# Signet 9950 Dual Channel Transmitter



#### Member of the SmartPro® Family of Instruments



The 9950 Transmitter is a two channel controller that supports two sensors of same or different types in one instrument. The sensor types supported by the 9950 are Signet Flow, pH/ ORP, Conductivity/Resistivity, Salinity, Temperature, Pressure, Level, Dissolved Oxygen, and devices that transmit a 4 to 20 mA signal with the use of the 8058 iGo® Signal Converter.

The 9950 includes advanced features such as derived functions, advanced multiple relay modes, and timer based relay functions. Derived function allows for the control of a relay or current loop with the sum, delta (difference), or ratio of two measurements, for example delta pressure and delta temperature. Multiple relay modes allow up to three signals to be used for the control of a single relay. This can be any combination of analog and binary inputs. The timer relay modes allow a relay to be activated on a repeating basis from every minute to once every 30 days. Weekday timer mode allows a relay to be energized on a specific day or days of the week at a specific time.

The 3-9950.393-3 Relay Module includes the ability to interface up to four binary inputs. The binary inputs are compatible with either open collector or mechanical contacts. The binary inputs can supply power to the four inputs or accepts powered outputs from external devices. These inputs can be used with level switches, flow switches, pressure switches or other devices. The inputs can be used to directly control the relays of the 9950 or can be used in combination with the measurement readings for advanced control of your process.

The 9950 supports the following relay modules:

- Four Channel Mechanical Relay Module
- Two Mechanical and Two Solid State Relay Module
- Two Mechanical Relays and Four Binary Inputs Module

The 9950 supports one or two direct conductivity modules for conductivity, resistivity or salinity measurements.

A dual channel 4 to 20 mA passive output module is available. This will allow expansion from a base of 2 current loop outputs to a maximum of 6 current loop outputs in a single transmitter.

#### Features

- One instrument for multiple sensor types
- Multiple language support for Simplified Chinese, English, French, German and Spanish
- Two different sensor types can be combined in one instrument
- Configurable display
- Derived measurements
- Advanced boolean logic
- Single Channel Direct Conductivity/Resistivity Module
- Two passive, 4 to 20 mA current loop outputs in base unit, four additional current loops via optional modules
- Optional Dual Channel, passive 4 to 20 mA Current Loop Module for 2 or 4 additional loop outputs
- USB Port for Field Upgrades using standard USB Flash Drive



#### **Applications**

- Wastewater Treatment
- Reverse Osmosis
- Deionization
- Chemical Manufacturing / Addition
- Metal and Plastic Finishing
- Fume Scrubber
- Cooling Towers
- Media Filtration
- Chemical Dosing/ Injection
- Aquatic Life Support
- Pools & Fountains
- Rinse Tanks
- Chemical Neutralization

