

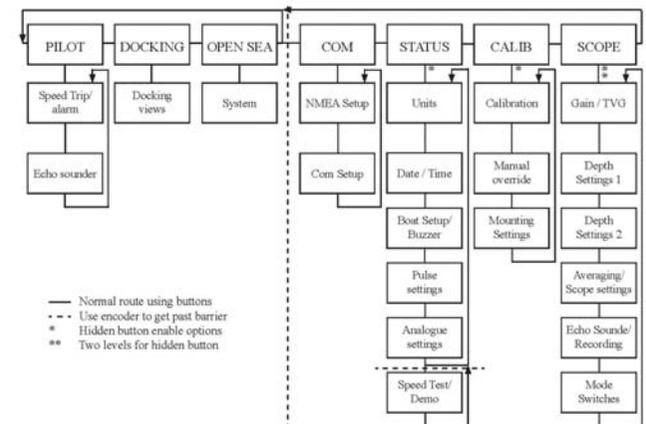
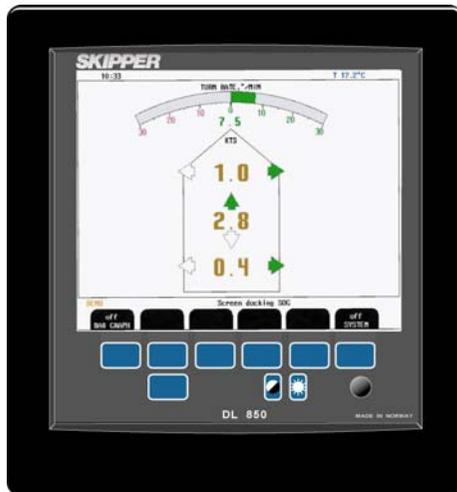


The DL850-540(D) SAM-4682/3 (RevA)



Doppler Log

Diagnostics guide



Basic diagnostics of a skipper DL850

Every component in a system has potential to fail. This guide gives an oversight of how to locate the general area of a hardware problem with the DL850. The main failures are covered, this covers about 95% of the errors found. The aim being that the correct replacement parts can be specified and changed.

Failures covered:

- Broken transducer
- Cable (communication) errors
- Transceiver card failures.
- Display unit failures

Note the calibration settings.

Turn off unit for at least 30 seconds, turn on pressing softkeys 1 and 5 at the same time. The unit will perform a reset.

Q: Is the screen black on startup?

Yes (goto 1)

Q: Do you have a Handshake error on the status screen?

Yes (goto 2)

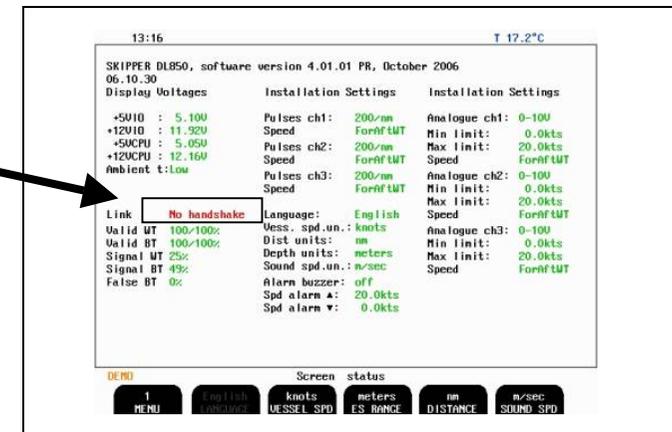
Q: Do you have problems with the system outputs/interfacing?

Yes (goto 3)

Q: Do you have values that are clearly wrong?

Yes (goto 4)

Q: Other problems, contact your distributor.



1 Screen problems:

Check with external monitor –

Q- does it work?

1.1 **Yes, Q:** - If you look closely with a torch, can you see values on screen?

1.1.1 **Yes,** Check the Keyboard card cabling to the inverter. Remove the cable restart display, put cable back.

Errors - Most likely – Keyboard card

Inverter (remember to give inverter and screen serial numbers),

Least likely - Screen backlight – change screen

1.1.2 **No, Q :-** Check the screen cable, Error?

Yes – replace screen cable

No – replace screen (or CPU)

1.2 **No,** Check the voltages on the board,

Check the fan is moving,

Look at LEDS and measure voltage (test pt J701),

test cable connected to J 700

Q: - Are they in spec? (11.5-12.5V) (4.7-5.3V)

Yes. Change the CPU card

No Remove the cables from combo card to external components, If the voltages are still wrong - change the combo card if not contact Skipper.

2 Communication problems 'No handshake'

Check cabling,

Check screw terminals at bridge unit are tight
handshake/cable problem

Check cable from display to transceiver

Q: - Are the cables OK?

Yes – problem with link to transducer

Go to transceiver and check screw terminals are tight on connectors, measure between pins (20 & 21) (21&23) on connectors J502 & 503

Is voltage +/- 9V?

In the transceiver cabinet, connect a cable J17 in Tx J503 to HSINB on the connector to J501

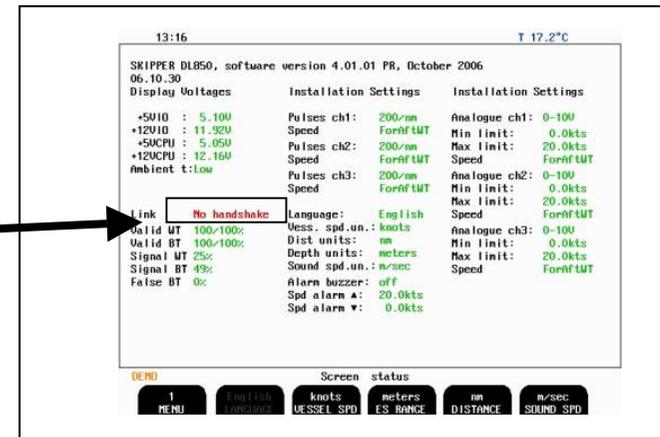
Turn on the power in the transceiver.

Q: - Do the lights start, and continue flashing?

