TELEDYNE
ANALYTICAL INSTRUMENTS
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LXT330 & LXT380

UNIVERSAL LIQUID TRANSMITTERS

LXT330 General Purpose

Model LXT330 Liquid Transmitter is a single or dual channel, universal, multi-parameter transmitter, designed for continuous online liquid measurements. It is paired with SP3 Smart sensors and is intended for use in non-hazardous, general purpose rated industrial environments. The SP3 sensor platform covers a wide range of liquid analytical measurements such as pH, ORP, Specific Ion (pION), dissolved oxygen, free chlorine, total chlorine, conductivity, resistivity, and turbidity. The LXT330 transmitter can be used with any SP3 smart sensors without additional user reconfiguration. The Universal Transmitter & Smart Sensor loop philosophy removed the need to stock for multiple instrument types. The process parameter, sensor details, serial number and calibration history are stored in the sensor's main memory, facilitated by two-way digital communication between the sensors and transmitter. The LXT330 universal transmitter allow for up to two SP3 sensors per transmitter (contact factory for available combinations).

LXT330 Configuration Builder (LXT-330-AB-CD-E)

LXT330	A	B	C	D	E
1st Channel	1 SP3 Digital Sensor, pH, ORP, pION, DO*, ppb DO, Conductivity, Resistivity, TSS, ODO				
	4 Internal Pre-amp, Digital to SGTC Conductivity/Resistivity (High Temp.)				
	2nd Channel	0 No Second Channel			
		1 SP3 Digital Sensor, pH, ORP, pION, DO*, ppb DO, Conductivity, Resistivity, TSS, ODO			
		Power & Relays:	00 (LOOP) 2 Wire - Single Channel Only		
			01 4 Wire - DC Power, No Relays		
			11 4 Wire - DC Power, (3) Relays		
			20 110/220 VAC Power, No Relays		
			21 110/220 VAC Power, (3) Relays		
			Outputs:	0 4-20 mA & MODBUS**	
				1 HART®	
				2 2x 4-20mA & MODBUS**	
				3 2x 4-20mA & HART®	
				Mounting:	00 No Mounting Hardware
					01 Universal Mounting Hardware
					02 Panel Mounting Hardware
					03 Handrail Mounting Hardware
					04 Polyester Sun-Shield with Pole Mount
					05 Polyester Sun-Shield with Rail Mount

* Galvanic DO must be single channel due to solution ground interference
**MODBUS - AC/DC version only

Pre-pHault & Sentinel Sensor

What is pre-pHault?

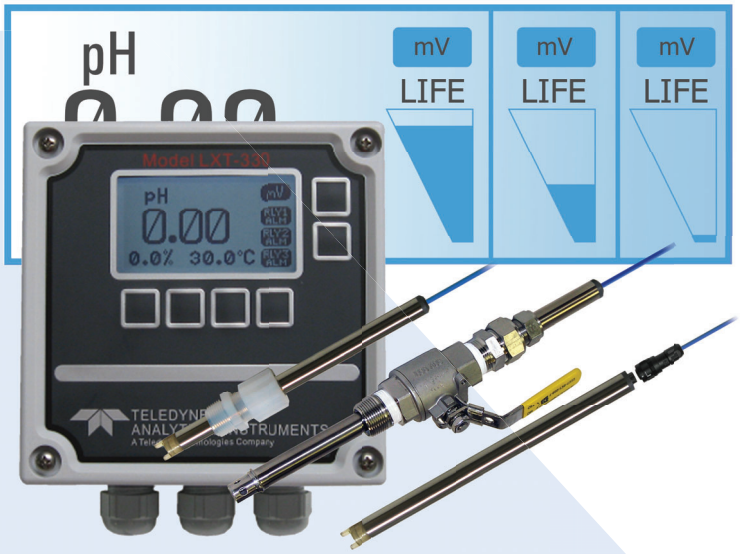
It is a diagnostic feature showing the health of a mV sensor (pH, ORP or pION) on the transmitter.

What is the requirement?

Customer would have to purchase a SENTINEL enabled electrode, only available on SP3 sensor platform.

