

USER GUIDE FOR

DATALINE-X™

MULTI

Stowe Marine Ltd.

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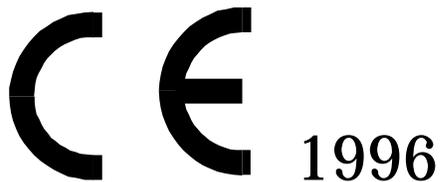
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Dataline-X Multi Manual, Part Number 06097SM, Issue 3, Dec 1995.

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.



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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 MULTI**, used within the Dataline-X System.

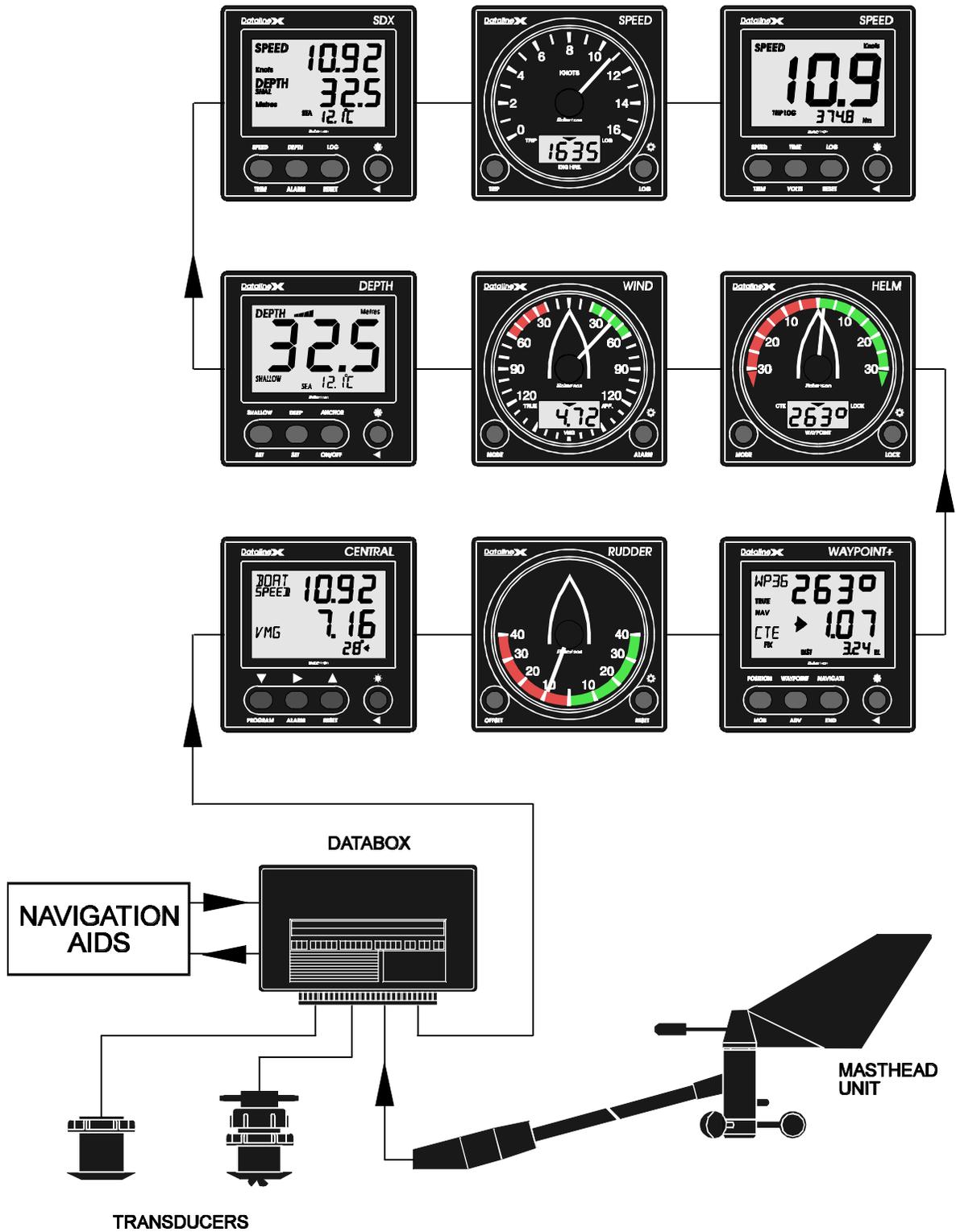


Figure 1.1 - Dataline-X System Diagram

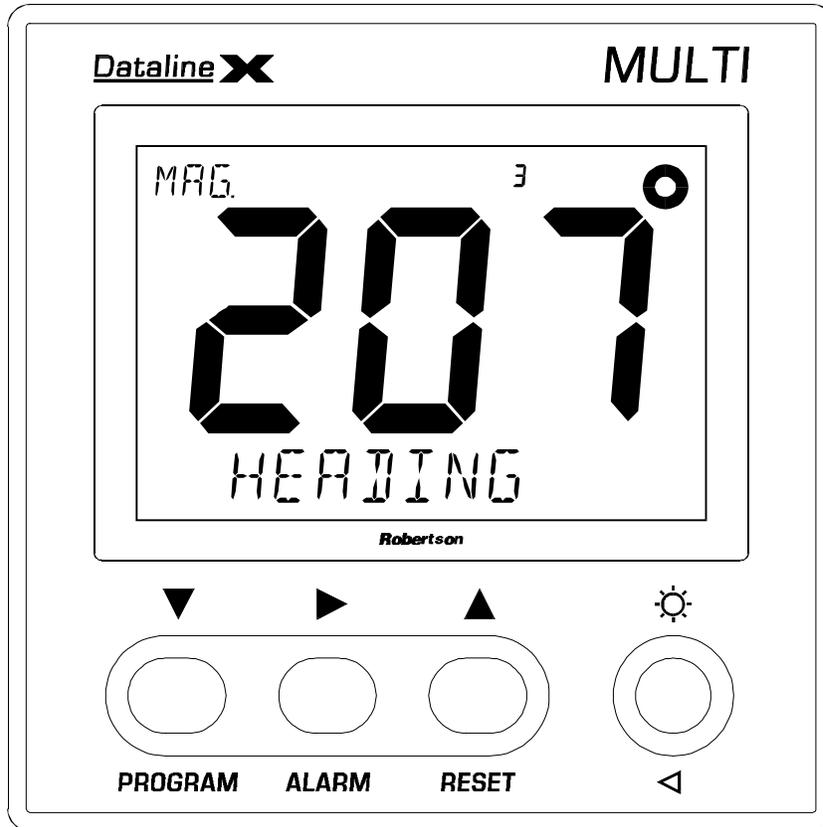


Figure 1.2 - Dataline-X MULTI Instrument

1.2 Dataline-X MULTI SpecificationSpeed Functions

Speed Units	Knots, mph or km/h
Speed Display	0 to 99.9 Speed Units (see Note 1)
Speed Precision	0.1 or 0.01 Speed Units
Speed Damping	1 fixed damping level
Average Speed Display	(over trip distance)
Speed Trim	(changes in speed to 0.1/0.01 Speed Units)
Speed Over Ground Display	(with suitable radio nav input)

Depth Functions

Depth Units	Metres, Feet or Fathoms
Depth Display	0 to 999 Depth Units (see Note 2)
Depth Precision	0.1 Depth Units
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 Units	°C/°F
Sea Temperature	-10 to 40° C, ± 0.1° C
Sea Temperature Precision	To 1°C/°F or to 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

