Navigational
Echo Sounders & Speed Logs

Version 1.41

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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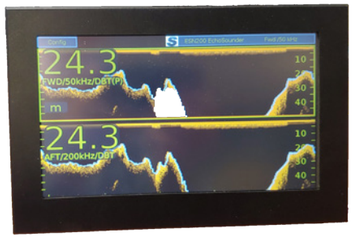
SKIPPER ESN200



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. DC: 20-32 V	**Frequencies**	24, 30, 33, 38, 50, 100, 200 and 210 kHz
Power Consumption	Display unit: Nominal 6W Electronic unit 20W	**Output power**	Nominal 700W. Max>1000W
Display	9” Resistive touch. 400 NITS Weight: 1.1 kgs	**Depth alarms**	BAM compatible (IEC62923) ALF or ALR. Internal sounder. 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
		Languages	English
Memory	24 Hour storage. (More than 1 month available on SD card)	**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 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)	**Classification**	Made to IMO performance standard
Power Consumption	Display unit 5W Electronic unit 10W	**Service**	Available in most major harbours, world-wide through extensive dealer network
Display	9” RESISTIVE TOUCH. 400NITS		
Mounting Dimensions	242x158 mm Display unit 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 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		

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.

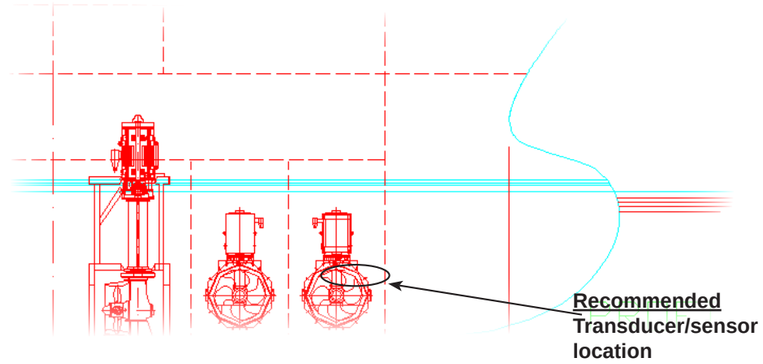
Power Supply	DC: 24 V DC (19-36)	**Weight cabinet**	1 kg
Power Consumption	30 W at 24 V	**Protection**	IP 56
		Outputs	1 x NMEA 0183
Display	Up to 4 lines with LED	**Inputs**	1 x NMEA 0183 protocols
Display outputs	***Depth* –** below surface, keel and transducer		Remote dimmer input
	***Speed* –** over ground and through water (longitudinal, transverse, aft and relative)		* Depth: DPT, DBK, DBT, DBS * Speed: VBW, VTG, VHW * Distance: VLW * Heading: VTG, VHW, THS, HDT, HDM, HDG * Rotation: ROT * Pitch and Roll: XDR * Wind: MWV, VWR, VWT, MWD * Temperature: MTA, MTW, MDA * Drive: RPM, RSA * Clock: ZTG, ZDA, GGA, RMC * Auxillary: User defined. * Current: IIVDR, PSKPVDR * 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

ETN200S(X)G

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:

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

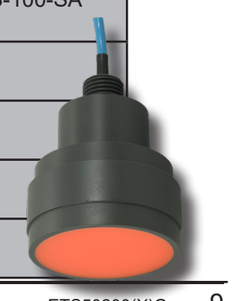
The transducer normally includes a junction box and mounting materials.

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) and Germanisher Lloyds (GL) 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.

