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manual onboard!



# User Manual

*Including Installation Guide for Voyage Data Recorder Interface, VDRI-1*



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# Warnings and Safety

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It is essential to follow all instructions within this document to avoid potential personal injury, death, or damage to existing products in the vessel, the vessel's hull integrity, and including this product during installation or operation. Failure to follow instructions within this document will render all warranties given by Sleipner Motor as VOID.

Warnings and situations requiring extra caution are outlined in the documentation. Take extra consideration when warnings are outlined.



### WARNING

Indicate a potentially hazardous situation that, if not avoided, could result in death or severe injury.



### CAUTION

Indicates a potentially hazardous situation that could result in minor or moderate injury or critical damage to vessel integrity if not avoided.



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MC\_0451

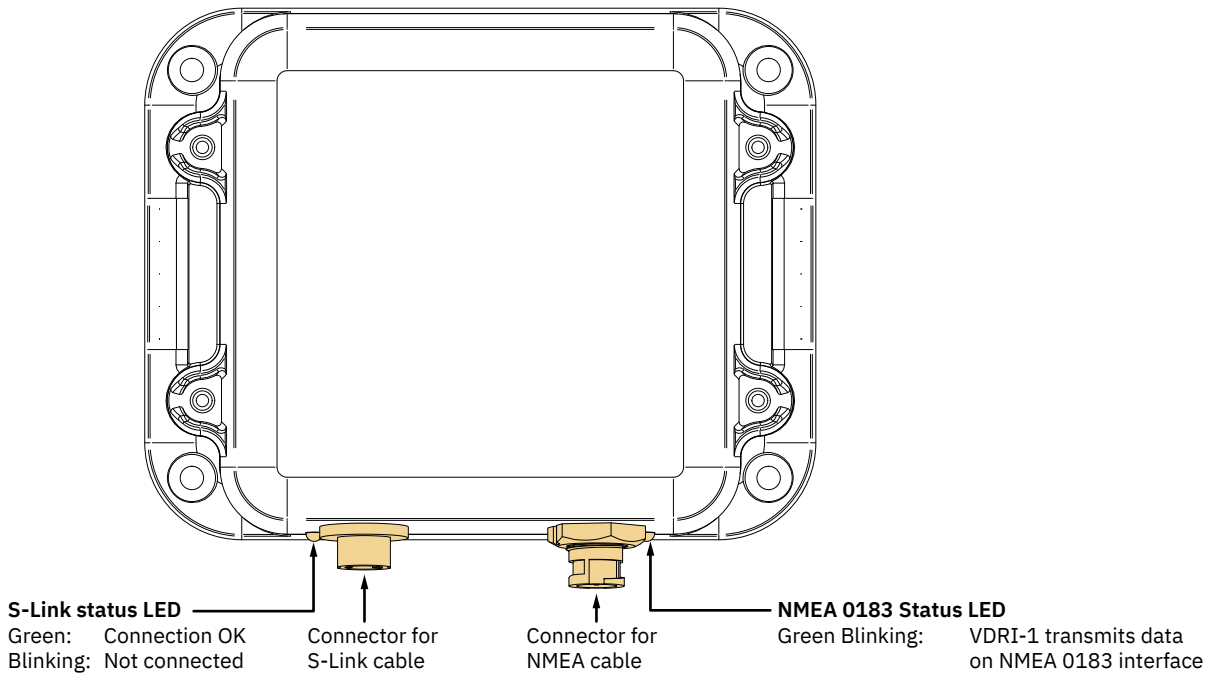
The Voyage Data Recorder Interface (VDRI-1) enables data logging of thruster operation to support the requirements of SOLAS chapter V Safety of navigation – REGULATION 20 Voyage data recorders and IMO Resolution A.861(20).

VDRI-1 acts as a gateway between Sleipner S-Link bus and a voyage data recorder with NMEA0183 interface. All relevant thruster operation messages are forwarded from the S-Link bus to the NMEA interface.

