

TASMAN

INTEGRATION GUIDE



TELEDYNE
MARINE
Everywhereyoulook™



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HOW TO CONTACT TELEDYNE RD INSTRUMENTS

If you have technical issues or questions involving a specific application or deployment with your instrument, contact our Field Service group:

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Self-Service Customer Portal

Use our online customer portal at <https://www.teledynemarine.com/support/RDI/technical-manuals> to download manuals or other Teledyne RDI documentation.

Teledyne Marine Software Portal

Teledyne RD Instruments Firmware, software, and Field Service Bulletins can be accessed only via our Teledyne Marine software portal.

To register, please go to <https://tm-portal.force.com/TMsoftwareportal> to set up your customer support account. After your account is approved, you will receive an e-mail with a link to set up your log in credentials to access the portal (this can take up to 24 hours).

Once you have secured an account, use the Teledyne Marine software portal to access this data with your unique username and password.

If you have an urgent need, please call our Technical Support hotline at +1-858-842-2700.

Getting Started with the Tasman

Identifying what's in the Box

Tasman Inventory

Part Number	Name	Description
TAS300H-xx-xxxxx TAS300V-xx-xxxxx TAS600H-xx-xxxxx TAS600V-xx-xxxxx	Tasman 6000-meter DVL	The Tasman 300 and 600 kHz systems includes the transducer and connector (Horizontal or Vertical configuration) with protective cap. When unpacking, use care to prevent physical damage to the transducer face and connector. Use a soft pad to protect the transducer.
MRD11191	Shipping Case	Shipping case with foam inserts.
73B-6085-003	Power/Comm Pigtail Cable	The DVL Power/Comm pigtail 3-meter cable allows you to build custom cable to connect the Tasman to your vehicle/platform. It provides all the leads for serial and Ethernet COM, Power, and Trigger.
95B-6155-00 95Z-6007-00 (part of 75BK6107-00)	Tasman Getting Started Guide	A printed quick start card showing test setup is included.
	Download instructions	This sheet has instructions for downloading the software and manuals.
Download from website	TRDI Toolz	TRDI Toolz is a utility and testing software package that can be used to test the DVL.
	NavUI	The Navigation User Interface (NavUI) is designed to setup Tasman systems with a focus on ease of use and accessibility.
Spare Parts	See table below for description	Includes spare closing hardware, spare anodes, and lubricant for the connector.



See the packing slip for additional options. If you are missing parts, contact TRDI support rdifs@teledyne.com or call +1 (858) 842-2700.

Tasman Spare Parts 75BK6134-00

Description	Quantity	Part number	Where used
Anode, housing	2	81B-4216-00	Anodes for Housing Exterior
Anode Screw	2	M5X0.8X10FH	
Hex Key, 3mm, Ball End	1	97Z-6176-00	Field replaceable transducer
Hex Key, 4mm, Long Arm	1	6958A14	Mounting hardware for transducer
Washer, Isolating Sleeve, M5 Screw, Nylon	8	97Z-6175-00	
Washer, Flat, 10MM OD, SST	16	M5WASHSTD	
Locknut, HEX, SST	8	M5X0.8LOCKNUT	
Screw, SKT HD, SST	8	M5X0.8X40SH	
Plate, Isolator, Tasman	1	81B-6118-00	
Silicone Lubricant, 4-pack	1	5020	
Tool Bag, Canvas	1	84Z-6000-00	Spare parts are located inside bag



Installing Documentation and Software

The Tasman documentation and software are downloaded.

1. Follow the instruction sheet on downloading TRDI software and manuals.
2. Software is available on <https://tm-portal.force.com/TMsoftwareportal>. Install *TRDI Toolz* and *NavUI*.
3. Use our online customer portal at <https://www.teledynemarine.com/support/RDI/technical-manuals> to download manuals or other Teledyne RDI documentation. Download the Tasman DVL Guide.



Connecting to the Tasman

Power Overview

The 600 kHz Tasman requires a DC supply between 10.7 to 36 VDC (24 VDC typical) and the 300 kHz Tasman uses 12 to 36 VDC. Either an external DC power supply or battery can provide this power.

- The power supply should be able to source at least two Amps for a bench test setup (no pinging in air).
- Assuming that typical operation will be in water, TRDI recommends a power supply that can provide 6.4A at 24VDC for a 300 kHz Tasman DVL and 2.3A at 24VDC for a 600 kHz Tasman.

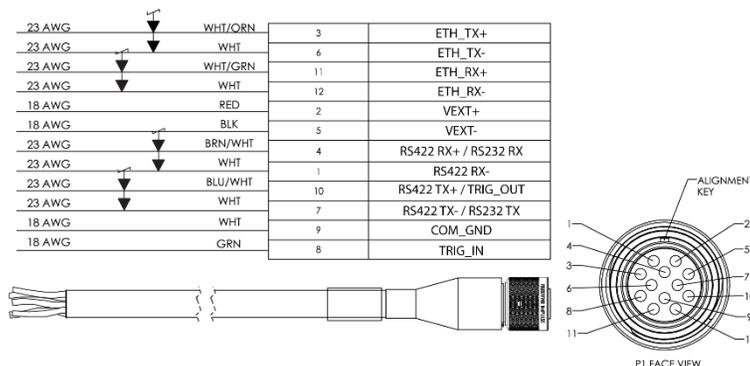
 See the Tasman DVL Guide, Table 1, page 26 for a full review of the recommended power supply for system installation.

Power on Cycle – The power supply must be able to handle the inrush current as well. Inrush current is the current required to fully charge up the capacitors when power is applied to the Tasman. The capacitors provide a store of energy for use during transmit. The inrush current is as much as 6.4A for a 300 kHz system if plugged in after the DVL Transmit Cap is fully discharged. The Tasman will draw this amperage until its capacitors are fully charged (less than 200ms).

 If the power supply limits the current or the power drop on the cable is significant, then the power on cycle will fail or the system will reset during pinging. Therefore, TRDI recommends that the power supply meets the Peak Current specified in the Tasman DVL Guide, Table 1, page 26 to cover all performance cases.

 **Pinging in air is not recommended.** Although this will not damage the Tasman, the Peak Current when operating in air may be up to twice the values shown in the Tasman DVL Guide Table 1, page 26. The transducer is pinged by sending a CS, PA, PT3, or PT5 command or if the Tasman system is started for collecting data.

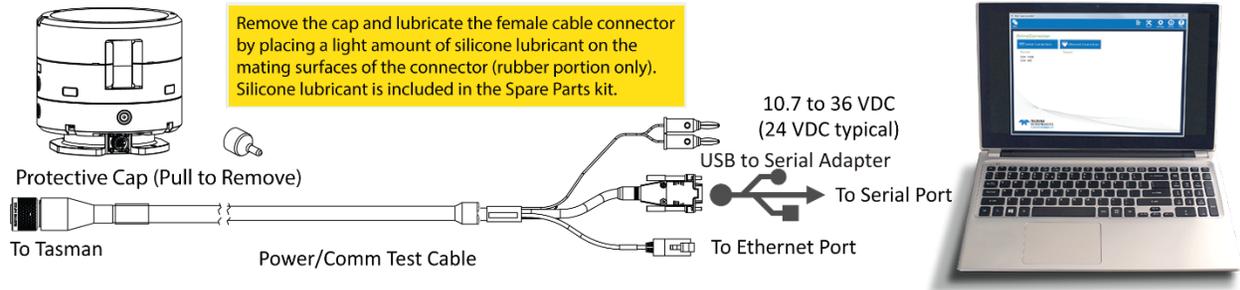
Wiring Diagram



Tasman Power/Comm Cable 73B-6085 Pigtail Cable

 Where shown, RX is the incoming signal; TX is the outgoing signal.
Cable bend radius is 11.4 cm (4.5 inches).
The 12-pin connector part number is MKS(W)-3XL12-CCP from Teledyne Impulse.

Using the Optional Test Cable



Tasman Connections for Bench Test [Optional Test Cable kit]

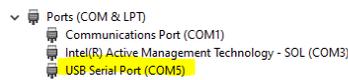
The Optional Test Cable Kit 75BK6141-00 includes the 73B-6094-00 RS-232 test cable and the USB adapter.

If you purchase your own USB adapter, TRDI recommends: sales@connectiveperipherals.com <https://us.connectiveperipherals.com/products/ft232r-chipset?variant=32248004476987>. Possibly any device with FTDI drivers and devices will also work.

