

**USER GUIDE FOR**

**DATALINE-X™**

**ANALOGUE SPEED**

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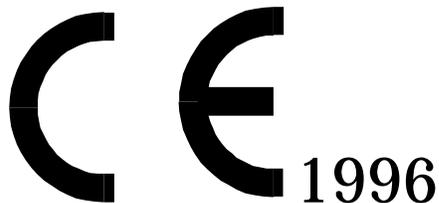
Dataline-X Analogue Speed Manual, Part Number 06253SM, Issue 2, Dec 1995.

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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.***



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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 Navigation System Repeater digital display, known as **Dataline-X ANALOGUE SPEED**, used within the Dataline-X System.

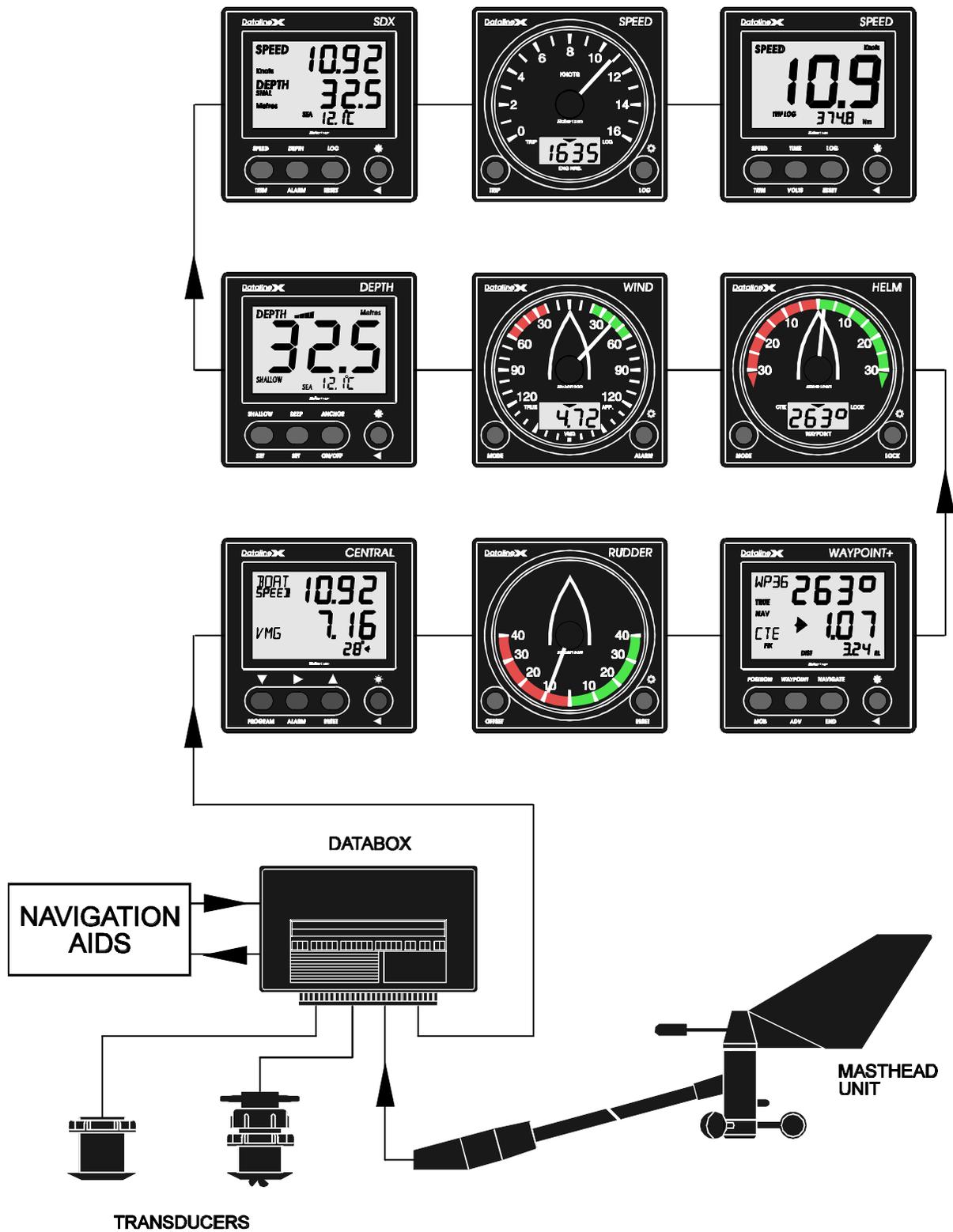


Figure 1.1 - Dataline-X System Diagram

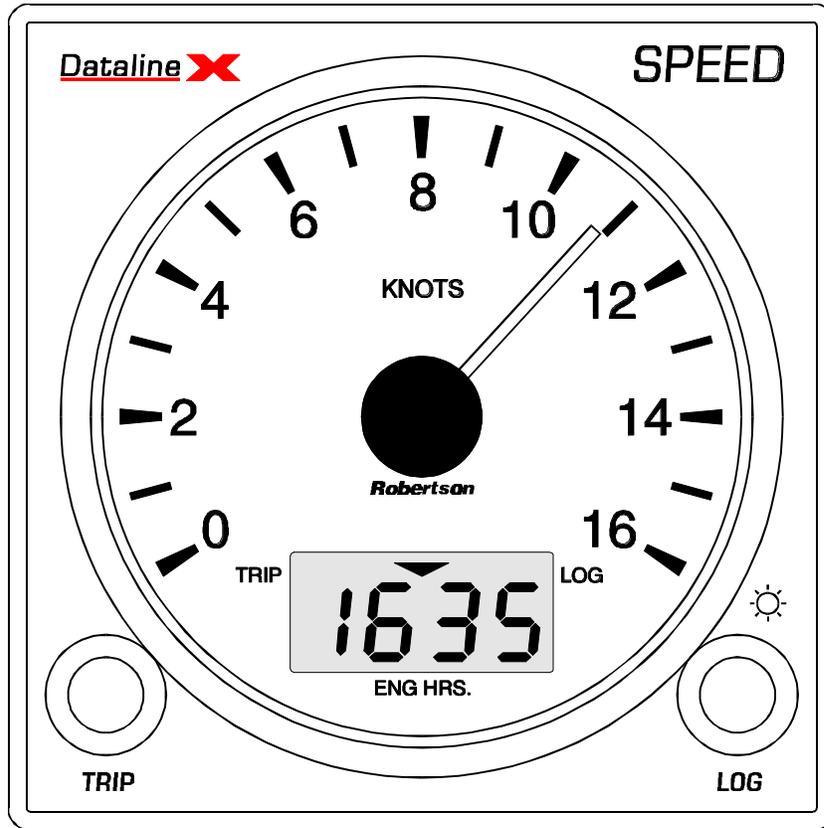


Figure 1.2 - Dataline-X ANALOGUE SPEED Instrument

**1.2 Dataline-X ANALOGUE SPEED Specification**Speed Functions

Speed Display	0 to 16.0 Knots (See Note 1)
Speed Units	Knots
Speed Damping	1 fixed damping level

Sea Temperature Functions

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

Log Functions

Log	To 9999 Nm (permanently saved)
Trip Log	To 9999 Nm (resettable/saved)
Log Units	Nautical miles/kilometres
Log Precision	1, 0.1 or 0.01 units as appropriate (4 digits)

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 2)
Display Backlighting Levels	Seven levels plus Off
Display Backlighting Colours	Three colours, (Red, Green, Yellow)
Display Backlighting Control	Two independent lighting banks.
Sat Nav Output	(via Databox)

General

Power Requirement	10 to 16V, 70 mA, (100 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, log, or sea temperature NMEA data being transmitted from another sensor to the Databox, then this alternative data will be used.

## Notes:

1. The maximum speed and precision given relate to the display, the transducer installed will determine the actual maximum speed and precision.