To enable logging of all required parameters control panels with Station Control functionality must be used, see chapter VDRI-1 Configuration for more information. Sleipner control panel PJC4xx supports Station Control.

Since IEC 61162-1 is harmonized standard of NMEA 0183, VDRI-1 is also IEC 61162-1 compliant.

## Layout & Functions



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## VDRI-1 Technical Specification

MC\_0447

Parameter	Specification		
	Min	Typical	Max
Supply Voltage	9VDC	12V/24V	31VDC
Rated max input power	< 1W		
Operating temperature	-20°C to +70°C		
IP rating	IP66		
Weight	150g		
Size	121x96x43mm (WxHxD)		

VDRI-1 can forward thruster data to a Voyage Data Recorder (VDR) from up to 4 thruster locations, called instances:

- Bow - Represents bow thruster or bow thruster port side if two bow thrusters are installed.
- Stern - Represent stern thruster or stern thruster port side if two stern thrusters are installed.
- Bow Starboard - Represents bow thruster on starboard side.
- Stern Starboard – Represents stern thruster on starboard side.

The VDRI-1 can get motor RPM data from either eVision, PDC-301 or TMU-1. Speed Source is a configurable parameter in VDRI-1 that defines the source of reported thruster RPM data. For all four instances the Speed Source must be configured:

- For AC thrusters the Speed Source can be configured to PDC-301 or TMU-1
- For hydraulic thrusters the Speed Source must be configured to TMU-1
- For eVision DC thrusters the Speed Source must be configured to eVision
- For instances which have no thruster installed the Speed Source must be configured to “-”

TMU-1 reports actual measured thruster RPM, measured by external RPM sensor on motor.

PDC-301 reports RPM calculated by Variable Frequency Drive (VFD).

eVision reports actual measured thruster RPM, measured by internal RPM sensor on motor.

Speed Source is configured using Sleipner control panel PJC4xx or S-Link Programmer. See PJC4xx and S-Link Programmer user manual for more information. At least one Speed Source must be configured for the VDRI-1 to start forwarding data on the NMEA 0183 interface.

Control panel supporting Station Control functionality must be used to enable logging of control panel location. Sleipner control panel PJC4xx supports Station Control. To be able to report the physical location of control panels the control panel must be configured to be in one of the following locations:

- 0 = Bridge
- 1 = Port Wing
- 2 = Starboard Wing
- 3 = Engine Control Room
- 4 = Engine (engine side / local)
- 5 = Wing (port or starboard not specified) (default)

Control panels not supporting Station Control will by default report the location Wing if thruster commands are logged.

If several control panels are installed and joysticks controlling the same thruster are moved in the same direction simultaneously, VDRI-1 will forward the highest % of thrust to the VDR for logging.

If joysticks controlling the same thruster are moved in the opposing direction simultaneously, the thruster will not respond, and VDRI-1 will not forward the % of thrust to the VDR.

Data is transmitted according to NMEA 0183 specification:

- 4.8KBaud
- 8 data bits
- Parity None
- Stop bit One

Two types of sentences are transmitted by the VDRI-1 on the NMEA interface:

- TRC – Thruster control data sentence
- TRD – Thruster response data sentence

Every second VDRI-1 starts to transmit the last received message from the control panel being In Command and all thrusters connected to the S-Link bus. One TRC and one TRD is transmitted for each installed thruster. Depending on the number of installed thrusters up to 8 sentences are transmitted each second.

The sentences are according to NMEA 0183 specification of TRC and TRD. All parts of the sentence are represented as ASCII characters.