Installing the USB Adapter Driver

If there is an available internet connection, Windows 10/11 will install the USB driver on first connection. If necessary, install the Virtual COM port (VCP) driver to make the USB adapter appear as an additional COM port. The free FTDI driver download page is available here: <https://ftdichip.com/drivers/>

Use Windows Device Manager® to determine the USB to Serial adapter COM port number. Remove the adapter, wait a moment, note the list of ports, reinsert the adapter and note the new port.



RS-422 to RS-232 Converters

If the Tasman system is set for RS-422, then check to make sure the host computer supports RS-422 or use a RS-232 to RS-422 converter. TRDI recommends the [Advantech BB-422PP9R](#) serial converter.



Using TRDI Toolz

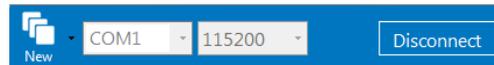
The command-and-control port can be Serial or Ethernet, but NOT both. The last port used to send a break is the command-and-control port.

To establish communications with the Tasman:

1. Connect the system and apply power.
2. Start the *TRDI Toolz* software.
3. Select **New Serial Connection** or **New Ethernet Connection**.
4. Enter the Tasman's communication settings.

Serial Communications:

Select the **COM Port** the serial cable is connected to and set the **Baud Rate** from the drop-down list to 115200



Ethernet Communications:

Enter the Static DHCP server **IP or host name** 192.168.1.100

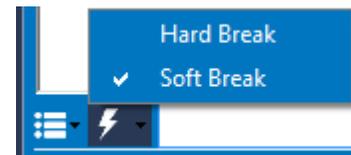
Enter the **Port Number** 1033

Select **TCP**



If the network assigns a Dynamic IP address, the Static IP address **192.168.1.100** will not work; Connect using the serial port and use the CE command to verify the IP address. You must have the RJ45 connector plugged into the network switch for the CE command to return the Ethernet setting info.

5. Click the **Connect** button. Once connected, the button will change to **Disconnect**.
6. From the **Break** button drop down menu, select **Soft Break** (= = =). Click the **Break** (⚡) button. The wakeup banner will display in the terminal window.



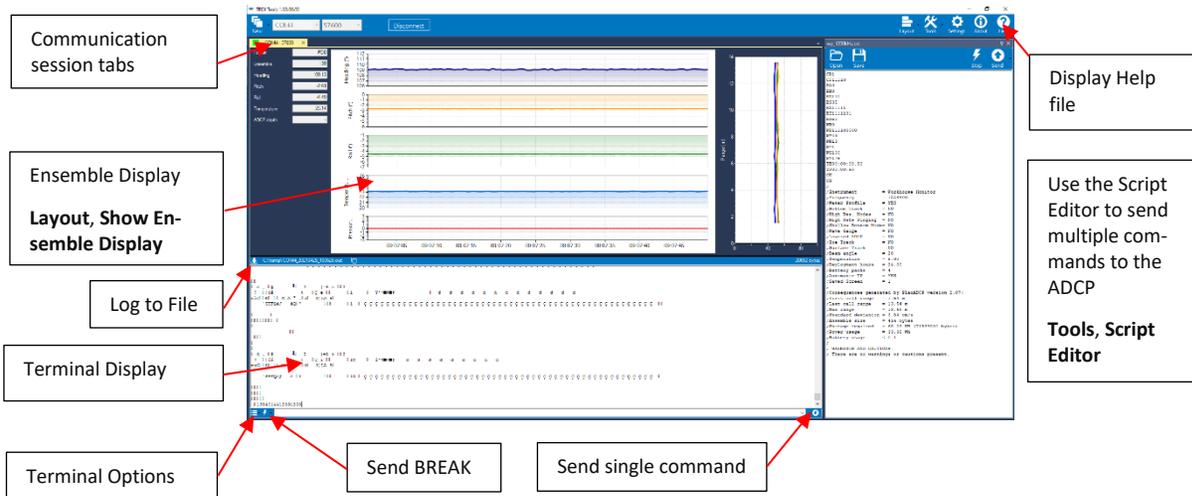
```
DVL
Teledyne RD Instruments (c) 2021
All rights reserved.
Firmware Version: 83.xx
Current time is: 21/12/22,09:01:38.47
Break received, serial
>
```



You must have the RJ45 connector plugged into the network switch for the CE command to return the Ethernet setting info.



The command-and-control port can be Serial or Ethernet, but NOT both. The last port used to send a break is the command-and-control port.



For more information on *TRDI Toolz*, click the Help icon () to open the TRDI Toolz Software help file.

Using the Network Configuration Page



The system must be connected to the Ethernet port to use the Network Configuration page.

To establish communications with the Network Configuration page:

1. Connect the system and apply power.
2. Open a browser on the laptop (*Internet Explorer*®, *FireFox*®, *Google Chrome*®, etc.).
3. Enter the Tasman’s DHCP server IP address **10.20.230.17** into the address bar.
4. On **Network Configuration**, choose **STATIC** or **DHCP**. Use Dynamic Host Configuration Protocol (DHCP) server protocol when the network automatically provides an Internet Protocol (IP) host with its IP address and other related configuration information such as the subnet mask and default gateway.

If you are using a STATIC network, then configure the **Base IP Address**, **Network Mask**, **Gateway Address**, **Name Server Address**, and **Command/Control Port** as needed. The default configuration is shown below.

5. On the Output Formats section, enable or disable the output data formats (PD0, PD4, PD5, PD6, PD11, PD13, and PD26), **Protocol (TCP or UDP)**, **Address**, and **Ports**.
6. Once done, click **Submit**.



If all outputs are enabled, it can affect the ping rate.

Phased Array DVL Network Configuration Update
Software Version v1.05

Network Settings

Network Configuration: STATIC Link Status: Not Active

Base IP Address:

Network Mask:

Gateway Address:

Name Server Address:

Command/Control Port:

Output Formats

FORMAT	ENABLE	PROTOCOL	ADDRESS	PORT
PD0	ON	TCP	10.20.229.99	1035
PD4	ON	TCP	10.20.229.1	1036
PD5	ON	UDP	10.20.229.5	1037
PD6	ON	UDP	10.20.229.5	1038
PD11	ON	UDP	10.20.229.5	1039
PD13	ON	TCP	10.20.229.11	1040
PD26	ON	TCP	10.20.229.1	1041

Network Configuration Page

Testing the Tasman DVL

You should test the Tasman DVL:

- When you first receive the system.
- Before each deployment or every six months.
- When you suspect instrument problems.
- After each deployment.

To test the Tasman:

1. Interconnect the system as described in Setting Up the Tasman System.
2. Place the Tasman transducer in water (at least 2 to 4 cm to cover the transducer face).
3. Apply power to the system.
4. Start the *TRDI Toolz* program (for help on using *TRDI Toolz*, see the TRDI Toolz Help file).
5. Click the **Break** button. The wakeup banner appears on the log file window.

```
DVL
Teledyne RD Instruments (c) 2021
All rights reserved.
Firmware Version: 83.xx
Current time is: 21/12/22,09:01:38.47
Break received, serial
>
```

6. At the “>” prompt in the communication window, enter the command **CR1** then press the **Enter** key. This will set the Tasman to the factory default settings.
7. At the “>” prompt in the communication window, enter the command **CK** then press the **Enter** key. This will save the factory default setting.
8. At the “>” prompt in the communication window, enter the command **PS0** then press the **Enter** key. This will display the Tasman system configuration data.

```
>ps0
Serial Number: 0
Frequency: 614400 Hz
Configuration: DVL : 4-beam velocity.
Transducer Type: PHASEDARRAY
Beam Angle: 30 Degrees
Beam Pattern: CONVEX
Sensors: TEMP PRESS 600BAR
CPU Firmware: 83.xx
FPGA Version: 1.00.011 [0x100b]
```

```
Board Serial Number Data:
E3 00 00 0A 8D 30 7A 28 DS18B20 TMP SNS
B6 00 00 03 02 D9 CA 23 ETH72B-2306-01A
15 00 00 02 D5 6F 6A 23 XDC72B-2356-00A
CA 00 00 02 96 27 11 23 PTX72B-2304-10A
F4 00 00 01 F1 91 75 23 DSP72B-2303-01B
EF 00 00 02 A7 21 8B 23 RCV72B-2302-13A
```

9. At the “>” prompt in the communication window, enter the command **PA** then press the **Enter** key. This will run the Tasman Pre-Deployment test.



Submerge the transducer face in 2 to 4cm of water. **The PA test may fail in air.** Only a failure with the transducer in water is a relevant test.



