



Software Handbook

ProViewer 4



Part Number: 204714

Revision: -, January 2014

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Disclaimer

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Warranty Information

For more information on safety and/or maintenance issues please call Teledyne BlueView, Inc. at 425-492-7400.

Chapter 1: Welcome

This manual describes the features of ProViewer from Teledyne BlueView, Inc. ProViewer is used to view and record live imagery from a forward looking imaging sonar as well as sonar data files in the .son format.

System Requirements

ProViewer requires a system that meets or exceeds the following requirements for optimum performance.

Windows XP with Service Pack 3 , Windows 7

Dual-core CPU (or better)

1GB or more of RAM

100 MB or more of free disk space

.NET 4 Framework installed

CD-ROM drive for CD installation or internet access for download

Additionally, if you will be connecting to a BlueView sonar you will need a free Ethernet port, and if you will be connecting to a Pan/Tilt unit, you will need either a serial port or USB port (for a USB to Serial adapter) free.

Installation

To install ProViewer, just insert the ProViewer CD into your computer's CD-ROM drive and follow the instructions to complete the installation. You may also launch the installation by double clicking on **setup.exe** in the CD's root directory. You may also download the ProViewer software at our website by visiting <http://blueview.com/software/2d-imaging/>.

When you start ProViewer, if you have a personal firewall enabled, you may receive a warning message saying that ProViewer is attempting to connect to the network. BlueView recommends that you select the option that will always allow ProViewer to access the network (which it needs to do to communicate with sonar). For example, in the image below, click **Unblock**.



Technical Support

Teledyne BlueView, Inc. is committed to providing industry leading customer service and technical support for all of our products. For technical assistance with ProViewer or your Teledyne BlueView sonar, please email your questions to swa_support@teledyne.com, or contact our customer service department at 425-492-7376 between the hours of 8am and 5pm Pacific Time, or visit our website at:

<http://www.blueview.com>

Chapter 2: Understanding Imaging Sonar

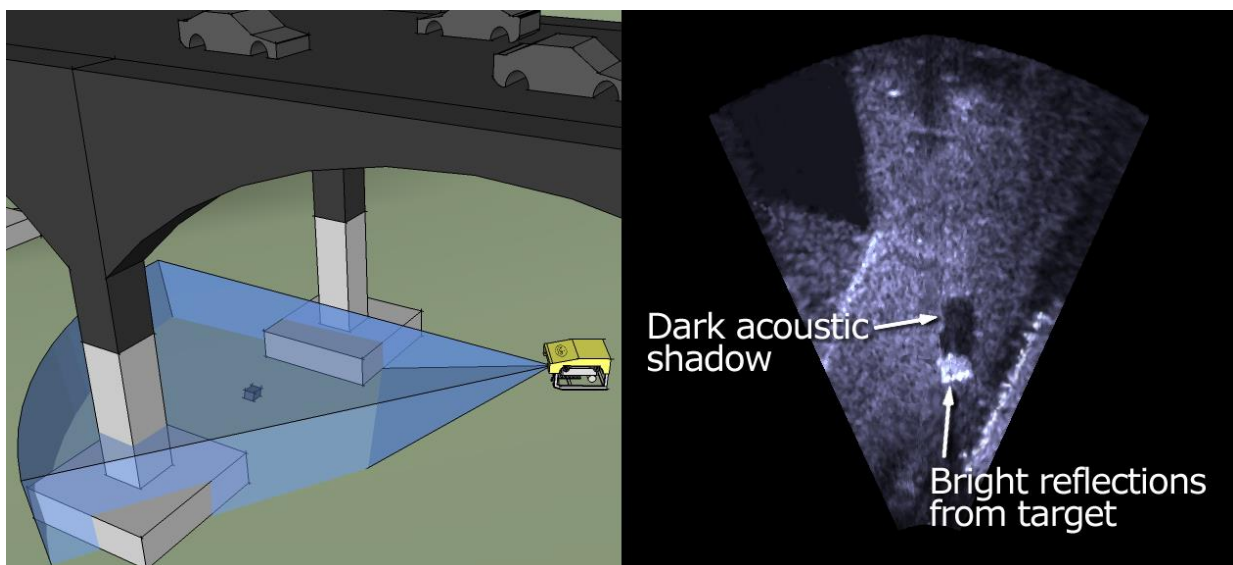
Many people are familiar with scanning type sonar and radar, which work by mechanically rotating a single beam over an imaging area. These work well when used on stationary platforms and/or when imaging static targets. They become much less useful when working from a moving platform and/or trying to image moving targets, such as divers, since any motion can cause errors in the final image.

By comparison, imaging sonar are multi-beam sensors, which form many small acoustic beams at once. This allows them to work well from both stationary and moving platforms. An imaging sonar can produce several high quality images per second, making it possible to get movie-like imagery from the sonar. BlueView sonar are imaging sonars.

Interpreting Sonar Images

Imagine a flashlight lying on a table and an object, such as a coffee cup, located in front of the flashlight. If you look directly down from above this scene, you will see a bright area where light is reflecting off the face of the coffee cup. You will also see a dark shadow behind the coffee cup where light is unable to reach.

The same idea can be applied to imaging sonar by replacing the light source with a sound source. Bright areas on the sonar image are the result of objects reflecting sound, while dark areas are acoustic shadows resulting from an object blocking the sound. The image below provides an example of how a scene would appear when viewed visually and with imaging sonar.



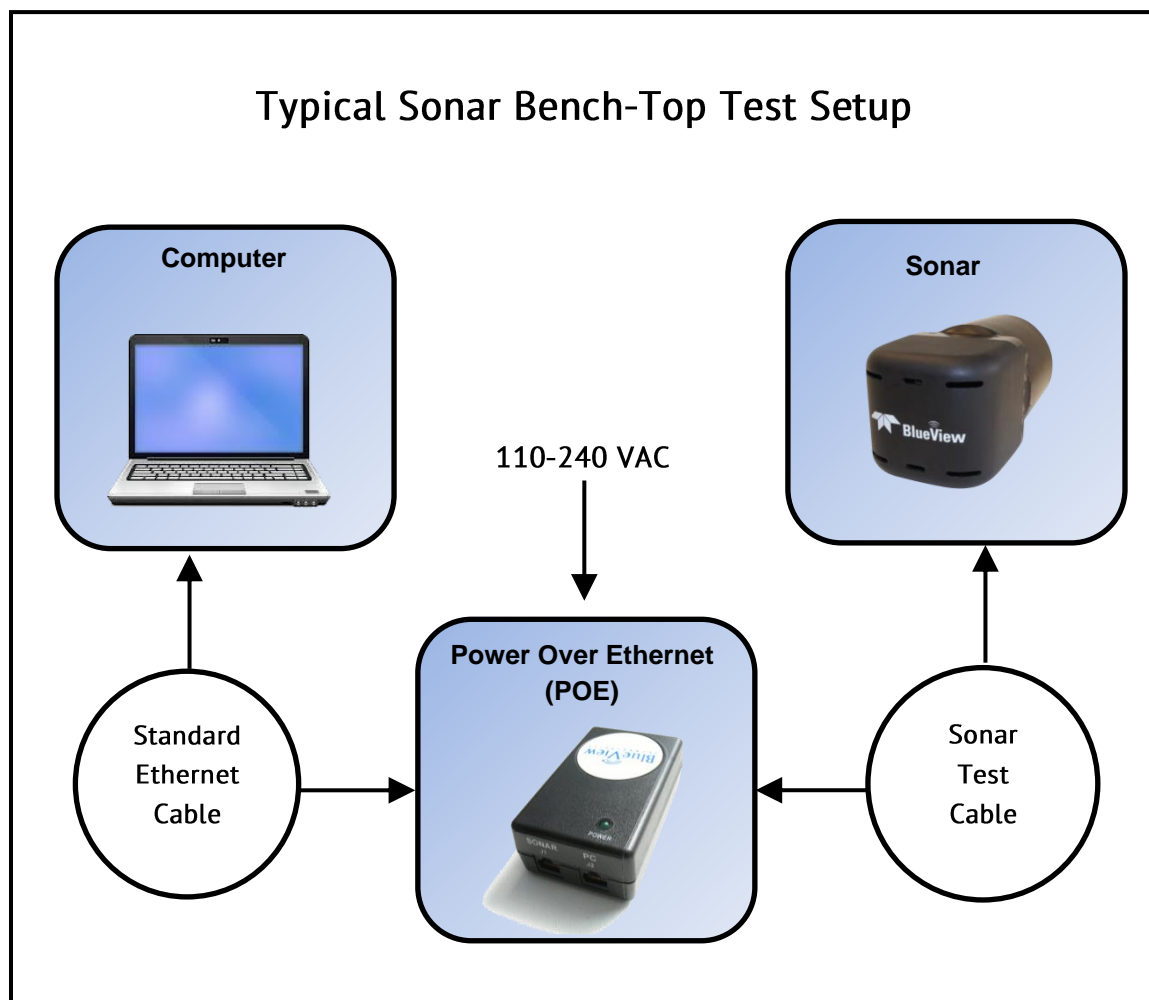
Chapter 3: Connecting to a Sonar

Setup

Begin by installing the ProViewer Software provided on the included CD or online, as described previously in this manual.

Using the provided test cables, connect the sonar to the external PC's Ethernet port through the POE box as shown below. For more information, see the quick start guide included with your BlueView sonar.

