SAMM

Stand Alone Mosaicking Module
for Forward-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;
    - Gemini/R2Sonic owners using serial heading and navigation sources, make sure that your sensors output NMEA streams. You need either GreenSea navigation (Ethernet) or a dual serial nav/heading system like Hemisphere, or separate nav and 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;
  - 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 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)
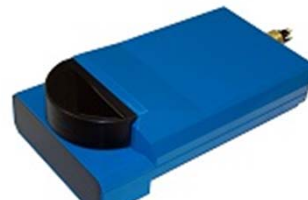
Teledyne BlueView 2D Multibeam Imaging Sonar
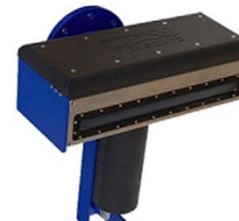
P/M900 Series   P/M450 Series

Tritech Multibeam Imaging Sonar

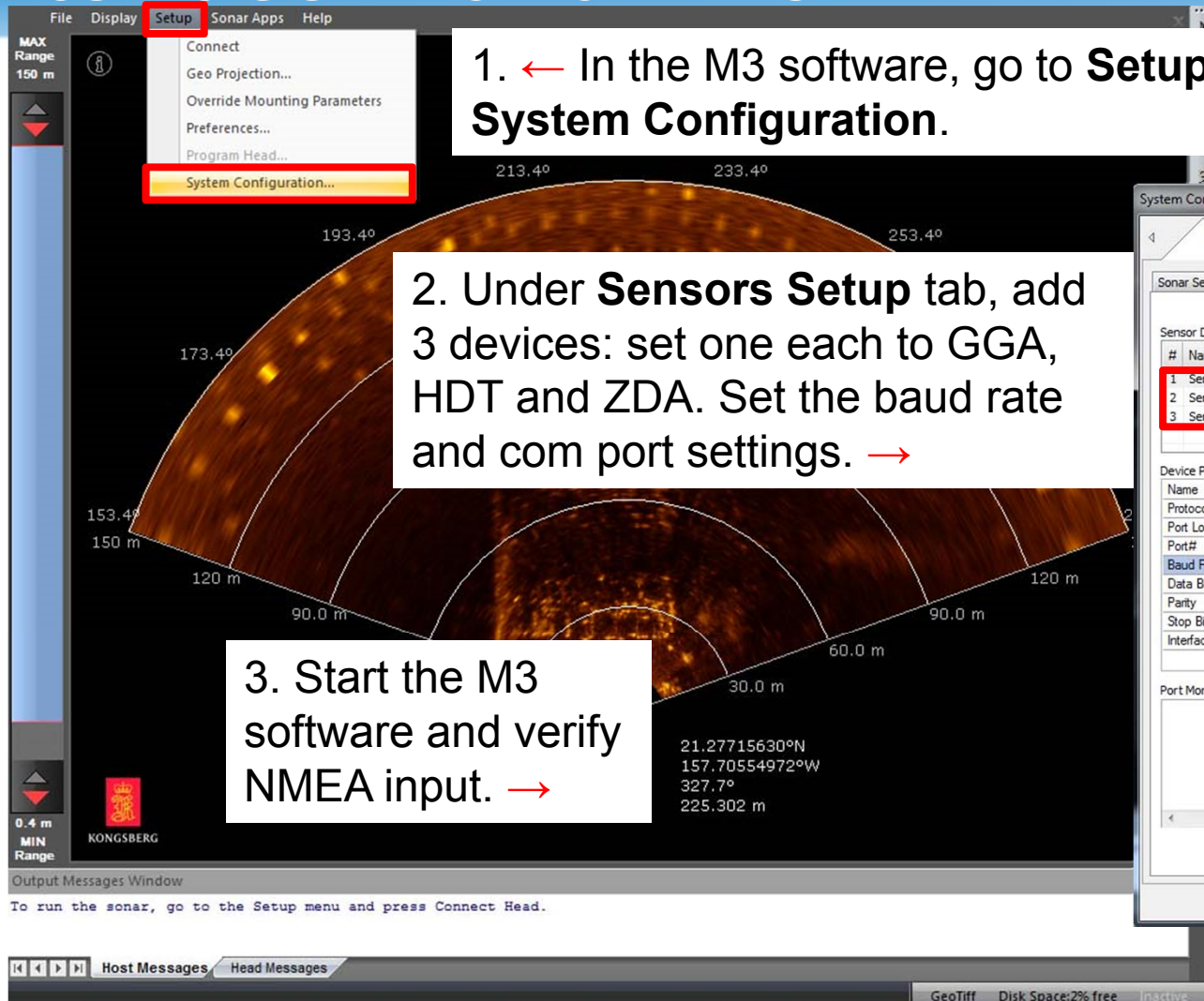Gemini 720i

Marine Electronics Dolphin SeaView

R2Sonic 2024

Gemini 720is

2. **Gemini/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. **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.
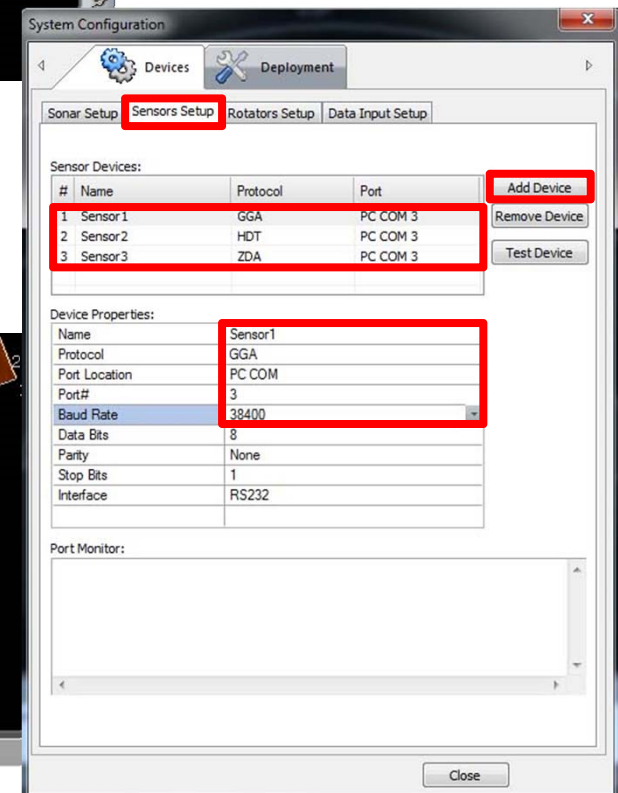
Interface with an M3

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. →

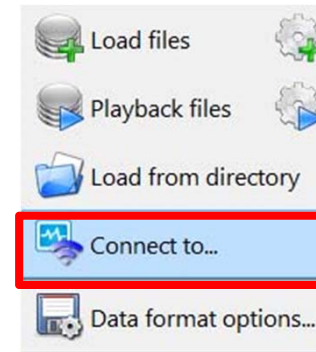3. Start the M3 software and verify NMEA input. →

Interface with an M3

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

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

Load files
Playback files
Load from directory
Connect to…
Data format options…

--- Supported sensors ---

Simulator

Kongsberg M3

Kongsberg MS1000

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

Please select a sensor setup from the left and click Load.

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. →

Sonar network configuration

Network interface   Default

IP address   127 . 0 . 0 . 1   Local

Port   20001

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

Save setup   ✔ Connect

Interface with a BlueView

In ProViewer4…

← 1. Click the Application settings icon.

Application	Units	HotKeys	Pan/Tilt	AppEx	He

← 2. Click the AppEx tab.

Send Data to Third-Party Applications

☐ XY Images   ☑ RTheta Images
☐ Targets   ☑ Nav Data   ☑ Pan/Tilt Data

3. Uncheck the XY images box and check the RTheta Images box.