Pinging in air is not recommended. Although this will not damage the Tasman, the Peak Current when operating in air may be up to twice the values shown in the Tasman DVL Guide Table 2, page 26. The transducer is pinged by sending a CS, PA, PT3, or PT5 command or if the Tasman system is started for collecting data.

```
>PA
ROM Test...PASS [ 3aad ]
RAM test...PASS
FRAM test...PASS
Receive Buffer Test...PASSED
XMIT RAM Test...PASSED
Receive Path Test (Hard Limited)...PASSED
Transmit/Receive Continuity Check...PASSED
```

```
Composite Result:
GO for Deployment
```

10. If the wakeup displays, PSO displays, and PA message displays with a result of “GO for Deployment”, the Tasman is functioning normally.
11. If the result shows “NO-GO for deployment” then run a PT200 test to obtain a more detailed log of the failure. See Troubleshooting EMI for more information.

Mechanical Integration

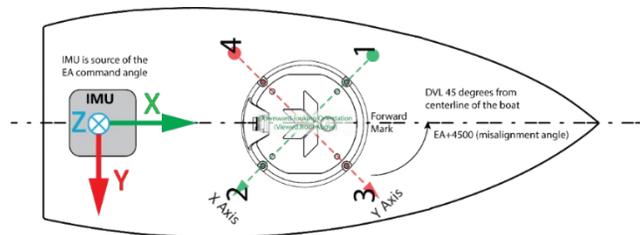
Alignment

The mechanical alignment of the transducer head is important to DVL data accuracy. Mechanically mount the head as close as possible to your reference point. You also must mount the transducer head as level as possible using the ship's roll and pitch references.



TRDI recommends mounting the transducer head with Beam 3 (instrument Y-axis) rotated 45° relative to the ship forward axis. The Forward Mark on the transducer will face forward.

Mounting the transducer head with Beam 3 (instrument Y-axis) rotated 45° relative to the ship forward axis causes the magnitude of the signal in each beam to be about the same. This improves error rejection, reduces the effect of ringing, and increases the Tasman's effective velocity range by a factor of 1.4. If Beam 3 is aligned at an angle other than zero, use the EA command to describe the rotation between instrument Y-axis (beam 3) and ship forward axis.



Installing the DVL on the ROV

There are many options for mounting the Tasman systems and they depend on the application. Use the four mounting holes on the customer interface plate. See the [Outline Installation Drawings](#) for dimensions and weights. When the Power/Comm cable is properly lubricated and connected, the Tasman DVL can be fully submerged in water.



Your Tasman DVL transducer housing is made of aluminum that is protected by sacrificial anodes and a hard anodize coat. **Do not connect other metals to the DVL.** Other metals may cause corrosion damage.

TRDI recommends the use of the Isolator Plate and M5 isolating bushings when mounting the DVL to a metal structure. These parts are included in the 75BK6134-00 spare parts kit. Keep this in mind when fabricating a fixture, which materials to use, or deciding how to place it on the vehicle.

Use the optional 81B-6119-00 Delrin adapter plate to mount a Tasman DVL using the same hole pattern as a Workhorse Navigator DVL.



Electrical Integration

Grounding Recommendations

The DVL has three isolated grounds to achieve the desired performance levels of the instrument. The grounding systems are as follows:

- Communication ground
- Power ground
- Chassis ground

Multiple grounds connected to a vehicle hull or to a vehicle chassis can have undesirable consequences. Grounding problems can be avoided by implementing prudent grounding schemes.

Bypassing or shorting the DVL isolation / ground noise filter circuit will increase the sensitivity of the DVL to vehicle noise, which will increase noise floor in the instrument and in the data, thereby resulting in a reduced operational range and data contamination from interference. Additionally, bypassing of the DVL isolation/ground filter can lead to accelerated corrosion.

Avoiding Electro-Magnetic Interference (EMI)

The main sources of EMI are induced voltages from signal and power lines that are in proximity to the affected component or signal. These problems are avoided or minimized by the proper routing of wires, proper shielding of wires and proper location of individual systems components. EMI is also caused by unwanted differences in potential on signal or ground electronic lines.



For more information, see the Tasman Guide, Chapter 2 – System Integration, Identifying EMI.

Acoustic Integration

The following items must be taken into consideration when using the Tasman DVL.

Flow Noise – Water flowing over the transducer faces increases the acoustic noise level, which in turn decreases the operational range of the DVL. Flow noise can be reduced across the transducer faces by mounting the DVL behind a sea chest, fairing, or acoustic window. Flow noise can also be reduced by optimizing the transducer head type and design to conform to the platform hull form being used.

Cavitation – Cavitation is the formation of air bubbles due to the reduction of ambient pressure because of hydrodynamic flow conditions. Cavitation at the edges of the transducer or surrounding area near the transducer often results in increased acoustic noise, and a corresponding reduction in operating range. As with flow noise, cavitation can also be reduced by optimizing the transducer head type and design to the platform hull form being used.

Ringling – Ringing occurs in DVLs when the energy from the side lobes of the transmitted signal excites the metal portion of the DVL transducer such that a resonant condition occurs. This causes the transducer and anything attached to it to resonate at the system's transmit frequency. While some ringing is normal in DVLs, its magnitude must be minimized.

Windows Use Considerations – Windows can be used to produce overall performance improvements in vessel-mounted DVLs. There are several advantages and disadvantages to consider before using an acoustic window.

Advantages

- Well will not fill with air bubbles caused by the ship moving through the surface water.
- Flow noise is reduced.
- The well can be filled with fresh water to limit corrosion.
- Barnacles cannot grow on the transducer faces. Barnacle growth is the number one cause of failure of the transducer beams.
- The transducer is protected from debris floating in the water.

Disadvantages

- The range of the DVL may be reduced because the window can and will absorb some of the transmit and receive energy.
- The transmit signal could be reflected into the well, causing the well to “ring”. This will cause the data being collected during the ringing to be biased. Some vessels have reported a loss in range as great as 50 meters. As noted, the ringing may be damped by applying sound absorbing material on the well walls (Precision Acoustics F48 anechoic tile).
- The transmit signal could be reflected off the window and back into the other beams.

SONAR Interference Considerations – Interference from other acoustic and electromagnetic devices can cause velocity and direction bias. In extreme cases, interference may prevent the DVL from operating.



For more information, see the Tasman Guide, Chapter 2 – System Integration.

Operational & Setup Integration

The following items must be taken into consideration when using the Tasman DVL.

Unfavorable Environments – There are certain environmental conditions where the DVL's errors may be large or where the instrument does not function at all.

- In the surf zone where waves are actively breaking, the acoustic beams may not be able to penetrate the bubble clouds, and even if they do, the sound speed may be significantly affected by the high concentration of bubbles. This changes the Doppler scale factor.
- The dense growth of weeds or kelp on the bottom may prevent the DVL from detecting the true bottom. If the DVL locks onto the top of the weeds by mistake, they may have motion relative to the bottom due to wave action, which would give inaccurate velocity measurements.
- In areas of high salinity (>35ppt), the absorption of the sound by the water column will reduce the altitude capability of the DVL. Absorption (maximum range) can also be affected by water temperature.
- In areas where the salinity varies as a function of location and/or time, the Doppler scale factor will be varying, and it may be necessary to integrate a speed-of-sound sensor into the navigation system to keep the velocity measurement errors to an acceptable value. Temperature gradients can cause similar issues. This is only for the Z-axis velocity, as Speed of Sound does not impact 2D velocities on a Phased Array Transducer.

Triggering – There are three methods for triggering the DVL:

- **Sending ASCII Character through Serial Port.** When the system is interfaced to a serial port (e.g. a navigation computer), the system can be setup to wait for an input before each ping. To setup the DVL in this fashion, clear the Auto Ping Cycle bit in the CF command by sending CFx0xxx, where the x's represent the settings of the other parameters. Start the DVL pinging with the CS command. The DVL will output a '<' before each ping and wait for input. Send any valid ASCII character to trigger the ping. The instrument will not enter sleep mode while it is waiting for the trigger.
- **Using Low-Latency Triggering.** The trigger methods shown above all have latencies ranging from a few milliseconds to a few hundred milliseconds, which may be excessive for high-precision applications. Consequently, TRDI has developed a low-latency trigger method. To configure the DVL for low-latency triggering, set the CX command to enable trigger input. Start the DVL pinging with the CS command. The DVL will then wait for a trigger before each ping. Setting the trigger lines to a break state for no less than 10 microseconds sends the trigger. The DVL will then ping within 1 millisecond of the leading edge of the break pulse. Note that it is possible through the CX command settings to set a timeout for the DVL to wait for a Trigger and then if no Trigger occurs during that time, it will either Self Deploy and never look for Trigger again or Ping once and then go back to waiting for Trigger. The input trigger voltage is 2.5VDC to 4.0VDC.
- **Trigger Out.** This trigger is set with the #CO command and gives an approximate indication of when transmit and receive occurs for the Tasman. It is not intended to provide the exact timing of transmit or receive. This trigger can be used to hold off pinging of other devices that would otherwise interfere with Tasman operation. TRIG_OUT is TTL compatible at load currents up to ±24mA. (0.55V and 2.2V). At 100uA, the voltages extremes are 0.2V and 3.1V.



