

Tech-Tip: MP TROLL 9000 Calibration Frequency

Instrument Calibration

Users frequently want to know how often they need to calibrate their In-Situ instruments and sensors. The most accurate answer to that question is “it depends”.

In theoretical terms, a calibration performed on any instrument represents the response of the instrument only for the period of time during which the calibration was performed. As we move away from that time, the response of the instrument can change for various reasons. In practical usage of the instrument, we can set a pre-determined error range that is acceptable. So long as the instrument produces values that are within this acceptable error range, we can consider the last calibration to be valid. All In-Situ instruments have published error specifications for all parameters that they measure. When properly calibrated, the instrument will return values that are accurate to within these published error specifications.

What can cause an instrument's readings to drift outside of the published error specifications? Factors include the amount of regular use the instrument has seen, how quickly bacteria, algae and chemicals deposit on the sensors, and how the instrument was handled during use, transportation, and storage. Below are estimates of typical calibration frequencies under average conditions.

| <u>Sensor</u> | <u>Avg. Calibration Frequency</u> |
|--------------------------|-----------------------------------|
| Ion selective electrodes | Daily |
| Dissolved oxygen | 2 - 4 weeks |
| PH | 1 - 2 months |
| ORP | 1 - 2 months |
| Conductivity | 2 - 3 months |
| Pressure | 1 year (factory) |
| Turbidity with wiper | 5 years + (factory) |

These times are not by any means firm, however. Varying environmental conditions and instrument handling procedures can result in an increase or decrease in the amount of time between required calibrations. Also, since each type of sensor has different requirements for recalibration, the type of sensors being deployed will affect the required recalibration frequency. The best advice is to set up a calibration schedule appropriate for each type of sensor and operating environment. It is best to have a routine schedule and recalibrate each sensor or instrument before its readings go outside the accuracy specifications. The exact schedule employed will depend on the type of instrument and sensors used, the amount of use the instrument gets, the specific operating environment, and the type of care the instrument receives. This means the calibration schedule will be unique to each user and specific application. Along with the rough guidelines above, experience and periodic checks of the instrument's readings will determine what the exact calibration schedule needs to be for a given application.