The purpose of this guide is to provide the basic operation for this equipment. For more detailed information, see the Operator’s Manual.

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### Radar Controls

**BRILL**
- **Rotate**: Adjusts the brilliance of a FURUNO monitor.
- **Push**: Selects a color palette.

**A/C RAIN**
- **Rotate**: Suppresses rain clutter.
- **Push**: Toggles between manual and automatic rain clutter adjustment.

**A/C SEA**
- **Rotate**: Suppresses sea clutter.
- **Push**: Toggles between manual and automatic sea clutter adjustment.

**ALARM ACK**
- Acknowledges alerts; silences the audio alarm.

**ACQ/ACT**
- **TT**: Acquires cursor-selected target, for target tracking.
- **AIS**: Activates cursor-selected sleeping AIS target.

**POWER SWITCH**
- Turns the system on or off.
- *(This switch does control monitor on/off.)*

**USB PORT**
- For connection of a USB flash memory.
- To use the USB port, connect the processor unit to the USB port at the rear side of the control unit, using the optional USB cable.

**V-view/hide**
- Radar mode, chart radar mode: Shows or hides AZ box, Drop mark boxes, Mark box, PI line box, Trial box.
- Chart mode: Shows or hides EBLs, InstantAccess bar, [Overlay/NAV Tools] box, [Route information] box, VRMs.

**VIEW/HIDE**
- Radar mode, chart radar mode: Shows or hides AZ box, Drop mark boxes, Mark box, PI line box, Trial box.
- Chart mode: Shows or hides EBLs, InstantAccess bar, [Overlay/NAV Tools] box, [Route information] box, VRMs.

**UNDO**
- Undoes edit or text input when creating a radar map, route, user chart.

**InstantAccess knob**
- Selects the buttons on the InstantAccess bar.

**ESC**
- Goes back one step in current operating sequence on the InstantAccess bar.

**RANGE**
- Selects radar range (radar and chart radar modes), chart scale (chart mode).

**Status LED**
- The color and state of the LED change according to system or alert status.

**GAIN**
- Adjusts the sensitivity of the radar receiver.

**Rotary control for VRM**
- Adjusts the diameter of the active VRM.

**VRM1, VRM2**
- Activates or deactivates the respective VRM.

**Trackball module**
- Operates similar to a PC mouse.

**ACQ/ACT**
- **TT**: Acquires cursor-selected target, for target tracking.
- **AIS**: Activates cursor-selected sleeping AIS target.

**TARGET DATA**
- Displays the detailed data for selected TT, AIS target, in the TT/AIS information box.

**TARGET CANCEL**
- **TT**: Stops tracking cursor-selected tracked target.
- **AIS**: Sleeps cursor-selected activated AIS target.
- Long-press to erase all displayed TT target data.
HL OFF
Temporarily erases everything except radar echoes when pressed and held down.

EBL OFFSET
Activates or deactivates the offset EBL.

MODE
Selects a presentation mode.

OFF CENTER
Puts sweep origin at the cursor location.

CU/TM RESET
Course-up: Resets heading line to 000°.
True motion: Moves own ship position 75% of the radius in stern direction.

INDEX LINE
Short press: Selects an index line.
Long press: Activates or deactivates selected index line.

VECTOR TIME
Sets the vector time (length) for TT and AIS targets.

VECTOR MODE
Sets the vector mode (relative, true) for TT and AIS targets.

TARGET LIST
Displays AIS, TT data in the target list.

TRAIL
Short press: Turns the echo trail display on or off.
Long press: Resets all trails.

PANEL
Adjusts the backlighting of the keys.

MARK
Inputs selected mark, at the position selected.
**Radar Display Indications**

**Range/Presentation mode box**
- Selects the radar range.
- Selects the presentation mode.

**REF point box**
Selects the reference point (antenna or CCRP) for measurements (range, bearing, etc.) and markers (position, etc.)

**Tuning bar**
Shows tuning status except for solid state radar.

**InstantAccess bar (see page 6)**
Quick access to often-used radar, chart radar functions.

**Watch box**
Counts down the time remaining until the buzzer sounds to alert the operator to view the radar picture.

**PI line box**
- Adjusts the direction and width of the parallel index lines.
- Activates or deactivates the parallel index lines.

**Mark box**
Selects the mark to inscribe on the radar display.

**Cursor position box**
This box shows
- Latitude and longitude of the cursor position.
- Range and bearing to the cursor position.
- TTG to the cursor position.

**Status bar (see page 5)**

**Sensor information, datum box**
Shows your ship's heading, heading source, ship's speed, water tracking speed, speed source, course over ground, speed over ground, course and speed source, ship's position, position source, chart datum.