True and Apparent Wind Speed Functions

Wind Speed Units	Knots, m/s, km/h or Beaufort Scale
Wind Speed Display	0 to 99.9 Wind Speed Units
Wind Speed Precision	0.1 Wind Speed Units
Wind Speed Damping	1 fixed damping level
True Wind Speed Alarms	On/Off Control on three alarms

Velocity Made Good (VMG) Functions

VMG Units	Knots, km/h or mph
VMG Display	0 to 99.9 VMG Units
VMG Precision	0.1 VMG Units
VMG Damping	1 fixed damping level

Timing Functions

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

Log Functions

Log Units	Nautical Miles or Kilometres
Log	To 9999 Log Units (permanently saved)
Trip Log	To 9999 Log Units (resettable/saved)
Race Log	To 999.9 Log Units (over race distance)
Log Precision	1, 0.1 or 0.01 Log Units (3 digits)

Position Functions

Lat/Long Display	Degrees, Minutes and Hundredths of Minutes
Datum	As received from Navigator
Course Over Ground (COG)	0 to 359°
COG Precision	1°
Speed Over Ground (SOG)	0 to 99.9 Speed Units
SOG Precision	0.01 Speed Units
Local Time	24 Hour Clock, Hours and Minutes

Waypoint Functions

Waypoint Identity	9 Alpha-Numeric characters
Waypoint Bearings	0 to 359° (True or Magnetic)
Waypoint Bearing Precision	1°
Waypoint Distance	0 to 999 Log Units

Waypoint Distance Precision 1, 0.1, or 0.01 Log Units as appropriate (4 digits)

Navigation Functions

CTE unit Nautical miles or Kilometres
 Cross Track Error (CTE) 0 to 999 CTE unit (see Note 4)
 CTE Precision 1, 0.1 or 0.01 CTE unit (3 digits)
 Direction to Steer Port or Starboard Arrow (See Note 6)

Additional Functions

Engine Hours Counter (2 inputs) 0 to 9999 hrs, \pm 0.1 hr
 Battery Voltage (2 inputs) 0 to 30V, \pm 0.1V (see Note 7)
 Battery Voltage Precision 0.1V
 Display Backlighting Levels Seven levels plus Off
 Display Backlighting Colours Three colours, (Red, Green, Yellow)
 Display Backlighting Control Two independent lighting banks
 External Depth Alarm Drive (via Databox)
 Sat Nav Output (via Databox)

General

Power Requirement 10 to 16V, 36 mA, (96 mA max with Yellow 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 MULTI 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 0.001 Nm (or km), 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 0.01 Nm (or km).
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 centre section is the main display, while the smaller upper and lower section shows additional data. All data is described by text on the bottom sub-screen, while the upper screen is split into parts, displays the data unit to the left and the group or remote number to the right.

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 can be pressed together or by:-

1. Pressing the * (*) key.
2. Pressing the RESET (or ALARM or PROGRAM) key within 3 seconds of pressing the * (*) key.

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.

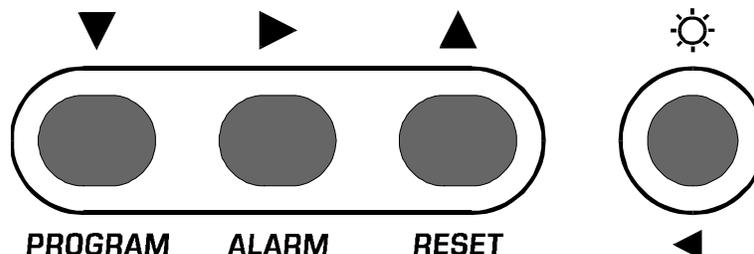


Figure 2.1 - The Buttons

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.

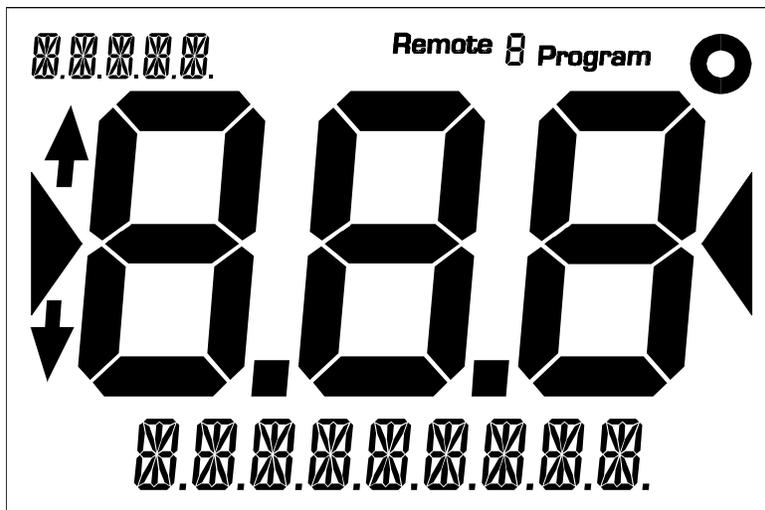


Figure 2.2 - Display on Power Up

2.3 Display Screens

The data screens of the MULTI 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.

2.4 The Table of Display Screens

The data screens of the MULTI instrument are arranged in a 'table' as below. To access the screens you move 'up' or 'down' through the table using the ☒ (RESET) and ☐ (PROGRAM) buttons, and move 'sideways' through the table with the * (ALARM) 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 5
☒ Screen Group 9 ☐	Trip Log	Permanent Log	Passage Time	Local Time	
☒ Screen Group 8 ☐	CTE	Waypoint Bearing	Waypoint DST	SOG	COG
☒ Screen Group 7 ☐	Engine Hours 1	Battery Volts 1	Engine Hours 2	Battery Volts 2	
☒ Screen Group 6 ☐	Race Time (10:00)	Race Time (5:00)	Race Log	Local Time	
☒ Screen Group 5 ☐	App. Wind Speed	App. Wind Angle	True Wind Speed	True Wind Angle	Wind Direction
☒ Screen Group 4 ☐	VMG	Boat Speed	Trim Speed		
☒ Screen Group 3 ☐	Heading / COG	Autopilot Course			
☒ Screen Group 2 ☐	Depth	Shallow Alarm	Deep Alarm	Sounder Off	Sea Temperature
☒ Screen Group 1 ☐	Boat Speed	Average Speed	Trim Speed	SOG Speed	

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.
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 9.
4. Screen group ‘0’ is a sub-set of screen group ‘8’. Details of accessing this group and the data displayed therein is given in Section 2.12.1.

2.5 Screen Group 1 - Speed

	*	*	*	*	*
	Screen 1	Screen 2	Screen 3	Screen 4	Screen 5
☒ Screen Group 1 ☐	Boat Speed	Average Speed	Trim Speed	SOG	

There are four screens in this group:

1. The upper sub-screen always displays a Speed unit, ‘KNOTS’, ‘KM/H’ or ‘MPH’. See Note 5.
2. The middle sub-screen displays the Boat Speed, Average Speed, Trim Speed and SOG.
3. The lower sub-screen displays the data type, i.e. SPEED, AVG SPEED, TRIM SPD or SOG.