<b>TRC – Thruster control data sentence format</b>
\$--TRC,x,x,x,a,x,x,a,x,x,a,a*hh<CR><LF>

<b>TRD - Thruster response data sentence format</b>
\$---TRD,x,x,x,a,x,x,a,x,x,a,x,x*hh<CR><LF>

Field	Description of field types in TRC and TRD sentences
\$	Start of sentence
--	Talker identifier
TRC	Sentence type
TRD	Sentence type
a	Alphabet character variable A through Z or a through z
x	Numeric character variable
x.x	Variable length integer or floating numeric field
*hh	Checksum- 2 HEX characters, MSB on the left.
,	Field delimiter

A negative sign “-” (HEX 2D) is the first character in a field if the value is negative. When used, this increases the specified size of fixed length fields by one. The sign is omitted if the value is positive.

VDRI-1 implementation of TRC and TRD is described in tables below.

Field	VDRI-1 implementation of TRC sentences
\$	
--	RC - Propulsion machinery including remote control
TRC	
1	1 - Represents bow thruster or bow thruster port side if two bow thrusters are installed. 2 - Represent stern thruster or stern thruster port side if two stern thrusters are installed. 3 - Represents bow thruster on starboard side. 4 - Represents stern thruster on starboard side.
2	Number between 0 and 100 - Indicates % thrust Negative numbers represent movement towards port side, represented by “-” before number. Positive numbers represent movement towards starboard side, no character before number.
3	P - Thrust is represented in %
4	No value
5	V – Data invalid
6	No value
7	Character - Location according to control panel definition.  B = Bridge P = Port wing S = Starboard wing C = Engine control room E = Engine side / local W = Wing (port or starboard not specified)  If control panel has no location defined, definition W is used.
8	R – Sentence is a status report of current settings
*hh	Checksum
<CR>	Carriage return character
<LF>	Line feed character – End of sentence delimiter

Field	VDRI-1 implementation of TRD sentences
\$	
--	RC - Propulsion machinery including remote control
TRD	
1	1 - Represents bow thruster or bow thruster port side if two bow thrusters are installed. 2 - Represent stern thruster or stern thruster port side if two stern thrusters are installed. 3 - Represents bow thruster on starboard side. 4 - Represents stern thruster on starboard side.
2	Number between 0 and 100 - Indicates % thrust Negative numbers represent movement towards port side, represented by “-” before number. Positive numbers represent movement towards starboard side, no character before number.
3	P - Thrust is represented in %
4	No value
5	Number – Thruster motor RPM
6	No value
*hh	Checksum
<CR>	R – Sentence is a status report of current settings
<LF>	R - Thrust is represented in RPM

## S-Link Fault Codes

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Fault situations in S-Link compliant products generates Fault Codes which are broadcasted on the S-Link bus. If a control panel receives a Fault Code, it will trigger an alarm in the control panel and the user will be able to get information about which product that reports the fault and the reason for the fault. Please see the user manual of your S-Link compliant control panel for more information on how to access Fault Code information in case of an alarm situation.

All Sleipner S-Link compliant products have product specific Fault Codes. For legacy reasons some control panels display Generic Fault Codes for certain products.

## VDRI-1 Fault Codes

MC\_0449

Fault Code	Fault Name	Fault Description	Action
109.0.0	Configuration Error - -	<ul style="list-style-type: none"><li>-No Speed Source configured. At least one instance must be configured for VDRI to log data.</li><li>-Instance configured to receive data from PDC-301, but receive data from TMU-1 or vice versa.</li><li>-An instance receives data when no Speed Source is configured, or vice versa.</li></ul>	Check configuration and installed devices on S-Link bus.

## Responsibility of the installer

MC\_0038

### General:

- The installer must read this document to ensure necessary familiarity with the product before installation.
- Directions outlined in this document cannot be guaranteed to comply with all international and national regulations, including but not limited to health and safety procedures. It is the installers responsibility to adhere to all applicable international and national regulations when installing Sleipner products.
- This document contains general installation guidelines intended to support experienced installers. Contact professional installers familiar with the vessel, Sleipner products and applicable regulations if assistance is required.
- If local regulation requires any electrical work to be performed by a licensed professional, seek a licensed professional.
- When planning the installation of Sleipner products, ensure easy access to the products for future service and inspection requirements.

