



electrolab[®]

LEVEL SENSORS



PRODUCT CATALOG

RUGGED. RELIABLE. ACCURATE.

MADE IN THE U.S.A.

WHY CHOOSE ELECTROLAB?



At Electrolab, we know you have a choice of companies to partner with for your oilfield instrumentation needs. We believe Electrolab offers the best combination of quality, dedicated service, support and value that you will find! Our long-term relationships with many world-class end-users, distributors and integrators are testaments to this belief. Electrolab products are among the most rugged, reliable and accurate on the market. Our focus on safety, both the safety of workers and the environment, will give you peace of mind when purchasing our products.

Our engineering, manufacturing, sales and support teams understand the energy sector. They work together diligently designing instrumentation to simplify field processes, while providing the information and control that your applications require. Our instrumentation designs include open communications protocols allowing Electrolab products to integrate easily with other manufacturers' equipment as part of your total oil-field automation strategy.

Electrolab manufactures our products in the United States in the heart of Texas Oil Country. We produce our own electronics in-house with state-of-the-art surface mount equipment, allowing us to produce high quality, high-temperature electronics and maintain extremely low warranty rates year after year. We control our production lead times, which allows us to accommodate special orders and requests, handle specific invoicing and shipping requirements, and maintain tight control of our product quality. Our simplified support policies make it easy to do business with us and allow us to offer faster response times to your inquiries.

Our Channel Sales Partner distribution network ensures local representation of Electrolab products throughout North America. These partners receive training and support from Electrolab's field based sales team to provide expert and timely consultation and service. Our Channel Sales Partners locally stock Electrolab accessories and replacement parts to ensure timely repairs and efficient maintenance of your Electrolab products.

Since 1974, Electrolab has provided INNOVATIVE, QUALITY, RELIABLE sensors, controls and industrial electronics. With our Texas-based corporate office and manufacturing facility, our expert and experienced field sales team, and our Channel Partner distribution network across the United States, we are uniquely positioned to serve customers throughout the Americas. Let Electrolab put our experience to work for you!

CUSTOM BUILD

A SENSOR TO FIT YOUR SITE REQUIREMENTS

ONE SENSOR...MULTIPLE OPTIONS...INSTALLS IN A SINGLE TANK PORT
 Pick Your "Preferred Solution" from the Available Options

HOUSING



Explosion Proof Housing
(12V or 24V)



"L" Housing (Standard)



"T" Housing



"C" Housing

Or Choose No Housing for Integration with Specific
 Third-party Application Requirements

RESOLUTION

- 1/8" resolution with +/- 3/16" accuracy
- 1/4" resolution with +/- 1/8" accuracy
- 1/2" resolution with +/- 1/4" accuracy

The Model 2100 Digital Level Sensors (RU Flex and Rigid Stainless Steel) are ready for **API 18.2 Custody Transfer Requirements** when ordered with the 1/8" resolution (+/- 3/16" accuracy) option. Electrolab level sensors install in the tank and reside in the fluid where the most accurate measurements occur.

SENSOR TYPE & MATERIAL



Flexible Sensor with Patent-pending Hose Design, Standard Housing

Flexible Sensor with Patent-pending Hose Design, Explosion Proof Housing



Rigid Sensor, Fiberglass Tube, Standard Housing



Rigid Sensor, Stainless Steel Tube, Explosion Proof Housing



Electrolab level sensors are ideal for:
 Production Tanks | Water Tanks | SWD Locations | Separators | Condensate Tanks
 Midstream Collection and Blend Tanks | Refinery Holding Tanks
 Chemical Tanks and many others.

HIGH LEVEL SHUT-IN

Offers Three Floats for High Level Alarm and High-High Level Shut-In



Flexible Sensor,
High Level Shut-In,
Explosion Proof Housing

Stainless Steel Sensor,
High Level Shut-In,
Standard Housing

Fiberglass Sensor,
High Level Shut-In,
Standard Housing

See pages 6 and 7 for recommended tank environments

INTEGRATED TEST FIXTURE

Integrated Test Fixture shown on the RU Flex 2100 HLS. This fixture allows you to manually test the operation of the high level shut-in while keeping the tank hatch closed.



