

# 6205S2 BATHYMETRY & SIDE SCAN SYSTEM

## USER HARDWARE MANUAL

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# ATTENTION – READ THIS FIRST!

## Warnings, Cautions, and Notes

Where applicable, warnings, cautions, and notes are provided in this manual as follows:

**WARNING!** Identifies a potential hazard that could cause injury or death.

**CAUTION!** Identifies a potential hazard that could damage equipment or data.

**NOTE:** Recommendations or general information that is particular to the presented material.

All personnel involved with the installation, operation, or maintenance of the equipment described in this manual should read and understand the warnings and cautions provided below.

**CAUTION!** This equipment contains devices that are extremely sensitive to static electricity. Therefore, extreme care should be taken when handling them. Normal handling precautions involve using anti-static protection materials and grounding straps for personnel.

**WARNING!** High Voltage may be present in all parts of the system. Therefore, use caution when the electronics are removed from their containers for servicing.

**CAUTION!** Operation with improper line voltage may cause serious damage to the equipment. Always ensure that the proper line voltage is used.

## HARDWARE VARIATIONS AND COMPATIBILITY

The 6205s2 Bathymetry & Side Scan System contains both standard and proprietary hardware. At times, EdgeTech may change the standard components due to their availability or performance improvements. Although the component manufacturers and their models and styles may change from unit to unit, replacement parts will generally be interchangeable.

EdgeTech will make every effort to see that replacement components are interchangeable and use the same software drivers (if applicable). At times, however, direct replacements may not exist. EdgeTech will provide the necessary drivers with the replacement part when this happens.

EdgeTech may also change certain hardware per customer requirements. Therefore, portions of this manual, such as parts lists and test features, are subject to change. These sections should be used for reference only. When changes are made that affect system operation, they will be explicitly noted. Also, some options and features may not be active in the customer's unit at the time of delivery. Upgrades will be made available when these features are implemented.

Contact [EDGE TECH CUSTOMER SERVICE](#) with any questions relating to compatibility.



## ABOUT THIS DOCUMENT

We, the employees at EdgeTech, would like to thank you for purchasing a 6205s2 system. At EdgeTech, our policy is to provide high-quality, cost-effective products and support services that meet or exceed your requirements. We also strive to deliver them on time and continuously look for ways to improve them. We take pride in the products we manufacture and want you to be entirely satisfied with your equipment.

### Purpose of this Manual

The purpose of this manual is to provide the user with information on the setup and use of EdgeTech's 6205s2 Bathymetry & Side Scan System. Although this manual encompasses the latest operational features of the 6205s2, some features may be periodically upgraded. Therefore, the information in this manual is subject to change and should be used for reference only.

### Liability

EdgeTech has made every effort to document the 6205s2 Bathymetry & Side Scan System. However, EdgeTech assumes no liability for errors or any damages resulting from the use of this manual or the equipment it documents. EdgeTech reserves the right to upgrade this equipment's features and make changes to this manual without notice at any time.

### Revision History

REVISION	DESCRIPTION	DATE	APPROVAL
A	Release to Production	5/26/2022	JF

## WARRANTY STATEMENT

All equipment manufactured by EdgeTech is warranted against defective components and workmanship for a period of one year after shipment. Warranty repair will be done by EdgeTech free of charge.

Shipping costs are to be borne by the customer. Malfunction due to improper use is not covered in the warranty, and EdgeTech disclaims any liability for consequential damage resulting from defects in the equipment's performance. No product is warranted as fit for a particular purpose, and there is no merchantability warranty. This warranty applies only if:

- i. The items are used solely under the operating conditions and in the manner recommended in the seller's instruction manual, specifications, or other literature.
- ii. The items have not been misused or abused in any manner, nor have repairs been attempted thereon without the approval of **EDGETECH CUSTOMER SERVICE**.
- iii. Written notice of the failure within the warranty period is forwarded to the seller, and the directions received for properly identifying items returned under warranty are followed.
- iv. The return notice authorizes the seller to examine and disassemble returned products to the extent Seller deems necessary to ascertain the cause for failure.

The warranties expressed herein are exclusive. There are no other warranties beyond those, either expressed or implied herein. The seller does not assume any other obligation or liability in connection with the sale or use of said products. Any product or service repaired under this warranty shall only be warranted for the remaining portion of the original warranty period.

Equipment not manufactured by EdgeTech is supported only to the extent of the original manufacturer's warranties.

# SOFTWARE SERVICE OVERVIEW

EdgeTech provides software services free of charge. This software agreement does not address customer-specified modifications or enhancements. These services may be ordered separately. Furthermore, EdgeTech software upgrades are meant for the sole use of EdgeTech customers. Any reproduction of EdgeTech-supplied software or file sharing is strictly prohibited.

## Software Updates and Enhancements

EdgeTech customers can download new software releases with all modifications and enhancements by contacting **EDGE TECH CUSTOMER SERVICE**. Major software issues, should they occur, will be reported directly to the customer. New software releases consist of the following:

- Software enhancements that are not on the price list
- Software fixes and changes
- Product integration
- Documentation updates to online help
- Tests for compatibility with other modules

Software patches consist of software that has undergone the following:

- Minor software enhancements
- Software fixes and changes

EdgeTech customers are entitled to contact **EDGE TECH CUSTOMER SERVICE** by telephone, facsimile, or e-mail to report a difficulty, discuss a problem, or receive advice on the best way to perform a task. When contacted, **EDGE TECH CUSTOMER SERVICE** will do the following:

- Respond within 24 hours via Telephone, Facsimile, and E-mail Support
- Immediately attend to serious problems affecting operations
- Attempt to find an immediate workaround

## RETURNED MATERIAL AUTHORIZATION

Prior to returning any equipment to EdgeTech, a Returned Material Authorization (RMA) Number must be obtained from **CUSTOMER SERVICE**.

### RMA Purpose

The RMA Number identifies returned equipment when it arrives at our receiving dock and enables tracking while at our facility. Refer to the RMA number on all documentation and correspondences.

All returned materials must be shipped prepaid. Freight collect shipments will not be accepted. All equipment should be adequately insured for shipping, but equipment belonging to EdgeTech must be insured for full value.

If there is more than one item per consignment, include a packing with the shipment. An invoice can double as a packing slip only when the contents are clearly numbered and identified on the invoice.

**CAUTION!** Never attempt to ship a topside unit in its SKB® case alone. Although rugged, these cases are not intended to be used as shipping containers, and the delicate internal components could be damaged. Shipping in this manner will void any warranties.

**NOTE:** All shipping charges shall be the customer's responsibility, unless under warranty, as EdgeTech will pay for return shipping.

**NOTE:** For International Shipments valued over \$1000, the following Shipper's oath must be sent with the invoice.

Shipper's Oath:

"I, \_\_\_\_\_, declare that the articles herein specified are the growth, produce, or manufacture of the United States; that they were exported from the United States from the port of \_\_\_\_\_, on or about \_\_\_\_\_; that they are returned without having been advanced in value or improved in condition by any process of manufacture or any other means; and that no drawback, or allowance has been paid or admitted hereof."

Signed \_\_\_\_\_

## CUSTOMER SERVICE

Customer service personnel at EdgeTech are always eager to hear from users of our products. Your feedback is welcome and is a valuable source of information that we use to improve these products. Therefore, we encourage you to contact EdgeTech Customer Service to offer any suggestions or to request technical support:

**NOTE:** Have your system Serial Number available when contacting Customer Service.

**E-mail:** service@edgetech.com

**Mail:** 4 Little Brook Road  
West Wareham, MA 02576

**Telephone:** (508) 291-0057

**Fax:** (508) 291-2491

**24-Hour Emergency  
Technical Support Line:** (508) 942-8043

For more information, go to [WWW.EDGETECH.COM](http://WWW.EDGETECH.COM).

## COMPANY BACKGROUND

EdgeTech (formerly EG&G Marine Instruments) traces its history in underwater data acquisition and processing back to 1966. EdgeTech has designed, developed, and manufactured products, instruments, and systems for the acquisition of underwater data—including marine, estuarine, and coastal applications—for over 50 years.

The company has responded to the scientific, Naval, and offshore communities' needs by providing equipment—such as sub-bottom profilers, side-scan sonar, acoustic releases, USBL positioning systems, and bathymetric systems—that have become standards in the industry.

EdgeTech has also consistently anticipated and responded to future needs through an active research and development program. Current efforts are focused on the application of cutting-edge CHIRP and acoustic technology.



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# 1.0 OVERVIEW

The EdgeTech 6205s2 is a fully integrated swath bathymetry and dual-frequency side-scan sonar system that uses multiple receive elements and one discrete transmit element to produce real-time high resolution, side-scan imagery, and three-dimensional maps of the seafloor. The 6205s2 overcomes the limitations of multibeam echo sounders (MBES) and interferometric systems in shallow water using EdgeTech's unique Multi-Phase Echo Sounder (MPES) Technology. This hybrid approach combines beamforming and phase discrimination techniques to determine each sounding along the seafloor. With the integration of EdgeTech's Full Spectrum® CHIRP technology, the 6205s2 exceeds IHO SP-44, NOAA, and USACE specifications for feature detection and bathymetric point data uncertainty.

EdgeTech's MPES technology enables the 6205s2 to produce a wider and cleaner swath (over 200°) than current technologies, resulting in superior coverage enabling faster and safer survey completion. In addition, the 6205s2 concurrently rejects multipath effects, reverberation, and acoustic noise commonly encountered in shallow water environments.

The 6205s2 provides simultaneous dual-frequency side scan sonar, operating at 520/850kHz, 850/1600kHz, or 520/1600 kHz. The bathymetry operates at either 520kHz or 850kHz.

Additionally, EdgeTech's latest 2205 Electronics and Modular Arrays are utilized in the 6205s2, resulting in an extremely lightweight design required for shallow water applications and vessels of opportunity. The 2205 electronics and arrays are mounted onto a streamlined body deployed over the bow or side or underneath a crewed or uncrewed survey vessel. Sonar data is transferred from the transceiver to the processing unit onboard via an Ethernet network interface.

The 6205s2 system and its available integrations offer a powerful and versatile acquisition system suitable for many different survey applications. It includes an integrated sound velocity sensor. It interfaces with most third-party acquisition and processing software packages, standard DGPS/RTK GNSS systems, heading, motion, sound velocity profilers, and INS.

The 6205s2 key features include:

- Next-generation MPES technology
- Unrivalled swath coverage in shallow water, when compared to other single head systems
- Swath sectors of up to 200°
- Co-registered dual-frequency side scan and single-frequency bathymetry
- Superior multipath rejection
- IHO SP-44 Special Order compliant
- Equidistant and equiangular soundings output options
- Comes with EdgeTech's Discover Bathymetric Sonar Control Software
- Motion tolerant side scan
- Optional integrated OEM RTK GNSS aided INS unit
- Optional EdgeTech 3400-OTS-based sub-bottom profiler kit that integrates sub-bottom data with 6205s2 bathymetry and side scan data.

## 1.1 Applications

The 6205s2 next-generation Swath Bathymetry & Side Scan Sonar has many potential applications, a few of which include:

- Shallow Water Hydrographic Surveys
- Benthic Habitat Mapping
- Nautical Charting
- Military Rapid Environmental Assessments (REA)
- Route Surveys
- Dredging Operations
- Marine Debris Search
- Port & Harbor Security

## 1.2 6205s2 Configuration Options

There are four configuration option choices to be made:

- Which frequency pair is required?
- Would you like a rack-mounted topside or a custom integrated stack interface unit?
- Whether or not to have the OEM integrated RTK GNSS aided INS unit?
- Would you like to have the 3400-OTS-based Sub-Bottom Profiler Kit?

### 1.2.1 Frequency Options

The 6205s2 is available in the following standard frequency configurations:

- 520 / 850 kHz Dual Frequency Side Scan with 520 kHz Bathymetry Data
- 520 / 850 kHz Dual Frequency Side Scan with 850 kHz Bathymetry Data
- 520 / 1600 kHz Dual Frequency Side Scan with 520 kHz Bathymetry Data
- 850 / 1600 kHz Dual Frequency Side Scan with 850 kHz Bathymetry Data

### 1.2.2 OEM RTK GNSS Aided INS Unit

The 6205s2 requires data from a third-party peripheral time/position/heading/motion sensor. This sensor can be COTS (commercial off-the-shelf). The sensor can be integrated as separate components to the 6205s2, or it can be an OEM unit where the GNSS processor is integrated inside the rackmount topside, and the IMU is integrated inside the sonar head unit.

**NOTE:** When the 6205s2 includes the OEM Integrated RTK GNSS aided INS unit, there is no need to use the RS-232 or LAN ports to receive data from peripheral GNSS/Heading/Motion sensors.

The 6205s2 is available with the following OEM RTK GNSS aided INS units:

- **SBG SYSTEMS EKINOX 3, WITH SEPTENTRIO ASTERX4 RTK GNSS KIT**

## 1.3 Main System Components

The following components come standard with the 6205s2 System:

### 1.3.1 6205s2 Swath Bathymetry and Side Scan Sonar Head

The 6205s2 hydrodynamic sonar head is light, durable, and designed to be pole-mounted. The sonar electronics are contained inside a single housing, and two dual side scan arrays are mounted on the port and starboard sides of the vehicle. A sound velocity sensor is housed in the nose cone. Power/data deck cable and optional GNSS/INS Cable connectors are located on the top aft section of the sonar head. The system is delivered in a hardened traveling case. Further technical details on the 6205s2 Sonar Head are found in the **6205s2 SONAR HEAD TECHNICAL DESCRIPTION** section of this manual.



*Figure 1-1: 6205s2- Forward-Port View*



*Figure 1-2: 6205s2 Aft-Starboard View*

### 1.3.2 6205S2-R Rack Mounted Topside Sonar Interface Box

The topside sonar interface box delivers power to the sonar head and provides direct links between the sonar head, supporting sensors, and a topside computer. The sonar head receives power and transmits and receives data via the provided deck cable. The serial and Ethernet ports act as a dry connection to the sonar head for all ancillary information (i.e., position, attitude, time, etc.) and data from the sonar head to the topside computer. BNC and TNC connectors provide connections to optional OEM/SBG devices and triggers. Front panel power switches control power to topside components, and indicator lights give information on their status. The interface box can be mounted within a 19-inch computer rack or a hardened SKB<sup>®</sup> case. Technical details are found in the [6205s2 TOPSIDE SONAR INTERFACE BOX TECHNICAL DESCRIPTION](#) section of this manual.





Figure 1-3: 6205s2 Topside Interface Box on Hardened SKB® Case

### 1.3.3 Discover Software

EdgeTech's Discover Bathymetric Software Acquisition package provides a way to control, store, and display the Bathymetry and Dual Frequency Side Scan Sonar data. For more information, refer to the [DISCOVER BATHYMETRIC SOFTWARE MANUAL](#).

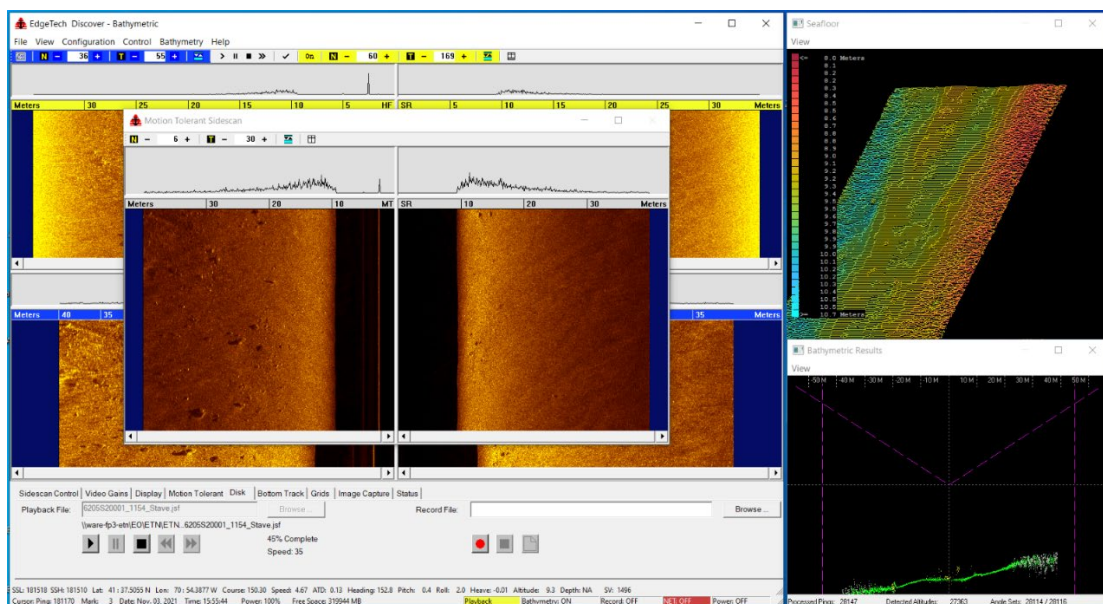


Figure 1-4: Discover Bathymetric Software

### 1.3.4 Third-Party Software

Several third-party topside software applications are capable of acquiring and processing Bathymetry and Side Scan data from EdgeTech systems. Currently, Hypack, SonarWiz, Beamworx, and Qinsy software packages have been approved, and work continues to expand the number of compatible topsides. CARIS HIPS/SIPS and SonarWiz support our native JSF files for post-processing.

For further information on third-party interfacing with Discover Bathymetry, refer to the [THIRD-PARTY SOFTWARE](#) section of this manual.

### 1.3.5 Sonar Deck Cable

The sonar deck cable is a 20-meter (65 ft) underwater, high-speed network data and power cable that connects the sonar head to the topside. The deck cable includes Cat 5e 4-pair stranded conductors that meet or exceed TIA 568-B and is suitable for 10Base-T and 100Base-T. The deck cable is terminated with a 16-pin wet mate connector on both ends, has a breaking strength of 545 kg (1200 lbs), and provides power and telemetry to 6205s2 Sonar Head. Refer to [FIGURE 2-5](#) for a wiring diagram of this cable.



*Figure 1-5: Sonar Deck Cable*

## 1.4 Optional Equipment

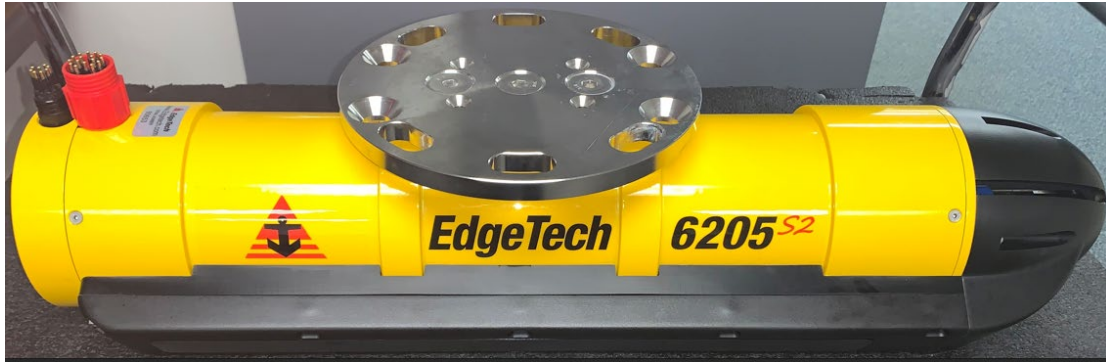
- Adaptor Flange Kit
- 3<sup>rd</sup> party rugged laptop computer for data collection and post-processing
- 3<sup>rd</sup> party RTK GNSS aided INS unit, COTS (Commercial Off The Shelf)
- 3<sup>rd</sup> party Sound Velocity Profiler unit

### 1.4.1 Adaptor Flange Kit

An adaptor flange kit is available if the standard 6205s2 three-hole pattern will not mate with a customer's static pole mount or flange. The kit includes a durable adaptor flange plate that is designed to be attached to the 6205s2 mounting plate using the kit's included hardware. Kit instructions are found in this manual's [ADAPTOR FLANGE INSTALLATION KIT](#) section.



*Figure 1-6: Optional Adaptor Flange Plate*



*Figure 1-7: 6205s2 with Optional Adaptor Flange Plate Installed*

## 1.4.2 EdgeTech Ruggedized Getac Laptop

EdgeTech offers an optional Ruggedized Getac Laptop, preloaded with EdgeTech's Discover Bathymetric Software and all supporting software. The laptop has the specifications below:

- Windows 10 Professional Operating System
- Intel® Core™ i7-8650U vPro 1.9GHz processor with Turbo Boost Technology
- 8 GB of Memory (RAM)
- 1TB Hard Drive
- Intel UHD Graphics 620
- NVIDIA Quadro M2000M (4GB GDDR5)
- 3 USB 3.0 (9-pin)
- 1 USB 2.0 (4-pin)
- 1 Ethernet RJ45 Port
- 1 Mini Display Port1 HDMI Port



*Figure 1-8: GETAC Laptop Computer*

### 1.4.3 SBG Systems Ekinox 3, with Septentrio AsterX4 RTK GNSS Kit

EdgeTech is currently offering an SBG Ekinox 3 Inertial system with a Septentrio Asterx-m3 RTK GNSS Kit. The Ekinox is a MEMS-based inertial system that includes an internal measurement unit (IMU) and extended Kalman filter (EKF). The Septentrio AsterX4 Real Time Kinematics (RTK) and Global Navigation Satellite System (GNSS) provide highly-rated RTK position accuracy and all in view satellite tracking on three frequencies. In addition, EdgeTech can integrate the internal components, provide configuration and the necessary external cabling and antennas. Contact your EdgeTech salesperson or [EDGE TECH CUSTOMER SERVICE](#) for details.



Figure 1-9: GNSS Antenna and Cabling



Figure 1-10: 6205s2 System with RTK GNSS Kit



### 1.4.4 GNSS/INS Unit Deck Cable

A GNSS/INS deck cable is required for the 6205s2 OEM Integrated GNSS/INS unit option. EdgeTech's GNSS/INS cable is a 20-meter (65 ft) underwater, high-speed network data and power cable that links the processing module to the IMU. The cable is a double-screened RS422/485 data cable with three twisted pairs and three power conductors. It is terminated with an eight-pin sea waterproof wet mate connector on both ends and has a breaking strength of 545 kg (1200 lbs). Refer to [FIGURE 2-6](#) for a wiring diagram of this cable.



*Figure 1-11: GNSS/INS Deck Cable*

**CAUTION!** Do Not use this cable for towing. It should never be bearing the weight of the sonar head.

### 1.4.5 GNSS/INS Antenna Cable

Two GNSS/INS antenna cables are required for the 6205s2 OEM Integrated GNSS/INS unit option. The GNSS/INS antenna cable is typically a 10-meter (30 ft) coax signal and power cable. The antenna cable links the GNSS processing module to each antenna. EdgeTech currently provides Times Microwave Systems ([WWW.TIMESMICROWAVE.COM](http://WWW.TIMESMICROWAVE.COM)) LMR®-240 Flexible Low Loss Communications Coaxial Cable with TNC connector cables.



*Figure 1-12: GNSS/INS Antenna Cable*

## 2.0 SPECIFICATIONS

This section details the 6205s2 system specifications.

### 2.1 Physical Specifications

PHYSICAL	
<b>Size</b>	<u>Without Adaptor Flange:</u> L: 72.7 x W: 20.2 x H: 13.9 cm (28.6 x 7.9 x 5.5 in) <u>With Adaptor Flange:</u> L: 72.7 x W: 20.2 x H: 18.6 cm (28.6 x 7.9 x 7.4 in)
<b>Weight</b>	Without Adaptor Flange:14 kg (32 lbs) With Adaptor Flange:19 kg (40 lbs)
<b>Construction</b>	316 Stainless Steel Frame
<b>Color</b>	Blue Angels Yellow
<b>Sealing</b>	O-Ring Seal with Purge Valve

*Table 3-1: Physical Specifications*

### 2.2 Acoustic Specifications

SONAR HEAD MODEL	520/850/1600 KHZ SS – 520/820 BATHY
<b>SIDE SCAN SONAR</b>	
<b>Center Frequency</b>	520/850/1600 kHz
<b>Range (per Side)</b>	150/75/35 m (490/245/115 ft)
<b>Range Resolution</b> Dependent on environmental conditions (absorption, reverberation, sea noise)	10/9/6 mm (0.4/0.35/0.24 in)
<b>Beam Width Along Track</b>	0.36°/0.29°/0.20° (2-way)
<b>Depression Angle</b>	35°
<b>MPES BATHYMETRY</b>	
<b>Center Frequency</b>	520/850 kHz
<b>Maximum Swath</b>	200/75 m (655/246 ft)
<b>Beam Width Along/Across Track</b> resolution expressed as a beamwidth at nadir	1/0.5° / 1/0.4°
<b>Ping Repetition Rate</b> (Both Sides Simultaneously)	15 m (16 ft) = 50 Hz 25 m (82 ft) = 30 Hz 50 m (164 ft) = 15Hz 100 m (328 ft) = 8 Hz 200 m (656 ft) = 4 Hz

<b>Max Swath Sector</b>	200°
<b>Max Number of Soundings/Ping</b>	800
<b>Sounding Patterns</b>	Equidistant and Equiangular, auto-EquiDistant
<b>SYSTEM</b>	
<b>Pulse Modulation</b>	CW & FM CHIRP
<b>Construction</b>	316 Stainless Steel Frame
<b>Dimensions</b>	<u>Without Adaptor Flange:</u> L: 72.7 x W: 20.2 x H: 13.9 cm (28.6 x 7.9 x 5.5 in) <u>With Adaptor Flange:</u> L: 72.7 x W: 20.2 x H: 18.6 cm (28.6 x 7.9 x 7.4 in)
<b>Deck Cable Length</b>	20m (Standard)
<b>Depth Rating</b>	50 m
<b>Weight (In Air)</b>	Without Adaptor Flange:14 kg (32 lbs) With Adaptor Flange:19 kg (40 lbs)
<b>Input Voltage</b>	48-60 VDC
<b>Power</b> (Typical /Max)	55W / 70W
<b>Data Products</b>	Bathymetry, Backscatter, Side Scan Imagery, and Real-Time Uncertainties

*Table 3-2: Acoustic Specifications*

## 2.3 Power Requirements

<b>POWER REQUIREMENTS</b>	
<b>DC Input Range</b>	36-60 VDC (48 VDC Nominal)

*Table 3-3: Power Requirements*

## 2.4 Environmental Specifications

<b>ENVIRONMENT</b>	
<b>Operating Temperature</b>	0°C to 40°C (32°F to 104°F)
<b>Storage Temperature</b>	-20°C to 60°C (-4°F to 140°F)
<b>Relative Humidity</b>	Operating 0 to 80%, Non-Operating 0 to 100%

*Table 3-4: Environmental Specifications*

## 2.5 Topside Specifications

SPECIFICATION	
<b>Size</b>	L: 48.3cm x W: 52.1cm x H: 8.9cm (L: 19 x W: 20.5 x H: 3.5 )
<b>Weight</b>	5.4 kg (12 lbs) excl INS parts 6.4 kg (14 lbs) incl INS parts
<b>Construction</b>	Aluminum
<b>Interfaces</b>	(1) Sonar Deck Lead (1) 1 PPS TTL via BNC (1) Trigger TTL In via BNC (3) 100 BaseT Ethernet Ports (3) Serial RS-232 Ports  Optionally extra for INS unit (1) IMU Deck Lead (1) 1 PPS (out) via BNC (2) GNSS antenna via TNC (1) Serial RS-232 Port for RTK (2) Serial RS-232 Ports
<b>Input Power Supply</b>	115/230 VAC Auto-Sensing
<b>Output Power Supply</b>	60VDC
<b>Current Draw</b>	1.40A

*Table 3-5: 6205s2 Topside Interface Specifications*



## 2.6 Mechanical Drawings

This section contains supporting drawings for the 6205s2 Swath Bathymetry and Dual Frequency Side Scan Sonar System:

### 2.6.1 6205s2 Sonar Head Drawing

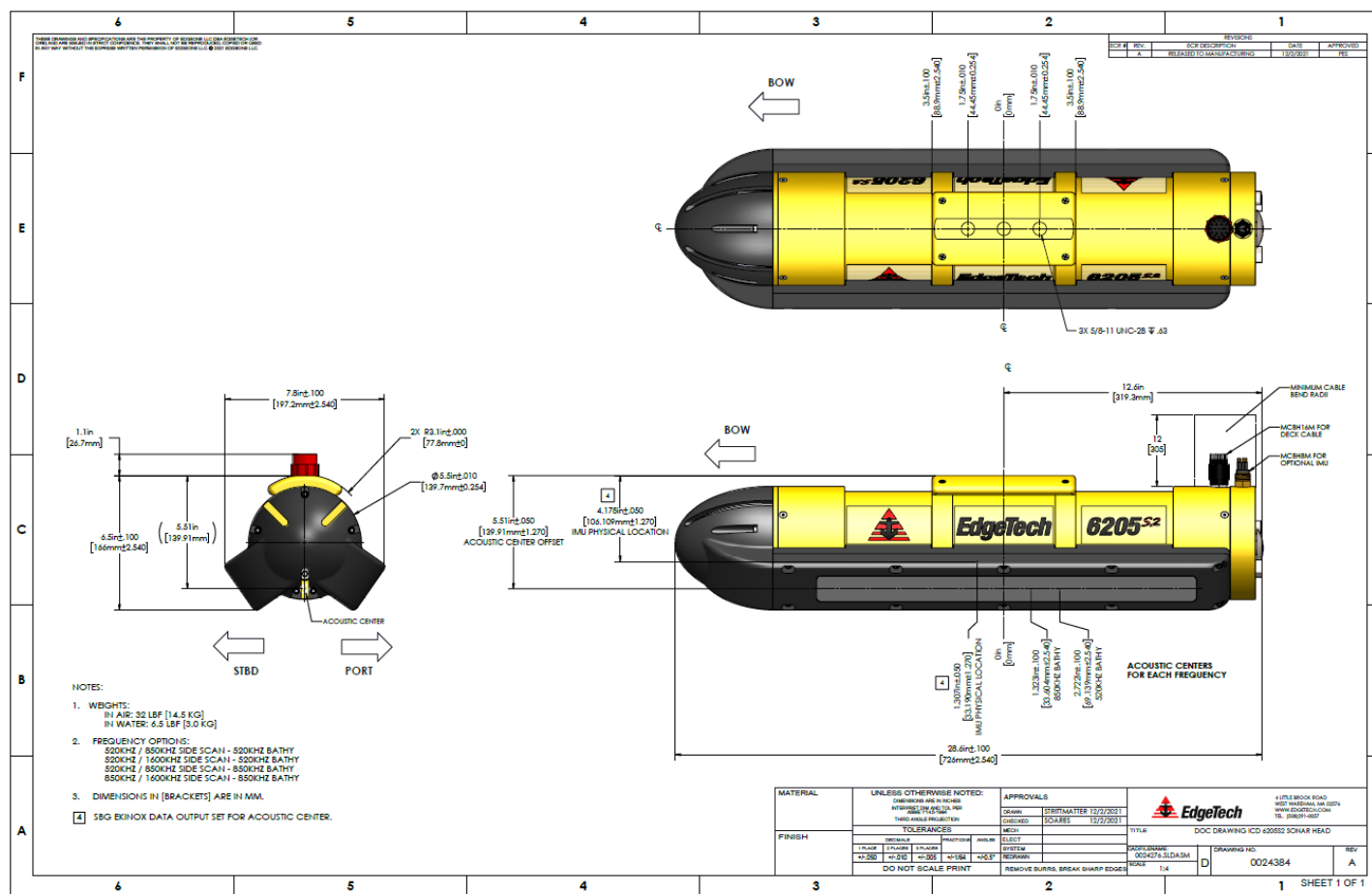


Figure 2-1: 6205s2 Sonar Head ICD

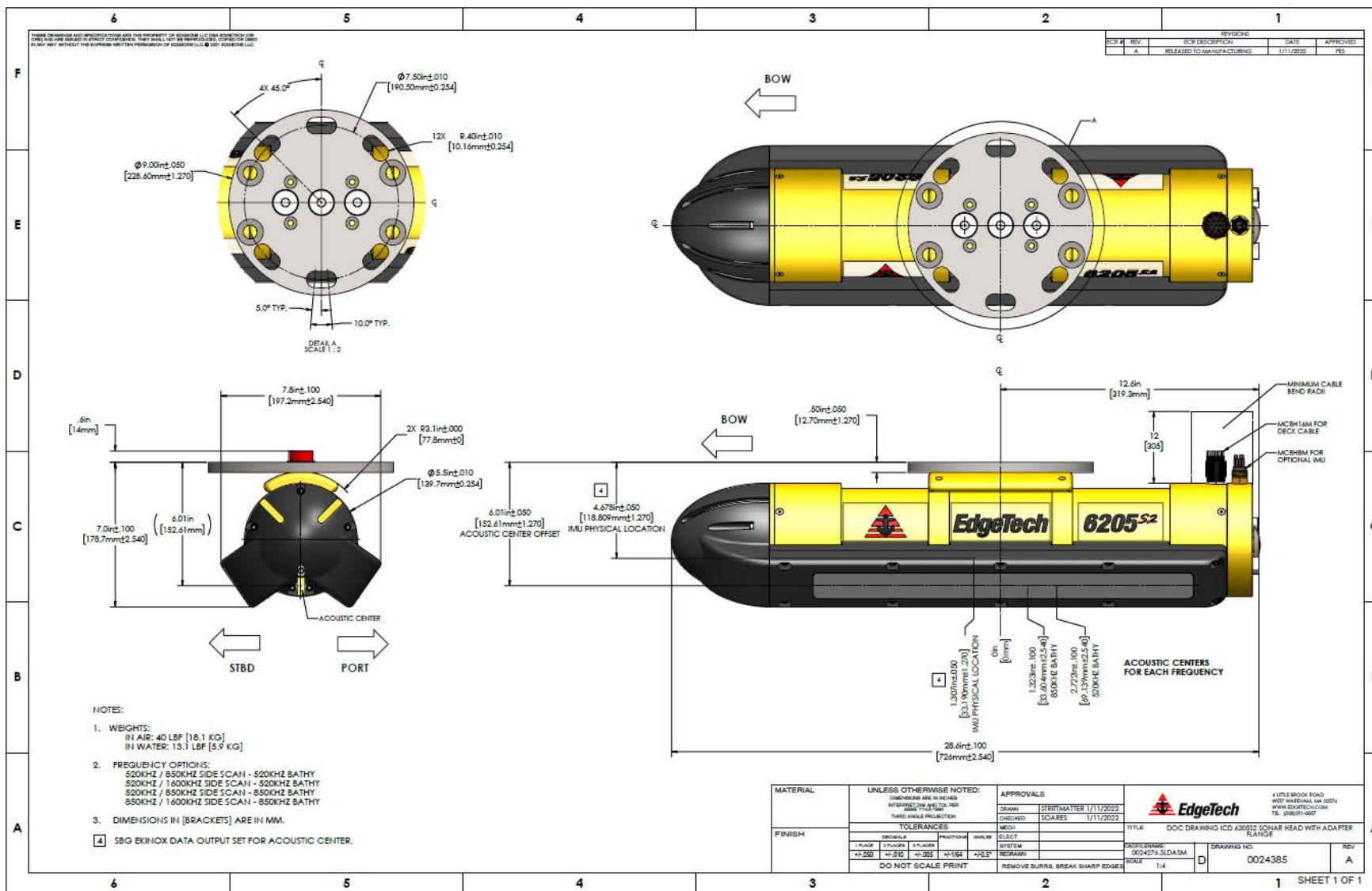


Figure 2-2: 6205s2 Sonar Head with Adaptor Flange ICD

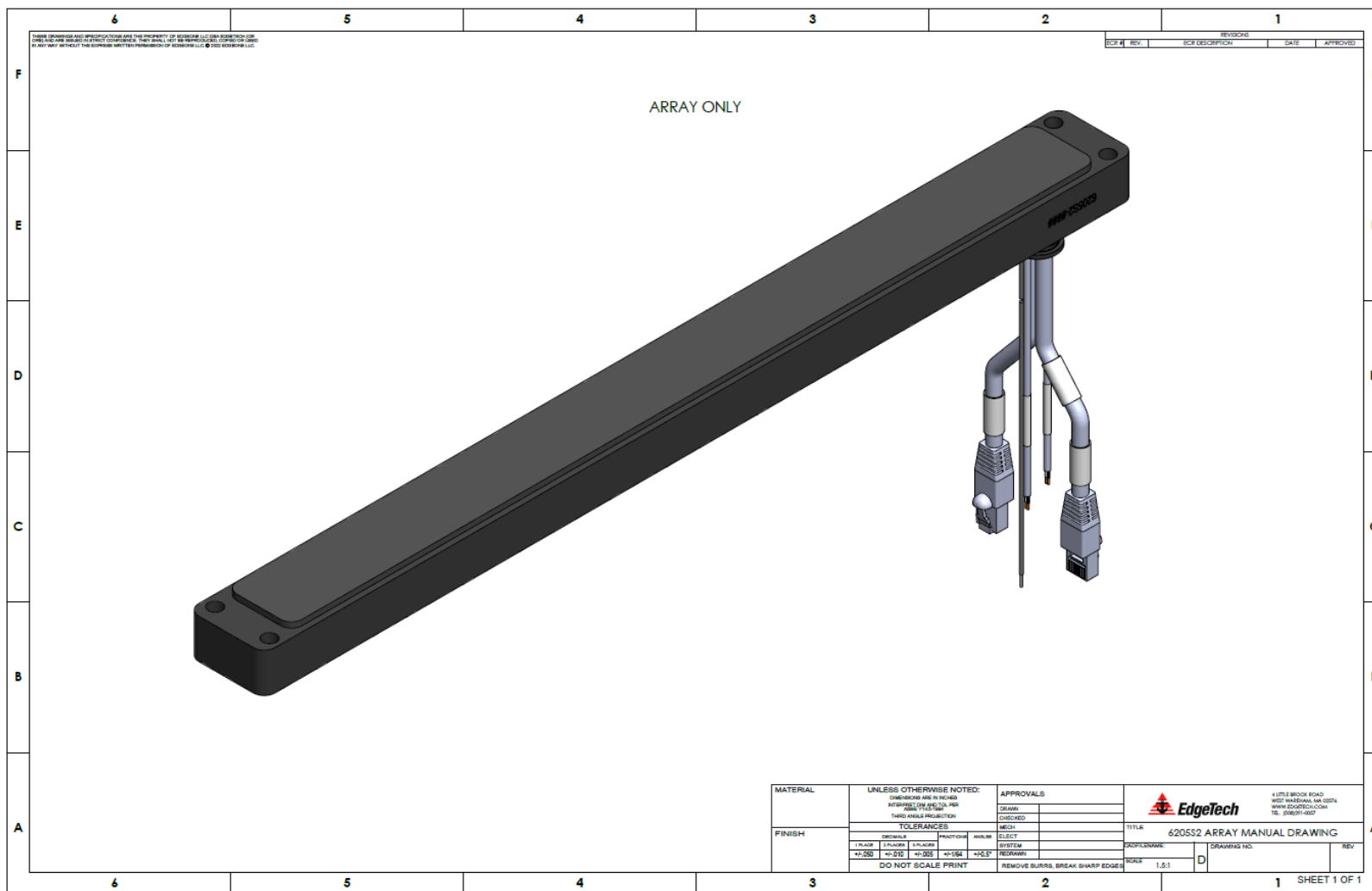


Figure 2-3: 6205s2 Side Scan Transducer

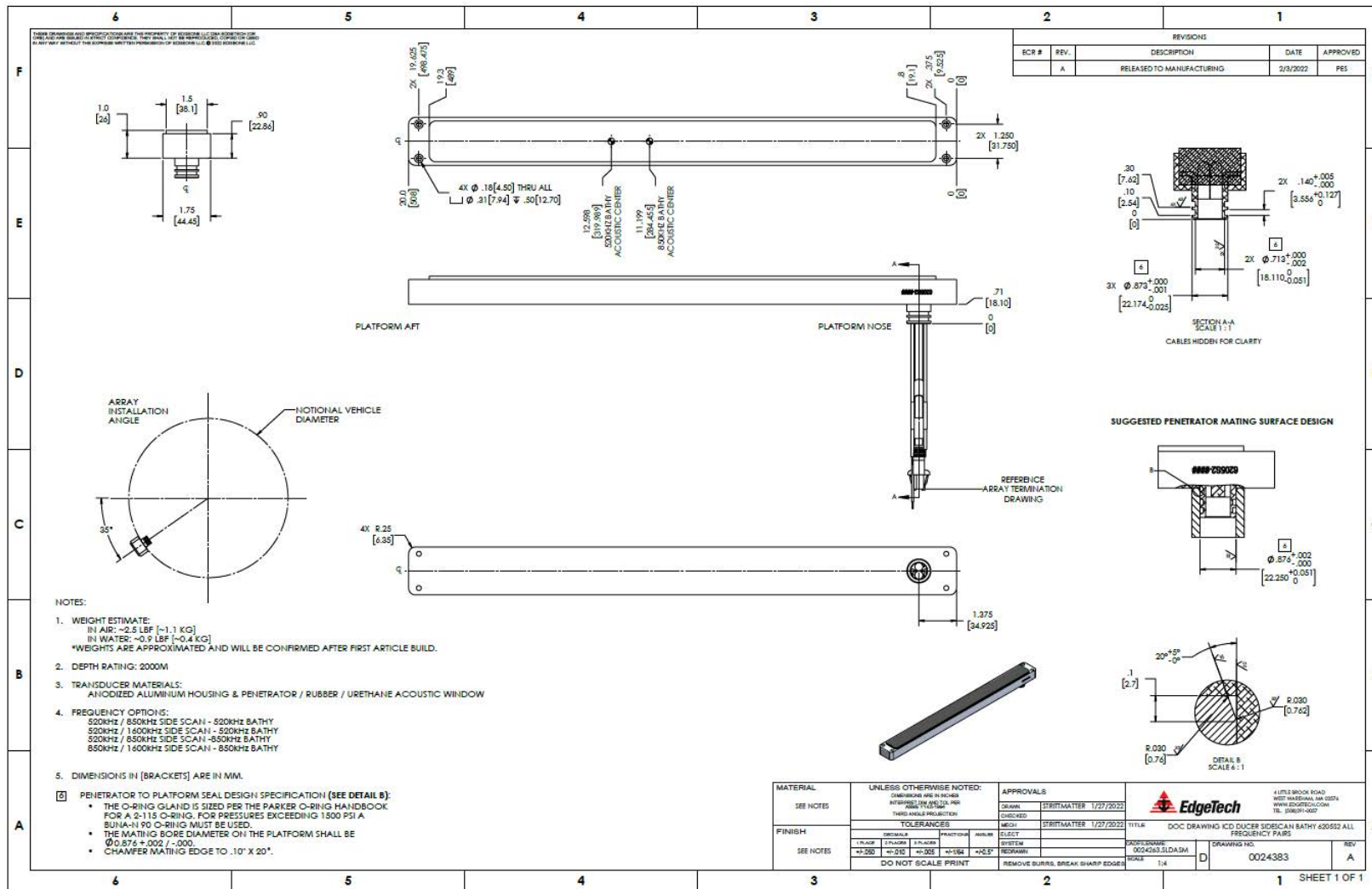


Figure 2-4: 6205s2 Side Scan Transducer Details

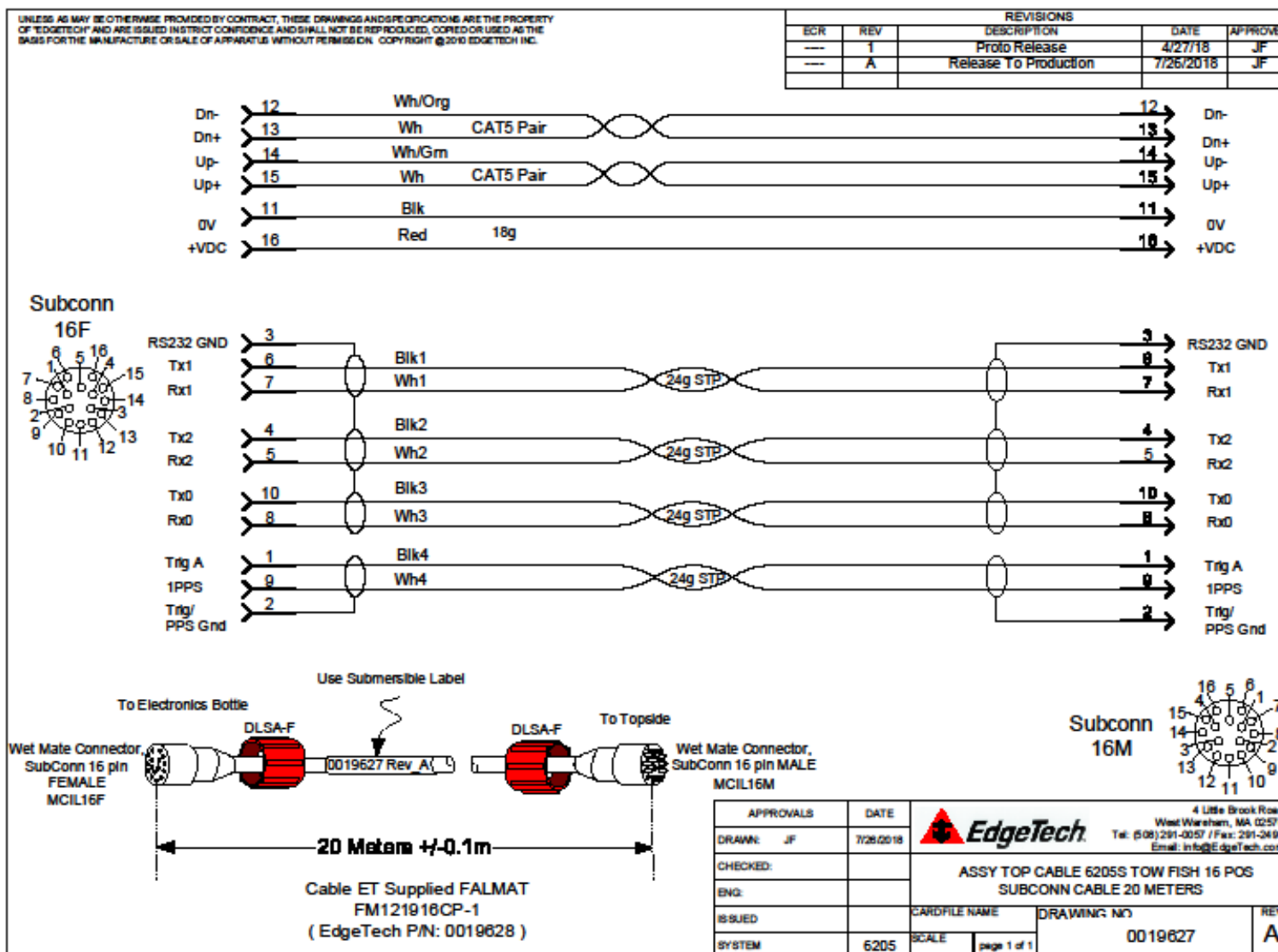


Figure 2-5: 6205s2 Deck Cable Wiring Diagram

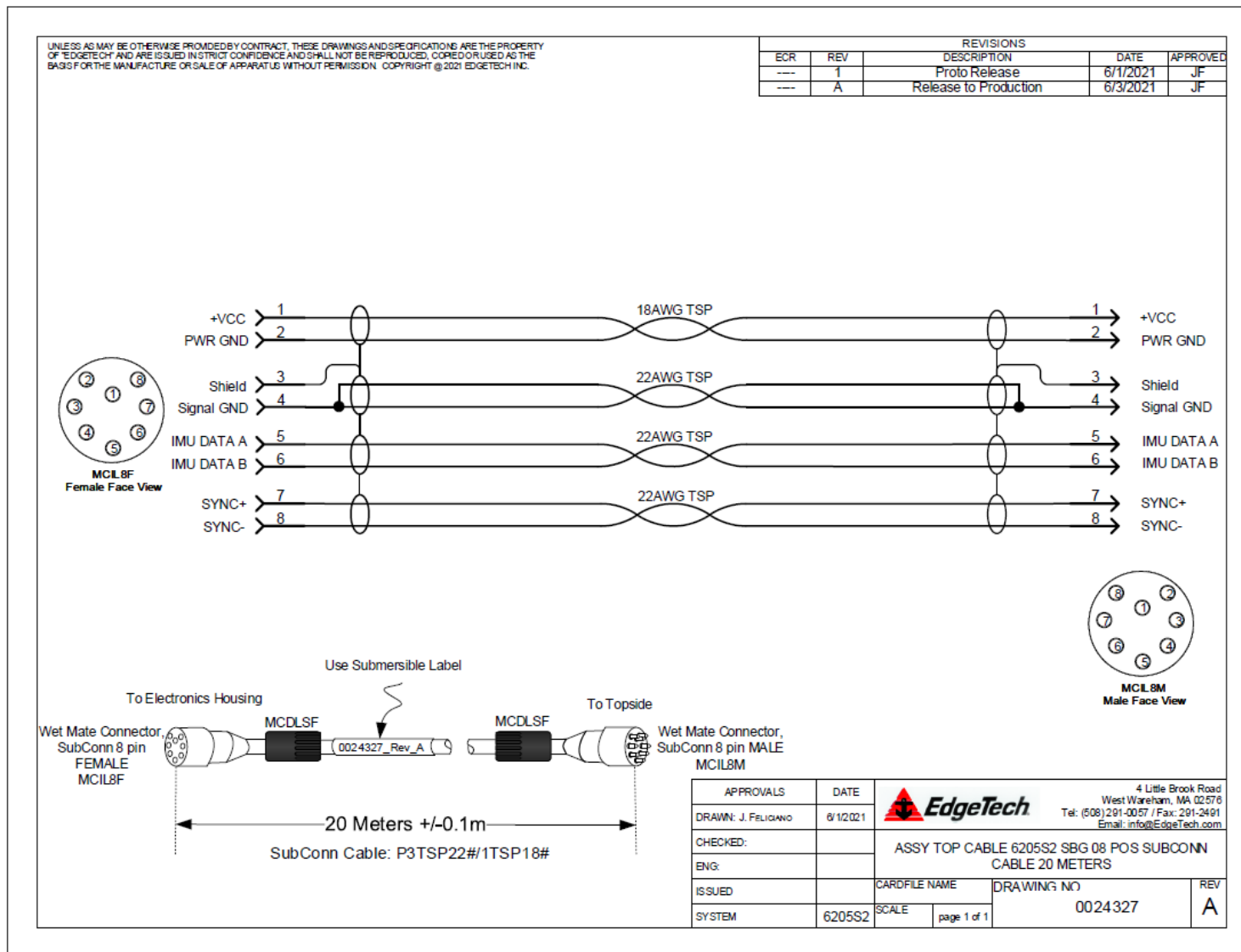


Figure 2-6: 6205s2 GNSS/INS Deck Cable Wiring Diagram

### 2.6.2 6205s2 Topside

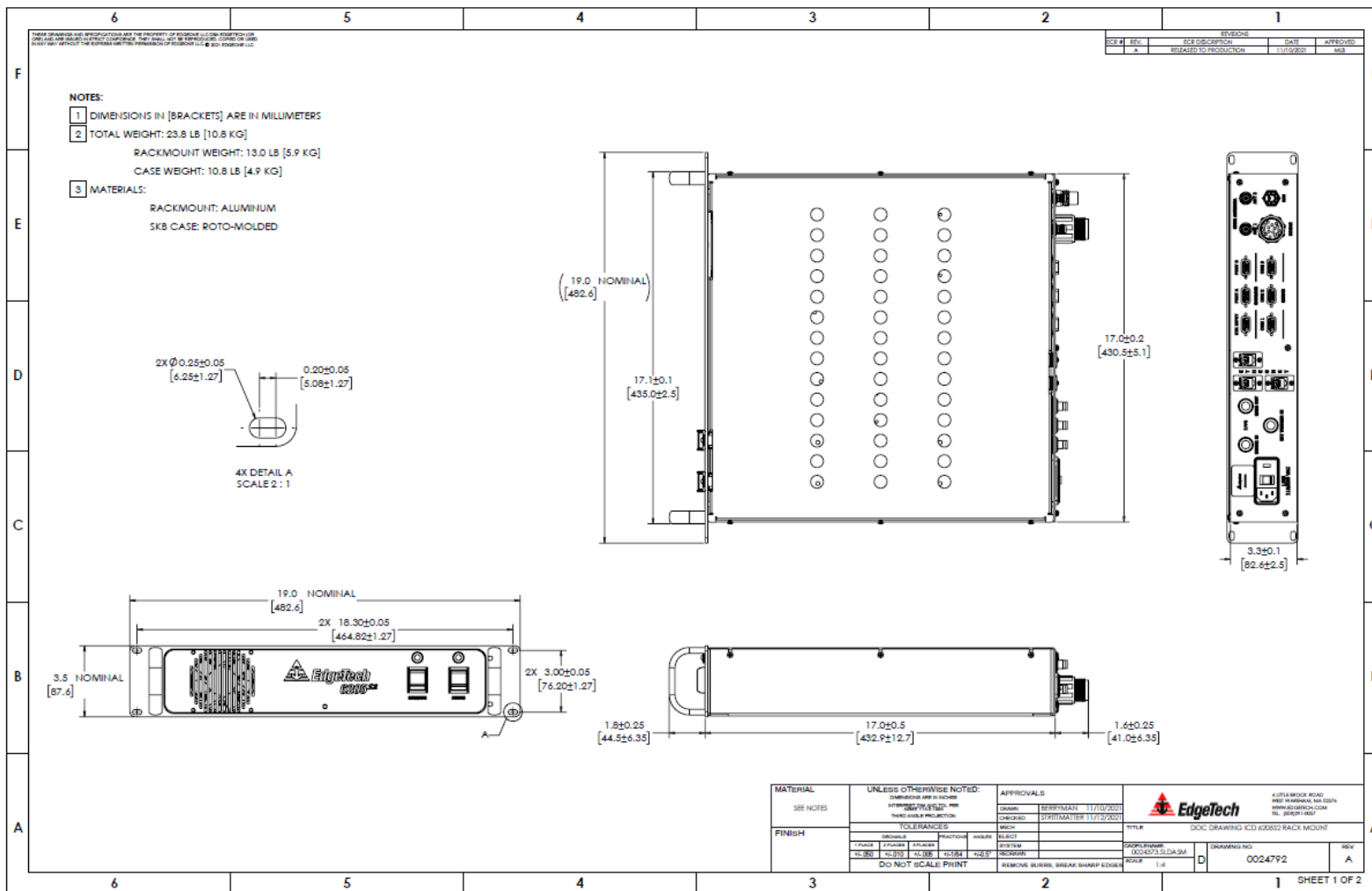


Figure 2-7: 6205s2 Rack-Mounted Topside





## 3.0 TECHNICAL DESCRIPTION

The complete 6205s2 system consists of a sonar head, a topside interface box, and an attached topside computer. This section describes the 6205s2 System's main components and provides drawings for system integration and operations.

### 3.1 The 6205s2 Sonar Head

The 6205s2 is a lightweight, durable, hydrodynamic sonar head designed for side scan and bathymetric surveys. The sonar electronics are contained inside a single housing, and two dual side scan and bathymetric arrays are mounted on the port and starboard sides of the vehicle. A sound velocity sensor is housed in the nose cone. A deck cable connector and optional GNSS/INS cable connector are located on the top aft section of the sonar head.

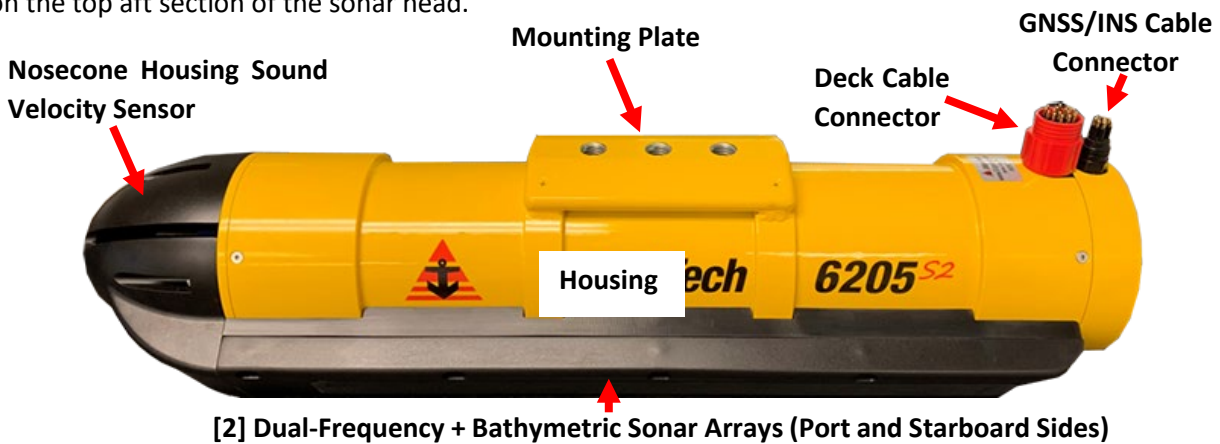


Figure 3-1: 6205s2 Sonar Head Port View



Figure 3-2: 6205s2 Aft View



Figure 3-3: 6205s2 Forward View



Figure 3-4: 6205s2 Nose Cap Removed- AML SVT OEM Probe Visible and Optional Adaptor Flange Installed

### 3.1.1 Sonar Arrays

The 6205s2 provides single-frequency bathymetry and simultaneous dual-frequency side-scan sonar. The 6205s2 Swath Bathymetry and Side Scan Sonar Head are available in a variety of frequency options:

- 520 / 850 kHz Dual Frequency Side Scan with 520 kHz Bathymetry Data
- 520 / 850 kHz Dual Frequency Side Scan with 850 kHz Bathymetry Data
- 520 / 1600 kHz Dual Frequency Side Scan with 520 kHz Bathymetry Data
- 850 / 1600 kHz Dual Frequency Side Scan with 850 kHz Bathymetry Data

The frequency sets listed above were chosen to provide optimum results for any given water depth up to 50m (165ft) below the transducer. The 6205s2 is pressure-rated for water depths between 1m – 50m (3ft – 164ft). The optimal frequency depends on survey requirements.

The 6205s2 utilizes two arrays (port and starboard) to map the seafloor, much like a dual-head multibeam system. Each 6205s2 array is constructed using ten independent longitudinal PZT elements and two multi-segment PZT strings. The two multi-element strings (one per side scan frequency) are used for the transmit function and as a full-resolution side-scan receiver. The remaining ten elements make an approximately half-wavelength spaced array of sensors for its bathymetry receiver.

### 3.1.2 Sonar Head Housing

The pressure housing and end caps are made of painted hard coat anodized aluminum. The nose cone and array covers are made of a urethane elastomer. The housing supplies a streamlined body for efficient underwater maneuvers rated up to 10 knots while protecting the SVS, arrays, and deck cable connections.

**CAUTION!** Although the 6205s2 can handle transit up to 10 knots, survey speeds should be constrained to 4-5 knots or less. EdgeTech recommends recovering the Sonar Head from the water during transit above 7-8 knots (unless the unit is installed inside a suitable hull fairing).

#### 3.1.2.1 Sonar Processor

The 6205s2 Sonar Processor has a built-in Windows® Embedded PC. The main firmware installed on the embedded PC is Sonar.exe, which controls the sonar's hardware and performs specific functions, such as signal processing and time synchronization of the acquired data.

