

Installation of DFF3D Multibeam Sounder

The "DFF3D" and "PBG" Modules need to be unlocked prior to configuring the Furuno DFF-3D in TZ Professional.

Computer Setup

The DFF-3D connects to the PC through an Ethernet connection (100Base-T). All Furuno Ethernet sensors (including Ethernet sounders) only operate on the 172.31.x.x. / 255.255.0.0 network.

• You will have to setup your computer IP address to match that network. We highly recommended using 172.31.3.150 as a fixed IP address for the computer with a subnet mask of 255.255.0.0.

Open the "Network Connections" control panel of your computer to adjust the IP address:

- Press [Windows] + [R] to bring up the Run Dialog box
- Type "ncpa.cpl" and press [Enter]
- Double click on the Network Adapter connected to the DFF-3D (usually "Local Area Connection").
- Select "Properties" on the "Local Area Connection Status" window.

💷 Run	×
Dpen: ncpa.c	e name of a program, folder, document, or Internet e, and Windows will open it for you. pl
	OK Cancel <u>B</u> rowse
Network Connectio	ns — L X
	< Net > Network マ ひ Search Ne
le Edit View Ad	Ivanced Tools
Organize • »	
Connexion a informatiqu Realtek PCIe	iu réseau local e-mer.fr e GBE Family Controll
Réseau Network cal Realtek PCIe	General
	Connection IPv4 Connectivity: Internet IPv6 Connectivity: No network access Media State: Enabled Duration: 5 days 23:34:54 Speed: 1.0 Gbps Details
	Activity Sent Received Bytes: 1,573,286,611 9,228,160,203
	Close

Note: If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the DFF-3D, you can temporary disconnect the Ethernet Cable connected to the DFF-3D from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and the one that needs to be configured.



(TCP/IPv4)".

Double click on "Internet Protocol Version 4

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Connexion au réseau local Properties	×
Networking Sharing	
Connect using:	
🛃 Realtek PCIe GBE Family Controller #2	
Configure	
This connection uses the following items:	
Client for Microsoft Networks File and Printer Sharing for Microsoft Networks OS Packet Scheduler	
Internet Protocol Version 4 (TCP/IPv4) Microsoft Network Adapter Multiple or Protocol Microsoft LLDP Protocol Driver	
Internet Protocol Version 6 (TCP/IPv6)	
Install Uninstall Properties	
Description Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.	
OK Cancel	5

• Use the fixed IP address 172.31.3.150 with a subnet mask of 255.255.0.0:

Internet Protocol Version 4 (TCP/IPv4) Properties			
General			
You can get IP settings assigned autor this capability. Otherwise, you need to for the appropriate IP settings.	natically if your network supports ask your network administrator		
Use the following IP address:	lų	- 11	
IP address:	172 . 31 . 3 . 150	11	
Subnet mask:	255.255.0.0	- 18	
Default gateway:	<u> </u>	11	
Obtain DNS server address autor	natically		
• Use the following DNS server add	resses:	- 11	
Preferred DNS server:		- 11	
Alternate DNS server:		11	
Validate settings upon exit	Advanced		
	OK Cancel		

Make sure that the DFF-3D is set for the fixed IP address mode. Open the DFF-3D cover and make sure that all the "S2" and "S3" DIP Switches are set to the OFF position:



Connect the DFF-3D to the computer directly or better, via a HUB/Switch.

Note: You can "Ping" the DFF-3D from the computer to make sure that the connection in between the computer and the DFF-3D is OK. The address of the DFF3D to ping is: 172.31.92.21. For more information on how to ping an Ethernet device, refer to the <u>How To Ping</u> chapter.



TZ Professional settings

Open TZ Professional in Navigation mode, select the "Multibeam Sounder" Options.

DFF-3D Transducer Setup

Scroll down inside the "Multibeam Sounder" Options page to the "Setup" category.

- 1. Adjust the "Transducer Draft" (distance in between the water line and the transducer location). This should always be a positive number.
- 2. Select "Salt Water" if you are operating in Salt Water (this adjusts the sound speed for distance measurement).
- 3. Click on the "Transducer Setup" button.

Options				
Sounder	^	Setup		
Multibeam Sounder		Transducer Draft	0.0 ft	
PBG		Salt Water		-
Alarm	v	Transducer Setup		
<u> </u>		Reset Default Settings	Close	

Adjust the position of the Center of Gravity ("GC"), GPS, Heading and Motion Sensor (Pitch/Roll/Heave) relative to the transducer using the coordinate system below:



Transducer Setup	
Transducer Mis-mount Correction	
Transducer Position Bow/Stem	0.0 ft
Transducer Position Up/Down	0.0 ft
Transducer Position Port/Starboard	0.0 ft

- Select "Transducer Mis-mount Correction" if the DFF-3D transducer has been installed the wrong way (reversed).
- Enter the distance (on the bow / stern axis) in between the transducer and the ship's center of gravity in the "Transducer Position Bow/Stern" field. If the Center of Gravity is "in front" of the transducer (like the picture above), enter a negative value.
- Enter the distance (on the down / up axis) in between the transducer and the ship's center of gravity in the "Transducer Position Up/Down" field. For upward location of center of gravity (like the picture above), enter a positive value.
- Enter the distance (on the starboard / port axis) in between the transducer and the ship's center of gravity in the "Transducer Position Port/Starboard" field. For port location of the center of gravity, enter a positive value.

