Service data bulletin

Instrument: DL850 540 kHz
SDB: Trouble shooting guide

Date: 24.11.2006
Created by: Geir Theodorsen

TROUBLE SHOOTING GUIDE
DL850 540 kHz

CONTENTS

1 BASIC DIAGNOSTICS OF A SKIPPER DL850

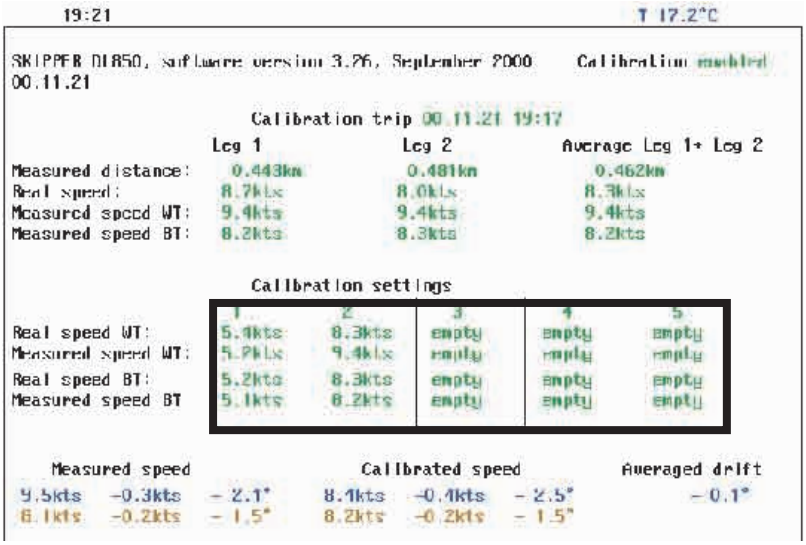
Every component in a system has potential to fail. This guide gives an oversight of how to locate the general area of a hardware problem with the DL850. The main failures are covered, this covers about 95% of the errors found. The aim being that the correct replacement parts can be specified and changed.

1.1 Failures covered:

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

1.2 Initial diagnostics

Note the calibration settings in Screen calibration.



Calibration sceen

Turn off unit for at least 30 seconds, turn on pressing softkeys 1 and 6 at the same time. The unit will perform a reset.
If calibration datas are lost after reset please insert old settings. (Instructions in operational manual)

Q: Is the screen black on startup?
Yes (goto Section 2)
Q: Do you have problems with the system outputs/interfacing?
Yes (goto Section 3)
Are speed signals completely lost?
Yes (goto Section 4)
Q: Do you have values that are clearly wrong?
Yes (goto Section 5)
Q: Other problems, contact your distributor.

2 SCREEN PROBLEMS:

Check with external monitor

VGA terminal for for external PC monitor

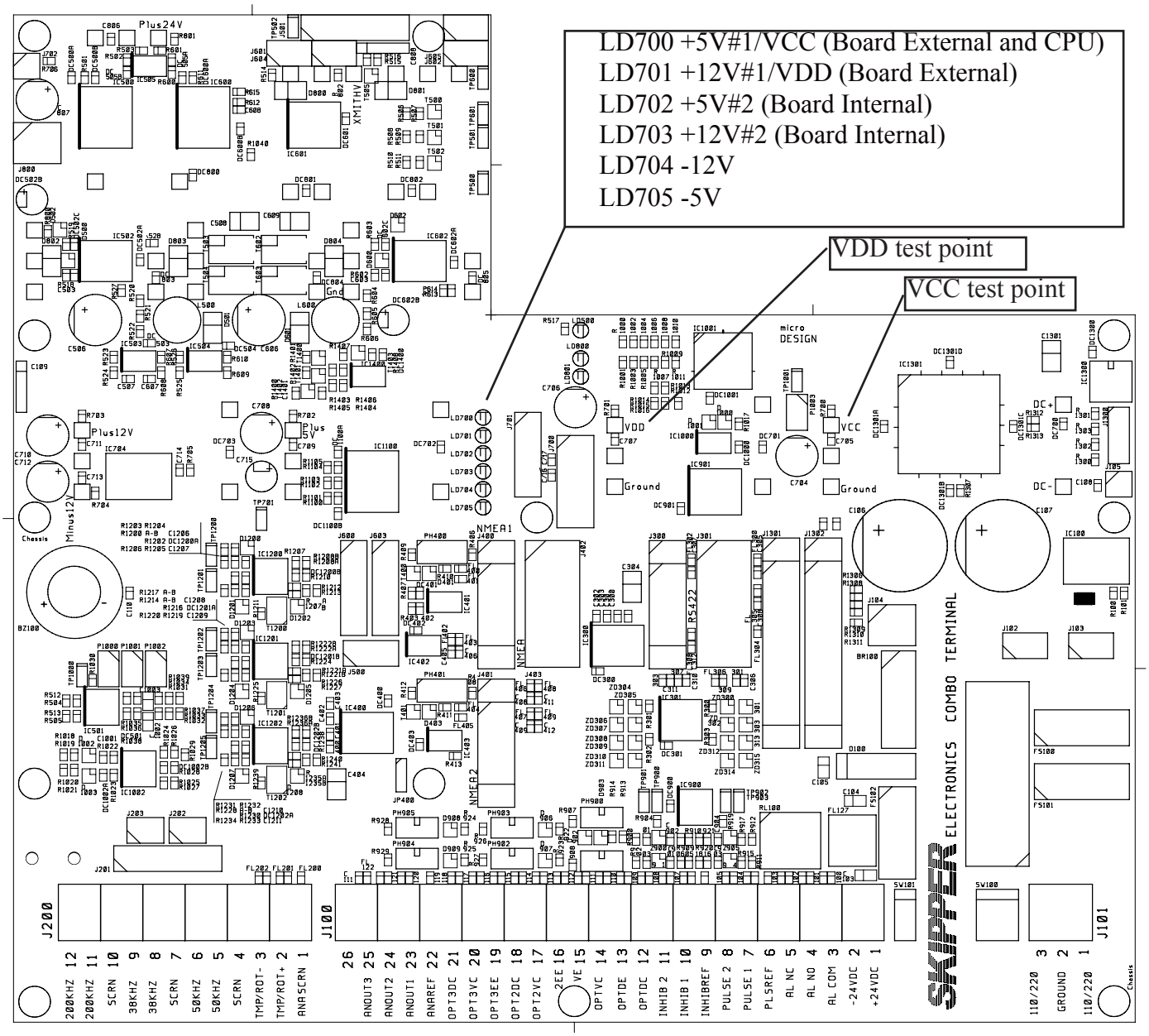
EXTERNAL MONITOR WORKING

Yes, Change Screen Subassembly.