← 4. Click the Connect to Sonar icon.

Sonar	Head	IP Address	Firmware	
M900-2250-130 (M9 ▼	MDF2250-130 ▼	192.168.1.45:1149	9446	Connect

5. Proviewer will search and find your sonar. Click on Connect to start the sonar. →

nual Search

SAMM is compatible with ProViewer Version 4.3.0.9526 and later. If that's not your version, please update ProViewer. ↓

Build 9526

6

Interface with a BlueView

← 6. Click the Application settings icon.

7. Click the NMEA (GPS) tab. → **NMEA (GPS)**

8. Select the com port and baud rate settings for your NMEA input, then check GGA, HDT and ZDA. →
9. Click **Add Current** then **Start All** to have ProViewer take in NMEA. →

Interface with a BlueView

9. Click the Appex Broadcast icon.

10. Verify Sonar operation.

11. Verify NMEA values.

Interface with a BlueView

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

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

- Load files
- Playback files
- Load from directory
- **Connect to...**
- Data format options...

- Kongsberg MS1000
- **BlueView ProViewer**
- Tritech Gemini
- R2Sonic
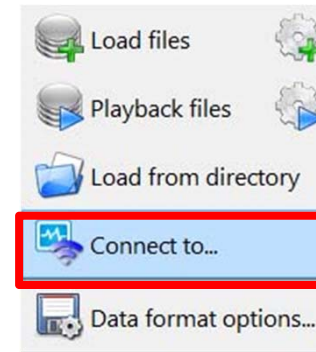
← 3. Click **BlueView ProViewer** then **Load.→**

Please select a sensor setup from the left and click Load.

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. →

Sonar network configuration

Network interface	Default
IP address	127 . 0 . 0 . 1 Local
Port	1152
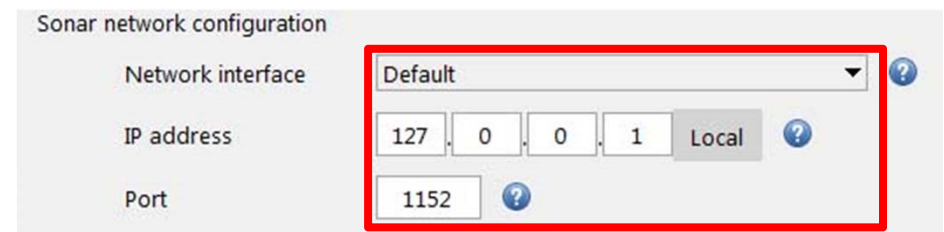
5. Click **Connect** and SAMM will begin collecting, recording and mosaicking your data.

Save setup   Connect

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.** →

Please select a sensor setup from the left and click Load.

Load

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

Position and heading   ☐ separate heading sensor

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

Position and heading

Serial port   Network

Port   COM1
Baud   9600
Data bits   8

Connect

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

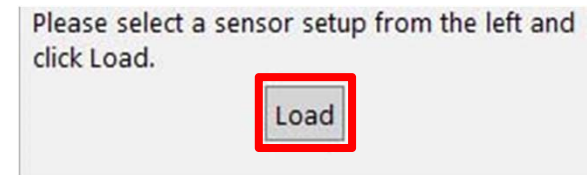# Interface with a Dolphin SeaView

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.

