Instruction Manual

Simrad ITI Trawl Eye
Installation and operation

(CD4324)

Software version 3.08/5.10

SIMRAD
A KONGSBERG Company

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ITI Trawl Eye

This document contains information regarding the installation and operation of the Simrad ITI Trawl Eye.

Document revisions

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Contents

Document history

(The information on this page is for internal use)

Rev. A	Original issue
Rev. B	Renew bottom command explained
Rev. C	Correction in chapter 5.2
Rev. D	New software version 3.08/5.10

1 INTRODUCTION

1.1 About this document

This document contains information regarding the installation and operation of the Simrad ITI Trawl Eye.

It is assumed that the reader is acquainted with the general operation of the Simrad ITI system. For information regarding all other installation and operation of the ITI, refer to the standard ITI Operator and Installation manuals.

1.2 Brief description of the Trawl Eye

The Trawl Eye sensor is to be mounted on the trawl's headrope. It contains an echo sounder that gives information about fish in the trawl opening, the height of the trawl and the clearance to the bottom. The amount of fish in the trawl opening is clearly displayed in a new display picture.

The Trawl Eye sensor also contains a transducer and electronics for wireless communication with the vessel.

1.3 The scope of the delivery

The Trawl Eye sensor

An installation kit containing:

- 2 PROMs
- 1 programming cable
- 4 carbine hooks
- 2 rubber straps

1.4 Installation procedures

The installation of the system includes as follows:

1 Inserting new PROMs

2 Programming the Trawl Eye

3 Mounting the Trawl Eye on the trawl

1.5 What the operator needs to know

The operator needs to know how to access the Trawl Eye mode and to understand the elements of the Trawl Eye mode's screen presentation. He also needs to get acquainted with some new menu commands.

2 OPERATION

2.1 The Trawl Eye screen presentation

General

In the Trawl Eye mode the upper half of the screen shows the plan view position of the trawl relative to the vessel. This is the same picture as in Normal mode, explained in the ITI Operator Manual. The lower half of the screen shows the Trawl Eye picture. The Trawl Eye picture is a graphical presentation of footrope, bottom and fish echo data received from the Trawl Eye. Data received from other trawl mounted sensors are also presented.

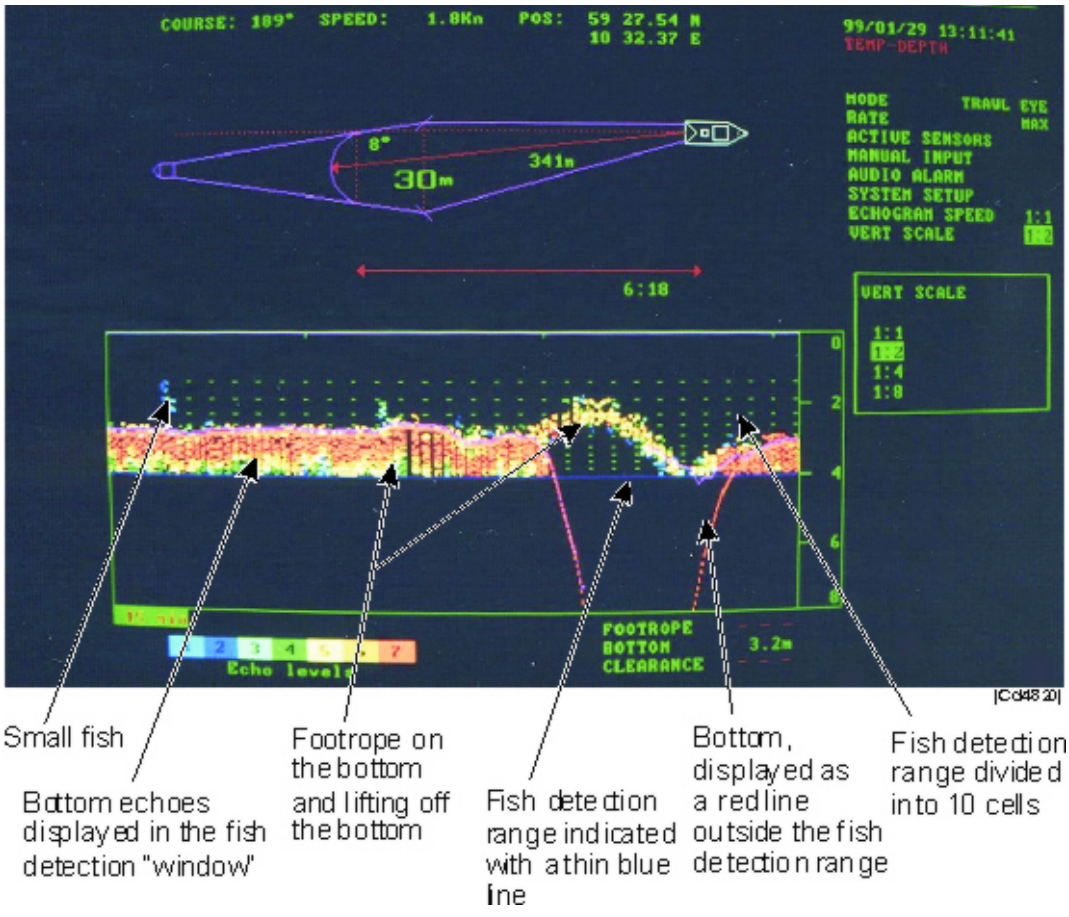

Figure 1 Trawl Eye mode screen presentation

The echogram

In the Trawl Eye mode the headrope is shown in a fixed position as the upper line in the echogram. The footrope is shown as a violet line. The boundary of the fish detection window is indicated by a thin blue line. The echoes in the trawl opening (within the fish detection window) are colour–coded according to the echo–level diagram below the echogram. The red colour represents the strongest echoes.