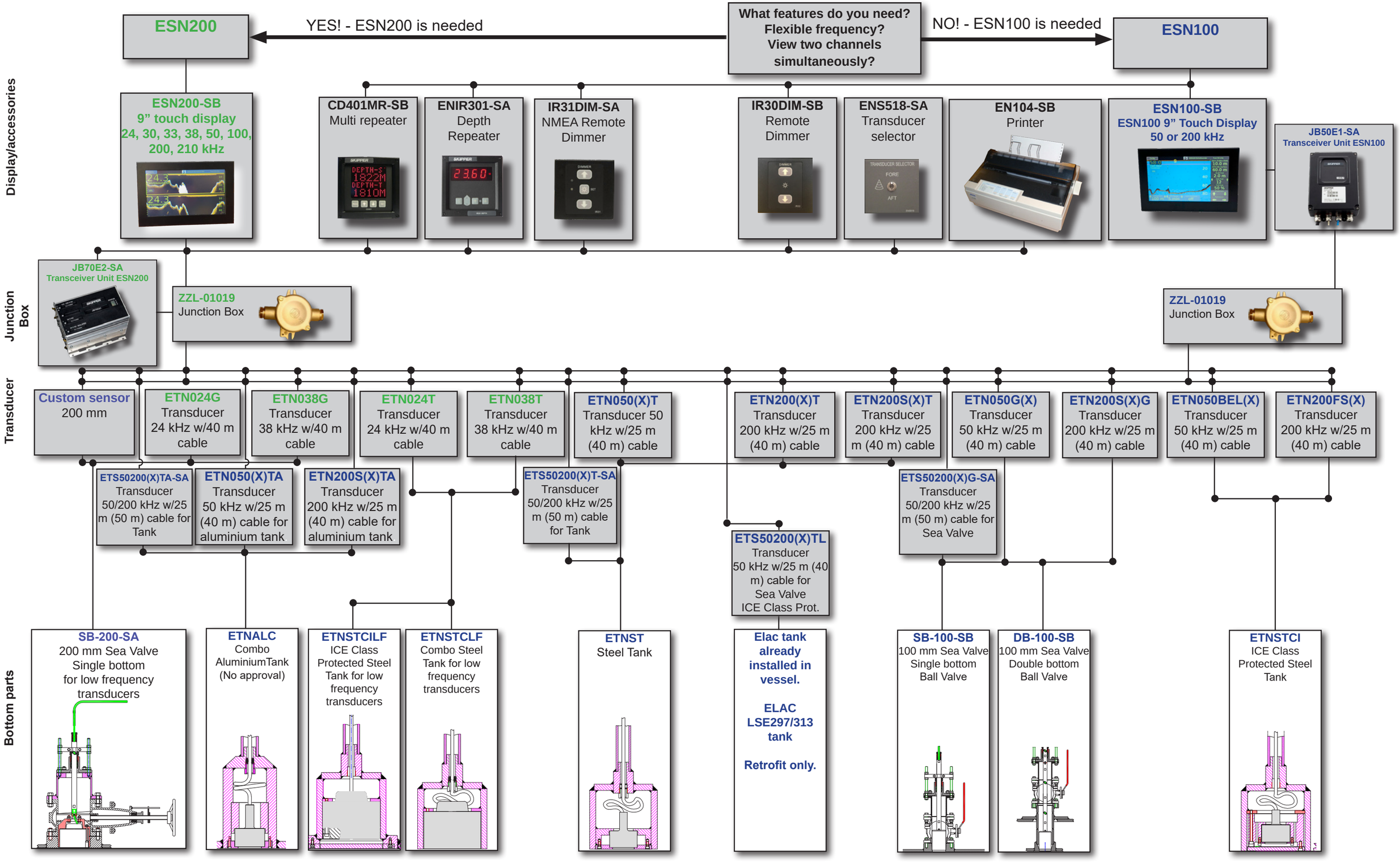
100 mm Sea Valve for single bottom (Part no. SB-100-SB)

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.

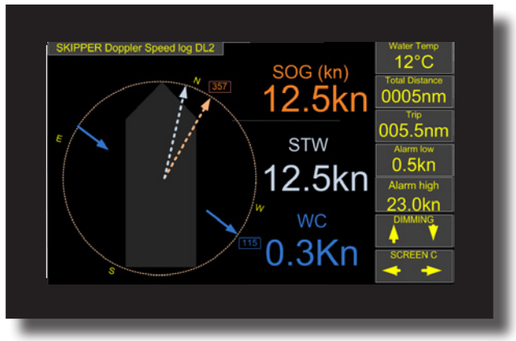
100 mm Sea Valve for double bottom (Part no. DB-100-SB)