Load files
Playback files
Load from directory
Connect to…
Data format options…

Klein 3000/3500
GeoDAS
Dolphin Sea View

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

Dolphin Sea View
Range 50 meters
Gain 40dB
Clutter 0%
Resolution Low Medium High
SoundVel 1500 meters/sec
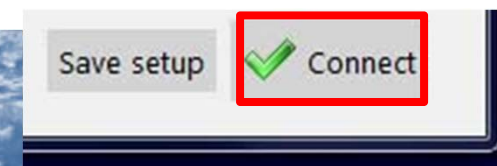Angle 30° 60° 90° 120°
Transmit
Auto
TxPower 50%
PulseLen 1000µs
Bearing ☐ (provided by the sonar)

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.↓

Position and heading
🚫 Not configured

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

Position and heading
⊙ 🧭 Serial port   ○ 🖥 Network
Port   COM1
Baud   9600
Data bits 8
Parity   None
Stop bits 1
setup ✓ Connect

← 6. Click **Serial port** then set your com port and baud rate settings to match your GPS/compass.
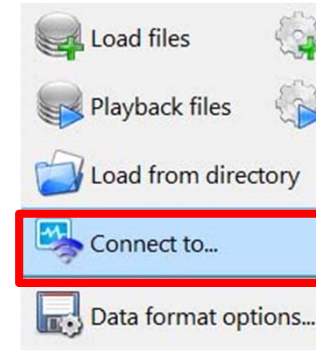
← 7. Click **Connect** and SAMM will begin collecting, recording and mosaicking your data.
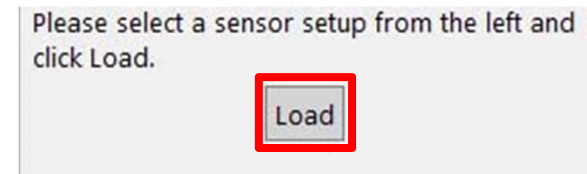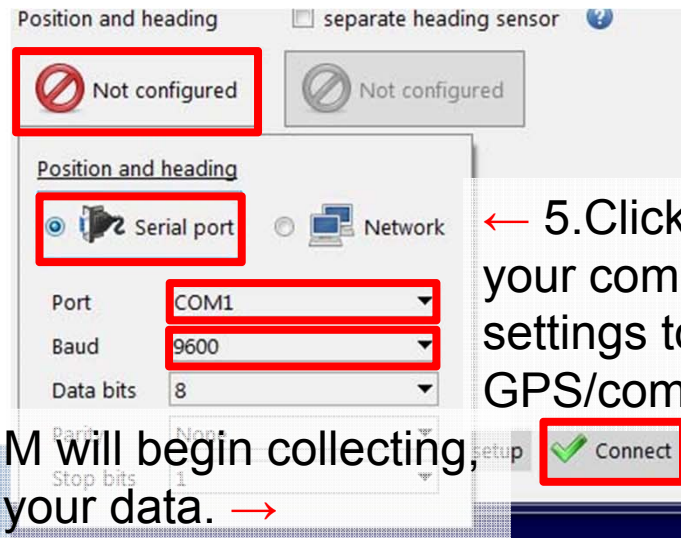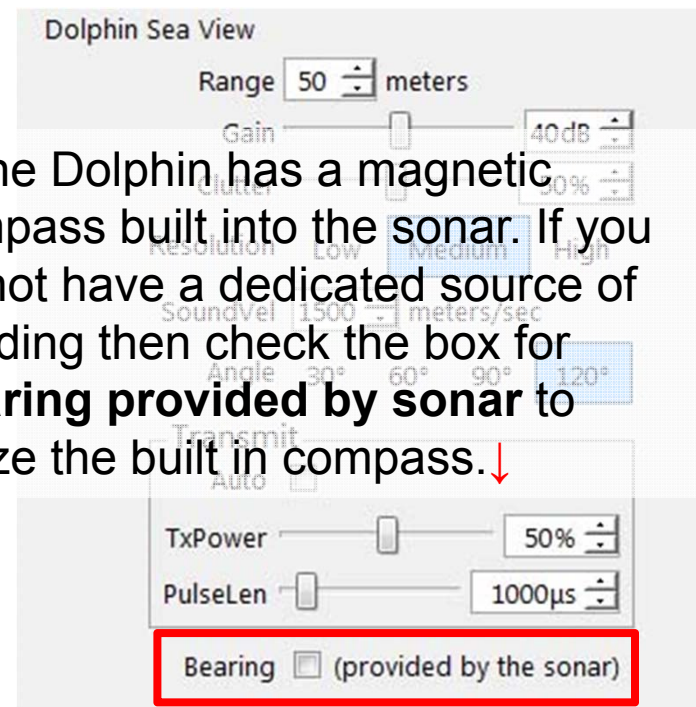
Interface with an R2Sonic

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.