EXTERNAL MONITOR NOT WORKING

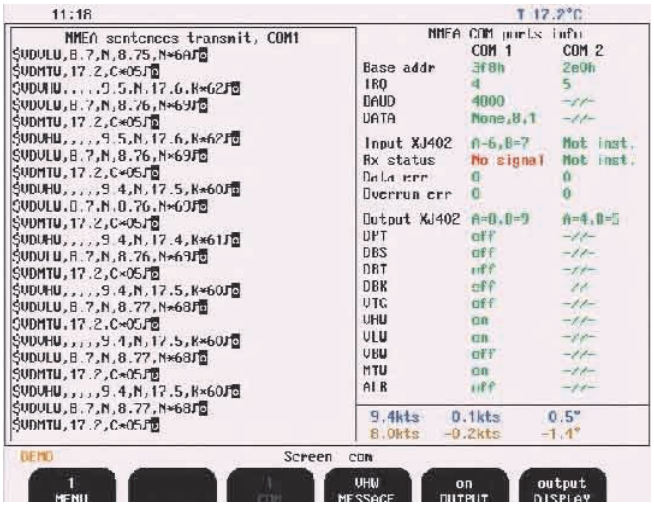
Check the voltages on the Combo terminal board,
Check the fan is moving,
Look at LEDS and measure voltage VCC and VDD
Q: - Are they in spec? (11.5-12.5V) (4.7-5.3V)

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.



3 COMMS PROBLEMS WITH EXTERNAL DEVICES

3.1 Digital input/output (NMEA signals)



Goto Screen com
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

3.2 Analog input/output

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?

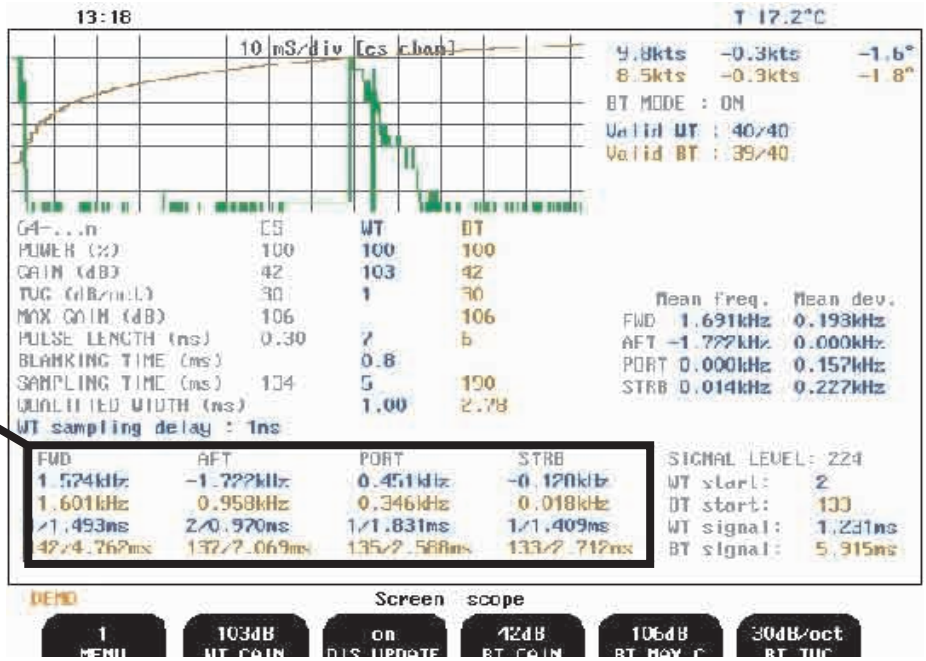
Q: - Pulses are strong enough?
No – Remove output cable re-measure
if no better replace Combo – card
If better check the attached equipment follows the requirements, try a buffer.
Yes – rate is wrong, check settings.

4 NO OR WRONG SPEED VALUES

Goto Screen status
Q: Do you have a Handshake error in screen status ? (Figure 1:Link: No Handshake)
Yes
This indicates no communication between Display cabinet and transceiver unit.
Check cabling,
Check screw terminals at bridge unit are tight
Check cable from display to transceiver.
Check if sensor cable plug is connected to transducer.

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 in transceiver or sensor.

