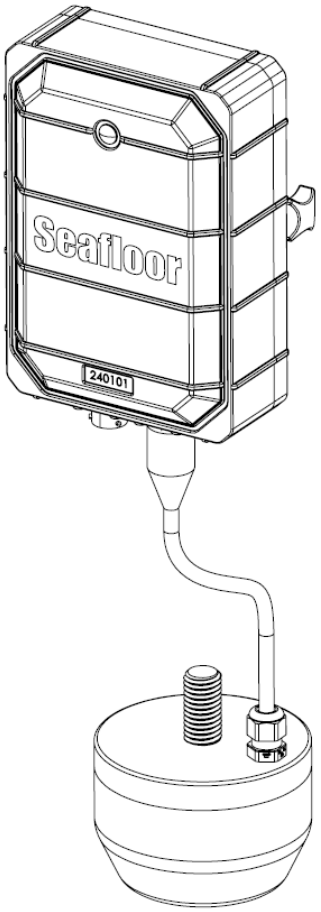
Hydrolite™ SF200-9

Generation 1

User and Technical Manual

Seafloor Systems, Inc



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1 Introduction

1.1 System Overview

Welcome to the Seafloor Systems Hydrolite™ SF200-9 manual. This document provides an overview of the key features and functionalities of our Single Beam Sonar system, designed for hydrographic surveying and underwater mapping applications. The Hydrolite™ SF200-9 delivers depth measurement capabilities, robust performance in various marine environments, and seamless integration with modern survey platforms. The Hydrolite™ SF200-9 features a durable transducer, reliable signal processing technology, and an intuitive user interface for data verification. This manual is intended for hydrographic surveyors, land surveyors, marine scientists, and technical personnel involved in underwater mapping and depth measurement tasks using the Hydrolite™ SF200-9.

1.2 Terms and Acronyms

ANP	AutoNav Plus
ASV	Autonomous Survey Vessel
Bow	Front or forward part of the vessel
BHSC	Button Head Socket Cap Screw
CAA	Collision Avoidance Assist
CCW	Counter-Clockwise
CW	Clockwise
ESC	Electronic Speed Controller
FAQ	Frequently Asked Questions
GND	Ground (Voltage)
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HDPE	High Density Polyethylene
HLP	Hydrolite Plus
HUD	Heads Up Display
LED	Light Emitting Diode
LiPo	Lithium Polymer Battery
Motor	Center electronic part of the Thruster
NC	Not Connected
MBES	Multibeam Echosounder
NMEA	National Marine Electronics Association
PoE	Power over Ethernet
Port	Left side of vessel - facing towards bow
Prop	Propeller
RCU	Remote Control Unit
RCV	Remote Controlled Vessel
RDP	Remote Desktop Protocol, Remote Desktop Connection
Receiver, RCVR	Receiver for the Transmitter
RSSI	Received Signal Strength Indicator
RTK	Real Time Kinematic
RTL	Return to Launch
Rx	Receive
SBES	Single Beam Echosounder
Servo Thruster	Servo Thruster Assembly
SIU	Sonar Interface Unit
SOC	State of Charge
Starboard	Right side of vessel - facing towards the bow
Stern	Rear or aft part of the vessel
SVP	Sound Velocity Profiler
SVS	Sound Velocity Sensor
Thruster	Thruster assembly with prop
Transmitter	Transmitter also known as Radio Control Unit
Tx	Transmit

UI	User Interface
USV	Uncrewed Survey Vessel
VDC	Voltage - Direct Current
VAC	Voltage - Alternating Current

Information

Information banner is to notify useful information for operator.

Caution

Caution banner is provide important information that if disregarded may result in accidental misuse or damage to the system.

Important Alert

Important Alert is to provide important information that if disregarded may prove harmful to personnel or equipment.

1.3 System Specifications

Recommended Survey Speed	3-5 knots (1.5m/s - 2.5m/s)
Transducer Pressure Rating	0.43 PSI
Acoustic Frequency	200kHz
Beam Width	9° Conical
Transmit Pulse Width	10µsec - 200µsec (10µsec step)
Range	0.49 - 328ft (0.15m - 100m)
Ping Rate	1Hz
Accuracy	0.03ft (1cm)
Digital Output	RS-232
Communication Type	Serial(DB9), Bluetooth, and WiFi
Communication Speed	9600 Default Baud Rate
Data Output Format	NMEA0183(DBT), ASCII, Old Sonarmite, Sonarmite
User Interface	WebUI
Operating Water Temperature for Transducer	23F – 122F (-5C – 50C)
Operating Air Temperature for SIU	23F - 95F (-5C - 35C)
Storage Temperature	-4F – 95F (-20C – 35C)
Power	Internal Battery 14.4V, 45Wh
Bluetooth Range	10m Class 2
Compatibility	Trimble, Leica, Topcon, Carlson, Hypack, QPS, PDS

1.4 System Limitations

To limit the potential damage to Hydrolite™ SF200-9, it is not recommended to use the system under the following conditions:

- Cold environments can decrease the system battery capacity and operational time.
- Weather Conditions: Do not use in adverse weather. Thunderstorms, lightning, hurricanes, monsoons, extreme heat, strong current, strong wind, heavy rain, etc.

1.5 Warranty

Seafloor Systems, Inc. is committed to upholding the highest standards of quality, reliability, and durability in its products. We provide a warranty to the original purchaser or purchasing agency, guaranteeing that each Hydrolite™ SF200-9 will be free from defects in materials or workmanship for a duration of one year from the date of shipment.
The warranty provided does not cover defects resulting directly or indirectly from misuse, negligence, accidents, repairs, or alterations carried out outside our facilities. It does not cover the utilization of the Hydrolite™ SF200-9 for purposes other than water measurements or pairing it with instruments.
Seafloor assumes no responsibility for the loss of boats, instruments, property damage, or any injury

or fatality associated with the use of its products, or any products that may be included or used in conjunction with Seafloor products. Seafloor's warranty does not extend to third-party products sold by Seafloor, which may encompass items such as GPS devices, depth sounders, and other supplementary equipment.

1.6 Technical Support

Seafloor Systems, Inc. provides comprehensive customer support through an online support system during regular business hours. For assistance outside of standard business hours, support is available by appointment.

If your Hydrolite™ SF200-9 was purchased through an authorized dealer, we kindly request that you contact your dealer's designated point of contact for immediate support and assistance.

To submit a support request, please fill out our support form on our website www.seafloorsystems.com via the big green button. Please include as much information as possible:

- Your Name and Company
- Where you purchased the system
- Purchase Order number
- Serial number of the system
- In-depth explanation of the issue
- Any helpful pictures of the issue

Upon submitting your support request through our website, a case will be automatically generated in our support system. One of our support representatives will reach out to you to assist with your inquiry or issue within 48 hours. Please note that this response time does not include weekends.

- Website: www.seafloorsystems.com
- Phone (PST/PDT): +1 530-677-1019 (Business Hours: Monday - Thursday, 0700-1730)

2 Safety

2.1 Battery Safety

Please read through these instructions carefully before you operate the Hydrolite™ SF200-9.

Important Alert

Danger to life from electric shock. Contact with uninsulated or damaged parts can result in severe physical injuries.

- If at any time you have an accident with your Hydrolite™ SF200-9, or if the battery swells, "balloons", or feels too hot to the touch, immediately stop use of the battery and follow these safety steps carefully:
  - Using electrical protective gloves, place the battery in a Li-ion safety bag or other fireproof container, and place the battery in a well-ventilated area without flammable objects.
  - Observe the battery from a safe distance for at least 30 minutes.
  - If after 30 minutes the pack appears stable, follow the battery disposal instructions below.
  - Under no circumstances should you return a battery to operation that has "ballooned" or been damaged in any way.
- Always handle Li-Ion batteries with extreme care. Take all necessary precautions to avoid dinging, denting, damaging, or puncturing battery packs and battery cells.
- Keep battery packs out of the reach of children and pets.
- Do not disassemble, modify, or attempt to repair a Li-Ion battery.
- Do not allow the exposed battery wires to touch each other.
- Always disconnect your Hydrolite™ SF200-9 from any device when not in use. All devices continue to draw power even when turned off.
- Always take precautions to cover the Hydrolite™ SF200-9 connectors while not in use.
- Never leave Hydrolite™ SF200-9 in an automobile. Temperatures within a vehicle can quickly reach unsafe levels.
- Always keep a class D chemical fire extinguisher on hand to extinguish potential fires that arise from storing, handling, charging, or using Li-Ion battery packs.
- If the battery exceeds temperatures of 140°F (60°C) immediately discontinue charging and isolate the battery pack. Refer to point number two above from the Safety Warnings for further instruction.
- Never heat a battery pack to increase the performance of the battery pack. Doing so greatly increases the risk of fire.
- Damaged or ruptured battery packs or cells may leak electrolytes, which can cause moderate to severe irritation, including burning and dryness of the skin and eyes. For contact with the skin, thoroughly wash the affected area with soap and warm water. For contact with the eyes, rinse thoroughly with cool water. Seek immediate medical attention for any burns.

Important Alert

Never open the batteries.

2.2 Battery Charging Safety

Important Alert

Failure to follow any of the instructions and safety warnings contained within this document may cause irreversible damage to the battery pack.