- Load files
- Playback files
- Load from directory
- Connect to...
- Data format options...
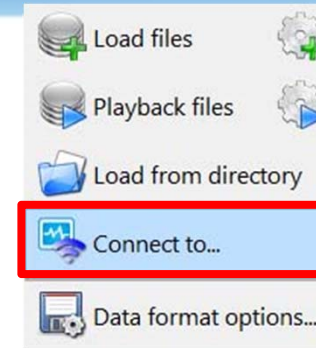
← 3. Click **R2sonic** then **Load.**

- BlueView ProViewer
- Tritech Gemini
- R2Sonic

R2Sonic
- Use system time for data sync
- Use GPS (NMEA: ZDA)   SIM serial port   SIMPORT,9600,8N1
- PPS edge   Rising

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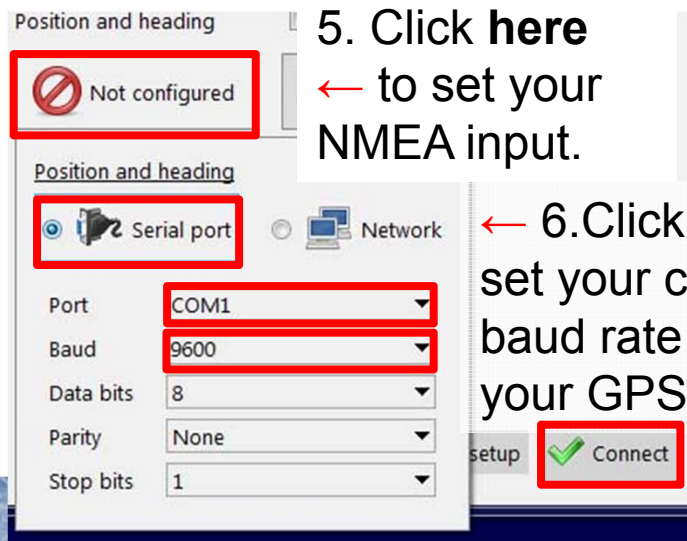
5. Click **here** ← to set your NMEA input.

Position and heading
- Not configured

Position and heading
- Serial port   ○ Network
- Port   COM1
- Baud   9600
- Data bits   8
- Parity   None
- Stop bits   1
- setup   Connect

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

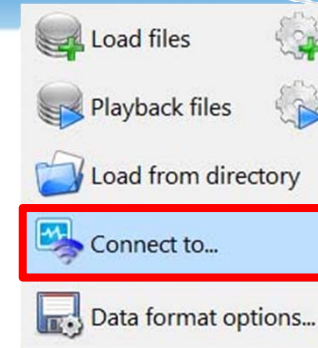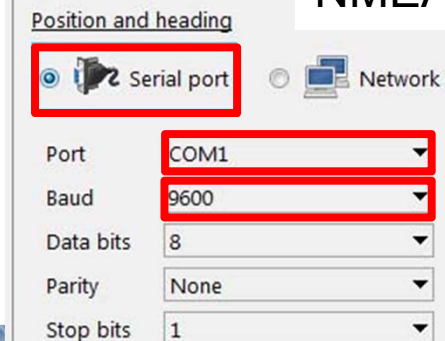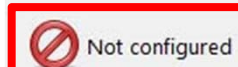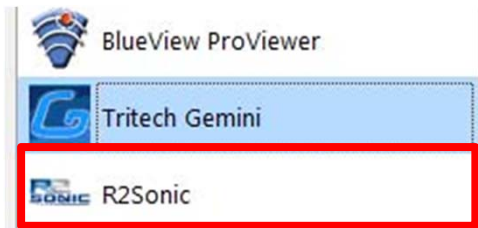← 7.Click **Connect** and SAMM will begin collecting, recording and mosaicking your data.
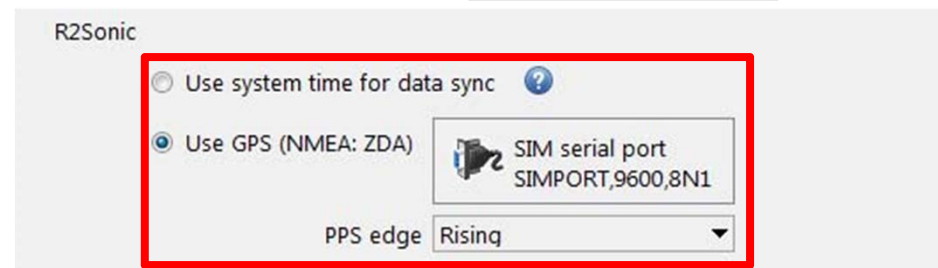
Monitor Connection and Images

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Live info

UTC 2014/02/01 01:15:02
N21°16'44.487"
W157°42'26.071"

HDG 128.4 °   ALT   n/a m
SND 1534.4 m/s   SYNC   1.334 s

Live info feed looks accurate

On SAMM: All Good

10.9 MB/s   Pos:GGA Hdg:HDT

Status bar shows good connection

Image is present in PPI (click 📶 to display)

Live info

UTC 1970/01/01 00:00:00
N0°0'0.000"
E0°0'0.000"

HDG 0.0 °   ALT   n/a m
SND 0.0 m/s   SYNC   0.000 s
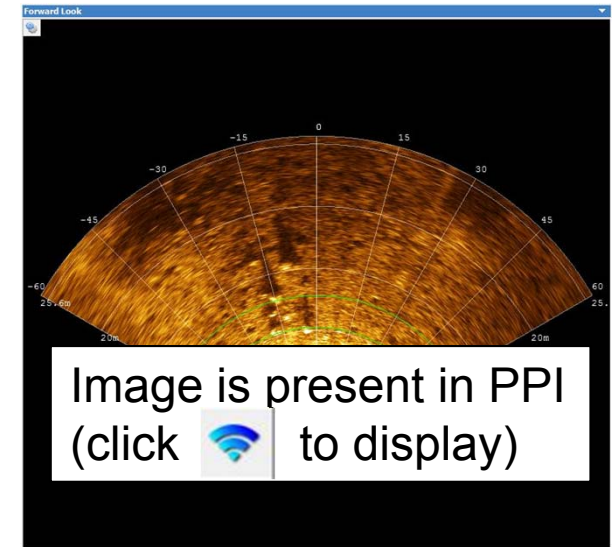
Troubleshooting Time

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.

