



SCS900 v3.5 - Ohmex Extension module



Recent changes in SonarMite hardware

All SonarMite systems now use MILspec connectors. These offer robust industry standard connectors designed for field use and to prevent misalignment.

The SonarMite batteries are updated to conform with the recent EU Batteries Directive 2006/66/EC which came into force in October 2008, the SonarMite system is now powered by a rechargeable NiMh battery pack providing up to 10 hours continuous use. The battery pack is charged by a microprocessor controlled adaptor which is powered by a worldwide range of AC power sources and associated adaptors, the charger can also take the pack through a deep discharge/charge cycle to greatly extend battery life.

The SonarMite SPX/BTX OEM devices offer an installation version of the portable SonarMite hardware available for permanent installation fitting to a work vessel. The device has no carry case or internal batteries and is connected to a wide variety of power sources directly from the vessel. All versions have the option of a permanent 'thru hull' transducer in addition to the conventional 'transom mount' component. These SonarMite modules are devices intended to be permanently incorporated in other third party products such as survey craft or remotely controlled vessels. The units are functionally identical to the standard BTX and SPX versions but

are supplied in half size IP65 metal cases without internal batteries and associated charger. Power leads are provided for connection to an external battery or power source, the power circuit is protected against reverse voltage connection and features a thermal fuse in case of short circuit. As with the standard devices the BTX includes a serial port and parallel Bluetooth communication ports, the SPX is a serial port only device, both devices can connect to an external standard Ohmex USB serial interface powered directly through the serial connector. The OEM units can be ordered with either a standard pole mounted P66 transducer or a DT800 through hull mounted model, both are supplied with a shortened lead for interconnection. As this SonarMite device is incorporated in another product the requirement to supply it within an IP68 transit case is optional.



SonarMite BTX/SPX OEM module

LED Status Feedback - The front of the SonarMite panel has two LED indicators, one for current status information, the other for Bluetooth connection on/off.

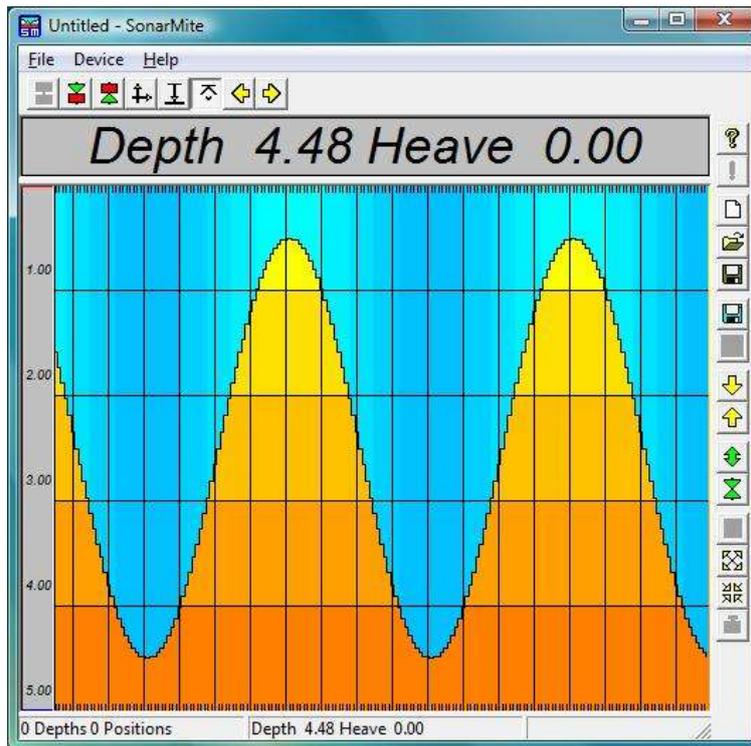
solid blue		Bluetooth Connected
solid red		Low Power
flash red		Txr fault
flash orange		Txr data bad
flash green		Txr data good

Front Panel status LEDs

SonarMite application software (SCS900 v3.5 version).