Group 1 - Screen 1

In this display screen:

1. The middle sub-screen displays the Boat Speed.
2. The lower sub-screen displays the data type, ‘SPEED’.

Group 1 - Screen 2

In this display screen:

1. The middle sub-screen displays the Average Speed.
2. The lower sub-screen displays the data type, ‘AVG SPEED’.

Group 1 - Screen 3

In this display screen:

1. The middle sub-screen displays the Trim Speed.
2. The lower sub-screen displays the data type, 'TRIM SPD'.

Group 1 - Screen 4

In this display screen:

1. The middle sub-screen displays the Speed Over Ground (SOG).
2. The lower sub-screen displays the data type, 'SOG'.

Notes:

1. 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 2.13.)
2. The Trim Speed is the difference in speed between the present Boat Speed and the target speed.
3. The Trim Speed will only be indicated if it has been reset, until that time it will show '---'.
4. The Speed Over Ground (SOG) will only be shown if a suitable Navigation Receiver input is present.
5. The upper sub-screen is split into two, showing the data unit to the left (5 characters) and the group or remote number (1 digit) to the right.

2.5.1 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  () button first and then RESET () button (within 3 seconds of pressing the  button). This will set the target speed as the current speed. The Trim Speed displays will then show changes from this.

2.6 Screen Group 2 - Depth, Shallow and Deep Alarm Settings and Sea Temperature

	 Screen 1	 Screen 2	 Screen 3	 Screen 4	 Screen 5
 Screen Group 2 	Depth	Shallow Alarm	Deep Alarm	Sounder Off	Sea Temperature

There are five screens in this group:

1. The upper sub-screen displays the data units (METRS, FEET, FATHM, °C or °F). See Note 3.
2. The middle sub-screen displays the Depth of the water, the Shallow and Deep alarm settings, Sounder Off and the Sea Temperature.
3. The lower sub-screen displays the data type i.e. DEPTH, SHAL ALRM, DEEP ALRM or SEA TEMP.

Group 2 - Screen 1

In this display screen:

1. The upper sub-screen displays the data unit, such as 'METRS'.
2. The middle sub-screen displays the Depth of the water.
3. The lower sub-screen displays the data type, 'DEPTH'.

Group 2 - Screen 2

In this display screen:

1. The upper sub-screen displays the data unit, such as 'METRS'.
2. The middle sub-screen displays the depth that the Shallow Alarm is set to. See Note 2.
3. The lower sub-screen displays the data type, 'SHAL ALRM'.

Group 2 - Screen 3

In this display screen:

1. The upper sub-screen displays the data unit, such as 'METRS'.
2. The middle sub-screen displays the depth that the Deep Alarm is set to. See Note 2.
3. The lower sub-screen displays the data type, 'DEEP ALRM'.

Group 2 - Screen 4

In this display screen:

1. The upper sub-screen displays the data unit, such as 'METRS'.
2. The middle sub-screen displays 'OFF'. See Para 2.5.1 and Note 2.
3. The lower sub-screen displays the data type, 'DEPTH'.

Group 2 - Screen 5

In this display screen:

1. The upper sub-screen displays the data unit, '°C' or '°F'.
2. The middle sub-screen displays the current Sea Temperature.
3. The lower sub-screen displays the data type, 'SEA TEMP'.

Notes:

1. If the Databox depth transducers echo signal is lost, the Depth display will flash the last good echo value. If there is an alternative NMEA Depth input to the Databox, in which case, this data will only be shown if the Databox Depth Sounder is turned OFF! See the next paragraph.
2. Screens 2, 3 and 4 will be displayed when the * button is pressed and for a period of 2 seconds after it has been released and will return screen 1 after this period.
3. The upper sub-screen is split into two, showing the data unit to the left (5 characters) and the group or remote number (1 digit) to the right.

2.6.1 Depth Sounder On / Off Control

The depth sounder can be switched off or on directly from the group 2 screens.

Turning Off the Depth Sounder

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

1. Change the group to group 2, using the  and  buttons.
2. Use the * button to select screen 4 ('OFF') and release. See Notes 1, 2 & 3.

Turning On the Depth Sounder

The Depth Sounder can be turned back on as follows:

1. Change the group to group 2, using the ☒ and ☐ buttons. See Note 3.
2. Use the * button to select screen 2, 3 or 5 and release.

Notes:

1. If the * button is released in screen 4 (Depth Off), after a period of 2 seconds, a message will be sent to the Databox turning off the Depth Sounder.
2. 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.
3. On power up, the sounder is always On.

2.7 Screen Group 3 - Heading / COG and Autopilot Course

	* Screen 1	* Screen 2	* Screen 3	* Screen 4	* Screen 5
☒ Screen Group 3 ☐	Heading / COG	Autopilot Course			

There are two screens in this group:

1. The upper sub-screen always displays the bearing type, 'MAG / TRUE'. See Note 4.
2. The middle sub-screen displays the Heading / COG or Autopilot Course.
3. The lower sub-screen displays the data type i.e. HEADING, COG or AUTOPILOT. See Notes 1 & 2.

Group 3 - Screen 1

In this display screen:

1. The middle sub-screen displays the Heading / Course Over Ground (COG) in degrees. See Note 3.
2. The lower sub-screen displays the data type, 'HEADING or COG'.

Group 3 - Screen 2

In this display screen:

1. The middle sub-screen displays the Autopilot Set Course in degrees.
2. The lower sub-screen displays the data type, 'AUTOPILOT'.

Notes:

1. The Heading and the Autopilot 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.
4. The upper sub-screen is split into two, showing the data unit to the left (5 characters) and the group or remote number (1 digit) to the right.

2.8 Screen Group 4 - VMG, Boat Speed and Trim Speed

	* Screen 1	* Screen 2	* Screen 3	* Screen 4	* Screen 5
☒ Screen Group 4 ☐	VMG	Boat Speed	Trim Speed		

There are three screens in this group:

1. The upper sub-screen always displays the data unit, 'KNOTS', 'KM/H' or 'MPH'. See Note 2.
2. The middle sub-screen displays the Velocity Made Good (VMG), Boat Speed or Trim Speed.
3. The lower sub-screen displays the data type, i.e. 'VMG WIND, SPEED or TRIM SPD'.

Group 4 - Screen 1

In this display screen:

1. The middle sub-screen displays the Velocity Made Good (VMG) in wind. See Note 1.
2. The lower sub-screen displays the data type, 'VMG WIND'.

Group 4 - Screen 2

In this display screen:

1. The middle sub-screen displays the Boat Speed.
2. The lower sub-screen display the data type, 'SPEED'.

Group 4 - Screen 3

In this display screen:

1. The middle sub-screen displays the Trim Speed. See Notes 3 & 4.
2. The lower sub-screen display the data type, 'TRIM SPD'.

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 upper sub-screen is split into two, showing the data unit to the left (5 characters) and the group or remote number (1 digit) to the right.
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 '---' (To reset the Trim Speed see paragraph 2.5.1).

2.9 Screen Group 5 - Apparent / True Wind Speed / Angle and Wind Direction

	*	*	*	*	*
	Screen 1	Screen 2	Screen 3	Screen 4	Screen 5
 Screen Group 5 	App. Wind Speed	App. Wind Angle	True Wind Speed	True Wind Angle	Wind Direction

There are normally five screens in this group:

1. The upper sub-screen displays 'KNOTS, M/S, KM/H, BEAUF, ANGLE, TRUE or MAG'.
2. The middle sub-screen displays the Apparent Wind Speed or Angle, True Wind Speed or Angle, or Wind Direction.
3. The lower sub-screen displays the data type, i.e. 'APP. WIND, TRUE WIND or WIND'.

Group 5 - Screen 1

In this display screen:

1. The upper sub-screen displays the data unit, such as 'KNOTS'.
2. The middle sub-screen displays the Apparent Wind Speed.
3. The lower sub-screen displays the data type, 'APP. WIND'.

