

9950 Dual Channel Transmitter



Top 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
- Relay Modules available with 2 or 4 relays and optional binary inputs
- Single and Dual Channel Direct Conductivity/Resistivity modules available
- Two, passive, 4 to 20 mA current loop outputs in base unit
- Dual Channel 4 to 20 mA current loop modules available to expand to 4 or 6 loop outputs
- Serial RS485 Modbus Module for connection to PLC and SCADA systems
- USB Port for Field Upgrades using standard USB Flash Drive

Ideal for

- Wastewater Treatment
- Reverse Osmosis
- Deionization
- Chemical Manufacturing/Addition
- Metal and Plastic Finishing
- Cooling Towers
- Media Filtration

Relay Module

- Three relay modules available, four mechanical relays, two mechanical and two solid state relays, or two mechanical relays and four binary inputs
- Interface up to four binary inputs
- 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



Dual Channel 4 to 20 mA Current Loop Module

- Up to six 4 to 20 mA current loops in one 9950
- Passive loops, requires external 12 to 24 VDC power



Single Channel Conductivity/Resistivity Module

- Two conductivity modules can be added for conductivity, resistivity or salinity measurements



Dual Channel Conductivity Module

- Monitor two different conductivities with a single module
- The module design allows for additional expansion opportunities with the 9950 such as additional current loop outputs or Modbus output



Modbus Module

- Connects the 9950 to existing modbus RTU, serial RS485, and automation networks
- Allows digital access to live measurement readings
- Simplifies the interfacing of the 9950 to automation networks



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 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

Multi-Parameter Instruments

Communication Protocol

Chlorine

Dissolved Oxygen

Flow

pH/ORP

Conductivity/Resistivity

Level

Temperature

Pressure

Other Products

Installation & Wiring

Technical Reference

Temperature/Pressure Graphs

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 8058 iGo Signal Converter	
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	
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	
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)		
Maximum Current Rating	6.0 mA		
Maximum 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		
Maximum 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		
Maximum Voltage Rating	30 VDC or 250 VAC		
Maximum Current Rating	5 A resistive		
Solid State Relays (3-9950.393-2)			
Type	SPDT		
Form	C		
Maximum Voltage Rating	30 VDC or 30 VAC		
Maximum 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		