The picture above shows a low opening bottom trawl which is lifted off the bottom for a period of time. Notice that all echoes displayed on the screen detected within the Trawl Eye fish detection range are displayed as an ordinary echogram. This applies to both fish, footrope and bottom echoes. In addition, calculated bottom and footrope echoes from the bottom detection ping are displayed as a red and a pink line. Outside the fish detection range (boundary indicated by the blue thin line), only the calculated bottom and footrope echoes will be displayed as red and violet "graphic" lines.

The fish detection window is divided into ten cells, and the echoes of the detected fish are placed within their respective cells. The vertical length of the cells vary and gets progressively smaller from the top to the bottom, so that the resolution is greatest at the lower part of the echogram.

While the fish detection range is set during system set–up, the bottom and footrope has a constant range of 150 metres that cannot be changed. This means that the bottom is detected down to 150 metres independently of the fish detection range setting.

The vertical scale of the echogram may be changed by means of the Vert. scale command. Refer to explanation on page 9.

The time scale of the echogram is selected in the Echogram Speed Menu, and is displayed directly below the echogram at the left side.

The text information

Various information about the trawl is presented on the right–hand side of the echogram:

- The trawl depth,
- The vertical trawl movement (ASC/DSC)
- The temperature measured by the temperature sensor..
- Grid information

On the bottom part of the screen is presented information about the distance from headrope to footrope, footrope to bottom and the clearance between footrope and bottom. The echo sounder time axis (30, 60 or 120 minutes) and the seven different echo level colours are presented on the left–hand side.

Information from the vessel's echo sounder is presented on the right-hand side.

Screen presentation example

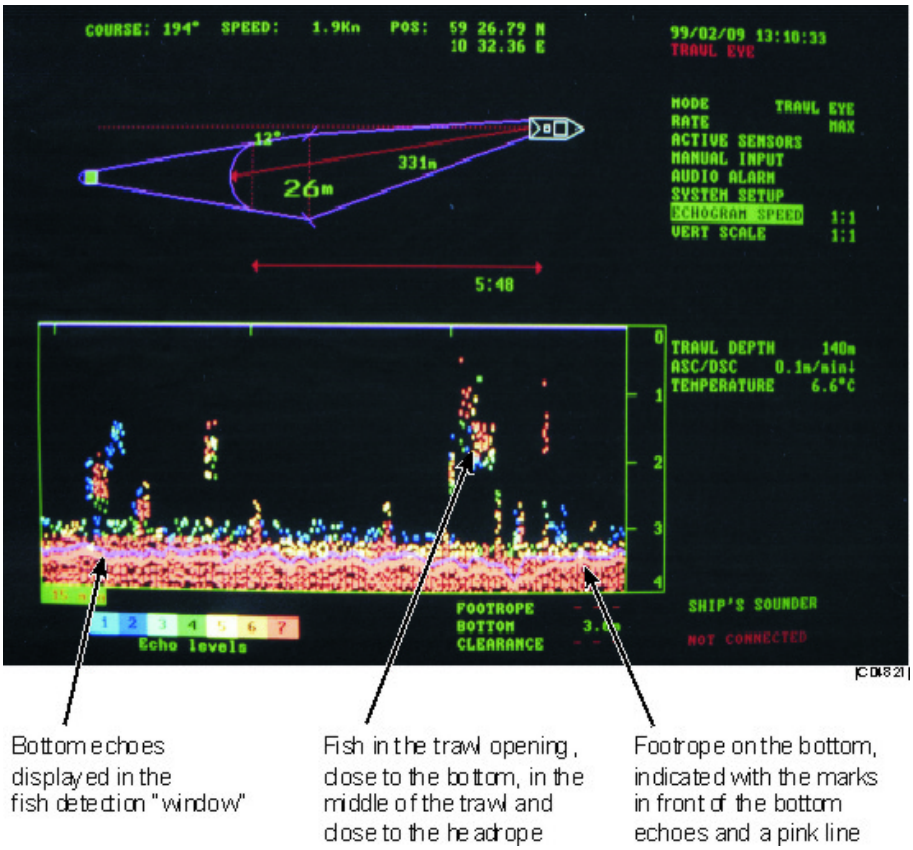

Figure 2 A bottom trawl presentation

The picture above shows the ITI display in the Trawl Eye mode and shows a bottom trawl being towed on the bottom with good bottom contact. The presentation of the data from the Trawl Eye looks like an ordinary echogram. All echoes detected within the fish detection range, are transmitted to the boat and displayed. We are leaving the final decision of "what is what" to the skipper.

The fish close to the headrope is probably haddock which also were caught. The fish close to the bottom is probably cod and some saithe.

