Model X80 Universal Transmitter
S88 Intelligent Sensor
for Hazardous Locations
FM Approved

Measure pH, ORP, Specific Ion, Dissolved Oxygen, Turbidity, Conductivity, Resistivity and Chlorine with
Model S88 Intelligent Sensors and B88 Barrier

ECD ELECTRO-CHEMICAL DEVICES

Model X80 Universal Transmitter

The ECD ⑥ Point Advantage

1 **Universal Transmitter:** Single or dual channel measures pH, ORP, DO, Specific Ion, Turbidity, Chlorine, Conductivity and/or Resistivity

2 **Hazardous Location Approved**

3 **Graphic LCD Display & Intuitive Menu Structure:** Easy Navigate

4 Use with ECD **Digital Intelligent Sensors** that are factory calibrated sensors and store data

5 **4-20 mA output, relays, MODBUS RTU or HART® communication:** Flexible configurations for all applications

6 **Rugged Corrosion Resistant 316 Stainless Steel Housing**

Description

The ECD Model X80 Universal Transmitter is a single or dual channel transmitter designed for the continuous measurement of pH, ORP, pION, Dissolved Oxygen, Turbidity, Conductivity or Resistivity in a hazardous location industrial environment. The Model X80 transmitter digitally communicates with any ECD Model S88 Intelligent Sensor, automatically configuring the transmitter's menus and display screens to the measured parameter. The same transmitter can be used for any of the measurements, i.e. plug an S88 Conductivity Sensor into a Model X80 pH transmitter and it will automatically reconfigure into a conductivity transmitter. There is no longer any need to inventory multiple instrument types, the one Model X80 transmitter will automatically configure to any of the listed measurements. Each S88 Sensor contains a B88 Barrier comprising energy limiting devices to comply with hazardous location requirements. Connection between the X80 and B88 Barrier is accomplished using flameproof conduit and installation practices recognized by National, State, and Local codes (NFP, NEC, etc.). The S88 Sensor connects to the B88 Barrier with a MiniFast Connector with tamper-proof lockout guard.

X80 Transmitter, B88 Barrier and S88 Sensors

SENSORS

The Model S88 Intelligent Sensors facilitate two way communication with the Model X80 transmitters. The type of sensor, identity and serial number are stored in the sensor's memory along with calibration registers. The Model S88 sensors are calibrated at the factory so they are ready to use when connected to a Model X80 transmitter. The Model S88 sensors are waterproof and submersible with all internal components epoxy encapsulated inside the ¾" O.D. housing. The Model S88 sensors use the same field proven, easily replaceable electrodes as the Model S10,S17, S80 sensors saving time and money.

DISPLAY

The Model X80 Transmitter features a large easily viewed LCD display. Loop powered instruments have Black lettering on a Grey background, while the 24

Optional Sensor Process Fittings

Model X80 Universal Transmitter

VDC powered instruments have blue lettering on a white background when the LED backlight is on. The Model X80 has three easily switchable Main Display screens; the Data Screen, the Millivolt Screen and the Graphical Display screen. (six screens for two channel units) The Data Screen displays the measurement type, the measured value with units, the % milliamp output of the 4-20 mA channel and the temperature. The mV Screen displays the measurement type, the raw millivolt signal from the sensor, the % milliamp output of the 4-20 mA channel and the temperature. The Graphical Screens display the measurement type, the measured value with units and a graphical representation of the % milliamp output. Three graphical styles are available; a Trend line, a Bar graph or a Gauge. The status of alarm relays, energized/de-energized is displayed on transmitters with relays.

X80 Home Screens

MENUS

Menu navigation is accomplished using magnetic switchs. Soft keys display the function associated with each button. Pressing any of the buttons twice within 2 seconds activates the Model X80 soft key menus. The primary selections are the Calibration menu, Configuration menu, Info Screens and Simulate menu.

CALIBRATION

Model S88 sensors come precalibrated from the factory. Field calibrations are easily performed with the Model X80. The Calibration menu includes the Auto Cal function, a two point calibration, the Standardize function, a single point calibration or the Manual Calibration, where previously determined Offset and Slope values are entered manually into the Model X80 transmitter.

CONFIGURATION

The Configuration menus allow the Model X80 transmitter's Display and Output functions and the Model S88 sensor's characteristics to be configured or adjusted. Display screens include the Hold function, Graphical Display Style, Back Light and Contrast adjustments, Labels/Tags for naming the transmitter, Password Protection and a Factory Default reset. Output screens include setting the addresses for MODBUS or HART® outputs, setting the 4-20 mA range and fault settings and configuring the Alarm Relays.

INFO

The Info screens provide Transmitter and Sensor Information. The transmitter screens display the Name, Power, Serial#, Firmware version and the output configuration. The sensor screens display the Name, Part #, Serial # and stored Calibration data.

SIMULATE

The Simulate Menu allows the input and output signals to be simulated. The outputs are easily tested by entering a 4-20 mA output value or energizing and de-energizing each of the relays. The Ramp function cycles the signal across the configured 4-20 mA range, i.e. the transmitter generates a signal from 0 pH to 14 pH and back to 0 pH generating a 4-20 mA output. The cycle time and the duration are adjustable allowing sufficient time for an individual to walk to the control room to verify the output.

