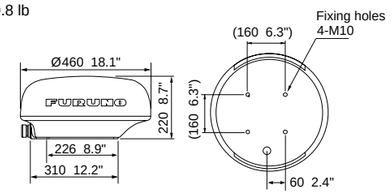
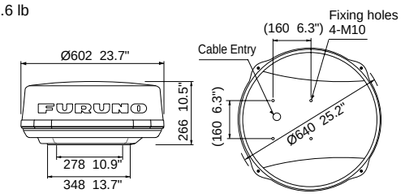
Specifications of NavNet vx2

NAVnet® vx2

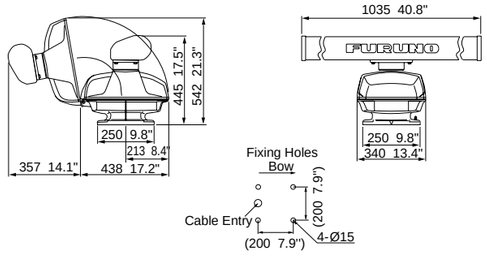
18" Radome Antenna
4.9 kg 10.8 lb



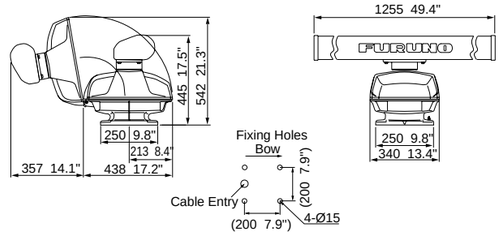
24" Radome Antenna
8 kg 17.6 lb



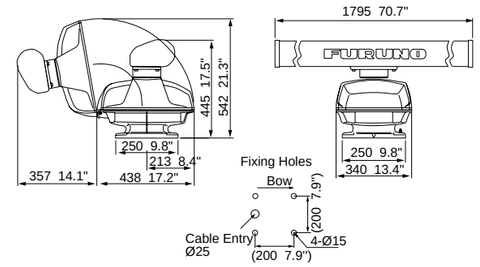
3.5 ft Open Antenna
22 kg 48.5 lb



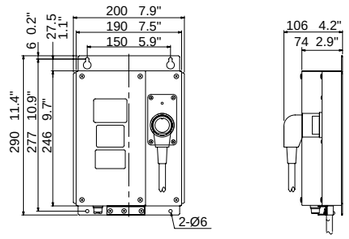
4 ft Open Antenna
23 kg 50.7 lb



6 ft Open Antenna
25 kg 55.1 lb



Power Amp Unit
PSU-005 for MODEL 1954C/1954C-BB
1.9 kg 4.2 lb



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Catalogue No. R-188b

NavNet vx2 —— “A Natural Evolution”

10.4" Color LCD

7" Color LCD

Since its release back in 2001, FURUNO’s NavNet series has been enjoying unrivalled popularity worldwide for its high reliability, performance and expandability. It has even been voted Best Integrated Navigation System by the National Marine Electronics Association for three consecutive years. Now, NavNet vx2 is ready to carry on the tradition.

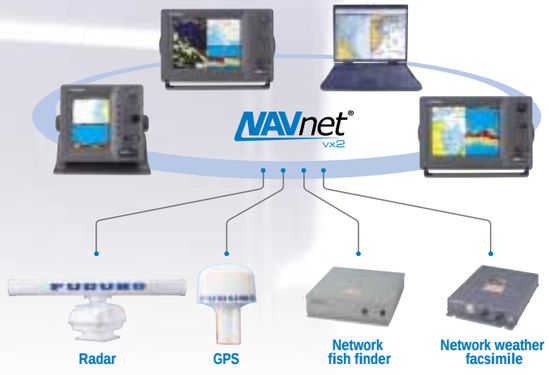
NavNet vx2 combines radar, GPS/WAAS chart plotter, fish finder, and network weather facsimile into an all-round navigation network. Its wide range of options fulfils virtually every desire you may have for a navigation system.

- *All display units are capable of controlling any component connected to the NavNet network*
- *Perfect for single or multi display installations*
- *Fully supports C-Map NT MAX and Navionics® GOLD chart.*
- *Utilizes SD cards for chart and memory.*
- *Fast chart drawing speed.*
- *Straightforward “Plug ’n Play” installation with wizard style set-up.*
- *AR-coated, high-brightness display unit for improved sunlight viewability.*

NavNet vx2 network capability

From a stand-alone, single station navigation system to a multistation integrated navigation network, NavNet vx2 lets you build your navigation system according to your needs. Utilizing state-of-the-art network technology, NavNet vx2 provides you with seamless data sharing and vast future expandability.

The heart of NavNet vx2 is its Ethernet-based network. Up to four displays, together with various navigational sensors, can be interconnected in addition to new MaxSea-NavNet navigational software, which adds even more features to your NavNet vx2 network. Stress-free navigation can be performed from any display unit connected to the onboard network, due to the high-speed transfer of data available.



NAVnet vx2 Building a NavNet vx2 system

1 Select your display units

You can select your display units from NavNet vx2 from the following: 7", 10.4", 12" and 15" high-brightness LCDs. You can choose either a single- or a multi-station system of up to four displays.

7"

10.4"

12" with BB unit

15" with BB unit

2 Select additional components

When you have selected the display units for your system, you can now choose the basic operating equipment of the NavNet vx2 system. NavNet vx2 has four main components including radar, GPS/WAAS chart plotter, fish finder and weather facsimile to create the navigation network. You can create your own network by selecting components according to your needs.

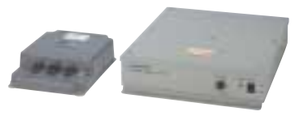
Radar antenna

GPS/WAAS antenna

Chart cards

- *C-Map NT MAX*
- *Navionics® GOLD*

Network fish finder



Network weather facsimile

3 Compliment your system with additional FURUNO equipment

With a variety of optional add-ons, NavNet vx2 can offer you additional useful functions, such as: radar overlay, AIS display, NAVpilot autopilot data and ARPA target tracking. You can even interface it with your PC and MaxSea-NavNet PC software to make it the most versatile navigation network on the market.

