



User's Manual

MB-Series Sonars



Part Number: 205696-00

Revision: Rev -

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System Contents

Along with the MB-Series Sonar, you will receive an accessory kit containing the following:

Cable Whip (4 ft.)
Sonar to Surface Bench Test Cable (25 ft.)
7ft Cat5 Ethernet Cable
60 W POE Box
Power Cable
Carrying Case

The Manual Packet includes:

Manual CD with:
<ul style="list-style-type: none">• Electronic copy of M-Series User's Manual• Electronic copy of M-Series Quickstart Guide
Printed copy of the M-Series Quickstart Guide
ProScan Software

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Warning! This product contains lead, a chemical known to the state of California to cause cancer, birth defects and other reproductive harm. Handling and/or opening this unit may result in exposure to lead, in the form of solder.

Warning! Disassembly and repair of this electronic unit should only be performed by authorized service personnel. Any modification of the serial number or attempt to repair the original equipment or accessories by unauthorized individuals will void the warranty.

Warning! Changes or modifications to this unit not expressly approved by the party responsible for compliance may void the user's authority to operate this equipment.

Warning! This equipment contains High Voltage electronics. Tampering with or using damaged equipment could lead to serious injury.

Warranty Information:

The sonar is backed by a standard 12-month parts and labor warranty policy. Seller's terms and conditions of sale can be found at www.blueview.com

For more information on safety and/or maintenance issues please call Teledyne BlueView, Inc. at 425.492.7376.

Chapter 1: Introduction

This manual covers installation, operations, and technical specifications of Teledyne BlueView, Inc. MB series sonar. For detailed information on using the sonar imaging software, please see the ProScan Software Handbook found both on the software CD as well as under the software's installation directory.

About the Sonar

The MB-Series sonar is a 3D MicroBathymetry underwater imaging sonar designed to create high resolution 3D point clouds of underwater environments.

Advanced sonar technology, rugged design, and powerful software are just a few highlights of your sonar system. With its Ethernet interface and user-friendly software, the sonar system is designed to be a valuable tool for bathymetric applications.

This manual explains imaging sonar interpretation and provides instructions on the installation and operation of your sonar system. For detailed information on using the sonar imaging software, please see the ProScan Software Handbook found both on the software CD as well as under the software's help menu.

Chapter 2: Understanding a Multi-Beam Sonar

What is a Multi-Beam Sonar?

Teledyne BlueView's MB systems are widely used throughout the marine industry to produce high resolution point clouds. The sonar deployed from a vessel or ROV mount for high resolution swath bathymetric mapping. The swath sonar data can be logged by any of several major data acquisition systems such as: HYPACK, QPS QINSy, EIVA NaviPack and Fugro StarFIX.

Chapter 3: Bench Top Setup

The following chapter contains step by step instructions for setting up your Teledyne BlueView, Inc. sonar.

Install the Software

Whether connected to an external PC or an onboard AUV controller, the ProScan software is required to operate the MB-Series Sonar. The following describes how to install the ProScan software on a user-supplied PC. For more information on ProScan and integration, see the ProScan Software Handbook found on the software CD, as well as under the software's help menu.

Note: Running other applications in conjunction with the Software may affect performance of one or both of the applications.

- 1) Place the ProScan CD-ROM in the CD-ROM drive. Installation will start automatically.

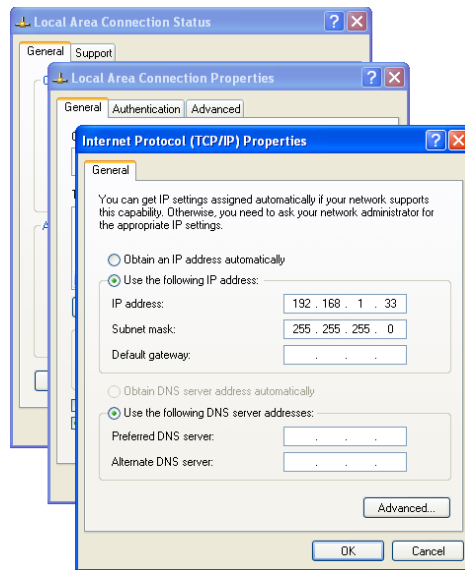
If the CD-ROM drive does not automatically run:

Select **Run** from the **Start** menu, and type **x:\setup** in the **Open** box (where x is the drive letter for the CD-ROM drive), then click **OK**.