For more information, see the Tasman Guide, Chapter 2 – System Integration and Chapter 7 - Commands.

INS Integration

The Tasman is integrated into the vehicle and connected to its network. The user accesses the Tasman's configuration HTML page and navigates to the network configuration page. The network configuration page provides a selection of PD outputs and a network configuration for each. The web page automatically refreshes and displays the current setting.

Network Settings

Network Configuration STATIC

Base IP Address: 192.168.1.100

Network Mask: 255.255.255.0

Gateway Address: 192.168.1.1

Name Server Address: 192.168.1.1

Command/Control Port: 1033

Link Status
Active

Output Formats

FORMAT	ENABLE	PROTOCOL	ADDRESS	PORT
PD0	ON	UDP	192.168.1.255	1001
PD4	OFF	UDP	192.168.1.255	1035
PD5	OFF	TCP	192.168.1.255	1036
PD6	OFF	TCP	192.168.1.255	1037
PD11	OFF	TCP	192.168.1.255	1038
PD13	OFF	TCP	192.168.1.255	1039
PD26	OFF	TCP	192.168.1.255	1040

Submit Reset

1. Configure the Tasman to output PD0 via UDP broadcast socket 255:255:255:255, port 1001.
2. The command file used by the Tasman enables Ethernet turnkey mode, and sets the delay start time to 30 seconds (CT command set to CT 2 30) (see Chapter 3, Creating or Modifying Command Files in the Tasman **DVL** Guide).
3. Cycle power to the Tasman (wait 30 seconds between power off and power on) and monitor the output via Wireshark. The user can also command the DVL to start (as an alternative to waiting for Turn Key timeout) by sending a CS command to the DVL TCP Command and Control Port (192.168.1.100, port 1033).
4. 30 seconds after application of power the UDP broadcast packets from the Tasman are observed. Use *TRDI Toolz* to see that the DVL is outputting the Broadcast UDP data (255.255.255.255: port 1001).
5. The Bottom-Track High Resolution Velocity (output data format ID 5803h) and Navigation Parameters Data (output data format ID 2013h) blocks provide aid in the velocity measurement resolution and quality information for use in an Extended Kalman Filter (EKF) Inertial Navigation System (INS) solution. Time Of Validity output for highly accurate coupling with an INS further improves your resulting DVL aided INS position accuracy. See the Navigation Parameters Data Format, bytes 54-69.
 - The Figure of Merit (FOM) is calculated for every velocity estimate and each beam
 - Estimates the standard velocity error
 - Confidence that when FOM is low, error is low
 - FOM can provide warning for individual beams, not entire velocity solution
 - May be used to filter data to reduce standard deviation and bias

Choosing a Data Format

Deciding on which output data format to use depends on the needs of the deployment. The following describes the basics of the formats available.

- **PD0** – PD0 is Teledyne RD Instrument’s standard format. PD0 is a binary output format. It provides the most information possible including a header, fixed and variable leader, bottom track, and water profile information. The fixed and variable leader is a recording of time, DVL setup, orientation, heading, pitch, roll, temperature, pressure, and self-test diagnostic results. Data fields to be output are user selectable. PD0 has distance made good in the output if the Bottom Track High Resolution Velocity Output Format is selected. This format is selected via the #BJ command.



The Bottom-Track High Resolution Velocity (5803h) and Navigation Parameters Data (2013h) blocks provide aid in the velocity measurement resolution and quality information for use in an Extended Kalman Filter (EKF) Inertial Navigation System (INS) solution.

- **PD4** – PD4 is a binary output format of bottom track speed over the bottom, speed through the water, and range to bottom information.
- **PD5** – PD5 is a superset of PD4 and includes information on salinity, depth, pitch, roll, heading, and distance made good.
- **PD6** – PD6 is a text output format. Data is grouped into separate sentences containing system attitude data, timing and scaling, and speed through the water relative to the instrument, vehicle, and earth. Each sentence contains a unique starting delimiter and comma delimited fields. If PD6 is selected, there is no data written to the recorder.
- **PD11** is a text output format. It complies with the NMEA 0183 version 2.30 standard.
- **PD13** - PD13 outputs like PD6, except it adds Pressure and Range-to-bottom for all four beams and omits the System Health Monitor Data line.
- **PD26** - The PD26 format includes the \$VMVBW, \$VMDBT, and \$VMVLW NMEA Speed Log Formats.



For more information, see the Tasman DVL Guide, Chapter 8 – Output Data Formats.

PDDecoder Library in C language

The Teledyne Marine PDDecoder library is an open-source library written in C language to decode the PDO data formats that are commonly output by Teledyne Marine/Teledyne RD Instruments ADCPs. The definition and details of the PDO format can be found in any of the manuals under the section, Output Data Format.

Available for download from the Teledyne Marine software portal:

<https://tm-portal.force.com/TMsoftwareportal>

Want to know more?

Congratulations! You have completed the Tasman Integration Guide. Read the following chapters in the Tasman Guide for more detailed information.

-  **Chapter 1 – Tasman Overview**
This chapter includes an overview of the Tasman features, options, computer and power requirements, and connecting to the Tasman DVL.
-  **Chapter 2 – System Integration**
This chapter covers system integration in detail.
-  **Chapter 3 – Collecting Data**
Use this chapter to create a command file that will be used to collect data.
-  **Chapter 4 – Maintenance**
This chapter covers Tasman DVL maintenance. Use this section to make sure the Tasman is ready for a deployment.
-  **Chapter 5 – Returning Systems to TRDI for Service**
Use this information to obtain a Return Material Authorization (RMA) number if the Tasman DVL needs to be returned to TRDI.
-  **Chapter 6 – Specifications**
This chapter includes specifications and dimensions for the Tasman DVL (including outline installation drawings).
-  **Chapter 7 – Commands**
This chapter defines the commands used by the Tasman.
-  **Chapter 8 – Output Data Formats**
This chapter defines the output data formats used by the Tasman.

NOTES: UNLESS OTHERWISE SPECIFIED
1. DIMENSIONS AND TOLERANCES ARE IN INCHES PER ASME Y14.5-2009.

PART NUMBER	MATERIAL	FINISH	DEPTH RATING (FT [M])	WEIGHT IN AIR (LB [KG])	WEIGHT IN WATER (LB [KG])
70B-9223-XX	7075-T6 ALUMINIUM	HARD BLACK ANODIZE	19,700 [6000]	19.2 [8.7]	9.6 [4.4]
70B-9233-XX	6061-T6 ALUMINIUM	HARD BLACK ANODIZE	13,150 [4000]	18.7 [8.4]	9.1 [1.7]

600 BAR PRESSURE SENSOR

POWER/COMM CONNECTOR
MKS(W)-3XL12-FCR

QTY 5 ANODES

QTY 2 M4 NUT INSERTS
81B-4553-00

QTY 2 M4 CAPTIVE BOLTS
TORQUE TO 8 IN-LBS (1 N·M)

LEAK TEST PORT

LED

REMOVABLE 300KHZ XDCR
71B-1163-00

PIN DIAGRAM :
MKS(W)-3XL12-FCR

PIN	SIGNAL
1	RS422_RX-
2	RS422_RX+
3	PWR (+)
4	ETH_TX+
5	RS232_RX+ / RS422_RX+
6	PWR RTN (-)
7	ETH_TX-
8	RS232_TX- / RS422_TX-
9	TRIG_IN
10	D_COMM
11	TRIG_OUT / RS422_TX+
12	ETH_RX+
	ETH_RX-

