FURUNO

NavNet 3D FAQ v2.0

Furuno USA, Inc

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1. NavNet 3D System

Q1.SYS   **How many NavNet 3D MFDs are allowed in one network?**

Any combination of up to 10 (ten) MFDs are allowed in one Network. However, the actual number of displays in the system may be higher if MFDBBs are installed using "Clone" or "Extended" Display Mode. More information about the Clone and Extended Modes for the MFDBB can be found in this document

Q2.SYS   **Can I connect multiple position, depth and other data sensors to the system?**

Multiple sensors of the same or different kinds (i.e. two GPS Sensors) may be connected to any NN3D network for backup purposes. When multiple sensors providing independent but redundant data are connected, the installer will have to define the primary sensor at the Master MFD during installation. Primary sensor selections are global settings, as they will be used and displayed by all NN3D MFDs in a network. All other sensors providing the redundant information will be used as "Back-Up" sensors. NN3D will automatically "Switch" and utilize these back-up sensors in the event that a failure occurs with the primary sensor.

Q3.SYS   **How many Digital Radar Sensors (DRS) can be installed in one network?**

Up to 2 (two) DRS can be installed and controlled in one network.

Q4.SYS   **How many Fish Finders can be installed in one network?**

Up to two Network Fish Finders can be installed and controlled in one NN3D network. For example, both a DFF1 and DFF3 may be installed on one vessel and the operator may select which one to be enabled as the echo sounder source. This allows the vessel to change geographic regions and instantly select the optimal echo sounder source for a particular fishery.

Q5.SYS   **What is the NavNet 3D memory capacity?**

All NN3D MFDs and Black Box systems have a ruggedized, shock resistant internal Hard Disk Drive (HDD) with 40 Gigabytes of memory storage capacity.

Q6.SYS   **Does MFD have a capability to convert NMEA2000<-->NMEA0183?**

The NMEA0183 sentences and NMEA2000 PGNs that are used and accepted in the system can be converted and output with either/both NMEA0183/NMEA2000 format (except for the engine data that is input only). Note that only one type of data can be output at a time (one position, one depth, one heading…). In case of multiple GPS, the position which is output is the one currently used by the display.

Q7.SYS   **Can Engine Data be displayed on MFD?**

Yes, certain engine data (up to three engines) in NMEA2000 format is compatible and may be displayed on any NN3D MFD in the Network. The currently accepted engine data is as follows:

- Engine Speed (Revolutions)   (PGN 127488)
- Engine Boost Pressure   (PGN 127488)
- Engine Oil Pressure   (PGN 127489)
- Engine Temperature   (PGN 127489)
- Engine Temperature Status   (PGN 127489)
- Engine Warning Status   (PGN 127489)

Q8.SYS   What is the purpose of Audio In/Out?

An analog speaker can be connected to any MFD/MFDBB (for Alarm). Audio Input is provided for future applications.

Q9.SYS   What is shared in the network?

The NN3D was designed as a network system. Radar, Sounder, IP Camera, Points, Routes, Tracks, Navigation Data, and System Settings are all shared via Ethernet on the NN3D network.
Please note that the Charts are not shared across the network and need to be installed on the Internal Memory of every MFD.

Q10.SYS   What is the difference between MFD12 and DCU12?

The MFD12 is a NN3D 12" multi-function display/processor unit, while the DCU12 is an optional integrated 12" display and MFD BB Keyboard – essentially it is a 12" display and keyboard without its own processor. The DCU12 is a suitable option for those wishing to use the advanced features of the MFDBB with a display-based keyboard. NavNet MFDBB Systems offer some unique features not available on the MFD8 and MFD12 such as a TimeZero Radar image, faster chart zoom performance, multiple USB 2.0 ports, selectable video resolutions, etc...