POWER SUPPLY and OUTPUTS

The Model X80 transmitter is available as a loop powered transmitter or a 24 VDC powered transmitter. The loop powered version has a 4-20 mA output with an optional HART® output. The line powered instruments have a 4-20 mA output with MODBUS RTU (standard) or the optional HART® output. The 24 VDC Transmitter is also available with (3) Alarm Relays that can be configured as Alarm relays (setpoint), Timed Relays or as a Fault relay.
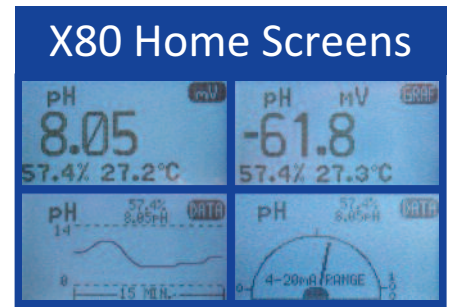
B88 Barrier for
Class I, Div 1, Groups B, C and D
Class I, Zone 1 IIB+H_2 T5
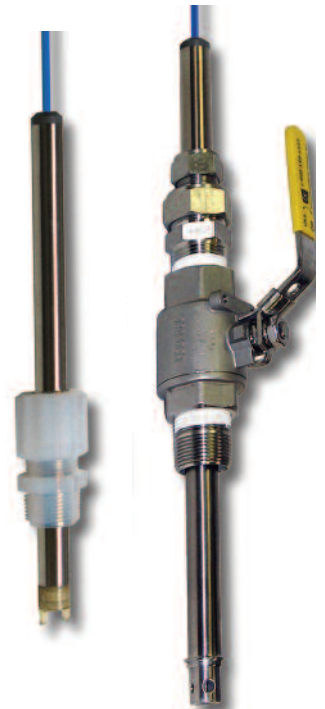
S88 Sensors Intrinsically Safe For
Class I, Div 1, Groups B, C, D
Class I, Zone 0 IIB+H_2 T5

HART
COMMUNICATION PROTOCOL

Specifications

Input Specification

Digital protocol, ECD S80/S88 sensors, Liquid, Gas, Process sensors

Input Ranges

pH	-1.00 – 15.00 pH
ORP	-1500 - +1500 mV
pION	000.1 – 999.9, Auto Ranging: ppb $\leftrightarrow$ ppm $\leftrightarrow$ ppthousand
Dissolved Oxygen	000.1 – 999.9 Auto Ranging: ppb, ppm, % SAT, mg/L
Conductivity	0.055 µS – 2.00S Auto Ranging: µS, mS, S
Resistivity	0.001 - 50.00 meg-ohms
Free Chlorine	Auto Ranging: ppb $\leftrightarrow$ ppm

Electrical / Mechanical

Materials:
Electro Polished 316 SS

Mounting:
2 x M4 ($\frac{3}{16}$") and 3 x ¾" FNPT

Environmental Conditions

Ambient Temperature	-20°C - 85°C
Storage Temperature	-30°C - 85°C
Relative Humidity	0 – 90% NC

Display
128 x 64 pixels (2.75" x 1.5") LCD, Black/Grey background on loop powered instruments, Blue/White background LED backlight on 24 VDC powered instruments

Input Power
Code -0: Loop powered, 24 VDC, 600 Ω maximum load (18-36VDC @ 35 mW min)
Code -1 24 VDC (18-36 VDC @ 250 mW minimum)

Outputs
4-20 mA output(s) standard single channel or an optional second channel
Modbus RTU (standard)
HART® (optional)
Alarm Relays (Optional) Three (3) SPDT, form 1C, 250 VAC, 3 Amp resistive maximum relays, user configurable as Hi/Lo or Fault alarms

Shipping
Size: 8" x 8" x 5"(20.5 x 20.5 x 12.7 cm)
Weight: 316 SS, 8.0 lbs. (3.65 kg)

Hazardous Location Approvals

FM Approved X80 Transmitter:
Class I, Division 1, Groups B, C, D, E, F, and G, T4 -40°C to +85°C
Class I, Zone 1 IIB+H_2 T4 -40°C to +85°C Type 4X; IP66;

FM Approved B88 Barrier:
Explosion-Proof with Associated Intrinsically Safe Connections For:
Class I, Division 1, Group B, C and D, T5 -40°C to +80°C
Class I, Zone 1 IIB+H_2 T5 -40°C to +80°C

FM Approved S88 Sensor:
Intrinsically Safe For:
Class I, Division 1, Groups B, C, D, T5 -40°C to +80°C
Class I, Zone 0 IIB+H_2 T5 -40°C to +80°C

FM Approved Explosion Proof Enclosure: X80 Enclosure:
Class I, Division 1, Groups B, C and D
Class II, Division 1, Groups E, F and G
Class III, Division 1
NEMA 4X, IP66

Model X80-	Transmitter Part Number Guide				
Number of Channels	10 Single Channel, pH, ORP, pION, Conductivity, Resistivity, Dissolved Oxygen, Chlorine & other measurements				
	11 Dual Channel, pH, ORP, pION, Conductivity, Resistivity, Dissolved Oxygen, Chlorine & other measurements				
	Power Supply	-0 Loop Powered Transmitter (Single Channel only)			
		-1 24 VDC Powered Transmitter			
		Alarm Relays	0 No Relays		
			1 (3) formC 250 V 3A relays		
			Output	0 4-20 mA output and MODBUS RTU	
				1 HART®	
				2 2 x 4-20 mA with MODBUS RTU	
				3 2 x 4-20 mA with HART®	
				Approvals	-00 CSA and FM Enclosure Approvals only
					-01 FM Approved
					-02 ATEX & IECEx Approved Single Channel
					-03 ATEX & IECEx Approved Dual Channel
(Example) Model X80-	10	-0	0	1	-00

Specifications subject to change without notice.

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