**Menu**
Drop-down menu with various radar and chart radar functions.

**NAV data/Route information box**
Provides various navigation data and route information.

**TT/AIS setting box (see page 8)**
Sets the parameters for TT and AIS targets.

**Past POSN, Trail box**
Sets the parameters for the past position display and target trails.

**Alert box**
Shows alert messages by alert name and alert number.

**Target List button**
Displays the TT and AIS target list.

**Trial maneuver box**
Sets the parameters for the trial maneuver.

**Acquisition zone box**
Sets an acquisition zone for TT, AIS.
Radar Display Indications (con’t)

**Heading line**
Indicates ship’s heading.

**EBL1**
Measures the bearing to a target.

**Bearing scale**
The bearing scale provides an estimate of the bearing to a target.

**EBL2**
Measures the bearing to a target.

**Range rings**
Provides an estimate of the range to a target.

**Own ship marker**
(Blue horizontal line)
Marks your ship’s position.

**Stern marker**
Marks location of stern.

**North marker**
Marks North.

**Drop mark**
Finds the range and bearing to drop mark position.

**VRM1**
Measures the range to a target.

**VRM2**
Measures the range to a target.

**Message area**

**Indicates ship’s heading.**

**Bearing scale**
The bearing scale provides an estimate of the bearing to a target.

**EBL1**
Measures the bearing to a target.

**EBL2**
Measures the bearing to a target.

**Range rings**
Provides an estimate of the range to a target.

**Own ship marker**
(Blue horizontal line)
Marks your ship’s position.

**Stern marker**
Marks location of stern.

**North marker**
Marks North.
**Status Bar (radar, chart radar mode)**

**Operating mode**
Selects a mode: radar or chart for radar.

- **RADAR**
- **STBY TX**
- **ANT-3(M) X-BAND**
- **OCEAN**
- **IMO Standard**

**Antenna**
Selects an antenna.

**STBY TX**
Toggles the radar between stand-by and transmit.

**Chart database**
Selects the IMO chart database (base, primary, standard or all).
Available in the chart radar mode.

**Customize Echo**
Presets the radar controls for specific navigation purpose; for example, set up to use the radar in congested waters.

**Status Bar**

- **GAIN**
  Adjusts the gain of the radar receiver.

- **User profiles, Settings menu**
  Manages user profiles; opens the Settings menu.

- **Date**
  Displays the date; selects the time to use, local or UTC.

- **Time**
  Displays the time.

- **Working indicator**
  Rotates clockwise if the system is working properly.

**RAIN**
Reduces rain clutter.

**SEA**
Reduces sea clutter.

**GAIN**
Adjusts the gain of the radar receiver.
### Radar-mode

- **MAP ON/OFF**
  - Shows or hides the radar map marks on the radar display, in the radar mode.

- **Chart ON/OFF**
  - Shows or hides the electronic chart.

### Chart radar mode

- **Chart ON/OFF**
  - Shows or hides the electronic chart.

- **Chart Disp**
  - Shows or hides various chart objects.

  - **Coast Line Only**
    - Shows only the coastline when clicked.

  - **Chart Top Layer**
    - Puts the chart objects on the top layer when clicked.

  - **Sel Disp Object**

  - **Chart Legend**
    - Opens the [SEL DISPLAY OBJECT] menu.
    - Opens the [CHART DISPLAY] menu.
    - Shows chart legend.

### Instant Access Bar (radar, chart radar mode)

- **PULSE M3**
  - Selects the radar pulse length.

- **TUNE** (other than solid state radar)
  - Tunes the radar receiver.

- **TX CH** (for solid state radar)
  - Selects the transmit frequency.

- **IR OFF**
  - Activates or deactivates the interference rejector.

- **ES OFF**
  - Activates or deactivates the echo stretch.

- **Automatic Clutter Elimination (ACE)**
  - The indication for the EAV button is grayed out.

- **EAV OFF**
  - Activates or deactivates the echo averaging.

- **EAV ON**
  - The Automatic Clutter Elimination (ACE) function is on.

- **ACE OFF**
  - The Automatic Clutter Elimination (ACE) function is off.

- **ACE ON**

- **HL OFF**
  - Temporarily erases everything but radar echoes.

- **CU/TM reset**
  - Resets ship’s position in course-up and true motion modes.

- **OWN AIS**
  - Shows the [VOYAGE DATA] menu, to set your ship’s AIS data.

- **AIS message**
  - Displays screen for “received AIS messages”.

- **Palette**
  - Selects a color palette.

- **MOB**
  - Enters a MOB mark at the current position.

- **Capture**
  - Takes a screenshot.

