open: Software is installed in SCC board *NOTE: A damage will be given to a circuit if software is installed while this jumper has been short.*
J27	1-2 short	LOG contact signal selection	Input port：GTERM board, TB1: "SL" 1-2 short = 200p.p.n.m. 3-4 short = 400p.p.n.m. *NOTE: Never use both jumpers at the same time!*
J28	1-2 short	"Rate of turn" Analog signal level selection	Output port: GTERM board, TB1 "1RT～3RT" 1-2 short = Output voltage 0v to ±5v DC or 0v to ±10v DC 3-4 short = Output voltage 0v to +5v DC or 0v to +10v DC *NOTE: Never use both jumpers at the same time!*

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J29	1-2 short	Setting of polarity for "external heading sensor" signal	Input port: GTERM board, TB1 " ESRX" 1-2 short = Standard 3-4 short = Polarity is carried out reversely. *NOTE: When a signal cannot be received by "1-2 short", it is set as "3-4 short."* *NOTE: Never use both jumpers at the same time!*
J30	Short	Software install or internal communication with SCOIF board	Short = Internal communication with External heading sensor Open = Software is installed in SCOIF board *NOTE: A damage will be given to a circuit if software is installed while this jumper has been short.*
J31	Short	Software installation	Open = Software is installed in SCOIF board *NOTE: A damage will be given to a circuit if software is installed while this jumper has been short.*
J32	Open	CPU reset	This jumper is used when resetting "CPU."

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J33	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") 3-4 short = With an external heading sensor (with HDM or EHS unit) Type M or E.
J34	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") 3-4 short = With an external heading sensor (with HDM or EHS unit) Type M or E.
J35	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") 3-4 short = With an external heading sensor (with HDM or EHS unit) Type M or E.
J36	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") 3-4 short = With an external heading sensor (with HDM or EHS unit) Type M or E.

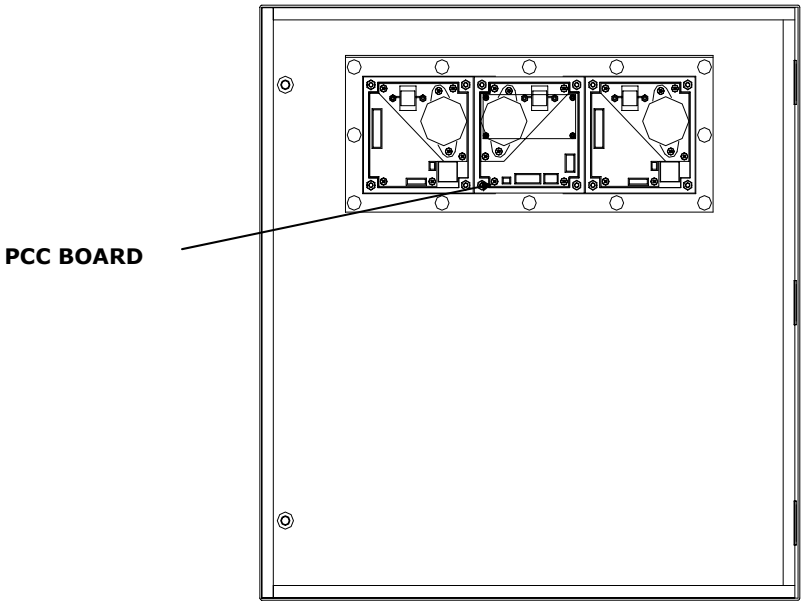
JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J37	3-4 short	Output serial signal	Output port : GTERM board, TB2: "6TX" 1-2 short = EC61162-2 or TOKIMEC version 3-4 short = IEC61162-1 ed.2 (ref. page 4) *NOTE: Never use both jumpers at the same time!*
J38	3-4 short		Output port : GTERM board, TB2: "7TX" 1-2 short = IEC61162-2 or TOKIMEC version 3-4 short = IEC61162-1 ed.2 (ref. page 4) *NOTE: Never use both jumpers at the same time!*
J39	3-4 short		Output port : GTERM board, TB2: "8TX" 1-2 short = IEC61162-2 or TOKIMEC version 3-4 short = IEC61162-1 ed.2 (ref. page 4) *NOTE: Never use both jumpers at the same time!*
J40	3-4 short		Output port : GTERM board, TB1: "9TX" 1-2 short = IEC61162-2 or TOKIMEC version 3-4 short = IEC61162-1 ed.2 (ref. page 4) *NOTE: Never use both jumpers at the same time!*
J41	3-4 short		Output port: GTERM board, TB1: "10TX" 1-2 short = IEC61162-2 or TOKIMEC version 3-4 short = IEC61162-1 ed.2 (ref. page 4) *NOTE: Never use both jumpers at the same time!*