## **Specifications**

Actional and Display       PBT         Case Material       PBT         Window       Shatter-resistant glass         Keypad       4 buttons, injection-molded silicone rubber seal         Display       Dot matrix, LCD         Indicators       Two horizontal digital bar graphs, four LED relay status indicators         Jpdate Rate       1 s         CD Contrast       5 settings         Size       ½ DIN         Mounting       Valit         Valit       Wall Mount enclosure (sold as an accessory)         Ferminal Blocks       Valit Mount enclosure (sold as an accessory)         Panel       ½ Dis minimum 105 °C rated wire         Forque Ratings       Power/Loop       0.49 Nm (4.4 lb-in.)         Freq/S1L       16 to 28 AWG         Aclay Module       0.49 Nm (4.4 lb-in.)         Freq/S1L       16 to 28 AWG         Freq/S1L       16 to 28 AWG         Freq/S1L       16 to 28 AWG         Actional Discover       -10 °C to 70 °C         Act Power       -10 °C to 70 °C         A °F to 158 °F       Cower <tr< th=""><th>General</th><th></th><th></th></tr<>	General				
Aase Material PBT Window Shatter-resistant glass Keypad 4 buttons, injection-molded silicone rubber seal Jisplay Dot matrix, LCD Mindicators Two horizontal digitat bar graphs, four LED relay status indicators Two horizontal digitat bar graphs, four LED relay status indicators Two horizontal digitat bar graphs, four LED relay status indicators Judate Rate 1 s Settings Keypad 4 bUN Job antirx, LCD Michael 5 settings Size 7 Wo Will Mount enclosure (sold as an accessory) Ferminal Blocks Ferminal Blocks Vall Wount enclosure (sold as an accessory) Ferminal Blocks Valugable Screw Type Use minimum 105 °C rated wire Forque Ratings Power/Loop 0.49 Nm (4.4 lb-in.) Freq/S <sup>1</sup> L 0.49 Nm (4.4 lb-in.) Freq/S <sup>1</sup> L 0.49 Nm (4.4 lb-in.) Relay Module 0.49 Nm (4.4 lb-in.) Relay Module 0.49 Nm (4.4 lb-in.) Relay Module 0.49 Nm (4.4 lb-in.) Freq/S <sup>1</sup> L 0.49 Nm (4.4 lb-in.) Relay Module 0.49 Nm (4.4 lb-in.) Rela	Input Channels	Two frequency or S	<sup>3</sup> L inputs, or optional direct conductivity modules, maximum of 2 channels		
WindowShatter-resistant glassGeypad4 buttons, injection-molded silicone rubber sealDisplayDot matrix, LCDmolicatorsTwo horizontal digital bar graphs, four LED relay status indicatorsJpdate Rate1 sLCD Contrast5 settingsLCD Contrast5 settingsVallVallNMountingVantingVallWall Mount enclosure (sold as an accessory)VallVall Mount enclosure (sold as an accessory)Verminal BlocksPlagable Screw TypePlagable Screw Type0.49 Nm (4.4 lb-in.)Frem/S L0.49 Nm (4.4 lb-in.)Frem/S L0.49 Nm (4.4 lb-in.)Freg/S L0.49 Nm (4.4 lb-in.)Relay Module0.49 Nm (4.4 lb-in.)Freg/S L10 for 2 a VAGFreg/S L10 for 2 to 28 AWGFreg/S L10 for 2 to 70 °C14 °F to 158 °FConver10 °C to 70 °C14 °F to 158 °FStorage Temp10 °C to 60 °C 10 °C to 50 °C co 70 °C14 °F to 158 °FStorage Temp10 °C to 60 °C co 70 °C14 °F to 158 °FStorage Temp10 °C to 60 °C co 70 °C14 °F to 158 °FStorage Temp10 °C t	Enclosure and Display				
Keypad         4 buttons, injection-moled silicone rubber seal           Display         Dot matrix, LCD           Display         Dot matrix, LCD           Indicators         Two horizontal digital bar graphs, four LED relay status indicators           Jpdate Rate         1 s           CD Contrast         5 settings           Size         ½ DIN, ribbed on four sides for panel mounting clip inside panel, silicon gasket included           Malt         Walt Mount enclosure (sold as an accessory)           Forminal Blocks         Valt Mount enclosure (sold as an accessory)           Panel         ½ M DIN, ribbed on four sides for panel mounting clip inside panel, silicon gasket included           Valt         Walt mount enclosure (sold as an accessory)           Forminal Blocks         Forminal Blocks           Plaggable Screw Type         Use minimum 105 °C rated wire           Forag/S <sup>1</sup> L         0.49 Nm (4.4 lb-in.)           Freq/S <sup>1</sup> L         0.49 Nm (4.4 lb-in.)           Freq/S <sup>1</sup> L         16 to 28 AWG           Connector Wire Gauge         Iso 28 AWG           Ato y To 0 °C         14 °F to 180 °F           Connector Wire Gauge         Iso 28 AWG           Convert         -10 °C to 70 °C         14 °F to 180 °F           CC Power         -10 °C to 60 °C         14 °F to	Case Material	PBT			
Display Dot matrix, LCD   Indicators Two horizontal digital is graphs, four LED relay status indicators  Ipdate Rate 1 S CD Contrast 5 Settings CD Contrast 5 Settings  Is of NIN  CD Ontrast VIN  A DIN  A	Window	Shatter-resistant gl	ass		
Two horizontal digital bar graphs, four LED relay status indicators           Jpdate Rate         1 s           LCD Contrast         5 settings           Size         ½ DIN           Aounting	Keypad	4 buttons, injection-	molded silicone rubber seal		
Jpdate Rate       1 s         LCD Contrast       5 settings         LCD Contrast       5 settings         Vall       V DIN         Adunting       Ya DIN, ribbed on four sides for panel mounting clip inside panel, silicon gasket included         Vall       Wall Mount enclosure (sold as an accessory)         Ferminal Blocks       Power/Loop         Pluggable Screw Type       Use minimum 105 °C rated wire         Forque Ratings       Power/Loop         Power/Loop       0.49 Nm (4.4 lb-in.)         Freq/S <sup>1</sup> L       0.49 Nm (4.4 lb-in.)         Relay Module       0.49 Nm (4.4 lb-in.)         Connector Wire Gauge       Power, Loop         Power, Loop       12 to 28 AWG         Freq/S <sup>1</sup> L       16 to 28 AWG         Relay       12 to 28 AWG         Environmental       Vall         Appender       12 to 28 AWG         Environmental       Server         CP Power       -10 °C to 70 °C       14 °F to 158 °F         CQ Power       -10 °C to 70 °C       14 °F to 158 °F         CP Power       -10 °C to 70 °C       14 °F to 158 °F         Relative Humidity       0 to 100% condensing for (front only); 0 to 95% non-condensing (rear panel)         Adaximum Altitude       4,0	Display	Dot matrix, LCD			
