X2-SDL Submersible Data Logger Quick Start Guide

The NexSens X2-SDL Submersible Data Logger is a rugged, self-powered remote data logging system for deploying environmental sensors in lakes, streams, rivers, wetlands, coastal waters, sewers, and culverts without fear of accidental flooding.

The system is configured with three sensor ports for connection to industry-standard digital interfaces including RS-232, RS-485 and SDI-12. Power comes from (16) internal D-cell alkaline batteries.

Unlike many data loggers, the X2-SDL is truly submersible. The housing and battery compartment are completely sealed and waterproof.

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Unboxing

What's included:

- X2-SDL
  - (1) impact-resistant PVC housing
  - (2) elastomer bumpers
  - Internal circuit boards and communication modules
  - Pre-installed Antenna (for all but base Wi-Fi models)
- Maintenance kit
  - Spare UW-plugs, 116EDM O-rings, O-ring Grease
  - 16 Duracell D-Cell Batteries
  - 3/16" hex key
  - Quick Start Card with WQData LIVE Device Claim Code

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Apply Power

Accessing the battery compartment

The battery lid is designed to be watertight at depths to 200 feet. Tight O-ring seals are required to maintain this pressure rating and may make lid removal difficult.

The lid removal tool (3/16" handled Allen wrench) supplied in the X2-SDL maintenance kit can be used for additional leverage when unthreading the battery lid from the communication bulkhead.

Important: Only remove the white top from the X2-SDL as opening the unit will expose sensitive electronics which could be damaged in the process.

DO NOT open the unit here

Apply Power

Installing batteries

Once the lid has been removed, the batteries can be installed.

Note: Listen for a single audible beep to indicate the system has properly powered up.

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Configure Telemetry

Most cellular and iridium systems will be pre-configured for plug-and-play transmissions to WQData LIVE. Wi-Fi and user-configured data accounts will require set up.

Direct Connect –Establish permanent wireless data transmission for standard X2-SDLs.

Wireless Network Setup process

Cellular- a 4G Compliant Mini-SIM card is required for installation on cellular models of the X2-SDL. Factory-installation is recommended, but user installation is possible.

SIM Installation process

Configure Network APN

Iridium- Factory-installed Iridium satellite modems allow for communication in the most remote deployment locations.

Iridium Setup process

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Connect Sensors

All sensors connected to an X2-SDL must have a NexSens factory installed UW plug connector. Refer to the NexSens sensor listing at https://www.nexsens.com/support/product-manuals to verify if special setup is required prior to integration with an X2-SDL.

Connect all desired sensors to the X2-SDL via any combination of the three available sensor ports after removing the pre-installed blank plugs.

Important: **Record** the port number (P0, P1, or P2) occupied by each sensor. After the initial setup, sensors must always be reconnected to the same port for proper communication.

Sensor Auto-Detection

Following the configuration of the logger telemetry (if required) and the connection of all sensors to the X2-SDL, disconnect and re-apply power to the X2-SDL.

Following the power-up beep, the logger will automatically begin to scan through a list of common sensors to build the deployment sensor list. Sensors discovered during this process will automatically be updated on WQData LIVE via the X2's on-board telemetry.

Sensor detection will take approximately 10 minutes. Leave the full system connected and powered while proceeding through the WQData LIVE setup. Following detection, sensor readings will be logged and uploaded at a 10 minute interval until adjusted by the user.

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WQData LIVE Overview

WQData LIVE is a Cloud Data Center used in conjunction with the X2 data logger line for the following functionality:

Data Collection- automatic X2 data upload to the web

Data Export

Remote System Configuration

WQData LIVE Setup

To begin accessing sensor data from the X2 logger online, proceed through the following walkthrough:
https://www.nexsens.com/pdf/WQData-Live-Getting-Started.pdf

The guide covers the three main prerequisites for setting up the Data Center

-Creating a free WQData LIVE account

-Creating a new project on the WQData LIVE Datacenter

-Using the Claim Code provided with each X2-SDL to add the logger profile to the project