Information

Due to shipping regulations, batteries are not shipped fully charged. All battery packs should be fully charged before first use.

Lithium-Ion Battery (Li-Ion):

- Always use a charger specifically designed for Li-Ion batteries. Never use LiPo, NiCD or NiMH chargers to charge Li-Ion batteries.
- Never leave batteries unattended while charging. Batteries on charge MUST remain under constant observation so that you may react quickly should any problems arise.

3 System Operation

3.1 What's Included

Item	Quantity	Description	Image*
Hydrolite™ Sonar Interface Unit	1	Electronics module for the SF200-9 that also supplies power to the transducer	
Hydrolite™ SF200-9 Transducer	1	Mounted in Transducer Housing	
Hydrolite™ SF200-9 Charger	1	Lithium Ion Battery Charger	
Serial Cable	1	Provides RS-232 output from the Sonar Interface Unit to the acquisition computer	
Transom Mount	1	Mounting system for the SF200-9 designed to attach to the side of a hull	
Survey Pole	3	2ft section survey poles	
USB Drive	1	Contains software, drivers, and manuals for the SF200-9	
DB9 Null Modem	1	Swaps TX and Rx, usually orange in color	
DB9 Gender Changer	1	Male to Male DB9 gender changer, usually yellow in color	
USB to Serial Adapter	1	For devices that do not have a DB9 port	

Table 3: What's Included

*Please note that the provided images are for illustrative purposes only and may not precisely represent the delivered product. Seafloor Systems reserves the right to modify any product at its discretion.