Group 5 - Screen 2

In this display screen:

1. The upper sub-screen displays the data type, 'ANGLE'.
2. The middle sub-screen displays the Apparent Wind Angle. See Note 1.
3. The lower sub-screen displays the data type, 'APP. WIND'.

Group 5 - Screen 3

In this display screen:

1. The upper sub-screen displays the data unit, such as 'KNOTS'.
2. The middle sub-screen displays the True Wind Speed.
3. The lower sub-screen displays the data type, 'TRUE WIND'.

Group 5 - Screen 4

In this display screen:

1. The upper sub-screen displays the data type, 'ANGLE'.
2. The middle sub-screen displays the True Wind Angle in degrees. See Note 1.
3. The lower sub-screen displays the data type, 'TRUE WIND'.

Group 5 - Screen 5

In this display screen:

1. The upper sub-screen displays the bearing type, 'TRUE or MAG'.
2. The middle sub-screen displays Wind Direction. See Notes 2, 3 & 4.
3. The lower sub-screen displays the data type, 'WIND'.

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. The upper sub-screen is split into two, showing the data unit to the left (5 characters) and the group or remote number (1 digit) to the right.

2.10 Screen Group 6 - Race Timer, Race Log and Local Time

	* Screen 1	* Screen 2	* Screen 3	* Screen 4	* Screen 5
 Screen Group 6 	Race Time (10:00)	Race Time (5:00)	Race Log	Local Time	

There are normally four screens in this group:

1. The upper sub-screen displays the data unit or type, ‘MIN.S, HOURS, N.M., K.M. or LOCAL’.
2. The middle sub-screen displays the Race Timer start time (either five or ten minutes), Race Timer running time or Race Log (which is “---” when the Race Timer is not started) or blank.
3. The lower sub-screen displays the data type i.e. ‘RACE TIME, RACE LOG ‘ or the Local Time.

Group 6 - Screen 1

In this display screen:

1. The upper sub-screen displays the data units, 'MIN.S or HOURS'.
2. The middle sub-screen normally displays the Race Timer start time of ten minutes. See Note 1.
3. The lower sub-screen displays the data type, 'RACE TIME'.

Group 6 - Screen 2

In this display screen:

1. The upper sub-screen displays the data unit, 'MIN.S or HOURS'.
2. The middle sub-screen displays the Race Timer start time of five minutes. See Note 1.
3. The lower sub-screen displays the data type 'RACE TIME'.

Group 6 - Screen 3

In this display screen:

1. The upper sub-screen displays the data unit, 'N.M.' or 'K.M.'.
2. The middle sub-screen displays the Race Log (which is "---" when the Race Timer is not started). See Notes 2 & 3.
3. The lower sub-screen displays the data type, 'RACE LOG'.

Group 6 - Screen 4

In this display screen:

1. The upper sub-screen displays the data type, 'LOCAL'.
2. The middle sub-screen is blank.
3. The lower sub-screen displays the data type, 'TIME' and data, or Local Time. See Notes 4 & 5.

Notes:

1. When the Race Timer is running the actual Race Time count is shown in place of either of the start times.
2. The Race Log gives the distance covered after the race start time.
3. The Race Log is reset if the system is turned off, or if the Race Time is reset.
4. 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.)
5. The Local Time display gives the time of the day in 24 hour format.
6. The upper sub-screen is split into two, showing the data unit to the left (5 characters) and the group or remote number (1 digit) to the right.

2.10.1 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

2.10.2 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 or Race Log display screen. See Note 3.
2. Press the * button to freeze the Race Time display.
3. Press the * button a second time show the running Race Timer again. See Notes 1 & 2.

Notes:

1. If the Race Time display is frozen after the start of the race the timer itself will continue to count and the Race Log will continue to log, so that when the display is unfrozen the count and log 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. The Race Log is unaffected by freezing the Race Time.

2.10.3 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 * (*) button first and then RESET (☒) button (within 3 seconds of pressing the * button) to reset the Race Time to the previous start time and to reset the Race Log to “---”.

Note: Race Timer synchronisation with other Dataline X Central and Multi instruments.

The Race Timer instructions are echoed to all (Software V5.20 onwards) other Central and Multi instruments so that Start/Freeze/Reset occur synchronously (together).

2.11 Screen Group 7 - 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 12 Volts when the engine is running, this will always be recorded.

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

2.11.1 Screen Group 7 - Option 1 - Two Engine Hours and Two Battery Voltages

	* Screen 1	* Screen 2	* Screen 3	* Screen 4	* Screen 5
✉ Screen Group 7 ☰	Engine Hours 1	Battery Volts 1	Engine Hours 2	Battery Volts 2	

There are four screens in this option:

1. The upper sub-screen displays the data units, 'HOURS or VOLTS'. See Note 1.
2. The middle sub-screen is always blank.
3. The lower sub-screen displays the data type and the Engine Hours Counter or Battery Voltage.

Group 7 - Option 1 - Screen 1

In this display screen:

1. The upper sub-screen displays the data unit, 'HOURS'.
2. The lower sub-screen displays the data type ('ENG1') and the Engine Hours Counter 1.

Group 7 - Option 1 - Screen 2

In this display screen:

1. The upper sub-screen displays the data unit, 'VOLTS'.
2. The lower sub-screen displays the data type ('ENG1') and the Battery Voltage 1, - the engine 1 ignition battery.

Group 7 - Option 1 - Screen 3

In this display screen:

1. The upper sub-screen displays the data unit, 'HOURS'.
2. The lower sub-screen displays the data type ('ENG2') and the Engine Hours Counter 2.

Group 7 - Option 1 - Screen 4

In this display screen:

1. The upper sub-screen displays the data unit, 'VOLTS'.
2. The lower sub-screen displays the data type ('BAT2') and the Battery Voltage 2, - the engine 2 ignition battery.

Note:

1. The upper sub-screen is split into two, showing the data unit to the left (5 characters) and the group or remote number (1 digit) to the right.

2.11.2 Screen Group 7 - Option 2 - One Engine Hours and Two Battery Voltages

	* Screen 1	* Screen 2	* Screen 3	* Screen 4	* Screen 5
✉ Screen Group 7 ☰	Engine Hours	Battery Volts 1	Engine Hours	Battery Volts 2	

There are four screens in this option:

1. The upper sub-screen displays the data unit, 'HOURS or VOLTS'. See Note 1.
2. The middle sub-screen is always blank.
3. The lower sub-screen displays the data type and the Engine Hours Counter or Battery Voltage.

Group 7 - Option 2 - Screen 1

In this display screen:

1. The upper sub-screen displays the data unit, 'HOURS'.
2. The lower sub-screen displays the data type ('ENG') and the Engine Hours Counter.

Group 7 - Option 2 - Screen 2

In this display screen:

1. The upper sub-screen displays the data unit, 'VOLTS'.
2. The lower sub-screen displays the data type ('BAT1') and the Battery Voltage 1, - the engine 1 ignition battery.

Group 7 - Option 2 - Screen 3

In this display screen:

1. The upper sub-screen displays the data unit, 'HOURS'.

The lower sub-screen displays the data type ('ENG') and the Engine Hours Counter.

Group 7 - Option 2 - Screen 4

In this display screen:

1. The upper sub-screen displays the data unit, 'VOLTS'.
2. The lower sub-screen displays the data type ('BATT') and the Battery Voltage 2, - the engine 2 ignition battery.