The sensor settings during the tow were:

- Data rate: 4
- Range: Auto
- Gain: 6 dB
- Trawl height: 3.5 m
- Bottom mode

Trawl echogram mode

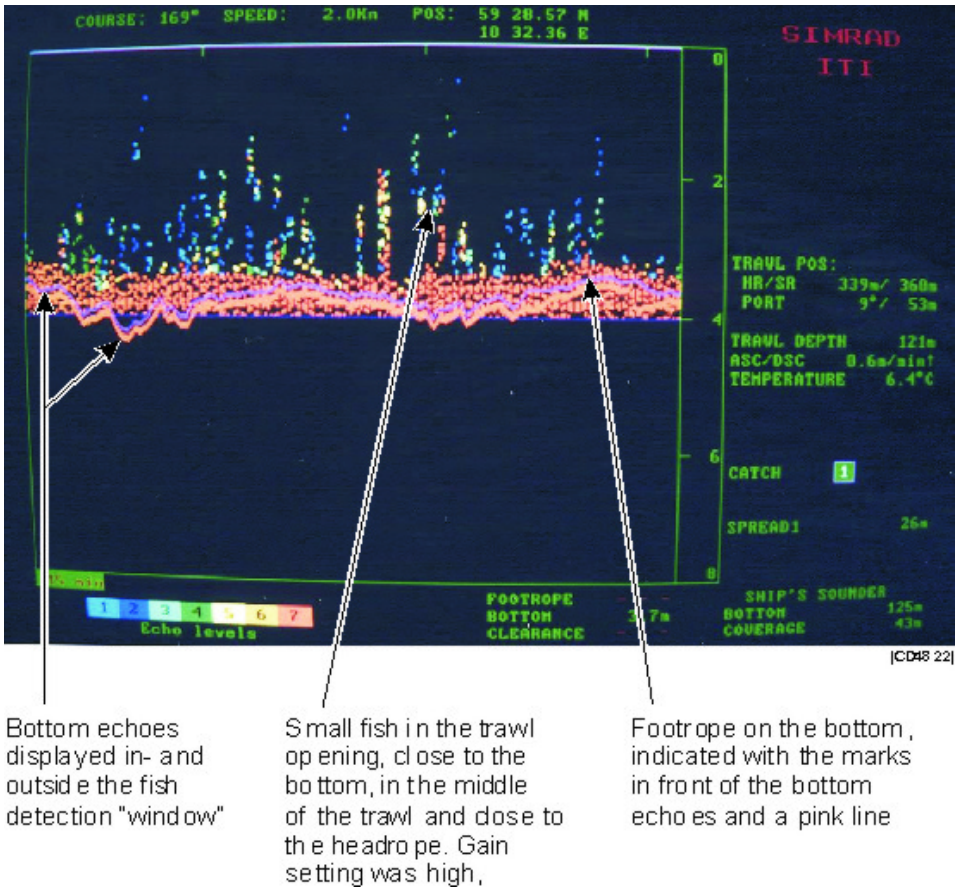

Figure 3 Trawl echogram

Besides the Trawl Eye mode, there is a mode called Trawl echogram. In this mode the whole screen is used to display data from the Trawl Eye. The upper part of the screed shows the fish detection range set by the user.

The lower part of the screen will show any bottom or footrope echo outside the fish detection range, which is useful in pelagic mode.

The sensor settings during the tow were:

Data rate: 4

Range: Auto

Gain: 30 dB

Trawl height: 3.5 m

Bottom trawl

2.2 How to activate the Trawl Eye sensor

When the ITI system is first switched on, it will always be in the *Normal* mode. The display presents the following main menu:

```
MODE                    NORMAL
RATE                       OFF
ACTIVE SENSORS
MANUAL INPUT
AUDIO ALARM
SYSTEM SETUP
```

1 Select *Active sensors* on the main menu.

```
ACTIVE SENSORS

DEPTH                      OFF
TEMP                       OFF
TEMP DEPTH                 OFF
GRID                       OFF
HEIGHT1                    OFF
HEIGHT2                    OFF
SPREAD1                    OFF
SPREAD2                    OFF
TRAWL EYE                  OFF
CATCH                      OFF
CATCH AVAIL                OFF
```

2 Select Trawl Eye and set it to the desired interrogation rate. As for the other sensors, there is a choice between 1:1 (maximum rate), 1:2 and 1:3.

Note ! *Sensors which are not in use should always be set to Off. Otherwise the overall performance will be reduced, slowing down the speed of the system.*

2.3 How to select the Trawl Eye mode

1 Select the *Mode* menu on the Main menu.

Main menu:

```
MODE                    NORMAL
RATE                       OFF
ACTIVE SENSORS
MANUAL INPUT
AUDIO ALARM
SYSTEM SETUP
```

Mode submenu:

```
MODE

NORMAL
TACTICAL
TEMP-DEPTH
TRAWL DATA LOG
GRID
STATUS
TRAWL ECHOGRAM
TRAWL EYE
TEST
```

2 Select the Trawl Eye mode. The Trawl Eye mode will then appear on the screen.

For a description of the *Trawl Eye* and *Trawl echogram* screen layouts, refer to the The Trawl Eye screen presentation chapter and the Trawl echogram mode chapter.

2.4 New menu commands

In the Trawl Eye mode there are four new commands, Echogram speed,Vert scale, Pos.window and Pos/gyro filt.. All the other commands are described in the standard ITI Operator Manual.

```
MODE                TRAWL EYE
RATE                      OFF
ACTIVE SENSORS
MANUAL INPUT
AUDIO ALARM
SYSTEM SETUP
ECHOGRAM SPEED            1:1
VERT SCALE                1:1
```

The menu entries Pos. window and.Pos./gyro filt. are introduced to improve the ITI signal reception in bad weather These menu entries are available from SYSTEM SETUP.

Echogram speed

This command enables you to select the time scale of the echogram, i.e. how long time it takes for the echogram to move from right to left across the screen. Three alternatives are available:

- 1:1.
- 1:2.
- 1:4.

The normal setting is 1:1 which means that the echogram movement from right to left takes 30 minutes. When the Echogram speed is set to 1:2, the echogram speed is halved and the screen presentation covers 60 minutes, while at 1:4 it covers 120 minutes.

The echogram speed may be increased by changing the scroll clock setting in the in the SYSTEM SETUP →TRAWL EYE menu.