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



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 850-920 STW primary 264 STW secondary	kHz
Speed range (lon/tra)	+45 to -10 Longitudinal +/- 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 Speed alarm, power failure alarm and function alarm
Others	MTW (temp), DDC, HBT, DPT and XDR
Pulse output	Yes
Analogue output	Defalt no 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 IP 22 Electronic unit 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 850-920 STW primary 264 STW secondary	700-730	kHz
Speed range (lon/tra)	+45 to -10 Long. +-/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% whatever greater	0.2 or 2% whatever greater	knots
Tilt accuracy	<2	<2	deg
Temperature accuracy	<1	<1	°C
Mounting			
Sea Valves	Single bottom, Double bottom (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) 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 IP 22 Electronic unit IPX7 Sensor unit	
Clasification	IMO 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 Power failure Sensor failure	
Clock	- Year-month-day/Hour-min. (taken from GPS if available)	
Outputs	- 4 x NMEA 0183	
	- 3 x Aux (pulse)	
	- Relay	
	- LAN	
Inputs	- 1 NMEA 0183 (OPTO Isolated) - 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 DC: 24V
Power Consumption	Max. 30 W
Display	28X30 led's
Accessories	ENIR300-SA Speed repeater IR31DIM-SA Dimming Control CD401MR-SA Multi repeater
Classification	MED-B/IMO
Weight cabinet	2.5 kg
Standard cable length for sensor	40 m
Mounting dimen-sions for cabinet	124x124 mm Bracket or panel mounting, (144x144 mm front)
IP rating	Electronic unit: 22 Display: 22 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 Power failure Sensor failure	
Clock	- Year-month-day/Hour-min. (taken from GPS if available)	
Outputs	- 2 x NMEA 0183	
	- 2 x contact closure (pulse)	
	- Relay	
Inputs	- 1 NMEA 0183 (OPTO Isolated) - 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 DC: 24V
Power Consumption	Max. 30 W
Display	28X30 led's
Accessories	ENIR300-SA Speed repeater IR31DIM-SA Dimming Control 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 dimen-sions for cabinet	124x124 mm Bracket or panel mounting, (144x144 mm front)
IP rating	Electronic unit: 22 Display: 56 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:

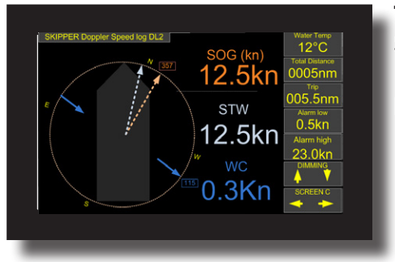
- NMEA 0183
- Compact display (144 x 144 mm)
- Alarm functions
- IMO Wheelmarked
- Speed through water in 1 or 2 axis
- Fully automated settings
- Support software for easy setup and diagnostics

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 - 1 x contact closure (pulse) - Relay - Fitness		

Inputs	- 1 NMEA 0183 - 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) 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 +/- 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 IP 20 Electronic unit 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) - 2 x NMEA 0183 outputs (IEC61162-1) - 1 x contact closure (pulse) - Alarm (Relay)		

Inputs	- 2x NMEA 0183 inputs (IEC61162-1) - External dimming (DDC) - 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 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

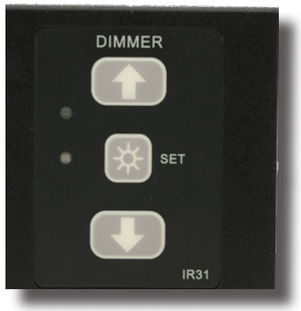
The SKIPPER CD401MR multi repeater repeats information about several essential information needed on a vessel. The operator may select between the information needed by use of the display, and could even customize the information shown. Brightness is adjusted on the front panel, or from a remote dimmer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

Power Supply	DC: 24 V DC (19-36)
Power Consumption	30 W at 24 V
Display	Up to 4 lines with LED
Display outputs	***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
	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
Mounting Dimensions	124 x 124 mm. Cut out for panel mounting. Brackets are included.
Front plate	144 x 144 mm to DIN standard
Depth	59 mm

Weight cabinet	1 kg
Protection	IP 56
Outputs	1 x NMEA 0183
Inputs	1 x NMEA 0183 protocols
	Remote dimmer input
	* Depth: DPT, DBK, DBT, DBS * Speed: VBW, VTG, VHW * Distance: VLW * Heading: VTG, VHW, THS, HDT, HDM, HDG * Rotation: ROT * Pitch and Roll: XDR * Wind: MWV, VWR, VWT, MWD * Temperature: MTA, MTW, MDA * Drive: RPM, RSA * Clock: ZTG, ZDA, GGA, RMC * Auxillary: User defined. * Current: IIVDR, PSKPVDR * Display Dimming: DDC
Protection	IP 56
Classification	Made acc. to IMO performance standard
Service	Available in most major harbours, world-wide through extensive dealer network

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.