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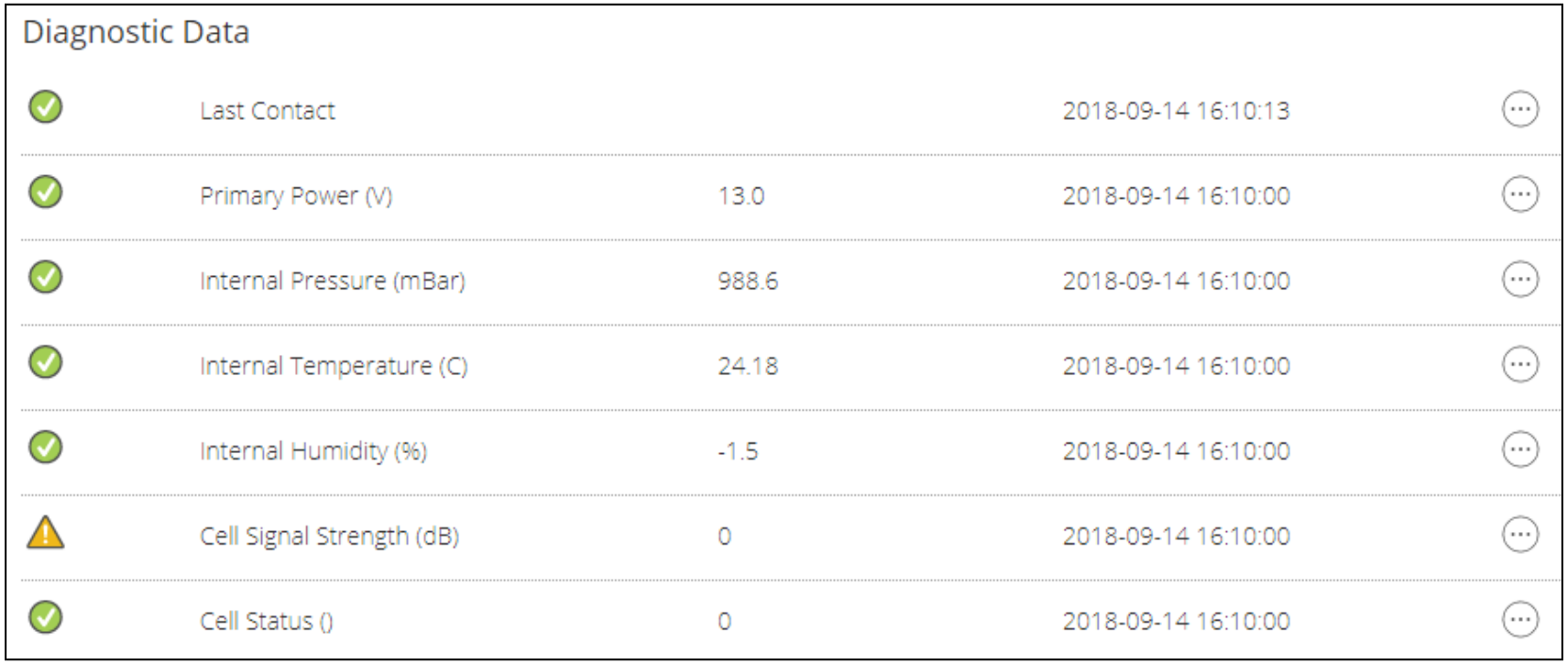
Review X2-SDL Project Configuration

Once the logger has been claimed into the project and it is visible on WQData LIVE, check the 'Last Contact' time located in the lower right corner of the Project Dashboard page. The last successful data transmission from the X2-SDL is denoted by this parameter.

Provided more than 10 minutes has elapsed since the last power cycle, the parameter lists from the detected sensors as well as the logger's internal diagnostic parameter set (shown below) will automatically be updated.



Customize Logger Settings

Adjustments to the X2-SDL such as those listed below can be made remotely from the Remote Device Configuration Menu on WQData LIVE.

-Change Data Upload/Transmit Frequency

-Change Individual Sensor Logging Intervals

-Set offsets for parameters

-Queue additional Sensor Detections if new instrumentation has been connected to the system

Generate/Review Reports

CSV or PDF Reports can be manually generated, or configured to send automatically on a user-defined schedule from WQData LIVE.

Information on the Report tool for the WQData LIVE datacenter can be found here.

Technical Information

Material: PVC body with Acetal battery lid

Weight: 12.0 lbs. without batteries; 16.6 lbs. with batteries

Dimensions: 5.5" (13.97 cm) diameter; 17.3" (43.94 cm) length (antenna length varies by model)

Power Requirements: 5-24 VDC +/-15% (Reverse polarity protected)

Current Draw (Typical @ 12VDC): Low power sleep: 200uA; Logger Active: 20mA; Wi-Fi Transmitting: 43mA; Cellular Transmitting: 200mA

Peak Current: Power supply must be able to sustain a 500mA 1-second peak current (@ 12V)

Operating Temperature: -20C to 70°C

Rating: Submersible to 200 ft. (requires SDL-CAP on telemetry models)

Wi-Fi Communications: 802.11b/g/n (Direct to X2 or Connect X2 to an existing network)

Wi-Fi Antenna: Internal to device

Wi-Fi Range: 250 ft. maximum[1]

User Interface: RS-485 direct to PC software, Wi-Fi-Enabled embedded web, WQDatalive Web Datacenter, Magnet trigger for Wi-Fi enable, Status LEDs

Data Logging: 64MB internal flash*, 256MB microSD card (expandable up to 32GB)

Data Processing: Parameter level polynomial equation adjustment; Basic & Burst Averaging (min, max, standard deviation, and raw data available)

Real Time Clock (RTC): <30sec/month drift[2]; Auto-sync weekly[3]; Internal backup battery

Log Interval: User configurable from 1 second (10 minute default)[4]; Unique interval per sensor

Transmission Trigger: Time-based, parameter threshold*; Selective parameter upload option

Sensor Interfaces: SDI-12, RS-232 (3 Channels), RS485

Sensor Power: (3) 12V regulated switch channels with 1.5A capacity[5,6]

Built-in Sensors: Temperature (-40C to 85C, 0.002C resolution, ±2C accuracy); Pressure (300 mbar to 1100 mbar, 0.016 mbar resolution, ±2 mbar accuracy); Humidity (0% to 100%, 0.04% resolution, ±5% accuracy); Battery voltage

Sensor Ports: (3) 8-Pin for Sensor Interface (RS-232, RS-485, SDI-12, 5V, 12V, GND)

Power Port: (1) 6-Pin for Power and Communication (Primary/Secondary/Backup Input, RS-485 Host, GND)

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