### 3.1.2.2 Sonar Processor Endcap and Pinout Drawings

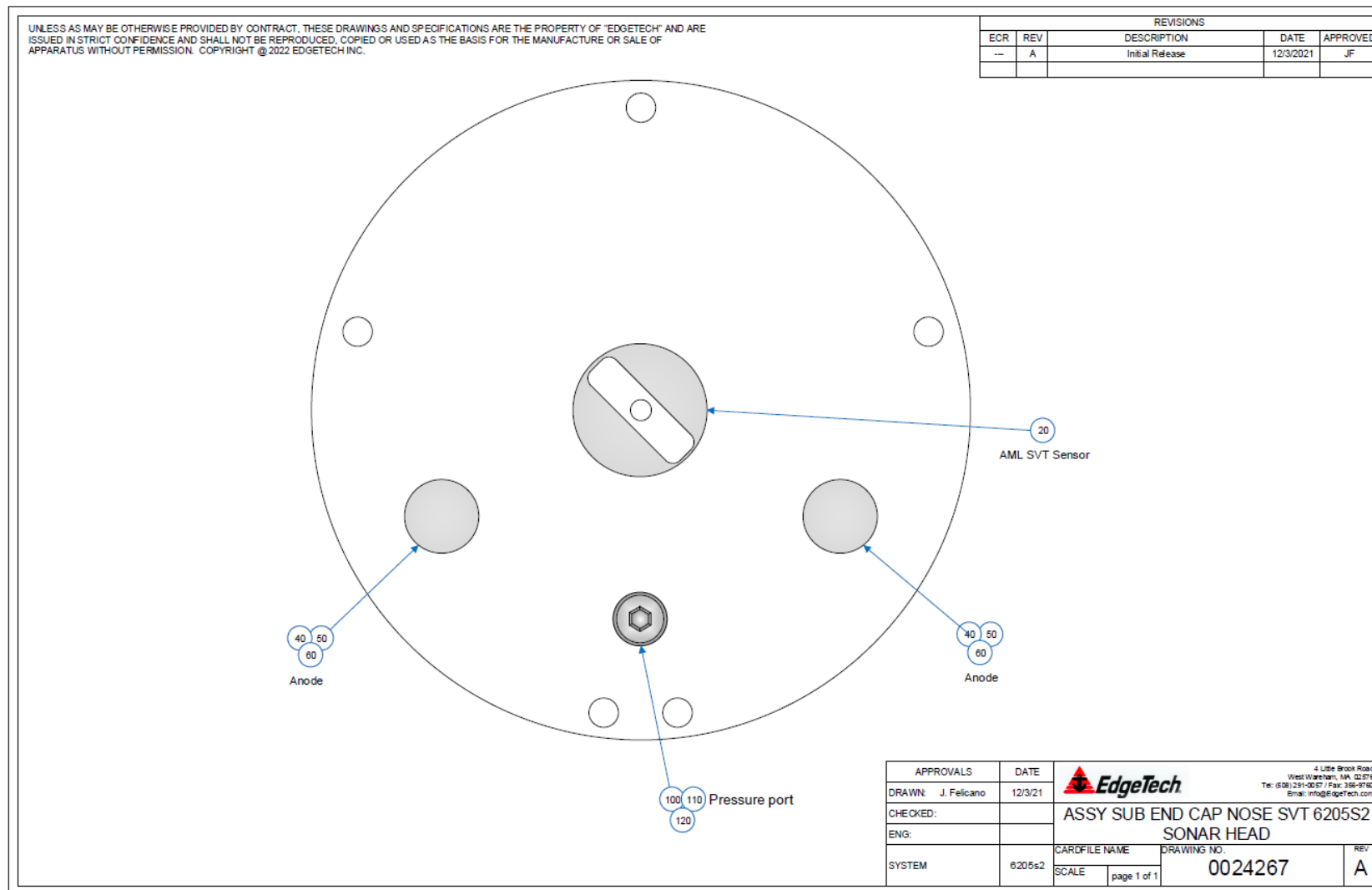


Figure 3-5: 6205S2 Forward End Cap

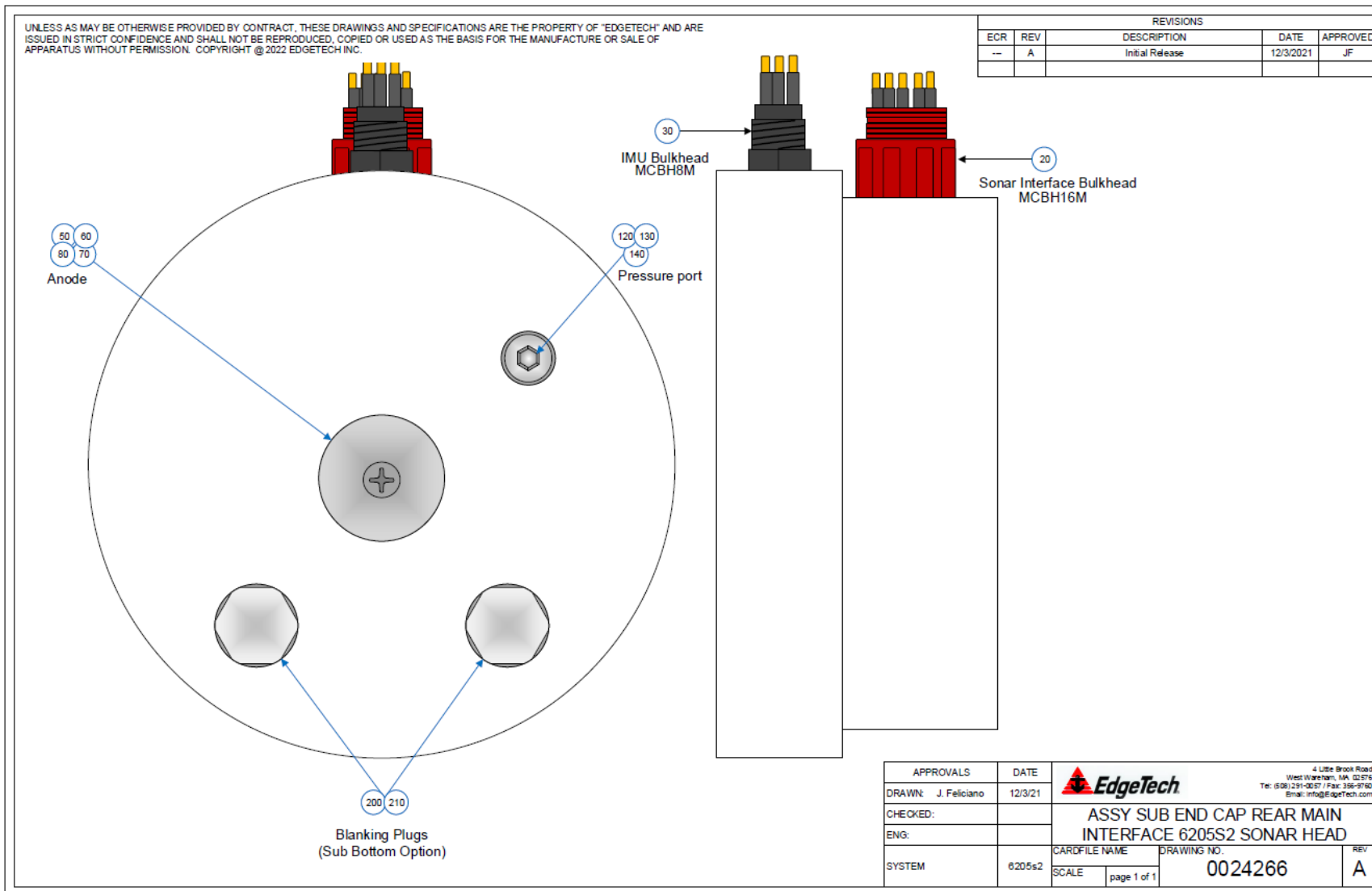


Figure 3-6: 6205s2 Aft End Cap

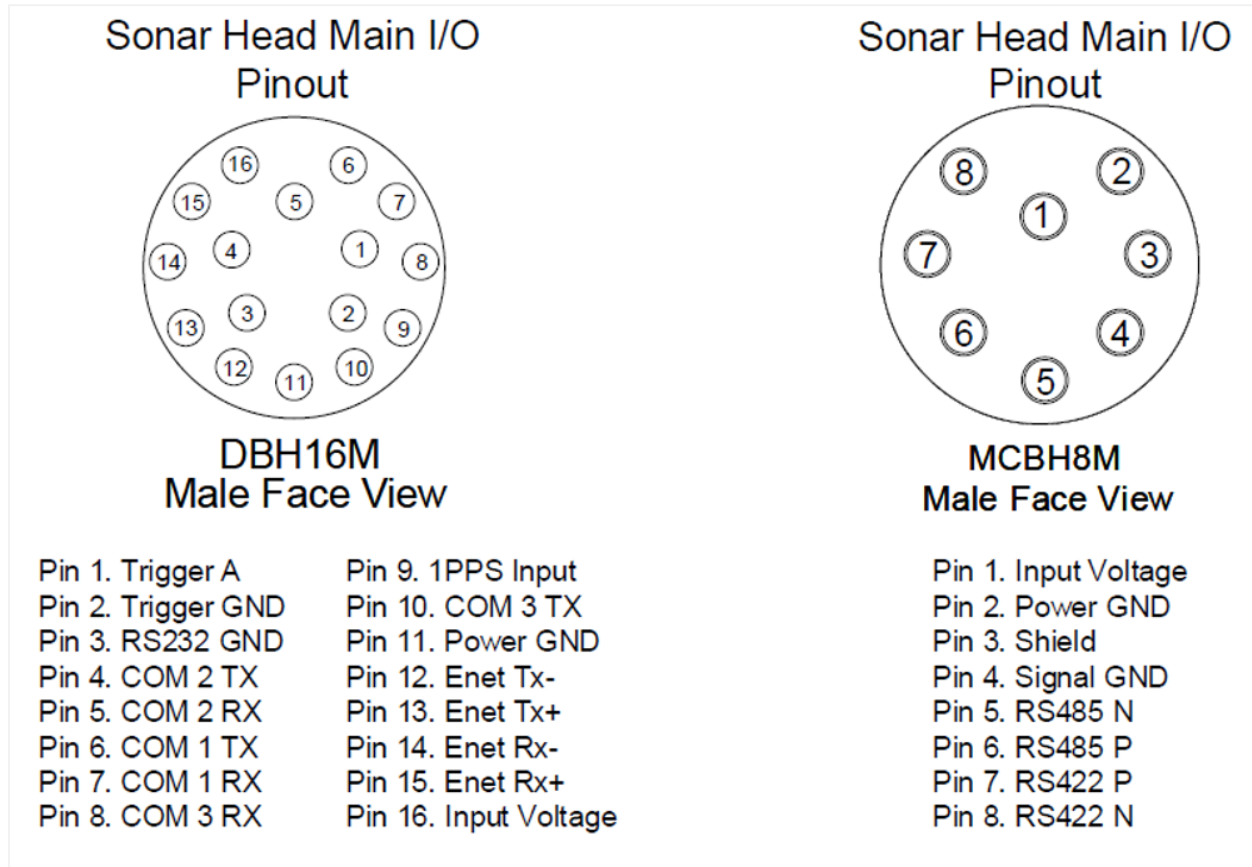


Figure 3-7: 6205s2 Pinout Drawing

### 3.1.2.3 Sound Velocity Sensor

The 6205s2 Sonar Head nosecone is a flooded section that houses an AML Sound Velocity Sensor (SVT), which provides a response time of 47  $\mu$ s, a resolution of 0.001 m/s, and a theoretical accuracy of  $\pm 0.025$  m/s.

EdgeTech recommends collecting a sound velocity profile, especially in the area where you collect survey data. The water being operated in likely does not have a uniform sound velocity, and depending on how drastic the profile is, a depth error as large as 1.6 m has been observed.

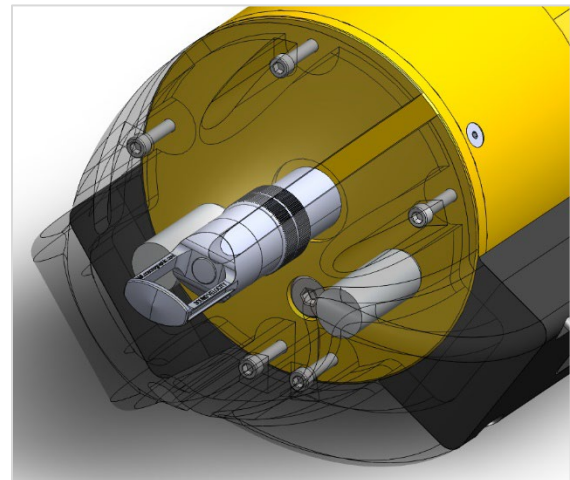


Figure 3-8: Sound Velocity Sensor

### 3.1.3 Mounting Plate

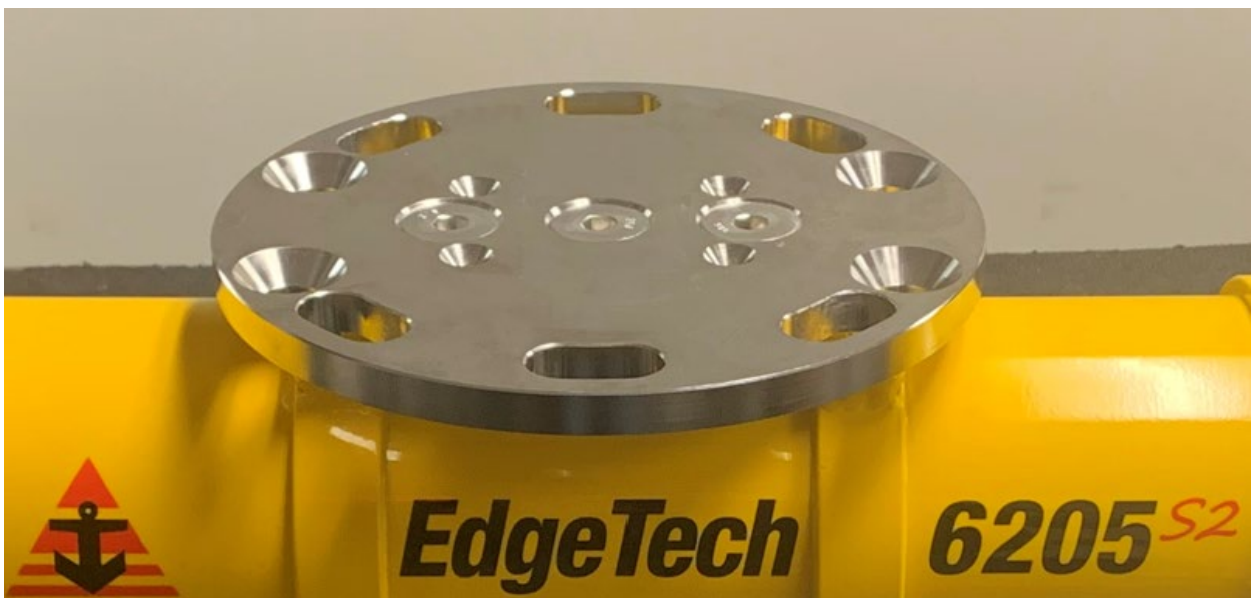
The 6205s2 Mounting Plate is made of electropolished 316 stainless steel and was designed with a three-bolt pattern to securely fix the system to the customer's mounting fixture, thereby cutting back on installation and mobilization time. The bolt pattern is shown in **FIGURE 3-9**.

EdgeTech advises mounting the 6205s2 Sonar Head to the bow of a survey vessel. By placing the system at the bow, the sonar should be far enough away from most interference, such as hull echoes, propeller noise, and wake.



*Figure 3-9: The Mounting Plate*

Edgetech does offer an **OPTIONAL ADAPTOR FLANGE KIT** to accommodate pole mounts and flanges that don't match the plate's three-bolt pattern.



*Figure 3-10: The Optional Adaptor Flange Installed onto the Mounting Plate*

### 3.1.4 Acoustic Center

The individual acoustic centers of each array (port and starboard) converge at a single point along the centerline of the 6205s2 Sonar Head. Therefore, when entering sonar head offsets into the third-party acquisition and processing software, the port and starboard array offsets (sometimes referred to as Sonar Head 1 and Sonar Head 2) are identical in all dimensions.

Remember that the individual acoustic centers for both port and starboard converge on the centerline (or  $X = 0$ ).

**NOTE:** The acoustic center along the y-axis is different for the 520kHz model than the 850kHz model.

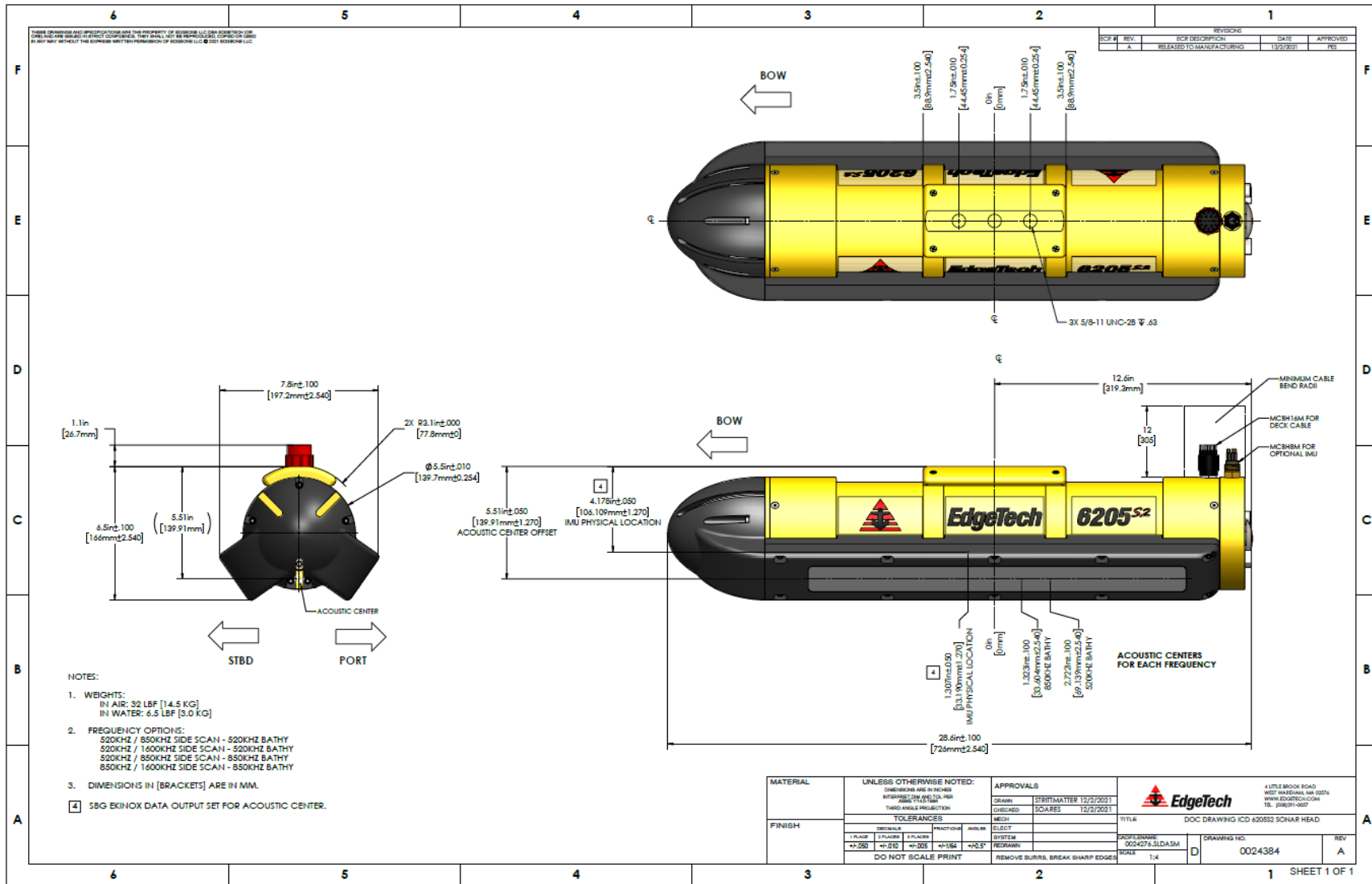


Figure 3-11: 6205s2 Acoustic Center Location (X,Y,Z) and Bolt Pattern



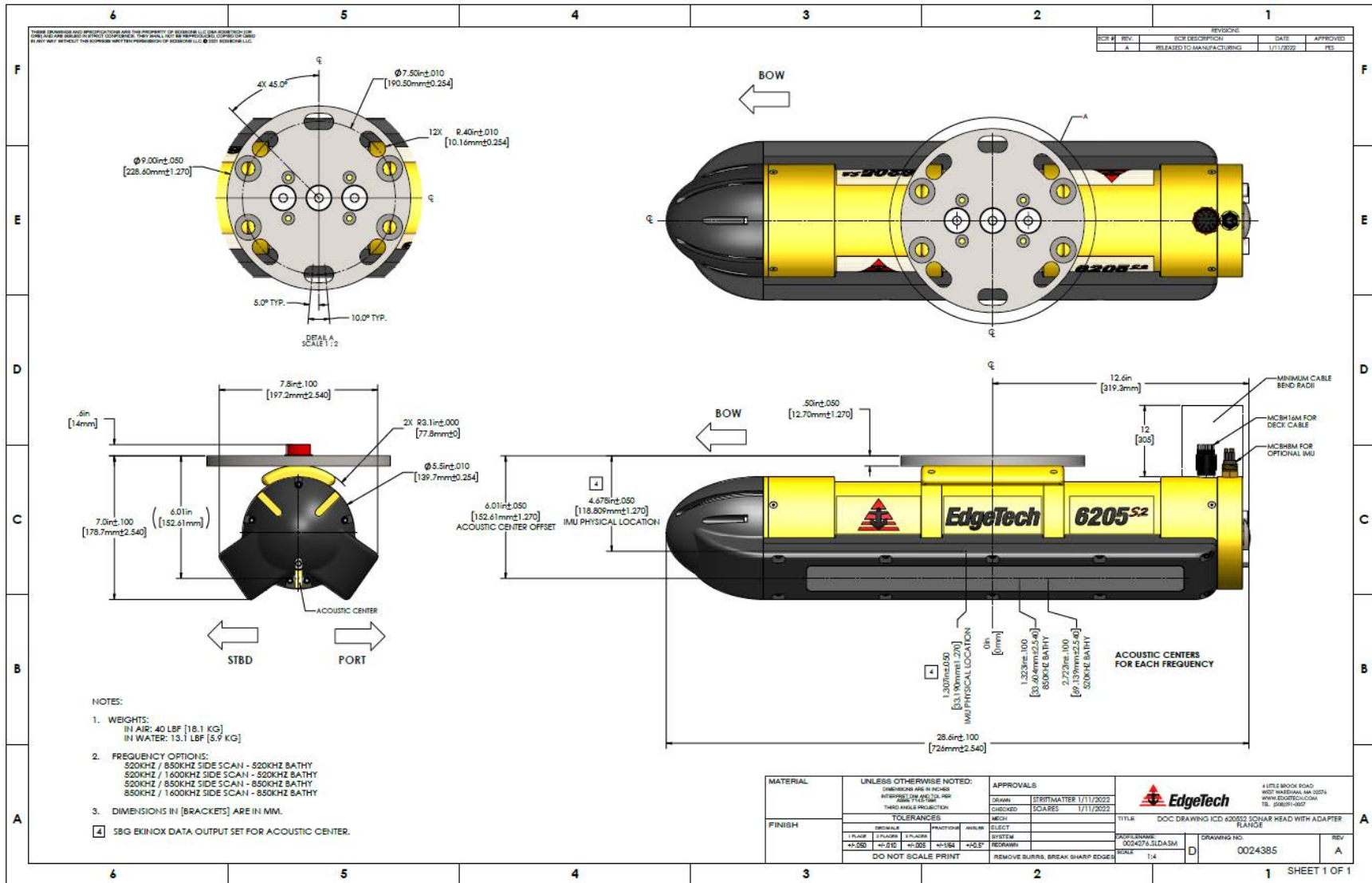


Figure 3-12: 6205s2 with Adaptor Flange Acoustic Center Location (X,Y,Z) and Bolt Pattern

## 3.2 The 6205s2 Topside Sonar Interface Box

The 6205s2 Topside Sonar Interface Box has two purposes:

1. To provide power to the Sonar Head
2. To provide a direct link between Sonar Head, any supporting sensors, and Topside Computer.

The topside sonar interface box delivers power to the system and transmits/receives data via the provided 20m (65ft) Deck Cable and a SubConn 16-pin wet mate connector. The topside supplies ethernet ports to communicate with the topside computer and provide navigation and data from connected sensors. The topside also has (3) RS-232 serial ports to intake navigation, heading, and altitude data from the supporting sensors.

**CAUTION!** When the 6205s2 is purchased with an OEM Integrated RTK GNSS aided INS unit, there is no need to use the RS-232 or LAN ports to receive data from peripheral GNSS/Heading/Motion sensors!

The 6205s2 Topside Sonar Interface Box serial ports are configured to meet specific requirements. The first two RS232 serial ports are configured for high speed and high accuracy, while the third RS232 serial port is configured for standard serial connections. Typical latencies for the high speed/high accuracy ports are less than 100us, whereas the standard serial port may have up to 100ms. The high-speed ports are unidirectional; however, data cannot be transmitted from the 6205s2 to an external device. All three communications ports are isolated via a proprietary signal conditioning isolator board. This ensures noise generated or carried by grounds on the survey vessel does not generate artifacts in the side-scan and bathymetry data sets.

The 6205s2 can receive navigation and altitude data from supporting sensors via the ethernet connection utilizing UDP. Refer to [SECTION 8.3.4 UDP CONNECTIONS](#) in this manual for more information on configuring 6205s2 for UDP data transfer.

The 6205s2 Topside is delivered with a USB drive that contains system manuals and [EDGE TECH'S DISCOVER BATHYMETRIC ACQUISITION SOFTWARE](#). Optional laptops come preloaded with EdgeTech's Discover Bathymetric Acquisition Software and all user manuals. The newest manuals can be downloaded from the EdgeTech product pages and [SUPPORT CENTER RESOURCE WEBPAGE](#).

### 3.2.1 6205s2-R Rack Mount Topside Interface Box

The 6205s2-R Rack Mount Topside Sonar Interface Box was designed to slide into a 19-in Rack Mount SKB® Case or shelf. The serial and Ethernet ports act as a dry connection to the sonar head for all ancillary information (i.e., position, attitude, time, etc.) and data from the sonar head to the topside computer. BNC and TNC connectors provide connections to optional OEM/SBG devices and triggers. The front panel power switches and indicators power topside components and give information on their status.



Figure 3-13: 6205s2-R Topside Interface

Refer to **TABLE 3-6: 6205S2-R TOPSIDE CONNECTORS, SWITCHES, AND INDICATOR LIGHTS** below for detailed topside component information and to the **CONNECTIONS AND FORMATS** section of the manual for system configuration instructions.

#### 3.2.1.1 6205S2-R Topside Connectors, Switches, and Indicator Lights



Figure 3-14: Rack Mount Topside, Front Panel



Figure 3-15: Rack Mount Topside, Rear Panel

FRONT PANEL 6205S2-R	
<b>SONAR Power Switch</b>	Rocker switch that turns the system on or off. The rear line power switch needs to be turned on for this switch to function.
<b>SONAR Indicator Light</b>	A Green LED that indicates power is being output to the vehicle.
<b>GNSS/INS Power Switch</b>	Rocker switch that turns the power to the GNSS/INS system on or off.
<b>GNSS/INS Indicator Light</b>	A Green LED that indicates power is being output to GNSS/INS device. This LED is included regardless of whether the OEM GNSS/INS kit is purchased. The LED will illuminate if no OEM kit is installed.
BACK PANEL 6205S2-R	
<b>Line VAC Connector</b>	Connection for the AC power cord.
<b>Line Power Switch</b>	Rocker switch that switches AC power to the front panel POWER switch
<b>AC Fuse</b>	5A 250VAC Fuse (PN# 0003728)
<b>Network Ethernet Connectors (3)</b>	RJ-45 Standard Ethernet connections. The top left port is typically connected to the computer.
<b>SONAR Connector</b>	Subconn 16 MCIL16F input connector for MCIL16M deck cable connector. Connect the topside to the sonar head.
<b>IMU Connector</b>	Subconn 8 MCIL8F input connector for MCIL8M IMU cable connector.
<b>1PPS Sonar In BNC</b>	BNC connection to Pulse Per Second device.
<b>1 PPS GNSS Out BNC</b>	BNC connection to the GNSS/INS system.
<b>EXT Trigger In BNC</b>	BNC connection to an external input trigger.
<b>GNSS/INS RTK Input Serial Port</b>	Input only RS232 serial port connector to GNSS/INS system. If a GNSS/INS isn't integrated, the connector is disconnected internally.
<b>GNSS/INS Port A Input Serial Port</b>	Bidirectional RS232 serial port connector to GNSS/INS system. If a GNSS/INS system isn't integrated, the connector is disconnected internally.
<b>GNSS/INS Port B Input Serial Port</b>	Bidirectional RS232 serial port connector to GNSS/INS system. If a GNSS/INS system isn't integrated, the connector is disconnected internally.
<b>Sonar COM 1 Serial Port</b>	High-speed unidirectional RS232 serial port connector.
<b>Sonar COM 2 Serial Port</b>	High-speed unidirectional RS232 serial port connector.
<b>Sonar Com 3 Serial Port</b>	Standard Bidirectional RS232 serial port connector.
<b>GNSS Antenna ANT 1 TNC</b>	TNC connection for GNSS antenna. If a GNSS/INS system isn't integrated, the connector is disconnected internally.
<b>GNSS Antenna ANT 2 TNC</b>	TNC connection for GNSS antenna. If a GNSS/INS system isn't integrated, the connector is disconnected internally.

*Table 3-1: 6205s2-R Topside Connectors, Switches, and Indicator Lights*

**NOTE:** The customer must provide a computer to run the Discover software application for the rack mount topside sonar interface box option. Minimum computer requirements are found in sub-section **3.2.3** of this manual.

If the 6205s2-R Rack Mount Topside Interface Box does not turn on, check the on/off switch on the back panel. It is located next to the power plug.

**CAUTION!** When the 6205s2 is purchased with an OEM Integrated RTK GNSS aided INS unit, there is no need to use the RS-232 or LAN ports to receive data from peripheral GNSS/Heading/Motion sensors!

### 3.2.2 6205s2-S Stack Topside Interface

Custom minimal topsides are available on a case-by-case basis. Please contact your EdgeTech salesperson for more information.