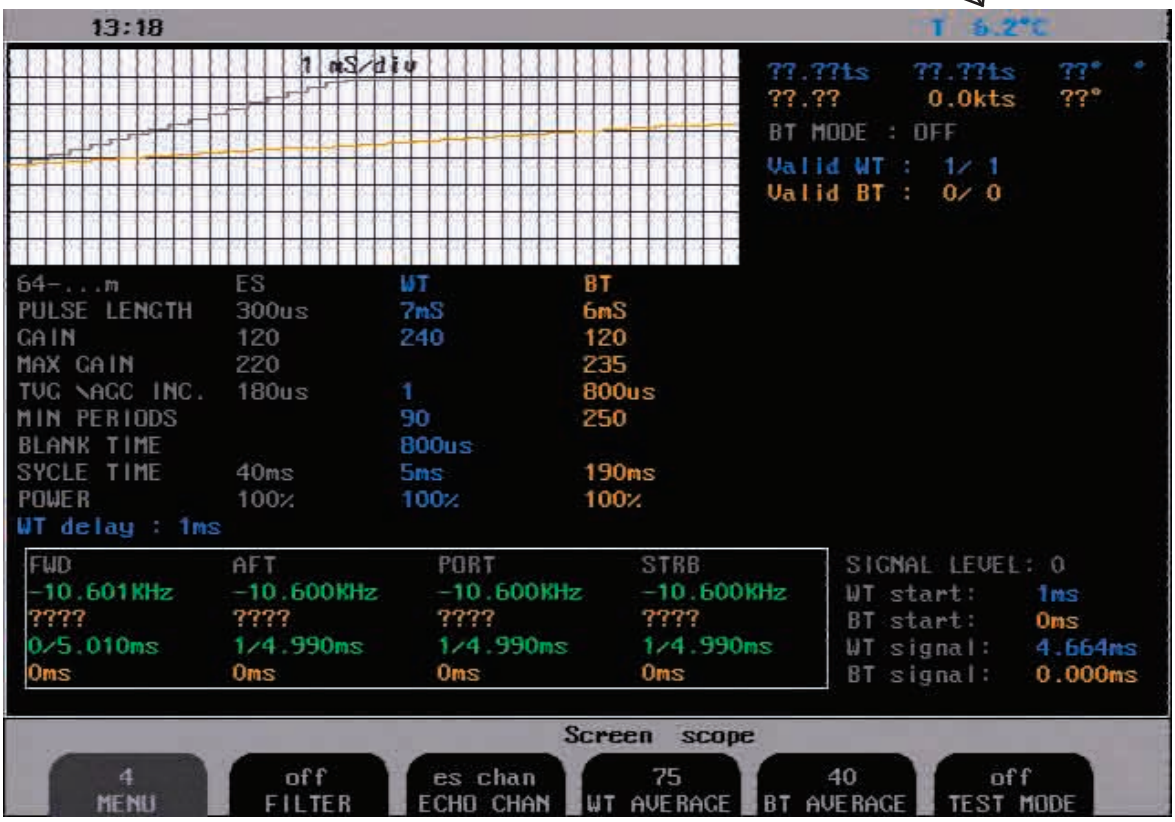
Screen scope.
No errors.
Frequencies at 10 knot



Negative frequencies indicates lost -9V from power PCB in transceiver unit.
At the same time temperature value indicates 0.0deg
Switch unit off, wait 30 seconds and turn on again.
If same negative values/0.0deg temp then check TP202 on Power PCB in transceiver unit.

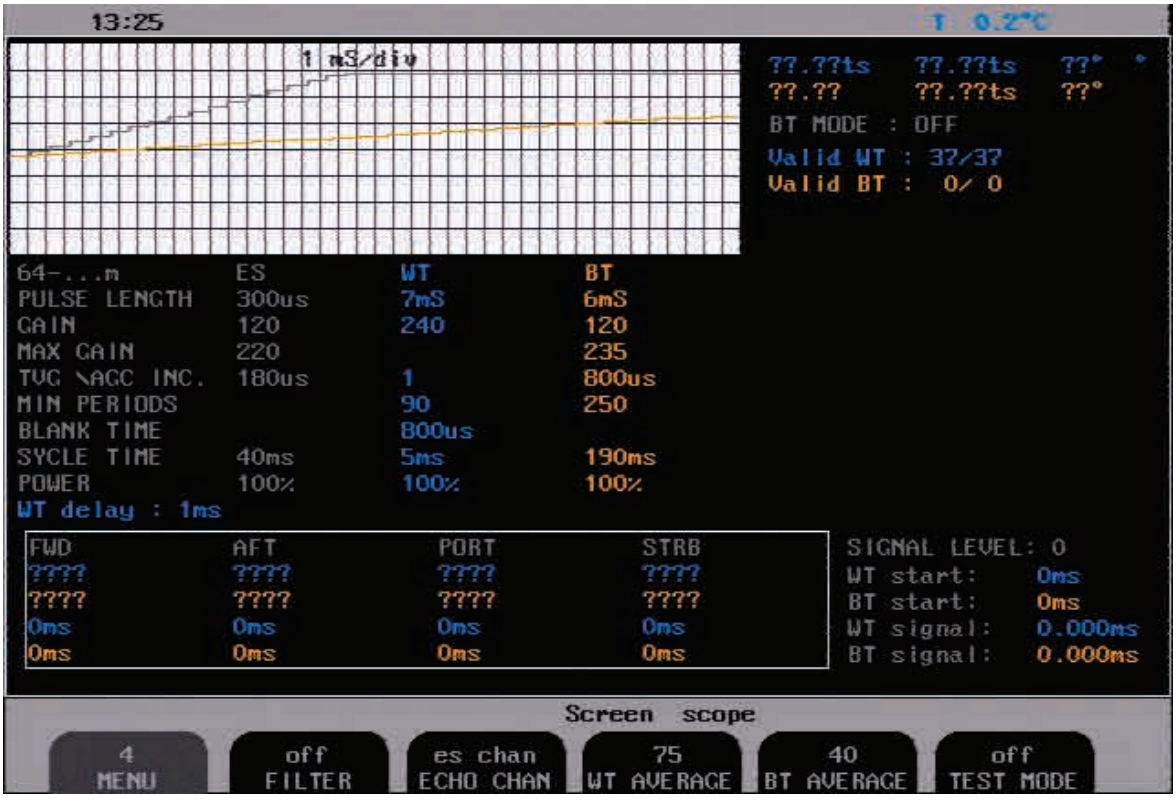
Temperature

Frequencies



Questionmark on all channels indicates either defective +9V on power PCB in transceiver unit or totally damaged sensor.