TIPS : If the location of the Center of Gravity is unknown, use the following approximation for its location:	W L Top view
	H Engine GC H/2 GC: Gravity Center

Enter the GPS Sensor position using the same rules as the Transducer to Center of Gravity location.

GPS Sensor Pos	
GPS Sensor Pos. Bow/Stem	0.0 ft
GPS Sensor Pos. Up/Down	0.0 ft
GPS Sensor Pos. Port/Starboard	0.0 ft



- Select "Internal" or "SC" for the Motion Sensor Source ("Off" is not recommended).
- When set to "Internal", the motion sensor built inside the DFF-3D transducer will be used. In that case, there is no need to enter the Motion Sensor position (because it is the same location as the transducer!).
- Select "SC" when a SC30 is connected to TIMEZERO (preferably using an Actisense NGT-1 via the NMEA2000 bus). In that case, enter the SC30 position (enter the relative position from transducer to SC30 location) using the same rules as the Transducer to GPS location. If your SC30 is also your primary GPS sensor, you can enter the same offset as GPS location.

Motion Sensor	
Motion Sensor Source	Internal \sim
Motion Sensor Position Bow/Stem	0.0 ft
Motion Sensor Position Up/Down	0.0 ft
Motion Sensor Position Port/Starboard	0.0 ft
Roll Sensor Offset	0.0 °
Pitch Sensor Offset	0.0 °
Motion Sensor Time Lag	20 ms
Heading Sensor Time Lag	20 ms
Position Sensor Time Lag	20 ms

IMPORTANT: For the best motion compensation performance, we highly recommend using a SC30 connected to TIMEZERO via NMEA2000 (using the Actisense NGT1 USB to NMEA2000 adapter). In that case, "Motion Sensor Source" should be setup to "SC" with accurate GPS and Motion sensor offset values.



Below is an example illustrating proper offset (SC30 is used for both GPS and Motion Sensor):

Transducer Setup		
Transducer Mis-mount Correction		
Transducer Position Bow/Stem	-9.0 ft	
Transducer Position Up/Down	5.0 ft	
Transducer Position Port/Starboard	3.0 ft	
GPS Sensor Pos		
GPS Sensor Pos. Bow/Stem	-20.0 ft	
GPS Sensor Pos. Up/Down	10.0 ft	
GPS Sensor Pos. Port/Starboard	5.0 ft	
Motion Sensor		
Motion Sensor Source	SC	
Motion Sensor Position Bow/Stem	-20.0 ft	
Motion Sensor Position Up/Down	10.0 ft	
Motion Sensor Position Port/Starboard	5.0ft	

If the Motion Sensor (Pitch & Roll values) seems incorrect, it is possible to adjust an offset.

TIPS: You can use the "DFF-3D Monitor" window to see the Pitch & Roll value in action. You can refer to the DFF-3D Monitor chapter.



Adjust the Sensor Time lag (inside the "Transducer Setup" window) according to the following situations:

Motion Sensor Time Lag	20 ms	
Heading Sensor Time Lag	20 ms	
Position Sensor Time Lag	20 ms	

Motion Sensor (when using SC30):

Only adjust these parameters if "Motion Sensor Source" is set to "SC" (not "Internal").

- 250ms if the SC30 is connected via NMEA2000 using the Actisense NGT1 USB to NMEA2000 adapter.
- 280ms if the SC30 is connected via NMEA0183 (COM Port) at 38400 bps with a repeat interval of 10Hz minimum.
- 380ms if the SC30 is connected via NMEA0183 (COM Port) at 4800 bps with a repeat interval of 10Hz minimum.

Heading Sensor:

When using SC30 as a position source:

- 250ms if the SC30 is connected via NMEA2000 using the Actisense NGT1 USB to NMEA2000 adapter.
- 280ms if the SC30 is connected via NMEA0183 (COM Port) at 38400 bps with a repeat interval of 10Hz minimum.
- 380ms if the SC30 is connected via NMEA0183 (COM Port) at 4800 bps with a repeat interval of 10Hz minimum.

When using a PG700 or third party Heading Sensor:

- 290ms if the Heading Sensor is connected via NMEA2000 using the Actisense NGT1 USB to NMEA2000 adapter.
- 320ms if the Heading Sensor is connected via NMEA0183 (COM Port) at 38400 bps with a repeat interval of 10Hz minimum.
- 420ms if the Heading Sensor is connected via NMEA0183 (COM Port) at 4800 bps with a repeat interval of 10Hz minimum.

Position Sensor:

When using SC30 as a position source:

- 250ms if the SC30 is connected via NMEA2000 using the Actisense NGT1 USB to NMEA2000 adapter.
- 280ms if the SC30 is connected via NMEA0183 (COM Port) at 38400 bps with a repeat interval of 10Hz minimum.
- 380ms if the SC30 is connected via NMEA0183 (COM Port) at 4800 bps with a repeat interval of 10Hz minimum.