PC software
MaxSea-NavNet

Autopilot
NAVpilot series

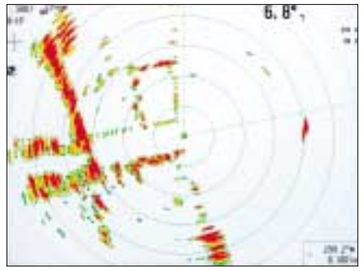
Instruments
FI-30 series

Heading sensor
SC-50/110
PG-500
C-500

AIS
FA-150

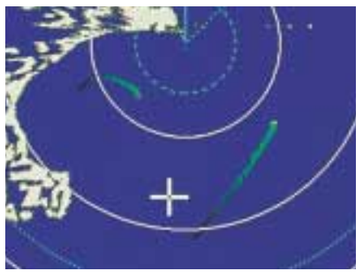
Nav data organizer/Remote display
RD-30

Radar

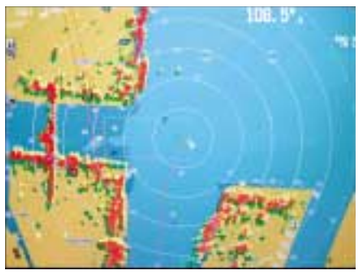


High-performance radar is one of the main components of NavNet vx2. Known for our award winning, reliable radar, the NavNet vx2 radar includes the following features:

- Presentation modes selectable from: North-up, Head-up, Course-up and True Motion
- Overlay radar targets on chart (appropriate heading sensors required, i.e. PG-500, C-500, SC50/110, etc.)
- Auto gain control
- Echo trail shows an afterglow of moving radar targets
- Automatic radar plotting to track up to ten targets (Not available on stand-alone 7" models, unless part of a network incorporating 10.4" or BlackBox models with ARP-11 fitted.)
- Radar Guard Zone alerts you to potential danger
- Energy saving Watchman feature
- Dual EBL (Electronic Bearing Lines) and dual VRM (Variable Range Markers) give distance and bearing to targets
- Off-center display allows you to focus on a specific area
- Customizable color presentation for night-time operation



Echo trails
This feature displays afterglows of all the targets to show their tracks. It helps you foresee their heading directions at a glance. Its trail duration is adjustable among 15, 30 s, 1, 3, 6, 15, 30 min and continuous.



Radar overlay
Radar targets can be overlaid onto the electronic chart so that you can better recognize what's around your vessel by referencing the target locations on both the chart and the radar.

Automatic radar plotting (ARP)
Up to ten targets can be simultaneously acquired and tracked to show you the heading direction and speed of the targets.

NavNet vx2
Radar

NAVnet vx2

Radar antennas

NavNet vx2 presents a wide range of radar antennas that offer unparalleled performance to suit a variety of your needs. Powerful X-Band transmitters offers detailed target detection. While the compact 2.2 kW and 4 kW radomes offer the maximum range of 24 and 36 nm respectively, high performance open arrays offer longer detection ranges.

Open antennas
- Selectable from 4 kW (3.5'), 6 kW (4'), 12 kW (4/6') and 25 kW (4/6') models
- Narrow horizontal beam width enhances target identification and ensures detection of smaller targets
- Longer range scales of up to 72 nm
- High power output for enhanced long range performance

Radomes
- Selectable from 2.2 kW (18") and 4 kW (24") models
- Stylish, compact and lightweight units
- Simplified installation
- Modest power consumption

Radar antenna selection

	Open antennas						Radomes	
Output power	4 kW	6 kW	12 kW	12 kW	25 kW	25 kW	2.2 kW	4 kW
Size	3.5 ft	4 ft	4 ft	6 ft	4 ft	6 ft	18 inch	24 inch
Beam width Horizontal	2.2˚	1.9˚	1.9˚	1.2˚	1.9˚	1.2˚	5.2˚	3.9˚
Beam width Vertical	22˚	22˚	22˚	22˚	22˚	22˚	25˚	20˚
Maximum range	48 nm	64 nm	72 nm	72 nm	72 nm	72 nm	24 nm	36 nm
Optional 48 rotation	Available*	Available*	Available	N/A	Available	N/A	N/A	N/A

*BlackBox models only

NavNet vx2

GPS/WAAS Chart Plotter

Working in perfect collaboration with the NavNet vx2 radar is the GPS/WAAS chart plotter. It shows your exact position and offers a variety of display modes that allow you to organize your nav data with unparalleled ease.

C-Map NT MAX chart

NavNet vx2 accepts the C-Map's new NT MAX chart. Its unique features include live nav-aids, tidal flows, local street maps, photographs of harbors and perspective view in addition to grounding alarm (Guardian Technology™).

Live nav-aids (Flashing buoys/Light houses)

Flashing buoys and light houses are displayed with only visible sector colors according to boat's position.

Tidal flows

Intuitive arrows show direction and strength

Local street maps

Coastal roads, land elevation contours, airports and other land objects are shown in major port areas.

Photographs of harbors

Photographs of major harbors and nav-aids are included

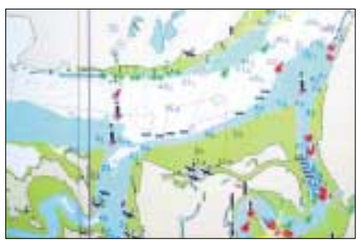
Perspective view

Grounding alarm (Guardian Technology™)

Continuously scans the chart data in front of the boat to detect dangerous objects (land, rocks,..).

Navionics® GOLD chart

Navionics® GOLD chart offers "object-oriented" color rich presentation with superior clarity and detail. The "Xplain" feature translates every navigational symbol into an easy to understand description. The IC™ (Intelligent Clarity)' feature that automatically filters the on-screen presentation at every zoom level to offer a clear, uncluttered display of all essential nav data.



NavNet vx2

GPS/WAAS Chart Plotter

NAVnet vx2

NavNet vx2

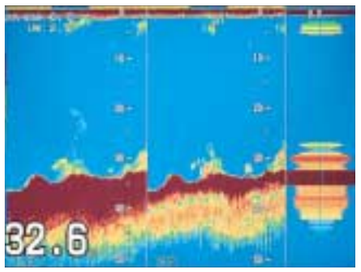
Fish Finder

For years, Commercial Fisherman have relied on FURUNO's fish finding technology to help them make a living. FURUNO's network fish finders implement the same tried and true fish finding technology that is used in our commercial-grade fish finders. Plug a network fish finder into your NavNet vx2 system and it turns any display in the network into a high-performance fish finder.

