Go Beyond What The Eye Can See

ENVISION

FURUNO
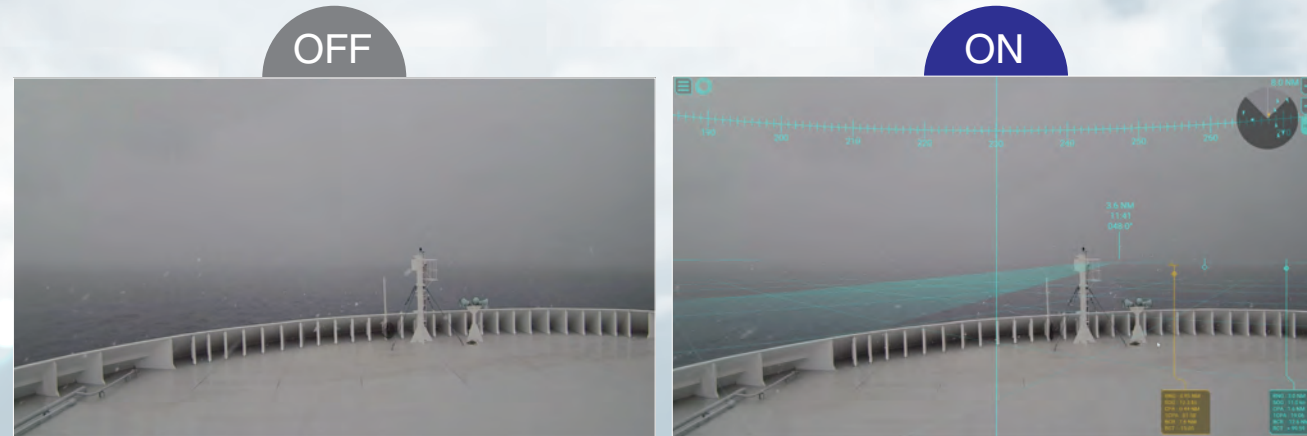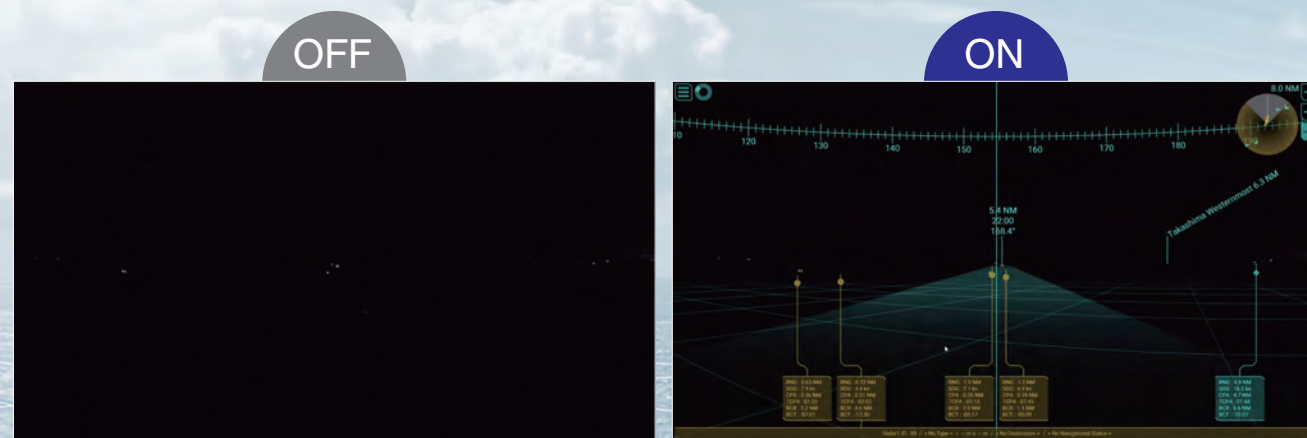
> AR information overlaying the screen is particularly useful in poor visibility conditions.

