

SIS QA

SEAFLOOR INFORMATION SYSTEM QUALITY ASSURANCE

Post-processing of Kongsberg Maritime echo sounder data.

SIS QA 2.0 adds new tools to detect errors in a dataset. The operator is given extended possibilities to inspect and analyze the data in order to find out if there are any artifacts that should be corrected using SIS QA.

SIS QA

Kongsberg Maritime Multibeam Echo sounder Systems (MBES) correct for all external sensor input in real time so the quality of external sensors providing motion data (heave, roll, pitch), heading, sound speed profile and position are crucial to the quality of the final data set during a survey.

To enhance survey data even further, external sensor input can be improved using post-processing using the advanced SIS QA solution. For instance, the heave signal from the Kongsberg Seatex developed Seapath Heading, Attitude and Positioning system is better with 100 seconds delay. With SIS QA positions from Seapath can be corrected during post-processing using Precise Point Positioning (PPP), which can significantly improve the accuracy of a data set. SIS QA will also correct any errors made in the installation setup, such as wrong lever arms or installations angles whilst sound speed profiles can be refined and reapplied to make new depths.

SIS QA improves MBES data very efficiently. With just a few steps the operator can apply correct sensor data to the multibeam data and increase its quality significantly, making it more useable for applications requiring highly accurate readings.

Define survey

Getting started with SIS QA is easy as most operations have been given common default values. To define a survey to be post-processed, the operator simply needs to apply a name to the project and add the files. SIS QA will automatically find the right parameters for features such as map projection and terrain modelling although the operator has complete freedom to customise these should the need arise.

The data logged by SIS QA contains all information needed for post processing, so records of vessel configuration are not needed, making set-up and operations even more straightforward.

Line Processing

A key aspect of SIS QA is the Line Processing window. Using Line Processing functionality the operator can change lever arms and installation angles, and choose which sensors to use for motion, heading and heave, including delayed (true) heave from the Seapath system. Sound speed profiles can be changed, including interpolation in time and area whilst PPP processing of GPS data logged from Seapath is also easy to do from within the Line Processing functionality. All Line Processing is carried out in a single batch when the operator presses the Apply-button.

Features

- Correct for any error in the lever arms, positioning system, motion reference unit or transducers.
- Apply delayed (true) heave instead of real time heave.
- Change sound speed profiles, including sound speed profile interpolation both in time and area.
- Use TerraPos from TerraTec to do Precise Point Positioning, recalculate positions from raw GPS signals and correction files.
- Export corrected data in .all-format files and Generic Sensor Format (GSF) files for map production.

3D Window

SIS QA also offers a 3D window where the terrain model can be displayed together with each and every depth sample. This is a very good tool to inspect that the data is correct.

SIS QA Black Box

All of the processing described above can be done using the SIS QA Black Box (BB), which does not use a graphical user interface (GUI). The survey definition and the processing parameters are defined beforehand and SIS QA BB will simply do everything from the command line. Afterwards the operator can inspect the results.

This option makes it easy to automate daily processing up to a certain point where all 'standard' processes have been run. The operator simply has to verify that the results are correct. SIS QA BB also serves as an external process that can be controlled from other systems. Should other vendors provide a graphical user interface to SIS QA BB, the same calculations can be done to the data from the MBES as from a Kongsberg system.

The screenshot shows the 'Line Processing' window with the following sections:

- Survey lines (26):** A list of 19 selected survey lines, each with a checkbox and a filename (e.g., 0000_20100826_094748_Pingeline.all).
- Time:** [New Rule]
- Operator:** [Empty field]
- Comment:** [Empty field]
- Time to use:**
 - Datagram System
 - Position Delay (sec): [Empty field]
 - Enable Position Motion Correction
 - Datum: WGS84
 - Motion Delay (ms): 0
- Active Sensors:**
 - Heave: Use Delayed Heave
 - Motion: 01_01
 - Heading: 01_01
- SVP Recalculation:**
 - Select SVP to use: Use SVP
 - 1 Active SVP line(s)
- TerraPos:**
 - Positions: [Empty field]
 - Antenna Arms:
 - Forward(X): 0.0000
 - Starboard(Y): 0.0000
 - Downward(Z): 0.0000
- External Data:**
 - Select Data: [Empty field]
- Location Offset (m):**

