

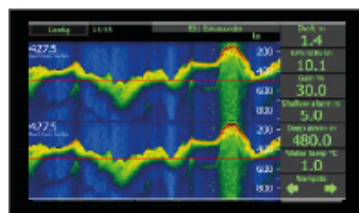


ESN200

Operation and Installation Manual

Dual channel multi frequency Echo sounder

Display unit ESN200-SB



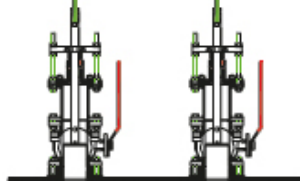
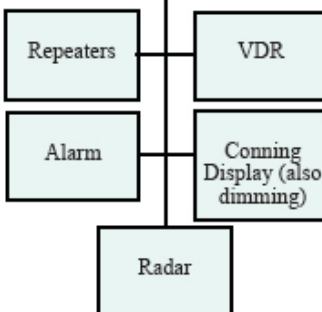
24 V DC

LAN communication with Display
(Multiple displays available)

Electronic / Transceiver unit
JB70E2-SA



24 V DC - 115/230VAC



Document no: **DM-G005-SB**

Rev: 1936

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Date: 2021.03.12

IMPORTANT

When doing service or repair, please wait two minutes after power off, before unplugging internal connectors.

Do not run the sounder for a long time with the transducer in air.
The transducer may be damaged.

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Introduction

The SKIPPER ESN200 is a dual channel echosounder. Each channel is frequency programmable. It is made to fulfill all ISO/IMO standards, as well as the modern IEC standards for maritime equipment and alarm handling.

Features

The ESN200 is a navigational echo sounder system that is made to fulfil the needs of a modern SOLAS vessel. Its aim is to be automated, so that the user does not need to adjust settings. But it also allows the user to adjust if they feel the need.

The ESN is part of the SKIPPER Multi family, allowing the use of LAN to interconnect systems and use multiple screens.

Features include:

- Easy and logical operation via a touch display, with fully automatic settings
- Possibility of multiple control units
- Fully integratable and frequently updated with the latest integration standards
- Remotely accessible
- Internal diagnostics and Built in test
- 2 simultaneous channels, each of which is frequency controllable
- 7 available frequencies. 24, 30, 33, 38, 50, 100, 200kHz
- 3 IMO approved frequencies. 38, 50, 200kHz
- Other available transducers from SKIPPER: ETN024 24kHz

The ESN200 comprises of one Display unit, one Electronic unit and up to 2 transducers

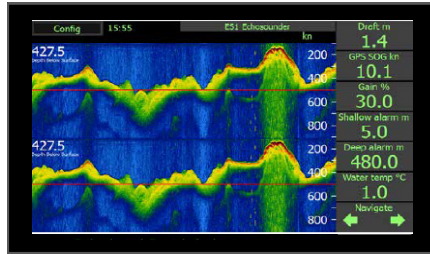
ESN200-SB Display unit: Contains a 2 NMEA outputs and 2 NMEA inputs used solely for dimming, or normal DPT outputs. An RJ45 connector is used for LAN communication (IEC61162-450) to the Electronic/transceiver unit. Power input 24VDC

JB70E2-SA Electronic and transceiver unit; This unit is the echosounder producing the acoustic signals and processing the returns to give the appropriate outputs for depth. It contains connections for 2 transducers, 2 LAN ports for connection to the bridge or control units, auxiliary inputs and outputs, 5 NMEA outputs and 3 inputs, and power input 24VDC and 110-230VAC. This unit is mounted on or close to the bridge, with long cables coming from the transducers.

If 7 outputs is not enough, the NMEA will typically be sent to a splitter/Expander such as the SKIPPER NE108-SA to give the information to the bridge/alarm system and VDR.

Overview

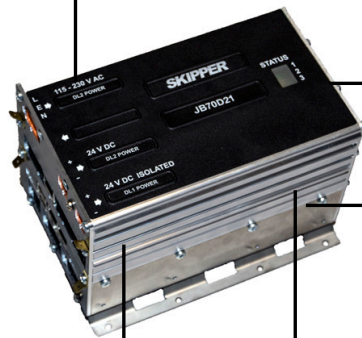
Display unit ESN200-SB



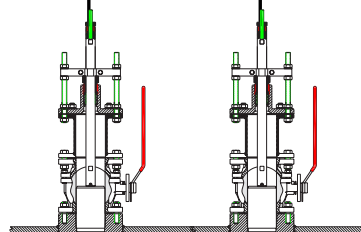
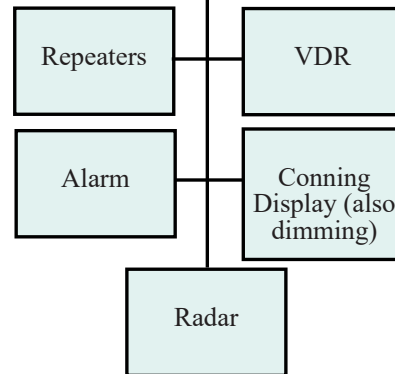
24 V DC

LAN communication with Display
(Multiple displays available)

Electronic / Transceiver unit
JB70E2-SA



24 V DC - 115/230VAC



Options for tank,
sea valve (single and double hull)
and retrofit.

Specification



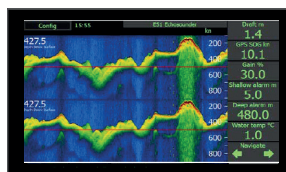
ESN200 Navigation Echo Sounder

Specifications

| | |
|--|--|
| Channels | Dual channel echo sounder |
| Transducer connectors: | 2 Transducer connectors in Electronic / transceiver unit. |
| Frequencies | 7 set delectable frequencies 24kHz, 30kHz, 33kHz, 38kHz, 50kHz, 100kHz and 200 kHz |
| Power Supply | DC: 20 - 32 V and/or 115/230VAC |
| Power Consumption | Display unit. Nominal 6W Electronic unit 20W |
| Display ESN200-SB | 9" Resistive touch. 400NITS Dimensions: 242 x 158mm Weight: 1.1kg 1 x LAN 2 x NMEA 0183 Outputs (IEC61192-1) 3 x NMEA 0183 Inputs (IEC61192-1) |
| Electronic unit JB70E2-SA | Dimension: 115x115x180mm Weight: 1.5kg 2 x LAN (IEC61192-450) 5 x NMEA 0183 Outputs (IEC61192-1) 3 x NMEA 0183 Inputs (IEC61192-1) 1 x AUX in 2 x AUX out 1 x Relay out |
| Ranges | Selectable from 0 - 5 m to 0 - 5000 m |
| Approved SKIPPER transducers with expected depth limits | 50/200kHz ETS50200T/G: 1m-750m 200kHz ETN200T: 1m - 350m 200kHz ETN200ST/G: 1m - 250m 50kHz ETN050T/G: 1.5m - 750m 38kHz ETN038T/G: 2 m- 1200m |
| Non-approved SKIPPER transducers expected limit | 24kHz ETN024T/G: 2m - 2100m |
| Measuring Accuracy | 1-10m: Accuracy 0.1m Resolution=0.1m 10m-100m Accuracy 1% Resolution 0.1m 100m-5000m: Accuracy 1%. Resolution Display=1m NMEA=0.1m |
| Output power | Nominal 700W. Max >1000W |
| User functions | Auto mode (for all settings) Manual control: Gain, Power, TVG, Frequency Transducer setup by part number Diagnostic screens / BIT Dimming (remote or local) |
| Print/Archive function | Printers: By use of EPSON 350, OKI 280Eco, OKI Microline ML1190eco. Network printers / Review: Service software via LAN Extended Internal Logging, by USB or SD |
| Depth alarms | BAM compatible (IEC62923) ALF or ALR. Internal sounder. Relay output and AUX in/out |
| Options | IR31Dim Remote/Automatic dimming unit CD401MR-SB Multi-repeater ESN200-SB Extra Displays |
| Classification | MED B approved |

Overview

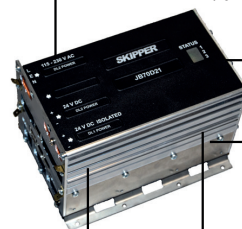
Display unit ESN200-SB



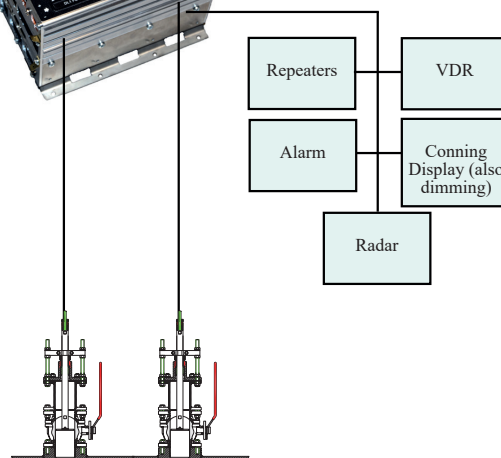
24 V DC

LAN communication with Display
(Multiple displays available)

Electronic / Transceiver unit JB70E2-SA



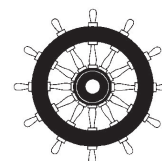
24 V DC - 115/230VAC



Options for tank, sea valve (single and double hull) and retrofit.



SKIPPER Electronics AS
Norway
E-mail: sales@skipper.no
www.skipper.no



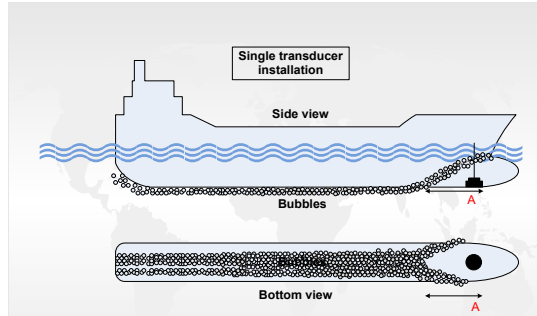
Version: 2021-01-11

Mechanical installation

Positioning of the transducers

- A transducer should be installed in an area securing optimal measurement free from noise and aeration.
- Transducers are normally installed in the noise free area in the foreship (see **A** on fig.)

Optimal system operation is achieved by fitting the transducer as deep as possible on the hull. The transmitting surface of the transducer must be installed horizontally.



Do not mount transducers close to the propeller or aft of other hull installations (outlets, vents or other protruding details). It is necessary to select a part of the hull that is submerged under all load and speed conditions, and to avoid positions where air is trapped in heavy weather.

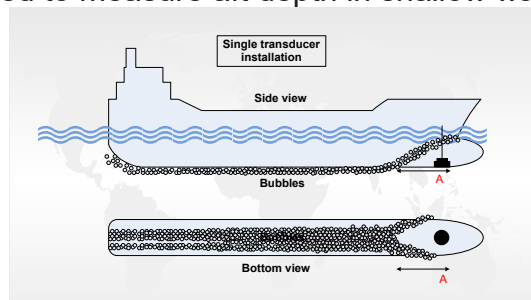
If a flat, horizontal section is not available for transducer fitting, the shipyard must construct a suitable bed.

Larger vessels are often fitted with two transducers, one fore and one aft (see fig.)

The fore transducer is the primary transducer, (normally 50 kHz).

The aft transducer is a secondary transducer, (normally 200 kHz).

An aft transducer may be troubled with aeration and turbulence and may not operate in higher-speed. It is normally solely used to measure aft depth in shallow water / slow speed.



Installation Details

Refer to SKIPPER’s installation procedures in the appendix and on our web site www.skipper.no regarding information about sea valve, tank installation, welding, cable glands etc

Note:

Protect the active element of the transducer and **do not paint the surface.**

Transmission in **the air must be avoided!** This may cause mechanical damage of the element.

Transducers should be positioned as close to the bow as possible within the first 3rd of the ship. It should be possible to draw a cone of +/-60 degrees underneath the transducer without any objects entering the cone. The face of the transducer should be horizontal with no more than 5 degrees tilt. If this is not possible a blister should be assembled. This should have at least 0.3m of flat area in front of the transducer, and be tear drop shaped.

Generally there should be nothing in front of the transducer that can cause turbulence within 2m. and 0.5m to the side.

Positioning/wiring of the units

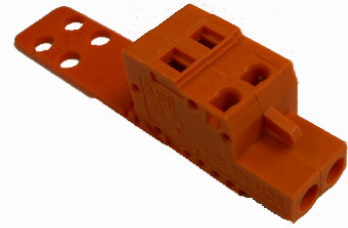
| Length | Transducer cable type: 1 x shielded pair (twisted pair recommended if available) |
|------------|---|
| 25/40m | Connected transducer cable |
| 40-100m | 1.5mm |
| 100 – 300m | 2.5mm |



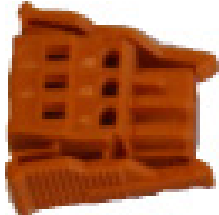
Connectors supplied with the system



ZZN-01126 Relief Housing,
3 pole snap-on.
WAGO: 232-633



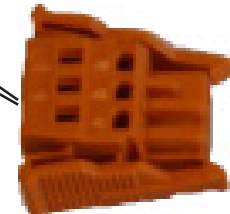
ZZN-01124 Plug, Female 2
pole, 231-302_032-000



ZZN-01136 Plug, Female
3 pole with locking levers,
231-303/037-000



ZZN-01130 Connector, Fe-
male w/ejectors 3x2 pole, black
WAGO 713-1103/037-000



ZZN-01136 Plug, Female
Coded and labeled for transducers.
3 pole with locking levers,
231-303/037-000



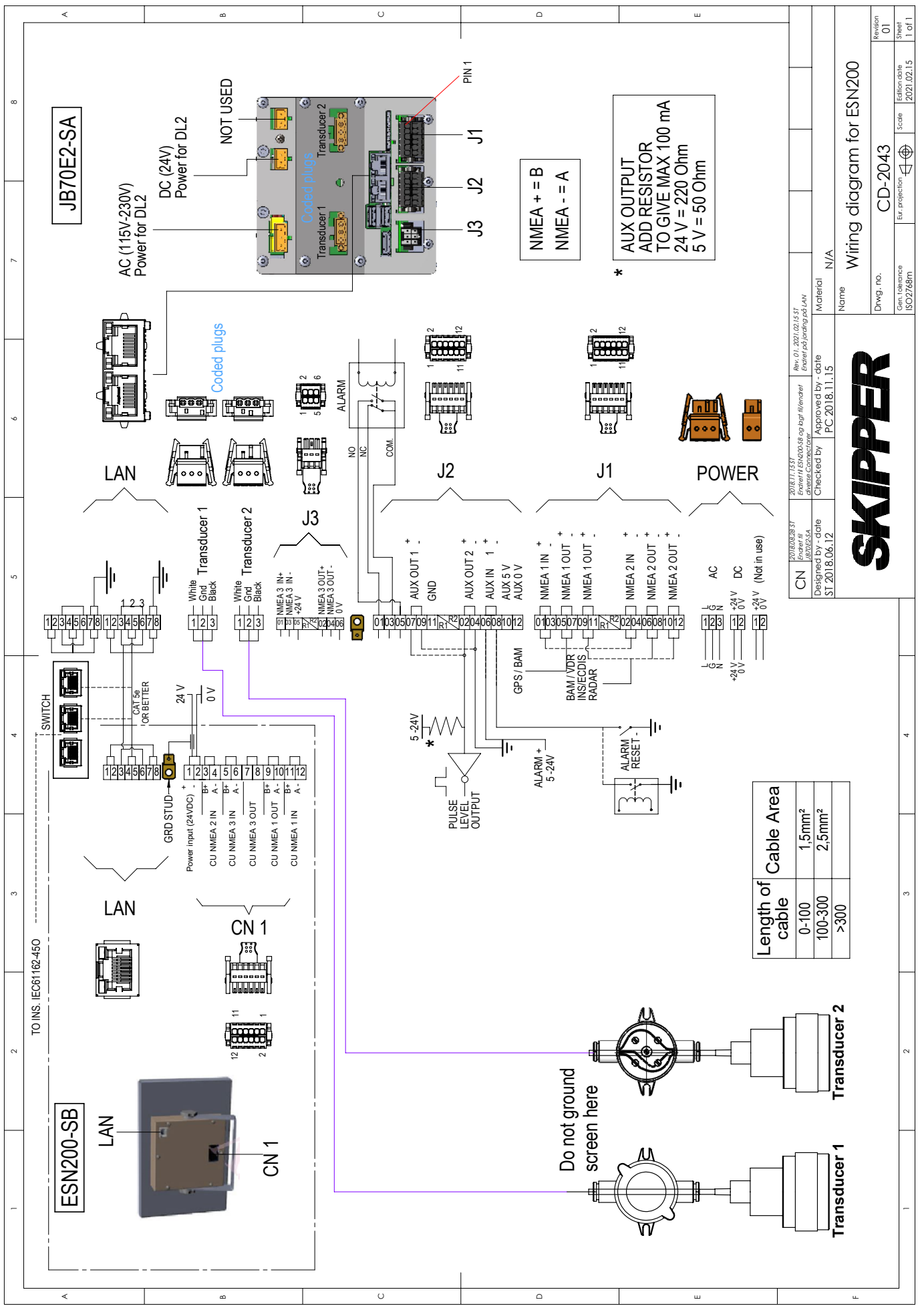
ZZN-01120 Connector Fe-
male w ejectors 6x2 pole, black
WAGO 713-1106/037-000



ZZN-01123 Strain relief
plate, 6x2 pole, width 11 mm
WAGO 713-126



ZZN-01123 Strain relief
plate, 6x2 pole, width 11 mm
WAGO 713-126



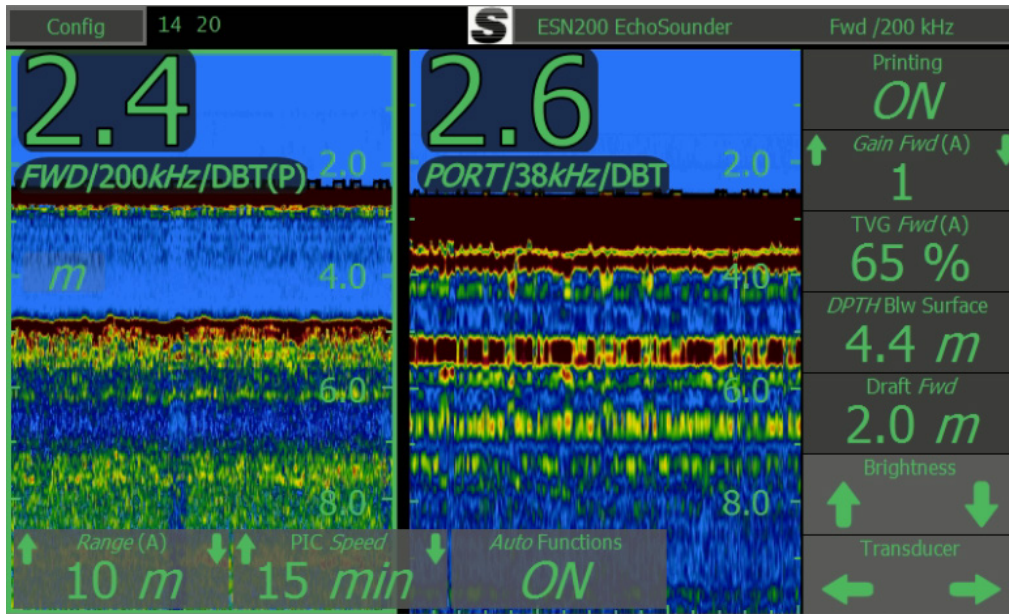
2018.06.12
 CN 20180828 ST
 Engr. fil
 2022-04
 ST 2018.06.12
 Designed by
 2018.11.15
 Approved by
 PC-2018.11.15
 Checked by
 Material
 N/A
 Name
 Wdg. no.
 CD-2043
 Gen. tolerance
 ISO2768m
 Scale
 Etc. projection
 Edition date
 2021.02.15
 Sheet
 1 of 1
 Revision
 01



Wiring diagram for ESN200

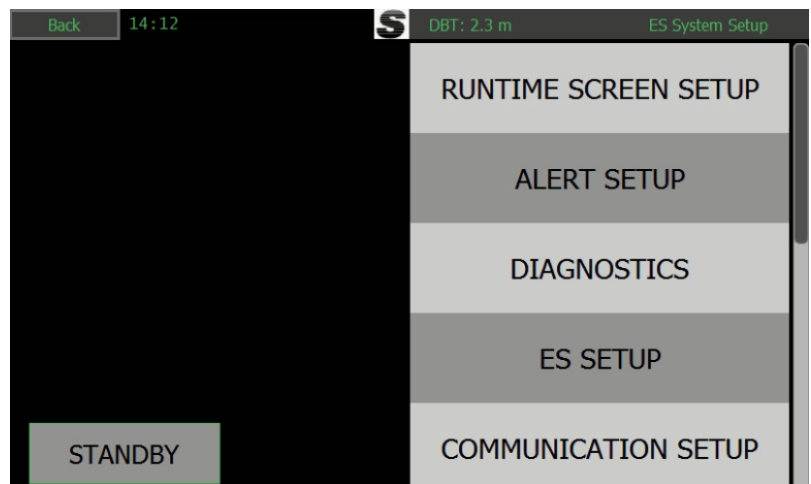
CONFIG software setup

The ES system setup is accessed by pressing “CONFIG” button in left upper corner.