Multi-Parameter Instruments

Communication Protocol

Chlorine

Dissolved Oxygen

Flow

pH/ORP

Conductivity/Resistivity

Level

Temperature

Pressure

Other Products

Installation & Wiring

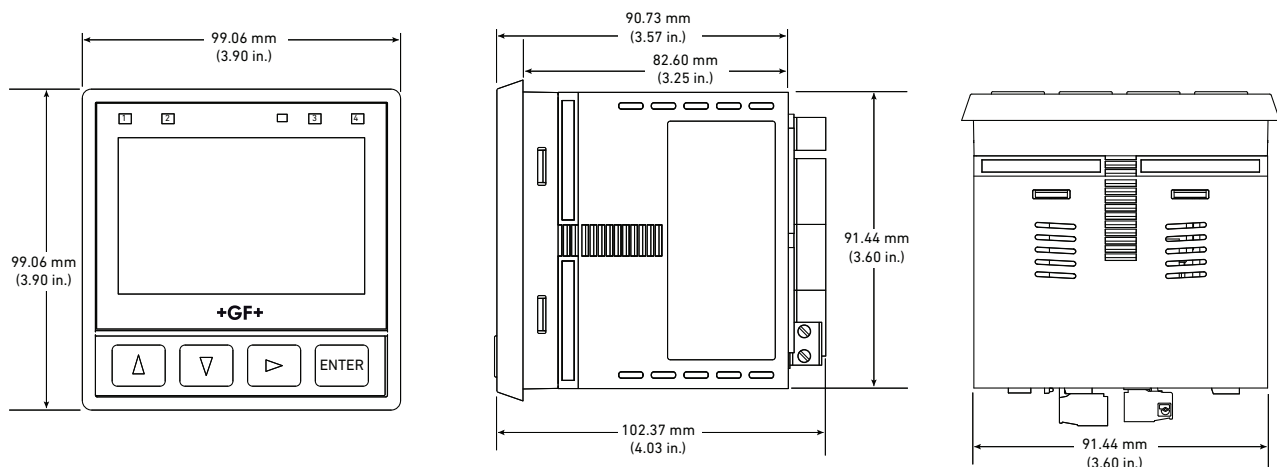
Technical Reference

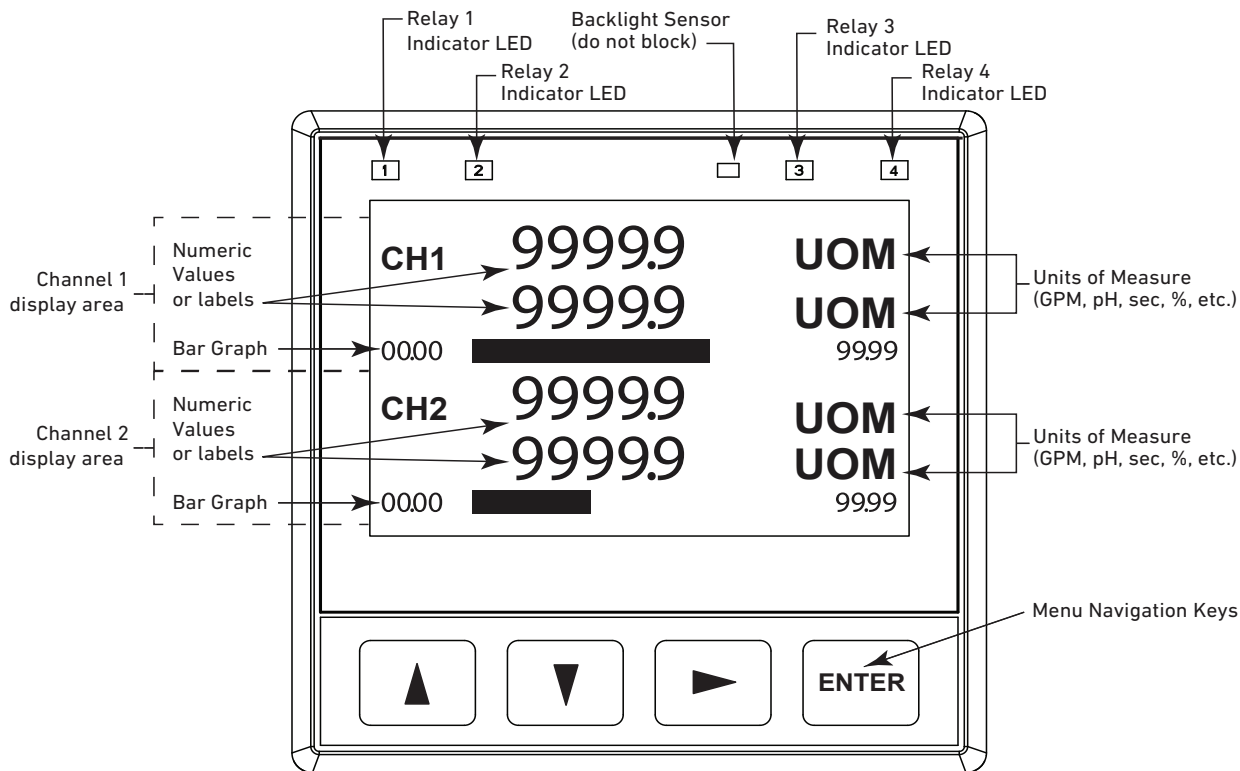
Temperature/Pressure Graphs

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	
Conductivity Temperature	-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.



