

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 single or dual channel 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.

The 9950 Modbus Module allows for remote access to measurements, derived functions, state of current loop outputs and relays over a serial RS485 Modbus automation network.

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 and Dual Channel Direct Conductivity/Resistivity Modules
- 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
- Modbus Module for connections to Serial RS485 automation networks



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

| General | | |
|-----------------------------------|--|----------------------|
| Input Channels | Two frequency or S ³ L inputs, or optional direct conductivity modules, maximum of 2 channels | |
| Enclosure and Display | | |
| 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 | |
| Update Rate | 1 s | |
| LCD Contrast | 5 settings | |
| Size | ¼ DIN | |
| 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) | |
| Terminal Blocks | | |
| Pluggable Screw Type | Use minimum 105 °C rated wire | |
| Torque Ratings | | |
| | Power/Loop | 0.49 Nm (4.4 lb-in.) |
| | Freq/S ³ 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 ³ L | 16 to 28 AWG |
| 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 | 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 | |
| | 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, ±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 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 | |
| Reverse-Voltage protection | |
| Input Types | |
| Digital (S ³ L) or AC frequency | |
| 4 to 20 mA input via the 3-8058-1 iGo Signal Converter. | |
| Note: The 9950 is not compatible with the 3-8058-2 Dual Channel iGo device. | |
| Open collector | |
| pH/ORP input via the Digital (S ³ L) output from the 2750 pH/ORP Sensor Electronics or 2751 pH/ORP Smart Sensor Electronics | |
| Conductivity/Resistivity via the Digital (S ³ L) output from the Direct Conductivity Module or 2850 Conductivity/Resistivity Sensor Electronics. Note: The 9950 is not compatible with the 3-2850-63 Dual Channel Conductivity device | |
| Sensor Types | Flow, pH/ORP, Conductivity/Resistivity, Pressure, Temperature, Level/Volume, Salinity, Dissolved Oxygen, Other (4 to 20 mA) |
| Sensor Input Specifications | |
| Digital (S ³ L) | 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 | ± 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 | (1/frequency) + 100 ms |
| Direct Conductivity Module - 3-9950.394-1 (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, ±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 Type | | | |
| Short Circuit and Reverse Polarity Protected | | | |
| 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)

| | |
|---------------------|-------------------|
| Type | SPDT |
| Form | C |
| Max. Voltage Rating | 30 VDC or 250 VAC |
| Max. Current Rating | 5 A resistive |

Solid-State Relays (3-9950.393-2)

| | |
|------------------------|--|
| Type | SPDT |
| Form | C |
| 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 |

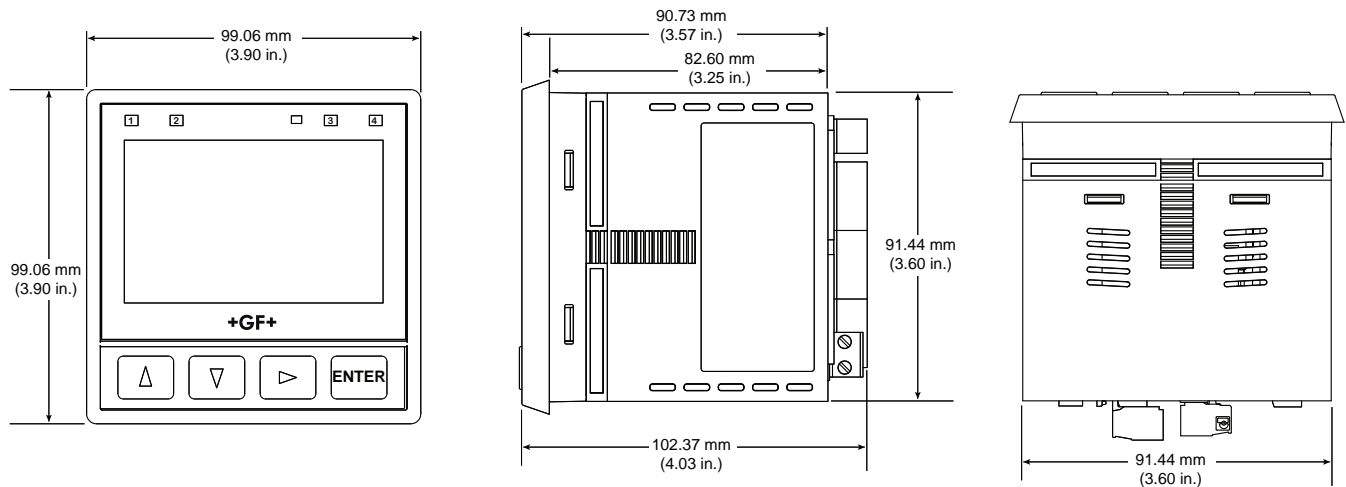
Specifications (continued)