SEE MORE OPTIONS IN THE CUSTOMIZATION TABLE AT RIGHT

MODEL 2100 DIGITAL LEVEL SENSOR CUSTOMIZATION OPTIONS

SENSOR TYPE & MATERIAL

- Flexible
- Rigid: Stainless Steel
 Fiberglass

SENSOR LENGTH

(Select based on actual height of tank)

- 15 feet
- 16 feet
- 20 feet
- 25 feet
- Other _____ feet

Available Lengths by Sensor Type:
Flex: 2-48 feet
Stainless Steel: 2-35 feet
Fiberglass: 2-33 feet

RESOLUTION

- 1/2 inch
- 1/4 inch
- 1/8 inch (Available on flexible and stainless steel sensors)

TEMPERATURE SENSOR

- One (standard)
- Custom (multiple temperature sensors available)

LEVELS

- Product Level
- Water interface level
- * Custom Floats Available

HIGH LEVEL SHUT-IN (OPTIONAL)

- Yes With Integrated Test Fixture
 Without Integrated Test Fixture
- No

HOUSING

- Explosion Proof Housing
 - 12V
 - 24V
- "L" Housing (standard)
- "T" Housing
- "C" Housing
- No Housing (for specific third-party integration requirements)

MODEL 2100 DIGITAL LEVEL SENSOR

Reliable, Accurate Industry Workhorse
Serving Harsh Oilfield Environments

Since 1976, Electrolab has been a leader in developing electronic sensors & controls.

Electrolab's Model 2100 Digital Level Sensor (DLS) delivers continuous, accurate, and reliable monitoring of tank level and temperature.

Patented sensing technology ensures accurate measurement of up to two levels and eight temperatures in the same tank with a single sensor. Robust design, built-in reliability and low power consumption keep maintenance and life-cycle cost minimal.

Multiple fluid densities and temperatures do not affect measurement. The Model 2100 Digital Level Sensors are suitable for production monitoring, inventory control, and leak detection in a variety of different types of storage tanks (crude oil, diesel, kerosene, gasoline, water and compatible chemicals).

Open communications protocols allow for these sensors to work with most wireless systems.

NO ONGOING CALIBRATION

After installing the sensor hardware and setting the initial level offset, these sensors require no calibration. All electronics are sealed inside the sensor tube, which is constructed of either stainless steel or fiberglass. The Model 2100 Digital Level Sensor is virtually maintenance free.

ANTI-PARAFFIN TREATMENT

The Model 2100 Digital Level Sensor is treated with the patented e9 Pro Metal Treatment. This oleo-phobic coating deters paraffin, asphaltene and other pollutants from building up on the metal components of Electrolab sensors and ensures ongoing measurement accuracy.

LOW POWER CONSUMPTION

The Model 2100 Digital Level Sensor consumes little power and maximizes external battery life making it ideal for use with third-party wireless communication devices and other equipment.

DEPENDABLE

Oil fields depend on the Model 2100 Digital Level Sensor's quality and reliability. Since their introduction, these level sensors have consistently had warranty repair rates less than 0.25% year after year.

ACCURATE & RELIABLE

All Model 2100 Digital Level Sensors deliver consistently accurate level and temperature measurements of different types of fluids in both hazardous and non-hazardous environments.

Unlike some competitors' level sensing products, these sensors are not affected by electromechanical interference, tank turbulence or changing environmental variables.

API 18.2 READY

With the optional 1/8" resolution (+/- 3/16" accuracy) available on stainless steel and flexible sensors, the Model 2100 Digital Level Sensors are ready to meet API Custody Transfer requirements.