Switch display unit off, wait 30 seconds and turn on again.
Goto Screen status. Check “LINK”
If lost +9V link indicates: No handshake

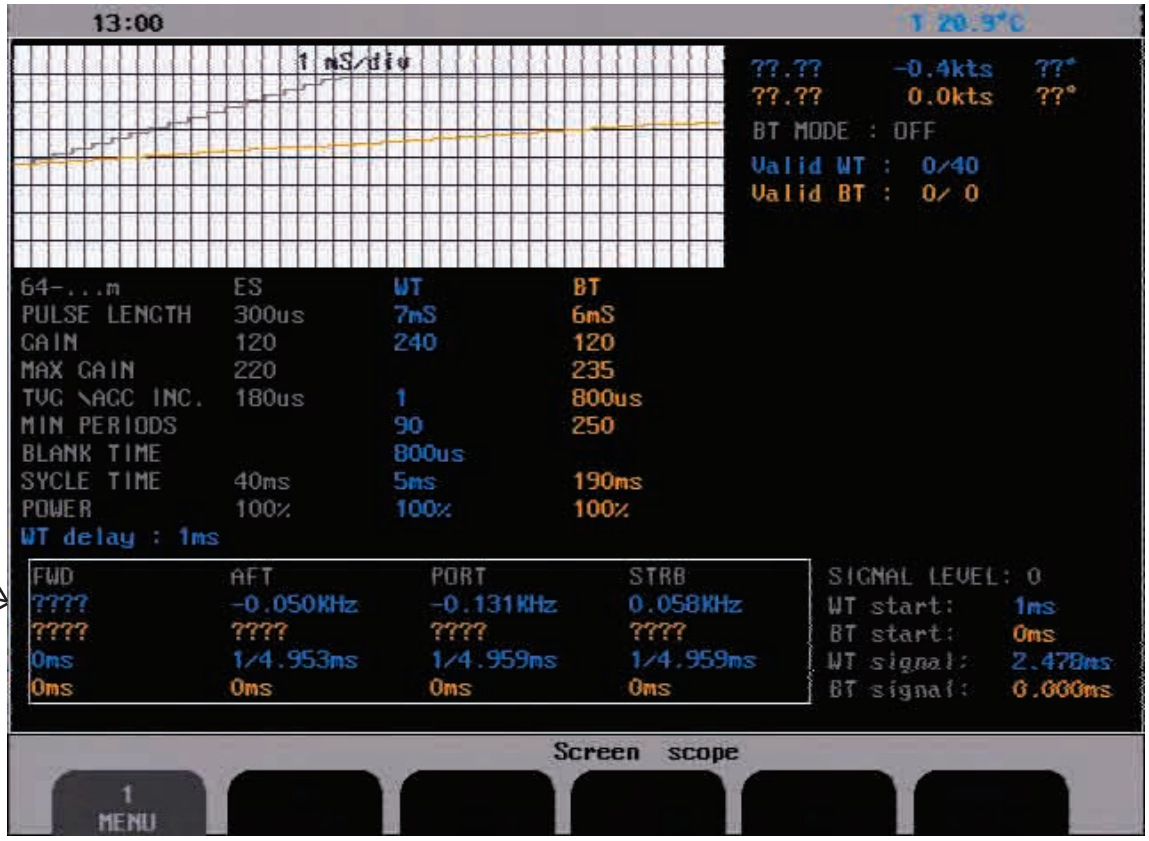


Possible reasons:
+9V in transceiver unit defective.

Go to “CHECK TRANSCEIVER UNIT”

6.2 How to **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” inside the display unit.
Press two times untill a “pip” is heard.

Choose channel to be shown in “scope”.

Note!
Do not forget to enter back to “ES CHAN ECHO CHAN” after testing.
To do that, keep holding keypad and turn encoder (black knob on your right hand side) unclockwice.