TELEDYNE
TELETYPE
20000 001000 12004

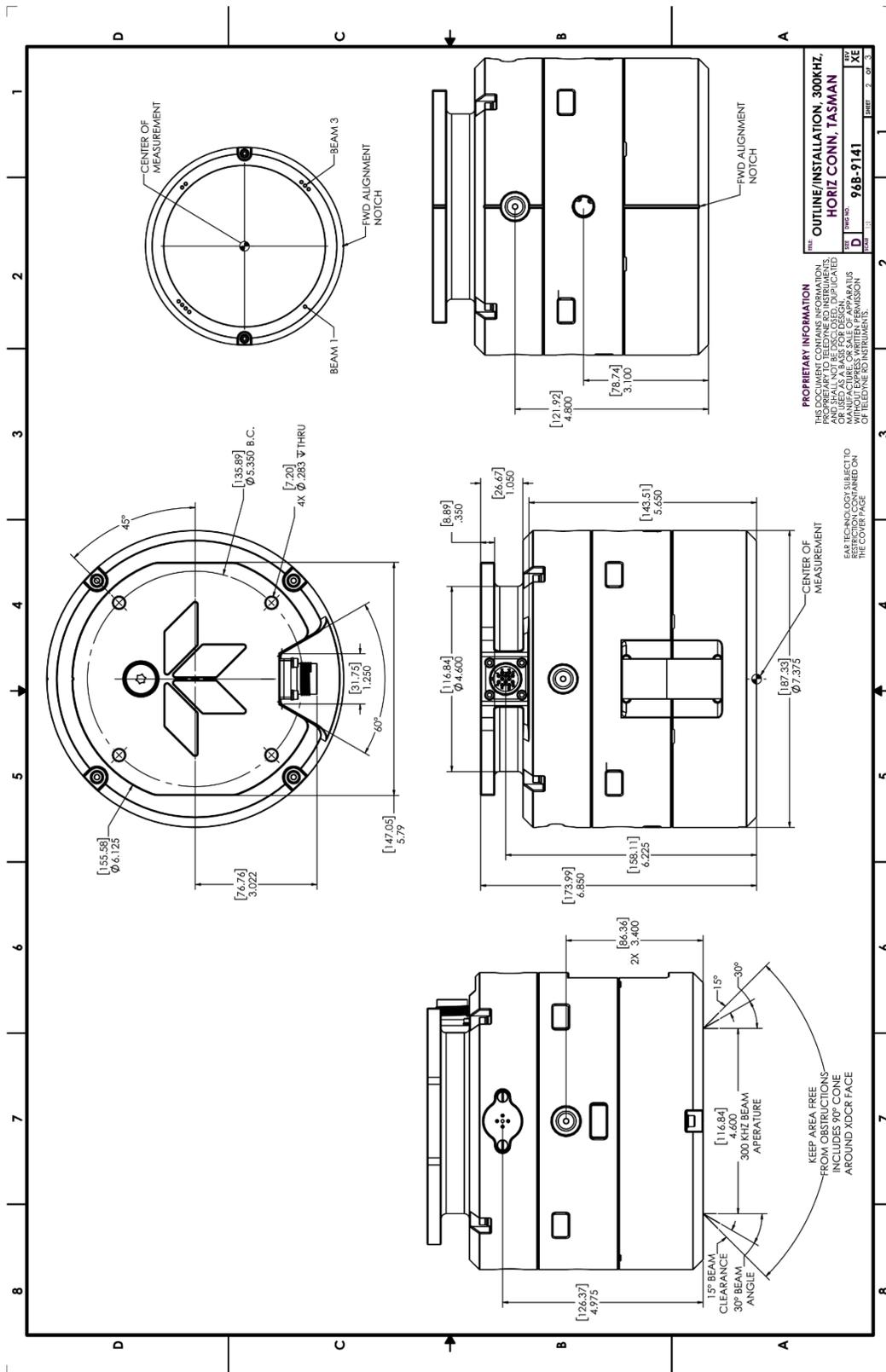
APPROVALS
DESIGNER: H. SADDLER
DATE: 2/10/2025
CHECKED: H. SADDLER
DATE: 2/10/2025
APPROVED: H. SADDLER
DATE: 2/10/2025

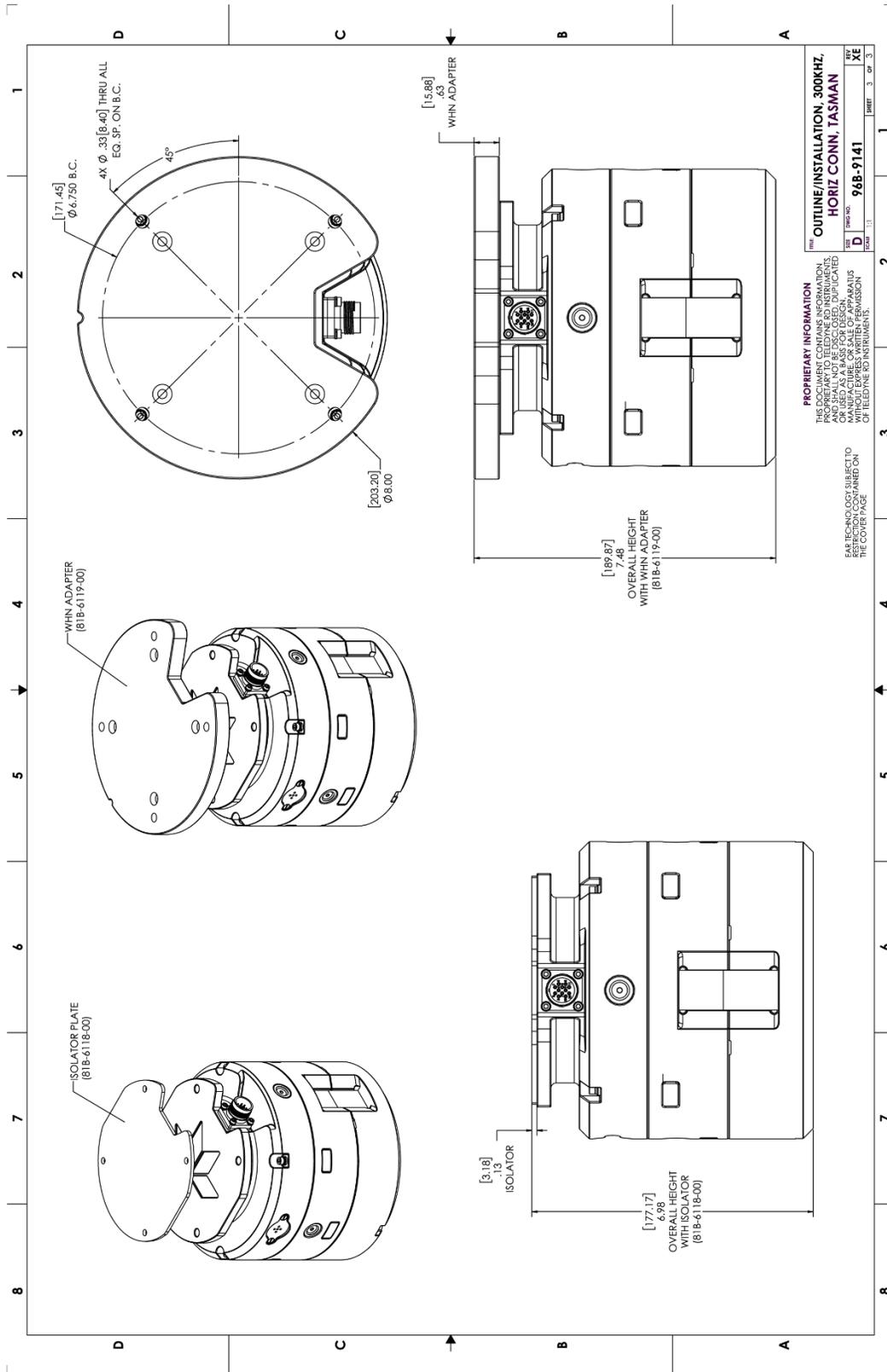
TELETYPE
TELETYPE
20000 001000 12004

**OUTLINE/INSTALLATION, 300KHZ,
HORIZ CONN, TASMAN**

REV: D
DATE: 1/13/2025
PART NUMBER: 95B-9141

DO NOT SCALE DRAWING





NOTES: UNLESS OTHERWISE SPECIFIED
1. DIMENSIONS AND TOLERANCES ARE IN INCHES PER ASME Y14.5-2009.

