SIMRAD

Simrad EK80
Scientific echo sounder
Harbour acceptance test

This document explains how to do the Harbour Acceptance Test on the Simrad EK80 Scientific echo sounder.

Customer/Vessel identification
WHOI / NEIL ARMSTRONG

System serial numbers (if applicable)

401925/A

Document information

- **Product**: Simrad EK80
- **Document**: Harbour acceptance test
- **Document number**: 401925
- **Revision**: A
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Warning

The equipment to which this manual applies must only be used for the purpose for which it was designed. Improper use or maintenance may cause damage to the equipment and/or injury to personnel. The user must be familiar with the contents of the appropriate manuals before attempting to operate or work on the equipment.

Kongsberg Maritime disclaims any responsibility for damage or injury caused by improper installation, use or maintenance of the equipment.

Disclaimer

Kongsberg Maritime AS endeavours to ensure that all information in this document is correct and fairly stated, but does not accept liability for any errors or omissions.

Kongsberg Maritime AS
www.kongsberg.com

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Introduction

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Purpose

This is the Harbour acceptance test for the EK80 Scientific echo sounder system.

The purpose of this Harbour acceptance test procedure is to verify that the EK80 installed on the vessel is fully functional and ready for the Sea acceptance test.

After the test is concluded it must be signed by the relevant parties. The complete test then becomes the official test report.

Personnel and location

Successful completion of the test requires qualified and experienced test engineers and/or technicians.

This harbour acceptance test is done on board the vessel, alongside the quay, by technical personnel from Kongsberg Maritime. All personnel have good knowledge of the product to be tested.

A representative from an authorized dealer or distributor can do the harbour acceptance test on behalf of Kongsberg Maritime.

Representatives from the client and/or end user are normally present to witness the test and results.

As with all assembly and test procedures related to advanced technical and/or electronic equipment, the skill of the operator is vital to a successful completion of the tasks. The only way to secure high quality of our products is first rate workmanship and high professional standards throughout the production chain.

It is equally important that all members of the production and test crews show initiative, and are willing to suggest improvements to functionality, design, procedures and documents. If you find a mistake in a document, or find that information is missing, offer this information to the proper authorities without further delay. Likewise, your experience as a skilled worker is valuable. Please forward any suggestions to make improvements to the product, the design, the production method, or any other matter related to your expertise.

Referenced documents

Some documents may be required to do this test, while other documents can prove to be useful for reference purposes.

Note

Unless specified in the applicable procedure(s), the EK80 documents listed here are not required during this test.

Refer to the following documents.

Note that all end user manuals can be download from our website.

- http://www.simrad.com

End user manuals:

- Quick start guide (NYA)
- Operator manual (NYA)
- Reference manual (NYA)
- Installation manual (394149)

Software documents:

- Software release note (NYA)

Customer acceptance tests:

- Factory acceptance test (393714)
- Harbour acceptance test (401925)
- Sea acceptance test (401926)

Production and in-house test procedures:

- Wide Band Transceiver (WBT), Final test (NYA)

Hardware and software registration

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Verification of previously tested items

It is not necessary to fill in registration tables for software and hardware items that have already been recorded in a previous test.

If the EK80 user interface software and hardware units are the same as those tested during the factory acceptance test, the relevant registration tables will not be required.

- If no changes have been made to neither the software nor the hardware, sign the table below to verify this.
- If the software has updated, record the new software version.
- If hardware changes have been made (units are replaced), all serial numbers must be recorded again.

Verification
Neither user interface software nor hardware units have been changed on this EK80 system since the *Factory acceptance test*. For this reason, the registration tables have not been filled in.
Date and signature

Software registration table

Every user interface software program that is provided as a part of the EK80 system delivery must be registered.

Simrad EK80

Software program	Order number	SW version
Simrad EK80	389847	1.8.2

Software media

When applicable, the *software media* item can be any memory device (CD, DVD, USB memory device etc) that contains the EK80 software. End user documentation may be included on the software media, or provided on a separate memory device.

Software information on http://www.simrad.com

The latest software version can be found in the EK80 *Software release note* and on the EK80 pages on our website.

- http://www.simrad.com/ek80

Hardware registration tables

Every hardware unit that is provided as a part of the EK80 system delivery must be registered.