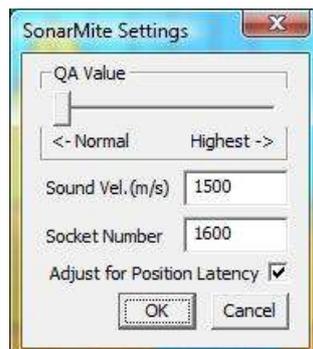
☑ The SonarMite application software has been updated to provide the time stamped data form required by the updated SCS900 application, this includes updated 'pipe' and 'socket' processes for passing data between applications. The SonarMite application has been tied to the following operating systems ...

- PC Versions - Windows Vista, Tablet PC, W7, W8 and W10
- Mobile Version - Trimble TSC3 Windows Mobile 6.0



☑ To avoid the problems associated with applications working in forthcoming updates to these operating systems the applications have been compiled as 'standalone' with no dependence on version specific extensions to the MFC environment.

☑ The properties dialog box does not show the settings used by the HPR sensor but includes prime sonar setting control settings ...

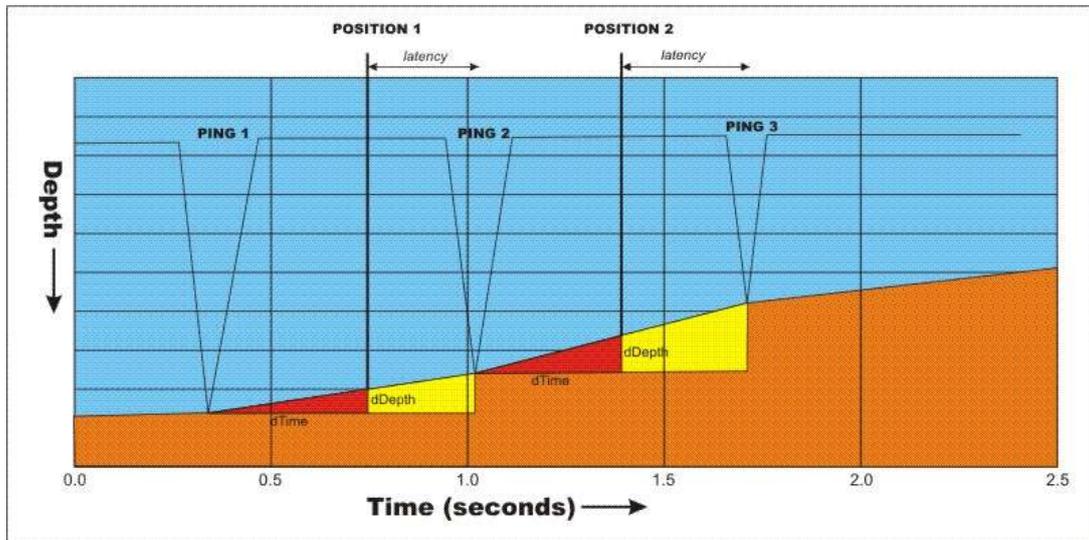


- QA control - A slider control has been added so the user can set the acceptance level for the QA value between normal and highest value. The highest will filter out all but the very best shots based on QA
 - Speed of Sound - The user can set the sound velocity value between 1400-1600m/sec, the default setting being 1500 m/sec.
 - Socket Number – The socket number used to transmit the data between applications (PC version only), default updated to #1600 to avoid confusion with earlier SCS900 versions.
 - Latency Calculation - The user can enable/disable the Latency correction algorithm within the SCS900 extension module, unless the system is using SCS900 to measure positions this function is inoperative.
- The internal call to the extension module now always returns TRUE regardless of the Z value having been adjusted by depth. This enables the user to have the extension module loaded but when the SonarMite application is not running then SCS900 will continue saving position data with no depth applied.

SCS900 Extension Module DLL

Depth Time (latency) adjustment

The SCS900 extension dll is called by the main application and passed a position with a timestamp, the SonarMite extension dll adjusts the depth based on the depth timestamps to suit the timing of the position, this calculated depth is then subtracted from the current position Z value (or height) and returned to the main SCS900 application.