- **UNDO**
  - Restores previous condition in radar map and text input.
**TT Operations**

### TT symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>○</td>
<td>Target under manual acquisition (green)</td>
</tr>
<tr>
<td>○</td>
<td>Target under automatic acquisition (red)</td>
</tr>
<tr>
<td>○</td>
<td>Acquired target (red)</td>
</tr>
<tr>
<td>○</td>
<td>Dangerous target (red)</td>
</tr>
<tr>
<td>✗</td>
<td>Lost target (red)</td>
</tr>
</tbody>
</table>

#### How to manually acquire a target for tracking

Click the radar echo.

- TT symbol (under acquisition)
- TT symbol (target acquired)

#### How to show a tracked target’s data

Click the TT symbol.

#### How to stop tracking a target

Right-click the display area to show the context-sensitive menu.

Select [Target Cancel] then click the TT symbol.

---

**AIS Operations**

### AIS symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>▲</td>
<td>Sleeping AIS target (green)</td>
</tr>
<tr>
<td>▲</td>
<td>Activated AIS target (green, thick line)</td>
</tr>
<tr>
<td>▲</td>
<td>Association AIS target (green)</td>
</tr>
<tr>
<td>▲</td>
<td>Dangerous AIS target (red)</td>
</tr>
<tr>
<td>▲</td>
<td>Dangerous association AIS target (red)</td>
</tr>
<tr>
<td>✗</td>
<td>Lost AIS target (red)</td>
</tr>
</tbody>
</table>

#### How to activate a sleeping target

When you convert a sleeping target to an activated target, the activated target’s course and speed are shown with a vector. You can easily judge target movement by monitoring the vector.

- Vector
- ROT
- Heading line

#### How to show an AIS target’s data

Click the AIS target symbol.
The TT/AIS setting box shows or hides the TT and AIS displays, and sets the CPA/TCPA alarm, the past position display, vector time and reference, etc.

- **Sets TT acquisition method; hides TT display.**
- **Shows or hides AIS display.**
- **Sets TT/AIS vector reference.**
- **Sets TCPA condition for TT/AIS CPA/TCPA alarm.**
- **Sets TT/AIS lost target filter conditions.**
- **Sets plot interval for TT/AIS past position displays.**
- **Sets CPA condition for TT/AIS CPA/TCPA alarm.**
- **Sets TT/AIS vector time.**
- **Click to set association criteria (with arrow).**
  - `<: AIS symbol used for association target.
  - `>: TT symbol used for association target.
  - No indication: Disables association.
- **Sets conditions for automatic activation of AIS targets when their CPA is within the CPA set.**
- **Sets reference (true or REL) for TT/AIS past position points.**
- **Sets TT/AIS CPA/TCPA alarm.**

**Symbol Menu:**
- **Disp Off**
- **Disp Filt**
- **Disp All**
- **(AIS Menu)**
- **[Symbol Menu]**

**AIS Menu:**
- **True-G**
- **REL**
- **[OS Vector Menu]**
- **[Target Vector Menu]**

**Target Vector Menu:**
- **True-G**
- **REL**
- **[AIS Lost Filter Menu]**

**Lost Filter Menu:**
- **OFF**
- **Filt**
- **ALL**
- **[TT Lost Filter Menu]**
- **[AIS Lost Filter Menu]**

**Auto Activate Menu:**
- **OFF**
- **AUTO ACT Filt**
- **AUTO ACT ALL**
- **[Auto Activate Menu]**
Status Bar (chart for radar mode)

Operating mode Selects the operating mode: RADAR or CHART for RADAR.

NAVI Selects the Voyage navigation mode.

CHARTS Goes to the Chart maintenance mode.

PLAN Selects the Voyage planning mode.

OTHERS Sets system in standby.

How to open a drop-down list:

Indicates a drop-down list.

Click button

Drop-down list

CHART ONLY Shows only the chart, when left button is pressed and held down.

STD DISP Restores the IMO standard display.

User profiles, Settings menu Manages user profiles; opens the Settings menu.

Date Displays the date; selects the time to use, local or UTC.

Chart database Selects the pre-defined presentations of ENC content: IMO BASE, IMO STD or IMO ALL.

Working indicator Rotates clockwise if the system is working properly.

Time Displays the time.
How to create a route

1. Click [New].
2. Enter name for route.
3. Click [OK].
4. Click [Save].

At last waypoint, right-click and select [Finish].