Display

Fill in the serial number for the display(s) that is provided with the delivery. For units that are not provided, set serial number to "N/A" (not applicable).

Item	Order number	Serial number
19" display (Hatteland JH19T14 MMD)	335513	N/A
Other type (specify make and model):		

If more than one display is provided, use this table to record the serial numbers:

Item	Serial number	Comments
1		
2		
3		
4		

Processor Unit

Processor Unit	Order number	Serial number
Processor Unit (*Enix*) with software	386927	CZC3407HCB

HP-MPB300

Ethernet switch

For units that are not provided, set serial number to "N/A" (not applicable).

Ethernet switch	Order number	Serial number
Black Box LBS209AE-R2	352527	N/A
Other type (specify make and model):		
NETGEAR 8-PORT	GS108V4	3TX2577T885F2

Wide Band Transceiver (WBT) units

The Wide Band Transceiver (WBT) units have all the same order number, as their operational parameters are defined in the EK80 software and the license strings.

If fewer than eight transceivers are provided, set serial number to "N/A" (not applicable).

Wide Band Transceiver (WBT)	Order number	Serial number	Frequency
Wide Band Transceiver (WBT)	392729	549755	18 KHz
		545613	38 KHz
		582202	70 KHz
		545617	120 KHz
		582209	200 KHz

Additional comments

Use this space to include additional comments related to the hardware units.

Tools and test equipment

Specific tools and/or test equipment may be required to do this test. If such equipment is required, it must be made available before the test can start.

Specific test equipment is not required for this test.

Test procedures

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Visual inspection of the display

A visual inspection of the EK80 display is required to verify that the unit has not been physically damaged during the installation.

Prerequisites

This procedure assumes that the EK80 system has been installed as specified in the EK80 *Installation manual*.

No specific tools or instruments are required for this test.

Context

Observe the installation shipyard's procedures for workmanship, installation of physical units, and installation and termination of cables.

Note

This test procedure is only used when the display is provided by Simrad as a part of the EK80 delivery.

Procedure

1 Check that the display is installed in the correct location, and that it is suitably orientated with respect to ambient light conditions and reflections.

2 Check that the structure to which the display is fastened is substantial enough to hold the unit securely under all operating conditions.

   If the display is secured to a table or shelf, check that it is bolted or welded securely to the deck and/or bulkhead.

3 Check that the unit is securely connected to the ship's ground with an earthing strap.

   The strap must be in addition to any incidental electrical contact made by the mounting lugs on the unit.

4 Use a standard multimeter to check that the resistance between the unit and the ship's ground is approximately 0 (zero) Ω.

5 Check the physical installation of the unit.

   a Check that the bolts, screws or studs holding the unit are of the correct size.

   b Check that the correct flat and shake-proof washers have been used.

   c Check that all nuts have been tightened properly.

6 Check that all welds and brackets have been painted with the correct preservation medium to prevent corrosion.

7 Check that all cables leading to the unit have been properly mounted and secured.

8 Verify that enough slack has been provided on the cables to allow maintenance and replacement.

9 Check that the unit is not physically damaged, and that the paint-work is clean.

The physical handling of the unit during the installation may have caused some scratches to the paint-work. This can be accepted. However, if rough handling has caused serious damage to the unit, this must be recorded with a written statement and necessary photos, so that corrective actions can be made.

10 Verify that the unit's serial number has been recorded in the list of hardware items.

Result

Task summary and requirements	Ok / Not ok / Results
Check the display with a close visual inspection. a The display shall be new, clean and free from scratches, dents or other physical damage. b The display has been properly mounted. c Welds and brackets supporting the display have been painted with the correct preservation medium to prevent corrosion. d All cables leading to the display have been properly mounted and secured. Enough slack has been provided on each cable to allow maintenance and replacement. e The display has been properly grounded. f The display is clearly identified with a product label.	O/C

Related topics

Customer acceptance form, page 29

Visual inspection of the Processor Unit

A visual inspection of the EK80 Processor Unit is required to verify that the unit has not been physically damaged during the installation.

Prerequisites

This procedure assumes that the EK80 system has been installed as specified in the EK80 *Installation manual.*

No specific tools or instruments are required for this test.

Context

Observe the installation shipyard's procedures for workmanship, installation of physical units, and installation and termination of cables.

Note

This test procedure is only used when the Processor Unit is provided by Simrad as a part of the EK80 delivery.