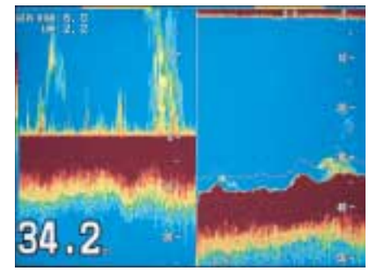
- Variety of presentation modes: Marker Zoom, Bottom Discrimination, Bottom Lock Expansion, A-scope and many more
- FURUNO Free Synthesizer (FFS) transceiver on the ETR-30N allows you to choose any two operating frequencies from 28 to 200 kHz
- Two selectable automatic gain control modes: Cruising and Fishing modes to match your style of boating
- Wide output power range selectable from regular 600 W to powerful 3 kW
- Two pages of fish finder images can be stored and displayed

Dual-frequency (Vertical split)

Dual-frequency (Horizontal split)



Dual-frequency with A-scope



Bottom discrimination

FURUNO Free Synthesizer (FFS)

The ETR-30N employs the FURUNO Free Synthesizer based on the professional fish finder FCV-1200L, which allows you to operate a fish finder in any two operating frequencies from 28 to 200 kHz without a matching box. This transceiver gives you the flexibility to choose your operating frequencies for more productive fishing. Output power can also be selected among 1, 2, and 3 kW to suit a variety of situations.

NavNet vx2

Fish Finder

NAVnet vx2

NavNet vx2

FAX, AIS & NAVpilot

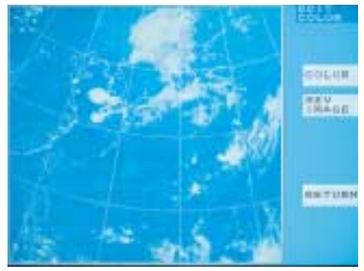
Network weather facsimile receiver

The network weather facsimile FAX-30 receives weather map images and NAVTEX messages. The images and messages can be displayed on the 10.4" or BlackBox models.

- Up to 12 pictures can be stored on memory
- Programmed with all currently existing facsimile stations and frequencies: up to 320 channels storable
- Presentation in monochrome, 16-gradation gray scale or color (three patterns of color presentation are available)
- Built-in NAVTEX receiver (490 kHz and 518 kHz) in which up to 130 messages can be stored

Weather map

NAVTEX



Satellite image

Interface with AIS

NavNet vx2 lets you integrate AIS (Automatic Identification System) into the network with an optional component. Information for up to 100 AIS targets can be displayed on any networked unit. This integration provides you with a solution for observing other vessels. (AIS receiver required)

- Displays up to 100 AIS equipped targets information (the information is displayed in the AIS data cell)
- Indicates the state of targets with five symbols


Sleeping AIS Target | Activated Target | Selected Target | Lost Target | Dangerous Target

Interface with the NAVpilot

When the NAVpilot is added onto the network, you can set the destination and course to steer on the plotter mode, and transfer the course information to the NAVpilot. The NAVpilot will do the rest, steering your craft automatically to the destination. You can set the course and steer your craft from the NavNet vx2.

NavNet vx2

FAX, AIS & NAVpilot

Presentation

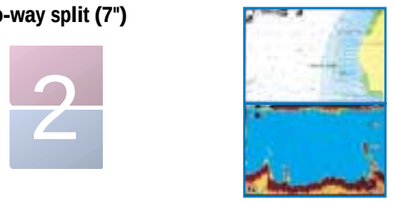
NavNet vx2 offers a wide variety of display combinations to provide you with what you are looking for in various situations. There are over 50 combinations ensuring the right display for the right situation. Mode selection is easy with the display menu window.

- Display multiple functions simultaneously with two-way and three-way split screen presentations
  - · Three-way split-screen presentation available for a 10.4" or BlackBox models
  - · Two-way split-screen presentation available for all models
- Analog RGB output available on a 10.4" models
- Optional NTSC/PAL interface available for displaying TV/VCR/DVD on a 10.4" display unit (Standard on BlackBox models)
- Favorite snapshot displayable as wallpaper
- 256 colors enhancing “Look & Feel” of presentations

User programmable HotPages
There are six user programmable modes (five for 7" LCD) to allow you to customize your favorite displays with just a few key strokes.

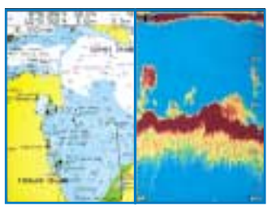
Rotary encoder

Two-way split (7")



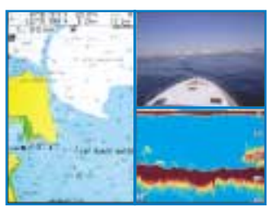
Nav data at the top of the display
Simple nav data cell at the top of the display.

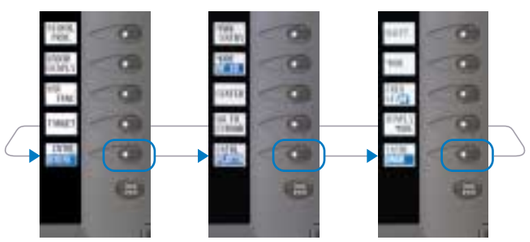
Two-way split (10.4", BlackBox)