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- 2. 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 display is divided into two sections, the pointer, and the LCD. The pointer always shows the Boat Speed, while the LCD is controlled by the two buttons.

**2.1.1 The Dialplate**

The dialplate is printed with a scale of 0 to 16 Knots Boat Speed.

**2.1.2 The LCD Display**

The LCD normally shows one of the values below:

- Trip Log
- Permanent Log
- Sea Temperature
- Engine Hour Count (Port / Starboard / Single)
- Battery Voltage (Port / Starboard / Single)

There are three arrows at the top of the LCD which show which data is being displayed at any one time. The left arrow points to TRIP on the dialplate for 'Trip Log', the right arrow points to LOG on the dialplate for 'Permanent Log', and the centre arrow points to **ENG. HRS** on the dialplate for 'Engine Hour Counter' (and either the left or right arrow may be lit to indicate which engine hour count is shown, if there are two engines attached to the system). For 'Battery Volts' no arrows are lit, unless two engine battery banks are being monitored, in which case either the left or right arrow will be lit as appropriate.

### 2.1.3 The Buttons

The word below the button indicates the main function for that button.

The TRIP button changes the current display mode to showing the Trip Log from showing the Permanent Log, and when it is pressed again it will, cycle around all the other available data displays. If this button is held down it resets the Trip Log.

The LOG button (this button has a  $\star$  symbol above it) changes the current display mode to showing the Permanent Log. If this button is held down it sets the lighting level.

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

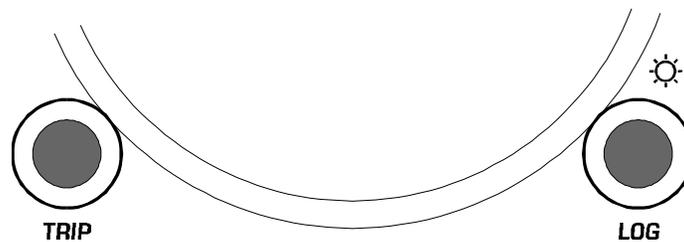


Figure 2.1 - The Buttons

## 2.2 Powering Up

When powering up the instrument, it will beep, the pointer will move to the zero position, and will show all the LCD segments for approximately one second.

The pointer will then show the current Speed if it is available, while the LCD will show the Trip Log if that is available.

## 2.3 The Display Menu

Notes:

1. If any data is not available then either the screen will not be shown, or “----” will be displayed in place of the data in the appropriate screen(s).

## 2.4 To Reset The Trip Log to Zero

1. Press the TRIP button and hold. The LCD will show ‘rSt?’. If the button continues to be held, the Trip Log will be reset and the LCD will change to show this.
2. Once the Trip Log has been reset, release the TRIP button.

**2.5 To Set Display Backlighting**

1. Press the LOG 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 LOG 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.).

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

**2.6 Demonstration Mode**

The Demonstration Mode allows the user to familiarize himself/herself with all the functions of the instrument with the device removed from the system. Demonstration software within the instrument produces realistic values for the display.

A +12V power supply will be required to be connected as follows:

- 0V to the BLACK (far right) terminal.
- +12V to the RED (far left) terminal.

To enter the Demonstration Mode, press the LOG button whilst applying power to the instrument.

To leave the Demonstration Mode, switch off and re-apply power.

Notes:

1. The display will leave demonstration mode if any data is received.
2. The display can be set to automatically enter 'Shop' demonstration mode every time it is powered up. (See Part 4 for further details.)



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- 3.1 General
- 3.2 Installation
- 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.