C.D Contrast         5 settings           Size         ¼ DIN           4ounting         K           Panel         ½ DIN, ibbed on four sides for panel mounting clip inside panel, silicon gasket included           Vall         Wall mount enclosure (sold as an accessory)           ferminal Blocks         Vall Mount enclosure (sold as an accessory)           ferminal Blocks         Vall           Power/Loop         0.49 Nm (4.4 lb-in.)           Freq/S <sup>3</sup> L         0.49 Nm (4.4 lb-in.)           Freq/S <sup>3</sup> L         0.49 Nm (4.4 lb-in.)           Relay Module         0.49 Nm (4.4 lb-in.)           Connector Wire Gauge         Vall           Freq/S <sup>3</sup> L         12 to 28 AWG           Freq/S <sup>3</sup> L         16 to 28 AWG           Relay Module Connector Wire Gauge         Valt 2 to 28 AWG           Freq/S <sup>3</sup> L         12 to 28 AWG           Acode Same         Valt 2 to 28 AWG           Storage Temp         -10 °C to 70 °C         14 °F to 158 °F           CC Power         -10 °C to 70 °C         14 °F to 158 °F           CP Ower         -10 °C to 70 °C         5 °F to 158 °F           Storage Temp         -15 °C to 70 °C         5 °F to 158 °F           Relative Humidity         0 to 100% condensing for (fron only); 0 to 95% non-condensin	Indicators	Two horizontal digit	al bar graphs, four LED relay status indicators		
Size         ¼ DIN           Aounting         Mounting           Panel         ¼ DIN, ribbed on four sides for panel mounting clip inside panel, silicon gasket included           Wall         Wall Mount enclosure (sold as an accessory)           Ferminal Blocks         Pulggable Screw Type           Use minimum 105 °C rated wire         Forger Strew Type           Power/Loop         0.49 Nm (4.4 lb-in.)           Freq/S <sup>2</sup> L         0.49 Nm (4.4 lb-in.)           Relay Module         0.49 Nm (4.4 lb-in.)           Freq/S <sup>2</sup> L         16 to 28 AWG           Relay Module Connector Wire Gauge         It to 28 AWG           Relay         12 to 28 AWG           Storage Temperature         It to 270 °C           CP Ower         -10 °C to 70 °C         14 °F to 158 °F           Storage Temp         -15 °C to 70 °C         5 °F to 158 °F           Relative Humidity         0 to 100% condensing for (front only): 0 to 95% non-condensing (rear pane	Update Rate	1 s			
Advanting         Valuantion           Panel         1/k DIN, ribbed on four sides for panel mounting clip inside panel, silicon gasket included           Wall         Wall Mount enclosure (sold as an accessory)           Ferminal Blocks         Use minimum 105 °C rated wire           Pluggable Screw Type         Use minimum 105 °C rated wire           Forque Ratings         0.49 Nm (4.4 lb-in.)           Freq/S <sup>1</sup> L         0.49 Nm (4.4 lb-in.)           Relay Module         0.49 Nm (4.4 lb-in.)           Connector Wire Gauge         0.49 Nm (4.4 lb-in.)           Power, Loop         12 to 28 AWG           Freq/S <sup>3</sup> L         16 to 28 AWG           Relay         12 to 28 AWG           Storage Temp         12 to 28 AWG           Environmental         V           VC Power         10 °C to 70 °C           14 °F to 188 °F         V           CP Power         10 °C to 70 °C           CP Power         10 °C to 70 °C           14 °F to 140 °F         Storage Temp           15 °C to 70 °C         14 °F to 140 °F           Storage Temp         15 °C to 70 °C         5 °F to 158 °F           CP Power         10 °C to 60 °C         14 °F to 140 °F           Storage Temp         15 °C to 70 °C         5 °F to 1	LCD Contrast	5 settings			
Panel¼ DIN, ribbed on four sides for panel mounting clip inside panel, silicon gasket includedWallWall Mount enclosure (sold as an accessory)Ferminal BlocksUse minimum 105 °C rated wirePluggable Screw TypeUse minimum 105 °C rated wireForque RatingsPower/LoopPower/Loop0.49 Nm (4.4 lb-in.)Freq/S'L0.49 Nm (4.4 lb-in.)Relay Module0.49 Nm (4.4 lb-in.)Relay Module0.49 Nm (4.4 lb-in.)Connector Wire GaugePower, LoopRelay Module Connector Wire Gauge12 to 28 AWGRelay Module Connector Wire Gauge12 to 28 AWGRelay Module Connector Wire Gauge12 to 28 AWGRelay12 to 28 AWGConvert I Convert I	Size	1/4 DIN			
Wall     Wall Mount enclosure (sold as an accessory)       Ferminal Blocks     Use minimum 105 °C rated wire       Pluggable Screw Type     Use minimum 105 °C rated wire       Torque Ratings     Power/Loop     0.49 Nm (4.4 lb-in.)       Freq/S <sup>1</sup> L     0.49 Nm (4.4 lb-in.)       Relay Module     0.49 Nm (4.4 lb-in.)       Relay Module     0.49 Nm (4.4 lb-in.)       Connector Wire Gauge     Power, Loop     12 to 28 AWG       Preq/S <sup>3</sup> L     16 to 28 AWG       Relay Module Connector Wire Gauge     Relay     12 to 28 AWG       Relay Module Connector Wire Gauge     Relay     12 to 28 AWG       Servironmental     Power, Loop     12 to 28 AWG       Connector Wire Gauge     Relay     12 to 28 AWG       Servironmental     Power     12 to 28 AWG       Conver     -10 °C to 70 °C     14 °F to 158 °F       OC Power     -10 °C to 60 °C     14 °F to 158 °F       OC Power     -10 °C to 60 °C     5 °F to 158 °F       Storage Temp     -15 °C to 70 °C     5 °F to 158 °F       Relative Humidity     0 to 100% condensing for (front only): 0 to 95% non-condensing (rear panel)       Maximum Attitude     4.000 m (13.123 ft)       Server     Soften Accuracy       Primarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the ensor electronics.   <	Mounting				
Terminal Blocks         Use minimum 105 °C rated wire           Poluggable Screw Type         Use minimum 105 °C rated wire           Forque Ratings         Power/Loop         0.49 Nm (4.4 lb-in.)           Freq/S°L         0.49 Nm (4.4 lb-in.)           Relay Module         0.49 Nm (4.4 lb-in.)           Connector Wire Gauge         Power, Loop         12 to 28 AWG           Freq/S°L         16 to 28 AWG           Freq/S°L         16 to 28 AWG           Relay Module Connector Wire Gauge         Relay         12 to 28 AWG           Relay Module Connector Wire Gauge         Relay         12 to 28 AWG           Store Twironmental         Relay         12 to 28 AWG           AC Power         Relay         12 to 28 AWG           Storage Temp         10 °C to 70 °C         14 °F to 158 °F           AC Power         -10 °C to 70 °C         5 °F to 158 °F           Storage Temp         -15 °C to 70 °C         5 °F to 158 °F           Relative Humidity         0 to 100% condensing for (front only): 0 to 95% non-condensing (rear panel)           Maximum Altitude         4.000 m (13.123 ft)           Storage Temp         -15 °C to 70 °C         5 °F to 158 °F           Storage Temp         -15 °C to 70 °C         5 °F to 158 °F           Relative Hu	Panel	1/4 DIN, ribbed on for	ur sides for panel mounting clip inside panel, silicon gasket included		