	Forward(X)	Starboard(Y)	Downward(Z)
Pos, COM1	0.00	0.00	0.00
Pos, COM3	0.00	0.00	0.00
Pos, COM4/UDP2	0.00	0.00	0.00
TX Transducer	4.30	0.16	1.23
TX Transducer 2			
RX Transducer	4.40	-0.16	1.23
RX Transducer 2			
Attitude 1, COM2/UDP5	0.00	0.00	0.00
Attitude 2, COM3/UDP6	0.00	0.00	0.00
Waterline			0.00
Heave Sensor	0	0	0
Heave Motion Delay			0
- Offset Angles (deg):**

	Roll	Pitch	Heading
TX Transducer	0.00	0.00	0.00
TX Transducer 2			
RX Transducer	0.00	0.00	180.00
RX Transducer 2			
Attitude 1, COM2/UDP5	0.00	0.00	0.00
Attitude 2, COM3/UDP6	0.00	0.00	0.00

At the bottom, there are buttons for 'Apply', 'Delete', and 'Close', along with a status bar showing 'New Delayed Heave Folder In Use: E:/sisdata/raw/Test01_01SEP10'.

Time Series Window

The Time Series Window allows the operator to select one or more lines and to compare different time-varying measurements like heave, roll, pitch and heading. These datasets can be compared with selected beams from the EM to see if there are any correlations between artifacts in the depths and the input sensors. If more input sensors have been logged, like two motion reference units, the data from both units can be compared.

The Time Series Windows is closely connected to the Map Window. Select one shiptrack in the Map Window and simply right-click to open the Time Series Window for that line. If there are any suspicious artifacts in the Map Window, it has now become very easy to investigate the underlying sensor input for that dataset. This integration works both ways: selecting a point in the Time Series Windows lights up a position in the Map Window so it is easy to see what data has been affected by that specific sensor input.

Features

- Display sensor data from .all-files and sensor files.
- Display data from two different sensors.
- Display selected beams from the EM simultaneously.
- Mark the corresponding depths in the Map Window.
- Several lines can be loaded at one time (RAM dependent).

Position Processing

SIS QA offers Precise Position Processing of GPS orbit data, and it is possible to replace the real time positions with post-processed positions. In addition to this, positions can be imported directly from files to replace the real time positions, in all lines, some lines or even in parts of some lines. The input format are SBET and plain ascii files, which should make it very easy to allow external positions into a SIS QA survey.



Crossline Window

The Crossline window allows the operator to create a corridor and then see all depths from all survey lines in that corridor. In addition all depths from the surrounding area will be loaded into memory for fast recalculations. Most installation parameters and the sound speed profile can now be changed and the effect displayed almost immediately.

This is a very efficient way to verify that the EM system is properly calibrated, and to verify that all sensor input like sound speed profile, is working properly. Most installation parameters and the sound speed profile can be changed and the effect displayed almost immediately.

All depths from all lines within the corridor will be recalculated using the same algorithms that was used in real time.

This makes the results very reliable that the changes made to the parameters here, will be the effects in real time as well.

It is also possible to recalculate all depths within a larger geographical area around the corridor to see the effects on the terrain model. This requires more computer memory as EM-models like the EM 2040 can provide very dense datasets.

The corridor can be automatically made to follow one line.