Available Setup screens:

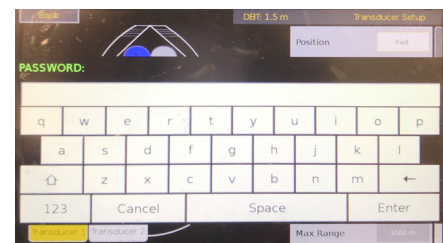
- Runtime screen setup
- Alert setup
- Diagnostics
- ES Setup
- Communication setup (NMEA)
- 24 hours history
- AUX Setup
- JB70 Setup
- Logging Setup
- Display setup
- Print Setup



Additionally the “STANDBY” button is available to put system in standby for a period not in use. Will switch off the display and pinging.

Transducer settings and output settings are password protected for changes.

The password for all units is ‘service’. The password will be remebered for 1 hour, or until reboot of the system.



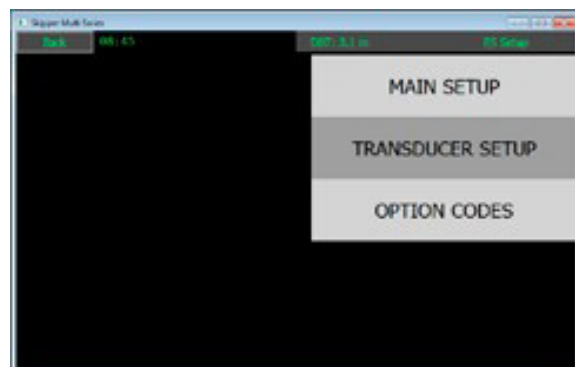
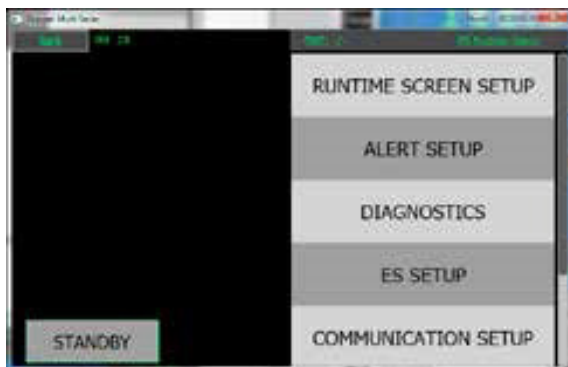
ES Setup

Transducer setup

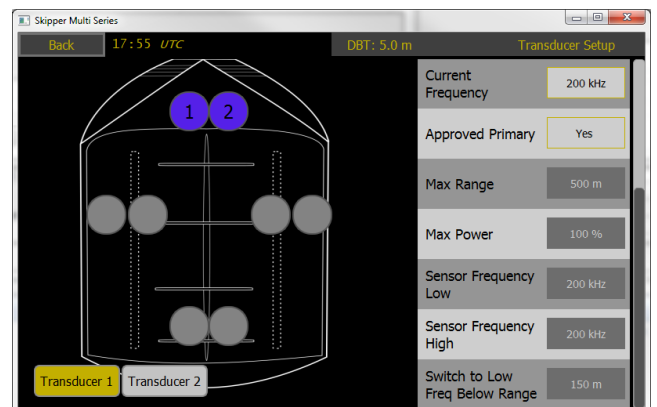
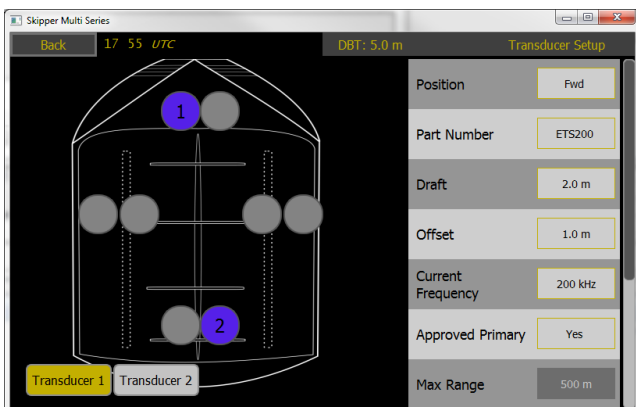
Once connected the system requires the installer to identify which transducer is connected to which of the 2 connectors. System required 1 approved transducer to be installed (currently 200/50/38 kHz), the second can be any transducers.

The approved transducer should be set to primary, and this is the transducer that reports the standard DPT output messages.

Both connectors can have a transducer fitted. To select the correct fixture, start the system and go to the config menus, and then the ES setup.



Here you can select the transducer menu and by clicking on the transducer connector port you can move the transducer to the appropriate area of the vessel, and select the transducer, by part number. This will change the parameters to match your transducer.



If you are not using a standard transducer, then select other, and the frequency, max power and max expected range can be set for that

Selectable transducer types

| Part number | Type | Approved for use |
|-------------|---|------------------|
| ETN050 | 50 kHz of types ETN50(X)G, ETN50(X)T | Yes |
| ETN200 | 200kHz of types ETN200(X)T | Yes |
| ETN200S | 200kHz of type ETN200S(X)G, ETN200S(X)G | Yes |
| ETN50200 | Combined 50 and 200kHz of types ETN50200(X)G and N50200(X)T | Yes |
| ETN038 | 38 khz | Yes |
| 8B-200 | Furuno 200kHz Transducer | Yes** |
| S-50-18 | SIMRAD 50kHz (500W max) | No |
| Other | Any other | No |
| ETN024 | 24kHz | No |

** The named transducers have BV reviewed tests, proving they work to specification with the system.

Standard transducers have the required values set.

'Other' transducers can change values in the settings. See section 'Other Transducers'

At least 1 installed transducer should be within the SKIPPER approved list.

| m Transducer Setup | |
|--------------------------------|--------|
| Position | Aft |
| Part Number | ETN038 |
| Draft | 2.0 m |
| Offset | 3.0 m |
| Current Frequency | 38 kHz |
| Approved Primary | No |
| Max Range | 2000 m |
| Max Power | 100 % |
| Sensor Frequency Low | 38 kHz |
| Sensor Frequency High | 38 kHz |
| Switch to Low Freq Below Range | 150 m |

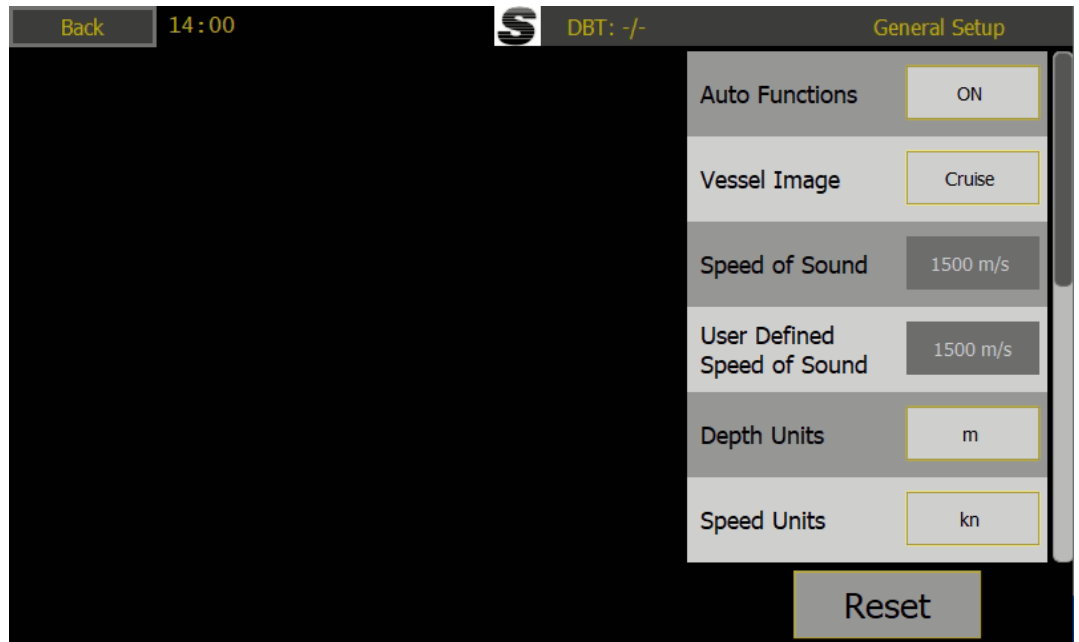
| |
|--|
| Position (FWD,AFT,PORT,STRB) |
| Part number, or other Approved part numbers, are ETN050 (50kHz) ETN200/ETS200 (200kHz) ETN200S/ETS200 (200kHz for valve) ETS50200 (combined 50/200kHz) ETN38 (38 kHz) |
| Draft of this sensor, can be changed on main screens |
| Offset. Distance from transducer to keel |
| Current Frequency 200 or 50kHz. – The current frequency in use on this transducer. (selectable on dual frequency transducers) |
| Approved Primary: Any of the above transducers can be primary, if a non approved transducer is used as the second transducer, this must not be primary |

Settings available only in the case Part number is 'other':

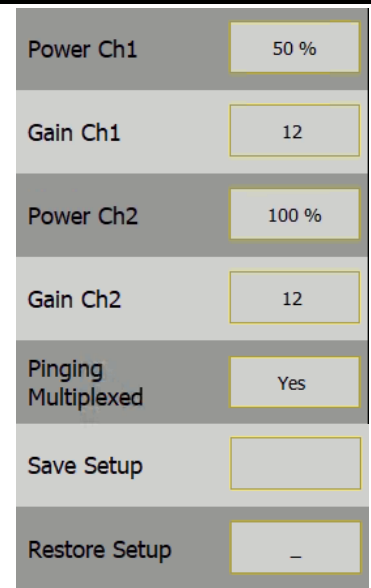
| |
|---|
| Max range (set automatically for part number, adjustable for 'other') |
| Max Power: This system is up to 1kW Peak power, and this can be limited if required |
| Sensor frequency low: if the sensor is a dual frequency then this is s the low frequency or main frequency if not (available frequencies are 24, 30, 33, 38, 50, 100, 200 kHz) |
| Sensor frequency high: If dual frequency this is the high frequency |
| Switch to low Freq below Range: At this depth a dual frequency transducer will switch between low/high |

Main setup

Echosounder parameters are set by default, but can be adjusted in the “ES Setup”, “Main Setup”



| |
|---|
| Auto functions will take control of range, gain (and frequency for ETS50200) |
| Vessel image: Change the design of the vessel in the menus |
| Speed of sound can be changed with an option or with a temperature input. User can only define the sound speed with an option code. |
| Depth units (also available on screen). m (meters) ft(feets) fm (fathoms) |
| Speed units: kn, m/s, Mi/h |
| Power Ch1: Power output 0-100% Normally controlled by Auto when Auto function ON |
| Gain Channel 1: Receiver Gain 1-12. Normally controlled by Auto when Auto function ON |
| Power Ch2: Power output 0-100% Normally controlled by Auto when Auto function ON |
| Gain Ch2: Receiver Gain 1-12. Normally controlled by Auto when Auto function ON |
| Pinging multiplexed: YES/NO. No: The two transducers will ping simultaneously. YES: Each transducer will ping every second time. This to avoid interference if having two transducers with the same frequency |
| Save setup: Save setup to internal memory |
| Restore setup: Restore a saved setup |
| Reset will reset the settings to default |



Options

Some settings are not changed as standard, but can be accessed by entering a code (available from SKIPPER)

| | |
|--|--|
| <p>Option Code <input type="text"/></p> | <p>Codes can be entered to allow the options to be activated</p> |
| <p>Speed of Sound <input type="button" value="Disabled"/></p> | <p>Speed of sound, is activated by unique code from SKIPPER</p> |
| <p>Mute <input type="button" value="Disabled"/></p> | <p>Mute, a function to stop all pinging. A 'M' Symbol will show on screen. Mute is approved for ISO9875</p> |
| <p>Mute Without Alert <input type="button" value="Disabled"/></p> | <p>Mute, a function to stop all pinging, after a period an alarm will activate. A 'M' Symbol will show on screen. This mode is not approved for ISO9875.</p> |
| <p>Advanced Diagnostic Setup <input type="button" value="Disabled"/></p> | <p>Advanced diagnostic features can be shown by activating this option</p> |
| <p>Bottom Detection Setup <input type="button" value="Disabled"/></p> | <p>Automatic features can be changed when this setup is activated</p> |
| <p>Alarm Sounder Off <input type="button" value="Disabled"/></p> | <p>The alarm sounder can be disabled if this option is activated</p> |
| <p>Advanced System Settings <input type="button" value="Disabled"/></p> | <p>Advanced system settings can be changed if this option is activated</p> |

Asynchronised pinging with external acoustic system Not Master status

The mute option can be used for stop the pinging.

This mode may set a too low number of pings for IMO requirement.

The options "Mute" and "Mute without alarms" will require an option code to enable.

To synchronise with other systems use the 'ping now' function. The system will only ping if it is finished with its expected receiver time. Pinging too fast will probably cause interference within this system, that may be detected as a false bottom detection

Options: Synchronised pinging

The ESN200 will by default ping on both transducers simultaneously. The time between each ping is depending on the range setting. Shallow water range will ping more often than deeper water range.

For the system to be MED (Wheelmark) approved it must ping at least :

2-20m range = Minimum 36 ping per minute.

20-200m range= minimum 12 ping per minute,

This gives some leeway in when the system pings.

Multiplexed ping

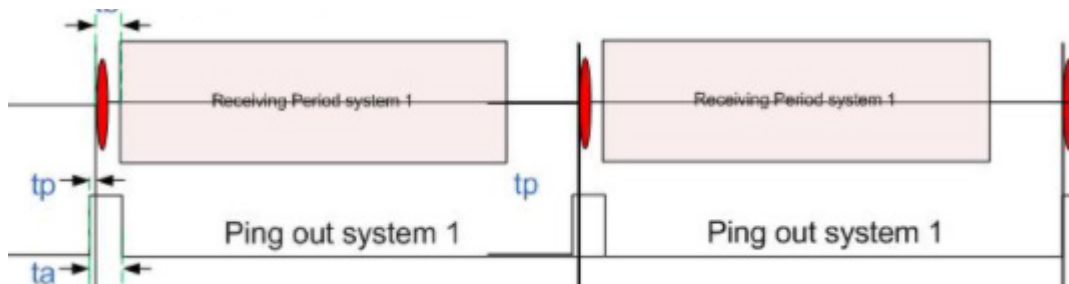
“Config”, “ES Setup”, “Main Setup”

Multiplexed “ON” the system will take turns to ping on channel 1 and channel 2. This can be used if 2 transducers of the same frequency are installed and effect each other.

Synchronisation with external acoustic systems

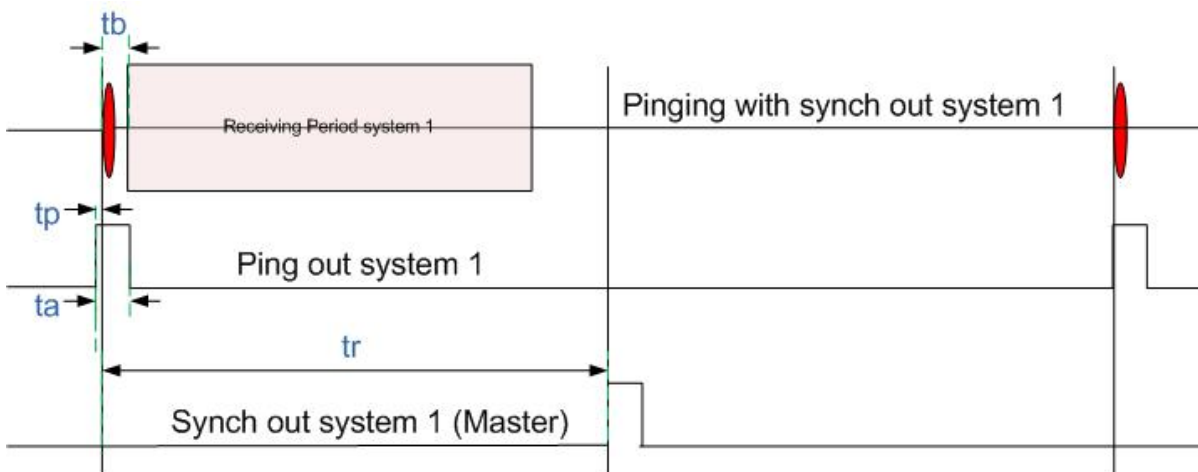
The ESN200 may have to work with other acoustic systems without interference.

The AUX output “ping out” is an indication for the external equipment to ping synchronised with ESN200. In this mode the ESN200 is the master.



Asynchronised pinging with external acoustic system

AUX output When “Sync Out +/-” enabled on one of the AUX outputs it will half the amount of pings to allow another system to ping. (For asynchronized pinging of two systems)



Communications Setup (NMEA)

Outputs

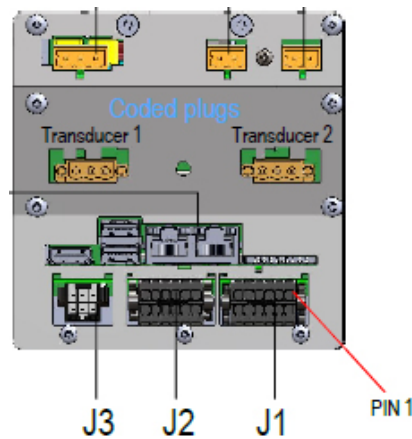
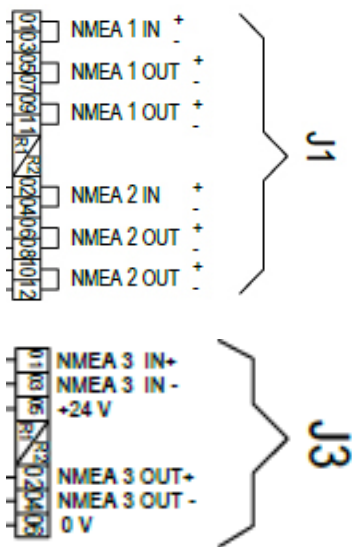
The communications menu allows the NMEA messages to be selected for the output.

On this system there are 7 NMEA outputs. 5 in the Electronic unit JB70E2-SA

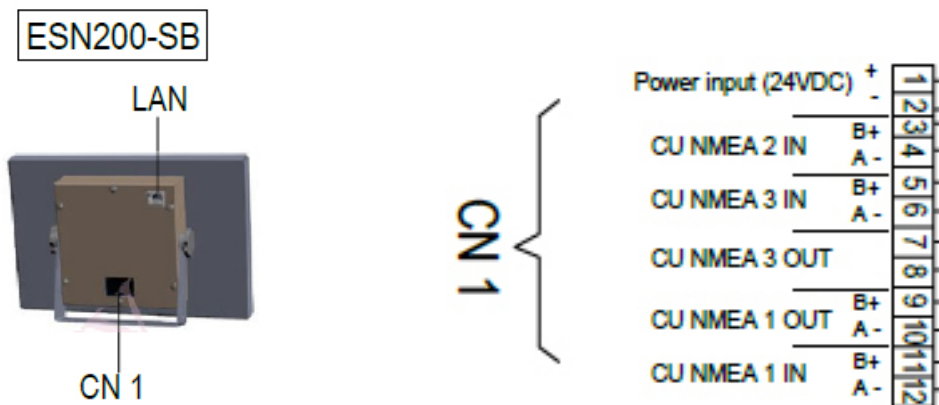
NMEA1 OUT x 2

NMEA2 OUT x 2

NMEA3 OUT x 1



2 NMEA outputs on the display ,



NMEA style sentences will be shown as the 3 letter mnemonic when the sentence is sent or received. There are 2 channels

1. Output for NMEA
2. LAN input and output for IEC61162-450 messages

This port can provide communication both by TCP/IP V4.0 and using IEC61162-450. If being used it requires a network that does not exceed 60kbits/second directed to the system. The system will exert/receive a maximum load of 40 datagrams/second. The network load should not exceed 20Mb/s, The LAN ports on this system support IEC61162-450 V1, and V2 and IGMP V1 to 3.

The Baud rate output 4800, 38400 or 115200. System reports at 1Hz.

The left side show a terminal emulator that shows the input or output messages of the selected channel. Pressing 'Message headers' will show the full message.

Exact formats for these sentences can be found in the relevant IEC standards.