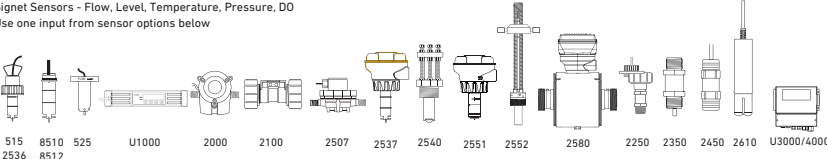
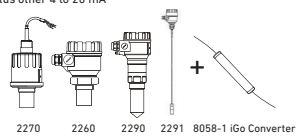
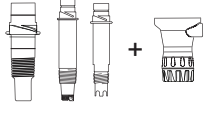
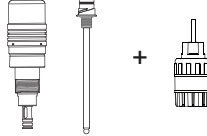

- pH and ORP electrodes require the Signet 2750 or 2751 DryLoc® Sensor Electronics (sold separately).
- Conductivity/Resistivity or measurement requires the Signet 2850 Conductivity/Resistivity sensor electronics (sold separately).

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	
2580	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	

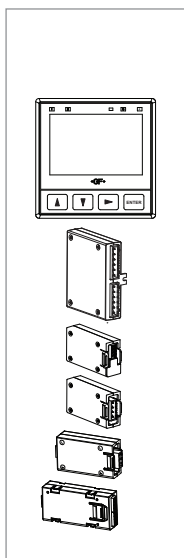
Binary Input compatible sensors. For use with
3-9950.393-3 Relay Module

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

System Overview

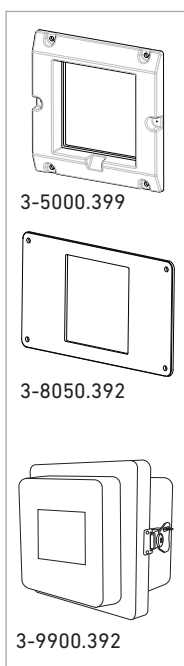
Panel or Wall Mount	Automation System
<p>Signet Model 9950 Transmitter (Includes mounting bracket and panel gasket)</p> 	<p>Signet Model 9950 Transmitter with Modbus Module and - PLC (Customer supplied)</p> 
<p>Signet Sensors - Flow, Level, Temperature, Pressure, DO Use one input from sensor options below</p> 	<p>Other Level with 8058 iGo Converter plus other 4 to 20 mA</p> 
<p>Signet Sensors - pH/ORP Use one input from sensor options below with 2750 or 2751 pH/ORP Smart Sensor Electronics</p> 	<p>Signet Wet-Tap Electrode Model 2756, 2757 and 3719 Wet-Tap with 2750 or 2751 pH/ORP Smart Sensor Electronics</p> 
<p>Signet Sensors - Conductivity/Resistivity and Salinity Electrodes Use one input from electrode options below with Conductivity Module or 2850 Sensor Electronics</p> 	
<p>Signet Fittings - See individual sensor data sheets All sold separately</p>	