Vert scale

This command enables you to change the vertical scale of the echogram. Four alternatives are available:

- 1:1
- 1:2
- 1:4
- 1:8

1:1 gives a vertical scale equal to the fish detection range selected in the Trawl Eye menu during system set–up. If the fish detection range is 5 metres, the setting 1:2 doubles the total range to 10 metres, with a dotted blue line indicating the fish detection range of 5 metres. By using the Vertical scale settings, the operator may get a good overview of the distance between the trawl and the bottom when shooting or hauling.

Pos. window

There is a choice between NARROW, NORMAL and WIDE.

- NARROW
  The receiver will accept a sector of ± 35°for positioning the sensor on the trawl (applies for a Dual transducer installation) before the the ITI starts a new search mode. Select this option when towing with long wire length and under calm sea conditions.
- NORMAL
  The receiver will accept a sector of ±40° for positioning the sensor on the trawl (applies for a Dual transducer installation) before the the ITI starts a new search mode. Because you will get a small reduction in gain compared to Narrow mode, this option should be selected when towing with normal wire length and fair weather conditions.
- WIDE
  The receiver will accept a sector of ±45° for positioning the sensor on the trawl (applies for a Dual transducer installation) before the the ITI starts a new search mode. Recommended setting for shorter towing length and or bad weather conditions.

It is recommended to experiment with the different settings because the results will depend on the signal to noise ratio which varies with the different types of installations.

Pos/gyro filt.

There is a choice between MAX, MED and MIN

- MAX
  Select the MAX option to get a smooth and steady course track of the trawl in the Tactical Mode.
- MED (medium) and MIN (minimum) will reduce the filtering effect, and might lead to more unstable course tracks. Experiment to find the best results.

The importance of a gyro compass connected

When the ITI calculates the bearing from the vessel to the trawl, the measurement is relative to the vessel's heading. To determine the exact position of the trawl, the system must know the vessel's instantaneous heading at the same moment as the reply pulse from the sensor reaches the vessel's transducer. Currently, only a gyro compass can provide this heading information accurately.

Note !

Without a gyro compass (or other accurate information on the vessel's heading), the calculated bearing to the trawl will vary due to the influence of roll and pitch changes. This will in turn affect the receiver and hence the ability of the ITI to pick up weak signals in bad weather, thereby reducing the maximum range of the system. The ITI will therefore not work without a gyro compass or other accurate instruments giving the vessel's heading.

3 INSTALLATION

3.1 Inserting the new PROMs

Note ! *This procedure may only be carried out on a processor board with software version number. 3.10 or higher. If your board has a lower software version number, refer to page 22.*

Two PROMs have to inserted on the CPB286 processor board in the Transceiver Unit.

Note ! *Before replacing the PROMs, write down any default settings of sensor parameters, units, trawl settings and the transducer configuration on the sheet at the end of this manual.*

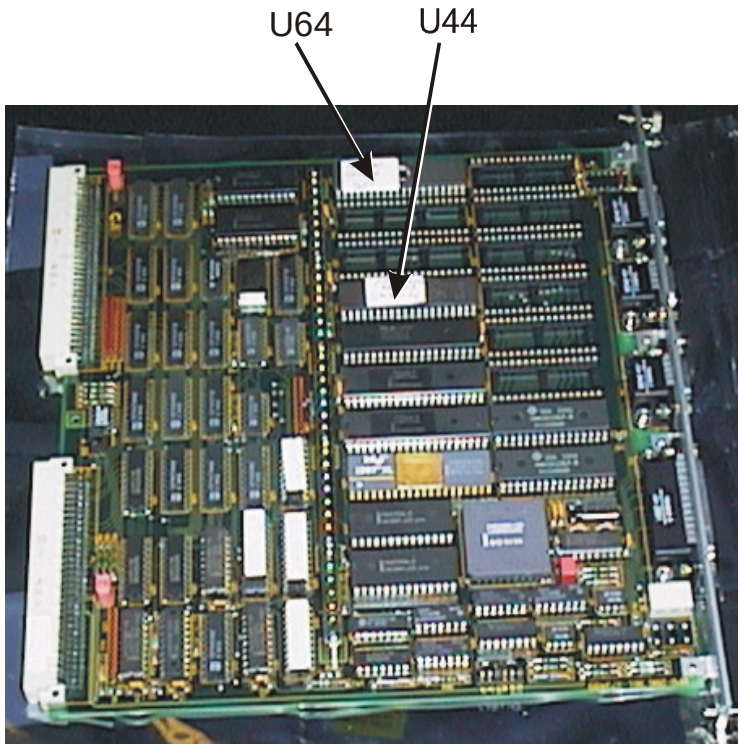

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Figure 4 The PROMs on the CPB286 processor board

WARNING ! The following procedure must be carried out by experienced personnel. Care must be taken not to expose the PROMS to static electricity. Note the orientation of the PROMS. When inserting the PROMS, ensure that they are oriented correctly, with the notch pointing towards the same side as the for the other ICs. Otherwise the PROMS may be damaged.

1. Switch the ITI transceiver off. Locate the CPB286 processor board in the transceiver unit (extreme left side PCB with all input/output connectors). Notice the positions of each cable connected to the board. The PROM in location U44 holds the Trawl Eye software. The PROM in location U64 holds the ITI transceiver and display software.

2. Remove the old PROMs and replace them with the new ones **(U64PROM marked U64 ITI 5.10 or higher., U44 PROM marked U44 ITI/TE3.08 or higher)**. When inserting the PROMS, ensure that they are oriented correctly, with the notch pointing towards the same side as for the other ICs. Otherwise the PROMS will be damaged. Insert the Processor Board and connect all cables in their right positions.