### 3.2.3 Topside Computer Requirements Specifications

The topside computer must be able to run EdgeTech's Discover Bathymetric Acquisition Software and any additional third-party software. To do so, it must include the following minimum requirements:

- Windows 10 Professional Operating System
- Quad-Core Intel Core i7-4900MQ @ 2.8GHz Processor or similar
- 8 GB of Memory (RAM)
- 500GB Hard Drive
- 3 USB Ports
- 1 Ethernet Port
- 1 GB Graphics Card

EdgeTech can provide an **OPTIONAL GETAC LAPTOP** that meets 6205s2 system requirements and comes with Discover preinstalled.

**CAUTION!** Installing additional software outside the provided EdgeTech and third-party bathymetric software is NOT recommended. Installing software other than those supplied can have undesirable effects, such as poor and/or slow performance when acquiring Bathymetry and dual-frequency Side Scan data. A list of approved third-party packages is provided in **THIRD-PARTY SOFTWARE**.

**CAUTION!** The laptop's performance can change when running on internal battery power. Therefore, EdgeTech recommends ensuring the laptop is plugged into AC power when operating with the sonar and acquiring real-time bathymetry and side-scan data.

## 4.0 CONNECTIONS AND FORMATS

The 6205s2 system relies on specific data formats and connections to produce high-quality images and measurements. This section describes these data formats and connections and provides diagrams to better understand the system's hardware and data flow.

### 4.1 Data Formats

**CAUTION!** When the 6205s2 includes the OEM Integrated RTK GNSS aided INS unit, there is no need to use the RS-232 or LAN ports to receive data from peripheral GNSS/Heading/Motion sensors.

Data from 3<sup>rd</sup> party peripheral sensor(s) are required to support correctly output geo-referenced soundings and side scan sonar data surveys. At a minimum, the following peripheral data is needed:

- a. TimeSync and 1PPS, Position, true north Heading, Motion (heave/roll/pitch).
- b. GNSS Position in NMEA or supported 3<sup>rd</sup> party format, latitude and longitude, and height; minimum of 5Hz
- c. Heading data in NMEA format or supported 3<sup>rd</sup> party format; minimum of 20Hz
- d. Attitude or roll/pitch/heave data in or supported 3<sup>rd</sup> party format; minimum of 50Hz
- e. Time sync data in NMEA or supported 3<sup>rd</sup> party format; minimum of 1Hz
- f. 1PPS TTL, typically from the GNSS receiver

Data may be supplied by 1, 2, or 3 individual sources (sensors) and are listed below in order of priority.

- a. **Position Data** – this may be supplied via any (one) of the following type sentences/messages:
  - i. \$xxGGA NMEA
  - ii. \$xxGLL NMEA
  - iii. \$xxRMC NMEA  
\$xxGGK \*\* (Applanix PosMV format)      \*\* = Non-NMEA standard sentences
  - iv. \$PTNL, GGK, ... \*\* (Trimble format, non standard NMEA)
  - v. 3<sup>rd</sup> party proprietary messages, at 50Hz, like Applanix POS-MV grp 102 or SBG EKF or iXBLUE StndBinary, etc. Contact EdgeTech for further details of supported messages
- b. **True North Heading Data** – this may be supplied via:
  - i. NMEA, \$xxHDT sentence, OR
  - ii. EM3000 binary format together with motion data



- iii. 3<sup>rd</sup> party proprietary messages, at 50Hz, like Applanix POS-MV grp 102 or SBG EKF or iXBLUE StndBinary, etc. Contact EdgeTech for further details of supported messages
- c. **Attitude (Roll, Pitch, and Heave) Data** – this may be supplied via:
  - i. TSS1 format, OR
  - ii. EM3000 binary format
  - iii. 3<sup>rd</sup>-party proprietary messages, like Applanix POS-MV grp 102 or SBG EKF or iXBLUE StndBinary, etc. Contact EdgeTech for further details of supported messages
- d. **Time Input** - supported sentences are in order of priority/use
  - i. \$xxZDA
  - ii. \$xxRMC
  - iii. \$xxGGK (derived from data in item a. above)
  - iv. \$xxGGA (only supports time, no date field)
  - v. \$xxGLL (only supports time, no date field)
  - vi. 3<sup>rd</sup>-party proprietary messages, like Applanix POS-MV grp 102 or SBG EKF or iXBLUE StndBinary, etc. Contact EdgeTech for further details of supported messages

**NOTE:** The prefix “\$xx” represents a specific manufacturer's proprietary NMEA message prefix. \$GPGGA, \$GPZDA, etc., are examples of NMEA output sentences for a Hemisphere GPS.

We recommend you also supply the system with a source of Speed Over Ground in NMEA format (i.e., VTG, minimum of 1Hz) so that the system can correctly compute Along-Track Distance between each ping and display it in Discover Bathymetric Software.

**NOTE:** It is most strongly recommended to use 1PPS timesync together with 3rd party proprietary messages, like Applanix POS-MV grp 102 or SBG EKF or iXBLUE StndBinary, etc., as only these such messages are accurately UTC time-tagged at source and the UTC time is included as part of the data stream sent to the sonar unit. Failure to use such data that is accurately UTC time-tagged will nearly always result in data artifact of some kind that is not the fault of the EdgeTech sonar system.



## 4.2 System Connections and Data Flow

The following sub-sections describe the connections and data flow for the 6205s2 System.

### 4.2.1 Ethernet LAN Connections

The Ethernet LAN connection from the sonar head to the 6205s2 topside interface is made using a physical wired connection via the standard 20m (65 ft) Deck Cable. The 6205s2 sonar interface connects to a topside computer via a standard RJ-45 ethernet plug. The (default) correct IP addresses for the sonar head and topside computer are as follows:

#### **Standard Configuration:**

- Sonar Head IP Address = **192.9.0.101**
- Topside Computer IP Address = **192.9.0.99**

**NOTE:** Factory defaults for the 6205s2 Sonar head IP address is 192.9.0.101 and should not be changed for any reason. The optional laptop will also be preconfigured to 192.9.0.99 on delivery from EdgeTech. When the customer supplies their own topside computer, the IP address needs to be set to an address similar to the above.

#### **Options:**

- SBG Ekinox = **192.9.0.51**
- Septentrio GNSS = **192.9.0.50**

The 6205s2 can receive data from supporting sensors via the ethernet connection utilizing UDP. Refer to the **UDP CONNECTIONS** section of the manual for more information on configuring 6205s2 for UDP data transfer.

Optionally, when the system includes the OEM SBG, there is no need, in a loop-back style, to send time/position/attitude to the sonar as the INS data is internally transferred via the ethernet connection.

### 4.2.2 Serial Port Connections

There are three RS-232 serial ports provided on the 6205s2 Sonar Interface box. COM1 and COM2 have been configured for high speed and high accuracy). COM3 is configured for standard RS-232 serial connections. Typical latencies for the high speed/high accuracy ports are less than 100us, whereas the standard serial port has up to 100ms.

These serial ports are provided to intake the navigation, heading, and attitude (roll, pitch, and heave) data from the supporting sensors. The **CONFIGURING COM PORTS** section of this manual has instructions to configure them.

Optionally, when the system includes the OEM SBG, there are two RS-232 (Port A/B) for data from the GNSS/INS unit. Note, these RS-232 ports are not needed in a loop-back style to send time/position/attitude to the sonar as the INS data is internally transferred via the ethernet connection. Also, there is one RS-232 (RTK Input) that should be used to send the data stream from an RTK Corrections Service to the GNSS/INS unit (and the NMEA GGA from the GNSS/INS unit to the RTK Service) via an externally connected Internet modem and using the NTRIP protocol.

### 4.2.3 Hardware Connectivity

**FIGURE 4-1** is a block diagram that illustrates interconnections between the 6205s2-R Rack Mount Topside Interface and all supporting sensors. This illustration gives examples of three possible sensor configurations that are explained below.

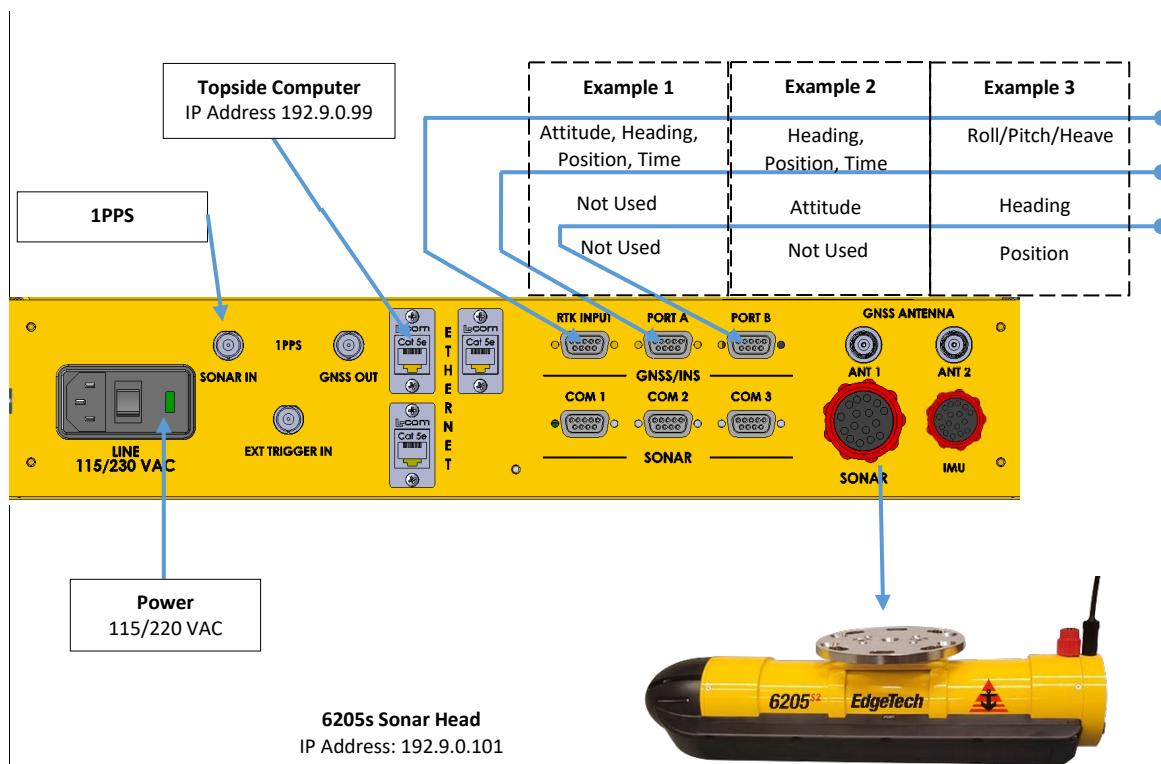


Figure 4-1: 6205s2 Rack Mount Topside Interface Connections

In **FIGURE 4-1**, the 6205s2 topside interface connects to the sonar head via deck cable. Time and 1PPS, navigation, heading, roll, pitch, and heave data from supporting sensors via COM ports 1, 2, and/or 3 and 1PPS, are inputted at the sonar interface, passed through the deck cable, and processed by the sonar processor in sonar head.

These processed navigation and attitude data are transmitted (along with the raw side-scan data) with a common timestamp up the deck cable to the 6205s2 sonar interface. Together, they are then passed to the topside computer through an Ethernet cable and via the 100Mbps link on an Ethernet port (IP Address: 192.9.0.99).

The topside computer then processes the data using the Discover Bathymetric software to send amplitude, angle, and range data to the 3rd party software for logging and post-processing. This process is explained in further detail in the following section. The 3rd party software and Discover Bathymetric processors may all run on the same topside computer.

### 4.2.3.1 Serial Port Configuration Examples

**CAUTION!** When the 6205s2 includes the OEM Integrated RTK GNSS aided INS unit, there is no need to use the RS-232 or LAN ports to receive data from peripheral GNSS/Heading/Motion sensors.

Example 1 in **FIGURE 4-1** depicts a sensor interfacing to the 6205s2 sonar interface that provides time and 1PPS, navigation (latitude/longitude), heading, roll, pitch, and heave data over one serial connection—such as a NovaTel ProPak 6 or Applanix POS-MV or SBG Systems (RS-232 data output, not Ethernet data output). As depicted in **FIGURE 4-1**, the sensor is connected to COM1.

Example 2 shows the most common interfacing scenario, a GNSS that provides navigation and heading and time data, accompanied by a separate motion sensor for heave/roll/pitch measurements.

The COM ports should be assigned as such:

- COM1 = MRU (Roll, Pitch, Heave)
- COM2 = GNSS (Navigation and Heading and Time)
- 1PPS = 1PPS TTL from the GNSS unit

These assignments may be interchanged between COM1 and COM2 because both ports have been configured for high speed and accuracy. COM3 should not be used in this scenario.

Example 3 portrays a situation where the GNSS does not provide heading data. In this case, three sensors are required: a GNSS for navigation (latitude/longitude/height and time), a gyrocompass for heading, and a motion sensor for roll, pitch, and heave measurements.

Therefore, all three COM ports should be used and assigned as follows:

- COM1 = MRU (Roll, Pitch, Heave)
- COM2 = Gyrocompass (Heading)
- COM3 = GNSS (latitude/longitude/time)
- 1PPS = 1PPS TTL from the GNSS unit

The sensors allocated to COM1 and COM2 may be interchanged for the same reason stated in the second example. GNSS data, or latitude and longitude and height data, must be allotted to COM3 because position messages include a valid timestamp. In contrast, attitude and heading messages accepted by 6205s2 do not have a valid time tag.

**NOTE:** To configure the serial ports according to the examples given above, see [CONFIGURING COM PORTS](#).

### 4.2.3.2 Ethernet Port Configuration Examples

**CAUTION!** When the 6205s2 includes the OEM Integrated RTK GNSS aided INS unit, there is no need to use the RS-232 or LAN ports to receive data from peripheral GNSS/Heading/Motion sensors.

The 6205s2 can receive navigation and altitude data from supporting sensors via the Ethernet connection utilizing UDP. Refer to [SECTION 8.3.4 UDP CONNECTIONS](#) for more information on configuring 6205s2 for UDP data transfer.

**FIGURE 4-2** depicts a sensor interface to the 6205s2 topside interface that provides a time and 1PPS connection and a navigation (latitude/longitude), heading, roll, pitch, and heave data connection over an ethernet connection (Ethernet 1). Systems that include an Applanix POS-MV or SBG Systems would use this configuration.

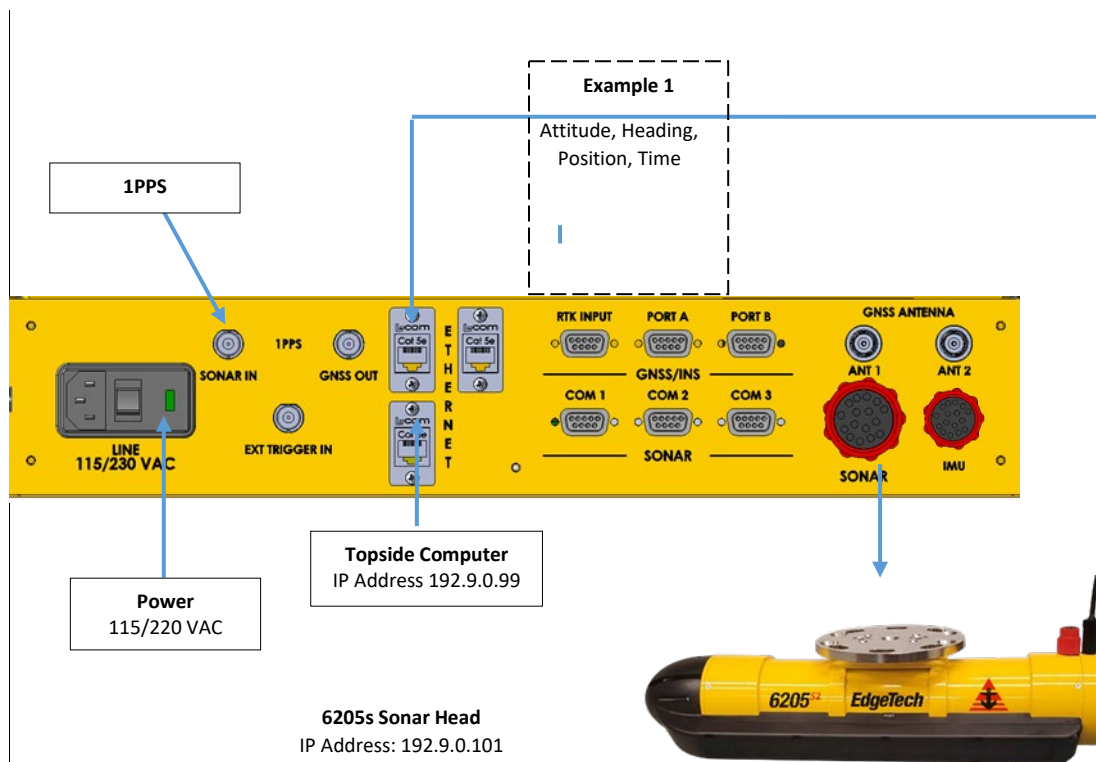


Figure 4-2: 6205s2-R Rack Mount Topside Interface Connections

**NOTE:** The 6205s2-S Stack topside interface connections are similar.

### 4.2.3.3 Integrated GNSS/INS Port Configuration Example

Optionally, the 6205s2 can receive navigation and altitude data from an integrated GNSS/INS system unit via the Ethernet connection utilizing UDP.

**FIGURE 4-3** depicts a sensor interface to the 6205s2 topside interface that provides a time and 1PPS connection and a navigation (latitude/longitude), heading, roll, pitch, and heave data connection over an ethernet connection (internal to topside unit).

When using the GNSS/INS system, an external cable is used to loopback the 1PPS signal from the “GNSS Out” BNC connector to the “Sonar In” BNC Connector.

Examples of OEM units include the SBG Systems

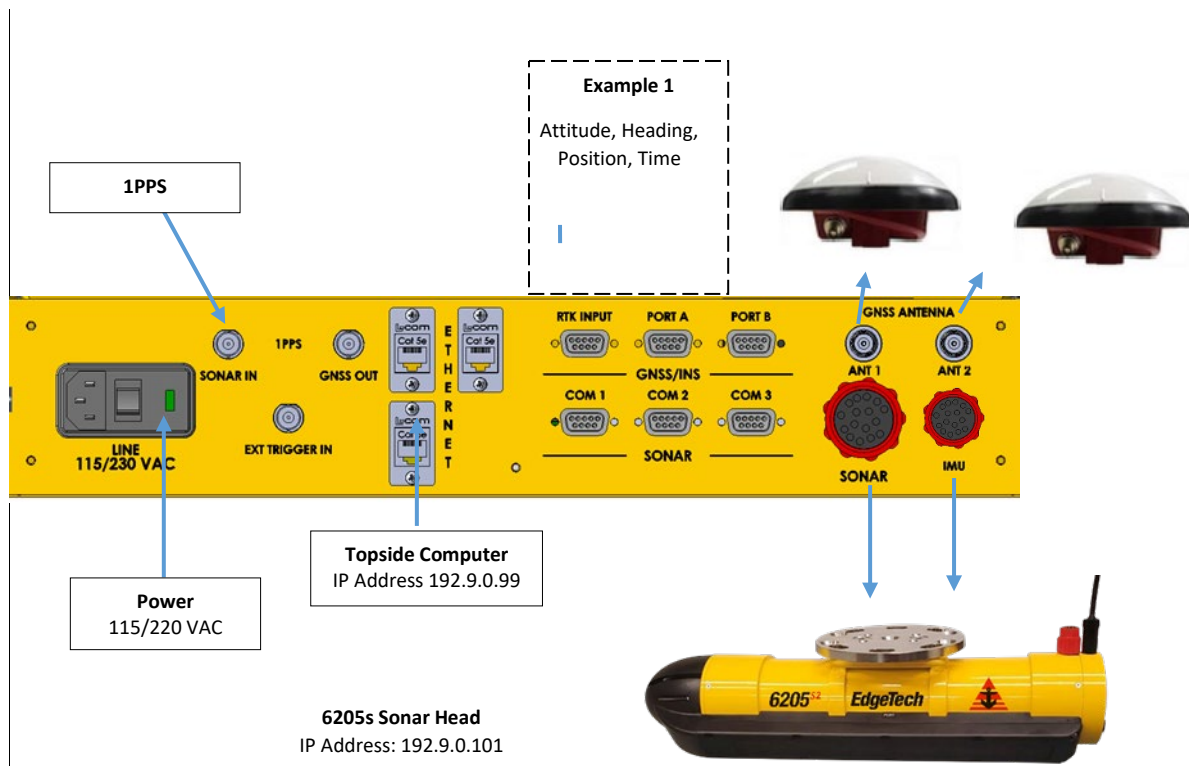


Figure 4-3: 6205s2-R Rack Mount Topside Interface Connections

For more information, refer to the [DISCOVER BATHYMETRIC SOFTWARE USER MANUAL](#).

#### 4.2.3.4 One PPS Port Configuration

One Pulse Per Second (1PPS) is a feature in many GNSS units to provide an accurate timing mechanism to synchronize various devices to a precise, common clock. The Edgetech 6205s2-R (FIGURE 4-2.) rack-mount provides a 1PPS port to physically connect to a PPS-capable unit. The logical configuration is done in the attached GNSS configuration and activating the 1PPS option in **EDGETECH'S DISCOVER BATHYMETRIC SOFTWARE**.

**CAUTION!** The 6205s2 system is optimized to work with a falling edge 1PPS signal.

The EdgeTech Isolator Board identifies the input signal's falling edge and reconstitutes it as a rising edge 2.27ms pulse. This signal is passed down the deck cable to the subsea electronics, where the rising edge is utilized as the 1PPS time sync reference. Refer to FIGURE 4-4. This configuration produces negligible latency when a falling edge 1PPS signal is injected at the topside.

**NOTE:** To learn more about the EdgeTech Isolator Board, refer to the **TOPSIDE PROVIDED ISOLATION** section of this manual.

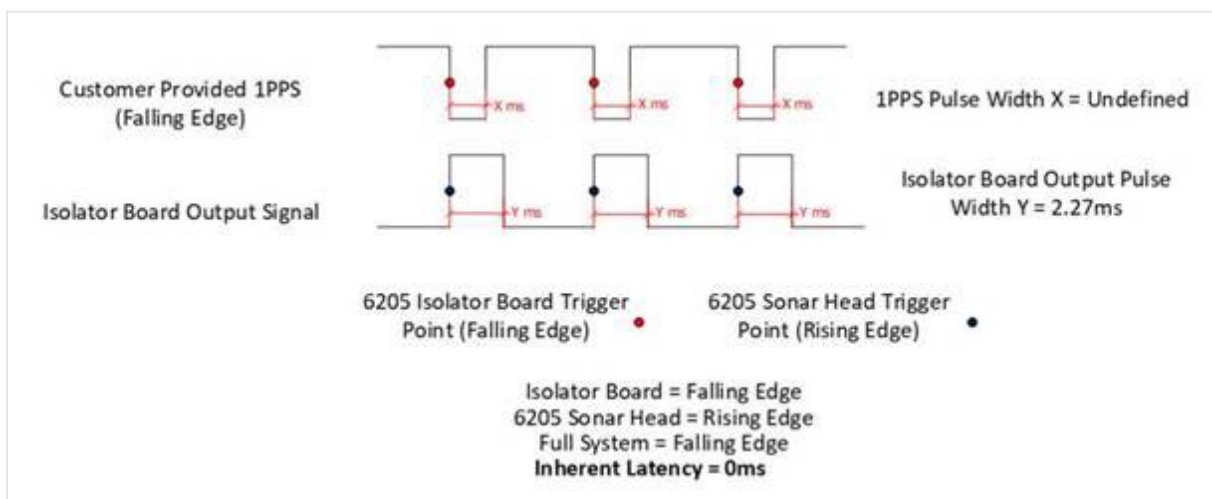


Figure 4-4: 6205s2 System Is Optimized To Work With A Falling Edge 1PPS Signal

A rising edge trigger can be used when a falling edge trigger is not available. There are no software or hardware adjustments required. However, a latency equivalent to the input trigger's pulse width will be generated. As a result, EdgeTech recommends using a pulse width (duration) of not longer than 1ms if a rising edge trigger must be used. Static latency correction occurs during the patch test process in third-party software packages.

## 4.2.4 Sonar Data Flow

The Discover Bathymetric software acquisition package provides a way to control, store, and display the bathymetry and side-scan sonar data. Discover Bathymetric contains two sub-modules. The first is the Bathymetric Processor, which processes the bathymetry solutions. The second is the Discover application, that processes and displays the dual-frequency side-scan data. If third-party software is utilized, it would be added to the data flow. The Sonar Data Flow Chart below (**FIGURE 4-5**) illustrates the data flow between Discover, the Bathymetric Processor, and any third-party software.

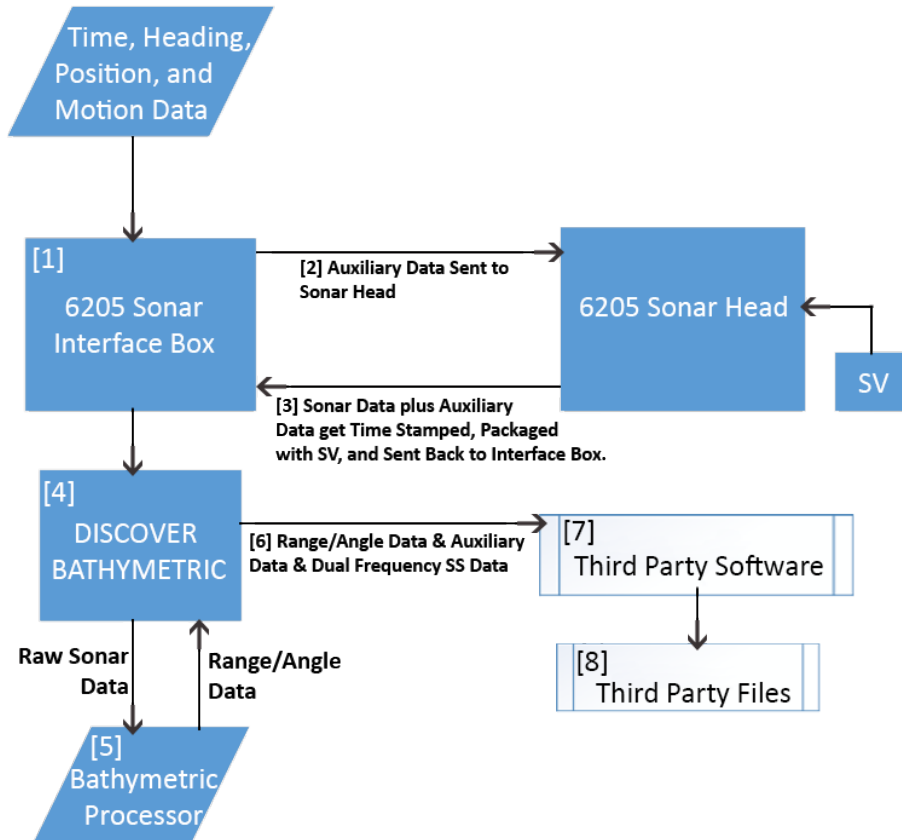


Figure 4-5: Sonar Data Flowchart

The flow chart in **FIGURE 4-5** demonstrates the following:

1. The auxiliary sensors provide time, heading, position (latitude/longitude), and motion (roll, pitch, and heave) data to the 6205s2 Topside Interface Box via the provided RS-232 serial ports or UDP connections over the ethernet link.
2. Auxiliary data is then relayed without additional latency to the 6205s2 Sonar Head via the deck cable.

3. Auxiliary data is then combined with the raw sonar data and instantaneous sound velocity (SV) measurements. They are time-stamped with a common value and then sent back to the 6205s2 Topside Interface Box.
4. The Discover Bathymetric application takes in the raw sonar data and sends it to the Bathymetric Processor.
5. The Bathymetric Processor processes the raw sonar data to produce uncorrected range and angle data and then transmits this back to the Discover Bathymetric application, where it is packaged with the auxiliary and dual-frequency side-scan data. At this point, each ping is represented by a complete data package containing all sonar and auxiliary data.

**NOTE:** Once the data is passed back to Discover Bathymetric, data is displayed on the provided graphical displays to illustrate the bathymetry and simultaneous dual-frequency side scan data in real-time. The data may also be recorded as a \*.JSF file if the user desires.

6. The completed data package (range/angle, dual-frequency side scan, and all auxiliary data) is sent to the third-party software.
7. The third-party software processes these complete data packets to a native format. The third-party software also provides graphical displays to show the bathymetry, dual-frequency side scan, and auxiliary data.
8. Finally, the third-party software saves native data files that contain every piece of information to post-process the data and generate final hydrographic products.



### 4.3 Topside Provided Isolation

The two most common sources of electrical noise (interference) are power supplies and poor grounding on survey vessels. Edgetech's proprietary signal conditioning and isolation board is shipped with every topside to protect against the noise fluctuations on the ground line of the subsea electronics. This board isolates the sensitive subsea electronics from potentially noisy grounds provided by the trigger and serial port inputs. Noise can often be identified as repeating patterns at the edge of the usable range of data within Discover's waterfall display.