Procedure

1 Check that the Processor Unit is installed in the correct location, and that it is suitably oriented for replacement and cabling.

2 Check that you have free access to rear and front side connectors on the Processor Unit for maintenance purposes.

3 Check that ample space is provided to open/close DVD and/or CD lids, and to insert and remove USB memory devices.

4 If the unit is installed inside a rack or a closed compartment, check that ample ventilation is provided to avoid overheating.

5 Check that the unit is securely connected to the ship's ground with an earthing strap.

   The strap must be in addition to any incidental electrical contact made by the mounting lugs on the unit.

6 Use a standard multimeter to check that the resistance between the unit and the ship's ground is approximately 0 (zero) Ω.

7 Check the physical installation of the unit.

   a Check that the bolts, screws or studs holding the unit are of the correct size.

   b Check that the correct flat and shake-proof washers have been used.

   c Check that all nuts have been tightened properly.

8 Check that all welds and brackets have been painted with the correct preservation medium to prevent corrosion.

9 Check that all cables leading to the unit have been properly mounted and secured.

10 Verify that enough slack has been provided on the cables to allow maintenance and replacement.

11 Check that the unit is not physically damaged, and that the paint-work is clean.

The physical handling of the unit during the installation may have caused some scratches to the paint-work. This can be accepted. However, if rough handling has caused serious damage to the unit, this must be recorded with a written statement and necessary photos, so that corrective actions can be made.

12 Verify that the unit's serial number has been recorded in the list of hardware items.

Result

Task summary and requirements	Ok / Not ok / Results
Check the Processor Unit with a close visual inspection. a The Processor Unit shall be new, clean and free from scratches, dents or other physical damage. b The Processor Unit has been properly mounted. c Welds and brackets supporting the Processor Unit have been painted with the correct preservation medium to prevent corrosion. d All cables leading to the Processor Unit have been properly mounted and secured. Enough slack has been provided on each cable to allow maintenance and replacement. e The Processor Unit has been properly grounded. f The Processor Unit is clearly identified with a product label.	OK

Related topics

Customer acceptance form, page 29

Visual inspection of the Transceiver Unit

A visual inspection of the EK80 transceiver is required to verify that the unit has not been physically damaged during the installation.

Prerequisites

This procedure assumes that the EK80 system has been installed as specified in the EK80 *Installation manual*.

No specific tools or instruments are required for this test.

Context

Observe the installation shipyard's procedures for workmanship, installation of physical units, and installation and termination of cables.

Procedure

1 Check that the transceiver is installed in the correct location, and that it is suitably oriented for easy maintenance and replacement of parts.

2 Check that you have free access to all the connectors on the transceiver for maintenance purposes.

3 Check that the bulkhead structure to which the transceiver is fastened is substantial enough to hold the unit securely under all operating conditions.

4 Check that the unit is securely connected to the ship's ground with an earthing strap.

   The strap must be in addition to any incidental electrical contact made by the mounting lugs on the unit.

5 Use a standard multimeter to check that the resistance between the unit and the ship's ground is approximately 0 (zero) Ω.

6 Check the physical installation of the unit.

   a Check that the bolts, screws or studs holding the unit are of the correct size.

   b Check that the correct flat and shake-proof washers have been used.

   c Check that all nuts have been tightened properly.

7 Check that all welds and brackets have been painted with the correct preservation medium to prevent corrosion.

8 Check that all cables leading to the unit have been properly mounted and secured.

9 Verify that enough slack has been provided on the cables to allow maintenance and replacement.

10 Check that the unit is not physically damaged, and that the paint-work is clean.

   The physical handling of the unit during the installation may have caused some scratches to the paint-work. This can be accepted. However, if rough handling has caused serious damage to the unit, this must be recorded with a written statement and necessary photos, so that corrective actions can be made.

11 Verify that the unit's serial number has been recorded in the list of hardware items.

Result

Task summary and requirements	Ok / Not ok / Results
Check the display with a close visual inspection. a The transceiver shall be new, clean and free from scratches, dents or other physical damage. b The transceiver has been properly mounted. c Welds and brackets supporting the transceiver have been painted with the correct preservation medium to prevent corrosion. d All cables leading to the transceiver have been properly mounted and secured. Enough slack has been provided on each cable to allow maintenance and replacement. e The transceiver has been properly grounded. f The transceiver is clearly identified with a product label.	Ok

Related topics

Customer acceptance form, page 29

Starting the EK80 Scientific echo sounder

A basic functional test includes power-up, frequency channel installations and initial bottom detection.

