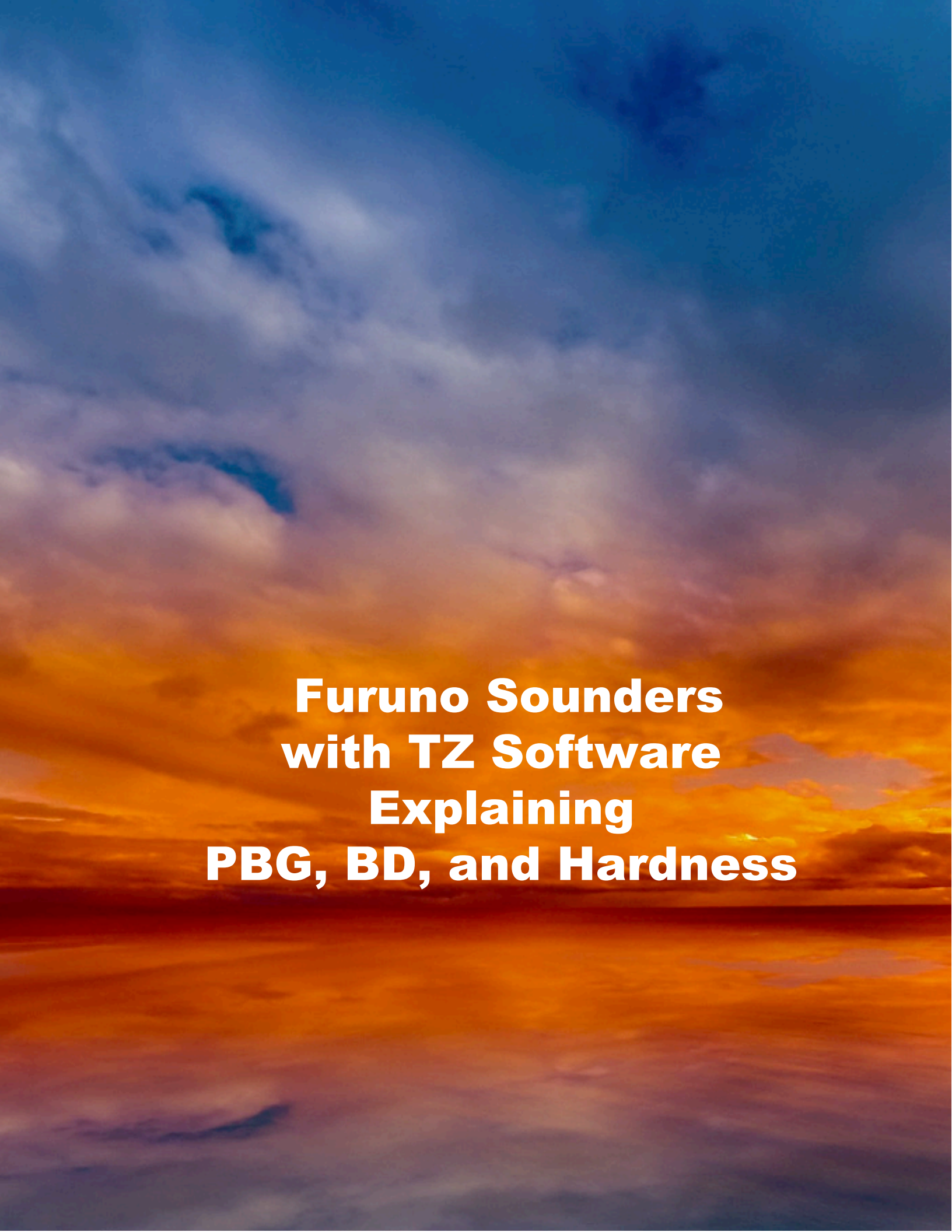

Furuno Sounders
with TZ Software
Explaining
PBG, BD, and Hardness

Furuno and TZPro Interface

PBG vs BD vs Hardness vs Backscatter

Summary – Various combinations of ***sounder*** and ***transducer*** combined with ***TZPro software*** are interfaceable together with the proper ***TZPro software licenses*** to attain added functionality and features to a system. This document helps to clarify those combinations in the effort to achieve one or more of the following desired results:

- PBG = Personal Bathymetric Generator
- BD = Bottom Discrimination/Classification
- Hardness = Bottom Hardness
- Backscatter = Bottom Backscatter