Note:

1. The upper sub-screen is split into two, showing the units data to the left (5 characters) and the group or remote number (1 digit) to the right.

2.11.3 Screen Group 7 - Option 3 - One Engine Hours and One Battery Voltage

	*	*	*	*	*
	Screen 1	Screen 2	Screen 3	Screen 4	Screen 5
 Screen Group 7 	Engine Hours	Battery Volts			

There is two screen in this option:

1. The upper sub-screen displays the data unit, 'HOURS or VOLTS'. See Note 1.
2. The middle sub-screen is always blank.
3. The lower sub-screen displays the data type and the Engine Hours Counter or Battery Voltage.

Group 7 - Option 3 - Screen 1

In this display screen:

1. The upper sub-screen displays the data unit, 'HOURS'.
2. The lower sub-screen displays the data type ('ENG') and the Engine Hours Counter.

Group 7 - Option 3 - Screen 2

In this display screen:

1. The upper sub-screen displays the data unit, 'VOLTS'.
2. The lower sub-screen displays the data type ('BATT') and the Battery Voltage, - the engine ignition battery.

Note:

1. The upper sub-screen is split into two, showing the data unit to the left (5 characters) and the group or remote number (1 digit) to the right.

2.12 Screen Group 8 - Waypoint and Navigational Data

	*	*	*	*	*
	Screen 1	Screen 2	Screen 3	Screen 4	Screen 5
 Screen Group 8 	CTE	Waypoint Bearing	Waypoint Dist	SOG	COG

There are five screens in this group:

1. The upper sub-screen displays 'N.M., K.M., KNOTS, KM/H, MPH, MAG or TRUE'.
2. The middle sub-screen displays the COG, Cross Track Error, SOG, Waypoint Bearing or Waypoint Distance. See Note 6.
3. The lower sub-screen displays the destination waypoint I.D. and the data type, 'CTE HELM, BRNG, DIST, SOG or COG'.

Group 8 - Screen 1

In this display screen:

1. The upper sub-screen displays the data unit, such as 'N.M.'.
2. The middle sub-screen displays the Cross Track Error (CTE). See Notes 3 & 4.
3. The lower sub-screen displays the data type, 'CTE HELM'.

Group 8 - Screen 2

In this display screen:

1. The upper sub-screen displays the bearing type, 'MAG or TRUE'. See Note 1.
2. The middle sub-screen displays the Waypoint Bearing.
3. The lower sub-screen displays the destination waypoint I.D. and the data type, 'BRNG'.

Group 8 - Screen 3

In this display screen:

1. The upper sub-screen displays the data unit, such as 'N.M.'.
2. The middle sub-screen displays the Waypoint Distance.
3. The lower sub-screen displays the destination waypoint I.D. and the data type, 'DIST'. See Note 2.

Group 8 - Screen 4

In this display screen:

1. The upper sub-screen displays the data unit, such as 'KNOTS'.
2. The middle sub-screen displays the Speed Over Ground (SOG).
3. The lower sub-screen displays the data type, 'SOG'.

Group 8 - Screen 5

In this display screen:

1. The upper sub-screen displays the bearing type, 'MAG or TRUE'.
2. The middle sub-screen displays the Course Over Ground (COG).
3. The lower sub-screen displays the data type, 'COG'.

Notes:

1. The Course Over Ground and Waypoint Bearing may be referenced to either Magnetic or True North as selected for the Heading. 'MAG' or 'TRUE' is shown to indicate which, 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 True / Magnetic selection details).
2. The Waypoint ID will be shown as 'WPXX' if it is a number of up to 99, or as 'XXXX' if it is a number of 100 or over, or if it is alphanumeric.
3. 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.
4. The Cross Track Error direction to steer is shown for any error of greater than 0.001 Nm, even though the CTE display itself does not show errors of less than 0.01 Nm. If there is less Cross Track Error than 0.001 Nm then both direction to steer arrows are shown.
5. The data will be from Rhumb Line or Great Circle calculations as selected. (See Part 4 for selection details.)
6. The upper sub-screen is split into two, showing the data unit to the left (5 characters) and the group or remote number (1 digit) to the right.

2.12.1 Screen Group 0 - Positional Data

	*	*	*	*	*
	Screen 1	Screen 2	Screen 3	Screen 4	Screen 5
✉ Screen Group 0 ☰	Latitude	Longitude			

There are two screens in this group:

1. The upper sub-screen displays the data type, 'LAT or LONG'.
2. The middle sub-screen is always blank..
3. The lower sub-screen displays the Latitude or Longitude.

Group 0 - Screen 1

In this display screen:

1. The upper sub-screen displays the data type, 'LAT'.
2. The lower sub-screen displays the Latitude.

Group 0 - Screen 2

In this display screen:

1. The upper sub-screen displays the data type, 'LONG'.
2. The lower sub-screen displays the Longitude.

2.12.1.1 Changing to Screen Group 0

Change to the positional data screen is as follows:

1. Using the ☒ and ☐ buttons to change to the group 8 screens.
2. Press and hold the * button for 2 seconds. See Note 1.

Note:

1. Using the * button to move between screen 1 and 2 in the normal way.

2.12.1.2 Leaving the Screen Group 0

Leaving the positional data screen is as follows:

1. Pressing the ☒ and ☐ buttons once will return to the group 8 screens.

2.13 Screen Group 9 - Permanent Log, Trip Log and Passage Time

	* Screen 1	* Screen 2	* Screen 3	* Screen 4	* Screen 5
☒ Screen Group 9 ☐	Trip Log	Permanent Log	Passage Time	Local Time	

There is four screen in this group:

1. The upper sub-screen displays the data units or type, 'N.M. or K.M., HOURS, MIN.S or LOCAL'. See Note 6.
2. The middle sub-screen is always blank.
3. The lower sub-screen displays the Trip Log, Permanent Log, Passage Time or Local Time and the data type 'TRIP, LOG, PASS or TIME'.

Group 9 - Screen 1

In this display screen:

1. The upper sub-screen displays the data unit, 'N.M.' or 'K.M.'.
2. The lower sub-screen displays the data type ('TRIP') and the Trip Log. See Note 2.

Group 9 - Screen 2

In this display screen:

1. The upper sub-screen displays the data unit, 'N.M.' or 'K.M.'.
2. The lower sub-screen displays the data type 'LOG' and the Permanent Log. See Note 1.

Group 9 - Screen 3

In this display screen:

1. The upper sub-screen displays the data units, 'HOURS or MIN.S'.
2. The lower sub-screen displays the data type 'PASS' and the Passage Time. See Note 3.

Group 9 - Screen 4

In this display screen:

1. The upper sub-screen displays the data type, 'LOCAL'.
2. The lower sub-screen displays the data type 'TIME' and the Local Time. See Notes 4 & 5.

Notes:

1. The Permanent Log is the total distance travelled 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 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.)
5. The Local Time display gives the time of the day in 24 hour format.
6. The upper sub-screen is split into two, showing the data unit to the left (5 characters) and the group or remote number (1 digit) to the right.

2.13.1 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 * (*) button first and then RESET (☒) button (within 3 seconds of pressing the * button) briefly. The Passage Time will be reset.

Notes:

1. The resetting of the Passage Time on this instrument will reset it on other Multi and Central instruments (Software V5.20 and above).

2.13.2 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 * (*) button first and then RESET (☒) button (within 3 seconds of pressing the * button). This will initially reset the Passage Time. Keep the RESET button 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.

2.14 The Depth Alarms, Wind Alarm 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:

1. All alarm values are set by other instruments in the Dataline-X system.
2. The Setting of the Alarms to On or Off is system wide, and will set the Alarms on all other instruments in the Dataline-X system.

