*EXCELLENCE IN MARINE ELECTRONICS*

# *NETWORK COMPASS MANUAL*

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## CONTENTS

## GENERAL INTRODUCTION TO B&G NETWORK

Welcome to the B&G Network system. This world beating series of intelligent navigational instruments has been brought to you through a combination of scientific innovation and high quality production to create a computerised data system you can trust. As an intelligent system each unit can be used by itself to display specific data, alternatively any combination of units can be linked into a Network with units processing their own data or acting as repeaters for data from other units. This Network providing a comprehensive navigational system. Screened cables combined with the latest technology provide protection from interference between units and other systems.

The Network system is continuously expanding your options and currently consists of the following units:

**INSTRUMENTS**

- Network SPEED
- Network DEPTH
- Network QUAD
- Network WIND
- Network TACK
- Network DATA
- Network COMPASS

**NAVIGATIONAL AIDS**

- Network NAV
- Network GPS
- LCD CHART

**AUTOPILOTS**

- Network PILOT

## INTRODUCTION TO NETWORK COMPASS

The Network COMPASS unit uses the latest advances in electronics to display Off Course, Cross Track Error (XTE)*, Rudder* and Head/Lift information on an easy to read Liquid Crystal Display (LCD). Five keys on the unit select the displayed data, calibration factors and alarms.

It can operate as a standalone unit compass display or as part of an Integrated B&G Network Instrument System. The unit can also operate as a repeater of course data received via the Network. These connections plug directly into the rear of the display.

The Network COMPASS includes two adjustable alarms:

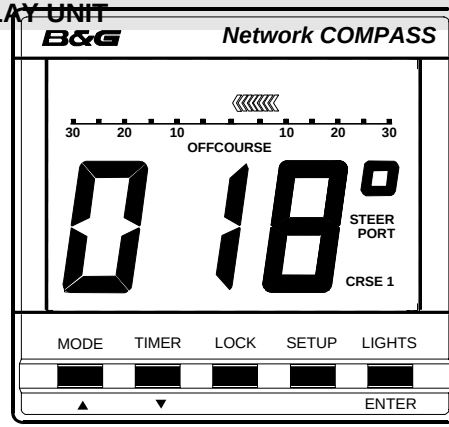
- Off course alarm
- Head alarm

An internal alarm buzzer will sound and the display will flash when the alarm condition is met. Other Network instruments will also sound their alarms and flash their displays.

Additionally a racing timer with alarm signals at set intervals is included in the unit.

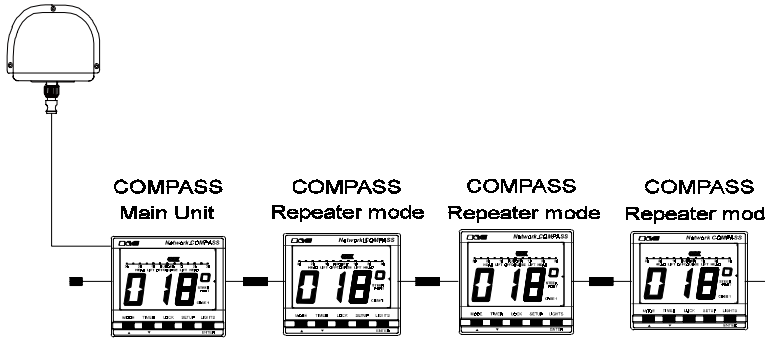
* These functions will only appear if the relevant sensors i.e. GPS or PILOT are in the system

## COMPASS DISPLAY UNIT

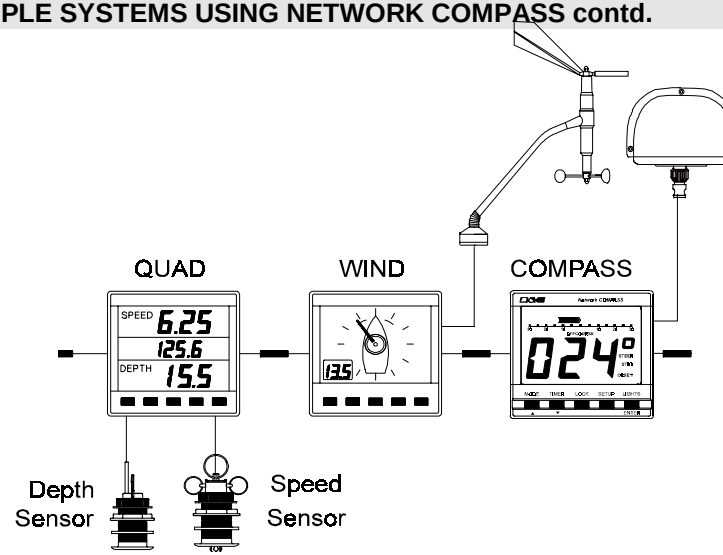



## EXAMPLE SYSTEMS USING NETWORK COMPASS

Up to four COMPASS units can be connected to the system. Only one of these should be linked to a fluxgate and set to transducer mode, the other three must be set to repeater mode. Refer to SELECTING THE DISPLAY MODE for details. The **MODE** key then cycles the display through Off Course, Cross Track Error (XTE), Rudder and Head/Lift displays (if enabled).



