

# **USER GUIDE FOR**

**DATALINE-X™**

**CENTRAL**

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Dataline-X Central Manual, Part Number 06037SM, Issue 2, Dec 1995

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## **Warning**

***The equipment to which this manual applies must only be used for the purpose for which it was designed. Improper use or maintenance may cause damage to the equipment and/or injury to personnel. The user must be familiar with the contents of the manual before attempting to operate or work on the equipment.***

***Simrad Ltd disclaims any responsibility for damage or injury caused by improper installation, use or maintenance of the equipment.***

**CE** 1996

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**1.1 The Dataline-X System**

The Dataline-X System, as its name implies, uses a single cable to carry both power and data around the vessel to each instrument. This is done using a NMEA 0183 serial digital communication link, which is an established industry standard. Because of this, instruments from other manufacturers may be interfaced to the Dataline-X System - assuming that they have a NMEA output or input.

This User Guide describes the Instrument and Navigation System Repeater digital display, known as **Dataline-X CENTRAL**, used within the Dataline-X System.

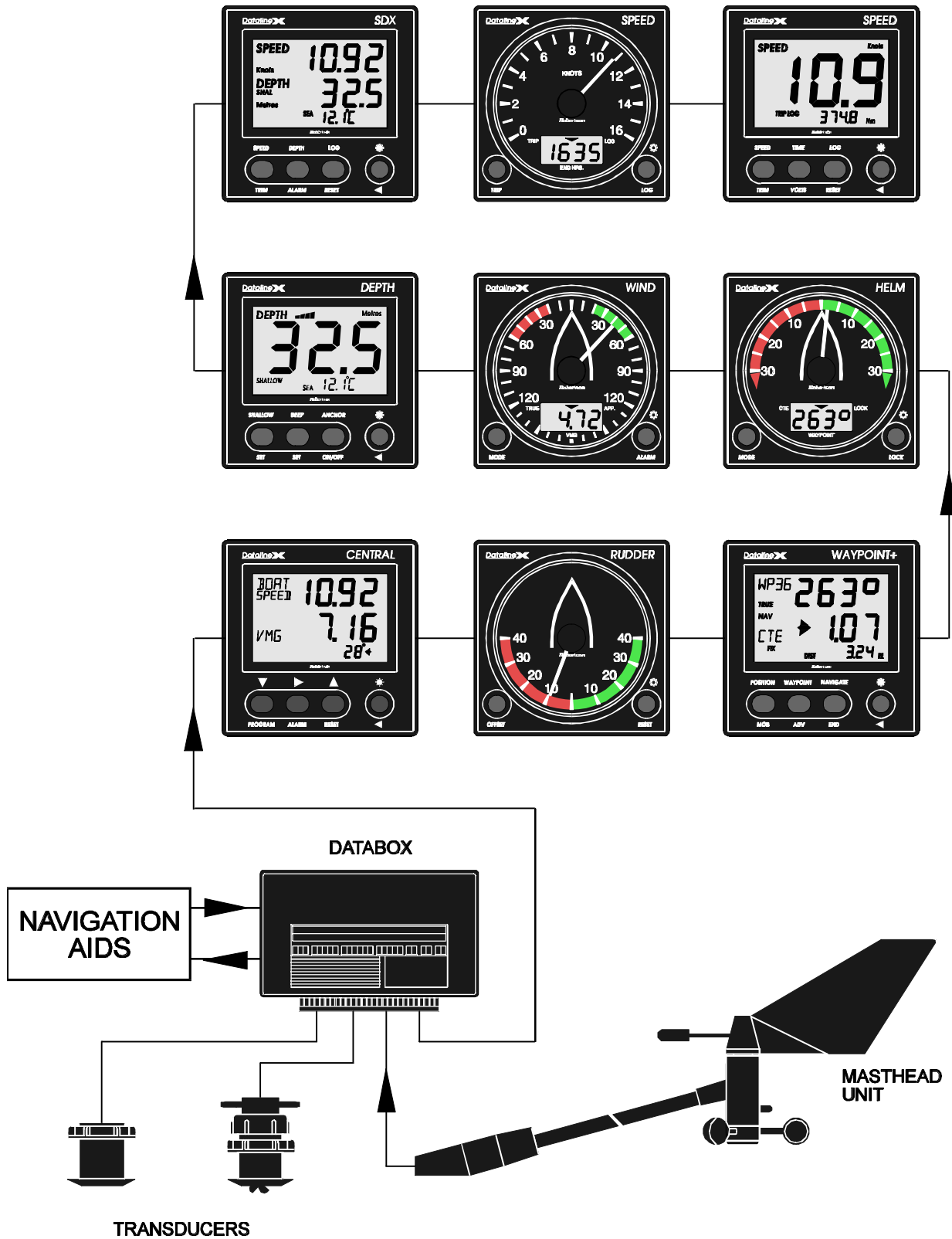


Figure 1.1 Dataline-X System Diagram

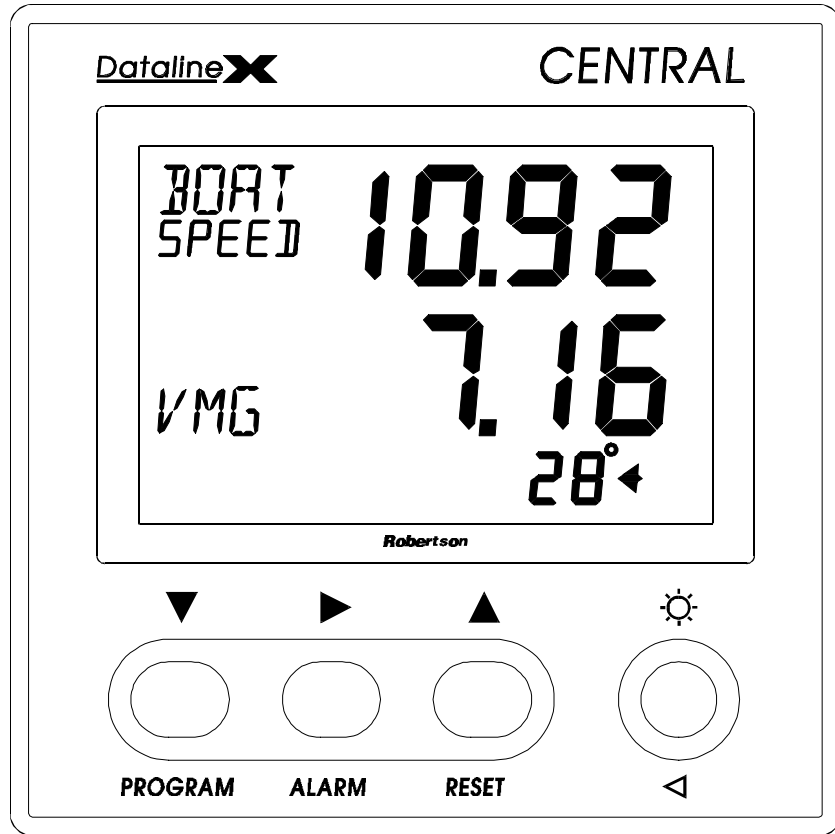


Figure 1.2 Dataline-X CENTRAL Instrument

**1.2 Dataline-X CENTRAL Specification**Speed Functions

Speed Display	0 to 99.9 Knots (See Note 1)
Speed Units	Knots
Speed Precision	0.1 Knots
Speed Damping	1 fixed damping level
Average Speed Display	(over trip distance)
Speed Trim	(changes in speed to 0.1 Knots)
Speed Over Ground Display	(with suitable Navigation Receiver input)

Depth Functions

Depth Display	0 to 300 metres (See Note 2)
Depth Units	Metres
Depth Precision	0.1 metres, 0.1 feet, 0.1 fathoms
Depth Alarms	Deep, Shallow and Anchor Alarm
	On/Off Controls (See Note 3)
Sounder On/Off Control	Switches the Databox Sounder On or Off

Sea Temperature Functions

Sea Temperature	-10 to +40° C
Sea Temperature Units	°C
Sea Temperature Precision	0.1°C

Heading Functions

Heading Display (Digital)	0 to 359° (See Note 4)
Heading Precision	1°
Heading Reference	True or Magnetic North (See Note 5)

'Autopilot' Functions

Autopilot Course Display	0 to 359° (See Note 4)
Autopilot Set Course Precision	1°
Autopilot Display Compatibility	Standard NMEA Sentence Used

True and Apparent Wind Angle Functions

Wind Angle Display	0 to 180° Port / Stbd
Wind Angle Precision	1°
Wind Angle Damping	1 fixed damping level

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Wind Direction

0 to 360° Mag / True

**True and Apparent Wind Speed Functions**

Wind Speed Display	0 to 99.9 Knots
Wind Speed Units	Knots
Wind Speed Precision	0.1 Knots
Wind Speed Damping	1 fixed damping level
True Wind Speed Alarms	On/Off Control on three alarms

**Velocity Made Good (VMG) Functions**

VMG Display	0 to 99.9 Knots
VMG Units	Knots
VMG Precision	0.1 Knots
VMG Damping	1 fixed damping level

