# Navigational
# Echo Sounders & Speed Logs


Version 1.42

JOTRON
SKIPPER

# Introduction

SKIPPER was established as a brand in 1973 by SIMRAD. In 1984 SKIPPER became an independent Norwegian owned company, and started to convert from a trading to a production company. In 2023 SKIPPER was aquired by Jotron and changed name to Jotron SKIPPER AS.

Today more than 90 % of all products are produced by SKIPPER.

Jotron SKIPPER is situated in Oslo, Norway, in modern facilities with production, training, warehouse and office at the same location. This makes Jotron SKIPPER a flexible and reliable supplier of navigational electronics.

Jotron SKIPPER AS is ISO 9001:2008 certified, and all the navigational electronics is IMO Wheelmarked.

Jotron SKIPPER AS manufactures marine electronics for the merchant fleet as well as for fishing and navy purposes. Our design is based on experience, research and traditions.

Our products are known worldwide for reliability, quality, sophistication and good value for money.

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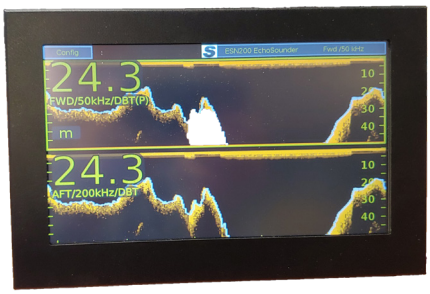
# Navigational Echo Sounders

## SKIPPER ESN200




**The SKIPPER ESN200 is a dual channel Navigation Echo Sounder with a touch screen display.**

**Highlighted features as:**

- NMEA 0183 and LAN
- 24, 30, 33, 38, 50, 100, 200 and 210 kHz transducer options
- 9” Resistive touch. 400 NITS
- Alarm functions
- Memory functions
- IMO Wheelmark
- Auto mode for all settings

The SKIPPER ESN200 is the latest dual channel Navigation Echo Sounder. It have the ability to show two separate transducers in the same screen - vertically and horizontally presented. The touch screeen is intuative and the system includes LAN integration possibilities. IMO approved frequencies for this Echo Sounder is 38, 50 and 200 kHz.


**Specifications for the ESN200 (Part no. ESN200-SB and JB70E2-SA):**

| | | | |
|---|---|---|---|
| **Power Supply** | AC: 115 V/ 230 V 50/60 Hz.<br>DC: 20-32 V | **Frequencies** | 24, 30, 33, 38, 50, 100, 200 and 210 kHz |
| **Power Consumption** | Display unit: Nominal 6W<br>Electronic unit 20W | **Output power** | Nominal 700W. Max>1000W |
| **Display** | 9” Resistive touch. 400 NITS<br>Weight: 1.1 kgs | **Depth alarms** | BAM compatible (IEC62923)<br>ALF or ALR. Internal sounder.<br>Relay output and AUX in/out |
| **Mounting Dimensions** | 249x155mm | **Outputs** | 3xLAN (IEC61192-450) |
| | | | 5xNMEA 0183 |
| | | | 2xAUX |
| **Printer** | Epson LQ-350 or OKI 280 Elite, Network printers/Review: Service software via LAN. Extended internal logging, by USB or SD | | Relay |
| | | **Inputs** | 5xNMEA 0183 |
| | | | AUX |
| **Memory** | 24 Hour storage. (More than 1 month available on SD card) | **Languages** | English |
| | | **Options** | Remote depth indicators |
| | | | Printer |
| **Ranges** | Selectable from 0-5 m to 0-5000 m | **Classification** | Made to IMO performance standard |
| **Measuring Accuracy** | 2-20 m: <0.5 m Resolution = 0.1 m<br>20-200 m: <5 m Resolution = 1 m | **Service** | Available in most major harbours, world-wide through extensive dealer network |

## SKIPPER ESN100 Navigational Echo Sounder


**The SKIPPER ESN100 is a navigation Echo Sounder with a black box and a 9” touch display. The Echo Sounder graphics are continuously shown on the screen along with complete navigational details. Most of the functions are automatic, but it is also possible to run it in manual mode.**

**Highlighted features are:**

- Autorange
- Autogain
- Autopower
- 9” touch display
- Both terminals software are programmable to 50 and 200 kHz

**Specifications for the ESN100 (Part no. ESN100-SB and JB50E1-SA):**

| | |
|---|---|
| **Power Supply** | DC: 24 V Nominal (21-32 VDC) |
| **Power Consumption** | Display unit 5W<br>Electronic unit 10W |
| **Display** | 9” RESISTIVE TOUCH. 400NITS |
| **Mounting Dimensions** | 242x158 mm Display unit<br>215,8x163,8 mm JB50E1-SA |
| **Memory** | 12 Hour storage. |
| **Ranges** | Selectable from 0-1000 m |
| **Measuring Accuracy** | 2-20 m: Accuracy<0.5 m<br>20-200 m: Accuracy<5 m |
| **Frequencies** | 50 or 200 kHz selectable from the touch display |
| **Output power** | 600W |
| **Depth alarms** | Alert complies with IEC61924-2:2012. ALF or ALR. Internal sounder. |
| **Outputs** | 1xRS485 communication with transceiver unit |
| | 1xNMEA0183 (IEC61192-1) |
| | 1xLAN (IEC61192-450) |
| **Inputs** | 2xNMEA0183 (IEC61192-1) |
| **Language** | English |
| **Options** | Remote depth indicators |

| | |
|---|---|
| **Classification** | Made to IMO performance standard |
| **Service** | Available in most major harbours, world-wide through extensive dealer network |

## CD401MR SKIPPER Multi repeater


**The SKIPPER CD401MR is a remote multi repeater for NMEA signals. It is designed for use with SKIPPER products together with products from other manufacturers, when these have an NMEA 0183 output.**

**Highlighted Features:**

- Depth below surface, keel and transducer
- Speed over ground and through water (longitudinal, transverse, aft and relative)
- Distance, total/trip for both ground and water
- Heading, true, magnetic and relative
- Rotation, rate of turn and direction
- Wind speed and direction (true, magnetic and relative)
- Temperature in water and air
- Drive, RPM, propeller pitch and rudder position
- Clock UTC, local time and expected time of arrival (ETA)
- Current, true and relative

The SKIPPER CD401MR multi repeater repeats information about several essential information needed on a vessel. The operator may select between the information needed by use of the display, and could even customize the information shown. Brightness is adjusted on the front panel, or from a remote dimmer control and NMEA.

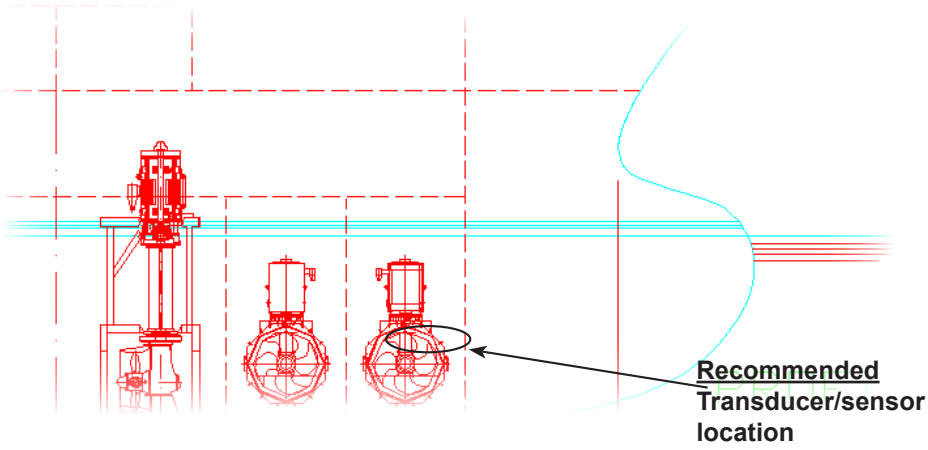
| | | | |
|---|---|---|---|
| **Power Supply** | DC: 24 V DC (19-36) | **Weight cabinet** | 1 kg |
| **Power Consumption** | 30 W at 24 V | **Protection** | IP 56 |
| | | **Outputs** | 1 x NMEA 0183 |
| **Display** | Up to 4 lines with LED | **Inputs** | 1 x NMEA 0183 protocols |
| **Display outputs** | ***Depth –*** below surface, keel and transducer | | Remote dimmer input |
| | ***Speed –*** over ground and through water (longitudinal, transverse, aft and relative) | | * Depth: DPT, DBK, DBT, DBS<br>* Speed: VBW, VTG, VHW<br>* Distance: VLW<br>* Heading: VTG, VHW, THS, HDT, HDM, HDG<br>* Rotation: ROT<br>* Pitch and Roll: XDR<br>* Wind: MWV, VWR, VWT, MWD<br>* Temperature: MTA, MTW, MDA<br>* Drive: RPM, RSA<br>* Clock: ZTG, ZDA, GGA, RMC<br>* Auxillary: User defined.<br>* Current: IIVDR, PSKPVDR<br>* Display Dimming: DDC |
| | ***Distance –*** total/trip for both ground and water | | |
| | ***Heading -*** true, magnetic and relative | | |
| | ***Wind -*** speed and direction (true, magnetic and relative) | | |
| | ***Temperature –*** water and air | | |
| | ***Drive –*** RPM, propeller pitch and rudder position | | |
| | ***Clock –*** UTC, local time and ETA | **Protection** | IP 56 |
| | **Current - true and relative** | **Classification** | Made acc. to IMO performance standard |
| **Mounting Dimensions** | 124 x 124 mm. Cut out for panel mounting. Brackets are included. | **Service** | Available in most major harbours, world-wide through extensive dealer network |
| **Front plate** | 144 x 144 mm to DIN standard | | |
| **Depth** | 59 mm | | |

# Transducer and sensor location

## Echo Sounder transducer location

There is always uncertainty in placing the transducer in the vessel. Jotron SKIPPER products have several different mounting options; Tank (Ice protected, aluminium and steel), Sea Valve for single and double bottom. Ice protection for Sea Valve is also available.

The mounting position of these different Tanks or




Sea Valves are usually the same. The most important parameter is to place the transducer in a position where there is a minimun amount of airation in the waterflow passing the hull of the ship in the full speed range of the vessel. The transducer should therefore be mounted on a flat, horizontal surface on to the hull, as low as possible, and preferably in the front of the ship, where the forward transom is reaching down to the water level (see figure).