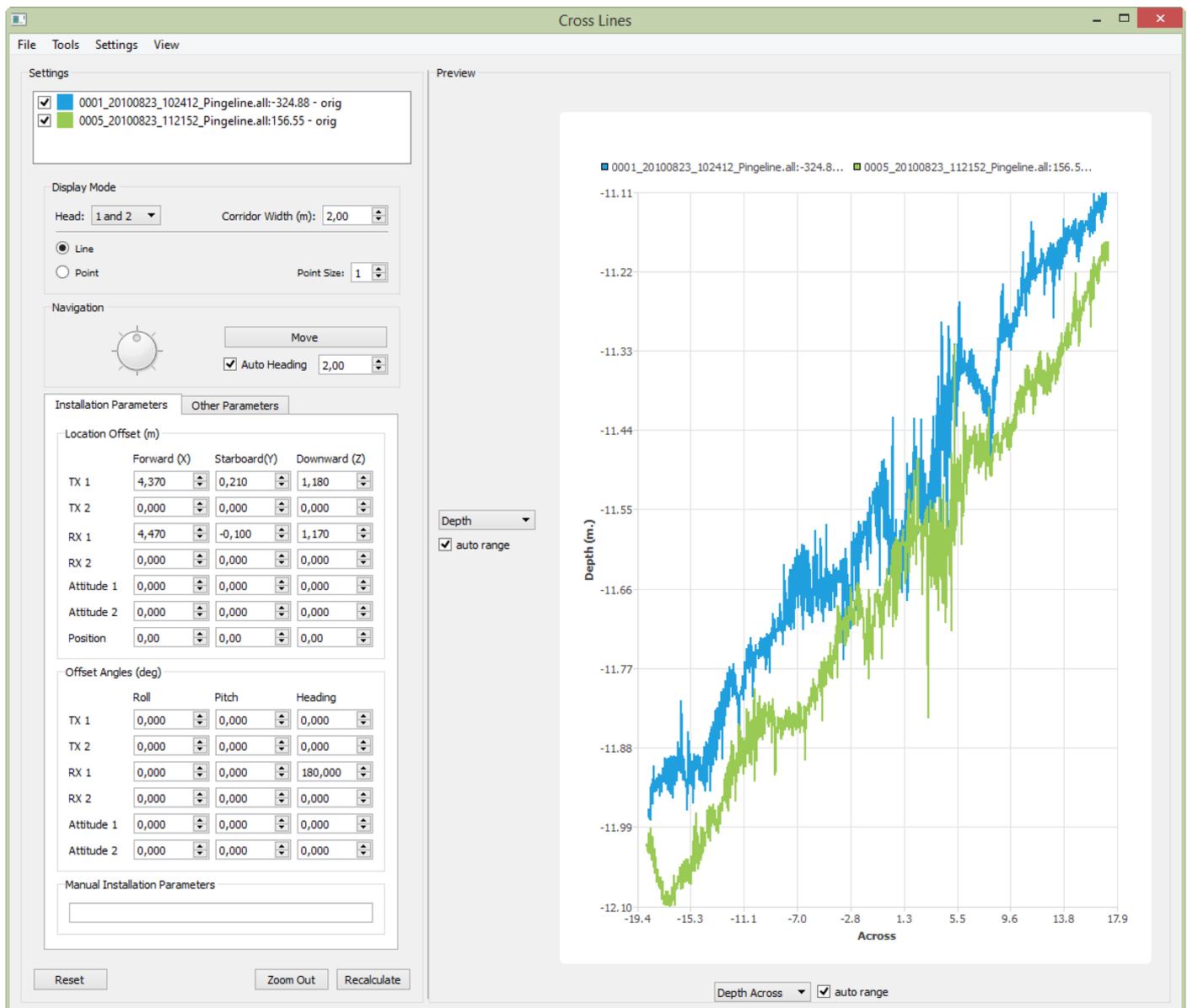
Pressing one button will move the corridor some meters further

on, but still all depth from all lines inside the corridor will be displayed. This allows the operator to “follow” one line and to see how the dataset align with all other lines. Not only depths along the corridor can be displayed, but the operator can choose to see the correlation between various features. Simply select Quality Factor in the y-axis and Beam Number on the x-axis to see how the quality factor varies with the beam number. There are about 10 various parameters that can be correlated in this display. Interactive editing is also possible allowing the operator to flag out depths that should not be part of the delivery. No depths are ever removed, they are only flagged as invalid and may be put back into the dataset at any time.

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Features

- Display all depths from all lines.
- Display correlation between various features: depth, quality factor, beam, etc.
- Recalculate depths with new parameters with the same algorithm as in real time.
- Follow line automatically.



Specifications subject to change without any further notice.