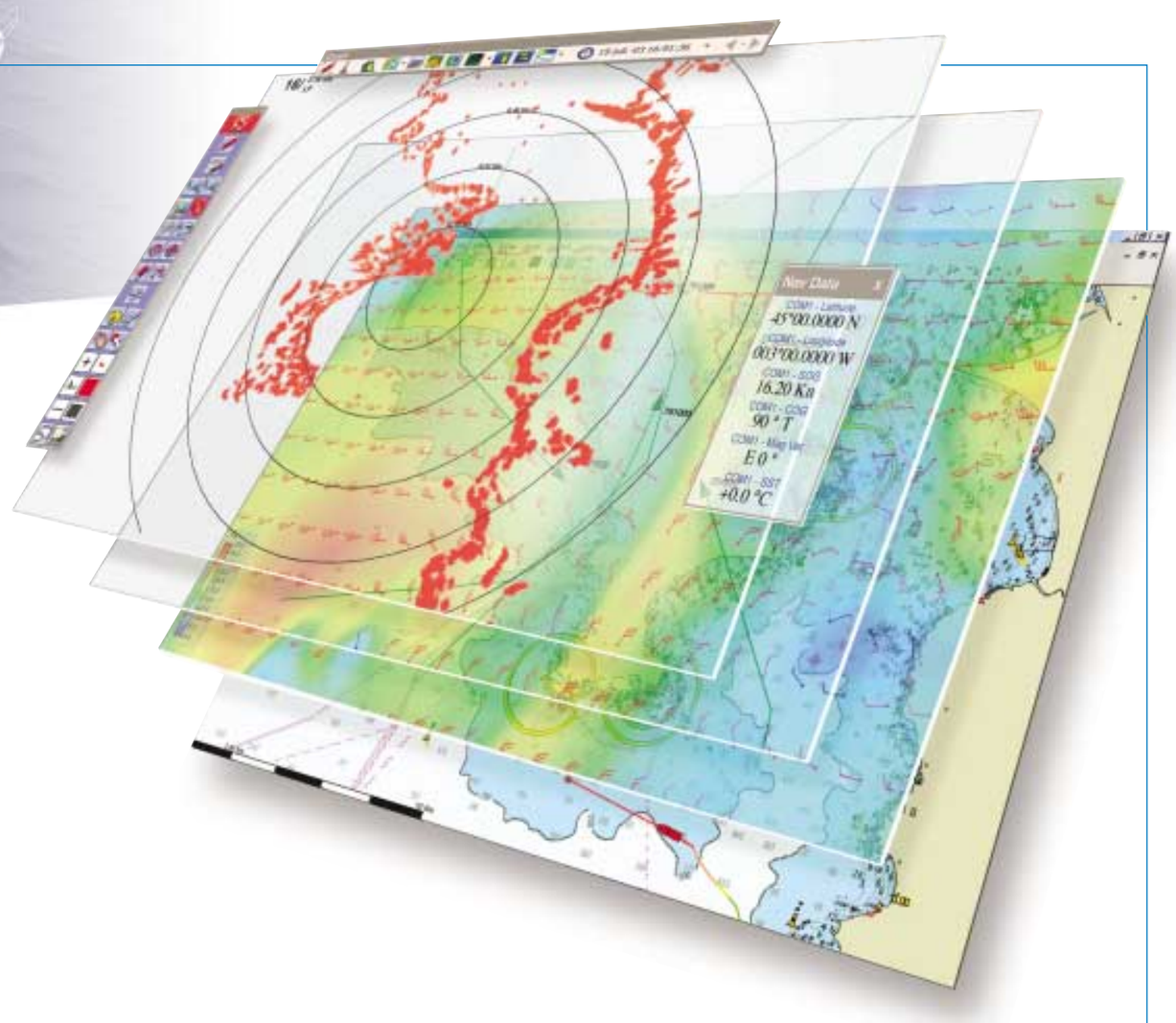


Function keys alongside the screen
Five soft keys are placed alongside the screen to allow you to operate virtually all the functions of NavNet vx2. With these keys, you can select and control each operation mode. All of the controls can be accessed intuitively by using the soft keys.

Three-way split




Radar | Plotter | Sounder



MaxSea-NavNet PC software

Defining the cutting-edge of applied information technology, MaxSea-NavNet software is powerful navigation software for boaters who are looking for a user-friendly interface and a more comprehensive navigation tool.

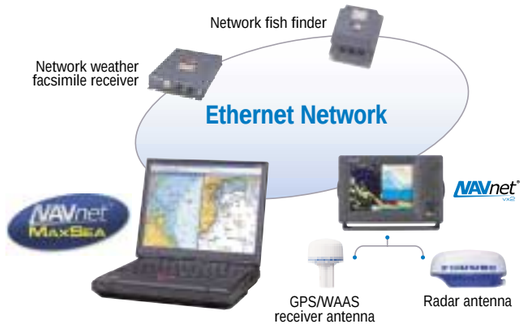
MaxSea-NavNet software offers increased efficiency at sea by using its exclusive capabilities, such as seamless chart displays, advanced weather forecast overlay, real-time three dimensional images of the seabed (Personal Bathymetric Generator) and many more. Intuitive operation of the MaxSea-NavNet is achieved by its user-friendly interface and graphical tool palette. The MaxSea-NavNet presents the ultimate solution to navigational data management.

- **Sharing C-Map NT chart data as well as all the navigation data within the NavNet network**
  NavNet provides the MaxSea-NavNet with radar, fish finder and essential navigation data from various networked sensors.
- **Full control of NavNet**
  The MaxSea-NavNet takes full control of the NavNet display, such as radar range, gain, STC control, etc., in addition to handling the navigation data to display in a diverse range of formats.
- **2D/3D ground discrimination function allows boaters to see the bottom roughness, hardness and classification overlaid with MaxSea 2D/3D charts***
- **3D chart data conversion with C-Map NT chart***
- **ARPA radar target tracking capability***
- **AIS transponder compatibility***

* Optional modules that require additional equipment

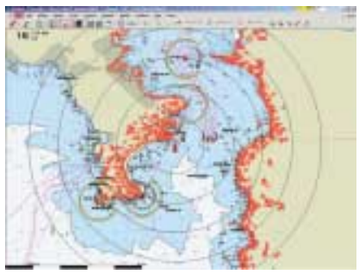
Interface with the NavNet system

The MaxSea-NavNet software is capable of combining and analyzing data from multiple sources in real-time. Fully integrated into the NavNet system through a high-speed Ethernet network, the MaxSea-NavNet facilitates the complete integration between the PC and the NavNet network, sharing information from the radar, GPS, echo sounder and other nav data within the NavNet system. A variety of display orientations can be selected to meet your needs.



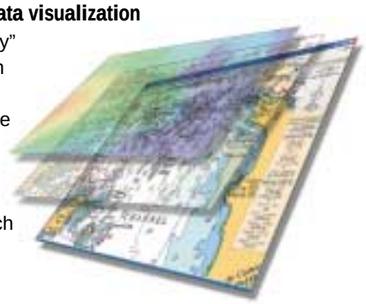
MaxSea-NavNet radar overlay

The MaxSea-NavNet provides the highest quality electronic charts available as the basis for its radar overlay. The MaxSea-NavNet overlays the full radar image at the same scale and creates a dramatic improvement in accuracy and clarity. MaxSea-NavNet radar overlay gives you amazingly detailed images. The range of color and transparency of the overlay guarantees that the chart is not hidden. This allows for the confirmation of precise positioning relative to the chart and clearly reveals any inconsistencies.



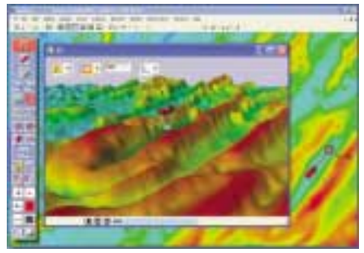
The unique overlay system optimizes data visualization

Using MaxSea-NavNet's multiple “overlay” system, various layers of information can be superimposed on the screen. Each layer of the overlay contains different type of data, such as tracks, marks, hazards, wrecks, ports, currents, water temperature, etc. Based on the needs of the moment, a single click can make each layer visible or invisible, eliminating irrelevant information and clearly show objects of interest.



