SAMM

Stand Alone Mosaicking Module

for Forward-Looking and Side-Looking Sonar

Acquisition Tutorial

This tutorial shows you how to connect a sonar, monitor connection status, troubleshoot, enter the sensor offsets and tune image quality in SAMM. Please refer to the User Manual for detailed instructions and the playback tutorial for prerequisite information.

Getting Started

- Before you sea-test the software, we suggest you:
  - install SAMM to make sure the disc and dongle work;
  - play with SAMM in playback mode using the demo data and the playback tutorial to get familiar with creating projects, mouse navigation, swath rendering settings and marking targets (we assume knowledge of the playback material in this tutorial);
  - start a new project, measure and enter survey offsets;
  - SAMM needs position and heading to mosaic accurately, we suggest you:
    - check that your GPS is set to the WGS 1984 datum;
    - SAMM owners using serial heading and navigation sources, make sure that your sensors output NMEA streams. You need either a system providing both position & heading such as the Hemisphere VectorGPS, or separate pos & heading sources connected to separate serial ports.
- While you have internet connection, we suggest you:
  - download updated navigational charts and populate SAMM's chart database, i.e. put them in c:\Charts\;
  - update your video driver;
  - BlueView owners, make sure you have ProViewer™ Version 4.3.0.9526 or later. Please contact your BlueView sales representative for updates.

Attach a Forward Look Sonar

1. Attach the SAMM host computer to one of the supported sonars pictured below (linked to product Website) according to the sonar system owner's manual. Test the connection in the sonar software.

Kongsberg Mesotech M3 (shown pole-mounted)

Teledyne BlueView 2D Multibeam Imaging Sonar

P/M900 Series

P/M450 Series

Tritech Multibeam Imaging Sonar

Gemini 720i, 720is, 720ik

Marine Electronics Dolphin SeaView

R2Sonic 2024

BluePrint Oculus

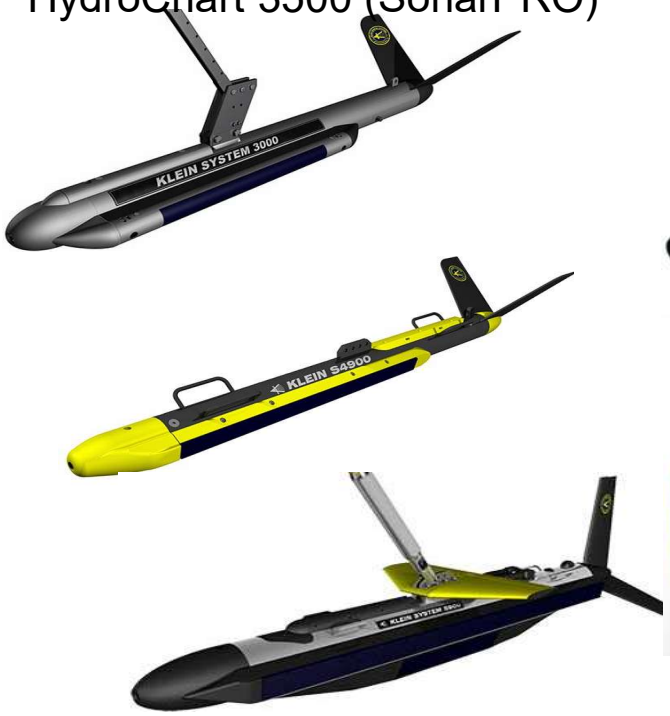
Sound Metrics Aris

2. **Gemini/Oculus/R2Sonic/Dolphin users**, SAMM replaces the native sonar software. SAMM interfaces directly with the Gemini/R2Sonic/Dolphin sonar heads and the navigation and heading sources, so the sonar software doesn't need to be running. **Aris**, **M3 and BlueView users**, SAMM must run in parallel with the native sonar software, receiving data streams via real-time socket connections with host software.

Attach a Sidescan Sonar

1. Attach the SAMM host computer to one of the supported sidescan sonars pictured below (linked to product Website) according to the sonar system owner's manual. Test the connection in the sonar software.

Klein Sonars: 3K, 4K, 5K and HydroChart 3500 (SonarPRO)

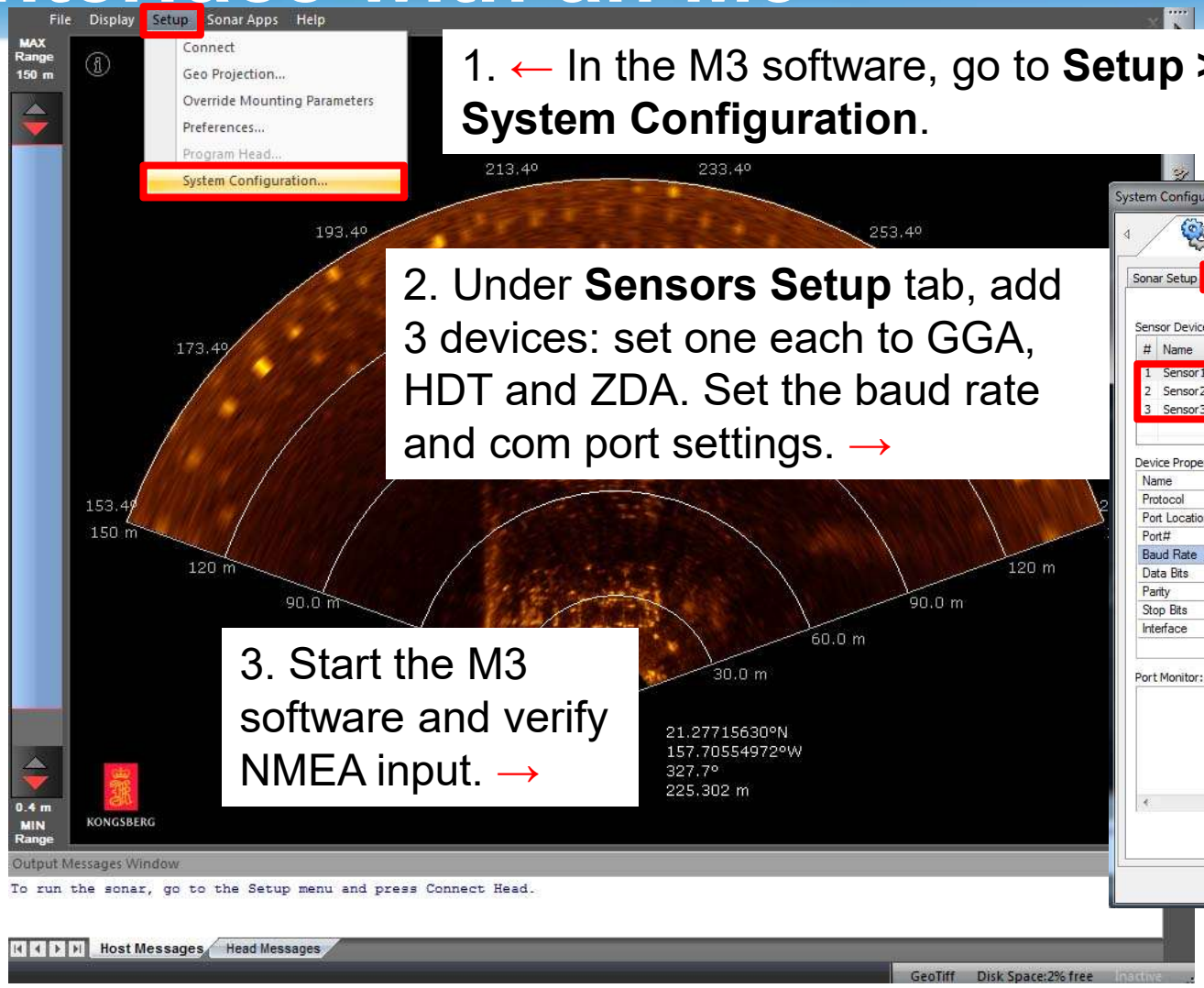


EdgeTech (4125, 4200, 6205) (Discover)

Tritech Starfish or others

2. **Then connect SAMM to the sonar system socket connection (usually 127.0.0.1) For details see SAMM manual, individual sections on each sidescan system.**

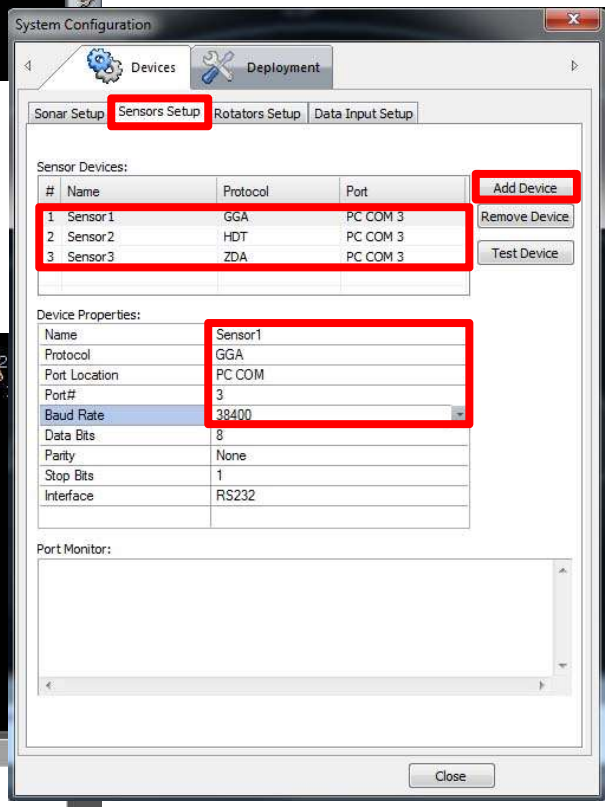
Interface with an M3



1. ← In the M3 software, go to **Setup > System Configuration**.

2. Under **Sensors Setup** tab, add 3 devices: set one each to GGA, HDT and ZDA. Set the baud rate and com port settings. →

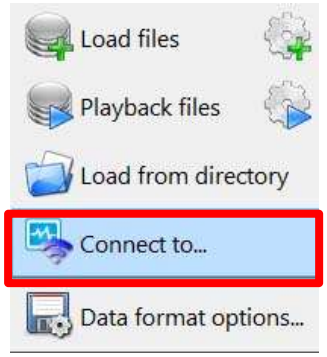
3. Start the M3 software and verify NMEA input. →



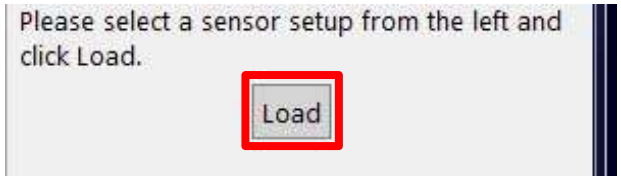
Interface with an M3

4. Launch SAMM, create a project and click the **Add data** icon.

5. Click **Connect to…** from the dropdown menu.

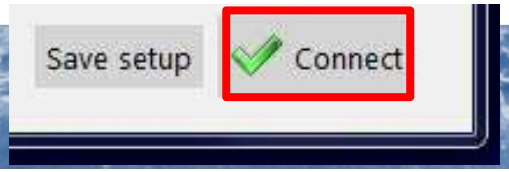


← 6. Click **Kongsberg M3** then **Load.** →

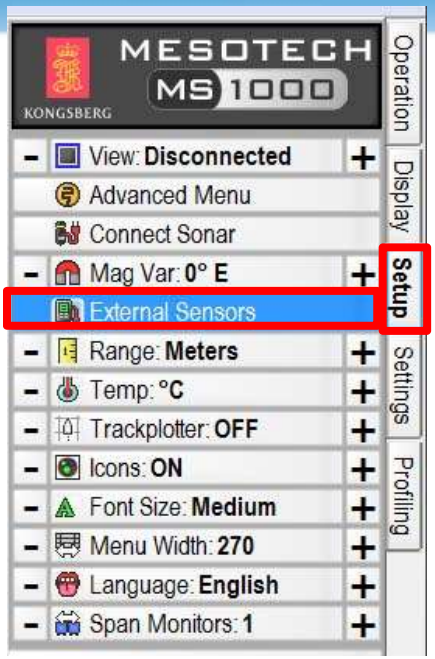


7. If the M3 Software is running on the same computer as SAMM, IP address should be 127.0.0.1 (default). If the M3 Software is running on a different computer than SAMM, change IP address to which the M3 is connected using these dialogs. →

8.Click **Connect** and SAMM will begin collecting, recording and mosaicking your data.