The screenshot displays the 'ES Communications Setup' interface. At the top, it shows 'Back', '14 56', 'DBT: 3.1 m', and 'ES Communications Setup'. The main area is divided into two sections:

NMEA 1 output message headers:

- Valid messages (green text):
 - \$\$DDBK,9.8,3.0,1.6,*71
 - \$\$DDBS,16.4,5.0,2.7,*5F
 - \$\$DDBT,10.2,3.1,1.7,*5C
 - \$PSKPDPT,3.1,-0.1,2000.0,2,STRB*4F
 - \$\$DDPT,3.1,-0.1,2000*57
 - \$PSKPDPT,,1000.0,1,PORT*6F
- Unrecognized messages (blue text):
 - \$\$DDBK,9.8,3.0,1.6,*71
 - \$\$DDBS,16.4,5.0,2.7,*5F
 - \$\$DDBT,10.2,3.1,1.7,*5C
- Messages with invalid data (yellow text):
 - \$\$DDBK,9.8,3.0,1.6,*71
 - \$\$DDBS,16.4,5.0,2.7,*5F
 - \$\$DDBT,10.2,3.1,1.7,*5C
- Messages with error (red text):
 - \$PSKPDPT,3.1,-0.1,2000.0,2,STRB*4F

At the bottom of the message list, there are two buttons: 'Output' and 'Full messages'.

Configuration Options:

- Channel: NMEA 1
- DPT: ON
- PSKPDPT: ON
- DBS: ON
- DBK: ON
- DBT: ON
- Alarm: off

Legend:

- Valid message (green)
- Unrecognized message (blue)
- Message with invalid data (yellow)
- Message with error (red)

| | |
|----------------------|--|
| DPT (default ON) | \$SDDPT Depth below Transducer, offset to keel, Max range |
| PSKPDPT (default ON) | \$PSKPDPT Depth below Transducer, offset to keel, Max range, position frequency ,text , |
| DBS (default OFF), | \$SDDBS Depth below surface in feet, meters, fathoms |
| DBK (default OFF), | \$SDDBK Depth below keel in feet, meters, fathoms |
| DBT (default OFF), | \$SDDBT Depth below transducer in feet, meters, fathoms |
| Alarm (default ON) | \$SDALR, \$SDALF, \$SDALC The selected alarm type (ALF or ALR) will be sent via this port. See section "Alert setup and usage" |

Default is ALARM outputs set to the ALF version of the standard

PSKP sentences are proprietary for SKIPPER and has the following format.

| | |
|--|---|
| \$PSKPDPT,x.x,x.x,x.x,xx,xx,c-c*hh<CR><LF> | |
| _____ | Check sum, possible to turn on/off (see screen 8) |
| _____ | Transducer location AFT, FWD, PORT, STB |
| _____ | Echo sounder channel number (1/2) |
| _____ | Signal strength |
| _____ | Maximum range scale in use, meters |
| _____ | Offset to keel, meters |
| _____ | Water depth relative to transducer, meters |

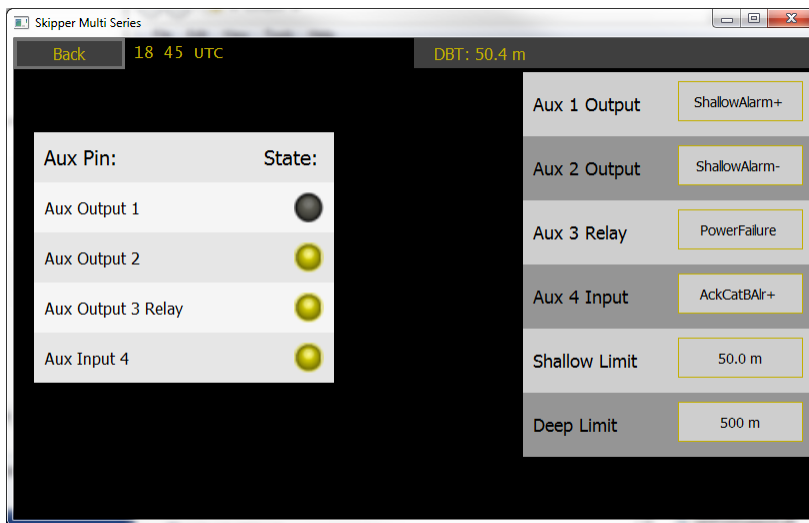
Example \$PSKPDPT,3.7,0.0,500.0,,3,FWD*11

Accepted NMEA inputs

| Format | Function |
|---|--|
| \$__DDC,X,yy,X,C*nn | Dimming function X= O,N,K,D , YY is % the system will accept X and adjust to the user set level (See dimming) |
| \$__XDR,D,x.x,M,pos,D,x.x,M,pos,D,x.x,M,pos,*nn | If the vessel has a draft sensor, the following input can be used to automatically adjust the draft Draft sensor depth values. x.x - draft value pos - transducer position (fwd, aft, prt, str) |
| \$GPZDA, | Time and local time, The system will show UTC or Local time if available in the message |
| \$GPVTG, Speed | GPS Speed Logged in history |
| \$GPGGA | GPS Position Logged in history |
| \$GPRMC | Position and speed logged in history |
| ACN,102104.00,,230,<1-999999>,s,c*hh | Silence alarm for 30 seconds ALF |
| ACN,102104.00,,230,<1-999999>,q,c*hh | Request/Repeat ALF info ALF |
| ACK,xxx*hh<CR><LF> | Acknowledge alarm ALR(B). |
| ACK,xxx*hh<CR><LF> | Silence alarm ALR(A) |
| Internal UDP | The System can also take information from other SKIPPER devices within the same network for display on screen or for logging |
| \$PSKPSYC,0*nn | Mute off |
| \$PSKPSYC,1*nn | Mute on |

The Communications on NMEA are 4800, 8 data bits, 1 stop bit. Baud rate can be changed to 32400 or 115200

AUX Setup



The ESN200 system has

AUX1 Output: optoisolated auxiliary output.

AUX2 Output: optoisolated auxiliary output.

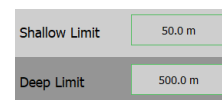
AUX3 Relay: Relay Output

AUX4 Input: optoisolated auxiliary input.

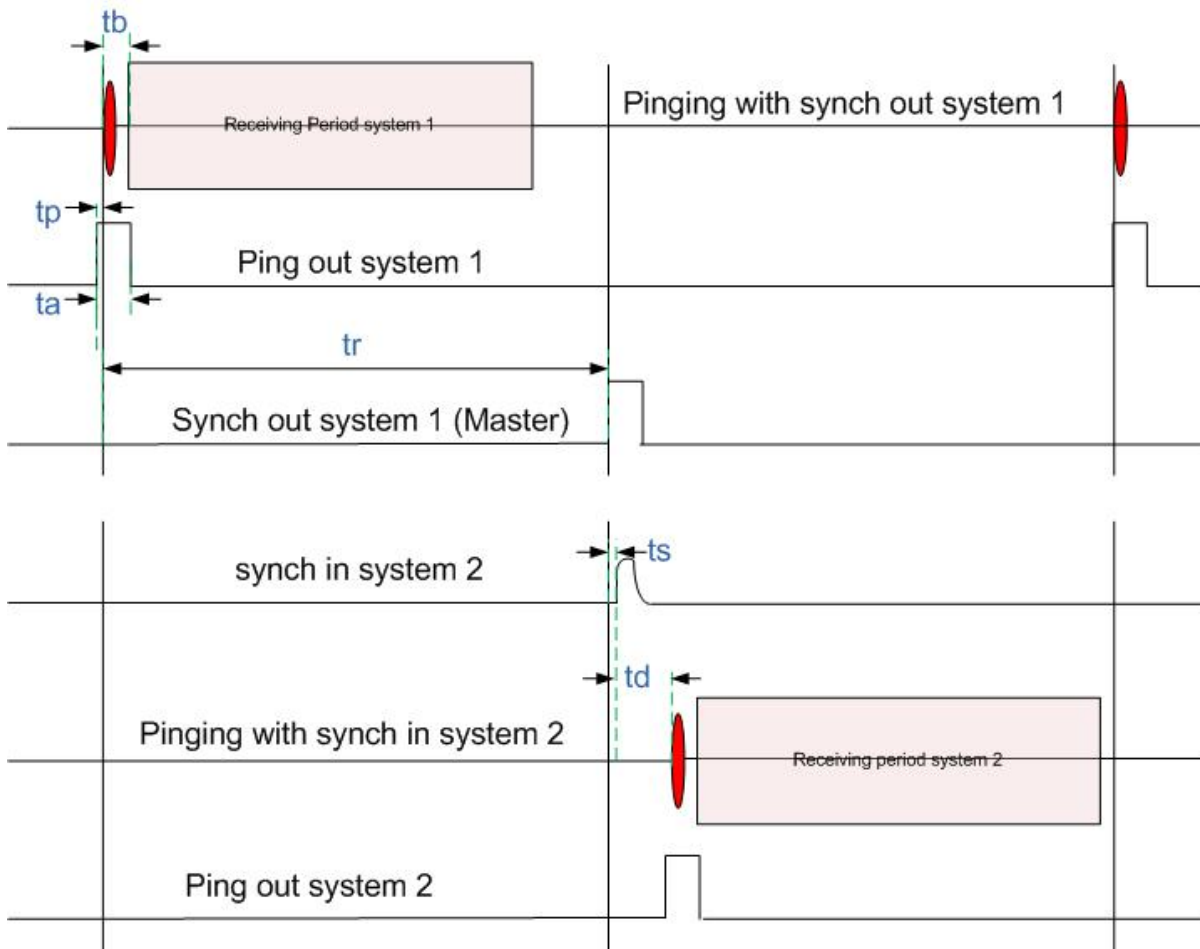
The state of these can be seen on this screen on the left and the functions are selected on the right.(+/- meaning the function can be active hi or active low)

Aux 1 and 2 output: An opto-isolated output with the following available functions:

- ShallowAlarm+/- Changes on shallow alarm
- ShallowAlrBeep+/- 3changes every 10 seconds as defined in standard. To be connected to external beeper
- DeepAlarm Changes when deeper than limit
- DeepAlrBeep+/- 2changes every 10 seconds as defined in standard. To be connected to external beeper
- ShallDeepAlr+/--both alarms
- DeepAlrBeep+/- beeps for both alarms
- ShallDeep limit+/- Out put change state when outside set limit.



- Sync Out +/- Changes when a second system can ping. When enabled on one of the AUX outputs it will half the amount of pings to allow another system to ping.(For asynchronized pinging of two systems)



- Mute confirm +/-
- Disabled
- Power failure, changes when no power on JB70
- Ping +/- Changes when a ping is being sent (for synchronized pinging of two systems.)

Aux 3 Relay output: As above except ping

Aux 4 input:

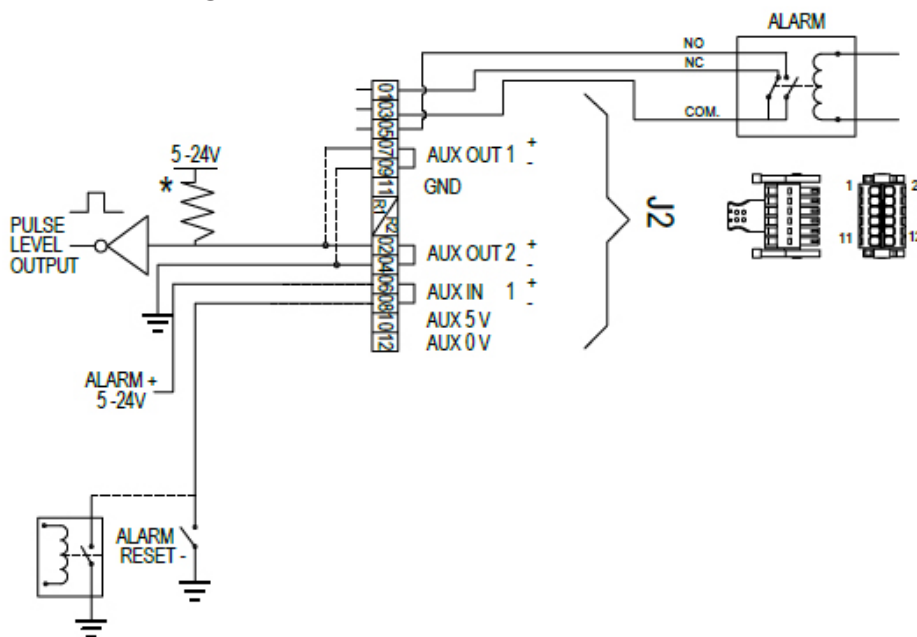
- AckCatBAI+/- Acknowledge and alarm (Not shallow water)
- AckAllAI+/- Acknowledge and alarm (Option)
- SilenceAI+/- Silence an alarm
- Ping now +/- Synch with other system
- Mute +/- Mute in - Stops this system pinging - shows M on screen in warning trangle, when muted
- Disabled

Please note:

Mute function only available as special option with option code from SKIPPER. and may make the echosounder non wheelmark approved.

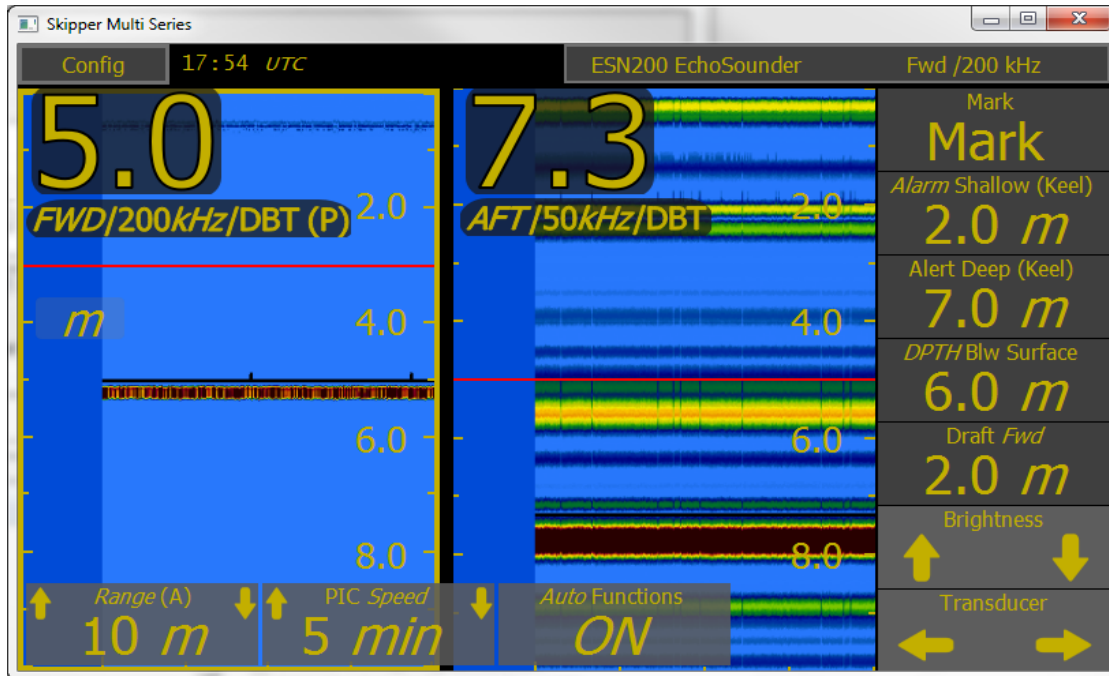
Ping Now will create a warning if the number of pings are outside IMO requirement 36 pings per minute in 20m range (or less) and 12 in >20m range.

The opto-isolated input and outputs need a voltage between 5V and 30V to operate. If isolation is not important, this 5v can be taken from the connector, otherwise it should be supplied from an external source. Connection is as follows

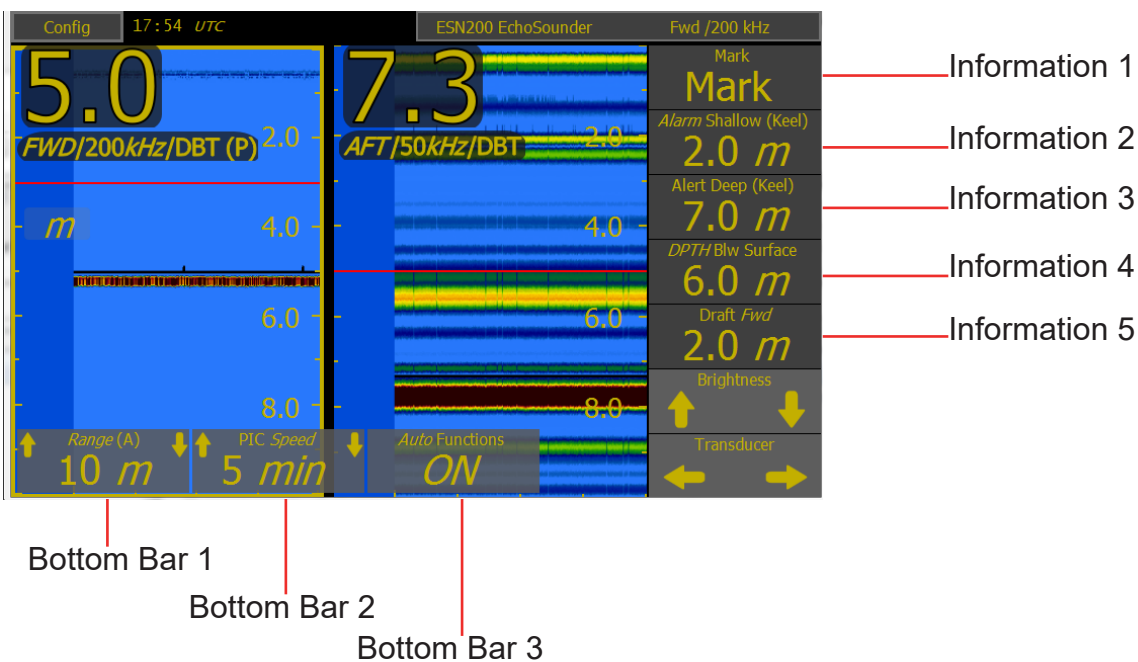


Runtime Screen Setup

The information shown is programmable and can be made to show what the user wishes. It comprises of 5 information's on the right, and 3 on the bottom. These information's can show parameters of the system or parameters being sent into the system from other equipment. These parameters can be made to, after a short time, slide off screen. Touching the screen will make them return.



Information 1-5 and Bottom Bar 2-3 are selected by default, but can be changed to show whatever the user chooses.



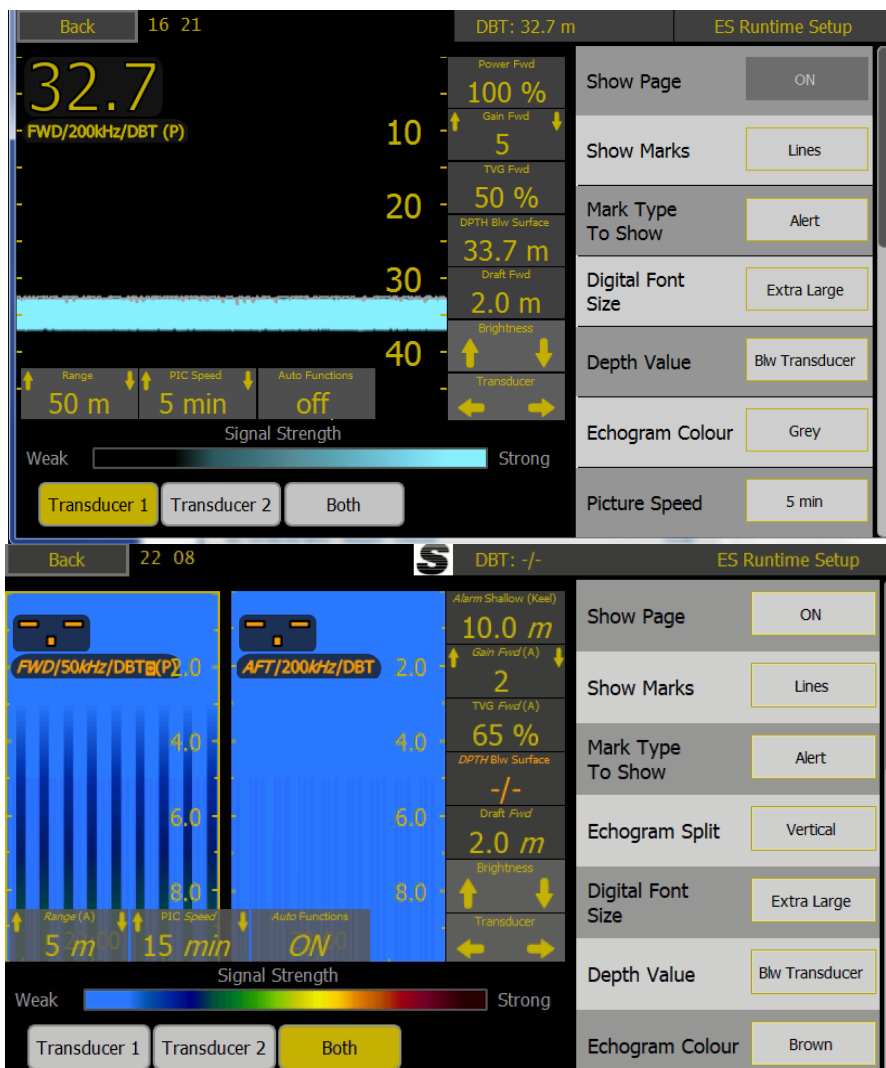
There are 3 “Runtime Screens” to setup.

| | |
|--------------|--|
| Transducer 1 | The Transducer connected to transducer connector 1 (if this is a dual frequency transducer it will show the low or high frequency) |
| Transducer 2 | The Transducer connected to transducer connector 2 (if this is a dual frequency transducer it will show the low or high frequency) |
| Both | Show both transducer on the screen (select the transducer with active information by pressing the echogram (a yellow border will show) |

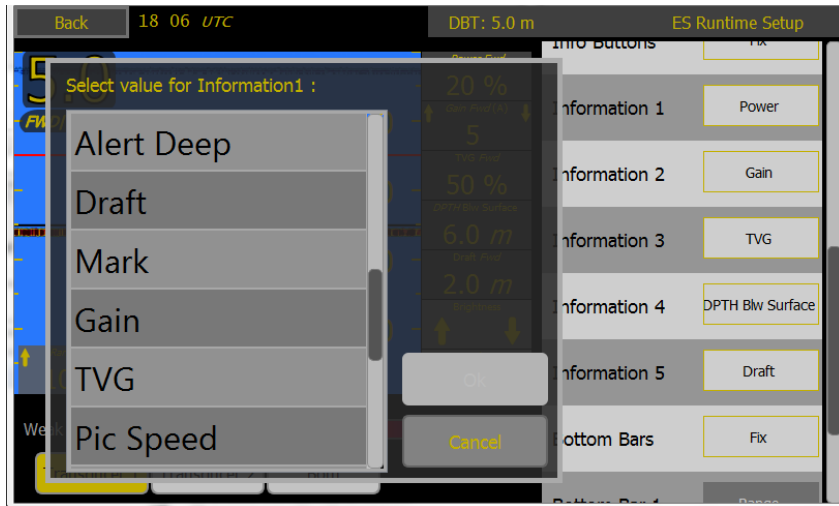
To change a value on one of the information bars go to “Config”, “Runtime Screen Setup”, select the transducer screen to be changed and change the information value.