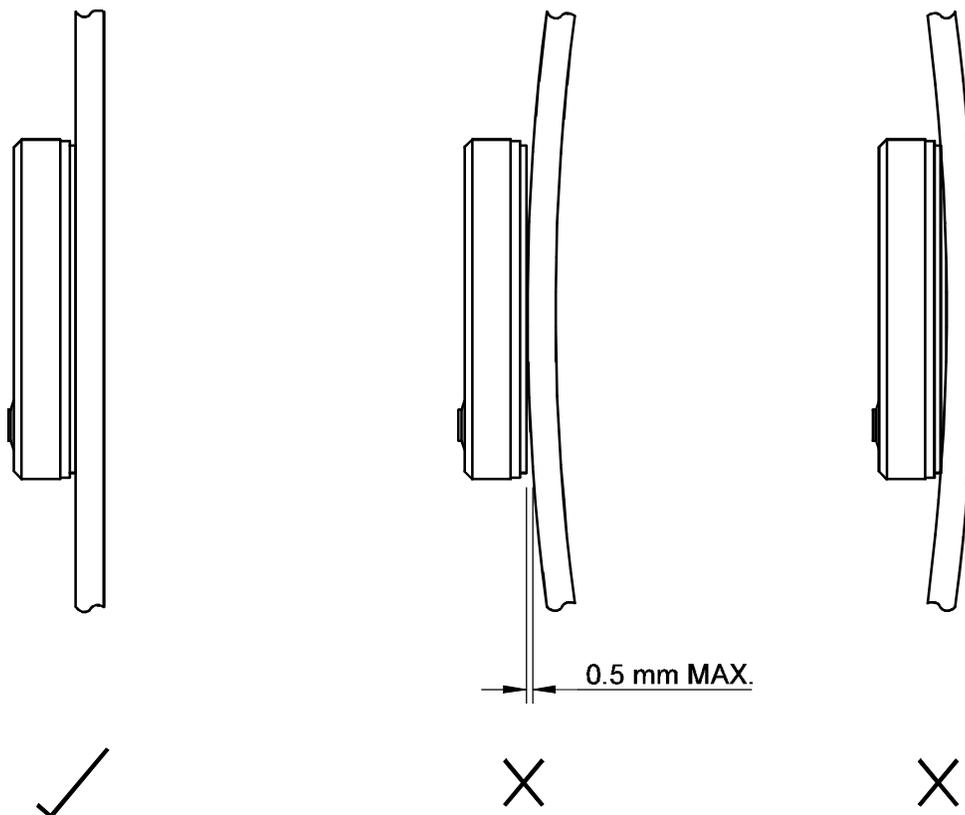


Figure 3.1 - Installation

**3.2 Installation**

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.

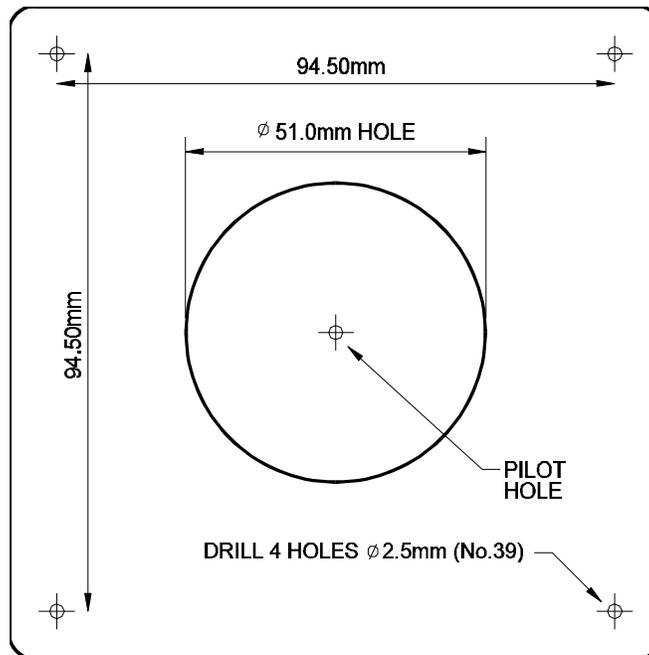


Figure 3.2 - Mounting Details (Not To Scale)

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 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.

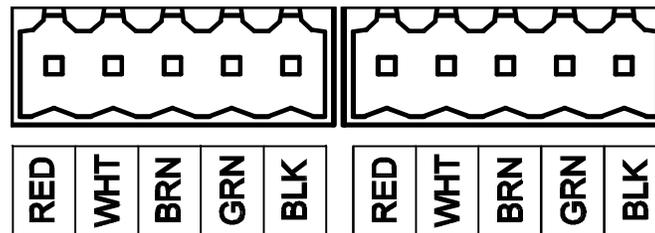


Figure 3.3 - Electrical Connections

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 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.