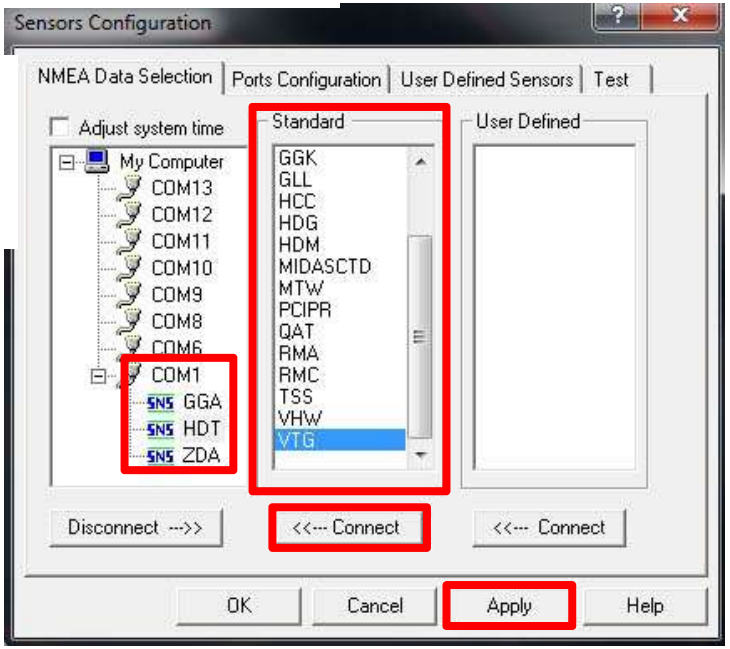


Interface with an MS1000

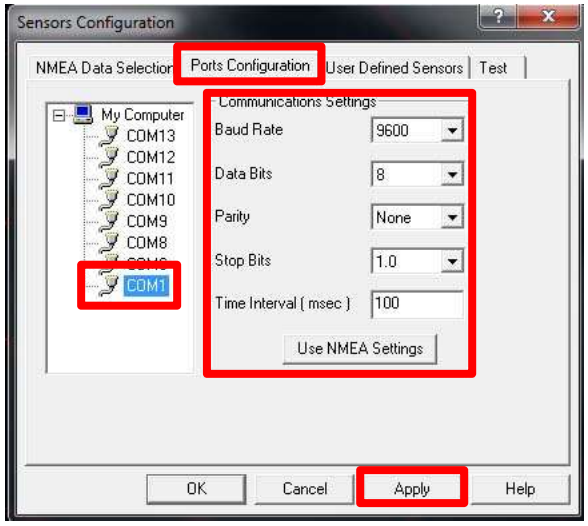


1. ← In the MS1000 software, go to **Setup > External Sensors**.

2. Choose a com port, and connect GGA, HDT and ZDA.→



3. Go to ports configuration tab, and set the port baud rate and other settings. →

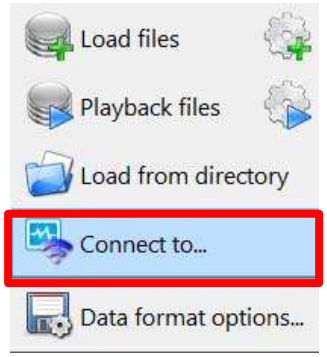


4. Start MS1000 software, and verify data and navigation is coming in.

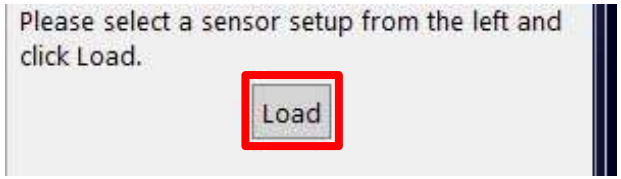
Interface with an MS1000

4. Launch SAMM, create a project and click the **Add data** icon.

5. Click **Connect to…** from the dropdown menu.

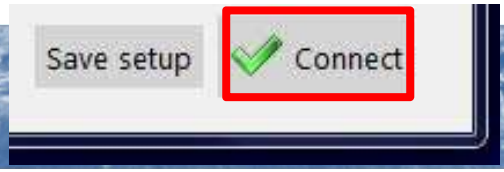


← 6. Click **Kongsberg M3** then **Load.** →



7. If the MS1000 Software is running on the same computer as SAMM, IP address should be 127.0.0.1 (default). If the MS1000 Software is running on a different computer than SAMM, change IP address to which the MS1000 is connected using these dialogs. →

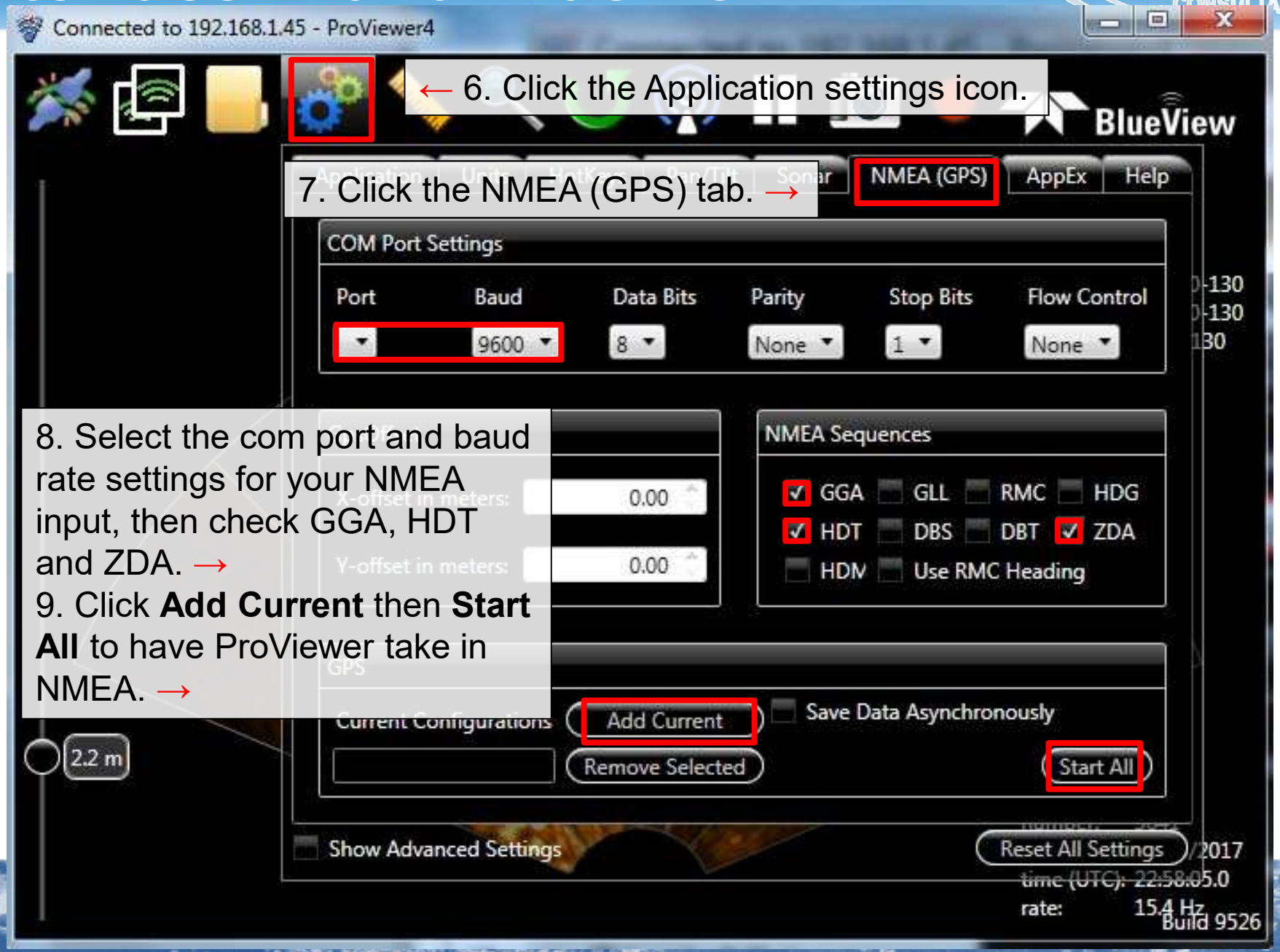
8. Click **Connect** and SAMM will begin collecting, recording and mosaicking your data.