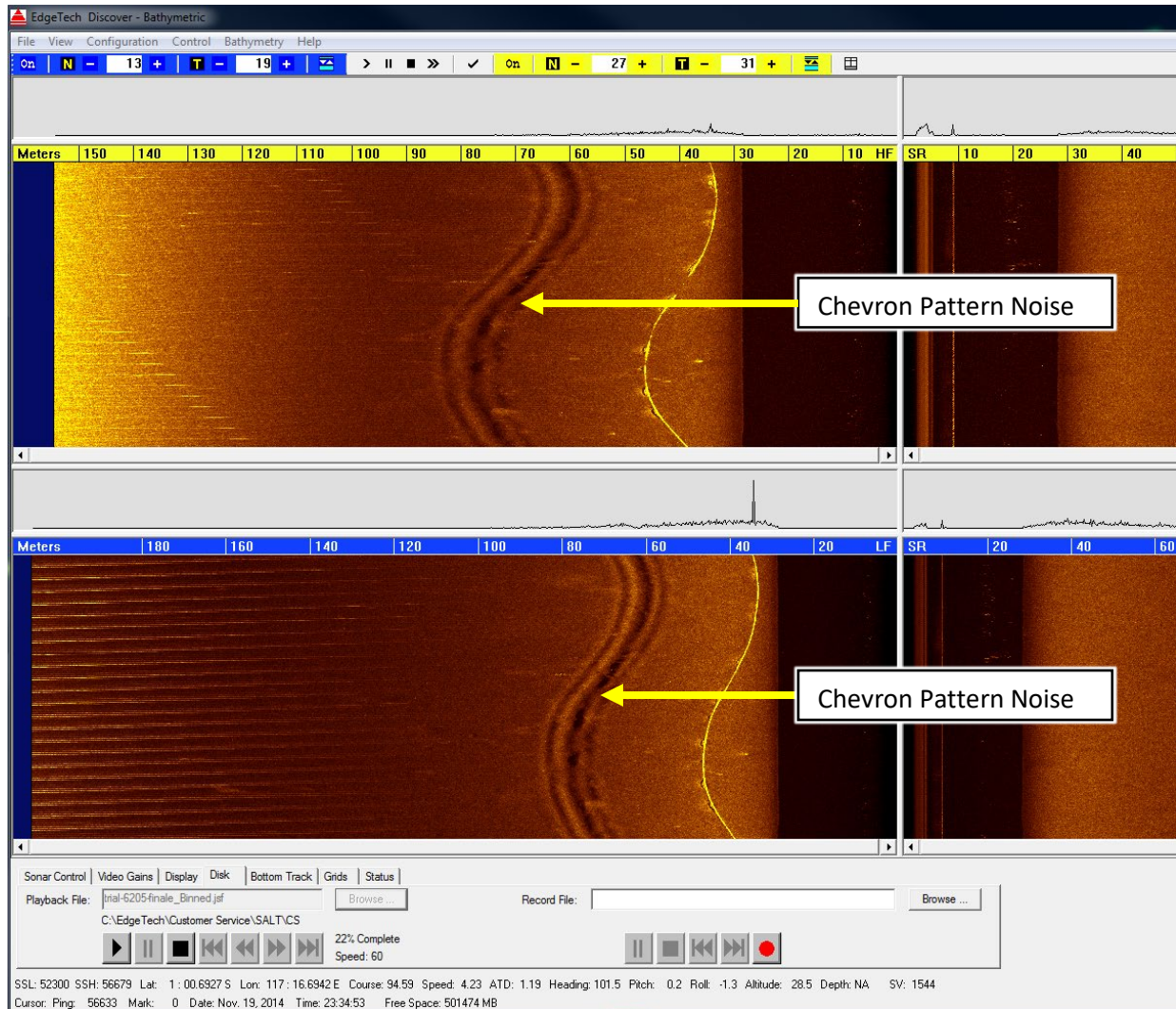


Figure 4-6: Chevron Pattern Noise in a Cropped Portion of Discover Bathymetric

## 5.0 INSTALLATION

This section provides an overview of unpacking, inspecting, installing, and caring for the EdgeTech 6205s2 Swath Bathymetry and Dual Frequency Side Scan Sonar System.

### 5.1 Unpacking and Inspecting

The sonar head and Topside Interface units are shipped in heavy-duty, reusable transport cases with appropriate packing material. All documentation, including manuals, is provided in electronic form on the USB thumb drive.

Before unpacking the system's components, inspect the shipping containers for damage. If any damage is found, report it to the carrier and to EdgeTech immediately. If the shipping containers appear damage-free, carefully unpack the components and inspect them.

Check the packing list and verify all the items on the list are included. If any damage is found after unpacking the components, immediately report it to the carrier and to EdgeTech. If any items are missing, contact **EDGE TECH CUSTOMER SERVICE**. Do not install or operate any equipment that appears damaged.

Although the items shipped may vary depending on the customer's requirements, the standard components for the 6205s2 Swath Bathymetry and Dual Frequency Side Scan Sonar system are listed in **MAIN SYSTEM COMPONENTS** section of this manual.

### 5.2 Sonar Head Installation

Installing the 6205s2 system on the survey vessel is the customer's responsibility, but it is important to keep the following considerations in mind.

1. The sonar head can be mounted on the side of a vessel or on the underside of the vessel, but it is recommended to secure the 6205s2 to the boat's bow.
2. If the customer wishes to mount the sonar off their vessel's side/underside, care must be taken to ensure keel clearance.

#### 5.2.1 Pole Mounting

The 6205s2 is designed to be pole mounted to a pole flange using the 3-bolt plate provided on the top of the sonar head. Customers can manufacture their own, or EdgeTech offers a kit that offers a flange adaptor plate and the necessary hardware to attach it to a customer-supplied pole. Further information and instructions are found in this manual's **ADAPTOR FLANGE INSTALLATION KIT** section.

## 5.2.2 Over-the-Bow Deployment

Edgetech's recommended option is to mount the 6205s2 sonar head to the bow of the survey vessel. An example of an over-the-bow deployment is depicted in the photographs in **FIGURE 5-1**. If help is needed with this type of installation, do not hesitate to contact **EDGETECH CUSTOMER SERVICE**.



*Figure 5-1: 6205s2 Deployment, Option 1 – Over-the-Bow*



### 5.2.3 Over-the-Side Deployment

An alternative to the bow mount is to secure the 6205s2 sonar head over the survey vessel's side via a pole. An example of an over-the-side deployment is illustrated in the images in **FIGURE 5-2**. If help is needed with this type of installation, contact **EDGETECH CUSTOMER SERVICE**.



*Figure 5-2: 6205s2 Deployment, Option 2 – Over-the-Side*

### 5.2.4 USV Deployment

An alternative to the ship-mounted sonar is to secure the 6205s2 system to an uncrewed survey vessel. An example of an Unmanned Surface Vehicle (USV) deployment is illustrated in the image in **FIGURE 5-3**. Contact **EDGETECH CUSTOMER SERVICE** for assistance with any USV installation.



Figure 5-3: 6205s2 USV Deployment (IM Solutions USV)

### 5.3 Positioning the Topside Interface Box

The Topside Interface Box should be positioned to enable direct communications with the deck crew operating the survey vessel, sonar head, and other supporting sensors. Try and position the box out of areas of direct sunlight, especially in tropical environments, as heat build-up can occur, and viewing status indicators can become difficult to see due to brightness and glare. It should be located and set up in a dry, sheltered area on the survey vessel that is protected from weather and water spray.

## 6.0 CONNECT TO SONAR

This section describes how to connect to the sonar, ensure all supporting data is present within the system for proper operation, and correctly time sync the 6205s2 data. It also briefly describes the EdgeTech Discover Bathymetric software. Refer to [THE DISCOVER BATHYMETRIC SOFTWARE USER MANUAL \(0014878\)](#) for complete software details and instructions.

### 6.1 Connecting to Sonar via Remote Desktop

A user can connect to the 6205s2's internal computer using Windows's Remote Desktop application and view the sonar application (Sonar.exe) to check the status of the supporting data if a device is not connected properly. If this is the case, Discover Bathymetric will display its diagnostic window and show which serial port is causing the error. Connecting to the sonar without EdgeTech support is not recommended, except for the instructions below.

#### 6.1.1 Connecting with the User-supplied computer

1. Navigate to the **Remote Desktop** using Windows 'Start' button > All Programs > Accessories > Remote Desktop Connection. Alternatively, click the Windows 'Start' button, type **mstsc** in Search, and hit <Enter>. The following window will appear:

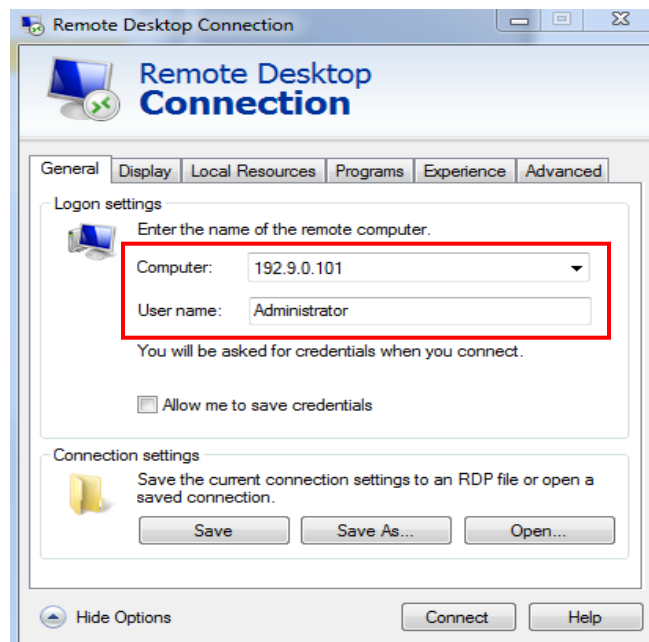


Figure 6-1: Manual Remote Desktop Credentials for Customer Supplied Computer

2. Connect to the 6205s2 Sonar using an IP address of **192.9.0.101** and the User name, **Administrator**.
3. When prompted for a password, input **admin**. Once logged on, the following window will appear on the desktop or be minimized:

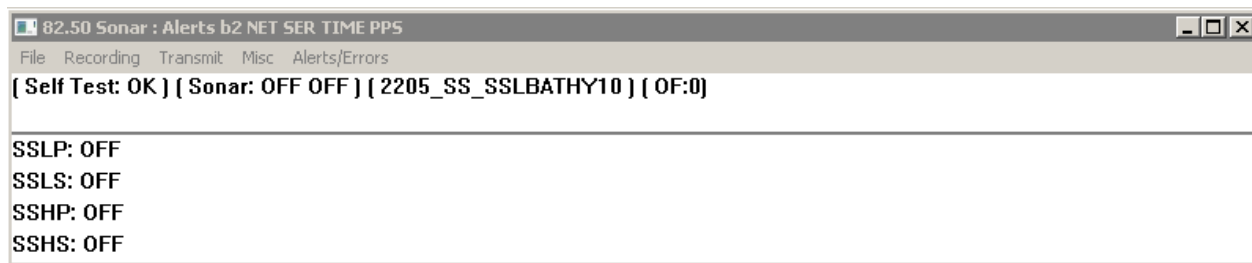


Figure 6-2: Sonar 192.9.0.101 Remote Desktop Connection Window

This window represents the main firmware running on the embedded CPU located in the bottle of the sonar head. Called *Sonar.exe*, this program is responsible for controlling the sonar's hardware and performs specific functions such as signal processing and time synchronization of the acquired data.

## 6.1.2 Connecting with the EdgeTech supplied computer

When using an EdgeTech supplied computer:

1. Launch the **Remote Desktop to Sonar** application on the desktop screen. If prompted for a password, input **admin**.

Once logged on, the Sonar Application will be displayed on the screen, as shown in **FIGURE 6-2**. This window represents the main firmware running on the embedded CPU located in the bottle of the Sonar Head. Called *Sonar.exe*, this program is responsible for controlling the sonar's hardware and performs specific functions, such as signal processing and time synchronization of the acquired data.

## 6.2 Confirming Supporting Data is Present

To ensure the sonar head's processor is communicating properly with the topside, complete the following:

**NOTE:** This section assumes all auxiliary sensors have been connected to the 6205s2 Interface Box (whether this is the 6205s2-R or 6205s2-S), the sonar head is installed on a survey vessel (or reasonably setup in a suitable workshop environment), and it is submerged in water.

1. Launch **Remote Desktop to Sonar** on the Windows desktop. The following window should appear:

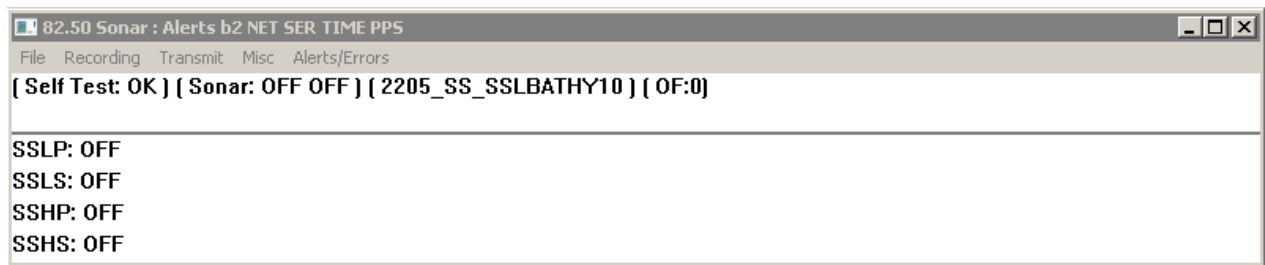


Figure 6-3: Sonar 192.9.0.101 Remote Desktop Connection Window

2. Click on **Menu > Misc > Serial Port Information**.
3. Check each COM port in the dropdown menu to ensure the correct baud rates are set and data is coming through for each device and in the correct format, as shown in **FIGURE 6-4**.
  - a. COM1 = MRU
  - b. COM2 = GNSS
  - c. COM4 = Sound Velocity Sensor located in the sonar head's housing

**NOTE:** GNSS and MRU are interchangeable on COM1 and COM2 as long as the appropriate baud rate is set in the dropdown menu next to channel assignment in Serial Port Information Window, as shown in **Figure 6-4**, red arrow.

More information on how to configure the COM ports is presented in **CONFIGURING COM PORTS**.

If all systems are working properly, close this window and proceed to Step 4. If there is an issue with one of the ports, contact **EDGETECH CUSTOMER SERVICE**.

**CAUTION!** Sound velocity is extremely important for the system to operate correctly. When sound velocity measurements are not present (i.e., the port is reporting no data), use **SECTION 7: TROUBLESHOOTING** to go through the troubleshooting process.



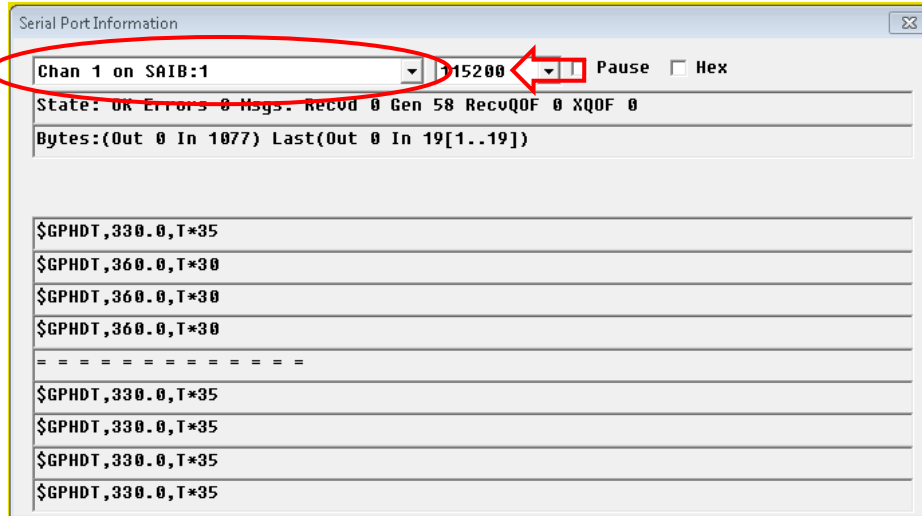


Figure 6-4: Serial Port Information Window

4. Click on **Menu > File > Show Status**. The System Status window will appear.
5. At the bottom of the window, click the **Config** bullet, then the dropdown menu item named **Config Item**.
6. Select **Serial** from the list.

Check to make sure all sensors' usage percentages are well below 80%, as shown in **FIGURE 6-5**.

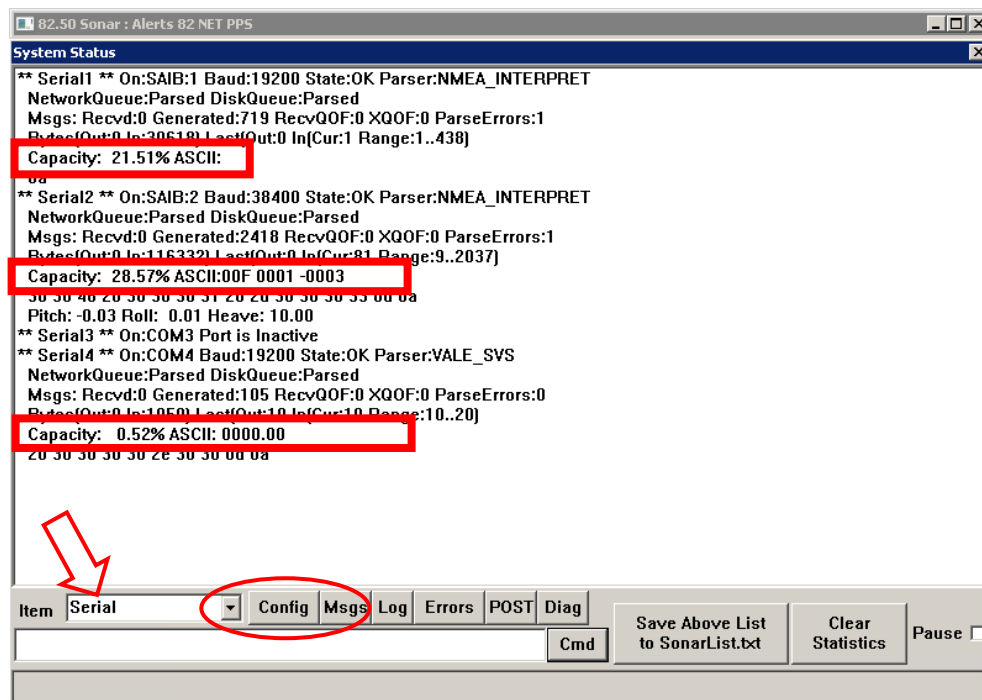


Figure 6-5: Sensor Usage Percentage Check

7. If they are not, increase the baud rates of the sensors until these percentages drop. Make sure to change the baud rate accordingly in **Sonar**.
8. When satisfied with the incoming data, press **OK** in the System Status window and close the **Sonar - 192.9.0.101 - Remote Desktop Connection** window.

## 7.0 MAINTENANCE

The 6205s2 Sonar Head is not designed for long-term deployments, and it is not recommended to keep the system in water for more than two weeks at a time, especially in warm, salty waters.

After each mission, the system should be rinsed thoroughly with fresh water, making sure to rinse the SVS, which is mounted onto the connector nose cap, and connectors at the back.

EdgeTech recommends regularly checking the array faces. Fouling and corrosion may degrade the 6205s2 system's measurements and/or the sound velocity sensor at the bottom of the Sonar Head. If fouling is observed, clean the sonar head using a washcloth with mild soap and freshwater. The SVS, mounted onto the connector nose cap, should be regularly inspected, cleaned, and re-calibrated according to the manufacturer's guidelines.

Contact [EDGE TECH CUSTOMER SERVICE](#) as soon as possible when any damage is observed.

**CAUTION!** The 6205s2 system should NEVER be turned on and left powered on when the sonar head is not submerged in water because the unit will, in all likelihood, overheat, causing permanent damage (despite a basic protection system). In limited circumstances, the 6205s2 can be turned on but only with the Tx Power OFF (see Discover Bathymetric) to quickly test the system before deployment; however, this should never exceed a few minutes. Contact [EDGE TECH CUSTOMER SERVICE](#) for further details

## 8.0 TROUBLESHOOTING

### 8.1 Troubleshooting the SV Sensor

In some cases, the sound velocity sensor may not start operating correctly. When this occurs, Discover Bathymetric will show a **Port 4: Error** on its **Diagnostic Window**, indicating that no sound velocity measurements are being reported to the sonar head. An example of this error is shown in **FIGURE 8-1**.



Figure 8-1: No Sound Velocity on Port 4

If this error persists longer than 30 seconds, follow the procedure below to resolve the issue:

1. Place the Sonar Head in water, deep enough to submerge the SV probe (immerse the sonar head so that only the uppermost edge of the sonar head is exposed). This will submerge the sound velocity sensor as well.
2. On the Windows Desktop, launch **Remote Desktop to Sonar**. The following window should appear:

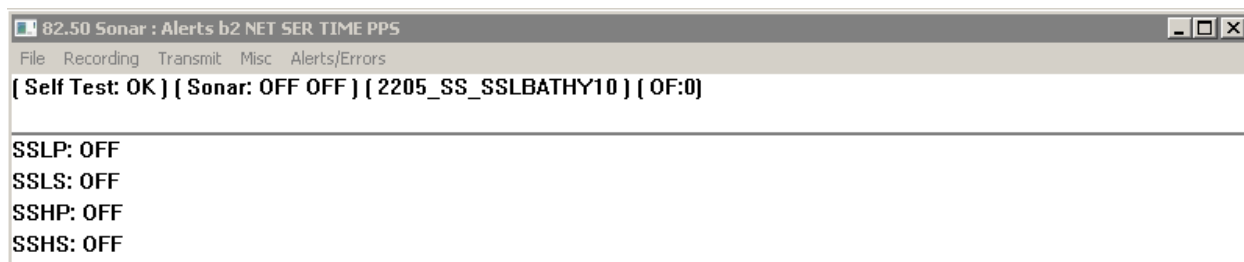


Figure 8-2: Sonar 192.9.0.101 Remote Desktop Connection Window

3. Click on Menu > Misc > Serial Port Information.
4. Check **Chan 4 on Com 4** from the dropdown list to see if any data is being reported by port.

5. If no data is present, cycle the power on the sonar head using the On/Off switch on the Topside Interface unit. Allow the sonar to be off for at least 10 seconds before turning it back on.
6. Once the sonar is reconnected, go back into the **Remote Desktop** application and check **Chan 4 on COM 4** again, as in step 4 above.
7. If the port reports data, then proceed to normal operation. If not, continue to step 8.
8. Closeout of *Sonar.exe* by clicking on the 'X' in the top right corner, as shown in **FIGURE 8-3**, red arrow.

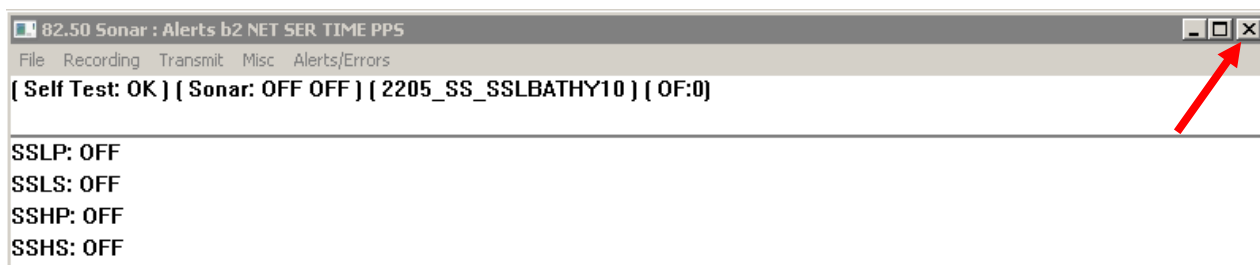


Figure 8-3: Closing the Sonar.exe Application

9. Double-click the “EdgeTech Shortcut” and navigate to the Utilities/TeraTerm folder. Launch **ttermpro.exe**.
10. Select **Serial**, choose **COM4** from the dropdown menu, as shown in **FIGURE 8-4**, and click **OK**.

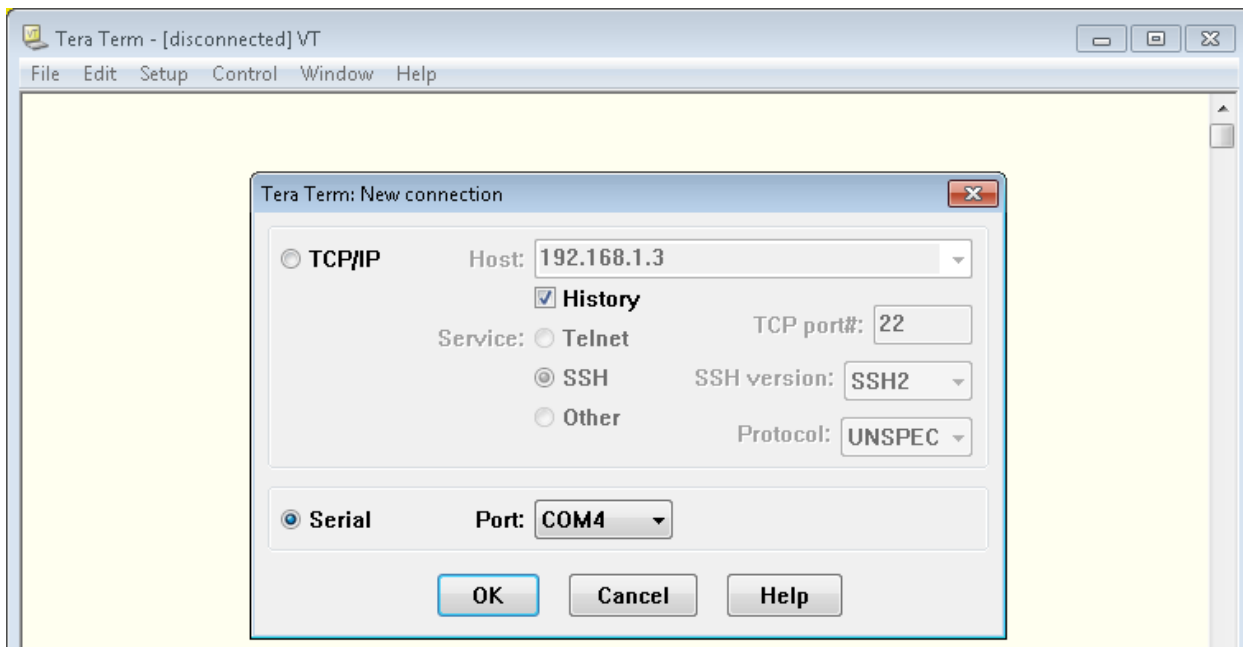


Figure 8-4: Connecting to COM4 using TeraTerm

11. Now, choose **Setup** from the top menu and then **Serial port**.
12. Configure the serial port options as shown in **FIGURE 8-5**, and then click **OK**.

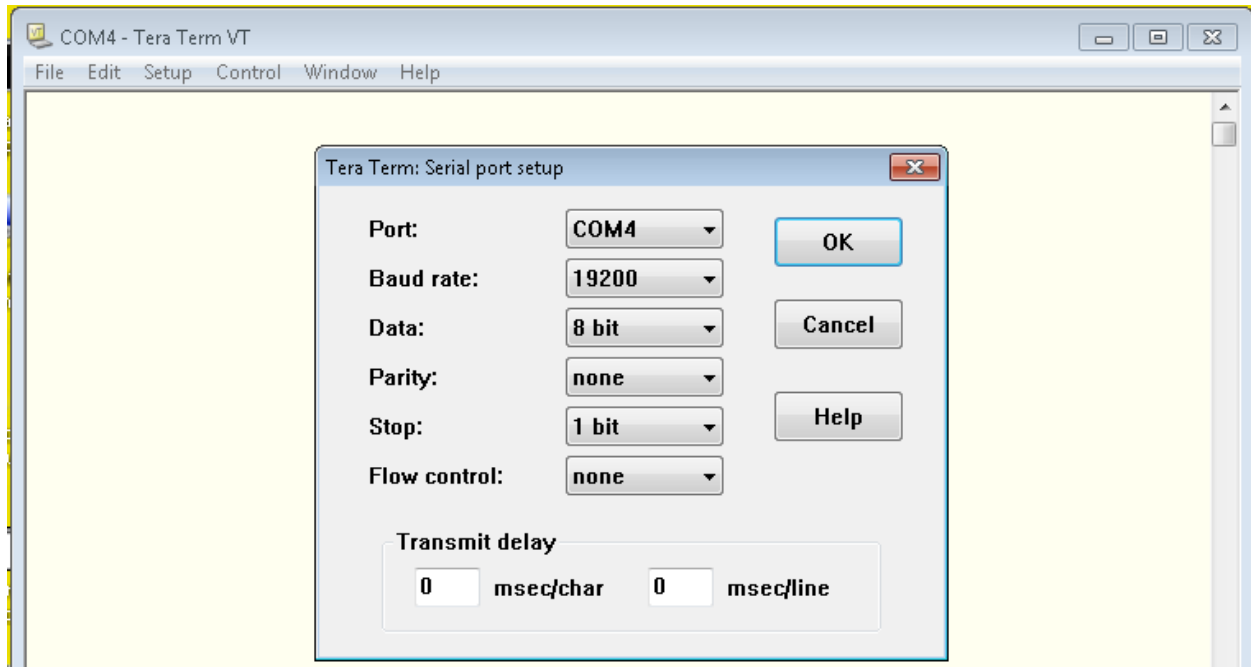


Figure 8-5: COM4 Port Settings

13. Input the following commands:

Press <Enter> to start communications to SV sensor.  
Type in "**SET STARTUP NOHEADER**" and press <Enter>.  
Type in "**SET SV FORMAT 42**" and press <Enter>.  
Type in "**SET SAMPLE 1/S**" and press <Enter>.  
Type in "**SET DETECT 06**" and press <Enter>.