Construction         Use minimum 105 °C rated wire           Corque Ratings	Wall	Wall Mount enclosur	re (sold as an accessory)		
Power/Loop         0.49 Nm (4.4 lb-in.)           Freq/S <sup>3</sup> L         0.49 Nm (4.4 lb-in.)           Relay Module         0.49 Nm (4.4 lb-in.)           Relay Module         0.49 Nm (4.4 lb-in.)           Connector Wire Gauge         0.49 Nm (4.4 lb-in.)           Power, Loop         12 to 28 AWG           Freq/S <sup>3</sup> L         16 to 28 AWG           Relay         12 to 28 AWG           Storage Temperture         Conver           O1 °C to 70 °C         14 °F to 158 °F           AC Power         -10 °C to 70 °C         14 °F to 158 °F           Relative Humidity         0 to 100% condensing for (front only); 0 to 95% non-condensing (rear panel)           Maximum Altitude         4,000 m (13,123 ft)           Enclosure Rating         NEMA 4X/IP66 (front face only)           Performance Specification	Terminal Blocks				
Power/Loop0.49 Nm (4.4 lb-in.)Freq/SºL0.49 Nm (4.4 lb-in.)Relay Module0.49 Nm (4.4 lb-in.)Connector Wire GaugePower, Loop12 to 28 AWGFreq/SºL16 to 28 AWGRelay Module Connector Wire GaugeRelay12 to 28 AWGRelay12 to 28 AWGRelay12 to 28 AWGConnector Wire GaugeRelay12 to 28 AWGEnvironmental12 to 28 AWGAmbient Operating Temperature12 to 28 AWGDC Power-10 °C to 70 °C14 °F to 158 °FAC Power-10 °C to 60 °C14 °F to 140 °FAC Power-10 °C to 60 °C14 °F to 140 °FStorage Temp-15 °C to 70 °C5 °F to 158 °FRelative Humidity0 to 100% condensing for (front only): 0 to 95% non-condensing (rear panel)Maximum Altitude4,000 m (13,123 ft)Enclosure RatingNEMA 4X/IP65 (front face only)Performance SpecificationsPrimarily dependent upon the sensorSystem ResponsePrimarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics.Minimum update period is 100 ms	Pluggable Screw Type	Use minimum 105 °	°C rated wire		
Freq/S <sup>3</sup> L         0.49 Nm (4.4 lb-in.)           Relay Module         0.49 Nm (4.4 lb-in.)           Connector Wire Gauge            Power, Loop         12 to 28 AWG           Freq/S <sup>3</sup> L         16 to 28 AWG           Relay Module Connector Wire Gauge         Relay           Relay         12 to 28 AWG           CPOwer         -10 °C to 70 °C           At °F to 140 °F         14 °F to 140 °F           Relative Humidity         0 to 100% condensing for (front only); 0 to 95% non-condensing (rear panel)           Maximum Altitude         4,000 m (13,123 ft)           Enclosure Rating         NEMA 4X/IP65 (front facc only)           System Accuracy	Torque Ratings				
Relay Module         0.49 Nm (4.4 lb-in.)           Connector Wire Gauge         Power, Loop         12 to 28 AWG           Freq/S <sup>3</sup> L         16 to 28 AWG           Relay Module Connector Wire Gauge         12 to 28 AWG           Relay         12 to 28 AWG           Storemental         12 to 28 AWG           Ambient Operating Temperure         12 to 28 AWG           OC Power         -10 °C to 70 °C         14 °F to 158 °F           AC Power         -10 °C to 60 °C         14 °F to 158 °F           Relative Humidity         0 to 100% condensing for (front only); 0 to 95% non-condensing (rear panel)           Aaximum Attitude         4,000 m (13,123 ft)           Enclosure Rating         NEMA 4X/IP65 (front face only)           Performance Specifications         System Accuracy           System Accuracy         Primarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics.           Minimum update perior is 100 ms         100 ms		Power/Loop	0.49 Nm (4.4 lb-in.)		
Connector Wire Gauge         Power, Loop         12 to 28 AWG           Freq/S <sup>3</sup> L         16 to 28 AWG           Relay Module Connector Wire Gauge         Relay         12 to 28 AWG           Relay         12 to 28 AWG           Ambient Operating Temperature         12 to 28 AWG           OC Power         -10 °C to 70 °C         14 °F to 158 °F           AC Power         -10 °C to 60 °C         14 °F to 158 °F           Storage Temp         -15 °C to 70 °C         5 °F to 158 °F           Relative Humidity         0 to 100% condensing for (front only); 0 to 95% non-condensing (rear panel)           Aaximum Altitude         4,000 m (13,123 ft)           Enclosure Rating         NEMA 4X/IP65 (front face only)           Performance Specifications         Frianily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics.           System Response         Primarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics.		Freq/S <sup>3</sup> L	0.49 Nm (4.4 lb-in.)		
Power, Loop12 to 28 AWGFreq/S <sup>3</sup> L16 to 28 AWGRelay Module Connector Wire GaugeRelayRelay12 to 28 AWGEnvironmental12 to 28 AWGAmbient Operating Temperature12 to 28 AWGDC Power-10 °C to 70 °C14 °F to 158 °FAC Power-10 °C to 60 °C14 °F to 158 °FAC Power-15 °C to 70 °C5 °F to 158 °FRelative Humidity0 to 100% condensing for (front only); 0 to 95% non-condensing (rear panel)Maximum Altitude4,000 m (13,123 ft)Enclosure RatingNEMA 4X/IP65 (front face only)Performance Specifications:Primarily dependent upon the sensor.System AccuracyPrimarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics.Minimum update period is 100 ms100 ms		Relay Module	0.49 Nm (4.4 lb-in.)		
Freq/S³L         16 to 28 AWG           Relay Module Connector Wire Gauge         Relay         12 to 28 AWG           Relay         12 to 28 AWG         Relay           Invironmental         Image: Image	Connector Wire Gauge				
Relay Module Connector Wire Gauge         Relay       12 to 28 AWG         Environmental         Ambient Operating Temperature         DC Power       -10 °C to 70 °C       14 °F to 158 °F         AC Power       -10 °C to 60 °C       14 °F to 140 °F         Storage Temp       -15 °C to 70 °C       5 °F to 158 °F         Relative Humidity       0 to 100% condensing for (front only); 0 to 95% non-condensing (rear panel)         Maximum Altitude       4,000 m (13,123 ft)         Enclosure Rating       NEMA 4X/IP65 (front face only)         Performance Specifications:       System Accuracy         System Response       Primarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics.         Minimum update period is 100 ms       100 ms		Power, Loop	12 to 28 AWG		