3.2 System Overview Diagram

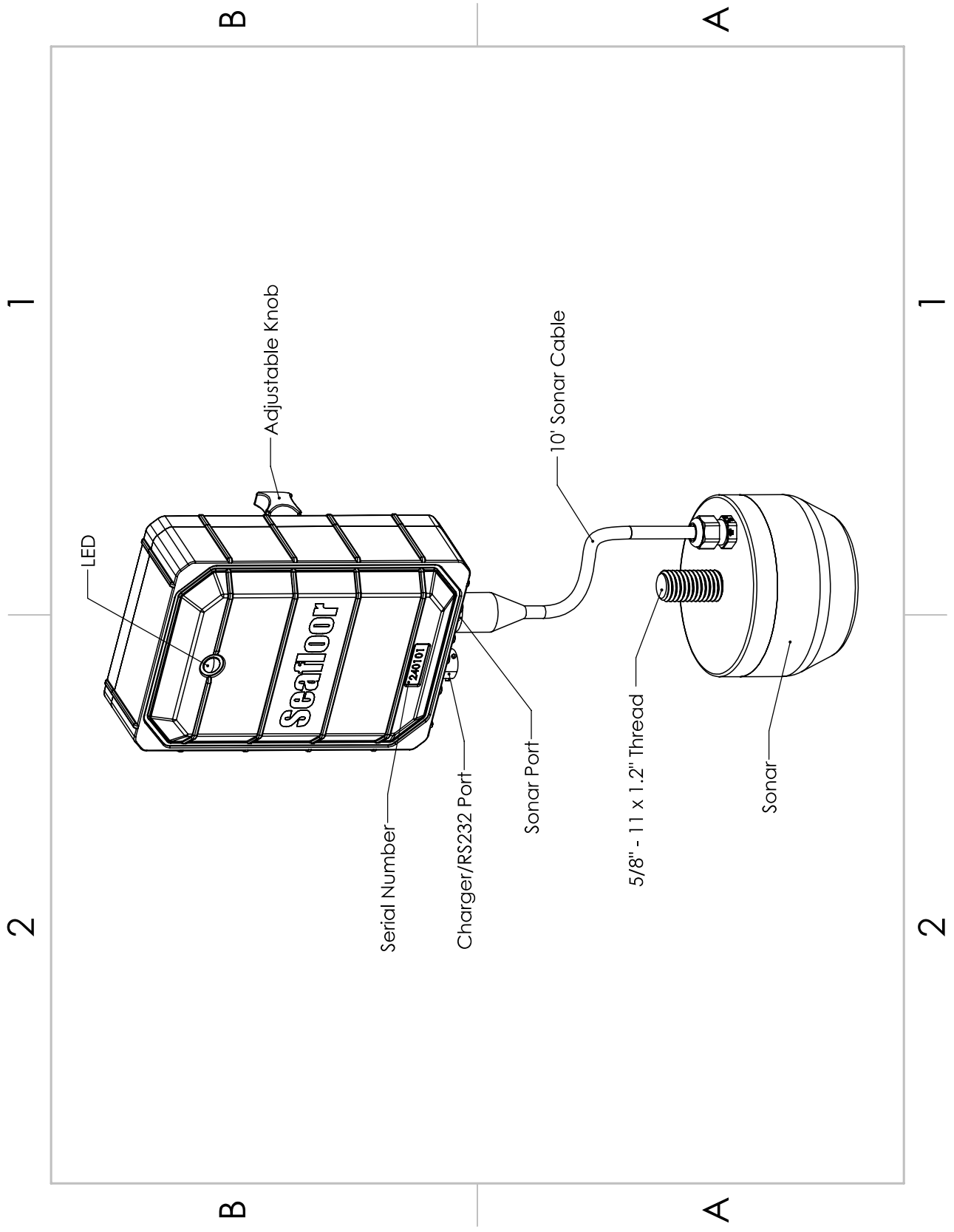


Figure 1: Hydrolite™ SF200-9 System Overview

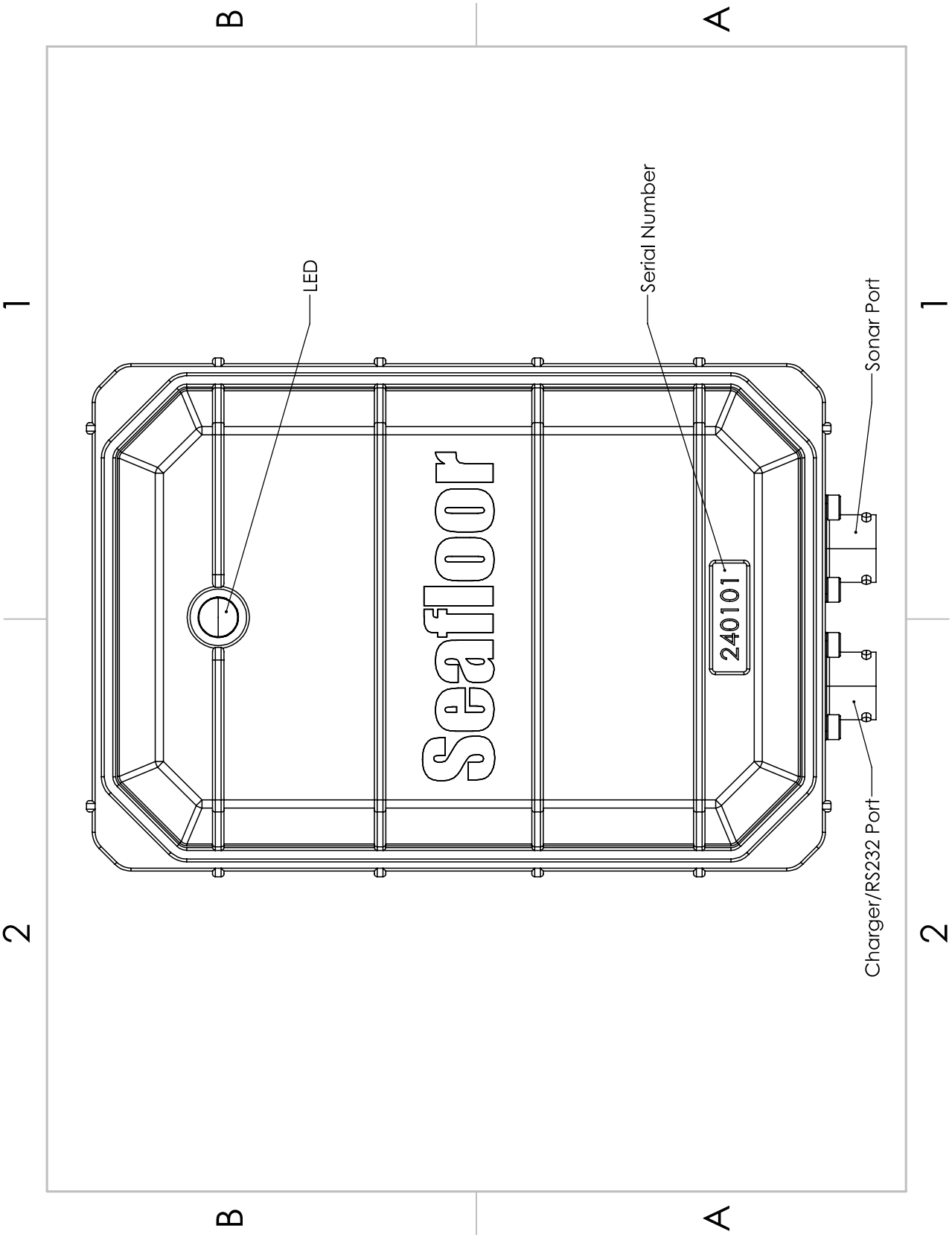


Figure 2: Top View Diagram

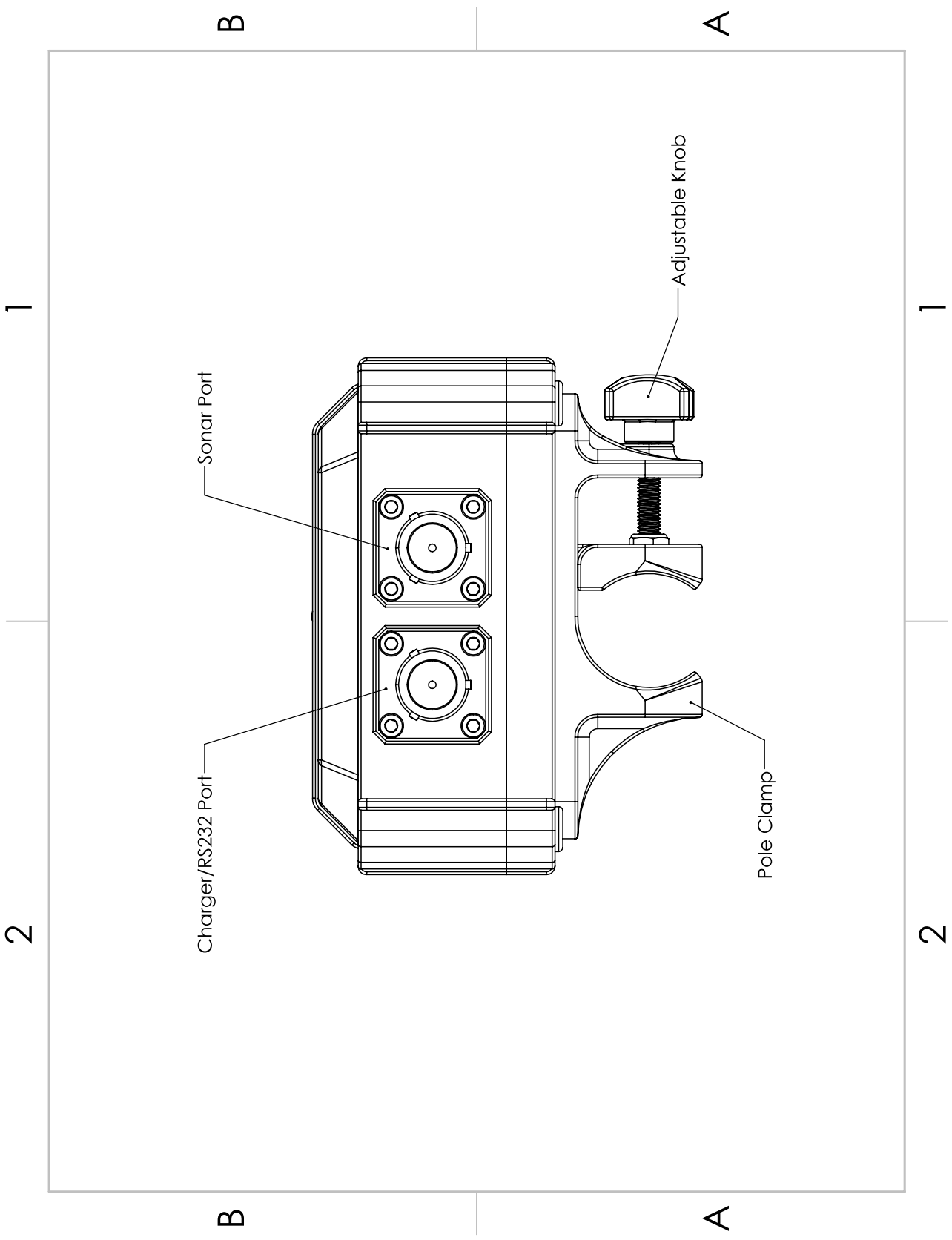


Figure 3: Front View Diagram

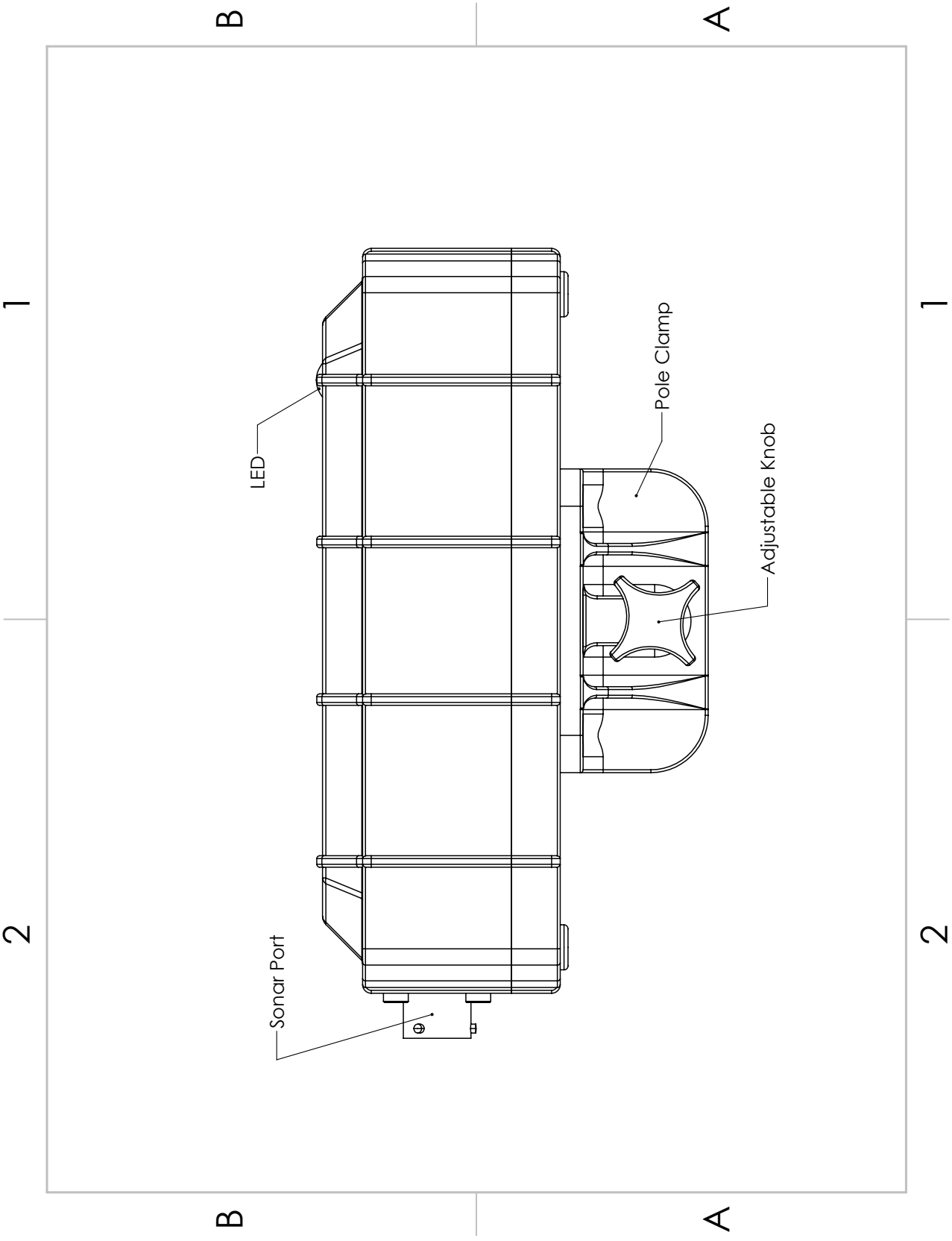


Figure 4: Side View Diagram

3.3 LED Status

LED Status

Property	Value
Flashing GREEN	Good charge and receiving sonar data
Steady GREEN	Good charge, receiving sonar data, and WiFi connected
Flashing YELLOW	No data from sonar
Long RED flash	Low Battery ($\leq 10\%$)
Steady BLUE	Bluetooth Connected

Table 5: Hydrolite™ SF200-9 LED Color Status

3.4 Battery Charging

Important Alert

Never leave batteries unattended while charging. Batteries on charge MUST remain under constant observation so that you may react quickly should any problems arise.