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

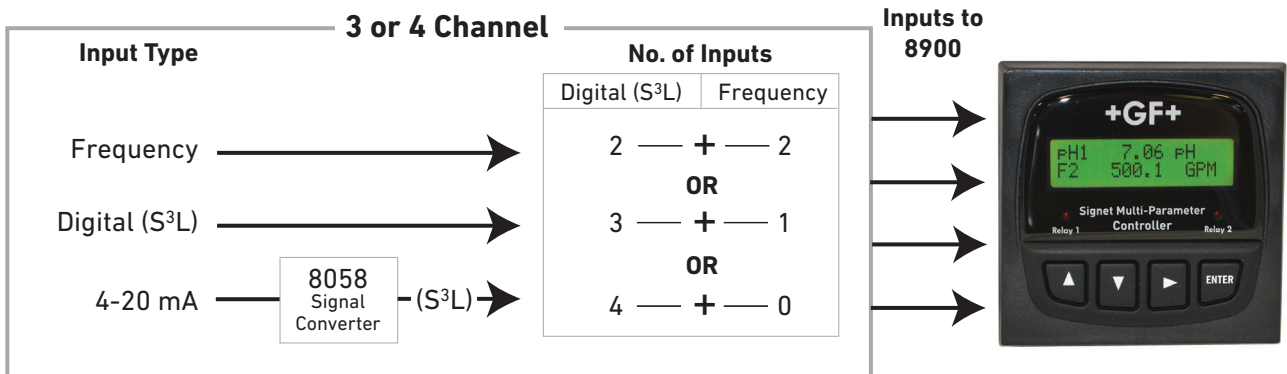
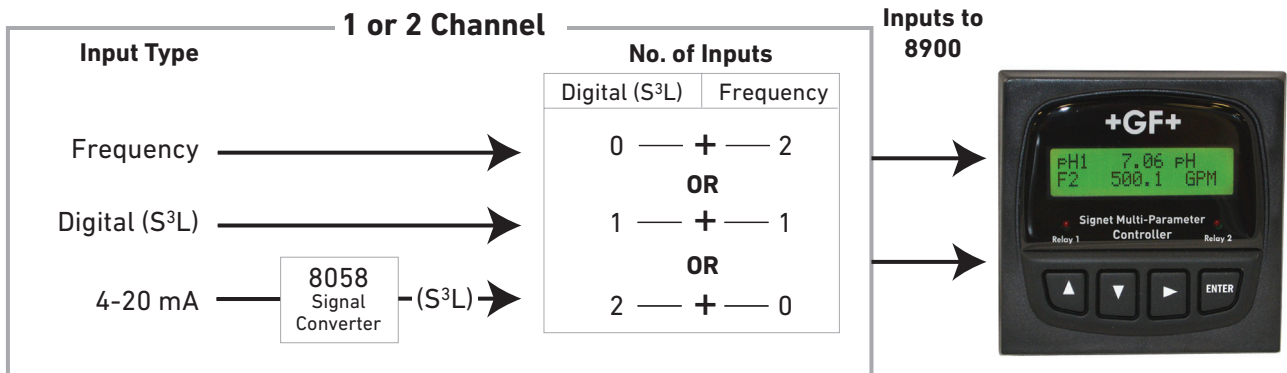


Mfr. Part No	Code	Description
3-5000.399	198 840 224	5 x 5 inch Retrofit Adapter
3-8050.392	159 000 640	CR200 ¼ DIN Retrofit Adapter
3-8050.396	159 000 617	RC Filter Kit (for relay use), 2 per kit
3-8058-1	159 000 966	i-Go® Signal Converter, wire-mount
3-9950.391	159 310 278	Connector Kit, In-Line, 9950 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.)

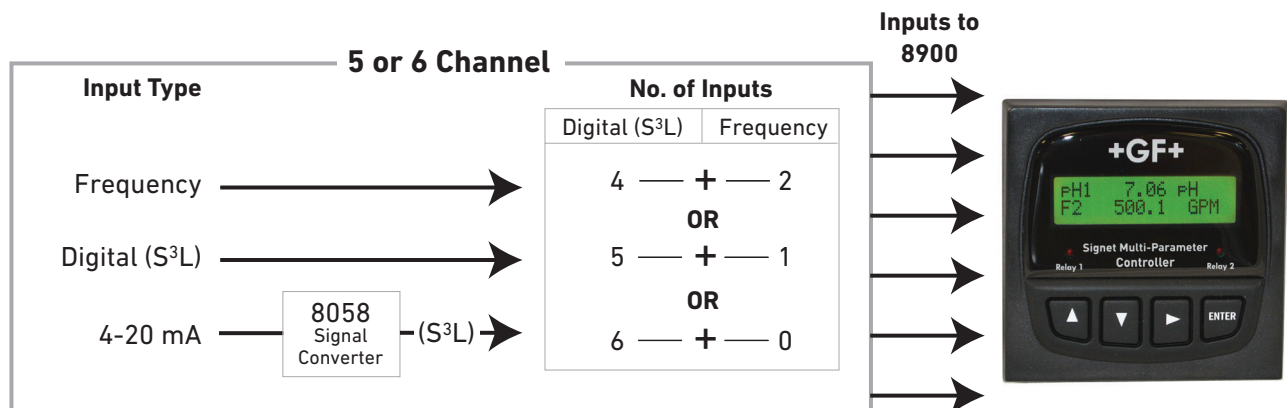


Signet 8900 Multi-Parameter Controller Input Capability

Flow pH ORP
 Conductivity Resistivity Level
 Temperature Pressure Other (4-20 mA)



Note: The digital (S³L) inputs can come directly from digital (S³L) sensors or 4-20 mA sensors whose signal has been converted to digital (S³L) via the 8058 Signal Converter.