The result of the placement of the transducer can only be recommended, and it is not possible to guarantee the correct position, even on vessels of the same design from the same yard.

It is always recommended to place the transducer in a dry compartment, for easier maintenance of the sensor, especially when mounted in Sea Valve.

In some cases there may be an option to place a special hull fitting for the transducer in order to avoid the air bubbles.

Feel free to contact Jotron SKIPPER for a recommendation for the transducer placement.

When installing two different transducers, we recommend to install the high frequency transducer (200 kHz) aft in the vessel and the lower frequency transducer (50 kHz) in the forward part of the vessel. The aft transducer will normally work only at low speeds due to aeration.

## Speed Log sensor location:

The same basic rules are true when mounting the sensor for Doppler Speed Logs. Air bubbles should be avoided.

The sensor placement for the EML is not that critical because this sensor uses the electromagnetic field in order to measure the speed of the vessel. However EML should be placed away from any object that can interfere with a linear water flow.

It is never recommended to place Speed Log sensors aft in any vessels.

When installing both Echo Sounder transducer and Speed Log sensor, place the Speed Log sensor forward of the Echo Sounder transducer when using a Doppler Speed Log. The distance between the Echo Sounder Transducer and the Speed Log Sensor should be minimum 2 m.

# Transducers for Echo Sounders

## 24 kHz Transducers (ETN024T and ETN024G)

The 24 kHz transducer is a ceramic type. It has a beam angle of 20 degrees, and a 40 m cable length.
The fittings for the ETN024T transducer is ETNSTCLF (Steel Tank) or ETNSTCILF (Ice Tank). When using a Sea Valve (SB-200-SA) the correct transducer part no. is ETN024G.
The transducer includes a junction box and mounting materials.

## 38 kHz Transducers (ETN038T and ETN038G)

The 38 kHz ceramic transducer has a beam angle of 16 degrees, and a 40 m cable length.
The ETN038T can be mounted in the ETNSTCLF (Steel Tank) or ETNSTCILF (Ice Tank). The ETN038G transducer can be mounted in the SB-200 (Sea Valve).
The transducer includes a junction box and mounting materials.

## 50 kHz Transducers

The 50 kHz ceramic transducer has a beam angle of 33 degrees. There is a choice of two different cable length with the 50 kHz transducer, namely 25 and 40 m.

| Transducer | Cable length (m) | Beam (degrees) | Frequency (kHz) | Diameter (cm) | Installed in |
|---|---|---|---|---|---|
| ETN024T | 40 | 20 | 24 | 20 | ETNSTCLF |
| ETN024G | 40 | 20 | 24 | 20 | SB-200-SA |
| ETN038T | 40 | 16 | 38 | 20 | ETNSTCLF |
| ETN038G | 40 | 16 | 38 | 20 | SB-200-SA |
| ETN050T | 25 | 44 | 50 | 10 | ETNST and ETNSTC |
| ETN050XT | 40 | 44 | 50 | 10 | ETNST and ETNSTC |
| ETN050G | 25 | 44 | 50 | 10 | SB-100-SA, SB-100-SB, DB-100-SA and DB-100-SB Sea Valves. |
| ETN050XG | 40 | 44 | 50 | 10 | SB-100-SA, SB-100-SB, DB-100-SA and DB-100-SB Sea Valves |
| ETN050BEL | 25 | 44 | 50 | 10 | ETNSLJB Sea Valve (No junction box included) and ETNSTCI |
| ETN050BELX | 40 | 44 | 50 | 10 | ETNSLJB Sea Valve (No junction box included) and ETNSTCI |
| ETN050TA | 25 | 44 | 50 | 10 | ETNALC Aluminium Tank |
| ETN050XTA | 40 | 44 | 50 | 10 | ETNALC Aluminium Tank |

The transducer includes a junction box and mounting materials.

## 200 kHz Transducers

ETN200S(X)T

The 200 kHz ceramic transducer has a beam angle of 6 or 10 degrees depending whether, it is 100 mm (6 degrees) or 50 mm (10 degrees) in diameter.

There is a choice of two different cable lengths (25 and 40 m) and two different diameters (5 cm and 10 cm) with the 200 kHz transducer:

ETN200S(X)G

| Transducer | Cable length (m) | Beam (degrees) | Diame-ter (cm) | Frequency (kHz) | Installed in |
|---|---|---|---|---|---|
| ETN200T | 25 | 6 | 14 | 200 | ETNST and ETNSTC |
| ETN200XT | 40 | 6 | 14 | 200 | ETNST and ETNSTC |
| ETN200ST | 25 | 11 | 10 | 200 | ETNST and ETNSTC |
| ETN200SXT | 40 | 11 | 10 | 200 | ETNST and ETNSTC |
| ETN200SG | 25 | 11 | 10 | 200 | SB-100-SA, SB-100-SB, DB-100-SA and DB-100-SB Sea Valves |
| ETN200SXG | 40 | 11 | 10 | 200 | SB-100-SA, SB-100-SB, DB-100-SA and DB-100-SB Sea Valves |
| ETN200FS | 25 | 11 | 10 | 200 | ETNSLJB Sea Valve (No junction box included) and ETNSTCI Ice protected Tank |
| ETN200FSX | 40 | 11 | 10 | 200 | ETNSLJB Sea Valve (No junction box included) and ETNSTCI Ice protected Tank |
| ETN200STA | 25 | 11 | 10 | 200 | ETNALC Aluminium Tank |
| ETN200SXTA | 40 | 11 | 10 | 200 | ETNALC Aluminium Tank |

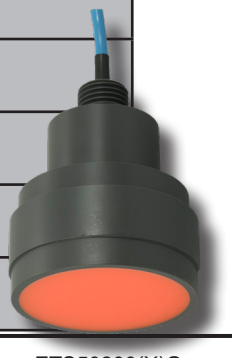
The transducer normally includes a junction box and mounting materials.

ETN200(X)T

## 50 and 200 kHz Dual Transducers

The 50 and 200 kHz transducers operate on both frequencies in one unit.

| Transducer | Cable length (m) | Beam (degrees) | Diame-ter (cm) | Frequency (kHz) | Installed in |
|---|---|---|---|---|---|
| ETS50200T-SA | 25 | 10/32 | 10 | 50 and 200 | ETNST and ETNSTC |
| ETS50200XT-SA | 50 | 10/32 | 10 | 50 and 200 | ETNST and ETNSTC |
| ETS50200G-SA | 25 | 10/32 | 10 | 50 and 200 | SB-100-SA, SB-100-SB, DB-100-SA and DB-100-SB Sea Valves |
| ETS50200XG-SA | 50 | 10/32 | 10 | 50 and 200 | SB-100-SA, SB-100-SB, DB-100-SA and DB-100-SB Sea Valves |
| ETS50200TA-SA | 25 | 10/32 | 10 | 50 and 200 | ETNALC Aluminium Tank |
| ETS50200XTA-SA | 50 | 10/32 | 10 | 50 and 200 | ETNALC Aluminium Tank |
| ETS50200TL-SA | 25 | 10/32 | 13,35 | 50 and 200 | ELAC LSE297/313 tank |
| ETS50200XTL-SA | 50 | 10/32 | 13,35 | 50 and 200 | ELAC LSE297/313 tank |



ETS50200(X)G

# Sea Valves and Tanks for Echo Sounders

The bottom parts are needed in order to fit the transducers into the hull of the ship. The bottom parts delivered by Jotron SKIPPER are approved by Det Norske Veritas (DNV) as standard. It is also possible to get approval by other classification authorities on request.

Jotron SKIPPER always recommends to install the transducers into Sea Valves. It is then much easier to change the transducer, and to maintain and clean the transducers regularly without entering any drydock or using divers. The installation of a tank will require installation of cable pipes above load water line. This is time consuming, costly, and, when everything is taken into consideration, normally the installation of Sea Valve will often be the cheapest option for installation.

## Standard Tank (Part no. ETNST)

Our standard tank is delivered with a special red coating in order to protect the tank during transport and storing. The tank is made of durable approved steel in order to withstand the harsh environment it is exposed for.

There are several transducers that fits into this tank. Please see the section for transducers.

## Combo Tank (Part no. ETNSTC)

The Combo Tank is similar to the Standard Tank, the difference being a flange that is installed inside in order to fit various transducers and sensors.
The red coating is the same as for standard tank as well as the steel.

## Ice protected Tank (Part no. ETNSTCI)

The ice protected tank is, as described by the name, made in order to protect the transducer from ice in arctic sea waters, or ships likely to “beach” the vessel, like landgoing military vessels. The tank is similar to the Combo Tank, the difference being an “acoustic see through” plate placed in front of the transducer. The tank is filled with water and the cable pipe extended above the load water line as well as for the Standard and Combo Tanks.

The ice protected tanks include all the fittings for the transducers and a junction box in order to extend the cable.

This tank is required for the NAUT-OSV class if a Sea Valve is not used.

## Aluminium Combo Tank (Part no. ETNALC)

The Aluminium Combo Tank is made in order to fit the 50 and 200 kHz transducer, together with our speed log sensors. This tank is ideal for mounting in aluminium hulls or to be moulded into composite hulls. The aluminium tank is not DNV certified and will need to be approved with the hull after installation.

## 100 mm Sea Valve for single bottom (Part no. SB-100-SB)

The SB-100-SB is an alternative to the SB-100-SA. The difference being that the SB-100-SB is a Ball Valve with a lever to close the valve. It is also made of stainless steel. Some confined spaces will make SB-100-SA or SB-100-SB version more suitable. Please contact SKIPPER for details in space needed for each separate Sea Valve, or visit www.skipper.no for download of installation manuals.

## 100 mm Sea Valve for double bottom (Part no. DB-100-SB)

The DB-100-SB is the Ball Valve in stainless steel to be installed in a double hull configuration.  As standard SKIPPER deliver 2 x 0.5 m and 1 x 1 m extension pipe to lower the transducer into the Ball Valve. Extra extension pipes are available on request.