DCU12 (BB Controller with built-in display)

Power 24VDC

MFDBB

Network Port, RJ45 (2/5/10m)

DVI port, DVI-D (5/10m)
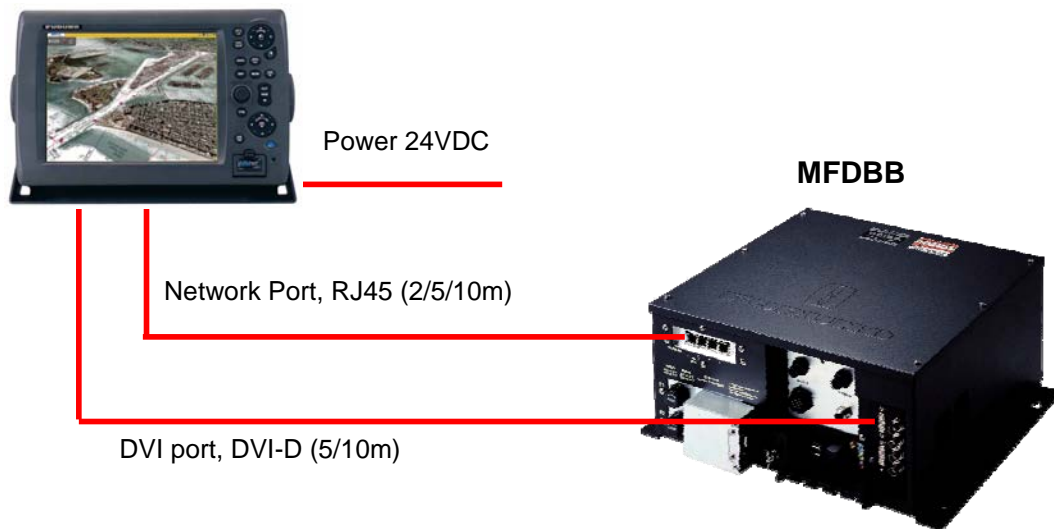
Q11.SYS   Which combination of MFD+DRS requires the Power Supply Unit?

Power for the Digital Radar Sensor is supplied by MFD. Some combinations require the additional Power Supply Unit in order to provide enough power for the DRS.

	DRS2D	DRS4D	DRS4A	DRS6A	DRS12A	DRS25A
MFD8			PSU-012	PSU-012	PSU-012	PSU-013
MFD12					PSU-012	PSU-013
MFDBB						PSU-013

2. NavNet 3D Connections

Q1.CON   **Can I connect a USB mouse?**

Yes. A generic USB mouse may be connected to any NN3D MFD. Virtually any "off the shelf" USB mouse (wired or RF wireless but NOT Bluetooth) will work with NN3D. However, in order to utilize full RotoKey functionality, you will need a mouse that has a scroll wheel that is also "clickable" with a middle click, which will emulate selection and confirmation of a desired RotoKey function. No loading of additional mouse software (driver) is permitted. However, the standard Mouse HID drivers will load automatically, allowing most mice and wireless mice to work fine.
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Q2.CON   **What is Power Synchronization?**

A NN3D network is a system in which all components share information (navigation data, settings, points, routes, etc) with each other. To allow proper network synchronization and functionality, the MFDs have a special "sleep mode" that allows each MFD to process data while consuming low power. NN3D MFDs can be in 3 states:

[ON]
This is the regular mode of operation. The screen is ON and the user can interact with the device. The unit can process and share information on the network.

[Sleep Mode]
The screen is off and no user interaction is possible (except turning the unit ON with the Power Key). Even though the MFD seems to be turned off, it will still process and share information with other MFDs on the network. The MFD consumes lower current in this state. Any sensors attached to the MFD data ports will still function normally.

[OFF]
The unit is completely OFF and don't process information. No power is consumed in this state

Sleep Mode Functional Description: When the first MFD is powered ON (using the power key), all the other networked MFD(s) automatically start in sleep mode. Using the Power key on an MFD in sleep mode will turn it ON. Using the Power key on any MFD that is turned "ON" will turn the system (all the MFDs) completely OFF. If you want to turn a MFD back in sleep mode (after he has been powered ON), use the RotoKey "Sleep"

IMPORTANT: Full Power Synchronization functionality requires the use of Furuno proprietary Hubs. The Internal MFDBB Hub and the optional Furuno HUB101 both provide NN3D full Power Synchronization functionality. Use of other generic Ethernet Hubs/Switches, while allowed, will not allow the MFDs to power ON automatically! Caution must also be used in that only "Two Pair" Ethernet cables may be utilized with generic hubs/switches so that the Power Synchronization signal are not short circuited by "Four Pair" Ethernet cables.