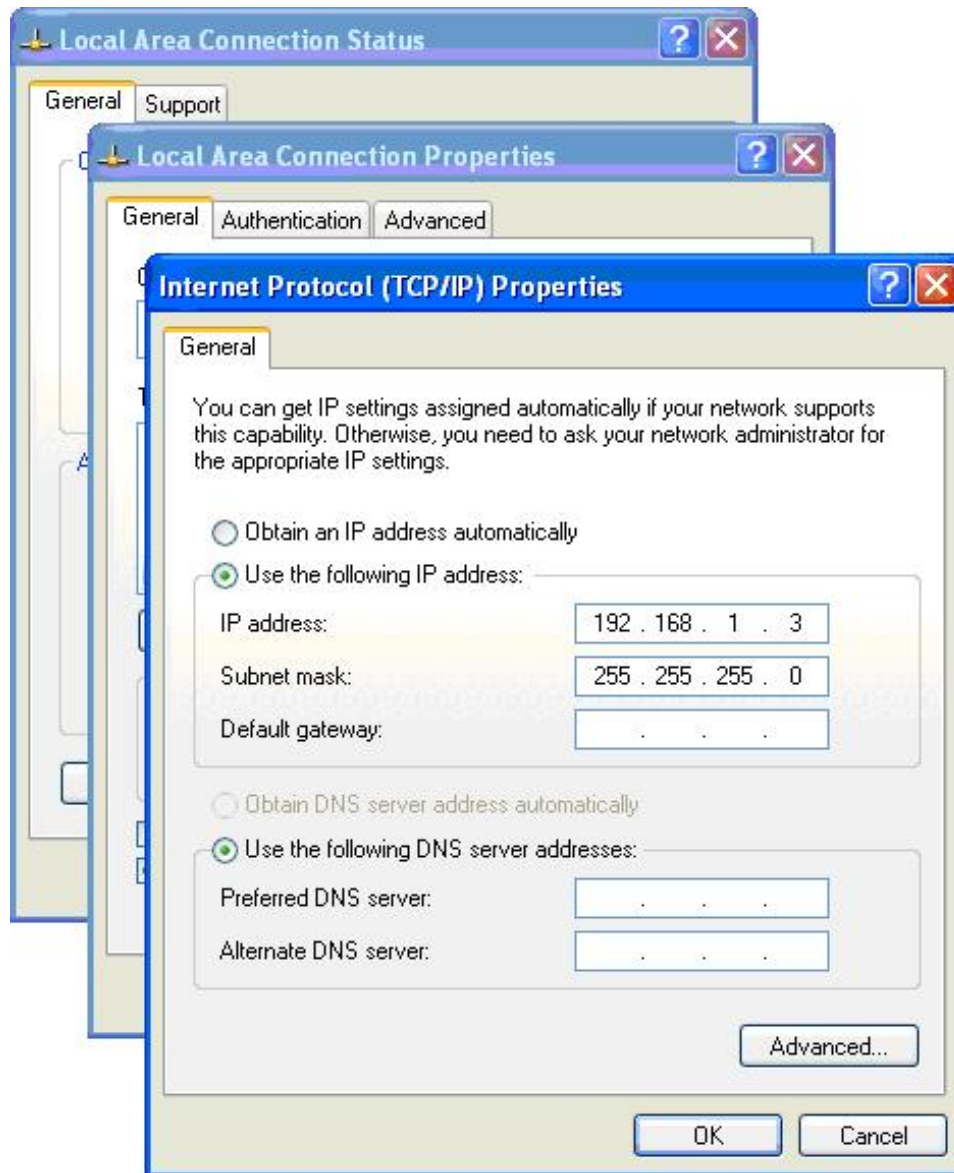
NOTE: This description assumes the sonar is still set up as shipped from the factory. For other sonar networking options, please see Appendix B.



The IP address for the Ethernet port on the PC which is connecting to the sonar will need to be set to a static IP: 192.168.1.3.

Windows XP

To access a PC's IP address in Windows XP, click **Start** → **Control Panel** → **Network Connections** and double-click on the computer's Ethernet port (usually Local Area Connection 1). Right click and select **Properties** then double click on **Internet Protocol (TCP/IP)** in the list of components. Make sure the IP address is set as shown below:



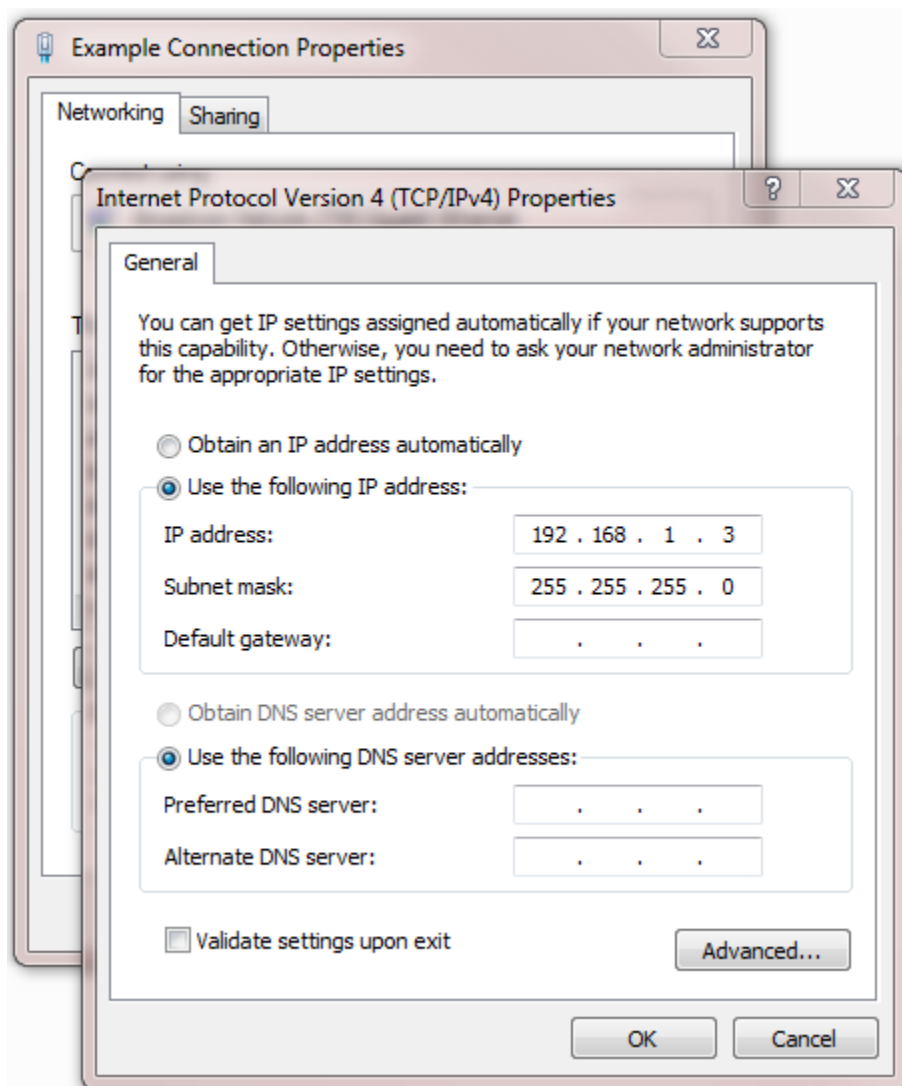
Windows 7

To access a PC's IP address in Windows 7, click Start → Control Panel → Network and Sharing Center → Change Adapter Settings.

Right click the connection that should be changed, and click **Properties**. You may be asked for an administrator password.

Click the **Networking** tab. Under *This connection uses the following items*, double click **Internet Protocol Version 4 (TCP/IPv4)**.

As described in the previous section, set the IP address to **192.168.1.3**, and the subnet mask to **255.255.255.0**.

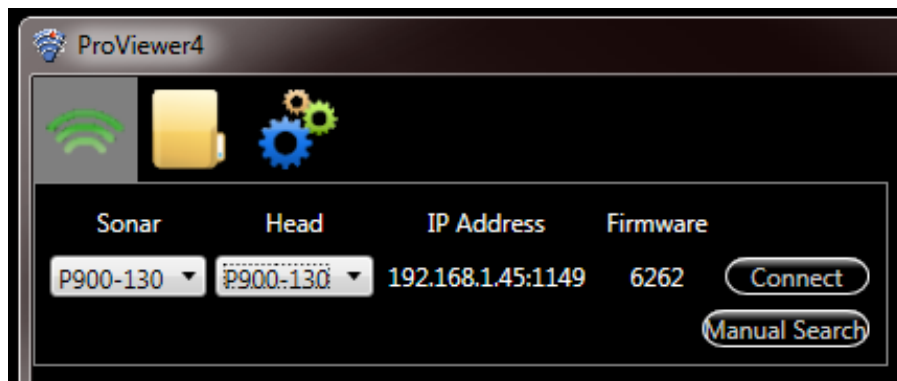


Connecting

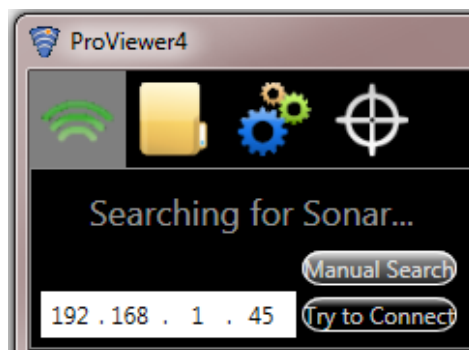
Once the network settings are properly configured, open the ProViewer Software on the User Computer and click on the connect button, as shown below. (Note that if the sonar has just received power, it will take 30-60 seconds to boot and be ready for a connection)



When the **Connect** button is pressed, the ProViewer software will automatically search for, and list, any sonars which are connected to the PC. If more than one sonar is present, or a sonar with multiple heads is present, ProViewer displays the available sonar heads to connect to in the **Sonar** and **Head** dropdown menu, respectively.