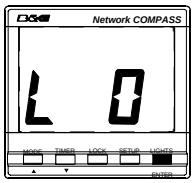
## EXAMPLE SYSTEMS USING NETWORK COMPASS contd.

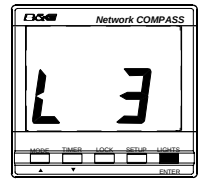


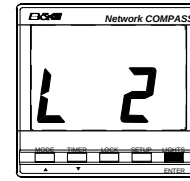

## SETTING THE DISPLAY BACK LIGHTING

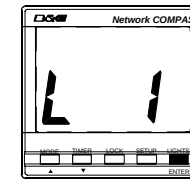
The Network COMPASS display has three brightness settings or off. Pressing the **LIGHTS** key cycles through these in the following order.

- ***L 0*** OFF
- ***L 3*** High
- ***L 2*** Medium
- ***L 1*** Low



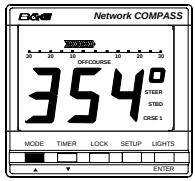



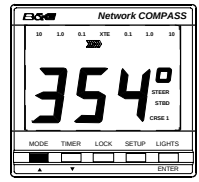



## THE OFF COURSE DISPLAY

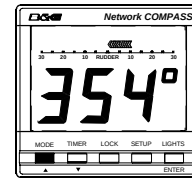
Pressing the **MODE** key will cycle the display between Off Course, Cross Track Error (XTE) if GPS is fitted, Rudder angle if Network PILOT fitted and the Head/Lift display (if enabled).



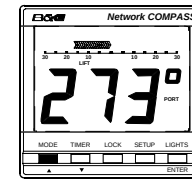

The Off Course Display




The XTE Display with Network GPS

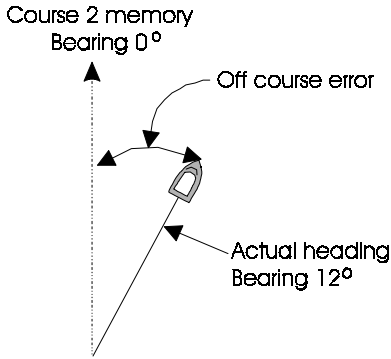


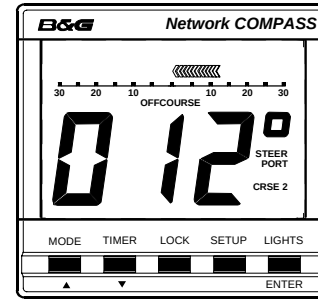

The Rudder Display with Network PILOT




The Head/Lift Display if enabled

The unit will autodetect the presence of a GPS or PILOT on the Network and will activate the displays accordingly. The Off Course display is used to show the difference between the current heading and the heading stored in the selected course memory (see SETTING THE COURSE MEMORIES).



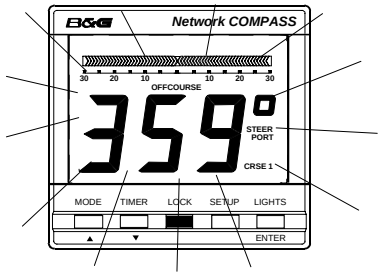



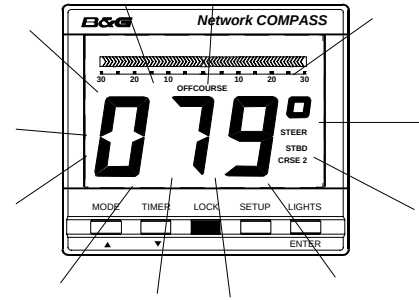

In this instance the vessel is heading starboard of the setting in course 2 memory, the display shows the current bearing. The Off Course scale is visible below the bar graph which points to port, the legends **STEER** and **PORT** indicate the direction required to steer to correct the error.

The Off Course scale indicates how many degrees the vessel is from its intended heading.

## SETTING THE COURSE MEMORIES

Whilst in Off Course mode the two course memories may be set. The currently active course memory is shown by the legend **CRSE1** or **CRSE2**.