PART NUMBER	MATERIAL	FINISH	DEPTH RATING FT [M]	WEIGHT IN AIR (LB [KG])	WEIGHT IN WATER (LB [KG])
708-9224-XX	7075-T6 ALUMINUM	HARD BLACK ANODIZE	19.700 [6000]	19.2 [8.7]	9.6 [4.4]
708-9234-XX	6061-T6 ALUMINUM	HARD BLACK ANODIZE	13.150 [4000]	18.7 [8.5]	9.1 [4.1]

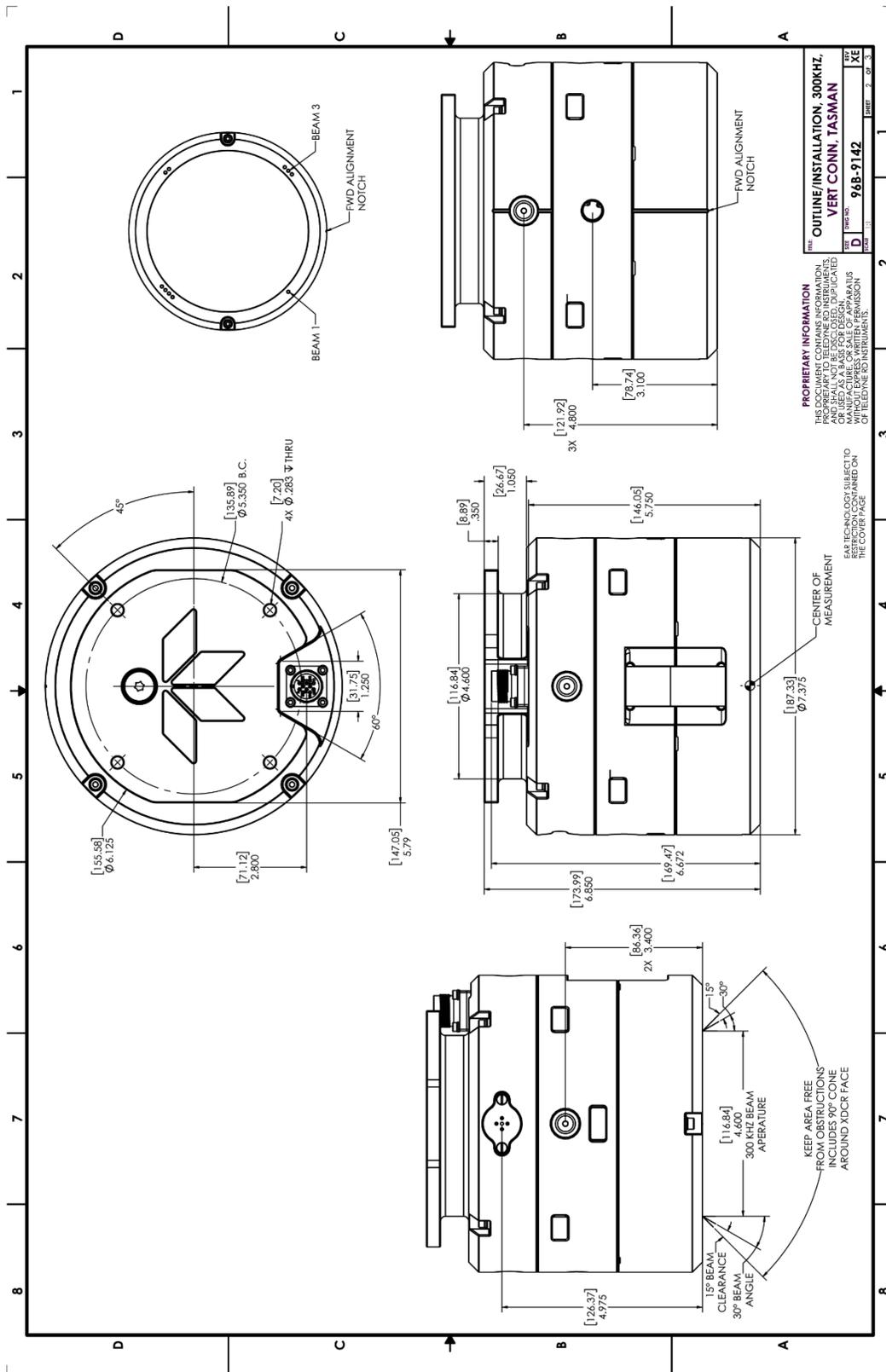
SEE SEPARATE BILL OF MATERIALS OF THE PART NUMBER

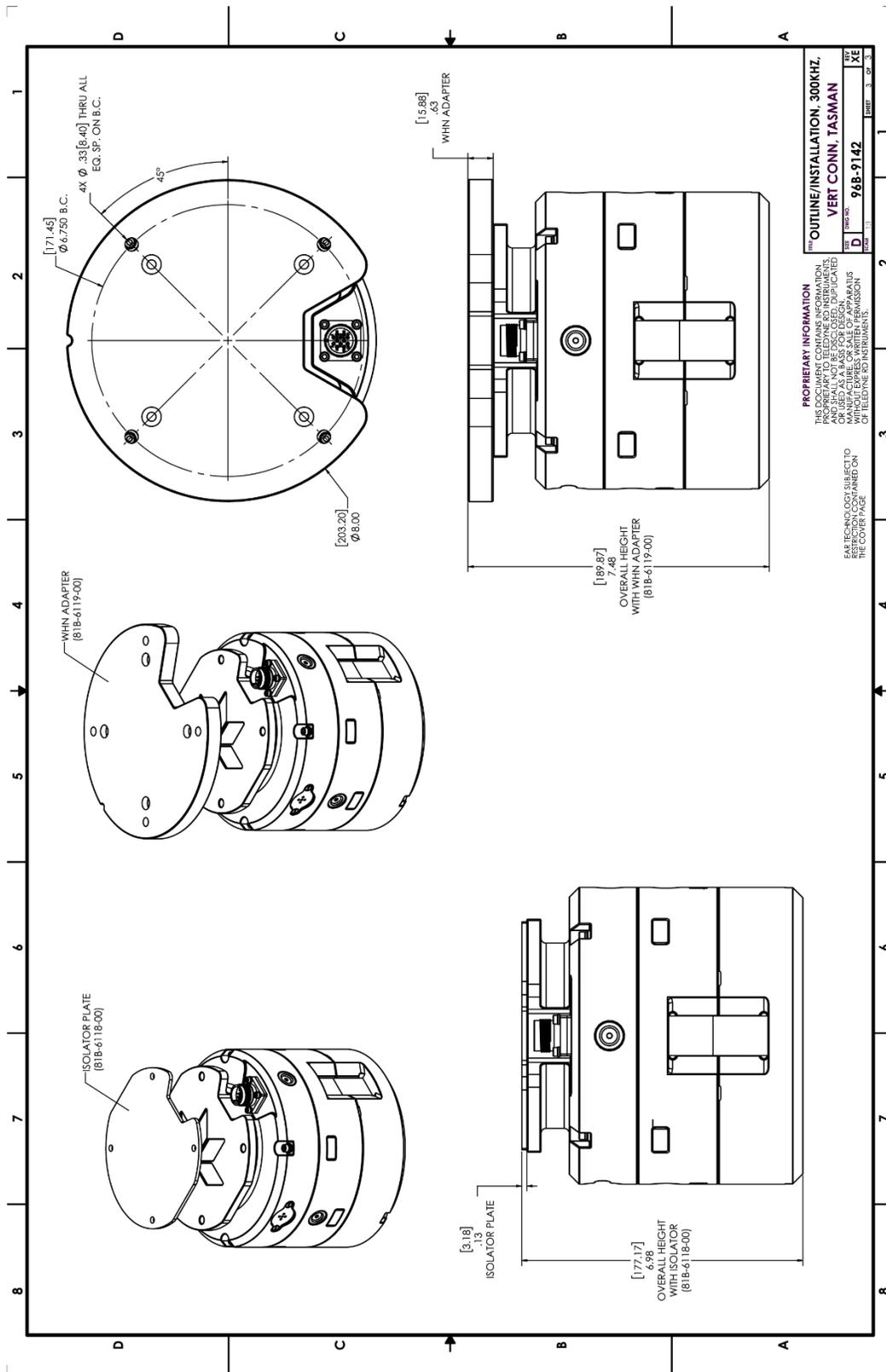
ITEM	DESCRIPTION	QTY	UNIT
1	RS422 RX-	1	PCB
2	PWR (+)	1	PCB
3	ETH TX+	1	PCB
4	RS232_RX+ / RS422_RX+	1	PCB
5	PWR RTN (-)	1	PCB
6	ETH TX-	1	PCB
7	RS232_TX- / RS422_TX-	1	PCB
8	TRIG_IN	1	PCB
9	D_COM1	1	PCB
10	TRIG_OUT / RS422_TX+	1	PCB
11	ETH_RX+	1	PCB
12	ETH_RX-	1	PCB

**PIN DIAGRAM :
POWER/COMM CONNECTOR
MKS(W)-3XL12-FCR**

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OUTLINE/INSTALLATION, 300KHZ, VERT CONN., TASMAN

DATE: 11/13/2024
 DRAWN BY: J.E.
 CHECKED BY: J.E.
 PART NO.: 95B-9142

NOTES: UNLESS OTHERWISE SPECIFIED
1. DIMENSIONS AND TOLERANCES ARE IN INCHES PER ASME Y14.5-2009.