# Echo Sounder Systems and Options

**ESN200** — YES! - ESN200 is needed

Display/accessories

**ESN200-SB**
9” touch display
24, 30, 33, 38, 50, 100, 200, 210 kHz

**CD401MR-SB**
Multi repeater

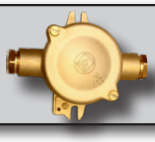
**ENIR301-SA**
Depth Repeater

**IR31DIM-SA**
NMEA Remote Dimmer

Junction Box

**JB70E2-SA**
Transceiver Unit ESN200

**ZZL-01019**
Junction Box



Transducer

**Custom sensor**
200 mm

**ETN024G**
Transducer 24 kHz w/40 m cable

**ETN038G**
Transducer 38 kHz w/40 m cable

**ETN024T**
Transducer 24 kHz w/40 m cable

**ETN038T**
Transducer 38 kHz w/40 m cable

**ETN050(X)T**
Transducer 50 kHz w/25 m (40 m) cable

**ETS50200(X)TA-SA**
Transducer 50/200 kHz w/25 m (50 m) cable for Tank

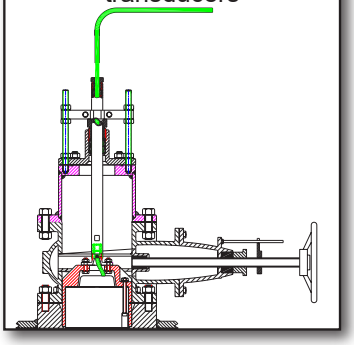
**ETN050(X)TA**
Transducer 50 kHz w/25 m (40 m) cable for aluminium tank

**ETN200S(X)TA**
Transducer 200 kHz w/25 m (40 m) cable for aluminium tank

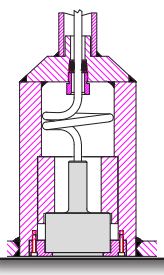
**ETS50200(X)T-SA**
Transducer 50/200 kHz w/25 m (50 m) cable for Tank

Bottom parts

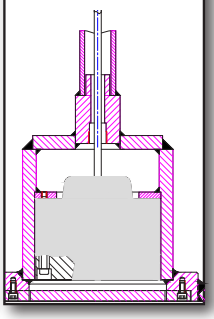
**SB-200-SA**
200 mm Sea Valve
Single bottom
for low frequency transducers



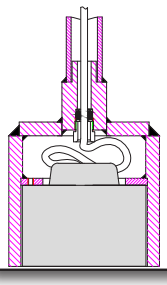
**ETNALC**
Combo AluminiumTank
(No approval)



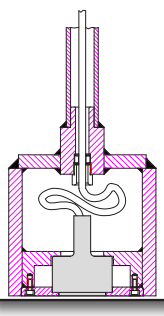
**ETNSTCILF**
ICE Class Protected Steel Tank for low frequency transducers



**ETNSTCLF**
Combo Steel Tank for low frequency transducers



**ETNST**
Steel Tank

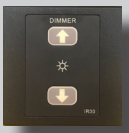


**What features do you need? Flexible frequency? View two channels simultaneously?**

NO! - ESN100 is needed

**ESN100**

**IR30DIM-SB**
Remote Dimmer



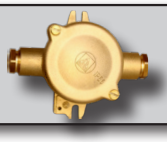
**ENS518-SA**
Transducer selector


**EN104-SB**
Printer

**ESN100-SB**
**ESN100 9" Touch Display 50 or 200 kHz**

**JB50E1-SA**
**Transceiver Unit ESN100**

**ZZL-01019**
Junction Box



**ETN200(X)T**
Transducer 200 kHz w/25 m (40 m) cable

**ETN200S(X)T**
Transducer 200 kHz w/25 m (40 m) cable

**ETN050G(X)**
Transducer 50 kHz w/25 m (40 m) cable

**ETN200S(X)G**
Transducer 200 kHz w/25 m (40 m) cable

**ETN050BEL(X)**
Transducer 50 kHz w/25 m (40 m) cable

**ETN200FS(X)**
Transducer 200 kHz w/25 m (40 m) cable

**ETS50200(X)G-SA**
Transducer 50/200 kHz w/25 m (50 m) cable for Sea Valve

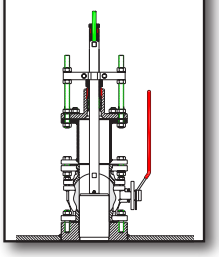
**ETS50200(X)TL**
Transducer 50 kHz w/25 m (40 m) cable for Sea Valve ICE Class Prot.

**Elac tank already installed in vessel.**

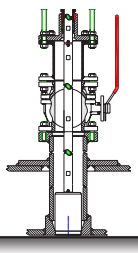
**ELAC LSE297/313 tank**

**Retrofit only.**

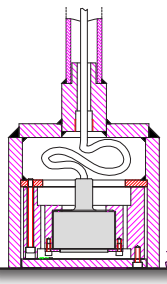
**SB-100-SB**
100 mm Sea Valve Single bottom Ball Valve



**DB-100-SB**
100 mm Sea Valve Double bottom Ball Valve

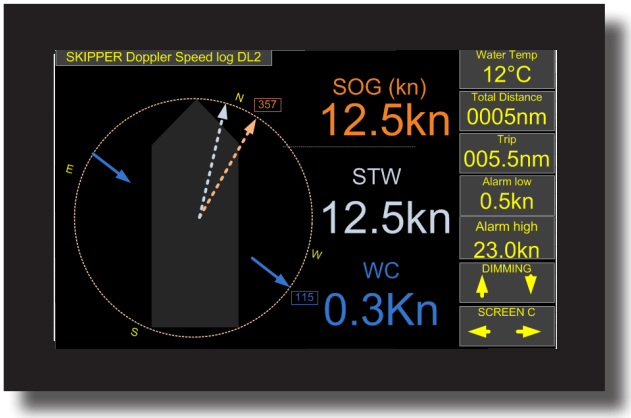


**ETNSTCI**
ICE Class Protected Steel Tank



# Navigational Speed Logs

## SKIPPER DL2 Dual axis Doppler Speed Log




**The SKIPPER DL2 are our newest range of Doppler Speed Logs. It works with the doppler principle STW in two axis and SOG in two axis. The DL2 can be mounted using several options, such as Sea Valve for double bottom and Sea Valve for single bottom.**

**It contains features as:**

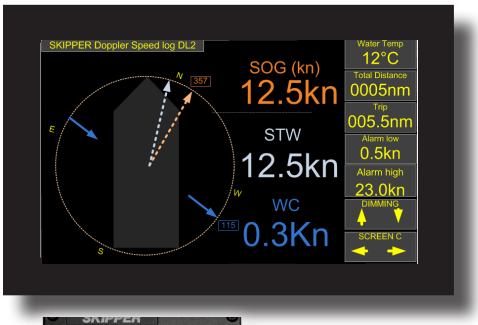
- Water track of speed in two axis (STW)
- Bottom track of speed in two axis (SOG)
- Sea temperature
- Wheelmark
- On screen diagnostics
- Logging functions
- LAN integration
- Touch display


### Specifications for the DL2:

| | DL2 | UNITS |
|---|---|---|
| Primary Frequency | 270 SOG<br>850-920 STW primary<br>264 STW secondary | kHz |
| Speed range (lon/tra) | +45 to -10 Longitudinal<br>+/- 25 Transversal | knots |
| Bottom track | Avaliable from 2-200 | meters |
| Water track (from) | 0,5 - 3 | meters |
| Aft transversal speed | yes (requires ROT) | |
| Pulse output power (rms) | 30 | Watts |
| Accuracy (better than) | 0.2 or 2% (Opt. 0.1 or 1%) whatever greater | knots |
| Tilt accuracy | <2 | deg |
| Temperature accuracy | <1 | °C |
| **Mounting** | | |
| Sea Valves | Single bottom, Double bottom (SB-100-SB), (DB-100-SB) | |
| Housing | | |
| JB70D2-SA | DIN mountable Housing NMEA, LAN, Digital IO (Pulse alarms etc.) USB, SD Flash, 2 transducer connections, power connections | |
| Display CU-M001-SB | Flush mount 9.0” Touch panel 240x155mm. Ethernet | |
| Sensors | DL2SXX-XX sensor (100mm) | |
| Speed alarms | High and low speed limits | |
| Clock | - internal or From NMEA | |

| | |
|---|---|
| Outputs | - 4 x NMEA 0183 |
| | 2 x LAN |
| | - 4 x Aux (pulse , alarm etc |
| | - Alarm (Meets all current requirements for INS/ OSV) |
| Inputs | LAN, NMEAx2, Aux (user selectable) |
| **Accepted NMEA formats** | |
| **Inputs** | |
| Gyro | ROT, THS and HDT |
| GPS | GLL, GGA, RMC, VTG and ZDA |
| Trip | PSKPRSTT (Trip reset) |
| Others | DDC, ACN and ACK |
| **Outputs** | |
| Speed | VBW and VHW |
| Distance | VLW |
| Alarm | ALR, ALF and ALC<br>Speed alarm, power failure alarm and function alarm |
| Others | MTW (temp), DDC, HBT, DPT and XDR |
| Pulse output | Yes |
| Analogue output | Defalt no<br>Optical 4-20 mA and 0-10V |
| Power Supply | AC 115 - 230 V 50/60 Hz, DC, 24 V |
| Power Consumption | Max. 60 W |
| Clasification | IMO |
| IP rating | IP 22 Control unit<br>IP 22 Electronic unit<br>IPX7 Sensor unit |

# SKIPPER DL21 Dual and Single axis Doppler Speed Log

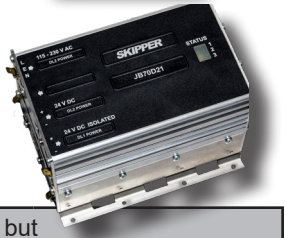




**The SKIPPER DL21 are our newest range of Doppler Speed Logs. It works with the doppler principle with STW in one axis and SOG in two axis. The DL21 can be mounted using several options, such as Sea Valve for double bottom and Sea Valve for single bottom. Comply with the requirements of MSC334(90) with one sensor/hull mounting and one electronic unit for vessels above 50 000 GT.**

**It contains features as:**

- Water track of speed in one axis (STW)
- Water track of speed in two axis (STW)
- Bottom track of speed in two axis (SOG)
- Two separate speed logs in one sensor
- Sea temperature
- On screen diagnostics
- Logging functions
- LAN integration and touch display