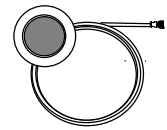



Pressing the **LOCK** key brings up the current course memory (e.g. **CRSE1**) which will flash on the display. Pressing **LOCK** again displays the second course memory (**CRSE2**). Whilst the setting is displayed it can be adjusted by using the ▲ and ▼ keys (normally the **MODE** and **TIMER** keys). The display will revert to normal four seconds after the last key is pressed.

Alternatively the displayed course memory can be reset by sailing on a heading then depressing the **LOCK** key for one second. The current course will then be stored in the selected course memory.

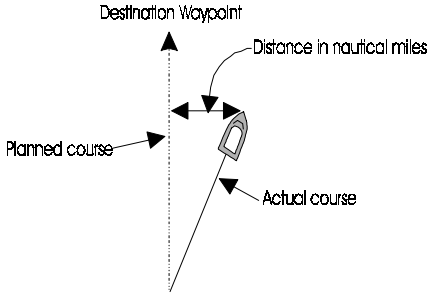
If a remote button, shown below, is fitted as an option then this performs the same functions as the **LOCK** key.

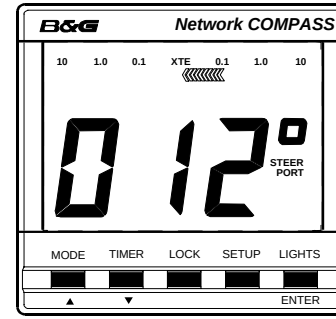


The Optional Remote Button with 15m cable

## THE XTE DISPLAY

REQUIRES A GPS ON THE NETWORK. The Cross Track Error display is used to indicate how far the vessel is from the intended track (from waypoint to waypoint).



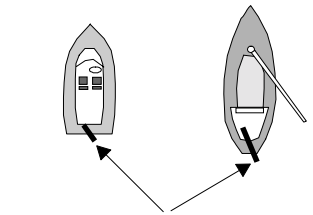




In this instance the vessel is heading starboard of the planned course. The display shows the current bearing and the **XTE** scale is visible above the bar graph which points to port, the legends **STEER** and **PORT** indicate the direction required to steer to correct the error.

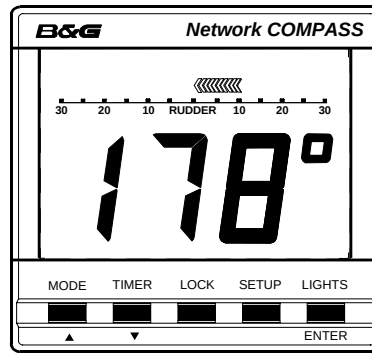
The **XTE** scale indicates how many nautical miles the vessel is from the track (waypoint to waypoint).

## THE RUDDER DISPLAY

REQUIRES B&G NETWORK PILOT IN CIRCUIT. The rudder display indicates the current angle of the rudder, which is particularly useful on wheel steered boats.



Rudder angle for a starboard turn

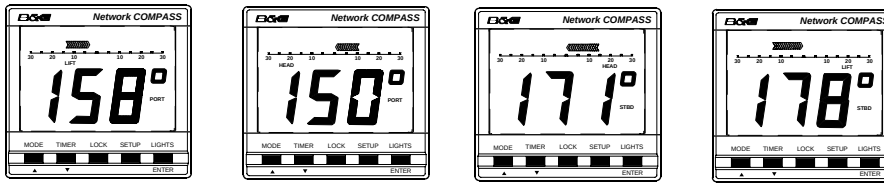


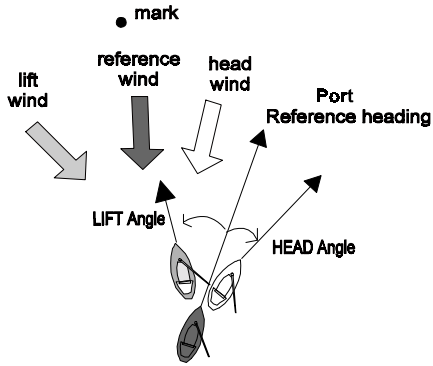

The vessel is turning to starboard, the display shows the current heading and the rudder scale is visible beneath the bar graph which points to port; the direction to turn the wheel to straighten the rudder.

The scale indicates the degrees at which the rudder is angled.

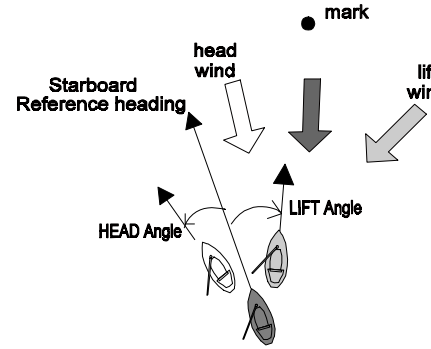
## THE HEAD/LIFT DISPLAY

THE HEAD/LIFT PAGE HAS TO BE ENABLED IN THE SET UP MENU before it can be displayed.