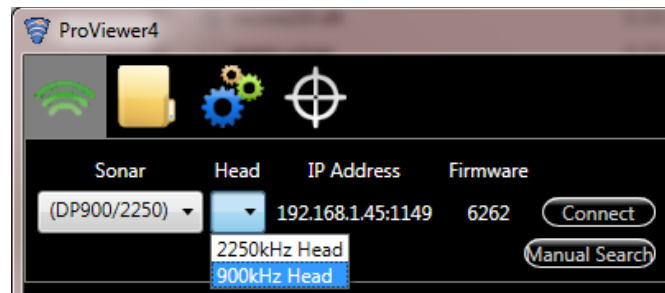
If a sonar head does not appear using ProViewer's auto-discover, click the **Manual Search** button and type **192.168.1.45**, the default Sonar IP address for all BlueView sonar systems, as shown below:



If you still cannot connect, please see Appendix A: Troubleshooting section of this manual.

Dual Frequency Sonar

Some BlueView products operate at more than one center frequency. These sonar are called ‘multi-head’ sonar. When connecting to a multi-head sonar, the **Head** dropdown in the **Connect** window will show you all the sonar heads available to connect to:



Simply click the head you want to use and click the ‘connect’ button. If already connected to a sonar head, you can switch which head you are using with the ‘Head’ drop-down menu.

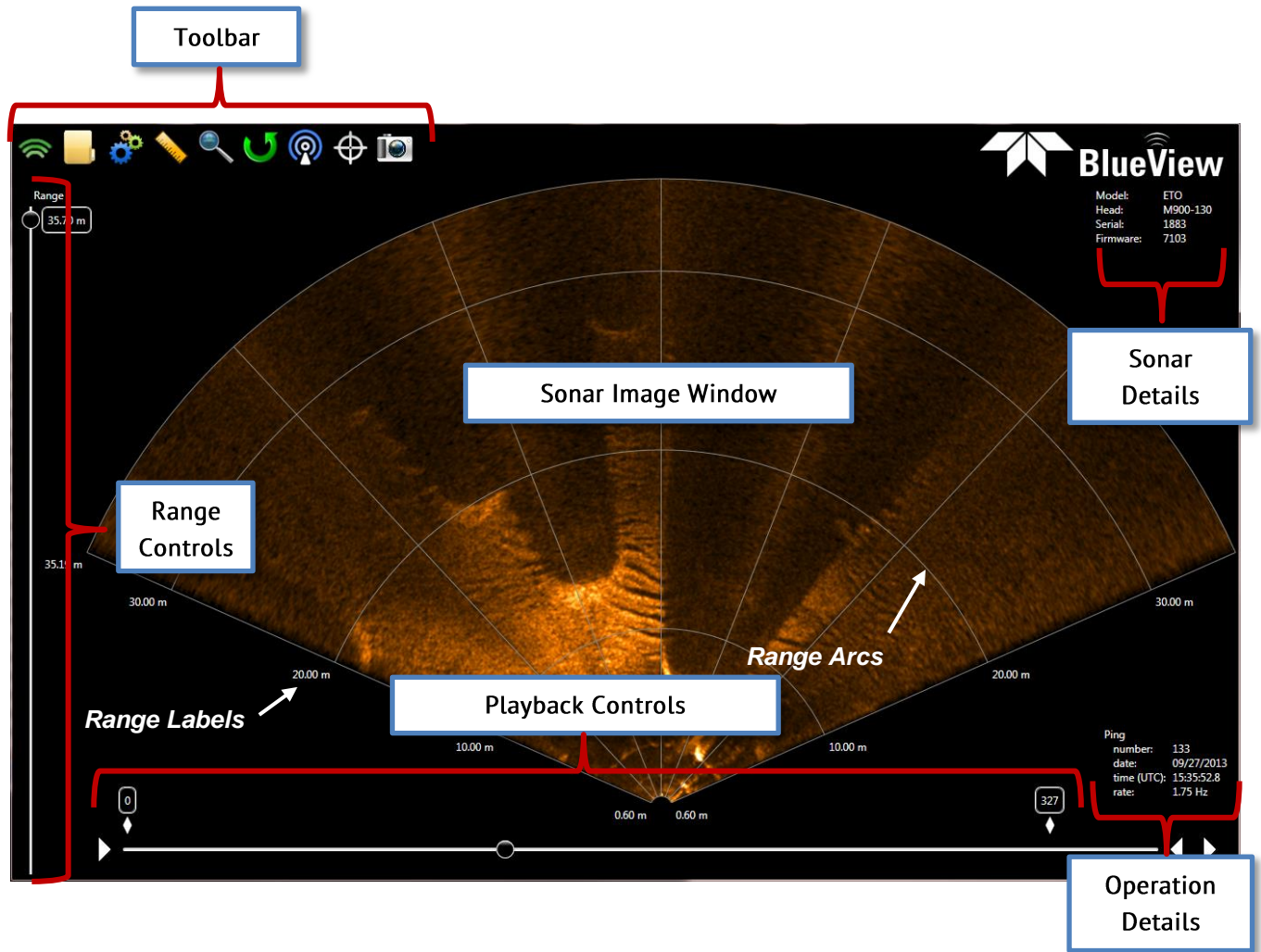
Run the two heads simultaneously by running two instances of ProViewer and selecting a different head for each instance.

Shutdown

To disconnect from the sonar, close the “Sonar Window” by selecting Disconnect from the File menu. Be sure to save and close any data files in use. It is now safe to power down the sonar or disconnect the Ethernet cable from the computer.

Chapter 4: Software Basics

Typical Screenshot








Range Controls





The sonar range slider (along the left side of the ProViewer window) allows you to change the maximum range to which the sonar will image. Lowering the range using this control will allow you to zoom in on an object at a particular range. Note that zooming in too far can create a degraded picture because not enough data is available to fill the screen pixels, resulting in pixilation.


NOTE: You may enable a **Minimum Range** slider by clicking on Settings→Application→ Allow Changes to Minimum Range

Toolbar

The toolbar provides quick access to several commonly used sonar functions. See the table on the following pages for descriptions of all toolbar functions.





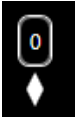

<p><i>Connect</i></p>	<p>To connect to the sonar, see Chapter 3.</p>	
<p><i>Disconnect</i></p>	<p>To disconnect from the sonar, click the Disconnect icon. Be sure to save and close any data files in use.</p> <p>It is now safe to power down the sonar or disconnect the Ethernet cable from the computer.</p>	
<p><i>Open Recorded File</i></p>	<p>Each time you open a sonar file or connect to a sonar unit, ProViewer replaces the current sonar display with your selection.</p>	
<p><i>Settings</i></p>	<p>To open ProViewer settings, click the Settings icon. See Chapter 7 for more details on ProViewer settings.</p>	
<p><i>Measurement</i></p>	<p>ProViewer provides a simple length measurement tool. To activate this tool, click the Measurement button on the toolbar. Next, click the location where you want to start the measurement. ProViewer then draws a dotted line between that point and the mouse cursor. Click a second time to freeze the current measurement. A third click sets the starting point for a new measurement.</p> <p>To clear the measurement line, click on the Measurement button a second time or press the Escape key on your keyboard. Clicking on the Measurement button toggles the measurement mode on and off.</p> <p><i>Note:</i> While in measurement mode, the cursor will return both range and bearing of its current location.</p>	

<p><i>Zoom</i></p>	<p>ProViewer provides a zoom function which will allow you to zoom in on specified sections of your sonar imagery. To activate this tool, click the Zoom button on the toolbar. Next, click the location where you want to zoom in or use the scroll wheel on your mouse to zoom.</p> <p>To return to the default view, you can press the escape key. Clicking on the Zoom button toggles the zoom mode on and off.</p> <p><i>Note:</i> You can use the mouse scroll wheel to zoom regardless of if you are in Zoom mode or not.</p>	
<p><i>Rotate</i></p>	<p>ProViewer provides a rotate function which will allow you to rotate the sonar imagery to an angle of your choosing or to preset positions. This tool is primarily needed when the sonar is mounted on a Pan and Tilt module, and the relative position of the sonar is changing.</p> <p>To activate this tool, click the Rotate button on the toolbar. You may choose a Sonar Up, Heads Up, or Fixed Angle view.</p> <p>Fixed Angle You may input a value to position the sonar imagery at a specific value on a 360° axis. This option is useful when the sonar is mounted in a fixed angle or vertical orientation, and you prefer to see it at a different angle.</p> <p>Heads Up When Heads Up is selected, the sonar image rotates according the pan angle of the sonar. This allows for the current position of the sonar to be quickly determined. (See Chapter 7 for more information on the Pan and Tilt option)</p> <p>Sonar Up When Sonar Up is selected, the sonar image stays locked in a vertical orientation. This setting is more appropriate for a ROV (Remotely Operated Vehicle) mounted installation.</p>	
<p><i>Tracker</i></p>	<p>Start/Stop One-Click Target Tracking. See Chapter 8 for details on usage.</p>	
<p><i>Export</i></p>	<p>ProViewer provides an export function for exporting files of various formats. Click this button to pull up a menu of export options, including Screenshot, Subset, and Video. See Chapter 6 for details on export functions.</p>	

<p>Record</p>	<p>ProViewer uses a proprietary file format that can be used to save sonar data into compressed records that are stored in a single file during collection. The sonar data in these files can then be accessed at a later time and exported into a variety of standard formats. While viewing live sonar, click the Record button on the toolbar to start recording. After a second press, recording will stop and you will be prompted for a location to save the file. The default file name is the current date and time with a .son extension.</p> <p><i>Note:</i> The time used for the file name is the system's local time</p> <p>A recording status indicator will appear in the upper right hand portion of the screen, along with a file size estimator, showing you the size of the recorded file in real-time.</p>	
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Playback Controls

When a .son file is loaded, the playback controls appear at the bottom of the window. The table below describes the different controls available.