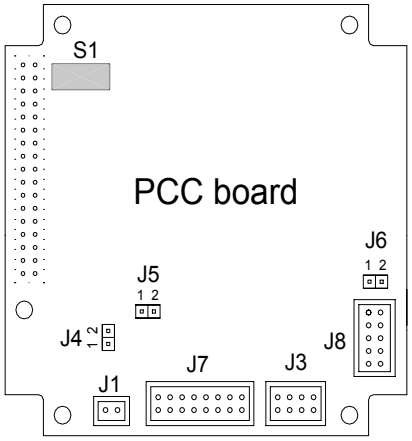
JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J42	3-4 short	Alarm contact output for Control panel (or Change Over panel)	Output port: DTERM board. TB21D: " MALCN" 1-2 short = Alarm "CLOSES" Normal "OPEN" 3-4 short = Alarm "OPEN" Normal "CLOSES" NOTE: *Never use both jumpers at the same time!*
J43	1-2 short	Running contact output for Control panel (or Change Over panel)	Output port: DTERM board. TB21D: " MRNCN" 1-2 short = Alarm "CLOSES" Normal "OPEN" 3-4 short = Alarm "OPEN" Normal "CLOSES" NOTE: *Never use both jumpers at the same time!*
J44	3-4 short	Difference alarm contact output for Control panel (or Change Over panel)	Output port: DTERM board. TB21D: "DFCN" 1-2 short = Alarm "CLOSES" Normal "OPEN" 3-4 short = Alarm "OPEN" Normal "CLOSES" NOTE: *Never use both jumpers at the same time!*
J45	3-4 short	Off course alarm contact output	Output port: DTERM board. TB21D: "OCACN" 1-2 short = Alarm "CLOSES" Normal "OPEN" 3-4 short = Alarm "OPEN" Normal "CLOSES" NOTE: *Never use both jumpers at the same time!*

JUMPER	DEFAULT	FUNCTION	DESCRIPTION
J46 *	1-2 short	Output port setup for GTERM board	Output port: GTERM board. TB2: "ST1/OPRX+" 1-2 short = The step signal for "Step signal type repeater" is output (ST1). 3-4 short = Serial signal receive.(OPTION) (OPRX+) NOTE: *Never use both jumpers at the same time!*
J47 *	1-2 short		Output port: GTERM board. TB2: "ST2/OPRX-" 1-2 short = The step signal for "Step signal type repeater" is output (ST2). 3-4 short = Serial signal receive.(OPTION) (OPRX-) NOTE: *Never use both jumpers at the same time!*
J48 *	1-2 short		Output port: GTERM board. TB2: "ST2/OPRXC" 1-2 short = The step signal for "Step signal type repeater" is output (ST3). 3-4 short = Serial signal receive.(OPTION) (OPRXC) NOTE: *Never use both jumpers at the same time!*

*: All three jumpers should be changed simultaneously

11.6 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 SW1-4 OFF	No external sensor connected
			SW1-3 OFF SW1-4 ON	Magnetic system connected (back-up)
S1-4	OFF		SW1-3 ON SW1-4 OFF	External sensor connected
			SW1-3 ON SW1-4 ON	External sensor connected (back-up)
S1-5	ON	Input of steering mode information		
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 SCCpwb *NOTE:* *A damage will be given to a circuit if software is installed while this jumper has been short.*
J6	Open	"Power supply" switch	Short: Power "ON." (Power supply switch" pass.)

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12 ALARM LISTING

This section provides a listing of alarm codes, a short description, and the possible cause for the alarm message.

12.1 The alarm system

A GC80/GC85 compass 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.

In a GC80/85 Dual system, alarms will be generated both from each single gyro compass, and from the dual system. Refer Alarm messages, page 25.

For a complete list of alarm codes, refer to the tables on the following pages.

12.2 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 a list of alarm messages that may be displayed on the gyro compass control panels and on the change over panel.

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

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

Alarms generated by each gyro compass

Alarm code	Alarm content	Datailed code	Possible cause
E-1	Main power is abnormal	1	When the 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	+12.5V is abnormal.
		8	-12.5V is abnormal.
		9	+10V is abnormal.
		10	-10V 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.
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.)

Alarm code	Alarm content	Datailed code	Possible cause
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 is 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 is 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 encorder signal is not completed.
E-u *1	LOG (contact) data abnormal	37	LOG (contact) is abnormal.

*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 exceeded 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 is 15sec.)
MSIF Comm(Trans)	System internal transmission abnormality	