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

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- 4.2 Calibration Mode
- 4.3 Lighting Colour Selection
- 4.4 Lighting Bank Selection
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- 4.8 Sea Temperature Units Selection
- 4.9 Test Mode Entry Screen
- 4.10 Shop Demo Mode Setting
- 4.11 Leaving Calibration Mode

**4.1 System Calibration**

After installation, the system may be calibrated to take into account the physical position of and type of transducers installed. Additionally, such things as display units and precision may be selected.

**4.2 Calibration Mode**

To enter Calibration Mode:

1. Press both buttons together, and hold for more than 3 seconds, until 'rEd', 'Grn', or 'YEL' is shown on the display.
2. For each successive press of the LOG button, the display will step through the calibration menu. To step through backwards, press the TRIP button.
3. The menu function may be changed immediately by pressing both buttons together, or this may cause the value to flash, depending on the function.
4. The TRIP and LOG buttons may be used to decrement or increment values, which are flashing. When the value is correct, press both buttons together again to save it.

- 
5. Selecting the Calibration Mode End Screen and pressing both buttons together 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)\*
- LCD Contrast (select Level 1 or Level 2)
- Log Calibration (value entry, -97.5% to +97.5%)\*
- Two Engines / One Engine / Sat Nav Output (select)\*
- Sea Temperature Units (select, °C, °F)
- Test Mode entry screen (select, On, Off)
- Shop Demo Mode Selection (select On, Off)

The options marked with ‘\*’ perform no function if the display is not part of the 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 both buttons together, and hold for more than 3 seconds.
2. The display should indicate the current lighting colour as either 'rEd', 'Grn', or 'YEL', and will light to show this.
3. Press both buttons together to the desired colour, 'rEd' (Red), 'Grn' (Green) or 'YEL' (Yellow).
4. Return to the main display by pressing the TRIP button once to select the Calibration Mode End Screen, and then pressing both buttons together.

### **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 both buttons together, and hold for more than 3 seconds, until 'rEd', 'Grn', or 'YEL' is shown on the display.
2. Press the LOG button once until the LCD indicates '-1-' (or '-2-').
3. Select the required lighting bank, either 1 or 2, by pressing both buttons together.
4. Return to the main display by pressing the TRIP button twice to select the Calibration Mode End Screen, and then pressing both buttons together.

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

The LCD on Dataline-X Series instruments can be set to one of two or more contrast levels to best suit the viewing angle of the particular installation. This display has two contrast levels.

The default level (level 2) is suitable for a wide range of viewing angles and will probably not require alteration. However, if viewing the display from above, the contrast level may be lowered to level 1 to reduce the 'ghosting' of the parts of the display which are turned off. The lighting is illuminated when setting the contrast to highlight the display.

1. Press both buttons together, and hold for more than 3 seconds, until 'rEd', 'Grn', or 'YEL' is shown on the display.
2. Press the LOG button twice until the LCD indicates the current contrast level as 'LCd2' (or 'LCd1').
3. Select the required LCD contrast level, either 1 or 2, by pressing both buttons together.
4. Return to the main display by pressing the TRIP button three times to select the Calibration Mode End Screen, and then pressing both buttons together.

#### **4.6 Manual Log Calibration**

This function enables the LOG function to be calibrated manually by comparing the measured distance against a known distance (e.g., a measured nautical mile). (See Appendix A for details on making the calculations).

1. Press the TRIP and LOG buttons together, and hold for more than 3 seconds, until 'LItE' is shown on the display.
2. Press the LOG button seven times until the LCD indicates 'CAL ?'.
3. Press both buttons together to enable the calibration value to be entered. Use the TRIP and LOG buttons to change the CAL setting. The value will start to flash. This will change in steps of 2.5%.
4. Return to the calibration menu by pressing both buttons together, to the main display by pressing the TRIP button 4 times to select the Calibration Mode End Screen, then pressing both buttons together.