PART NUMBER	MATERIAL	FINISH	DEPTH RATING (FT [M])	WEIGHT IN AIR (LB [KG])	WEIGHT IN WATER (LB [KG])
70B-9225-XX	7075-T6 ALUMINUM	HARD BLACK ANODIZE	19.700 (6000)	19.2 (8.7)	9.6 (4.4)
70B-9235-XX	6061-T6 ALUMINUM	HARD BLACK ANODIZE	13.150 (4000)	18.7 (8.4)	9.1 (4.1)

ZONE	ESCP#	REV	DESCRIPTION	DATE	APPROVED
		XA	FWG CREATED AT THIS REV	210227	H. SADDLER
		XB	UPDATED MODELS TO SHOW ALIGNMENT PLATE ON CALIBRATION BOLTS AND NUT INSERTS.	210605	H. SADDLER
	63410	XC	ADDED CENTER OF MEASUREMENT MARK	220908	C. BABELA
	63411	XD	ADDED CENTER OF MEASUREMENT MARK (POWER/COMM CONNECTOR)	221010	C. BABELA
	68792		ADDED SHEET 1 TO SHOW BEACON AND WIND ADAPTER	240305	M. TESTA

PIN DIAGRAM :
MKS(W)-3X(L)2-FCR

PIN	SIGNAL
1	RS422_RX-
2	PWR (+)
3	ETH_TX+
4	RS232_RX+ / RS422_RX+
5	PWR RTN (-)
6	ETH_TX-
7	RS232_TX- / RS422_TX-
8	TRIG_IN
9	D_COM1
10	TRIG_OUT / RS422_TX+
11	ETH_RX+
12	ETH_RX-

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DENVER, CO 80202-2501
USA
TEL: 303.440.0000
WWW.TELEDYNERO.COM

APPROVALS
DATE: 210605
BY: H. SADDLER
CHECKED: H. SADDLER
DATE: 210605
BY: H. SADDLER

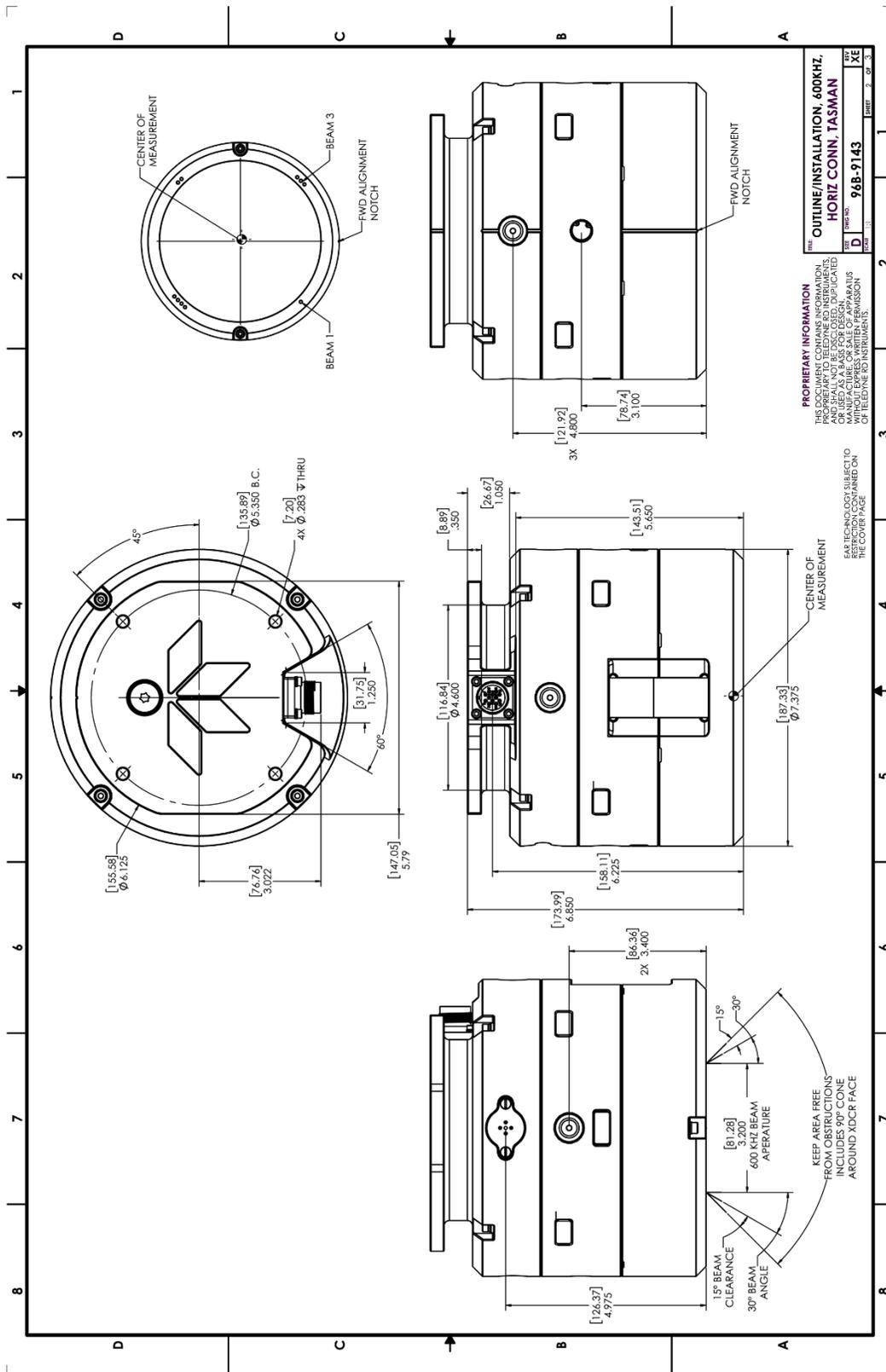
TELEDYNE RO INSTRUMENTS
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DENVER, CO 80202-2501
USA
TEL: 303.440.0000
WWW.TELEDYNERO.COM

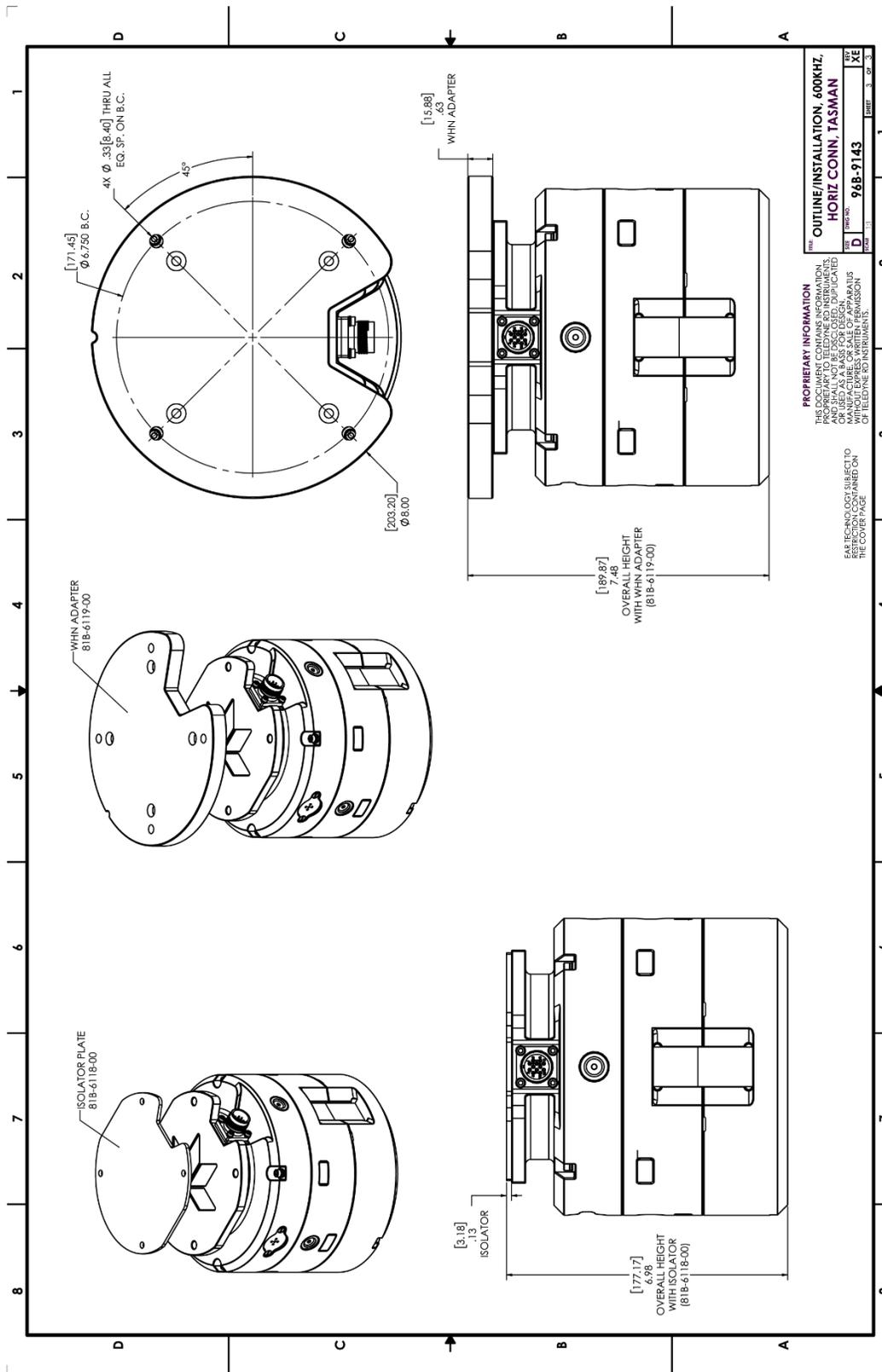
**OUTLINE/INSTALLATION, 600KHZ,
HORIZ CONN, TASMAN**