When using a GP330B or third-party GPS:

- 290ms if the GPS is connected via NMEA2000 using the Actisense NGT1 USB to NMEA2000 adapter.
- 320ms if the GPS is connected via NMEA0183 (COM Port) at 38400 bps with a repeat interval of 10Hz minimum.
- 420ms if the GPS is connected via NMEA0183 (COM Port) at 4800 bps with a repeat interval of 10Hz minimum.



4. **Transmission Power:** It is recommended to leave the Transmission Power to Auto. If you are operating the DFF-3D over 100 meters, it is recommended to set it to Maximum (10).

Note: It is recommended to leave all other parameters to their default values. You can refer to the <u>Multibeam</u> <u>Sounder</u> Options chapter to get a description of all the settings.

Transmission Power Auto	
Transmission Power	10 🔹
External KP	2
Bottom Level	0
Auto Gain Offset (Fish Finder)	0
Auto Gain Offset (Side Scan)	
Auto Gain Offset (Section)	0
STC (Fish Finder)	5 🔹
STC (Side Scan)	5 🔹
TX Pulse	Standard \checkmark
✓ Tidal Height Correction	

Connection Wizard

First make sure that TIMEZERO is properly configured to receive position, heading and optionally, motion data (when the SC30 is used). If you are using an SC30 connected to the computer using NMEA2000 via the Actisense NGT-1 (recommended setup), make sure that you have configured a NMEA2000 connection from the Connection Wizard. Note that the depth data is sent to TZ Professional via the Ethernet connection on the NavNet NMEA port. Also, if the DFF-3D is directly integrated to the PC (without any Furuno MFD on the network such as NavNet TZT or NavNet TZT2), TIMEZERO must be set to send back heading and motion information to the DFF3D.

Follow the instructions below to configure properly the NavNet port and send back data to the DFF-3D (if no MFD is present on the network):

- Select the "Connection Wizard" that can be found under the "TIMEZERO" button
- Select "Manual Port Configuration" from the Connection Wizard
- Select "Add/Configure NavNet Connection" and click on "NMEA & AIS"
- Make sure that "Depth" is checked for the "NavNet NMEA" port
- Click on "Next".

Ajouter/Configurer un port. Série
 Ajouter/Configurer une connexion NavNet
 NMEA & AIS
 Compas (Cap)
 ARPA

Port Name	Nickname		Position (Detected)
Navnet NMEA		Delete	Date/Time (Detected)
Navnet Fast Heading		Delete	Heading (Detected)
Navnet ARPA		Delete	Depth (Detected)
NMEA 2000		Delete	ST (Delected)

 On the next page, make sure to check "DFF3D Output" ONLY if there is no Furuno MFD on the network. This will enable heading (and motion if external motion sensor such as SC30 is used) output to the DFF3D.

When an MFD is on the network, do not enable this output as the MFD will be in charge of sending this data to the DFF3D.

Data	Master	Master		Navnet Fast Heading	Nav
Position	NMEA 2000	~	Selected & Detected	Unselected	Unselect
Date/Time	NMEA 2000	~	Selected & Detected	Unselected	Unselect
COG/SOG	NMEA 2000	~	Selected & Detected	Unselected	Unselect
Heading	NMEA 2000	\sim	Selected & Detected	Selected & Not Detected	Unselect
MagneticVariation	NMEA 2000	\sim	Selected & Detected	Unselected	Unselect
Depth	Navnet NMEA	\sim	Selected & Detected	Unselected	Unselect
Output : Port Name Type					
DFF3D Motion Data Output 172.31.3.150					
			< Back Next >	Cancel He	elp

• "Finish" to close the Connection Wizard



DFF-3D Monitor

• Click on the DFF3D Monitor in the "Multibeam sounder" option:

The DFF-3D monitor allows you to troubleshoot issues with the DFF-3D and make sure that TIMEZERO receives the proper data from it. After configuring the DFF-3D and TIMEZERO, it is recommended to look at the DFF-3D Monitor.

- Make sure that all data is received properly.
- It is also recommended to check "Display DFF3D Swath on Chart" temporary while at the dock to make sure that offset has been configured properly. Selecting this option will display a green line showing the DFF3D swath.



IMPORTANT: In order for the boat icon to scale properly, make sure to enter the Boat Length, Boat Width, and GPS location from the Initial Setup Options. Note that the coordinate system used by TIMEZERO is different than the one used to enter the DFF3D offset in the Transducer Setup.

When the boat is moving, you should see the green line (displaying the current swath) and trail of red lines showing the previous 50 swaths. When the boat is running a straight line on a calm day (no pitch) at a constant speed, the red line should almost be equally spaced like the picture below:

Note that it is normal to have the green line "lagging" behind the boat (due to sensor lag and processing time of DFF3D).

When making a turn, the red line should look like this:

If the red lines are not evenly spaced, this might indicate that heading refresh rate is below 10Hz.