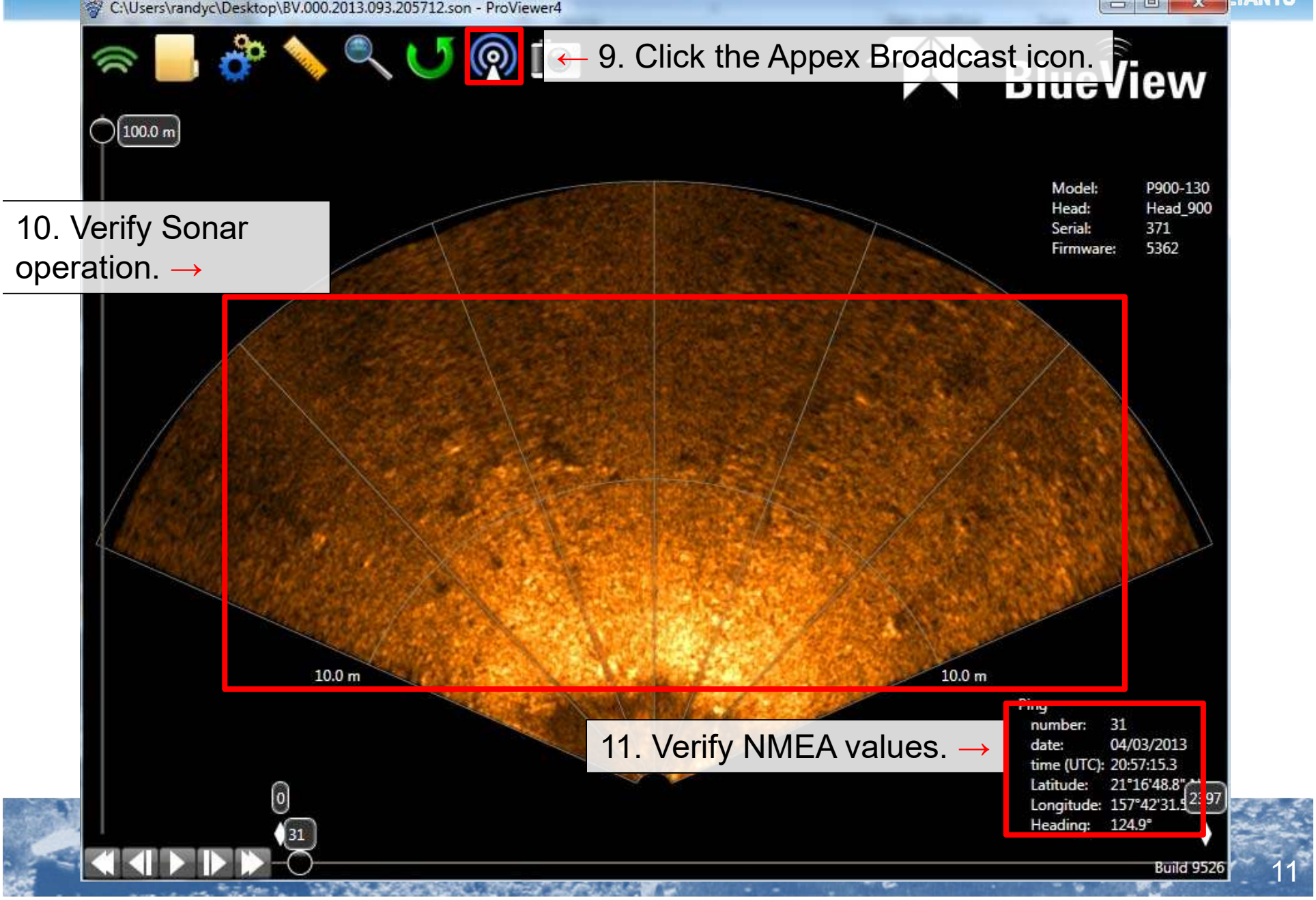
Interface with a BlueView

In ProViewer4…

Interface with a BlueView



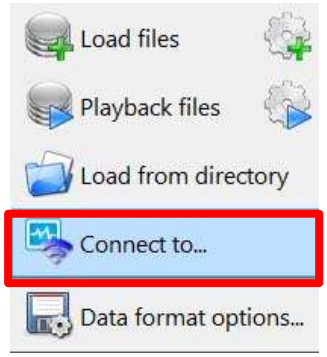
Interface with a BlueView

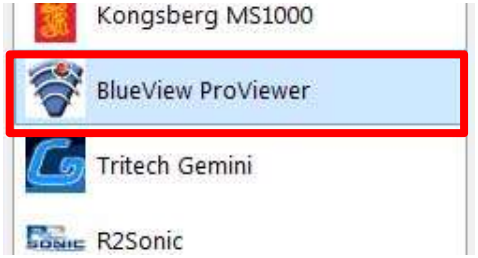


Interface with a BlueView

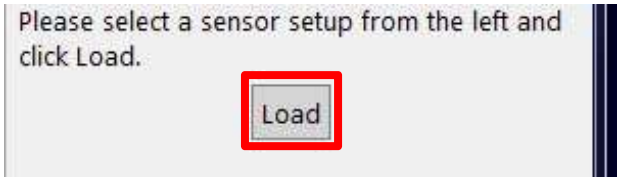
1. Launch SAMM, create a project and click the **Add data** icon.

2. Click **Connect to…** from the dropdown menu.

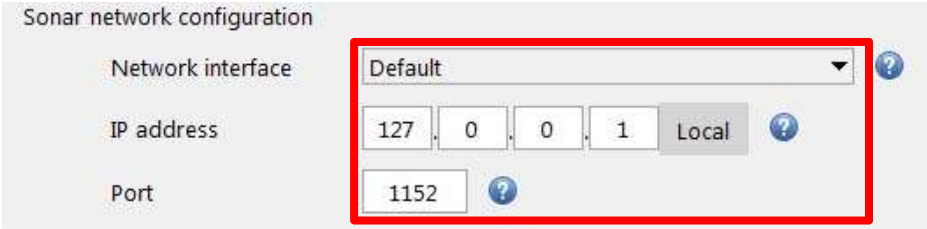




← 3. Click **BlueView ProViewer** then **Load.**→



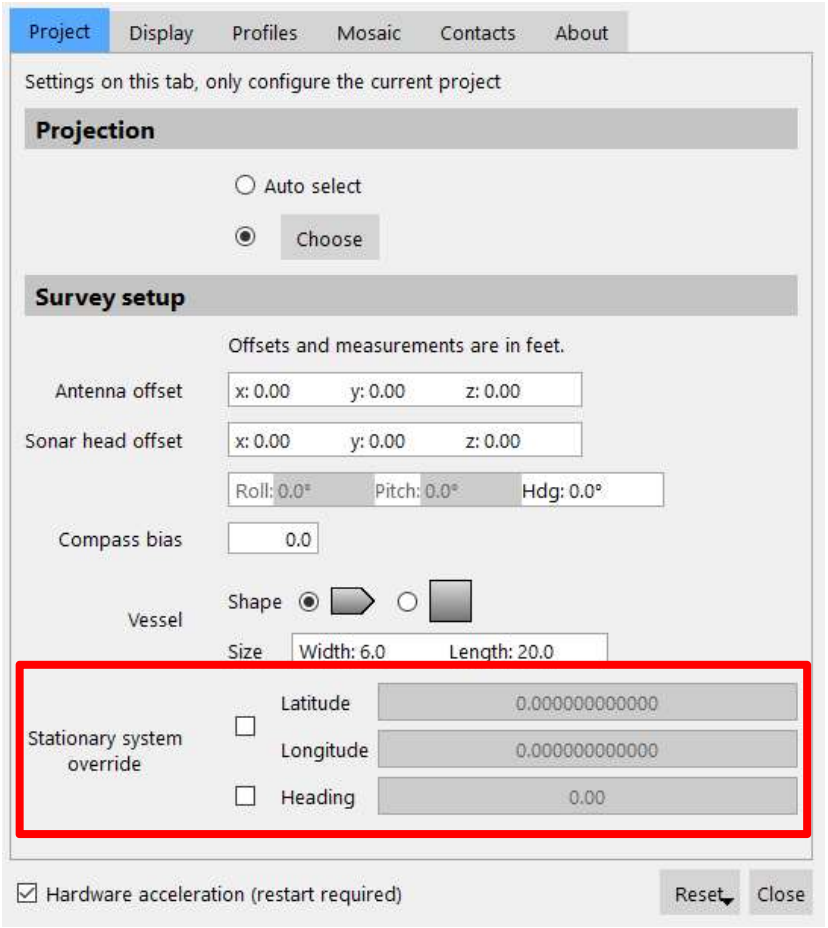
4. If ProViewer is running on the same computer as SAMM, IP address should be 127.0.0.1 (default). If the ProViewer is running on a different computer than SAMM, change IP address to which the BlueView is connected using these dialogs. →

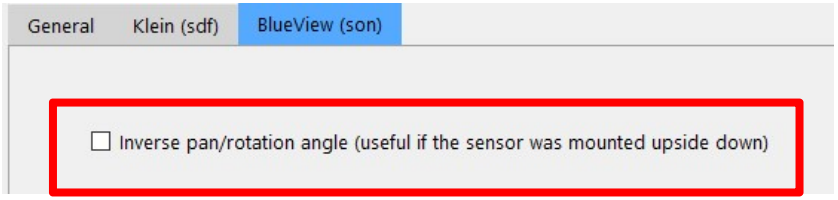


5.Click **Connect** and SAMM will begin collecting, recording and mosaicking your data.

Rotational Scans with BlueView

1. To mosaic rotational scan data you must enable the Stationary system override. Click the configuration icon to open the project configuration window.
2. Check the two boxes and input valid values for lat/lon and a starting heading.
3. Connect to Proviewer to being mosaicking rotational scans.
4. If the Pan and Tilt unit was installed on a vessel(and hence inverted), invert the pan values by clicking on Add Data>Data format options, then going to the BlueView tab.

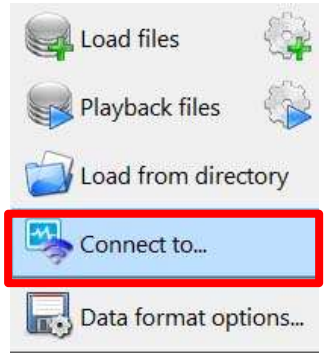




Interface with a Gemini

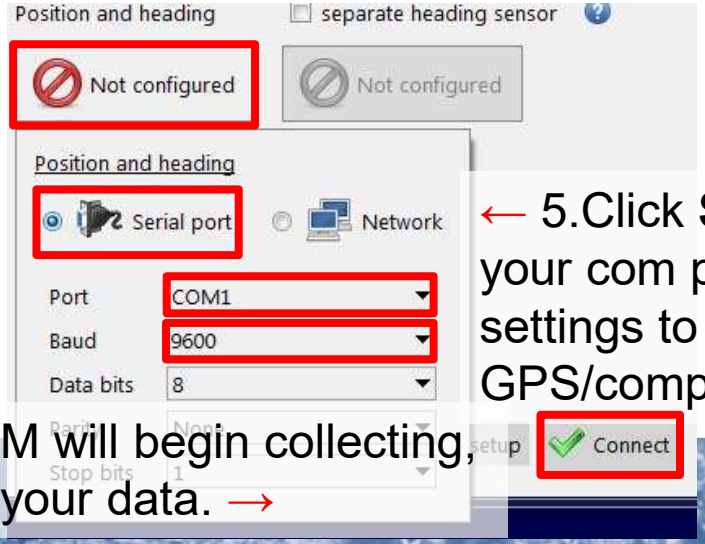
1. Make sure the Gemini sonar software is NOT running. Launch SAMM, create a project and click the **Add data** icon.

2. Click **Connect to…** from the dropdown menu.



← 3. Click **Tritech Gemini** then **Load.** →

4. Click **here** → to set your NMEA input.



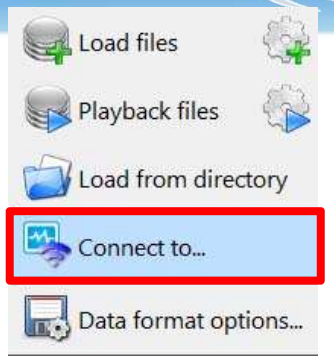
← 5.Click **Serial port** then set your com port and baud rate settings to match your GPS/compass.

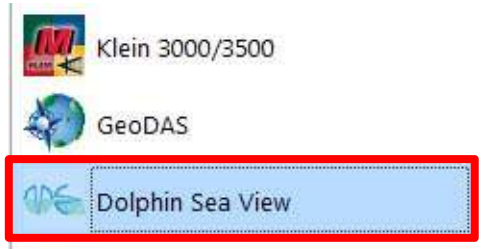
6.Click **Connect** and SAMM will begin collecting, recording and mosaicking your data. →

Interface with a Dolphin SeaView

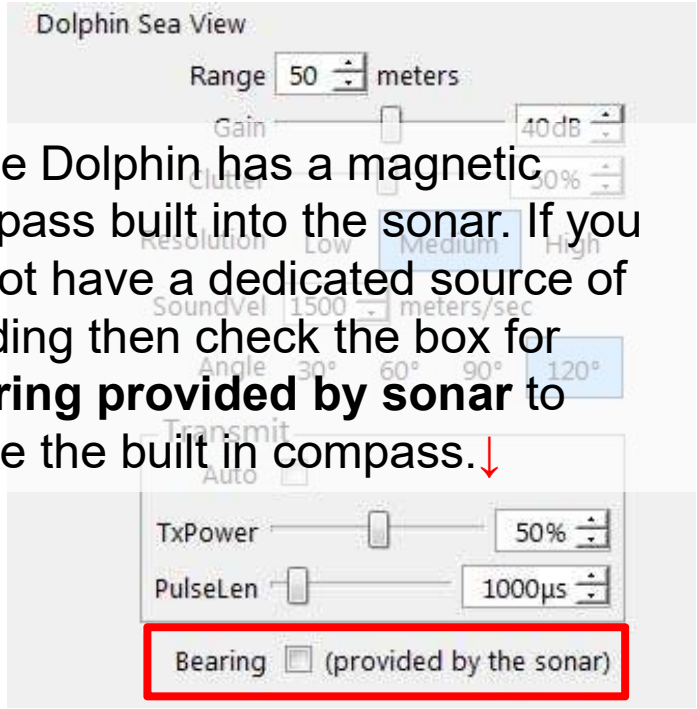
1. Make sure the Dolphin SV sonar software is NOT running. Launch SAMM, create a project and click the **Add data** icon.