**Log Functions**

Log	To 9999 NM (permanently saved)
Trip Log	To 9999 NM (resettable/saved)
Race Log	To 999.9 NM (over race distance)
Log Units	Nautical Miles
Log Precision	1, 0.1 or 0.01 units as appropriate (4 digits)

**Timing Functions**

Passage Time	0 to 99.59 hours (rolls over to zero / resettable)
Race Timer	10 and 5 minute countdown

**Position Functions**

Course Over Ground (COG)	0 to 359°
COG Precision	1°
Speed Over Ground (SOG)	0 to 99.9 Knots
SOG Precision	0.1 Knots
Local Time	24 Hour Clock, Hours and Minutes

**Waypoint Functions**

Waypoint Identity	4 Alpha-Numeric characters
Waypoint Bearings	0 to 359° (True or Magnetic)
Waypoint Bearing Precision	1°
Waypoint Distance	0 to 9999 NM
Waypoint Distance Precision	1, 0.1, or 0.01 NM as appropriate (4 digits)

### Navigation Functions

Cross Track Error (CTE)	0 to 999 NM (See Note 4)
CTE Precision	1, or 0.1 NM as appropriate (3 digits)
Direction to Steer	Port or Starboard Arrow (See Note 6)

### Additional Functions

Engine Hour Counts (2 inputs)	0 to 9999 hours, to 0.1 hour
Battery Voltage (2 inputs)	0 to 30V, $\pm 0.1V$ (See Note 7)
Display Backlighting Levels	Seven levels plus Off
Display Backlighting Colours	Three colours, (Red, Green, Yellow)
Display Backlighting Control	Two independent lighting banks.
External Alarm Drive	(via Databox)
Sat Nav Output	(via Databox)

### General

Power Requirement	10 to 16V, 14 mA, (50 mA max with lighting)
Size	110 x 110 x 18 mm (above panel)
Mounting Hole Size	50 mm (2 inches)
Total Depth Below Panel Front	32 mm
Weight	210 grams
Environmental Rating	IP65
Temperature Range	0°C to 70°C

### Alternative Transducers

If any of the system transducers are not fitted to the Databox, but there is alternative speed, depth, wind, log, or sea temperature NMEA data being transmitted from another sensor to the Databox, then this alternative data will be used.

### Programmable Power Up Screen

The display screen that is selected on power up may be programmed by the user to any one of the available screens.

## Notes:

1. The maximum speed and speed precision given relate to the display, the speed transducer installed will determine the actual maximum speed and precision for the system.
2. The maximum depth and depth precision given relate to the display, the depth transducer installed and sea conditions will determine the actual maximum depth and precision for the system.
3. The alarm values are all set by other instruments, although the CENTRAL may turn each of the alarms On or Off. The anchor alarm does not monitor the depth for a minimum or maximum value, but sounds if the change in depth exceeds a set rate. This can be used together with one or both of the shallow and deep alarms, if desired.
4. The Heading, Autopilot, and Navigational values and functions given relate to the display, the Heading Sensor, Autopilot and Radio Navigator installed will determine the actual values and functions.
5. All Headings and Bearings may be referenced to either True or Magnetic North. If True North is selected, and True data is not directly available then the local magnetic variation will be used to convert the data if it is being received from the Navigation Receiver.
6. If the vessel is off course by more than 0.01 NM, the appropriate off course arrow will be shown on the Cross Track Error display, even though the numeric display does not show errors of less than 0.1 NM.
7. The battery voltage range is dependent on the power supply voltages supplied to the Databox - i.e., the 12 volt Databox will measure over the range 10V to 16V, while the 24 volt Databox will measure over the range 20V to 30V.

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## 2.1 General Description

The LCD display is generally controlled by the three oval buttons. These buttons move up, down, or sideways through the groups of display screens that are available.

### 2.1.1 The LCD Display

The LCD is divided into three sections, known as sub-screens. The top two sections are the main display, while the smaller, lower, section shows additional data. All data is described by legends located to their left. In addition, there are a number of general information legends.

### 2.1.2 The Buttons

The word above the button (in white) indicates the main function for that button.

The word below the button (in grey) indicates an additional function which can only be selected when that button is used in conjunction with the round \* button. Both must be pressed together.

For some functions, such as setting the display backlighting with the round button, the button must be held for greater than 3 seconds.

When a function has been selected, a BEEP will be heard to confirm correct operation

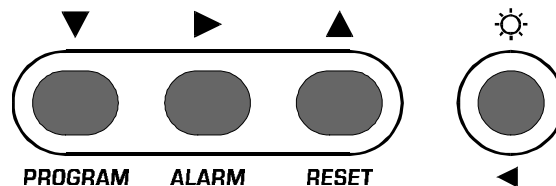


Figure 2.1 The Buttons

The data screens of the CENTRAL instrument are arranged in a 'table'. This consists of a number of groups of screens, each group being a logical collection of useful screens. A particular group is selected by moving 'up' or 'down' through the table using the ↑ and ↓ buttons. The ⇒ button is then used to scroll 'sideways' through the screens in the selected group. When moving 'up' or 'down' to a new group the first display will be the last one accessed in that group.

### 2.2 Powering Up

When powering up the instrument, it will beep and will show all the LCD segments for approximately half a second.

The display will then show the user pre-programmed start-up screen with the desired data being displayed if it is available.

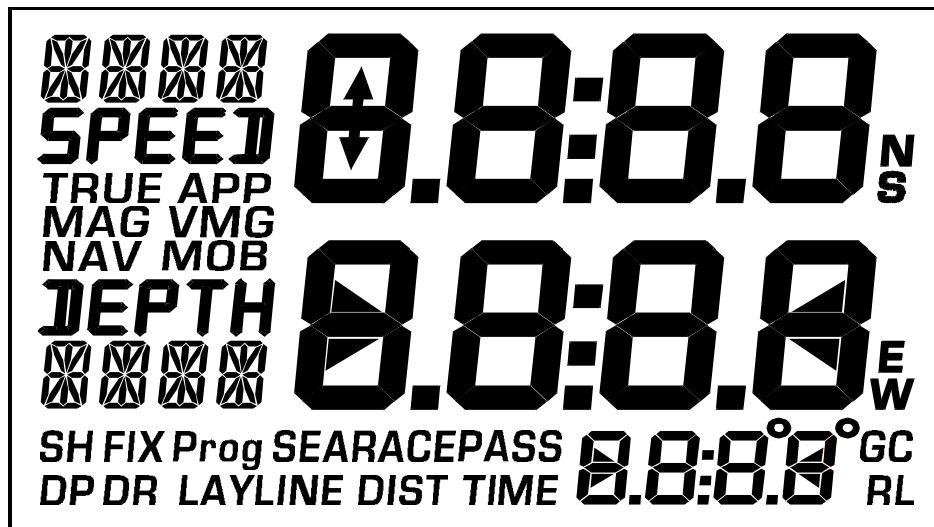


Figure 2.2 The Display on Power Up

**2.3 The Table of Display Screens**

The data screens of the CENTRAL instrument are arranged in a ‘table’ as below. To access the screens you move ‘up’ or ‘down’ through the table using the ↑ and ↓ buttons, and move ‘sideways’ through the table with the ⇨ button. When moving ‘up’ or ‘down’ to a new group the first display will be the last one accessed in that group.

	⇨ Screen 1	⇨ Screen 2	⇨ Screen 3	⇨ Screen 4
↑ Screen Group 8 ↓	Permanent Log Trip Log Passage Time			
↑ Screen Group 7 ↓	Waypoint Bearing CTE Waypoint Dist.	Waypoint Bearing COG Waypoint Dist.	SOG COG Local Time	
↑ Screen Group 6 ↓	Engine Hours 1 Battery Volts 1	Engine Hours 2 Battery Volts 2		
↑ Screen Group 5 ↓	Race Time (10:00) Race Log Local Time	Race Time (5:00) Race Log Local Time		
↑ Screen Group 4 ↓	App. Wind Speed App. Wind Angle Wind Direction	True Wind Speed True Wind Angle Wind Direction		
↑ Screen Group 3 ↓	Boat Speed VMG App. Wind Angle	Trim Speed VMG App. Wind Angle	App. Wind Speed VMG App. Wind Angle	
↑ Screen Group 2 ↓	Boat Speed Depth Heading / COG	Boat Speed Depth Autopilot Course		
↑ Screen Group 1 ↓	Boat Speed Depth Sea Temperature	Average Speed Depth Sea Temperature	Trim Speed Depth Sea Temperature	SOG Speed Depth Sea Temperature

Figure 2.2 The Table of Display Screens

Notes:

1. If any data is not available then “----” will be displayed in place of it in the appropriate screen(s).
2. Until the instrument is re-programmed the first display on Power Up will be Group 1, Sub-Screen 1; Boat Speed, Depth, and Sea Temperature.
3. The ⇨ button loops the screens around from the end of each group back to the start, and the ↑ and ↓ buttons loop around directly from group 1 to group 8.