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

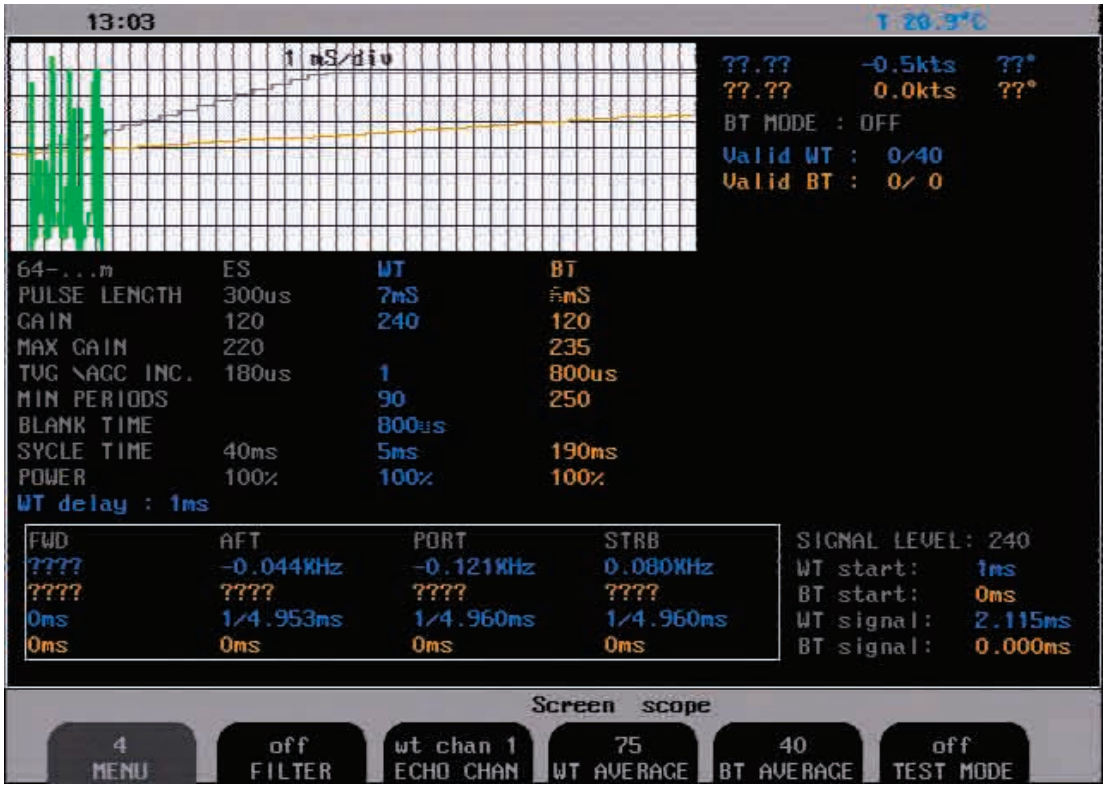
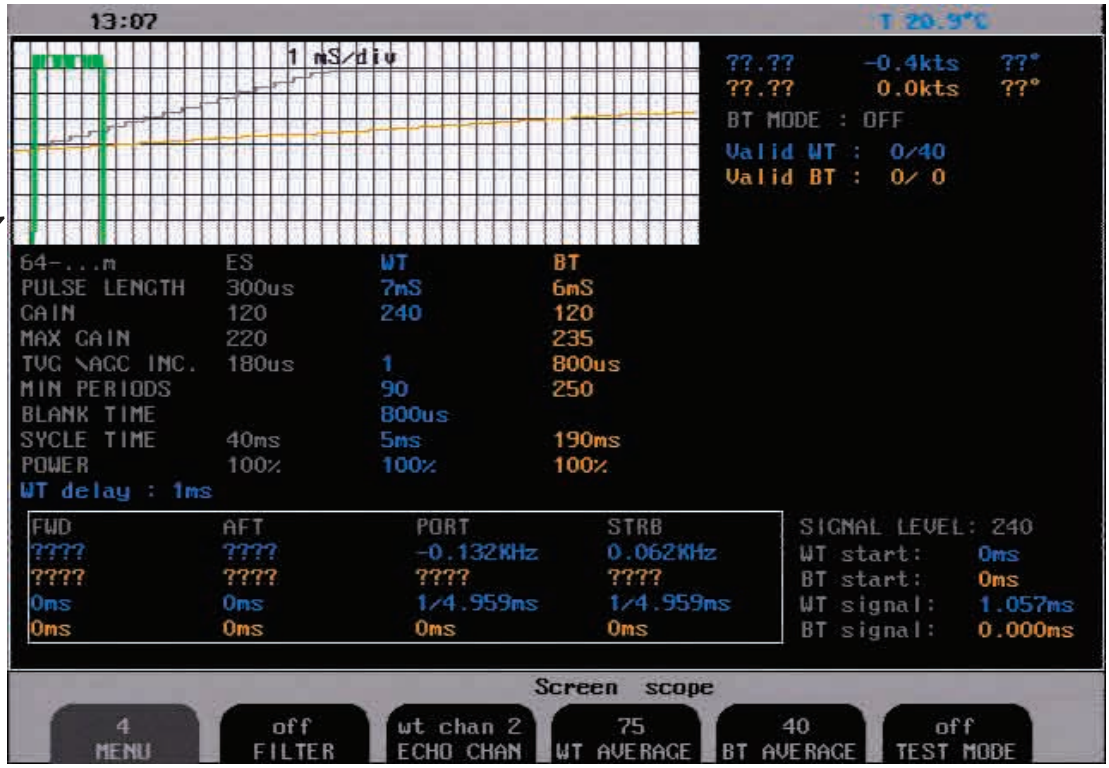


Figure shows normal good signal in chosen channel.

Signal level 240 indicates max signal.



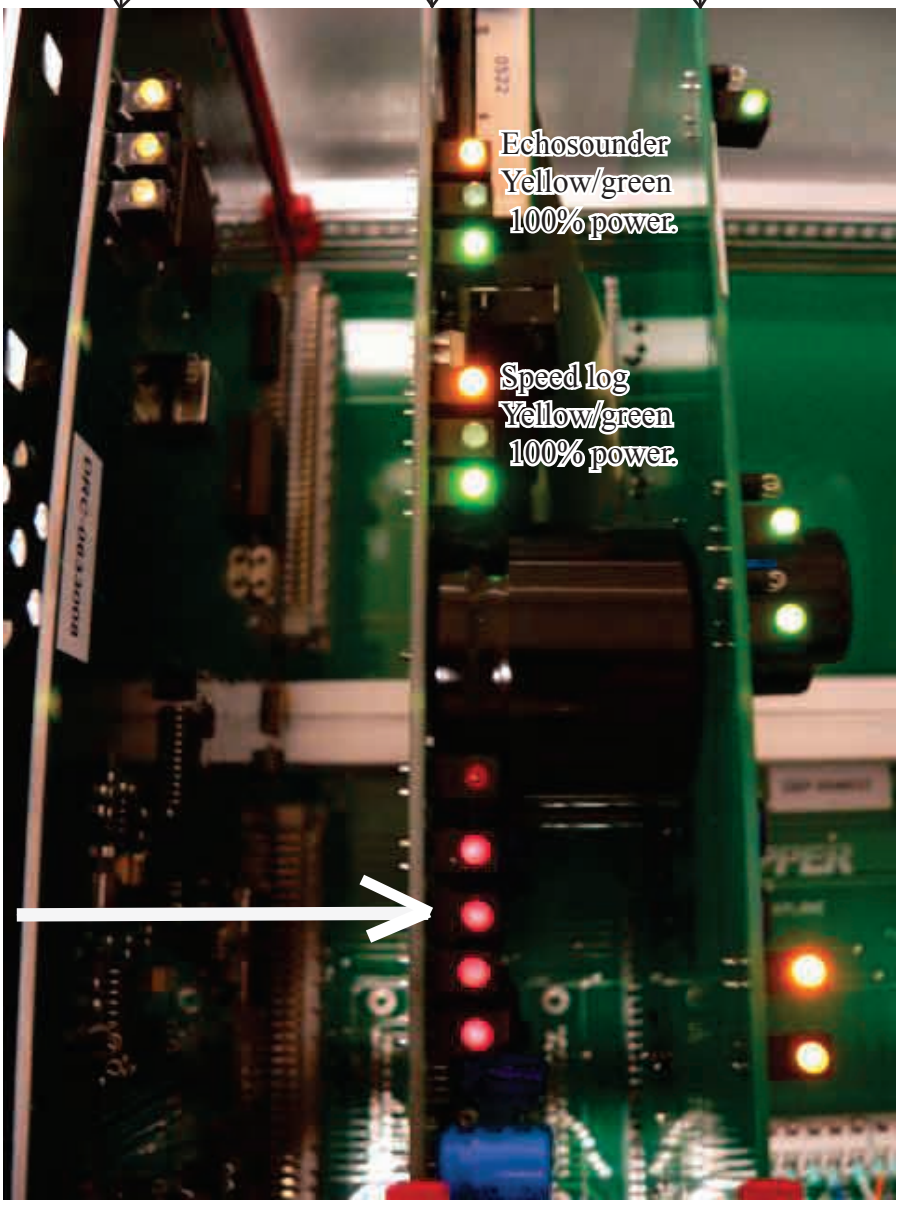
If a channel is weak this can imply a bad transmitter channel, connection, transducer plug or transducer. Check the vessel has not recently grounded.