Optional Personal Bathymetric Generator (PGB) clearly shows the bottom contours

Connected to the network sounder and GPS, MaxSea-NavNet PBG records the position and the depth as your boat proceeds, which enables you to create 2D and 3D charts with pinpoint accuracy in real-time. With a single click, MaxSea-NavNet PBG will be activated to give breathtaking real-time 2D and 3D images of the seabed.



SYSTEM REQUIREMENTS

Your PC must meet the following system requirements in order to work with the MaxSea-NavNet. Please verify these requirements before installing.

- Windows® 2000 or XP
- 800 MHz processor
- CD-ROM drive – for installing MaxSea-NavNet
- Serial or USB port(s) – for connecting navigation equipment (An adapter must be used for USB connections)
- 700 MB of hard drive space
- Graphic card: 32 MB (64 MB recommended)
- Network facility required
- Memory requirements:

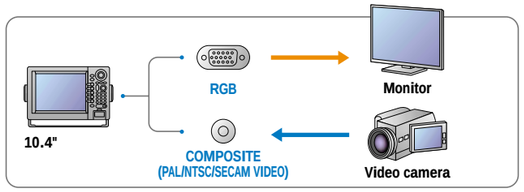
Operating	System Memory
Windows® 2000	64 MB (128 MB recommended)
Windows® XP	128 MB (256 MB recommended)

- Note:
  For the best performance we advise you to follow the ‘recommended’ guidelines.
  The MaxSea-NavNet is an advanced software program which makes good use of faster computers with more memory.

Display unit

10.4"/7" display unit
NavNet vx2 provides you with a multi-station option for your navigational requirements. Two types of display units are provided: 10.4" and 7" high brightness, sunlight viewable LCD's. Excellent and all-round presentation with a wide viewing angle, VGA screen resolution ensures a superbly detailed picture.

- High-brightness LCD viewable under direct sunlight
- Enhanced viewability with Anti-Reflective (AR) coating to cut down annoying glare
- Common user interface for compatibility among the display units networked
- Easy operation by a trackball* and rotary encoder (*for 10.4" models)
- Multi-station networking of up to four display units
- Simple connection between each sensor and display unit
- Optional analog RGB video output available for remote monitoring (for 10.4" models)
- NTSC/PAL input available for displaying video images from onboard TV/VCR/DVD player (for 10.4" models)

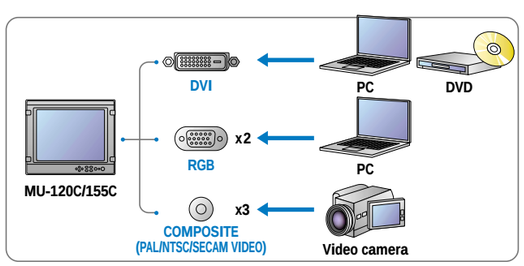


12"/15" LCDs with BlackBox unit
FURUNO MU-120C/155C LCD units can be used as display units for BlackBox models. When connected to BlackBox models, the MU-120C/155C offers the same functions as the 10.4" display unit on top of its exclusive functions. BlackBox models also can work with commercial monitors.

- Picture-in-Picture (PIP) function to display a small image window on top of the main display
- Built-in scaler to accept up to SXGA screen resolution*
  *With NavNet vx2, the display unit display the images in VGA resolution
- Easy channel selection
- Waterproof, low profile unit for flexible installation

Photo: MU-155C

Control unit for
BlackBox models



Network sensors

Whether it is the radar and GPS/WAAS antennas that are connected directly to the NavNet vx2 displays or the optional network sensors that are connected through the Ethernet network, all the data obtained from each sensor can be shared by every display on the network. The beauty of NavNet vx2 is that you can start with a single unit and expand its features as needed.

Radar antenna
Each NavNet vx2 radar comes with a commercial-grade FURUNO antenna. The output power of the antenna units ranges from the sleek 2.2 kW radome to the powerful 25 kW open array.

GPS antenna
Simply by plugging the GP-320B GPS/WAAS receiver antenna into any NavNet vx2 display, all the displays networked can show highly accurate position data.

Network fish finder
The network fish finder can be plugged into any display or a Hub to turn the NavNet vx2 display into a high-performance dual-frequency fish finder.

ETR-6/10N
Frequency: Dual-frequency 50/200 kHz
Output Power: 600 W/1 kW rms
Basic Range: 8 range scales to 1,200 m

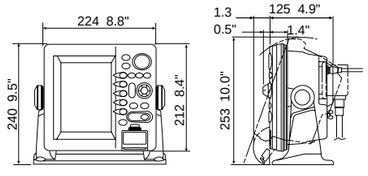
ETR-30N
Frequency: Dual-frequency selectable from 28/38/50/88/107/200 kHz
Output Power: 1/2/3 kW rms
Basic Range: 8 range scales to 1,500 m

Network weather facsimile
The FAX-30 is a network weather facsimile receiver that works with 10.4", BlackBox models or a PC to display weather maps, satellite images, NAVTEX and other navigation information.