2.14.1 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 * (*) button first and then ALARM (*) button (within 3 seconds of pressing the * button): Except for group 6 (The Race Timer group) where both the * and ALARM buttons must be pressed together.
2. "ALARM ON (or OFF) SET SHAL" is displayed.
3. Use the * button to select ON or OFF as desired.
4. Return to the main display by pressing the * (*) button.

2.14.2 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 * (*) button first and then ALARM (*) button (within 3 seconds of pressing the * button): Except for group 6 (The Race Timer group) where both the * and ALARM buttons must be pressed together.
2. Press the ☒ button once until “ALARM ON (or OFF) SET DEEP” is displayed.
3. Use the * button to select ON or OFF as desired.
4. Return to the main display by pressing the * (*) button.

2.14.3 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 * (*) button first and then ALARM (*) button (within 3 seconds of pressing the * button): Except for group 6 (The Race Timer group) where both the * and ALARM buttons must be pressed together.
2. Press the ☒ button twice until “ALARM ON (or OFF) SET ANCH” is displayed.
3. Use the * button to select ON or OFF as desired.
4. Return to the main display by pressing the * (*) button.

2.14.4 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 * (*) button first and then ALARM (*) button (within 3 seconds of pressing the * button): Except for group 6 (The Race Timer group) where both the * and ALARM buttons must be pressed together.
2. Press the  button twice until “ALARM ON (or OFF) SET WIND” is displayed.
3. Use the * button to select ON or OFF as desired.
4. Return to the main display by pressing the * (*) button.

2.14.5 To Set The Depth Sounder On or Off

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

1. Press the * (*) button first and then ALARM (*) button (within 3 seconds of pressing the * button): Except for group 6 (The Race Timer group) where both the * and ALARM buttons must be pressed together.
2. Press the  button once until “DPTH ON (or OFF) SET TDX” is displayed.
3. Use the * button to select ON or OFF as desired. See Notes 1 & 2.
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.

2.15 To Program The Power Up Display Screens

The MULTI instrument can have its power up display screen set to any one of the screens, with the first screen from every other group also set.

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

In order to set up 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 * (*) button first and then PROGRAM () button (within 3 seconds of pressing the * button).
4. The symbol 'Program' will light on the display to show that the screens have been programmed, for five seconds.

The power up display screens have now been programmed. This can be tested by turning the instrument system off and then back on again.

2.16 To Set The Display Backlighting

The display backlighting 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.)
3. Note: On some Dataline Systems (not Dataline-X) only lighting levels 0, 3, 5 and 7 are available.

CONTENTS

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

3.1 General

The instrument head is water resistant and can, therefore, be installed on deck or below. The connections should be protected from water penetration. 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.

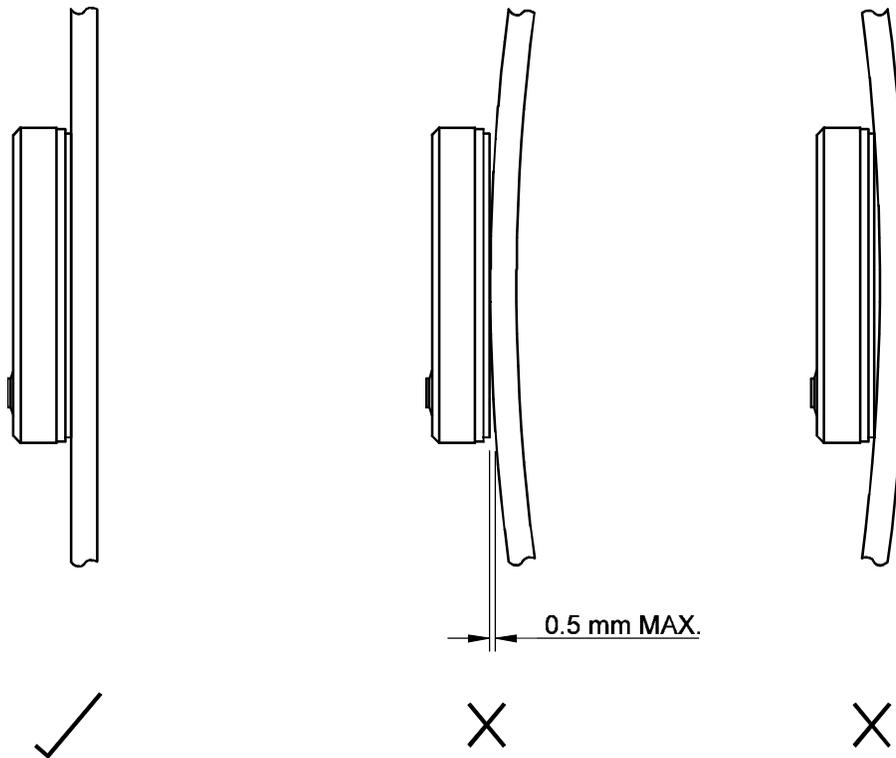


Figure 3.1 - Installation

3.2 Installation

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 the 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.

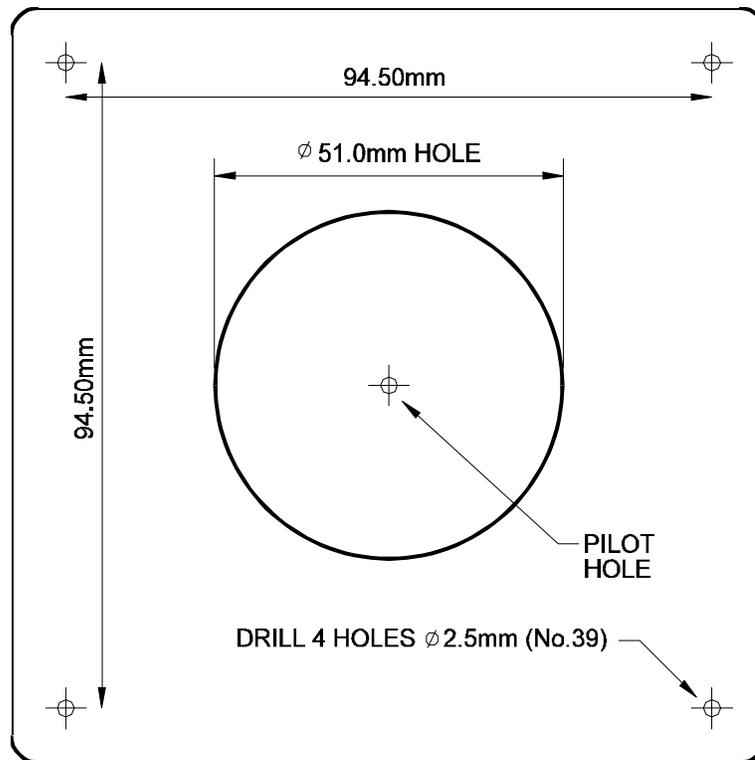


Figure 3.2 - Mounting Details (Not To Scale)

1. 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 disconnect it from the cable. The cable may then be run through holes of 6mm (0.25") diameter before reconnecting the Dataplug connector. The correct positions for the different coloured wires to the terminals are shown on the rear label.

- 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.

If fitted, the external alarm sounder should be connected between the Alarm Output and 0V.