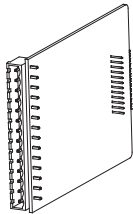
Note: The digital (S³L) inputs can come directly from digital (S³L) sensors or 4-20 mA sensors whose signal has been converted to digital (S³L) via the 8058 Signal Converter.

This chart is for reference only. Please contact your local Georg Fischer Sales Office for more information.

Signet 8900 Multi-Parameter Output Capability



8900 I/O Module with 2 Analog Outputs

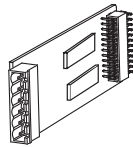


3-8900.401-X

Choose from:

- Passive Current
- Active Current
- 0 to 5/10 VDC

8900 Analog Output Module with 2 Outputs

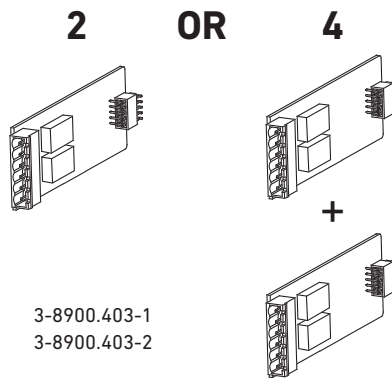


3-8900.405-X

Choose from:

- Passive Current
- Active Current
- 0 to 5/10 VDC

8900 Relay Module with up to 4 Internal Relay Outputs

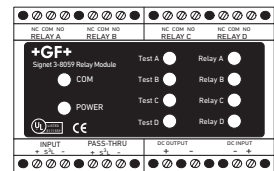


3-8900.403-1
3-8900.403-2

Choose from:

- Dry Contact
- Solid State

8900 Module with External 4-Relay Module



3-8059-4
3-8059-4AC

Multi-Parameter Instruments

Communication Protocol

Chlorine

Dissolved Oxygen

Flow

pH/ORP

Conductivity/Resistivity

Level

Temperature

Pressure

Other Products

Installation & Wiring

Technical Reference

Temperature/Pressure Graphs

This chart is for reference only. Please contact your local Georg Fischer Sales Office for more information.

Signet 8900 Multi-Parameter Controller

Member of the ProcessPro® Family of Instruments



The Signet 8900 Multi-Parameter Controller takes the concept of modularity to the extreme. Each 8900 is field commissioned with the users specified combination of inputs, outputs, and relays using simple-to-install modular boards into the base unit. Configure the system by selecting either four or six input channels which accepts any of the Signet sensors listed below, and/or other manufacturer's sensors via a 4 to 20 mA signal converter (Signet Model 8058). To complete your unit, choose a power module with universal AC line voltage or 12 to 24 VDC $\pm 10\%$, regulated.

If more features are needed, analog output and relay modules are available and easily installed. Plus, the 8900 will support four additional relays via an external relay module. There are other notable features that the 8900 offers. For instance, digital input to the 8900 enables longer cable runs and simplified wiring with minimal noise interference. Advanced relay logic allows users to select up to 3 measurement sources to trigger 1 relay. Derived measurements include difference, sum, ratio, percent recovery, percent rejection, percent passage and BTU. The menu system can be programmed to display in multi-languages including English, German, French, Spanish, Italian, and Portuguese.

Features

- Measures Flow, pH, ORP, Conductivity, Pressure, Level and Temperature
- Multi-language display
- ¼ DIN enclosure
- Up to 4 analog outputs
- Up to 8 relays
- 12 to 24 VDC or 100 to 240 VAC $\pm 10\%$, regulated power
- Digital communication allows for extended cable lengths and easy wiring
- Accepts 3rd party 4 to 20 mA output devices when used with 8058 signal converter
- Available with 4 to 6 channels
- Simultaneous BTU Calculations with Heating & Cooling Totalizers per calculation