<p>Play</p>	<p>Resume playback</p>	
<p>Playback Slider</p>	<p>The playback slider shows the current location inside the file. You may click on it to jump to a new location or simply drag the marker back and forth to quickly scan through a file</p>	
<p>Previous Ping</p>	<p>Go to the previous ping</p>	
<p>Next Ping</p>	<p>Go to the next ping</p>	
<p>Start Ping Range</p>	<p>Indicates a starting point for an exported subset of pings. Used in subset (.son) file exports and video (.avi) exports.</p>	
<p>Stop Ping Range</p>	<p>Indicates a stopping point for an exported subset of pings. Used in subset (.son) file exports and video (.avi) exports.</p>	

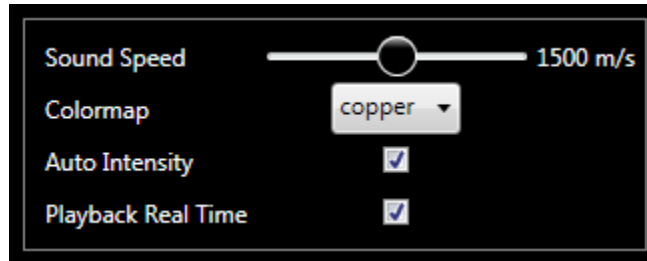
Operation Details

By default, several important pieces of information are superimposed on the image. Range arcs and labels provide a visual indication of how far objects are from the sonar head. Both can be toggled on or off by selecting the appropriate option under the **Settings → Application Settings**. For playback files, the time when the ping was taken is displayed in the lower right corner. For playback and real-time, the format of the time is selectable in **Settings → Units**. The current ping number is always displayed above the time and date and current ping rate is displayed below.

```
Ping
number: 332
date: 09/27/2013
time (UTC): 15:36:25.0
rate: 8.53 Hz
```

Chapter 5: Display Menu

To access the Display Menu, right click anywhere in the imagery window. See below for descriptions of each function.



Sound Speed

If your image looks ‘broken’ or mis-aligned, you may need to adjust the sound speed. We recommend measuring sound speed, or calculating based on environmental factors, prior to sonar use. This will ensure that you are receiving the most accurate imagery possible.

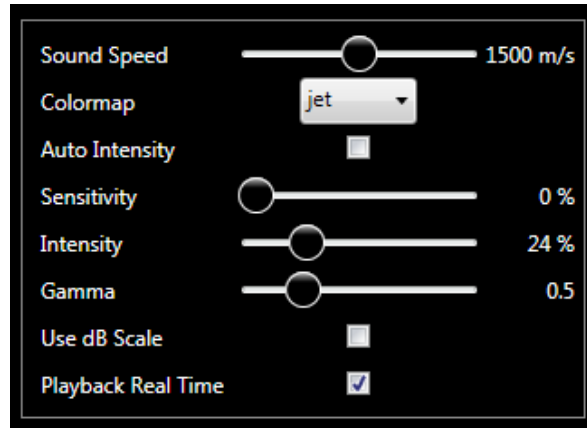
Colormap

The colors used in displaying the sonar image are referred to as the colormap. The selected colormap for the image is displayed in a drop down box in the display menu. To choose different colormaps, click on the drop down box and select a colormap from list. The following list describes the available colormaps and their characteristics. We recommend that you experiment with the different color maps to best understand their individual strengths and weaknesses.

Colormap	Characteristics
<i>Bone</i>	Best image definition, but low contrast makes it hard to use in bright sunlight conditions
<i>Cool</i>	Softer colors that work well in low light conditions
<i>Copper</i>	Great image definition and contrast. Best general purpose colormap
<i>Green</i>	Good image definition with high visibility. Good for bright light conditions
<i>Hot</i>	Good image definition and contrast. Good general purpose colormap
<i>Jet</i>	High contrast with low image definition. Jet is ideal for quickly spotting targets in bright light conditions

Auto Intensity

By default, ProViewer automatically adjusts the image intensity to produce an optimum image for most situations. However, there are some cases where you may want to disable this feature. You can do so by unchecking Auto Intensity in the Display Menu. With Auto Intensity disabled, ProViewer shows the Sensitivity, Intensity, and Gamma sliders in the toolbar.



Lowering the Sensitivity will allow more of the background to be displayed in the image. Increasing the Sensitivity will suppress background noise, increasing the contrast of the image. The Intensity control affects the brightness of the image, similar to brightness controls on a camera. Setting the Intensity too low or too high will make the image dim or blown out respectively, making image details difficult to see. You can checkmark the **Use dB Scale** box to represent the Sensitivity, Intensity, and Gamma values in decibels, rather than percent.

Note that these display adjustments are completely independent of the data being saved to a file, so you can make image adjustments for better viewing at any time.

NOTE: Increasing the Sensitivity too far may make some types of targets hard to track. Similarly, increasing the Intensity too far will cause much of the image to saturate, making target tracking impossible.

Chapter 6: Exporting Data

ProViewer provides options for exporting previously saved sonar data into several useful data formats. To use the export data, first load a file into ProViewer and then select one of the export options in the Export menu.



The following sections describe these export options.

Screenshot

Snapshot allows you to save the current image to a JPEG. The actual image size is the same as the image in ProViewer. Therefore, increasing the ProViewer window size will increase the size of the saved image. When this option is chosen, a **Save As** dialog box will appear, asking where you want to save the screenshot.

Subset



The subset export option allows the user to export a range of pings, specified by the start and stop ping range indicators, into a separate .son file. This smaller file can be loaded by ProViewer at a later date. This allows the user to 'edit' a data set, minimizing the file size and focusing on specific areas of interest in long sonar recordings. When this option is chosen, a **Save As** dialog box will appear, asking where you want to save the .son file.

Video



The Video export option allows the user to export a range of pings, specified by the start and stop ping range indicators, into an AVI movie file. When this option is chosen, a **Save As** dialog box will appear, asking where you want to save the video. ProViewer then displays a list of available compression types. Note that many of the codecs listed are not available for encoding/writing files (only reading/decoding).

Care should be taken to choose a compression format that is supported by the system where the AVI will be viewed. For AVI files, the "Microsoft Video 1" is often the best choice. Data can also be exported as an uncompressed AVI, if desired.

NOTE: To avoid lag while saving captured video, make sure ProViewer's temp directory and final save location are on the same hard drive. Otherwise the video file's transfer can cause a bottleneck, and slow down ProViewer.

Chapter 7: ProViewer Settings

ProViewer has a number of user-customizable settings that can be accessed through the Settings menu.



The following sections describe the settings menus in detail.

Application

See below for descriptions of the functions in the Application tab of ProViewer settings.



Display Range Labels and **Display Range Grid**: These options will allow the toggling of these respective indicators on or off by selecting the appropriate option. The Range Labels and Grid provide a visual indication of how far objects are from the sonar.

Display Help Tooltips: This option will toggle the help tooltips shown in the ProViewer display window.

Allow Changes to Minimum Range: If this option is enabled, an additional range slider is added to the left hand side of the display window. The slider will allow the setting of the start range so that the user can specify where ProViewer begins to display data.

Stop playback at stop marker: In playback mode, this option will stop the .son file from playing when it reaches the stop ping marker, instead of looping back to the beginning.

Show Advanced Settings: This option will enable or disable Advanced Settings for all Settings menu options. See below for details on these settings for the Application menu.

Reset All Settings: Clicking this button will reset all settings to default.

Advanced Application Settings

Fullscreen Display: This option will enable or disable a fullscreen display for ProViewer.

Maximum File Size (Mb): Using this setting, you can set the maximum file size, in megabytes, of a .son file being recorded. Once the recorded file reaches the specified size, a new .son file will be created.

Recording Directory: Using this setting, you can set your temp directory for .son files in the process of being recorded. Once the recording is stopped, the file will move from this temp directory into the directory specified at the end of the recording. .son files which are not completed before the **Save As...** prompt due to a software or equipment failure can be found in this temp directory. If you try to open that file, ProViewer may detect that it is corrupt and will attempt to recover what it can. For large files, this process could take a long time.

Timeout for sonar discovery (seconds): Sets the amount of time ProViewer spends searching the network for a sonar

Cartesian (XY) Image: Sets Display Window to a Cartesian Image.

Polar (RTheta) Image: Sets Display Window to a Polar Image.

Smoothing Filter: This option enables a smoothing filter, removing grain from the sonar imagery.

Units

The Units tab of ProViewer settings allows the setting of default units displayed in the sonar window. These unit settings are for display only, and do not affect how the data is saved in the file.