Q3.CON   **Can I connect non-Furuno devices to the HUB101 (PC, Sensor…)?**

The Furuno HUB101 has a dipswitch for each Ethernet port that can enable/disable the Power Synchronization. When connected to an MFD, the switch must be setup to allow the Power Synchronization. When connected to any other device (PC, old generation sensors…) the switch MUST be setup to disable the Power Synchronization to protect other devices (such as PC) from the Power

Synchronization signal. Here is a list of all devices that support the Power Synchronization:

- All NN3D Display: MFD8, MFD12, MFDBB and DCU12
- All NN3D Radar Power Supply: PSU-012 and PSU-13
- Sounder: DFF1 and DFF3

Q4.CON — Can a standard Ethernet Switch be used for NavNet 3D?

Yes, a 100Mbps Switch can be used. In this case, "**2-pair**" Ethernet cable must be used between each MFD and the generic Ethernet Switch so that the Furuno Power Synchronization signal does not interfere with or harm the Ethernet Switch.

1. Orange/White
2. Orange
3. Green/White
4.
5.
6. Green
7.
8.
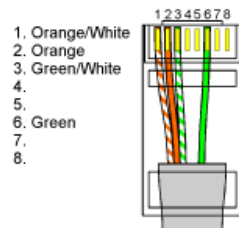
Failure to do so could damage the switch and any other components connected to it. Note that when a regular switch is used, the Power Synchronization will not fully work. The use of the Furuno Hub is strongly advised. It will allow power synchronization on the network and protect your equipment such as PC when regular CAT6 (4 pair Ethernet) cable is used.

Q5.CON — How is the BB Keyboard Control Unit (MCU-001) connected to the BB Processor?

The BB Keyboard is an Ethernet Network Device that is powered directly from the MFDBB via the Ethernet Cable. This is NOT true Power-Over-Ethernet (POE). Standard POE Devices may NOT be directly connected or powered by the internal hub in the MFDBB. Direct connection of the BB Keyboard to the MFDBB allows an easy single standard Ethernet cable connection to the MFDBB Keyboard. The MFDBB Processor Unit (MPU001) contains 4 Ethernet ports. Two of these ports provide special power and are dedicated ONLY for MFDBB Keyboard connections. MFDBB Keyboards must be directly connected to one of the dedicated Ethernet ports on the MFDBB (the Keyboard cannot be connected to a Switch). Note that the supplied Ethernet cable is 5M but other lengths are available.

Q6.CON — Is it possible to connect dual monitors and dual control heads to an MFDBB?

Yes, the following BB MFD installation configurations are possible.

| Single | Dual (Clone Mode) | Dual (Extended Mode) |
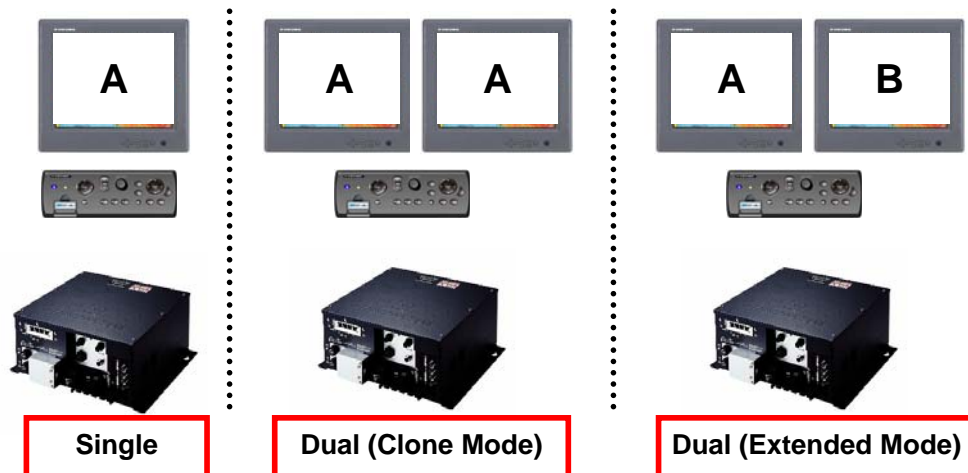
When Extended Mode is used (with only one keyboard), the two screens need to be located in close proximity to each other. Dual keyboard installation from one processor requires uses of the monitor "Clone" mode.