Other information can be shown on the side parameter, these are from the NMEA inputs or from other systems connected via LAN. (e.g. DL2 speed sensor) These include:

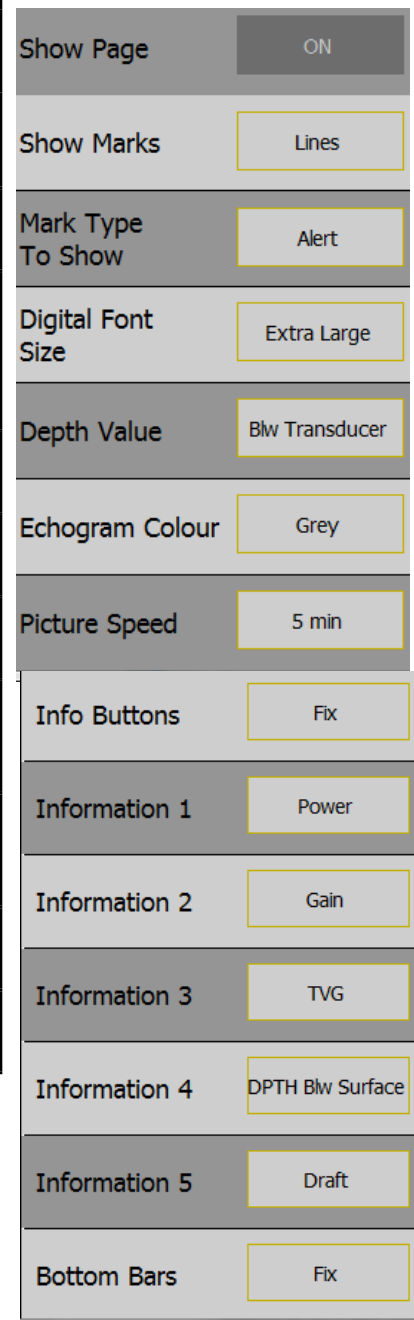
Information available are: Dpth below surface, Dpth below keel, dpth below Transducer, SOG from GPS, SOG from log, STW from log, heading, ROT, Depth from log, alarm shallow, alert deep, draft, mark, gain, TVG, pic speed, range, show marks, power, frequency, auto functions, print



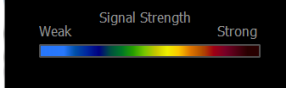
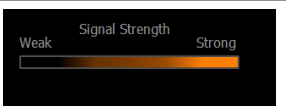
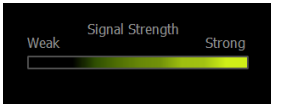
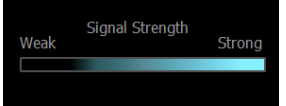
A long (3 second) press will show a menu of the available options. RANGE is always available in the bottom left position with a single touch.



| Button | Description |
|-------------------|---|
| Show page | Activate this transducer display |
| Show marks | Show changes in the system as vertical line with minimal information (lines, info, full, none) |
| Mark type to show | Alert / Basic / other / all |
| Digital Font size | Adjusts the size of the depth text on the left. Small – 1m viewing distance Medium – 3m viewing distance Large – 5m viewing distance |
| Depth value | The reference point from which the depth is measured (Surface/Transducer/Keel) |
| Echogram colour | Grey / brown / orange / yellow |
| Picture speed | The amount of information shown on screen (5mins to 24 hrs) |
| Info buttons | The information on the right can be made fixed or to disappear after a time, recalled by touching the screen |
| Information 1-5 | Select the information/parameters to be shown on each information. Press to change or press and hold to get all options. |
| Bottom bars | The information on the bottom can be made fixed or to disappear after a time |
| Bottom bar 1-3 | Select the parameter/ information to be shown on the bottom bar. (1 is fixed to range) |



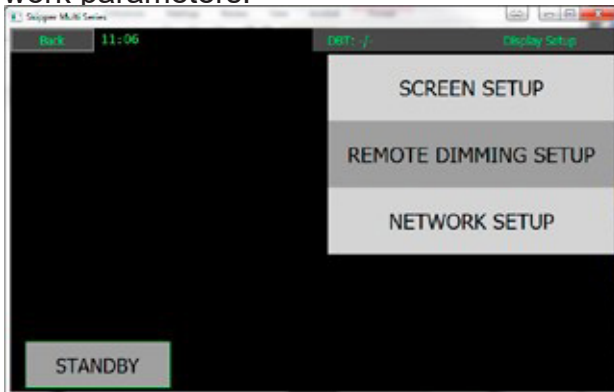
The echogram colour scheme

| | |
|--|--------|
|  <p>Weak Signal Strength Strong</p> | Brown |
|  <p>Weak Signal Strength Strong</p> | Orange |
|  <p>Weak Signal Strength Strong</p> | Yellow |
|  <p>Weak Signal Strength Strong</p> | Grey |

Changing the colour scheme effects only this dimming theme, dimming themes can also be changed in the remote dimming screen.

Display setup

The Display setup menu gives access to the system parameters the dimming set up and the Network parameters.



Screen setup

Language: Only English currently available

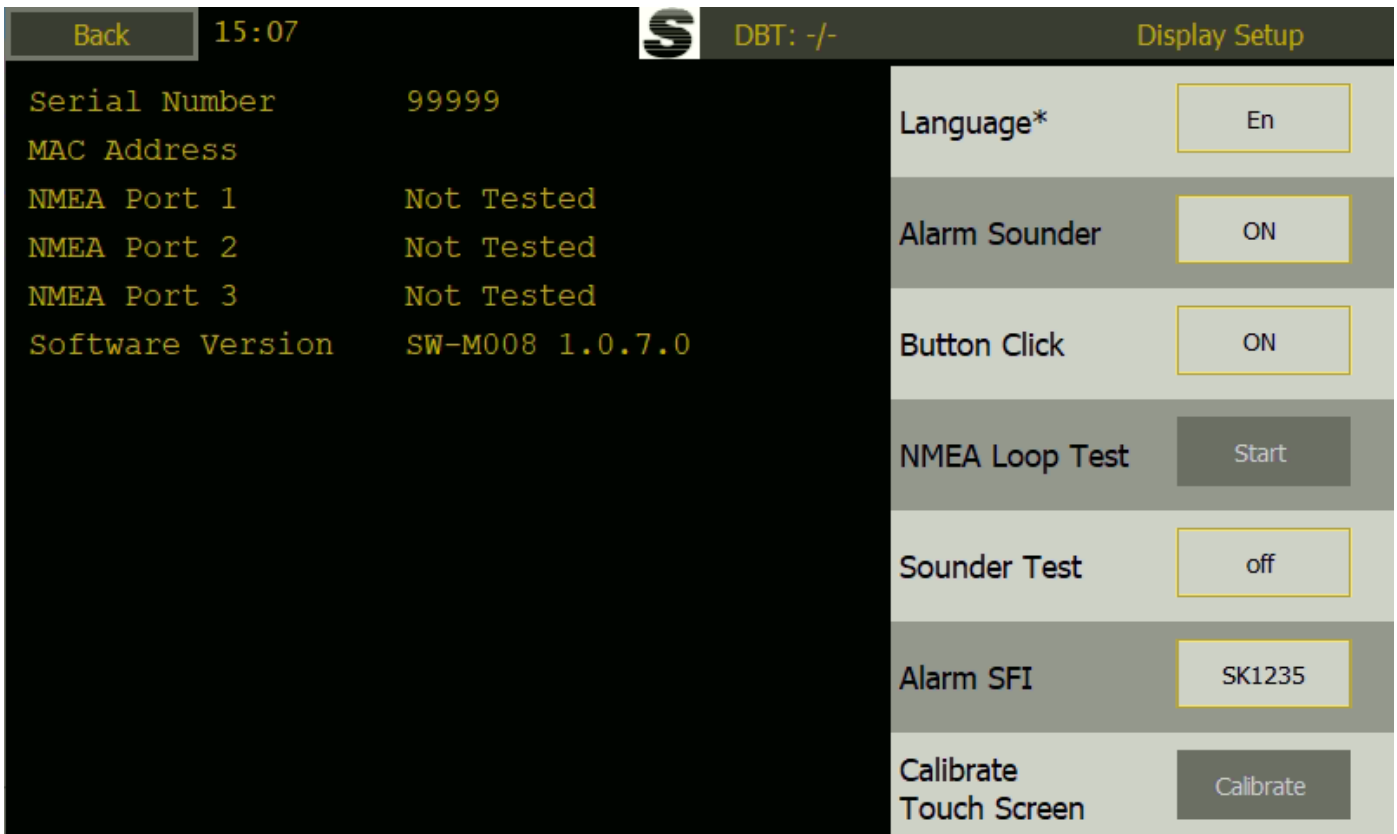
Alarm sounder: Internal alarm sounder is always on in ALF mode

Button click: Sound feedback on touching the screen

NMEA loop test: Testing of NMEA ports in JB70E2-SA with loop feedback on ports

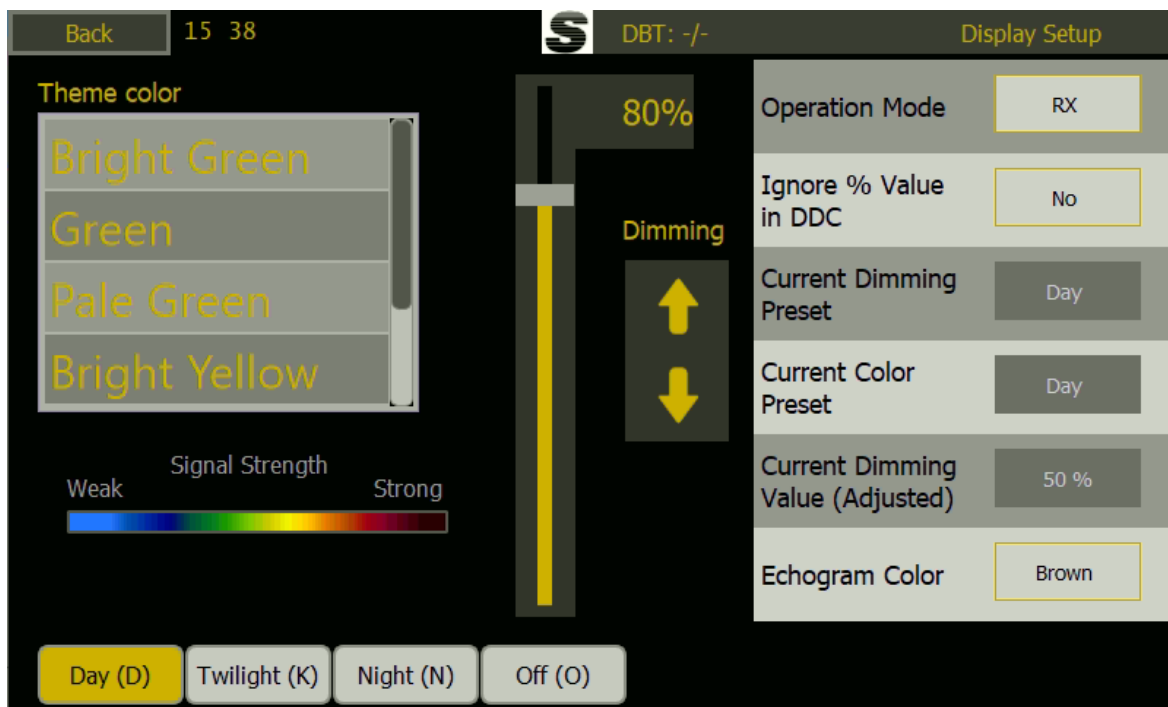
Sounder test: This will beep at full volume

Calibrate touch screen: Will start touch calibration. If touch screen is totally off then calibration may be initiated by the SKIPPER service software.



Remote dimming setup

The Dimming levels can be set up on this screen. The user can select dimming and color choices for the 4 preset levels that can be sent remotely (using DDC NMEA command). When the user uses the on screen dimming, the color scheme will change when the dimming level passes the set % value.



By changing to Day, Twilight, Night , and OFF Text colours can be selected and echogram colour for that level. As the dimming is changed, these colours will change as the dimming level passes through the set level, or if a remote (DDC) command is sent. This allows the user to decide what dimming level is required for this particular display (This may be different in different areas of the Bridge/Control room)

In some cases the remote dimmer may wish to just use the 4 theme levels of Day, twilight, night, off as defined in the DDC part of the IEC61162-1 'NMEA' standard. If there is a % value in this sentence, then this will be used by the system. If however you wish to have a local setting for this, use the button 'ignore %' The system will then use the predefined brightness level set in this configuration

The current dimming settings (whether set by remote or locally), are shown in the greyed out buttons.

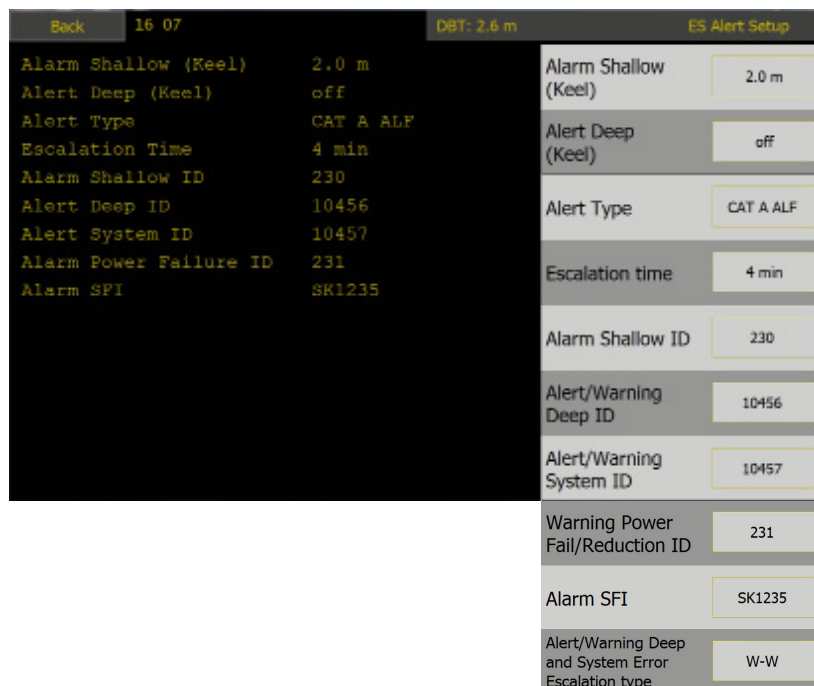
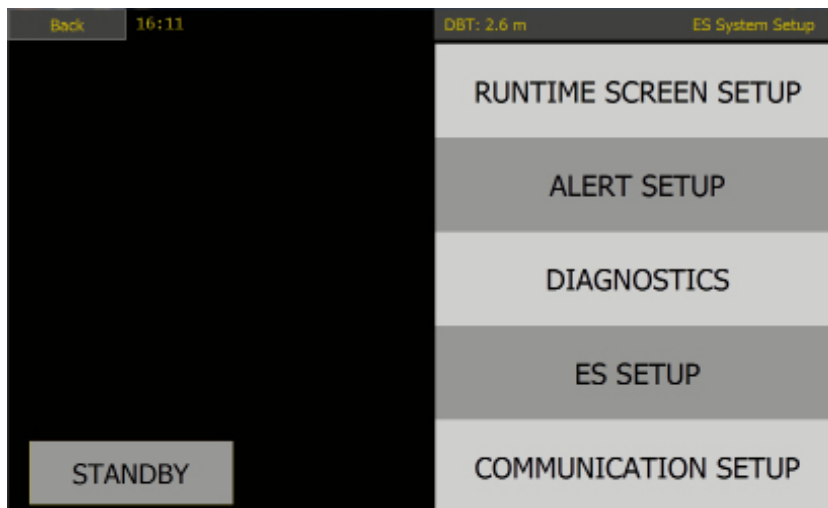
Alert setup

Echosounders are safety critical instruments and should be configured such that the user must view the echogram screen to acknowledge a shallow water alarm. This is so that the history of the water getting shallower is seen.

“Shallow alarm” is classed as a category A alarm. On a dual channel ESN200 the shallow alarm will be triggered when the depth goes from deeper area, passes the alarm limit, on the primary transducer.

“System failure” and “deep water” alerts are warnings or alerts that can be centrally acknowledged. (Category B or warning)

The ESN200 can be made to handle alerts using the ALR/ACK protocol or the ALF/ACN/ALC Protocol. The Protocol is selected on the config – Alert setup page



Buttons:

| | |
|-------------------------------|--|
| Alarm shallow | The value at which the alarm sounds as the vessel approaches shallow water |
| Alert Deep | a second warning or alarm sounding if the vessel goes deeper than the specified value - Setting value to zero will deactivate them. |
| Alert type | <p>The Alarms can be made to follow older or new protocols. Depending on the CAM system in use, the following options are available</p> <ul style="list-style-type: none"> - CAT A ALF/ACN/ALC: The newer IEC61924 standard allowing the system to connected to a central alarm management (CAM) system. Allowing the alerts (Deep water, system failure, system power) to be acknowledged remotely or taken over by the CAM, but forcing the user to acknowledge locally on the echosounder for shallow water - CAT B ALF/ACN/ALC: The newer IEC61924 standard allowing the system to connected to a central alarm management (CAM) system. Allowing all alarms and alerts to be handled by the CAM. This assumes the presentation of the depth is on the INS and is approved for this usage - CAT A ALR/ACK: The user may not acknowledge the shallow water alarm except by acknowledging on the Echosounder Display (Forcing the user to look at the history of the depth. - CAT B ALR/ACK: User can select the traditional way of using NMEA alarms where the user uses ACK to acknowledge the alarms. |
| Escalation type | <p>The Deep water and system alarm are by default CAT B or warnings, this option allows the user to decide what to do if the alert is not handled within a fixed (Escalation time) period</p> <p>W-A Alert starts as warning and escalates to alert after the escalation time</p> <p>W-W The Alerts are warnings and will continue as warnings</p> |
| Escalation time | The amount of time a warning can remain unhandled. |
| Alarm Shallow ID | The unique identity of the Shallow water alarm (default 230) can be changed here |
| Alert Deep ID | The unique identity of the Shallow water alarm (default 10456/456) can be changed here |
| Alert system ID | The unique identity of the system alarm (default 457) can be changed here |
| Alarm Power Fail/reduction ID | The unique identity of the power reduction alarm (default 231) can be changed here |
| Alarm SFI | The System identification number of a LAN based Alarm system |

The system has an internal alarm sounder, that can be disabled for CAT B Usage on the display menu. The ESN200 has the following default alarms and alerts.

| Alert type | Alert ID* | Alert text on output | Description |
|---------------|-------------|---|---|
| Shallow | 230 | Shallow water | The Vessel has entered an area of water shallower than the user defined depth. |
| Deep | 10456 /456 | Deep water | The vessel has entered an area of water deeper than the user defined depth |
| System | 10457 / 457 | System | The system has an internal error |
| Power Failure | 231 | Display-Voltage Sensor-Voltage Sensor-Comms | All, or part of Systems power supply is out of specification (21V-32V), also displayed on screen if power is present on screen. <ul style="list-style-type: none"> • The voltage to the display is out of spec • The voltage to the transceiver is out of spec • The communications to from display to transceiver is not correct Also triggers relay in JB50E1 unit |

Power failure alarm:

If the power to the unit fails, this state must be indicated to the bridge in an audible form. If no other method is available, a beeper can be connected to the power failure relay (auxiliary output), and on failure the beeper will sound. In the case of just the JB70 Electronic unit failing the Display will give an alert.

