

TEST & SPECIFICATIONS

Form No. 727, Oct 2007

Layout No: Product: Seaguard RCM SW

Circuit Diagram No: Serial No: 1733

Component	Serial No.	Remarks
Main Assembly Seaguard 9340	2297	
DCS 4830	147	
Oxygen Optode 4330	2188	
Multipunktskalibrert 4330	2188	Attached on a separate PDF on this CD

1.

Visual and Mechanical Checks

- 1.1. Sensors fixed in correct position
- 1.2. Watertight receptacle and plugs connected
- 1.3. HUB connectors connected to main board
- 1.4. Pressure sensor filled with oil
- 1.5. Epoxy coating intact
- 1.6. Zinc anode installed
- 1.7. O-ring groove inspected, cleaned and greased

2. Pre-performance Setup

- 2.1. Hardware and sensors configured
- 2.2. Sensors detected and displayed in configuration wizard
- 2.3. Analog channels configured if used
- 2.4. Touch screen calibrated
- 2.5. Battery indicator calibrated
- 2.6. SD card operation
- 2.7. S-Flash operation
- 2.8. USB Connection to PC(only if installed)
- 2.9. Clock adjusted to correct UTC
- 2.10. Analog switch in correct position

3. Performance test

- 3.1. Clock adjusted to UTC
- 3.2. Current drain after power up (max 130 mA)

20.9 mA 0.59 mA

3.3. Current drain in Power Down Mode (max 1.0 mA)

3.4. Pressure test

- 3.5. Field test and data analysis
- 3.6. Operation of display at 0°C
- 3.7. Operation with test probes on transducers, -5°C to +35°C (all sensors, 16 hours, data on SD)

Windows CE License-Key : 00039-677-515-087

Date: 07 Sep 2015 Sign:

Form No. 728, Oct 2007

Product: Seaguard RCM SW

Serial No: 1733

1. Final Check prior to Shipment: (point 1.1 – 1.10 depending on sensors installed)

- 1.1. Doppler Current Sensor is tested with Test Unit 3731
- 1.2. Temperature readings correspond to room temperature
- 1.3. Conductivity Sensor reads correct with seawater loop
- 1.4. Check that the pressure sensor is oil filled
- 1.5. Pressure Sensor gives correct reading at air pressure
- 1.6. Turbidity reading increases when a reflector is placed 20cm in front of it
- 1.7. The oxygen sensor reads maximum in air
- 1.8. Inspect O-ring groove and clean and grease O-ring
- 1.9. Battery in lower slot,
 - a) Type:
 - b) Open loop voltage: V
 c) Voltage with 100 ohms load: V
- 1.10. Battery in upper slot,
 - d) Type:
 - e) Open loop voltage: V f) Voltage with 100 ohms load: V

Date: 07 Sep 2015 Sign:



Product: Seaguard RCM SW

Serial No: 1733 Date: 01.09.2015 **Certificate No:** 1102601621733

This is to certify that this product has been pressure tested with the following instrument, and we confirm that no irregularities were found during the test:

Autoklav 800 bar - sn: 0210005

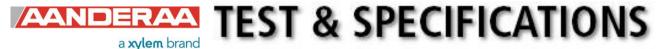
Pressure readings:

- 1 obs 41 o 1 o 44 d 11 o 5 o 5 o 5 o 5 o 5 o 5 o 5 o 5 o 5				
Pressure (Bar)	Pressure time (hour)			
30	1			

Date: 01 Sep 2015 Sign:

Astrid Fjeldtvedt, Production Engineer

Fredhor



Oct 2014

Product: Seaguard RCM SW

Serial No: 1733

License:

Analog Sensors(31 Aug 2015): **5493-4743-3259-9254** AADI Real-Time(31 Aug 2015): **9337-1147-7267-4729**

Date:31 Aug 2015 Sign:



4.13 Data collection test

TEST & SPECIFICATIONS

Serial No: 2297

Form No. 776, Jul 2008

Product Name: Main Assembly Seaguard 9340

Main Board Seaguard 9341 Serial No: 2297

Main Board tested according to form 773

1. Visual component check prior to assembly in covers

2. Initial hardware test after bootloader and image loaded and display added	
2.1 Current drain after bootloader start-up (max 70mA)	24.00mA
2.2 Current drain with image loaded (max 130mA)	
2.3 Voltage 3.3V (3.3V ± 0.1V)	
2.4 Voltage 1.25V (1.25V ± 0.13V)	
2.5 Check that the SD card is detected and found in application in Control Panel	
2.6 Check that the touch panel responds when the Start button is clicked	
2.7 Check that the S-Flash is present in application in Control Panel	
3. Hardware test with covers	
3.1 Current drain with image loaded (max 130mA)	mA
3.2 Voltage 3.3V (3.3V ± 0.1V)	
3.3 Check that the SD card is detected and found in application in Control Panel	
3.4 Check that the touch panel responds when the Start button is clicked	
3.5 Check that the S-Flash is present in application in Control Panel	
3.6 Check that the USB port is working	
4. Seaguard Main assembly test	
4.1 Current drain with display connected (max 130mA)	19.2mA
4.2 Visual display check	
4.3 Current drain in Sleep Mode (max 350µA)	289.0µA
4.4 Clock setting (check new clock setting after switching power on)	·
4.5 Battery setting (check battery setting after power off)	
4.6 Compact flash storage	
4.7 SD card storage	
4.8 USB connection to PC	
4.9 RS485 connection to PC	
4.10 Power spec test	
4.11 Temperature test	
4.12 Sensor setup test	

Date: 07 Sep 2015 Sign:



TEST & SPECIFICATIONS

Form No. 769, Jun 2008

Layout No:

Circuit Diagram No: 79 Serial No: 147

Product: DCS 4830

Digital Board

1. Tested according to Test Procedure Form 754.

Analog Board

2. Tested according to Test Procedure Form 757.

Complete Sensor

3. Tested according to Test Procedure Form 759.

Performance test and results from Test Procedure Form 759

4. Visual Check

- 4.1. Inspection of o-ring grove.
- 4.2. Pressure tested.
- 4.3. Electrical isolation to flange after pressure test (only 4520).
- 4.4. Communication tested (AiCaP, Rs-232/Rs-422).