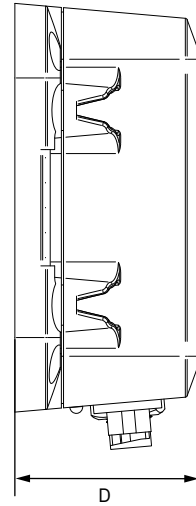
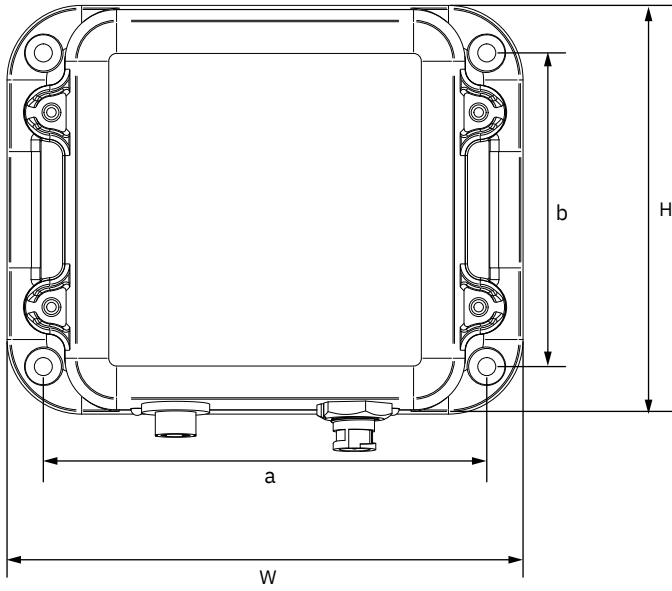
### For Sleipner S-Link™ systems:

MC\_0105

- When installing an S-Link™ system, connect ONLY original Sleipner S-Link™ products or other authorized control equipment directly to the S-Link™ bus. When connecting non-authorized third-party equipment, it must always be connected through a Sleipner-supplied interface product.
- Any attempt to directly control or connect to the S-Link™ control system without a designated and approved interface from Sleipner will void all warranties and responsibilities of the connected Sleipner products. If you interface the S-Link™ bus by agreement with Sleipner through a designated Sleipner-supplied interface, you are still required to install at least one original Sleipner control panel to enable efficient troubleshooting if necessary.