Continue in section.. Check the transceiver unit

7 CHECK TRANSCEIVER UNIT.

7.1 Inside transceiver unit.

Locate the transceiver unit. The transceiver unit is normally placed ner th senor (max 40m)



LD802
LD801
LD800

LD802/LD801 blinking indicates handshake with display unit

TP200 +5V
LD200 +5V

TP201 +9V
LD201 +9V

TP202 -9V
LD202 -9V

4 red LED's indicating signal transmitted out on each of the 4 channels.

The upper red LED indicates "ES MODE" active.

LD101 System on

LD100 Power On

Check LED's on power board.

If only LED LD100 is on, the communications is not operational, check cabling to the bridge unit and try bypassing the handshake.See section 2 (Handshaking)
If al LEDs (200,201,202,100,101) are blinking there is a power problem possibly in the power card.
This can also indicate a problem in the cable to the sensor or in the sensor.
The power supply to the sensor
Try:
Remove the TX cables to the transducer J503
Retry

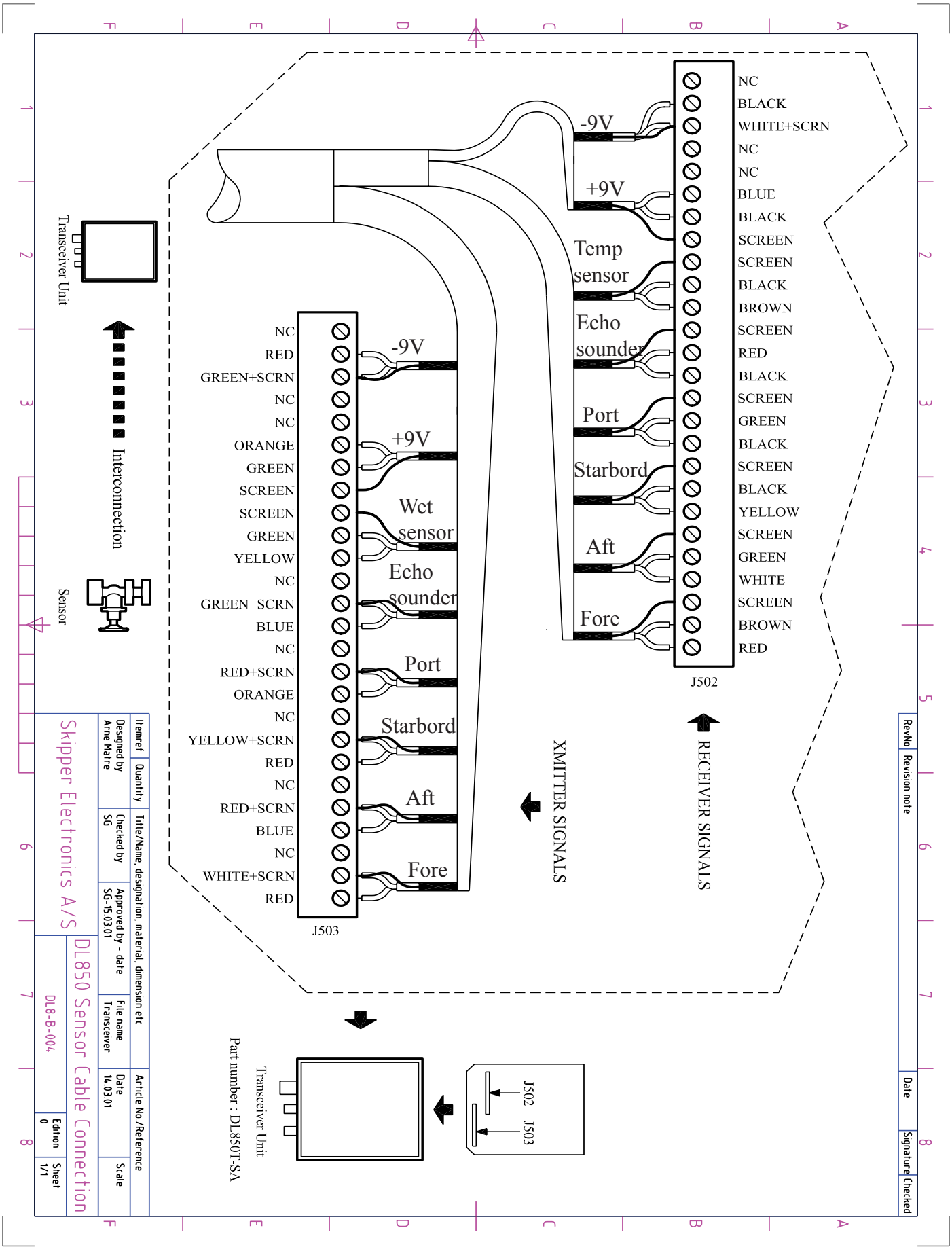
if not working remove the 9v supply from both connectors
Retry
Add a handshake cable as described in section 2
If the card starts the problem is in the transducer or cable and needs inspecting. see 3.5
If this does not help the problem is in the transceiver unit.
If possible replace the Power card.
If this does not work replace the Tx card
Communications my 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
I

Check red LED on transmitter board.
If all are blinking.

Check LED's on receiver board.