INVENTORY LEVEL INSTRUMENTATION

EXPLOSION PROOF HOUSING (OPTIONAL)

The Explosion Proof Housing (2110EX) can be added to any Model 2100 Digital Level Sensor: RU Flex, Stainless Steel or Fiberglass. This housing actively limits current and voltage to protect intrinsically safe equipment from power spikes and sparking in hazardous environments—ensuring the safety of oilfield personnel. The Explosion Proof Housing is available in 12V and 24V versions.

Digital level sensors with the explosion proof housing are NRTL (Nationally Recognized Testing Laboratory) certified explosion proof and intrinsically safe, Class I, Div. 1, Group D.

SIMPLIFIED SITE DESIGN

The Explosion Proof Housing option simplifies site design by allowing any Model 2100 Digital Level Sensor (RU Flex, Stainless Steel or Fiberglass) to meet code without installing additional equipment. Step-down transformers, barrier boards and other devices are not needed when the sensor is wired to explosion-proof conduit.



RU FLEX 2100 DIGITAL LEVEL SENSOR

Flexible, Rugged Hose Design
Easy to Install, Reliable, No On-going Calibration

Now offering the innovative RU Flex 2100 Digital Level Sensor.

Electrolab's RU Flex 2100 Digital Level Sensor (DLS) is a flexible, extremely rugged, chemically and abrasion resistant digital level sensor offering the same continuous, accurate, and reliable monitoring of tank level and temperature as our standard Model 2100 Digital Level Sensors.

Built on Electrolab's proven, patented sensing technology, the RU Flex's patent-pending flexible hose design can be coiled to a 36-inch diameter, allowing for one person to install the RU Flex 2100 DLS, regardless of sensor length. A unique barrier layer within the hose material ensures electronics stay dry and survive long-term in harsh oilfield and chemical service environments.

With a naturally non-stick surface, the flexible hose prevents buildup and wipes clean.

MULTIPLE FLUID COMPATIBILITY

The RU Flex 2100 Digital Level Sensor is compatible with a variety of different fluids and chemistries, such as: hydrochloric acid, petroleum distillate and crude, phosphoric acid and hydrogen sulfide. It is ideal for caustic and corrosive environments.

For a list of chemicals compatible with the RU Flex hose material, visit the RU Flex page of our website at www.electrolabcontrols.com and select the "RU Flex Hose Chemical Compatibility Chart" from the Tech Library.

All the Great Features
of the Model 2100
Digital Level Sensor in
a Flexible Package.

FLEXIBLE AND EASY TO INSTALL

- A** The RU Flex 2100 DLS fits neatly in a box for shipping and storage. All components fit inside the same box, reducing the possibility of misplaced pieces.
- B** Once delivered to the installation site and assembled, the RU Flex 2100 DLS is easily carried on the shoulder and installed in a tank by one person.
- C** A weight attaches to the bottom of the hose before installation to ensure the sensor straightens out inside the tank and to prevent sensor movement from affecting measurement accuracy.

A turbulent option is available for high flow rate tanks (70+ barrels/hour). This option provides additional weight to ensure the sensor remains straight in the tank and provides accurate level measurement.



INVENTORY LEVEL INSTRUMENTATION

HIGH LEVEL SHUT-IN (OPTIONAL)

The High Level Shut-In option can be added to any Model 2100 Digital Level Sensor: Stainless Steel, Fiberglass or RU Flex.

With the addition of a third float, the High Level Shut-In Option provides two digital outputs, one for a high level alarm and one for a high-high level shut-in.



TWO DISTINCT CIRCUITS

The High Level Shut-In includes two distinct circuits: one for normal continuous level and temperature measurements; the other for high-level alarm and shut-in. The high-level alarm requires no power and unlike competitors' sensors, is not affected by power outages. **The high level alarm and shut-in feature is always active.**

An **integrated test fixture** provides a vital safety benefit by allowing for a manual test of the high level shut-in feature at any time, with the tank hatch closed.