Q7.CON   **If two monitors with different sizes and different native resolutions are connected to the MFDBB, what will happen?**

The BB can only output the same resolution to both of its DVI-I ports. Some DVI Monitors have a video scaling feature that allows higher than native resolutions to be displayed. However it is NOT recommended to connect two monitor with different size and aspect ratio to the MDBB (such as a 15' monitor and a Plasma screen)

NOTE: While DVI-I ports, containing both DVI and VGA signals, are available on the MFDBB, the MFD8 and MFD12 only provide a DVI-D video repeater port. This means that a true DVI display must be used if a customer wishes to repeat video from either the MFD8 or MFD12.

Q8.CON   **How are NMEA2000 sensors connected?**

NavNet 3D MFD units have one NMEA2000 connector (Device Net style connector). In addition, all DRS radar sensors have one NMEA2000 port (Terminal Block connector). You can directly connect Furuno NMEA2000 sensors to the DRS radar sensor without having to running another NMEA2000 cable up the mast. Compatible Furuno NMEA2000 sensors are the GP330B, SC30 and WS200.
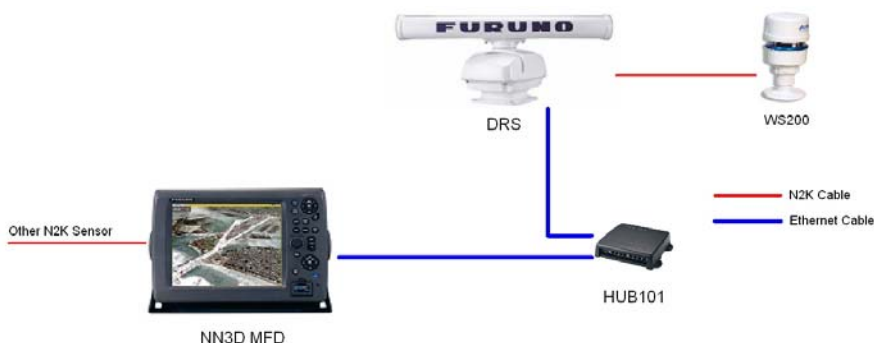
NOTE: You may ONLY connect one MFD or DRS to the same NMEA2000 Network. Some NN3D vessels may contain several smaller NMEA2000 Networks where their data is linked via the High-Bandwidth NN3D Ethernet Network. In these cases, each separate NMEA2000 network will be "Bridged" together via the NN3D Ethernet Network. NN3D MFD and DRS NMEA2000 ports shall not be connected together. In the case where NMEA2000 engine data, or other ship's data, is introduced to the NN3D Network, the connection is made to only one MFD, and this MFD will bridge the data to other MFDs in the network
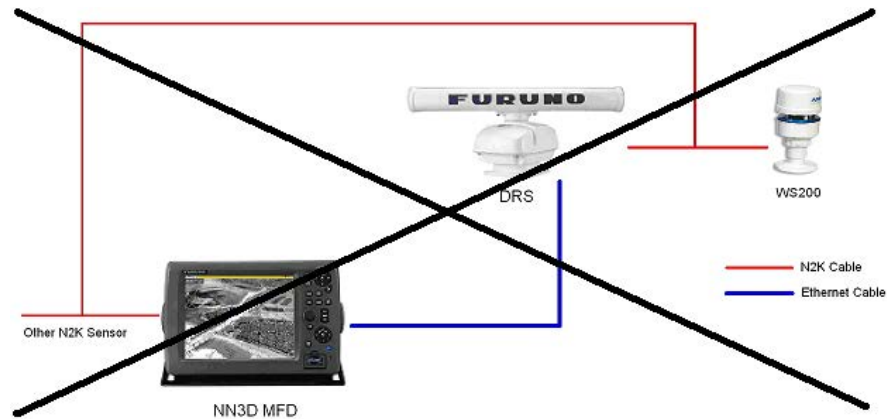
Q9.CON   Is it possible to terminate a NMEA2000 bus in the DRS?

A termination resistor is provided with each DRS. In most cases, this resistor will be required when connecting one or two Furuno NMEA2000 Devices to the DRS. It must be inserted into the appropriate NMEA2000 terminals inside the DRS while installing the system.

Q10.CON   How many NMEA2000 sensors can be connected directly to DRS?

The total number of Furuno NMEA2000 sensors that can be connected is dependent upon on the sum of their power consumption. The DRS can supply a maximum of one ampere (20 LEN) to the connected Furuno NMEA2000 Sensors. Power consumption of the various NMEA2000 that can be connected to the DRS:
SC30 = 10 LEN
GP330B = 3 LEN
WS200 = 13 LEN

NOTE: one LEN = 50mA

Q11.CON   Is the NMEA2000 port on the DRS a standard NMEA2000 Port?

Technically the answer is NO, only Furuno, or Furuno approved, NMEA2000 products may be connected to the NMEA2000 Port on DRS. Memory limitations do not allow the DRS to support every NMEA2000 PGN, especially proprietary PGNs that may be required to program and configure other manufacturer's sensors. At this time, the DRS NMEA2000 Port is directly compatible with the SC30, GP330B and WS200.

Q12.CON   Does the DRS need to be turned "ON" for the NMEA2000 data port to be active?

Power needs to be supplied to the DRS in order for the NMEA2000 information to be processed. This will occur if any MFD supplying power to the DRS is either in "Sleep Mode" or in the normal power "ON" state as described earlier. Of course, the DRS may be in either Transmit or Standby modes of operation.

Q13.CON   How many NMEA0183 ports are provided on every NN3D MFD?

Each NN3D MFD has three full NMEA0183 I/O ports. One is located in a dedicated MJ7 connector. This is identical to the NavNet 1/vx2 "DATA1" port and allows direct connection of a Furuno BBWGPS or 0183 Smart Depth sensor. The others are located in a single 18 pin connector. A 2 meter "Pig-Tail" cable is supplied as

standard with each MFD. Each 0183 I/O port can accept baud rates of 4800 or 38.4Kbps and output strings are independently programmable for each port.

Q14.CON   What type of Heading inputs are supported by NavNet 3D?

Only NMEA heading (NMEA0183 or MEA2000) can be connected to a NN3D MFD or DRS. Furuno proprietary AD10 (4-wire Clock and Data) protocol is no longer supported.
Heading input to NN3D will allow functions such as Radar Overlay, North Up in Radar and heading stabilization to work correctly. The NMEA0183 heading refresh rate needs to be 100ms (or faster) in order for the DRS ARPA to function! If the DRS ARPA feature is not required, a refresh rate of heading information can be 200ms (5 times per second). NN3D will reject 0183 Heading Information if refresh rate is limited to only once or twice per second. NMEA0183 heading can be accepted on any NMEA port at a baud rate of 4800 or 38.4kbps. Heading coming from NMEA2000 sensors will always be at the correct speed for ARPA function.

Example of connection with PG500 and NavPilot:

3. Compatibility

Q1.COMP   **Are NavNet 1/vx2 systems compatible with NavNet 3D?**

NN3D has limited compatibility with certain Furuno NMEA0183 and Ethernet sensors that may be part of an existing NavNet 1/vx2 System. Some of these are the BBGPS, BBWGPS, BBFF1, BBFF3, BBWX1, FAX30, FA150 and most existing transducers. However, because NN3D is based on new technology, there is no network compatibility between NavNet 1/vx2 processors/radars and NN3D MFDs. Further, NN3D and NavNet 1/vx2 displays (processors) cannot exist on the same Ethernet Network. Only NavNet 1/vx2 NMEA0183 serial outputs may be used to interconnect NavNet 1/vx2 to NN3D MFDs.

Q2.COMP   **Can an AIS receiver other than FURUNO be used for NavNet 3D?**

Yes, any AIS receiver that outputs VDM strings (NMEA0183) at a data rate of 38.4kbps can be connected using one of the 3 NMEA inputs on a NN3D MFD.

Q3.COMP   **Can VX2 network cable be used for NavNet 3D?**

No, only RJ45 style connector cables are used for NN3D instead of the old NavNet 1/vx2 6-pin round connector cable.

Q4.COMP   **Can FAR2xx7 radar be connected to NavNet 3D?**

FAR2XX7 connectivity is available from software v1.12

Q5.COMP   **Can FCV1150 Sounder be connected to NavNet3D?**

FCV1150 connectivity is available from software v1.12

4. Chart

Q1.CHART   **Are current Navnet vx2 CMAP or Navionics Charts compatible with NavNet 3D?**

No, however, NN3D is preloaded with the entire U.S. NOAA Raster (RNC), Vector (S57-ENC), and Bathymetric Database. Free high resolution satellite photos are available for the USA coastline as well. Note that it is not possible to preload all satellite photos, due to their large file sizes. The dealer or end user will have to install specific satellite photo areas on the internal Hard-Drive.
For areas outside of the U.S., a worldwide portfolio of MapMedia Charts is available for purchase with NN3D Systems. These MapMedia charts (MM3D) will be available in Raster and/or Vector Formats. Most Vector Format MapMedia charts will be based on Navionics Database information. It is very important to note that this Navionics vector data will be converted into MapMedia "MM3D" format for use with NN3D. Therefore, Navionics Chart products such as Platinum, Silver, and Classic are NOT compatible with NN3D.
In summary, all NN3D Chart Data must originate from MapMedia in the "MM3D" format.

Q2.CHART   **Which charts come preloaded in NN3D systems supplied in North America??**

All NN3D MFDs come pre-loaded with Raster charts, Vector charts and Bathymetric Data (3D), covering the USA coastline, including Alaska and Hawaii.
The Raster charts come from the official NOAA raster chart library that has been converted to the TimeZero compatible format.
The Vector chart data comes from the official NOAA S57 chart library that has been converted to the TimeZero compatible format.
The Satellite Photo areas do not come preloaded; however, they will be available at no cost when downloaded from the Furuno USA website. Users will be able to install several Satellite Photo Areas on the NN3D hard drive.

Q3.CHART   **What is the chart coverage in the USA?**

The Raster Chart coverage is complete (equivalent to more than 1000 paper Charts), including Alaska and Hawaii.
Vector Charts Coverage (S57) currently includes most of U.S. areas (NOAA advises that they have converted approx. 80% of all their detailed raster charts)
NOAA adds and updates Vector and Raster charts daily! Update will be provided to the end users free of charge.

Q4.CHART   **What is the chart coverage outside the USA?**

A complete MM3D chart catalog is available online .

Q5.CHART   **How are the charts installed in NavNet 3D?**

Charts outside the USA are installed on the system using SD-Cards. The Charts will be copied (transferred from the SD-Card to the internal memory) allowing the user to install multiple areas at the same time. When the installation is done, the SD-Cards can be removed and stored safely for backup.
When a chart is installed (outside the USA), an unlock code is required to view the chart.
On the MFDBB, the charts can also be installed using a USB Jump drive (available only with version 1.12 and above)

Q6.CHART **Can I directly load NOAA charts from the NOAA site?**

No, not directly. NN3D can only display MapMedia charts in MM3D format. For the USA, the MapMedia chart data comes from the NOAA BSB raster chart and S57 vector chart library. Customers will be able to update their NN3D charts for free using an SD Card and a PC connected to Internet (to download the charts). Information will be posted to registered users when new updates are available.

Q7.CHART **Can I update charts outside the USA?**

Customers will be able to update their charts by purchasing a new SD Card through a Furuno dealer, at a discounted price.

5. Chart Plotter

Q1.PLOT **What is the "Ghost Cursor"?**

The cursor movement is synchronized between radar and plotter screens when displaying both radar and plotter screens. Heading data is required to enable this function.

Q2.PLOT **What is the Minimum/Maximum Zoom Range?**

50 feet to 3,000 nm, horizontally across the full MFD display.
Zoom range is based on the distance of radius of the inscribed circle that is fitting inside the screen.

Zoom Scale

Q3.PLOT **How many points (waypoints/marks) can be stored?**

Up to 2,000 points at a time. An end-user can use files on SD cards to store an unlimited amount of additional points.

Q4.PLOT **How many points for ship's tracks?**

Memory for ship's track is fixed to 12,000 points. Once the points reach the maximum, the oldest data will be replaced by the new data (Circular Buffer). The ship's track displayed can be saved in NN3D memory and/or on SD cards to store or backup an unlimited amount of additional track points.

Q5.PLOT **How many routes can be stored?**

Up to 200 routes with up to 100 points per route. NN3D Internal Memory Route Storage is limited to 2,000 points. An end-user can use files on SD cards to store an unlimited amount of additional routes and points.

Q6.PLOT **Is Heading used in the NN3D Plotter Modes?**

Yes, unlike NavNet 1/vx2, which only uses GPS COG for vessel alignment, if provided, NN3D will use Heading information to orient the boat icon. Additionally, a useful heading line can be enabled in the plotter mode as well.

Q7.PLOT **Is PBG (Personal Bathymetric Generator) available on NavNet 3D?**

At this time, the PBG function is not planned for NN3D MFDs. To use this function, the user will have to connect a PC to the NN3D network loaded with MaxSea Explorer v12.6

6. Radar – Digital Radar Sensors (DRS)

Q1.DRS   **Do all NavNet 3D DRS products have High Speed antenna capability?**

Yes, all DRS antennas, Domes and Open Arrays, automatically increase in speed from 24 to 36 to 48 rpm as range is decreased, and depending on the radar range 14 selected. When the Radar is used in Dual Range, the antenna rotation is fixed at 24RPM. The antenna rotation speed can also be fixed at 24rpm for all modes/ranges if desired.

Q2.DRS   **What are the changes in the DRS AUTO performance?**

The AUTO clutter controls for Gain, Rain and Sea are dramatically improved; for normal operation, it should no longer be necessary to manually adjust the DRS Radar Image setting from the default AUTO modes in most conditions.

Q3.DRS   **Is the ARPA function an option like older Navnet Systems?**

NO, every DRS radar sensor includes a "Built-In" 30 Target ARPA! ARPA functionality does still require input of stabilized heading at appropriate data rates (10Hz).

Q4.DRS   **Is GPS COG information allowed for Heading and ARPA capability?**

No, while some competitor's radar systems allow GPS COG for Heading and ARPA functionality, Furuno believes that this capability is dangerous and not reliable, especially for ARPA calculations. NN3D systems require actual Heading information at appropriate data rates (10Hz) for these functions.

Q5.DRS   **Do NavNet 3D DRS products all have Dual Range antenna capability?**

All DRS antennas, Dome and Open Arrays have "True" Dual Range radar capability which provides "simultaneous" transmission of both short and long pulse. This allows complete independent control of range, gain, sea clutter and rain clutter for two separate ranges on each MFD. This is a very useful and powerful feature.

Q6.DRS   **What is "Time Zero Radar"?**

On the MFD BB, the radar picture is displayed using "TimeZero" technology. This allows seamless zooming and offset. Additionally, the radar picture is stabilized with a new process, thus completely removing all smearing effect.