5. Current Consumption

5.1. Quiescent, no ping (maximum 265 μA)
 5.2. Total with one ping each second (maximum 14.5 mA)
 13.40mA

6. Compass and Tilt sensor

6.1. Compass calibrated and verified to be within $\pm 2.0^{\circ}$ at 0° tilt and $\pm 3.5^{\circ}$ at 30° tilt.

7. Tilt Compensation

7.1. Tilt sensor calibrated and verified to be within $\pm 1.0^{\circ}$ in the range from $+35^{\circ}$ to -35° on both axes.

8. Performance test

- 8.1. The sensor is tested with Test Unit 3731 during climatic tests to control sensor performance over the whole temperature range.
- 8.2 The direction data is also controlled by changing the direction of the Test Unit 3731.

Date: 20 Aug 2015

Sign:

Halvard Skurre

Halvard Skurve, Production Engineer



Form No. 726, June 2007

Product: DCS 4830 Serial No: 147

Calibration Date: 21 Aug 2015

This is to certify that this product has been calibrated using the following instruments:

Calibration Bath model FNT 321-1-40 ASL Digital Thermometer model F250 Serial: 6792/06

Calibration points and readings:

Parameter: Temperature

Calibration points and readings

Temperature (°C)	0.968	11.896	23.853	35.879	0.000	0.000
Reading (LSB)	2220579	4705731	7618815	10433173	0	0

Giving these coefficients

Index	0	1	2	3	4	5
TempCoef	2.70371E01	3.49954E01	3.79419E00	6.00905E00	0.00000E00	0.00000E00

Date: 21 Aug 2015 Sig

Tor-Ove Kvalvaag, Calibration Engineer

Tor Ove Horlvog



Product: DCS 4830 **Serial No:** 147 **Date:** 01.09.2015

10. 01.07.2013

Certificate No: 110261255147

This is to certify that this product has been pressure tested with the following instrument, and we confirm that no irregularities were found during the test:

Autoklav 800 bar - sn: 0210005

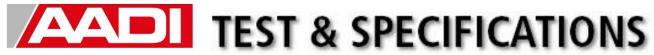
Pressure readings:

Pressure (Bar)	Pressure time (hour)
30	1

Date: 01 Sep 2015 Sign:

Astrid Fjeldtvedt, Production Engineer

Fredhor



a **xylem** brand

Program Version: V4.9.1 **Product:** Oxygen Optode 4330

Serial No: 2188

Visual	and Mec	chanical Checks:
1.1	Solderin	ng quality
1.0	x 7' 1	C

- 1.2 Visual surface
- 1.3 Galvanic isolation between housing and electronics

Current Drain and Voltages:

2.1	2.1 Average current drain at 0.5 Hz sampling (Max.: 33 mA) 22.7		mA	
2.2	CANBus Current drain at 0.5 Hz sampling (Max.: 33 mA)		mA	
2.3	Current drain in sleep (Max.: 180 µA)	121	μΑ	
2.4	CANBus Current drain in sleep (Max.: 180 μA)		μΑ	
2.5	DSP IO voltage, J4.18 (3.3 ±0.15V)		3.31	V
2.6	DSP Core voltage, J4.17(1.8 ±0.05 V)	1.81	V	
2.7	Excitation driver voltage, C4 Analog Board (4.5 ±0.15 V)	4.36	V	

Performance test: Chann		Channel:	Blue		Red	l
3.1	Average of Receiver readings (0±150mV)		-2.9	mV	-1.5	mV
3.2	Standard Deviation of Receiver readings (Max.: 45mV/10mV	V)	1.85	mV	0.49	mV
3.3	Amplitude measm. with non-fluorescence foil (<60mV/650-	1200mV)	12.1	mV	912.4	mV

3.4 CANBus Output test

Functio	on test from 0 to 40°C:	Channel:
4.1	Minimum amplitude measurement (Blue: >550)	mV. Red >650 mV)

4.1	Minimum amplitude measurement (Blue: >550 mV, Red >650 mV)	753.5	mV	685.2	mV
4.2	Maximum amplitude measurement (Blue: <1600 mV, Red <1400 mV)	1217.3	mV	1175.9	mV
4.3	Minimum phase measurement (Blue: >24°, Red: >1°)	34.4	0	8.18	0
4.4	Maximum phase measurement (Blue: <34°, Red: <5°)	41.54	0	8.79	0
4.5	Maximum standard deviation of Phase measurement: (< 0.02°)	0.03	0	0.02	0
4.6	Minimum temperature raw data measurement: (<-200 mV)			.07.0	mV
4.7	Maximum temperature raw data measurement: (>450 mV)			767.5	mV

Sign:

Pressure test:

5.1 Pressure (IW version: 20MPa, DW version 60MPa)

60MPa

Blue

Red

Date: 14 Apr 2015

Vidar Selsvik, Production Engineer



Product: Oxygen Optode 4330

Serial No: 2188 **Date:** 20.04.2015 **Certificate No:** 1068491752188

This is to certify that this product has been pressure tested with the following instrument, and we confirm that no irregularities were found during the test:

Autoklav 800 bar - sn: 0210005

Pressure readings:

Pressure (Bar)	Pressure time (hour)
600	1

Date: 13 Apr 2015 Sign:

Vidar Selsvik, Production Engineer