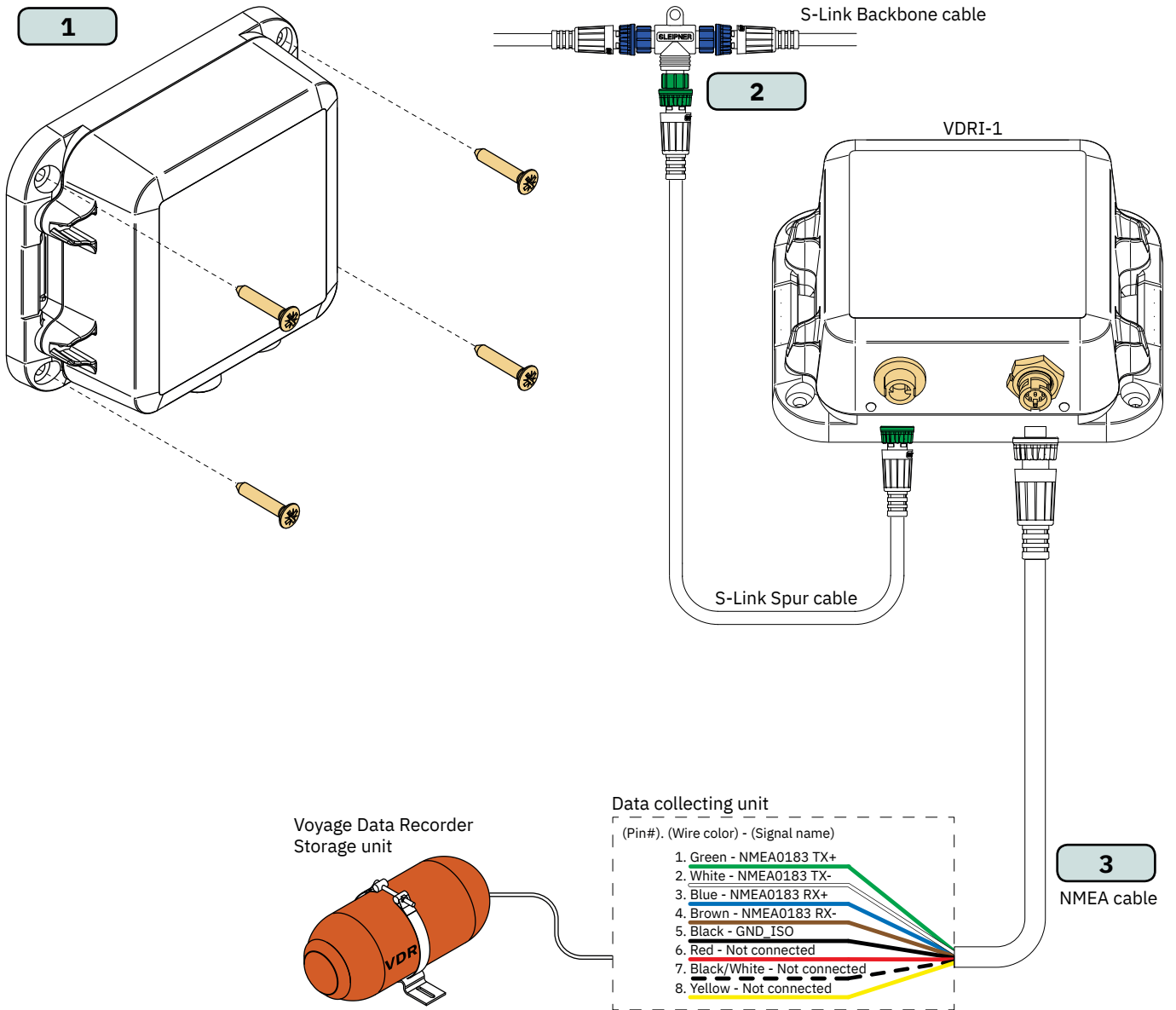


Dimension code	Dimension description	mm	inch
W	Width	121	4.8
H	Height	96	3.8
D	Depth	43	1.7
a	Distance between fastening holes	104	4.1
b	Distance between fastening holes	74	2.9



MG\_0744

1. Screw the box to a solid surface.
2. Connected S-Link SPUR Cable between VDRI-1 and a T-connector on the S-Link BACKBONE Cable. See *S-Link System Description* chapter for detailed information about S-Link systems.
3. Connect the NMEA cable between the VDRI-1 and the data collecting unit. See image below for detailed information on cable pinout. The supplied cable is delivered with flying leads and a connector interfacing the NMEA interface on the VDRI-1
4. Ensure that all PJC4xx control panels are configured with correct location. See PJC4xx User Manual for configuration instructions.
5. Configure Speed Source on VDRI-1, see chapter *VDRI-1 Configuration* for detailed information.



MG\_0494

S-Link is a CAN-based control system used for communication between Sleipner products installed on a vessel. The system uses BACKBONE Cables as a common power and communication bus with separate SPUR Cables to each connected unit. Only one S-Link POWER cable shall be connected to the BACKBONE Cable. Units with low power consumption are powered directly from the S-Link bus.

**Main advantages of S-Link system:**

- Compact and waterproof plugs.
- BACKBONE and SPUR Cables have different colour coding and keying to ensure correct and easy installation. BACKBONE Cables have blue connectors and SPUR Cables have green connectors.
- Different cable lengths and BACKBONE Extenders make the system scalable and flexible to install.