Yes – Problem with Transducer cable or transducer (flooding)

Check the cable is tightened on the transducer head

- Check transducer for damage
- Check inside the transducer for damage/water



3 Comms problems

Q:- Is the problem with the digital in/outputs?

No – see next page

Yes – The problem is with the digital in/outputs

Inputs / Check the spec in the manual, that the port being given the correct signals and levels.

Q: - Do you see the messages in the NMEA window (set to input) ?

- **Yes** but garbled.

Check the baud rate. Try a lower baudrate with loopback

- **No**

Make a loopback for RS422 pins 6-8 and 7-9

Send a message out and look at the input.

Q: -Do you see the message?

Yes

Problem with external device or cabling to unit

No

Make a loopback for rs232 port (short pins 2-3) on the CPU Com 2.

Send an output, and look at the input.

Q:- Does the output signal go into the input screen?

Yes

Problem with cabling from com port or combo-card

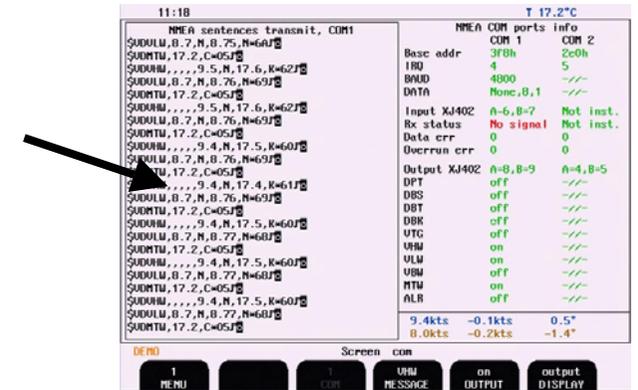
No

Problem with the com port.

Check you have the correct com port,

Restart and recheck,

replace CPU



No – The problem is not with the digital in/outputs

Q: - Is the problem with the analogue outputs?

Yes –

Check status screen to see what set up is for output.

Check cabling to output, remove cabling and measure direct (0-10V) or 4-20mA

Turn on the simulator to get realistic values.

If the values are wrong, the combo card will have to be changed

No-

Problem with the Pulse output?

Q: - Pulses are strong enough?

No – Remove output cable re-measure
if no better replace Combo – card

If better check the attached equipment follows the requirements, try a buffer.

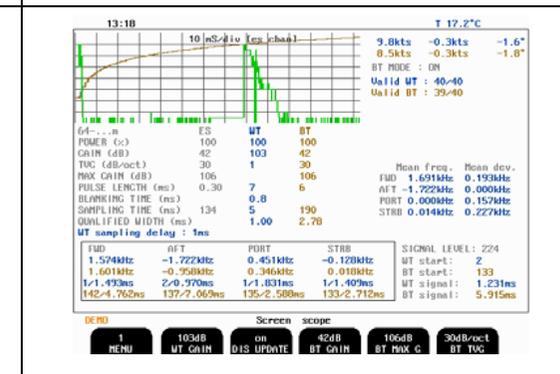
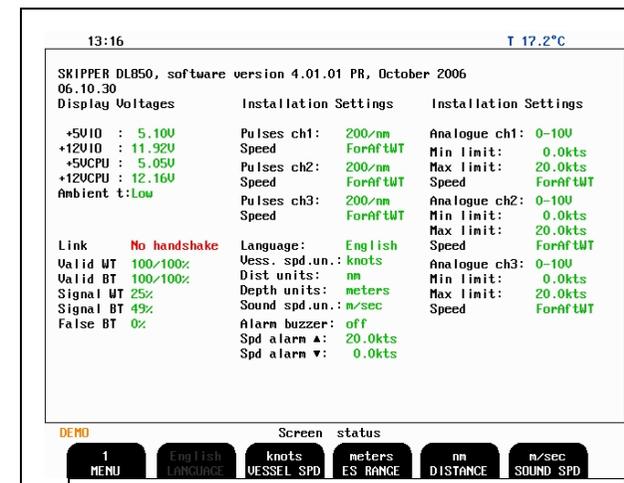
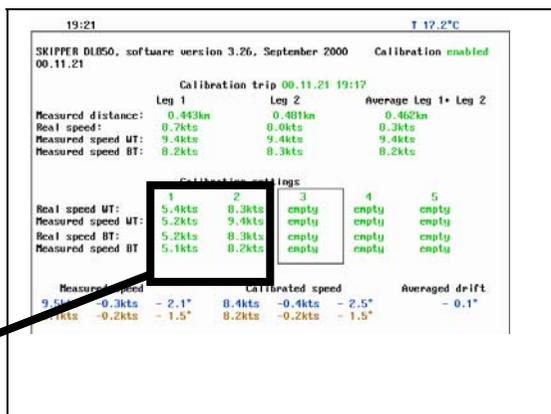
Yes – rate is wrong, check settings.

3 Wrong Values

Check calibration is in place and correct- At least 2 sets of values.

Look at Valid WT and Valid BT if BT is low and WT is high, the water quality can be effecting the system or it is too deep.
If WT is low too, there may be a problem.