Note: The alarm handling is currently being updated to the IEC62923 (2018). Next software upgrade (1.1.0.0) will be available before the august 2021 deadline).

Alarm/Alert states

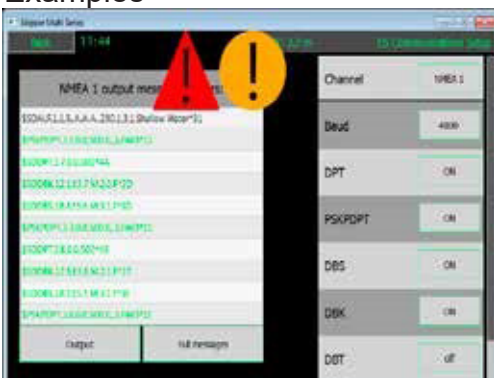
| | |
|---------------|---|
| Alarm Shallow | Value for shallow water alarm (usually also available on informations) |
| Warning Deep | A second alert that can indicate when the vessel passes into deep water |

The Following symbols indicate the current Shallow water alarm status

| Symbol | Symbol warning | Alarm/Alert Status | Sound for Shallow water (Alarm) | Sound for other warnings |
|-----------|----------------|---------------------------------|---------------------------------|--------------------------|
| | | Unrectified, unacknowledged | 3 beep | 2 beep |
| | | Rectified, unacknowledged | No beep | No beep |
| | | Unrectified, acknowledged | No beep | No beep |
| No symbol | | Rectified, acknowledge (Normal) | No beep | No beep |
| | | Silenced alarm | No beep for 30 seconds | No beep for 30 seconds |
| | | Responsibility transferred | No beep | No beep |

If responsibility is transferred, the transferred alarm will remain passive in this system for the escalation time set in config-alert setup screen.

Examples



Connection between JB70E2 and Display units

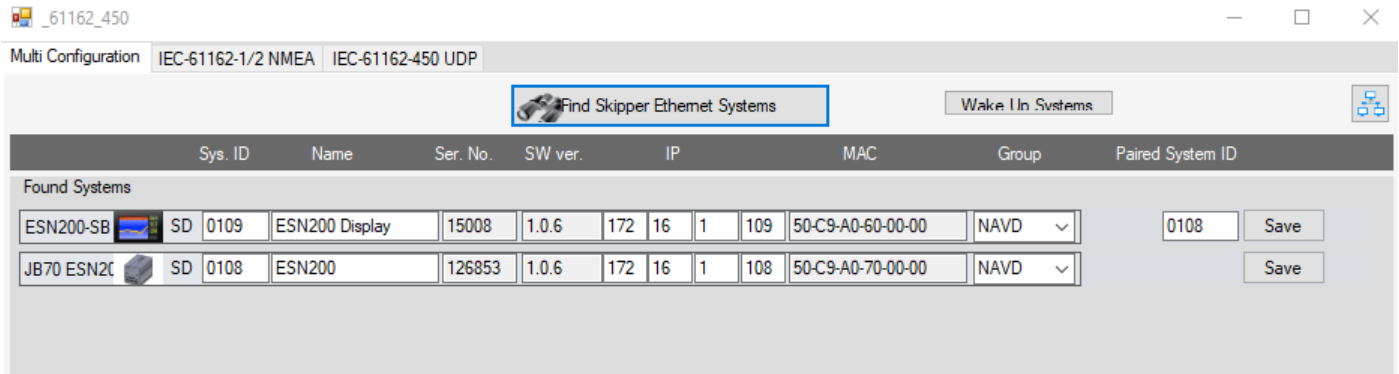
The system is setup to communicate by default. Each unit has an IP address and and SFI. These must be different.

IP address: The IEC61162-450 standard allows ranges of 172.16.X.X (2011) and 192.168.0.X

SFI: This is set default to SD, but the value after this can be changed.

Service software

To change the values of these the skipper service support software can be connected to the system and using the Tools- Com setup option The IP can be changed



The Connected screens need to be paired to the JB70E2 electronic unit as shown.

These values can also be changed on the screen menu/ Network settings

Display Unit setup – Network settings

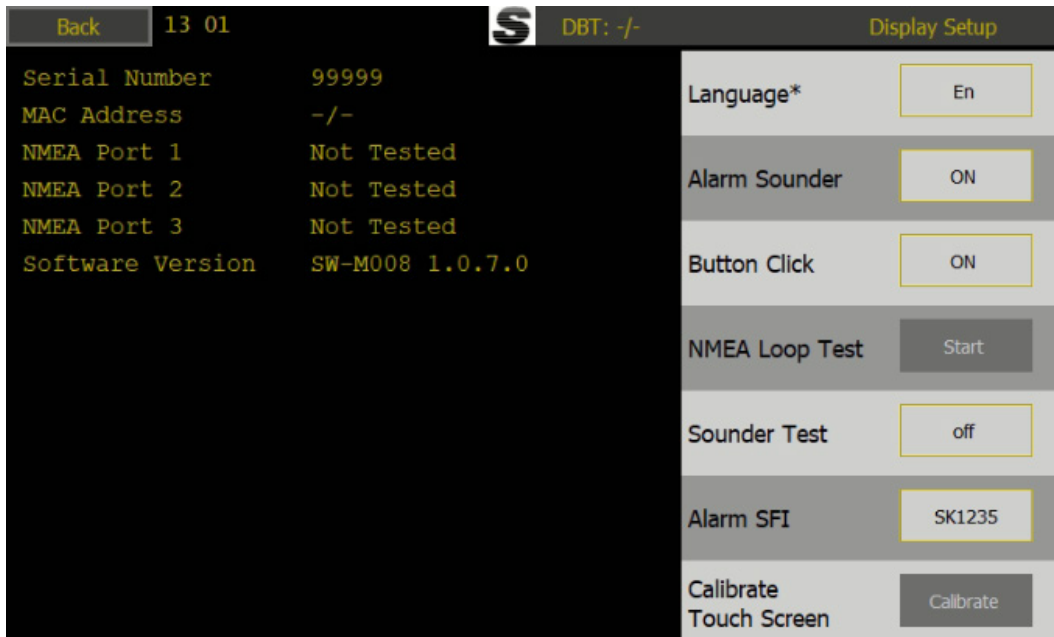
| | |
|--|--|
| | <p>IP: The screen IP can be set up. Approved ranges are 172.16.X.X and 192.168.0.X The IP address must be unique for each unit.</p> |
| | <p>Local SFI This is the unique identifier of this display. If more than one display is in use this must be different</p> |
| | <p>Paired SFI: The display has to be paired to the JB/0 Electronic unit, as it is possible to have multiple systems on the same network.</p> |
| | <p>Group: The complete system belongs to a group of systems (default NAVD) This can be changed, but all units must be on the same group</p> |

JB70 setup

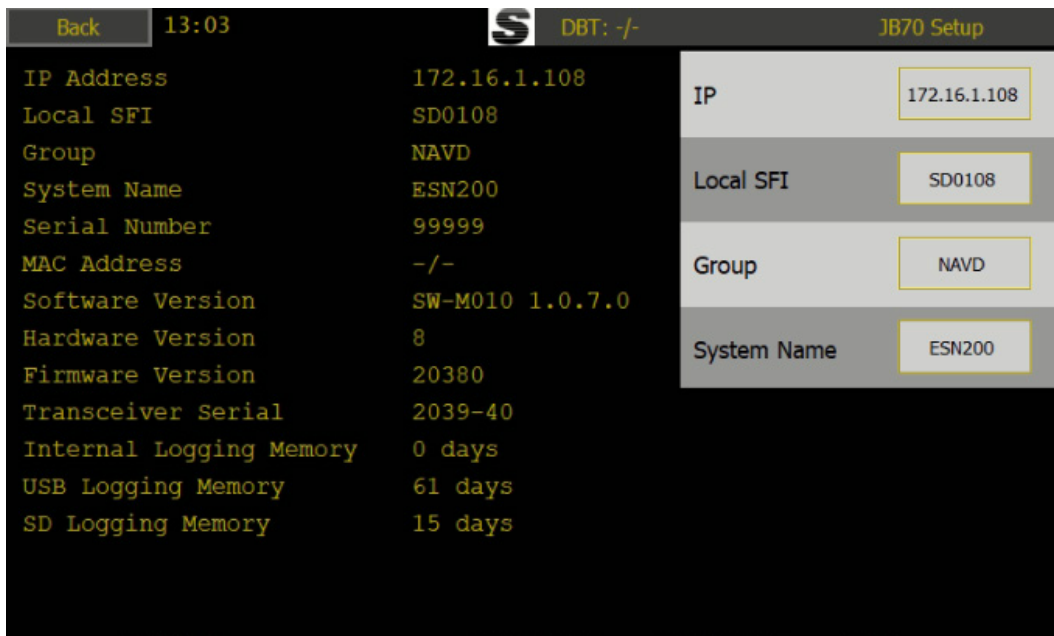
JB70 unit can only be changed by display if it is already connected.

| | |
|--|---|
| | <p>IP: The screen IP can be set up. Approved ranges are 172.16.X.X and 192.168.0.X The IP address must be unique for each unit.</p> |
| | <p>Local SFI This is the unique identifier of this display. If more than one display is in use this must be different</p> |
| | <p>Group: The complete system belongs to a group of systems (default NAVD) This can be changed, but all units must be on the same group. Groups available are MISC, TGTD, SATD, NAVD(default), VDRD, RCOM, TIME, PROP</p> |
| | <p>System Name: The name to be reported on the LAN applications</p> |

It is also possible to find which software is loaded in the Display on display.
 Press “Config”, “Display setup”, “Screen setup”



Find software version loaded on the JB70E2 unit
 Press “Config”, “JB70 setup”



Printing

Printers

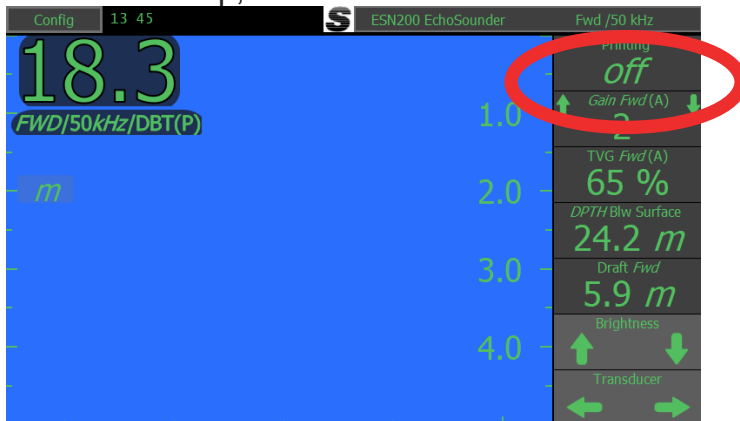
EPSON LQ350, OKI ML1190eco or OKI ML280 can be connected to the JB70 USB connector for continuous/page printing.

OEM or branded printers is not tested and may not be supported

An information on the screen can be changed to activate printing (from software version 1.0.6)

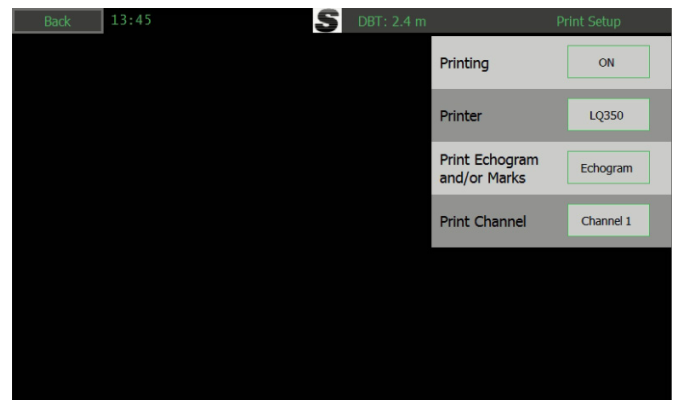
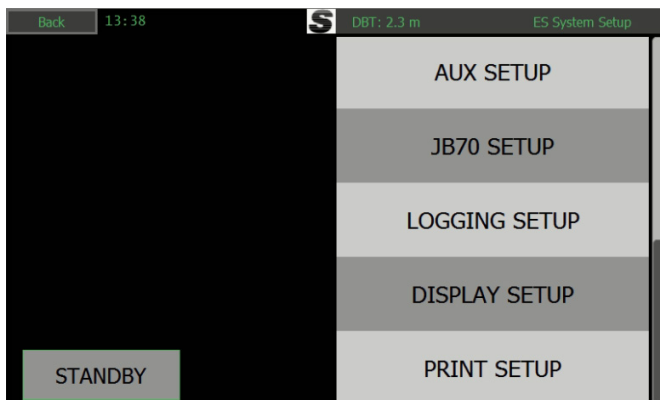
Setup print button in Runtime Screen

In runtime setup, activate one of the information buttons to Printing. This will show 'On' or 'Off'



Setup printer type in "Print Setup" menu

The printer is enabled and type selected in "Config", "Print setup".



Select Printing "ON", select the correct printer and channel.

Printers: EPSON350, OKI ML280, OKI ML 1190eco, LAN – using service software to print from a local printer, None

Print Echogram and or marks: (Echo/marks(text)/both)

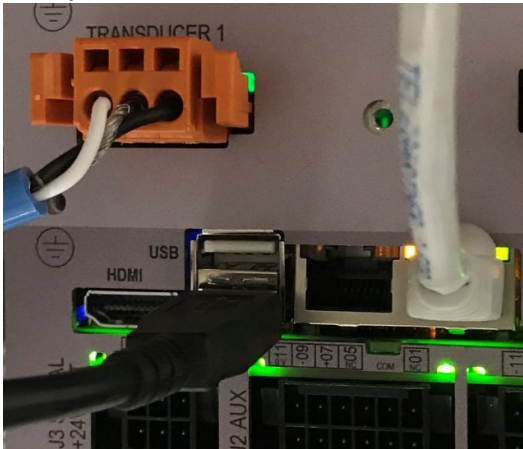
Print channel: Which channel to print (1/2/primary/both)

The printer prints a full page per channel every 15-17 minutes.

To test the printer, place the system in simulator mode, using the source-'show file' option in diagnostic setup. Then activate the printer, and wait for the printer to print (17 mins).

Connecting the printer

The printer needs to be connected to one of the two USB port in the JB70E2 unit,



Network printing

An alternative to the above USB printer is to print via Network printer. In this case a PC has to be connected to the network and SKIPPER service software can be used for printing.

PC connection Setup

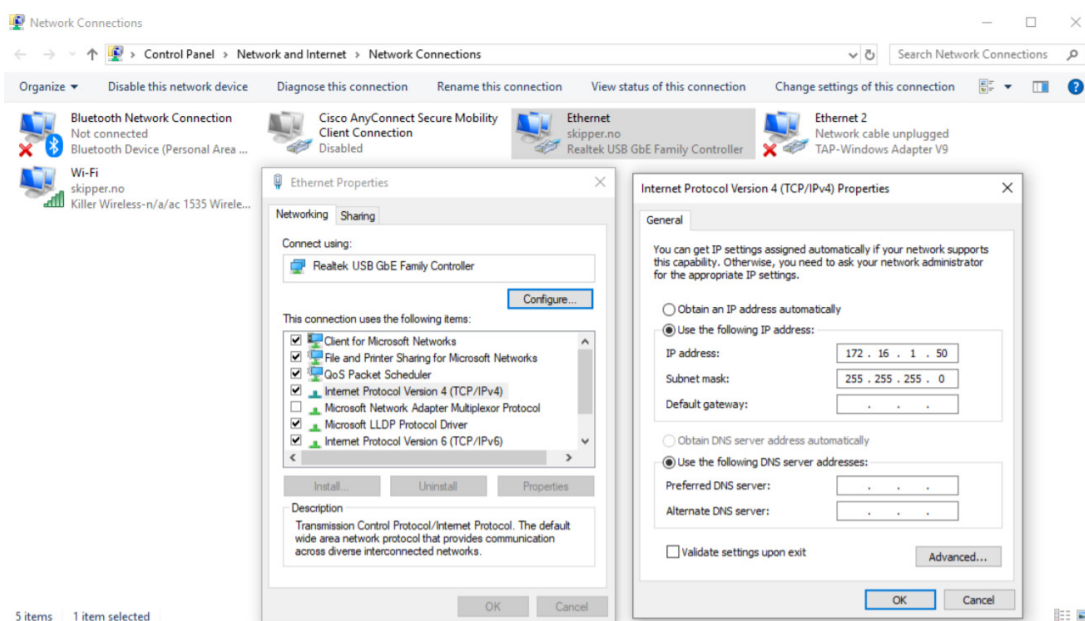
Features available via JB70E2-SA second ethernet LAN connector to a PC with SKIPPER software:

- Printing to PC printer
- History download
- Software upgrade

The PC ethernet adaptor to be connected to the ESN200 needs to be preconfigured to a unique IP address on the same subnet mask as the ESN200. e.g. 172.16.1.xxx (The Display unit ESN200-SB default IP address is 172.16.1.109 and the electronic unit JB70E2-SA is 172.16.1.108.)

Setting up static IP address in Windows:

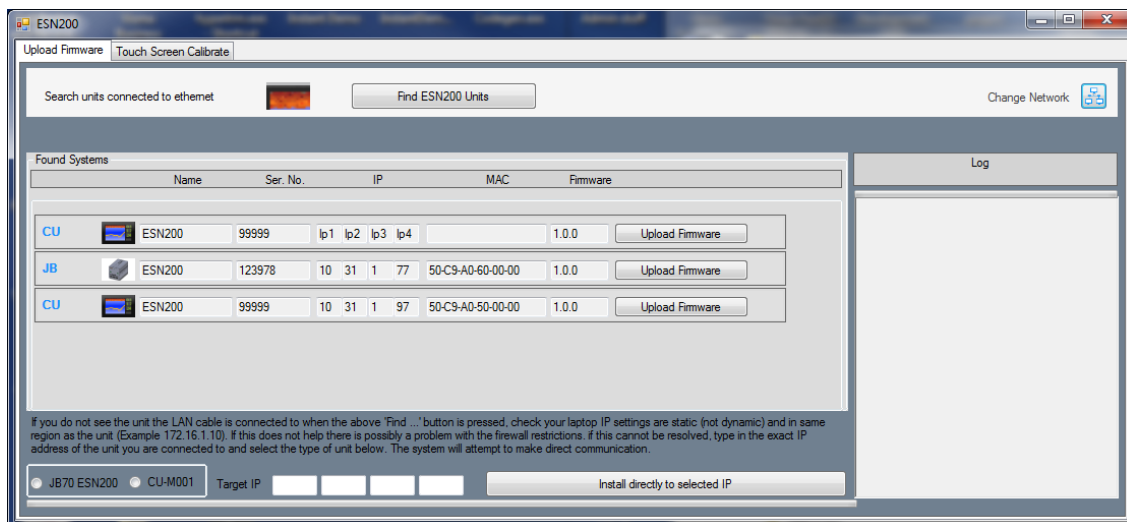
- 1: Click Start menu > Control panel > Network and sharing center or Network and internet > Network and sharing center.
- 2: Click change adaptor settings.
- 3: Right click on local area connection.
- 4: Click properties.
- 5: Select Internet protocol version 4 (TCP/IPv4)
- 6: Click properties.
- 7: Select Use the following IP address



The ESN Printing app is installed with the service software and a shortcut can be made to it in folder C:/Skipper/servicesoftware/esnprinter.exe

Upgrading software

Both Display and JB70 unit have their own software. It is always wise to upgrade both units if software is to be upgraded. To do this the skipper service software is used. Selecting the ESN200 app, will allow you to search for the units, and then upgrade using a file downloaded from www.skipper.no, or sent from your service hub. JB70E2-SA uses software SW-M010, ESN200-SB Display uses software SW-M008. These softwares are in a compressed format .tar and should not be decompressed before loading.