2. Click **Connect to…** from the dropdown menu.

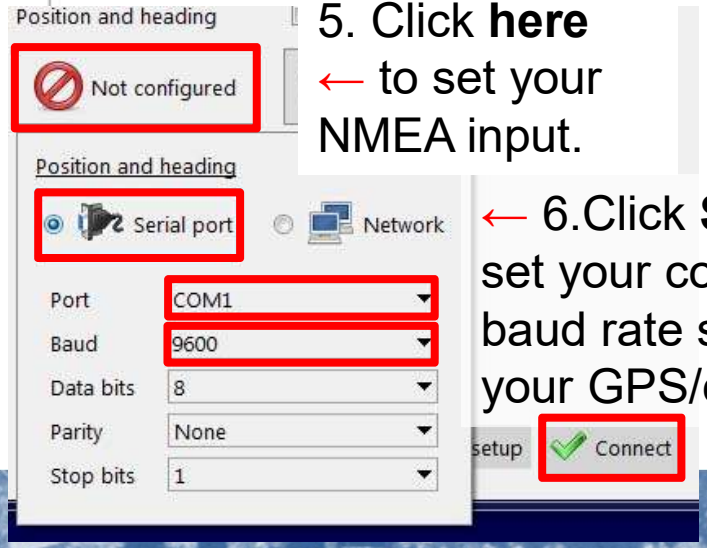




← 3. Click **Dolphin Sea View** then **Load.**



4.The Dolphin has a magnetic compass built into the sonar. If you do not have a dedicated source of heading then check the box for **Bearing provided by sonar** to utilize the built in compass.↓



5. Click **here** ← to set your NMEA input.

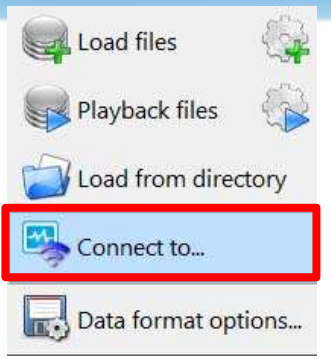
← 6.Click **Serial port** then set your com port and baud rate settings to match your GPS/compass.

← 7.Click **Connect** and SAMM will begin collecting, recording and mosaicking your data.

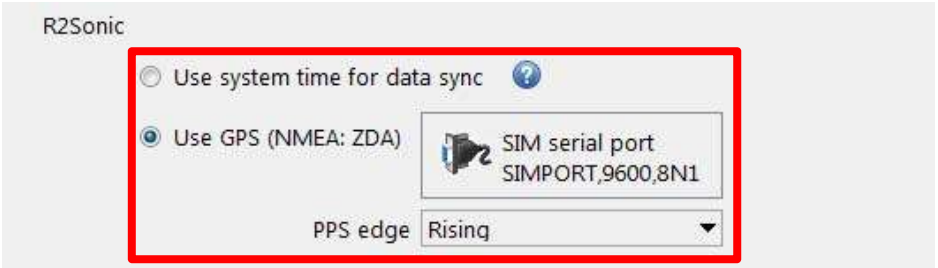
Interface with an R2Sonic

1. Make sure the R2Sonic sonar software is NOT running. Launch SAMM, create a project and click the **Add data** icon.

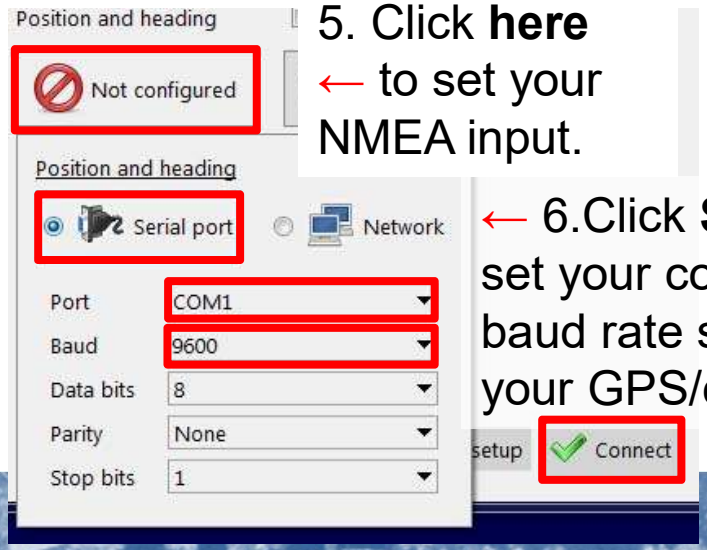
2. Click **Connect to…** from the dropdown menu.



← 3. Click **R2sonic** then **Load.**



4. Set your time source for data sync: ZDA and PPS brought in via the R2Sonic topside box, or system time of the acquisition computer.



5. Click **here** ← to set your NMEA input.

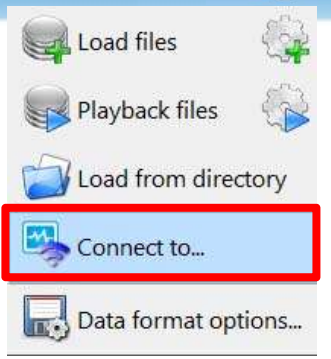
← 6.Click **Serial port** then set your com port and baud rate settings to match your GPS/compass.

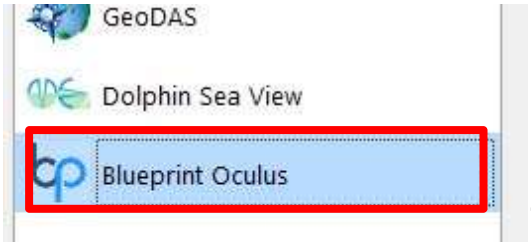
← 7.Click **Connect** and SAMM will begin collecting, recording and mosaicking your data.

Interface with Blueprint Oculus

1. Make sure the Oculus sonar software is NOT running. Launch SAMM, create a project and click the **Add data** icon.

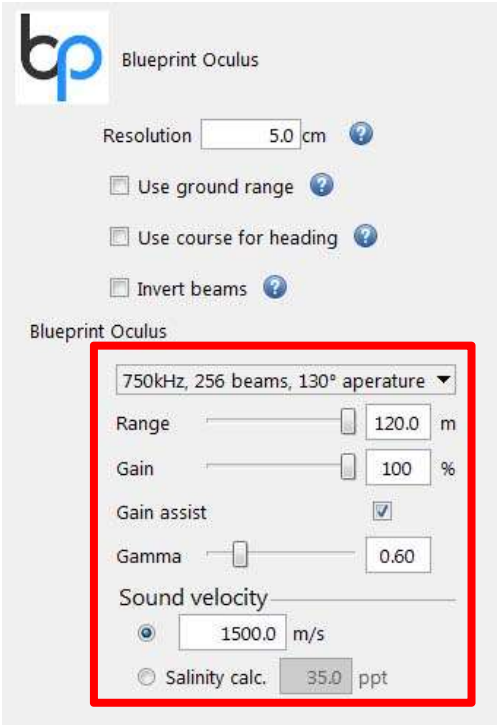
2. Click **Connect to…** from the dropdown menu.

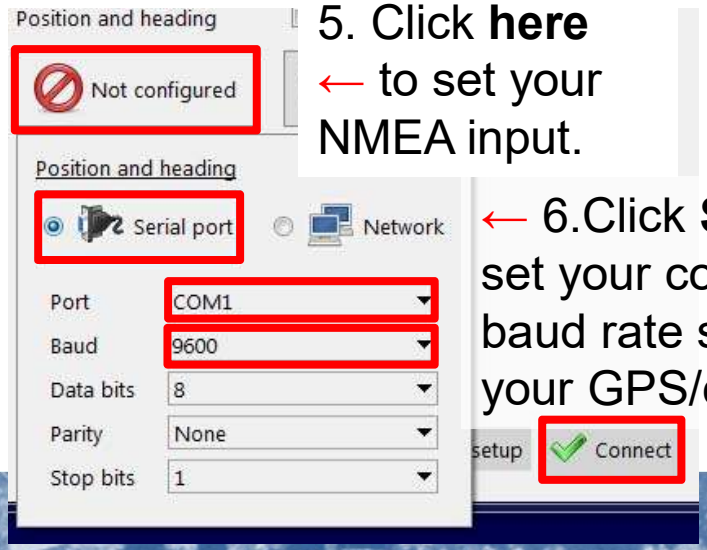




← 3. Click **Blueprint Oculus** then **Load.**

4. Set the frequency, range, gain, gain assist, gamma, and sound velocity settings. We recommend gain assist off.





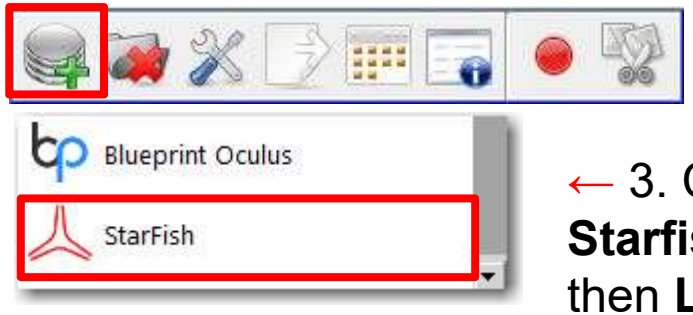
5. Click **here** ← to set your NMEA input.

← 6.Click **Serial port** then set your com port and baud rate settings to match your GPS/compass.

← 7.Click **Connect** and SAMM will begin collecting, recording and mosaicking your data.

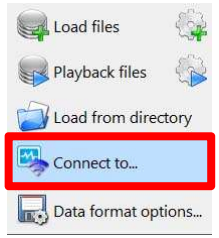
Interface with Tritech Starfish

1. Connect Starfish to interface box, and box to SAMM computer. Supply power. Launch SAMM, create a project and click the **Add data** icon.

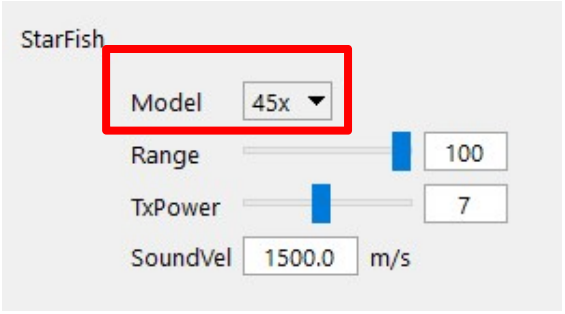


← 3. Click **Starfish** then **Load.**

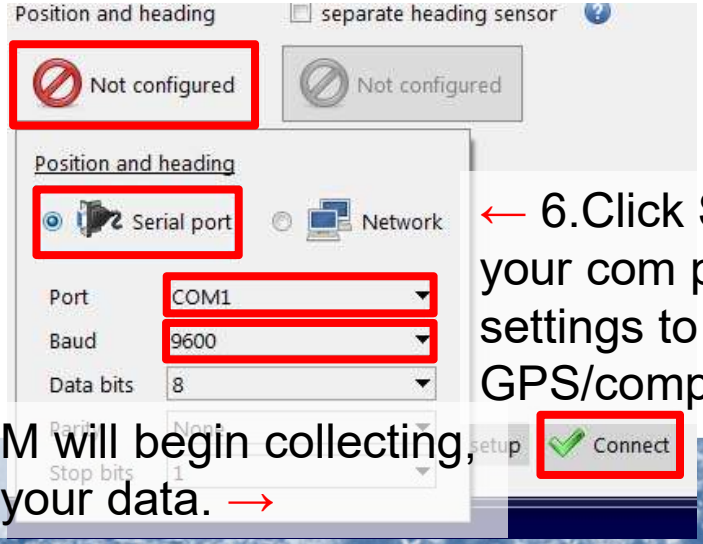
2. Click **Connect to…** from the dropdown menu.