- 2) The Welcome window opens. Click **Next**.
- 3) Follow the instructions on the screen to complete the installation

Configure the PC

The IP address on the user's PC will need to be set either to "Obtain an IP address automatically," or to a static IP: 192.168.1.x where x is any number besides 45 that doesn't conflict with the user's system:



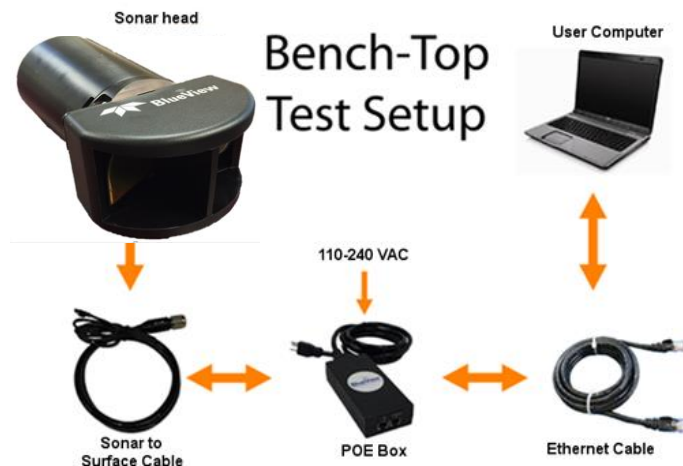
Firewall Software

ProScan Software communicates with the Sonar Head using standard networking protocols. If your PC has firewall software, you may see a warning “**popup**” that asks permission to allow the ProScan Software to connect to the Sonar. In that case, you may need to configure the firewall to allow communications between your Sonar and your PC using TCP and UDP on port 1149. Refer to your anti-virus software vendor or your computer tech support resources for assistance with your anti-virus software.

Setup Equipment

After installing ProScan, the MB-Series Sonar is ready for standalone operation. The only additional items required are the included Power Over Ethernet box (POE) and the Sonar to Surface Cable. The diagram below illustrates the proper connections needed for the system to function properly.

Note: The sonar shown may not look like your sonar but still has the same setup.



1. Inspect all cable connector contacts to ensure no moisture, corrosion, or damage exists before assembling the system.
2. Connect the underwater connector on the Sonar to Surface Cable to the mating bulkhead connector on the rear of the sonar. Once connected, ensure that the connector is fully engaged and tightened.
3. Connect the RJ45 connector on the Sonar to Surface Cable to the “SONAR J1” port on the POE Junction Box.
4. Connect one end of the Standard Ethernet Cable to the “PC J2” port on the POE Box.

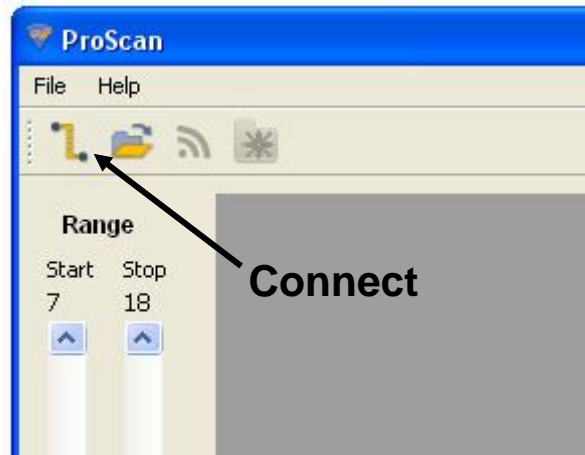
Note: The Sonar Head cabling is conveniently designed so that you can connect your POE Box to a PC with a **standard** Ethernet cable.