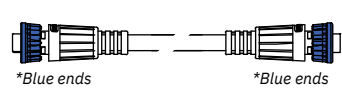
**Installation of S-Link cables:**

Select appropriate cables to keep the length of BACKBONE- and SPUR Cables to a minimum. In case of planned installation with total BACKBONE Cable length exceeding 100 meters please consult your local distributor. The S-Link cables should be properly fastened when installed to avoid sharp bend radius, cable chafing and undesired strain on connectors. Locking mechanism on connectors must be fully closed. To ensure long lifetime, cables, T-Connectors and Extenders should not be located so that they are permanently immersed in water or other fluids. It is recommended to install cables in such a way that water and condensation do not flow along the cables into the connectors. This can be done for example by introducing a u-shape bend before the cable enters the product connector.

Ideally, the POWER Cable should be connected to the middle of the BACKBONE bus to ensure an equal voltage drop at both ends of the BACKBONE Cable. The yellow and black wire in the POWER Cable shall be connected to GND and the red wire connected to +12VDC or +24VDC.

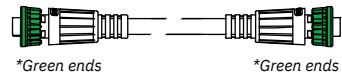
To reduce the risk of interference, avoid routing the S-Link cables close to equipment such as radio transmitters, antennas or high voltage cables. The backbone must be terminated at each end with the END Terminator.

SPUR cables can be left unterminated to prepare for the installation of future additional equipment. In such cases, ensure to protect open connectors from water and moisture to avoid corrosion in the connectors.



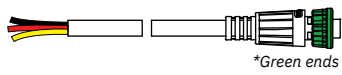
**BACKBONE Cable**

Forms the communication and power bus throughout a vessel. Available in different standard lengths.



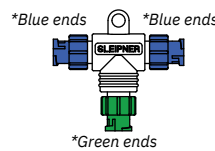
**SPUR Cable**

Used to connect S-Link compliant products to the backbone cable. One SPUR Cable must be used for each connected component, with no exceptions. Recommended to be as short as practically possible. Available in different standard lengths.



**POWER Cable**

Required in all installations for connection of BACKBONE Cable to a power supply and should be protected with a 2A fuse.



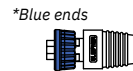
**T-Connector**

Used for connection of SPUR or POWER Cable to the BACKBONE Cable. One T-Connector for each connected cable.



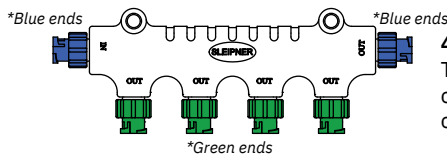
**BACKBONE Extender**

Connects two BACKBONE Cables to extend the length.