REV: 1
DATE: 210605
BY: H. SADDLER
CHECKED: H. SADDLER

95B-9143

DO NOT SCALE DRAWING





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OUTLINE/INSTALLATION, 600KHZ, HORIZ CONN, TASMAN

ITEM NO. 95B-6156-00
 PART NO. 95B-6156-00
 REV. 3.02

NOTES: UNLESS OTHERWISE SPECIFIED
1. DIMENSIONS AND TOLERANCES ARE IN INCHES PER ASME Y14.5-2009.

PART NUMBER	MATERIAL	FINISH	DEPTH RATING (FT [M])	WEIGHT IN AIR (LB [KG])	WEIGHT IN WATER (LB [KG])
70B-9226-XX	7075-T6 ALUMINUM	HARD BLACK ANODIZE	19.700 [6000]	19.2 [8.7]	9.6 [4.4]
70B-9236-XX	6061-T6 ALUMINUM	HARD BLACK ANODIZE	13.150 [4000]	18.7 [8.4]	9.1 [4.1]

ZONE	ECO#	REV	DESCRIPTION	DATE	APPROVED
		1A	DMG CREATD AT THE REV	210527	H. SADDLER
		1B	UPDAD MODELS TO SHOW DIMENSIONS CALL OUT TO M4 BOLTS AND NUT INSERTS	210803	H. SADDLER
		1C	ADDED CENTER OF MEASUREMENT MARK	220908	C. BEBELA
		1D	ADDED WEIGHT IN AIR/WATER, ADDED 6000M CONFIGURATION TO TABLE	231010	C. BEBELA
		1E	ADDED SHEET 3 TO SHOW ISOLATOR AND WRM ADAPTER.	240605	M.TETA

PIN DIAGRAM : POWER/COMM CONNECTOR M5S(W)-3X12-FCR

PIN	SIGNAL
1	RS422_RX-
2	PWR (+)
3	ETH_TX+
4	RS232_RX+ / RS422_RX+
5	PWR RTN (-)
6	ETH_TX-
7	RS232_TX- / RS422_TX-
8	TRIG_IN
9	D_COMM
10	TRIG_OUT / RS422_TX+
11	ETH_RX+
12	ETH_RX-

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TELEDYNE 15000 WILSON BLVD
DALLAS, TEXAS 75244-1000
TEL: 972.281.2000 FAX: 972.281.2001

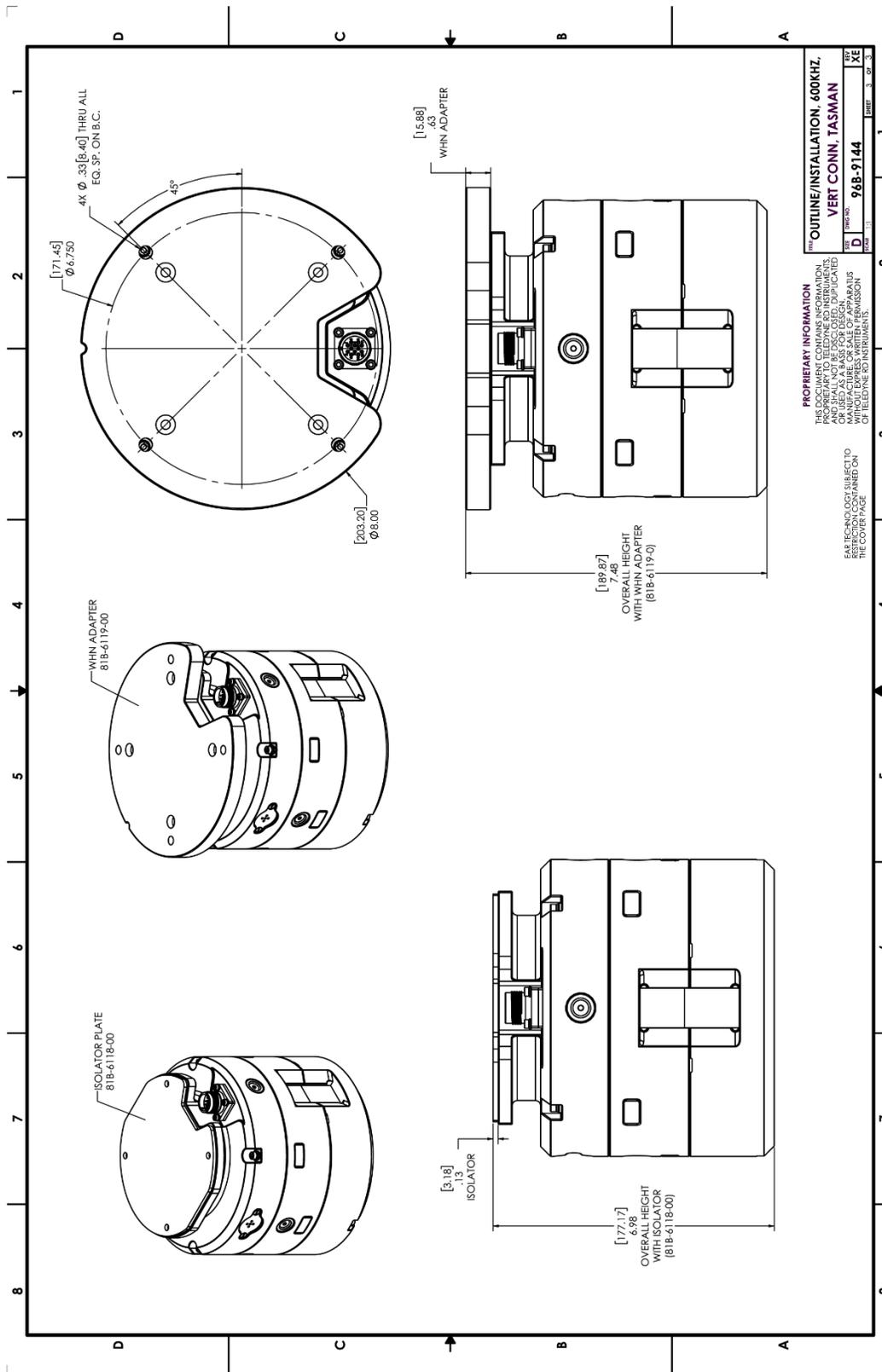
APPROVALS
DATE: 210527
BY: H. SADDLER
CHECKED: H. SADDLER
DATE: 210527
BY: H. SADDLER
DATE: 210527
BY: H. SADDLER

TELEDYNE 15000 WILSON BLVD
DALLAS, TEXAS 75244-1000
TEL: 972.281.2000 FAX: 972.281.2001

OUTLINE/INSTALLATION, 600KHZ, VERT CONN, TASMAN

DATE: 210527
BY: H. SADDLER
CHECKED: H. SADDLER
DATE: 210527
BY: H. SADDLER
DATE: 210527
BY: H. SADDLER

TELEDYNE PART NUMBER: 95B-9144
REV: 1



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 10000 WILSON AVENUE
 FORT WORTH, TEXAS 76150-2899
 TEL: 817-435-3000
 FAX: 817-435-3001
 WWW.TDI.COM

OUTLINE/INSTALLATION 400KHZ, VERT CONN, TASMAN

REV: 1.0
 DATE: 02/2025
 PART NO: 95B-6156-00
 DRAWING NO: 95B-9144

NOTES