5. Connect the other end of the Standard Ethernet Cable to the Ethernet port on the User computer.
6. Plug the POE Box power cable into a standard 120 or 220 VAC wall outlet. The Sonar Head will power up and initialize itself in approximately 40 seconds. Correct operation requires that power be cycled from the AC side of the Junction Box.
Note: If you cycle the power off briefly, make sure you leave the power unplugged for at least 10 seconds.
7. Turn on your computer and connect to sonar through ProScan.

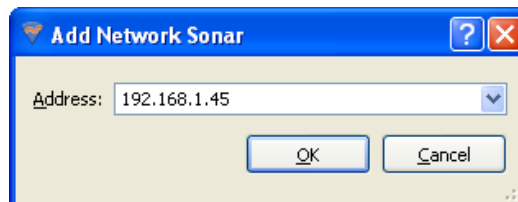
Chapter 4: Connecting with ProScan

Once the network settings are properly configured, open the ProScan Software on the User Computer and click on the connect button, as shown below.

Note: If the sonar has just received power, it will take 30- 60 seconds to boot and be ready for a connection.



When the connect button is pressed, ProScan should connect automatically to the sonar. If it doesn't, click File/Connect. Add to display the Add Network Sonar Dialog. The sonar's default network address is shown below.



Click OK. If the sonar does not connect, refer to the troubleshooting section of this manual.

Shutdown

To shut down the sonar, close the Sonar Window by clicking on the X icon in the top right-hand corner of the window, or select Exit from the File menu to close the entire program. To avoid data loss, be sure to close and save any sonar data files before removing the sonar power. It is now safe to power down the sonar or dis-connect the sonar Ethernet cable from the computer.

When power cycling the sonar, be sure to allow at least 10 seconds of 'off time' before turning the sonar back on.

Chapter 5: Troubleshooting

Possible Cause	Solution
No Power	Confirm that the POE Box is plugged into a standard 120 or 220 VAC outlet and that the small green LED on the POE Box is illuminated. Check that the Sonar-to-Surface cable is plugged into the SONAR J1 port on the POE Box.
Improperly connected	In addition to the connections described above, verify that you have a good cable between the computer Ethernet port and the PC J2 port on the POE Box.
Bad State	Reset the sonar by removing the POE box AC power cord for 10 seconds. The sonar head takes ~ 40 seconds to reboot after power is re-applied.
Dirty connectors	Make sure that all connector pins are clean and corrosion free.
Improper Ethernet cable	The Sonar Head cabling is conveniently designed so that you can connect your POE Box to a PC with a standard Ethernet cable. However, when connecting your POE Box to a network hub, a crossover Ethernet cable is required unless your network hardware is capable of automatically handling crossed Ethernet cables.
PC networking software is confused	Restart the networking software. There are several ways to do this depending on your particular operating system: Open the windows network connection window and right click on the Ethernet connection. Select repair or disable then enable . You can also simply restart the computer or cycle the power on the sonar.
IP subnet masks don't match	Make sure the subnet mask is the same on both PC and sonar. For the factory default Class C network configuration, the subnet mask is 255.255.255.0. The 255 defines the network portion of the IP address. The 0 defines the device portion of the IP address.
IP network addresses don't match.	Make sure the IP network part of the IP address is the same on both the sonar and the computer. In the factory default case, this is the first 3 numbers in the IP address: 192.168.1.
IP network device addresses are the same.	The device part of the IP address must be different for every device on the network. In the factory default case, the sonar is set to 45 and the PC is set to 3. Do not use 255 as it is reserved for broadcast use.
PC ARP table is stale.	In the ProScan Sonar Devices window, click the Add button and enter the IP address you think the sonar is set to respond to, then click OK . The sonar should respond within several seconds. Alternatively, the PC power can be cycled to refresh the ARP table.
Poor connection quality	Use an Ohmmeter to verify Tx and Rx line connectivity between the Ethernet connector that plugs into the PC and the connector that plugs into the Sonar Head. Refer to the ProScan Sonar to Surface Cable Drawing in the Spec sheet for pin to pin connection information.

