

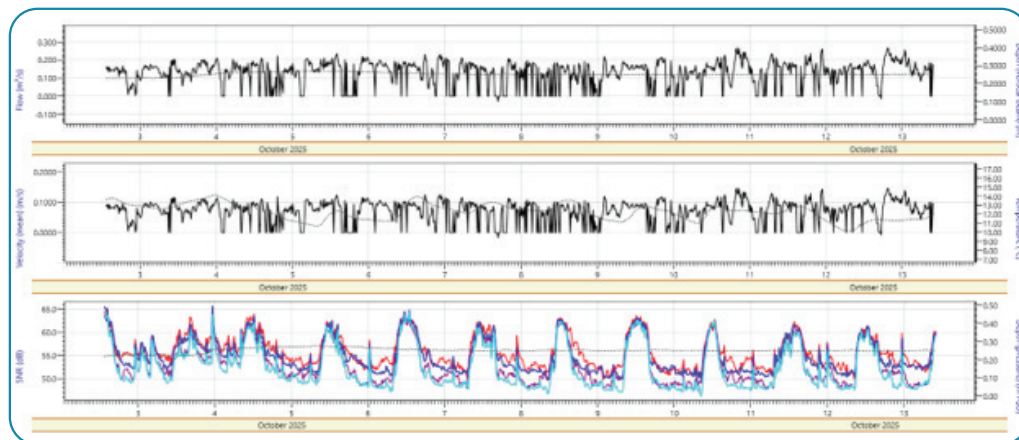
Understanding SonTek-SL and IQ velocity threshold



The problem

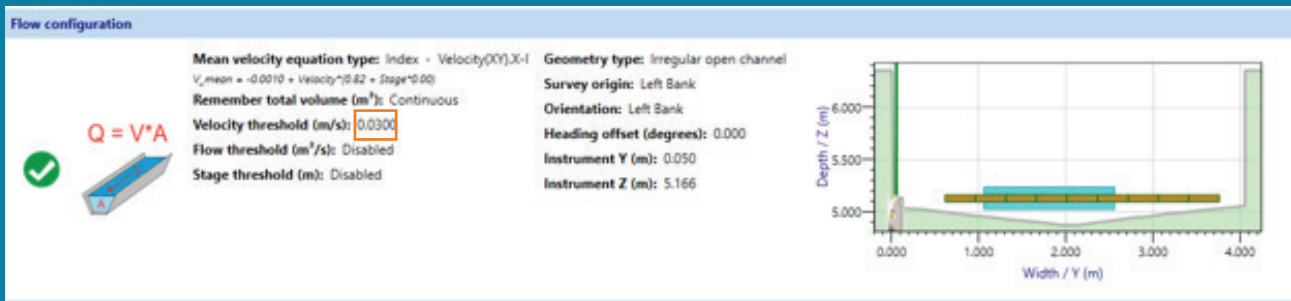
Customers sometimes ask, “Why does my flow drop to zero when water is still present at the site?” or “Why is my velocity data dropping out?” In some cases, instruments are returned for repair because users assume that zero velocity and flow values indicate a malfunction.

The example below illustrates this behavior. Data retrieved from the recorder of an SL1500-3G after it arrived at the SonTek Repair facility showed frequent drops to zero in both velocity and flow.



As shown in the top and middle time-series plots, both velocity and flow frequently drop to zero. However, the user independently confirmed that actual site conditions did not include periods of zero velocity or zero flow.

A common cause—and the first setting to check—is the Velocity Threshold in the instrument's Flow Configuration. The default threshold is 0.03 m/s (0.098 ft/s).



The Velocity Threshold (right) is intended to filter very low velocities that may contribute little to total flow and can contain greater measurement variability. However, when site velocities regularly fall below the configured threshold, the algorithm automatically replaces those measurements with zero—even when the underlying data are valid.

Flow settings

Initialize volume: Continuous

Initial volume value (m³): 0.00

Use velocity threshold: ☐

Velocity threshold (m/s): 0.0300

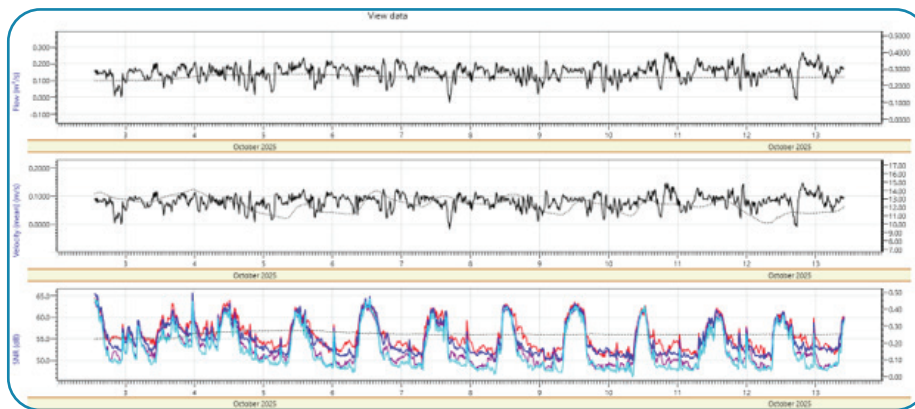
Use flow threshold: ☐

Flow threshold (m³/s): 0.000

Use stage threshold: ☐

Stage threshold (m): 0.0000

When the velocity-threshold requirement is disabled, the same dataset produces the results shown below.



With the threshold disabled, velocity and flow remain non-zero and are consistent with actual site conditions. If velocity or flow values unexpectedly drop to zero, review the threshold settings before removing the instrument or returning it for repair.

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