A LIFT and a HEAD on the port tack

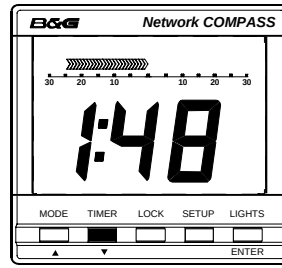



A LIFT and a HEAD on the starboard tack

The port and starboard tacks are stored manually as **PORT** and **STBD** headings (see SETTING THE COURSE MEMORIES). When the helmsman has to vary from these headings due to wind changes the legends **HEAD** or **LIFT** will appear on the display for the relevant tack. If wind data is available over the Network a tack will automatically change between the **PORT** and **STBD** reference course. Otherwise it can be switched manually by two short presses of the **LOCK** key or the remote button. The **HEAD/LIFT** values are displayed in the analogue bar graph as degrees. If the Off Course alarm is enabled the unit will sound an alarm and **HEAD** will flash if a head occurs, pressing **ENTER** on the unit will cancel the alarm. The alarm will not sound for a lift.

## USING THE TIMER

Pressing the **TIMER** key enters the timer display mode, this is shown by the presence of a colon which flashes every second.




The timer can be set to any required value to a maximum time period of 99 hours 59 minutes and 50 seconds. The analogue bar graph shows the time left, in minutes, from 30 minutes before time zero (bar graph on the left) to 30 minutes after (bar graph on the right).

The unit will also beep to indicate the passage of set units of time, the number and frequency of beeps depending on the time left to time zero, there are no beeps after time zero. The beep sequences are shown in the table below.

| Beeps begin at | Beeps end at | Number of beeps | Frequency |
|---|---|---|---|
| < 60 hours | 1 hour | 5 | every hour |
| < 1 hour | =>10 minutes | 4 | every 10 minutes |
| < 10 minutes | => 1 minute | 3 | every minute |
| < 1 minute | => 10 seconds | 2 | every 10 seconds |
| < 10 seconds | >0 | 1 | every second |
| = 0 | >-10 seconds | continuous | for 10 seconds |

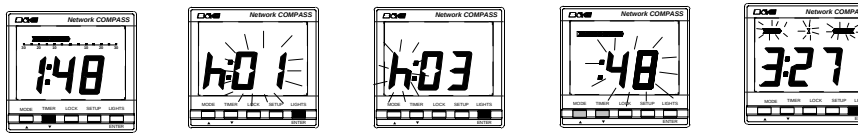
This means that for the example given above of 1 hour 48 minutes the following beeps will occur:

- 5 beeps at 1:00
- 4 beeps at 0:50; 0:40; 0:30; 0:20; 0:10
- 3 beeps at 0:09; 0:08; 0:07; 0:06...0:01
- 2 beeps at 0:00:50; 0:00:40...0:00:10
- 1 beep at 0:00:09; 0:00:08; 0:00:07...0:00:01
- continuous beep at 0:00:00 for ten seconds

At each of these periods the display will briefly show the time left.
Press **MODE** to return to the heading display.

## SETTING THE TIMER

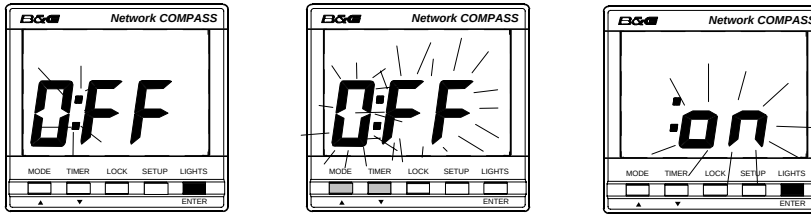
1. Press **TIMER** to enter timer mode.
2. Press **SETUP** to give the display **h:xx** (**xx** represents a two digit number) the **h** will be flashing.
3. Press **ENTER** and the numbers will flash.
4. Alter the hours using the ▲ or ▼ keys. If the key is held down the numbers will change more quickly.




5. Press **ENTER** to adjust the count down minutes. The display will show the current minutes setting and the bar graph on the left will represent the minutes before time zero (up to 30 minutes).
6. Alter the minutes using the ▲ or ▼ keys.
7. Press **ENTER** to set the timer, with the seconds set to zero. Both sides of the bar graph will now be full to show that the timer is ready to be started.
8. Press **ENTER** to start the timer and exit to the timer display.