Relay       12 to 28 AWG         Environmental       Ambient Operating Temperature         OC Power       -10 °C to 70 °C       14 °F to 158 °F         AC Power       -10 °C to 60 °C       14 °F to 140 °F         AC Power       -15 °C to 70 °C       5 °F to 158 °F         Storage Temp       -15 °C to 70 °C       5 °F to 158 °F         Relative Humidity       0 to 100% condensing for (front only); 0 to 95% non-condensing (rear panel)         Maximum Altitude       4,000 m (13,123 ft)         Enclosure Rating       NEMA 4X/IP65 (front face only)         Performance Specifications:       System Accuracy         Primarily dependent upon the sensor       Primarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics.         Minimum update period is 100 ms       100 ms		Freq/S <sup>3</sup> L	16 to 28 AWG		
Environmental         Ambient Operating Temperature         DC Power       -10 °C to 70 °C       14 °F to 158 °F         AC Power       -10 °C to 60 °C       14 °F to 140 °F         Storage Temp       -15 °C to 70 °C       5 °F to 158 °F         Relative Humidity       0 to 100% condensing for (front only); 0 to 95% non-condensing (rear panel)         Maximum Altitude       4,000 m (13,123 ft)         Enclosure Rating       NEMA 4X/IP65 (front face only)         Performance Specifications       System Accuracy         System Response       Primarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics.         Minimum update period is 100 ms       100 ms	Relay Module Connector W	Vire Gauge			
Ambient Operating Temperature         DC Power       -10 °C to 70 °C       14 °F to 158 °F         AC Power       -10 °C to 60 °C       14 °F to 140 °F         AC Power       -15 °C to 70 °C       5 °F to 158 °F         Storage Temp       -15 °C to 70 °C       5 °F to 158 °F         Relative Humidity       0 to 100% condensing for (front only); 0 to 95% non-condensing (rear panel)         Maximum Altitude       4,000 m (13,123 ft)         Enclosure Rating       NEMA 4X/IP65 (front face only)         Performance Specifications       System Accuracy         Primarily dependent upon the sensor       Primarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics.         Minimum update period is 100 ms       100 ms		Relay 12 to 28 AWG			
DC Power       -10 °C to 70 °C       14 °F to 158 °F         AC Power       -10 °C to 60 °C       14 °F to 140 °F         Storage Temp       -15 °C to 70 °C       5 °F to 158 °F         Relative Humidity       0 to 100% condensing for (front only); 0 to 95% non-condensing (rear panel)         Maximum Altitude       4,000 m (13,123 ft)         Enclosure Rating       NEMA 4X/IP65 (front face only)         Performance Specifications       Primarily dependent upon the sensor         System Accuracy       Primarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics.         Minimum update period is 100 ms       100 ms	Environmental				
AC Power       -10 °C to 60 °C       14 °F to 140 °F         Storage Temp       -15 °C to 70 °C       5 °F to 158 °F         Relative Humidity       0 to 100% condensing for (front only); 0 to 95% non-condensing (rear panel)         Maximum Altitude       4,000 m (13,123 ft)         Enclosure Rating       NEMA 4X/IP65 (front face only)         Performance Specifications       System Accuracy         Primarily dependent upon the sensor       Primarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics.         Minimum update period is 100 ms       100 ms	Ambient Operating Tempe	erature			
Storage Temp       -15 °C to 70 °C       5 °F to 158 °F         Relative Humidity       0 to 100% condensing for (front only); 0 to 95% non-condensing (rear panel)         Maximum Altitude       4,000 m (13,123 ft)         Enclosure Rating       NEMA 4X/IP65 (front face only)         Performance Specifications       Primarily dependent upon the sensor         System Accuracy       Primarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics.         Minimum update period is 100 ms       100 ms	DC Power	-10 °C to 70 °C	14 °F to 158 °F		
Relative Humidity       0 to 100% condensing for (front only); 0 to 95% non-condensing (rear panel)         Maximum Altitude       4,000 m (13,123 ft)         Enclosure Rating       NEMA 4X/IP65 (front face only)         Performance Specifications       Primarily dependent upon the sensor         System Accuracy       Primarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics.         Minimum update period is 100 ms       Minimum update period is 100 ms	AC Power	-10 °C to 60 °C	14 °F to 140 °F		
Maximum Altitude       4,000 m (13,123 ft)         Enclosure Rating       NEMA 4X/IP65 (front face only)         Performance Specifications       System Accuracy         System Accuracy       Primarily dependent upon the sensor         System Response       Primarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics.         Minimum update period is 100 ms       Minimum update period is 100 ms	Storage Temp	-15 °C to 70 °C 5 °F to 158 °F			
Enclosure Rating NEMA 4X/IP65 (front face only) Performance Specification System Accuracy Primarily dependent upon the sensor System Response Primarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics. Minimum update period is 100 ms	Relative Humidity	0 to 100% condensi	0 to 100% condensing for (front only); 0 to 95% non-condensing (rear panel)		
Performance Specifications         System Accuracy       Primarily dependent upon the sensor         System Response       Primarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics.         Minimum update period is 100 ms	Maximum Altitude	4,000 m (13,123 ft)			
System Accuracy         Primarily dependent upon the sensor           System Response         Primarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics.           Minimum update period is 100 ms	Enclosure Rating	NEMA 4X/IP65 (front face only)			
System Response Primarily dependent upon the sensor. Controller adds a maximum of 150 ms processing delay to the sensor electronics. Minimum update period is 100 ms	Performance Specification	ons			
sensor electronics. Minimum update period is 100 ms	System Accuracy	Primarily dependent upon the sensor			
	System Response				
Evistem response is tempored by the display rate system to consider and constituity for the		Minimum update period is 100 ms			
System response is tempered by the display rate, output averaging and sensitivity feature		System response is	System response is tempered by the display rate, output averaging and sensitivity feature		