Prerequisites

This procedure assumes that the EK80 system has been installed as specified in the EK80 *Installation manual*.

No specific tools or instruments are required for this test.

Context

This procedure shall verify that the transceiver(s) provided with the EK80 system are operational.

Procedure

1 Verify that the EK80 units have been set up to operate with the voltage you have available (115 Vac or 230 Vac or +12 Vdc).

2 Verify that the transducer cables are not installed close to power cables.

3 Apply power to all units.

4 Verify that the power LED on the Wide Band Transceiver is lit.

5 Start the EK80 program.

6 On the **Setup** menu, click **About** to verify that the correct software version is installed.

7 Install the correct transducers for all frequencies.

8 Start the EK80 in normal operational mode.

9 Verify that you can see the bottom in all echograms.

Result

Task summary and requirements	Ok / Not ok / Results
Start the EK80 Scientific echo sounder.	
a Supply voltage is ok.	
b Transducer cables are ok.	OK
c The power LED on the Wide Band Transceiver is lit.	
d The latest software version is installed (write down the SW version in the right column).	
e All transducers are installed.	
f The bottom echo is visible on all echograms.	

Further requirements

When all tests are finished, open the *Customer acceptance form*, and sign it.

Related topics

Customer acceptance form, page 29

Measuring noise in *Passive* mode

Low noise is a key factor for high quality and reliable measurements.

Prerequisites

This procedure assumes that the EK80 system has been installed as specified in the EK80 *Installation manual*.

No specific tools or instruments are required for this test.

Context

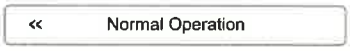
This procedure shall verify that the noise level in *Passive* mode is acceptable.

Procedure

1 Operate all relevant frequencies in *Passive* mode with 1,024 ms pulse duration.

2 Prepare the EK80 to read the noise values.

a On the **Operation** menu, click **Normal Operation** to open the dialog box.

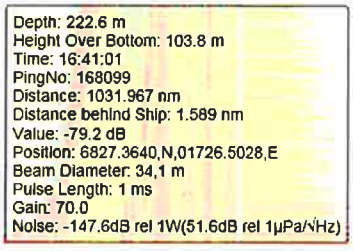


b In the **Normal Operation** dialog box, set **Mode** to *Passive*.

c On the **Display** menu, click **Display Options** to open the dialog box.

d In the **Display Options** dialog box, enable the **Noise** tooltip.

3 Place the cursor over the echogram, and observe the tooltip information.



4 Read the noise values for each channel.

Write down the measured noise value.

Result

Frequency	Noise estimate	Frequency	Noise estimate
18 kHz	-56 dB	120 kHz	-103 dB
38 kHz	-69 dB	200 kHz	-118 dB
70 kHz	-82 dB	333 kHz	

Task summary and requirements	Ok Not ok / Results
Measure the noise in *Passive* mode. a Write down the measured noise value.	

Further requirements

When all tests are finished, open the *Customer acceptance form*, and sign it.

Related topics

Customer acceptance form, page 29

Testing the synchronization interface

In larger hydroacoustic systems, the individual products are frequently connected to provide transmit synchronisation.

Prerequisites

This procedure assumes that the EK80 system has been installed as specified in the EK80 *Installation manual*.

It is also assumed that the EK80 is connected to an external hydroacoustic system for triggering purposes.

No specific tools or instruments are required for this test.

Context

This procedure shall verify that the external trigger interface is operational.

Note

If the EK80 is set up to operate as a 'stand-alone' system independent of other hydroacoustic systems, this test can be omitted.

Procedure

1 On the **Setup** menu, click **Synchronization** to open the dialog box.

2 Select the relevant synchronization mode.

3 Start both the EK80 and the external system, and set them both to normal operation.

4 Verify that the EK80 transmissions are synchronized with the external system.

Result

Task summary and requirements	Ok / Not ok / Results
Test the synchronization interface. a The synchronization interface is operational.	OK

Further requirements

When all tests are finished, open the *Customer acceptance form*, and sign it.