#### **4.7 Sat Nav Output/Engine Hours/Battery Volts Selection**

The display can show one or two battery voltages, and one or two engine hour counts, and the Databox may or may not have a SatNav Output of 100 or 200 pulses per Nautical Mile. This depends on the set up of the 'AUX' and 'IGN' terminals on the Databox.

The options are as below:

'2ENG' =

- i. Two Engine Hour Inputs (IGN = Port, AUX = Stbd)
- ii. Two Battery Voltage measurements, one for each engine's battery bank (IGN = Port, AUX = STBD)
- iii. No Sat Nav Output

'1ENG' =

- i. One Engine Hour Input (IGN)
- ii. Two Battery Voltage Measurements (IGN = the engine ignition bank, AUX = the second battery bank)
- iii. No Sat Nav Output

'SAAt1' =

- i. One Engine Hour Input (IGN)
- ii. One Battery Voltage Measurement (IGN = the engine ignition battery bank)
- iii. A 100 Pulse Per Nautical Mile Sat Nav Output (AUX)

‘SAAt2’ =

- i. One Engine Hours Input (IGN)
  - ii. One Battery Voltage Measurement (IGN = the engine ignition battery bank)
  - iii. A 200 Pulse Per Nautical Mile Sat Nav Output (AUX)
1. Press the TRIP and LOG buttons together, and hold for more than 3 seconds, until ‘LItE’ is shown on the display.
  2. Press TRIP 5 times until the LCD indicates ‘SEt 2ENG’ (or similar).
  3. Select the required functions for the IGN and AUX Databox terminals by pressing both buttons together.
  4. Return to the main display by pressing the LOG button 4 times to select the Calibration Mode End Screen, then press both buttons together.

#### **4.8 Sea Temperature Units Selection**

Displayed temperature units may be set to either °F or °C.

1. Press both buttons together, and hold for more than 3 seconds, until ‘LItE’ is shown on the display.
2. Press the TRIP button four times until the LCD indicates °C or °F.
3. Select required units by pressing the both buttons together.
4. Return to main display by pressing the LOG button 3 times to select the Calibration Mode End Screen, then press both buttons together.

#### **4.9 Test Mode Entry Screen**

The Test Mode will test all display functions (See Part 5 for further details).

1. Press both buttons together, and hold for more than 3 seconds, until ‘rEd’, ‘Grn’, or ‘YEL’ is shown on the display.
2. Press the TRIP button three times, until the LCD shows ‘tESt’.
3. Press both buttons together to start to set Test Mode On, the current value, ‘OFF’, will be shown flashing.
4. Select Test Mode On by pressing either button on its own, the LCD will show ‘ON’ flashing.

5. Press both buttons together to start Test Mode.

If it is decided not to start Test Mode then press either button to change the LCD back to flashing 'OFF', then press both buttons to return to showing 'tEST'. Return to the main display by pressing the LOG button twice to select the Calibration Mode End Screen, and then pressing both buttons together.

#### **4.10 Shop Demo Mode Setting**

The instrument can be set to always power up in demonstration mode by setting 'Shop Demo' Mode On (this function is for use by dealers only).

1. Press both buttons together, and hold for more than 3 seconds, until 'rEd', 'Grn', or 'YEL' is shown on the display.
2. Press the TRIP button twice, until the LCD shows 'SHOP'.
3. Press both buttons together to start to change the Shop Demo mode setting, the current value, 'OFF' (or 'ON'), will be shown flashing.
4. Select Shop Demo Mode On (or Off) by pressing either button on its own, the LCD will show 'ON' (or 'OFF') flashing.
5. Press both buttons together to save the Shop Demo Mode setting.
6. Return to the main display by pressing the LOG button once to select the Calibration Mode End Screen, and then pressing both buttons together.

Note: After power up, the instrument will always return from Shop Demo Mode to showing data if any data is received.