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

# Specifications (continued)

Electrical Requirements			
Power to Sensors			
Voltage	+4.9 to 5.5 VDC @ 25 °C, regulated		
Current	30 mA Maximum		
Short Circuit	Protected		
Isolation	Low voltage (< 48 V AC/DC)		
Power Requirements			
DC (3-9950-1, 3-9950-2)	24 VDC nominal (12 to 32 VDC, $\pm$ 10% regulated), UL 60950-1 or UL 61010-1 Power Supply rated for operation at 4000 m altitude		
AC (3-9950-2)	100 to 240 VAC, 50 to 60 Hz, 24 VA		
Maximum current	200 mA (without optional relay module)*		
	500 mA (with optional relay module)*		
*The current draw of the other modules	s and the sensors are minimal		
Current Loop	12 to 32 VDC, ±10% regulated, 4 to 20 mA (30 mA max.)		
Overvoltage protection	48 Volt Transient Protection Device (for DC ONLY)		
Current limiting for circuit protection	n		
Reverse-Voltage protection			
Input Types			
Digital (S <sup>3</sup> L) or AC frequency			
4 to 20 mA input via the 8058 iGo S $$	ignal Converter		
Open collector			
pH/ORP input via the Digital (S <sup>3</sup> L) of	utput from the 2750 pH/ORP Sensor Electronics or 2751 pH/ORP Smart Sensor Electronics		
Conductivity/Resistivity via the Digita Sensor Electronics	al (S $^{3}$ L) output from the Direct Conductivity Module or 2850 Conductivity/Resistivity		
Sensor Types	Flow, pH/ORP, Conductivity/Resistivity, Pressure, Temperature, Level/Volume, Salinity, Dissolved Oxygen, Other (4 to 20 mA)		
Sensor Input Specifications			
Digital (S³L)	Serial ASCII, TTL level, 9600 bps		
Frequency Flow Sensors	0.5 to 1500 Hz		
Sensitivity (for coil type sensors)	80 mV @ 5 Hz, gradually increasing with frequency to 2.5 V		
Freq. Range (for square wave type sensors)	0.5 Hz to 1500 Hz @ TTL level input or open collector		
K-Factor Range	0.0001 to 9999999		
Accuracy	$\pm$ 0.5% of reading max error @ 25 °C		
Resolution	1 μs		
Repeatability	± 0.2% of reading		
Power Supply			
Rejection	No Effect ± 1 µA per volt		
Short Circuit	Protected		
Reverse Polarity	Protected		
Update Rate	odate Rate (1/frequency) + 100 ms		
Direct Conductivity Module - 3-9950	0.394-1 (and 3-9950.394-2 coming soon)		
Accuracy	Conductivity +/- 2% of Reading		
	Temperature 0.5 °C		
Resolution	Conductivity 0.1% of Reading		
	Temperature <0.2 °C		
Update Rate	2.5 Seconds Single Channel, 5 Seconds Dual Channel		
Compatible Electrodes	All GF Signet Sensors		