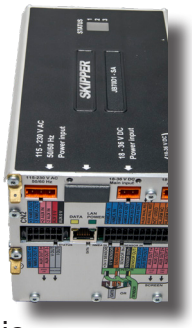

**Specifications for the DL21:**

| | DL2 | DL1 | UNITS |
|---|---|---|---|
| Primary Frequency | 270 SOG<br>850-920 STW primary<br>264 STW secondary | 700-730 | kHz |
| Speed range (lon/tra) | +45 to -10 Long.<br>+-/25 Trans. | +/-50 | knots |
| Bottom track | 2-200 | NA | meters |
| Water track (from) | 0,5-3 | 0,5-3 | meters |
| Aft transversal speed | Yes (ROT req.) | NA | |
| Pulse output power (rms) | 30 | 8W | Watts |
| Accuracy (better than) | 0.2 or 2%<br>whatever greater | 0.2 or 2%<br>whatever greater | knots |
| Tilt accuracy | <2 | <2 | deg |
| Temperature accuracy | <1 | <1 | °C |
| **Mounting** | | | |
| Sea Valves | Single bottom, Double bottom<br>(SB-100-SB), (DB-100-SB) | | |
| Housing | | | |
| JB70D21-SA | DIN mountable Housing NMEA, LAN, Digital IO (Pulse alarms etc.) USB, SD Flash, 2 transducer connections, power connections | | |
| Displayx | | | |
| CU-M001-SB | Flush mount 9.0” Touch panel with LAN connection and | | |
| CD402CU-SC | 144x144 DOT Matrix display for DL1 | | |

| | | |
|---|---|---|
| Sensors | DL21SG-XX (combined but electrically isolated DL2 -SOG/STW and DL1-STW) (100mm)<br>or separate sensors for DL2 and DL1 | |
| | **DL2** | **DL1** |
| Clock | - internal or From NMEA | From NMEA |
| Outputs | - 4 x NMEA 0183 | 4 x NMEA 0183 |
| | 2 x LAN | 1 x LAN |
| | - 4 x Aux (pulse, alarm etc.) | 3 x Aux (pulse, alarm etc) |
| | - Alarm (Meets all current requirements for INS/OSV) | NA |
| Inputs | LAN, NMEAx2, Aux (user selectable) | LAN, NMEAx2, Aux (user selectable) |
| **Accepted NMEA formats** | | |
| **Inputs** | | |
| Gyro | ROT, THS and HDT | - |
| GPS | GLL, GGA, RMC, VTG and ZDA | GLL, GGA, RMC, VTG and ZDA |
| **Outputs** | | |
| Speed | VBW and VHW | |
| Distance | VLW | |
| Others | MTW (temp), ALR and ALF (alarm), DDC | |
| Power Supply | AC 115 - 230 V 50/60 Hz, DC, 24 V | |
| Power Consumption | Max. 60 W | |
| IP rating | IP 22 Control unit<br>IP 22 Electronic unit<br>IPX7 Sensor unit | |
| Clasification | IMO<br>MSC.334(90) | |

## SKIPPER DL1 Multi Single axis Doppler Speed Log


**The SKIPPER DL1 Multi is our newest Doppler Speed Log. It works with the doppler principle with STW in one axis. The DL1 Multi can be mounted using several options, such as Sea Valve for double bottom and in tank.**



**It contains features as:**

- Water track of speed
- Sea temperature
- Wheelmark
- On screen diagnostics
- Logging functions
- Single axis
- LAN communication with JB70D1 Electronic unit
- All in/outputs connected to JB70D1 Electronic unit

**Specifications for the DL1 Multi:**

| | DL1 | Units |
|---|---|---|
| **Primary frequency** | 715 | kHz |
| **Speed range (longitudinal/ transversal)** | +/-50 | knots |
| **Water track (from)** | 2 | meters |
| **Accuracy** | <0.2 or 2% | knots |
| **Mounting** | | |
| **Sea Valve:** | | |
| **Single bottom** | Yes | |
| **Double bottom** | Yes | |
| **Steel tank** | Yes | |
| **Aluminium tank** | Yes | |
| **Speed alarms** | High and low speed limits<br>Power failure<br>Sensor failure | |
| **Clock** | - Year-month-day/Hour-min.<br>(taken from GPS if available) | |
| **Outputs** | - 4 x NMEA 0183 | |
| | - 3 x Aux (pulse) | |
| | - Relay | |
| | - LAN | |
| **Inputs** | - 1 NMEA 0183 (OPTO Isolated)<br>- External Dimming | |
| **Accepted NMEA formats** | | |
| **Outputs:** | | |
| | Speed: VBW AND VHW | |
| | Distance: VLW | |
| | Others: MTW (temp) | |
| | Dimming DDC | |

| | |
|---|---|
| **Power Supply** | AC: 115/230 V 50/60 Hz<br>DC: 24V |
| **Power Consumption** | Max. 30 W |
| **Display** | 28X30 led's |
| **Accessories** | ENIR300-SA Speed repeater<br>IR31DIM-SA Dimming Control<br>CD401MR-SA Multi repeater |
| **Classification** | MED-B/IMO |
| **Weight cabinet** | 2.5 kg |
| **Standard cable length for sensor** | 40 m |
| **Mounting dimensions for cabinet** | 124x124 mm Bracket or panel mounting, (144x144 mm front) |
| **IP rating** | Electronic unit: 22<br>Display: 22<br>Sensor: IPX7 |

# SKIPPER DL1 Single axis Doppler Speed Log


**The SKIPPER DL1 is a single axis Doppler Speed Log. It works with the doppler principle with STW in one axis. The DL1 can be mounted using several options, such as Sea Valve for double bottom and in tank.**

**It contains features as:**

- Water track of speed
- Sea temperature
- Wheelmark
- On screen diagnostics
- Logging functions
- Single axis

## Specifications for the DL1:

| | DL1 | Units |
|---|---|---|
| **Primary frequency** | 715 | kHz |
| **Speed range (longitudinal/ transversal)** | +/-50 | knots |
| **Water track (from)** | 2 | meters |
| **Accuracy** | <0.2 or 2% | knots |
| **Mounting** | | |
| **Sea Valve:** | | |
| **Single bottom** | Yes | |
| **Double bottom** | Yes | |
| **Steel tank** | Yes | |
| **Aluminium tank** | Yes | |
| **Speed alarms** | High and low speed limits<br>Power failure<br>Sensor failure | |
| **Clock** | - Year-month-day/Hour-min.<br>(taken from GPS if available) | |
| **Outputs** | - 2 x NMEA 0183 | |
| | - 2 x contact closure (pulse) | |
| | - Relay | |
| **Inputs** | - 1 NMEA 0183 (OPTO Isolated)<br>- External Dimming | |
| **Accepted NMEA formats** | | |
| **Outputs:** | | |
| | Speed: VBW AND VHW | |
| | Distance: VLW | |
| | Others: MTW (temp) | |
| | Dimming DDC | |

| | |
|---|---|
| **Power Supply** | AC: 115/230 V 50/60 Hz<br>DC: 24V |
| **Power Consumption** | Max. 30 W |
| **Display** | 28X30 led's |
| **Accessories** | ENIR300-SA Speed repeater<br>IR31DIM-SA Dimming Control<br>CD401MR-SA Multi repeater |
| **Classification** | MED-B/IMO |
| **Weight cabinet** | 2.5 kg |
| **Standard cable length for display** | 10 m (Unlimited on DL1 Multi) |
| **Standard cable length for sensor** | 40 m |
| **Mounting dimensions for cabinet** | 124x124 mm Bracket or panel mounting, (144x144 mm front) |
| **IP rating** | Electronic unit: 22<br>Display: 56<br>Sensor: IPX7 |
| **Service** | Available in most major harbours, world-wide through extensive dealer network. |

## SKIPPER EML224 Compact, Single and Dual axis Electromagnetic Speed Log


**The SKIPPER EML224 Compact is the newest electromagnetic Speed Log. The difference from the EML224 is that the operator unit (display) is smaller. The EML224 Compact is available in single or dual axis, making it more flexible depending on customers needs and demands.**

**Highlighted features as:**

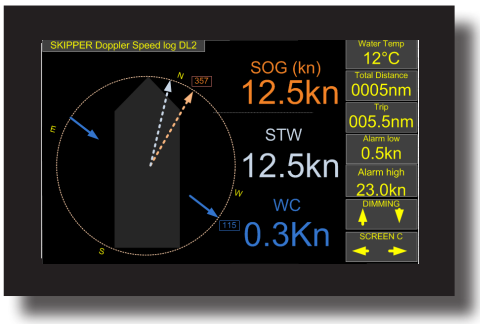
- NMEA 0183
- Compact display (144 x 144 mm)
- Alarm functions
- IMO Wheelmarked
- Speed through water in 1 or 2 axis
- Fully automated settings
- Support software for easy setup and diagnostics

**Specifications for the EML224 Compact:**

| Log | EML124 Compact | EML224 Compact | Units |
|---|---|---|---|
| Number of Axis | 1 | 2 | |
| Speed range Longitudinal | ±40 | ±40 | knots |
| Speed range Transversal | | ±40 | knots |
| Water track (from) | 0 | 0 | meter |
| Accuracy (better than) | 0.2 or 2 % | 0.2 or 2 % | knots |
| Temperature Accuracy error | < 1 | < 1 | °C |
| Mounting Dimensions | 124 x 124 mm. Cut out panel mounting. Brackets are included | | |
| Front plate | 144 x 144 mm | | |
| Depth | 59 mm | | |
| Weight cabinet | 1 kg | | |
| Standard cable length | 10 m (max 20 m) | | |
| Mounting | | | |
| Sea Valve: | | | |
| Single bottom | Yes | Yes | |
| Double bottom | Yes | Yes | |
| Tank: | | | |
| Steel | Yes | Yes | |
| Aluminium | Yes | Yes | |
| Outputs | - 2 x NMEA 0183<br>- 1 x contact closure (pulse)<br>- Relay<br>- Fitness | | |

| | |
|---|---|
| Inputs | - 1 NMEA 0183<br>- External dimming (pulse) and NMEA dimming |
| Accepted NMEA formats | |
| Outputs: | |
| Speed | VBW, VHW |
| Distance | VLW |
| Others | MTW (temp) |
| Power Supply | AC: 115/230 V 50/60 Hz. (Electronic unit)<br>DC: 20-32 V, Auto switch over. |
| Power Consumption | Max. 30 W |
| Display | 28 x 30 pixle alphanumeric LEDs (red) with dimming. |
| Language | English |
| IP rating | 56 |
| Service | Available in most major harbours, world-wide through extensive dealer network |

# SKIPPER SL1200 SATLOG




**The SKIPPER SL1200 is a stand aloneSATLOG providing SOG in two axis.**

**Highlighted features as:**

- NMEA 0183
- LAN
- 9” Touch display
- IMO Wheelmarked
- Speed over ground (SOG) in two axis
- Fully automated settings
- Support software for easy setup and diagnostics

