

**FURUNO**

# **OPERATOR'S MANUAL**

*ICE RADAR*

[www.furuno.fi](http://www.furuno.fi)

**Furuno Finland Oy**

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# **FOREWORD**

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## **A Word to the Owner of the Ice Radar**

Congratulations on your choice of the FURUNO Ice Radar.

Your equipment is designed and constructed to meet the rigorous demands of the marine environment. However, no machine can perform its intended function unless properly operated and maintained. Please carefully read and follow the operation and maintenance procedures set forth in this manual.

Thank you for considering and purchasing FURUNO.

We would appreciate feedback from you, the end-user, about whether we are achieving our purposes.

## **Features**

The Furuno Ice Radar is a hybrid ice radar. It is based on the normal Furuno ARPA radar, and captures a copy of the raw radar signal from the ARPA processor. The normal operation of the ARPA radar is not affected.

The Ice Radar is not a navigational device. It is a supplementary system for the specific task of observing ice conditions by radar.

If you like to know more about the Ice Radar capabilities please contact to Furuno Finland Oy ([www.furuno.fi](http://www.furuno.fi)).

## **Software history**

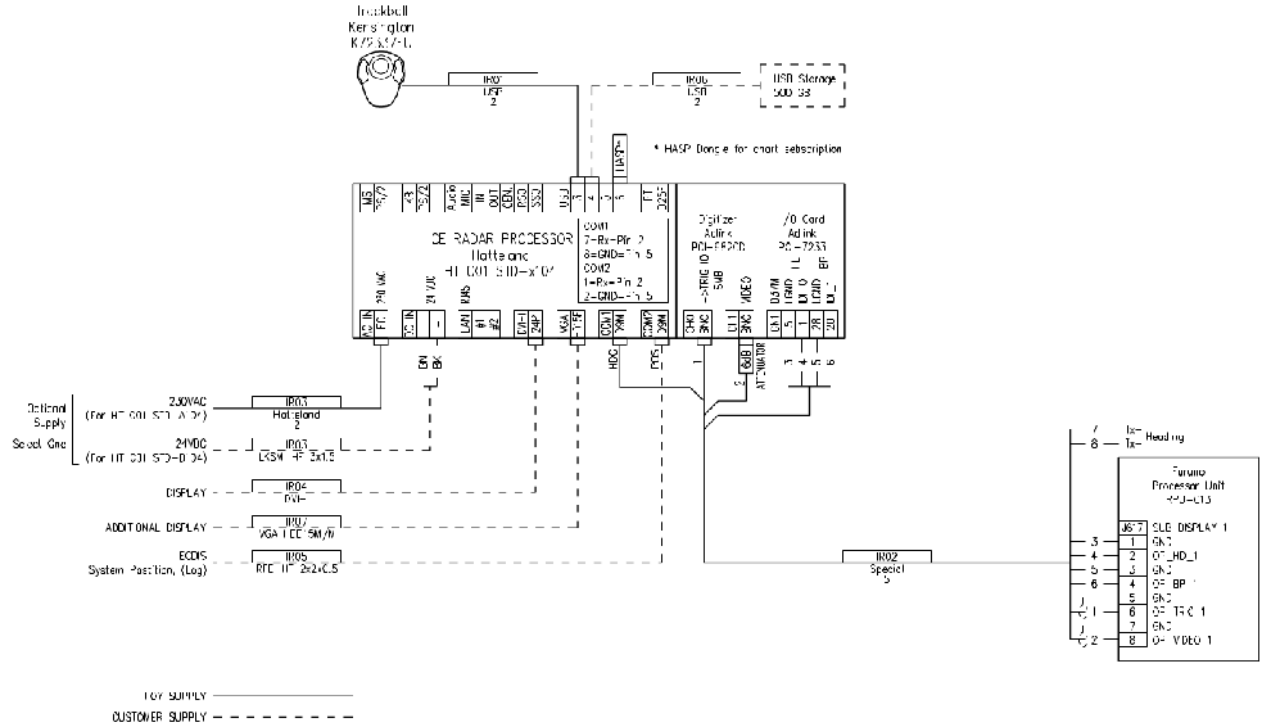
V1.00 Initial Release

V1.20 Motion compensation release

V1.30 New GUI and support for GPS sensors

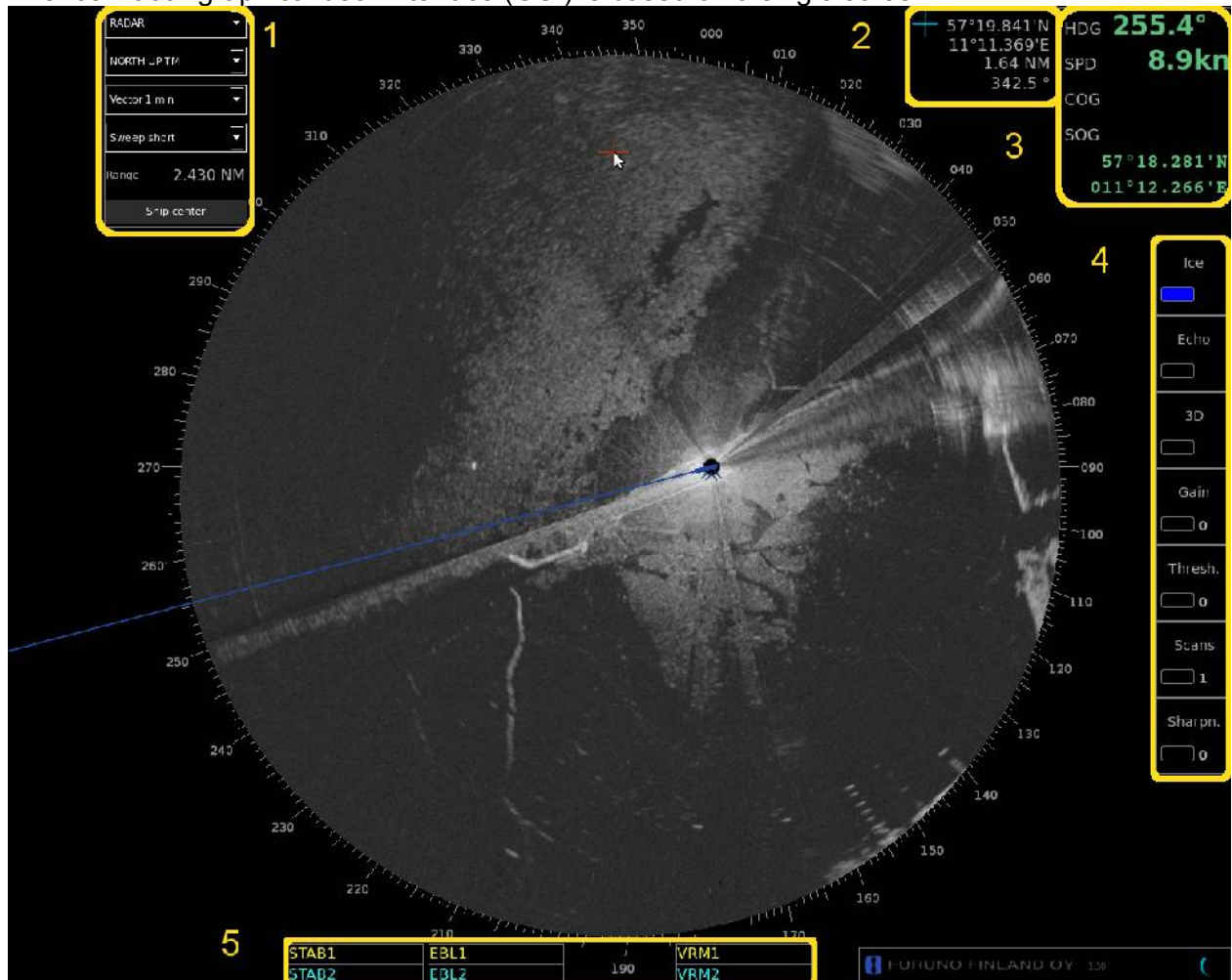
# SYSTEM CONFIGURATION

Typical Ice Radar system configuration:



# 1. GRAPHICAL USER INTERFACE (GUI)

The Ice Radar graphical user interface (GUI) is based on a single screen.



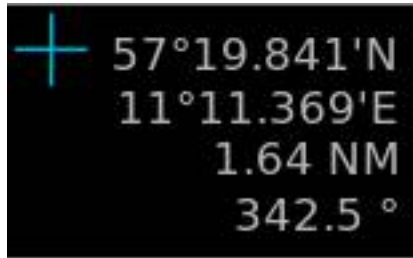
User interface sections	
1.	Operating mode, Heading mode, vector selection, sweep selection, range/scale and ship center button
2.	Cursor position indicator
3.	Navigational data
4.	Ice filter parameter adjustment
5.	EBL/VRM indicators