The Teledyne **6** Point Advantage

1. Unique Visual Sensor Life Indicator allows scheduled maintenance
2. Output the Diagnostic Signal to avoid unscheduled down time
3. Intelligent Pre-Calibrated Digital Sensors eliminate the need for field calibrations
4. Application Specific Electrode Cartridges, pH, ORP and Specific Ion
5. Submersible and Retractable Sensor Designs with various process fittings and lengths
6. Various Industrial Housing Materials, 316 SS, Titanium and Hastelloy provide process compatibility



The SENTINEL features allows the Model LXT 330 transmitter to provide Pre-pHault diagnostic information about the accuracy of a pH, ORP or pION measurement. The SENTINEL displays a filled triangular gauge that decreases proportionally to the degradation of the reference electrode, a filled gauge indicates a properly functioning measurement while the emptying gauge indicates the remaining life of the electrode. This Pre-pHault diagnostic alerts the user to potential problems and the remaining life before the measurement fails.

Model SP3 sensors for the measurement of pH, ORP and the various pIONs use replaceable electrode cartridges specific for the measured parameter. These electrode cartridges have a measurement cell (pH gas electrode, platinum ring or ion selective membrane) and a reference cell. The reference cell is designed to produce a standard potential independent of the solution it is immersed in. While this style of electrode is typically trouble free, there are conditions that lead to failure. Diffusion through the porous liquid junction decreases the concentration of the potassium chloride inside the electrode as the electrode ages. The decreasing concentration of potassium chloride changes the potential of the cell which shows up as a dip in the measured value. Diffusion also allows chemicals in the process to infiltrate into the electrode. If these chemicals can react with silver, then the electrode will become poisoned and a large offset voltage will be generated destroying the accuracy of the measurement.

The SENTINEL addresses these issues by including an additional sleeved silver element into the reference cell. When the electrode cartridge is now, both silver elements are at the same potential but as the electrode ages, or becomes poisoned, the bare element changes its potential in response to the electrode depletion or poisoning. The SENTINEL monitors the potential difference between the two elements and displays the value as a gauge of the electrodes remaining life. The protected silver element is still producing the correct potential but it is in danger of failing due to the changing environment inside the reference cell. This Pre-pHault indication notifies the user of the potential electrode failure before the measurement actually fails. When a model SP3 SENTINEL sensor is connected to a SP3 transmitter, the SENTINEL functions are displayed.

The Pre-pHault diagnostic is displayed on one of the model SP3s main screens along with the process variable, % 4-20 mA output and temperature. The diagnostic value can be assigned to an optional alarm relay and / or a secondary 4-20 mA output or monitored through HART® communication. The mV limit value for the diagnostic is user configurable with a default setting of 60 mV. The Model SP3 SENTINEL sensor uses diagnostic electrodes designated by part #'s 20053XX. These electrodes use a tri-axial connector with a PV connection (pH, ORP, ION), reference connection and diagnostic connection.

LXT380 Explosion Proof

The Model LXT380 transmitter is a single or dual channel, intelligent, multi-parameter transmitter designed for the online continuous measurement of pH, ORP, Specific Ion (pION), dissolved oxygen, free chlorine, total chlorine, conductivity and resistivity. The model LXT380 Transmitter digitally communicates with the SP3X digital sensor, automatically configuring the transmitter's menus and display screens to the measured parameter. The Model LXT380 transmitter can be Loop powered or 4-wired DC powered. The standard configuration has a 4-20mA and a serial communication port with MODBUS RTU output. Alarm relays option is only available on 4-wired DC powered transmitters. LXT380 transmitter loop is available in FM, ATEX, IECEx certification.

