

# Signet 9900 Transmitter



## Member of the SmartPro® Family of Instruments



Panel Mount

Field Mount

The Signet 9900 Transmitter provides a single channel interface for many different parameters including Flow, pH/ORP, Conductivity/Resistivity, Salinity, Pressure, Temperature, Level, Dissolved Oxygen, and other sensors that output a 4 to 20 mA signal. The 9900-1P Transmitter can also be used as a Batch Controller when a Batch Module and Relay Module are installed.

The 9900 is offered in both panel or field mount versions. Both configurations offer an extra large (3.90" x 3.90") auto-sensing backlit display features "at-a-glance" visibility that can be viewed at 4-5 times the distance over traditional transmitters. The highly illuminated display and large characters reduce the risk of misreading or misinterpreting the displayed values. The display shows separate lines for units, main and secondary measurements as well as a "dial-type" digital bar graph.

The 9900 can run on 12 to 32 VDC power (24 VDC nominal), and can also be loop powered with compatible sensors.

Rear Enclosure Kits are available for the 9900-1P Panel Mount. Kit options include either a Hinged Cover (3-9900.399-1) for wall or pipe mount installations, or a Flat Cover (3-9900.399-2) designed to fit inside a panel for waterproof protection.

The 9900 offers complete flexibility, plug-in modules allow the unit to easily adapt to meet changing customer needs. Optional modules include Modbus, Direct Conductivity/Resistivity, H COMM, Batch, 4 to 20 mA Output, and the 0252 Configuration Tool. The unit can be used with default values for quick and easy programming or can be customized with labeling, adjustable minimum and maximum dial settings, and unit of measure and decimal location choices.

## Features

- Modbus Module supports RS485 Serial Modbus Communications
- Multiple sensor types supported with one instrument
- "Dial-type" digital bar graph
- Modules are field installable and replaceable anytime
- Optional Relay Module for addition of two dry-contact relays
- Optional H COMM Module for two-way communication
- Optional Batch Module for Batch Control
- One 4 to 20 mA output in base unit. One additional 4 to 20 mA available with optional module
- Rear Enclosure Kits for panel, wall or pipe mounting
- Warning and Relay LED indicators for "at a glance" visibility
- Customizable features including digital label for custom identification
- Optional 0252 Configuration Tool for configuration at a PC



## Applications

- Wastewater Treatment
- Reverse Osmosis
- Deionization
  - Ultra Pure Water
  - Two Bed System
  - Mixed Bed System
- Chemical Manufacturing/Addition
- Metal and Plastic Finishing
- Fume Scrubber
- Cooling Towers
- Media Filtration

U.S. Patent Nos.: D662,844 S, D622,845 S  
Taiwan Patent Nos.: D147,149, D147,150

# Specifications

General			
Input Channels		One	
Input Types	Digital (S <sup>3</sup> L)	Serial ASCII, TTL level, 9600 bps	
	Frequency	Range	0.5 to 1500 Hz
		Accuracy	0.5% of reading
Measurement Types		Flow, pH/ORP, Conductivity/Resistivity, Salinity, Pressure, Temperature, Level, Dissolved Oxygen, Batch or user-defined (via 8058)	
Enclosure and Display			
Case Material		PBT	
Window		Shatter-resistant glass	
Keypad		4 buttons, injection-molded silicone rubber seal	
Display		Backlit, 7 and 14-segment	
Update Rate		1 s	
LCD Contrast		5 settings	
Indicators		“Dial-type” digital bar graph. LEDs for open collector, relays and warning indicator	
Enclosure Size		¼ DIN	
Mounting	9900-1P		
	Panel	¼ DIN, ribbed on four sides for panel mounting clip inside panel, silicon gasket included. Optional rear enclosure with flat cover available for waterproof protection when installed inside a panel.	
	Wall	Options include 9900-1P installed in pre-wired NEMA enclosure, wall mount enclosure or inside of rear enclosure with hinged cover. (USA Only)	
	Pipe	Optional Rear Enclosure with hinged cover and 9900-1P for pipe mount installation	
Mounting	9900-1		
	Field (Integral)	Options include yellow universal or integral kits for installation with sensor	
Display Ranges			
pH		0.00 to 15.00 pH	
pH Temperature		-99 °C to 350 °C	-146 °F to 662 °F
ORP		-1999 to +1999 mV	
Flow Rate		-9999 to 99999 units per second, minute, hour or day	
Totalizer		0.00 to 99999999 units	
Conductivity		0.0000 to 99999 µS, mS, PPM and PPB (TDS), kΩ, MΩ	
Conductivity Temperature		-100 °C to 250 °C	-148 °F to 350 °F (application and sensor dependent)
Temperature		-99 °C to 350 °C	-99 °F to 350 °F
Pressure		-40 to 1000 psi	
Level		-9999 to 99999 m, cm, ft, in, %	
Volume		0 to 99999 cm³, m³, in³, ft³, gal, L, lb, kg, %	
Salinity		0 to 99.97 PPT	
Dissolved Oxygen		PPM 0-50, % SAT 0-200, 0 to 999.9 TORR	
Dissolved Oxygen Temperature		-99 °C to 350 °C	-99 °F to 350 °F
Environmental			
Ambient Operating Temperature			
Backlit LCD		-10 °C to 70 °C	14 °F to 158 °F
Storage Temperature		-15 °C to 70 °C	5 °F to 158 °F
Relative Humidity		0 to 100% condensing for field mount; 0 to 95% non-condensing for panel mount	
Maximum Altitude		4,000 m (13,123 ft)	
Enclosure Rating		NEMA 4X/IP65 (front face only on panel mount); field mount is 100% NEMA 4X/IP65 when used with universal or integral installation kits	