AR Navigation ON/OFF Comparison in bad weather conditions

OFF | ON

AR Navigation ON/OFF Comparison during nighttime navigation

OFF | ON

* By using a surveillance video camera and overlaying AR information on the display, our AR Navigation system allows for quick and intuitive situational awareness.

Product name	AR Navigation System
Model name	AR-100M

Processor

CPU	Intel®Celeron®N3350 2.4GHz
Memory	4GB
Display mode	Target Tracking (TT), AIS, Azimuth, User chart, ENC chart symbol
Interface	Ethernet 2 ports
	RS-232 1 port
	USB USB2.0：4 ports, USB3.0：2 ports
	HDMI 1 port
Power Supply	100-240 VAC: 0.9-0.4 A, 1 phase, 50-60 Hz
Data sentences (IEC61162-1/2)	Input GGA、GNS、HDT、OSD、RMB、THS、TLB、TTD、TTM、VDM、VDO、VTG、ZDA

IP camera

Resolution	1920 x 1080
Frame rate	25 fps
Video Compressio	H.264 codec
Source	PoE Adapter

PoE Adapter

Power Supply	100-240 VAC: 0.2-0.08 A, 1 phase, 50/60 Hz

Monitor (option)

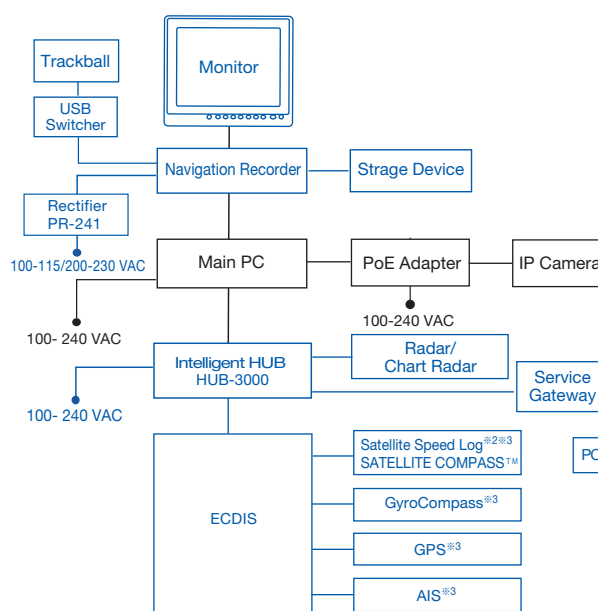|	
Resolution	1920 x 1080

Navigation Recorder (option)

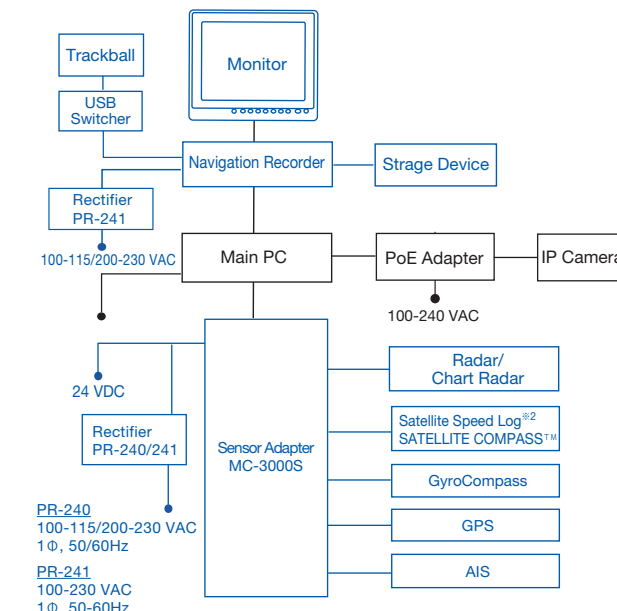|	
Recording data format	mp4*/jpeg *Audio data not available
Recording duration	Depending on the available size of the storage device, 2 TB can store up to 720 hours of data.