3.2 Programming the Trawl Eye

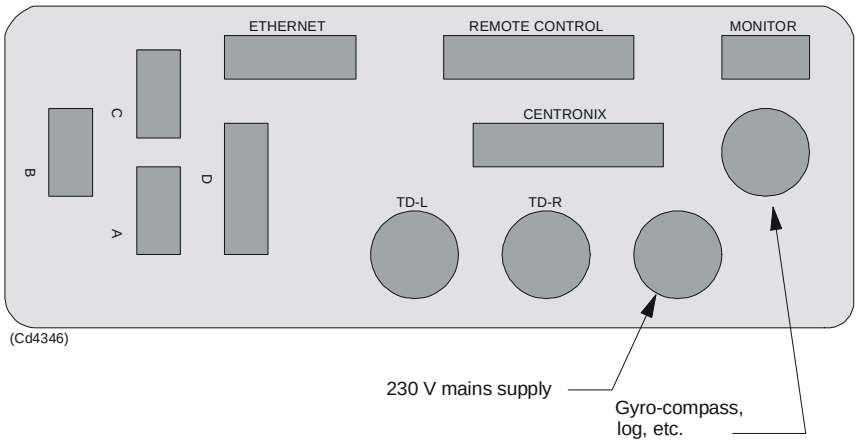

Figure 5 The Transceiver Unit connection panel

1 Connect the Trawl Eye programming cable plug to port B on the Transceiver Unit connection panel, or directly to port B on the Processor board. If port B is already in use by the chart plotter cable, first disconnect this cable. Connect the red clamp to + and the black clamp to the – lug on the Trawl Eye sensor.

Note ! *The sensor battery must be fully charged, otherwise the downloading might not work.*

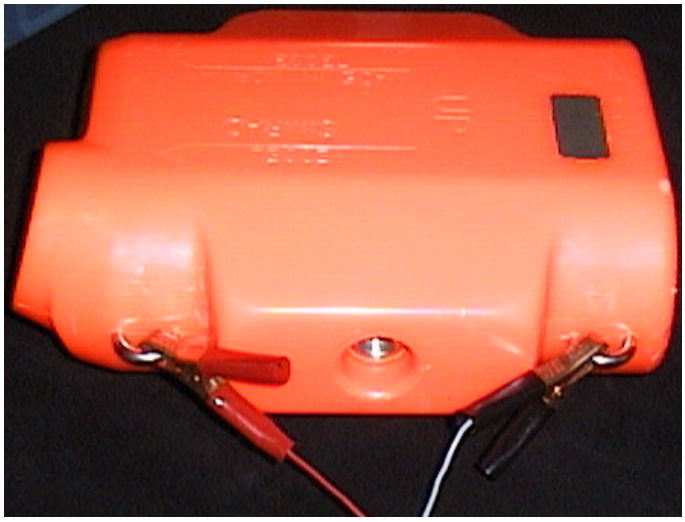

Figure 6 Connecting the cable to the Trawl Eye

2 Switch the ITI to ON. Select SYSTEM SETUP → SERIAL OUT and set AUX – DUMP to OFF. Go to the TEST menu on the Test page, select LOGGING OFF. If these settings are not set to Off, the downloading sequence will be disabled and the error messages Trawl Eye Cable Ill ... will appear. Check also that RATE in the main menu is set to OFF.

3 Select SYSTEM SETUP → TRAWL EYE → S.PROGRAM. The S.PROGRAM has the following submenus: CHECK, VERIFY and DOWNLOAD. To upgrade the sensor software, select DOWNLOAD. Check and verify will only test and verify that there is no mismatch between the information held in the transceiver and in the Trawl Eye sensor.

4 Downloading the sensor software might take several minutes. When the download sequence is completed, the message LOADED CODE OK will be displayed. Do not switch the ITI to OFF or disconnect the programming cable from the sensor during reprogramming. When the download sequence is completed, carry out "Inspecting or changing the ITI Trawl Eye sensor settings", point 3, described in the next subchapter.

Note ! *The transducer must be reconfigured after the software upgrade if the transducer configuration differs from DUAL. To do that, set the DIL switch S10.6 on the Interface PCB to position ON. Go to SYSTEM SETUP → TRANSDUCER. Select Single, Dual, Triple, Towed or Purse Seine. Set S10 in position OFF. Check that the transducer configuration in the Status menu is correct.*

3.3 Inspecting or changing the Trawl Eye sensor settings

The Trawl Eye sensor settings are stored in both the ITI transceiver and the sensor. If the sensor settings have to be changed, the sensor has to be reprogrammed according to the following procedure:

1 Switch the ITI to OFF. Connect the Trawl Eye programming cable to port B on the Transceiver Unit connection panel, or directly to port B on the Processor board. If port B is already in use by the chart plotter cable, first disconnect this cable. Connect the red clamp to + and the black clamp to the – lug on the sensor.

Note ! *The sensor battery must be fully charged, otherwise the downloading might not work..*

2 Switch the ITI to ON. Select SYSTEM SETUP → SERIAL OUT and set AUX – DUMP to OFF. Go to TEST menu on the Test page, select LOGGING OFF. If these settings are not set to Off, the programming sequence will be disabled and the error messages Trawl Eye Cable Ill ... will appear. Check also that RATE in the main menu is set to OFF.