## Specifications (continued)

•			
Binary Input (3-9950.393-3)			
Input Voltage Range (without damage)	-5 VDC to 30 VDC (No operation below 0 VDC)		
Max. Current Rating	6.0 mA		
Max. Voltage Rating	30 VDC		
Maximum Input Voltage for signal "Off" (low or "0")	1.5 VDC		
Minimum Input Voltage for signal "On" (high or "1")	3.0 VDC		
Maximum Current Draw for Signal "0" (low)	≤ 500 µA DC		
Minimum Current Draw for Signal "1" (high)	500 µA		
Typical Current Draw for Signal "1" (high)	6.0 mA at 30 VDC, 4.8 mA at 24 VDC, 2.4 mA at 12 VDC, 1.0 mA at 5 VDC		
Current Loop Specifications			
Current Loop Out	ANSI-ISA 50.00.01 Class H (Passive, external voltage required)		
Voltage	12 to 32 VDC, $\pm 10\%$ regulated, UL 60950-1 or UL 61010-1 Power Supply rated for operation at 4000 m altitude		
Max. Impedance	250 Ω @ 12 VDC 500 Ω @ 18 VDC 750 Ω @ 24 VDC		
Span	3.8 to 21 mA		
Accuracy	± 32 μA max. error @ 25 °C @ 24 VDC		
Resolution	6 μA or better		
Temp. Drift	± 1 μA per °C		
Isolation	Low voltage (< 48 VAC/DC)		
Update Rate	100 mS nominal		
Zero	4.0 mA factory set; user programmable from 3.8 to 5.0 mA		
Full Scale	20.0 mA factory set; user programmable from 19.0 to 21.0 mA		
Power Supply Rejection	± 1 μA per V		
Actual Update Rate Determined by Sensor T	ype		
Short Circuit and Reverse Polarity Protected	Ŀ		
Adjustable Span, Reversible			
Error Condition	Selectable error condition 3.6 or 22 mA or None		
Test Mode	Increment to desired current (range 3.8 to 21.00 mA)		
Analog Outputs	2 Passive 4 to 20 mA Outputs in Base Unit or 2 or 4 passive current loops by optional module(s)		
Relay Specifications			
Dry-Contact Relays (3-9950.393-1, 3-9950	).393-2, and 3-9950.393-3)		
Туре	SPDT		
Form	С		
Max. Voltage Rating	30 VDC or 250 VAC		

#### Max. Current Rating Solid-State Relays (3-9950 393-2)

Туре	SPDT	
Form	С	
Max. Voltage Rating	30 VDC or 30 VAC	
Max. Current Rating	0.050 A resistive	
Hysteresis	Adjustable (absolute in Engineering Units)	
On Delay	9999.9 seconds (max)	
Cycle Delay	99999 seconds (max)	
Test Mode	Set On or Off	
Maximum Pulse Rate	0 to 300 pulses/minute	
Proportional Pulse	0 to 300 pulses/minute	
Volumetric Pulse Width	0.1 to 3200 s	
PWM Period	0.1 to 320 s	

5 A resistive

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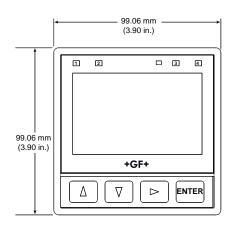
### **Specifications (continued)**

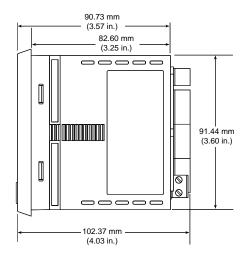
Display Ranges				
рН	-1.00 to 15.00 pH	-1.00 to 15.00 pH		
pH Temp.	-99 °C to 350 °C	-146 °F to 662 °F		
ORP	-1999 to +1999.9	-1999 to +1999.9 mV		
Flow Rate	-9999 to 99999 ur	-9999 to 99999 units per second, minute, hour or day		
Totalizer	0.00 to 99999999	units		
Conductivity	0.0000 to 99999 μ	ιS, mS, PPM and PPB (TDS), kΩ, MΩ		
Cond. Temp.	-99 °C to +350 °C	-146 °F to 662 °F		
Temperature	-99 °C to +350 °C	-146 °F to 662 °F		
Pressure	-40 to 1000 psi	-40 to 1000 psi		
Level	-9999 to +99999 r	-9999 to +99999 m, cm, ft, in, %		
Volume	0 to 99999 cm³, m³,	0 to 99999 cm³, m³, in³, ft³, gal, L, lb, kg, %		
Salinity	0 to 100 PPT	0 to 100 PPT		
Dissolved Oxygen	0 to 50 mg/L, 0 to	0 to 50 mg/L, 0 to 200%		
Shipping Weights				
Base Unit	0.63 kg	1.38 lb		
Relay Module	0.19 kg	0.41 lb		
Single Channel Module	0.075 kg	0.16 lb		
Dual Channel Module	0.075 kg	0.16 lb		
Standards and Approvals				
	CE, UL, CUL, FCC	CE, UL, CUL, FCC		
	DoUS Compliant (	Dolla Compliant China Dolla		