Image Updates Seem Slow

Possible Cause	Solution
Ethernet congestion	Shut down any other computers or services that are consuming the Ethernet network bandwidth
Range settings	When your sonar pings, it must wait for the echo to return from a distant object; long range settings directly cause slow updates. Reduce the Range Stop distance to increase the update rate.
GUI window size	The larger the displayed sonar image, the longer it takes for the ProScan software to construct the image. To increase the image display update rate, decrease the size of the sonar image display window by grabbing one of sides or corner of the GUI and dragging it towards the center of the GUI window.

Still not working

Please contact us:

Teledyne BlueView, Inc. Customer Support

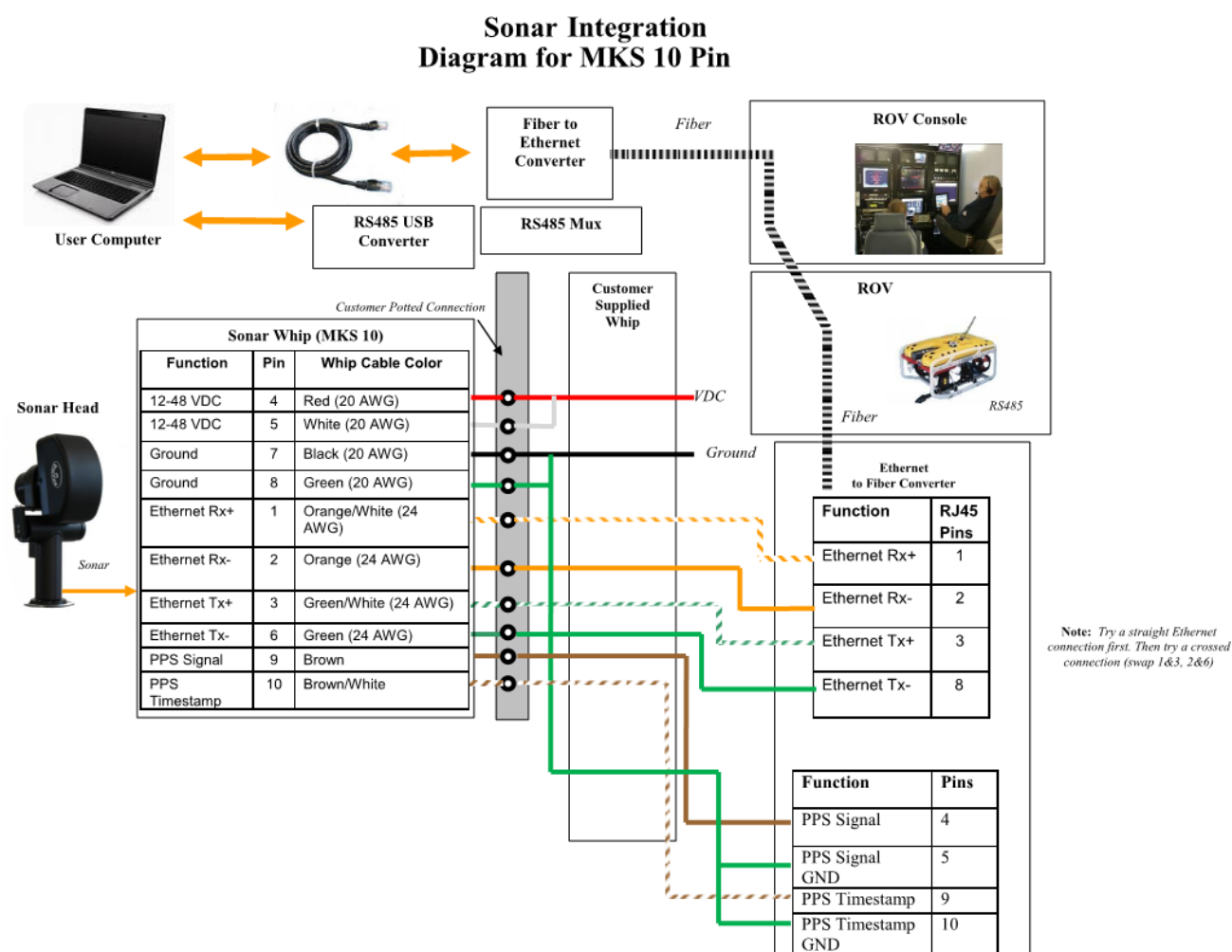
Website: www.blueview.com

Email: SWA_Support@teledyne.com

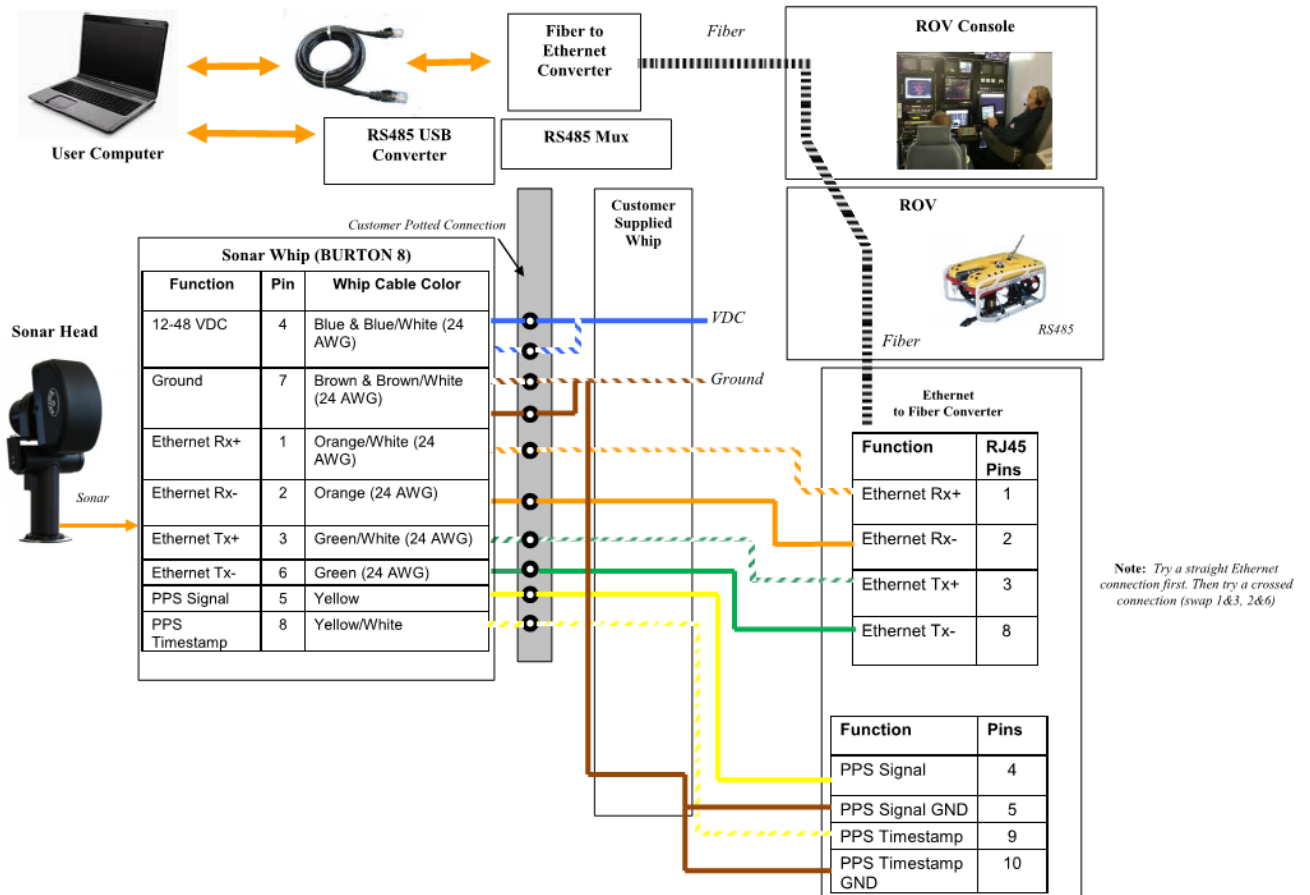
Phone Number: +1.425.492.7400

Hours of operation: 8am – 5pm PST Mon through Fri

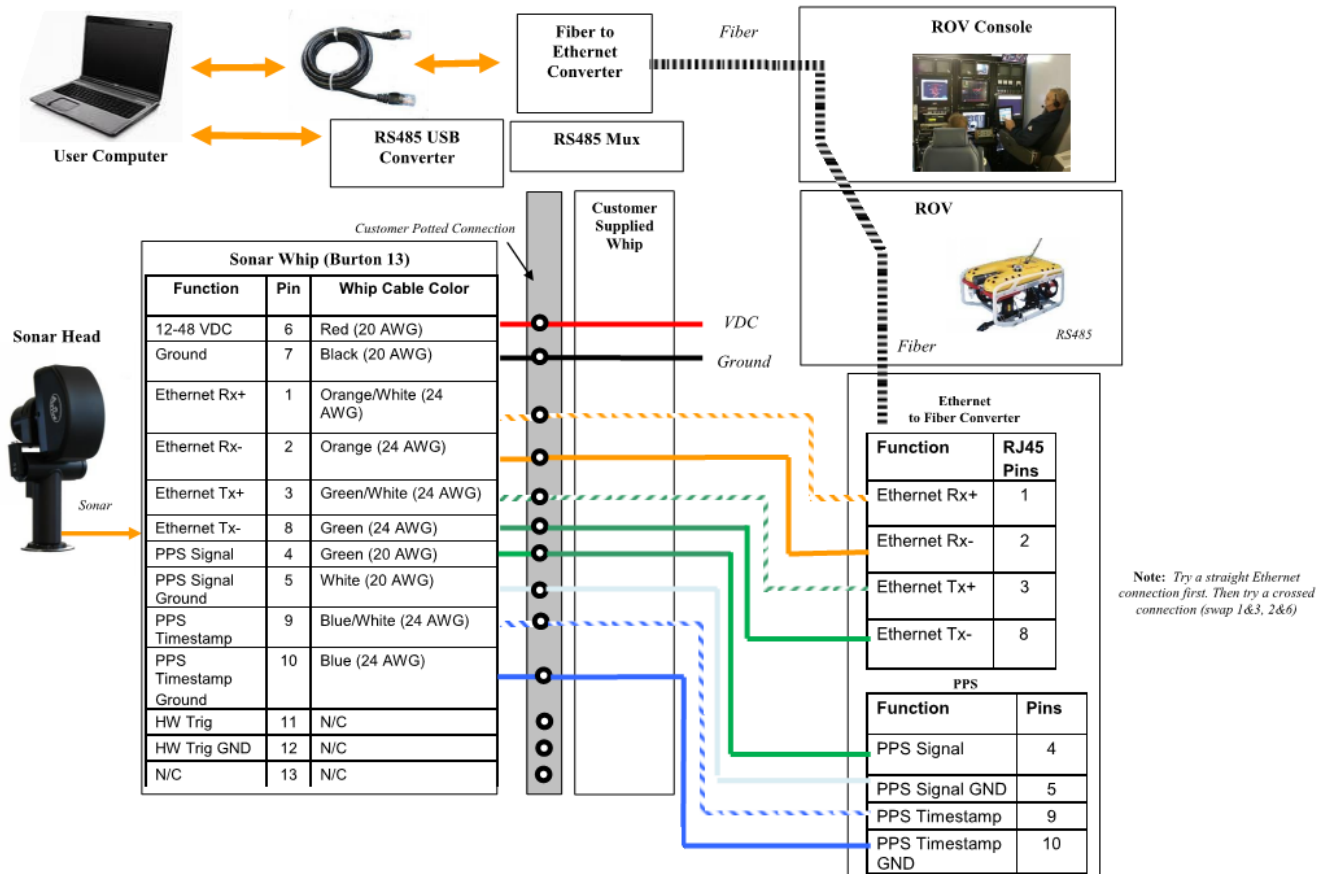
Appendix A: ROV Interface Setup



Sonar Integration Diagram for BURTON 8 Pin



Sonar Integration Diagram for Burton 13 Pin