3 Select SYSTEM SETUP → TRAWL EYE . The Trawl Eye has the following menu entries (when S10 – 6 is set to OFF) :

Menu entry	Select	Comments
DATA RATE	3	Controls the number of data telegrams from the Trawl Eye for each interrogation. Min 1, max 5, default 3.
DATA FORMAT	SMALL	Controls the data format for the sensor data transmission. Small is preferred, Medium or High if problems with communication is experienced
RANGE	AUTO	Controls the range of the fish detection window (3 – 50 m). For bottom trawling, AUTO is recommended. Auto range means that the range is controlled by the Trawl height menu entry.
GAIN	NORMAL	Sets the gain of the Trawl Eye echo sounder, –3 to 36 dB. (Normal = 0 dB). Experiment to find the right setting related to the type of fishing. Excessive gain might lead to noise in the echogram.
TRAWL HEIGHT	1 – 50 m	Sets the trawl height to correspond to the actual opening of the trawl and not to much higher. This is an important setting which controls the resolution of the Trawl Eye.
TRAWL TYPE	BOTTOM	Sets the trawl type, BOTTOM or PELAGIC
S.PROGRAM	CHECK	Menu entry for checking, verifying or downloading of new sensor software. Check and verify will test and verify that there are no mismatch between the information held in the transceiver and in the sensor. Download will change the sensor software.
SCROLL SPEED	2	Controls the echogram speed. 1 = 30 min, 2 = 15 min.
COLOUR THRESHOLD	1	Deletes weak echoes. 1: All echoes shown. 7: Only echoes coloured red are displayed.

4 After changing the settings of the sensor or just to inspect the settings, return to the Main menu and the data transfer will start automatically. Remember that the sensor must be connected to the ITI transceiver, otherwise no changes will be done and the settings will remain unchanged both in the transceiver and in the sensor.

5 When the programming sequence is done, set AUX – DUMP to ON if a chart plotter is connected.

6 The Trawl Eye is now ready for use.

3.4 Mounting the Trawl Eye on the trawl

Mounting the Trawl Eye bag

Refer to figure 7. The delivery includes the following items for mounting the Trawl Eye:
2 rubber straps
4 carbine hooks

For secure fastening of the The Trawl Eye, a bag of fine–meshed netting should be made and tied to the trawl, close to the middle of the headrope. Seize the two carbine hooks tightly to the headrope as shown in the figure. The length of the seizing should be 5 to 10 cm. On some types of bottom trawl with a large overhang, mount the bag behind the headrope so that the Trawl Eye echo sounder can detect echoes from the footrope. Either adjust the length of the seizing or use a rope to obtain the desired distance.

Note !

It is important that the fastening arrangement has a weak link to avoid destroying the attachment lugs on the Trawl Eye. The seizing or rope, however, should have a breaking strength of 1 ton or greater. The carbine hooks delivered by Simrad has a breaking strength adapted to the attachment lugs of the Trawl Eye.

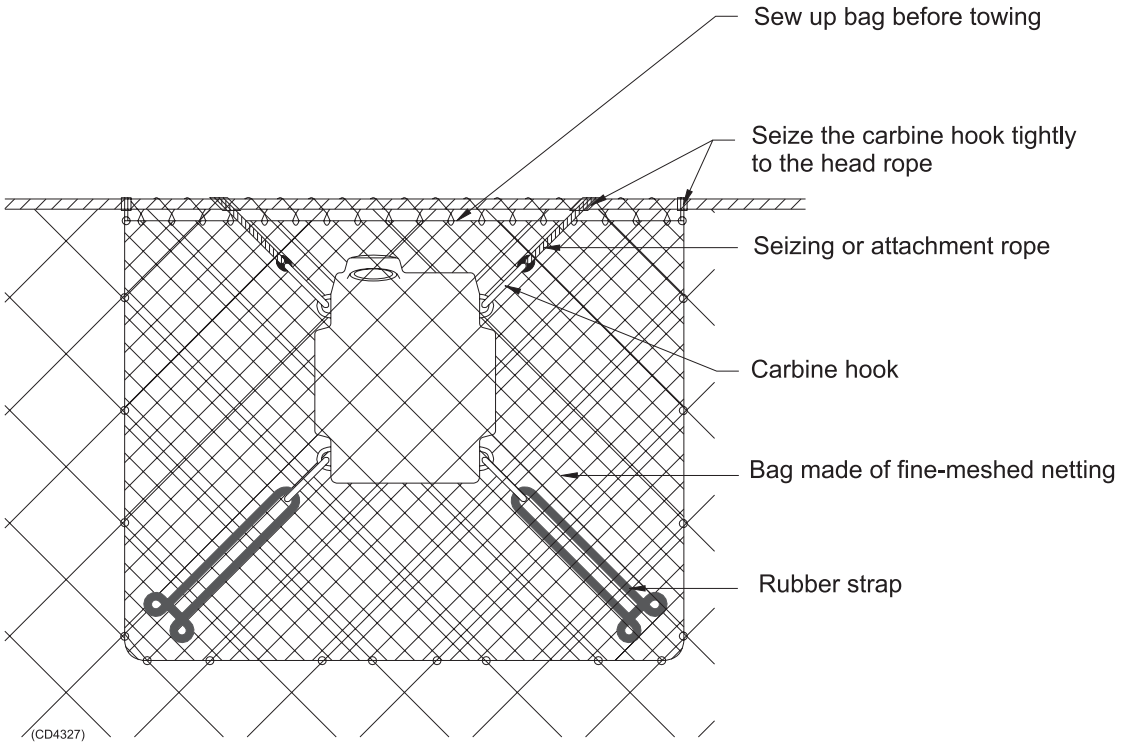

Figure 7 The Trawl Eye mounted in the trawl bag

Attaching the Trawl Eye

Place the Trawl Eye inside the bag as shown in figure 7. Ensure that the transducer on the front of the Trawl Eye has a clear line of sight to the vessel. Fasten the rubber straps to the bag by threading them as shown in the figure, and then fasten them to the lugs on the Trawl Eye via the carbine hooks.