SAMM v2.0.636 32-bit (refs/tags/sa...)

Device status

BlueView ProViewer
The socket has started
establishing a

Data required for mosaicking

✗ Latitude/Longitude
✗ Heading
✗ Sonar data

Disconnected   5.0cm   Scanning inputs

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

All Good

←Live info feed looks accurate

↓ Image is present in PPI

↑ PPI is aligned over background imagery

↓ Taskbar shows good connection
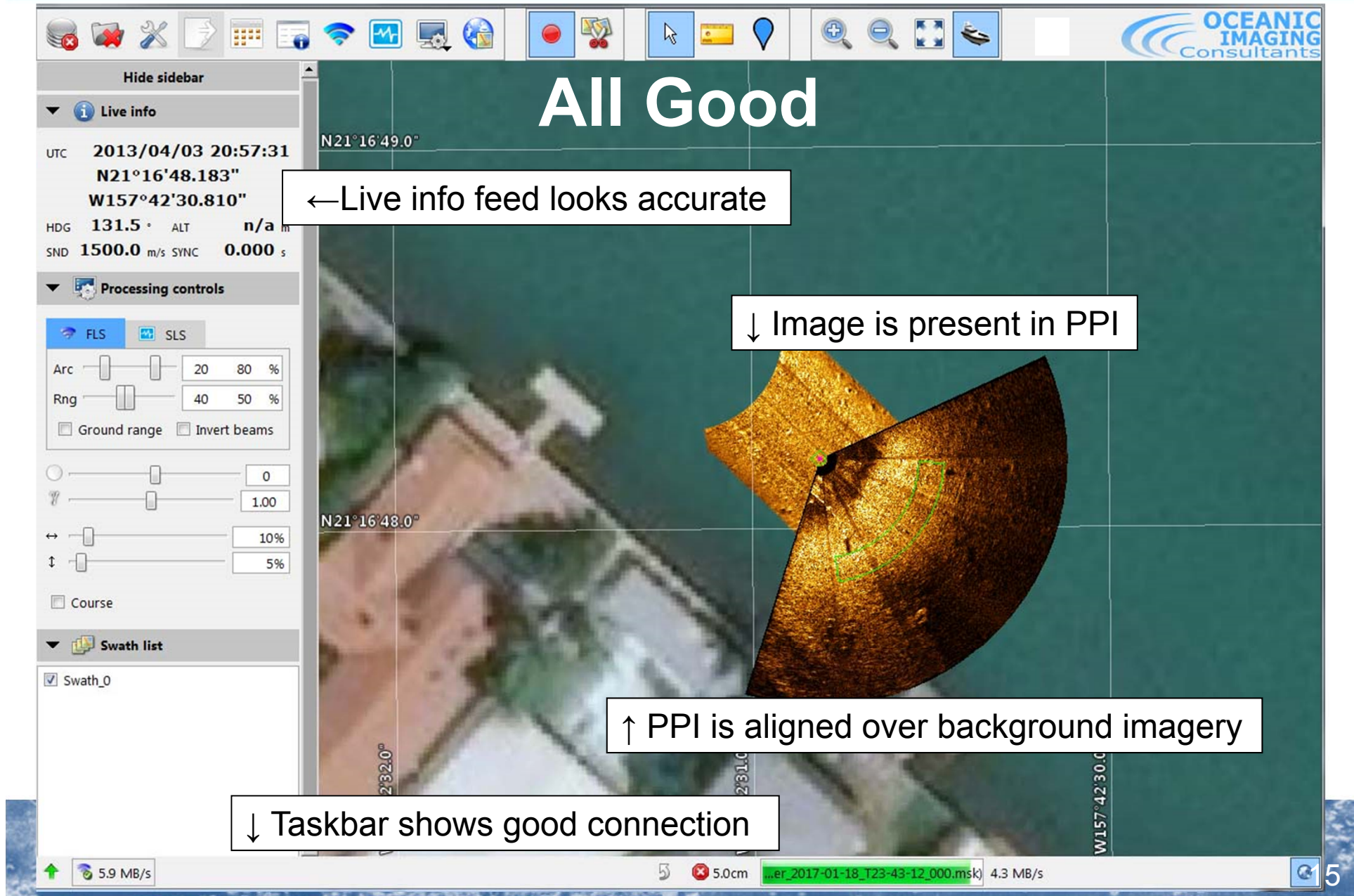
Live info

UTC 2013/04/03 20:57:31
N21°16'48.183"
W157°42'30.810"