#### **4.11 Leaving Calibration Mode**

To return to the main display from Calibration Mode the Calibration Mode End Screen has to be selected.

1. From any Calibration Mode menu screen press either the TRIP or the LOG button repeatedly until the LCD shows 'End?'. This is the Calibration Mode End Screen.
2. Return to the main display by pressing both buttons together.

## **CONTENTS**

- 5.1 General
- 5.2 Test Mode
- 5.3 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. The built in Test Mode will also help diagnose faults. For additional assistance, call your local dealer.

### **5.2 Test Mode**

The Test Mode will test all the display functions.

1. Press both buttons together, and hold for more than 3 seconds, until 'rEd', 'Grn', or 'YEL' is shown on the display.
2. Press the TRIP button three times, until the LCD shows 'tESt'.
3. Press both buttons together to start to set Test Mode On, the current value, 'OFF', will be shown flashing.
4. Select Test Mode On by pressing either button on its own, the LCD will show 'ON' flashing.
5. Press both buttons together to start Test Mode.

If it is decided not to start Test Mode then press either button to change the LCD back to flashing 'OFF', then press both buttons to return to showing 'tESt'. Return to the main display by pressing the LOG button twice to select the Calibration Mode End Screen, and then pressing both buttons together.

#### Test Mode

The display will go through six tests. In order to move on to the next test, press the TRIP button. In order to leave test mode, press the LOG button.

First the LCD will light all the segments and the pointer will return to the zero position. The LCD will then blank.

### Pointer Test

The LCD will then show the software code version, and after a few seconds the pointer will start to move backwards and forwards through its whole movement. This will be repeated until a button is pressed.

### LCD Segments Test

After the pointer test, the display will show 'tSt2', and start the LCD test. This will light every one of the segments on the LCD one by one. They will then be turned off one by one until they are all off again. This will be repeated until a button is pressed.

### LCD Contrast Test

After the LCD Segment test, the display will show 'tSt3' and start to swap between the two LCD contrast levels, showing 'LCd' and the contrast level. This will continue until a button is pressed.

### Lighting Test

After the LCD Contrast Test, the display will show 'tSt4' and start to cycle through the various lighting levels and colours. There are four red lighting levels (r8, r4, r2, r1), three green levels (G4, G2, G1) and three yellow levels (L4, L2, L1). This will continue until a button is pressed.

### NMEA Input Test

After the lighting test, the display will show 'tSt5' and start to monitor its NMEA input. It will show 'IN' and a count of the successful inputs up to five, when it will automatically step onto the next test.

If the display is receiving NMEA data, the count should happen without any actions on the user's part. If the display is powered up on its own, then its NMEA input (White) may be connected to the 12V power (Red) five times to simulate an input.

### NMEA Output Test

After the NMEA Input test, the display will show 'tSt6' and step onto the NMEA output test. If the display is connected to a Databox, then it will automatically transmit messages to the Databox and monitor the NMEA input for correct replies. This will count up from 1 to 5 while showing 'OUT'. (A failure here could be a wiring or Databox problem, however.) If the display is not on a Databox, then its NMEA Output (Brown) should be connected to the NMEA Input (White) and the display will transmit directly to itself.

After a successful test, the display will automatically step on to the next test.

### Button Test

After the NMEA Output test, the display will show 'tSt7', then test the two buttons, prompting with the button number. After a successful test of both buttons, the display will automatically return to normal mode.

The buzzer should beep on every button test.

## **5.3 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>
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<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 <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.