## Specifications (continued)

### Electrical Requirements

#### Power to Sensors

Voltage	+4.9 to 5.5 VDC @ 25 °C, regulated
Current	1.5 mA max in loop power mode (up to 2.0 mA with 24 V @ 300 $\Omega$ max. loop impedance); 20 mA max when using DC power
Short Circuit	Protected
Isolation	Low voltage (< 48V AC/DC) to loop with DC power connected

No isolation when using loop power only

Terminal Blocks	Pluggable screw type	14 AWG max wire gauge
-----------------	----------------------	-----------------------

### Input Power

DC	10.8 to 35.2 VDC, regulated
9900 without Relay Module	200 mA @ 10.8 VDC to 35.2 VDC
9900 with Relay Module	300 mA @ 10.8 VDC to 35.2 VDC
Overvoltage Protection	48 Volt Transient Protection Device

Current limiting for circuit protection

Reverse-Voltage Protection

### Loop Power

#### Loop Power Only

	Max. Loop Impedance	50 $\Omega$ @ 12 V	325 $\Omega$ @ 18 V	600 $\Omega$ @ 24 V
--	---------------------	--------------------	---------------------	---------------------

With DC Power Input or with 2nd loop, all the time

	Max. Loop Impedance	250 $\Omega$ @ 12 V	500 $\Omega$ @ 18 V	750 $\Omega$ @ 24 V
--	---------------------	---------------------	---------------------	---------------------

### Relay Specifications

	Dry Contact Relays (2)	Open Collector (1)
Type	SPDT	N/A
Form	C	N/A
Maximum Current Rating	5 A resistive	50 mA DC
Maximum Voltage Rating	30 VDC or 250 VAC	30 VDC
Hysteresis	Adjustable (absolute in engineering units) (EUs)	
Latch	Reset in test screen only	
Delay	9999.9 seconds (max.)	
Test Mode	Set On or Off	
Cycle Time	99999 seconds (max.)	
Maximum Pulse Rate	300 pulses/minute	
Proportional Pulse	400 pulses/minute	
Volumetric Pulse Width	0.1 to 3200 s	
Pulse Width Modulation	0.1 to 320 s	

### Input Types

Digital (S<sup>3</sup>L) or AC frequency

4 to 20 mA input via the 8058-1

pH/ORP input via the Digital (S<sup>3</sup>L) output from the 2751 pH/ORP Sensor Electronics

Raw Conductivity/Resistivity input directly from Signet Conductivity/Resistivity electrodes via Direct Conductivity/Resistivity Module or via 2850

### Input Specifications

Digital (S <sup>3</sup> L)	Serial ACSII, TTL level, 9600 bps
----------------------------	-----------------------------------

#### Frequency Input

Sensitivity	80 mV @ 5 Hz, gradually increasing with frequency
Span	0.5 Hz to 1500 Hz @ TTL level input
Accuracy	± 0.5% or reading max error @ 25 °C
Resolution	1 $\mu$ S
Repeatability	± 0.2% of reading

## Specifications (continued)

### Input Specifications continued

#### Power Supply

Rejection	±1 µA per volt
Short Circuit	Protected
Update Rate	(1/frequency) + 150 ms
Direct Conductivity/Resistivity Module (3-9900.394)	

Accuracy	Conductivity +/- 2% of Reading
	Temperature 0.5 °C
Resolution	Conductivity 0.1% of Reading
	Temperature <0.2 °C
Update Rate	2.5 Seconds
Compatible Electrodes	All GF Signet Sensors

### Output Specifications

#### Current Output - One (1); Two (2) with 4 to 20 mA Output Module

Current Loop Output Standard	ANSI-ISA 50.00.01 Class H		
Current Output	4 to 20 mA, isolated, fully adjustable and reversible		
Span	3.8 to 21 mA		
Zero	4.0 mA factory set; user programmable from 3.8 to 5.0 mA		
Full Scale	20.00 mA factory set; user programmable from 19.0 to 21.0 mA		
Accuracy	±32 µA max. error @ 25 °C @ 24 VDC		
Resolution	6 µA or better		
Temperature Drift	±1 µA per °C		
Power Supply Rejection	±1 µA per V		
Isolation	Low voltage (< 48 VAC/DC)		
Voltage	12 to 32 VDC ±10%		
Maximum Impedance (with DC power input)	250 Ω @ 12 VDC	500 Ω @ 18 VDC	750 Ω @ 24 VDC
Maximum Impedance (no DC power input)	50 Ω @ 12 VDC	325 Ω @ 18 VDC	600 Ω @ 24 VDC
Update Rate	150 mS nominal		
Short circuit and reverse polarity protected			
Adjustable Span	Reversible		
Error Condition	Selectable error condition 3.6 or 22 mA		
Actual update rate determined by sensor type			
Test Mode	Increment to desired current (range 3.8 to 21.00 mA)		

### Shipping Weights

Base Unit	0.63 kg	1.38 lb
Modbus Module	0.16 kg	0.35 lb
H COMM Module	0.16 kg	0.35 lb
Conductivity Module	0.16 kg	0.35 lb
Relay Module	0.19 kg	0.41 lb
Batch Module	0.16 kg	0.35 lb
4 to 20 Output Module	0.16 kg	0.35 lb
Rear Enclosure, Hinged cover	0.30 kg	0.65 lb
Rear Enclosure, Flat cover	0.28 kg	0.60 lb

### Standards and Approvals

CE, UL, CUL, FCC
RoHS Compliant, China RoHS
Lloyd's Register
Manufactured under ISO 9001, ISO 14001 and ISO 45001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety