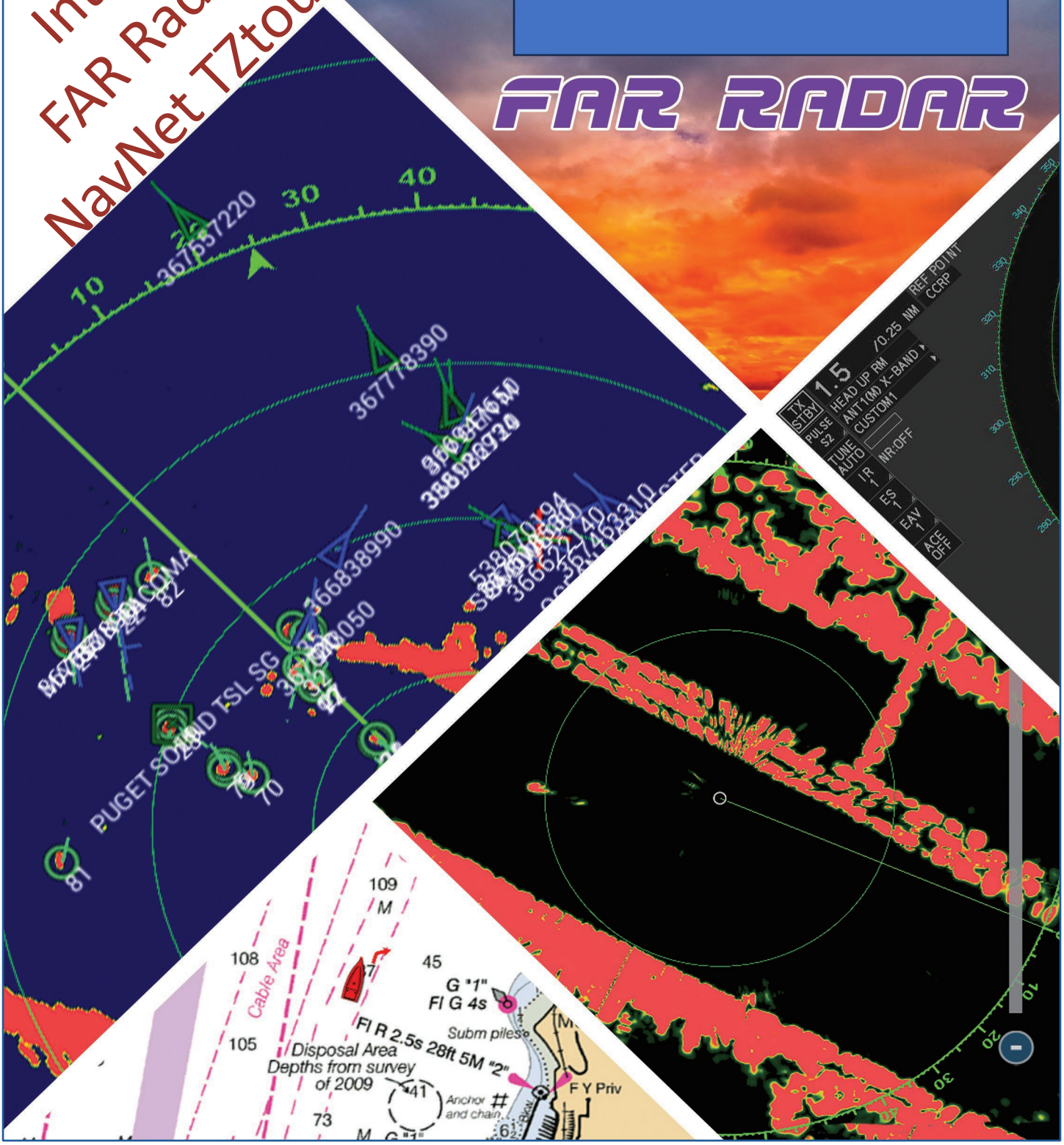
Interfacing FAR Radar with NavNet TZtouch2/3/XL

NAVnet

FAR RADAR



FURUNO

Interfacing FAR Radar with NavNet TZtouch2/3 MFD

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1. FAR Marine Radar and NavNet MFD Compatibility

NavNet TZtouch2/3 MFDs are compatible with popular commercially available Furuno FAR Marine radars via ethernet connection. The following table summarizes the network compatibility.

	TZtouch2 TZTL12F, TZTL15F, TZT2BB *(SW Ver. 07.01 or later)*	**TZtouch3** TZT9F, TZT12F, TZT16F, TZT19F *(SW Ver. 02.01 or later)*
FAR-2xx7 series *(C series version no. 04.08 or after)* FAR-2117(-BB) FAR-2127(-BB) FAR-2817 FAR-2827	**Compatible**	**Compatible**
FAR-2xx8 series *(Version no. 01.19 or after)* FAR-2218(-BB) FAR-2318 FAR-2228(-BB) FAR-2328W FAR-2238S(-BB) FAR-2338S FAR-2338SW	**Compatible**	**Compatible**
FAR-2xx8 NXT series and 58/68 FAR-2228-NXT(-BB) FAR-2338S-NXT FAR-2258 FAR-2268DS	*Not Compatible*	*Not Compatible*
FAR-15x8 series *(Version no. 01.10 or after)* FAR-1513(-BB) FAR-1523(-BB) FAR-1518(-BB) FAR-1528(-BB)	**Compatible**	**Compatible**

Benefits of Interfacing FAR radar:

The advantages for a recreational or commercial vessel owner to integrate and/or add a NavNet TZtouch2/3 into their new or existing commercial radar system could include the following:

A. Proven Reliability: Commercial radar systems are built to withstand continuous rugged use in all working environments where a DRS could be more susceptible to damage. The NavNet TZtouch2/3 can complement the FAR as a user-friendly alternative to an ECDIS, with simplified navigation and plotter functionality, making a good combination for 'Light-Commercial' applications such as Tugs, Barges, Fire boats, Pilot boats, Trawlers, or any other vessels that venture into challenging environments.
B. Commercial ARPA Features: While the recreational DRS would allow an operator to track up to 100 targets by different methods (e.g., 40 targets by *Auto Acquire by Doppler*, 30 targets by *auto acquire by guard zones*, and 30 targets by *manual tracking),* the commercial FAR radars allow an operator to *manually acquire* up to 100 targets using the TZtouch2/3 MFD.
C. Professional Uses: Some recreational boaters may use their vessels for professional purposes, such as scientific research, law enforcement, sport fishing or academic research. In such cases, the higher commercial performance and durability of a commercial radar combined with the functionality and ease of use NavNet TZtouch2/3 system can provide crews with a highly extensible platform to perform all sorts of tasks other than navigating.

Installation Considerations:

Commercial radar systems are considerably more expensive and robust than recreational radar systems and may require professional installation and maintenance depending on the installation. The combination of Furuno NavNet TZtouch2/3's and a commercial FAR radar is not IMO-typed approved, it cannot be interconnected with a HUB-3000 and ECDIS (FMD). The NavNet TZtouch2/3's is a good display for a FAR echo presentation, and includes basic controls to operate the radar, however the NavNet TZtouch2/3's is not a full replacement for the Control Unit (RCU). In most cases you will need to have independent heading, AIS, LOG, or AMS separated from a NavNet TZtouch2/3 network. Alerts and Alarms such as BAMS cannot be shared over the network between the two systems.

Disclaimer:

This document assumes the vessel has installed and tested a working FAR installation aboard their vessel and interested in adding an additional NavNet TZtouch2/3 MFD to their system. This document is not an installation document for the FAR or NavNet TZtouch2/3 MFD; always consult the appropriate installation manual when initially installing and configuring settings not explicitly written in this guide. Ensure that all installation considerations listed in both product's installation manual have been met before proceeding.

Customers should carefully consider their specific needs, budget, and the type of boating they plan to do when deciding between commercial and recreational radar options. If unsure contact Furuno Support or contact your local authorized Furuno Dealer.

2. Overview of Commercial Radar Features

2.1. Available Features

When interfacing a NavNet TZtouch2/3 MFD with a FAR-2xx8/2xx7/15x8 series marine radar the following functions are available:

Function	Notes
ACE GAIN	Available for the FAR-2xx8/15x8 series only. **Requires ACE GAIN to be enabled from the radar**. **Note:** Echoes may look different from what appears on the FAR-2xx8/15x8 radar. To use the ACE function, enable signal processing from the NavNet TZtouch2/3.
ARPA manual acquisition and removal	Up to 100 targets
AUTO SEA	Toggle ON/OFF operation only, setting adjustment must be done at the radar
Changing the range	Following ranges only: 0.125, 0.25, 0.5, 0.75, 1, 2, 3, 4, 6, 8, 12, 16, 24, 32, 48, 96 (nm).
Display AIS target data	Toggle ON/OFF operation only
Interference Rejector	Toggle ON/OFF operation only
Manual gain adjustment	Adjustable: 0 - 100
Manual rain/snow clutter removal	Adjustable: 0 - 100
Radar source selection, display of echoes	Selectable Source selection
Toggles transmit and standby modes	Toggle ON/OFF operation only
ARPA Advanced Settings	For service technician only. Do not change these settings. This item is available when [TX/STBY] is [ON]. Not available (greyed out) with the radar sensor FAR-2xx8/2xx7/15x8 series radar antennas.

2.2. Unavailable Features

The following functions are unavailable when interfacing a NavNet TZtouch2/3 MFD with a FAR-2xx8/2xx7/15x8 series marine radar:

- ARPA automatic acquisition
- AUTO RAIN
- Automatic gain adjustment
- Selection of range unit: Fixed at [NM]
- Split-screen display
- Tuning, antenna speed and other post-installation adjustments
- Watchman Feature
- Polygon acquisition zones (must be disabled)

3. Connections

Prerequisites:

The prerequisites to interfacing a commercial FAR Marine radar with a NavNet TZtouch2/3 system are an Ethernet HUB such as the HUB-101, one available port to connect the FAR RPU, one available port for the MFD, and two ethernet cables (100m or less). Connect the FAR to the NavNet TZtouch2/3 MFD according to the following interconnection diagrams. Instructions differ depending on whether you are interfacing a NavNet TZtouch with a FAR-2xx7, FAR-2xx8, or FAR-15x8.

Note 1. When using the HUB-101, make sure **all DIP switches** are in the **OFF position** before continuing in interfacing the products.

Interconnection Diagrams:

FAR-2xx7 and TZtouch TZtouch MFD Interconnection Diagram:

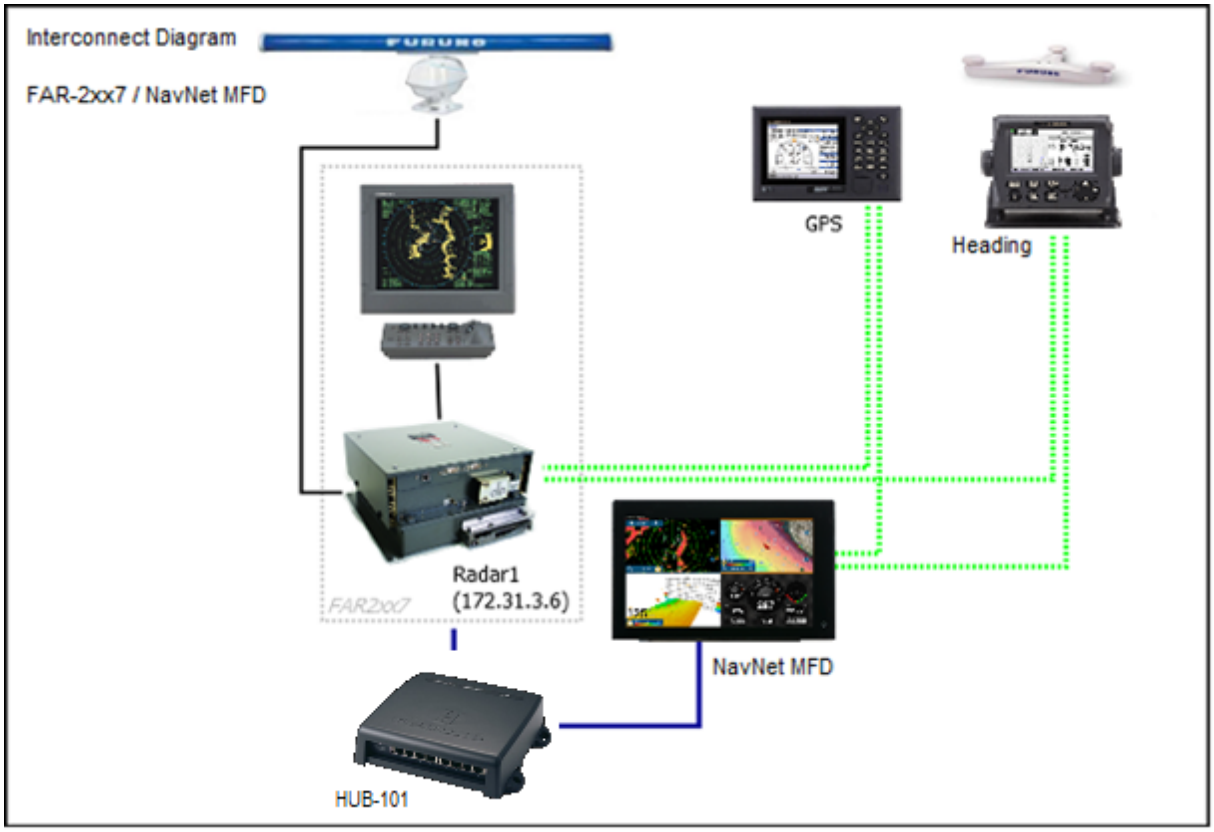

Figure 1

Installation: Connect an ethernet cable between the NavNet TZtouch2/3 MFD and an ethernet hub (HUB-101). Connect another ethernet cable between the ethernet hub and the **NETWORK port** of the FAR-2xx7 Radar Processor Unit (RPU-013) *(see Figure 1)*.

Note 1: A maximum of 6 units of NavNet TZtouch2/3 can be connected. NavNet TZtouch2 requires software version 7 or after, NavNet TZtouch3 requires software version 2 or after. For configurations with TZT2BB included a maximum of 4 NavNet TZtouch2/3 units can be connected. NavNet TZtouch one series cannot be connected.

Note 2: FURUNO networks allow a maximum of three network hubs (e.g., HUB-101) on the same network. Exceeding this can cause undesirable results.

Note 3: FAR-2xx7 is rated for either 24v DC power supply or 100-115v AC depending on the model; TZtouch2/3 is rated for either 12v or 24v DC power supply only.

FAR-2xx8 and TZtouch MFD Interconnection Diagram:

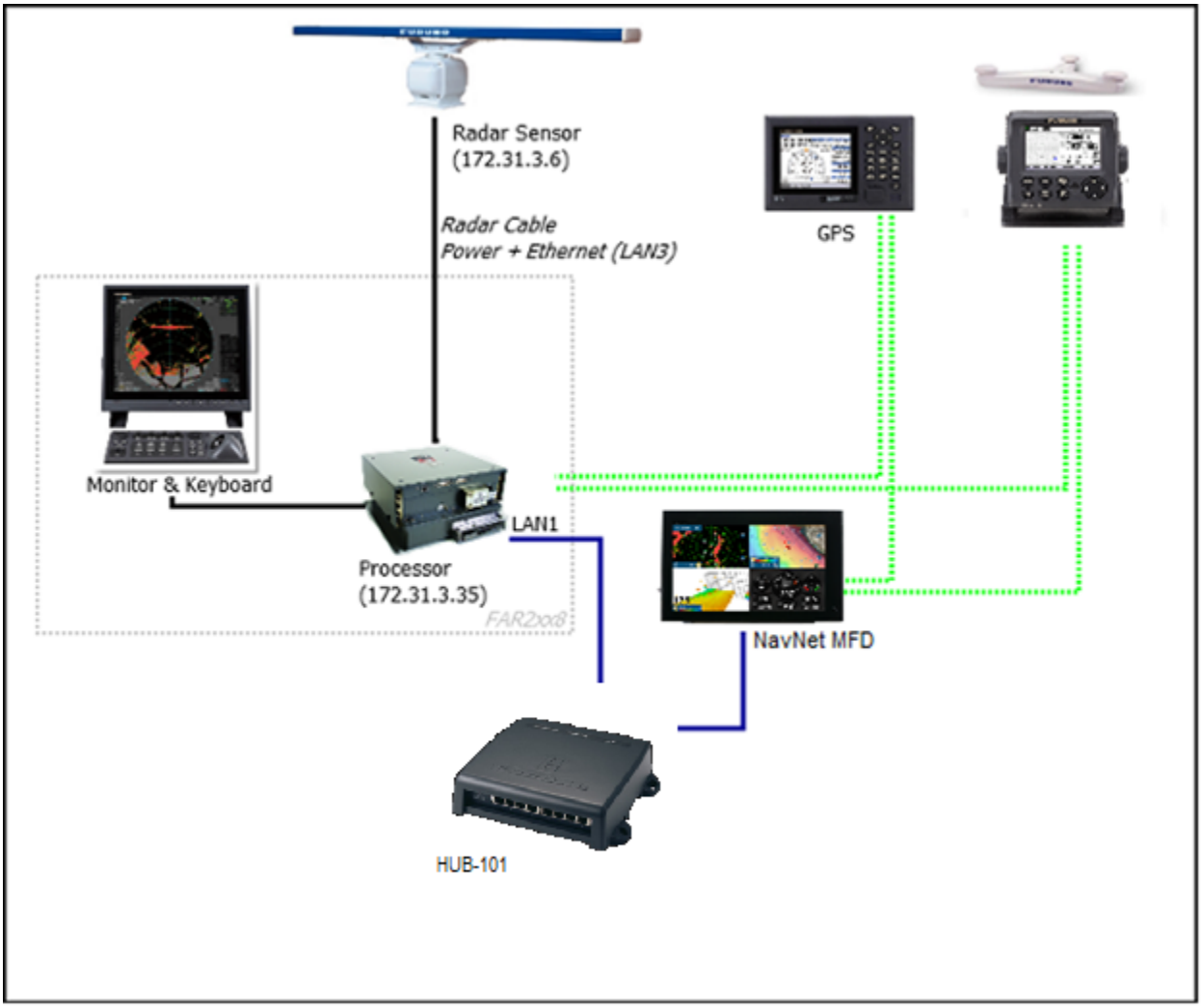

Figure 2

Installation: Connect an ethernet cable between the NavNet TZtouch2/3 MFD and an ethernet hub (HUB-101). Connect another ethernet cable between the ethernet hub and the **LAN1 port** of the FAR-2xx8 Radar Processor Unit (RPU-025) *(see Figure 2).*

Note 1: A maximum of 6 units of NavNet TZtouch2/3 can be connected. NavNet TZtouch2 requires software version 7 or after, NavNet TZtouch3 requires software version 2 or after. For configurations with TZT2BB included a maximum of 4 NavNet TZtouch2/3 units can be connected. NavNet TZtouch one series cannot be connected.

Note 2: FURUNO networks allow a maximum of three network hubs (e.g., HUB-101) on the same network. Exceeding this can cause undesirable results.

Note 3: FAR-2xx8 is rated for either 24v DC power supply or 100-115v AC depending on the model; TZtouch2/3 is rated for either 12v or 24v DC power supply only.

FAR-15x8 and NavNet TZtouch2/3 MFD Interconnection Diagram:

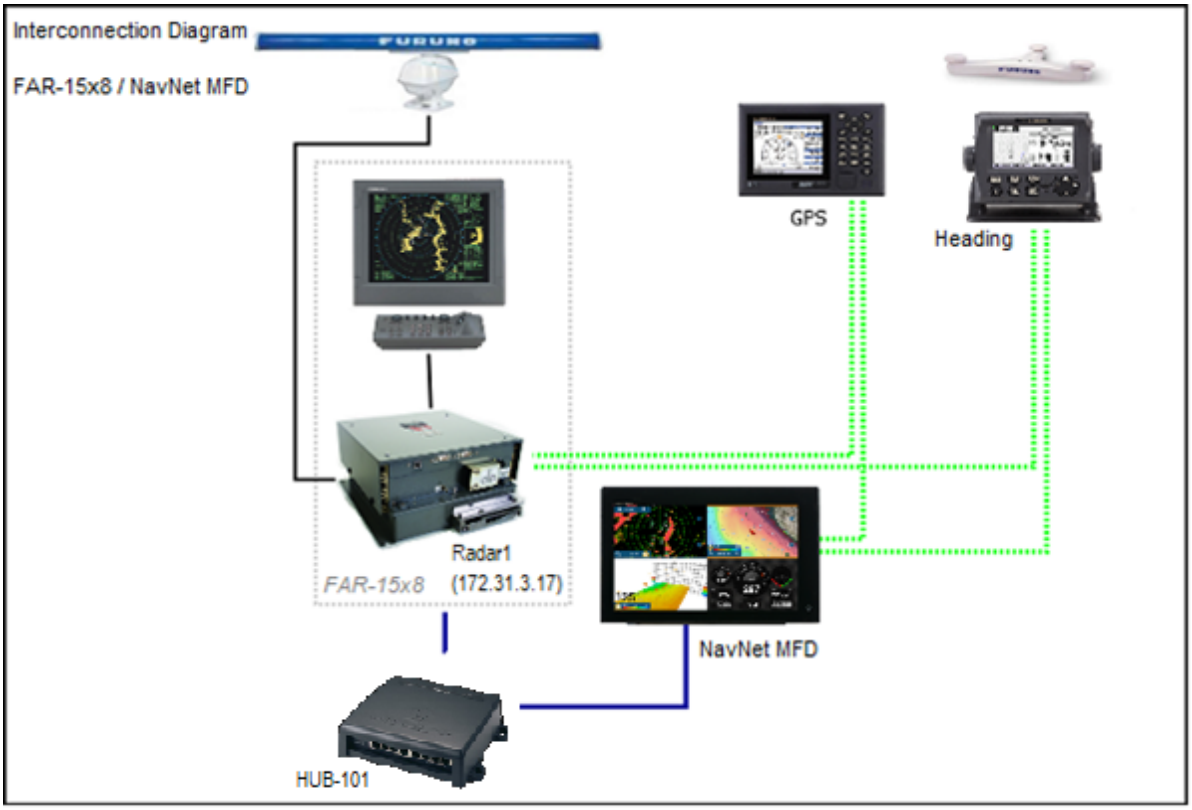

Figure 3

Installation: Connect an ethernet cable between the NavNet TZTouch2/3 MFD and an ethernet hub (HUB-101). Connect another ethernet cable between the ethernet hub and the **LAN port** of the FAR-15x8 Radar Processor Unit (RPU-024) *(see Figure 3).*

Note 1: A maximum of 6 units of NavNet TZtouch2/3 can be connected. NavNet TZtouch2 requires software version 7 or after, NavNet TZtouch3 requires software version 2 or after. For configurations with TZT2BB included a maximum of 4 NavNet TZtouch2/3 units can be connected. NavNet TZtouch one series cannot be connected.

Note 2: FURUNO networks allow a maximum of three network hubs (e.g., HUB-101) on the same network. Exceeding this will cause undesirable results.

Note 3: FAR-2xx8 is rated for either 24v DC power supply or 100-115v AC depending on the model; TZtouch2/3 is rated for either 12v or 24v DC power supply only.

4. FAR Marine Radar Settings

4.1 FAR-2xx7 Connection Settings

To interface the TZtouch2/3 with a FAR-2xx7 you need to perform the following changes to settings.

4.1.1. DIP Switch Setting

Check to make sure your S1 DIP #4 Switch is set to the OFF position, then perform a factory reset. This will switch the FAR back to a Class B address of 172.31.3.6.

1. Remove the top cover of the processor unit.
2. Open the SPU assembly block and identify the S1 Dip Switch *(see fig. 4)*
3. Set the DIP switch S1's 4th position to off. *(See fig. 5)*

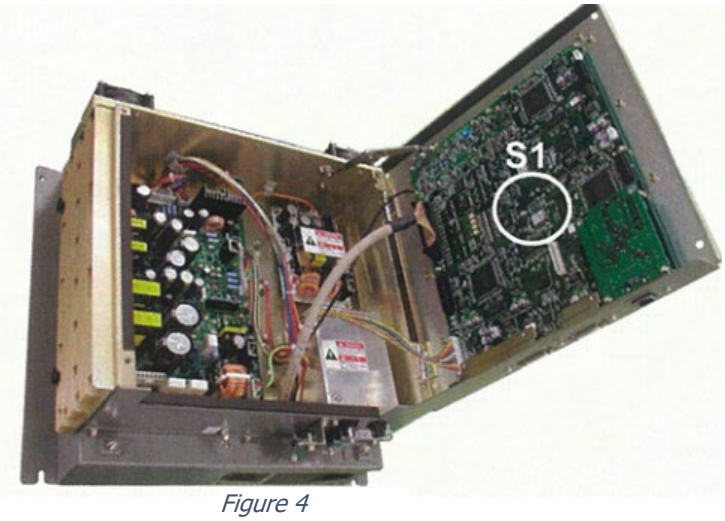

Figure 4

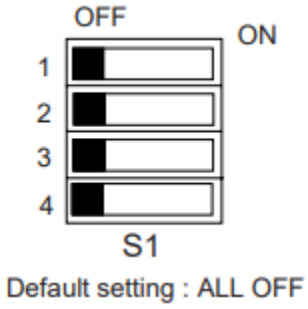

Figure 5

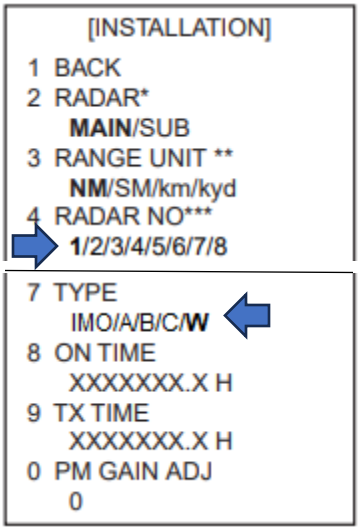

Figure 6

4.1.2. Connection Settings

4. While pressing and holding down the [HL OFF] key, press the [MENU] key five times. The [INITIALIZE] menu will appear.
5. Press the [4] key to show the [INSTALLATION] menu.
6. Choose radar number **1** on the [4 RADAR NO] menu and press the [ENTER/MARK] key. *(See fig. 6)*
7. Set the FAR-2xx7 to be in non-IMO Mode (if not already), choose **W** on the [7 TYPE] menu and press the [ENTER/MARK] key. If interfacing a TZtouch one series, select option **B** *(See Fig. 6).*

**Note: Whenever a network change is made, it is recommended that all radars are powered down and restarted.*

4.2 FAR-2xx8 Connection Settings

To interface with a FAR-2xx8 you need to confirm you have the correct settings.

1. Open the main menu then press the [HL Off] key + [MENU] key five times to enter [RADAR INSTALLATION]
2. Select the [Installation]
3. Navigate to [6 TYPE] and select either option **B** or **W**.
4. Navigate to [3 RADAR No.] and select **1.**

Note: When you change the radar number, this equipment restarts automatically. After restarting, confirm the IP address in [NETWORK SETTINGS].

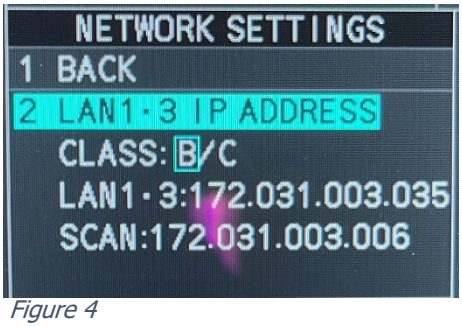

Figure 4

5. Enter [RADAR INSTALLATION] menu and select [NEXT] -> [NETWORK SETTINGS] to open the [NETWORK SETTINGS] menu.
6. Set [2 LAN 1•3 ADDRESS] to CLASS: B and confirm the following settings:
    a. LAN1•3:**172.031.003.035**
    b. SCAN:**172.031.003.006**

    (See fig. 7)

Note 1: Network settings should be done while the radar is disconnected from the LAN network, as a standalone radar.

Note 2: Then system restarts automatically after the network settings are changed.

Note 3: The NavNet TZtouch one series MFD is not compatible with the FAR-2xx8 Series.

4.3 FAR-15x8 Connection Settings

To interface with a FAR-15x8 you need to perform the following changes to settings. To setup the radar you will need to access the [RADAR INSTALLATION] menu.

1. Turn on the radar.
2. Press the [HL Off] key + [MENU] key five times to open the "[RADAR INSTALLATION]" menu.
3. Press [5 INSTALLATION] to access the [INSTALLATION] MENU and navigate down to [2 IP ADDRESS] and set the IP1: 172.031.003.017 (Default).
4. Navigate to [4 RADAR NO] and set it to **1**
5. Navigate further down to [7 TYPE] and set it to "Non-IMO."
6. Exit out of the Installation Menu.

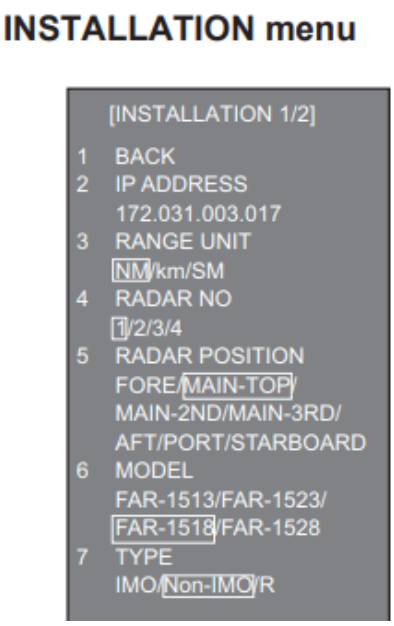

Figure 5

5. NavNet TZtouch2/3 MFD Settings

Next, you need to perform the following changes to settings on the NavNet TZTouch2/3 MFD:

1. Power on the FAR Radar and the NavNet TZTouch2/3 MFD and check for activity on the network HUB.
2. Navigate to Home > Settings > Initial Setup > Sensor List and confirm under NETWORK SENSOR that the correct model of FAR Radar is listed.

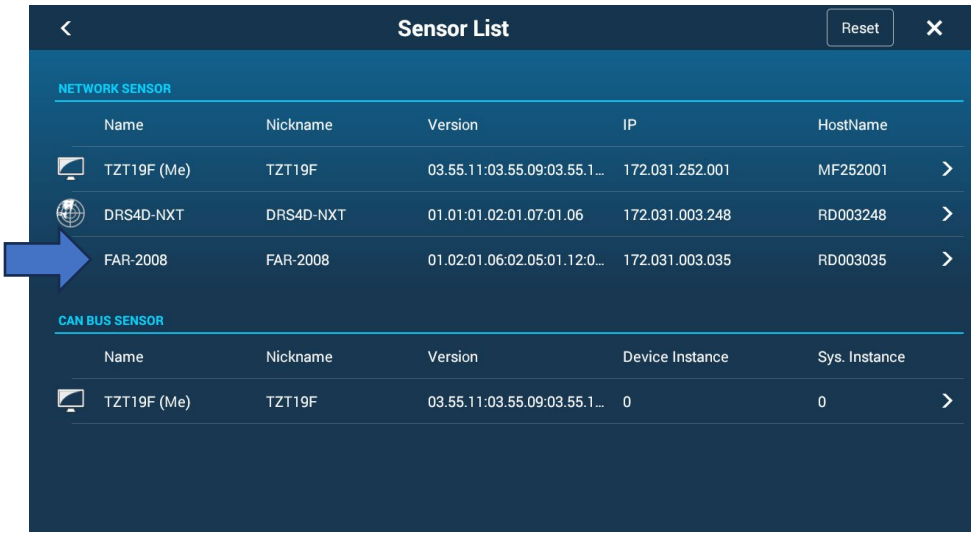

Figure 6

3. Tap the FAR radar to open the properties. On this page where you can set a Nickname, confirm the firmware version, HOSTNAME, and the IP Address.

Figure 7

4. If the FAR does not match the correct settings, check the FAR settings configuration. Exit out of the properties page and navigate back under SETTINGS > RADAR. Select the RADAR from the drop-down menu as the Radar Source then exit out of Radar Settings.

Frequently Asked Questions

Am I able to use the NavNet TZtouch2/3's auto gain features on a FAR radar?

No, only manual gain is available when connected to a FAR radar.

Can I use the NavNet TZtouch2/3's auto RAIN or SEA controls on a FAR radar?

Auto rain is disabled on the NavNet TZtouch2/3*, and you can only toggle on auto sea. Manual Rain and Sea controls remain available on the* NavNet TZtouch2/3*.*

Can manually tune a connected FAR Radar?

No, manual or automatic tuning cannot be performed by a NavNet TZtouch2/3*, it must be done at the FAR.*

What are all the orientation modes available on the NavNet TZtouch2/3's when connected to a FAR radar?

Head up and north up are available on the NavNet TZtouch2/3's*; stern up, course up, and true motion are unavailable on the* NavNet TZtouch2/3*.*

Can I still use the NavNet TZtouch2/3's range measurement tools with the FAR radar?

Yes, EBL (electronic bearing line), Fixed range rings, Ruler, Tap inside effective display, and VRM (variable range marker) are available on the NavNet TZtouch2/3*.*

Can I use Echo Averaging to remove sea clutter?

No, echo averaging is unavailable however manual gain/sea/rain is available as well as the ability to utilize ACE (automatic clutter erase)

Am I able to use Guard Zones from the NavNet TZtouch2/3's when connected to the FAR radar?

Yes, you're able to utilize the guard zones from the NavNet TZtouch2/3's *however you cannot use Polygon Zones; Polygon zones need to be disabled before interfacing with the* NavNet TZtouch2/3's*.*

Am I able to initiate the Watchman Feature on the FAR radar?

No, the watchman feature is disabled on the NavNet TZtouch2/3's *when connected to a FAR radar; Transmit and Standby are the only available options.*

Can I use the FAR radar in IMO mode?

No, you cannot use a FAR radar with a NavNet TZtouch2/3's *network when the type is set to IMO-Mode.*

What is the recommended radar "Type" the FAR-2xx7 should be set too?

The recommended type to set a FAR-2xx7 is type: "W" (or "C.")

How many FAR radars can be connected to a NavNet TZtouch2/3's Network?

It is recommended not to interface more than one FAR radar with a NavNet TZtouch2/3's *system.*

Can I use or manage Polygon guard zones from the NavNet TZtouch2/3's MFD?