## ENABLING/DISABLING THE TIMER BEEPS

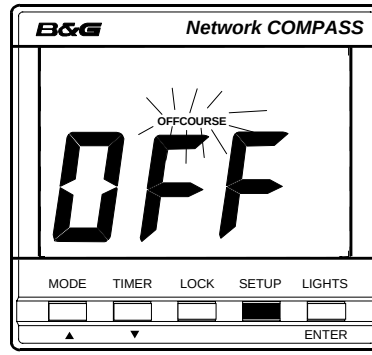
1. Press **TIMER** to enter timer mode.
2. Press **SETUP** to give the display **h:xx** (**xx** represents a two digit number) the **h** will be flashing.
3. Press **SETUP** to give the **O:FF** display (colon flashing).
4. Press enter, the **OFF** will flash.




5. Press ▲ or ▼ keys to change this to **ON**, enabling the beeps.
6. Press **ENTER** to store the new setting.
7. Press **SETUP** to return the unit to the timer set-up display.
8. Press **MODE/TIMER** to return to desired mode.

## ENABLING THE OFF COURSE ALARM

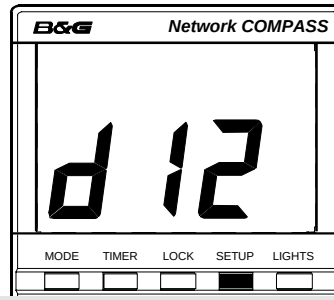
1. Press **SETUP** until the **OFFCOURSE** legend flashes to indicate the alarm set up display. This value is preset to 0° which is shown as **OFF**.
2. Press **ENTER** then **OFF** will flash.
3. Press the ▲ or ▲ keys to the desired value (between 0° and 30°).
4. Press **ENTER** to accept value and return to set-up mode.
5. Press **MODE** to return to desired mode.




## SETTING THE COMPASS DAMPING

Compass damping is used to smooth out compass readings.

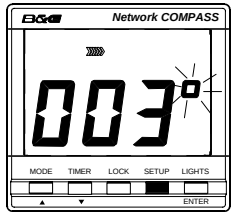
1. Press **SETUP** until **dxx** is displayed. The **d** will flash.
2. Press **ENTER,** the numbers will flash.
3. Press the ▲ or ▼ keys until the desired value is shown (between 1 and 99 seconds).
4. Press **ENTER** to accept value and return to set-up mode.
5. Press **MODE** to return to desired mode.



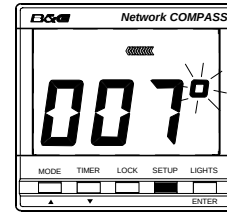

## SETTING THE COMPASS OFFSET

The compass offset compensates for fixed errors in the compass after installation and calibration such as sensor orientation.

1. Press **SETUP** until a bearing is displayed and the degrees sign is flashing.
2. Press **ENTER,** the numbers will flash.
3. Press the ▲ or ▼ keys until the desired value is shown (between +180 and -180 seconds). A positive offset has a bar graph on the right of the display, a negative offset has a bar graph on the left of the display
4. Press **ENTER** to accept value and return to set-up mode.
5. Press **MODE** to return to desired mode.



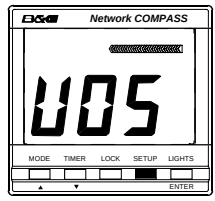

Compass Offset at -3°



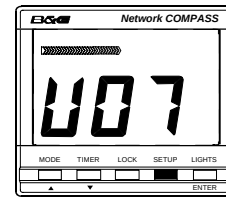

Compass Offset at +7°

## SETTING THE VARIATION

1. Press **SETUP** until **Uxx** is displayed (xx represents a number) and the U is flashing.
2. Press **ENTER,** the numbers will flash.
3. Press the ▲ or ▼ keys until the desired value is shown (between 90W and 90E). An easterly variation has a bar graph on the right of the display, a westerly variation has a bar graph on the left of the display.
4. Press **ENTER** to accept value and return to set-up mode.
5. Press **MODE** to return to desired mode.



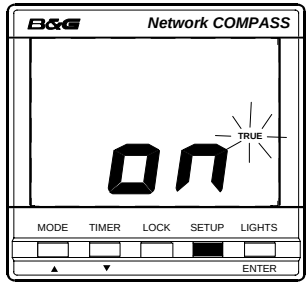

Variation is 5°E



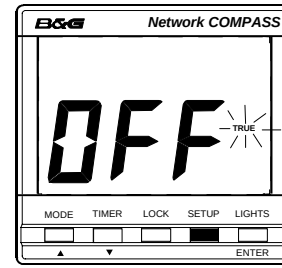

Variation is 7°W

## SETTING THE DISPLAY FOR TRUE OR MAGNETIC READINGS

1. Press **SETUP** until **TRUE** is flashing and either **ON** or **OFF** is displayed.
2. Press **ENTER, ON** or **OFF** will flash.
3. Press the ▲ or ▼ keys to switch the setting between on and off
4. Press **ENTER** to accept the setting and return to set-up mode.
5. Press **MODE** to return to desired mode.