Caution

Charging Li-Ion Battery: with Hydrolite™ SF200-9 charger

1. Connect the Hydrolite™ SF200-9 charger into the RS232 port of the Hydrolite™ SF200-9 Sonar Interface Unit.

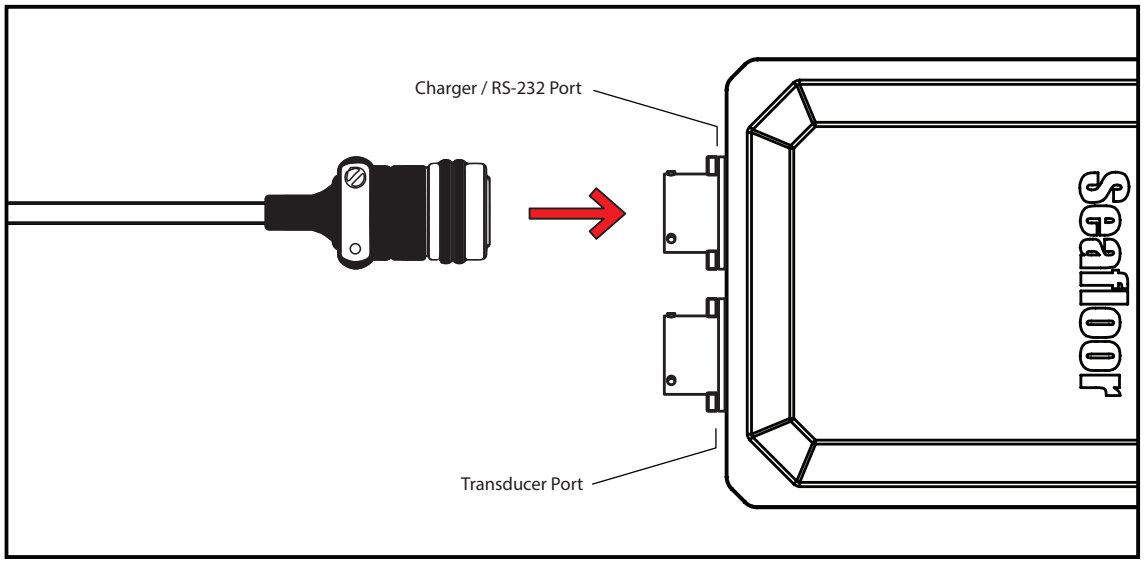


Figure 5: Connecting Charger to Hydrolite SIU

2. Plug the Hydrolite™ SF200-9 charger into an AC 100-240VAC/50-60Hz outlet.

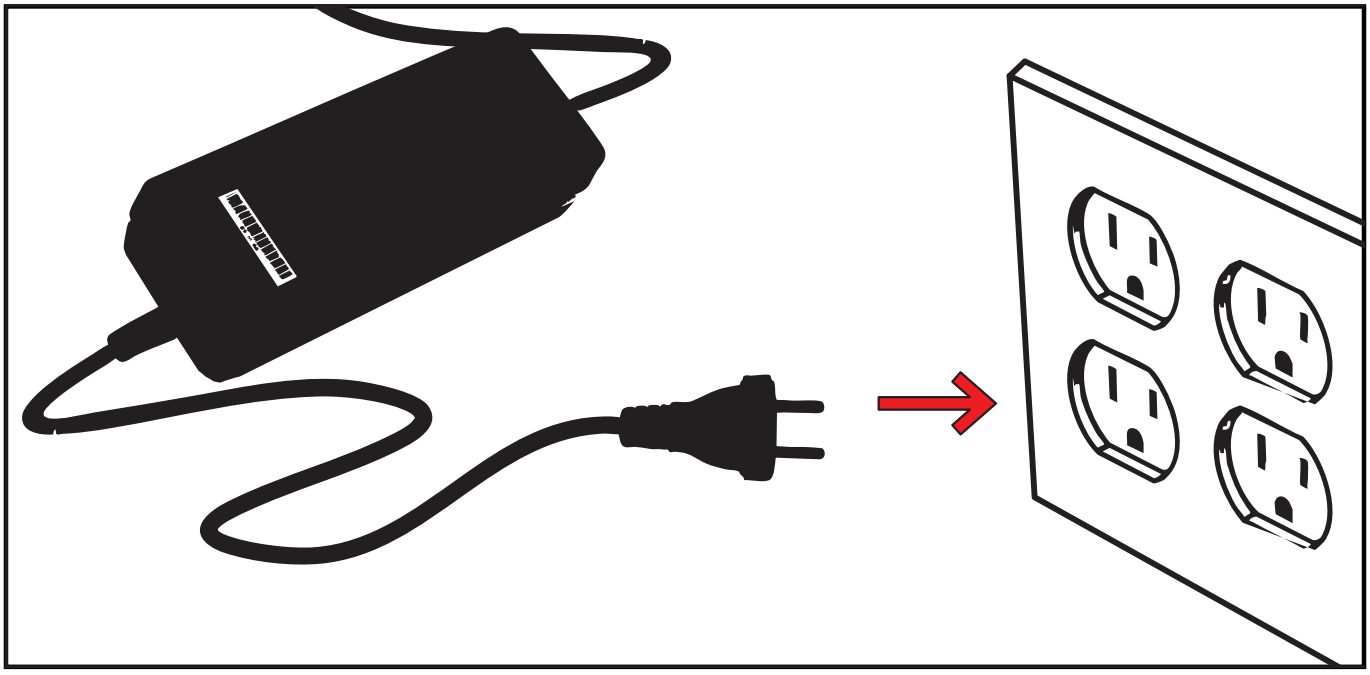
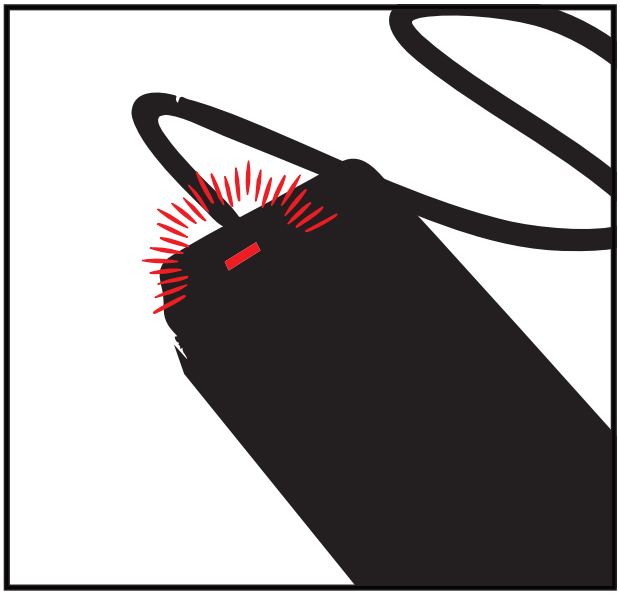
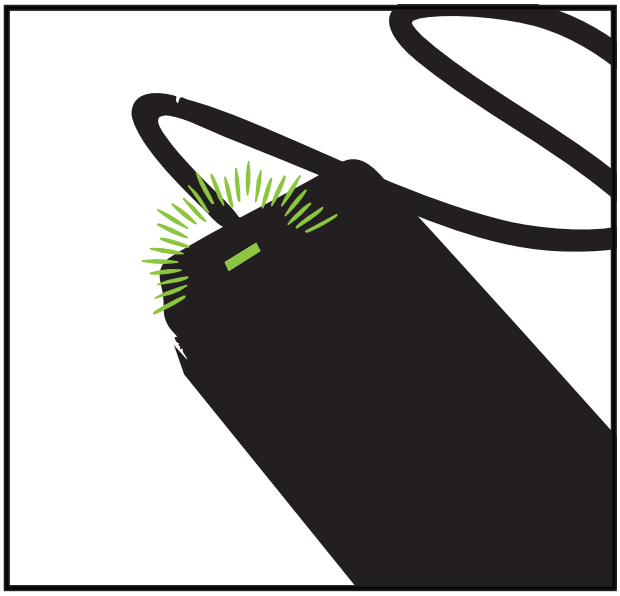


Figure 6: Connecting Charger to AC Outlet

3. When the battery is fully charged, disconnect the AC power first. Then disconnect from the Hydrolite™ SF200-9 SIU.



(a) Hydrolite™ SF200-9 Charging - Red LED



(b) Hydrolite™ SF200-9 Fully Charged - Green LED

Figure 7: LED Indicators for Charger

Technical Data

Property	**Value**
AC Input	100-240VAC(50/60Hz)
Rated Voltage	16.8VDC
Maximum charge current	2.0A
Charge Time	90 Minutes

Table 7: Hydrolite™ SF200-9 Charger Technical Data

3.5 Hydrolite™ SF200-9 Power On Procedure

Information

Hydrolite™ SF200-9 SIU powers on when the transducer is connected.

1. Using Figure 8, connect the transducer connector into the transducer port.
2. Rotate the connector collar clockwise to lock the collar into plae.