Applications

- RO/DI System Control
- Media Filtration
- Pure Water Production
- Demineralizers
- Chemical Processing
- Metal & Plastics Finishing
- Fume Scrubbers
- Proportional Chemical Addition
- Cooling Tower & Boiler Protection
- Wastewater Treatment
- Aquatic Animal Life Support Systems
- Rinse Tank

Specifications

General		
Compatibility	Modular (completely field-commissionable)	
No. of Input Channels	2, 4, or 6	
Compatible Sensors	See System Overview	
Input Signal Types	Digital (S ³ L)	Serial ASCII, TTL level 9600 bps
	Frequency	0.5% of reading
Measurement Types	Flow, pH, ORP, Conductivity/Resistivity, Pressure, Temperature, Level, or 3 rd party devices with a 4 to 20 mA output	
Derived Measurements	Sum, difference, ratio, % recovery, % reject, % passage, power (BTU)	
No. of Relays Supported	Available: 2, 4, 6 or 8 (8 dry contact or 4 solid state and 4 dry- contact)	
No. of Analog Outputs	Available in pairs: 2 or 4 (active and/or passive 4 to 20 mA); and/or 2 (0 to 5/10 VDC)	
Enclosure and Display		
Enclosure Rating	NEMA 4X/IP65 (front face only)	
Case Material	PBT	
Panel Gasket	Silicone Sponge	
Window	Self-healing polyurethane-coated polycarbonate	
Keypad	4-buttons, highly tactile and audible injection-molded silicone rubber seal	
Display	Alphanumeric 2 x 16 back-lit LCD	
Update Rate	1 second	
Accuracy	Sensor dependent	
LCD Contrast	4 settings	
Languages Available	English, French, Spanish, German, Italian and Portuguese	
Display Ranges (see sensor specifications for actual measurement limits)		
pH	-2.00 to 15.00 pH	
pH Temperature	-40 °C to 150 °C	-40 °F to 302 °F
ORP	-9999 to +9999 mV	
Flow Rate	0.0000 to 999999 units per second, minute, hour or day	
Totalizer	0.00 to 99999999 units	
Conductivity	0.0000 to 999999 µS, mS, PPM & PPB (TDS), kΩ, MΩ	
Conductivity Temperature	-99.9 °C to 250 °C	-148 °F to 482 °F
Temperature	-99.9 °C to 999.9 °C	-148 °F to 999.9 °F
Pressure	-99.99 to 9999 psi, kPa, bar	
Level	-99999 to 99999 m, cm, ft, in., %	
Volume	-99999 to 999999 m ³ , ft ³ , in ³ , cm ³ , gal, L, kg, lb, %	
Other (4 to 20 mA)	-99999 to 999999 user selectable units	
Environmental		
Ambient Operating Temperature		
Backlit LCD	-10 °C to 55 °C	14 °F to 131 °F
Storage Temperature	-15 °C to 80 °C	5 °F to 176 °F
Relative Humidity	0 to 95%, non-condensing	
Maximum Altitude	2,000 m (6,560 ft)	
	4,000 m (13,123 ft); use only DC power supply and, if applicable, solid state relays to maintain UL safety standard up to this altitude	

Multi-Parameter Instruments

Communication Protocol

Chlorine

Dissolved Oxygen

Flow

pH/ORP

Conductivity/Resistivity

Level

Temperature

Pressure

Other Products

Installation & Wiring

Technical Reference

Temperature/Pressure Graphs

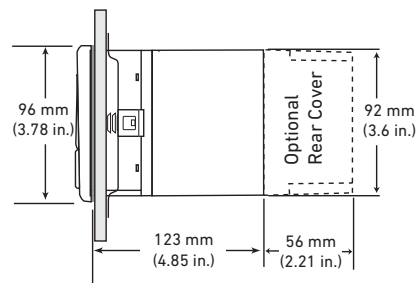
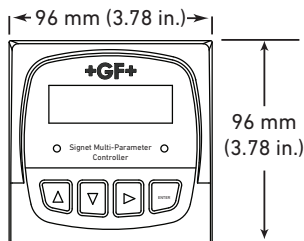
Specifications (continued)