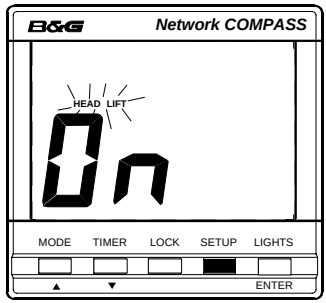

Compass will display TRUE headings

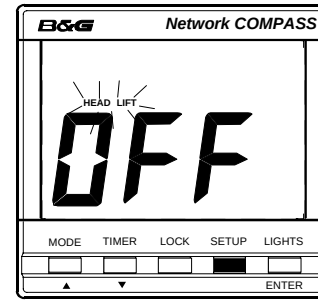



Compass will display MAGNETIC headings

## ENABLING THE HEAD/LIFT MODE

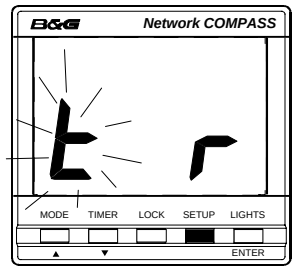
1. Press **SETUP** until **HEAD/LIFT** is flashing and either **ON** or **OFF** is displayed.
2. Press **ENTER, ON** or **OFF** will flash.
3. Press the ▲ or ▼ keys to switch the setting between on and off
4. Press **ENTER** to accept the setting and return to set-up mode.
5. Press **MODE** to return to desired mode.



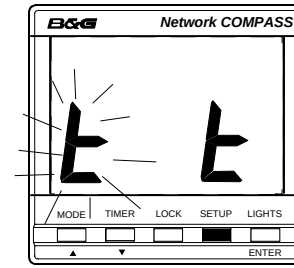



## SELECTING THE DISPLAY MODE

1. Press **SETUP** until a flashing **t** and either **r** or **t** is displayed.
2. Press **ENTER, r** or **t** will flash.
3. Press the ▲ or ▼ keys to switch the setting between repeater (**r**) and transducer (**t**).
4. Press **ENTER** to accept the setting and return to set-up mode.
5. Press **MODE** to return to desired mode.




Unit set to repeater mode

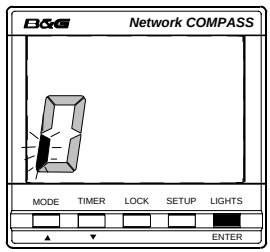


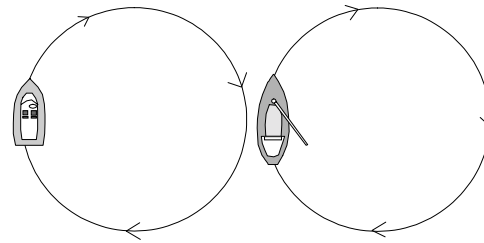

Unit set to transducer mode

## CALIBRATING THE COMPASS

Remember that a compass offset may be entered (see section SETTING THE COMPASS OFFSET).

1. Press **SETUP** until the rotating segment is displayed.
2. Press **ENTER** to begin calibration swing. The display shows a degree count.
3. Sail the vessel through a full circle, the display will count up to 360.
4. On completion the compass will display a **-P-** for pass or a **-F-** for fail (see troubleshooting).
5. Press **ENTER** to accept the calibration, the rotating segment will reappear.
6. Press **MODE** to return to desired mode.

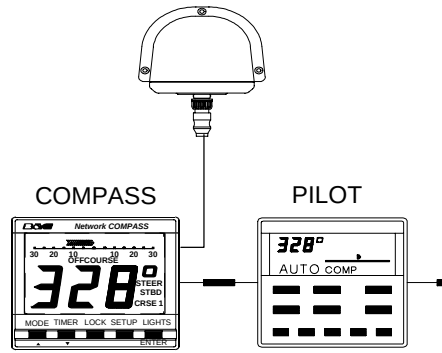


When the display shows a clockwise rotating segment press **ENTER** and turn the boat through a full circle

## OPERATION WITH AUTOPILOTS

REQUIRES A B&G NETWORK AUTOPILOT IN SYSTEM. If a B&G Network autopilot is present in the system, and the unit is set up within a system that includes a Network ACP1 or ACP2 then there are two options for the Network configuration.