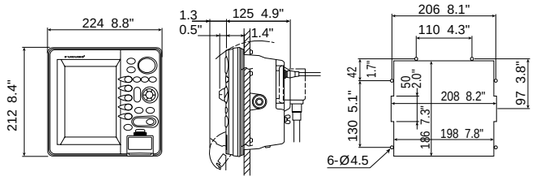
Specifications of NavNet vx2

	7" Color LCD Radar / Chart Plotter	
	MODEL 1724C	MODEL 1734C
		
DISPLAY UNIT		
1. Type	7" Color TFT LCD, VGA 480 x 640 pixels	
2. NavNet Interface	Ethernet 10-BaseT	
3. Interface (NMEA 0183 format)	Input: DBT, DPT, DSC, DSE, GGA, GLL, HDG, HDM, HDT, MTW, MWV, RMA, RMB, RMC, TLL, TTM, VHW, VTG, VWT, VWR, WPL, ZDA, ZTG Output: AAM, APB, BOD, BWC, BWR, DBT, DPT, GGA, GLL, GTD, HDT, HDT, MTW, MWV, RMA, RMB, RMC, TLL, TTM, VHW, VTG, WPL, XTE, ZDA, ZTG	
4. Language	English, French, Spanish, German, Portuguese, Italian, Danish, Norwegian and Swedish	
RADAR CHARACTERISTICS		
1. Display Modes	Head-up, Course-up*, North-up*, True Motion** (* Heading input required ** Heading and speed inputs required)	
2. Range Scales (nm)	0.125 to 24 nm 14 steps	0.125 to 36 nm 15 steps
3. Echo Trail	Interval: 15 s, 30 s, 1 min, 3 min, 6 min, 15 min, 30 min or Continuous	
PLOTTER CHARACTERISTICS		
1. Map Scale	0.125 to 2,048 nm	
2. Latitude Limits	Between 85°N and 85°S	
3. Plot Interval	1 s to 99 min 99 s or 0 to 99.99 nm	
4. Display Modes	Course plot, Nav data, Steering display, Highway	
5. Presentation Modes	TM/RM North-up, Course-up, Auto Course-up	
6. Memory Capacity	Up to 8,000 points for ship's track and marks, 999 waypoints, 35 quick points, 1 MOB, 200 planned routes (max. 35 waypoints/route), 1 quick route	
7. Alarms	Arrival/anchor watch, XTE, proximity alert, ship speed, depth*, water temperature*, fish*, grounding** (*Network sounder required, temperature sensor required for water temperature alarm ** C-Map version only)	
8. Electronic Charts	C-Map NT MAX or Navionics® GOLD	
ANTENNA RADIATOR		
1. Type	Ø460 mm (18") Radome	Ø602 mm (24") Radome
2. Rotation Speed	24/30 rpm (Automatic switch)	24 rpm
3. Wind Load	Relative wind 100 kt	
4. Beamwidth	Hor: 5.2° Vert: 25°	Hor: 3.9° Vert: 20°
RF TRANSCEIVER		
1. Peak Output Power	2.2 kW	4 kW
2. Frequency	9410 ± 30 MHz (X-Band)	
3. Pulselength & PRR	0.08 µs/2100 Hz (0.125 to 1.5 nm) 0.3 µs/1200 Hz (1.5 to 3 nm) 0.8 µs/600 Hz (3 to 48 nm)	
ENVIRONMENT (IEC 60945 test method)		
Temperature	-15°C to +55°C (Display Unit) -25°C to +70°C (Antenna Unit)	
Waterproofing	IEC 60529 IPX5, USCG CFR-46 (Display Unit) IEC 60529 IPX6 (Antenna Unit)	
POWER SUPPLY		
	12-24 VDC 75 W	12-24 VDC 75 W
	115/230 VAC with an optional rectifier PR-62	
Power Amp Unit	Not required	
Optional unit		
Antenna Bracket	OP03-93	OP03-92
10-Target Autoplotter	Full control when networked with 10.4" LCD, BB system and ARP-11	
External Buzzer	OP03-136 or Relay/Contact Closure	
NTSC/PAL Interface kit	Not available	
RGB Output Cable kit	Not available	
AIS Interface Unit	Available	

7" LCD (Bracket Mount)
3.5 kg 7.7 lb

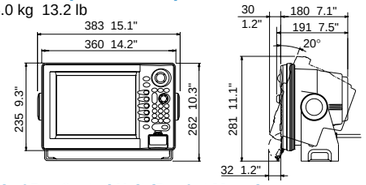


7" LCD (Flush Mount)
3.2 kg 7.1 lb

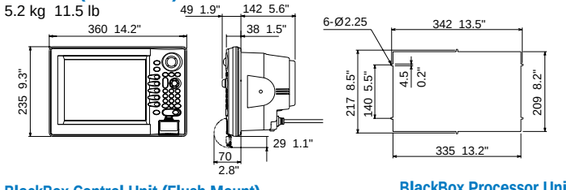


	10.4" Color LCD Radar / Chart Plotter BlackBox Radar / Chart Plotter					
	MODEL 1824C/-BB	MODEL 1834C/-BB	MODEL 1934C/-BB	MODEL 1944C/-BB	MODEL 1954C/-BB	MODEL 1964C/-BB
				BlackBox Radar / Chart Plotter 		
DISPLAY UNIT						
1. Type	10.4" Color TFT LCD, 640 x 480 pixels (Multi-sync monitor Required on BlackBox system)					
2. NavNet Interface	Ethernet 10Base-T					
3. Interface (NMEA 0183 format)	Input: DBT, DPT, DSC, DSE, GGA, GLL, HDG, HDM, HDT, MTW, MWV, RMA, RMB, RMC, TLL, TTM, VHW, VTG, VWT, VWR, WPL, ZDA, ZTG Output: AAM, APB, BOD, BWC, BWR, DBT, DPT, GGA, GLL, GTD, HDT, HDT, MTW, MWV, RMA, RMB, RMC, TLL, TTM, VHW, VTG, WPL, XTE, ZDA, ZTG					
4. Language	English, French, Spanish, German, Portuguese, Italian, Danish, Norwegian and Swedish					
RADAR CHARACTERISTICS						
1. Display Modes	Head-up, Course-up*, North-up*, True Motion** (* Heading input required ** Heading and speed inputs required)					
2. Range Scales (nm)	0.125 to 24 nm 14 steps	0.125 to 36 nm 15 steps	0.125 to 48 nm 16 steps	0.125 to 64 nm 17 steps	0.125 to 72 nm 18 steps	
3. Echo Trail	Interval: 15 s, 30 s, 1 min, 3 min, 6 min, 15 min, 30 min or Continuous					
PLOTTER CHARACTERISTICS						
1. Map Scale	0.125 to 2,048 nm					
2. Latitude Limits	Between 85°N and 85°S					
3. Plot Interval	1 s to 99 min 99 s or 0 to 99.99 nm					
4. Display Modes	Course plot, Nav data, Steering display, Highway					
5. Presentation Modes	TM/RM North-up, Course-up, Auto Course-up					
6. Memory Capacity	Up to 8,000 points for ship's track and marks, 999 waypoints, 35 quick points, 1 MOB, 200 planned routes (max. 35 waypoints/route), 1 quick route					
7. Alarms	Guard Zone, Arrival/anchor watch, XTE, proximity alert, ship speed, depth*, water temperature*, fish*, grounding** (*Network Sounder required, temperature sensor required for water temperature alarm ** C-Map version only)					
8. Electronic Charts	C-Map NT MAX or Navionics® GOLD					
ANTENNA RADIATOR						
1. Type	Ø460 mm (18") Radome	Ø602 mm (24") Radome	1035 mm (3.5 ft) Open	1255 mm (4 ft) Open	1255/1795 mm (4/6 ft) Open	
2. Rotation Speed	24/30 rpm (Automatic switch)	24 rpm			24/48* rpm	
*48 rpm is option BB	24/30 rpm (Automatic switch)	24rpm	24/48* rpm (*Not available in 6 ft)			
3. Wind Load	Relative wind 100 kt				Relative wind 100 kt (24 rpm) Relative wind 70 kt (48 rpm)	
4. Beamwidth	Hor: 5.2° Vert: 25°	Hor: 3.9° Vert: 20°	Hor: 2.2° Vert: 22°	Hor: 1.9° Vert: 22°	Hor: 1.9/1.2° Vert: 22°	
RF TRANSCEIVER						
1. Peak Output Power	2.2 kW	4 kW	4 kW	6 kW	12 kW	25 kW
2. Frequency	9410 ± 30 MHz (X-Band)					
3. Pulselength & PRR	0.08 µs/2100 Hz (0.125 to 1.5 nm) 0.3 µs/1200 Hz (1.5 to 3 nm) 0.8 µs/600 Hz (3 to 64 nm)				0.08 µs/2100 Hz (0.125 to 1.5 nm) 0.3 µs/1200 Hz (1.5 to 3 nm) 0.8 µs/500 Hz (3 to 96 nm)	
ENVIRONMENT (IEC 60945 test method)						
Temperature	-15°C to +55°C (Display unit) -25°C to +70°C (Antenna unit)					
Waterproofing	IEC 60529 IPX5, USCG CFR-46 (Display unit) IEC 60529 IPX6 (Antenna unit)					
POWER SUPPLY (at relative wind 100 kt)						
	12-24 VDC 90 W	12-24 VDC 90 W	12-24 VDC 110 W	12-24 VDC 115 W	12-24 VDC 125/150 (24/48 rpm, 4 ft), 130 W (6 ft)	12-24 VDC 138/153 (24/48 rpm, 4 ft, 163 W (6 ft)
BB	60 W	60 W	80/100 W (24/48 rpm)	85/105 W (24/48 rpm)	100/120 (24/48 rpm, 4 ft), 100 W (6 ft)	107/122 (24/48 rpm, 4 ft), 132 W (6 ft)
	115/230 VAC with an optional rectifier RU-3423/1746B-2					
Power Amp Unit	Not required				PSU-005	PSU-008
Optional unit						
Antenna Bracket	OP03-93	OP03-92	Locally arranged			
10-Target Autoplotter	ARP-11* (* Requires appropriate heading sensor)					
External Buzzer	OP03-136 or Relay/Contact Closure					
NTSC/PAL Interface kit	OP03-175 (Supplied as standard on BlackBox system)					
RGB Output Cable kit	OP03-176					
AIS Interface Unit	Available					