LXT380 Configuration Builder (LXT-380-AB-CDE-F)

LXT380	A	B	C	D	E	F
1st Channel	1 SP3X Digital Sensor, pH, ORP, pION, DO*, ppb DO, Conductivity, Resistivity, Free Chlorine, Chlorine Dioxide					
	2nd Channel	0 No Second Channel				
		1 SP3X Digital Sensor, pH, ORP, pION, DO*, ppb DO, Conductivity, Resistivity, Free Chlorine, Chlorine Dioxide				
		Power:	0 (LOOP) 2 Wire - Single Channel Only			
			1 (DC) 4 Wire - DC Power			
			Relays:	0 No Relay		
				1 3 Relays - DC Power Only		
				Outputs:	0 4-20mA & MODBUS**	
					1 HART®	
					2 2x 4-20mA & MODBUS**	
					3 2x 4-20mA & HART®	
					Approvals:	00 SS316 No Approval
						01 SS316 FM Approval
						02 SS316 ATEX/IECEx Approval - Single Channel
						03 SS316 ATEX/IECEx Approval - Dual Channel

* Galvanic DO must be single channel due to solution ground interference
**MODBUS - AC/DC version only

SPECIFICATIONS

	LXT330	LXT380
Input Sensors	SP3 Smart Sensor	SP3 or SP3X Smart Sensor
Input Ranges	pH: -1.00 to 15.00 pH ORP: -1500mV to +1500mV pION: 000.1 to 999.9, Auto Ranging: ppb, ppm, ppt DO: 000.1 to 999.9, Auto Ranging: ppb, ppm, %SAT, mg/L Conductivity: 0.055uS - 2.00S Auto Ranging: uS, mS, S Resistivity: 0.001 - 20.00 meg-ohms Turbidity: 000.0 - 4000NTU, Auto Ranging: NTU, FNU, mg/L, ppm, % Solids	
Temperature	Temperature: -22° to 284°F (-30° to 140°C)	Temperature: -4° to 185°F (-20° to 85°C)
Accuracy	pH: 0.02pH ORP: ± 1 mV pION: Contact factory for pION specification sheet DO: 2% of Calibrated Range Conductivity: 2% of Calibrated Range Resistivity: 2% of Calibrated Range Turbidity: 4% of Calibrated Range Temperature: ± 0.54°F (0.3°C)	
Enclosure	Polycarbonate, IP65, Weatherproof 5.7"L x 5.7"W x 3.5"D (14.48 x 14.48 x 8.89 cm) 1.6lbs (0.75kg)	Electro Polished SS316, Type 4X, IP66, Weatherproof 5.5"L x 5.1"W x 5"D (13.97 x 12.95 x 12.7 cm) 5.5lbs (2.5kg)
Interface Ports	1/2" Glands, 3 nos.	1/2" FNPT, 3 nos.
Environmental Conditions	Ambient Temp: DC & Loop: -4° to 158°F (-20° to 70°C) AC: -4° to 140°F (-20° to 60°C) Storage Temp: -22° to 185°F (-30° to 85°C) Relative Humidity: 0 to 80% Non-Condensing	Ambient Temp: -4° to 131°F (-20° to 55°C) Storage Temp: -22° to 185°F (-30° to 85°C) Relative Humidity: 0 to 80% Non-Condensing
Display	2.75" x 1.5" (128 x 64 pixels) LCD, Black/Grey background on loop powered units Blue/White background LED back lit on AC and 4-wire DC units	2.0" x 1.1" (128 x 64 pixels) LCD, Black/Grey background on loop powered units Blue/White background LED back lit on 4-wire DC units
Menu Selection	Soft Key Buttons	Magnetic Pen
Input Power	Loop Powered, 24 VDC, 600 ohm max load (18-36 VDC @ 35 mW minimum 4-wired 24 VDC (18-36 VDC @ 250 mW minimum) AC (100-250VAC, 50/60Hz)	Loop Powered, 24 VDC, 600 ohm max load (18-36 VDC @ 35 mW minimum 4-wired 24 VDC (18-36 VDC @ 250 mW minimum) AC Not Available
Signal Outputs	4-20mA, Fault Condition: 3.5mA, 22mA or none MODBUS RTU HART (Optional) Alarm Relays (Optional): Three (3) SPDT Form C, 250VAC, 3 AMP resistive maximum relays, user configurable as Hi/Lo or Fault Alarms	

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EMAIL: ASK_TAI@TELEDYNE.COM
WEBSITE: WWW.TELEDYNE-AI.COM

16830 CHESTNUT STREET, CITY OF INDUSTRY, CA
UNITED STATES OF AMERICA (USA)
TEL: +1 888.789.8168

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