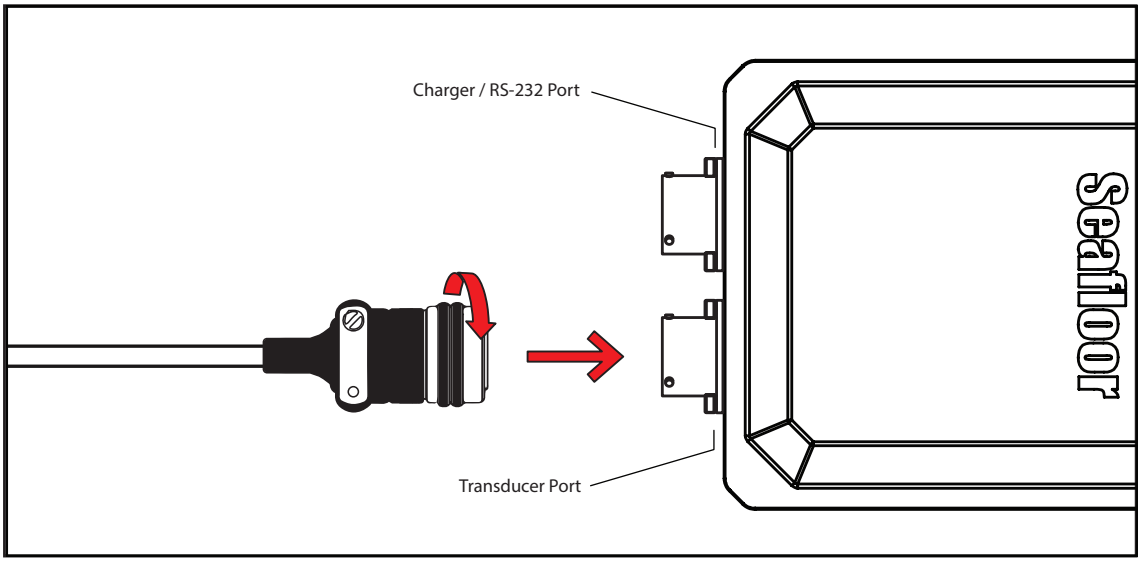


Figure 8: Topside Powering On

Caution

Damage to the equipment can occur if the transducer is powered on out of water for extended period of time.

3.6 Hydrolite™ SF200-9 Power Off Procedure

Information

Hydrolite™ SF200-9 topside powers off when the transducer is disconnected.

1. Using Figure 9, disconnect the transducer connector from the transducer port.
2. Rotate the connector collar counter-clockwise to remove.

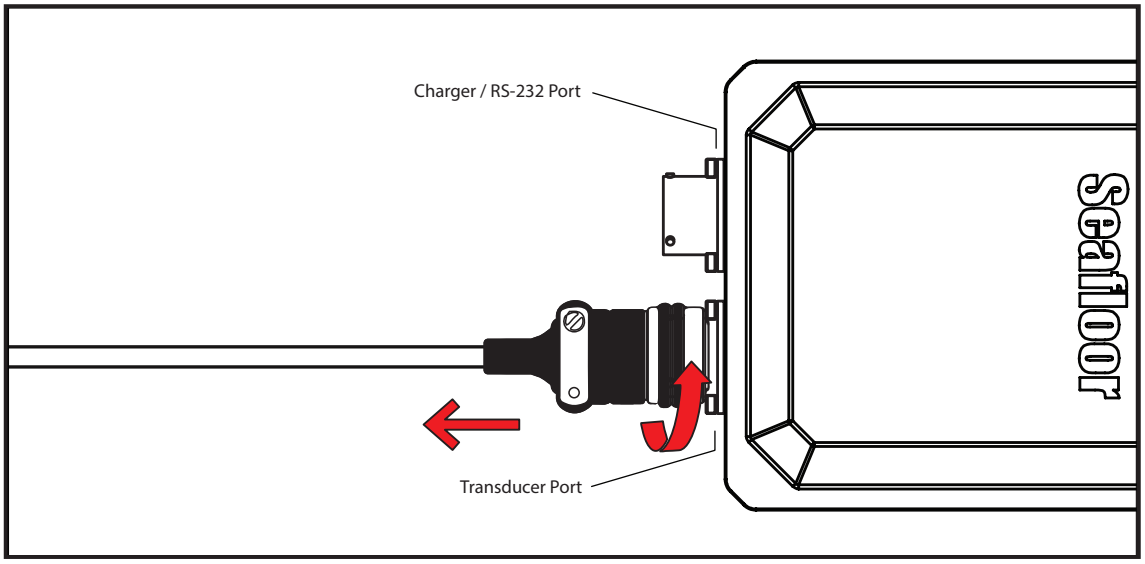


Figure 9: Topside Powering Off

Caution

Damage to the equipment can occur if the transducer is powered on out of water for extended period of time.

3.7 Connecting to the User Interface

Information

When powered, the Hydrolite™ SF200-9 will emit a WiFi signal with the SSID of "Hydrolite"

1. Using your Android, Apple, or Windows device, navigate to your WiFi settings.

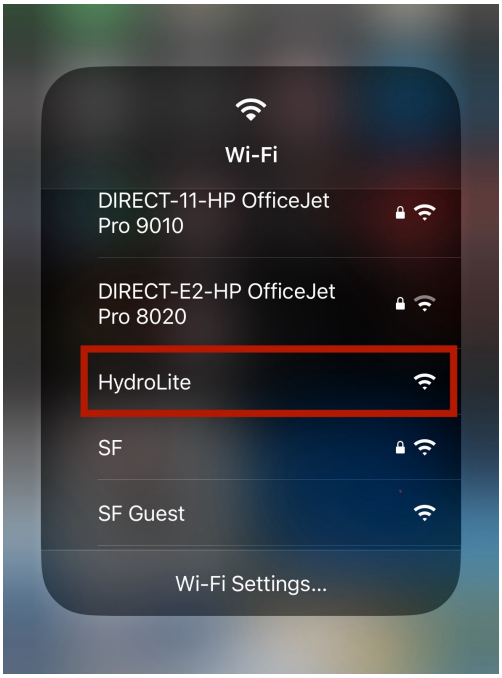


Figure 10: Wifi Connections

2. Connect to "HydroLite".
    - WiFi connection is not password protected.
3. Open your preferred internet browser and navigate to "192.168.199.1".
    - To access the specified IP address, please disconnect from the internet temporarily. This will prevent any automatic redirection while you're connected to the WiFi source.

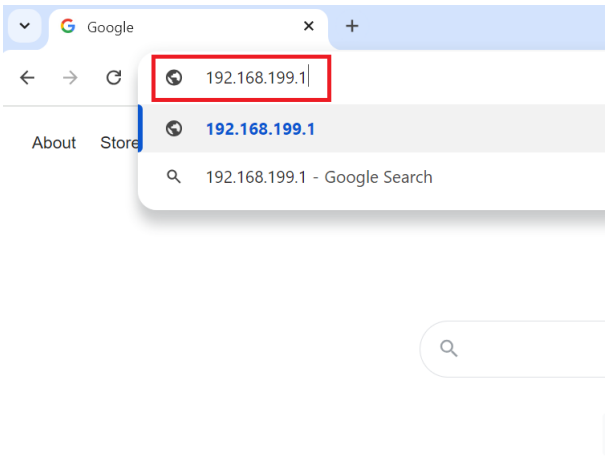


Figure 11: IP for User Interface

3.8 User Interface

Information

When connected, the User Interface will display live depth and basic settings.

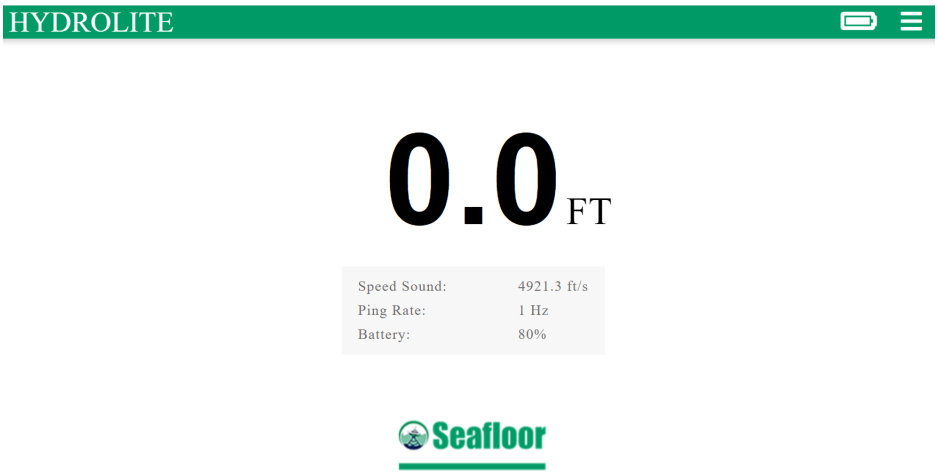


Figure 12: UI Main Screen

Select the Menu button (Three lines) in the top right corner to access the settings.

- Preferences
    - Can activate Metric or leave it unchecked for Imperial (Figure 13). Does not change output format, only the display of the WebUI depth.
    - Device IP Address is not used for this model.

