



LiORA Chloride Sensor

Continuous In-Well Chloride Monitoring

Technical Specification

Continuous, autonomous in-well sensor for dissolved chloride in groundwater. Replaces or supplements periodic manual sampling, delivering daily data for plume tracking, remediation performance, and groundwater-model updates without repeated field visits.



1. SENSOR SPECIFICATIONS

Measured	Chloride (Cl^-), hydrostatic pressure
Range	50 to 5,000 mg/L Cl^-
Accuracy	$\pm 30\%$ of reading or ± 30 mg/L (whichever is greater)
Sampling	1 sample per day
Communication	LoRaWAN (LiORA-provisioned gateway required on site)
Power	Internal battery
Service Interval	Every 180 samples (~6 months at 1 sample/day)

2. DETECTION PERFORMANCE

Measurement range and accuracy verified across 50–5,000 mg/L Cl^- . Every reported datapoint is referenced against an on-board two-point calibration performed with the sample, eliminating drift between datapoints and removing the need for in-field recalibration by the operator.

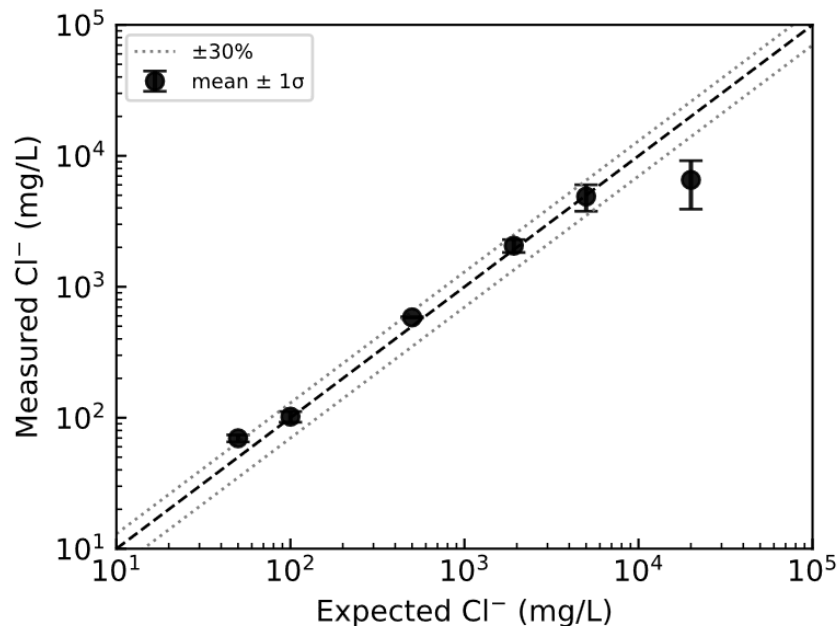


Figure 1 — Measured vs. expected Cl^- concentration. Dashed line: 1:1 ideal; dotted lines: $\pm 30\%$ bounds. Mean $\pm 1\sigma$ across development units.



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3. OPERATING CONDITIONS & SITE REQUIREMENTS

Water Temperature	5 °C to 30 °C
Submersion	Sensor bottom under ≥ 1.0 m of water during sampling
Well Diameter	≥ 2 " (50 mm) ID, existing groundwater monitoring well
Water Chemistry	See Appendix A for pH and interferent limits
On-site Infrastructure	LiORA-provisioned LoRaWAN gateway within radio range of all sensors. Coverage and placement per site survey.
Service	Sensor returned to LiORA every 180 samples (~6 months at 1 sample/day) for refurbishment

APPENDIX A — WATER CHEMISTRY LIMITS

Performance in Section 2 applies when groundwater falls within the bounds below. Operation outside these bounds is not specified.

pH	5 to 9
Sulfide (S^{2-} / HS^-)	< 0.1 mg/L
Bromide (Br^-)	< 10 mg/L
Bicarbonate (HCO_3^-)	< 500 mg/L
Dissolved Organic Anions	Low

Regulatory Compliance

Groundwater standards: 100 mg/L (agricultural use), 120 mg/L (all other uses). LiORA's 50–5,000 mg/L detection range covers both thresholds with significant margin, enabling early-warning detection well below regulatory limit levels.

Calibration — Certified Ion Chromatography (IC) Standards

Calibrations are referenced against certified Ion Chromatography (IC) standards — the same standard used by analytical laboratories. Every reported datapoint is traceable to a known certified concentration, ensuring defensible, audit-ready regulatory submissions.