HDG 131.5 · ALT n/a m
SND 1500.0 m/s SYNC 0.000 s

Processing controls

FLS   SLS

Arc   20   80 %
Rng   40   50 %

Ground range   Invert beams

0
1.00
10%
5%

Course

Swath list

Swath_0

5.9 MB/s   5.0cm   ...er_2017-01-18_T23-43-12_000.msk)   4.3 MB/s

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.
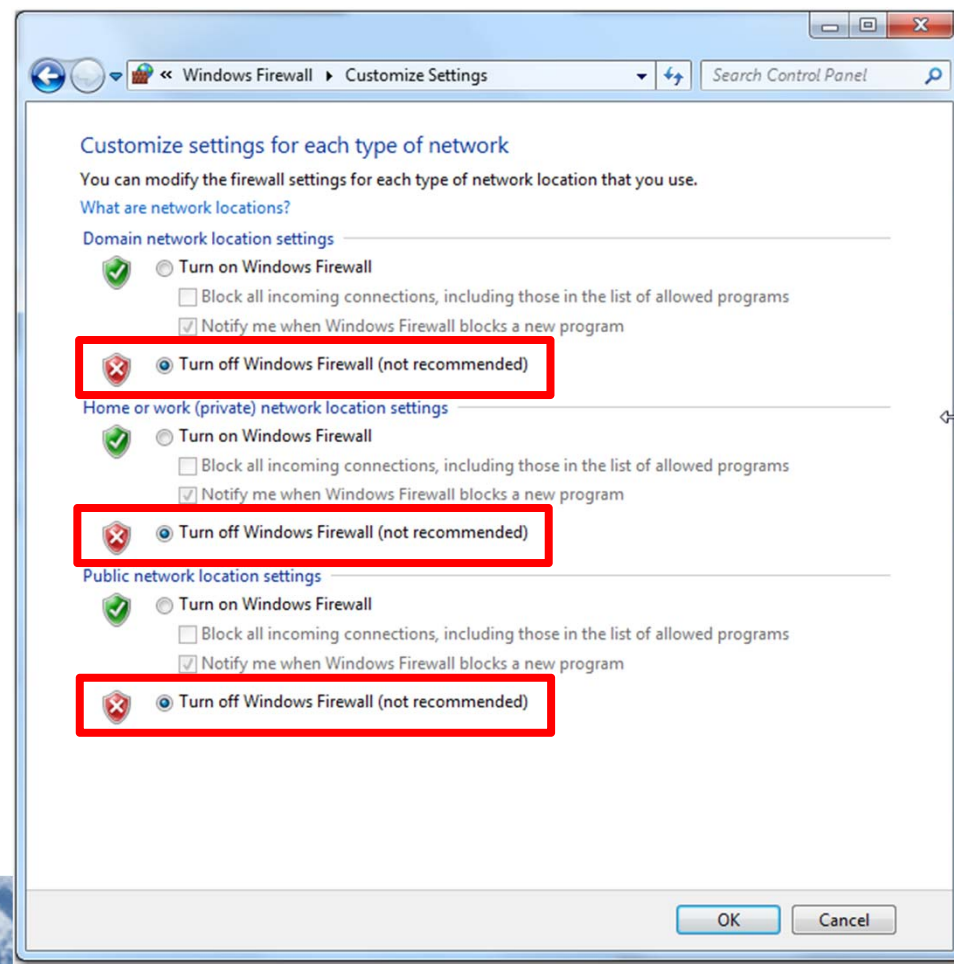
Troubleshooting

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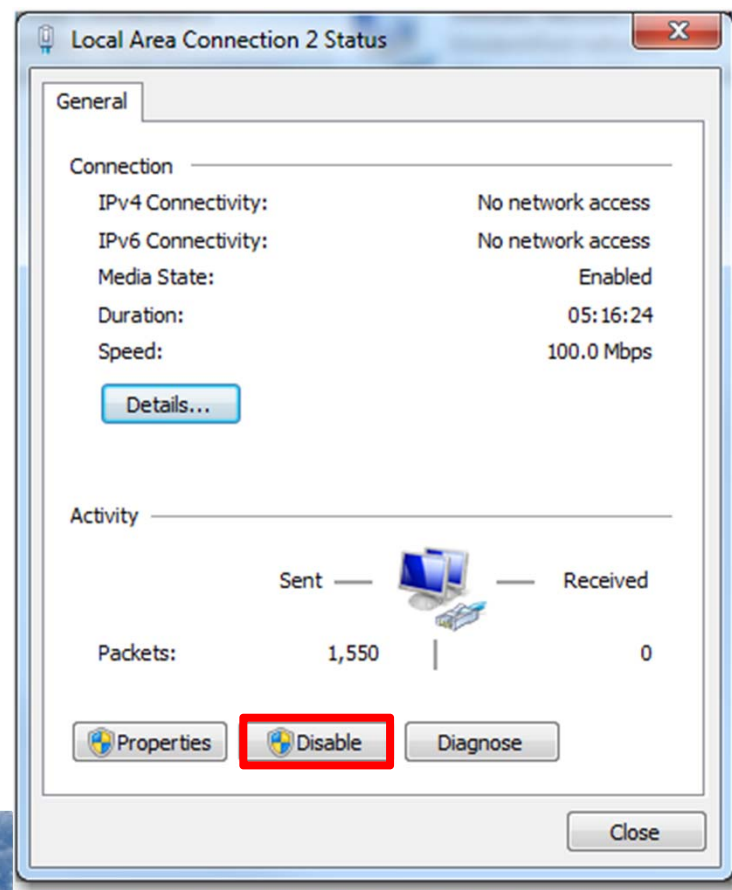
If your sonar software sees the sonar, nav and heading sources, but SAMM doesn't:

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
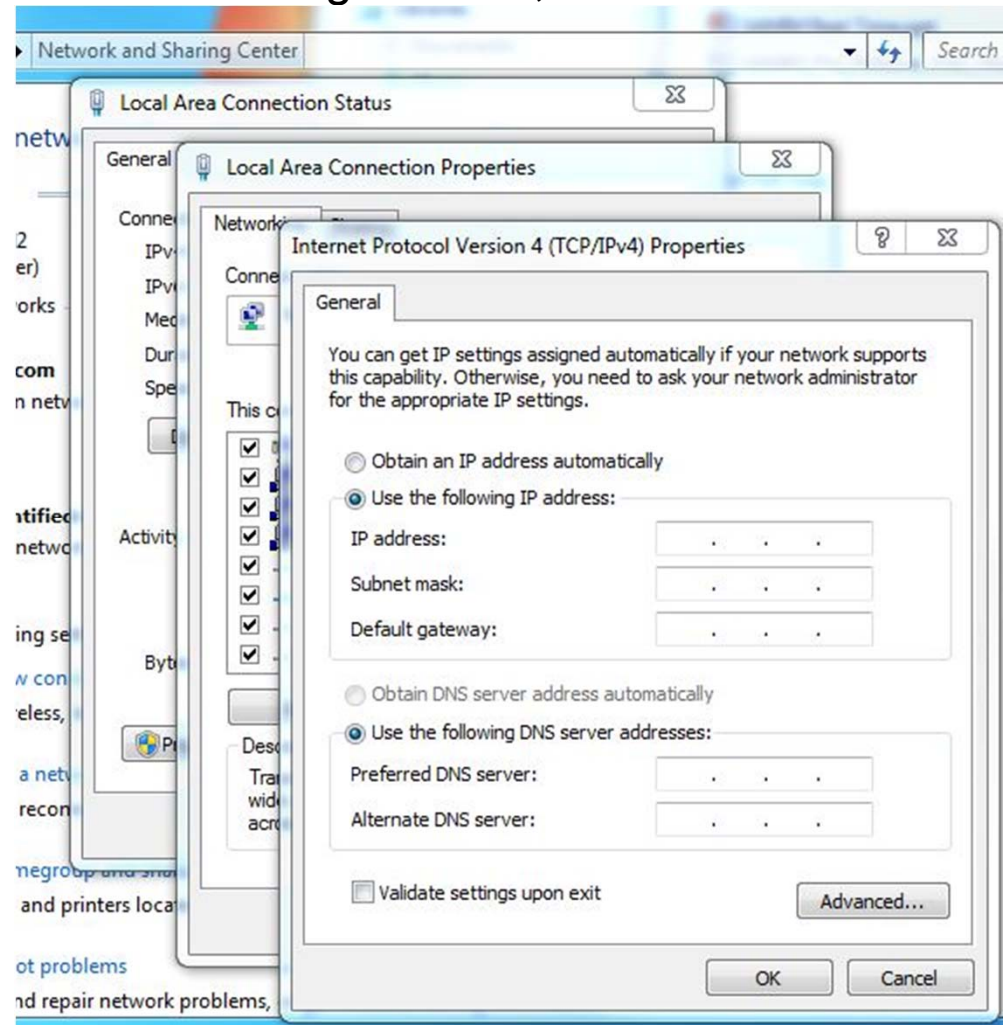
Configure Installation

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).
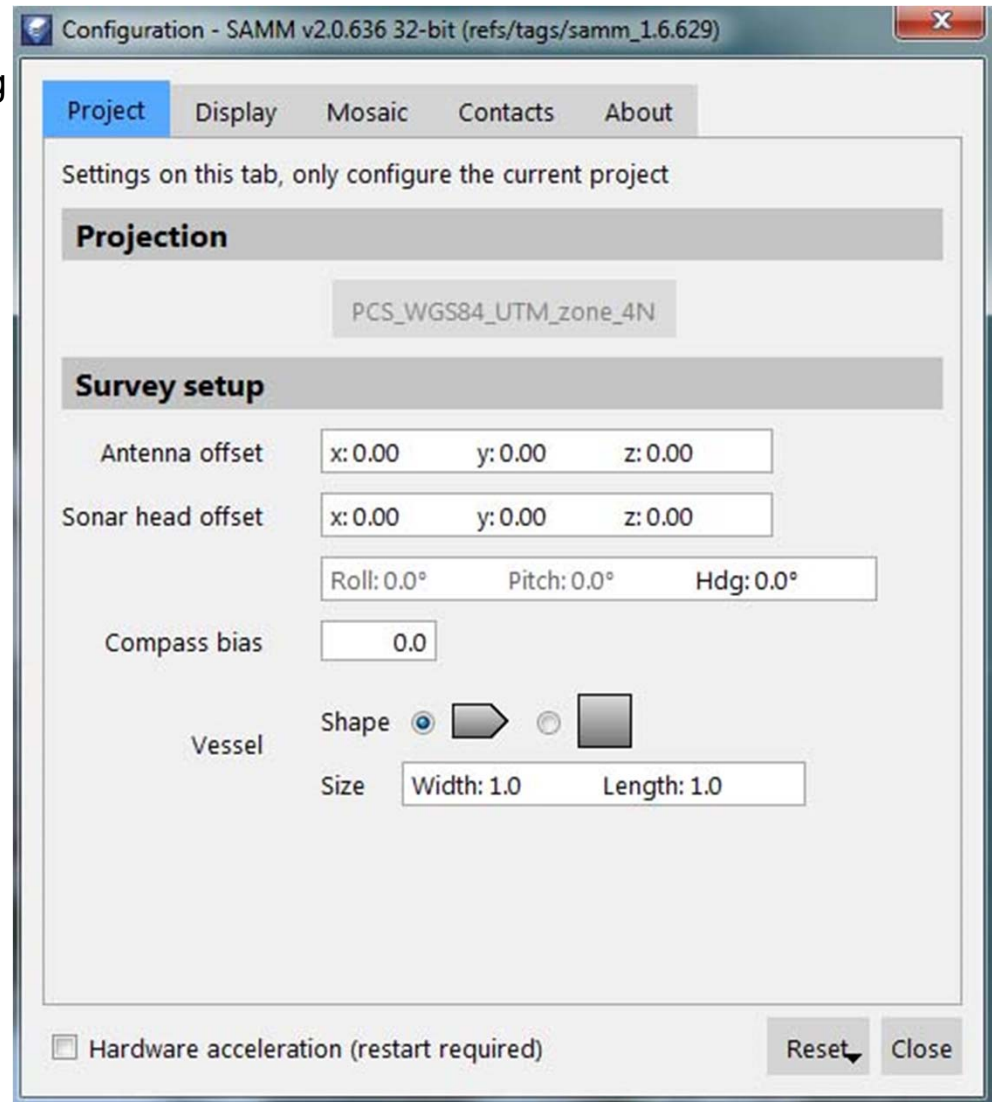Z = Height (positive number = above reference point, negative number = below reference point).