4. Set your Starfish model: 450, 452, 990



5. Click **here** → to set your NMEA input.



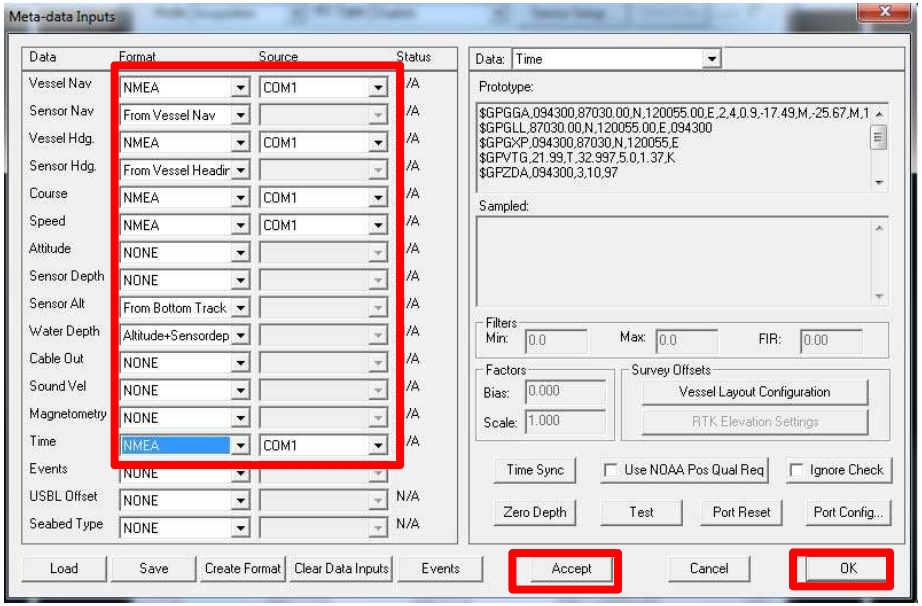
← 6.Click **Serial port** then set your com port and baud rate settings to match your GPS/compass.

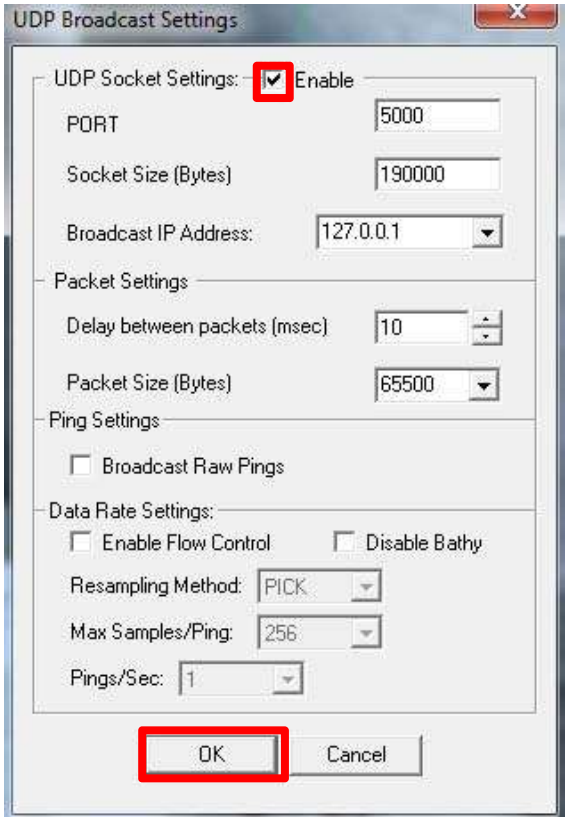
7.Click **Connect** and SAMM will begin collecting, recording and mosaicking your data. →

Interface with GeoDAS

1. Launch GeoDAS, set Mode to Acquisition, sensor Starfish; Configure NMEA inputs, start GeoDAS and connect to the Starfish sonar.

2. Once connected and Data and Navigation are properly received, enable broadcast.

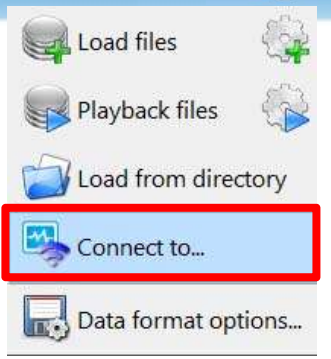




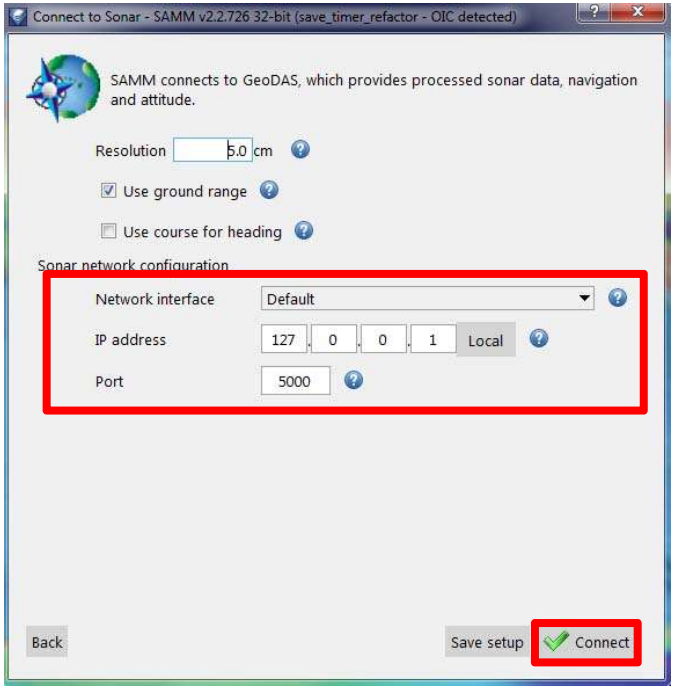
Interface with GeoDAS

1. Make sure GeoDAS is running and broadcast is enabled. Launch SAMM, create a project and click the **Add data** icon.

2. Click **Connect to…** from the dropdown menu.



← 3. Click **GeoDAS** then **Load.**



4. If GeoDAS is running on the same computer, then 127.0.0.1 is the correct address to use, otherwise, enter the IP address of the GeoDAS computer here. Also be sure to match the port setting that was used in GeoDAS. 5000 is default.

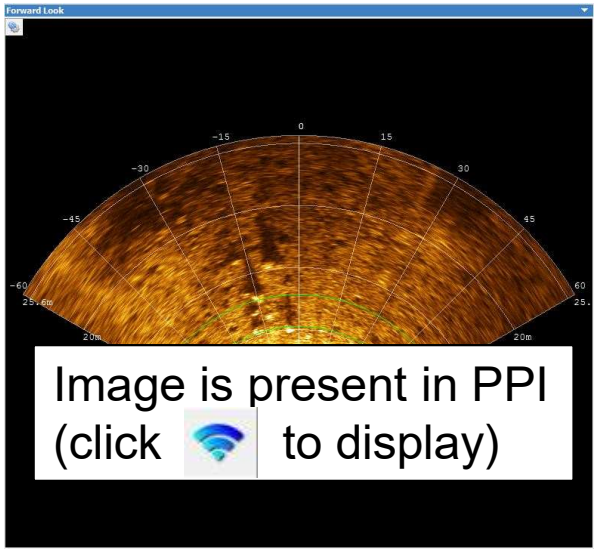
5.Click **Connect** and SAMM will begin collecting, recording and mosaicking your data.

Monitor Connection and Images

Live info feed looks accurate

On SAMM: All Good

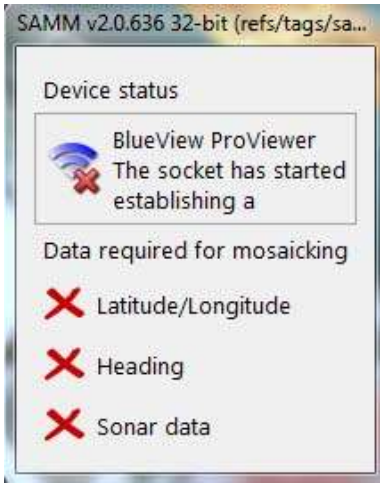
Status bar shows good connection

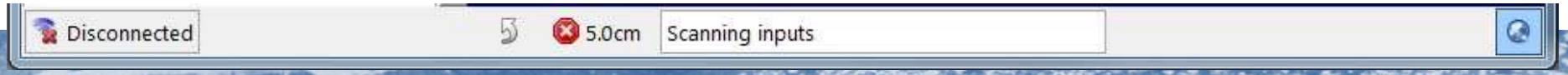


Troubleshooting Time

Troubleshoot in the sonar software first

a. Dialog shows missing data types;
b. No live info;
c. Status bar shows no connection;
Check connections, baud rates and cables.



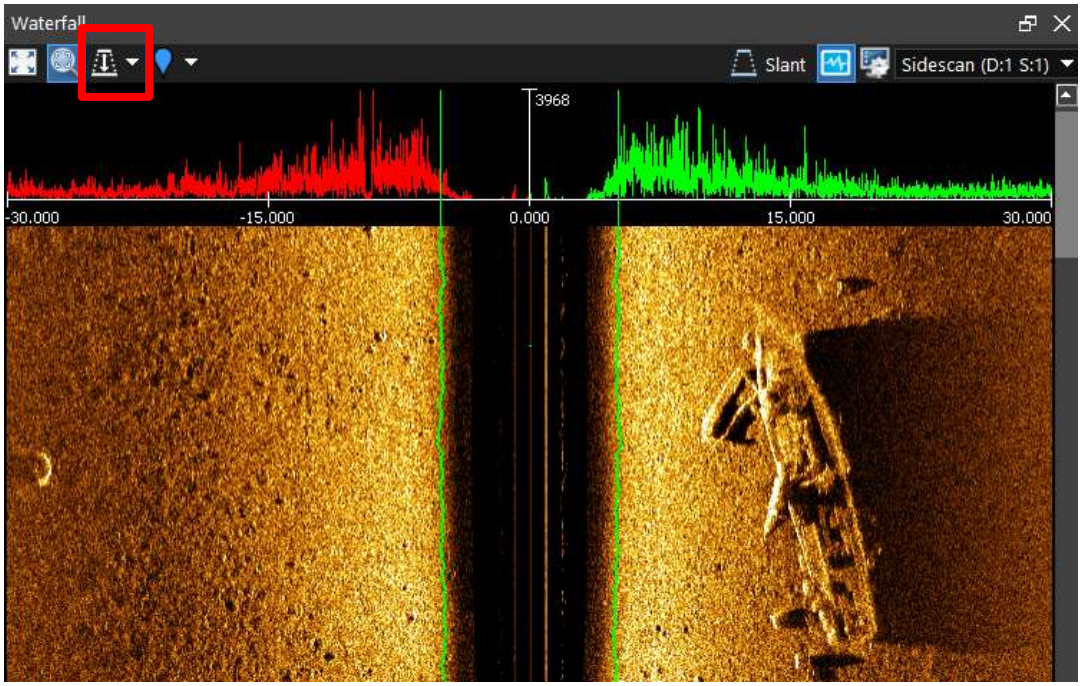


Monitor Connection and Images

Sidescan data in SAMM

Open the waterfall window and review the oscilloscope, imagery, and bottom tracking.