Related topics

Customer acceptance form, page 29

Testing the interfaces to external devices

In order to provide the relevant navigational data, the EK80 must be connected to external sensors.

Prerequisites

This procedure assumes that the EK80 system has been installed as specified in the EK80 *Installation manual*.

It is also assumed that the EK80 is connected to one or more external sensors to provide navigational information, and that these sensors are operational.

No specific tools or instruments are required for this test.

Context

This procedure shall verify that the interfaces to external sensors are operational.

All relevant procedures for setting up the interfaces to external devices can be found in the EK80 *Installation manual* and in the EK80 *Reference manual*. The procedures are also available in the on-line help.

Procedure

1 Set the EK80 to operate in normal operation.

2 Verify that the relevant external devices are operational, and that they transmit data.

3 Verify that theEK80 receives the data.

   a Open the **Setup** menu.

   b Click **Installation→I/O Setup**.

   c Use the **Port Monitor** dialog box to verify that sensor data is received as expected.

Result

Task summary and requirements	Ok / Not ok / Results
Test the interfaces to external devices. a All interfaces to the external sensors that are connected to the EK80 are operational.	Ok

Further requirements

When all tests are finished, open the *Customer acceptance form*, and sign it.

Related topics

Customer acceptance form, page 29

Reading the transceiver hardware and software versions

The **Transceiver Installation** page shows you all relevant information related to the hardware and software versions of the Wide Band Transceiver (WBT).

Prerequisites

The EK80 must be operational with all relevant channels (transceiver/transducer combination) installed.

Context

The hardware and software versions of the Wide Band Transceiver (WBT) are required for a unique identification of the EK80 system at the time of the test.

Procedure

1 Click the **Setup** icon.

This icon is located under the **Main** menu. It is used to open the **Setup** menu.

2 Click the **Installation** button.

a Observe that the **Installation** dialog box opens.

b On the left side, click **Transceiver**.

c Observe that the **Transceiver** page opens.

3 Check that all applicable transceivers and transducers are connected and operational.

For each transceiver, this is indicated by the green label with text "Installed".

If a problem exists, refer to the relevant procedure in the *Operational procedures* chapter.

4 Repeat this cycle for each transceiver in use.

a Click on the transceiver to select it.

b In the transceiver list, read the name of the transducer in use.

c In the *Transceiver Information* field, read the following information:

- Identity
- FPGA TX Firmware version
- FPGA RX Firmware version
- SW Version

d Write down this information in the result table

5 Close the **Installation** dialog box.

Result

Task summary and requirements	Ok / Not ok / Results
Read the transceiver hardware and software versions. a The software and hardware information is recorded in a dedicated table.	

WBT	Identity	Transducer ES18 - 11	TX Firmware version	RX Firmware version	SW Version
1	WBT 549755	18 KHZ	Rev. 4	Rev. 7	1.70
2	WBT545613	ES38 B	Rev. 4	Rev. 7	1.70
3	WBT582202	ES70 - 7C	Rev. 5	Rev. 7	1.70
4	WBT545617	ES120 - 7C	Rev. 4	Rev. 7	1.70
5	WBT582209	ES200 - 7C	Rev. 5	Rev. 7	1.70
6					

Further requirements

When all tests are finished, open the *Customer acceptance form*, and sign it.

Related topics

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Customer acceptance form

Fill in and sign this form for formal acceptance of the EK80 system.

The Harbour acceptance test for the EK80 Scientific echo sounder system for delivery to the vessel identified below has been performed according to procedure 401925 Revision A.

The EK80 is (*tick relevant column*):

Accepted	Accepted with comments	Not accepted
✓	Accepted	

Vessel/Customer:	R/V Neil Armstrong
Place and date:	North Charleston, USC 7 Feb 2016
Comments:	

Test done by	Company/Position	Signature
Tony DAHLHEIM	Kongsberg / Field Engineer	

Test accepted by	Company/Position	Signature
Amy Simoneau	WHOI / SSSG Tech	

When this test procedure has been completed with all relevant signatures and applicable forms filled in, the document (except appendices) must be sent to Simrad's support department at Strandpromenaden 50, P.O.Box 111, 3191 Horten, Norway. Alternatively, scan all the pages (except appendices) in this document, using minimum 200 DPI resolution, and send the file to simrad.support@simrad.com.

Related topics

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