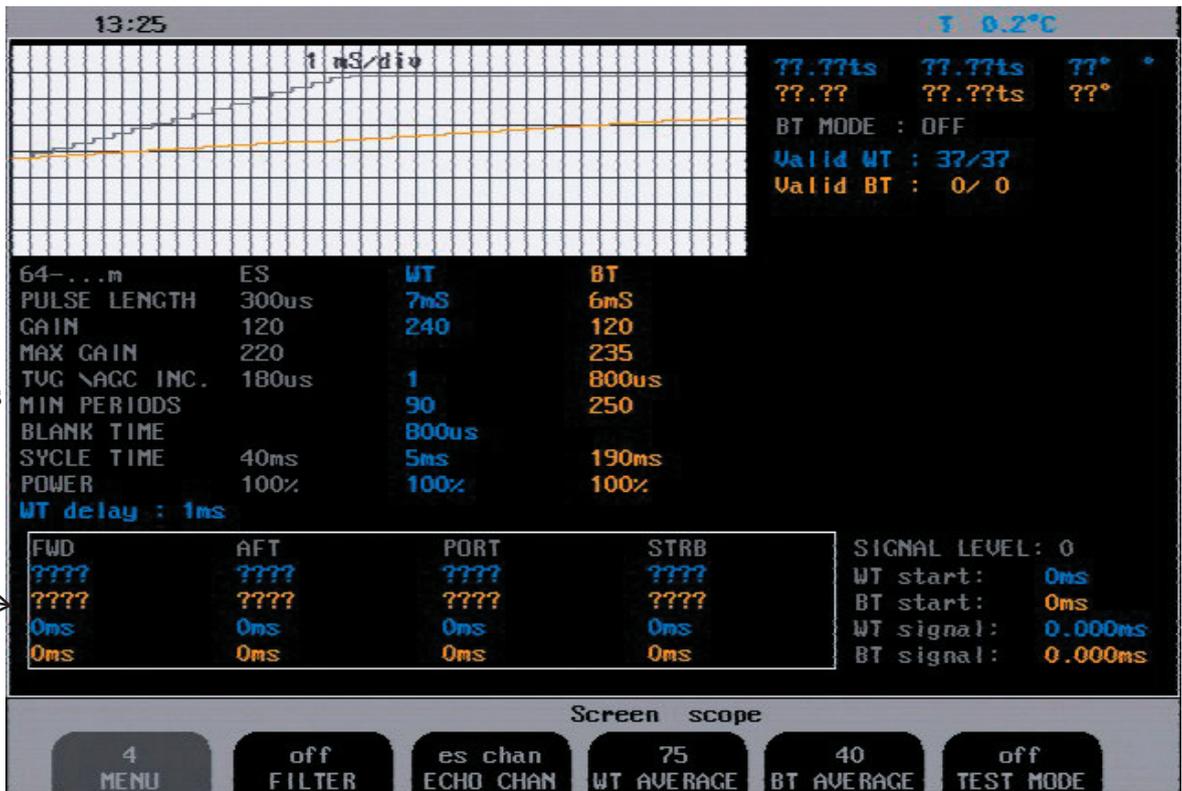
- Check scope screen
- Q:- Is temperature $\leq 0V$ in warmer water? And beams all '????'
 - o Probable cause – 9v failure from transceiver to cabinet, leakage.
 - o **Goto 3.1.**
- Is one of the beams very unstable or just '????', temp OK?
 - o Probable cause - grounding, bad transducer, tx card failure
 - o **Goto 3.2**
- Are a number of beams unstable or '????', temp OK?
 - o Probable cause – Tx card
 - o **Goto 3.3**



3.1 CHECK COMMUNICATION WITH TRANSCEIVER UNIT IN “SCREEN SCOPE”.

3.1 LOST SIGNALS ON ALL CHANNELS.

Questionmark on all channels indicates lost sensor signals before display unit switched on



The questionmarks may also be large -values.

Possible reasons:

+9V in transceiver unit defective.

This can be measured on the power PCB (on the right)

TP201 +9V

TP 202 -9V

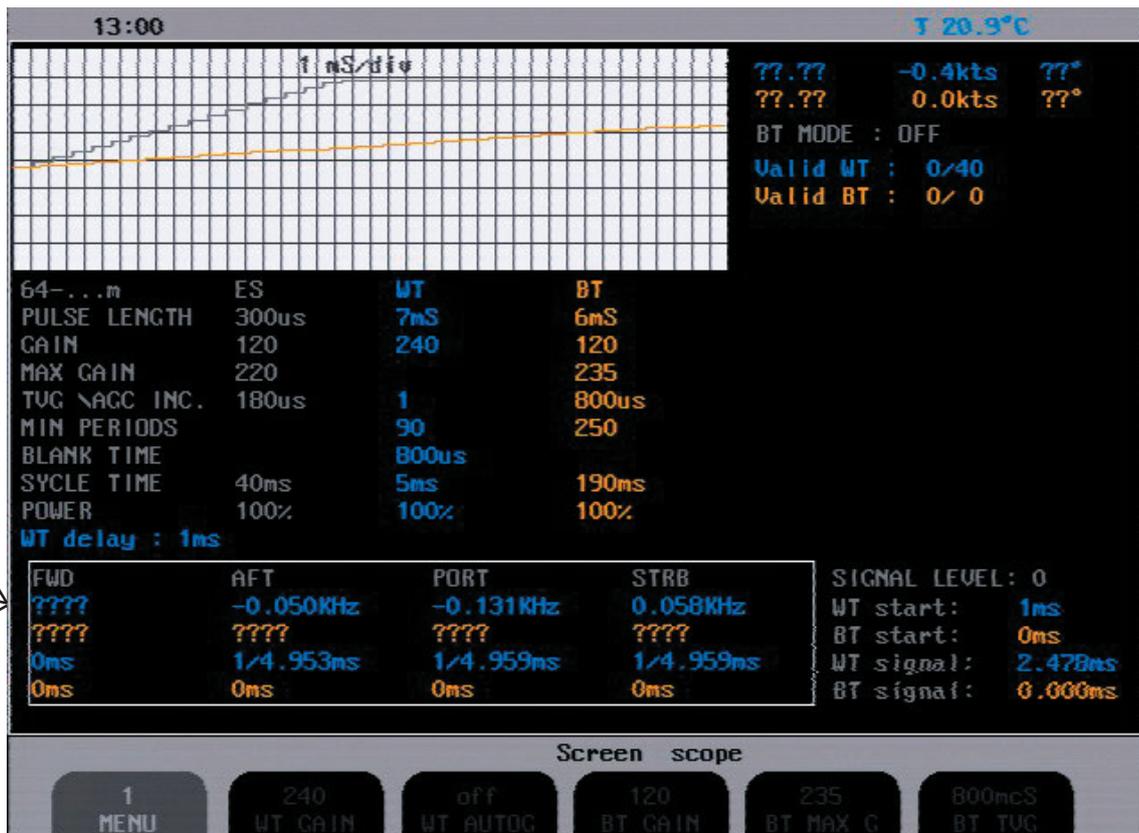
TP200 +5V

Go to “CHECK TRANSCEIVER UNIT”

3.2 CHECK SIGNALS FROM INDIVIDUAL CHANNELS IN “SCREEN SCOPE”.

3.2 SHOW INDIVIDUAL CHANNEL IN SCOPE.

Questionmarks on FWD indicates missing signal from FWD channel.