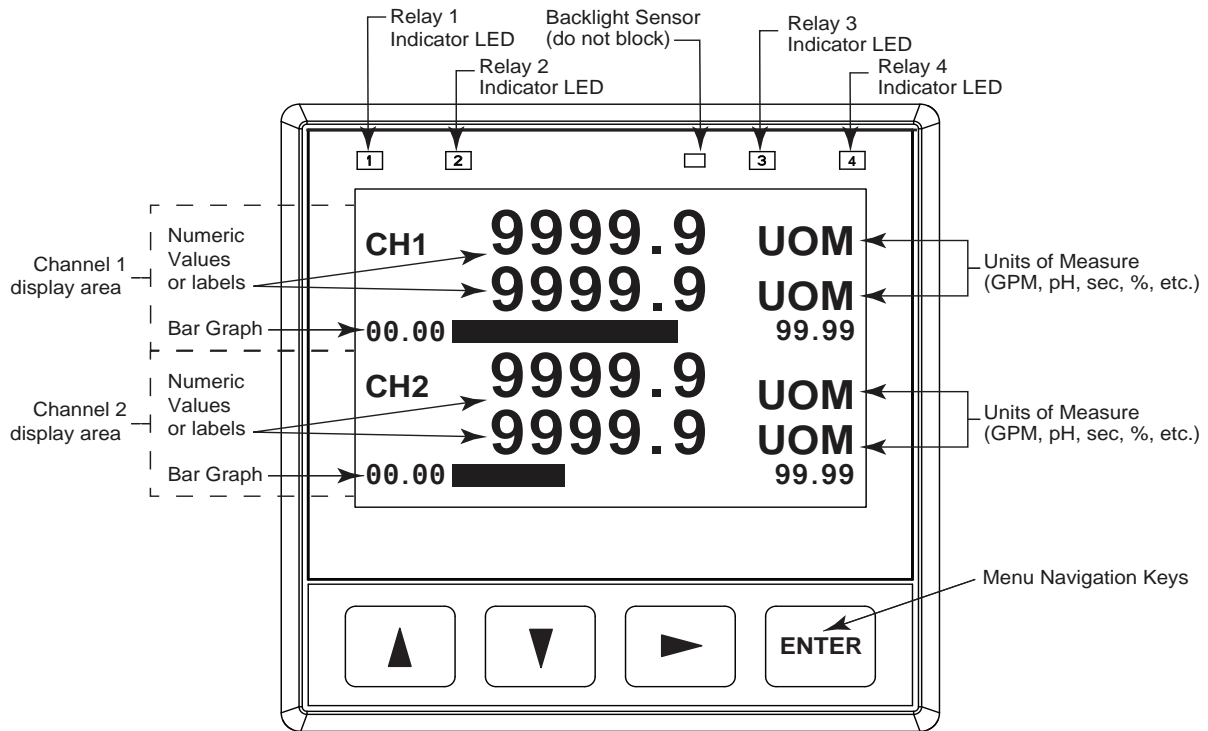
| Display Ranges | | |
|------------------|---|-------------------|
| pH | -1.00 to 15.00 pH | |
| pH Temperature | -99 °C to 350 °C | -146 °F to 662 °F |
| ORP | -1999 to +1999.9 mV | |
| Flow Rate | -9999 to 99999 units per second, minute, hour or day | |
| Totalizer | 0.00 to 99999999 units | |
| Conductivity | 0.0000 to 99999 µS, mS, PPM and PPB (TDS), kΩ, MΩ | |
| 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 | |
| Level | -9999 to +99999 m, cm, ft, in, % | |
| Volume | 0 to 99999 cm ³ , m ³ , in ³ , ft ³ , gal, L, lb, kg, % | |
| Salinity | 0 to 100 PPT | |
| Dissolved Oxygen | 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 |
| Modbus Module | 0.075 kg | 0.16 lb |

| Standards and Approvals | | |
|---|--|--|
| CE, UL, CUL, FCC | | |
| RoHS Compliant, China RoHS | | |
| Manufactured under ISO 9001 and ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety | | |

Dimensions



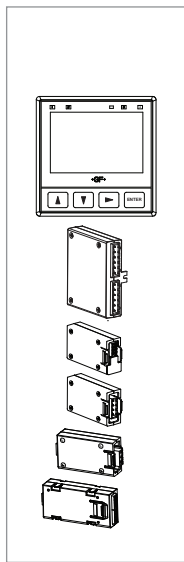


The 9950 is compatible with all GF Signet products listed in the column to the right.

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

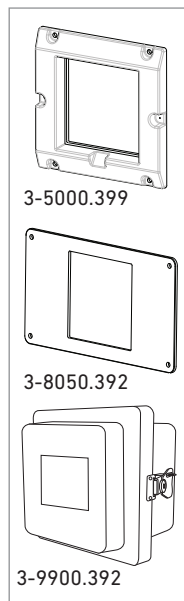
| Sensor Model | Freq Output | Digital (S ³ L) Output | Requires 8058 |
|--------------|-------------|-----------------------------------|---------------|
| 515/8510 | X | | |
| 525 | X | | |
| 2000 | X | | |
| 2100 | X | | |
| 2250 | | X | |
| 2350 | | X | |
| 2450 | | X | |
| 2507 | X | | |
| 2536/8512 | X | | |
| 2537-5 | | X | |
| 2540 | X | | |
| 2551 | X | X | |
| 2552 | X | X | |
| U1000 | X | | X |
| U3000 | X | | X |
| U4000 | X | | X |
| 2260 | | | X |
| 2270 | | | X |
| 2290 | | | X |
| 2291 | | | X |
| 2610-51 | | 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 | |

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 |
| 3-9950.394-2 | 159 001 847 | Dual Channel Direct Conductivity/Resistivity Module |
| 3-9950.395-M | 159 001 905 | Modbus Module |
| 3-9950.398-2 | 159 001 848 | Dual Channel 4 to 20 mA Current Loop Output Module |

Accessories and Replacement Parts



| 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 |
| 3-8058-1 | 159 000 966 | i-Go® Signal Converter, wire-mount |
| 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.) |