	TZPro Modules (Licenses) Required			
	PBG	***BD***	***Hardness***	***Backscatter***
NMEA0183 (DBT or DPT)	PBG	*NA*	*NA*	*NA*
DFF-3D	PBG & DFF3D	*NA*	*NA*	
***BBDS1**	PBG & Sounder	PBG & Sounder	PBG & Sounder	*NA*
***DFF1-UHD**	PBG & Sounder	PBG & Sounder	PBG & Sounder	*NA*
***TZT2**	PBG & Sounder	PBG & Sounder	PBG & Sounder	*NA*
***TZT3**	PBG & Sounder	PBG & Sounder	PBG & Sounder	*NA*
****FCV295**	PBG & Sounder	*NA*	Bottom Hardness	*NA*
****FCV1150**	PBG & Sounder	*NA*	Bottom Hardness	*NA*
*****WASSP**	PBG & WASSP	*NA*	*NA*	PBG & WASSP

*Specific transducers are required for BD from these sounders

**Specific transducers are required for Hardness from these sounders

***WASSP also requires its own licensing of TZPro and Backscatter…PLUS the TZPro licensing above

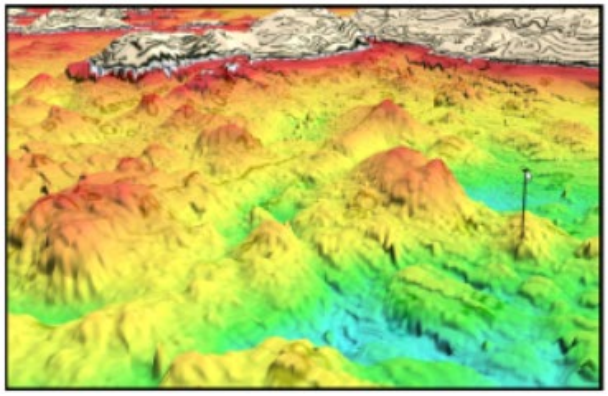
Please note that PBG data from TZ Pro is not the same as PBG from Furuno MFDs.

Explanation, comparisons, and pros/cons of each can be found in the following pages of this document.

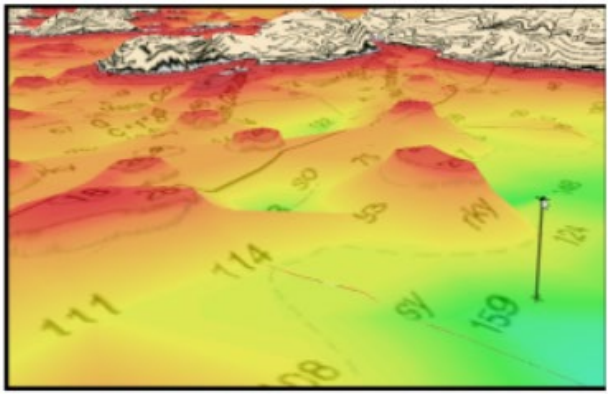
Personal Bathymetric Generator (PBG) enables you to record sea floor bathymetric information using a single beam or a multibeam echosounder. When you use PBG, it will create a 3D representation that will constantly improve with repeated trips over the same areas. In addition, the PBG module allows you to display depth shading (color according to depth), and custom contour lines.

REQUIREMENTS:

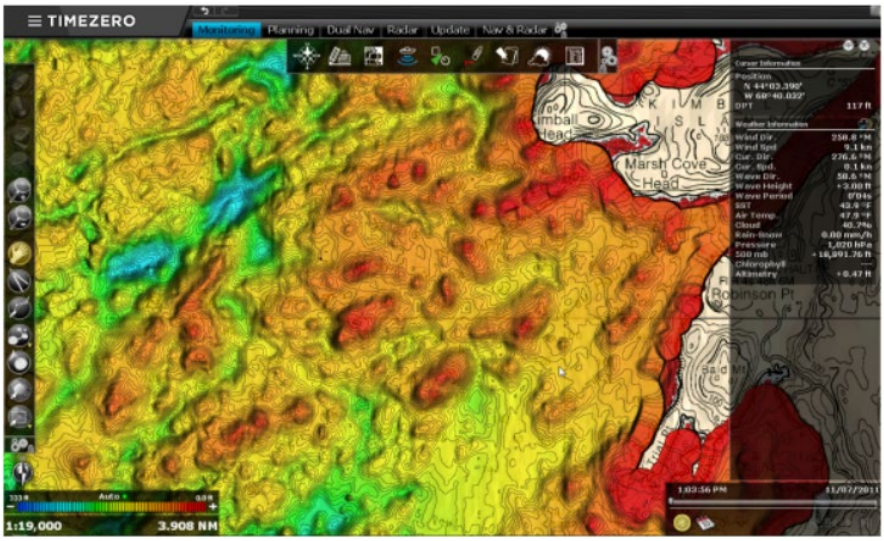
- Single beam sounder that will output NMEA0183 depth (DBT or DPT).
  - *Requires TZPro PBG module*
- **OR** a multi-beam like a DFF3D or WASSP (wider area, higher resolution, faster mapping).
  - *Requires BOTH a TZPro PBG & one of the following DFF3D modules (DFF-3D) or WASSP module (WASSP)*



On the left: 3D PBG enabled (after multiple passes).