Standard Equipment list

1.Processor   2. IP camera（Visible light camera） 3. PoE Adapter   4. Trackball mouse   5. ENC dongle*   6. Installation materials
（HDMI cable 5 m, LAN cable 10 m x2 /2 m, USB cable 5 m x2, Processor mount kit, IP camera bracket, Screws for bracket・
Washer, Aseismic mat for installing POE Adapter）

* ENC dongle provided separately from the box, only if ECDIS is included in the system configuration.

(1) ECDIS is included

Trackball — USB Switcher — Monitor
Navigation Recorder — Strage Device
Rectifier PR-241
100-115/200-230 VAC
Main PC — PoE Adapter — IP Camera
100-240 VAC
100- 240 VAC
Intelligent HUB HUB-3000 — Radar/Chart Radar — Service Gateway ※1
100- 240 VAC
ECDIS — Satellite Speed Log※2※3 SATELLITE COMPASS※4 — PC for ADP※4
GyroCompass※3
GPS※3
AIS※3

(2) ECDIS is not included

Trackball — USB Switcher — Monitor
Navigation Recorder — Strage Device
Rectifier PR-241
100-115/200-230 VAC
Main PC — PoE Adapter — IP Camera
100-240 VAC
24 VDC
Rectifier PR-240/241 — Sensor Adapter MC-3000S — Radar/Chart Radar
PR-240 100-115/200-230 VAC 1Φ、50/60Hz — Satellite Speed Log※2 SATELLITE COMPASS※4
PR-241 100-230 VAC 1Φ、50-60Hz — GyroCompass
GPS
AIS

━━ Option/Customer supply

※1 Needed for displaying UKHO® ADP chart
※2 The level of pitch, roll and yaw compensation may vary depending on the performance and data conversion rate of the connected equipment.
※3 When 3 or more instruments are connected to the FMD-3100, the sensor adapter MC-1000S is required.
※4 Windows 10®, Microsoft NET Framework® v4.0, LAN pot, FURUNO CAST ADP software, UKHO® ADP software installation and a valid license are needed.

Driving the Digitalization of Navigation

ENVISION

FURUNO ENVISION
A revolutionary solution
Designed for the future of navigation

AR Navigation System

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

More details on
www.furuno.com

ENVISION

Go Beyond What The Eye Can See

AR OVERLAY

- Azimuth ● AIS ● Heading ● Radar Target Tracking (TT)
- Route ● Waypoint ● User chart & ENC symbols
- UKHO® ADP current and tide display (option)

MENU
Date and time
Azimuth scale
Tide
Azimuth (Heading)
User chart information: Label
TVI (Top View Indicator): Display TT/AIS Information in 360° (own ship as center)

27 Feb 2019
01:57:10 UTC

Waypoint (Distance, TTG, Course)

Selection marker: Click to display TT or AIS information
Target shape: Digital representation on AIS target
Current (Data on nearest location)
User chart information: No-go area
Target Information box
Additional target information

Grid: Own coordinates or World coordinates
Navigation route (Planned route): Route synchronized with ECIDS