14. Cycle the power on the Sonar Head using the On/Off switch on the interface box. Allow the sonar to be off for at least 10 seconds before turning it back on.
15. Reconnect to the sonar via the Remote Desktop and check COM4 using the Sonar application as before in steps 3 and 4 above. SV data should not be scrolling as in:

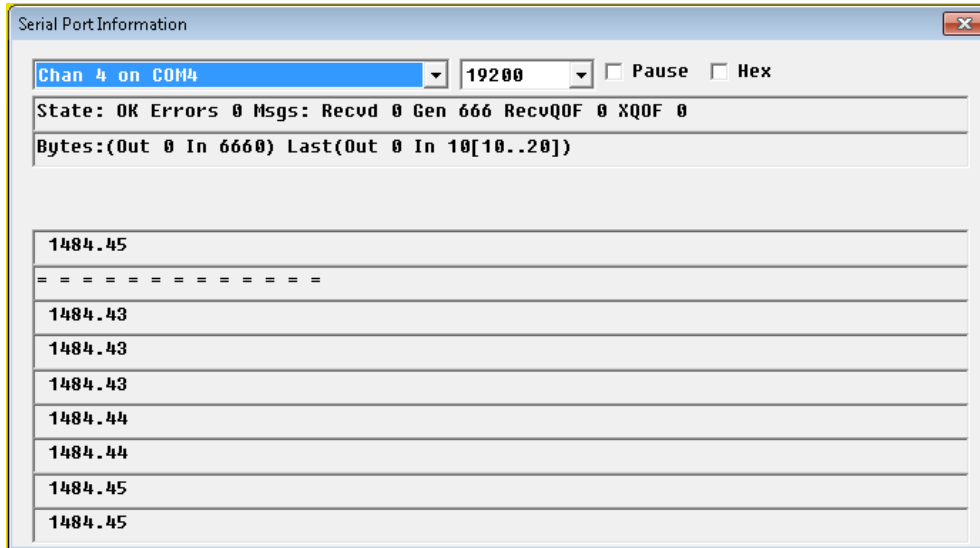


Figure 8-6: Scrolling SV Data in Sonar.exe

16. If SV data is still not present, contact [EDGE TECH CUSTOMER SERVICE](#) with the noted information.

## 8.2 Configuring Auxiliary Sensors for Redundant Information

Auxiliary sensors can input redundant auxiliary information into the 6205s2. This will cause a significant data alignment problem as the sequential sonar data packets will be inconsistently stuffed from multiple sources. This section defines redundant auxiliary information as multiple sources of the same class of auxiliary information (e.g., roll, pitch, heading). This redundancy problem is generally caused by two sensors supplying the same message string and two sensors supplying the same information but from different messages. The following subsections describe each problem and the configuration that should be done to remedy it. In the event the auxiliary sensors cannot be reprogrammed to output select data messages, the Discover software should be configured so that only one specific source of information is used.

### 8.2.1 Two Different Sensors Supplying the Same Message

If two different sensors are outputting the same message (NMEA HDT, for example) and the sensors cannot be reprogrammed, then the Discover Bathymetric Software must be configured to accept the HDT information from one of the sensors only. To do so, use the procedure described below.

**NOTE:** The configuration described below only works if there are two sensors outputting the same specific message (like HDT). It does not work for different messages that contain the same information (i.e., OCTANS and HDT). Refer to Scenario 7.3.2 in this case.

1. Open the Auxiliary Sensors control dialog box (**Configuration** menu > **Auxiliary Sensors**), as shown in **FIGURE 8-7** and **FIGURE 8-8**.

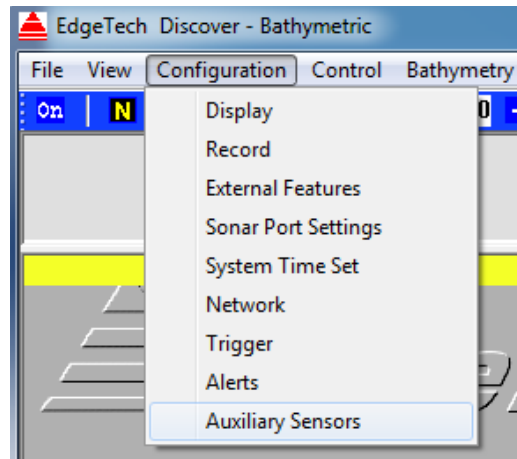


Figure 8-7: Configuration Menu

 The image shows a screenshot of the 'Auxiliary Sensors' dialog box. It contains a table with columns for sensor name, status, Total, Not Processed, and Average Rate (Hz). Several rows are highlighted with colored boxes: GGA, HDT, VTG, and GGK are highlighted in red, and HDT is highlighted in green.
 

		Total	Not Processed	Average Rate (Hz)
Pitch / Roll:	ON	1668	0	55.87
Pressure:	ON	35	35	1.11
Altitude:	ON	0	0	---
SV:	ON	35	0	1.11
NMEA:		1369	0	
GGA:	COM1	334	0	11.11
GLL:	OFF	0	0	---
RMA:	OFF	0	0	---
RMC:	OFF	0	0	---
HDG:	OFF	0	0	---
HDT:	COM2	0	334	11.11
DPT:	OFF	0	0	---
DBT:	OFF	0	0	---
VTG:	COM1	334	0	11.11
ETC:	OFF	0	0	---
GGK:	COM1	334	0	11.10
HYDRO:	OFF	0	0	---
PASHR:	OFF	0	0	---
HEAVEA:	OFF	0	0	---

Figure 8-8: Auxiliary Sensors



- Specify what serial port to use for each particular input message. For example, in **FIGURE 8-8**, COM1 is used to feed GGA, VTG, and GPK, as shown in **FIGURE 8-8**, red box, to the 6205s2 Sonar Head, while COM 2 feeds in HDT, as shown in **FIGURE 8-8**, green box.
- When satisfied with the serial port setup, click on the **X** at the top right of the dialog box.
- Monitor Discover's Lower Control Panel Main Status Line Display and Radio Indicator Tabs to ensure all supporting data is present.

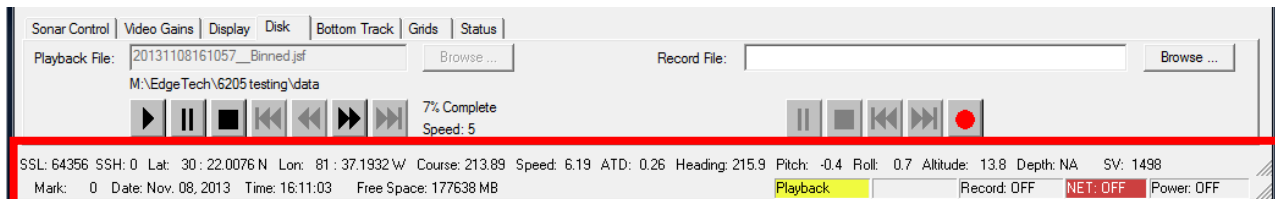


Figure 8-9: Sonar Control Tab

**NOTE:** Refer to the **DISCOVER BATHYMETRIC SOFTWARE MANUAL (PN 0014878)** for more information.

## 8.2.2 Two Sensors Output Same Information with Different Messages

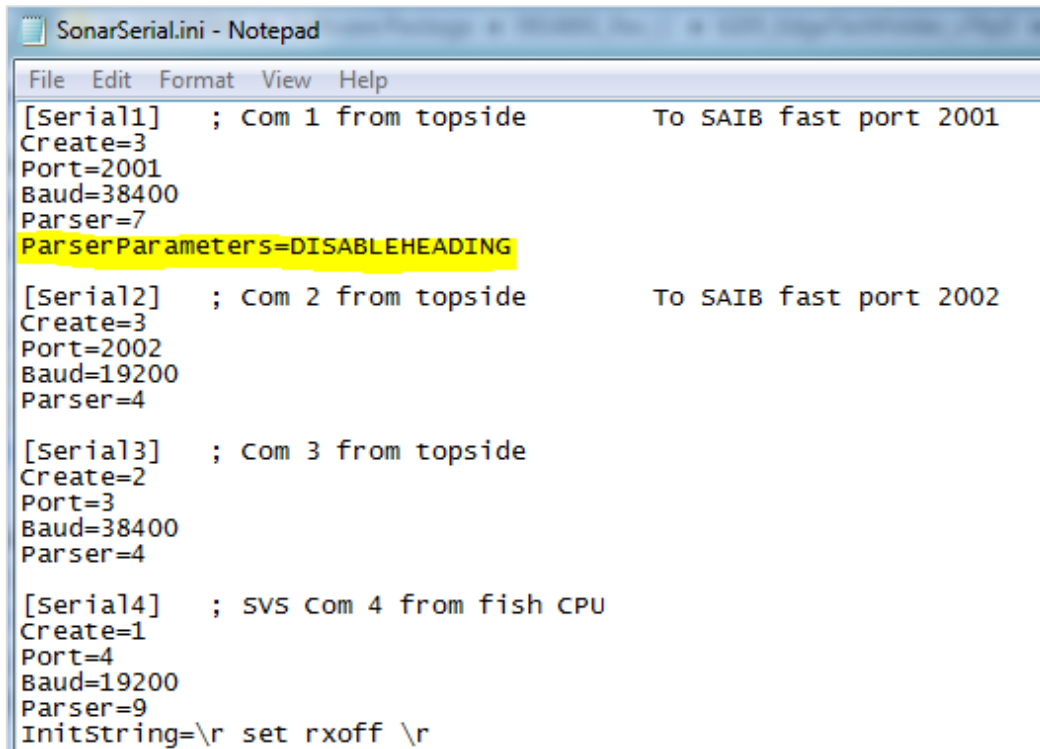
Some motion sensors cannot turn off specific fields within their output strings. For example, a sensor that outputs an OCTANS message delivers roll, pitch, heading, and heave to the 6205s2 Sonar Head with no way for the particular sensor to turn off any of these specific fields. If a sensor like this is paired with another sensor that outputs the same information but in a different message format (i.e., NMEA HDT), redundant information is supplied to the system. This poses a problem and can lead to a significant alignment error in the 6205s2 data.

To correct this, the 6205s2 can be programmed to ignore specific fields within one particular message. Use the example above and state the second heading sensor is preferred. Proceed to the following steps:

- Log in to Remote Desktop as outlined in sub-section 5.1.
- Double click on the folder labeled "Shortcut to EdgeTech Folder."
- Navigate to the **D:/EdgeTech/SSSSonarBathy/Sonar** directory and open the **SonarSerial.ini** file.

**WARNING!** Be careful in manipulating this file and only change what is stated in these directions. Changing any other field may cause sonar malfunction.

- Find the serial port outputting the redundant message, and under the **Parser** field, add the words **ParserParameters=DISABLEHEADING**. For example, if COM 1 on the interface box is used to input an OCTANS message at a baud rate of 38400, then SonarSerial.ini should be manipulated to reflect, as shown in **FIGURE 8-10**.



```

SonarSerial.ini - Notepad
File Edit Format View Help
[Serial1] ; Com 1 from topside To SAIB fast port 2001
Create=3
Port=2001
Baud=38400
Parser=7
ParserParameters=DISABLEHEADING
[Serial2] ; Com 2 from topside To SAIB fast port 2002
Create=3
Port=2002
Baud=19200
Parser=4
[Serial3] ; Com 3 from topside
Create=2
Port=3
Baud=38400
Parser=4
[Serial4] ; SVS Com 4 from fish CPU
Create=1
Port=4
Baud=19200
Parser=9
InitString=\r set rxoff \r

```

Figure 8-10: SonarSerial.ini

**NOTE:** This new keyword disables the heading message from the OCTANS message. The same can be done with an EM1000 binary format message.

Heading and heave are currently the only fields that can be enabled/disabled in the SonarSerial.ini file.

**To disable heave:** ParserParameters=DISABLEHEAVE

- Save the file and exit.
- Power cycle the 6205s2 Sonar Head, allowing at least 15 seconds between switching off and on.

## 8.3 Configuring COM Ports

There are three available COM ports on the Topside Interface Box to provide the necessary information to the 6205s2. This information includes position (latitude/longitude), heading, attitude (roll, pitch, and heave), and time. This appendix explains how to configure the three COM ports depending on the type of sensors used.

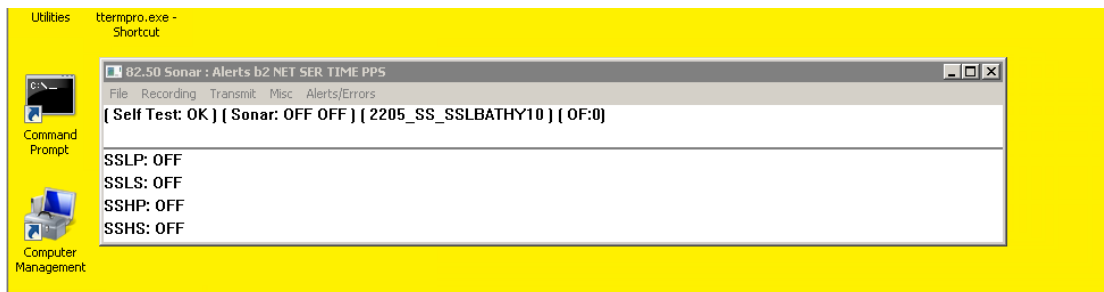
**NOTE:** Most COM port configurations should be completed via the Discover Bathymetric Software.

### 8.3.1 One Sensor

One sensor, such as the Applanix PosMV, may be used to supply position (latitude/longitude), heading, attitude, and a time source. For this type of configuration, only COM1 will be utilized.

To configure the COM ports for one sensor:

1. Turn on Topside PC and connect the 6205s2 via the deck cable to the 6205s2 Topside Interface Box.
2. Turn on the 6205s2 Sonar Head and run the Remote Desktop Application, named Sonar. The main screen, as shown in **FIGURE 8-11**, should appear.



*Figure 8-11: Sonar Remote Desktop Application, Main Screen*

Here, the user will see the Sonar Application running (designated by the blue arrow). Sonar.exe is the firmware that controls the system.

3. Click on the 'X' at the top right to close the firmware.
4. Double click on the Shortcut to EdgeTech icon and open the SSSonarBathy folder, then the Sonar folder.
5. Look for the SonarSerial.ini file, as shown in **FIGURE 8-12**, and open it using WordPad or Notepad, as shown in **FIGURE 8-13**.

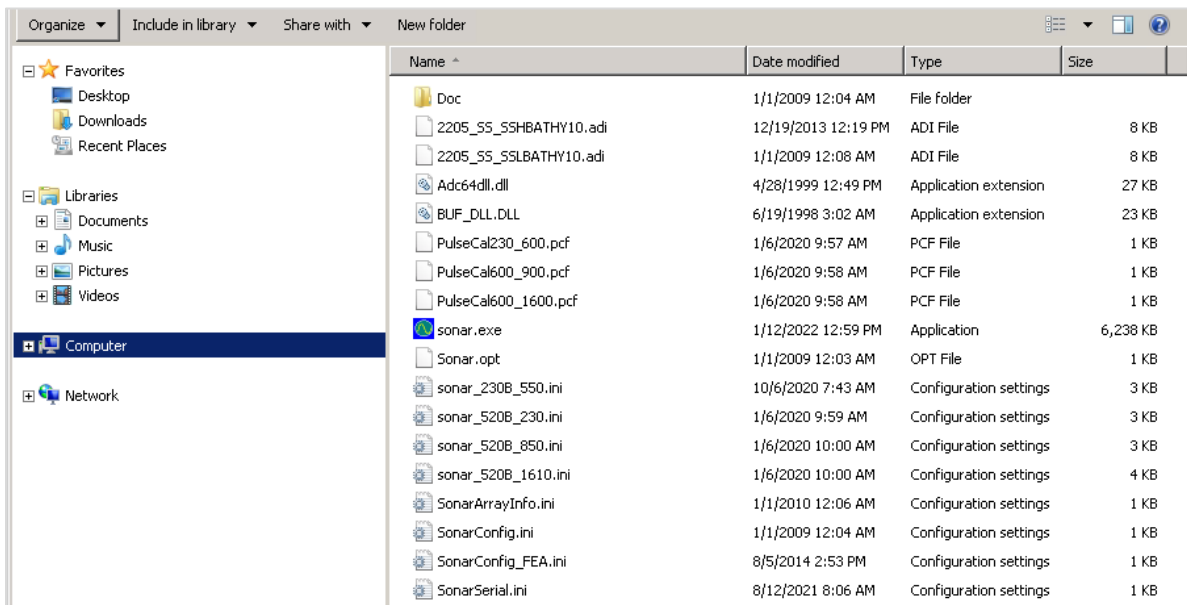


Figure 8-12: Finding the SonarSerial.ini File

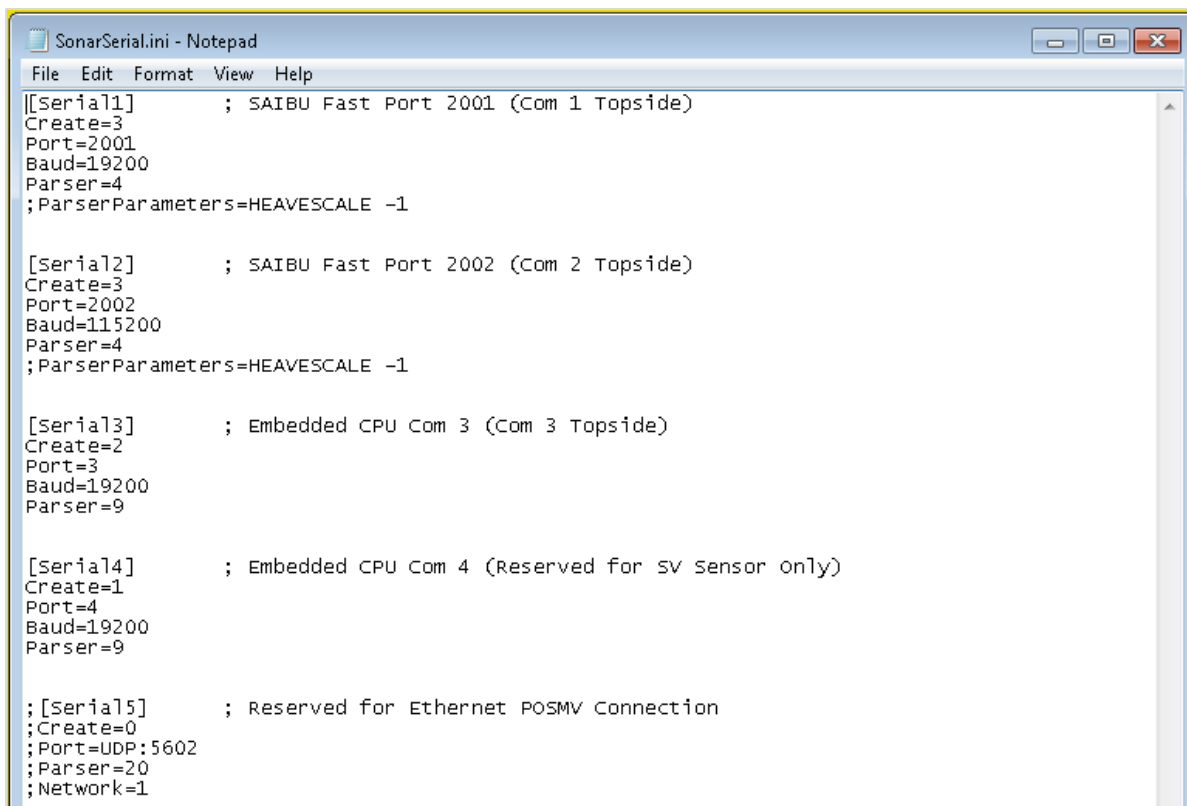


Figure 8-13: SonarSerial.ini File

- Under [Serial2] and [Serial3] set Create = 0, select File > Save, and close the file.

**CAUTION!** Do not alter the file in any way other than what has been specified.

This will deactivate COM ports 2 and 3. By deactivating these ports, Sonar will report to Discover that only one sensor is to be used on COM1 to parse the necessary sensor information. Therefore, Discover will not display any errors if a sensor is not connected to COM2 or COM3.

If steps 3 through 6 were not carried out, then these errors would be reported in the Diagnostic window, as shown in **FIGURE 8-14**.

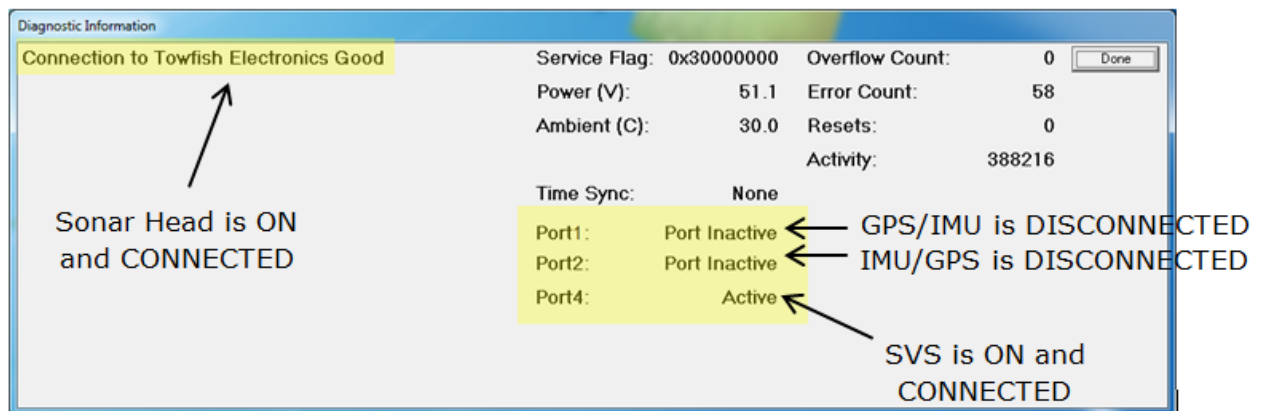


Figure 8-14: Diagnostic Window, Reporting Ports Inactive Error

- Close the SonarSerial.ini file and restart the Sonar application by double-clicking on the Sonar icon in the main Sonar Remote Desktop Screen, as shown in **FIGURE 8-15**



Figure 8-15: Sonar.Exe Desktop Location

- Plug the device into COM 1.
- Click **Misc.** at the top of the Sonar screen, as shown in **FIGURE 8-16**, then **Serial Port Information**.
- Check **COM1** and set the correct baud rate for that device using the dropdown menu, shown with a blue arrow in **FIGURE 8-16**. When the correct baud rate is set, the State should say **OK**, and **Errors** should not be increasing, as shown circled in green in **FIGURE 8-16**. In addition, the correct data string should also be scrolling in the lower part of the window, as shown by the green arrow, **FIGURE 8-16**.

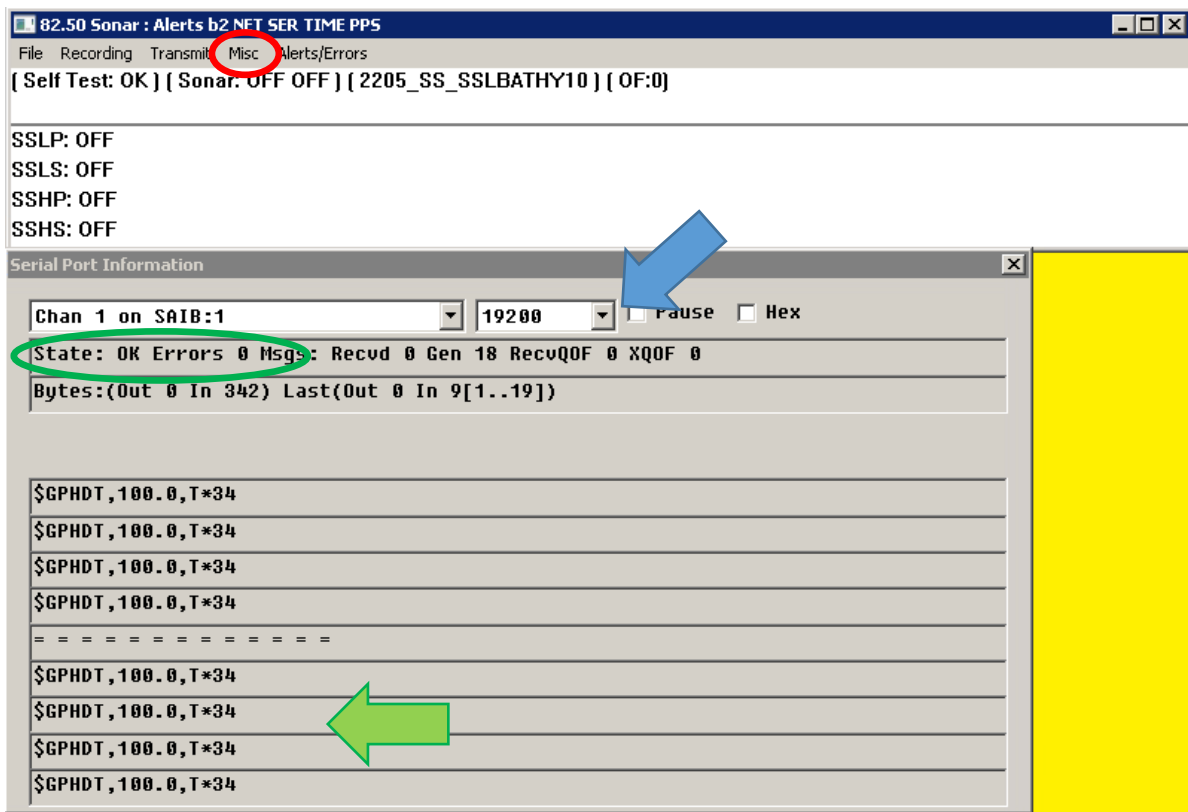


Figure 8-16: Checking Serial Port Information

11. Click **File > Show Status** in the sonar window, as shown circled in red in **FIGURE 8-17**.

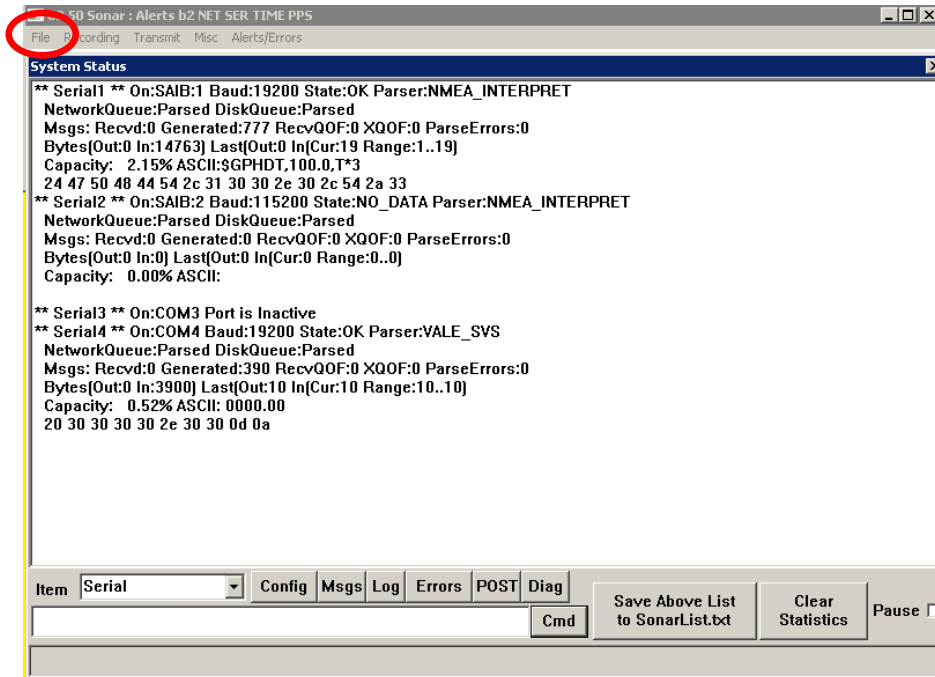


Figure 8-17: Checking Sensor Status

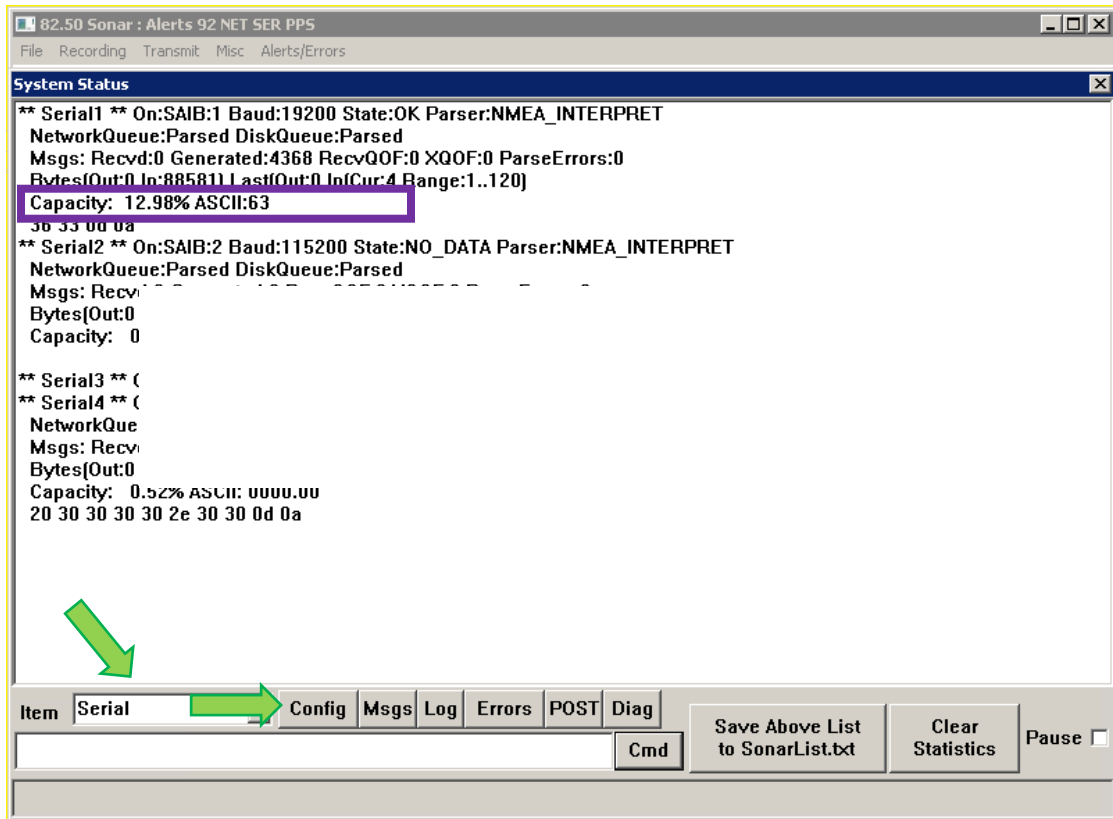


Figure 8-18: Closing the System Status Window

12. At the bottom of the window, make sure the item dropdown is Serial. Click the config button.
13. Check to ensure the sensor's usage percentage is well below 80% (marked by a purple box).
  - a. If it is not, increase the baud rate of the sensor. Change the baud rate under Serial Port Information, as shown in step 10. Check the Status again. Otherwise, the sonar will report errors.
14. When satisfied with the incoming data, press OK in the System Status window, as shown in [FIGURE 8-18](#).
15. Finally, close the Sonar - 192.9.0.101 - Remote Desktop Connection window.