Q7.DRS   **How does Radar Overlay function?**

The radar overlay is no longer a dedicated mode. Overlay is part of the Plotter and thus can be used with Raster Charts, Vector Charts, Weather and Satellite Pictures in 2D as well as in 3D. Radar overlay requires a Heading Sensor such as SC-30 or PG500.

7. Fish Finder

Q1.FF   **What is the new Airmar Transducer ID function available with NN3D and the DFF1 and DFF3??**

This feature enables compatible transducers to transmit important data to the DFF1 or DFF3, including transducer model, functions, frequency, power rating, beam pattern, impedance, ceramic element configuration and acoustic window material. Through this Transducer ID feature, the DFF1 and DFF3 Sounder Modules will automatically know the connected transducer's precise frequency, operating power and impedance, so it can "tune" its operation to automatically adjust and optimize echo sounder performance.

Q2.FF   **What do I need to utilize the new Heaving Compensation feature, and what does it provide??**

Echo Sounder Heaving Compensation is a revolutionary new feature available in NN3D! Heaving Compensation automatically removes vessel motion from the echo sounder display in rough seas. This is usually seen as a "Saw Tooth" distortion of the bottom image due to vertical vessel motion even though the bottom is actually flat. It greatly enhances bottom fishing and bottom trend analysis without sacrificing critical details as can occur when using a traditional Bottom Lock Echo Sounder Mode.
In order to utilize this new Heaving Compensation feature with NN3D, you need to use the DFF1 or DFF3 with a Furuno SC30, SC50 or SC110 satellite compass. Only these satellite compass products can provide vertical vessel motion information to remove this distortion.

8. Camera/Video

Q1.CAM   **What types of IP Cameras can be connected to NavNet 3D systems?**

Only AXIS IP Cameras that support MPEG4 Video are compatible with NN3D, as a networkable video source. Certain Axis PTZ (Pan-Tilt-Zoom) IP Cameras may also be controlled with NN3D Systems for features such as pan, tilt, and zooming. Furuno recommends utilizing AXIS POE (Power over Ethernet) compatible IP Cameras with a separate POE Ethernet Switch to provide power and Ethernet to each AXIS IP Camera with a single cable. Then, utilize a non-POE port on this switch to link the IP Cameras to a HUB101 in a NN3D Network.
Here is the list of AXIS IP Cameras that are tested on NN3D:
- AXIS 207 (Fixed)
- AXIS 211FD (Fixed)
- AXIS 212PTZ (Pan/Tilt/Zoom)
- AXIS 216FD (Fixed)
- AXIS 215PTZ (Pan/Tilt/Zoom)
- AXIS 225FD (Fixed)
- AXIS 233PTZ (Pan/Tilt/Zoom)

Q2.CAM   **How many IP Camera and analog video inputs are available?**

Up to four IP Cameras can be networked (requires software v1.12 for MFD8/12) Two composite inputs for MFD8/MFD12 (RCA connector) and four for MFDBB (BNC connector) are also available.
NN3D supports PAL and NTSC composite video signals (requires software v1.12 for PAL compatibility on MFDBB)

Q3.CAM   **Can the analog video input be distributed in a network?**

No. Unlike video from an IP camera, analog video can be seen only on the MFD that receives the composite video signal. When network IP Cameras (AXIS) are used, any MFD connected to the network can view the picture.

Q4.CAM   **What is the video output of the MFDs?**

The MFD8 has a 640*480@60Hz DVI-D output. The MFD12 has an 800*600@56Hz DVI-D output. The BB has DVI-I output 800*600 up to 1280*1024@60Hz.
The DVI-I output of the BB allows regular VGA monitor to be plugged thanks to a DVI-I to VGA adaptor:

Note that this adapter will only work with the BB which uses DVI-I (digital and analog video signal). The MFD8 and MFD12 use DVI-D which is digital only (only a DVI monitor can be connected). It can be possible to use a VGA monitor on the MFD8 and MFD12 using a "smart" adapter cable (more expensive) such as this one:

Please note that due to the MFD12 output vertical frequency, it cannot be directly connected to a TV (that only accept vertical frequency of 60Hz)

Check out the collection of marine electronics & navigation we offer.