**Specifications for SL1200:**

| | SL1200 | UNITS |
|---|---|---|
| Antenna | Dual - GPS and Glonas for relative heading and true axis speed | na |
| Speed range (lon/tra) | +/- 70 Longitudinal<br>+/- 70 Transversal | knots |
| Aft transversal speed | yes | |
| Accuracy (better than) | 0.2 or 2% whatever greater | knots |
| | | |
| | | |
| **Mounting** | | |
| Antenna | Brackets are included | |
| Housing | | |
| JB40POW-SA | Power connections | |
| Display CU-M001-SB | Flush mount 9.0” Touch panel 240x155mm. Ethernet | |

| | |
|---|---|
| Antenna | SL-SN300 |
| Outputs | - 1 x NMEA 0183 |
| | - 1 x LAN |
| Inputs | LAN and 2 x NMEA |
| **Accepted NMEA formats** | |
| **Outputs** | |
| Speed | VBW and VTG |
| Distance | VLW |
| Power Supply | AC 115 - 230 V 50/60 Hz, DC, 24 V |
| Power Consumption | Nominal 14 W |
| Clasification | IMO |
| IP rating | IP 20 Control unit<br>IP 20 Electronic unit<br>IP 66 Antenna unit |

## SKIPPER EML1100/1200, Single and Dual axis Electromagnetic Speed Log


**The SKIPPER EML1100 is a single axis speed log providing the Ship's speed in the longitudinal axis (forward and aft). The SKIPPER EML1200 is a dual axis speed log providing the Ship's speed in longitudinal and transversal axis. Both working on the electromagnetic principle. Both speed logs provide Speed Through Water (STW).**

**Highlighted features as:**

- IMO Wheelmarked with MED-B
- EML1100 - Water sspeed log in single axis (STW)
- EML1200 - Water speed log in dual axis (STW)
- 10" Touch Display
- Sea temperature readout from sensor
- NMEA 0183 and LAN output

**Specifications for the EML1100/1200:**

| Log | EML124 Compact | EML224 Compact | Units |
|---|---|---|---|
| Number of Axis | 1 | 2 | |
| Speed range Longitudinal | ±40 | ±40 | knots |
| Speed range Transversal | | ±40 | knots |
| Water track (from) | 0 | 0 | meter |
| Accuracy (better than) | 0.2 or 2 % | 0.2 or 2 % | knots |
| Temperature Accuracy error | < 1 | < 1 | °C |
| Front plate | 287*209,5 mm | | |
| Depth | 65 mm | | |
| Weight cabinet | 2 kg | | |
| Mounting | | | |
| Sea Valve: | | | |
| Single bottom | Yes | Yes | |
| Double bottom | Yes | Yes | |
| Tank: | | | |
| Steel | Yes | Yes | |
| Aluminium | Yes | Yes | |
| Outputs | - 2x LAN 2 independent LAN ports (IEC61162-450/460)<br>- 2 x NMEA 0183 outputs (IEC61162-1)<br>- 1 x contact closure (pulse)<br>- Alarm (Relay) | | |

| | |
|---|---|
| Inputs | - 2x NMEA 0183 inputs (IEC61162-1)<br>- External dimming (DDC)<br>- 2x LAN 2 independent LAN ports (IEC61162-450/460) |
| Accepted NMEA formats | |
| Outputs: | |
| Speed | VBW, VHW |
| Distance | VLW |
| Others | MTW (temp) |
| Power Supply | 2xDC: 24 V, auto switch over<br>JB40POW-SA: 24VDC or 110-240 V AC |
| Power Consumption | Max. 30 W |
| Display | 10" Graphical Touch Display |
| Language | English |
| Service | Available in most major harbours, world-wide through extensive dealer network |

## CD401MR SKIPPER Multi repeater


**The SKIPPER CD401MR is a remote multi repeater for NMEA signals. It is designed for use with SKIPPER products together with products from other manufacturers, when these have an NMEA 0183 output.**

**Highlighted Features:**

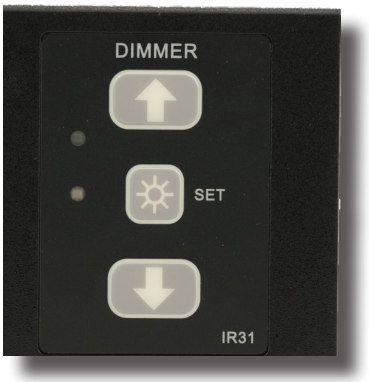
- Depth below surface, keel and transducer
- Speed over ground and through water (longitudinal, transverse, aft and relative)
- Distance, total/trip for both ground and water
- Heading, true, magnetic and relative
- Rotation, rate of turn and direction
- Wind speed and direction (true, magnetic and relative)
- Temperature in water and air
- Drive, RPM, propeller pitch and rudder position
- Clock UTC, local time and expected time of arrival (ETA)
- Current, true and relative

The SKIPPER CD401MR multi repeater repeats information about several essential information needed on a vessel. The operator may select between the information needed by use of the display, and could even customize the information shown. Brightness is adjusted on the front panel, or from a remote dimmer control and NMEA.

| | | | |
|---|---|---|---|
| **Power Supply** | DC: 24 V DC (19-36) | **Weight cabinet** | 1 kg |
| **Power Consumption** | 30 W at 24 V | **Protection** | IP 56 |
| | | **Outputs** | 1 x NMEA 0183 |
| **Display** | Up to 4 lines with LED | **Inputs** | 1 x NMEA 0183 protocols |
| **Display outputs** | ***Depth –*** below surface, keel and transducer | | Remote dimmer input |
| | ***Speed –*** over ground and through water (longitudinal, transverse, aft and relative) | | * Depth: DPT, DBK, DBT, DBS<br>* Speed: VBW, VTG, VHW<br>* Distance: VLW<br>* Heading: VTG, VHW, THS, HDT, HDM, HDG<br>* Rotation: ROT<br>* Pitch and Roll: XDR<br>* Wind: MWV, VWR, VWT, MWD<br>* Temperature: MTA, MTW, MDA<br>* Drive: RPM, RSA<br>* Clock: ZTG, ZDA, GGA, RMC<br>* Auxillary: User defined.<br>* Current: IIVDR, PSKPVDR<br>* Display Dimming: DDC |
| | ***Distance –*** total/trip for both ground and water | | |
| | ***Heading -*** true, magnetic and relative | | |
| | ***Wind -*** speed and direction (true, magnetic and relative) | | |
| | ***Temperature –*** water and air | | |
| | ***Drive –*** RPM, propeller pitch and rudder position | | |
| | ***Clock –*** UTC, local time and ETA | | |
| | **Current - true and relative** | **Protection** | IP 56 |
| **Mounting Dimensions** | 124 x 124 mm. Cut out for panel mounting. Brackets are included. | **Classification** | Made acc. to IMO performance standard |
| **Front plate** | 144 x 144 mm to DIN standard | **Service** | Available in most major harbours, world-wide through extensive dealer network |
| **Depth** | 59 mm | | |

# IR31DIM NMEA Dimmer

**The SKIPPER IR31DIM is a programmable dimmer switch giving NMEA or pulse output to simply control dimming on a number of displays. NMEA multiplexing feature allows the switch to be added in series. Simple connection, EMC tested (CCS).**




**Main functions:**
- Taking up to 2 NMEA lines and multiplexing onto it a DDC or proprietry message each time a button is pushed
- Auto mode with internal or external light sensor the unit can be made to send messages when the correct light conditions are reached (user adjustable)
- Up and Down relays also allow older repeaters to be adjusted manually or automatically

**Applications:**
- Typical usage in a zone of the bridge (overhead or in wing), but also can be used for individual equipment

**Specifications:**

| | |
|---|---|
| **Part number** | IR31DIM-SA |
| **To be used with** | All SKIPPER products and all products accepting NMEA dimming messages. |
| **Input Voltage** | 24 V DC (18-32 V) |
| **Interface unit IP rating** | ***IP 56 on front (IP22 otherwise)*** |
| **Approvals** | IEC60945 |
| **Inputs** | 2xNMEA0183 (IEC 61162-1), 1xexternal light sensor |
| **Output** | 2xNMEA0183 (IEC 61162-1), 1xrelay (up/down) |
| **Mounting format** | 96 mm format (cutout 63 mm x 84 mm) |
| **Weight** | 280 g |
| **Optional IR31 sensor** | External light sensor |
| **Service** | Available in most major harbours, world-wide through extensive dealer network |

# Speed Log Sensors

Jotron SKIPPER manufacture all the Sensors to the SKIPPER Speed Logs. SKIPPER manufacture two different Speed Log families, Doppler Speed Logs and Electromagnetic Speed Logs. The Doppler Speed Log consists of three versions based on the frequencies; 715 kHz, 540 kHz and 270 kHz.

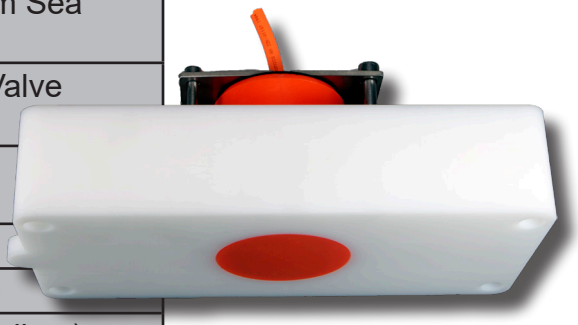
## DL2 Doppler Speed Log Sensor

The DL2 sensor consists of 3 ceramic transducers for measuring speed and 1 sensor measuring temperature. This sensor can be installed in a variety of bottom mountings.

There are one option for the cable, 40 m. This Doppler sensor gives speed through water (STW) and speed over ground (SOG) in two axis.