If one channel is missing or suspected defective please look at scope picture of missing channel compared to other channels.

Scope picture of individual channels are accessed from “Menu 4”



Button 3 is made “active” by pressing the “Hidden button” for 5 seconds, inside the display unit. Press two times untill a “pip” is heard.

Choose channel to be shown in “scope”.

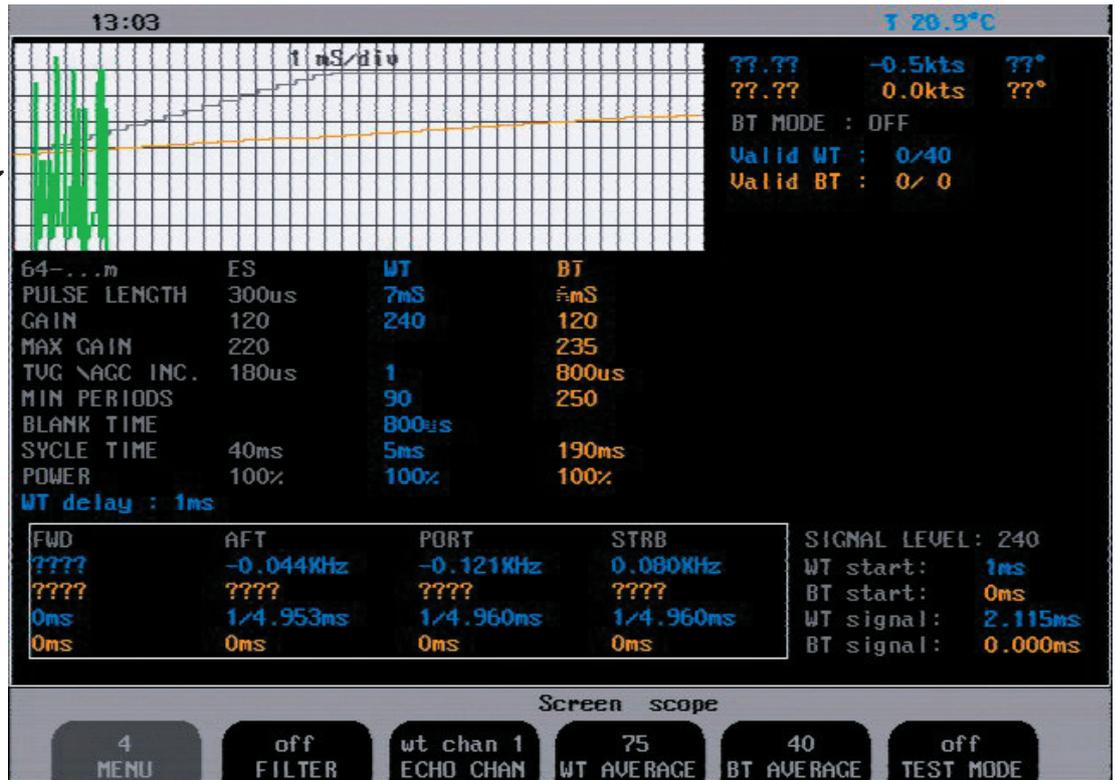


Figure shows noisy signal in chosen channel. May also be very low.

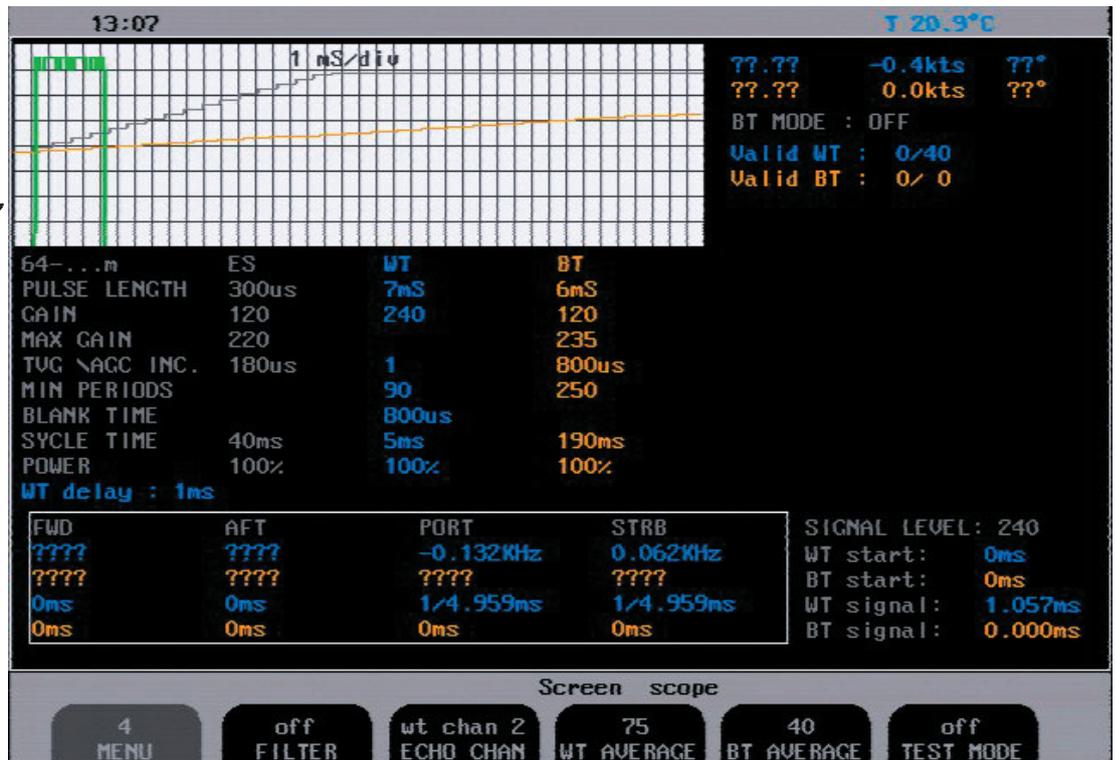


Figure shows normal good signal in chosen channel.