- The COMPASS unit can display rudder and compass information generated by the PILOT.
- The fluxgate sensor can be connected to the COMPASS unit giving an alternate remote fluxgate option.

The Network is more efficient if the fluxgate is connected to the Network ACP Pilot and the COMPASS is used as a repeater for the data but the system will operate normally with the pilot accepting data from the COMPASS unit.

Only one fluxgate is necessary for the Network but if a backup fluxgate is added and fitted into the COMPASS unit then it will override the PILOT's internal compass. The PILOT will then act as a repeater for the COMPASS data. It is important that the COMPASS is specifically set up in repeater mode. The fluxgate on the Network COMPASS may be enabled by changing modes in the event of a PILOT/FLUXGATE failure.

PILOT Off Course data is not fed into the COMPASS unit through the Network. If this information is required the PILOT heading can be manually entered into one of the COMPASS course memories.

## TROUBLESHOOTING

| PROBLEM | POSSIBLE CAUSE |
|---|---|
| Display fails to light up | Power not connected.<br>Supply not 10 to 16 Volts. |
| Data is not repeated from Network | Compass not in repeater mode.<br>Cables not correctly fitted. |
| Compass fails to calibrate (-F-) | Calibration manoeuvre performed badly.<br>Compass installed too close to onboard metallic object.<br>Calibration manoeuvre attempted near to large metallic vessel or equipment, e.g. loading crane. |
| Display shows **E** followed by a number | Error message. Switch off and restart. (If the message persists after three restart attempts contact your authorised dealer for assistance.) |
| -C- error message | Compass fluxgate error. Switch off check wiring. (If the message persists after three restart attempts contact your authorised dealer for assistance.) |

## INSTALLATION

The display heads are supplied with a clip-in mounting bracket which allows for easy installation, access from behind is not necessary to secure the unit in place. However to prevent theft and permanently fix the unit in position, locking studs and thumb nuts are supplied.

## SITING THE DISPLAY UNIT

All Network Instruments are designed for mounting on or below deck. A mounting position should be selected where they are:

- Easy to read by the helmsman
- On a smooth and flat surface
- At least 100mm (4") from a compass
- Accessible from behind for fitting locking studs if required.

## MOUNTING THE DISPLAY UNIT

Use the cutting template supplied to mark the centres of the holes for the self-tapping screw, the fixing stud holes and the mounting bracket.

- The template allows 4mm (5/32") between adjacent units for the suncover, increase this distance if required to maximum of 60mm (2 3/8") between units or 180mm (3 1/8") between centres. For greater distances between units extension cables are available.
- Use a 70mm (2 3/4") diameter hole-cutter for the mounting bracket hole.
- Use a 2.9mm for the self-tapping screw holes. Use a 5mm (3/32") drill for the locking stud holes.
- Secure the mounting bracket to the bulkhead with the self-tapping screws supplied
- Fit the rubber sealing gasket around the mounting bracket.
- Screw the locking studs into the back of the display head (if required).
- Carefully pass the cable tails through the mounting bracket hole, connect the cables to the main units.
- Clip the display head into the mounting bracket.
- Secure the instrument with the thumb nuts supplied.

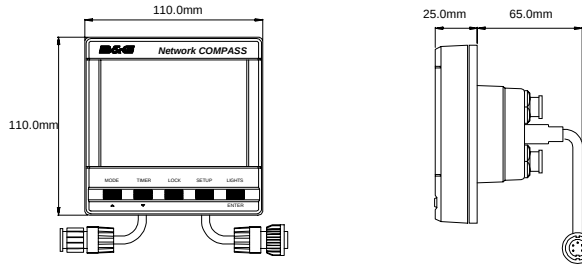
## SITING THE FLUXGATE

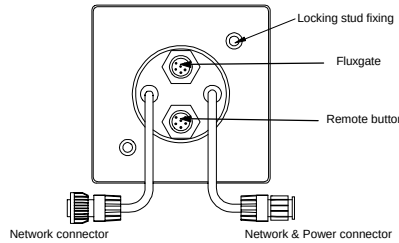
- Mount the unit upright on a flat vertical bulkhead.
- A safe distance from external magnetic interference: 1m/3ft from VHF, RDF, Loudspeakers, depth sounders, engines, power cables carrying heavy current etc.
  3m/10ft from Radar and SSB equipment.
- Well protected from physical damage.
- With the connector downwards.