DL2SG-SA

| Part no. | Cable length (m) | Installed in |
|---|---|---|
| DL2SG-SA | 40 | SB-100-SA, SB-100-SB, DB-100-SA, DB-100-SB. 100 mm Sea Valve |
| DL2SE-SA | 40 | ETNSLB 100 mm Sea Valve (Retrofit) |
| DL2SW-SA | 40 | Log Sensor for SPERRY SRD500/421 (Retrofit) |
| DL2ST-SA | 40 | ETNSTCL |
| DL2SDR-SA | 40 | Atlas Dolog 2x (Retrofit) |
| DL2STR-SA | 40 | ETNSTCL (Retrofit with diver) |
| DL2SC-SA | 40 | SAL 860T and T2 (Retrofit) |



DL2SDR-SA

## DL21 Doppler Speed Log Sensor

The DL21 sensor consist of a sensor housing with six ceramic transducers angled at 30°. The two systems are electrically isolated (SOG+STW 2-axis and STW 1-axis). Two separate temperature sensors measure water temperature.
Depth is calculated from slanted beams. The sensor is delivered with a 40 m cable as standard. The sensor can be installed in Sea Valve, for double and single bottom configurations.

| Part No. | Cable length (m) | Installed in |
|---|---|---|
| DL21SG-SA | 40 | SB-100-SA, SB-100-SB, DB-100-SA, DB-100-SB. 100 mm Sea Valve |
| DL21SE-SA | 40 | ETNSLB 100 mm Sea Valve (Retrofit) |
| DL21SW-SA | 40 | Log Sensor for SPERRY SRD500/421 (Retrofit) |
| DL21SC-SA | 40 | Log Sensor for SAL 860T and T2 (Retrofit) |

DL21SG-SA

## DL1 Doppler Speed Log Sensor

The DL1 sensor consists of 2 ceramic transducers for measuring speed and 1 sensor measuring temperature. This sensor can be installed in a variety of bottom mountings.

Standard cable length is 40 m, and the cable can be cut or extended with the junction box (JB12). This Doppler sensor gives speed through water.

| Part no. | Cable length (m) | Installed in |
|---|---|---|
| DL1SG-SA | 40 | SB-60-SA and DB-60-SA |
| DL1ST-SA | 40 | ETNSTCL |
| DL1STA-SA | 40 | ETNALC |
| DL1SN-SA | 40 | Retrofit to Simrad NL-Log |
| DL1SS-SA | 40 | Retrofit to Sagem Log |
| DL1SX-SD | 40 | Retrofit to PCSV60 |
| DL1SDB-SA | 40 | SB-100-SA, SB-100-SB, DB-100-SA and DB-100-SB. 100 mm Sea Valve |

DL1S

## DL850 270 kHz Doppler Speed Log Sensor


DL850S27G-SB

The 270 kHz sensor consist of a moulded sensor housing with three ceramic transducers angled at 30°. The depth is calculated and can not be directly read out. The sensor is delivered with a 40 m cable as standard. The sensor can be installed in tank or Sea Valve, for double and single bottom configurations.

| Sensor | Part No. | Cable length (m) | Installed in |
|---|---|---|---|
| Sensor 270 kHz | DL850S27E-SB | 40 | ETNSLB 100 mm Sea Valve (Retrofit) |
| Sensor 270 kHz | DL850S27G-SB | 40 | SB-100-SA, SB-100-SB, DB-100-SA, DB-100-SB. 100 mm Sea Valve |
| Sensor 270 kHz | DL850S27TA-SB | 40 | ETNALC Aluminium Tank |
| Sensor 270 kHz | DL850S27T-SB | 40 | ETNSTC Combo Steel Tank\| |
| Sensor 270 kHz | DL850S27D-SB | 40 | Log Sensor for Atlas Dolog |

## SATLOG Antenna

The SATLOG Antenna consist of the antenna and included brackets for mounting purpose.

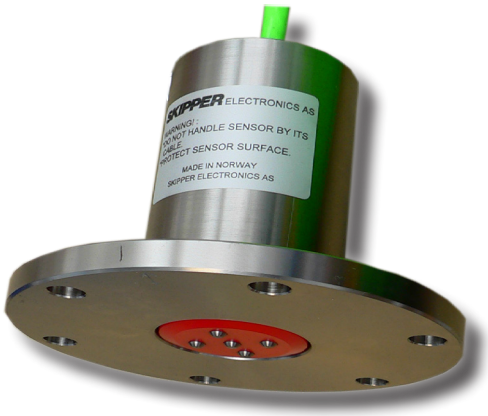
| Antenna | Part No. | Cable length (m) | Installation |
|---|---|---|---|
| Dual - GPS and Glonas for relative heading and true axis speed | SL-SN300 | Not included | Mounting brackets included |

## EML224 Electromagnetic Speed Log Sensor

The EML224 sensor is moulded and comes with a 40 m cable as standard. This sensor can be mounted in a Tank or Sea Valve for double and single bottom.

Other retrofit adapters are available on request.

EML224SG-SD




EML224ST-SD

| Sensor | Cable length (m) | Installed in |
|---|---|---|
| EML224SG-SD | 40 | SB-60-SA and DB-60-SA. 60 mm Sea Valve |
| EML224ST-SD | 40 | ETNSTCL Combo Steel Tank |
| EML224STA-SD | 40 | ETNALC Aluminium Tank |
| EML224SX-SD | 40 | PCSV60 60 mm Sea Valve (Retrofit) |
| EML224SN-SD | 40 | SIMRAD NL Log Sea Valve or Tank installation (Retrofit) |
| EML224SDB-SD | 40 | SB-100-SA, SB-100-SB, DB-100-SA and DB-100-SB. 100 mm Sea Valve |
| EML224SS-SD | 40 | LOG SENSOR FOR SAGEM Fittings EML, 40mtr ungrounded (Retrofit) |

EML224SDB-SD

# Sea Valves and Tanks for Speed Logs

The hull fittings are needed in order to fit the sensors into the hull of the ship. The bottom parts delivered by Jotron SKIPPER are approved by Det Norske Veritas (DNV). Approval by other classification authorities are available on requests.

Jotron SKIPPER always recommend to install the sensors into Sea Valves. It is much easier to change the sensor, and to maintain and clean the sensors regularly without entering any drydock or using divers. The installation of a Tank will require installation of cable pipes above load water line. This is time consuming, costly, and, when everything is taken into consideration, the installation of Sea Valve will often be the cheapest option for installation.

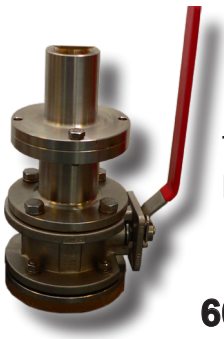
## Combo Tank (ETNSTCL)

The Combo Tank is specially made for SKIPPER's Speed Logs, DL850 270 kHz and the EML224 Speed Logs. The red coating as well as the steel alloy is the same for standard tank (ETNST). Tanks for Speed Logs have a mounting direction, and need to be installed correctly (please see the installation manual).

## Aluminium Combo Tank (ETNALC)

The Aluminium Combo Tank is also specially made for SKIPPER's Speed Logs. Please note that the aluminium tank needs to be certified with the hull of the vessel after installation.

## 60 mm  Sea Valve for single bottom (SB-60-SA)



SKIPPER 60 mm Sea Valve is manufactured for the EML Speed Logs. It is made in stainless steel, and the Ball Valve is operated with a lever. Because of the small size, it is easy to fit into small spaces at the bottom of the vessel.

The SB-60-SA is delivered with a 0.5 m extension tube in order to mount the SKIPPER EML sensor.

## 60 mm Sea Valve for double bottom (DB-60-SA)

If the vessel is constructed with a double bottom, or the valve needs to be moved away from the hull, the correct solution is the DB-60-SA. As seen on the figure, this Sea Valve is delivered with an extra flange to be installed in the outer hull of the vessel. The interhull distance is different for each hull setup, so the piping between the outer and the inner hull is yard supply and need to be welded between the outer hull flange and the inner hull flange.
Please see the installation manual for further information on the installation procedure. For use with SKIPPER EML Speed Logs only.

The DB-60-SA is delivered with 1 m and 0.5 m extension tubes. Extra extension tubes are available on request.

## 100 mm Sea Valve for single bottom (SB-100-SB) Recommended!

The SB-100-SB is an alternative to the SB-100-SA, the difference is that the SB-100-SB has a Ball Valve with a lever to close the valve instead of the screw operation of the SB-100-SA valve and it is made in stainless steel.
Difference in space in the installation location would require the choice between the SB-100-SA and the SB-100-SB. Please contact SKIPPER for details in space needed or visit www.skipper.no for downloads of installation manuals and installation videos.

## 100 mm Sea Valve for double bottom (DB-100-SB) Recommended!

The DB-100-SB is our Sea Valve in stainless steel to be installed in a double bottom configuration.  2 x 0.5 m and 1 x 1 m extension pipe to lower the transducer in the Sea Valve are delivered as standard together with the Sea Valve. Extra extension pipe is available on request.

# Speed Log Setup and Options

**Speed through Water (STW) Speed Log**

What features do you need?
Bottom track?
Acoustic sensor?
Vessel over 50 000 GT?

**CD401E2-SB**
Dual Axis Compact Display

**CD401E1-SB**
Single Axis Compact Display

**EML1100/1200**
10” Graphical display

**CD401D1-SB**
Single Axis Compact Display

**CD402CU-SC**
Single Axis Compact Display

**Repeaters/Remote dimmer for all products**

CD401MR-SC

IR31DIM-SA

NMEA dimmer

MAX 10m

Electronic unit

**JB60CD-SA**
Electronic Unit Max. 10 m from Compact display

**EML1100-SA**
10” Display single axis EML1100

**EML1200-SA**
10” Display dual axis EML1200

**JB40POW-SA**
Junction box with power

**JB70D1-SA**
Electronic Unit

40 m cable to be cut or extended

New installations

Sensor

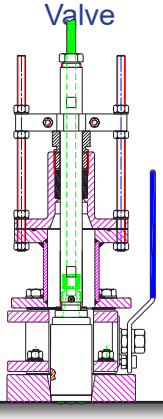
**EML224SG-SD/ DL1SG-SA**
Log Sensor for 60 mm Sea Valve

**EML224ST-SD/ DL1ST-SA**
Log Sensor for Combo Steel Tank

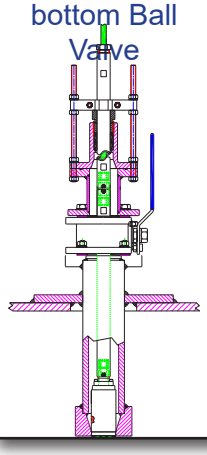
**EML224STA-SD/ DL1STA-SA**
Log Sensor for Combo Aluminium Tank

Bottom parts

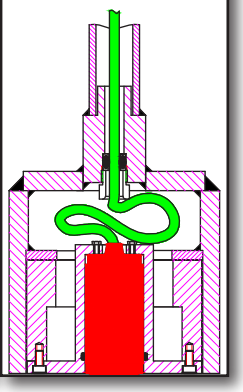
**SB-60-SA**
60 mm Sea Valve Single bottom Ball Valve