**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
- 6.4 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.

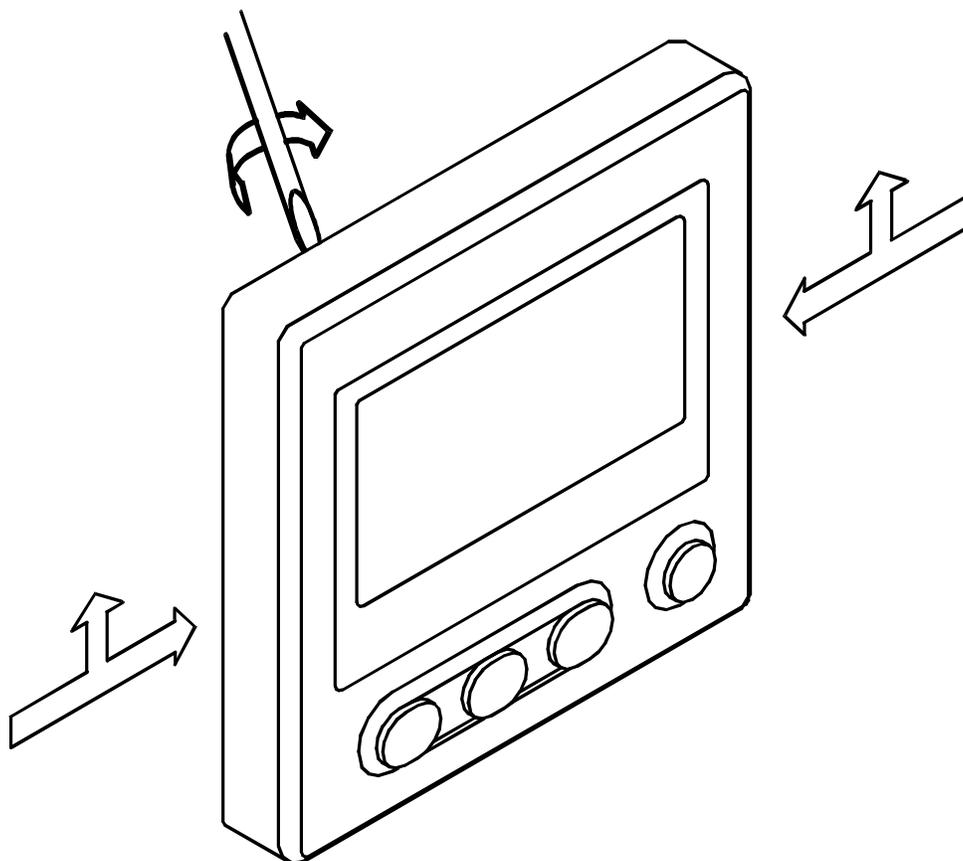


Figure 6.1 - Removal of Instrument

#### 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.

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The NMEA 0183 messages that are received by the SPEED display are as below:

VHW = Boat Speed (Knots Field)

VLW = Permanent Log, Trip Log

MTW = Sea Temperature

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## Introduction

The preferred method of calibration is to make two runs (in opposite directions) between points which are a known distance apart (measured off a map or chart). Ideally, the runs should be made in slack water, following the same track, one immediately following the other, should be over at least half a mile, and preferably more than one mile, at typical speeds for the vessel.

The display can calculate the correction factor automatically, but Manual Calibration may be done if desired. See Part 4.

## Manual Calibration Procedure

1. Make sure the calibration setting is 0%.
2. As the vessel passes the first marker, reset the TRIP LOG then maintain an approximately constant speed, until the second marker is reached, and on passing, record the TRIP LOG reading (L1).
3. Turn the vessel round and repeat Paragraph (2), only in the opposite direction. Record the TRIP LOG (L2).
4. Calculate the Average Distance Recorded ( $L = (L1 + L2)/2$ ).
5. Calculate Log Error (LE):
6.  $LE = \frac{(\text{Actual Distance} \times 100)}{L} - 100\%$
7. Manually enter the log calibration factor. See Part 4.
8. Return to main display by pressing the \* button twice.

## Example Calculation

Distance recorded on Run 1 = 1.21 Nm

Distance recorded on Run 2 = 1.18 Nm

Actual distance on chart = 0.80 Nm

Average distance (L) =  $\frac{1.21 + 1.18}{2} = 1.195$  Nm

Error (LE) =  $\frac{0.80 \times 100}{1.195} - 100 = -33.054\%$

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A calibration factor of -32.5% (the nearest available value) should be entered into the instrument.