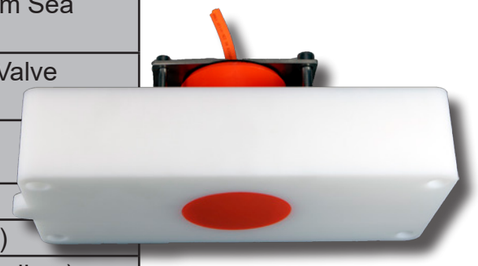
DL2 Doppler Speed Log Sensor

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

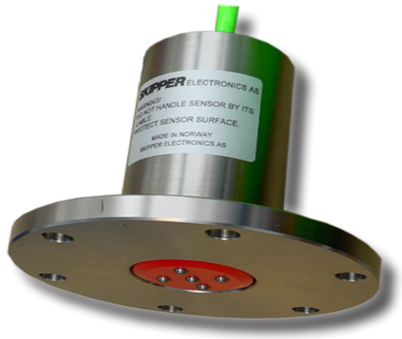
SL-SN300

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.

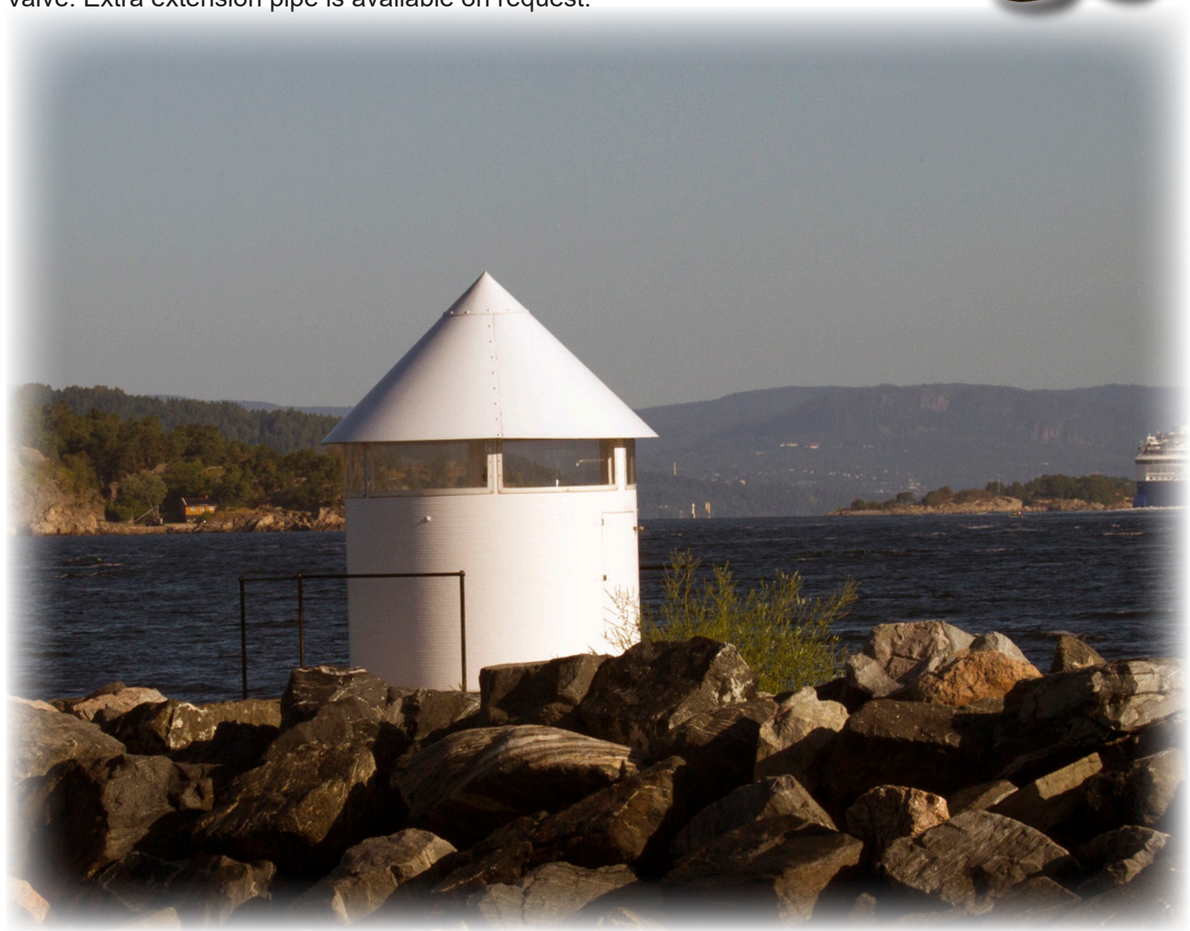
The DB-60-SA is delivered with 1 m and 0.5 m extension tubes. Extra extension tubes are available on request.