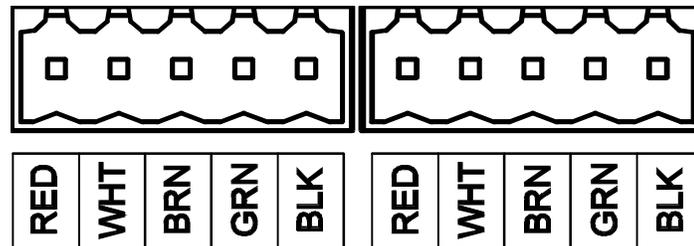


Figure 3.3 - Electrical Connections

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

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.

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 the cables from chafing.
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
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- 4.8 Unit selection (System wide).
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- 4.9 Local Time Offset from UTC
- 4.10 Multi as a REMOTE
 - 4.10.1 To Set the Multi for Remote use
 - 4.10.2 To Return from Remote use
- 4.11 Software 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 instruments.

4.2 Calibration Mode

To enter Calibration Mode:

1. Press the  and  buttons together, and hold for more than 3 seconds, until 'LITE' is shown on the display.
2. For each successive press of the  button, the display will step through the calibration menu. To step through backwards, press the  button.

3. The menu function may be changed immediately by pressing the * button, or this may cause the value to flash, depending on the function.
4. The ☒ and ☐ buttons may be used to decrement or increment values, which are flashing. When the value is correct, press the * button again, the value will stop flashing and become fixed.
5. Depressing the * button will return the instrument to its normal working mode and will save the setup parameters.

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)
- Unit selection (System wide)
- Local Time Offset from UTC/GMT (value entry, ± 12 hours)
- Multi as a Remote *
- Software Version Display

The options marked with '*' perform no function if the display 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 displays.

1. Press the ☒ and ☐ 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 and light to show this.
3. Press the * button to change to the desired colour, 'RED' (Red), 'GRN' (Green) or 'YEL' (Yellow).
4. Return to the main display by pressing the * button.

4.4 Lighting Bank Selection

The Dataline-X instrument system can have two separate banks of instruments. Setting the lighting level on one display will set all the other displays in that bank to the same level, but will not effect any displays 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.

This is independent of the display colour, so that displays 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 LCD indicates 'BANK -1- LITE' (or 'BANK -2- LITE').
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, extra data can be calculated (distance to waypoint and bearing to waypoint) when the Multi is set to Rhumb Line, that is not calculated whilst set to Great Circle.

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.

Note: The user is advised to select Magnetic or True to be in agreement with the selection made on the Navigation Receiver. However, if the Navigator outputs the variation, the instrument is able to compute either True or Magnetic from the other.

4.8 Unit selection (System wide).

Calibration mode, now enables the user to select the preferred units for display for Depth, Boat Speed, Distance, Wind Speed and Temperature. The Units type once entered is echoed around the system to change other Dataline X instrument to the selected choice (where possible).

4.8.1 Depth Unit selection

Depth can be set for: Metres, Feet and Fathoms.

1. Press the ☐ and ☒ buttons together, and hold for more than 3 seconds, until "LITE YEL." (or similar) is shown on the display.

2. Press the  button 4 times, until the display indicates:-
"UNITS "

"DPTH. METR." (or similar).
3. Press the  button until desired units are displayed:-
"DPTH. METR." for Metres or
"DPTH. FEET" for Feet or
"DPTH. FATH." for Fathoms.
4. Press the  button to enter the data and return to the main display (or press  or  to alter another calibration function).

4.8.2 Speed Unit selection

Speed can be set for: Knots, mph and km/h.

1. Press the  and  buttons together, and hold for more than 3 seconds, until "LITE YEL." (or similar) is shown on the display.
2. Press the  button 5 times, until the display indicates:-
"UNITS"

"SPD. KNOT" (or similar).
3. Press the  button until desired units are displayed:-
"SPD. KNOT" for Knots, or
"SPD. MPH " for miles per hour, or
"SPD. KM/H" for kilometres per hour.
4. Press the  button to enter the data and return to the main display (or press  or  to alter another calibration function).

4.8.3 Distance Unit selection

Distance can be set for: NM and km.

1. Press the  and  buttons together, and hold for more than 3 seconds, until "LITE YEL." (or similar) is shown on the display.
2. Press the  button 6 times, until the display indicates:-
"UNITS "

"DIST. NM " (or similar).
3. Press the  button until desired units are displayed:-

—
"DIST. NM " for Nautical Miles, or
"DIST. KM " for Kilometres.

4. Press the * button to enter the data and return to the main display (or press  or  to alter another calibration function).

4.8.4 Wind Speed selection

Wind Speed can be set for: Knots, km/h, m/s and Beaufort.

1. Press the  and  buttons together, and hold for more than 3 seconds, until "LITE YEL." (or similar) is shown on the display.
2. Press the  button 5 times, until the display indicates:-
"UNITS"

"WIND KNOT" (or similar).
3. Press the * button until desired units are displayed:-
"WIND KNOT" for Knots, or
"WIND KM/H" for km/h (kilometres per hour), or
"WIND M/S " for m/s (metres per second), or
"WIND BEAU." for Beaufort.
4. Press the * button to enter the data and return to the main display (or press  or  to alter another calibration function).

4.8.5 Temperature selection

Temperature can be set to Centigrade or Fahrenheit.

1. Press the  and  buttons together, and hold for more than 3 seconds, until "LITE YEL." (or similar) is shown on the display.
2. Press the  button 4 times, until the display indicates:-
"UNITS"

"TEMP. CENT." (or similar).
3. Press the * button until desired units are displayed:-
"TEMP. CENT." for Centigrade, or
"TEMP. FAHR." for Fahrenheit.
4. Press the * button to enter the data and return to the main display (or press  or  to alter another calibration function).

4.9 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 3 times, until the display indicates 'TIME HOUR 0' (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.

4.10 Multi as a REMOTE

The Multi can be set up as a remote unit, where Multi will display the same data as displayed on one of the Central's sub-screens. This data will changes automatically as the Central groups and screens are changed.

Notes:

1. The Multi screens can be change in the normal way while in Remote mode, but will revert back to Remote screen after 10 second or next time the Central group or screen is changed.
2. The Setup screens on the Central are not sent to the Multi.
3. A Multi operating in Remote mode will change to the appropriate Central screen on system power up.

4.10.1 To Set the Multi for Remote use

Setting the Multi as a remote unit can be done as follows:

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 shows 'SET OFF MULTI NO' and the 'Remote' legend. See Note 1.
3. Press the * button once and 'OFF' will flash. See Note 1.
4. To select the Multi number, use the  or  buttons until the desired number is displayed flashing. See Note 4.
5. When the Multi Number is correct return to the calibration menu by pressing the * button, and return to the main display by pressing the * button.
6. The Remote legend will be display at the top of the screen with the desired Multi number displayed along side. See Notes 2 & 3.

Notes:

1. If the Remote Legend is being displayed prior entering Calibration Mode then the previously selected Multi number will be displayed and not 'OFF'.
2. The Multi will only begin to operate in Remote mode at the next Central screen change or the next time the system is powered up.
3. The Multi will only operate in remote mode if there is a Central connected in the system.
4. The Multi number selection is dependant on the Central's configuration (the standard Central is permanently configured as Central 3).