**END Terminator**

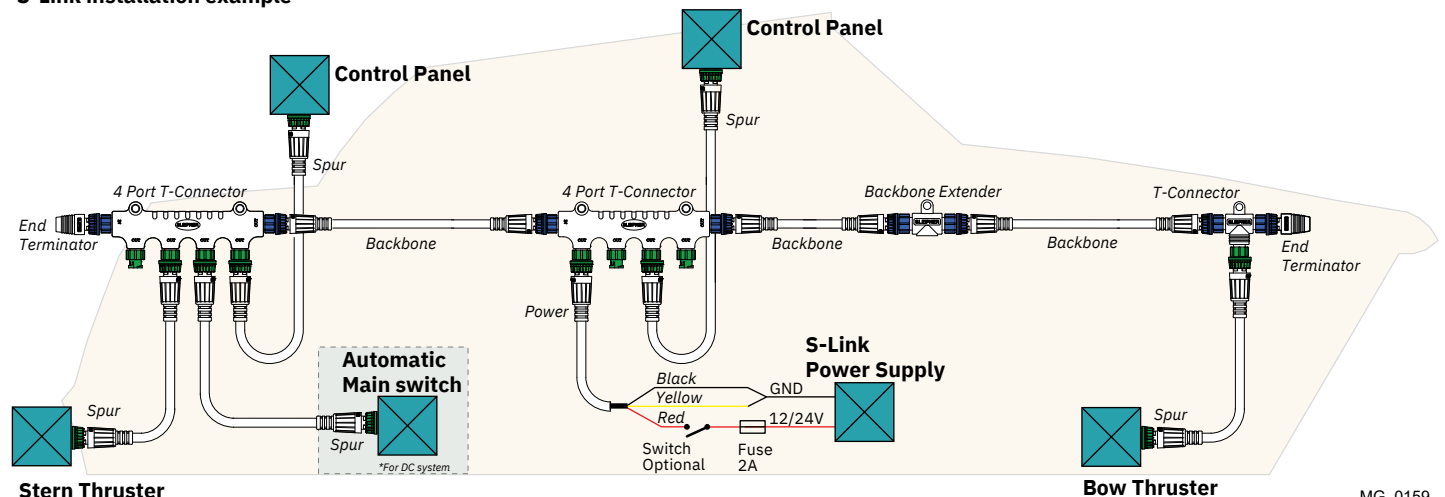
Must be one at each end of the BACKBONE bus.



**4-Port T-Connector**

The 4-PORT T-connector allows multiple SPUR Cables to be connected. The 4-PORT T-connector comes with two sealing caps to protect unused ports.

**S-Link installation example**



**Introduction:**

At Sleipner Group, we prioritize sustainability and encourage the repair and re-manufacturing of products to extend their life cycles. If disposal is necessary, please follow these guidelines to recycle and manage waste responsibly, ensuring our efforts align with environmental protection efforts.

**Electric Motors and Electronics:**

- Disconnect from any power sources and dismantle them carefully.
- Recycle components through certified e-waste recycling centers that can adequately handle and recover electronic materials.
- Dispose of any non-recyclable electronic parts according to local environmental regulations.

**Metals:**

- Collect and sort metal parts for recycling as scrap metal.
- To increase recycling efficiency, ensure that metals are clean and free from non-metal attachments.

**Plastics:**

- Identify recyclable plastics based on local recycling guidelines.
- Remove any non-plastic components and clean them before recycling to improve the quality of the recycled material.

**Hazardous Materials:**

- Correctly identify any hazardous substances within components, such as batteries or capacitors etc.
- Follow local regulations for the safe disposal of hazardous materials to prevent pollution and protect environmental health.

**General Disposal Instructions:**

- Consult local recycling programs to determine the acceptability of various materials.
- Use authorized disposal services to ensure compliance with environmental standards.

**Safe Disposal Practices:**

- Adhere to local laws and regulations for waste management to minimize environmental impact and ensure community safety.

This guide is designed to help reduce our products' environmental footprint through responsible end-of-life management. Please contact your local waste management supplier or our support team for more specific disposal information or further assistance.

**Find your local professional dealer from our certified worldwide network for expert service and support. visit our website [www.sleipnergrou.com/support](http://www.sleipnergrou.com/support)**

## Product spare parts and additional resources

**For additional supporting documentation, we advise you to visit our website [www.sleipnergrou.com](http://www.sleipnergrou.com) and find your Sleipner product.**