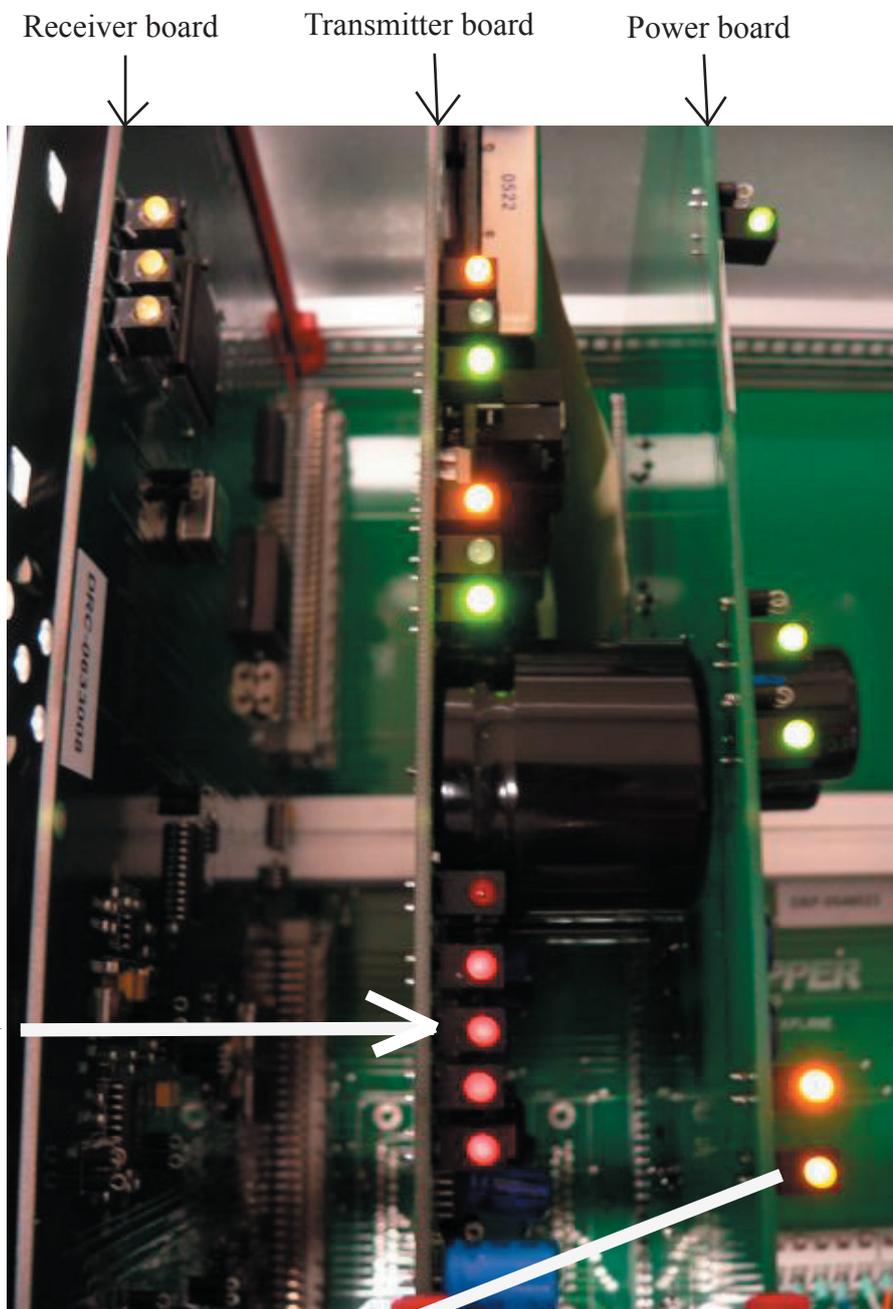
If the channel is weak this can imply a bad transmitter channel, a bad connection or a bad transducer. Check the vessel has not recently grounded.

Continue in section 3.4 check the transceiver unit.

3.4. CHECK TRANSCEIVER UNIT.

4.1 INSIDE TRANSCEIVER UNIT.

Locate the transceiver unit. The transceiver unit is normally placed near the sensor (max 40m, normally 30m)



5 red LED's
indicating signal
transmitted out
on each of the 5
channels.

When transceiver unit is turned "ON", the following LED's wil light.

If only this indicated LED is on, the communications is not operational, check cabling to the bridge unit and try bypassing the handshake. See section 2 (Handshaking)

If the unit flashes on and off (The green LADs (200,201,202,100,101)) there is a power problem possibly in the power card or there is no handshaking. This can indicate a problem in

The cable to the sensor

The power supply to the sensor

Try:

Remove the TX cables to the transducer J503

Retry

if not working remove the 9v supply from both connectors

Retry

Add a handshake cable as described in section 2

If the card starts the problem is in the transducer or cable and needs inspecting. see 3.5

If this does not help the problem is in the transceiver unit.

If possible replace the Power card.