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

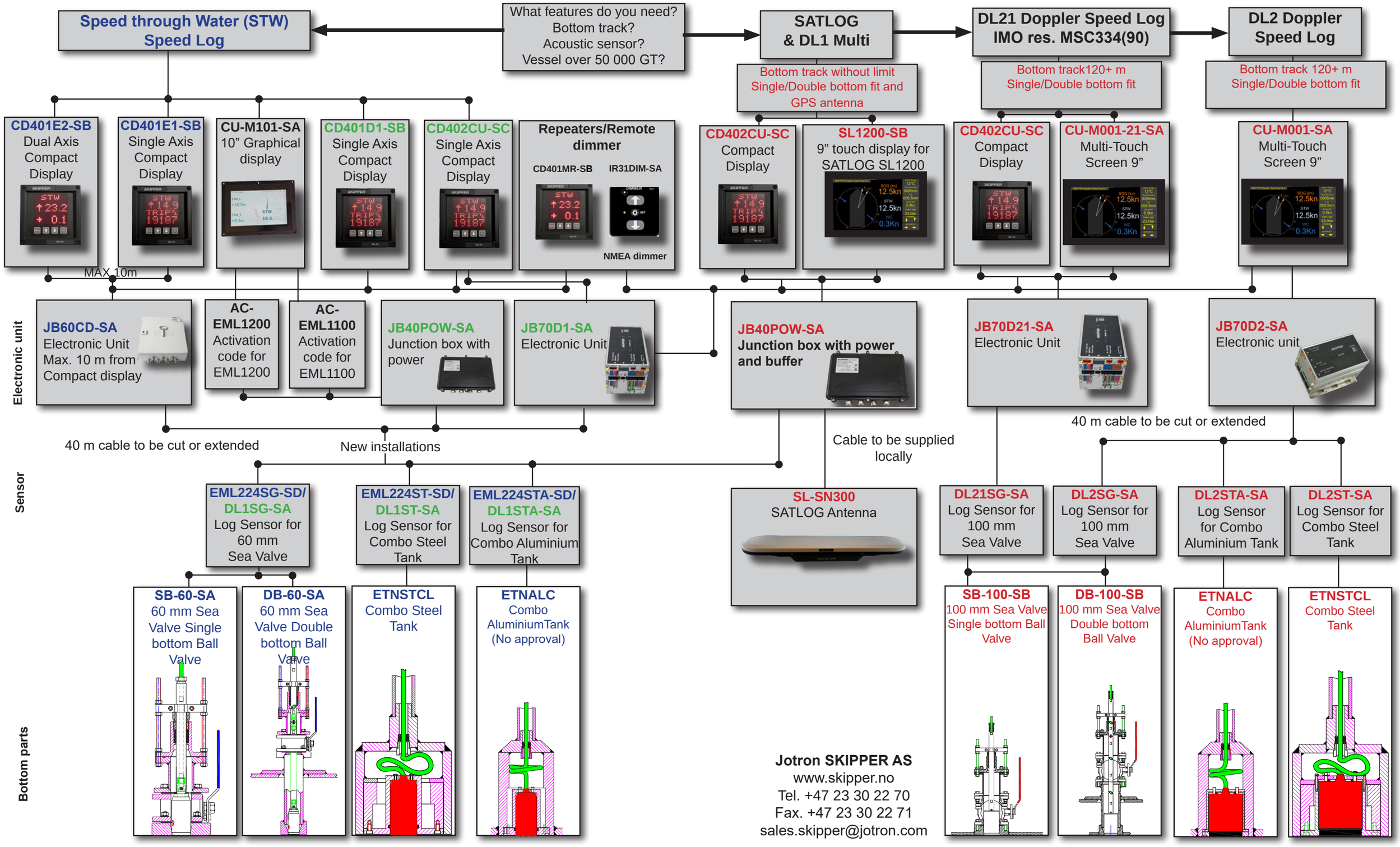
The SB-100-SB is an alternative to the SB-100-SA, the difference is that the SB-100-SB has a Ball Valve with a lever to close the valve instead of the screw operation of the SB-100-SA valve and it is made in stainless steel.
Difference in space in the installation location would require the choice between 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