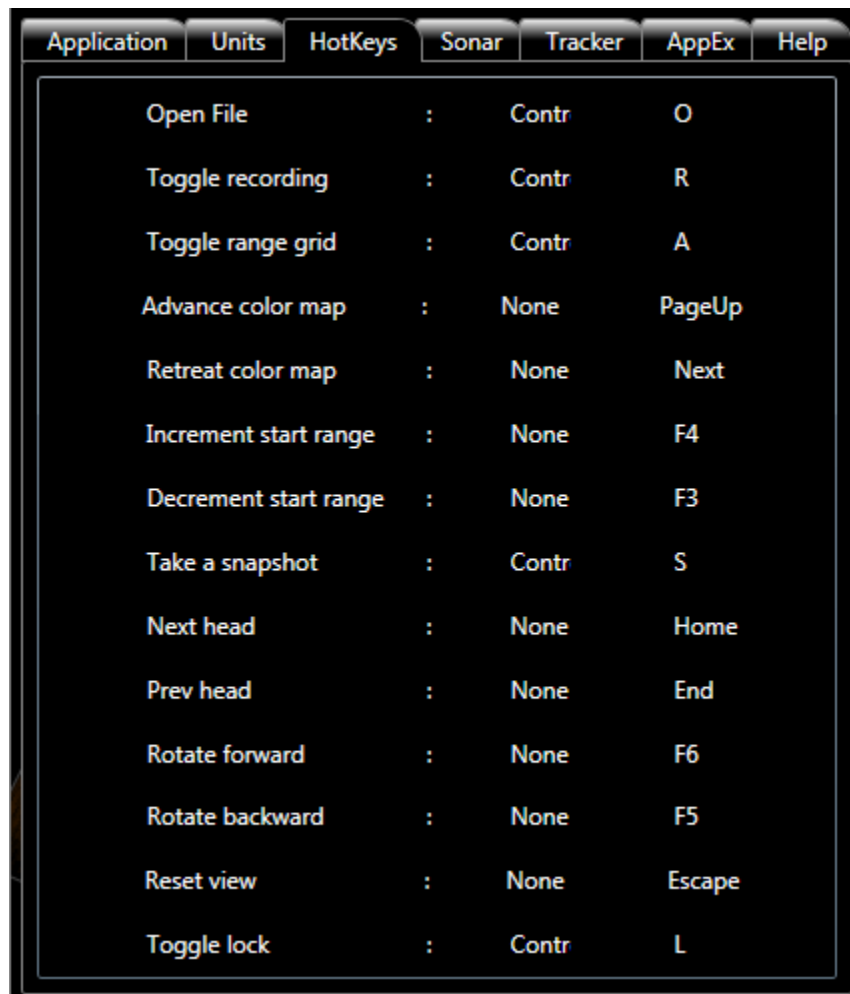


DateTime: This control allows you to change the format of the time displayed on the lower right hand corner of the ProViewer window. When data is recorded, the UTC time is always saved in the file, along with the time zone information. So UTC can be selected later for display, to give a definite time when the data was recorded, regardless of the time zone at that location.

NOTE: For files, the Local Time option is based on the time zone of the computer when the file was recorded. This ensures that if a file was recorded at 9AM in Seattle, ProViewer will show 9AM even when played back in Boston. To see an absolute time, use the UTC option.

HotKeys

The HotKeys tab in ProViewer settings lists all of the available hotkeys for use in the ProViewer software.



Function	Category	Hotkey
Open File	Contr	O
Toggle recording	Contr	R
Toggle range grid	Contr	A
Advance color map	None	PageUp
Retreat color map	None	Next
Increment start range	None	F4
Decrement start range	None	F3
Take a snapshot	Contr	S
Next head	None	Home
Prev head	None	End
Rotate forward	None	F6
Rotate backward	None	F5
Reset view	None	Escape
Toggle lock	Contr	L

Sonar

See below for descriptions of the functions in the Sonar tab of ProViewer settings. Note that the Sonar tab only populates with settings when a sonar is connected through ProViewer.



Network Settings:

TCP/IP Poll: Sets up a direct connection between ProViewer and the Sonar over TCP. This is the standard configuration

UDP Poll: Sends control messages and requests data over UDP, making the returned data available to anyone on the network listening. Useful when you want to setup “listen only” users at other locations on the network

UDP Listen: Disables all control for the sonar and just listens for sonar broadcasts, then displays the data when available. Useful when you want to setup “listen only” users at other locations on the network

IPv4 Settings: In this field, any current IPv4 settings will be displayed. To edit the IP address, you must enable Advanced Settings. See *Advanced Settings* for additional fields.

Generate Diagnostic File: Clicking this button will generate a diagnostic file which can be sent to Teledyne BlueView to assist in software troubleshooting.

Revert Factory Settings: Clicking this button will revert your sonar settings to factory default. Doing so may require a sonar power cycle for these settings to take effect.

Advanced Sonar Settings

Hardware Settings:

Base Gain: Adjusts the base analog gain on the receiver amplifiers

TVG: Adjust the time variable gain levels on the receiver amplifiers

Alt Ping: switches between higher ping rate mode and a improved imaging mode

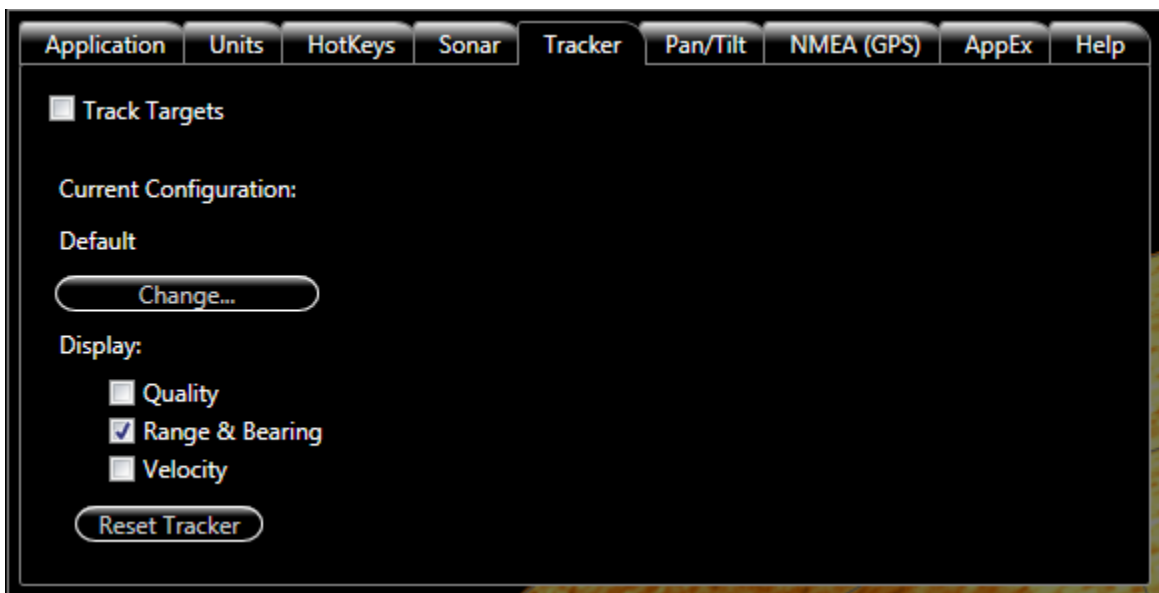
Hardware Trigger: If available, this option will enable or disable the hardware triggering function of the sonar.

Delay Live Pings: Enabling this option will allow you to put in a value for **Ping Interval (seconds)**, which delay each incoming ping by the specified amount of time.

IPv4 Advanced Settings: These settings allow for the input of a **Subnet Mask**, **Gateway**, and **Multicast IP Address**, as well as the enabling or disabling of a **Static IP Address** and **Onboard DHCP Server**.

Tracker

See below for descriptions of the functions in the Tracker tab of ProViewer settings. See **Chapter 8** for more details the use of the tracking feature.



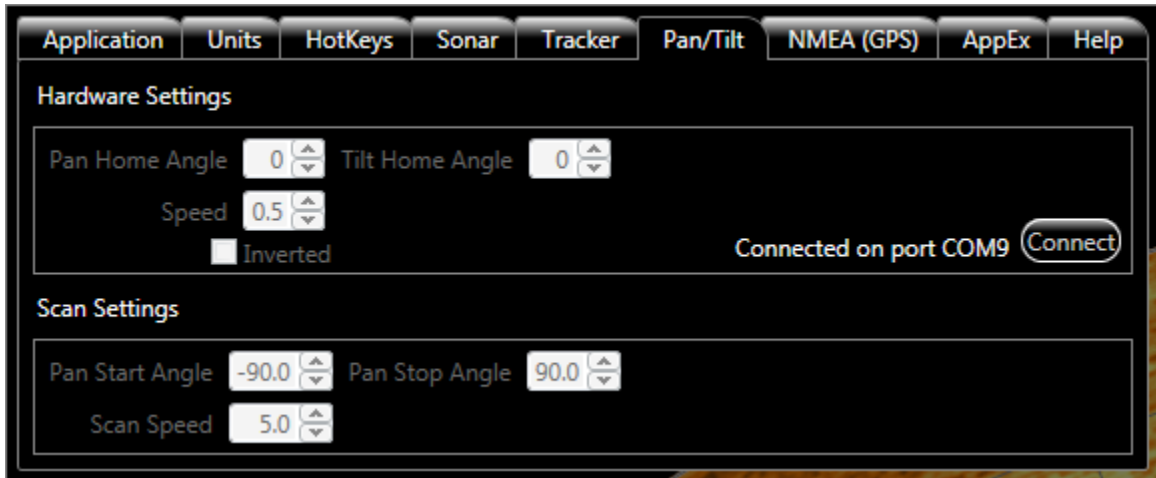
Track Targets: This option enables or disables the tracking function of the sonar. It has the same effect as pressing the tracking icon on the main window.

