Sea-Bird Electronics, Inc.
13431 NE 20th Street
Bellevue, WA 98005
USA

Phone: +1 425-643-9866
Fax: +1 425-643-9954
E-mail: seabird@seabird.com
Web: www.seabird.com

Field Service Bulletin 26 **July 2013**

SBE 49 FastCAT CTD

Equipment Affected

This field service bulletin applies to all SBE 49s.

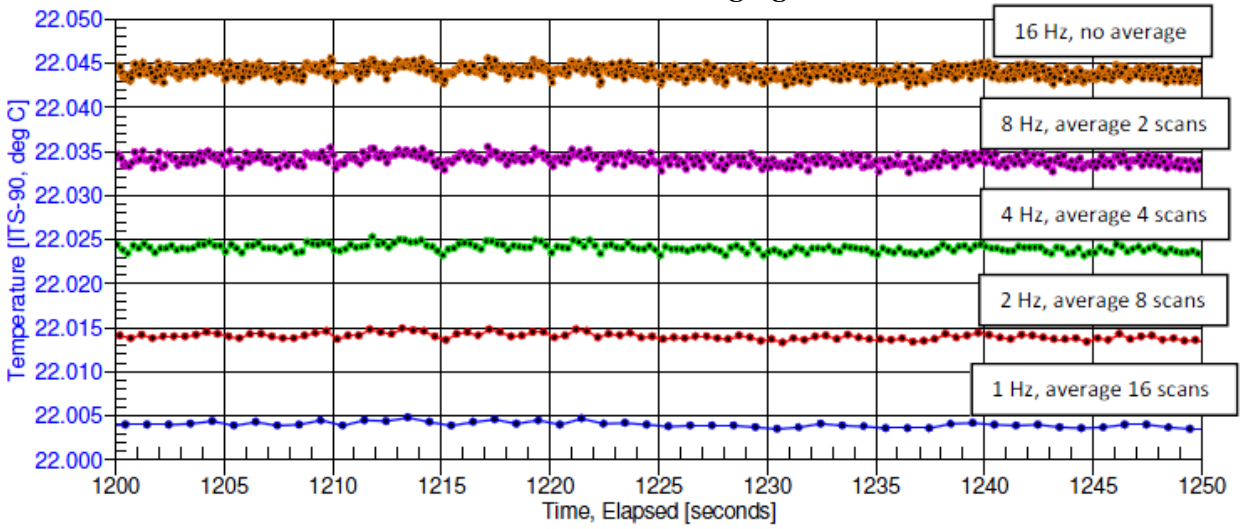
Description of Problems

Noise

A field report and subsequent testing at Sea-Bird revealed a noise signal in the temperature channel of approximately 2.5 mK peak-to-peak, at a frequency of 3 to 4 Hz. Parameters that are calculated using CTD temperature are affected similarly in magnitude and frequency (for example, salinity noise of approximately 0.003 psu peak-to-peak). The character of the noise is such that averaging of the SBE 49 data substantially reduces the effect of the noise. The SBE 49 samples at 16 Hz, and can be set up to average up to 255 samples (transmitting only the averaged data). The table and figure illustrate noise reduction through averaging data scans in the SBE 49.

Sample Rate (Hz)	Noise Amplitude (mK, peak-to-peak)	Scans Averaged
16	2.5	(sampling rate)
8	2	2
4	1.25	4
2	< 0.5	8
1	< 0.2	16

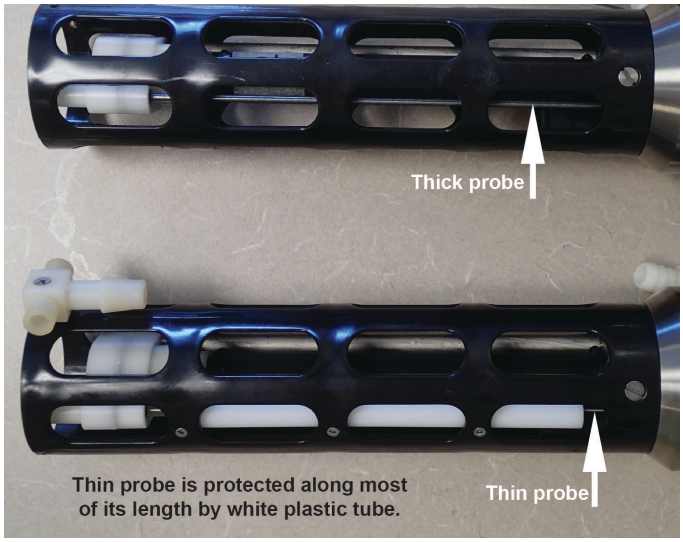
SBE 49: Noise Reduction via Averaging



For customers who are averaging 8 or more scans per sample in the SBE 49 and transmitting the averaged data, the noise is small compared to the instrument accuracy, and will have negligible impact on the output.

Temperature Sensor Modification for Serial Numbers 0276 - 0320, corresponding to SBE 49s shipped August 2012 - May 2013 (serial numbers approximate; see photo to compare to your SBE 49)

In August 2012 Sea-Bird began using a thinner temperature probe than the previous design (see photo). The thin probe uses the same thermistor resistor component as the thick probe, but the sheath design was modified due to a material change. The change was intended as temporary, until we could reproduce the original sheath with a new material. Although there have not been any reported failures, Sea-Bird returned to the original thick probe design in June 2013.



Solutions

Noise

An electro-magnetic (EM) modification to the SBE 49 substantially eliminates the noise. Sea-Bird has implemented this modification in all SBE 49s built after May 2013 (approximately serial numbers 0321 and later).

Temperature Sensor Modification for Serial Numbers 0276 - 0320, corresponding to SBE 49s shipped August 2012 - May 2013 (serial numbers approximate; see photo to compare to your SBE 49)

Sea-Bird returned to the thick temperature probe design in all SBE 49s built after May 2013.

Warranty Policy for all SBE 49s built before May 2013

There is no need to return the SBE 49 immediately for modification, unless you are using it without averaging or with minimal averaging and the noise affects your data quality.

Sea-Bird will make the modifications described below when you return the SBE 49 for servicing (repair and/or calibration):

Temperature Probe Design	Problem with Data? (data does not meet customer needs because of noise)	Customer returning SBE 49 for Service that requires Disassembly? (for example, repair or replacement of circuit boards)	Sea-Bird Response
Thick	no	no	Perform requested service (standard charge)
	no	yes	Perform EM modification (no charge) in addition to requested service (standard charge)
	yes	no	Perform EM modification (no charge)
	yes	yes	Perform EM modification (no charge) in addition to requested service (standard charge)
Thin	no or yes	no or yes	Perform EM modification and change to thick temperature probe (no charge), in addition to requested service (standard charge)