**2.4 Screen Group 1 - Speed, Depth and Sea Temperature**

	⇨ Screen 1	⇨ Screen 2	⇨ Screen 3	⇨ Screen 4
⇧ Screen Group 1 ⇩	Boat Speed Depth Sea Temperature	Average Speed Depth Sea Temperature	Trim Speed Depth Sea Temperature	SOG Speed Depth Sea Temperature

There are four screens in this group:-

The upper sub-screen displays a Speed, which changes between each screen.

The middle sub-screen always displays the Depth of the water.

The lower sub-screen always displays the Sea Temperature.

Notes:

1. If the Databox depth transducers echo signal is lost, the Depth display will flash the last good echo value, unless there is an alternative input to the Databox, in which case this data will be shown.
2. The Average Speed is calculated as the distance covered by the boat since power up or when the Passage Time was last reset, divided by the Passage Time (See Part 2.11.).
3. The Trim Speed is the difference in speed between the present Boat Speed and the target speed.
4. The Trim Speed will only be indicated if it has been reset, until that time it will show '----'.
5. The Speed Over Ground (SOG) will only be shown if a suitable Navigation Receiver input is present.

**2.4.1 To Reset The Trim Speed**

The Trim Speed may be reset at any time, as below:-

1. Use the ⇧, ⇩, and ⇨ buttons to select either of the two display screens that show the Trim Speed.

2. Press the RESET and < buttons together. This will set the target speed as the current speed. The Trim Speed displays will then show changes from this.

## 2.5 Screen Group 2 - Speed, Depth and Heading / Autopilot Course

	⇨ Screen 1	⇨ Screen 2	⇨ Screen 3	⇨ Screen 4
↑ Screen Group 2 ↓	Boat Speed Depth Heading / COG	Boat Speed Depth Autopilot Course		

There are two screens in this group:-

The upper sub-screen always displays the Boat Speed.

The middle sub-screen always displays the Depth of the water.

The lower sub-screen displays the Heading or the Autopilot's Set Course.

Notes:

1. The Heading and the Autopilot's Set Course may be referenced to either Magnetic or True North. Note however that this selection will set the reference for all the bearings that are shown by the instrument, including the Waypoint Bearing, the Course Over Ground, and the Wind Direction. (See Part 4 for selection details.)
2. If only one type of data is available, and the other data is required, the instrument can convert from one to the other. The conversion can be made if the local magnetic variation is being read in from a Radio Navigator. This may for instance enable the display of True data when only a Magnetic referenced Heading Sensor is available.
3. If no Heading data is available, but the Course Over Ground is available, then the Course Over Ground will be shown instead.

**2.6 Screen Group 3 - Speed, VMG and Apparent Wind Angle**

	⇨ Screen 1	⇨ Screen 2	⇨ Screen 3	⇨ Screen 4
↑ Screen Group 3 ↓	Boat Speed VMG App. Wind Angle	Trim Speed VMG App. Wind Angle	App. Wind Speed VMG App. Wind Angle	

There are three screens in this group:-

The upper sub-screen displays a Speed, which changes between each screen.

The middle sub-screen always displays the Velocity Made Good (VMG).

The lower sub-screen always displays the Apparent Wind Angle.

Notes:

1. The VMG display shows the Velocity Made Good into the wind, this is shown as a positive speed if the vessel is travelling upwind, and as a negative speed if the vessel is travelling downwind.
2. The wind is travelling in the direction of the arrow shown on the Apparent Wind Angle display.
3. The Trim Speed is the difference in speed between the present Boat Speed and the target speed. This will only be indicated if it has been reset, until that time it will show '----'.

## 2.7 Screen Group 4 - Wind Speed, Wind Angle and Wind Direction

	⇨ Screen 1	⇨ Screen 2	⇨ Screen 3	⇨ Screen 4
↑ Screen Group 4 ↓	App. Wind Speed App. Wind Angle Wind Direction	True Wind Speed True Wind Angle Wind Direction		

There are two screens in this group:-

The upper sub-screen displays the Apparent or True Wind Speed.

The middle sub-screen displays the Apparent or True Wind Angle.

The lower sub-screen always displays the Wind Direction.

Notes:

1. The wind is travelling in the direction of the arrow shown on the Apparent and True Wind Angle displays.
2. If there is Heading data available then the Wind Direction is calculated from this. In this case the wind direction given is the effective wind direction over the water. The display will be most accurate after a period on one heading, however it will respond rapidly to course changes.
3. If there is no Heading data, but Course Over Ground data is available then the Wind Direction is calculated from the Course Over Ground. In this case there is compensation for the tide, and the wind direction given is the effective wind direction over the ground. However the display will not be accurate after a course change, and will require a period on one heading before it is correct. (In addition, any errors in the Navigation Receiver's fix will degrade the accuracy of the wind direction.)
4. The Wind Direction may be referenced to either Magnetic or True North as selected for the Heading, and, as for the Heading, the data can be converted from one to the other if the local magnetic variation is available. (See Part 4 for selection details.)
5. Note that the 'TRUE' and 'APP' symbols that are shown in this group of screens relate to the Wind Speed and Angle, and not the Wind Direction.

**2.8 Screen Group 5 - Race Time, Race Log and Local Time**

	⇨ Screen 1	⇨ Screen 2	⇨ Screen 3	⇨ Screen 4
↑ Screen Group 5 ↓	Race Time (10:00) Race Log Local Time	Race Time (5:00) Race Log Local Time		

There are normally two screens in this group:-

The upper sub-screen normally displays the Race Timer start time,  
- either five or ten minutes.

The middle sub-screen displays the Race Log,  
- which is zero when the Race Timer is not started.

The lower sub-screen always displays the Local Time.

Notes:

1. When the Race Timer is running there is only one screen in this group, which shows the actual Race Time count in place of the start times.
2. When the Race Timer is counting down towards the race start time all of the other display screens show the Race Timer in place of their normal lower sub-screen. Then when the race has started these displays return to normal.
3. The Race Log gives the distance covered after the race start time.
4. The Race Log is reset if the system is turned off, or if the Race Time is reset.
5. The Local Time display is only given if a suitable GPS data input is available. The GPS system runs on Universal Co-Ordinated Time (UTC), which is the same as Greenwich Mean Time (GMT). This can be corrected to Local Time, (See Part 4).
6. The Local Time display gives the time of the day in 24 hour format.

**2.8.1 To Start The Race Timer**

The Race Timer may be started at any time, as below:-

1. Use the ↑, ↓ and ⇨ buttons to select the Race Time and Race Log display screen, with either the ten minute or five minute start time as required.

2. Start the timer by pressing the \* button. The timer will count down with audible alarms at times as below:-

5 minutes	BEEP	BEEP BEEP
1 minute	BEEP	BEEP
5 seconds	BEEP	
4 seconds	BEEP	
3 seconds	BEEP	
2 seconds	BE.....EP	→ GO

### **2.8.2 To Freeze the Race Timer**

The Race Timer may be frozen and restarted at any time that it is running, before or after the start of a race, as below:-

1. Use the ↑, and ↓ buttons to select the Race Time and Race Log display screen.
2. Press the \* button to freeze the Race Time display.
3. Press the \* button a second time to show the running Race Timer again.

Notes:

1. If the Race Time display is frozen after the start of the race the timer itself will continue to count, so that when the display is unfrozen the count is unaffected.
2. If the Race Time display is frozen before the start of the race the timer will stop counting, so that when the display is unfrozen it carries on from the displayed time, delayed from its original start time.
3. The Race Log is unaffected by freezing the Race Time.

### **2.8.3 To Reset the Race Timer and Race Log**

The Race Timer may be stopped and reset at any time that it is running, before or after the start of a race, as below:-

1. Use the ↑, and ↓ buttons to select the Race Time and Race Log display screen.

- 
2. Press the RESET and < buttons together to reset the Race Time to the previous start time and to reset the Race Log to zero.

**2.9 Screen Group 6 - Engine Hours and Battery Voltage**

The displays that are available in this group depend on the set up of the 'AUX' and 'IGN' terminals on the Databox. This set up is done by other instruments in the Dataline-X system, but the options are as below:-

- Option 1.
  - i) Two Engine Hour Inputs.
  - ii) Two Battery Voltage measurements, one for each engine's battery bank.
  - iii) No Sat Nav Output.
  
- Option 2.
  - i) One Engine Hour Input.
  - ii) Two Battery Voltage measurements.
  - iii) No Sat Nav Output.
  
- Option 3.
  - i) One Engine Hour Input.
  - ii) One Battery Voltage measurement.
  - iii) Sat Nav Output active.

Notes:

1. The Battery voltage range is dependent on the power supply voltages supplied to the Databox - i.e., the 12 volt Databox will measure over the range 10V to 16V, while the 24 volt Databox will measure over the range 20V to 30V.
  
2. The Dataline-X system does not need to be powered in order to record the engine run time. As long as the Engine Hour Counter input is above 10 Volts when the engine is running, this will always be recorded.