If this does not work replace the Tx card

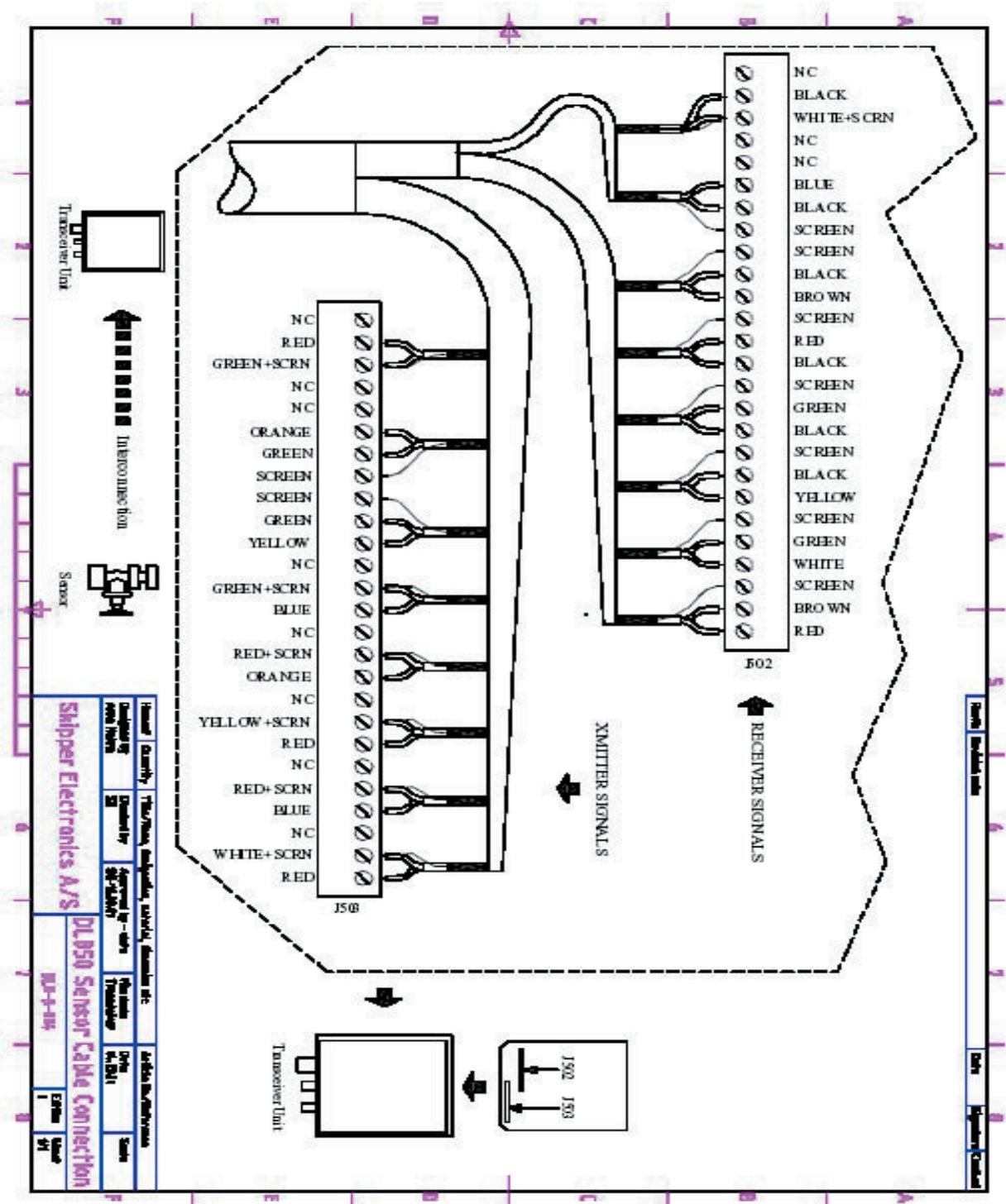
Communications may be failing in the combo card in the display unit.

If you do not have these cards available you may perform further diagnostics using a scop as shown in section 3.5

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3.5 CHECK TRANSCEIVER UNIT WITH OSCILLOSCOPE.

TRANSMITTER SIGNAL LOCATIONS.



Signals from transceiver unit to sensor may be found on “xmitter signal” connector.

Channel FWD:

Channel AFT:

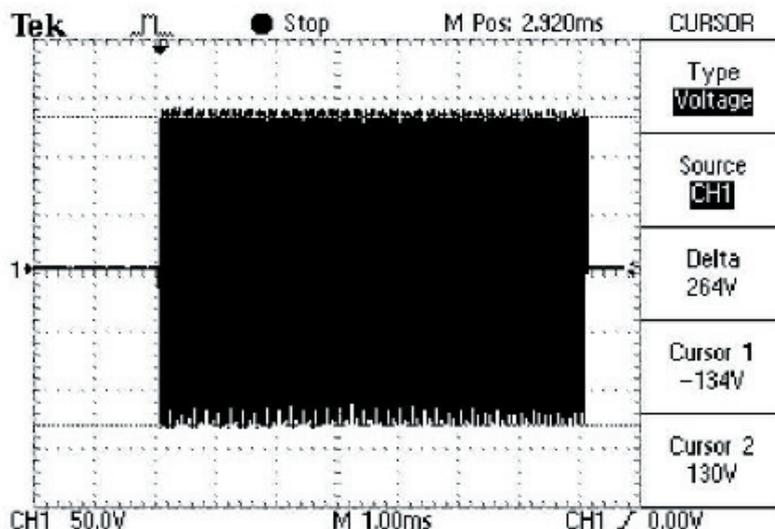
Channel PORT:

Channel STARBOARD:

Channel ECHO SOUNDER:

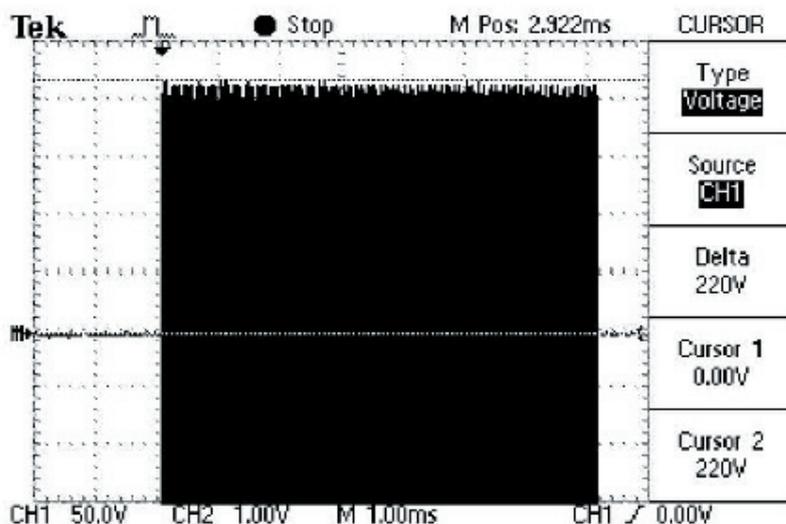
TRANSMITTER SIGNALS. OSCILLOSCOPE IMAGES.