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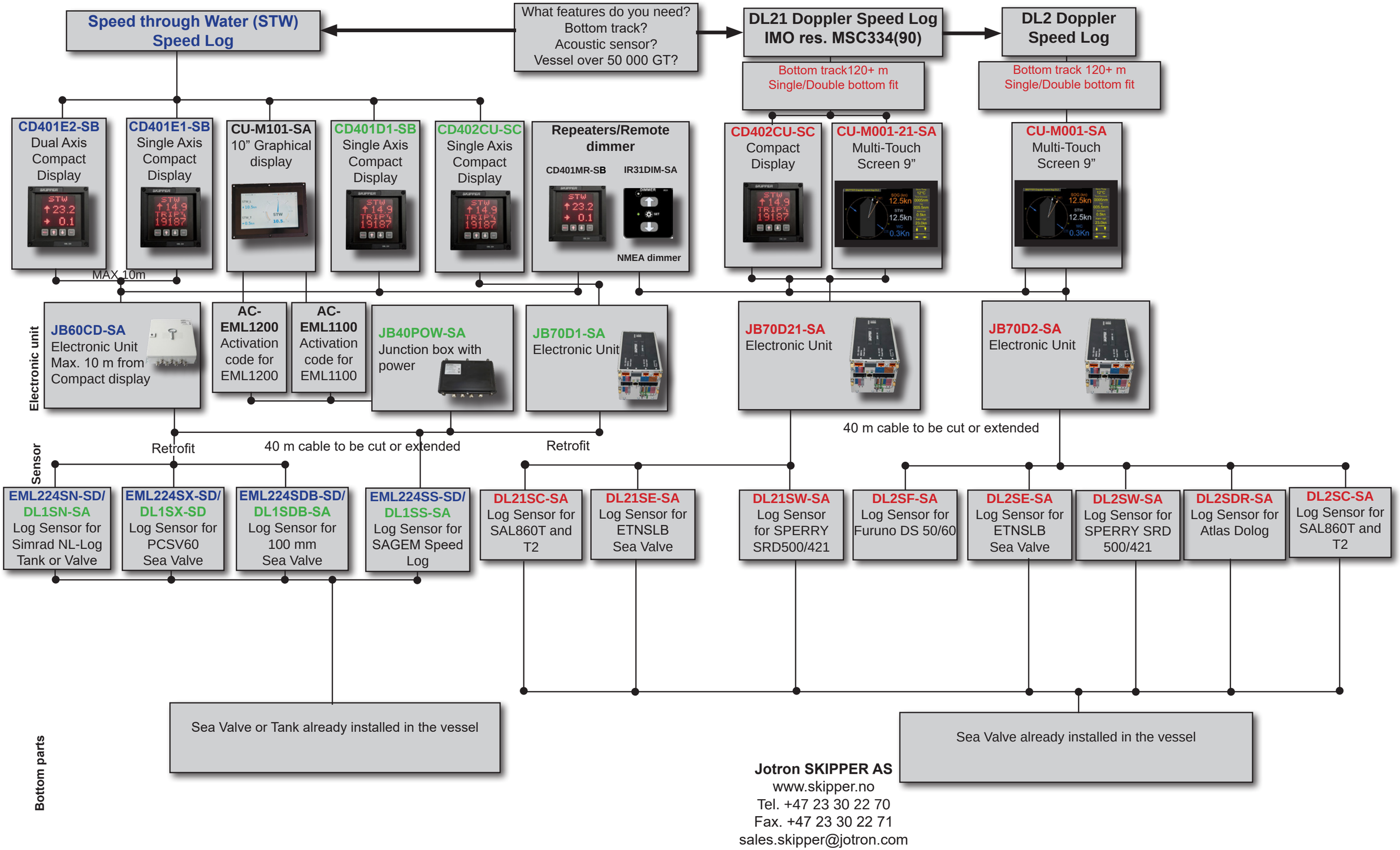
Revision: 05072023

