

Reliable catch monitoring

## WIRED TRAWL SONAR

- Wired transmission of trawl data for efficient pelagic and bottom trawling
- Monitoring the behavior and shape of trawl gear in relation with trawling speed, ocean current, warp lengths
- Assessing the fish catch
- Multi-window displays - scanned trawl mouth, vertical sounding, data area
- Vertical Sounding Window showing the clearance between foot rope and seabed
- Easy handling of data wire by remotely controlled winch
- Optional catch sensors
- The layout of a screen changes freely.

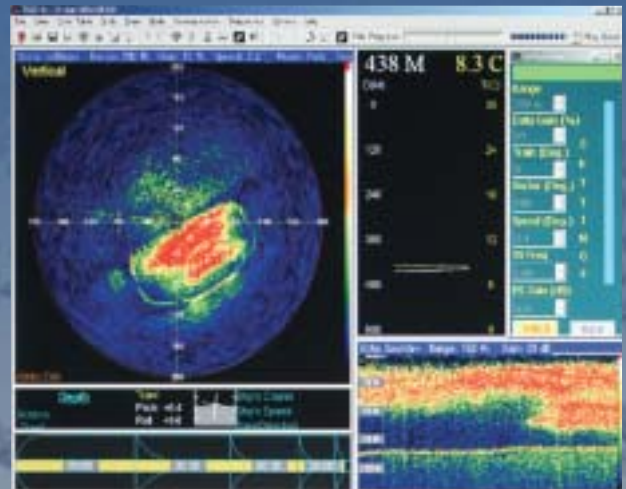
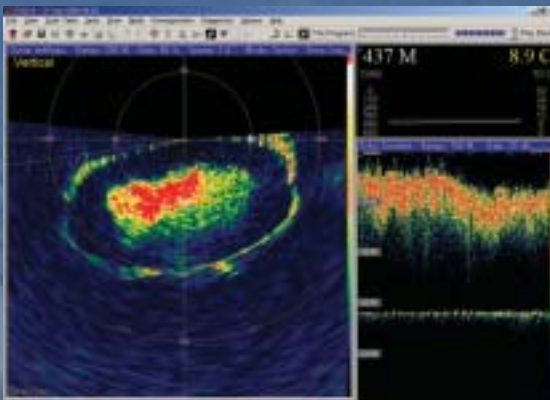
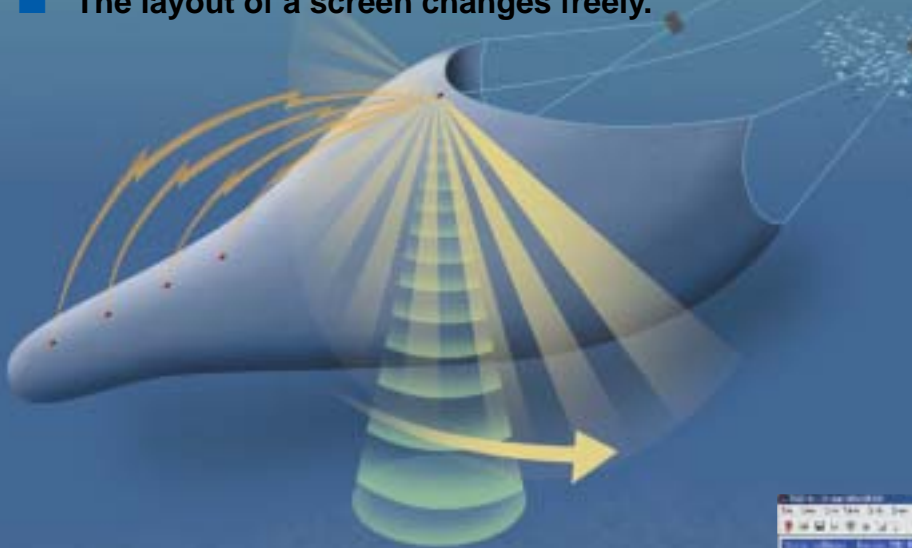
Model TS-331A



Underwater Unit TS-331A  
to be installed on the head rope.



Catch Sensor CS-400



The TS-331A is Wired Trawl Sonar for pelagic trawling. Trawl behavior and shape of trawl opening are affected with the trawl speed, warp length, ocean current. The TS-331A presents the trawl behavior showing the trawl mouth opening, motion and depth by using advanced ultrasonic technology.

The basic Trawl Sonar TS-331A consists of a sonar head (Underwater Unit) fitted on the head rope of the trawl gear, an on-board processor (Surface Processor Unit) and a data wire. The sonar head integrates a scanning array transducer, a down sounding transducer, a pressure sensor (to detect a distance to the surface), a backward transducer (to receive signals from optional catch sensors at the cod end) and a highly accurate motion sensor in a robust container. The motion sensor detects and displays

the precise net motion. This assists the operator in planning to trawl.

The display modes include: vertical scanning, down sounding and graph for temp/depth. The vertical scanning image offers a shape of the net mouth, motion of the net and the relation between the net and the seabed. Each mode can be displayed on one screen, and the size and position of each window can be easily changed, so a operator can arrange the presentation freely.

Up to four catch sensors can be installed on the cod end. Catch signals are transmitted to the sonar head via ultrasonic link when corresponding net mesh is expanded with filled fish. This function helps avoid trawl damages due to excessive fish caught in the net and tells the timing of hauling.