—*Beyond Reality*—

The FURUNO ENVISION series is our all-new advanced "AR Navigation System" (Augmented Reality Navigation System) that provides an advanced navigation support tool, using the power of AR to go beyond reality.
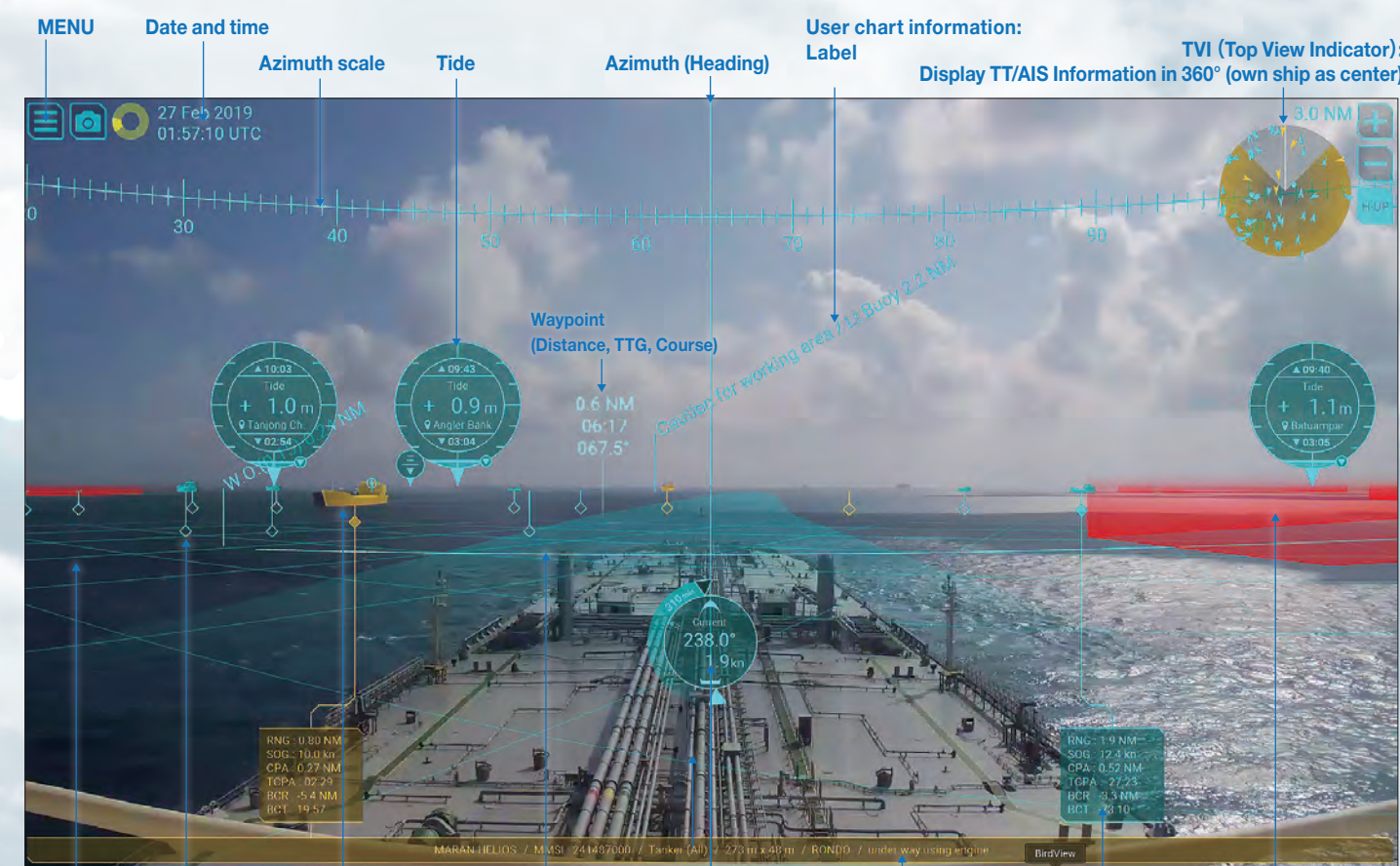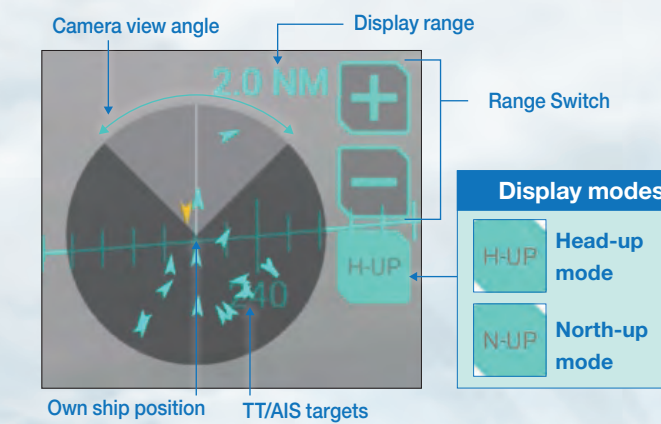
Thanks to a camera pointed forward of the vessel, an image of the front view projects on a display and all the necessary navigation information is superimposed over this live video imagery by our AR technology. Even in adverse weather or visibility conditions, you can clearly view other vessels' routes and critical information, as well as own ship data, allowing you stress-free maneuvering and navigation. This very intuitive way to display and share the information between the captain and the bridge team provides enhanced situational awareness, crew confidence, watchman support, and allows for better coordination of crew members.