Speed Log Retrofit Sollutions



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Revision: 05072023

ETT985 Tester

13 cm

23 cm

Depth: 6 cm
Weight: 728 g

24 cm

29 cm

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 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: **5**

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
Skipper Electronics 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) 2022/1157.

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

Issued at **Høvik** on **2022-09-28**

DNV local station:
East & South Norway CMC

Approval Engineer:
Steinar Kristensen

Notified Body
No.: **0575**

for **DNV AS**
Digitally Signed By: Eiler, Frederik Tore
Location: DNV Høvik, Norway
on behalf of

Sverre Olav Bergli
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 1/2019 dated February 22nd, 2019.

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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Form code: MED 211.NOR Revision: 2022-02 www.dnv.com Page 1 of 2

CERTIFICATE

Kiwa AS,
Kabelgata 2,
N-0580 Oslo

kiwa

Management System
Certificate

To certify conformity with // Godkjent overensstemmelse med
the Management System Requirements of // Styringssystemkravene i henhold til

NS-EN ISO 9001:2015

awarded // tildelt

JOTRON SKIPPER

Jotron Skipper AS
Enebakkveien 150, 0680 Oslo

Manufacturing/supplying following products/services:
for produksjon/leveranse av følgende produkter/tjenester:

For supply and production of Maritime Electronic.

For leveranser og produksjon av maritim elektronikk.

Certificate No // Sertifikat nr.:

151

First issued // Utstedt første gang: 2000-11-17
Last expiry // Forrige utløp: 2021-11-17
Last recertification // Siste resertifisering : 2021-11-10
Valid until // Gyldig til: 2024-11-17
Issued // Utstedt: 2023-06-23
Audit: Annual // Oppfølging: Årlig

Director Certification // Direktør Sertifisering

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,	Spain service@aagehempel.com	+34956573276
Middle east	Elcome international LLC Dubai	service@elcome.ae	+971 48121333
Asia	Seven Seas, Shanghai, China	info@sevenseas.cn	+86 21588552626
Asia	Jason Electronics, Singapore	service@jason.com.sg	+65 68720211
North America	Wärtsilä North America, Inc., Miami	Service.Florida.GAI@L-3com.com	+1 3053717039

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.

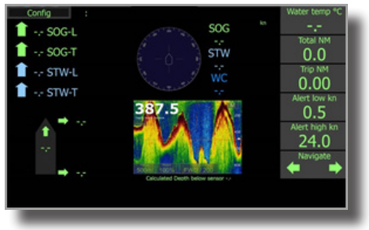
Jotron SKIPPER Service software is available free on www.skipper.no this software gives access to useful tools such as:

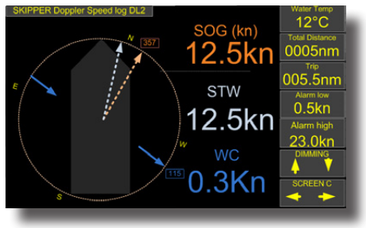
- NMEA monitors
- Data logging functions
- Firmware and software upgrade
- Diagnostics of sensors
- Remote control of MULTI systems
- Software for Transducer tester ETT985
- Latest software versions and company news

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

Jotron SKIPPER AS
Enebakkveien 150
0680 Oslo
NORWAY

Phone +47 23 30 22 70
(Press 1 for support, 2 for sales and 3 for administration)

E-mail:
Sales: sales.skipper@jotron.com
Service: support.skipper@jotron.com
Admin: admin.skipper@jotron.com

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

www.skipper.no

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