Normal signal.
264V p-p +/- 15%



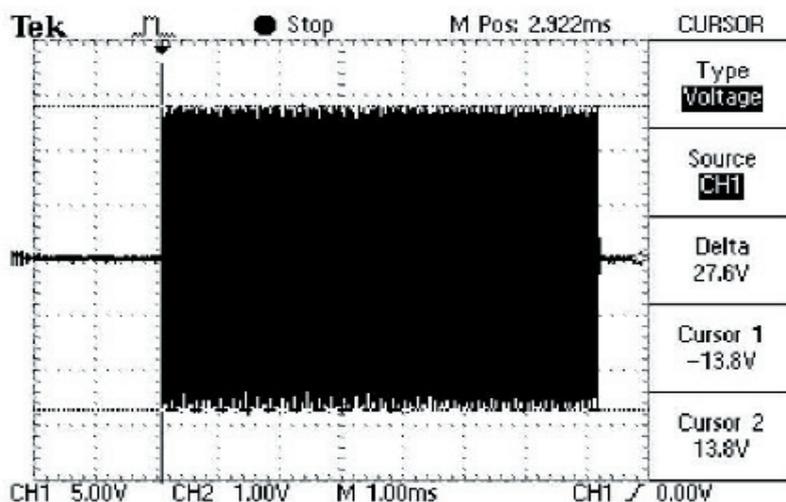
TDS 224 - 13:43:07 23.11.2006

Open circuit.
440V p-p



TDS 224 - 13:52:47 23.11.2006

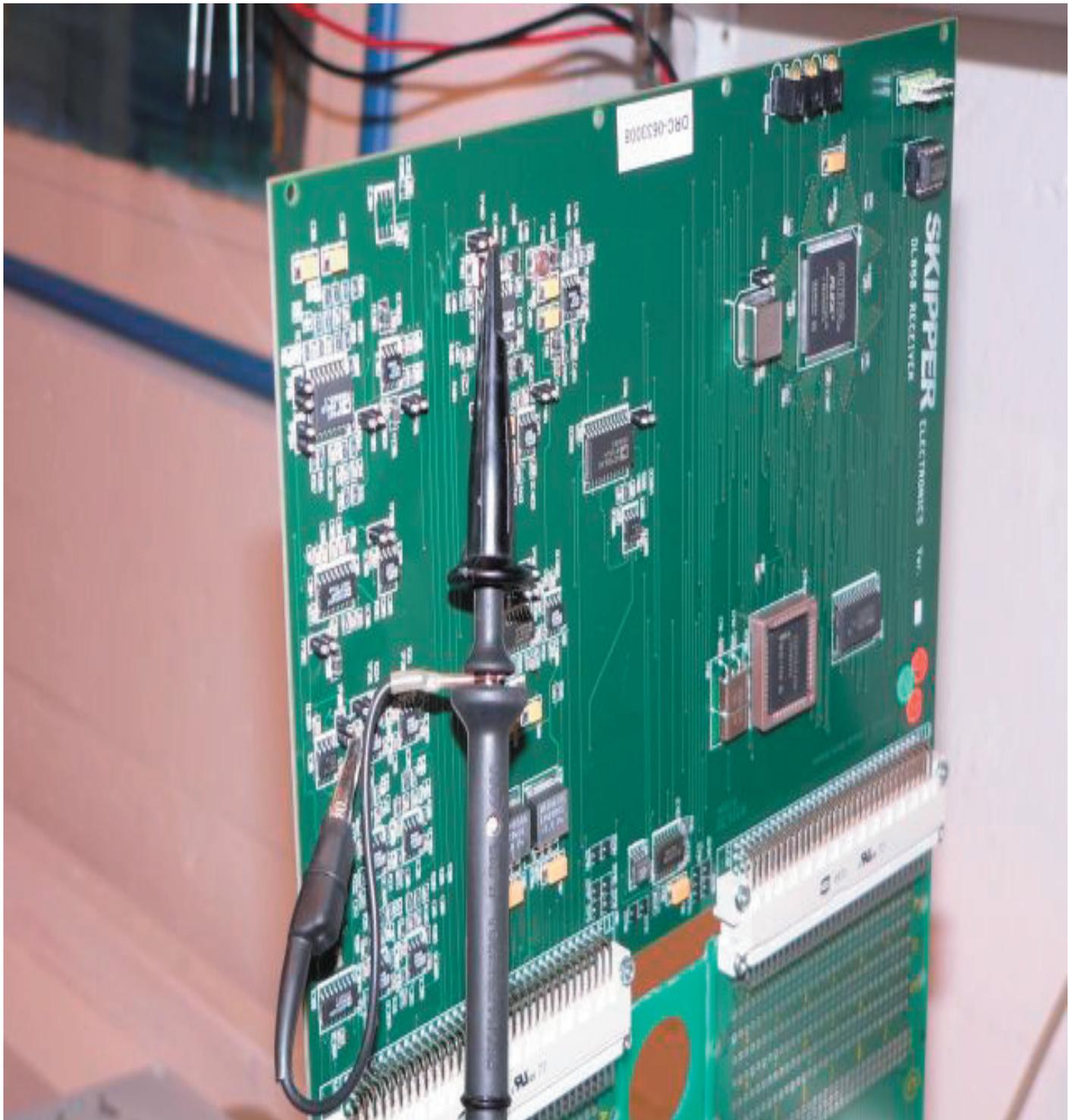
Short circuit in sensor
Element.
27V p-p
Can range from
0V-70V p-p



TDS 224 - 13:56:21 23.11.2006

3.5 RECEIVER SIGNALS LOCATION

Signal from sensor to receiver board is located on TP402 on receiver board.



Check the individual TX channels. If a channel is open or short circuit

Check the screw terminal,.