On the right: Regular 3D data without PBG



Above image is contour color shading and custom contour lines

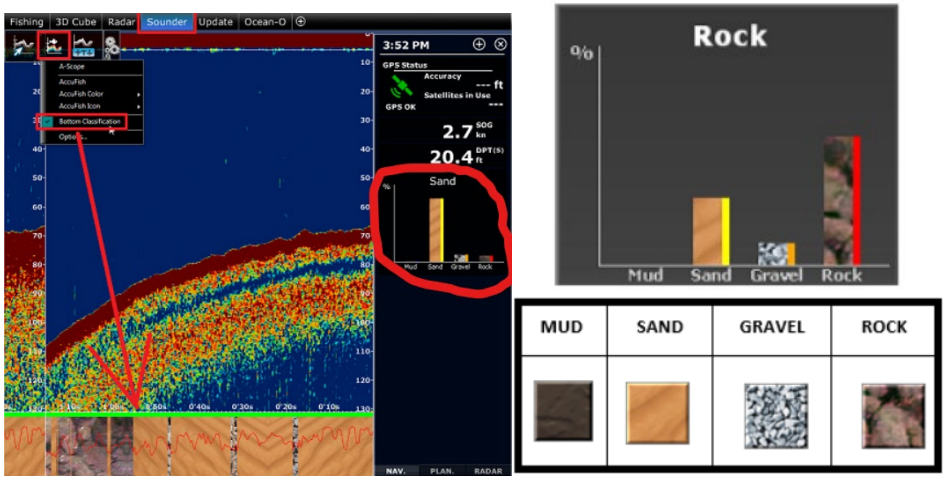
TZPro can also record Bottom Discrimination/Classification or Bottom Hardness or Backscatter information at the same time as the PBG depth and be able to display this information in various ways (see details below).

Bottom Discrimination/Classification (BD) is from connecting Furuno Ethernet sounders that have a bottom classification feature that determines the bottom structure and separates them into the following categories: mud, sand, gravel, and rock. They can be directly networked to TZPro. See the Furuno website for acceptable BD transducers for each sounder.

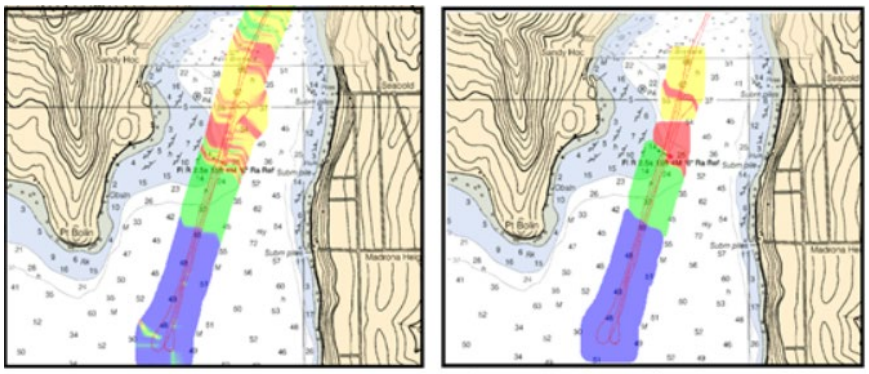
REQUIREMENTS:

- BBDS1, DFF1-UHD, TZT2, TZT3 with BD approved Dual frequency transducer (compares L vs H)
    - Requires TZPro Furuno Sounder module

PRO	CONS
Economical price	Not shallower than 16ft
Small hardware footprint	Shallow application (limited by 1kW 200kHz side)
Flexible with a list of specific BD transducers	Slower speeds
Probability graph	No calibration
Animated representation of bottom	Slows down TX rate
	Low resolution
	Sounder locks in AUTO range and gain



- TZPro can also map this BD in a type of Bottom Hardness. Customizable color palette for depth and hardness shading.
    - *Requires TZPro Furuno Sounder module and the PBG module.*



"Unfiltered" Bottom Hardness

Bottom Hardness with points over 70% probability

Bottom Hardness – Is from Furuno sounders that have a hardness feature that determines the bottom change in hardness using reflectivity of a single frequency transducer. FCV295 and FCV1150 can be interfaced via serial NMEA0183

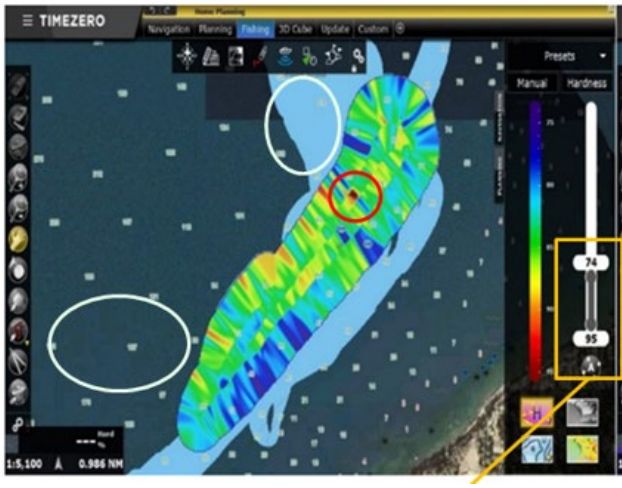
REQUIREMENTS:

- FCV295, FCV1150 must select a transducer from the list in the set-up page (no manual transducer set-up allowed)
    - *TZ requires both the PBG Module and Bottom hardness module (is a serial NMEA0183 connection)*

PRO	CONS
Mid-level price	Can get expensive for deeper depths
Can go deep	Lower resolution (295 and 1150)
Flexible with a list of specific transducers	Program a 'Furuno' transducer (295 and 1150)
Can choose and calibrate colors	Display modes LF/HF/DF alter hardness (295 and 1150)

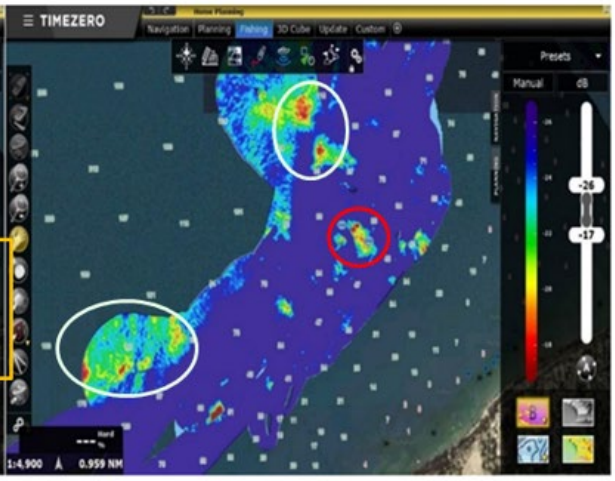
Hardness from FCV295 and 1150

FCV-1150



Backscatter from WASSP

WASSP F-3



- **It is important to note that though Hardness and Backscatter are often interchangeable terms…TZPro scales and stores these two types of data differently and separately. They cannot be combined.**

Backscatter – Is from a WASSP Multibeam that determines the bottom change in hardness using reflectivity of a single frequency transducer. WASSP can be directly networked and controlled through TZPro. The closest comparison to the WASSP interface is the DFF3D (which does not produce backscatter charts).

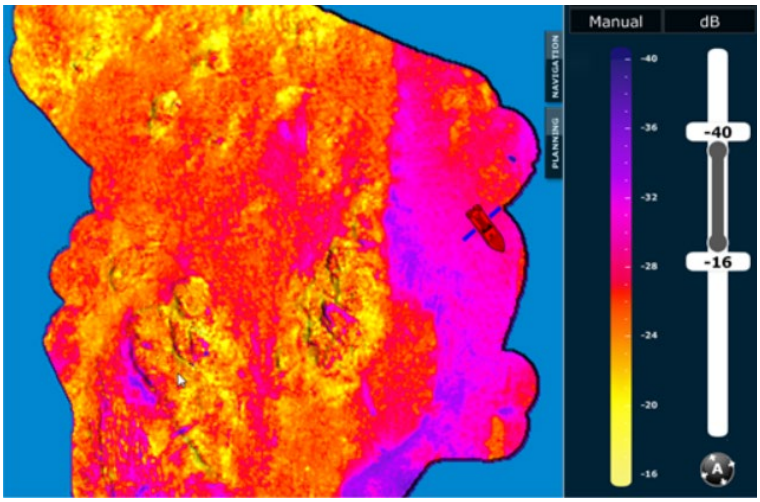
NOTE - that TZPro does not allow the simultaneous interface with a WASSP and a DFF3D system.

NOTE - *DFF3D PBG is not transferable between the Furuno MFD (TZT3) and TZPro*

REQUIREMENTS:

- WASSP is the best choice to give the customer affordable high level multibeam functionality
  - *TZ requires both the WASSP module and PBG Module (is a network connection)*
  - *WASSP requires both the TZPro output license and the Backscatter license*

WASSP	DFF3D
High resolution CHIRP processing (8cm PBG)	Entry level investment for multibeam (1.5m PBG)
Better bottom detection (discrimination of fish vs seabed)	Sidescan included
Deeper bottom detection at 850m max	300m limit
Calibrated backscatter	NO backscatter or hardness
Patch Test calibration capable	Uncalibrated built-in motion sensor
250 depth points per ping	50 depth points per ping



*Backscatter charting with WASSP

More Questions about the TZ Pro software?
Contact TZ Pro Support:

Phone 503-579-1414
Support@mytimezero.com