

Streaming Current Detector Calibration?

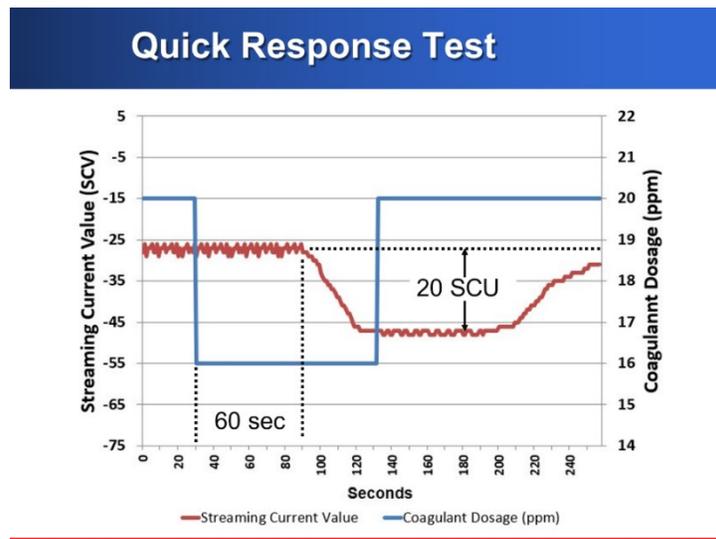
April 12, 2021

There are no true “standards” for calibrating Streaming Current Detectors (SCD). However, there are reliable and proven verification methods that can be used to ensure the SCD is working properly. The Quick Response Test, and the Total Response Test, provide a basis for adjusting the instrument’s gain setting to maintain consistent and repeatable responses to changes in water quality and coagulant dosage.

Quick Response Test

This simple test can be done at any time to ensure the SCD is responding properly:

- Note the Streaming Current Value (SCV) of the continuous flowing sample when the target coagulant dosage is being fed.
- For just a few minutes, reduce the coagulant dosage by 10 to 20% (e.g., go from 20 ppm to 16 ppm for a 20% reduction).
- Allow the reading to mostly stabilize at the more negative value, and note the SCV for the reduced dosage. In the example graph, the SCV drops from -27 to -47. This shows that a 20% reduction in coagulant dosage resulted in a -20 unit change in the SCV reading. The ideal response is 5 to 10 SCV units per 10% change in dosage. If the response is smaller, it is recommended to perform the **Total Response Test and Gain Adjustment** outlined below.
- Return the coagulant dosage to the original target and observe the SCV return to close to its original level.

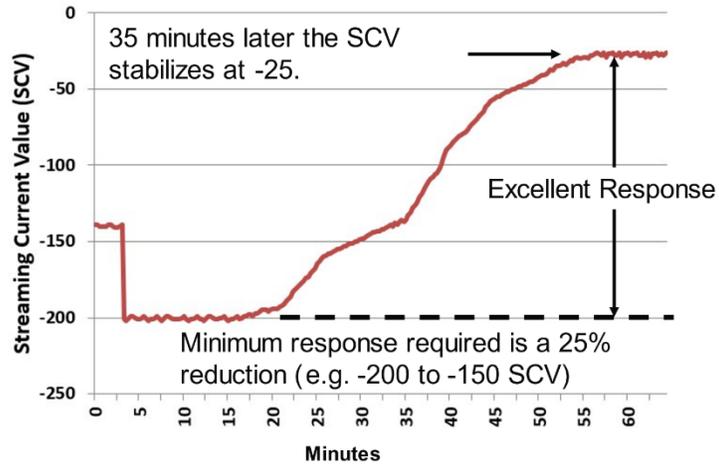


Total Response Test & Gain Adjustment

This test should be done as soon as the streaming current sensor has been installed, as well as every 1 to 3 months thereafter because over time the sensor parts will experience physical wear, resulting in a lesser measurement response. This response change can be corrected for by increasing the Gain as detailed below:

- Turn off the continuous treated water sample flow to the sensor.
- Clean the probe and piston and rinse thoroughly. It is also a good idea to clean inside the probe block area for this test, as residual coagulant that can build up inside the sensor can impact the results.
- Collect a sample of raw water that has not had any coagulant or polymer added to it. Pour the raw water sample to the sensor through the inlet or outlet fitting; or for the DuraTrac 4, inject the raw water sample into the sensor through the front ¼" push-to-connect port. Observe the Streaming Current Value (SCV), and continue to add the raw water, with brief pauses, until the SCV stabilizes at the most negative reading.
- Adjust the gain to attain an SCV reading of -200. On the DuraTrac 4 sensor, ensure the Signal Health is greater than 90%. If the Gain required for the -200 SCV is greater than 10.0, or if the Signal Health is less than 90%, then service is required. See our earlier blog post for more information on [what to service on the streaming current sensor](#).
- Turn on the treated water sample flow (this needs to be a continuous flowing sample taken at a point ideally within 60 seconds lag time of coagulant addition and adequate mixing). In the example graph, the SCV of the raw water was -140, and the Gain was adjusted to -200. When the treated water was turned on, the SCV climbed to -25.
- Assuming an SCV of -200 on the raw water sample, the treated water sample will typically have an SCV anywhere in the range of -100 to +50. At a minimum, the treated SCV needs to be -150 in order for the measurement to be sufficiently responsive to water quality changes.
- If there is any concern with the response, install a new probe and piston and repeat this procedure. If the new probe and piston are substantially more responsive, then leave the new sensor parts installed and discard the original set.

Total Response Test



So, while there are no true standards for calibrating streaming current monitors, the above procedures can be done to verify that your streaming current monitor is working properly. For more details on how to conduct these tests on your Chemtrac Streaming Current Analyzers, please [contact us](mailto:chemtrac@chemtrac.com) at 770-449-6233, or at chemtrac@chemtrac.com.