Appendix B: PPS Addendum

Introduction

This addendum provides the required instructions to utilize your Teledyne BlueView sonar's Pulse-per- Second (PPS) capabilities. PPS provides an advanced timing mechanism for applications that require strict time synchronization between the sonar and an external clock source.

Wiring details are provided with reference to specific functions. To correlate these functions with particular connector points and/or wire colors, see the cable pinout addendum for your specific unit.

Utilizing PPS

PPS operation requires both a pulse source for the PPS signal and a serial source to provide the timestamp (time-at-tone) message. Connect your PPS trigger source to the **PPS SIGNAL** wire and your PPS trigger source ground to the **PPS SIGNAL GND** wire. Connect your serial PPS timestamp source to the **PPS TIMESTAMP** wire and your PPS timestamp source ground to **PPS TIMESTAMP GND** wire.

Configure your trigger source according to the following specifications:

Specification	Quantity
Trigger Input Type	5V TTL/CMOS
Minimum input as logic '1'	2.5 Volts
Maximum input as logic '0'	0.8 Volts
Maximum input current to drive to logic '1'	0.26 mA
Maximum input current [@ Vin = 5V]	1.1 mA

Table -PPS Trigger Signal Levels

Specification	Quantity
PPS Trigger Point	Rising Edge
Minimum pulse width	25 uS
Maximum Duty cycle	1%
Maximum timing latency	1mS

Table -PPS Trigger Pulse Characteristics

Configure your serial timestamp source according to the following specifications:

Specification	Quantity
Serial standard	RS-232
Baud Rate	9600
Data Bits	8
Parity Bit	No
Stop Bit	1
Timestamp Sentence Format	NMEA ZDA Timestamp Sentence
Timestamp Sentence Terminating Character	'\n'
NMEA Checksum Required	No

Table -Serial Timestamp Description

During operation the timestamp sentence follows the PPS trigger pulse and indicates the time at which the rising edge of the pulse occurred. The timestamp sentence must occur at least 10mS after the pulse completes, and all serial transmission must complete before the next pulse arrives.

The trigger pulse alone allows the sonar firmware to compute its own clock drift and establish a consistent clock frequency. Upon validating the timestamp sentence, the sonar computes an offset between its internal clock and the external time source, and all subsequent ping data is time-stamped accordingly.

Software Setup

PPS operation requires very little software interaction. It should be noted, however, that any client system (e.g., ProViewer 4, ProViewer SDK) must be set up to display sonar timestamps (not client system timestamps). See the relevant product documentation for additional details.

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```

```
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```

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```

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```

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```
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Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type `show
w'.
```

```
This is free software, and you are welcome to redistribute it
under certain conditions; type `show c' for details.
```

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<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice

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