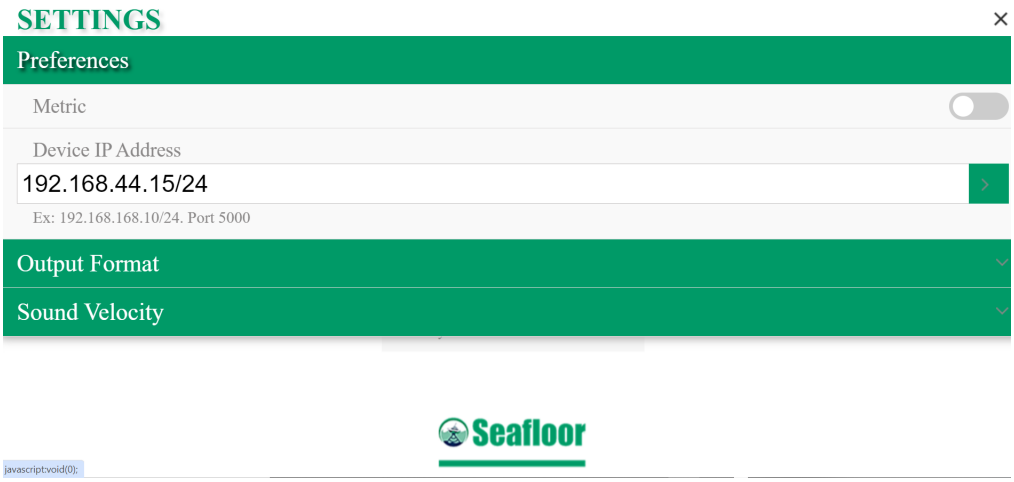


Figure 13: UI Preferences

- Output Format
  - Bluetooth Format - selecting the data format for bluetooth connections.
    - Carlson SurvCE/PC, Leica Captivate, Hypack, and Trimble Access should select Sonarmite (old).
    - Topcon Magnet Field, QPS, and PDS should select NMEA.
  - RS232 Format - selecting the data format for RS232(serial) connections.
    - Carlson SurvCE/PC, Leica Captivate, Hypack, and Trimble Access should select Sonarmite (old).
    - Topcon Magnet Field, QPS, and PDS should select NMEA.

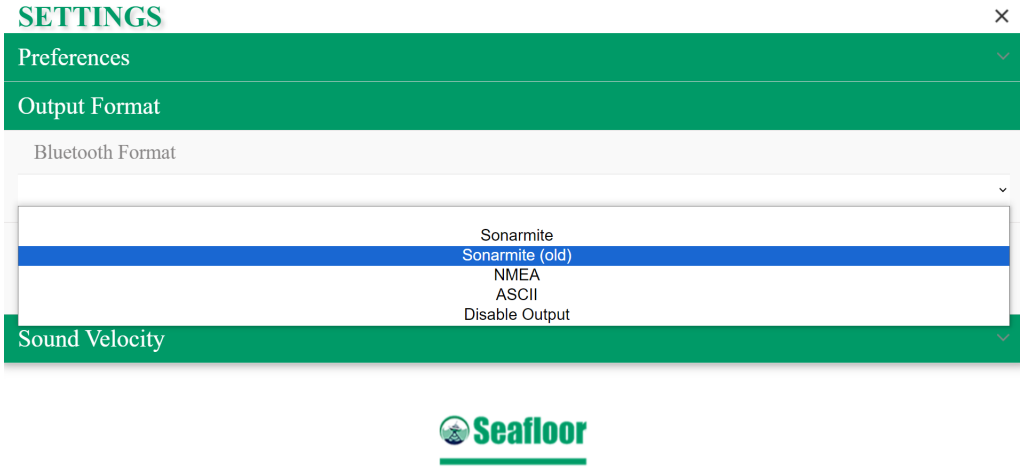


Figure 14: Output Formats

Information

- Sound Velocity
  - Manually input the speed of sound. This value dramatically effects the accuracy of your depth soundings if not entered correctly.

    Information

    The Hydrolite™ SF200-9 does not automatically calculate this for you.

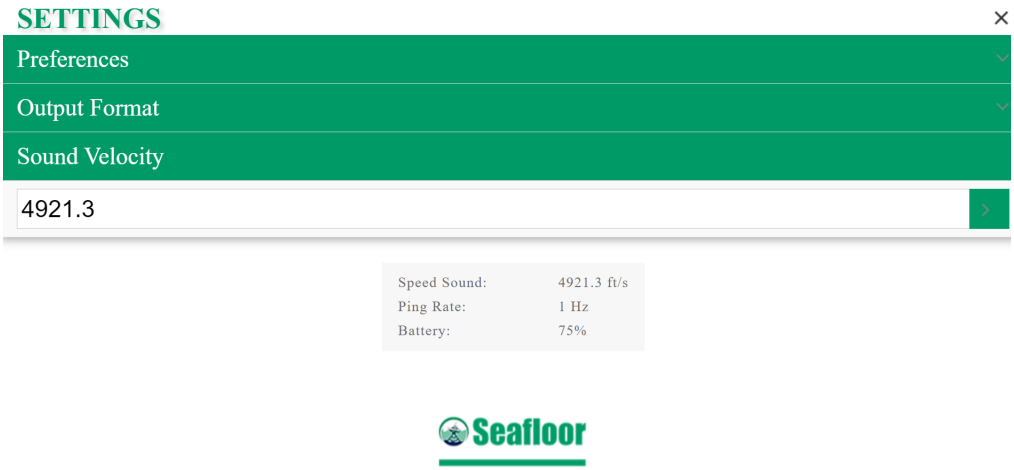


Figure 15: Sound Velocity

4 Frequently Asked Questions (FAQ)

Information Coming Soon. Updates will be made available as soon as possible.

5 Troubleshooting

Information Coming Soon. Updates will be made available as soon as possible.

6 Configuring Procedures

Information Coming Soon. Updates will be made available as soon as possible.

7 Service and Maintenance

Information Coming Soon. Updates will be made available as soon as possible.