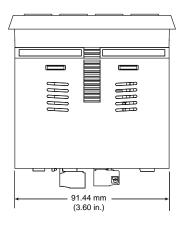
**RoHS Compliant, China RoHS** 

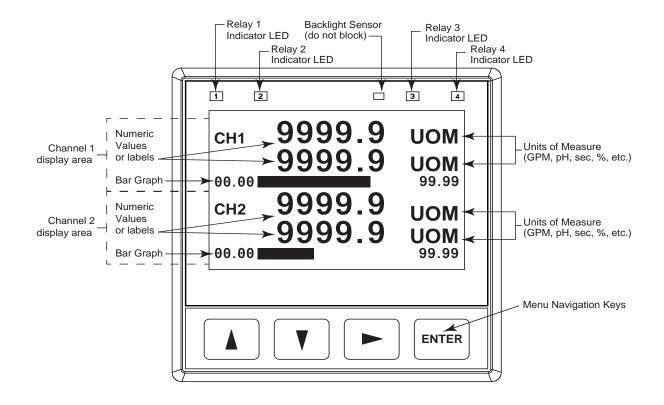
Manufactured under ISO 9001 and ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety

### **Dimensions**









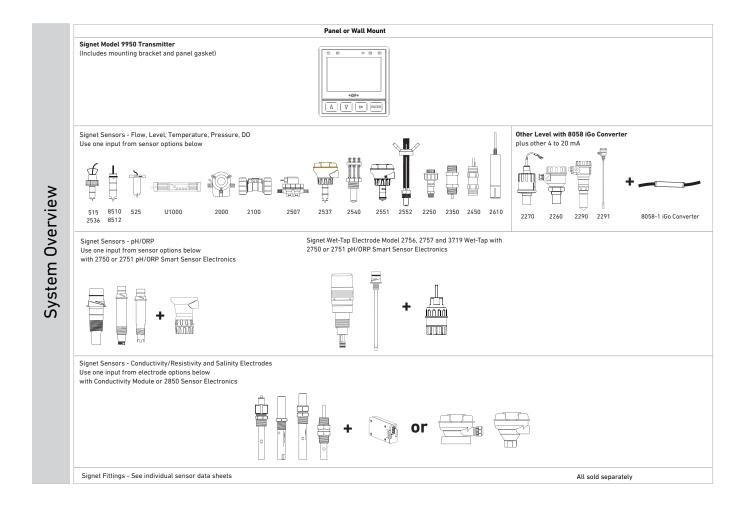
The 9950 is compatible with all GF Signet products listed in the column to the right.

- pH and ORP electrodes require the Signet 2750 or 2751 DryLoc<sup>®</sup> Sensor Electronics (sold separately).
- Conductivity/Resistivity or measurement requires the Signet 2850 Conductivity/Resistivity sensor electronics (sold separately).

Sensor Model	Freq Output	Digital (S <sup>3</sup> L) Output	Requires 8058
515/8510	X		
525	Х		
2000	Х		
2100	Х		
2250		X	
2350		X	
2450		X	
2507	Х		
2536/8512	Х		
2537-5		X	
2540	Х		
2551	Х	X	
2552	Х	X	
U1000	Х		X
U3000	Х		X
U4000	Х		X
2260			X
2270			X
2290			X
2291			X
2610-41		X	
2724-2726		X	
2734-2736		X	
2750, 2751		X	
2756-2757		X	
2764-2767		X	
2774-2777		X	
2819-2823		X	
2839-2842		X	
2850		X	

# Binary Input compatible sensors. For use with 3-9950.393-3 Relay Module

Sensor Model	Binary Input
2280	X
2281	X
2282	X
2284	X
2285	X



### **Ordering Information**

Mfr. Part No	Code	Description	
9950 Base Unit - Dual Channel, Multi-Parameter, AC Power and DC Power			
3-9950-1	159 001 841	9950 Base Unit – Two Channel Multi-Parameter Inputs, Two 4 to 20 mA Outputs, Panel Mount, DC Power	
3-9950-2	159 001 842	9950 Base Unit – Two Channel Multi-Parameter Inputs, Two 4 to 20 mA Outputs, Panel Mount, AC or DC Power	
Optional Accessory Modules			
3-9950.393-1	159 310 268	Relay Module with 4 Mechanical Relays	
3-9950.393-2	159 310 269	Relay Module with 2 Mechanical and 2 Solid State Relays	
3-9950.393-3	159 310 270	Relay Module with 2 Mechanical Relays and 4 Binary Inputs	
3-9950.394-1	159 001 846	Single Channel Direct Conductivity/Resistivity Module	
3-9950.398-2	159 001 848	Dual Channel 4 to 20 mA Current Loop Output Module	

### **Accessories and Replacement Parts**

<u> </u>	Mfr. Part No	Code	Description
	3-5000.399	198 840 224	5 x 5 inch Retrofit Adapter
	3-8050.392	159 000 640	CR200 ¼ DIN Retrofit Adapter
	3-8050.396	159 000 617	RC Filter Kit (for relay use), 2 per kit
3-5000.399	3-8058-1	159 000 966	i-Go® Signal Converter, wire-mount
9	3-9950.391	159 310 278	Connector Kit, In-Line, 9950 Transmitter
	3-9950.392	159 310 279	Relay Module Connector Kit, 9950 Transmitter
	3-9900.392	159 001 700	Wall Mount Enclosure Kit
	3-9000.392-1	159 000 839	Liquid Tight Connector Kit, NPT (1 pc.)
3-8050 392			