The FURUNO ENVISION series aims to contribute to the safety and security of the voyage by offering visual support to maneuvering and navigation during any operation, a further technological step towards autonomous navigation.

※ AR navigation is an auxiliary tool designed to improve the navigation comfort for safer navigation.
In no case should AR navigation replace Radar, ECDIS etc. and other required instruments for danger avoidance.

■ TVI（Top View Indicator）

Displays other ships by either Target Tracking (TT) or AIS in 360 degrees with own ship as center.

Camera view angle
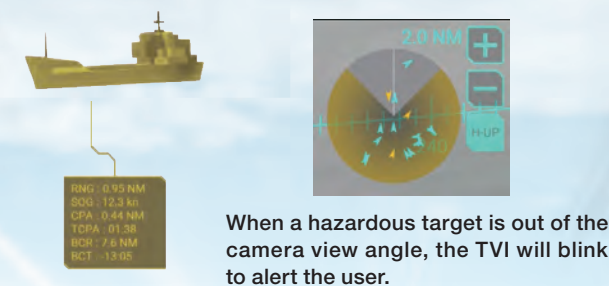Display range
Range Switch

Display modes

H-UP	Head-up mode
N-UP	North-up mode

Own ship position
TT/AIS targets

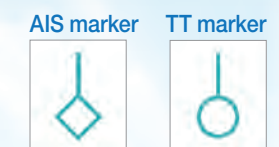|	HDG / COG off	HDG / COG on
AIS	●	◀ (HDG > COG)
TT	●	◀ (COG)

■ Intuitive color-coded display for targets*

Based on CPA/TCPA value, TT and AIS targets will be displayed in different colors according to their threat level. (TVI, selection marker, target information frame, target)

* Colors adjustable (Yellow, Orange and Red are available)

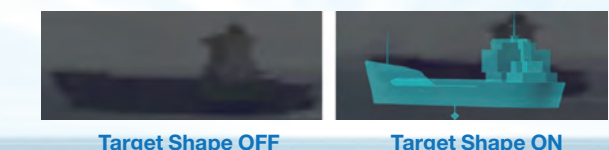When a hazardous target is out of the camera view angle, the TVI will blink to alert the user.

■ Selection marker and Target information box

Other ship information are collected by either TT or AIS are indicated with specific marks. When a mark is clicked, a box containing the information will open.

AIS marker   TT marker

■ Target shape

By superimposing the graphical virtual shape over AIS targets (virtual buoy, buoy, boat, tanker), it becomes easy to visually grasp the location of dangerous targets and their directions.

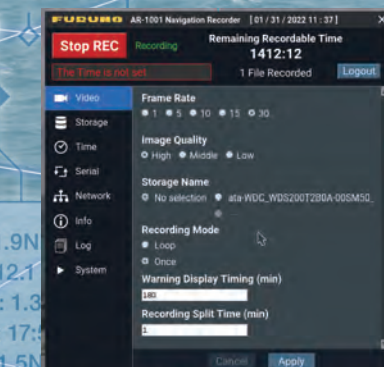Target Shape OFF   Target Shape ON

■ Safety Contour display

With ENC chart safety contours, objects can be displayed with Yellow/Orange/Red color contours.

■ Navigation data recording function (option)

By recording navigation data to an external USB device, events during an accident at sea can be analyzed and used as training materials for the crew.

RNG: 1.9NM
SPD: 12.1 kn
DCPA: 1.3 NM
TCPA: 17:58
BCR: 1.5NM
BCT: -11:12

Navigation recorder menu display

*Image is for illustration purposes.

For additional information AR Navigation features, scan to visit our YouTube channel.