8 Technical Diagrams

8.1 Block Diagrams

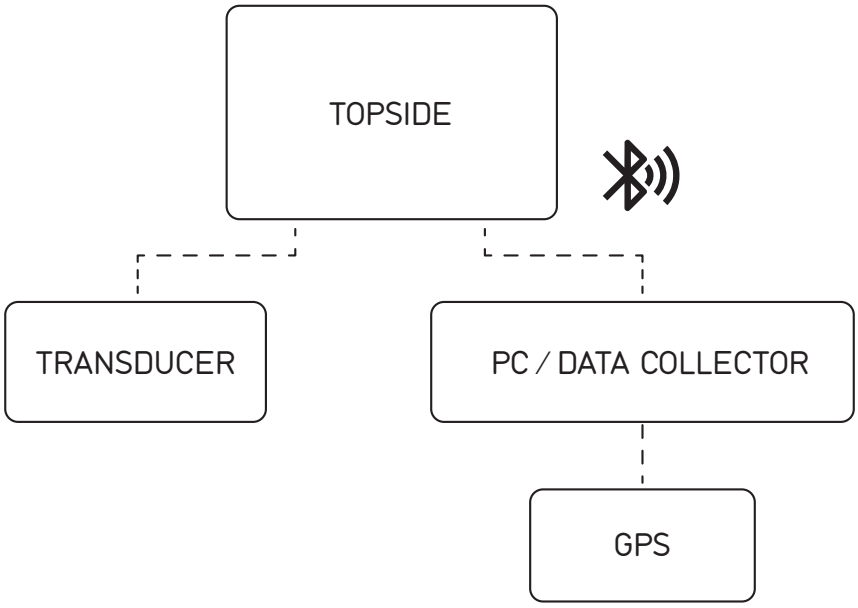


Figure 16: Block Diagram

8.2 Electrical Diagrams

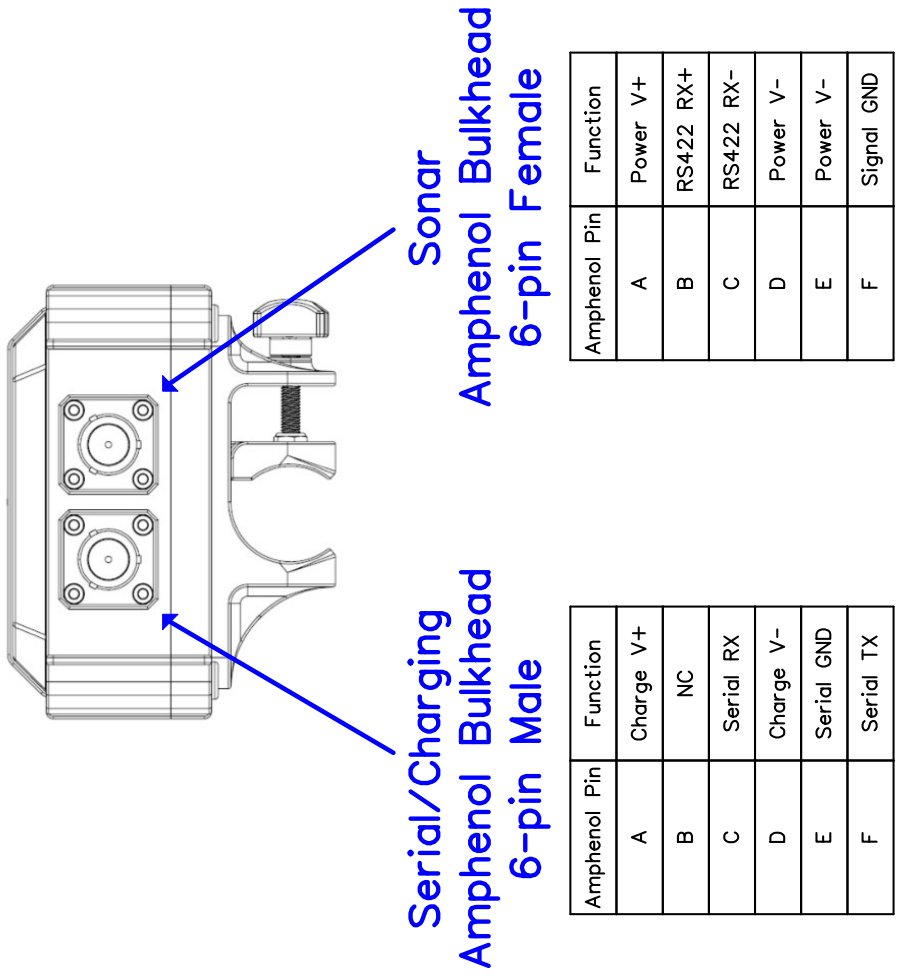


Figure 17: Hydrolite™ SF200-9 Topside Pin Out

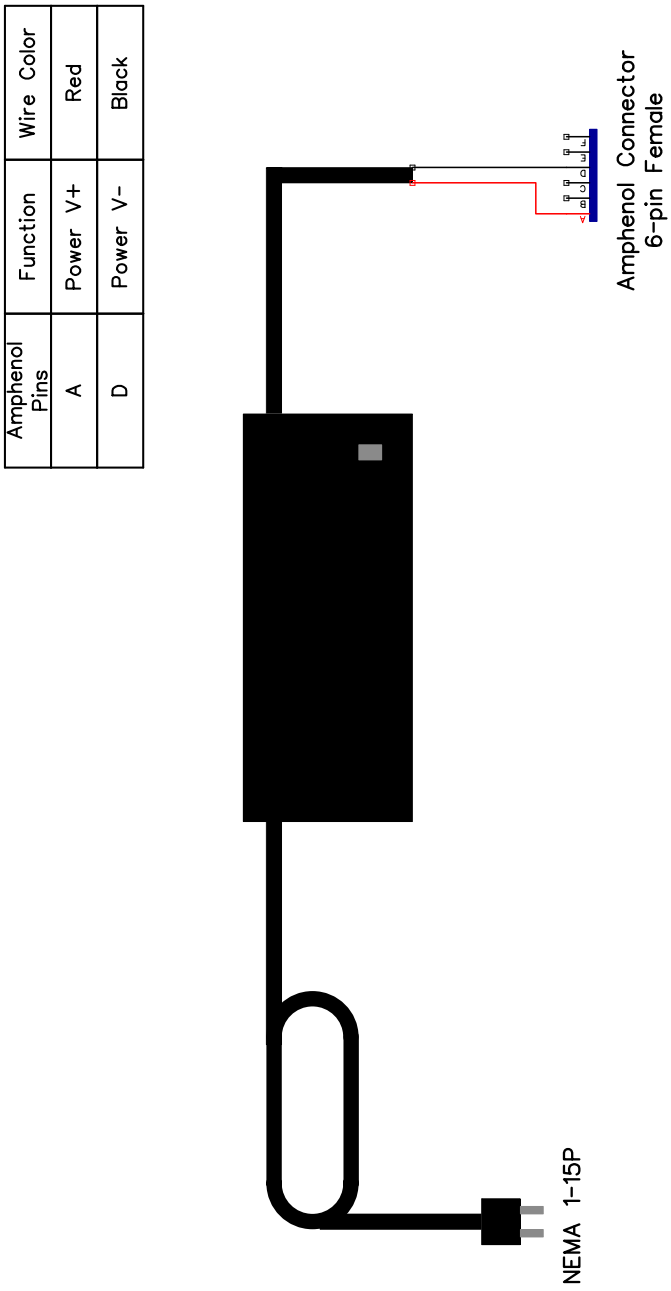


Figure 18: Charger Electrical Diagram

DB-9 Pin	Amphenol Pin	Function	DB-9 Color
2	F	Hydrolite TX	Grey
3	C	Hydrolite RX	Red
5	E	GND	Brown

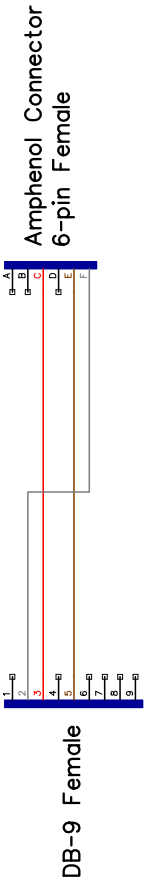


Figure 19: Serial Cable Electrical Diagram

Amphneol Pin	Transducer Wire Color	Transducer Function
A	Brown/White	Power V+
B	Orange/White	RS422 RX+
C	Orange	RS422 RX-
D	Brown	Power V-
E	Brown	Power V-
F	Green/White	Signal GND