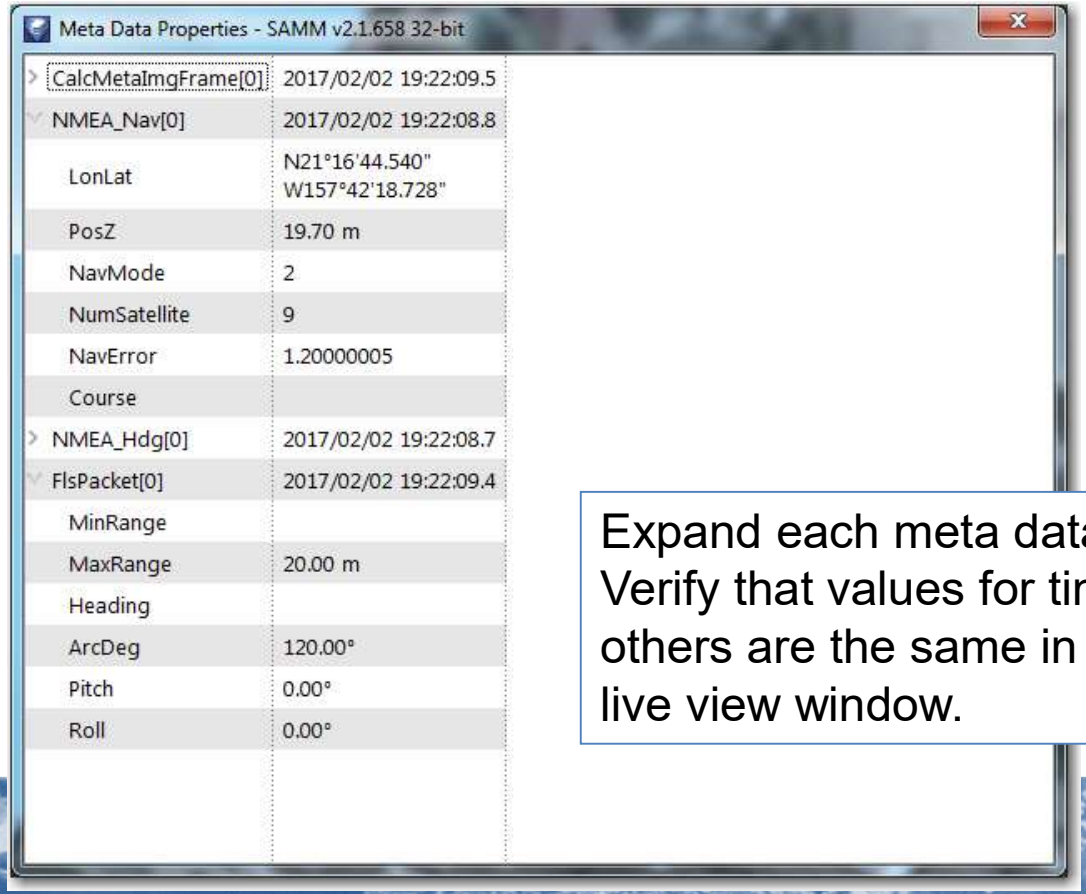
SAMM now offers manual bottom tracking, for sidescan data. To track the first return from the bottom, select the “bottom-tracking” icon on the oscilloscope (highlighted in red) and then left click where you see the first return on the port or starboard data. You will have to click again if the bottom changes.



Monitor Connection and Images

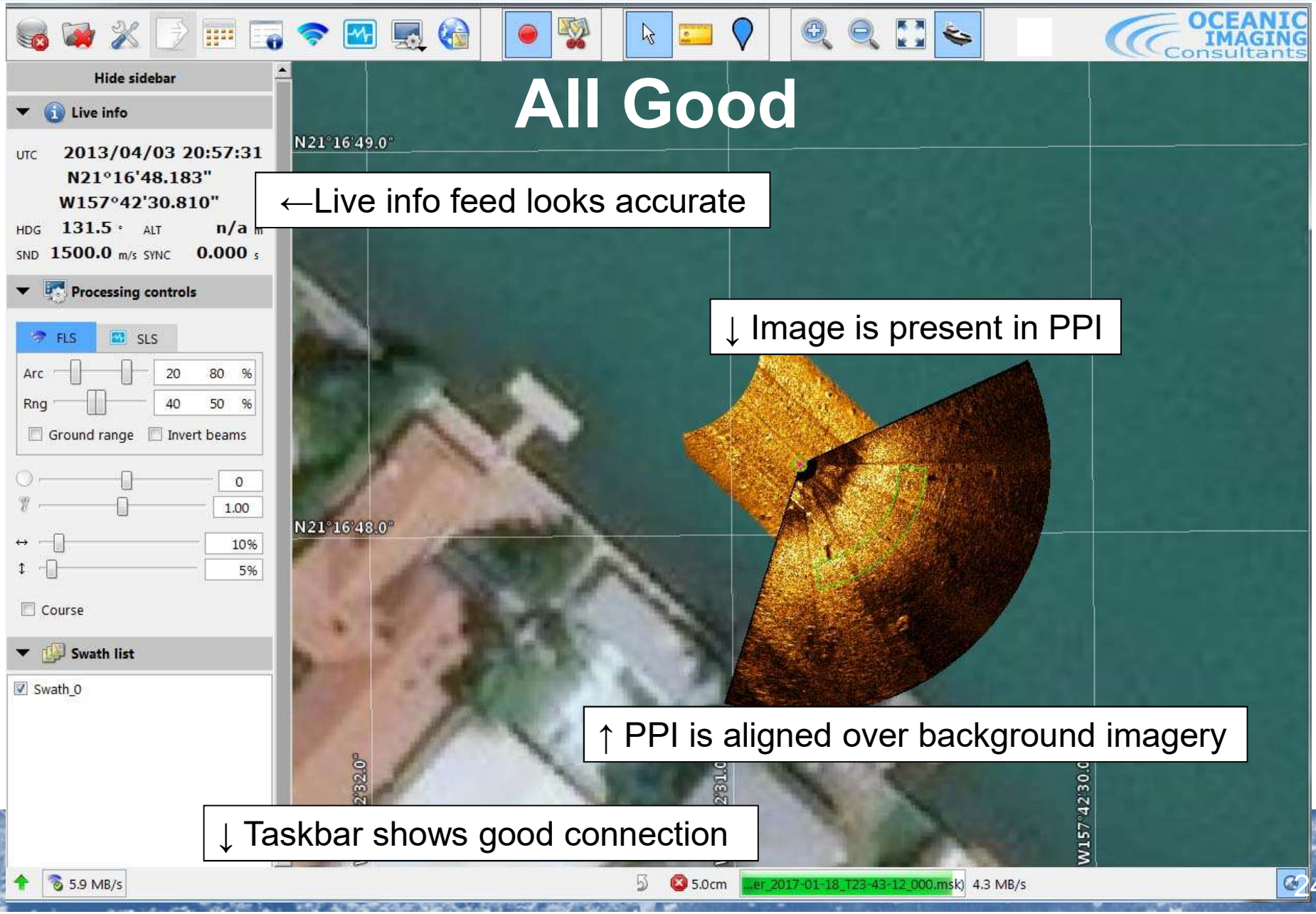
Double check meta-data properties

Click on the meta data properties icon.



Expand each meta data stream and view in real-time. Verify that values for time, position, heading and others are the same in the meta data streams as the live view window.

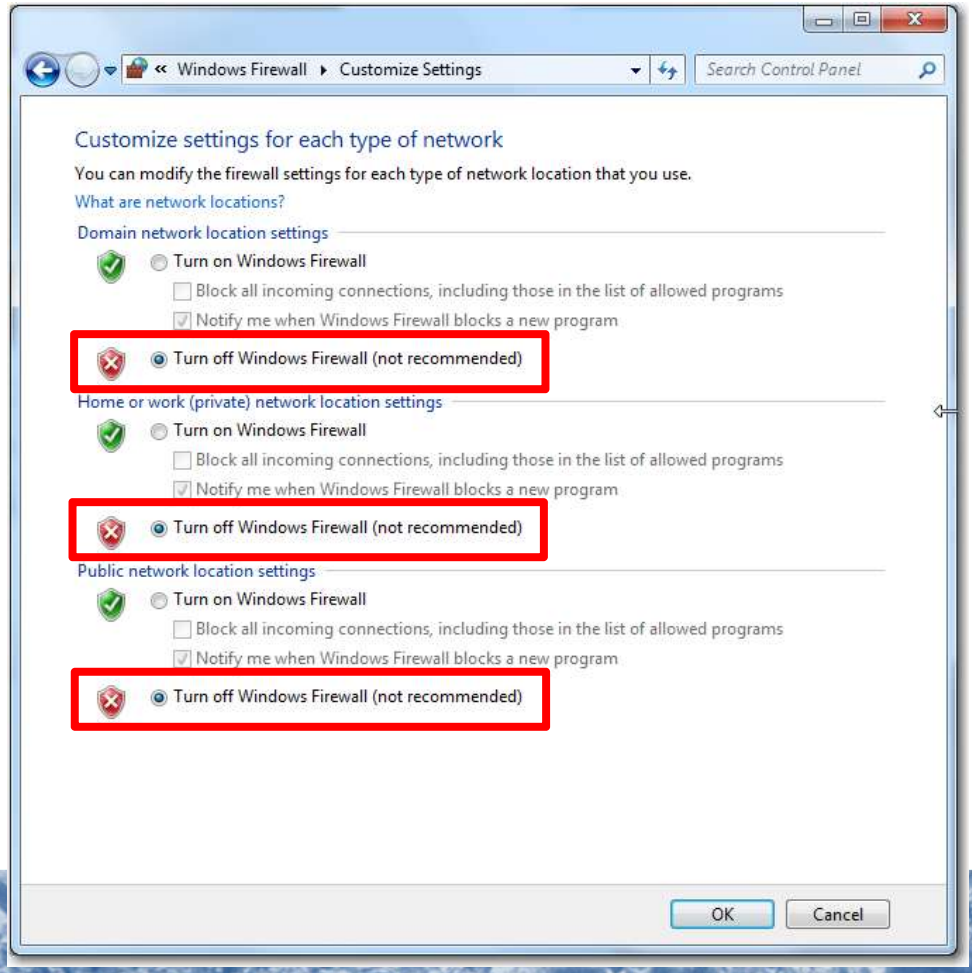
Monitor Connection and Images



Troubleshooting

If your sonar software sees the sonar, nav and heading sources, but SAMM doesn't:

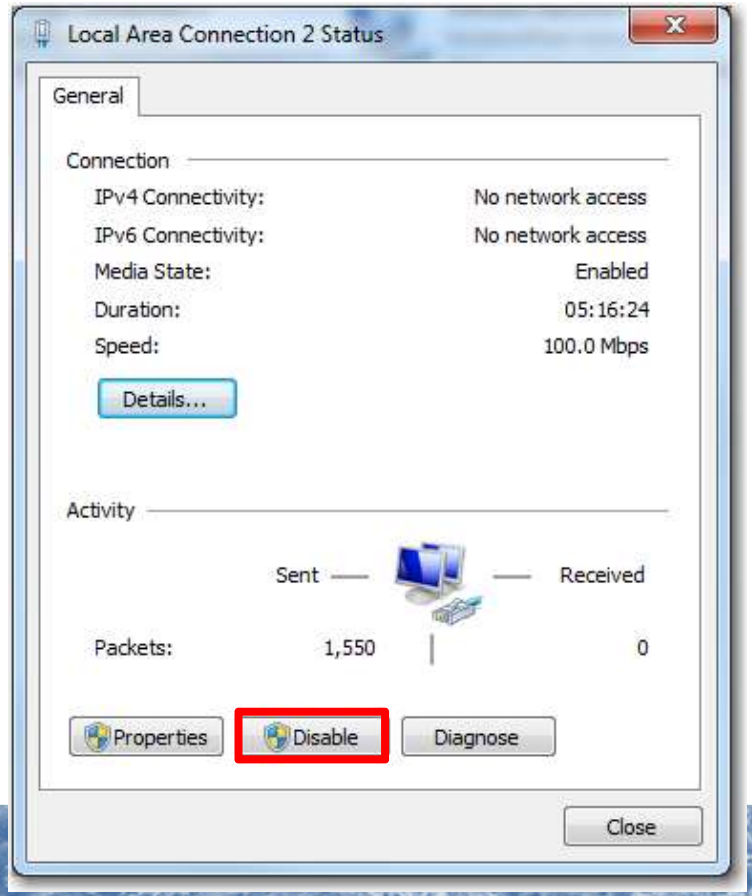
1. Turn off your firewall from the Windows Firewall customization screen (Control Panel). Disable or set SAMM exceptions in all other firewalls.



Troubleshooting

If your sonar software sees the sonar, nav and heading sources, but SAMM doesn't:

2. Disable all network adaptors other than the one hosting the Ethernet port to which the sonar is connected. From the Control Panel in the Network and Sharing Center, double-click on the network (Windows 7 pictured).