The three possible sets of displays in this group are as below:-

**2.9.1 Screen Group 6 - Option 1  
- Two Engine Hours and Two Battery Voltages**

	⇨ Screen 1	⇨ Screen 2	⇨ Screen 3	⇨ Screen 4
↑ Screen Group 6 ↓	Engine Hours 1 Battery Volts 1	Engine Hours 2 Battery Volts 2		

There are two screens in this option:-

The upper sub-screen displays Engine Hours 1 or Engine Hours 2.

The middle sub-screen displays Battery Volts 1 or Battery Volts 2.

The lower sub-screen is always blank.

**2.9.2 Screen Group 6 - Option 2  
- One Engine Hours and Two Battery Voltages**

	⇨ Screen 1	⇨ Screen 2	⇨ Screen 3	⇨ Screen 4
⇧ Screen Group 6 ⇩	Engine Hours Battery Volts 1	Battery Volts 2		

There are two screens in this option:-

The upper sub-screen displays the Engine Hours or is blank.

The middle sub-screen displays Battery Volts 1 or Battery Volts 2.

The lower sub-screen is always blank.

**2.9.3 Screen Group 6 - Option 3  
- One Engine Hours and One Battery Voltage**

	⇨ Screen 1	⇨ Screen 2	⇨ Screen 3	⇨ Screen 4
⇧ Screen Group 6 ⇩	Engine Hours Battery Volts			

There is one screen in this option:-

The upper sub-screen always displays the Engine Hours.

The middle sub-screen always displays the Battery Volts,  
- the engine ignition battery.

The lower sub-screen is always blank.

**2.10 Screen Group 7 - Waypoint and Navigational Data**

	⇨ Screen 1	⇨ Screen 2	⇨ Screen 3	⇨ Screen 4
↑ Screen Group 7 ↓	Waypoint Bearing CTE Waypoint Dist.	Waypoint Bearing COG Waypoint Dist.	SOG COG Local Time	

There are three screens in this group:-

The upper sub-screen displays the SOG or Waypoint Bearing.

The middle sub-screen displays the COG or Cross Track Error.

The lower sub-screen displays the Local Time or Waypoint Distance.

Notes:

1. The Course Over Ground (COG) and Waypoint Bearing displays may be referenced to True or Magnetic. The selection is shown as 'TRUE' or 'MAG' on the display. (See Part 4 for True / Magnetic set up details.)
2. The Local Time display is only given if a suitable GPS data input is available. The GPS system runs on Universal Co-Ordinated Time (UTC), which is the same as Greenwich Mean Time (GMT). This can be corrected to Local Time. (See Part 4 for correction details.)
3. The Waypoint ID will show the first 4 characters at the selected / current destination. e.g. 99 will show 'WP99', or 1000 will show '1000'. NEEDLES will show 'NEED'.
4. The Cross Track Error direction to steer arrow indicates the direction to steer in order to regain the original track. This may not be the direction to steer directly to the Waypoint, but may be important for safety reasons; for instance, if the track passes close to shoals, or a restricted area.
5. The Cross Track Error direction to steer is shown for any error of greater than 0.01 NM, even though the CTE display itself does not show errors of less than 0.1 NM. If there is less Cross Track Error than 0.01 NM then both direction to steer arrows are shown.

6. The data will be from Rhumb Line or Great Circle calculations as selected. 'RL' or 'GC' is shown to indicate which. (See Part 4 for selection details.)
7. When the instrument is receiving a valid position fix, 'FIX' will be shown on the display in this group of display screens.

**2.11 Screen Group 8 - Permanent Log, Trip Log and Passage Time**

	⇨ Screen 1	⇨ Screen 2	⇨ Screen 3	⇨ Screen 4
⇧ Screen Group 8 ⇩	Permanent Log Trip Log Passage Time			

There is one screen in this group:-

The upper sub-screen always displays the Permanent Log.

The middle sub-screen always displays the Trip Log.

The lower sub-screen always displays the Passage Time.

Notes:

1. The Permanent Log is the total distance traveled by the vessel, it cannot be reset.
2. The Trip Log can be reset, but is not lost when the system is turned off.
3. The Passage Time is the time since the system was powered up or since it was last reset.
4. The Average Speed display is the average speed during the time given by the Passage Timer. (See Part 2.4.)

**2.11.1 To Reset The Passage Time to Zero**

The Passage Time may be reset at any time, as below:-

1. Use the ⇧ and ⇩ buttons to select the Permanent Log, Trip Log, and Passage Time display screen.

2. Press the RESET and < buttons together briefly. The Passage Time will be reset.

### **2.11.2 To Reset The Trip Log to Zero**

The Trip Log may be reset together with the Passage Time at any time, as below:-

1. Use the ↑ and ↓ buttons to select the Permanent Log, Trip Log, and Passage Time display screen.
2. Press the RESET and < buttons together. This will initially reset the Passage Time. Keep the buttons held down for three seconds more and the Trip Log will also be reset.

Notes:

1. The Trip Log is system wide, resetting it on this instrument will reset it across the whole system.

### **2.12 The Depth Alarms, and the Depth Sounder On / Off Control**

When an alarm is triggered it flashes a warning on the lower sub-screen, and the instrument beeps. In order to cancel the alarm sound and to return the lower sub-screen to normal, press any button.

The symbols that are shown on the lower sub-screen when an alarm is triggered are as below:-

'SHAL' = The Shallow Water Alarm.  
'dEEP' = The Deep Water Alarm.  
'ANCH' = The Anchor Watch Alarm.

'HI 1' = The High Wind Speed Alarm 1.  
'HI 2' = The High Wind Speed Alarm 2.  
'HI 3' = The High Wind Speed Alarm 3.

Note: All alarm values are set by other instruments in the Dataline-X system.

**2.12.1 To Set The Shallow Alarm On or Off**

The Shallow Water Alarm may be set On or Off at any time, as below:-

1. Press the ALARM and < buttons together, “SHAL ALRM SET ON (or OFF)” is displayed.
2. Use the ⇨ button to select ON or OFF as desired.
3. Return to the main display by pressing the \* button.

**2.12.2 To Set The Deep Alarm On or Off**

The Deep Water Alarm may be set On or Off at any time as long as it has a value entered, as below:-

1. Press the ALARM and < buttons together.
2. Press the ↑ button once until “DEEP ALRM SET ON (or OFF)” is displayed.
3. Use the ⇨ button to select ON or OFF as desired.
4. Return to the main display by pressing the \* button.

**2.12.3 To Set The Anchor Alarm On or Off**

The Anchor Watch Alarm may be set On or Off at any time, as below:-

1. Press the ALARM and < buttons together.
2. Press the ↑ button twice until “ANCH ALRM SET ON (or OFF)” is displayed.
3. Use the ⇨ button to select ON or OFF as desired.
4. Return to the main display by pressing the \* button.

**2.12.4 To Set The High Wind Speed Alarm On or Off**

The High Wind Speed Alarm may be set On or Off at any time, as below:-

1. Press the ALARM and < buttons together.
2. Press the ↓ button twice until “WIND ALRM SET ON (or OFF)” is displayed.
3. Use the ⇒ button to select ON or OFF as desired.
4. Return to the main display by pressing the \* button.

**2.12.5 To Set The Depth Sounder On or Off**

In certain circumstances, e.g., to save power in known waters or out of depth range, it may be desirable to turn the depth sounder off. This may be done as follows:

1. Press the ALARM and < buttons together.
2. Press the ↓ button once until “DPTH TDX SET ON (or OFF)” is displayed.
3. Use the ⇒ button to select ON or OFF as desired.
4. Return to the main display by pressing the \* button.

Notes:

1. When the Depth Sounder is turned Off the Depth Display shows ‘OFF’, unless there is an alternative NMEA Depth input to the Databox, in which case this alternative Depth will be shown.
2. On power up, the sounder is always On.

### 2.13 To Program The Power Up Display Screens

The CENTRAL instrument power up screen can be selected and programmed from any of the screens described in section 1. The initial screen for each group can be similarly programmed.

For instance, if it is desired to have the first screen after power up to be Apparent Wind Speed, VMG, and Apparent Wind Angle, instead of Boat Speed, Depth, and Sea Temperature, then this can be done. Also if the first screen in the next group is desired to be the True Wind Speed, True Wind Angle, and Wind Direction, instead of the Apparent Wind Speed, Apparent Wind Angle, and Wind Direction, then this can be done.

In order to set the power up display screens, carry out the process below:-

1. Use the ↑, ↓, and ⇌ buttons to set all of the groups to the screen that you wish to be first in each group.
2. Use the ↑, ↓, and ⇌ buttons to select the particular screen that you wish to be displayed on power up.
3. Press the PROGRAM and < buttons together.
4. The symbol 'Prog' will light on the display for five seconds to show that the screens have been programmed.

**The power up display screens have now been programmed.**

### 2.14 To Set The Display Backlighting

The Display Lighting Level may be set at any time other than when the Race Timer, Race Log, and Passage Time display screen is selected, as below:-

1. Press the ★ button and hold. The display backlighting will change from 0 to level 7, then level 6, then level 5, and so on to level 0. If the button is still held, the level will then increase back to 7 again.