USER Information

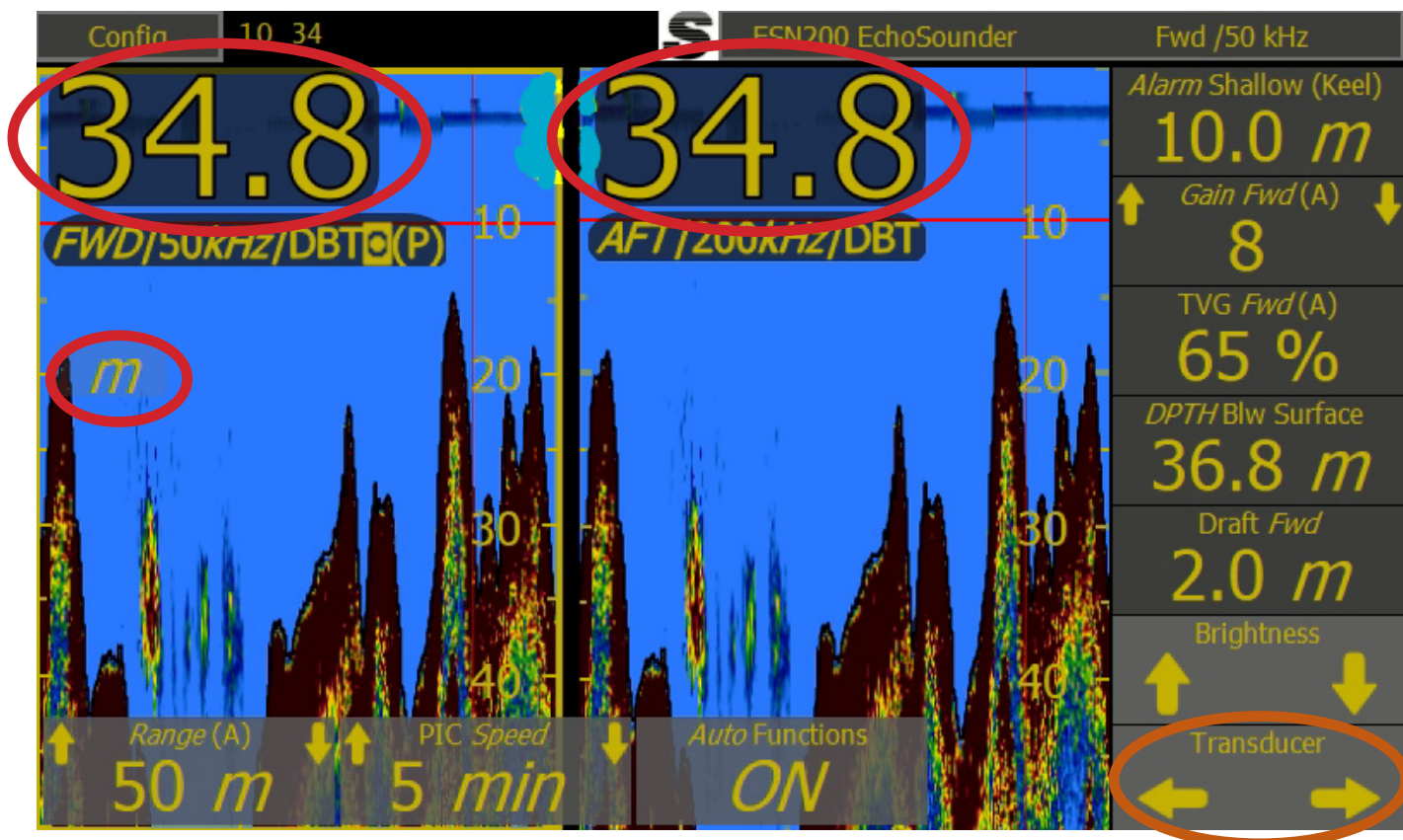
Introduction

The ESN 200 Echosounder system is an echosounder with 2 channels that can be switched between frequencies and transducers.

The Screen can be setup to show the parameters that the user wishes to see or control, but it also has an automatic function that takes over the control of range, gain, frequency and power of the system to minimize the required amount of user interaction.

The system has 1 mandatory alarm (Shallow water) and a second deep water alert. In addition it gives alerts of system failures.

The system will have 1 or 2 transducers installed, typically 50 kHz in the bow and 200kHz aft. With this system it is also possible to install any of 8 frequency transducer both forward and aft and if dual frequency transducers are used, the system can be made to select the best frequency at any particular time.



Single Channel or Dual channel screen (orange circle)

The transducer selector can switch between Transducer 1, Transducer 2 and Dual transducer screen..

Depth and units (red circle)

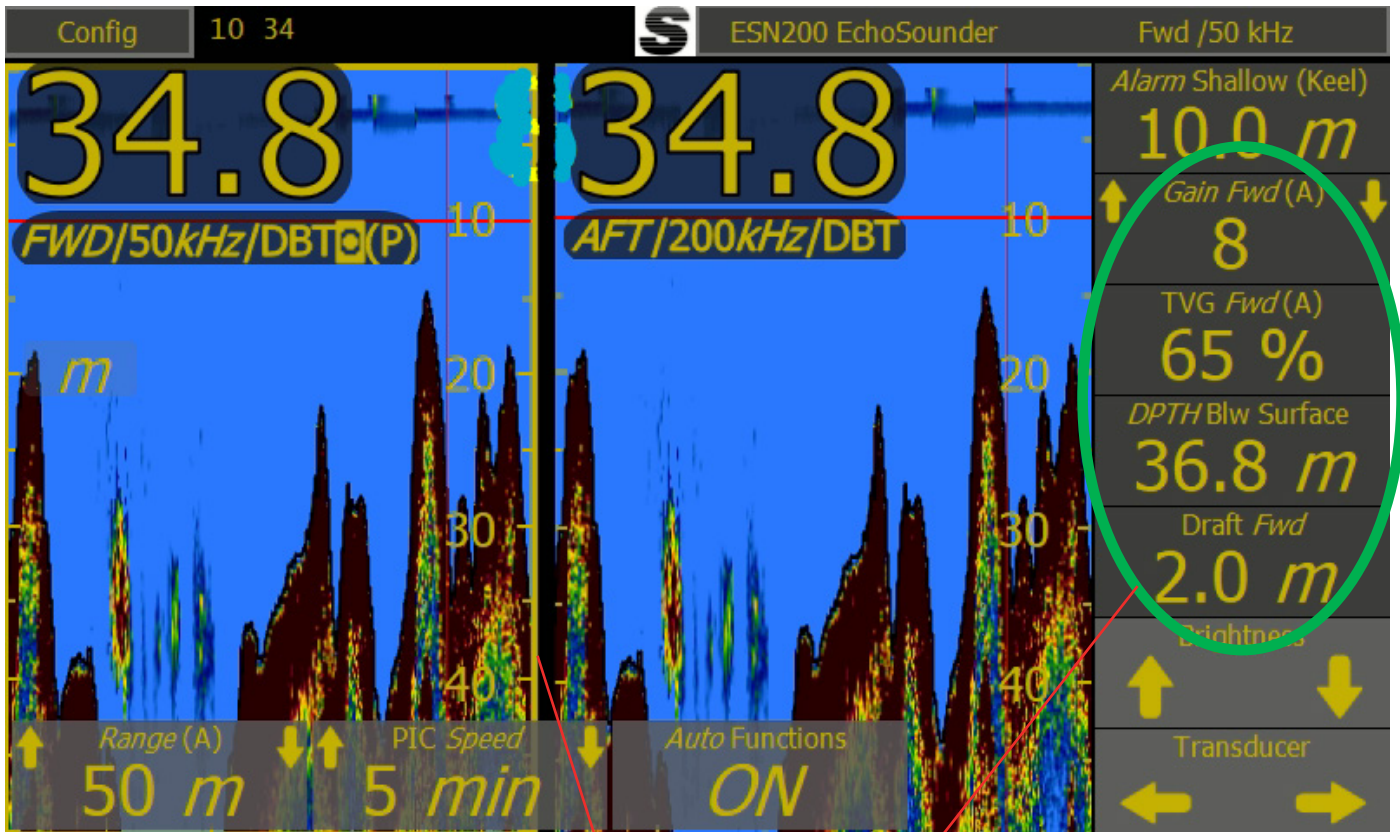
For each channel the Depth is shown numerically on the left. The Echogram shows the graphical variation of depth over time.

The units can be changed by touching the unit sign, or in “Config”, “ES Setup”, “Main Setup”.



Transducer info:
 Position: Fwd
 Frequency: 50kHz
 (P)=Primary transducer. Transducer for NMEA Out and Alarm
 These settings can be changed in:
 "Config", "ES Setup", "Transducer Setup"

Depth info:
 DBT (Depth Below Transducer)
 These settings can be changed in:
 "Config", "Runtime Setup"

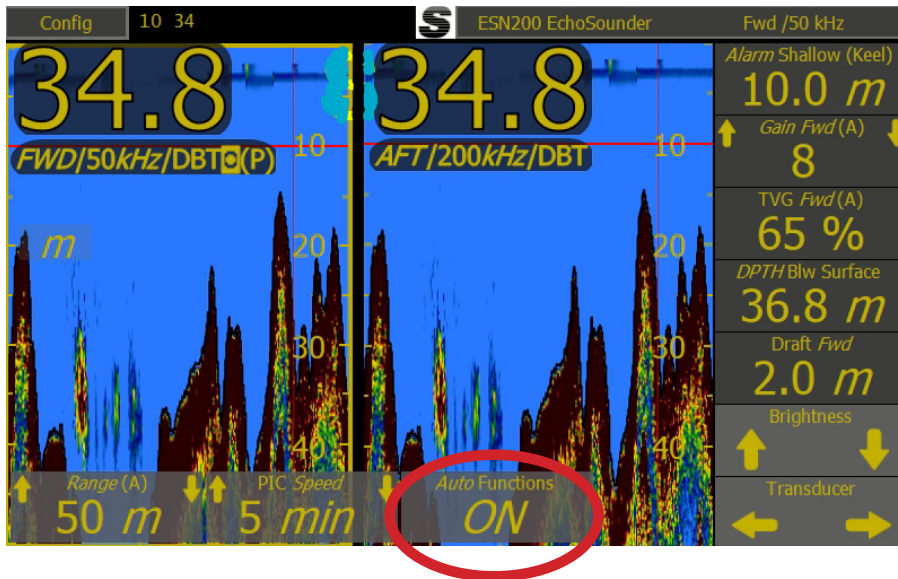


The settings of transducers in the right panel (green circle) is valid for the "Yellow highlighted" channel.(In this example it is the Fwd 50kHz primary transducer.)
 Change the highlighted channel by touching the area of the other channel.

Auto Functions

When the “Auto functions” are ON then the system will change the range, gain, TVG, power and Frequency (If transducer is dual 50/200kHz) automatically, as the depth changes.

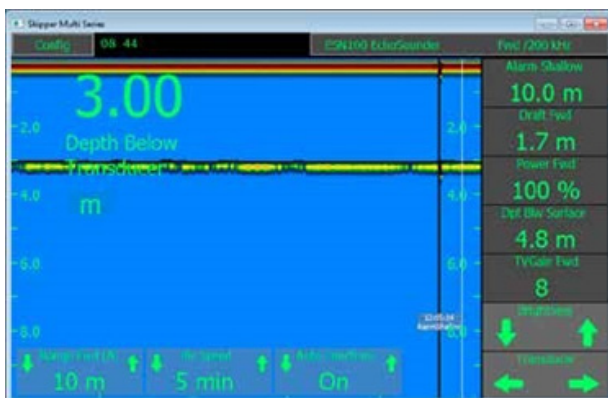
The user can take control of the auto parameters by setting “Auto functions OFF”. The system will inform that it is taken out of Auto mode and the user then has full control. The system can again be put into auto mode using on screen button (if selected), by pressing and holding a parameter, or within the menus.



Manual mode

In Manual mode, the user will typically be required to control the Range, and gain of the system, although it is also possible to control the power and time variable gain (TVG) to give a clearer picture. When in auto off mode the top 3 right side information's Will show power, Gain and TVG.

The system can be made to show the information/ options, or to hide it until the user touches the screen. (in Runtime screens)



Selectable Information

All the buttons on the side and bottom can be selected (Except Range which is permanent) And this information can be made to disappear after a short time (selection made in menu 'Runtime screen setup' using option Info buttons, or bottom bar: fix or slide). The information/options can be recalled by touching the screen



Screen Configuration




The main screen can be set up to show numerous informations on the right and below the screen Buttons on the information and bottom bar can be adjusted to show the information the user required in the runtime setup.

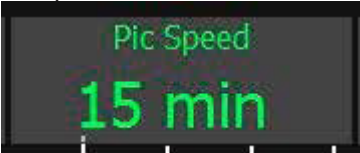

Press and hold the button to see all the choices.

Press on the config button and runtime setup to access the general screen information options

All button functions are available in the menus, so if a button is selected away, it can be accessed from the config menus.

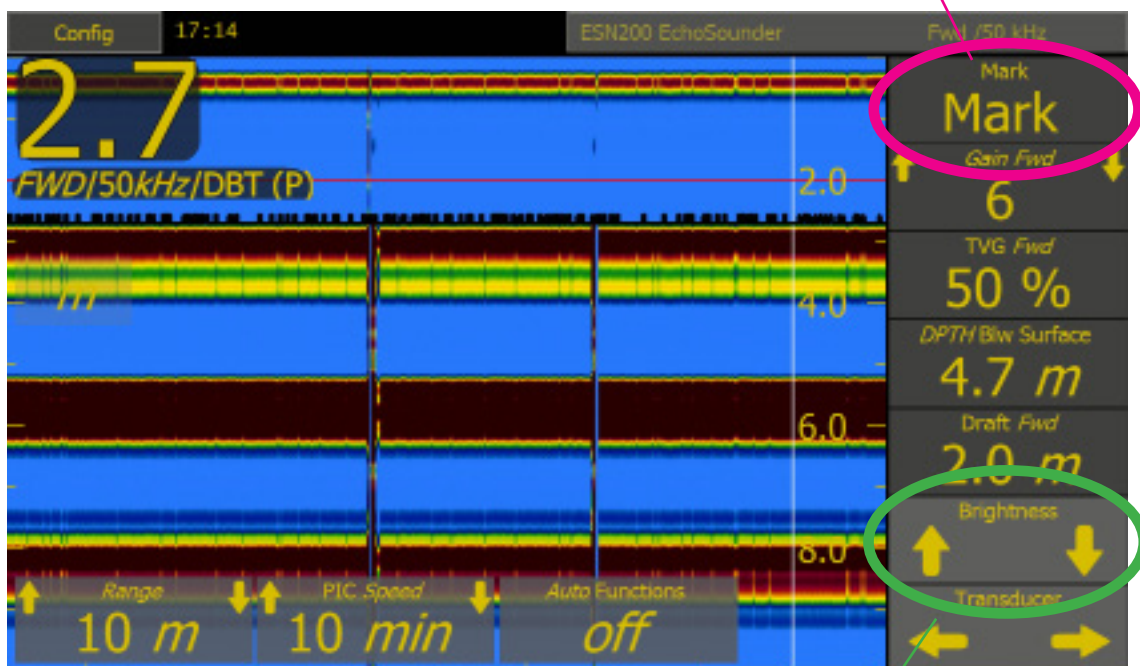
Main adjustable features are:

| | |
|--|---|
| <p>Range</p>  | <p>Range is always available within a single press of the screen on the bottom left corner.</p> <p>Manual Range can be set in 50m steps from 5m to the maximum the installed transducer can detect. Smaller steps are available below 50m.</p> <p>Auto: In this mode the range will change based on the digital readout of the system. Auto range is part of the full range of auto functions and will cause other functions to become auto as well</p> <p><i>The value can be changed by pressing</i></p> |
| <p>Gain</p>  | <p>Gain is the amount the signal, reflected from the bottom, is amplified. This should be adjusted such that the signal strongly visible at the bottom and below, but not above the bottom.</p> <p>Manual : Gain can be adjusted between 1 and 12 and is most effective for areas deeper than 50m</p> <p>Auto: Auto gain will, combined with TVG and range adjust to give the most signal.</p> <p><i>If not on screen this is available in menu ES Setup</i></p> <p><i>The value can be changed by pressing and holding</i></p> |
| <p>TVG</p>  | <p>Time variable gain Predicts how much the sound will fades in the water , and compensates.</p> <p>Manual adjusting this will give stronger/weaker signal near the surface, and can be used to reduce strong fish or bubble layers</p> <p>Auto : This function works together with gain to provide an acceptable picture and continuous bottom detection.</p> <p><i>If not on screen this is available in menu ES Setup</i></p> <p><i>The value can be changed by pressing and holding</i></p> |

| | |
|--|--|
| <p>Pic speed</p>  | <p>Picture speed selects the speed at which the bottom will move across the screen. Units are the time to refresh the whole screen. A scale can be seen at the bottom of the screen.</p> <p><i>If not on screen this is available in menu Runtime setup</i></p> <p>The value can be changed by pressing and holding</p> |
| <p>Alarm shallow</p>  | <p>The Shallow water alarm is obligatory, and is indicated on screen by a red horizontal line. When the depth is shallower than this the alarm will sound. And an indication will show on the screen. Depending on the system configuration the system may require acknowledgement on the control unit, or may allow remote acknowledgement.</p> <p><i>If not on screen this is available in menu Alarms</i></p> <p>The value can be changed by pressing and holding</p> |

A vertical mark will be made on the screen when this option is active, when an important setting is changed, or an alarm/alert is sounded. This mark will also be stored in the saved depth logs. If GPS is connected the time and position will be recorded.

If not on screen this is available in menu Runtime setup



Dimming up and down is available using the up and down arrows, or the slider that pops up when a dimming arrow is touched. IF the system is dimmed too far down, press and hold the screen, and it will return to a 'visible level'.

The screen will not dim fully down if an alarm is active. If an alarm becomes active when fully dimmed, the screen will return to the 'visible level'. And return after acknowledgement

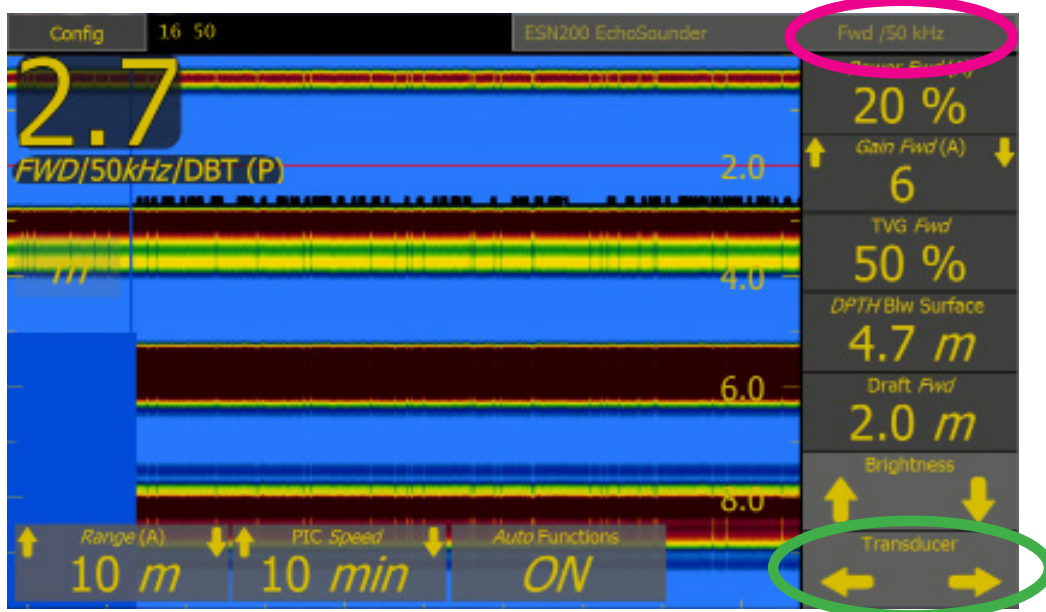
This is always available, but can be adjusted in Display setup

The position and frequency of the currently active transducer is displayed on the top banner

If dual frequency transducers are installed then the frequency button will allow the user to change between the available frequencies.

Manual: 50kHz / 200kHz

AUTO: The system will change frequency at a predefined depth. Default 0-200m 200kHz, below 200m 50kHz



The left right button will allow the user to change the transducer displayed. Each of these may have up to 2 frequencies.



24 Hours History

The ESN200 is automatically saving the last 24 hours of depth recording, including the relevant input s such as GPS, Heading, other depth measurements.