## SPECIFICATIONS OF TS-331A

### GENERAL

<b>Display</b>	PC monitor (SXGA) 1280 (H) x 1048 (V) pixels
<b>Display Mode</b>	Combination with Full Circle or Sector and sounder, Zoom (100 % ~ 400 %)
<b>Presentation Color</b>	9 patterns

### UNDERWATER UNIT

<b>Operating Depth</b>	2,000 m
<b>Vertical Scanning Sonar</b>	
<b>Frequency</b>	330 kHz
<b>Sector Size</b>	360°
<b>Scan Step</b>	0.3, 0.6, 0.9, 1.2, 2.4° per step
<b>Range</b>	10, 20, 30, 40, 50, 60, 80, 100, 150, 200, 250 m

<b>Echo Sounder</b>	
<b>Frequency</b>	120 kHz
<b>Ranges</b>	50, 100, 150, 200, 300 m

<b>Temperature Sensor</b>	
<b>Measurement Range</b>	-5°C to +35°C

<b>Depth Sensor</b>	
<b>Measurement range</b>	0 to 2000 m

<b>Pitch/Roll Sensor</b>	± 60°
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### CATCH SENSOR CS-400

<b>Operating Depth</b>	2000 m
<b>Frequency</b>	Channel 1: 69.75/70.25 kHz Channel 2: 72.25/72.75 kHz Channel 3: 74.75/75.25 kHz Channel 4: 77.25/77.75 kHz

<b>Power Supply</b>	3 Alkaline batteries
<b>Operating Time</b>	1000 h

### POWER SUPPLY

110/220 VAC

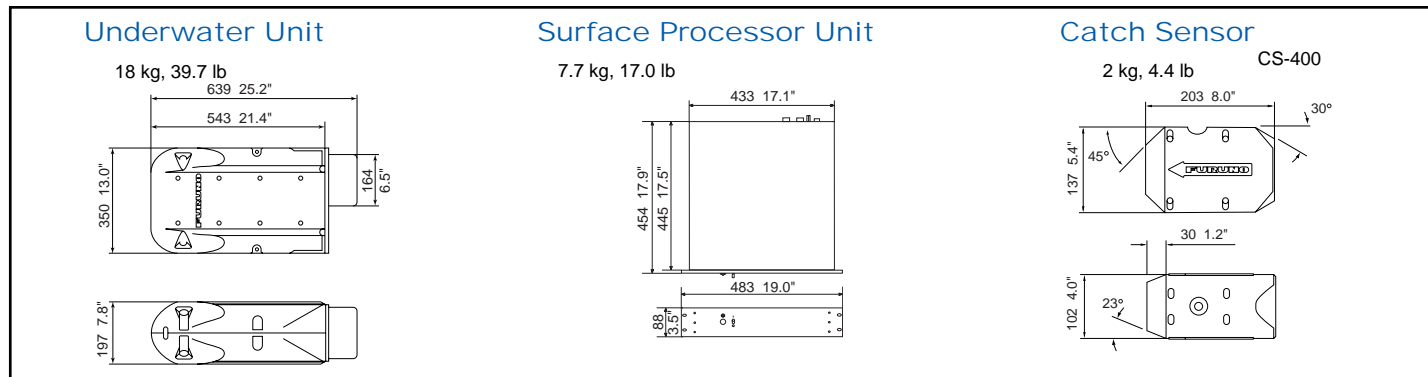
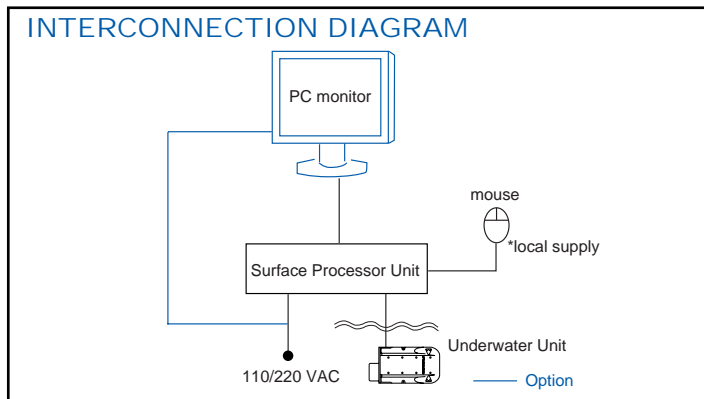
### EQUIPMENT LIST

<b>Standard</b>		
1. Underwater Unit		1 unit
2. Surface Processor Unit		1 unit
3. Installation Materials and Standard Spare Parts		

<b>Option</b>	
1. Catch Sensor CS-400	

### Third Wire System

<b>Winch System</b>	Shipyards supply
<b>Cable</b>	Armored coax cable
Loop Resistance	100 ohm
Attenuation	20 dB, 100 kHz
Length	3000 m



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

**FURUNO U.S.A., INC.**  
Camas, Washington, U.S.A.  
Phone: +1 360-834-9300 Fax: +1 360-834-9400

**FURUNO (UK) LIMITED**  
Denmead, Hampshire, U.K.  
Phone: +44 2392-230303 Fax: +44 2392-230101

**FURUNO FRANCE S.A.**  
Bordeaux-Mérignac, France  
Phone: +33 05 56 13 48 00 Fax: +33 05 56 13 48 01

**FURUNO ESPAÑA S.A.**  
Madrid, Spain  
Phone: +34 91-725-90-88 Fax: +34 91-725-98-97

**FURUNO DANMARK AS**  
Hvidovre, Denmark  
Phone: +45 36 77 45 00 Fax: +45 36 77 45 01

**FURUNO NORGE A/S**  
Ålesund, Norway  
Phone: +47 70 102950 Fax: +47 70 127021

**FURUNO SVERIGE AB**  
Västra Frölunda, Sweden  
Phone: +46 31-7098940 Fax: +46 31-497093

**FURUNO FINLAND OY**  
Espoo, Finland  
Phone: +358 9 4355 670 Fax: +358 9 4355 6710

04063Y Printed in Japan