2. At the desired display backlighting, release the \* button. This will set the lighting on ALL displays on the Dataline-X system which are in the same Lighting Bank. The Dataline-X system has two lighting banks, so that the internal lighting on a power boat may be set differently to that on the flybridge, or the cockpit lighting may be set differently to the chart table or mast display lighting on a yacht. All displays are supplied set to bank 1. (See Part 4 for the bank set-up information.)

CONTENTS

- 3.1 General
- 3.2 Installation of the Instrument
- 3.3 Choosing the Cable Routes
- 3.4 Securing the Cable

3.1 General

The instrument head is fully waterproof and can, therefore, be installed on deck or below. The connections should be protected from water penetration and should, if possible, allow rear access to remove the desiccant pack, if required. The position selected should, in the first instance, meet the requirements of the helmsman, or crew.

The selected surface for the instrument head must be flat and even to within 0.5 mm.

Before installation, note the Serial Number of the unit and keep it in a safe place.

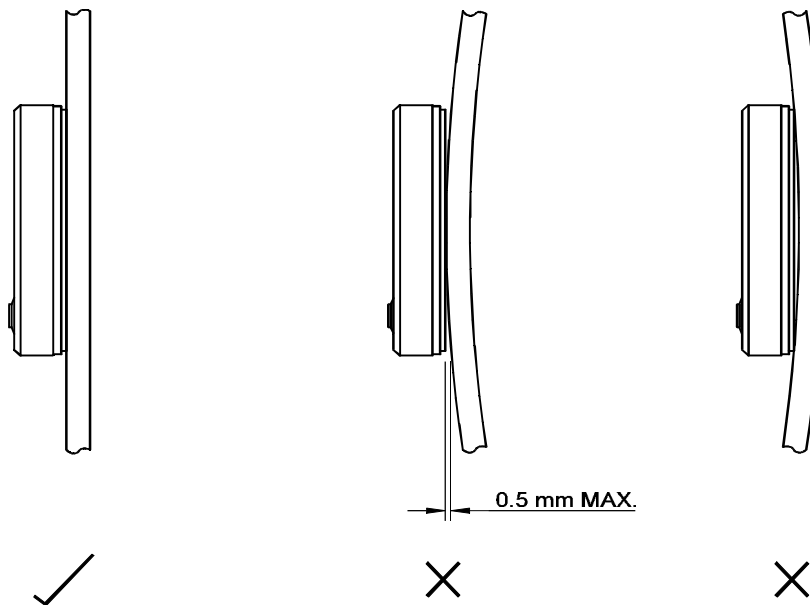


Figure 3.1 - Installation

### 3.2 Installation of the Instrument

1. Carefully position the self-adhesive template provided on the surface where the instrument is to be mounted.
2. Drill a small pilot hole first, and then check to location on the other side of the panel or bulkhead to confirm suitability.
3. Open out the pilot hole to 50 mm (2 ins.) using a cutter in a hand-held brace, or electric drill.
4. Drill the four fixing holes using a 2.5 mm (3.32 ins.) drill.

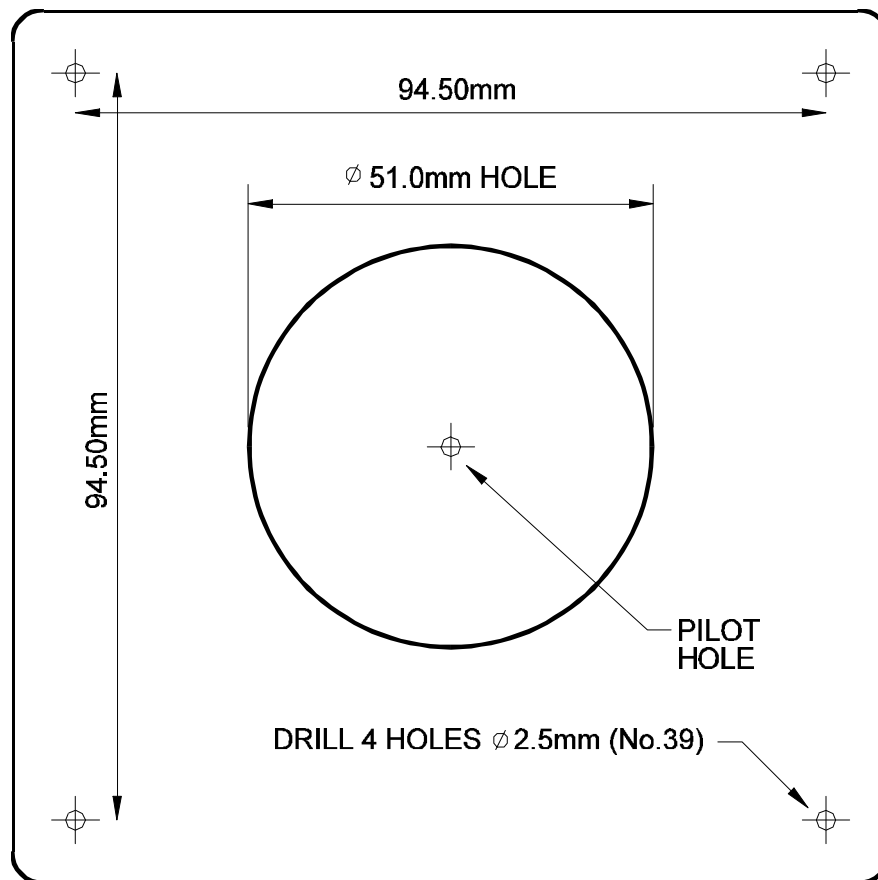


Figure 3.2 - Mounting Details (Not To Scale)

5. The instrument should next be wired into the system. The wiring should be carried out as in the 'Choosing the Cable Routes' and 'Securing the Cable' Sections below.
  - a. If the instrument is being connected to a Dataline-X system, then connect it to the Dataline wire. This can normally be done simply by using the 'Dataplug' connector and cable supplied to connect the display to the Databox or to any adjacent display.

If the cable routing cannot be made with the Dataplug connector attached, then simply disconnect it from the cable. The cable may then be run through holes of down to 6 mm (0.25 ins.) diameter before reconnecting the Dataplug connector, making sure that the colours are correctly wired to the terminals. The correct positions for the different coloured wires are shown on the rear label of the instrument.

- b. If the instrument is being connected to another instrument system then the connections are as below:-

Red = +12V Power In (Fused 1A).  
White = NMEA Signal In (A / + / Positive).  
Brown = Not Connected  
Green = NMEA Reference In (B / - / Negative).  
Black = 0V Power In.

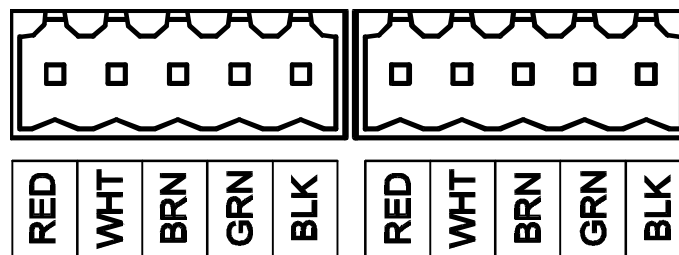


Figure 3.3 - Electrical Connections

6. Check that the instrument functions correctly.
7. Temporarily disconnect the Dataplug connectors and coat the terminals and wires with silicone grease or petroleum jelly. These products will not harm the instrument.
8. Make sure the 'dovetail lugs' are free from grease and securely located into the rear of the instrument when replacing the Dataplugs.

9. Secure the instrument using the four, No. 4 self-tapping screws

**CAUTIONS**

DO NOT OVER-TIGHTEN FIXING SCREWS.

DO NOT USE SEALING COMPOUND ON THE INSTRUMENT BACK.

DO NOT USE WD40 OR ANY SOLVENT ON ANY PART OF THE INSTRUMENT.

- provided. Ensure that the sealing gasket is correctly located.
10. Replace the front cover, the installation of the instrument is complete.

### **3.3 Choosing the Cable Routes**

After you have decided on the system and started to mount the components of the Dataline-X System, the next step in the installation process is to route the cables between the various parts of the system and to the power supply. When routing the cables, choose the most direct paths while avoiding the following hazards:-

- Sharp Bends or Kinks in the Cable
- Hot Surfaces (Exhaust Manifolds or Cooking Equipment)
- Rotating or Reciprocating Equipment
- Sharp or Abrasive Surfaces
- Door and Window Jambs
- Corrosive Fluids or Gases

### **3.4 Securing the Cable**

After the ideal cable routing has been established, use tie-wraps, 'P'-clips or other fixings to secure the cables along the routings.

Notes:

1. Install protection for the cable jackets where the cables pass through bulkheads, or past sharp edges. This will prevent chafing of the cables.
2. Secure the cable near to the terminals. This serves as a strain relief.