Change: This button will pull up the custom settings menu. This will allow you to set a number of parameters affecting the behavior of the tracker, and store them as custom configurations

Display: These settings will allow you to specify what information is displayed next to the tracked targets on the ProViewer main display.

Pan/Tilt

The Pan/Tilt tab in ProViewer settings provides a number of settings for pan and tilt integration into ProViewer.



Hardware Settings:

Pan Home Angle: Set the pan angle which will be returned to when the **Home** button is clicked on the pan and tilt controls.

Tilt Home Angle: Set the tilt angle which will be returned to when the **Home** button is clicked on the pan and tilt controls.

Inverted: Reverses the pan and tilt controls. Most commonly used when pan and tilt is being used in an inverted configuration, such as on a BV3100 pole mount system.

Connect: Searches for and connects to a pan and tilt system on its corresponding COM port.

Scan Settings:

These settings control the pan while in continuous scan mode, which is selectable from the main display pan and tilt control.

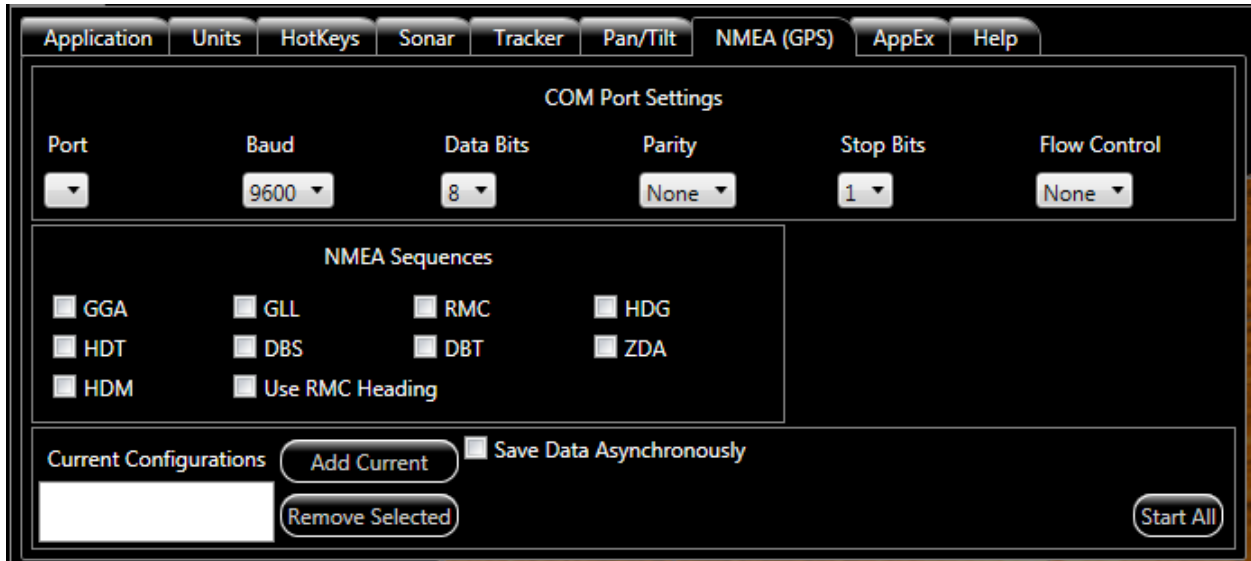
Pan Start Angle: Set the low angle limit during continuous scan mode.

Pan Stop Angle: Set the high angle limit during continuous scan mode.

Scan Speed: Rotational rate during continuous scan mode.

NMEA (GPS)

See below for descriptions of the functions in the Sonar tab of ProViewer settings. If connected, note that values captured from GPS devices will be saved in the .son file while recording, and will be displayed on the screen both on playback and during live viewing.



COM Port Settings: In this section, the proper COM port values corresponding to your GPS device must be filled in. The official NMEA setup is 4800 baud, 8 bits, no parity, one stop bit. Some newer devices use faster baud rates. Note that the current setup only supports a situation where all NMEA devices are consolidated to a single connection.

NMEA Sequences: In this section, specify the NMEA sentences which you want displayed on your ProViewer main window. Note that only the 3 letters identifying the message type are used. The first two letters (out of 5) in the full message identifies the “talker” and may be manufacturer specific, so they are effectively ignored for the purposed of choosing which messages to listen for.

Message	Content	Comments
GGA	GPS Fix data (time, position, fix data)	
GLL	Geographic Position (Lat/Long, time)	
RMC	Recommended Min Nav Information (Time, Position, Speed over ground, Track made good, Date, Mag variation)	
HDG	Heading – Deviation & Variation	
HDT	Heading True	

<i>HDM</i>	Heading Magnetic	
<i>DBS</i>	Depth below surface	
<i>DBT</i>	Depth below transducer	
<i>ZDA</i>	Time (UTC time and data)	
<i>Use RMC Heading</i>	Uses track made good value from RMC message as an approximate heading.	Only use if no other heading information is available.

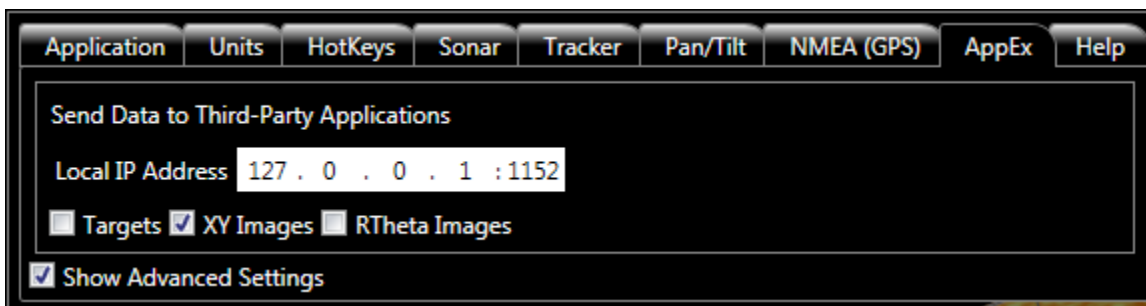
Current Configurations: Save a current configuration using the **Add Current** button and remove this selection using the **Remove Selected** button, when the configuration is highlighted. This allows for simple switching between various NMEA display preferences and devices.

Save Data Asynchronously: Allows nav data to be stored only when a new fix is received. If not selected, the current navigation data is repeatedly stored with the ping data until a new update is received.

Start All: Click this button to begin displaying NMEA information on your ProViewer main window.

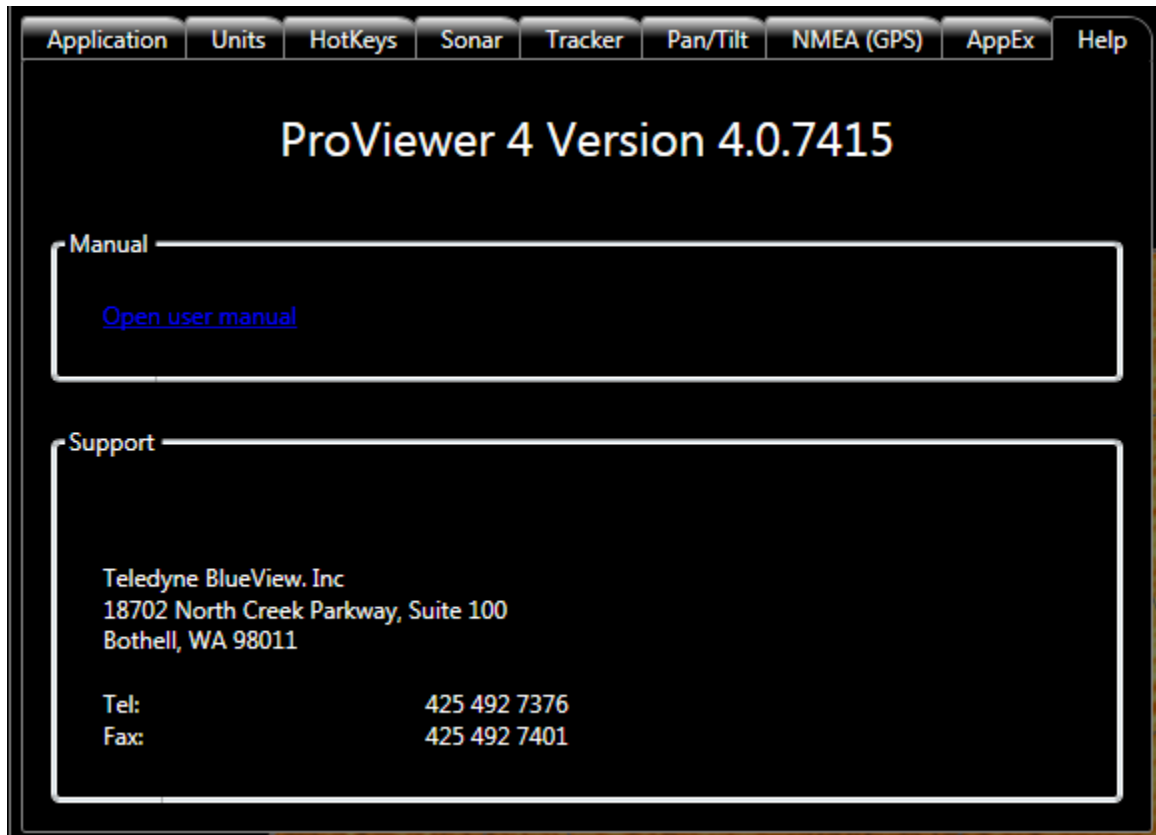
AppEx

The AppEx tab in ProViewer settings allows you to connect ProViewer with a third-party application for easy software integration. You can choose whether to send **XY Image** data, **Target** data, and/or **RTheta** data to the application running on the computer/port specified by the **Local IP Address**, available under advanced settings.