DLS SPECS & OPTIONS

RU FLEX 2100 DLS

MODEL 2100 - SS

MATERIAL/ LENGTH	<ul style="list-style-type: none"> A proprietary, patent-pending hose design with multi-layer barrier properties for use in difficult environments Measurement lengths from 2 to 48 feet 	<ul style="list-style-type: none"> 316L stainless steel, 18-gauge Measurement lengths from 2 to 35 feet
OPERATING TEMPERATURE	-40°C to 80°C	-40°C to 80°C
FLOAT*	<ul style="list-style-type: none"> Made of NYTROPHYL with paraffin resistant stainless steel carrier Two-piece float for ease of field installation and replacement Fits three-inch FNPT tank part <p>MEASURE TWO LEVELS with one float for product level; one float for water interface</p> <p>MEASURE THREE LEVELS with optional third float and High Level Shut-In</p>	<ul style="list-style-type: none"> Made of NYTROPHYL with paraffin resistant stainless steel carrier One-piece float Fits three-inch FNPT tank part <p>MEASURE TWO LEVELS with one float for product level; one float for water interface</p> <p>MEASURE THREE LEVELS with optional third float and High Level Shut-In</p>
RESOLUTION	<ul style="list-style-type: none"> 1/8 inch Resolution: +/- 3/16 in. Accuracy: Ready for API 18.2 Custody Transfer Requirements 1/4 inch Resolution: +/- 1/8 in. Accuracy 1/2 inch Resolution: +/- 1/4 in. Accuracy +/- 0.1%. Repeatability 	
TEMPERATURE MEASUREMENT	<ul style="list-style-type: none"> 14 inches from bottom +/- 1.5°C Accuracy Up to 8 distinct temperature measurements (one standard) 	<ul style="list-style-type: none"> 12 inches from bottom +/- 1.5°C Accuracy Up to 8 distinct temperature measurements (one standard)
POWER REQUIREMENT/ CONSUMPTION	<ul style="list-style-type: none"> 5.6VDC to 13 VDC 15mA nominal; 20mA maximum 	<ul style="list-style-type: none"> 5.6VDC to 13 VDC 15mA nominal; 20mA maximum
PRESSURE	40 psi: standard	40 psi: standard; higher pressure ratings available as special orders
COMMUNICATION/ PROTOCOL	<ul style="list-style-type: none"> Modbus RS485 <ul style="list-style-type: none"> 2- or 4-wire communications Baud rate and parity programmable 4-20mA signal available when connected to an Electrolab 3010 digital-to-analog converter board Wireless compatibility with preferred partners 	
APPLICATIONS	Oil tanks, water tanks, brine tanks, caustic and corrosive environments, high paraffin oil tanks, tanks with low overhead clearance	Production tanks, midstream collection tanks, tanks with paraffin

CLASSIFICATION/ CERTIFICATION

- All sensors are certified:
- Class I, Div 1, Group D hazardous locations (when connected to an approved intrinsically safe barrier device or used with the Explosion Proof Housing)
 - ANSI/UL-913, 7th Edition
 - CAN/CSA C22, No. 157





All Electrolab sensors' metal components are treated with e9 Pro Metal Treatment to prevent paraffin and asphaltene buildup, as well as to deter corrosion.

MODEL 2100 - FG

- Fiberglass for highly caustic and high H₂S environments
- Measurement lengths from 2 to 30 feet

-40°C to 70°C

- Made of NYTROPHYL with paraffin resistant stainless steel carrier
- One-piece float
- Fits four-inch FNPT port

MEASURE TWO LEVELS with one float for product level; one float for water interface

- 1/4 inch Resolution: +/- 1/8 in. Accuracy
- 1/2 inch Resolution: +/- 1/4 in. Accuracy
- +/- 0.1%. Repeatability

- 12 inches from bottom
- +/- 1.5°C Accuracy
- Up to 8 distinct temperature measurements (one standard)