8 CHECK TRANSCEIVER UNIT WITH OSCILLOSCOPE.

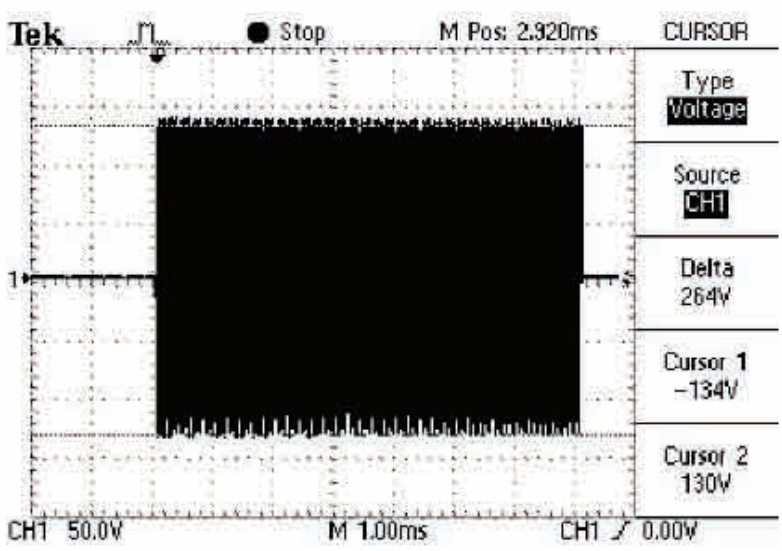
8.1 Signal locations.



8.2 Transmitter signals. Oscilloscope images.

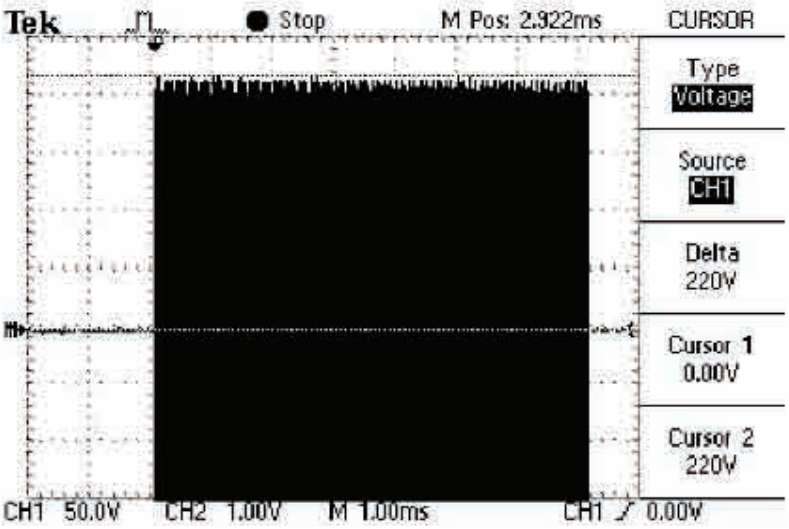
Signal from transmitter board to sensor is located on J503 on mother board in transceiver unit.
Fore, aft, starbord and port.