Check the connector onto the transducer

Check inside the sensor housing (can be done in situ)

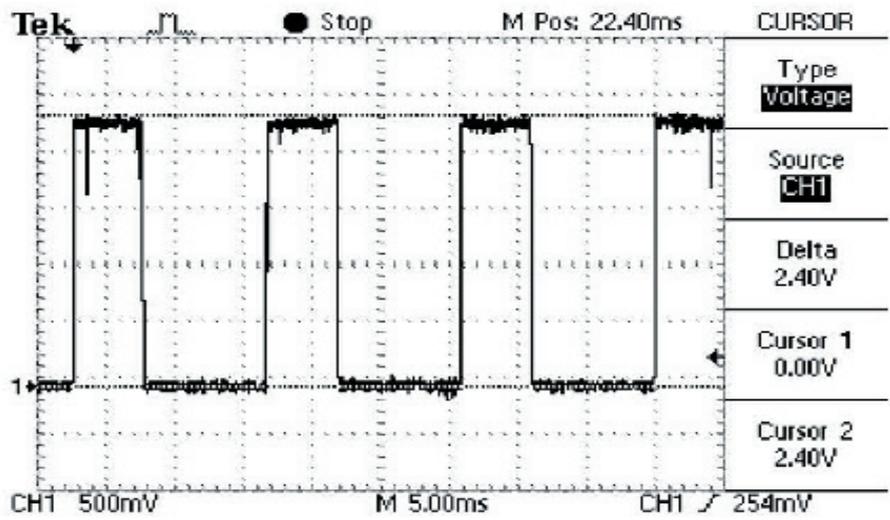
Remove the transducer unit and check the face. for damage.

Damage, however slight, implies a collision with the seabed or with an object. The transducer may be damaged.

If the signals are normal continue to section 3.6

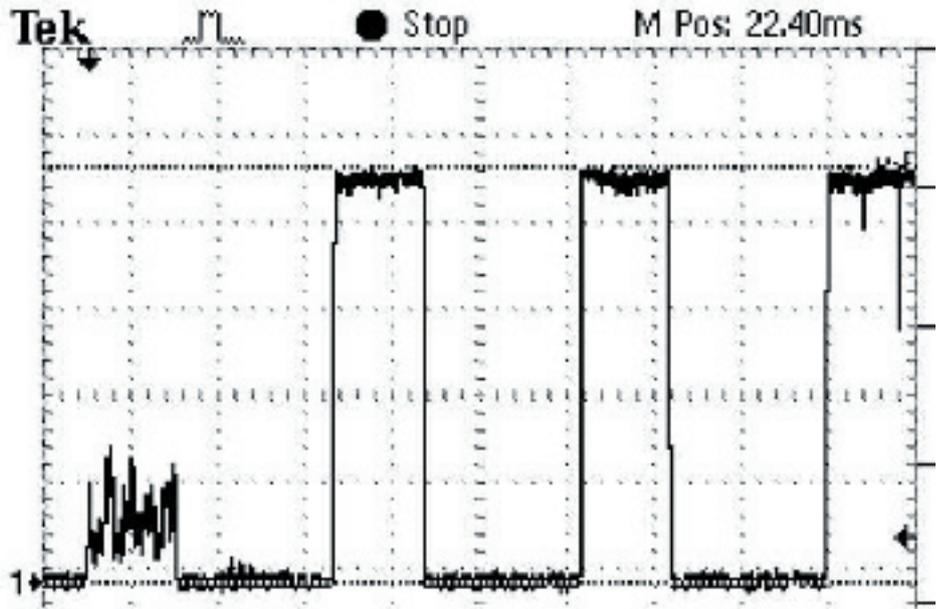
3.6 RECEIVER SIGNALS. OSCILLOSCOPE IMAGES.

TP402
All channels OK 2,4V

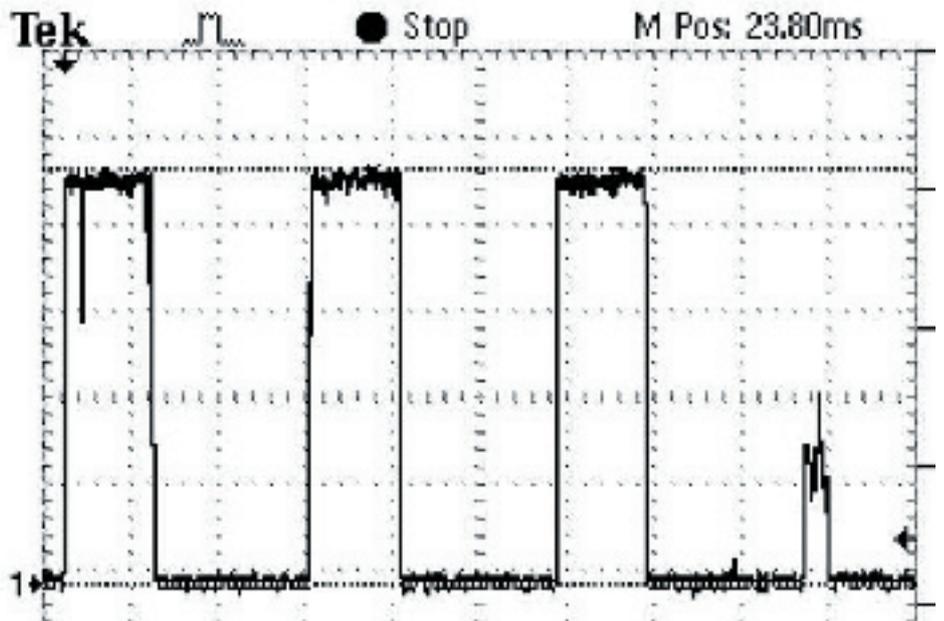


TDS 224 - 14:07:13 23.11.2006

TP402
FWD channel defective



TP402
PORT channel defective



3.5 cont.

If one of the receiver channels is damaged, check the cable, the sensor PCB and the sensor head for physical damage.
Change the sensor PCB.

If the problem is not found, contact skipper.