- 5.6VDC to 13 VDC
- 15mA nominal; 20mA maximum

40 psi: standard

High H₂S environments, water and other tanks with scaling issues, caustic or corrosive environments



OPTIONS

CUSTOMIZE A SENSOR TO MEET YOUR NEEDS

Build the sensor that fits your site requirements, select:

- Sensor type and material
- Sensor length
- Resolution
- Temperature sensor(s)
- One or two levels
- High-Level Shut-In Option (with or without the Integrated Test Fixture)
- Housing (L-Standard, Explosion Proof, C, T, or no housing)
- Other features available by request

EXPLOSION PROOF HOUSING

The Explosion Proof Housing is available in 12V (2110EX-12V) or 24V (2110EX-24V) versions, is NRTL Certified Explosion Proof and Intrinsically Safe (Class I, Div. 1, Group D). The Explosion Proof housing actively limits current and voltage to protect intrinsically safe equipment from power spikes and sparking in hazardous environments. The housing offers 2-wire RS485 digital signals and two emulated dry contact circuits for use with the High-Level Shut-In option. An analog version is also available.



Explosion Proof Housing Specifications

Supply Voltage	
Model 2110EX-12V	10-12VDC
Model 2110EX-24V	22-24VDC
Max. Input Current	50mA
Current Consumption	40mA
Communication Lines	
Voltage	5VDC nom. - 6VDC max.
Max. Input Current	50mA
Dry Contact Circuit	
Voltage Model 2110EX-12V	10-12VDC
Voltage Model 2110EX-24V	22-24VDC
Max. Input Current	50mA
Minimum internal "ON" resistance	65.5Ω
Conduit Connection Size	3/4" FNPT
Operating Temperature	-40 to 70°C

HIGH LEVEL SHUT-IN

With the addition of a third float, the High Level Shut-In Option provides two digital outputs, one for a high level alarm and one for a high-high level shut-in. Ensure environmental safety by preventing unintentional tank overflows with the High Level Shut-In (HLS) option. (Available on all Model 2100 Digital Level Sensors—Flexible and Rigid.)



INCLUDE THE INTEGRATED TEST FIXTURE

The High Level Shut-In option can be ordered with or without the integrated test fixture. The integrated test fixture (closeup at left) allows for testing of the high level shut-in feature at any time with the tank hatch closed. A stainless steel wire attached to the third float provides a means to manually raise the float and trigger the high-level output/alarm.



HIGH LEVEL PROBE

Accurate Alarm Level Sensing

HIGH AND LOW LEVEL DETECTION

Electrolab's High Level Probe offers point level detection for alarm, monitoring and control. It is available as either a single-point or dual-point float switch for either high or low level detection in liquid tanks. The High Level Probe mounts vertically through a female NPT port on the top of the tank. A side mount version is available upon request.

This sensor incorporates discrete circuits of magnetic reed switches configured such that when the float is seated on the hose clamp, the switches are activated (closed). As the float rises, the switch will open indicating a "high" or alarm condition. The float activates and maintains the output until the level returns to normal.

APPLICATIONS

Typical applications for the High Level Probe include:

- High or low level detection in oil and water tanks
- Overfill protection
- Pump protection
- Control points for pumps
- Liquid detection in containment areas
- Point level detection in caustic or corrosive environments

SIMPLE, ACCURATE, RELIABLE

Electromechanical interference, tank turbulence or other environmental variables do not effect the accuracy and reliability of the High Level Probe.

NO MAINTENANCE

Ongoing maintenance is practically non-existent—especially with the patented anti-paraffin treatment used on all of the High Level Probe's stainless steel components. This oleo-phobic coating significantly reduces paraffin buildup on steel instrumentation and ensures ongoing measurement accuracy. Cleaning of the High Level Probe is rarely necessary.