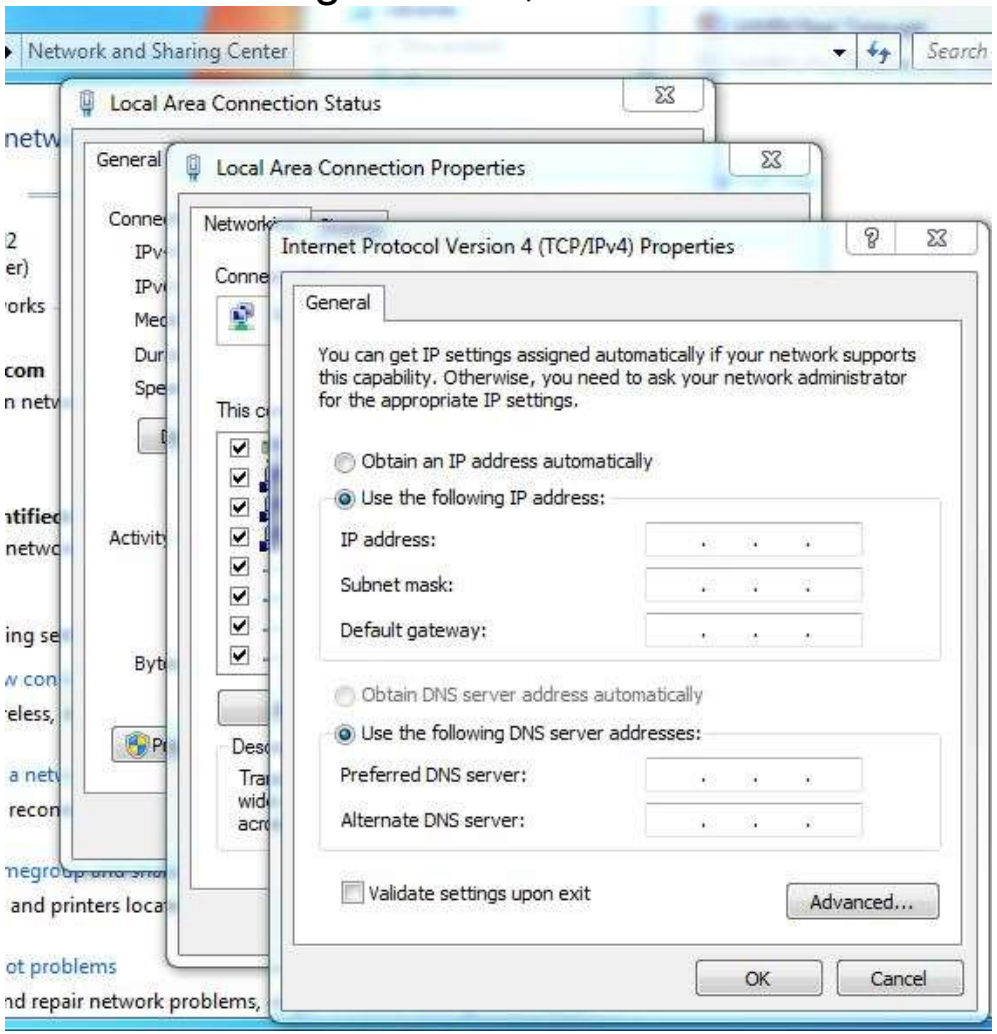


Troubleshooting

If your sonar software sees the sonar, nav and heading sources, but SAMM doesn't:

3. If you are running SAMM on a different computer than the sonar software host computer, check that the SAMM computer is on the same network as the sonar and sonar software host computer. From the network and sharing center, open the local area connection properties. Open the TCP/IPv4 Properties (double-click on Windows 7) and choose **Use the following IP address**. Match the first three sets of numbers to the sonar and sonar host computer numbers, then for the fourth set, use any number OTHER THAN the sonar and sonar host computer IP addresses. Set the Subnet mask to 255.255.255.0.

M3: 192.168.1.xxx, not 233 or 234.
BlueView: 192.168.1.xxx, not 3 or 45



Configure Installation

1. Click the **Configuration** icon. (You may want to also click the **Record** icon to stop logging during setup.)

2. In the Survey Setup area, enter your offsets. (These are saved between projects.)

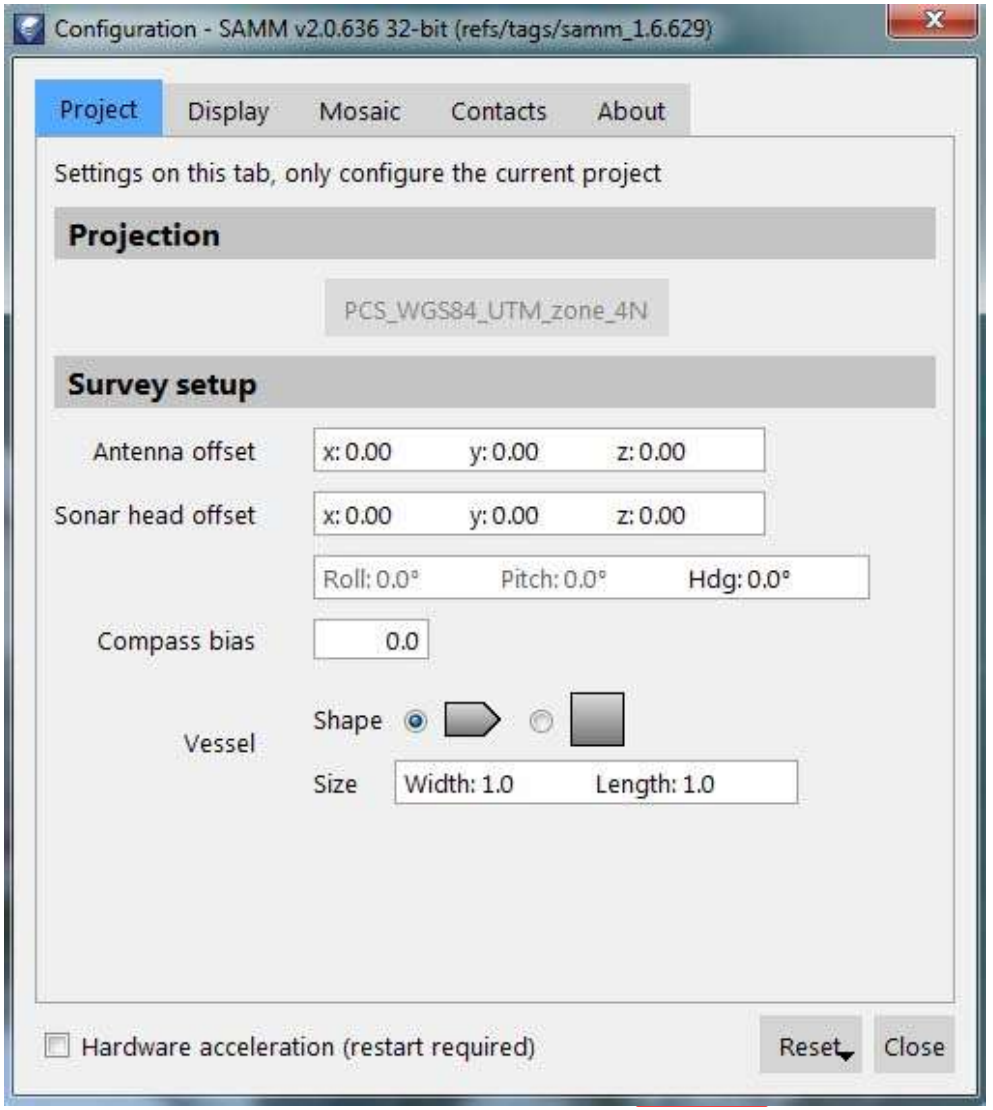
Where are your sonar head and navigation source relative to the center of your boat?
(measure/estimate in meters or change the unit under Display)

X = Port / Starboard (positive number = starboard, negative number = port).
Y = Fore / Aft (positive number = fore, negative number = aft).
Z = Height (positive number = above reference point, negative number = below reference point).

Where are your heading source and sonar pointing in relation to where your boat is pointing?
(Use the results of a heading offset calibration or estimate the sonar head and compass mounting biases in degrees. Add the declination for your location to the compass bias if you have a magnetic compass.)

Clockwise from boat direction is positive and counterclockwise from boat direction is negative.

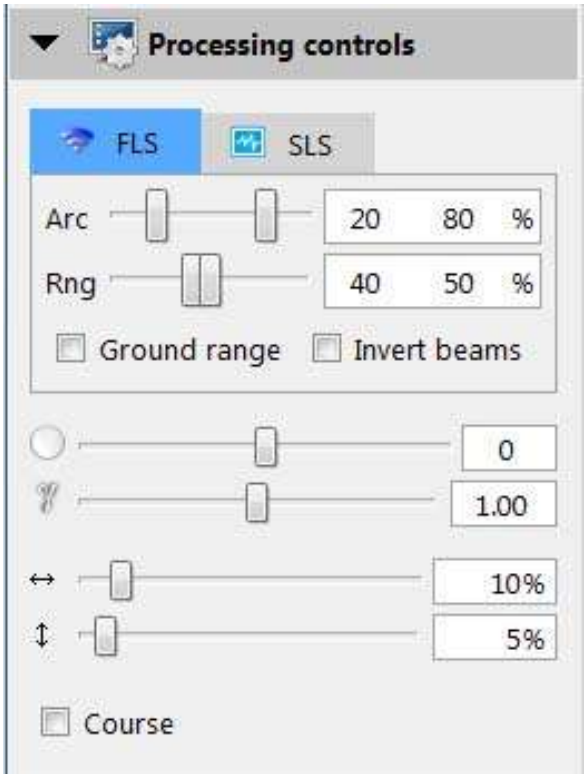
3. Click **Close**.



Tune Image

1. Find the **Processing Controls** under the **Live info** panel.

2. In the **Processing Controls**, change the Arc and Range sliders to trim which portion of the PPI is mosaicked.
   - ➢ The best values depend on where the best image is in the PPI.
3. Change the Brightness and Gamma sliders to change the image contrast.
   - ➢ The best values depend on the survey.
4. In the **Feathering Panel**, change the Horizontal and Vertical sliders to set across-track and along-track blending in the mosaicked images.
   - ➢ This adjusts the blending along-track and track to track.
5. Check the “Course” box to use course if heading is not present.



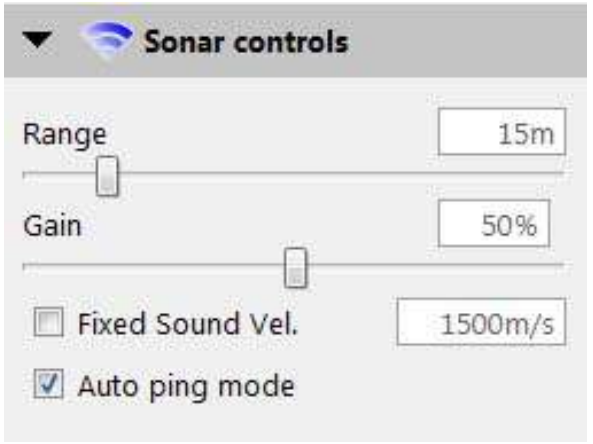
Modes of Operation

- For Starfish, M3 and BlueView control sonar range and gain in GeoDAS or the native sonar software, using recommended settings
- For Oculus, Tritech Gemini, Marine Electronics Dolphin and R2Sonic, use the controls in SAMM.
- Examples are shown below.