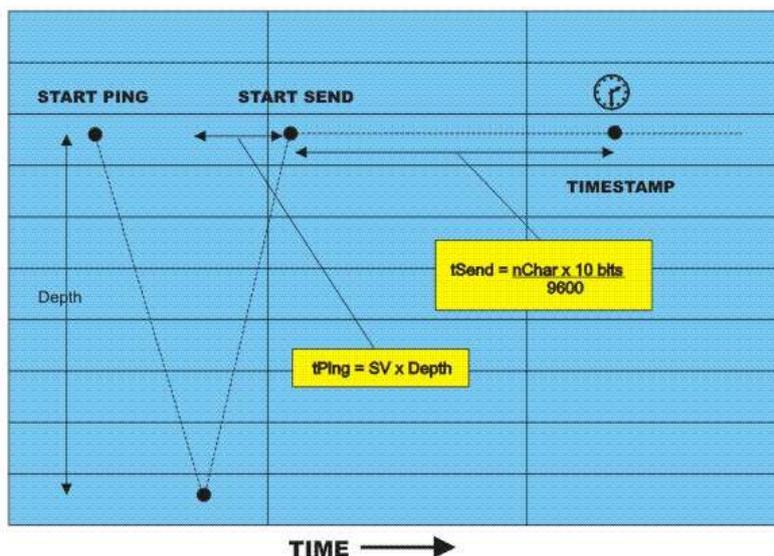


Adjustment of Depth to suit position timing

The above figure illustrates the linear interpolation of a depth based on the timestamp of the current depth, previous depth and the current position values. The latency correction algorithm times the depth reading using the same internal computer clock tick counts as the position reading timestamp.

Estimation of delay from Ping to Depth Timestamp

As the extension dll receives its data via serial transmission and timestamps it on reception of the Linefeed character ...



The above figure illustrates the calculation of the delay from the depth 'start ping' time and subtracts it from the applied depth timestamp. The SCS900 Latency Adjustment can be enabled/disabled from within the Properties Dialog Box of the SonarMite application software.

Retention of raw data

The SCS900 extension module returns the depth corrected Z value to SCS900 application (time adjusted if enabled), it also stores the following values in the extension data fields ...

- CustomDataField 1 = Depth subtracted from current Z value
- CustomDataField 2 = Current Depth QA value
- CustomDataField 3 = Time between Position and Depth (milliseconds).
- *CustomDataField 4 = Heave (reserved for future expansion).*

These values can be used to reconstitute the original data if required and also estimate the applied time shift and depth QA value.

Simulation Mode

The simulation mode in menu DEVICE/TEST DATA/ has been updated to send a timestamp with the simulated depth message. This helps configure or demonstrate the system without the need for a physical SonarMite to be connected.

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SonarMite v3.5 application software - SCS900 version

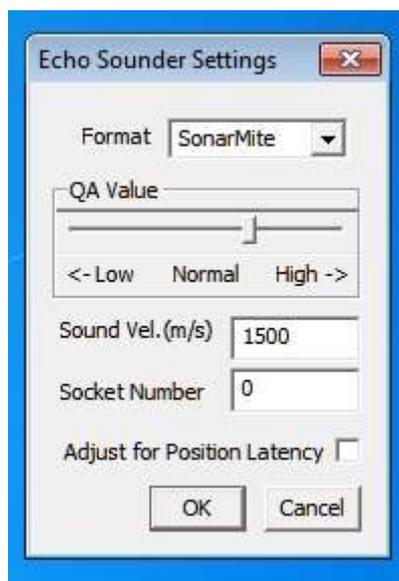
Both the PC and PDA versions of the software have been updated to facilitate updates of operating systems (Windows 7 and Windows Mobile 6).

☑ Modifications to QA filter settings

It was found the QA settings were previously set a little tight for reliable collection of data. The settings were made on the basis that reliable data would be required under the following conditions ...

- SCS900 would be used in turbid water conditions in a construction environment.
- It would be unlikely the software would be used in depths greater than 25m.

As there were several situations in which this was not the case and data was filtered out the QA filter slider has been modified for a wider range of operation and that a windows error beep is also sounded if data fails to pass the filter settings.