SPECIFICATIONS

MECHANICAL

- Material:
 - 0.5 inch (OD) stainless steel fits 2" FNPT port
 - 1.75 inch (OD) fiberglass fits 4" FNPT port
- NYTROPHYL float with embedded magnets
- Glass reed switch contacts
- Explosion-proof junction box

ELECTRICAL

- Operating temperature range: -40° C to +80° C
- Dry Contact ratings: 1-45VDC, 100mA (max.)

LENGTH

- 1 to 5 foot standard for stainless steel
- 2.5 to 5 foot standard for fiberglass
- Custom lengths available upon request

SWITCHES

Stainless Steel:

- Single or dual point float switch for high and/or high-high level detection

Fiberglass:

- One point float switch

COMMUNICATION

- Discrete dry contact digital output

CLASSIFICATION

- Class I, Div. 1, Group D Hazardous Locations when installed with an approved Intrinsically Safe Barrier Board



Fiberglass HLP (left); Stainless Steel HLP (right)

**A Simple, Reliable,
Low Power Solution for
Point Level Detection
that Works!**

OPTIONAL EQUIPMENT

HHC - 1000 HANDHELD COMMUNICATOR

This optional Hand-Held Communicator allows a field service technician to easily configure and communicate with a sensor. The HHC-1000 offers a menu driven, user-friendly interface for setting the sensor address and baud rate, number of floats, level and temperature offsets, and other commands.



The HHC is powered by 4 "AA" batteries or an external 12 VDC power source. An LCD back-lit display and front panel contrast adjustment ensure the device can be used in all lighting conditions. An auto power-off after 3 minutes ensures low energy usage.

TANKCHEK

Electrolab's TankChek is a Local Display and Modbus Scanner which communicates with one or more Model 2100 Digital Level Sensors to provide tank level and temperature data in an easy-to-read format. TankChek comes pre-configured to work with Electrolab's Model 2100.



The companion TankChek Wizard software provides for easy setup of up to 16 process variables. Monitor up to 5 tanks with one device when reading two tank levels and one temperature per tank; measure up to 8 tanks in a battery when measuring only two parameters.

3010 DUAL ANALOG CARD

The 3010 Dual Analog Card is designed to provide dual analog outputs from the Model 2100 Digital Level Sensor. It allows for two, 4-20mA signal outputs for dual fluid levels in a tank. It is intended for use when two analog signals for tank levels are required.



MODEL 2110 BARRIER UNITS

The Model 2110 R1 and R2 barrier units are intrinsically safe devices that actively limit current and protect the Digital Level Sensor from power spikes. The devices conform to U.S. and Canadian standards for use in Class I, Div. 1, Group D hazardous locations. One unit will handle up to five level sensors.



The Model 2110 R2 is a Din Rail mountable unit (above). The Model 2110 R1 (below) is housed in a traditional enclosure.



SERIES 2000 SURGE SUPPRESSORS

The Series 2000 surge suppressors are in-line protection devices to cover the power supply and RS485 communication wiring between a remote sensor and a terminal processing unit. These devices have a three-level suppression circuit that prevents voltage and current transients from damaging the electronic interfaces. A protective coating permits operation in corrosive environments.



DIGITAL LEVEL SENSOR GUIDE TOOL

The Digital Level Sensor Guide Tool (DLS-GT) provides a support structure designed for installing the Electrolab Model 2100 Digital Level Sensor. Using the DLS-GT, one person standing on a catwalk beside a tank can simply, safely, and quickly install the Model 2100 Digital Sensor without the need for additional equipment or personnel. The DLS-GT comes with two carrying cases: one for the loop, and one for the aluminum tubes. The two cases fasten together allowing one person to easily carry the tool to the installation site. Both cases are made of a rugged nylon suitable for the oilfield. The Digital Level Sensor Guide Tool is quickly and easily assembled without the need for additional tools.



SPECIAL ORDER

Electrolab provides customization for unique operating environments. Ask us about:

- High-density floats
- Custom sized floats
- High pressure tanks
- Turbulent tanks



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