3. Secure the cable ends with enough slack to allow for easy connection.
4. Cut any spare wire ends to an appropriate length.

## CONTENTS

- 4.1 System Calibration
- 4.2 Calibration Mode
- 4.3 Lighting Colour Selection
- 4.4 Lighting Bank Selection
- 4.5 LCD Contrast Setting
- 4.6 Rhumb Line or Great Circle Navigation Selection
- 4.7 Magnetic or True Bearings Selection
- 4.8 Local Time Offset From UTC
- 4.9 Software Code Version Display

### 4.1 System Calibration

After installation, the system may be set up for the desired displays. No calibration or set ups may be made for the Speed, Depth, Wind, or Heading Sensors however. These set ups need to be done from other Dataline-X instruments.

### 4.2 Calibration Mode

To enter Calibration Mode press the ↓ and ↑ buttons together, and hold for more than 3 seconds, until 'LItE' is shown on the display.

For each successive press of the ↑ button, the instrument will step through the calibration menu. To step through backwards, press the ↓ button.

The menu function may be changed immediately by pressing the ⇒ button, or this may cause the value to flash, depending on the function.

The ↓ and ↑ buttons may be used to decrement and increment values which are flashing. When the value is correct, press the ⇒ button again to save it.

Depressing the \* button will return the instrument to its normal working mode.

The following calibration functions are available:

- Lighting Colour (select Yellow, Red or Green)
- Lighting Bank (select Bank One or Bank Two)\*
- Navigation Mode (select Rhumb Line or Great Circle)
- Bearings Reference (select Magnetic or True North)
- Local Time Offset from UTC/GMT (value entry,  $\pm$  12 hours)
- Software Version Display
- The options marked with '\*' perform no function if the instrument is not part of a Dataline-X system.

### **4.3 Lighting Colour Selection**

This function enables the colour of the backlighting on the display to be set to Yellow, Red, or Green. This is independent of all other instruments.

1. Press the  $\Downarrow$  and  $\Uparrow$  buttons together, and hold for more than 3 seconds, until 'LItE' is shown on the display.
2. The display should indicate the current lighting colour as either 'rEd', 'Grn', or 'YEL', and will light to show this.
3. Press the  $\Rightarrow$  button to change to the desired colour, 'rEd' (Red), 'Grn' (Green) or 'YEL' (Yellow).
4. Return to the main display by pressing the  $\star$  button, or use the  $\Downarrow$  and  $\Uparrow$  buttons to select the next calibration function.

### **4.4 Lighting Bank Selection**

The Dataline-X instrument system can have two separate banks of instruments. Setting the lighting level on one instrument will set all the other instruments in that bank to the same level, but will not affect any instruments in the other bank. For instance, the lighting level can be independently controlled for:

1. The cockpit and chart table displays of a yacht.
2. The cockpit and mast displays on a yacht.

3. The cabin and flybridge of a motor yacht.

The lighting bank selection is independent of the display colour, so that instruments in the same bank may have different colours if desired.

1. Press the ↓ and ↑ buttons together, and hold for more than 3 seconds, until 'LItE' is shown on the display.
2. Press the ↑ button once until the display indicates 'BANK LItE-1-' (or 'BANK LItE-2-').
3. Select the required lighting bank, either 1 or 2, by pressing the ⇨ button.
4. Return to the main display by pressing the \* button.

#### **4.5 LCD Contrast Setting**

The LCD contrast level on this Dataline-X instrument can not be adjusted.

#### **4.6 Navigation Mode Selection**

Displayed navigation data may be set to either Rhumb Line or Great Circle. This is independent of all other instruments.

1. Press the ↓ and ↑ buttons together, and hold for more than 3 seconds, until 'LItE' is shown on the display.
2. Press the ↑ button twice until the display indicates 'NAV Set'.
3. Select the required navigation mode by pressing the ⇨ button. For Rhumb Line, 'RL' is shown, and for great Circle, 'GC' is shown.
4. Return to the main display by pressing the \* button.

Note: The user is advised to select Rhumb Line or Great Circle to be in agreement with the selection made on the Navigation Receiver. However, if the Receiver is set up for Great Circle Calculations, the instrument is able to compute Rhumb Line data.

#### **4.7 Bearing Reference Selection**

The displayed Bearings may be set to reference either Magnetic or True North. This is independent of all other instruments.

1. Press the ↓ and ↑ buttons together, and hold for more than 3 seconds, until 'LItE' is shown on the display.
2. Press the ↑ button 3 times until the display shows 'BRNG Set'.
3. Select the required Bearings by pressing the ⇨ button. For Magnetic Bearings 'MAG' is shown and for True Bearings 'TRUE' is shown.
4. Return to the main display by pressing the ★ button.

#### **4.8 Local Time Offset from UTC**

The display will show the local time if the time is received from an attached GPS. The GPS system works on 'Universal Co-Ordinated Time' (UTC), which is the same as 'Greenwich Mean Time' (or 'GMT'). So, to correct the time display, enter in the local time offset from GMT. For instance, the offset for British Summer Time is +1 hours. This is independent of all other instruments.

1. Press the ↓ and ↑ buttons together, and hold for more than 3 seconds, until 'LItE' is shown on the display.
2. Press the ↓ button twice, until the display indicates 'TIME 0 Hour' (or similar).
3. Press the ⇨ button to start to set the Local Time Offset, the value will start to flash.
4. Increase the value using the ↑ button, and decrease the value using the ↓ button.
5. When the value is correct return to the calibration menu by pressing the ⇨ button, and return to the main display by pressing the ★ button.

#### **4.9 Software Version Display**

The software version of the instrument may be checked as below:-

1. Press the ↓ and ↑ buttons together, and hold for more than 3 seconds, until 'LItE' is shown on the display.
2. Press the ↓ button once until the display indicates 'COdE 3.00' (or similar). The number shown is the software version, in this case, 3.00.

- 
3. Return to the main display by pressing the \* button.

**CONTENTS**

- 5.1 General
- 5.2 Fault Finding Chart
- 5.3 Removal of the Instrument
- 5.4 Return for Service

**5.1 General**

This instrument has been tested before shipment. However, installation conditions and procedures are outside the control of the manufacturer and can sometimes produce faults. The following check list is provided to assist the user in diagnosing such faults and suggests remedial action to be taken. For additional assistance, call your local dealer.

**5.2 Fault Finding Chart**

This chart assumes that the instrument is part of a Dataline-X instrument system. If it is connected to another instrument system then perform the equivalent checks on that system.

**General Display and Communications Faults**

<u>Condition</u>	<u>Probable Cause</u>	<u>Action</u>
All instruments have blank displays.	No 12V Power Supply.	<p>Check that the ships instrument system fuse(s) or circuit breaker(s) are not blown / tripped.</p> <p>Check the power supply wiring to the Databox.</p> <p>Check the 2.5A fuse inside the Databox. (This is the leftmost of the two fuses inside the Databox when it is viewed with the connectors at the lower edge, with the top cover removed. In order to remove the top cover to the Databox first remove the four screws in its corners.)</p> <p>Check the power supply wiring from the Databox to the instruments (the Red and Black 'Dataline' wires).</p> <p>Check for the Dataline-X instruments powering up, if not connected to the Databox, but directly to the power supply.</p> <p>Contact your dealer.</p>
One or more, but not all, instruments have blank displays.	There is no 12V power supply to the affected instrument (s).	<p>Check the power supply wiring to the affected instrument(s) (the Red and Black 'Dataline' wires). This is almost certainly the problem if more than one instrument is not functioning.</p> <p>Contact your dealer.</p>

<u>Condition</u>	<u>Probable Cause</u>	<u>Action</u>
All instruments always show '----', with the pointers of analogue instruments at their zero positions.	No data is reaching any of the instruments.	<p>Check that the battery voltage at the Databox Power Input terminals is greater than 10V.</p> <p>Check the signal wiring from the Databox to the instruments (the White and Green 'Dataline' wires). (If the lighting on any instrument can be controlled from another instrument then this is not the problem.)</p> <p>Contact your dealer.</p>
One or more, but not all, instruments always show '----', with the pointers of analogue instruments at their zero positions.	No data is reaching the affected instrument(s).	<p>Check the signal wiring to the affected instrument(s) (the White and Green 'Dataline' wires). This is almost certainly the problem if more than one instrument is affected. (If the lighting on any affected instrument can be controlled from another instrument then this is not the problem.)</p> <p>Contact your dealer.</p>
<p>All instruments show question marks on their display after they are used to set the lighting level, and the lighting level soon returns to Off, but other data is correct.</p> <p>Or:</p> <p>All instruments show question marks after setting any other data values.</p>	The lighting level or other data is not reaching the Databox.	<p>Check the return signal wiring to the Databox (the Brown 'Dataline' wire).</p> <p>Contact your dealer.</p>
<p>One or more instruments show question marks on their display after they are used to set the lighting level, and the lighting level soon returns to the previous level, but other data is correct, and other instruments can set the lighting level correctly.</p> <p>Or:</p> <p>One or more instruments show question marks after setting any other data values.</p>	The lighting level or other data is not reaching the Databox from the affected instrument(s).	<p>Check the return signal wiring from the affected instruments to the Databox (the Brown 'Dataline' wire).</p> <p>Contact your dealer.</p>