**NOTE:** If this window is left open during data acquisition, the user may experience a very slow computer. This is because the remote desktop application uses a large amount of the link capacity to stay open. So it is always a good idea to close the remote desktop application when finished with configurations.

### 8.3.2 Two Sensors

Two sensors, such as a dual-headed GNSS (heading, position, and time source) and a motion reference unit (roll, pitch, and heave), may be used to supply the necessary information. For this type of configuration, only COM1 and COM2 will be used.

To configure the COM ports for the two sensors:

1. Follow steps 1 through 6, as stated in the, **ONE SENSOR** instructions.
2. Under [Serial3], set Create = 0, select File > Save and close the file, as shown in **FIGURE 8-20**.

**CAUTION!** Do not touch anything else, or the system's configuration files could be seriously compromised, and functionality may suffer.

This will deactivate COM3. By deactivating this port, Sonar will report to Discover that only two sensors are to be used on COM1 and COM 2 to parse the necessary sensor information. Therefore, Discover will not throw up any errors if a sensor is not connected to COM3.

```

** Serial1 ** On:SAIB:1 Baud:19200 State:OK Parser:NMEA_INTERPRET
NetworkQueue:Parsed DiskQueue:Parsed
Msgs: Recvd:0 Generated:104 RecvQOF:0 XQOF:0 ParseErrors:1
Bytes(Out:0 In:4788) Last(Out:0 In[Cur:46 Range:2..438]
Capacity: 12.98% ASCII:0.0,T*34$GPZDA
30 2e 30 2c 54 2a 33 34 0d 0a 24 47 50 5a 44 41
** Serial2 ** On:SAIB:2 Baud:38400 State:OK Parser:NMEA_INTERPRET
NetworkQueue:Parsed DiskQueue:Parsed
Msgs: Recvd:0 Generated:389 RecvQOF:0 XQOF:0 ParseErrors:1
Bytes(Out:0 In:20442) Last(Out:0 In[Cur:47 Range:16..2037]
Capacity: 28.83% ASCII:GPVTD,307.00,T,3
47 50 56 54 47 2c 33 30 37 2e 30 30 2c 54 2c 33
Pitch: -0.03 Roll: 0.01 Heave: 10.00
** Serial3 ** On:COM3 Port is Inactive
** Serial4 ** On:COM4 Baud:19200 State:OK Parser:VALE_SVS
NetworkQueue:Parsed DiskQueue:Parsed
Msgs: Recvd:0 Generated:19 RecvQOF:0 XQOF:0 ParseErrors:0
Bytes(Out:0 In:190) Last(Out:10 In[Cur:10 Range:10..20]
Capacity: 0.52% ASCII:0000.00
20 30 30 30 30 2e 30 30 0d 0a

```

Figure 8-19: SonarSerial.ini File

3. Reboot the Sonar Firmware by double-clicking on the Sonar icon in the main Sonar Remote Desktop Screen, as shown in **FIGURE 8-15**, designated by green arrow.



4. Now, plug in the devices into **COM 1** and **COM 2**. Which device is connected to which COM port does not matter, as long as their respective ports and baud rates are set in Sonar.
5. Click on **Misc.** at the top of the Sonar screen, as shown in **FIGURE 8-16**, then **Serial Port Information**.
6. Check **COM1** and set the correct baud rate for that device using the dropdown menu shown in blue, as shown in **FIGURE 8-16**. When the correct baud rate is set, the State should say **OK**, and **Errors** should not be increasing, as shown in **FIGURE 8-16**, circled in green. The correct data string should also be scrolling in the lower part of the window, as shown in **FIGURE 8-16**, green arrow.
7. Now Check **COM2** and set the correct baud rate for the other device as done before in Step 6.
8. Now click on **File > Show Status** in the sonar window, as shown circled in red in **FIGURE 8-17**.
9. On the right-hand side of the window, click on the **Config** bullet under the **Update** button and then on the dropdown menu named **Config Item**, as shown in **FIGURE 8-18**.
10. Select **Serial** from the dropdown menu (green arrow), then click on the **Update** button (blue arrow) several times, as shown in **FIGURE 8-18**.
11. Check to make sure sensors' usage percentages are well below 80%, as shown in **FIGURE 8-20**, circled in purple. If they are not, increase the sensor's baud rate. Change baud rate under **Serial Port Information** as done in steps 6 and 7. Check **Status** again. Otherwise, sonar will report errors.

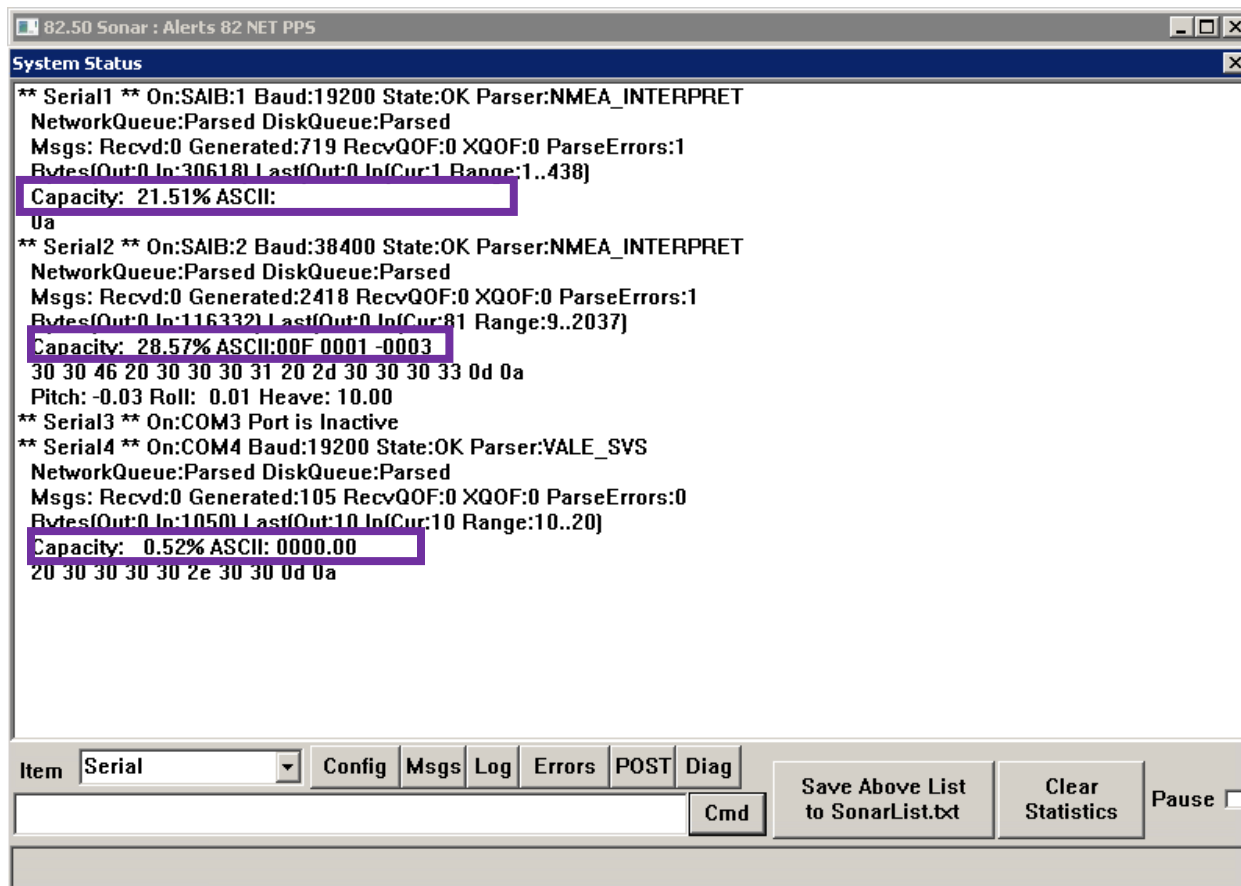


Figure 8-20: Checking Sensors' Usages

12. When satisfied with incoming data, press **OK** in the 'System Status' window, as shown in **FIGURE 8-20**.
13. Finally, close the Sonar - 192.9.0.101 - Remote Desktop Connection window.

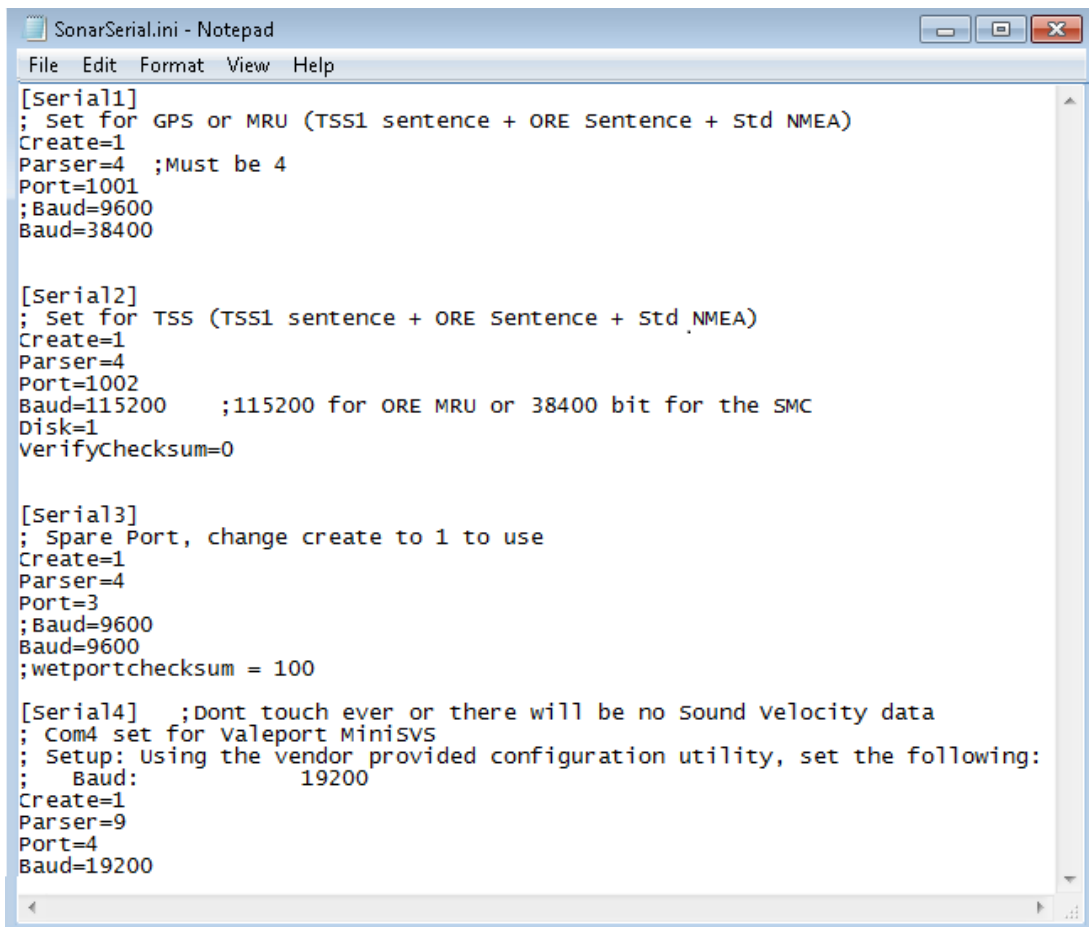
**NOTE:** If this window is left open during data acquisition, you may experience a very slow computer because the Remote Desktop uses a large amount of the link capacity to stay open. When finished with the configurations, it is wise to close the Remote Desktop.

### 8.3.3 Three Sensors

Three sensors, such as a gyro (heading), a GNSS (position and time source), and a Motion Reference Unit (roll, pitch, and heave), may be used to supply the necessary information. For this type of configuration, all available COM ports will be used.

The following steps should be carried out to configure the COM ports for the three sensors.

1. Follow steps (1.) through (6.) as stated previously under appendix sub-section **ONE SENSOR**.
2. Make sure Create=1 under each [Serial#], as shown in **FIGURE 8-21**.



```
SonarSerial.ini - Notepad
File Edit Format View Help

[Serial1]
; Set for GPS or MRU (TSS1 sentence + ORE sentence + Std NMEA)
Create=1
Parser=4 ;Must be 4
Port=1001
;Baud=9600
Baud=38400

[Serial2]
; Set for TSS (TSS1 sentence + ORE sentence + Std NMEA)
Create=1
Parser=4
Port=1002
Baud=115200 ;115200 for ORE MRU or 38400 bit for the SMC
Disk=1
VerifyChecksum=0

[Serial3]
; Spare Port, change create to 1 to use
Create=1
Parser=4
Port=3
;Baud=9600
Baud=9600
;wetportchecksum = 100

[Serial4] ;Dont touch ever or there will be no sound velocity data
; Com4 set for Valeport MinisVS
; Setup: Using the vendor provided configuration utility, set the following:
; Baud: 19200
Create=1
Parser=9
Port=4
Baud=19200
```

*Figure 8-21: All Sensors Set*

3. Select **File > Save** and close the file.

**CAUTION!** Do not touch anything else, or the system's configuration files could be seriously compromised, and functionality may suffer.

4. Close the SonarSerial.ini file and reboot the Sonar Firmware by double-clicking on the Sonar icon in the main Sonar Remote Desktop Screen, as shown in **FIGURE 8-15**, designated by the green arrow.

5. Now, plug in the devices into COM 1, COM 2, and COM 3. The Gyro should be connected to COM1, the MRU COM2, and the GPS to COM3. The devices connected to COM1 or COM2 may be interchanged, but the GPS must be connected to COM3.
6. Click **Misc.** at the top of the Sonar screen, as shown in **FIGURE 8-16**, then **Serial Port Information**.
7. Check COM1 and set the correct baud rate for that device using the dropdown menu shown in blue, as shown in **FIGURE 8-16**. When the correct baud rate is set, the **State** should say **OK**, and **Errors** should not be increasing, as shown in **FIGURE 8-16**, circled in green. The correct data string should also be scrolling in the lower part of the window, as shown in **FIGURE 8-16**, green arrow.
8. Check COM2 and set the correct baud rate for the other device as done before in Step 6.
  - a. Remember to check COM3 as before and set the correct baud rate for GPS.
9. Click on **File > Show Status** in the sonar window, as shown in **FIGURE 8-17**, circled in red.
10. On the right-hand side of the window, click on the **Config** bullet under the **Update** button and then on the dropdown menu named **Config Item**, as shown by the green arrow in **FIGURE 8-18**.
11. Select Serial (green arrow), then click on the Update button several times (blue arrow) in **FIGURE 8-18**.
12. Check to make sure sensors' usage percentages are well below 80%, as shown in **FIGURE 8-22**, circled in purple. If they are not, increase the sensor's baud rate. Change baud rate under Serial Port Information as done in steps 6 and 7. Check Status again; otherwise, sonar will report errors.
13. When satisfied with incoming data, press **OK** in the 'System Status' window, as shown in **FIGURE 8-18**.
14. Finally, close the Sonar - 192.9.0.101 - Remote Desktop Connection window.

**NOTE:** If this window is left open during data acquisition, the user may experience a very slow computer. This is because the remote desktop application uses a large amount of the link capacity to stay open. So it is always good to close the remote desktop application when finished with the configurations.

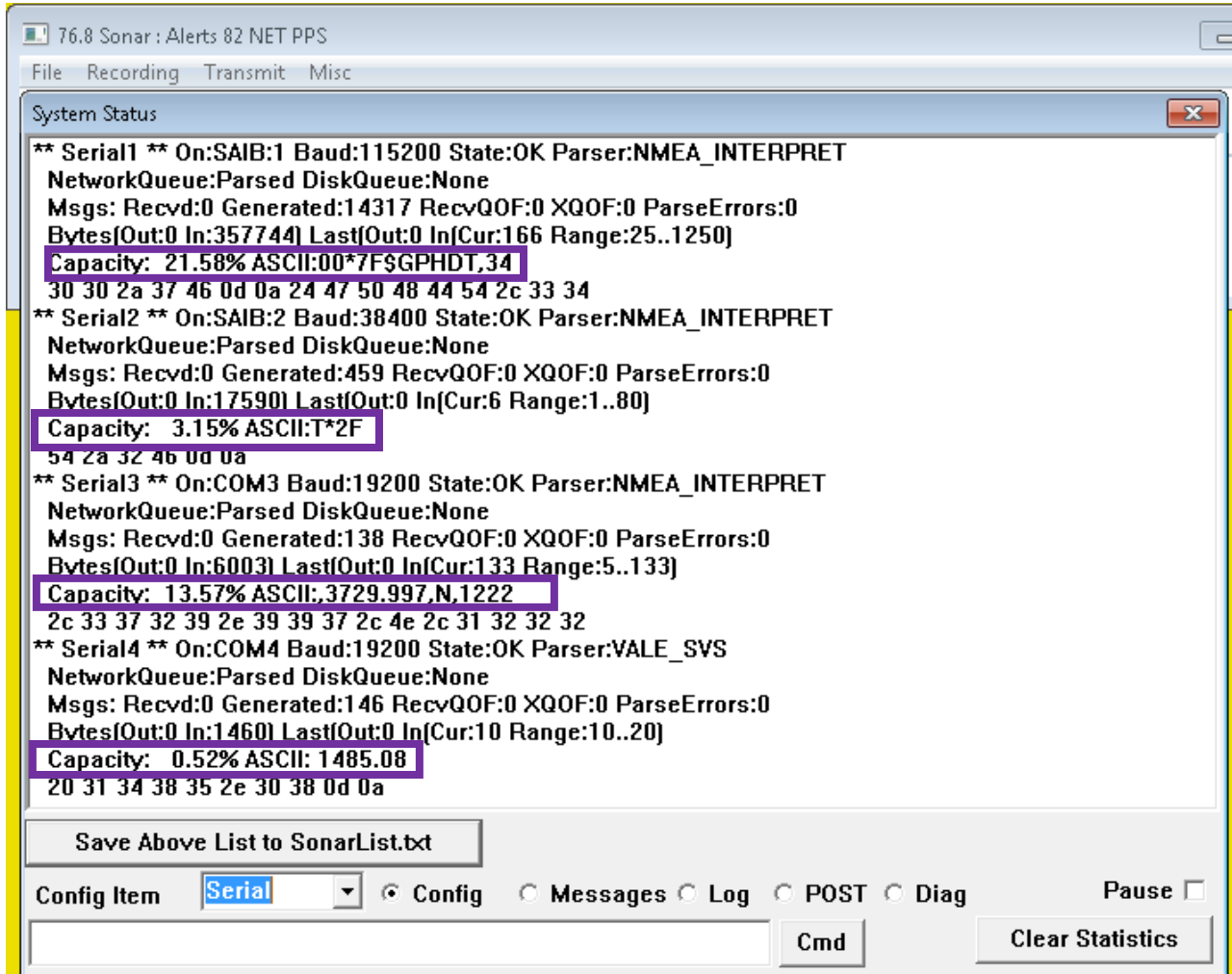


Figure 8-22: Checking all COM Ports

**CAUTION!** EdgeTech recommended performing the process described in the section below through Discover, but the process below provides an alternative. Please refer to the [DISCOVER BATHYMETRY MANUAL](#) for information on how to complete this process in Discover.

### 8.3.4 UDP Connections

The 6205s2 is compatible with data sent over the Ethernet connection via UDP. The SonarSerial.ini is utilized to configure the system to accept these messages. Note that 1PPS functionality must be utilized when operating with attitude / NAV being transferred with UDP messages.

All messages detailed in [SECTION 8.3 CONFIGURING COM PORTS](#) can also be sent to the 6205s2 over the Ethernet connection via UDP. EdgeTech does not recommend this method. The below example shows the same configuration detailed in [FIGURE 8-23](#) but with UDP functionality.

```
[Serial1]
; Set for GPS or MRU (TSS1 sentence + ORE sentence + Std NMEA)
Create=1
Parser=4      ;Must be 4
Port=UDP:10009 ;10009 is a place holder, data can be accepted on any UDP port.
;Baud=38400   ;Buad Rate not needed when using UDP

[Serial2]
; Set for TSS (TSS1 sentence + ORE sentence + Std NMEA)
Create=1
Parser=4
Port=UDP:10010 ;10010 is a place holder, data can be accepted on any UDP port.
;Baud=115200  ;Buad Rate not needed when using UDP
Disk=1
VerifyChecksum=0

[Serial3]
;Spare Port, Change create to 1 to use
Create=1
Parser=4
Port=UDP:10011 ;10011 is a place holder, data can be accepted on any UDP port.
;Baud=9600    ;Buad Rate not needed when using UDP

[Serial4]
; Dont touch ever or there will be no Sound Velocity data
; Come 4 set for Valeport MiniSVS
; Setup: Using the vendor provided configuration utility, set the following:
Create=1
Parser=9
Port=4
Baud=19200
;SVS can't utilize UDP functionality.
```

Figure 8-23: UDP Configuration Example

**CAUTION!** EdgeTech recommended performing the process described in the section below through Discover, but the process below provides an alternative. Please refer to the [DISCOVER BATHYMETRY MANUAL](#) for information on how to complete this process in Discover.

### 8.3.5 Applanix POS-MV Configuration

#### POS MV WaveMaster II SFF IP68



*Figure 8-24: Example Applanix POS-MV GNSS/INS Unit*

The 6205s2 is compatible with the POS-MV system from Applanix. Follow the below steps to configure the 6205s2 and the POS-MV for communication over the Ethernet interface via UDP.

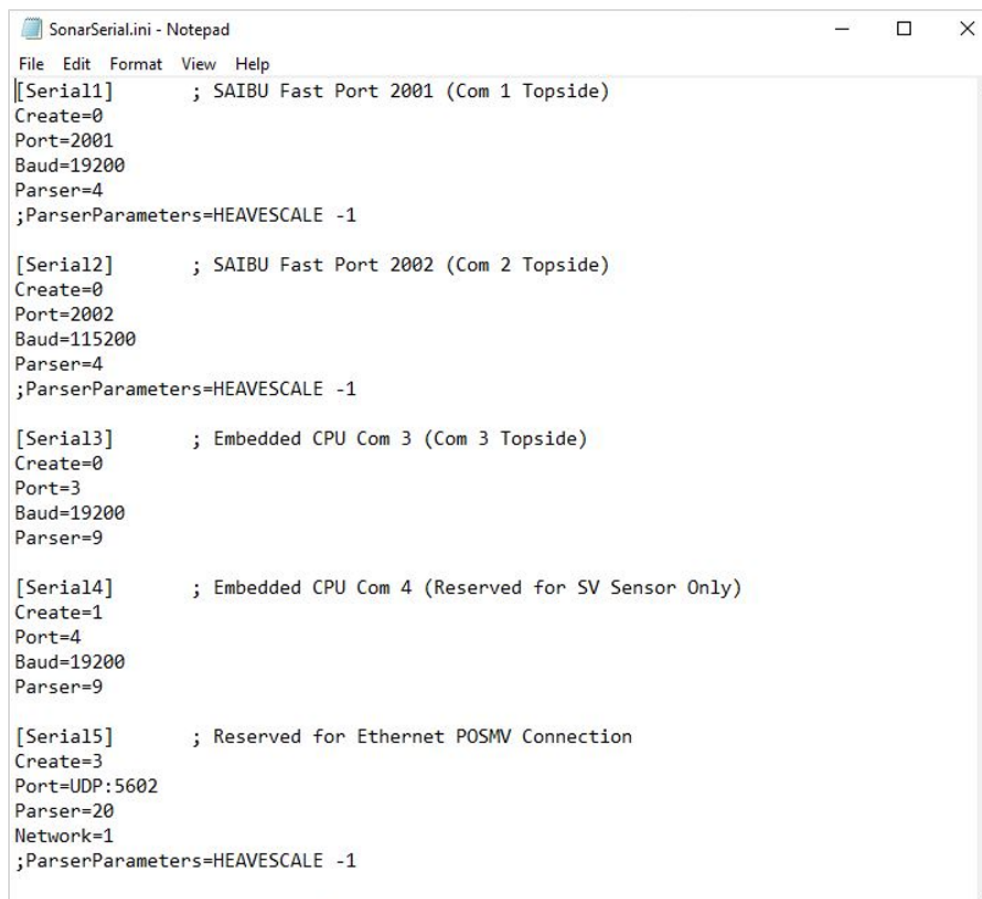
Utilizing the Applanix POSVIEW software:

1. Set the ethernet real-time output data to groups 3,7,10, and 102. The output rate of the POSMV data should be set to 50Hz.
2. The POS-MV must also be set to Falling (Negative) Edge or **Active Low** for the 1PPS as the 6205s2 defaults to sync on the falling edge.
3. Set the POS-MV Time Tag 1 to UTC.

To configure the 6205s2 COM ports for the UDP messages from the POS-MV:

1. Follow steps in [UDP CONNECTIONS](#).
2. Under [Serial1], [Serial2], and [Serial3] set Create = 0.

3. Under [Serial5], set Create = 3 and remove the semicolon from the beginning of each line in the [Serial5] section.
4. When the command Parserparameters=HEAVESCALE -1.0 is present in the [Serial5] section, add or ensure a semicolon at the beginning of the line to disable the command. When the command is not present, leave as is as the command is not required



```

SonarSerial.ini - Notepad
File Edit Format View Help
[Serial11] ; SAIBU Fast Port 2001 (Com 1 Topside)
Create=0
Port=2001
Baud=19200
Parser=4
;ParserParameters=HEAVESCALE -1

[Serial12] ; SAIBU Fast Port 2002 (Com 2 Topside)
Create=0
Port=2002
Baud=115200
Parser=4
;ParserParameters=HEAVESCALE -1

[Serial13] ; Embedded CPU Com 3 (Com 3 Topside)
Create=0
Port=3
Baud=19200
Parser=9

[Serial14] ; Embedded CPU Com 4 (Reserved for SV Sensor Only)
Create=1
Port=4
Baud=19200
Parser=9

[Serial15] ; Reserved for Ethernet POSMV Connection
Create=3
Port=UDP:5602
Parser=20
Network=1
;ParserParameters=HEAVESCALE -1

```

Figure 8-25: POSMV UDP Configuration

**CAUTION!** Do not alter the file other than what has been specified.

This will deactivate COM ports 1, 2, and 3 while activating COM 5, which has been pre-configured for POSMV functionality. Therefore, Discover will not throw up any errors if a sensor is not connected to COM1, COM2, or COM3.

To review the time synchronization sources:

1. Locate and open the SonarConfig.ini file. This file is located in the same directory as the SonarSerial.ini file modified above.



2. This file points the software to the correct configuration file based on the hardware's frequency set in use. Locate the [Main] section and take note of the .ini file being called out. As an example: the below file specifies the system is a 520kHz / 1600kHz Side Scan with 520kHz Bathymetry and, as such, utilizes the sonar\_520B\_1610.ini.

```

[Main]
ConfigFile=sonar_520B_1610.ini

[Config0]
Description=Bathymetry on 520kHz Arrays (Green Dot)
ConfigFile=sonar_520B_1610.ini

```

Figure 8-26: SonarConfig.ini Example

3. Close the SonarConfig.ini without making any changes to the text.
4. Open the file name specified in the SonarConfig.ini. It is found in the same directory.
5. Make sure the TimeSyncSource=POSMV\_BINARY or it includes it in a list. Ensure there is no semicolon in front of this iteration of the keyword.

```

File Edit Format View Help
; Main / overall settings.
;=====
[Main]
Config=2205_SS_SSLBATHY10
PulseCalFile=PulseCal600_1600.pcf
CompressNet=0
TimeSyncSource=SBG POSMV_BINARY ZDA GGA

```

Figure 8-27: TimeSyncSource POSMV\_BINARY Keyword

6. In the [DSP0] section of this file, ensure the OnePPSInputLine keyword is set to the following: OnePPSInputLine=2. Ensure there is no semicolon in front of the keyword.
7. Select File > Save and close the text document.

**CAUTION!** Do not alter the file other than what has been specified.

This configuration sets the software to utilize the time and date reference received from the POS-MV data string. It also activates the 1PPS port on the topside module. Due to the inherent added latency, a 1PPS sync must be utilized when data is received via UDP.

When the above steps are complete, Sonar.exe must be re-launched to activate the configuration changes. This can be completed via the “x” in the top right-hand corner of the Sonar.exe GUI and the Sonar.exe shortcut on the embedded CPU desktop.

Once the configuration of both the 6205s2 and the POS-MV is completed, the Sonar Serial Port Viewer can be utilized to confirm data is being accepted correctly. To access this, select the Misc. tab in the Sonar.exe GUI (as shown in [FIGURE 8-16](#)), then **Serial Port Information**. Next, select COM 5 in the first dropdown, ensure that data is received, and the State is reported as “OK.”

Discover Bathymetry can also be used to check the correct configuration of the two units. The diagnostic window, as shown in [FIGURE 8-14](#), should not report any errors. However, review all changes made in the above section if errors are seen. If errors persist, contact [EDGETECH CUSTOMER SERVICE](#).