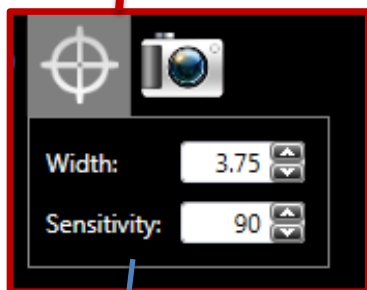
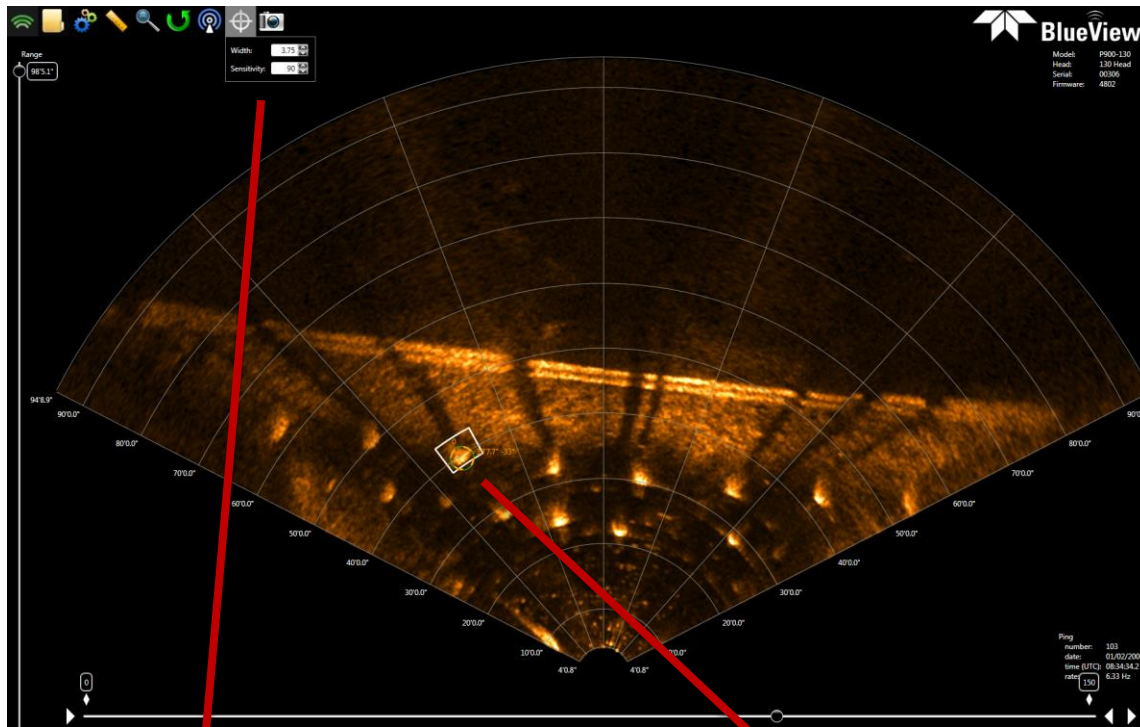
Help

The Help tab in ProViewer settings provides access to the User's Manual, as well as version and Teledyne BlueView support information.

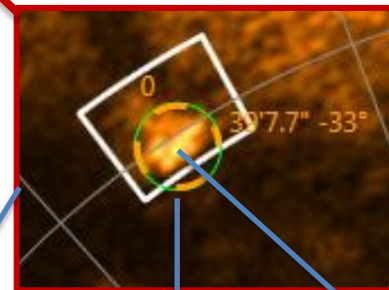


Chapter 8: One-Click Target Tracking

On sonar with the **Tracking Feature** enabled, ProViewer provides a one-click target tracking capability. This feature is optimized to quickly lock onto a target of interest with minimum user adjustments. As these tracks can be streamed using the AppEx ProViewer feature, the interface is ideal for dynamic position operations.



Tracker Settings



Tracker Window

Target Lock Circle

Target

The following sections describe One-Click Tracking feature.



Clicking on the tracker icon brings up the “Tracker Settings” inputs and enables the One-Click Tracker feature. Once enabled, the operator can lock onto a target of interest simple by clicking on the target within the sonar image. Upon clicking, a white “Tracker Window” appears around the click location. If a strong enough target is located in the window, that tracker will automatically lock onto that target (designated by the Target Lock Circle) and the tracker will automatically move the tracking window to follow that target as it moves around the screen. Click on new targets to move the tracking window to another target. Click the tracker icon again to disable target tracking.

Tracking Settings

Width: Set the estimated width of the desired target. This value will control the Tracker Window size created upon clicking a targeting area.

Sensitivity: Controls how strong a target the tracker will sense, lowering the sensitivity will pick up more targets, which can be an issue in noisy environments.

Tracker Window: This white window shows the area the tracker is currently searching for an acceptable target to track. Adjusting the “Width” tracker setting will adjust this size.

Target Lock Circle: When an acceptable target is detected in the “Tracker Window”, the tracker locks onto that target, and follows the target around the screen.

Target Info: Information such as target number, velocity, and range/bearing can be displayed next to each target. Adjust what information is displayed through the **Tracker** tab in the settings window.

Appendix A: Troubleshooting

This section is designed to help you quickly identify and solve issues dealing with the inability to connect to a BlueView sonar from a PC. While the basic connection between sonar and computer is straight forward, things can get more complex once integrated into a delivery system. The approach we will use attempts to test different potential causes in a way that optimizes the debugging process. The following steps are recommended to identify and possibly fix issues you may be having:

- ✓ Rerun ProViewer Software
- ✓ Reboot PC and Sonar
- ✓ Check Network Settings
- ✓ Check Connectors
- ✓ Check Power
- ✓ Test Sonar
- ✓ Common Communication Link Issues

Rerun ProViewer Software

ProViewer searches for sonar on the local network when the software is initially opened. If a sonar did not complete its boot process before ProViewer was opened, it may have missed that sonar. Rerunning the software can fix this.

If ProViewer still does not see the sonar, try manually adding the sonar by clicking the **Manual Search** button in the **Connect** window. Enter the sonar's IP address (factory set to 192.168.1.45) and click **Try to Connect**.

If you were not able to connect to the sonar, go on to the next section **Reboot PC and Sonar**

Reboot PC and Sonar

Power down both the sonar and computer and wait ten seconds. Turn on the computer first, letting it boot up completely before turning on the sonar. This can solve network configuration problems that may have come about. The sonar takes 35 seconds to boot up (with a static IP address, and about 100 seconds otherwise), so do not be surprised at sporadic network connectivity during this boot up process. Once everything is back up and running, open the ProViewer software and try to connect to the sonar. If you were not able to connect to the sonar, go on to the next section **Check Network Settings**.

Check Network Settings

For proper connection and operation of BlueView sonar, the control PC should be set to a static IP address of **192.168.1.3** as shown in **Chapter 3 – Connecting to a Sonar** of this manual.

While changes to the network settings can be done without restarting the PC, a quick power cycle can solve many network problems that can arise during network setup. With that in mind, power down both the sonar and computer, wait 10 seconds, and then power everything up. This can solve network configuration problems that may have come about. Once everything is back up and running, open the ProViewer software and try to connect to the sonar.

NOTE: The sonar takes up to 35 seconds to boot up, so do not be surprised at sporadic network connectivity during this boot up process.

If you were not able to connect to the sonar, go on to the next section **Check Connectors**.

Check Connectors

It is not uncommon for topside connectors to get pulled out of their ports or subsea connectors to get corroded. Power-down the sonar, and check the condition and proper seating of all connectors in the system. Once you have verified condition and proper seating of all connectors, re-power the Sonar, wait 35 seconds, then try to reconnect to the sonar from ProViewer software.

If you were not able to connect to the sonar, go on to the next section **Check Power**

Check Power

If the sonar does not receive the correct DC voltage on the correct pins, it cannot operate properly. Faulty power supplies, tripped breakers, and damaged cables can all be the source of this problem. The best way to verify proper voltage is by measuring the voltage at the sonar connector using a multimeter. Refer to the hardware manual for your specific sonar for detailed connector/pin information. If you were not able to connect to the sonar, go on to the next section **Check Sonar**.

Check Sonar

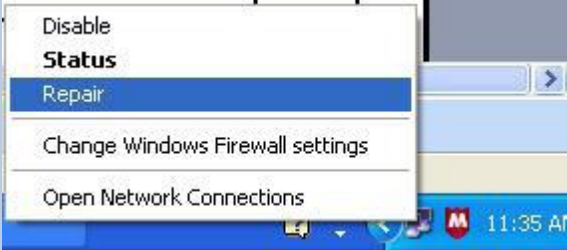
In most cases, the cause of the problem is not a faulty sonar, however it is worth taking a quick second to verify that the sonar is working properly. This is accomplished by setting up a bench-top test using the test cables and AC power supply that came with the sonar. This test will quickly tell us whether the problem is with the sonar/PC or with the rest of the system. Use the following diagram to setup and test your sonar, using the Troubleshooting Table below to identify the issue.