**Speed and Temperature Display Faults**

<u>Condition</u>	<u>Probable Cause</u>	<u>Action</u>
There are no Boat Speed or Sea Temperature displays, or these displays always show '----'.	The speed transducer is not connected to the Databox properly.	Check the speed transducer's connections to the Databox (especially the White and Yellow 'Speed' wires).  Check that the speed transducer cable is not damaged.  Contact your dealer.
The Boat Speed display always shows '0.0', but the Sea Temperature display is shown.	The speed transducer is not installed in the hull fitting.  The speed transducer is not connected to the Databox properly.  Jammed paddle wheel.  Damaged paddle wheel or transducer body.	Check, and replace the blanking plug with the transducer if necessary.  Check the speed transducers connections to the Databox (especially the Red, Blue and Black 'Speed' wires).  Check that the speed transducer cable is not damaged.  Clean the paddle wheel and transducer as required.  Check that the paddle wheel and transducer is not damaged, and that there are not 'holes' at the end of any of the paddle wheels vanes.  Contact your dealer.
The Boat Speed is too low, when it was previously correct.	Dirty paddle wheel or hull.  Damaged paddle wheel or transducer body.  The paddle wheel is not aligned fore / aft within the skin fitting.	Clean the paddle wheel and / or the hull as required.  Check that the paddle wheel and transducer is not damaged, and that there are not 'holes' at the end of any of the paddle wheels vanes.  Check, and if necessary turn the transducer within the skin fitting so that the cross pin is aligned with the centre line of the vessel.  Make other checks as for 'always showing 0.0' above.
The Boat Speed has always been too low or too high.	The speed transducer is not calibrated.	Calibrate the speed transducer. (Using another instrument.)  Make other checks as for 'the speed is too low when it was previously correct' above.

<u>Condition</u>	<u>Probable Cause</u>	<u>Action</u>
The Boat Speed is too low or too high and cannot be corrected by calibrating the speed transducer.	The hull form produces exceptionally low or high water speed over the paddle.	Check the siting of the speed transducer.  Contact your dealer.
The Boat Speed is different on each tack.	The hull form and transducer siting produces different water flow rates over the paddle wheel on each tack.	Turn the speed transducer <b>slightly</b> so that the cross pin is not aligned directly fore / aft, and recheck for the same speed display on both tacks. Repeat this until the correct angle is found for the same reading on each tack, and then recalibrate the transducer. (Using another instrument.)
The Sea Temperature display is incorrect.	The speed transducer is not connected to the Databox properly.	Check the speed transducers connections to the Databox (especially the White and Yellow 'Speed' wires).  Check that the speed transducer cable is not damaged.  Check that the Sea Temperature is in fact incorrect by comparing with another temperature sensor.  Contact your dealer.

**Depth Display Faults**

<u>Condition</u>	<u>Probable Cause</u>	<u>Action</u>
<p>The maximum depth capability is less than expected.</p> <p>Or:</p> <p>The performance at very low depths is unsatisfactory.</p> <p>Or:</p> <p>The Depth display always shows flashing numbers or flashing '0.0'.</p>	<p>The depth transducer is not connected to the Databox properly.</p> <p>There is a poor 12V Power Supply to the Databox.</p> <p>The power supply voltage is too low.</p> <p>The depth transducer cable is not the correct length.</p> <p>There is marine growth on the face of the depth transducer.</p> <p>If an in-hull depth transducer the transducer bonding may be broken or there may be insufficient oil to form a good interface between the transducer and the hull.</p> <p>If an in-hull depth transducer the GRP may be too thick or be poorly laid up in the region of the transducer.</p> <p>The depth transducer may have been damaged by impact, or by the boat being lifted with a strop over the transducer face.</p>	<p>Check the depth transducers connections to the Databox.</p> <p>Check that the depth transducer cable is not damaged.</p> <p>Check the Power Supply connections to the Databox (the '+' and '-' 'Power' wires).</p> <p>Check that the Power Supply wires are not damaged.</p> <p>Check that any fuses fit their holders correctly and are not loose.</p> <p>Check that the wire that has been used for the Power Supply is of sufficient size.</p> <p>Check the battery condition, and charge or change the battery if required.</p> <p>Check that the depth transducer cable was not cut or lengthened during the system installation.</p> <p>Check for growth and LIGHTLY scrub or sand the face of the transducer to remove it if necessary.</p> <p>Check and correct if necessary.</p> <p>If possible move the transducer to a more suitable location, or mount through the hull.</p> <p>Test with another transducer if possible.</p> <p>Contact your dealer.</p>
<p>The Depth display is normally correct but occasionally shows unexpected low readings.</p>	<p>Probably moving over weed, fish, or other obstacles.</p>	<p>No action possible.</p>

<u>Condition</u>	<u>Probable Cause</u>	<u>Action</u>
The Depth display is normally correct but occasionally flashes unexpectedly.	Probably moving over aerated water, such as the wash from a ferry.	No action possible.
The Depth display is normally correct but flashes when travelling at increased or planing speeds.	Probably suffering from aeration in front of the transducer face.	<p>Check the siting of the depth transducer.</p> <ol style="list-style-type: none"> <li>1. There should be no skin fittings or other obstructions in front of it.</li> <li>2. It should be well faired into the hull without any large steps.</li> <li>3. It should be mounted well to the rear of the hull in planing vessels, and not mounted in or near propeller tunnels.</li> </ol> <p>Make the checks for poor depth performance as above.</p> <p>Contact your dealer.</p>

## Wind Display Faults

<u>Condition</u>	<u>Probable Cause</u>	<u>Action</u>
There are no Wind Speed or Wind Angle displays, or these displays always show '----'.	<p>The wind transducer is not fitted to the mast head connector.</p> <p>The wind transducer is not connected to the Databox properly.</p> <p>50mA Quick Blow 20mm fuse has blown.</p>	<p>Check, and fit the transducer if necessary.</p> <p>Check the wind transducer's connections to the Databox (especially the Green, White and Yellow 'Wind' wires).</p> <p>Check that the wind transducer cable is not damaged.</p> <p>If there is a connector at the foot of the mast check that it is not corroded and is making good contact.</p> <p>Replace fuse.</p> <p>Contact your dealer.</p>

<p>The Wind Speed displays always show '0.0', but the Wind Angle displays are shown.</p>	<p>The anemometer rotor is seized.</p> <p>The wind transducer is not connected to the Databox properly.</p>	<p>Check the anemometer rotor and have the wind transducer serviced if necessary.</p> <p>Check the wind transducers connections to the Databox (especially the Red, Blue and Black 'Wind' wires).</p> <p>Make the checks as for 'no wind speed or wind angle displays' above.</p>
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<u>Condition</u>	<u>Probable Cause</u>	<u>Action</u>
<p>The Wind Speed is too low, when it was previously correct.</p>	<p>Worn anemometer rotor.</p> <p>Damaged anemometer rotor or transducer body.</p>	<p>Check the anemometer rotor and oil the rotor bearings or have the wind transducer serviced if necessary.</p> <p>Check that the rotor and transducer are not damaged.</p> <p>Make other checks as for 'always showing 0.0' above.</p>
<p>The Wind Speed is too high or erratic, when it was previously correct.</p>	<p>Damaged wiring causing intermittent contact.</p>	<p>Make checks as for 'always showing 0.0' above.</p>
<p>The Wind Speed has always been too low or too high.</p>	<p>The wind transducer may be poorly sited.</p>	<p>Check the transducer location.</p> <p>Contact your dealer.</p>
<p>The Wind Angle displays are incorrect.</p>	<p>The wind transducer is not connected to the Databox properly.</p>	<p>Check the wind transducer's connections to the Databox (especially the Green, White and Yellow 'Wind' wires).</p> <p>Check that the wind transducer cable is not damaged.</p> <p>If there is a connector at the foot of the mast check that it is not corroded and is making good contact.</p> <p>Contact your dealer.</p>
<p>The Wind Angle has always been incorrect.</p>	<p>The wind transducer is not calibrated.</p>	<p>Calibrate the wind transducer. (Using another instrument.)</p> <p>Make checks as for 'the wind angle displays are incorrect' above.</p>

**Heading and Autopilot Display Faults**

<u>Condition</u>	<u>Probable Cause</u>	<u>Action</u>
There are no Heading or Wind Direction displays.	The required data is not being received from the Heading Sensor or Autopilot.	<p>Check that the Heading Sensor is turned on.</p> <p>Check the Heading Sensor NMEA output specification against the instruments input specification. (See Appendix A).</p> <p>Check the Heading Sensor power supply wiring.</p> <p>Check the signal wiring from the Heading Sensor to the Databox.</p> <p>Check that the Heading Sensor is driving other remote displays correctly.</p> <p>Contact your dealer.</p>
There is no Autopilot Set Course display, even though the Heading display is working.	The required data is not available from the Autopilot.	<p>Check the Autopilot NMEA output specification against the instruments input specification. (See Appendix A).</p> <p>Make checks as for 'no heading or wind direction displays' above.</p> <p>Contact your dealer.</p>
<p>All Headings are incorrect, by the same amount.</p> <p>Note :</p> <p>When checking a Compass ensure that the check is against a deviated magnetic card compass, or against magnetic bearings, or against a good hand held compass held well away from any magnetic or ferrous objects.</p>	The Heading Sensor is not aligned correctly.	Consult the manufacturers instructions.