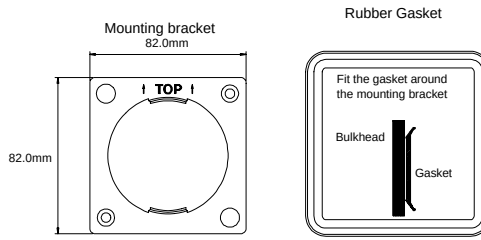
## MOUNTING THE FLUXGATE

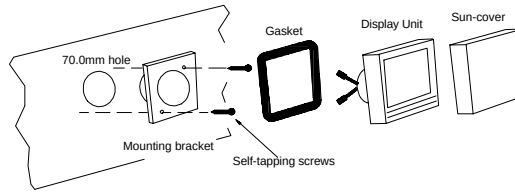
- Secure the unit in the selected site using the self tapping screws provided.
- Route the cable to the Network COMPASS display or the Network PILOT computer unit avoiding other cables carrying heavy currents, e.g. engine starter, trim tabs etc.
- Secure in place using cable clips or tie-wraps.
- Avoid bending the cable through a tight radius especially near the connector as this may damage the wires inside the cable.

## INSTALLATION DATA



## SPECIFICATIONS

### PHYSICAL PARAMETERS

**Display** : Backlit Liquid Crystal Display
**Dimensions** : 110 x 110 x 26 mm; 4.25 x 4.25 x 1"
A space of 65 mm (2.6") is required behind the bulkhead for display barrel.

### ENVIRONMENTAL

**Operating Temp** : -10 to +55ºC, +14 to +131º F @ 93% RH
**Storage Temp** : -25 to +70ºC, -25 to +70ºC @ 95% RH
**Sealing** : Fully sealed front, suitable for bulkhead cockpit mounting.

### ELECTRICAL

**Power Supply** : 12V DC nominal (10V to 16V).
**Operating Current** : 40 mA to 100 mA
**Protection** : Connect via external fuse or circuit breaker

### CABLES AND CONNECTIONS

Connection to adjacent units and other equipment is via plug and socket connections which carry power and Network data between units.

### ALARM

Internal piezo buzzer.

# CONDITIONS OF WARRANTY

**1** Brookes & Gatehouse Limited (B&G) warrants B&G NETWORK products, in normal usage, to be free from defects in materials or workmanship for a maximum period of two years (12 months with respect to mechanical items) from purchase by the original owner, subject to the conditions and limitations below. Any part that proves to be defective, in normal usage, during that period will be repaired or replaced by Brookes & Gatehouse Ltd at Brookes and Gatehouse Ltd's option on presentation of the warranty certificate to an authorised dealer, distributor or Brookes & Gatehouse Ltd.

This warranty is subject to the following conditions and limitations.

**A** Brookes & Gatehouse Ltd's liability shall be limited to the repair or replacement of goods or parts defective in materials or workmanship.

**B** Determination or the suitability of the material for the use contemplated by the owner is the sole responsibility of the buyer, and Brookes & Gatehouse Ltd shall have no responsibility in connection with such suitability.

**C** Brookes & Gatehouse Ltd shall not be responsible for any harm resulting from:

**1** Failures due to use of products in applications for which they are not intended.

**2** Failures due to corrosion, wear and tear, or improper installation.

**3** Accident, misuse or neglect.

**4** Malfunctioning of the product due to externally generated magnetic, electrical or acoustic interference.

**D** Brookes & Gatehouse Ltd shall not be responsible for boat slipping or lifting, freight shipping charges or installation labour associated with any warranty claims, or for loss or damage in transit.

**E** Brookes & Gatehouse Ltd shall not be responsible for any charges relating to onboard servicing, sea trials, or any other work associated with the installation. The right is reserved for any such service to be charged at local rate.

**F** Service by anyone other than Authorised Brookes & Gatehouse Ltd Representatives shall void this warranty unless it accords with Brookes & Gatehouse Ltd's guidelines and standards of workmanship.

**2** These are not warranties of merchantability, fitness for purpose of any kind, expressed or implied, and none shall be implied by law. The duration of any such warranties that are nonetheless implied by law for the benefit of the consumer shall be limited to a period of two years from the original purchase by the owner. The warranty is not transferable.

**3** Brookes & Gatehouse Ltd shall not be liable for consequential damages to vessels, equipment, or other property, or persons due to the failure of Brookes & Gatehouse Ltd equipment.

**4** This warranty does not limit in any way your common law or statutory rights.

**B&G WARRANTY CERTIFICATE**

**SERIAL Nos DISPLAY**
**TRANSDUCER**

**DISTRIBUTORS NAME**
**ADDRESS**

**DEALERS NAME**
**ADDRESS**

**OWNERS NAME**
**ADDRESS**

**DATE OF PURCHASE**

**VESSEL NAME**

**IMPORTANT**
**PLEASE RETAIN THIS DOCUMENT IN A SAFE PLACE**