Fasten the seized carbine hooks to the lugs on the Trawl Eye.

Close the bag by sewing it to the headrope.

Caution !

The Trawl Eye must be attached properly and not be able to rotate or move sideways. The attachment seizing and rubber straps should be mounted at an angle of 45 degrees.

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Figure 8 Here is the Trawl Eye mounted on M/S Simrad's bottom trawl.

4 CHARGING THE SENSOR BATTERIES

4.1 Introduction

The following text is an updated version of the text in the ITI Operator Manual.

4.2 Battery life

The term "Battery life" normally refers to the time a battery will last between recharges. An ITI sensor's battery life will depend on how often the unit is interrogated. This rate is set in the system menu. If the interrogation rate is set to maximum, the various sensors' battery lives will be (for new batteries) :

Temp, Depth, Catch ---------- Approximately 80 hours

Spread, Temp/Depth ---------- Approximately 80 hours

Height ---------- Approximately 40 hours

Trawl Eye ---------- Approximately 15 hours

Battery life can also refer to the number of years or recharging cycles the battery will last before becoming worn out. Nickel–cadmium batteries wear out very slowly, and when properly used will typically operate for several years and/or hundreds of recharging cycles.

Note ! *As the battery ages, its capacity to accept and hold a charge will decrease. The result of this is that the operating time between recharges reduces. The end of the sensor battery's life occurs when the battery no longer meets the operating time expected by the user.*

The battery's useful life can be greatly affected by the user. If the battery is misused it can fail much earlier than expected. The most important environmental factor affecting battery life is temperature. High temperatures cause the materials in the battery to degrade, therefore the sensor should not be stored or recharged in an area where the temperature is higher than 23°C (73°F). Generally, the battery life is reduced by half for each 10°C increase in temperature above 23°C.

If a sensor's battery pack is defective it can be replaced.

WARNING ! **WARNING ! Use only Simrad ITI battery charger. Use of another charger invalidates the guarantee and may cause the battery to explode.**

WARNING ! **The sensors must not be stored with flat batteries. Nickel Cadmium batteries must be recharged at least once every two months, whether they are used or not. The battery life will be reduced if a unit is stored for an extended period without charging the battery.**

WARNING ! **Always connect the charger clamps directly to the charging lugs and never indirectly via shackles, carbine hooks etc because this might corrode the lugs on the sensor severely.**

4.3 The sensor battery chargers

The *ITI Fast charger* has been specially designed to recharge ITI sensors which have BLUE labels.

Caution ! *Be aware that ITI sensors with Red labels are not prepared for fast charging, and will be severely damaged if connected to a fast charger unit.*

Caution ! *You MUST read the sensor charging instructions before attempting to use the battery charger !*

Special precautions must be taken when fast–charging nickel–cadmium batteries. The charger has a built–in controller to switch from fast charge to trickle–charging when the battery voltage reaches a pre set value, –or after approx. 3 hours controlled by the built in timer.

The charger has a lamp to indicate the status of the charging operation. The lamp colours indicate the following:

Off ---------- No charging
(charger switched off / battery not connected)

Red ---------- Fast charging

Green ---------- Trickle charging

Simrad recommends that the charger(s) is permanently mounted in an area where the temperature remains close to 20°C (68°F).

Caution ! *Charging must not be attempted when the temperature is less than 15°C (59°F) or more than 45°C (113°F).*

Both the charge acceptance and the actual capacity of the battery cells will be reduced at temperatures higher than 20°C (68°F). At low temperatures hydrogen gas may be generated in the cells resulting in a dangerous increase in internal pressure and with risk for explosion.

The standard charger unit is powered by a normal 230 Vac mains supply. A unit powered a by 115 Vac supply can be delivered on request. Check the charger's identification label before plugging the unit into the supply.

The charger will charge a sensor battery to approximately 75% of full capacity in three hours, and then automatically switch to maintenance charging indicated by the green lamp. To fully charge the battery, the sensor must be maintenance charged for additional 3 hours.

Note ! *The fast charger is designed for recharging sensors with Blue labels, which contain a particular type of high–capacity battery. Do not attempt to use the fast charger to recharge any other type of sensor or equipment – a hazardous situation may arise.*

4.4 General information about charging

The sensors each contain one Nickel–Cadmium rechargeable battery pack. The batteries can be recharged without removing them from the sensors.

No indication will be given by the system when a sensor's battery requires recharging, the system will merely lose contact with the sensor. The operator must keep track of the amount of time each sensor is in use, and recharge the batteries as required.

The batteries will accept the best charge at room temperature, and low temperatures will actually reduce the battery capacity. Charging at room temperature will therefore extend the battery life to a maximum.

Caution ! ***All personnel who may be involved with recharging sensor batteries must read and understand the battery charging procedure. A charging procedure comes with every charger unit delivered, and at least one copy should be left available and visible at the charging station.***

4.5 Charger installation

For safety reasons the charger should always be installed in a position where it will not be subjected to temperatures below 15°C (59°F) or above 45°C (113°F).

The charger has four holes to enable it to be screwed to a bulkhead.

The charger contains short–circuit protection, which will prevent damage to the electronics if the clamps inadvertently touch.

Mains supply: ----------230 Vac or 115 Vac, 50/60 Hz.

Check that the correct mains supply is available for the charger. Details of the supply required are printed on the label on the front of the unit.