24 Hours history is available by pressing “CONFIG”, and then “24 Hours history”

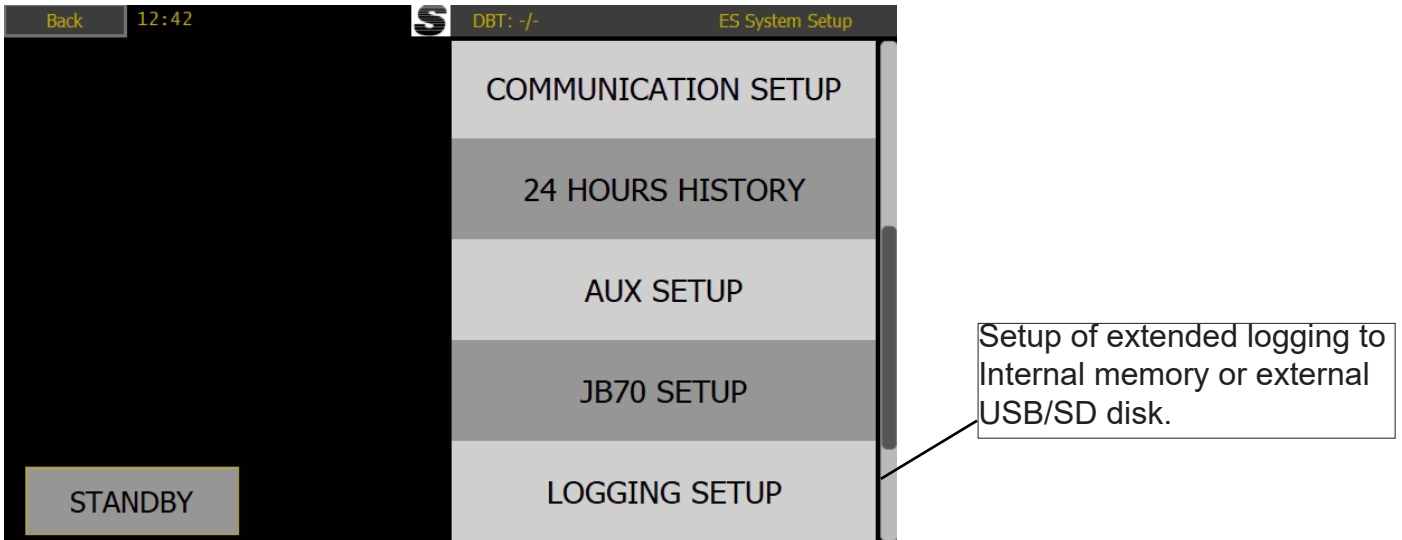
By selecting table, the depth of at least every minute and marks in between (indicating changes or highlighted events such as alarms or auto changes) are listed with time and position, if available. This can be viewed on the history page as a picture or table. It is possible to view all changes made manually or automatically by the system, all alarms and acknowledges, or just depth and position data.



| |
|---|
| Show marks, On the graphic display show a vertical line and information when something changes (Full, none, lines, info, alarms) |
| Mark type to show: Alr and Man: Alarms and manual marks Basic, all changes shown as 1 letter G=gain, P=power,R=range,M=mark Other, just manual changes All, All changes |
| Range: Range to show on history screen |
| Show Channel: Which channel to show on screen (1/2) |

Extended logging of history

In addition to the obligatory 24 hours logging, that can be viewed on the 'Show History screen' Logging to file can be activated in the 'logging setup' (picture). Here the system values can be logged internally or externally to disk (SD or USB) when logging the LED under the SD disk will light.

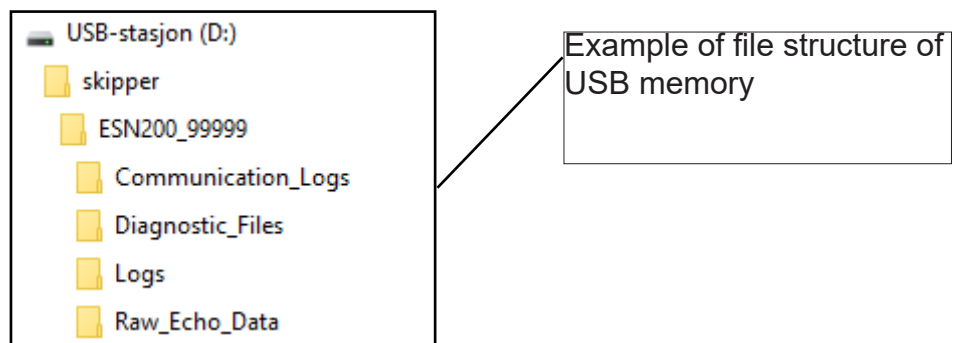
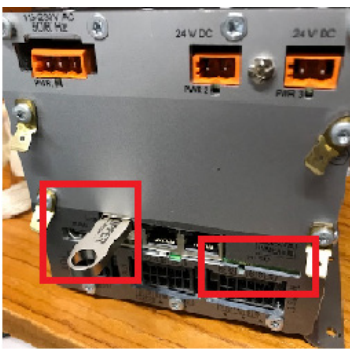


Saving to disk

Both the USB and SD disks can be used to save data. Insert the disk and select the data you wish to log in the Logging setup menu. This can be processed in the service software. Depending on what is input to the system, or selected to be logged, the system logs up to 4MB per 24 hours.

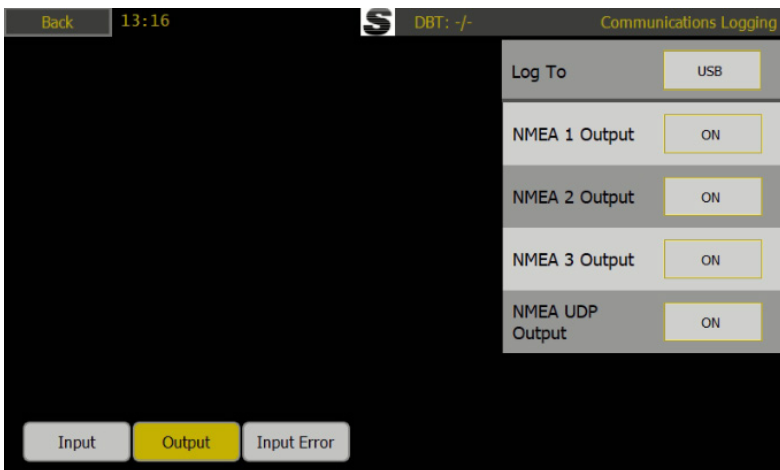
Each completed echogram is converted to a PDF file and can be extracted using the service software on a separate PC via LAN.

Logging to file can log all depth history in different formats and all NMEA input and output history.

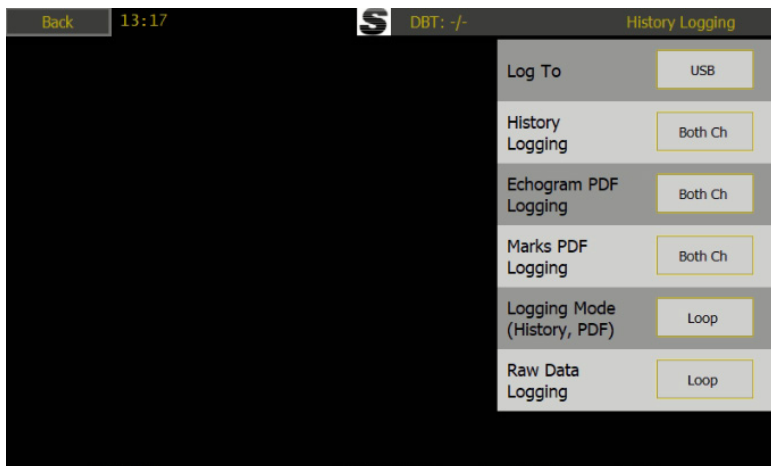




Setup of depth history and communication history (NMEA+LAN)



Setup for additional logging of NMEA and/or NMEA UDP to disk



Log to: Selection of the media to log to, (SD, USB, Internal)

History logging: Which channel to log (1/2/both)

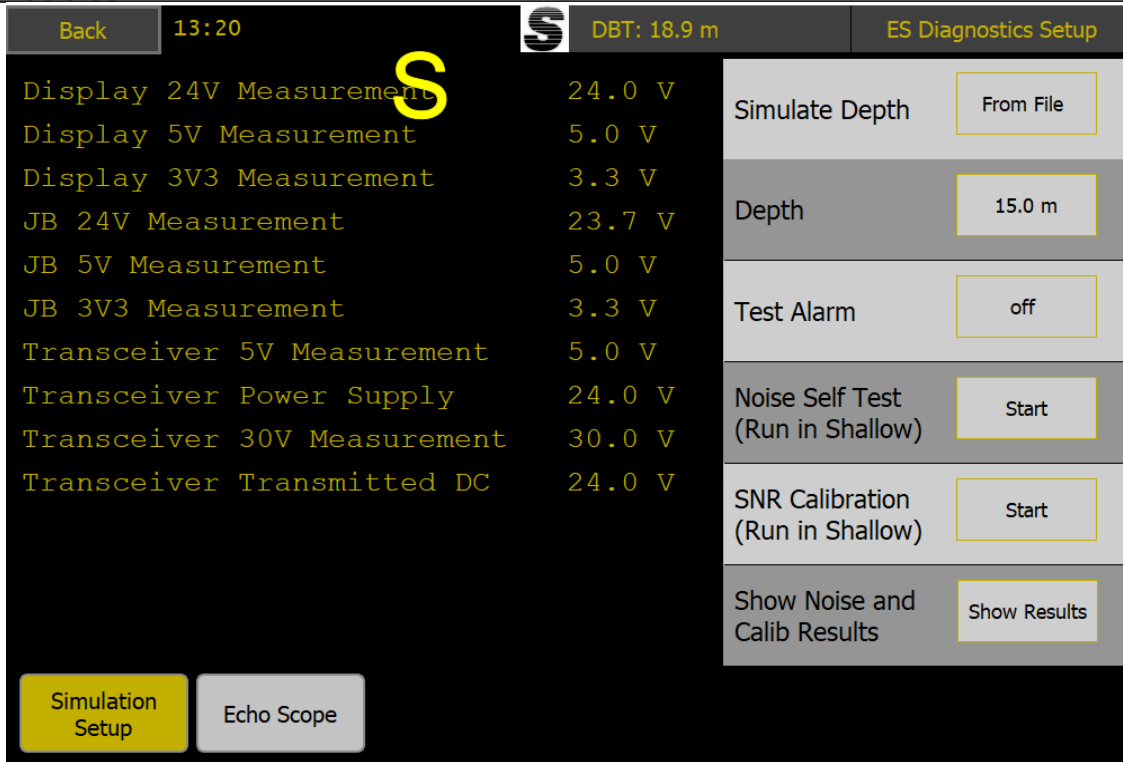
Echogram PDF logging: Save echogram and data to pdf (none/1/2/both)

Marks PDF Logging: Which channel to record the system changes on (none/1/2/both)

Logging mode: extended logging until the selected disk is full, and then the system will loop or stop

Raw Data Logging: If raw data is selected, all relevant data will be logged, again until the disk is full or the system will loop overwriting the oldest data.

Diagnostics



The ESN200 has a number of functions to allow the user to simulate, diagnose and optimise the system.

The Diagnostics setup will help identify the problem.

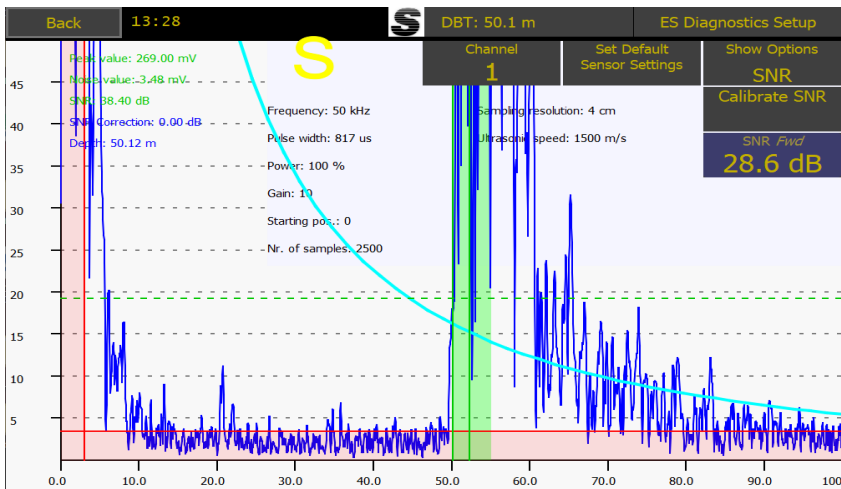
| Parameter | Description |
|--------------------|---|
| Simulate depth | Make a depth of the desired value (Depth button) To test outputs and alarms, alternatively have a moving depth , or run a simulation from file. |
| Depth | The value to be sent, or the value the moving depth will move above and below. |
| Test alarm | Send all known alarms to the output. (These can be acknowledged/ silenced/ changed as a normal alarm/alert) |
| Noise self test | Run this to check the Noise levels of the system |
| SNR Calibration | Run this calibration to tune the system once installed in the vessel |
| Show Noise results | Show the results of the noise test (See below) |

Noise self test will run a series of pings and measurement within the system to find the noise conditions. These can be inspected by pressing the show noise button



The values shown should be below 20mV once installed unless otherwise stated. High values can usually be reduced by improved cabling and / or filters on the power supply.

Once installed, the mounting of the system can cause some changes from the default setup. This can have an effect on the auto functions. To improve this the SNR calibration can be performed and the system will optimise itself.



Each ping is plotted in the Scope screen

Here you can see the pings and the parameters in use to detect it, The green zone is showing the detected depth , the red zones are areas where the bottom detection will not have an effect. this is typically at low signal levels and in the ringing period after the system sends a pulse.

LED indicators are as follows

Status 1 (Green) flashes on detected bottom (either channel)

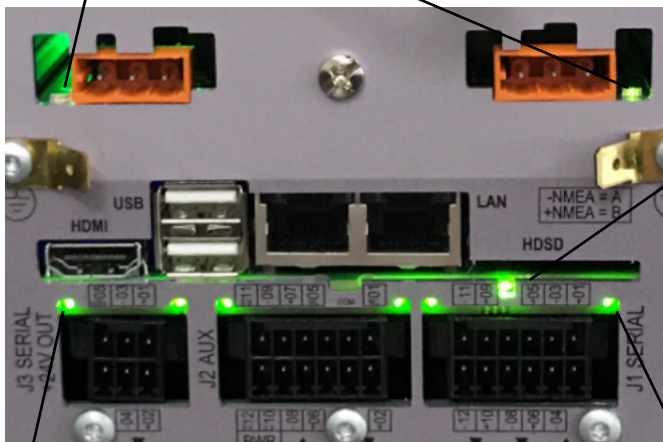
Status 1 (Green) Solid - sensor muted

Status 2 (Yellow) flashes on lost bottom

Status 2 (Yellow) solid if problem with transceiver. (comms to sensor not working)



Transducer 1 og 2 flashes when the system pings



-LD21 off - logging history to internal memory,
 -LD21 always on - logging history to USB or SD, and the device is present and has free space.
 -LD21 flashing at 1 Hz - Logging history to USB or SD, and the device is either not present or it is full.

From left

- LD 5 24V Sensor power out on / off
- LD 4 5V output power J3 (NMEA 3/Sensor)
- LD 6 input on AUX
- LD 3 NMEA input on J3 (sensor)
- LD2 Input on NMEA 2
- LD 1 Input on NMEA 1

Lost bottom or input information

If the system cannot locate the sea bed, for a period of time it will go into lost bottom mode. This is normal once it is too deep (depending on transducer frequency and sea/sailing situation) This will normally occur if there is lots of air under the transducer (sailing aft, being tugged or use of thrusters in shallow water) it can also occur if the water is very dirty, blocking the sound, or the sea bed is very absorbant (very soft mud)

In this situation the depth number will disappear from both the display and outputs. In its place on screen the following symbol will be shown -.-

If the information panels are set to show input parameters these will also show -.- if there is no, or invalid information on these inputs.

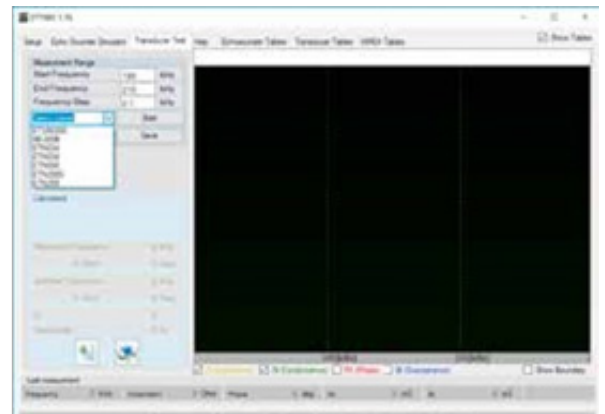
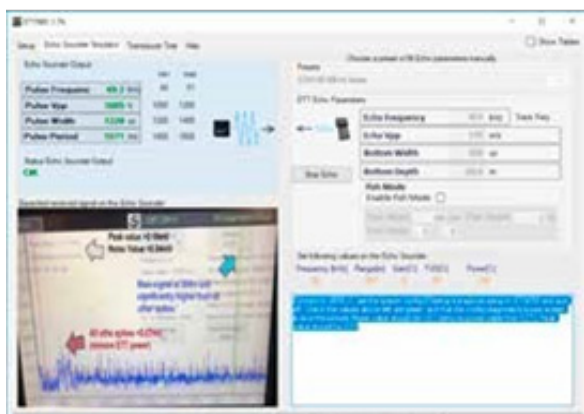
If the system is in AUTO mode the system will start changing parameters every few seconds to try to refind the bottom. In this case the displayed echogram range will lock until the bottom is refound, but the Range value, gain and power will change every few seconds

Diagnostics of the ESN200 using an ETT985

The ETT985 echosounder and transducer tester has been updated with tests for the ESN200 echosounder and the new transducers ETS50200 and Furuno 8B-200B. These updates can be downloaded from the skipper website when the ETT software is started.

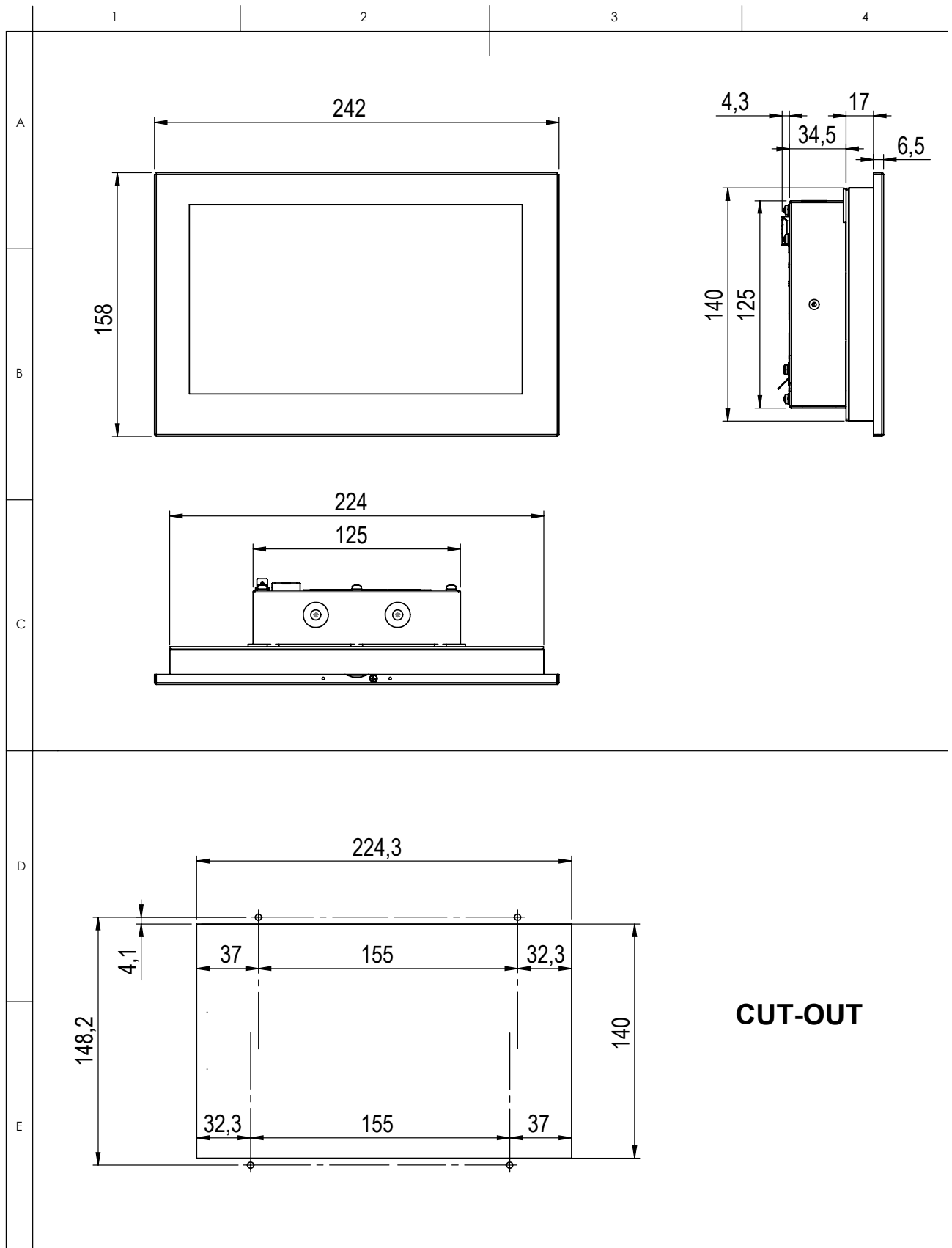
Connecting the ETT985 to the transducer ports of the JB70E2-SA unit and then running the ESN200 noise test for the appropriate frequency will allow the user or service technician to check the signal output and noise characteristics of the system.

Using the transducer tester, the connected transducers can be analysed to see if their resonance impedance is as expected.