Continue entering waypoints.
**Routes (con’t.)**

**How to select a route to navigate**

1. Right-click [Route].
2. Click [Select Route].
3. Select a route.
4. Route selected.

**How to view route waypoint information**

1. Right-click [Route].
2. Click [Route Info].
3. Click [Waypoints] tab.
4. Click [Open].

**How to delete a route**

1. Check route(s) to delete.
2. Click [Delete].

**To stop navigating a route:**

1. NAVI
2. Route
3. Unselect
**User Charts**

**How to create a user chart**

1. **PLAN**
2. **Planning**
3. **User Chart**

**Click object to draw.**

- **Tidal:**
  - Current  - Predicted
- **Line:**
  - Coast  - Route  - Depth
- **Clearing line:**
  - NMT  - NLT
- **Label:**
  - Label  - Point

**How to create a line**

1. **Click**
2. **Click**
3. **Right-click; select [Finish].**

**How to create a circle**

1. **Click**
2. **Drag cursor; double-click to set.**
3. **Right-click; select [Finish].**

**How to create an area**

1. **Click**
2. **Click**
3. **Right-click; select [Finish].**

**Click (3) Click (2) Click**

**Label:**

- Label  - Point

**Right-click to open options.**

**Example objects**

**Click [New].**

**Click **Save**.**

**Enter name for user chart.**

**Click [Save].**
User Charts (con’t)

How to select objects to display in user chart

- Click [Mariner] tab.
- Check item(s).
- Click [Save].

How to link a user chart to a route

- Click [User Chart] tab.
- Select user chart to link.
- Click [Save].

How to delete objects from a user chart

- Circle or area: Right-click, Select [Delete].
- Point on a line: Right-click the point, Select [DeletePoint].

How to delete user charts

- Click [Open].
- Click [Delete].

DISP → SET → Symbol

PLAN → Plan-ning → Route

Click [Select].
Click [Open].
Route selected.
Click [Save].

Check chart(s) to delete.
Click [Delete].
Chart Operations

How to control visibility of chart objects

Basic Setting
Control basic chart settings

DISP → SET
Chart DISP
Control chart objects

Symbol DISP
Control navigational features

How to control visibility of chart objects:
How to set safety contours and chart alerts

1. Click to select chart alert type:
   - Red (): Audio+visual indications
   - Orange (): Visual indication
   - Yellow (): No indication

2. Click to select chart alert type:
   - Red (): Audio+visual indications
   - Orange (): Visual indication
   - Yellow (): No indication

3. Set safety contours here.

4. Click to select chart alert type:
   - Red (): Audio+visual indications
   - Orange (): Visual indication
   - Yellow (): No indication

5. Set safety contours here.

How to find chart object information (ENC chart)

1. Put cursor on location where to insert object then click.

2. Right-click.

3. Select Object INFO.

   ① Select an object.

   ② Click [OK].

How to manually insert a “new” chart object

1. Click [Planning] tab.

2. Select object from Drawing type.

   ① Select object from Drawing type.

   ② Click object to add.

   ③ Click [Add].

   ④ Click [Commit].
How to find target info
Click a target to show its information.

TT/AIS Operations

How to set up TT and AIS on the TT/AIS page in Overlay/NAV Tools box

Sets TT/AIS CPA/TCPA alarm.

Sets TT/AIS lost target alarm conditions.

Sets past position point interval (time).

Sets reference for TT/AIS past position display.

Sets TT/AIS vector time.

Shows or hides TT display.

Shows or hides AIS display.

Set association method.

Vector (ex. TT)

Sets CPA and TCPA conditions for TT/AIS CPA/TCPA alarm.

Sets conditions for automatic activation of AIS targets when their CPA is within the CPA set.

Title bar
MMSI
Vessel name
Position
Heading
Bearing
Range
Course over ground
Speed over ground
CPA
TCPA
Bow crossing range
Bow crossing time
(Bow crossing range
Bow crossing time)

Symbol (Color)
Name
Past position point
Target under acquisition
Acquired target

Title bar
AIS Info
MMSI
Vessel name
Heading
Rate of turn
Bearing
Range
Course over ground
Speed over ground
CPA
TCPA
Position

Symbol (Color)
Name
Past position point
Sleeping AIS target
Activated AIS target

Vector (ex. TT)

Vector (ex. AIS)
TT/AIS Operations (con’t)

Open the chart menu, select TT/AIS Setting and then Setting.1 or Setting.2 as appropriate.

**AIS filter, how to sleep all AIS targets, auto activation of AIS targets by CPA**

- Filters AIS targets by target category.
- Filters AIS targets by range, speed.
- Sleeps all activated AIS targets.

Sets conditions to activate an AIS target when its CPA is within the CPA alarm setting.

**AIS and TT lost target filters**

- Sets conditions for AIS lost target filter.
- Sets conditions for TT lost target filter.

Sets conditions for association target filter.