Troubleshooting Table

Below is a problem solution table for some of the common problems encountered during the bench-top test setup.

Sonar does not connect:

Possible Cause	Possible Solution
<i>No Power</i>	Confirm that the POE box is plugged into a standard 120VAC outlet and that the small green LED on the POE box is glowing. Also check that the Sonar Test Cable is plugged into the SONAR J1 port on the POE box.
<i>Over current</i>	A short in the sonar cable or sonar could result in an over current condition which is indicated by a blinking LED on the POE box.

<i>Improperly connected</i>	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.
<i>Bad State</i>	Reset the sonar by removing the POE box AC power cord for 10 seconds. The sonar takes 35 seconds to reboot after power is re-applied.
<i>Dirty connectors</i>	Make sure that all connector pins are clean and corrosion free.
<i>Improper Ethernet cable</i>	<p>The sonar cabling is conveniently designed so that you can connect your POE box to a PC with a standard Ethernet cable.</p> <p>The price for this convenience is paid when connecting your POE box to a network hub. In this case, you will need to use a crossover Ethernet cable unless your network hardware is capable automatically handling crossed Ethernet cables.</p>
<i>PC networking software is confused</i>	<p>Restart the networking software. There are several ways to do this, depending on your particular operating system. On Windows, you can open do this via the desktop notification area icon (lower right of your desktop) and right click on the Ethernet connection. Select Repair, or disable then enable.</p>  <p>The screenshot shows a right-click context menu for a network connection in Windows. The menu items are: Disable, Status, Repair (highlighted), Change Windows Firewall settings, and Open Network Connections. The background shows a portion of the Windows taskbar with the time 11:35 AM.</p> <p>You can also simply restart the computer. Depending on your particular situation, it may also be helpful to cycle the power on the sonar. In this case, be sure to leave the sonar power disconnected for a full 10 seconds before restoring power.</p>
<i>IP subnet masks don't match</i>	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 part of the mask defines the network part of the IP address. The 0 part of the mask defines the device part of the IP address.

<i>IP network addresses don't match.</i>	Make sure the IP network portion 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.
<i>IP network device addresses are the same.</i>	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 normally set to 3. Don't use 255, as it's reserved for broadcast use.
<i>Poor connection quality</i>	Use an ohm meter to verify Tx and Rx line connectivity between the Ethernet connector that plugs into the PC and the 10 pin connector that plugs into the sonar. Refer to the sonar hardware manual that came with your sonar for information on pin to pin connection information.
<i>You suspect you've miss-configured the sonar IP address</i>	<p>See the steps below to troubleshoot IP address issues, which can be the most common cause of a no communication problem.</p> <ol style="list-style-type: none"> 1. Connect the sonar communication cable directly to a Windows computer network interface card. 2. Open the Network and Sharing Center in your control panel and click on Change Adapter Settings. 3. Right click on the local area connection which your sonar is connected through and click on Properties. 4. Double-click on the Internet Protocol (TCP/IP) Properties window (this may say 'Version 4'). 3. Under the General tab, select 'Obtain an IP address automatically'. 4. Under the Alternate Configuration tab, select 'Automatic private IP address' and click OK. 5. Close the rest of the windows folders you opened. 6. Cycle the sonar power off (for at least 10 seconds), then turn the sonar back on. 7. After about 100 seconds, the Windows PC and the sonar should have negotiated a 'link local' IP address (in the range of 169.254/16). 8. Using the ProViewer software, connect normally and reconfigure the sonar's network settings to be compatible with its intended network per Chapter 7: ProViewer Settings. If you are still unable to connect, continue to step 9. 9. Access the local area connection properties once again, however this time select Use the following IP address and use 192.168.1.3 for the IP address and the default 255.255.255.0 for the subnet mask. Power cycle the sonar and attempt to connect once again.

If the image looks broken or misaligned:

Possible Cause	Possible Solution
Image Calibration	Right click on the main ProViewer display to bring up Sound Speed controls and re-align the sonar image as needed.

If the image updates seem slow:

Possible Cause	Possible Solution
Ethernet Congestion	Shut down other computers or services that are consuming the Ethernet network bandwidth. The Sonar requires about 30 Mbps of network bandwidth to operate optimally. The sonar hardware supports 10 and 100 Mbps network cards and network routers and switches. (the sonar itself has a 100 Mbps network interface)
Range settings	When your sonar 'pings', it has to 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 is, the longer it takes for the ProViewer 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. Also, old video cards may have a limited ability to update the display quickly, which can cause the window size to be even more of an issue. PCI (not PCI Express) cards can have this problem.

At this point, if you were able to connect to your sonar, you can assume your sonar is working properly and that the PC is set up correctly.

Still not working?

Please contact us:

Teledyne BlueView, Inc. Customer Support

www.blueview.com

425-492-7376

8am – 5pm PST Mon through Fri

Appendix B: Advanced Networking Options

BlueView sonar are designed to operate either attached directly to your PC, or attached to a common Ethernet network.

Refer to the following sections for information about sonar networking configuration options.

Sonar Factory Default:

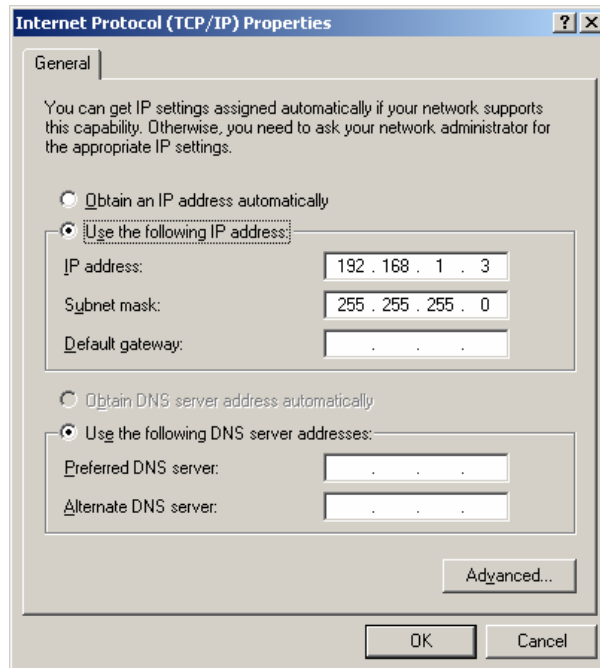
The sonar ships from the factory with this default configuration:

- ✓ Static IP address: 192.168.1.45
- ✓ Subnet Mask: 255.255.255.0
- ✓ DHCP server: enabled.

NOTE: With the onboard DHCP server enabled, you should not connect the sonar to a computer network that has its own DHCP service enabled.

To operate a BlueView sonar configured with the factory defaults, you must configure your PC network card TCP/IP properties appropriately. On the Windows platform, open the control panel. Double click the 'Network connections' tool. In Network Connections, select the network interface (probably 'Local Area connection') that is connected directly to the sonar.

The Windows TCP/IP Properties window looks like this:



If you choose 'Use the following IP address' as shown above, the PC will connect to the sonar in about 35 seconds. (shortly after the sonar finishes its boot process).

If you select '**Obtain an IP address automatically**', the PC will get its IP address from the DHCP server running on the sonar. It may take up to 100 seconds for the PC to get its IP address from the sonar. The PC's networking software may briefly report 'limited or no connectivity' while acquiring an IP address from the sonar. Once the sonar is finished booting, this process of the PC acquiring an IP address can usually be sped up by opening a "DOS Window" (Command Prompt), and running the command: "ipconfig /renew".

Instead of connecting the sonar directly to your computer, you may communicate with it via a common Ethernet network (using either a network hub or switch). In this case, you must configure your PC's Local Area Network TCP/IP properties, and your sonar network properties in a compatible fashion:

- ✓ The masked portion of the sonar IP network and the PC IP network must match (in the factory default case, a subnet mask of 255.255.255.0 means that the first three sections of the IP address, such as 192.168.1, must match between the sonar and the PC).
- ✓ Each sonar's device number within the network must be unique and different than the PC's device number. For example, you could set the PC's device number to '3', the first sonar to '45', a second sonar to '46', etc. (for instance: PC = 192.168.1.3, sonar 1 = 192.168.1.45, sonar 2 = 192.168.1.46)
Note: The sonar IP number can be changed in the Sonar tab of ProViewer settings, with Advanced Settings enabled.
- ✓ Both the sonar and the PC must have the same subnet mask (in this case 255.255.255.0)
- ✓ The PC 'Default gateway' and 'DNS server addresses' must be set appropriately to enable the PC to communicate with devices outside the 192.168.1 network. If you only have sonar attached to the PC network, you don't need to set the gateway or DNS server addresses.

Multiple sonar devices can be placed on the same network, as long as only one has its DHCP server enabled.

Note: The sonar Ethernet wiring is designed to connect directly to a PC network card. Generally, to connect the sonar to a network hub or switch, you need to use a 'cross-over' Ethernet cable. However, many modern network hubs and switches are designed to 'auto sense'. You can connect your sonar to an 'auto sensing' network device with the same cable you use to attach to a PC.

Warning: By factory default, the sonar provides DHCP service to the computer or network it is attached to. If your network has a DHCP server operating, you should disable the sonar DHCP server before hooking it up to the new network.