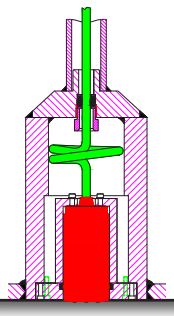
**DB-60-SA**
60 mm Sea Valve Double bottom Ball Valve



**ETNSTCL**
Combo Steel Tank



**ETNALC**
Combo AluminiumTank (No approval)



Revision: 24042024

**SATLOG & DL1 Multi**

Bottom track without limit
Single/Double bottom fit and GPS antenna

**CD402CU-SC**
Compact Display

**SL1200-SB**
9" touch display for SATLOG SL1200

**JB40POW-SA**
**Junction box with power and buffer**

Cable to be supplied locally

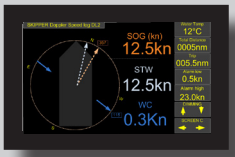
**SL-SN300**
SATLOG Antenna

**DL21 Doppler Speed Log IMO res. MSC334(90)**

Bottom track120+ m
Single/Double bottom fit

**CD402CU-SC**
Compact Display

**CU-M001-21-SA**
Multi-Touch Screen 9"

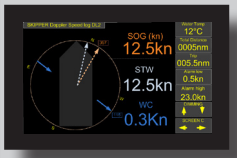


**JB70D21-SA**
Electronic Unit

**DL2 Doppler Speed Log**

Bottom track 120+ m
Single/Double bottom fit

**CU-M001-SA**
Multi-Touch Screen 9"



**JB70D2-SA**
Electronic unit

40 m cable to be cut or extended

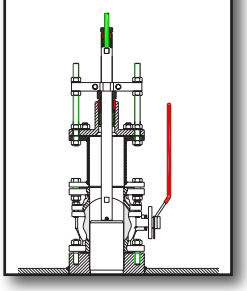
**DL21SG-SA**
Log Sensor for 100 mm Sea Valve

**DL2SG-SA**
Log Sensor for 100 mm Sea Valve

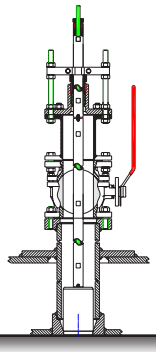
**DL2STA-SA**
Log Sensor for Combo Aluminium Tank

**DL2ST-SA**
Log Sensor for Combo Steel Tank

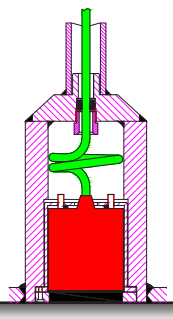
**SB-100-SB**
100 mm Sea Valve
Single bottom Ball Valve



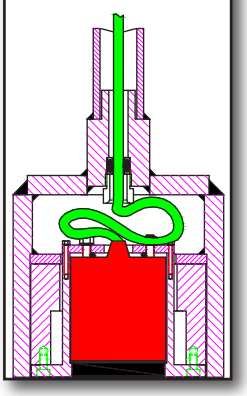
**DB-100-SB**
100 mm Sea Valve
Double bottom Ball Valve



**ETNALC**
Combo AluminiumTank
(No approval)



**ETNSTCL**
Combo Steel Tank



**Jotron SKIPPER AS**
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Tel. +47 23 30 22 70
Fax. +47 23 30 22 71
sales.skipper@jotron.com

# Speed Log Retrofit Sollutions

**Speed through Water (STW) Speed Log**

What features do you need?
Bottom track?
Acoustic sensor?
Vessel over 50 000 GT?

**CD401E2-SB**
Dual Axis Compact Display

**CD401E1-SB**
Single Axis Compact Display

**CU-M101-SA**
10” Graphical display

**CD401D1-SB**
Single Axis Compact Display

**CD402CU-SC**
Single Axis Compact Display

**Repeaters/Remote dimmer**

CD401MR-SB

IR31DIM-SA

NMEA dimmer

MAX 10m

Electronic unit

**JB60CD-SA**
Electronic Unit Max. 10 m from Compact display

**AC-EML1200**
Activation code for EML1200

**AC-EML1100**
Activation code for EML1100

**JB40POW-SA**
Junction box with power

**JB70D1-SA**
Electronic Unit

Retrofit

40 m cable to be cut or extended

Retrofit

Sensor

**EML224SN-SD/ DL1SN-SA**
Log Sensor for Simrad NL-Log Tank or Valve

**EML224SX-SD/ DL1SX-SD**
Log Sensor for PCSV60 Sea Valve

**EML224SDB-SD/ DL1SDB-SA**
Log Sensor for 100 mm Sea Valve

**EML224SS-SD/ DL1SS-SA**
Log Sensor for SAGEM Speed Log

**DL21SC-SA**
Log Sensor for SAL860T and T2

**DL21SE-SA**
Log Sensor for ETNSLB Sea Valve

Bottom parts

Sea Valve or Tank already installed in the vessel

**DL21 Doppler Speed Log IMO res. MSC334(90)**

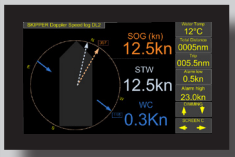
Bottom track120+ m
Single/Double bottom fit

**DL2 Doppler Speed Log**

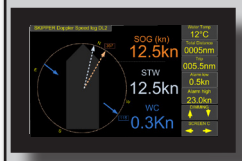
Bottom track 120+ m
Single/Double bottom fit

**CD402CU-SC**
Compact Display

**CU-M001-21-SA**
Multi-Touch Screen 9”



**CU-M001-SA**
Multi-Touch Screen 9”



**JB70D21-SA**
Electronic Unit

**JB70D2-SA**
Electronic Unit

40 m cable to be cut or extended

**DL21SW-SA**
Log Sensor for SPERRY SRD500/421

**DL2SF-SA**
Log Sensor for Furuno DS 50/60

**DL2SE-SA**
Log Sensor for ETNSLB Sea Valve

**DL2SW-SA**
Log Sensor for SPERRY SRD 500/421

**DL2SDR-SA**
Log Sensor for Atlas Dolog

**DL2SC-SA**
Log Sensor for SAL860T and T2

Sea Valve already installed in the vessel

**Jotron SKIPPER AS**
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sales.skipper@jotron.com

# ETT985 Tester


Depth: 6 cm
Weight: 728 g


A simple to use, reliable and accurate tester for most Echo Sounders. Preprogrammed with factory tests for Transducers, Echo Sounders and NMEA ports.
This unit can be used in a stand-alone mode, or using a connection to a PC to give accurate results and even print/save a status report, this unit eliminates uncertainty of whether a failure is in the Transducer or in the Echo Sounder. An expensive mistake if you get it wrong!

**Features:**

**Tester for Transducer of frequencies from 10 kHz to 1 MHz**

**Just the tester:**

- Impedance, resistance and phase
- Detection of resonant point and impedance at resonance
- Preprogrammed integrity tests for SKIPPER transducers (and others)

**With software:**

- Graph of impedance, conductance, phase and susceptance
- Detection of resonance, anti-resonance, bandwidth and factory limit check
- Save to .xls format and/or print out for service reports
- Add your own transducer checks and limits (saved in tester for later use)

**Simulator for SKIPPER and other continuous wave Echo Sounders**

**Just the tester:**

- Detect and measure pulses, frequency, strength, Vpp, width and period
- Generate return pulses with fixed or tracking format, at depth up to 999.9 m
- Simulate fish in the water column

**With software:**

- Check results against factory settings or preset default values
- Add your own Echo Sounder values and checks

**NMEA tester**

**Just the tester:**

- Monitor NMEA lines, loop back signals from devices, send standard formats for GPS, gyro, Echo Sounders, Speed Logs etc.
- Use the unit as a NMEA to RS232 converter or to USB with included converter

**With software:**

- Insert your own NMEA parameters (can be saved)

# DGR360 Digital Gyro Repeater


**DGR360 is a digital gyro repeater that displays the Heading Angle in the LED 7 segment display and indicates the direction of turn with 30 dual colour surrounding LEDs, changing from green to red depending on the direction of turn.**

**Highlighted features:**

- Digital gyro repeater
- Heading angle
- HDT/THS signals
- Bracket or panel mounting

The DGR360 will display Heading Angle given by the Heading message from a gyro or other equipment (NMEA 0183) and indicate “Direction of Turn” by calculating change in heading based on the HDT/THS input and the time between each message.

The dimming may be controlled by pressing the dimming key or by using an external dimming key.

**Specifications:**

| | |
|---|---|
| **Power Supply** | DC: 20-32 V |
| **Power Consumption** | 2 W at 24 V |
| **Display** | 1 line with 7 segments 30 x 20 mm |
| **Display outputs** | Heading (HDT, THS) from gyro compass or other HDT/THS devices |
| | Analogue indication of turn direction speed (red/green LEDs) |
| **Standard cable length** | 2 m |
| **Compass safe distance** | 85 cm |
| **Mounting Dimensions** | 190 x 158 mm. Cut out for panel mounting. Brackets are included. |
| **Front plate** | 220 x 170 mm |
| **Depth** | 63 mm |
| **Weight cabinet** | 2 kg |
| **Protection** | IP 56 |
| **Outputs** | NMEA 0183 |
| **Inputs** | NMEA 0183 protocols<br>Sentence: $--HDT, $--THS |
| | Remote dimmer input, pulse. |

| | |
|---|---|
| **Classification** | IEC 60945/2002. Approved up to IMO Standards. |
| **Service** | Available in most major harbours, world-wide through extensive dealer network. |

# NE108 NMEA Expander

**The SKIPPER NE108 is a NMEA Expander 1-8 and is produced according to IEC61162-1**

It is designed to distribute NMEA0183 signals from one input and out to 8 outputs in a user frendly way.
It is designed to fit a standard 35 mm DIN rail.