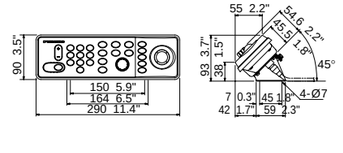
10.4" LCD (Bracket Mount)
6.0 kg 13.2 lb



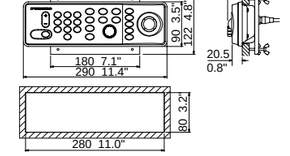
10.4" LCD (Flush Mount)
5.2 kg 11.5 lb



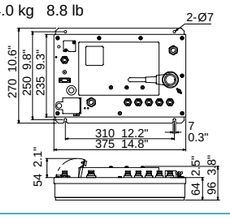
BlackBox Control Unit (Bracket Mount)
0.9 kg 2.0 lb



BlackBox Control Unit (Flush Mount)
0.8 kg 1.8 lb



BlackBox Processor Unit
4.0 kg 8.8 lb

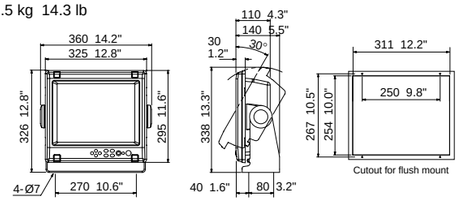


Specifications of NavNet vx2

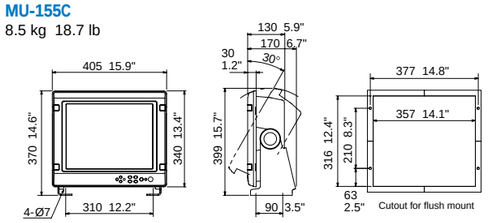
		Chart Plotter		BlackBox Chart Plotter
		GD-1720C	GD-1920C	GD-1920C-BB
				
DISPLAY UNIT				
1. Type		7" Color TFT LCD, VGA 480 x 640 pixels	10.4" Color TFT LCD 640 x 480 pixels	Multi-sync monitor Required (640 x 480 pixels)
2. NavNet Interface		Ethernet 10-BaseT		
3. Interface (NMEA 0183 format)		Input: DBT, DPT, DSC, DSE, GGA, GLL, HDG, HDM, HDT, MTW, MWV, RMA, RMB, RMC, TLL, TTM, VHW, VTG, VWT, VWR, WPL, ZDA, ZTG Output: AAM, APB, BOD, BWC, BWR, DBT, DPT, GGA, GLL, GTD, HDT, HDT, MTW, MWV, RMA, RMB, RMC, TLL, TTM, VHW, VTG, WPL, XTE, ZDA, ZTG		
PLOTTER CHARACTERISTICS				
1. Map Scale		0.125 to 2,048 nm		
2. Latitude Limits		Between 85°N and 85°S		
3. Plot Interval		1 s to 99 min 99 s or 0 to 99.99 nm		
4. Display Modes		Course plot, Nav data, Steering display, Highway		
5. Presentation Modes		TM/RM North-up, Course-up, Auto Course-up	TM/RM North-up, Course-up	
6. Memory Capacity		Up to 8,000 points for ship's track and marks, 999 waypoints, 35 quick points, 1 MOB, 200 planned routes (max. 35 waypoints/route), 1 quick route		
7. Alarms		Arrival/anchor watch, XTE, proximity alert, ship speed, depth*, water temperature*, fish*, grounding** (*Network Sounder required, temperature sensor required for water temperature alarm ** C-Map version only)		
8. Electronic Charts		C-Map NT MAX or Navionics® GOLD		
ENVIRONMENT (IEC 60945 test method)				
Temperature		-15°C to +55°C	-15°C to +55°C (Processor Unit, Control Unit)	
Waterproofing		IEC 60529 IPX5, USCG CFR-46	IEC 60529 IPX2, USCG CFR-46 (Processor Unit) IEC 60529 IPX5, USCG CFR-46 (Control Unit)	
POWER SUPPLY				
		12-24 VDC	12-24 VDC	12-24 VDC
		35 W	55 W	25 W
		115/230 VAC with an optional rectifier PR-62/RU-3423		
Power Amp Unit		Not required		
Optional unit				
Autoplotter		Full control when networked with 10.4" LCD, BB system and ARP-11		
External Buzzer		OP03-136 or Relay/Contact Closure		
NTSC/PAL Interface kit		Not available	OP03-175	Supplied as standard
RGB Output Cable kit		Not available	OP03-176	
AIS Interface Unit		Available		