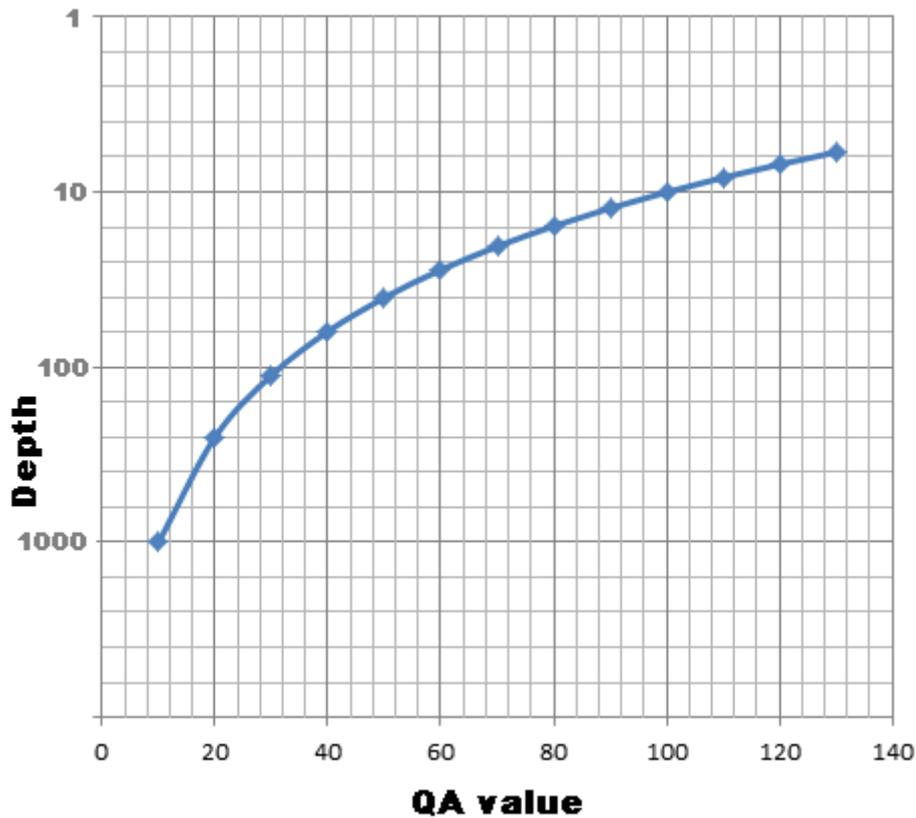
Modified QA slider control

Previously the slider filter point ranged from QA values 80 to 110, the new settings are set for a range of 40 through to 100.

Explanation of the QA value

The QA value is a numeric representation of the inverse gain applied to the sonar transmission in order to maintain minimum beam width. In simple terms more power has to be applied in bad conditions to achieve the same return. The value of this number is complex and depends on several parameters ...

- Turbidity - Quality of water in the column under the transducer.
- Reflection – The ‘hardness’ of the bottom surface.
- Sound Velocity – The transmission speed of sound in water.
- Depth – The total depth the sound has to travel through the water.



Attenuation of QA value with increase in depth

Auto enumeration of COM: ports.

The PC software has been modified to detect and auto enumerate com ports when making a serial connection to the SonarMite. This gets over the technical problems with port numbers greater than 10 in Windows Vista and Windows 7. The PDA version is still limited to ports COM1 to COM10.

Components Supplied

General

Help file in Windows CHM format – SMscs900.chm
Documentation in pdf format – SCSEv3.5.pdf
User Manual in pdf format – Userguide SCS900 Ohmex.pdf
SonarMite Hardware manual – SMhardware.pdf
Temporary enabling file - Option_EnableSCS900Api.txt

PC/Tablet Version

SonarMite Application – SMscs900.exe
SCS900 extension DLL – SCSE_smvx.dll

TSC3 Version

SonarMite Application – SMscs900.exe
SCS900 extension DLL – SCSE_smtsc.dll