**Specifications:**


| | |
|---|---|
| **Power Supply** | DC: 24 V DC (19-36) |
| **Power Consumption** | 4 W at 24 V |
| **Input NMEA** | 1xNMEA0183 (IEC61162-1/2) Isolated |
| **Ouput NMEA** | ***8xNMEA0183 (IEC61162-1/2) Max 20 mA*** |
| **Mounting Dimensions** | Width 77mm, Length 128mm, Depth 50mm |
| **Weight cabinet** | 0.18 kg |
| **Mounting** | 35mm DIN IEC60715 |
| **Manufactured in** | PRC |
| **Classification** | IEC61162-1 |
| **Service** | Available in most major harbours, world-wide through extensive dealer network |

# Ninglu AM706 Marine Anemometer

**The Ninglu AM706 is a reliable Marine Anemometer working in the hash Marine Environment.**

**Highlighted Features:**

- High Resolution Wind Speed (0,1 m/s)
- Wind direction (1 degree)
- Temperature resistant
- Moisture and salt proof mechanic design
- 7” High brightness LCD display
- Digital and analog display


**Specifications:**

| | |
|---|---|
| **Power Supply** | DC: 24 V DC (20-32V) 5W |
| **Brightness Adjustment** | 9 Levels adjustable |
| **Display** | 7” TFT/480x234 pixels |
| **Data output** | NMEA0183 Wind Speed and Direction |
| **NMEA Port** | RS422 Output 2pin NMEA A/B |
| **Direction Accuracy** | +/- 1 degree |
| **Wind Range** | 0-359 degree |
| **Speed Accuracy** | 0,1 m/s |
| **Speed Range** | 0-60 m/s |

| | |
|---|---|
| **Startup Wind Speed** | <= 1,2 m/s |
| **Operationg temperature** | -15 to +55 degree C |
| **Storage temperature** | -20 to +70 degree C |
| **Humidity** | 10-90% relative, no condensation |
| **Protection display** | IP23 |
| **Operating temperature sensor** | -15 to +85 degree C |
| **Storage temperature sensor** | -20 to +85 degree C |
| **Protection sensor** | IP56 |

# Quality Standards

An excellent quality is important for Jotron SKIPPER and will always be our main target. Jotron SKIPPER is continuously improving the quality of the existing products and all new products in the pipeline. It is important not only that the products leave Jotron SKIPPER in good condition, but also that the quality of the products remain excellent throughout its lifetime.

Jotron SKIPPER AS is approved with the standards as listed below:

- ISO 9001:2015
- IMO wheelmark (Med D)

All our Steel Tanks and Sea Valves are DNV approved. Approvals from other authorities can be provided on request.

DNV

## QS - CERTIFICATE OF ASSESSMENT - EC (MODULE D)

Certificate No:
**MEDD00001AF**
Revision No:
**6**

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED), issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Authority. This Certificate is issued by DNV AS under the authority of the Government of Norway.

**This is to certify:**

**That the Quality System for the products**

with type designation(s) as specified in the Appendix to this Certificate

Issued to
**Jotron Skipper AS**
**Oslo**, **Norway**

is found to comply with the applicable requirements.
The quality system has been assessed with respect to the procedure of conformity assessment described in Annex II, Module D in the directive 2014/90/EU and regulation (EU) 2023/1667.

This Certificate is valid until **2027-09-27**.

Issued at **Høvik** on **2024-04-05**

DNV local unit:
**East & South Norway CMC**

Approval Engineer:
**Frederik Tore Elter**

for **DNV AS**

Digitally Signed By: Biever, Tessa
Location: DNV Høvik, Norway

on behalf of

Notified Body
No.: **0575**

**Mydlak-Röder, Christine**
**Head of Notified Body**

The manufacturer is allowed to affix the U.S. Coast Guard approval number(s) as stated in the appendix attached hereto and as allowed by the "Agreement between the United States of America and the EEA EFTA states on the mutual recognition of Certificates of Conformity for Marine Equipment" signed 17 October 2005, and amended by Decision No 1/2023 dated August 21st, 2023.

0575/yyyy

0575: Notified Body number undertaking quality surveillance
yyyy: The year in which the mark is affixed

The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU.
This certificate authorizes the manufacturer in conjunction with the valid EC Type Examination (Module B) Certificate(s) of the equipment listed before to affix the Mark of Conformity (wheelmark) to the product described herein.
This certificate loses its validity if the manufacturer makes any changes to the approved quality system which have not been notified to and agreed with the notified body named on this certificate. This certificate remains valid unless suspended, withdrawn, recalled or cancelled.
The Manufacturer has to apply for periodical audits to verify the maintenance and application of the quality system every 12 months.





Nemko

Number **801501**

# CERTIFICATE

**Jotron Skipper AS**
Enebakkveien 150, 0680 Oslo, Norway

has implemented and maintains a Quality Management System which fulfills Nemko's provisions for Management System Certification and the requirements of the following standard

**ISO 9001:2015**
with the scope described by the organization, 2023-06-28

The certificate covers the following activities:

Developing, manufacturing and marketing navigation instruments for maritime industry

Oslo, 2024-10-28

Helena Vogl
Nemko Scandinavia AS, Certification Department

First time issued **2000-11-17**
Expires **2027-11-17**

Nemko Scandinavia AS, Philip Pedersens vei 11, P.O. Box 91, 1325 Lysaker, Norway - Enterprise Number NO927845687

# Service/Support

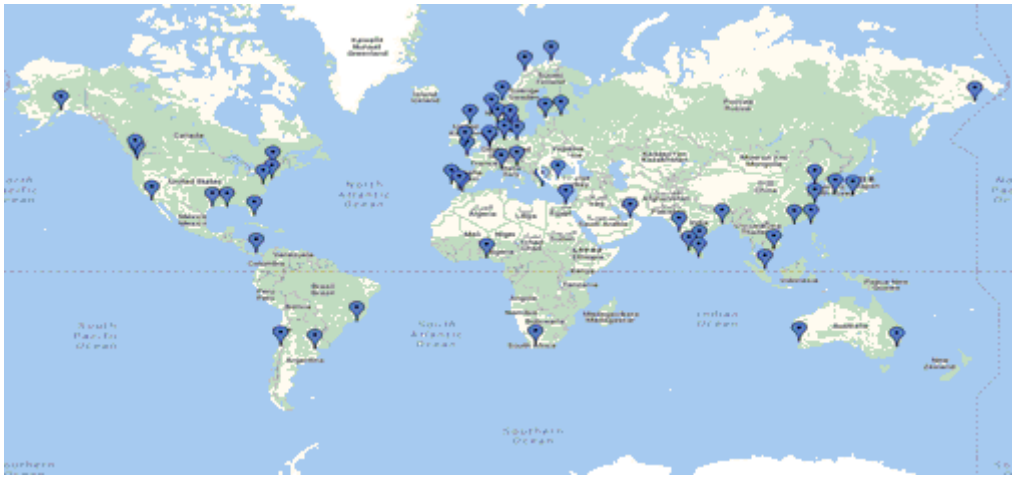
**Service HUBs and world wide stock:**
Jotron SKIPPER lays emphasis on the importance of a world wide service/support coverage. We have therefore established service hubs throughout the world. These service hubs keep all our main spare parts, to reduce the freight time for your service. A full list of all the spare parts they keep can be found on Jotron SKIPPER web pages.

The Hubs are currently

| Region | Main office | email | Tel |
|---|---|---|---|
| Mid. Europe | Radio Holland, Netherlands | info@radioholland.be | +3233209960 |
| South Europe | Aage Hempel Marine Electronics, | service@aagehempel.com | +34956573276 |
| Middle east | Elcome international LLC Dubai | service@elcome.ae | +97148121333 |
| Asia | Seven Seas, Shanghai, China | info@sevenseas.cn | +8621588552626 |
| Asia | Jason Electronics, Singapore | service@jason.com.sg | +6568720211 |
| North America | Wärtsilä North America, Inc., Miami | Service.Florida.GAI@L-3com.com | +13053717039 |

All Hubs have a local network of service stations

**Service centers:**
There are also several other service/support/dealers throughout the world, capable of service and support on all Jotron SKIPPER products. For a full list of all the service/support and dealers please go to www.skipper.no. Jotron SKIPPER schedules annual training for all its service/support/dealers, and have recently trained over 600 engineers worldwide. We also hold train a trainer courses in order to keep all up to date on Jotron SKIPPER Navigational Echo Sounders and Speed Logs.



Jotron SKIPPER have several means of support, including our web portal www.skipper.no with service bulletins, downloadable manuals, catalogues, brochures, drawings and also a forum to get information not covered in the manuals.

The New MULTI Series will include tips and information on screen to support the use of the systems.

Press the SKIPPER logo “  “ to get help whenever available.

**Remote support:**
The MULTI series is designed for remote support, by connecting the system to a LAN or connecting an internet connected computer to the system, it is possible for Jotron SKIPPER engineers to check your system, run diagnostics and support with issues that arise. In this way it is easier to ensure first time fix.

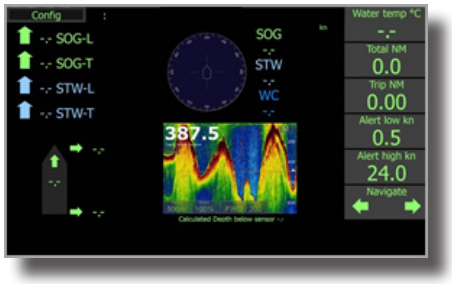
Jotron SKIPPER Service software is available free on www.skipper.no this software gives access to useful tools such as:

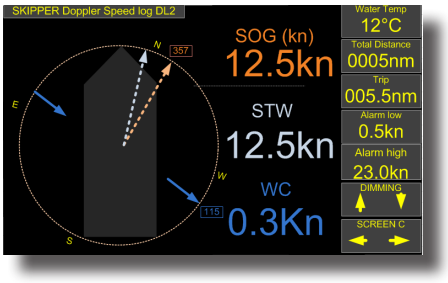
- NMEA monitors
- Data logging functions
- Firmware and software upgrade
- Diagnostics of sensors
- Remote control of MULTI systems
- Software for Transducer tester ETT985
- Latest software versions and company news


Jotron SKIPPER is also available for support/service on support@skipper.no, and on phone no. +47 23 30 22 70.

## Integration of the MULTI system

Jotron SKIPPER is dedicated to making the MULTI system fully integratable to modern bridges. Systems communicate using the new IEC61192-450 standard and Integrators can use a precompiled software application directly into their system.





- If used with a standard display, there should be no need for extra approval. If used without a display, a minimal check is required. In particular, attention should be paid to redundant displays and alarm systems (ALF format as standard).
- TCP-IP (Web pages) are also available, or soon to be available on all system setup parameters (Approval required in the case of echosounders).
- Command line control will also be available giving full freedom in your own GUI design (within regulation limits).
- Jotron SKIPPER is dedicated to giving support to any company attempting intigrate SKIPPER MULTI systems.

SKIPPER

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(Press 1 for support, 2 for sales and 3 for administration)

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Find out all about Jotron SKIPPER products, support and training on our web site:

www.skipper.no

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