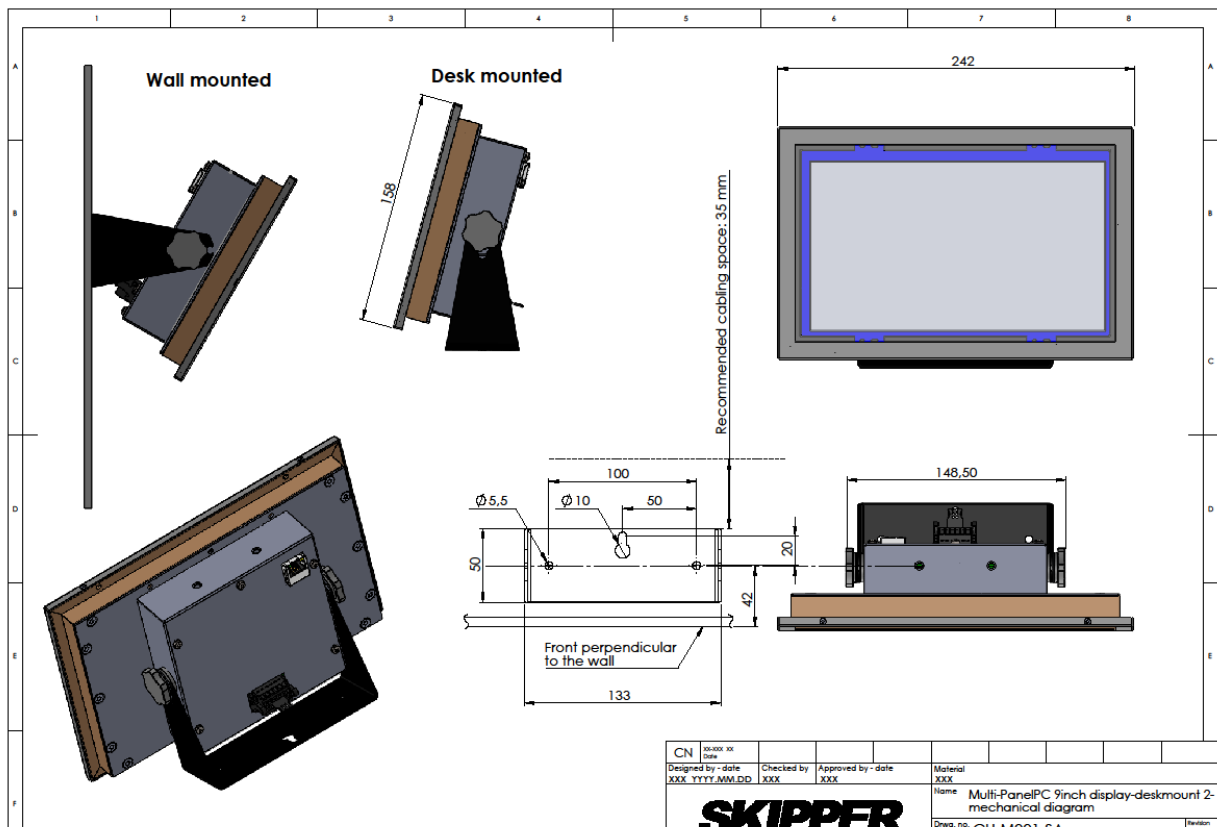
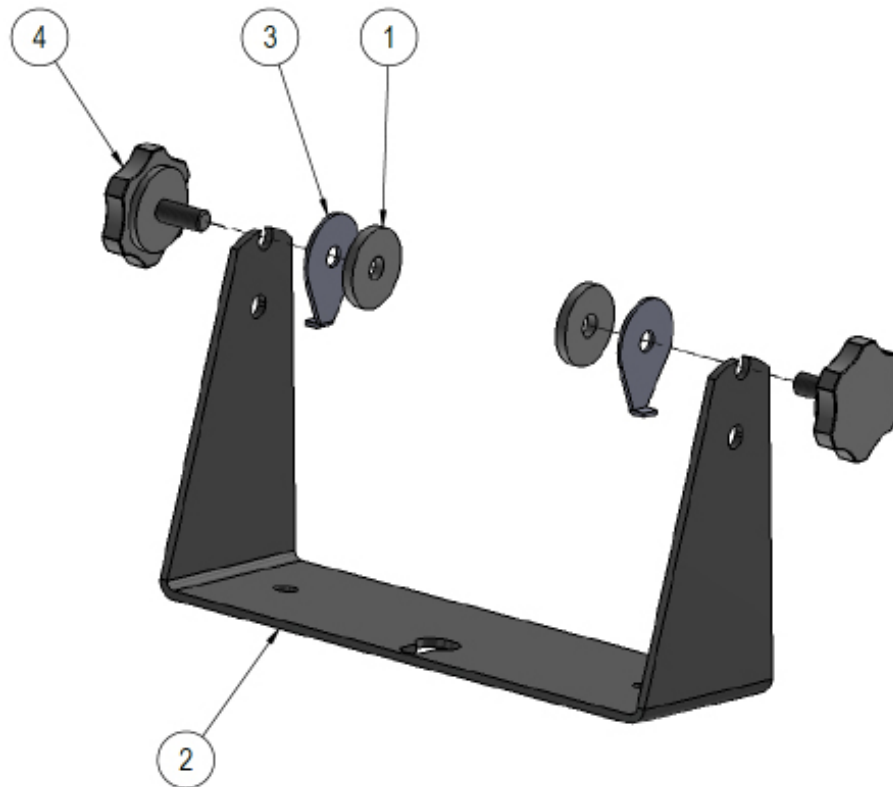


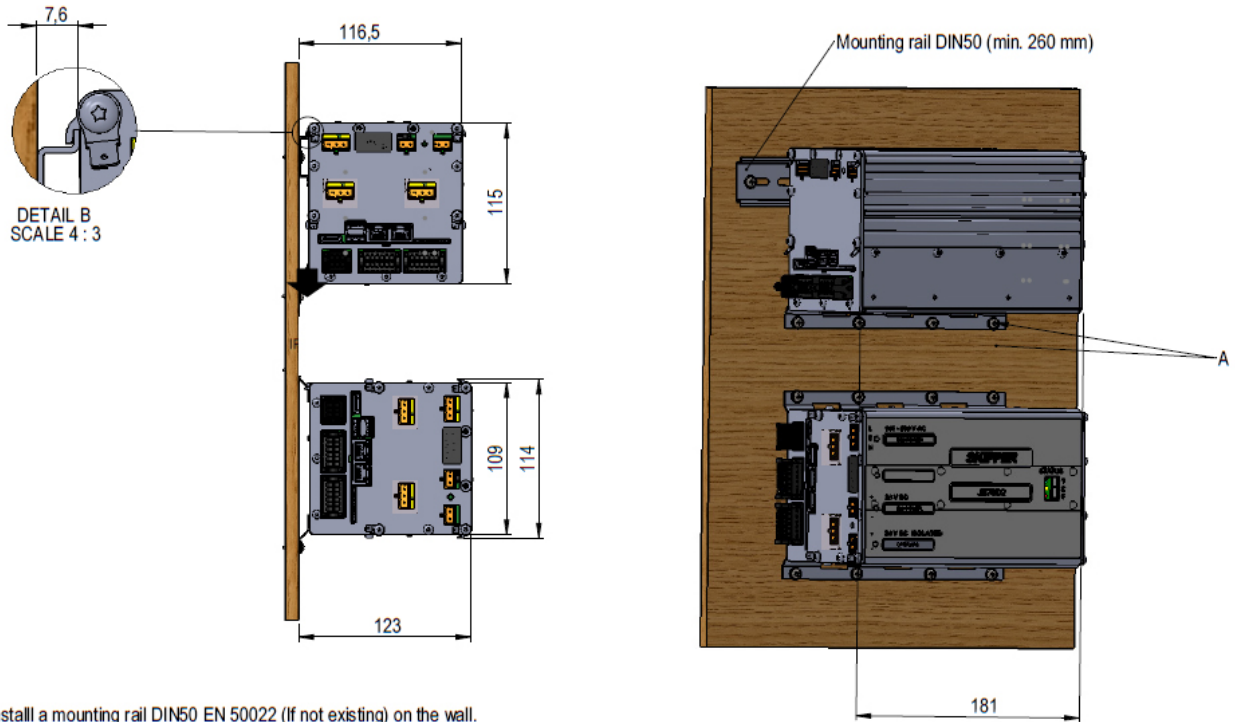
Appendix 1: Installation drawings

The display is designed for flushmount installation

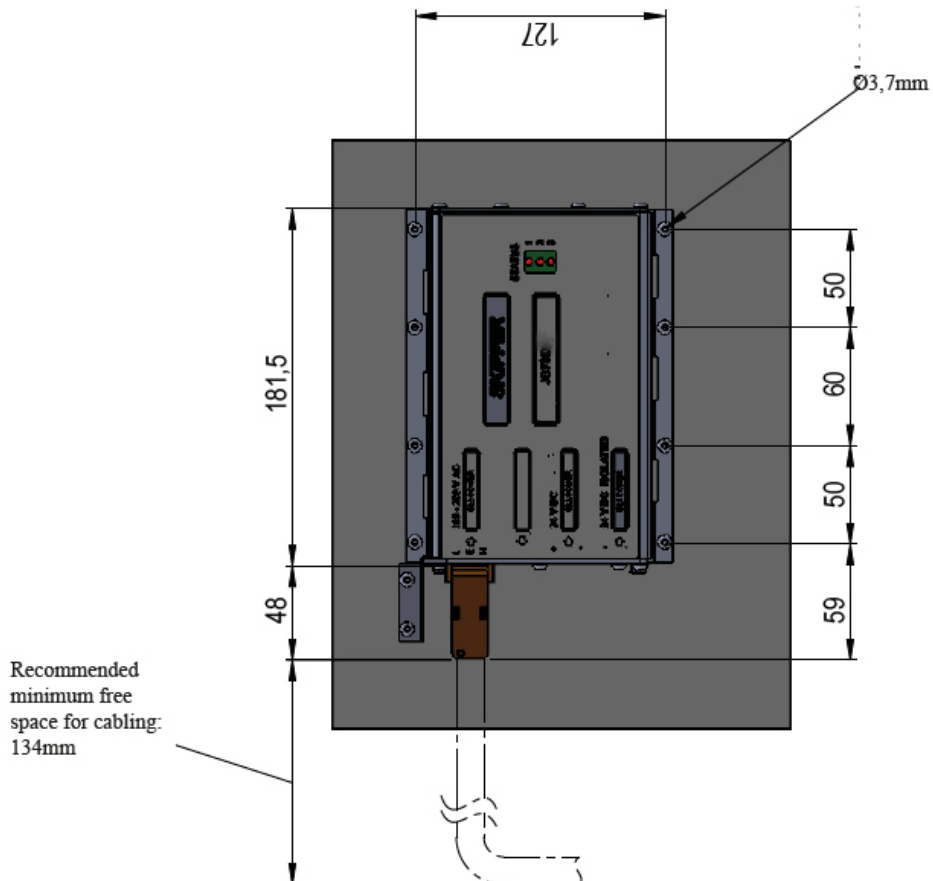


Optional wallmount/desktop bracket.Part number: MG-0002. Mounting bracket for 9inch display





1. Install a mounting rail DIN50 EN 50022 (If not existing) on the wall.
2. Mount the JB70E2-SA on the rail (Be sure that the unit is properly mounted, see detail B)
3. Mark the 4 centerpoints for the drill in the wall (A). NB! The drilling holes diam. depends on thickness and material of the wall.
4. Use self tapping screws ST3,5 DIN7981-C pozidrive (A) (The screw length depends on the wall thickness).

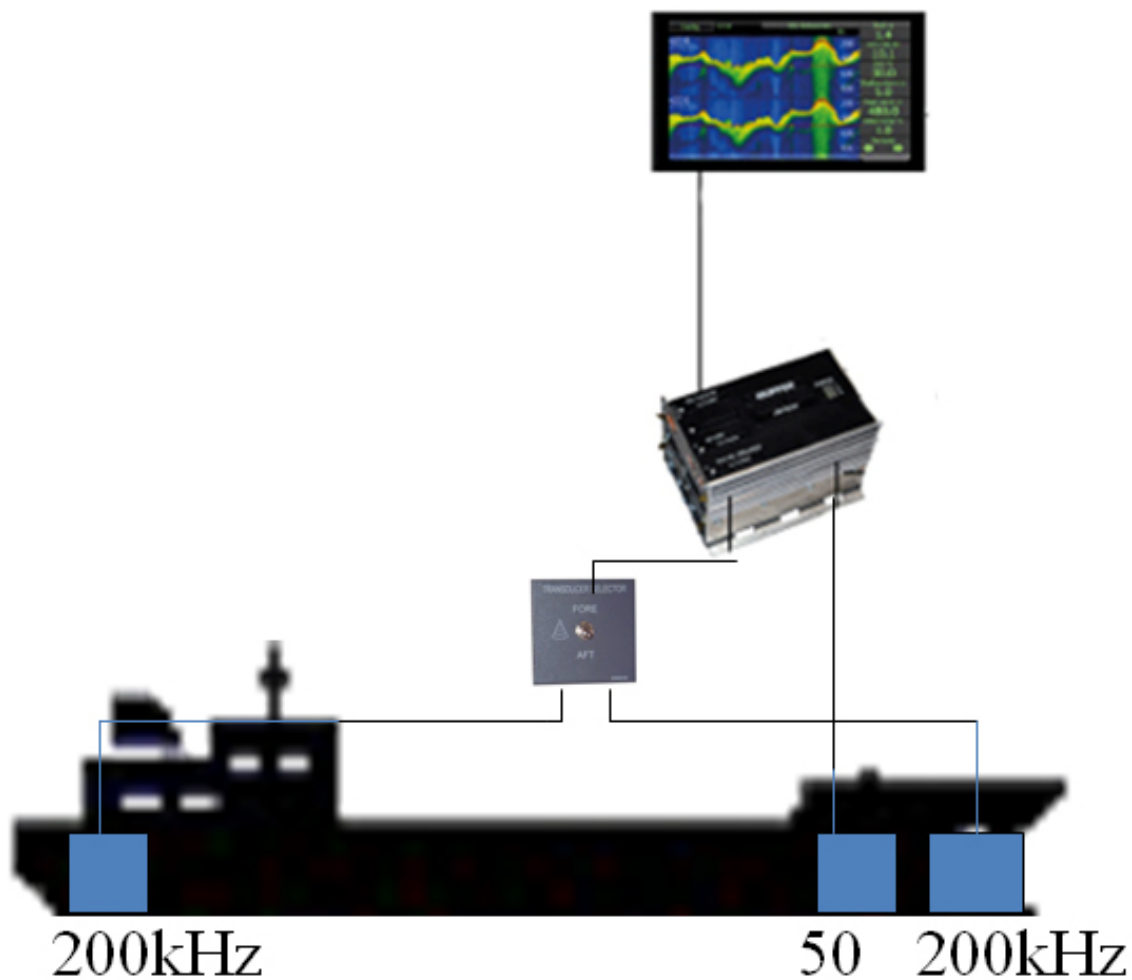


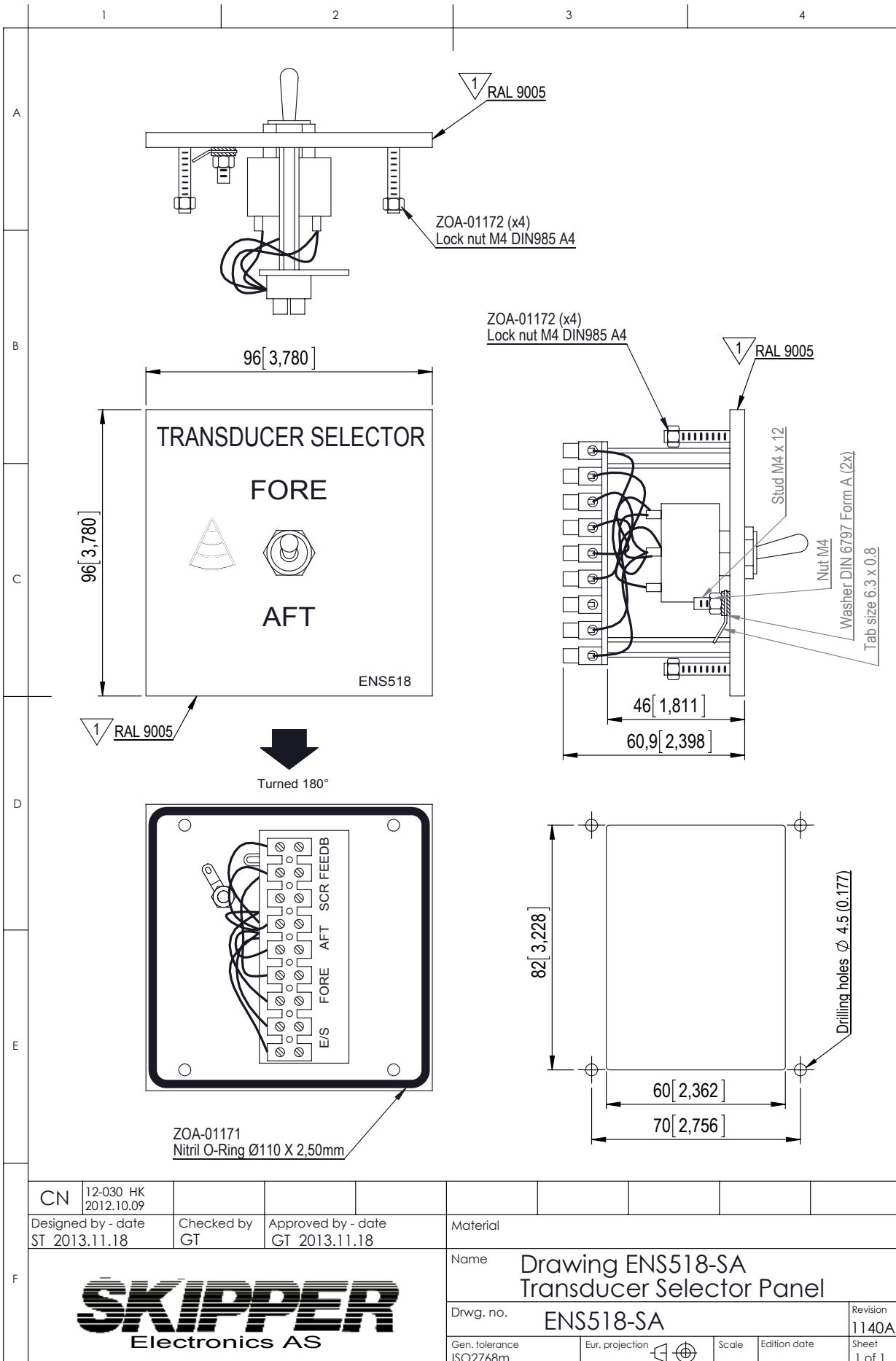
ENS518-SA Transducer selector

The ESN200 has two transducer terminals selectable from software. A transducer selector switch can be installed if more than two transducers are required.

The transducer selector switch will only be able to select between two transducers of same type and frequency











There are no selector feedback to ESN200 for indication of for/aft transducer is selected.





| | | | | | | | | | | | |
|----------------|--------------------|-------------------------|------------|----|--------------------|---------------|-----------|-------|--|-------|----------|
| F | CN | 12-030 HK 2012.10.09 | | | | | | | | | |
| | Designed by - date | ST 2013.11.18 | Checked by | GT | Approved by - date | GT 2013.11.18 | Material | | | | |
| | | | | | | | Name | | Drawing ENS518-SA Transducer Selector Panel | | |
| | | | | | | | Drwg. no. | | ENS518-SA | | Revision |
| Gen. tolerance | | | ISO2768m | | Eur. projection | | | Scale | Edition date | Sheet | 1 of 1 |

Table of abbreviations

| Symbol/abbreviation | Explanation |
|---|--|
| TVG | Time variable gain |
| FWD | Forward position |
| AFT | Aft position |
| <i>PORT</i> | Portside |
| <i>STBD</i> | Starboardside |
| Pic Speed | Picture speed. The amount of time presented on the screen |
| DBT | Depth below transducer |
| DBS | Depth below surface |
| DBK | Depth below keel |
| Draft | Depth from water surface to the lowest point of the vessel |
| Offset | Distance from Transducer to the lowest point of the vessel |
| <i>DPTH</i> | Depth |
| <i>M</i> | Meters |
| <i>ft</i> | Feet |
| <i>fm</i> | Fathoms |
| m/s | Speed in meters / second |
| kHz | kilohertz (Frequency) |
| <i>hr</i> | hour |
| <i>min</i> | minute |
| (A) | Automatic mode (system self adjusts range and gain) |
| (P) | Primary Channel |
| ALF | Alarm method according to IEC61924/62288 / MSC 302 with category (CAT) A - Alarm to be acknowledged on the display only B – Alarm may be acknowledged remotely To work with ACN – Alarm Acknowledge, request, transfer, silence |
| ALR | Older alarm standard to work with ACK Acknowledge |
|   | Active Alarm/Warning unacknowledged alarm |
|   | Active Alarm/Warning acknowledged Alarm |
|   | Alarm/Warning rectified but unacknowledged |
|   | Alarm/Warning responsibility transferred |
|   | Alarm/Warning silenced for 30 seconds |

| | |
|----------|---------------------------------|
| S | Simulate mode |
| M | Mute Mode (see options section) |

| | |
|-----|--|
| V | Volts |
| DC | Direct Current (for voltage) |
| CAM | Central alarm management |
| INS | Integrated navigation system |
| LAN | Local area network |
| SFI | System function identifier, from standard IEC61192-450 |
| UDP | Data sent on the LAN ports |
| MAC | Unique system identifier for LAN system |
| IP | Internet protocol address, unique in the network |