## 1.1 Operating mode selections



o.	Description
1.	Operation mode select – Available modes: <ul style="list-style-type: none"> <li>– Radar</li> <li>– Chart</li> <li>– Chartradar</li> </ul>
2.	Motion mode select - Available modes: <ul style="list-style-type: none"> <li>– Head Up TM</li> <li>– Head Up RM</li> <li>– North Up TM</li> <li>– North Up RM</li> </ul>
3.	Vector – Selection of vector length (Off, 1 min, 3 min, 6 min)
4.	Sweep length used for ice calculations, affects resolution of the ice image (1024 samples): <ul style="list-style-type: none"> <li>– short (1.18 NM, sample rate 70MHz)</li> <li>– medium (2.37 NM, sample rate 35MHz)</li> <li>– long (3.55 NM, sample rate 23MHz)</li> </ul>
5.	Range/Scale indicator – Shows the range in Radar and Chartradar modes and the current scale in the Chart mode.
6.	Ship Center button - clicking this will place the ship to the center of the screen

## 1.2 Cursor position indicator



No.	Description
1.	Cursor position display

### 1.3 Navigational data

The indicators are passive repeaters of navigational data received from the sensors.










No.	
1.	Heading
2.	Speed over water
3.	Course over ground
4.	Speed over ground
5.	Position



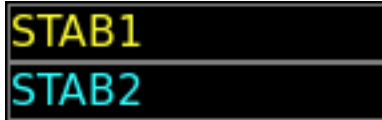
## 1.4 Ice filter parameter adjustments

These parameters affect the behavior of the ice filter

	No	Description
<b>Ice</b> 	1.	Ice – toggle ice echoes on/off
<b>Echo</b> 	2.	Echo – toggle navigational radar echoes on/off
<b>Brightn.</b> 	3.	Brightness – adjust brightness of ice layer. Zero is the best value found in lab.
<b>Contrast</b> 	4.	Contrast – adjust contrast of ice layer. Zero is the best value found in lab.
<b>Gamma</b> 	5.	Gamma – adjust linearity of ice color. Zero is the best value found in lab.
<b>Fusion Mode</b> 	6.	Fusion Mode – 0=off, 1=mean, 2=median, 3=min, 4=max, 5=range 3(minimum) reduces noise and is good for small detail in ice 2(median) is also good for ice navigation 5(range) was for detecting lack of waves. Not very useful. 1(mean) is classical mean. But it smoothens the image. 0 and 4 are kind of noisy. But they show everything.
<b>Fusion Scans</b> 	7.	Adjust number of scans – how many overlapping radar scans are used for the ice echoes

## 1.5 EBL/VRM

There are two EBL/VRM measurement tools available. You can choose the operating modes of these tools by clicking in the STAB1 or STAB2 box with your mouse.



No.	Description
1.	blank – tool is disabled
2.	Ship – the measurements are done from the ship's conning position
3.	Gnd – the measurements are stabilized to ground

The EBL and VRM values are shown both on screen and in the respective boxes.



No.	Description
1.	Click on EBL1 or EBL2 will toggle the EBL between true (T) and relative (R) measurements
2.	Click on VRM1 or VRM2 will show or hide the VRM measurement
3.	Using the scroll wheel on any box will adjust that value.

EBL/VRM can be adjusted by dragging the intersection point on the screen.

Note: you choose the point to drag by clicking on the first point with the right mouse button. To release the drag you have to click with the right mouse button again after moving the point to the new position.

## 2. INSTALLATION

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Sensor and conning positions on ship are in “shipInstall.ini” file, which must be edited at installation time.

No.	Description	Function
1.	Power up ice radar	Start up ice radar
2.	Open login screen	Press Ctrl-Alt F1 to open a login screen
3.	Authenticate	Login: ffoy Password: ffoy
4.	Edit shipInstall.ini file	nano ./FFOYBIN/shipInstall.ini
5.	Set position sentence	Alternatives are GLL, GGA or PNEDA
6.	Set length and width	Replace ship measurements to correct ones (in meters)
7.	Set offsets to conning position, gps antenna and radar antenna	<pre> ; Offset of conning position from ship's centerpoint ; x: positive (starboard), negative (port) or zero (centre) ; y: positive (bow), negative (stern) or zero (centre) x=2.0 y=50.0  [gpsAntenna] ; Offset of gps antenna position from ship's centerpoint x=3.0 y=50.0  [radarAntenna] ; Offset of radar antenna position from ship's centerpoint x=4.0 y=52.0 </pre>
8.	Save your edits	Ctrl-X and Y
9.	Restart ice radar	sudo reboot