No, polygons must be turned off before interfacing or using a FAR on a NavNet TZtouch2/3's *MFD.*

Am I able to turn on Echo Trails on the NavNet TZtouch2/3's when connected to a FAR radar?

Yes, you can turn on Echo Trails to show the movements of radar targets relative to Own Ship.

Am I able to use Dual Range mode on a FAR radar like a DRS radar?

No, like the DRS4DL+, DRS2D-NXT, DRS4D-NXT radars Dual Range options are also not available on FAR radars when connected to a NavNet TZtouch2/3's*.*

Am I able to use the Bird Mode features from the NavNet TZtouch2/3's on the FAR radar?

No, Bird Mode is disabled on FAR radars when connected to the NavNet TZtouch2/3's*. However, manual gain, sea, and rain controls remain available to the operator.*

Can I enable "Target Analyzer™" on a FAR radar from the NavNet TZtouch2/3's?

No, TA is only available for NXT DRS radars.

Am I able to use RezBoost™ on a NavNet TZtouch2/3's when connected FAR radar?

No, RezBoost™ is a feature only available on DRS NXT radars.

Am I able to enable Automatic Radar Plotting Aide (ARPA) on a FAR radar? How many targets can I acquire?

Yes, however only Manually Acquired targets is available on a FAR radar connected to a NavNet TZtouch2/3's*. The FAR radar is capable of manually acquiring 100 targets if heading requirement has been met.*

Is it necessary or important on the NavNet TZtouch2/3's to do the Radar initial setup section?

Antenna Rotation, auto tuning, and tuning source cannot be changed, however adding (if necessary) Antenna Heading Align values, a Main Bang Suppression level, a Sector Blank, Antenna Position, or antenna height can improve user experience and accuracy of the information.

Can the SIO LAN Output or IEC61162-450 data output from a FAR-2xx8/2xx7 be used by the NavNet TZtouch2/3's system?

No, FAR "SIO LAN Output" or IEC61162-450 data from LAN2 (ex. 2xx8) can interfere with other NavNet TZtouch2/3's *sensors (such as Ethernet Sounders) and therefore should be turned OFF or disconnected from the -450 network.*

Can I operate multiple FAR radars from the NavNet TZtouch2/3's MFD?

No, you can only connect and operate one FAR radar with a NavNet TZtouch2/3's *network.*

Do I need to change the IP Address of the NavNet TZtouch2/3's MFD to operate a FAR radar?

No, to interface with a NavNet TZtouch2/3's *system the FAR radar must have a Class B address of 172.31.3.x with a subnet mask of 255.255.0.0.*

Can I connect an ECDIS and a FAR radar to a NavNet TZtouch2/3's network?

No, the ECDIS requires the use of a Class C IP Address which is incompatible with the NavNet TZtouch2/3's *system. Users need to choose between interfacing with the ECDIS or* NavNet TZtouch2/3's *MFD, and modify the FAR settings accordingly.*

Can I display Radar overlay on a connected ECDIS when interfaced with a NavNet TZtouch2/3's system?

No, you cannot have an ECDIS in the same network as a NavNet TZtouch2/3's *system.*

Can I output AIS that is 'built-in" to my radar to the NavNet TZtouch2/3's Network?

No, AIS or any other sensory data input into the FAR processor cannot be output over the network to a NavNet TZtouch2/3's *device network.*

Will warnings, alarms, and notifications also alert on my NavNet TZtouch2/3's MFD system?

No, any warnings, alarms, or notifications from the FAR system will not be output over the network nor can a NavNet TZtouch2/3's *system interpret warnings, alarms or notifications from a FAR.*

Can I connect other NavNet TZtouch2/3's sensors (such as a DFF1-UHD or DFF3D sounder) to the same network as a FAR so that the NavNet TZtouch2/3's can display both the radar and sounder echo?

Because TimeZero cannot output any Navigation data on the network (Position, COG/SOG, Heading, Pitch & Roll, Heave) in presence of a FAR2xx8, only basic single beam sounder integration is supported. It is NOT possible to mix a DFF3D and FAR2xx8 on the same network. It is also NOT possible to mix FAR2xx8 and DRS radar on the same network. Also, please note that sounder heave compensation is not supported.

Can I output heading from a SCX20/SC33/SC30/SC70 via NMEA2000 Satellite heading sensor directly to the FAR via ethernet?

No, any sensors such as heading, or position must be input separately into the FAR. For example, for a NMEA2000 compliant heading sensor such as the SCX20 use the IF-NMEA2k2 serial to NMEA2000 converter.

Can I output AIS from a NMEA2000 device over the NavNet TZtouch2/3's ethernet to the FAR radar?

No, you would have to use a NMEA2000 to NMEA0183 converter such as an IF-NMEA2K2.

Can the FAR radar display SARTs, RACONs, and Radar Target Enhancers (RTE)?

Yes, the FAR radar can detect and display all of these on the NavNet TZtouch2/3's*. However, performance (noticeable distance) will vary the same as DRS radars between the magnetron and NXT models.*

If you have questions, please contact Furuno support technician at either our Camas, WA facility (360) 834-9300 or our Denton, MD facility (410) 479-4420.

www.FurunoUSA.com

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