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**.

Configuration - SAMM v2.0.636 32-bit (refs/tags/samm_1.6.629)

| Project | Display | Mosaic | Contacts | About |

Settings on this tab, only configure the current project

Projection

PCS_WGS84_UTM_zone_4N

Survey setup

Antenna offset   x: 0.00   y: 0.00   z: 0.00
Sonar head offset   x: 0.00   y: 0.00   z: 0.00
Roll: 0.0°   Pitch: 0.0°   Hdg: 0.0°
Compass bias   0.0

Vessel   Shape
Size   Width: 1.0   Length: 1.0

Hardware acceleration (restart required)   Reset   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.
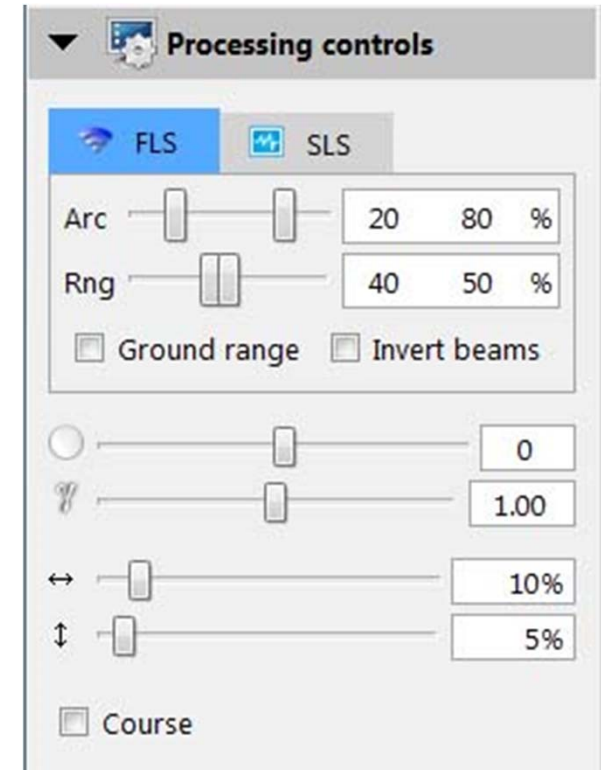
Modes of Operation

- For M3 and BlueView, control sonar range and gain in the native sonar software, using recommended settings

- For 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.
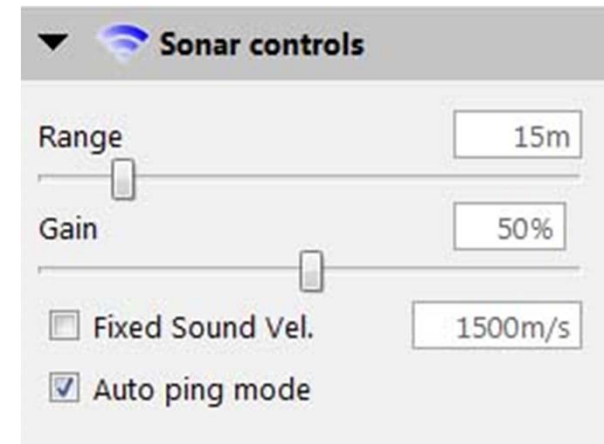
Gemini Sample

Mosaic view controls for Zooming/centering on vessel ↓

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

← Gemini sonar controls.

Display settings for ← image tuning.

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

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.

Live info

UTC	2016/11/02 22:29:46
	N21°16'51.866"
	W157°42'35.015"
HDG	121.3 ° ALT n/a m
SND	0.0 m/s SYNC 0.337 s

Sonar controls

RNG	100 m	WDTH	90.0 °	
BRT	30.0 dB	ROT	0.0 °	
GAIN	20.0 dB	PWR	200	dB/µPa
Plen	50 µsec TX	On		

Processing controls

FLS | SLS

Arc		0	100 %
Rng		50	60 %

☐ Ground range ☐ Invert beams

	0
	1.00
↔	10%
↕	5%

☐ Course

Display settings for ← image tuning.

Forward Look - SAMM v2.0.636 32-bit (refs/tags/samm_1.6....

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

Connected Pos:GGA Hdg:HDT   5 5.0cm ...r_2017-01-24_T19-30-05_000.msk) 118.5 KB/s N20°0'2.917"   W158°0'0.159"