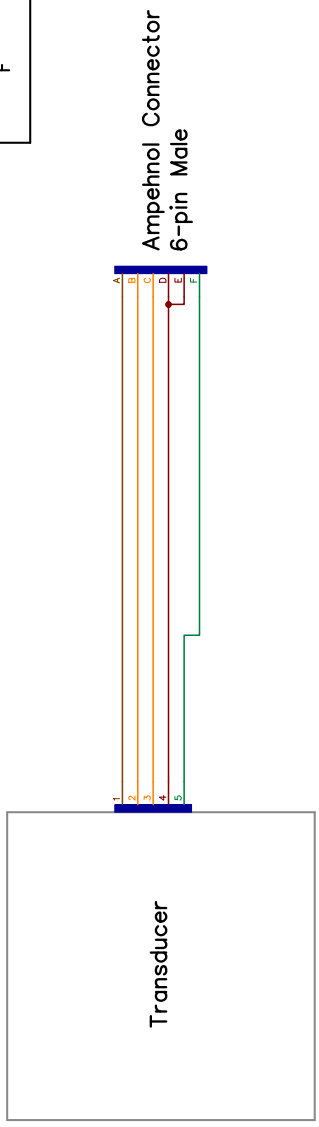


Figure 20: SF200-9 Transducer Electrical Diagram

8.3 Mechanical Diagrams

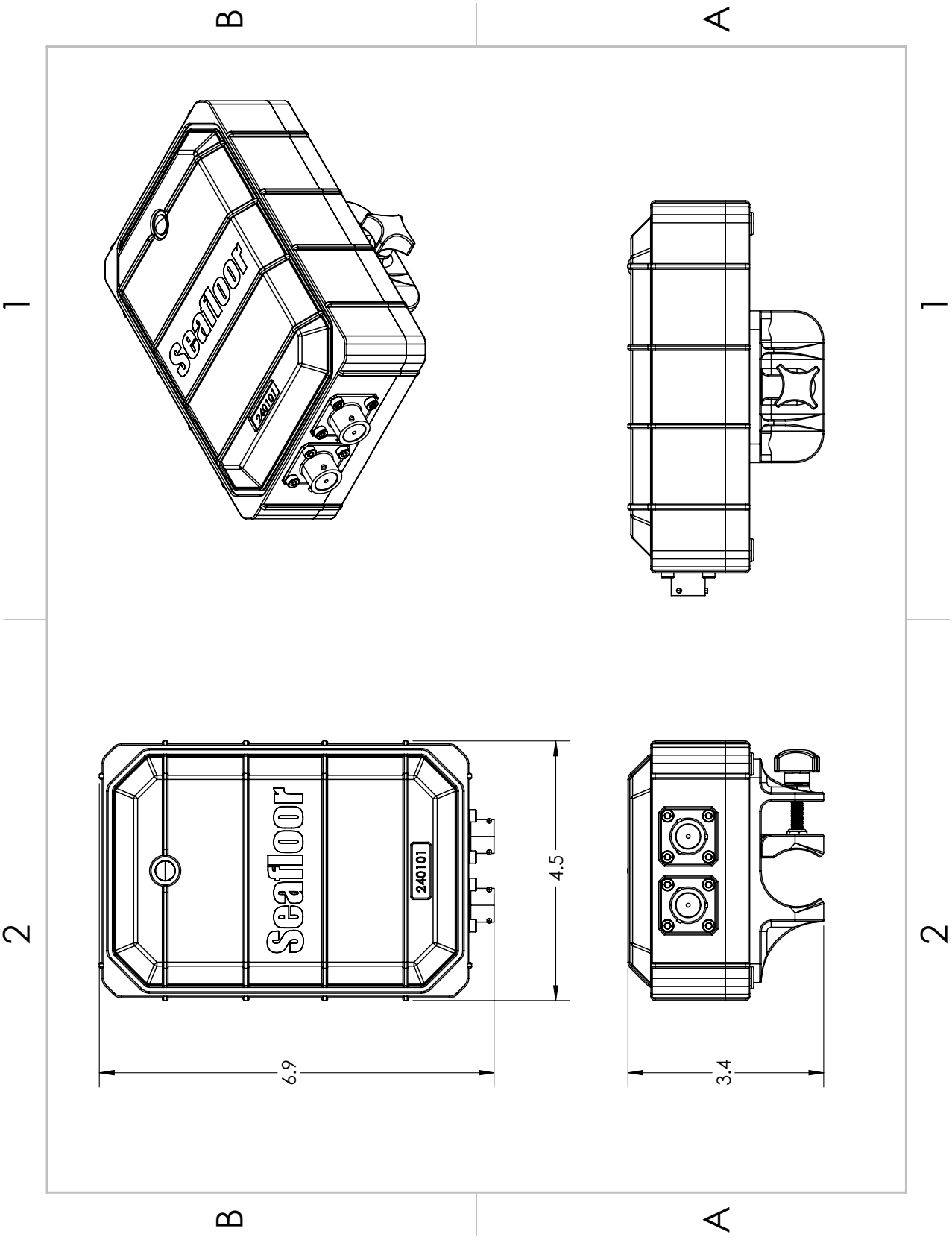


Figure 21: Hydrolite Topside Dimension Diagram

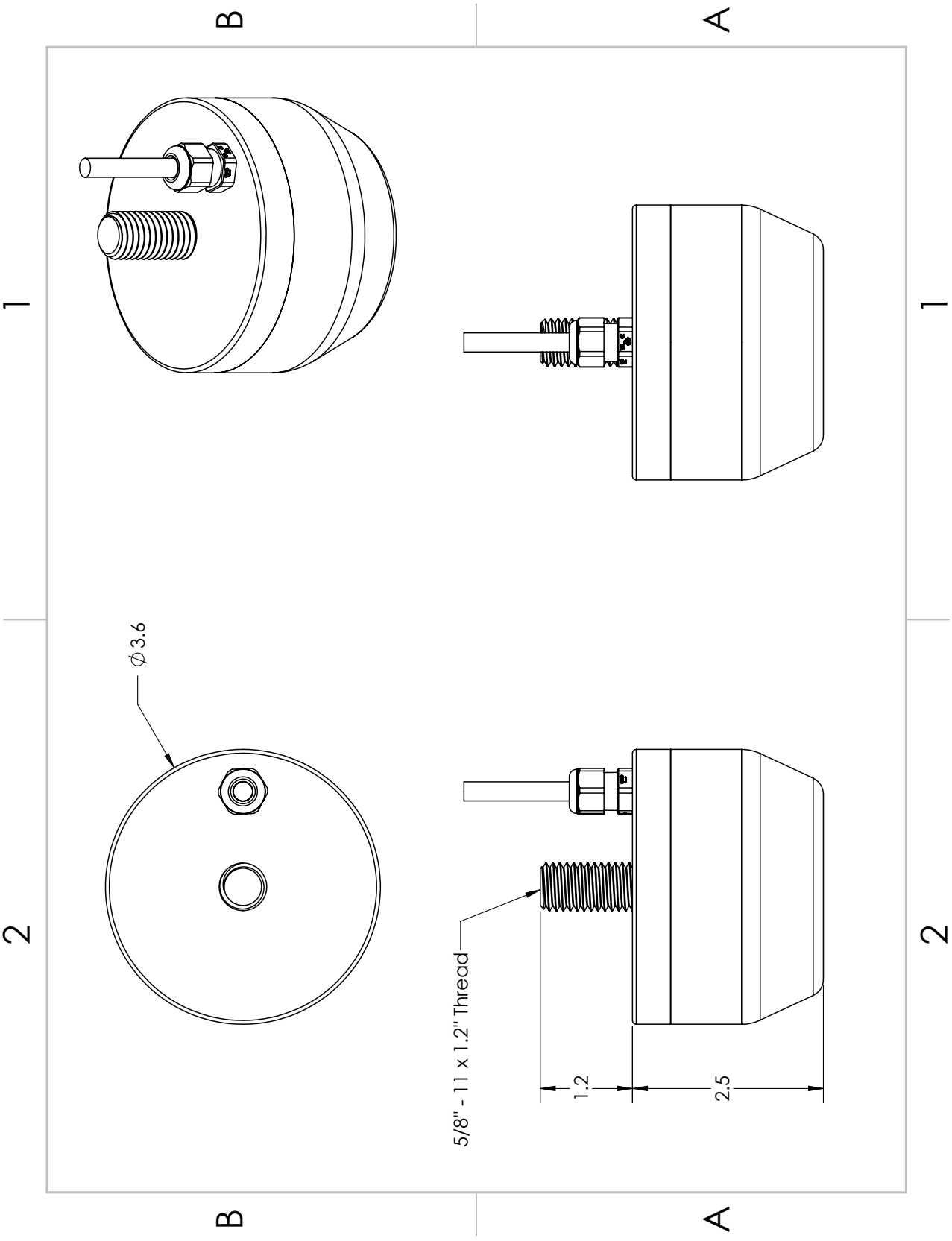


Figure 22: SF200-9 Transducer Dimension Diagram

8.4 Sound Velocity Charts

Speed of Sound in Freshwater							
Celcius/Meter				Fahrenheit/Meter			
Temp	Speed	Temp	Speed	Temp	Speed	Temp	Speed
4	1421.62	17.5	1474.38	39.2	1421.62	63.5	1474.38
4.5	1423.9	18	1476.01	40.1	1423.9	64.4	1476.01
5	1426.15	18.5	1477.62	41	1426.15	65.3	1477.62
5.5	1428.38	19	1479.21	41.9	1428.38	66.2	1479.21
6	1430.58	19.5	1480.77	42.8	1430.58	67.1	1480.77
6.5	1432.75	20	1482.32	43.7	1432.75	68	1482.32
7	1434.9	20.5	1483.84	44.6	1434.9	68.9	1483.84
7.5	1437.02	21	1485.35	45.5	1437.02	69.8	1485.35
8	1439.12	21.5	1486.83	46.4	1439.12	70.7	1486.83
8.5	1441.19	22	1488.29	47.3	1441.19	71.6	1488.29
9	1443.23	22.5	1489.74	48.2	1443.23	72.5	1489.74
9.5	1445.25	23	1491.16	49.1	1445.25	73.4	1491.16
10	1447.25	23.5	1492.56	50	1447.25	74.3	1492.56
10.5	1449.22	24	1493.95	50.9	1449.22	75.2	1493.95
11	1451.17	24.5	1495.32	51.8	1451.17	76.1	1495.32
11.5	1453.09	25	1496.66	52.7	1453.09	77	1496.66
12	1454.99	25.5	1497.99	53.6	1454.99	77.9	1497.99
12.5	1456.87	26	1499.3	54.5	1456.87	78.8	1499.3
13	1458.72	26.5	1500.59	55.4	1458.72	79.7	1500.59
13.5	1460.55	27	1501.86	56.3	1460.55	80.6	1501.86
14	1462.36	27.5	1503.11	57.2	1462.36	81.5	1503.11
14.5	1464.14	28	1504.35	58.1	1464.14	82.4	1504.35
15	1465.91	28.5	1505.56	59	1465.91	83.3	1505.56
15.5	1467.65	29	1506.76	59.9	1467.65	84.2	1506.76
16	1469.36	29.5	1507.94	60.8	1469.36	85.1	1507.94
16.5	1471.06	30	1509.1	61.7	1471.06	86	1509.1
17	1472.73			62.6	1472.73		

Figure 23: Fresh Water Sound Velocity Chart

Speed of Sound in Seawater @ 35 PPT / per Mille							
Celcius/Meter				Fahrenheit/Meter			
Temp	Speed	Temp	Speed	Temp	Speed	Temp	Speed
4	1466.86	17.5	1515.03	39.2	1466.86	63.5	1515.03
4.5	1468.95	18	1516.49	40.1	1468.95	64.4	1516.49
5	1471.02	18.5	1517.93	41	1471.02	65.3	1517.93
5.5	1473.07	19	1519.35	41.9	1473.07	66.2	1519.35
6	1475.09	19.5	1520.75	42.8	1475.09	67.1	1520.75
6.5	1477.08	20	1522.13	43.7	1477.08	68	1522.13
7	1479.05	20.5	1523.48	44.6	1479.05	68.9	1523.48
7.5	1481	21	1524.82	45.5	1481	69.8	1524.82
8	1482.93	21.5	1526.14	46.4	1482.93	70.7	1526.14
8.5	1484.83	22	1527.43	47.3	1484.83	71.6	1527.43
9	1486.71	22.5	1528.71	48.2	1486.71	72.5	1528.71
9.5	1488.56	23	1529.97	49.1	1488.56	73.4	1529.97
10	1490.39	23.5	1531.21	50	1490.39	74.3	1531.21
10.5	1492.2	24	1532.43	50.9	1492.2	75.2	1532.43
11	1493.98	24.5	1533.64	51.8	1493.98	76.1	1533.64
11.5	1495.74	25	1534.82	52.7	1495.74	77	1534.82
12	1497.47	25.5	1535.99	53.6	1497.47	77.9	1535.99
12.5	1499.18	26	1537.15	54.5	1499.18	78.8	1537.15
13	1500.87	26.5	1538.28	55.4	1500.87	79.7	1538.28
13.5	1502.53	27	1539.4	56.3	1502.53	80.6	1539.4
14	1504.18	27.5	1540.51	57.2	1504.18	81.5	1540.51
14.5	1505.79	28	1541.6	58.1	1505.79	82.4	1541.6
15	1507.39	28.5	1542.68	59	1507.39	83.3	1542.68
15.5	1508.96	29	1543.74	59.9	1508.96	84.2	1543.74
16	1510.51	29.5	1544.79	60.8	1510.51	85.1	1544.79
16.5	1512.04	30	1545.83	61.7	1512.04	86	1545.83
17	1513.55			62.6	1513.55		

Figure 24: Salt Water Sound Velocity Chart

Revision History

Revision	Date	Author(s)	Description
1.0	1.28.2025	HM	Created