Normal signal.
264V p-p



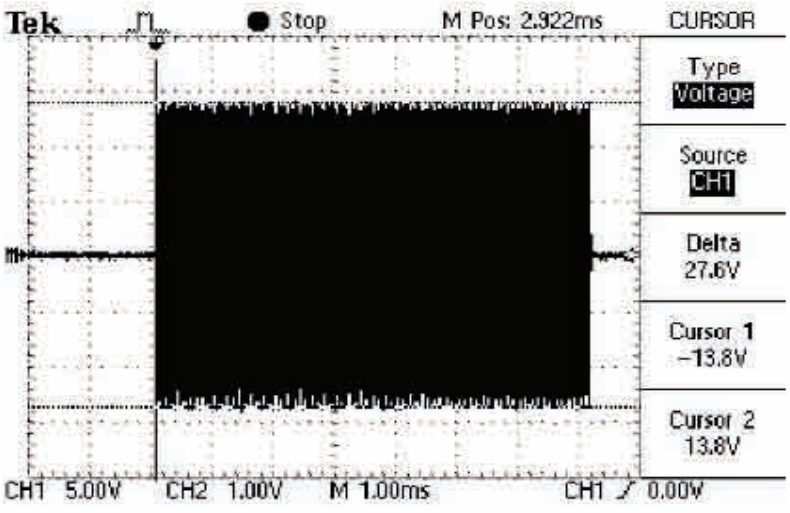
TDS 224 - 13:43:07 23.11.2006

Open circuit.
440V p-p



TDS 224 - 13:52:47 23.11.2006

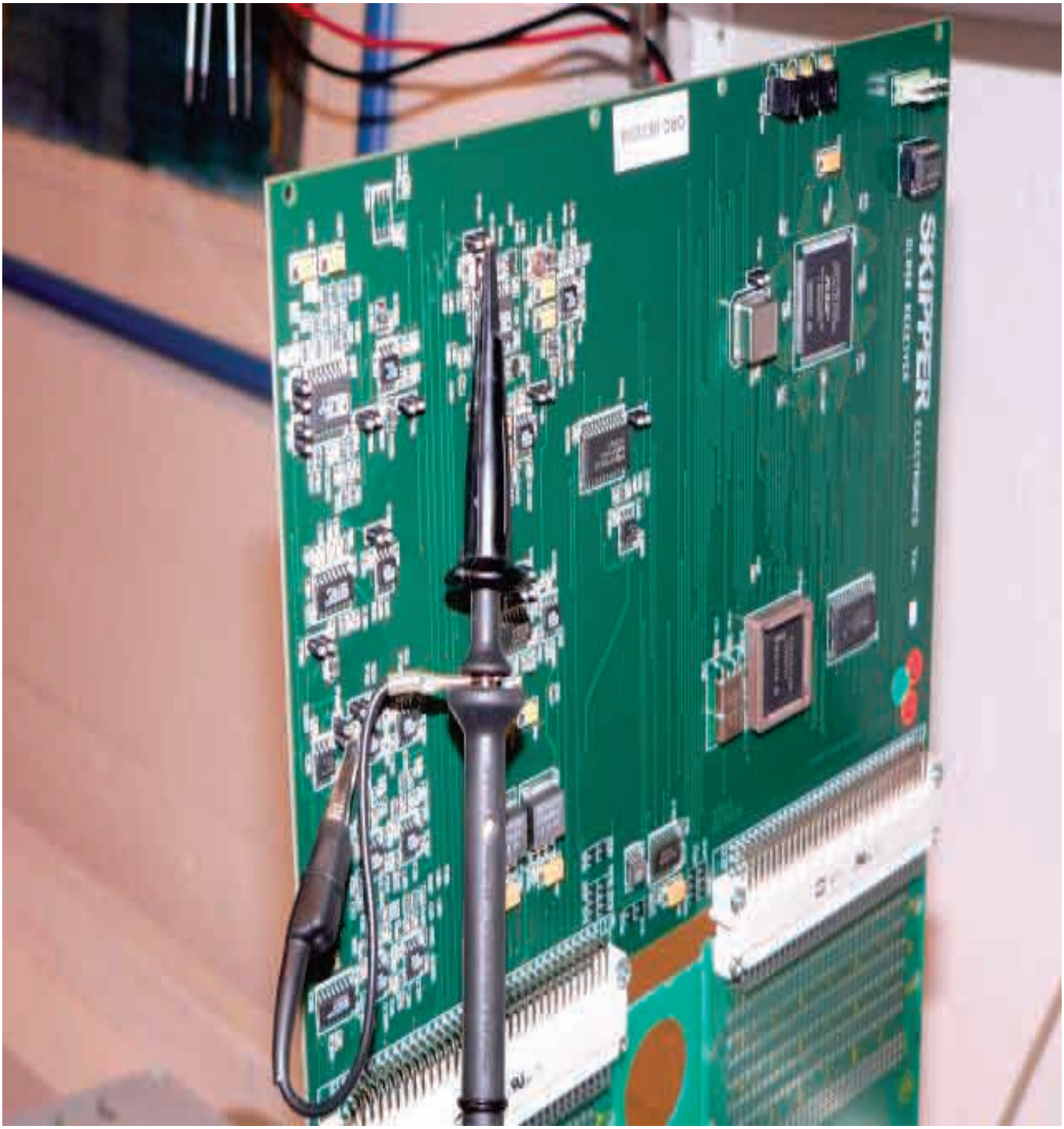
Short circuit in sensor.
27V p-p



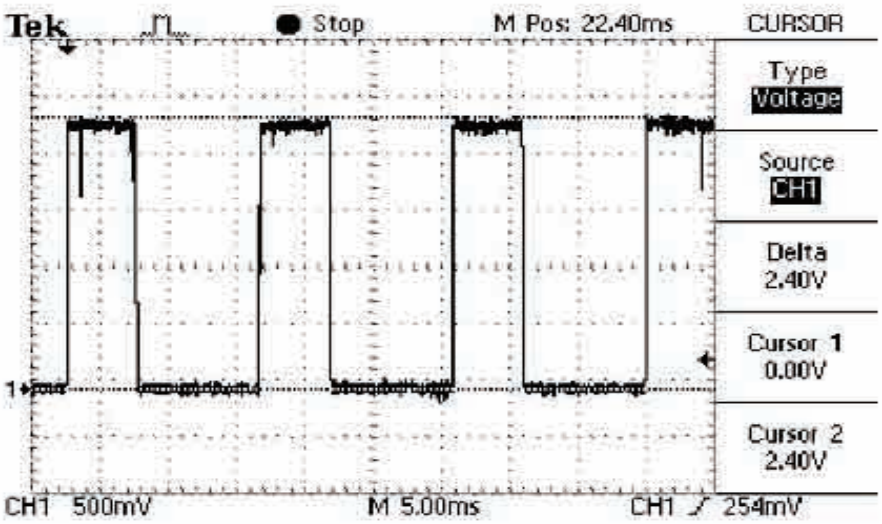
TDS 224 - 13:56:21 23.11.2006

8.3 Receiver signals location

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

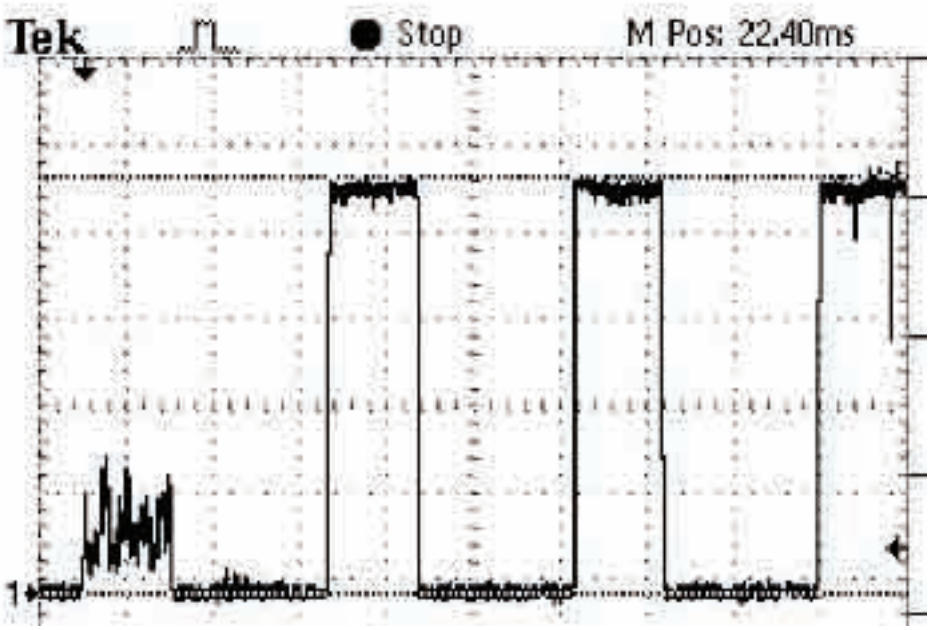


TP402
All channels OK 2,4V



TDS 224 - 14:07:13 23.11.2006

TP402
FWD channel defective



TP402
PORT channel defective