- Central 1:

Upper sub-screen is displayed by 'Multi number 1'

Middle sub-screen is displayed by 'Multi number 2'

Lower sub-screen is displayed by 'Multi number 3'

- Central 2:

Upper sub-screen is displayed by 'Multi number 4'

Middle sub-screen is displayed by 'Multi number 5'

—
Lower sub-screen is displayed by 'Multi number 6'

- Central 3 (Standard):

Upper sub-screen is displayed by 'Multi number 7'

Middle sub-screen is displayed by 'Multi number 8'

Lower sub-screen is displayed by 'Multi number 9'

4.10.2 To Return from Remote use

Return from Remote mode can be done as follows:

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 shows 'SET' current Multi Number 'MULTI NO' and the 'Remote' legend. See Note 1.
3. Press the * button once and 'Multi Number' will begin to flash. See Note 1.
4. To deselect the Multi number, use the  or  buttons until the 'OFF' is displayed flashing.
5. When the display shows 'OFF' return to the calibration menu by pressing the * button, and return to the main display by pressing the * button.
6. The Remote legend will disappear and the group number will reappear at the top right-hand side of the screen.

Note:

1. If the Remote Legend is being displayed prior to entering Calibration Mode then the previously selected Multi number will be displayed and not 'OFF'.

4.11 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 5.20' (or similar).
3. Return to the main display by pressing the * button.

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CONTENTS

- 5.1 General
- 5.2 Fault Finding Chart

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>
<p>All instruments have blank displays.</p>	<p>No 12V Power Supply.</p>	<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>
<p>One or more, but not all, instruments have blank displays.</p>	<p>There is no 12V power supply to the affected instrument (s).</p>	<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>
<p>All instruments always show '----', with the pointers of analogue instruments at their zero positions.</p>	<p>No data is reaching any of the instruments.</p>	<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>
<p>One or more, but not all, instruments always show '----', with the pointers of analogue instruments at their zero positions.</p>	<p>No data is reaching the affected instrument(s).</p>	<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>	<p>The lighting level or other data is not reaching the Databox.</p>	<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>	<p>The lighting level or other data is not reaching the Databox from the affected instrument(s).</p>	<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.	<p>Check the speed transducer's connections to the Databox (especially the White and Yellow 'Speed' wires).</p> <p>Check that the speed transducer cable is not damaged.</p> <p>Contact your dealer.</p>
The Boat Speed display always shows '0.0', but the Sea Temperature display is shown.	<p>The speed transducer is not installed in the hull fitting.</p> <p>The speed transducer is not connected to the Databox properly.</p> <p>Jammed paddle wheel.</p> <p>Damaged paddle wheel or transducer body.</p>	<p>Check, and replace the blanking plug with the transducer if necessary.</p> <p>Check the speed transducers connections to the Databox (especially the Red, Blue and Black 'Speed' wires).</p> <p>Check that the speed transducer cable is not damaged.</p> <p>Clean the paddle wheel and transducer as required.</p> <p>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.</p> <p>Contact your dealer.</p>
The Boat Speed is too low, when it was previously correct.	<p>Dirty paddle wheel or hull.</p> <p>Damaged paddle wheel or transducer body.</p> <p>The paddle wheel is not aligned fore / aft within the skin fitting.</p>	<p>Clean the paddle wheel and / or the hull as required.</p> <p>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.</p> <p>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.</p> <p>Make other checks as for 'always showing 0.0' above.</p>
The Boat Speed has always been too low or too high.	The speed transducer is not calibrated.	<p>Calibrate the speed transducer. (Using another instrument.)</p> <p>Make other checks as for 'the speed is too low when it was previously correct' above.</p>

<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 slightly 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 the display 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"> 1. There should be no skin fittings or other obstructions in front of it. 2. It should be well faired into the hull without any large steps. 3. It should be mounted well to the rear of the hull in planing vessels, and not mounted in or near propeller tunnels. <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>
<p>There are no Heading or Wind Direction displays.</p>	<p>The required data is not being received from the Heading Sensor or Autopilot.</p>	<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>
<p>There is no Autopilot Set Course display, even though the Heading display is working.</p>	<p>The required data is not available from the Autopilot.</p>	<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 : 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 is not aligned correctly.</p>	<p>Consult the manufacturers instructions.</p>

<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>
<p>The external alarm does not sound.</p>	<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>
<p>There are missing Engine Hour or Battery Voltage displays, or the Engine Hour counts don't work, or these displays always show '----'.</p>	<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>

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

6.1 General Maintenance

The instrument head will require no maintenance apart from occasional cleaning. Do this using 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

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

6.3 Removal of Instrument

1. If rear access is possible unplug the Dataplug connectors from the rear of the instrument. If the connection needs to be made up then the two wires may be joined using one of the connectors as a terminal block.
2. Remove the outer cover. 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.
3. Remove the cover and the four corner fixing screws.
4. Pull the instrument free from the surface, being careful not to strain the wiring if the connectors have not yet been removed.
5. If they are not yet removed, unplug the Dataplug connectors from the rear of the case, and make up the cable if necessary.

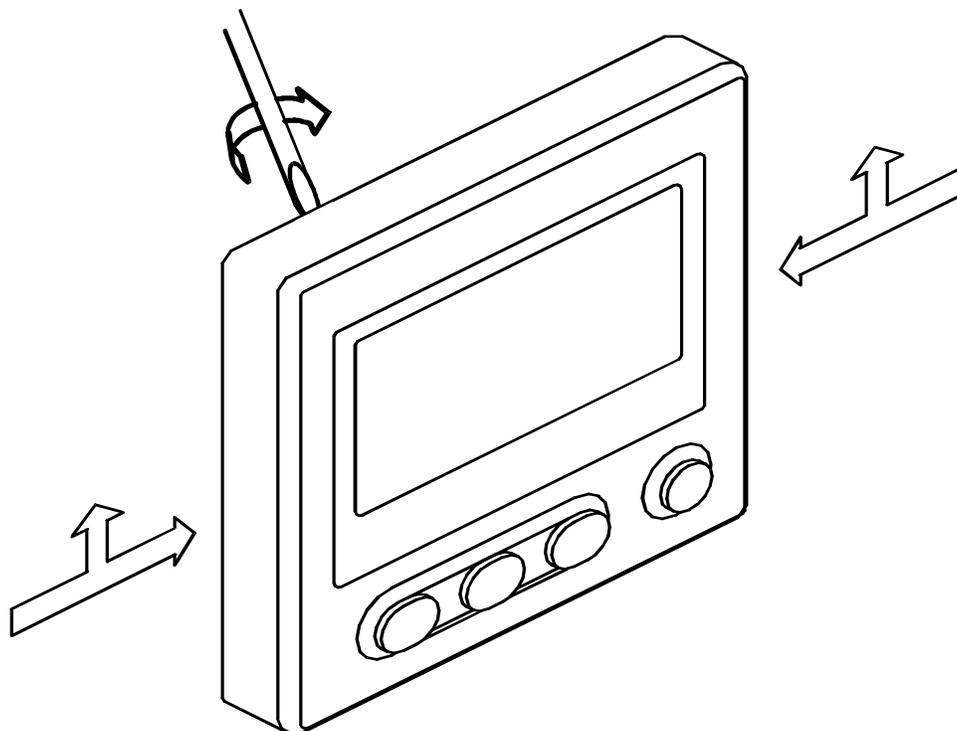


Figure 6.1 - Removal of Instrument

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 MULTI display are as below:

VHW	=	Boat Speed (Knots Field)
DBK		(DBK standard and Stowe)
DBS	=	Depth (Feet or Metres Fields)
DBT		
MTW	=	Sea Temperature
HDM		
HDT	=	Heading
VHW		
HSC	=	Autopilot Set Course
VWR	=	Apparent Wind Speed (Knots, m/s or km/m Fields)
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		

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The NMEA 0183 messages that are received by the MULTI 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