4.6 Charging time

The ITI fast charger will charge a discharged sensor battery to approximately 75% of full capacity in three hours, and then automatically switch to maintenance charging indicated by the green lamp. To fully charge the battery, the sensor must be maintenance charged for additional three hours.

Note !

If the battery temperature is below 15 °C, the battery charger will not fast charge the battery. To fully charge a sensor battery when maintenance charging only, charging time will be 14 – 16 hours.

When fast charging the red lamp is lit. The charger has a built–in controller to switch from fast charge to maintenance charging when the battery voltage reaches a pre set value, –or after approx. 3 hours controlled by the built–in timer.

If the sensor battery is not completely discharged prior to charging, the charger will switch from fast to maintenance charging when the battery voltage reaches the pre set value which will occur before the timer activates the switching.

The charger can remain connected for an unlimited time when the lamp is green.

4.7 Checking battery voltage

A voltmeter can be used to check the charge remaining in a sensor battery by connecting it across the positive and negative charging/securing lugs on the sensor in question. It is not easy to use the measured voltage to determine the exact charge though, because the cell's voltage response is very flat. The charger's built–in voltage sensing circuit will switch to maintenance charging (green light) when the voltage across the clamps reaches 14.1 V. (This voltage includes a 0.7 V drop across a diode). After the three–hour time limit, the battery should be charged to a minimum of 12.6 volts. If this level has not been reached, a problem exists. Check the following:

- If the ambient temperature is too high, the battery will not accept a full charge. Check the room temperature, and if necessary move the charger to a cooler area.
- The cables may be faulty or the clamps or lugs may be dirty, causing a volt drop outside the battery. The battery will not then receive the full charging voltage, resulting in a lower final charge. Check the charger cables, clamps and the sensor lugs, and clean as necessary.
- The battery pack may be faulty. It will then need to be changed.
- The charger may be faulty. It will then need to be changed.

4.8 Sensor and battery storage

Nickel–Cadmium batteries have a long life, and whether they are continually used or merely stored in a fully–charged condition, they should last for many years. The life of the battery is however influenced by use, the ambient temperature, the charging and discharging parameters. Also, all types of NiCad batteries degrade slowly with time, and this degradation rate increases with temperature. Proper use and storage conditions will slow the degradation and thus extend the life of the battery.

The batteries should be stored at a temperature between 0°C and 30°C (32°F and 86°F), the ideal being around 20°C (68°F). At this temperature the unit can be stored for long periods in either a charged or discharged state with virtually no degradation in capabilities. However, the batteries will slowly discharge over time, the discharge rate increasing with temperature, and damage may occur if the units are allowed to remain completely discharged over an extended period. *Simrad recommends that the batteries are stored in a fully–charged condition, and that they are recharged at least once every two months when not in use.*

4.9 Cleaning the charger clamps

When using the charger, it is important that the contact between the clamps and the sensor lugs is as good as possible. A resistive connection will cause a volt–drop across the contacts, and the battery will not receive a full charge. Clean the clamps and the lugs on the sensors at regular intervals using a piece of sand–paper to ensure a good electrical contact.

5 UPGRADING SYSTEMS WITH AN OLD PROCESSOR BOARD

Software versions 3.10 and higher need more PROM memory. Therefore, if the CPB286 processor board has a software version number lower than 3.10, the PROM U21 must be changed to an upgraded version with checksum EE06 (Simrad order No. 248–083082). Also some wire strap modifications must be made in the S1 strapping area on the board.

1 On the component side of the board, locate the strapping area S1

2 Make a wire strap between 6 and 9, and between 8 and 10. Solder both ends.

3 On the same location on the solder side of the board, disconnect the wire straps between 9 and 10 and between 9 and 8.

4 Change PROM U21 to an upgraded version marked EE06 95–11.12.

5 Then insert the new PROMs U64 and U44 according to the procedure starting on page 10

ITI check list, prior to upgrading

Vessel: ..... Written by: ..... Date: .....

Status mode

Software version ..... (top of the screen centred white text)
Transducer type ..... Std. offset .....° Port offset.....°
Gyro connected..... GPS ..... Chart plotter .....

Active sensors
Type ..... Priority ..... (example: Depth 1:2)
....
....
....
....
....
Catch available .....

Trawl Eye
Data rate ..... Data format ..... Range .....
Gain ..... Trawl height ..... Tr. Type .....
Scroll speed ..... Colour thresh. .....

System setup
Depth offset: ..... Timeout range: ..... Sensor filter .....

Type of trawl, type of fishing
Type of trawl .....Trawl height ..... Fishing depth .....
Type of fishing .....

Hydroacoustic equipment
Echo sounder and freq. ..... Sonar and frequency .....
Other cable–less trawl instrumentation and frequency .....

Comments: .....
.....
.....
.....
.....

ITI check list, after upgrading

Vessel: ..... Written by: ..... Date: .....

Status mode

Software version ..... (top of the screen centred white text)
Transducer type ..... Std. offset .....° Port offset.....°
Gyro connected..... GPS ..... Chart plotter .....

Active sensors
Type ..... Priority ..... (example: Depth 1:2)
....
....
....
....
....
Catch available .....

Trawl Eye
Data rate ..... Data format ..... Range .....
Gain ..... Trawl height ..... Tr. Type .....
Scroll speed ..... Colour thresh. .....

System setup
Depth offset: ..... Timeout range: ..... Sensor filter .....

Type of trawl, type of fishing
Type of trawl .....Trawl height ..... Fishing depth .....
Type of fishing .....

Hydroacoustic equipment
Echo sounder and freq. ..... Sonar and frequency .....
Other cable–less trawl instrumentation and frequency .....

Comments: .....
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