		Multi-purpose Marine LCD	
		MU-120C	MU-155C
			
DISPLAY UNIT			
Screen Size		12.1 inches, 246.0 x 184.5 mm	15 inches, 304.1 x 228.1 mm
Resolution		800 x 600 (SVGA)* * VGA up to SXGA signal is acceptable in analog RGB.	1024 x 768 (XGA)*
Contrast Ratio		300: 1	400:1
Viewing Angle	Vertical Horizontal	+60° to -50° left 70° to right 70°	+85° to -85° left 85° to right 85°
Brightness		1000 cd/m²	
INTERFACE			
Analog RGB		2 ports, D-SUB/15 pins	
DVI		1 port, DVI-D	
Composite(RCA)		3 ports, RCA	
ENVIRONMENT (IEC 60945 test method)			
Temperature		-15°C to +55°C	
Waterproofing		IEC 60529 IPX5 (Front Panel)	
POWER SUPPLY			
		12-24 VDC 48 W(at 12 VDC)	12-24 VDC 84 W(at 12 VDC)

MU-120C
6.5 kg 14.3 lb

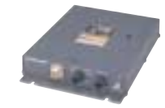


MU-155C
8.5 kg 18.7 lb

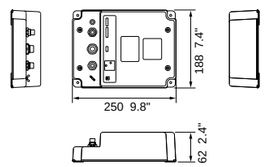


		Network Fish Finder	
		ETR-6/10N	ETR-30N
			
TRANSCEIVER & DISPLAY			
Display Modes		Single (50 or 200 kHz), Dual (50 and 200 kHz), Bottom-lock, Bottom Zoom, Bottom Discrimination, Marker Zoom, A-Scope	Single (Hi or Low frequency), Dual (both Hi and Low frequency) Bottom-lock, Bottom Zoom, Bottom Discrimination, Marker Zoom, A-Scope
Frequency		Dual frequency 50 kHz and 200 kHz	The synthesized transducer works with dual frequencies in 28 to 200 kHz
Output Power		600 W / 1 kW rms (Specify when ordering)	1, 2 or 3 kW (Specify when ordering)
Range Scale		8 basic ranges customized to max 1,200 m (4,000 ft, 650 fa)	Any ranges customized between 2 and 1500 m
Range Phasing		Up to 2,400 m (8,000 ft, 1,300 fa)	Up to 3000 m
ENVIRONMENT			
Temperature		-15°C to +55°C	-15°C to +55°C
Waterproofing		IEC 60529 IPX2	IEC 60529 IPX0
POWER SUPPLY			
		12-24 VDC	12-24 VDC
		11 W	30 W
TRANSDUCERS (Specify when ordering)		**600 W** 50/200 kHz: 520-5PSD (Plastic, thru-hull), 520-5MSD (Bronze, thru-hull), 520-5PWD (Plastic, transom), 525ST-MSD (Bronze, thru-hull with speed/temp sensor), 525ST-PWD (Plastic, transom with speed/temp sensor) **1 kW** (Optional Matching box MB-1000 required) 50 kHz: 50B-6, 50B-6G, 50B-6B, 50B-62M, 50B-9B, 50B-92M 200 kHz: 200B-5, 200B-5S 50/200 kHz: 50/200-1T, 50/200-12M	28 kHz: 28F-8, 28F-18, 50BL-24H, 28F-24H 50 kHz: 50B-6/6B, 50B-9/9B, 50F-8G, 50B-12, 50BL-12 88 kHz: 88B-8, 88B-10, 88F-126H 107 kHz: 100B-10R 200 kHz: 200B-5S, 200B-8/8B, 200B-8N, 200B-12H

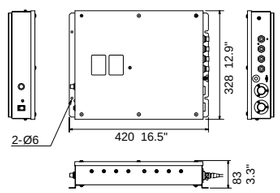
		GPS/WAAS Receiver Antenna
		GP-320B
		
RECEIVER CHARACTERISTICS		
Receiver Type		Twelve discrete channels, C/A code, all-in-view, WAAS
Receiver Frequency		L1 (1575.42 MHz)
Time to First Fix		12 s (warm start)
Tracking Velocity		999 kt
Geodetic Systems		WGS-84, NAD-27 and others
Accuracy		10 m (GPS) 3 m (WAAS)
ENVIRONMENT (IEC 60945 test method)		
Temperature		-25°C to +70°C
Waterproofing		IEC 60529 IPX6
POWER SUPPLY		
		12-24 VDC 1 W

		Network Weather Facsimile Receiver
		FAX-30
		
TRANSCEIVER CHARACTERISTICS		
Frequency Range		80 kHz to 160 kHz, 2 MHz to 25 MHz, 490 kHz, 518 kHz (NAVTEX)
Class of Emission		F3C, J3C, F1B (NAVTEX)
Receiving System		Double superheterodyne
Storage		Fax: 12 pictures, NAVTEX: 130 messages
ENVIRONMENT (IEC 60945 test method)		
Temperature		-15°C to +55°C
Waterproofing		IEC 60529 IPX2
POWER SUPPLY		
		12-24 VDC 12 W

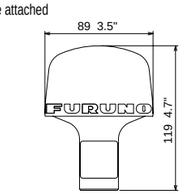
Network Fish Finder ETR-6/10N
1.5 kg 3.3 lb



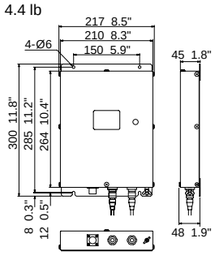
Network Fish Finder ETR-30N
5.6 kg 12.4 lb



GPS/WAAS Receiver Antenna GP-320B
0.8 kg 1.8 lb
10 m cable attached



Network Weather Facsimile Receiver FAX-30
2.0 kg 4.4 lb



Remote Controller
0.06 kg 0.1 lb