Control Gemini

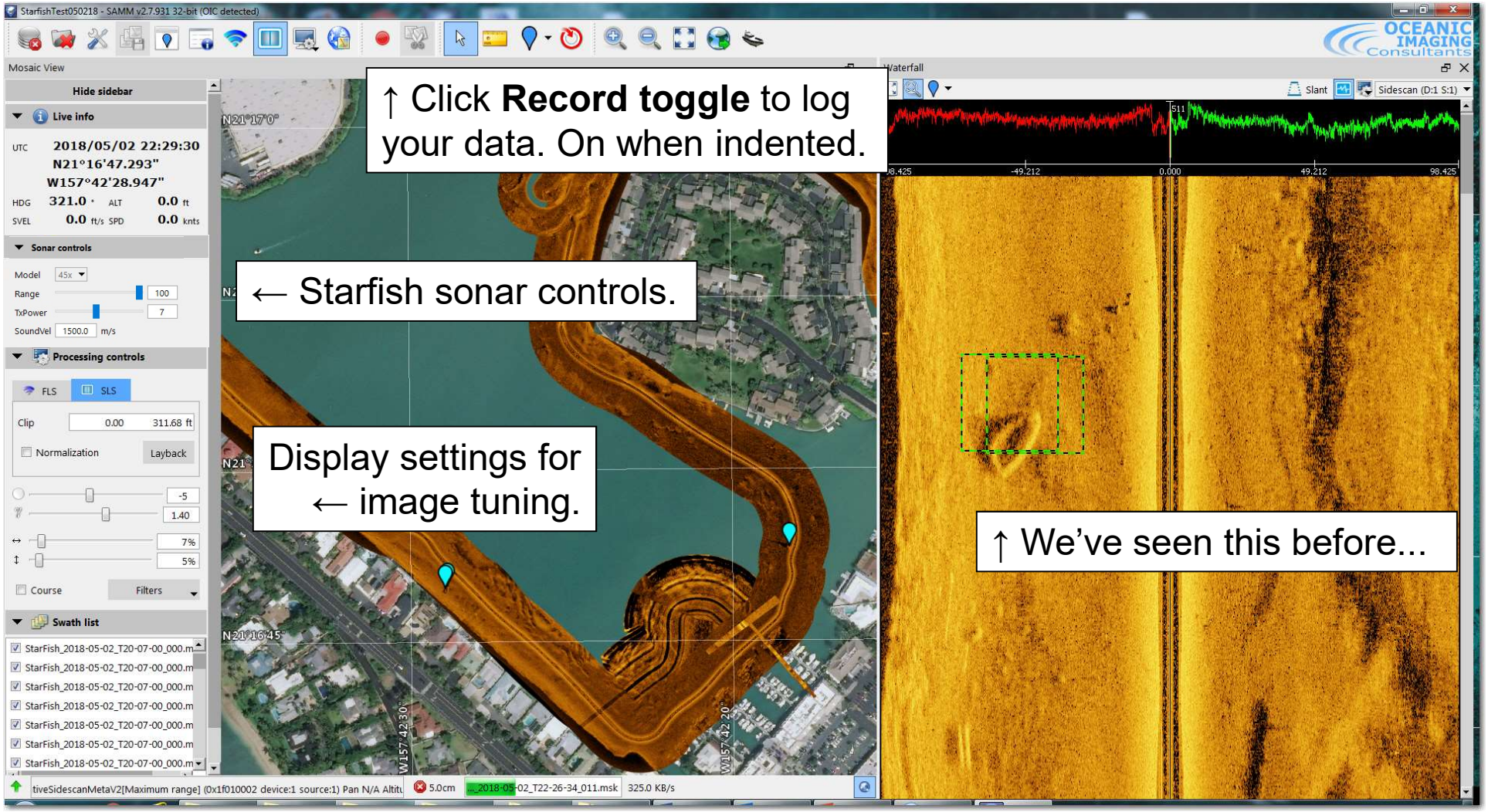
ADJUSTING THESE CONTROLS AFFECTS THE RAW DATA!

- Range and Gain are the same as in the Gemini sonar software.
- Fixed sound velocity should only be checked if you have reason to believe your sound velocity probe is faulty. 1500m/s is standard.
- Auto ping mode should be checked unless your computer is having trouble keeping up with the sonar (SAMM seems slow). By default, SAMM lets the sonar ping as quickly as it can send out the last received ping. Unchecking this box gives SAMM control of when the sonar pings. SAMM will send a command to the Gemini when it has processed the last ping sent from the sonar.



Starfish Sample

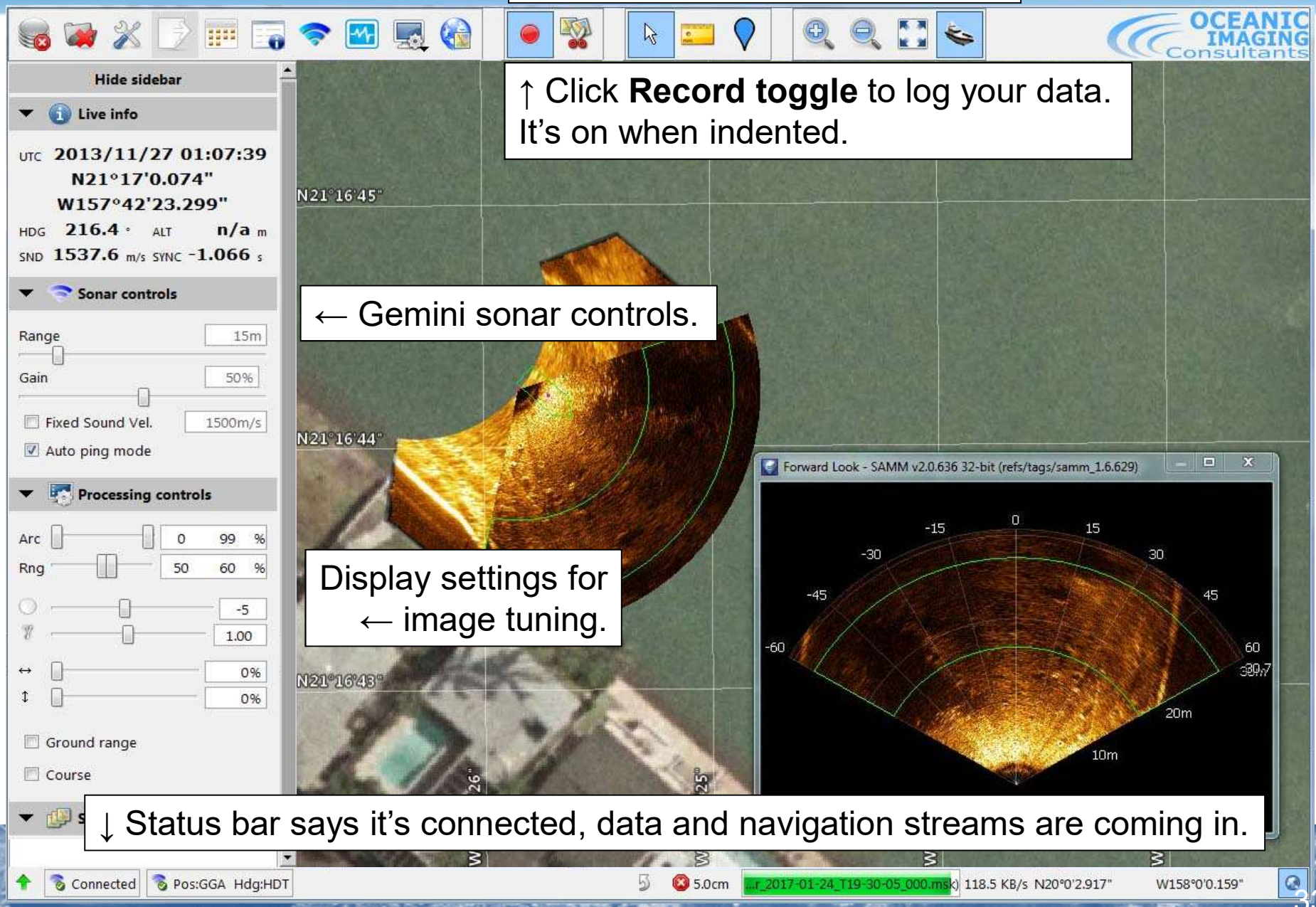
Mosaic view controls for Zooming/centering on vessel ↓



↑ Status bar says it's connected, data and navigation streams are coming in.

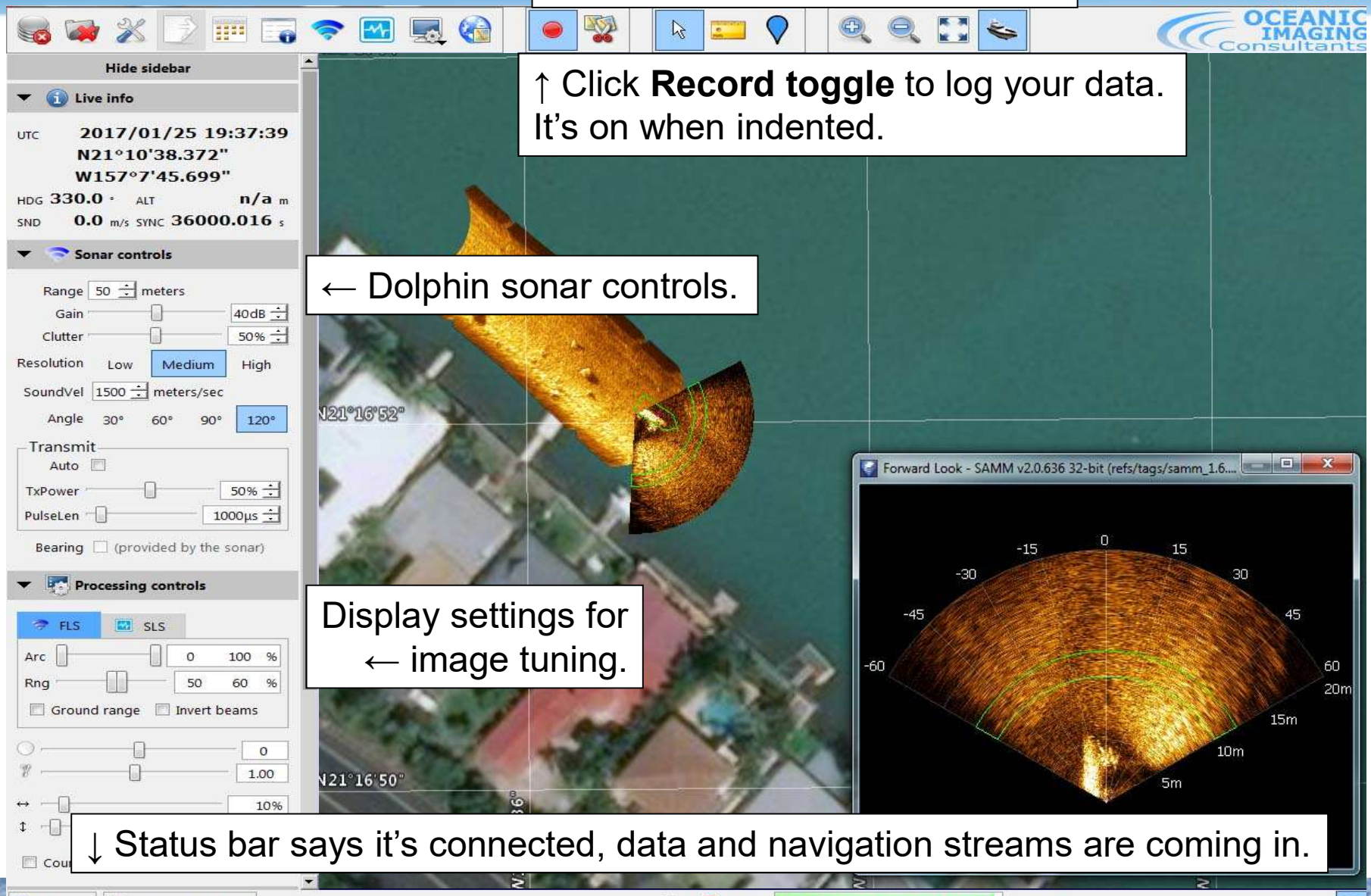
Gemini Sample

Mosaic view controls for Zooming/centering on vessel ↓



Dolphin Sample

Mosaic view controls for Zooming/centering on vessel ↓



↑ Click **Record toggle** to log your data. It's on when indented.

← Dolphin sonar controls.

Display settings for ← image tuning.

↓ Status bar says it's connected, data and navigation streams are coming in.

R2Sonic Sample

Mosaic view controls for Zooming/centering on vessel ↓

↑ Click **Record toggle** to log your data. It's on when indented.

← R2Sonic sonar controls.

Display settings for ← image tuning.

↓ Status bar says it's connected, data and navigation streams are coming in.