<p>Some or all Headings are incorrect, by different amounts.</p> <p>Note : When checking a Compass ensure that the check is against a deviated magnetic card compass, or against magnetic bearings, or against a good hand held compass held well away from any magnetic or ferrous objects.</p>	<p>The Heading Sensor hasn't been deviation compensated.</p> <p>Magnetic or ferrous objects have been moved into or away from the vicinity of the Heading Sensor.</p> <p>The location of the Sensor is unsuitable.</p>	<p>Recalibrate the Sensor.</p> <p>Check for possible objects that may affect the Sensor, e.g., a portable radio. If the change is permanent then recalibrate the Sensor.</p> <p>Check that the location of the Sensor is suitable, if not then resite it.</p> <p>Contact your dealer.</p>
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**Navigation Display Faults**

<u>Condition</u>	<u>Probable Cause</u>	<u>Action</u>
There are no Navigation displays, even though the Navigation Receiver is working.	The required data is not being received from the Navigation Receiver	<p>Check that the Navigation Receiver has a position fix.</p> <p>Check that the Navigation Receiver's NMEA output is set-up correctly.</p> <p>Check the Navigation Receiver's NMEA output specification against the instrument's input specification. (See Appendix A).</p> <p>Check the signal wiring from the Navigation Receiver to the Databox.</p> <p>Check that the Navigation Receiver is driving other remote displays correctly.</p> <p>Contact your dealer.</p>
There are no Waypoint Data displays, even though the Course Over Ground display is working.	The required data is not available from the Navigation Receiver.	<p>Check that the Navigation Receiver has a destination Waypoint.</p> <p>Make other checks as for 'no navigation displays', above.</p>
There is no Cross Track Error display, even though the Waypoint and Course Over Ground displays are working.	The required data is not available from the Navigation Receiver.	<p>Check that the Navigation Receiver is in Navigate Mode.</p> <p>Make other checks as for 'no waypoint displays', above.</p>
Rhumb Line/Great Circle selection changes independently, and/or the desired data is not shown, even though the other format is available.	Data of the required format is not being transmitted by the Navigation Receiver.	<p>Check that the Navigation Receiver is set to the same navigation mode, and is set up to transmit the correct navigation format.</p> <p>Contact your dealer.</p>
True / Magnetic Course Over Ground and Waypoint Bearing data is not shown, even though the other format is available.	Data of the required format is not being transmitted by the Navigation Receiver.	<p>Check that the Navigation Receiver is set to the same navigation mode, and is set up to transmit the correct navigation format.</p> <p>Contact your dealer.</p>

**Other Faults**

<u>Condition</u>	<u>Probable Cause</u>	<u>Action</u>
The external alarm does not sound.	<p>The alarm is not turned on, or the values are not as desired.</p> <p>The external alarm sounder is not connected to the Databox properly.</p> <p>The external alarm sounder is not suitable.</p> <p>The external alarm sounder is not working.</p>	<p>Check that the desired alarm is turned on and has the correct value.</p> <p>Check the alarms' connections to the Databox.</p> <p>Check that the alarm sounder does not require more current or a higher voltage than is available.</p> <p>Check with the alarm sounder driven directly from a suitable power supply.</p> <p>Contact your dealer.</p>
There are missing Engine Hour or Battery Voltage displays, or the Engine Hour counts don't work, or these displays always show '----'.	<p>The engine hour / sat nav set ups are incorrect.</p> <p>The engine hour / battery voltage inputs are not connected to the Databox properly.</p>	<p>Check the set up, and correct if necessary. (Using another instrument.)</p> <p>Check the connections to the Databox, and correct if necessary.</p> <p>Check that the engine inputs are active when the engines are turned on.</p> <p>Contact your dealer.</p>
Condensation forms inside the instrument.	Slight internal moisture.	Turn the lights to Level 7 and leave on until cleared.



**CONTENTS**

- 6.1 General Maintenance
- 6.2 Annual Maintenance
- 6.3 Removal of Instrument
- 6.3 Return for Service

**6.1 General Maintenance**

The instrument head will require no maintenance apart from occasional cleaning. This may be done using a little fresh water and a mild soap solution (not a detergent).

**CAUTION**

**DO NOT USE ANY ABRASIVES, CHEMICAL CLEANERS, PETROL OR DIESEL TO CLEAN THIS UNIT.**

**6.2 Annual Maintenance**

Check all connections to the instrument and, if necessary, cover with silicone grease or petroleum jelly.

**6.3 Removal of Instrument**

To remove the instrument head, the outer cover must first be removed. This can be done by squeezing the instrument sides between finger and thumb and applying an upward pressure. At the same time, place a flat-bladed screwdriver between the bulkhead (or panel) and the cover, and carefully rotate. Remove the cover and the four corner fixing screws. Pull the instrument free.

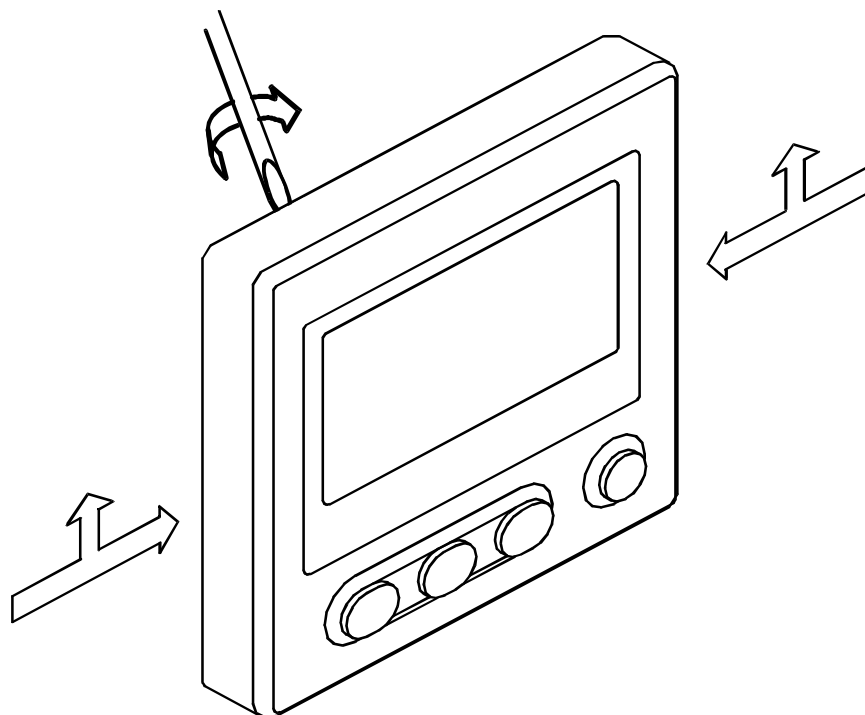


Figure 6.1 Removal of Instrument

#### 6.4 Return for Service

Please ensure that an instrument that is believed to be faulty is correctly installed, the wiring is in good condition and correct, that all connections are secure, and that a 12V supply is present at its power input terminals.

Should the unit have to be returned to your dealer, adequate packing must be used. Please ensure that your name, telephone number, return address, a clear fault description, and if possible a copy of the receipt of purchase are included with any returned equipment. Simrad Ltd. and their representatives are not responsible for any equipment lost in transit.

Please quote the instrument's serial number in all correspondence. This may be found on the rear of the instrument.

The NMEA 0183 messages that are received by the CENTRAL instrument are as below:-

VHW	=	Boat Speed (Knots Field)
DBK	=	Depth (Feet Field)
MTW	=	Sea Temperature
HDM		
HDT	=	Heading
VHW		
HSC	=	Autopilot Set Course
VWR	=	Apparent Wind Speed (Knots Field)
VWR	=	Apparent Wind Angle
VLW	=	Permanent Log, Trip Log
GLL		
GGA	=	Position Fix Quality
RMA		
RMC		
VTG		
RMA	=	Speed Over Ground
RMC		
VTG		
RMA	=	Course Over Ground
RMC		
GGA		
RMC		
BWC	=	Time (Universal Co-Ordinated Time)
BWR		
ZTG		

The NMEA 0183 messages that are received by the CENTRAL instrument  
(continued):

APA  
APB = Destination Waypoint Name/Number  
RMB  
BOD

APB  
RMB = Waypoint Bearing  
BWC  
BWR

RMB  
BWC  
BWR = Waypoint Distance  
WDC  
WDR

APA  
APB = Cross Track Error  
RMB  
XTE

RMC = Magnetic Variation