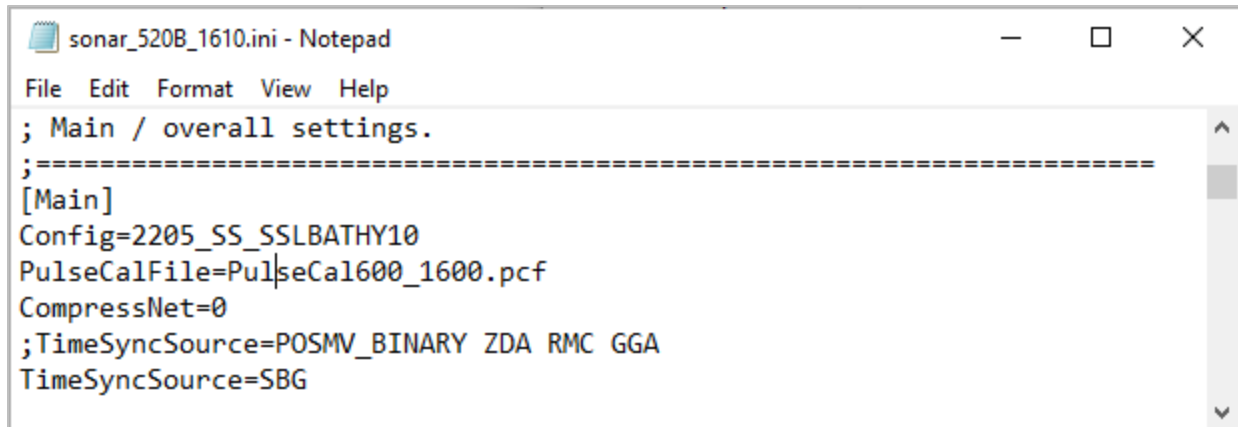
### 8.3.6 SBG Ekinox/Apogee Configuration



*Figure 8-28: Example SBG Systems GNSS/INS unit*

The 6205s2 is compatible with the Ekinox / Apogee systems from SBG Systems. Follow the below steps to configure the 6205s2 and the SBG for communication over the Ethernet interface via UDP. To configure:

1. The sonar.exe file should be modified as shown below.



```

sonar_520B_1610.ini - Notepad
File Edit Format View Help
; Main / overall settings.
;=====
[Main]
Config=2205_SS_SSLBATHY10
PulseCalFile=PulseCal600_1600.pcf
CompressNet=0
;TimeSyncSource=POSMV_BINARY ZDA RMC GGA
TimeSyncSource=SBG

```

Figure 8-29: Ekinox/Apogee Sonar.ini file TimeSyncSource Keyword Adjustments

- The sonarserial.ini should be adjusted as shown below.

```

[Serial15]           ; SBG
Create=3
Port=UDP:10001
Parser=19
Network=1

```

Figure 8-30: Ekinox/Apogee SonarSerial.ini File Adjustment

- Access the SBG software using the instructions for the SBG user manual.

**NOTE:** EdgeTech has assigned the IP address **192.9.0.51** to the OEM.

- Make the following required or suggested changes in the SBG Software UI (**FIGURE 8-32**)
  - Required: All selected outputs at the same rate. The Hydro-Hypack preset selection is recommended to enable the necessary data messages at a suitable output rate.
  - Required: EKF Euler (Provides Pitch, Roll, Heading)
  - Required: EKF Nav (for Ekinox or Apogee if you want Edgetech GGK and VTG generated)
  - Required: UTC Time
  - Recommended: Ship Motion 0 (Provides Heave)
  - Optional: Inertial Data (Provides Accelerometers)
- NMEA Configuration
  - NMEA messages can also be accepted.
  - Parser selection is done in Discover Bathymetric software.

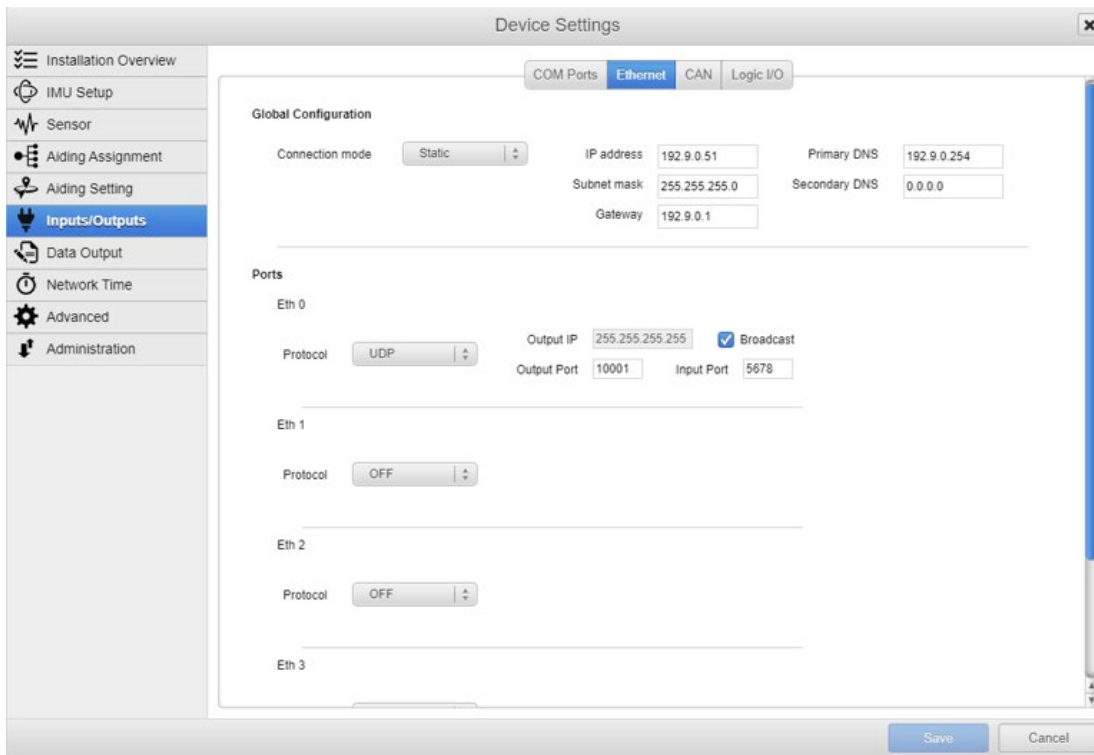


Figure 8-31: UDP broadcast settings example

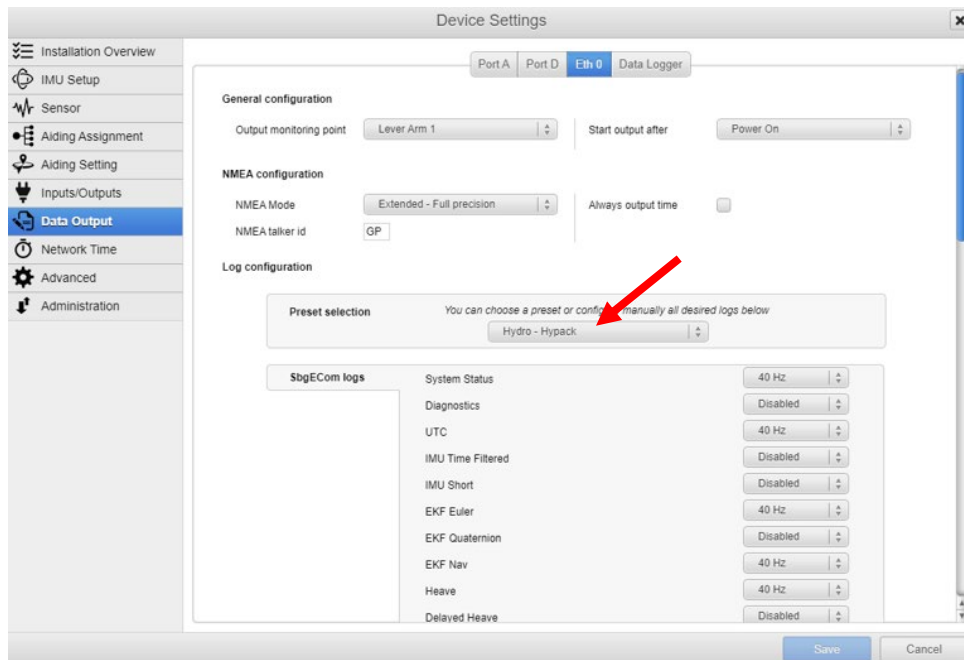


Figure 8-32: Data packets required, set using the recommended SBG's "Hydro-Hypack"

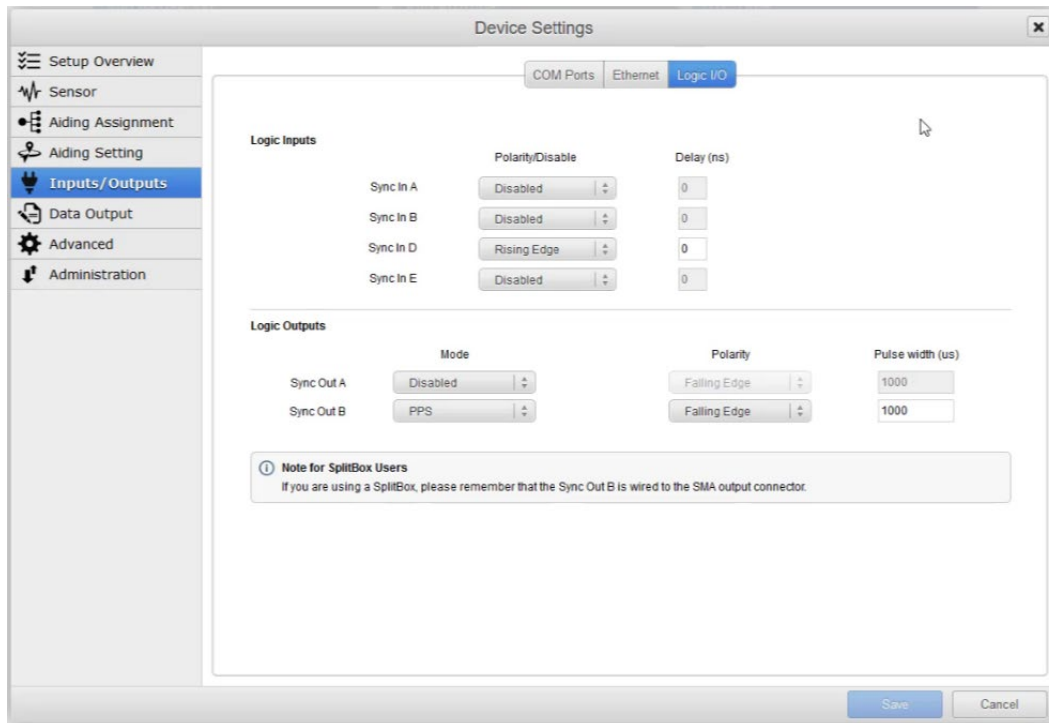


Figure 8-33: 1PPS settings example, Falling Edge and 1msec duration

### 8.3.7 OEM Integrated SBG Ekinox Configuration

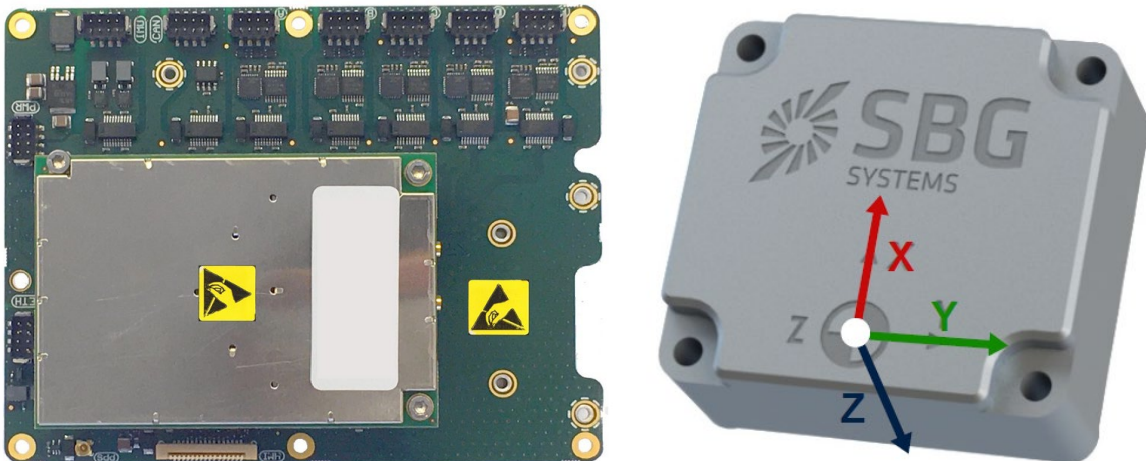


Figure 8-34: SBG Systems OEM GNSS and INS units

The 6205s2 is compatible with an OEM Integrated SBG Ekinox system. Edgetech does integrate and configure the systems when purchased. The only configurations required of the customer are setting lever arm and GNSS antenna positions in the SBG software, which are unique to each host platform.

### 8.3.7.1 Lever Arm and GNSS Antenna Position Configuration

6. Access the SBG software using the instructions for the SBG user manual.

**NOTE:** EdgeTech has assigned the IP address **192.9.0.51** to the OEM.

7. Select Sensor on the left menu and the Lever Arms Tab at the top of the SBG Window. The Sensor Lever Arms Primary Lever Arm Center of Rotation Level Arm (X,Y,Z) meter values should be populated. These are the offsets from the IMU to the center of the vessel.

**CAUTION!** Do not change any Monitoring Points values unless you're sure they should be changed. EdgeTech has set a Monitoring Point that is valid for the Ethernet data output to be the Sonar Acoustic Center, so only change these values when you do not wish for this and instead wish for the SBG data to be valid at an alternative location.

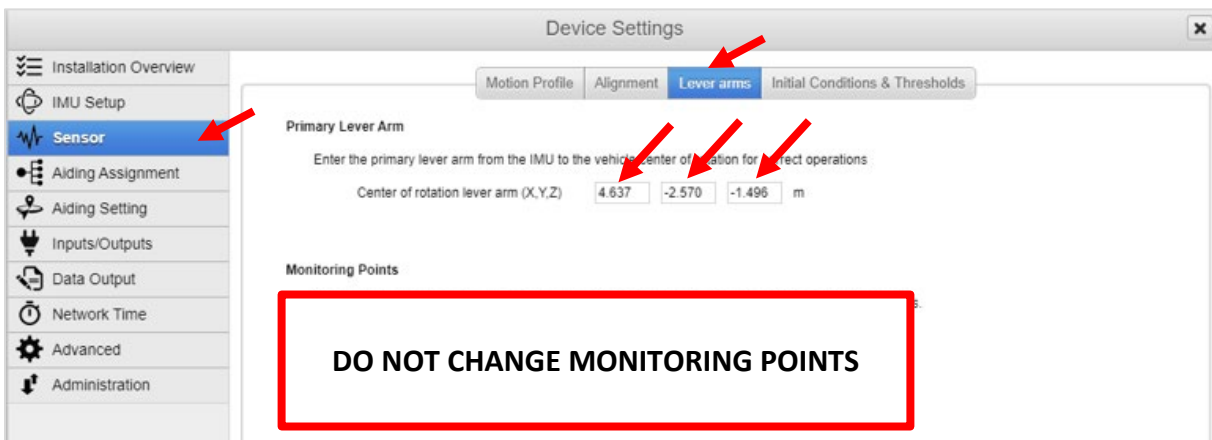


Figure 8-35: Sensor Lever Arms Primary Lever Arm Values

8. Next, select the Aiding Settings Menu Item on the left and then the GPS1 Tab at the top. The **GNSS Lever Arms Primary and Secondary Antenna (X,Y,Z) meter values should be entered**. These are the offsets from the antennas to the IMU. No other Aiding Setting values should be changed.

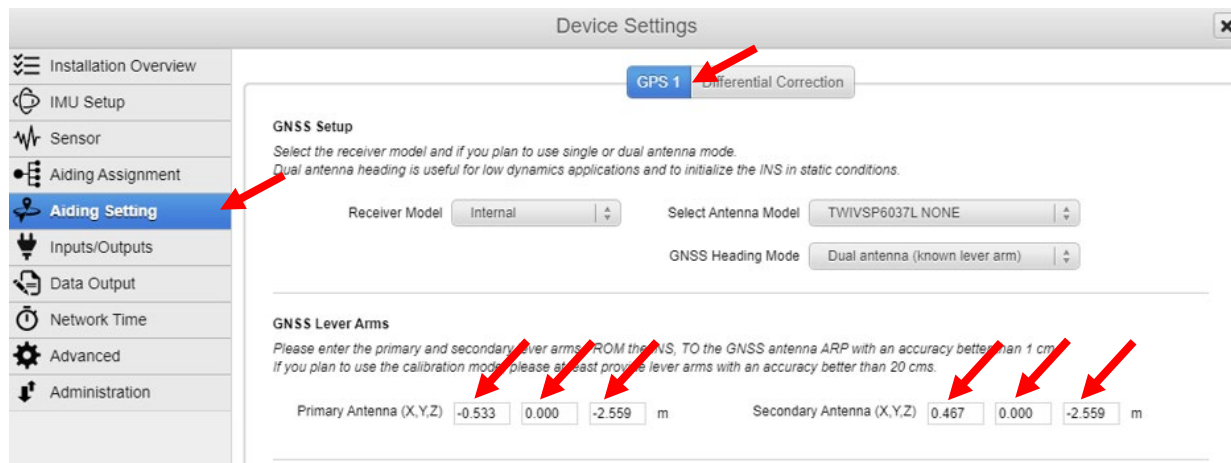


Figure 8-36: Aiding Setting GPS1 GNSS Lever Arm Values

Additional configurations are possible. Please see the SBG instruction manual for detailed information on settings and additional options. The following settings are required or suggested to configure the 6205s2 and the SBG for communication over the Ethernet interface via UDP.

EdgeTech preconfigures the sensor for the Hydro – Hypack preset output at 40 Hz. We do not recommend changing this setting. However, the following should be kept in mind if a change is unavoidable:

- Binary
  - Required: All selected outputs at the same rate, recommended 50Hz
  - Required: EKF Euler (Provides Pitch, Roll, Heading)
  - Required: EKF Nav (for Ekinox or Apogee if you want Edgetech GKG and VTG generated)
  - Required: UTC Time
  - Recommended: Ship Motion 0 (Provides Heave)
  - Optional: Inertial Data (Provides Accelerometers)
- NMEA
  - Required Messages: HDT, TSS1, GGA, VTG, ZDA
  - A change of message type may require a parser adjustment. This can be accomplished in Discover Bathymetric Software.

## 8.4 Computer System Restoration

The following section outlines the procedures for backing up and restoring the system drive. EdgeTech currently uses Macrium Reflect as system restoration software.

**CAUTION!** All data will be lost upon restoring the system to factory settings. Therefore, be sure to back up all data before performing the procedure below.



**NOTE:** A mouse may be needed to operate the Macrium Reflect UI.

### Macrium Reflect Instructions

1. Before Powering on the topside, insert the USB3 flash drive into a blue USB3 port.
2. Power on the topside and press the **F\*\*** key. **F\*\*** will be different depending on what you are booting.
  - a. If the Topside is a rack mount, Press **F11**.
  - b. If the Topside is a laptop, Press **F10**.
3. Under the **Boot Manager**. Use the up/down arrows to select the flash drive **Corsair Voyager 3.0**.
4. Wait for **Macrium Reflect** to boot, and then select the **Existing Backup** tabs.
5. Under the **Image** tab, select **Edit**

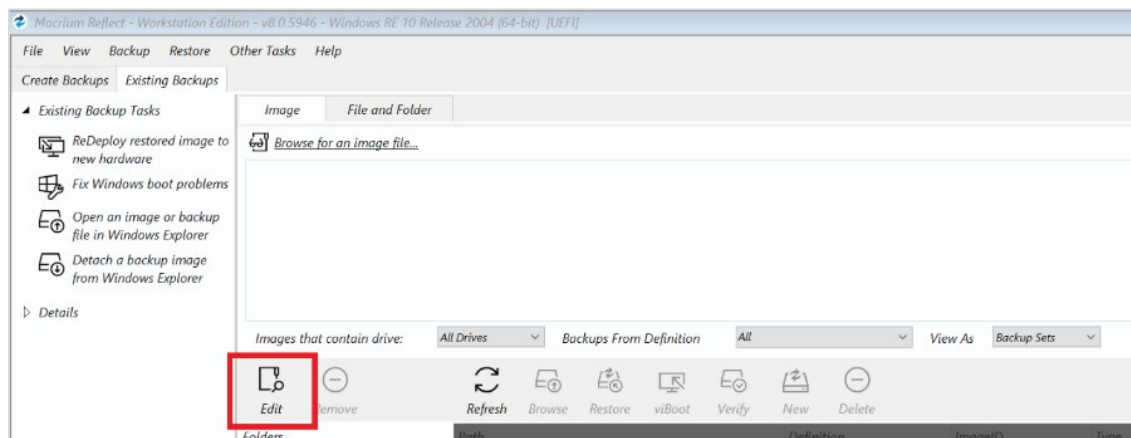


Figure 8-37: Restoration Edit Image Selection

6. **Browse** for the backup folder located on the **0020475\_Rev\_** drive. The folder should have the following format **XXXX\_SNSSSS**. Once the folder has been selected, click **OK** and then **OK**.



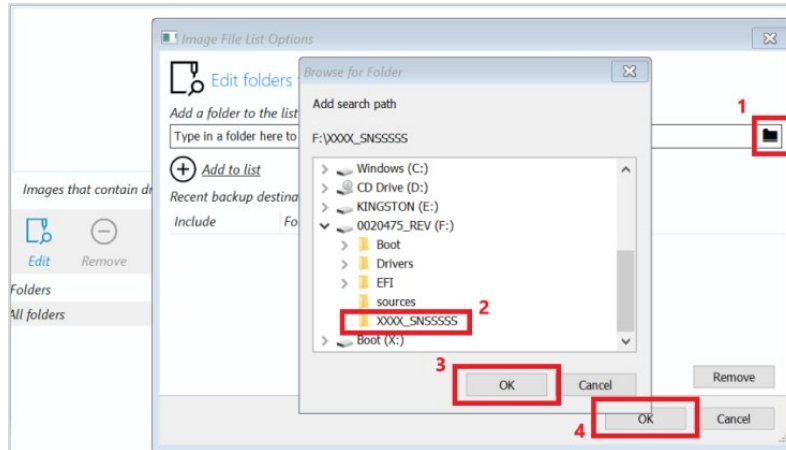


Figure 8-38: Restoration- Add Search Path Confirmation Buttons

7. You should now see that the restore file has been populated in the window. Next, click on **Restore**.

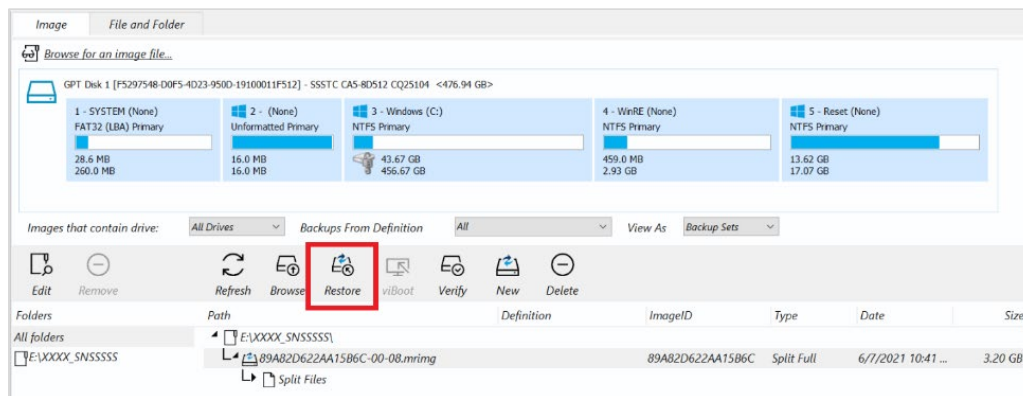
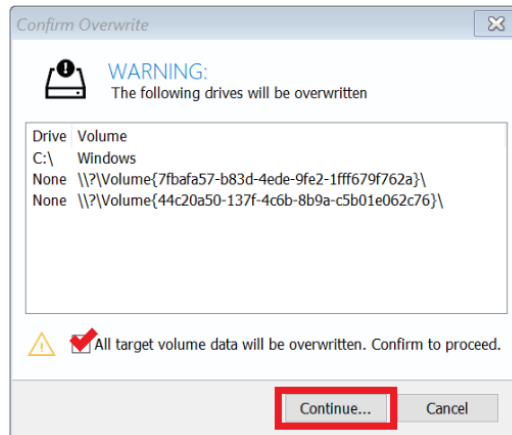



Figure 8-39: Restoration Restore Button

8. On the next window, Select **Next**, followed by **Finish**.

9. A window will open, warning you that everything will be overwritten. Click on the **Check Box** to approve and then click **Continue** on this window.



*Figure 8-40: Restoration-Confirm Overwrite Continue Button*

10. The restoring process should take 2-4 minutes to complete. Once it is finished, click the red button on the bottom left of the screen  and select **Shutdown**, and then **Okay**.
11. Remove the USB3 flash drive and turn the power to the topside back on to verify the image has been restored successfully.

# 9.0 KITS

EdgeTech offers spare, tool, and option kits to upgrade and maintain your 6205s2 system components. Please contact **EDGETECH CUSTOMER SERVICE** before any repair to maintain the warranty and receive the most up-to-date kit and instructions.

## 9.1 Spare Kits

PN#	KIT DESCRIPTION
0024484	ASSY TOP KIT SPARES 6205S2 TOPSIDE RACK MOUNT
0024485	ASSY TOP KIT SPARES 6205S2 ELECTRONICS 520 / 1600 KHZ SIDESCAN / 520 KHZ BATHY
0024486	ASSY TOP KIT SPARES 6502S2 ELECTRONICS 520 / 850 KHZ SIDESCAN / 520 KHZ BATHY
0024487	ASSY TOP KIT SPARES 6502S2 ELECTRONICS 520 / 850 KHZ SIDESCAN / 850 KHZ BATHY
0024488	ASSY TOP KIT SPARES 6502S2 ELECTRONICS 850 / 1600 KHZ SIDESCAN / 850 KHZ BATHY

Table 9-1: 6205s2 Topside and Sonar Head Spare Kits

## 9.2 Tool Kit

PN#	KIT DESCRIPTION
0024448	ASSY TOP KIT 6205S2 SYSTEM TOOLS

Table 9-2: 6205s2 Tool Kit

## 9.3 Adaptor Flange Installation Kit

EdgeTech offers an Adaptor Flange Kit that includes a high-quality flange and necessary hardware to mount the 6205s2 to a customer’s manufactured pole.

PN#	KIT DESCRIPTION
0024489	ASSY TOP KIT 6205S2 ADAPTOR FLANGE

Table 9-3: 6205S2 Adaptor Flange Installation Kit

**Tools:**

- 3/8” T-Handle Ball-Point Hey Key
- Adjustable Crescent Wrench
- 5/8” Socket Wrench

**Instructions:**

The Adaptor flange plate is attached to the 6205s2 by threading the [3] 5/8" hex screw hardware assemblies. EdgeTech suggests coating with a liquid thread locker such as Loctite®. The Adaptor Flange is connected to a customer's pole mounting by threading [6] .625 bolt, split-lock washer, washer, and nut assemblies.



*Figure 9-1: 6205s2 Adaptor Flange Installation*

## 9.4 Sensor SBG IMU and GNSS Installation Kit

PN#	KIT DESCRIPTION
0024541	ASSY TOP KIT 6205S2 SENSOR SBG IMU & GNSS

*Table 9-4: SBG IMU and GNSS Integration Kit*

## A.0 COMPATIBLE SOFTWARE

### A.1 Discover Bathymetric

EdgeTech's Discover Bathymetric Software provides a way to control, store, and display Bathymetric and Dual-Frequency Side Scan Sonar data. Data is presented in a color waterfall display and stored in the binary EdgeTech JSF file format on the hard disk of the topside processor. The JSF file format has been in use for 10+ years and has new public extensions to support the additional Bathymetry data messages. Refer to the [DISCOVER BATHYMETRIC USERS SOFTWARE MANUAL \(0014678\)](#) for detailed information on the software.

### A.2 Third-Party Software

There are several third-party software packages that EdgeTech has approved to use with the 6205s2 System, and work continues to expand the number of available 3<sup>rd</sup> party software packages. A brief description is listed below. For the latest list of 3<sup>rd</sup> party software packages, contact [EDGE TECH CUSTOMER SERVICE](#).

#### A.2.1 HYPACK

The bathymetry and side-scan data are sent in real-time to the HYPACK<sup>®</sup>/HYSWEEP<sup>®</sup> survey applications. These applications display and record the bathymetric data in HYPACK's HSX format. These HSX files can then be used offline in the MBMax, Side Scan Mosaic, and other proprietary packages that support these formats to edit, clean, and mosaic the collected data.

For more information on Hypack, visit: [HTTP://WWW.HYPACK.COM/NEW/](http://www.hypack.com/new/)

#### A.2.2 SonarWiz

SonarWiz from Chesapeake Technologies Inc. is an all-in-one suite of programs for the real-time acquisition of sonar data. The latest version of SonarWiz, called SonarWiz 7, now offers a bathymetry module to acquire and post-process the real-time 6205s2 Swath Bathymetry and Dual Frequency Side Scan data. In addition, the latest release also can ingest the native EdgeTech JSF files post-survey to post-process the sonar data files recorded by Discover Bathymetric.

For more information on SonarWiz, visit: [HTTPS://CHESAPEAKETECH.COM/](https://chesapeaketech.com/)

### A.2.3 Qinsy

Qinsy is a hydrographic data acquisition, navigation, and processing software package. The suite of applications can be used for various types of surveys, ranging from simple single beam surveys up to complex offshore construction works.

For more information on Qinsy, visit: [HTTP://WWW.QPS.NL/DISPLAY/QINSY/MAIN](http://www.qps.nl/display/qinsy/main)

### A.2.4 CARIS

CARIS HIPS and SIPS is a comprehensive Bathymetric, seafloor imagery, and water column data-processing software. The HIPS and SIPS software enables the user to simultaneously process multibeam, backscatter, side-scan sonar, LiDAR, and single beam data. In addition, its data importer supports EdgeTech's bathymetry and side-scan data formats.

For more information on CARIS, visit: [HTTP://WWW.CARIS.COM/](http://www.caris.com/)

### A.2.5 EIVA NaviSuite

EIVA's NaviSuite constitutes a complete, advanced, multipurpose suite of software products for virtually any subsea sonar and sensor survey or engineering operation. NaviSuite covers the entire data workflow in a continuous, non-sequential process from online data acquisition to offline post-processing.

For more information on EIVA NaviSuite, visit: [HTTP://WWW.EIVA.COM/PRODUCTS/SOFTWARE](http://www.eiva.com/products/software)

### A.2.6 BEAMWORX Suite

Beamworx's suite constitutes a multipurpose suite of software products for multibeam operations. From online data acquisition (NavAq) to offline post-processing (AutoClean) and also automated Patch Test (AutoPatch), the suite is fast and friendly.

For more information on Beamworx, visit: [HTTP://WWW.BEAMWORX.COM](http://www.beamworx.com)