## Warranty statement

1. Sleipner Motor AS (The “Warrantor”) warrants that the equipment (parts, materials, and embedded software of products) manufactured by the Warrantor is free from defects in workmanship and materials for purpose for which the equipment is intended and under normal use and maintenance service (the “Warranty”).
2. This Warranty is in effect for two years (Leisure Use) or one year (Commercial and other Non-leisure Use) from the date of delivery/purchase by the end user, with the following exceptions:
  - (a) For demonstration vessels, or vessels kept on the water, the dealer is considered as the end user from 6 months after their launch of the vessel;
  - (b) The warranty period starts no later than 18 months after the first launch of the vessel.
 Please note that the boat manufacturer and dealer must pay particular attention to correct maintenance and service both by the products manuals as well as general good practice for the location the boat is kept in the period the boat is in their care. In cases where the 6 and 18 months grace periods for boat builders and dealers are passed, it is possible to obtain a full warranty upon inspection and approval of the warrantor or such representative.
3. Certain parts, classified as wearable or service parts, are not covered by the warranty. A failure to follow the required maintenance and service work as described in the product manual render all warranty on parts or components directly or indirectly affected by this void. Please also note that for some parts, time is also a factor separately from actual operational hours.
4. This Warranty is transferable and covers the equipment for the specified warranty period.
5. The warranty does not apply to defects or damages caused by faulty installation or hook-up, abuse or misuse of the equipment including exposure to excessive heat, salt or fresh water spray, or water immersion except for equipment specifically designed as waterproof.
6. In case the equipment seems to be defective, the warranty holder (the “Claimant”) must do the following to make a claim:
  - (a) Contact the dealer or service centre where the equipment was purchased and make the claim. Alternatively, the Claimant can make the claim to a dealer or service centre found at [www.sleipnergrou.com](http://www.sleipnergrou.com). The Claimant must present a detailed written statement of the nature and circumstances of the defect, to the best of the Claimant’s knowledge, including product identification and serial nbr., the date and place of purchase and the name and address of the installer. Proof of purchase date should be included with the claim, to verify that the warranty period has not expired;
  - (b) Make the equipment available for troubleshooting and repair, with direct and workable access, including dismantling of furnishings or similar, if any, either at the premises of the Warrantor or an authorised service representative approved by the Warrantor. Equipment can only be returned to the Warrantor or an authorised service representative for repair following a pre-approval by the Warrantor’s Help Desk and if so, with the Return Authorisation Number visible postage/shipping prepaid and at the expense of the Claimant.
7. Examination and handling of the warranty claim:
  - (a) If upon the Warrantor’s or authorised service Representative’s examination, the defect is determined to result from defective material or workmanship in the warranty period, the equipment will be repaired or replaced at the Warrantor’s option without charge, and returned to the Purchaser at the Warrantor’s expense. If, on the other hand, the claim is determined to result from circumstances such as described in section 4 above or a result of wear and tear exceeding that for which the equipment is intended (e.g. commercial use of equipment intended for leisure use), the costs for the troubleshooting and repair shall be borne by the Claimant;
  - (b) No refund of the purchase price will be granted to the Claimant, unless the Warrantor is unable to remedy the defect after having a reasonable number of opportunities to do so. In the event that attempts to remedy the defect have failed, the Claimant may claim a refund of the purchase price, provided that the Claimant submits a statement in writing from a professional boating equipment supplier that the installation instructions of the Installation and Operation Manual have been complied with and that the defect remains.
8. Warranty service shall be performed only by the Warrantor, or an authorised service representative, and any attempt to remedy the defect by anyone else shall render this warranty void.
9. No other warranty is given beyond those described above, implied or otherwise, including any implied warranty of merchantability, fitness for a particular purpose other than the purpose for which the equipment is intended, and any other obligations on the part of the Warrantor or its employees and representatives.
10. There shall be no responsibility or liability whatsoever on the part of the Warrantor or its employees and representatives based on this Warranty for injury to any person or persons, or damage to property, loss of income or profit, or any other incidental, consequential or resulting damage or cost claimed to have been incurred through the use or sale of the equipment, including any possible failure or malfunction of the equipment or damages arising from collision with other vessels or objects.
11. This warranty gives you specific legal rights, and you may also have other rights which vary from country to country.

## Patents

At Sleipner we continually reinvest to develop and offer the latest technology in marine advancements. To see the many unique designs we have patented, visit our website [www.sleipnergrou.com/patents](http://www.sleipnergrou.com/patents)





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**[www.sleipnergroun.com](http://www.sleipnergroun.com)**



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