Electrical			
Power Requirements (AC or DC via Power Modules)			
Universal AC	100 to 240 VAC $\pm 10\%$, regulated 50-60 Hz, 24 VA max.		
DC	12 to 24 VDC, $\pm 10\%$, regulated recommended, 7 Watts max.		
Output Power to Sensors	5 VDC up to 40 mA total		
Terminal type	Screw-clamp, removable via plug-in modules		
Analog Outputs (via I/O Modules and Output Modules) All analog outputs are freely assignable to any channel.			
4 to 20 mA Output	Endpoints are adjustable and reversible		
Minimum Default	4.0 mA; user adjustable from 3.8 to 5.0 mA		
Maximum Default	20.00 mA; user adjustable from 19.0 to 21.0 mA		
Test Mode	Produces an adjustable 4 to 20 mA signal for functional verification of each output circuit		
Isolation	Up to 48 VAC/DC		
Error Condition	22.1 mA (default state when output source not configured)		
Update Rate	100 ms		
Accuracy	$\pm 32 \mu\text{A}$ over entire operating temperature range		
Passive 4 to 20 mA (External Power required)			
Voltage	12 to 24 VDC, $\pm 10\%$, regulated		
Maximum Impedance	250 Ω @ 12 VDC	500 Ω @ 18 VDC	750 Ω @ 24 VDC
Active 4 to 20 mA (Internally Loop Powered)			
Maximum Impedance	750 Ω		
0 to 5/10 VDC Output	Endpoints are adjustable and reversible		
Output Range	0 to 5 VDC or 0 to 10 VDC, software selectable		
Minimum Default	0 VDC; user programmable from 0 to 0.5 VDC		
Maximum Default	5 VDC; user programmable from 4.5 to 5.5 VDC, or 9.5 to 10.5 VDC		
Output Load	10 k Ω minimum		
Test Mode	Produces an adjustable signal for functional verification of each output circuit		
Isolation	Up to 48 VAC/DC		
Error Condition	0 VDC (default state when output source not configured)		
Update Rate	100 mS		
Accuracy	$\pm 20 \text{ mV}$ over entire operating temperature range		
Resolution	5 mV		
Power Supply Rejection	0.5 mV/V		
Relay Modules All relays are freely assignable to any channel.			
Internal relay modes of operation	Off, Low, High, Window, Proportional Pulse, Pulse Width Modulation, USP, Volumetric, Pulse, Totalizer Volume, Advanced, % Rejection, % Recovery, % Passage		
External relay modes of operation	Off, Low, High, Window, USP, Totalizer Volume, Advanced, % Rejection, % Recovery, % Passage		
Hysteresis	User adjustable		
Time Delay	0 to 6400 seconds		
Advanced Relay	Use "AND/OR" logic along with relay sources to trigger a relay. High/Low modes available for each of the 3 sources		
Solid State Relays	Non-mechanical switches		
Normally Open/Closed Operation	Software selectable		

Specifications (continued)


Relay Modules continued		
Maximum Voltage Rating	30 VDC or 42 VAC p-p	
Current Rating	50 mA DC or 50 mA AC RMS	
On-state Impedance	30 Ω or less	
Off-state Leakage	400 nA or less, AC or DC	
Isolation	Up to 48 VAC/DC	
Transient Protection	Embedded, up to 48 V over-voltage	
Dry Contact Relays	Mechanical contacts	
Type	SPDT	
Form	C	
Maximum Pulse Rate	600 pulses/min. (volumetric pulse & PWM modes) 400 pulses/min. (prop. pulse mode)	
Maximum Voltage Rating	30 VDC or 250 VAC	
Current Rating	5 A	
Shipping Weight		
Base Unit	1.00 kg	2.25 lb
Power Module	0.12 kg	0.25 lb
I/O Module	0.12 kg	0.25 lb
Output Module	0.12 kg	0.25 lb
Relay Module	0.12 kg	0.25 lb
Standards and Approvals		
	CE, UL, FCC	
	RoHS compliant, China RoHS	
	Manufactured under ISO 9001 for Quality and ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety	

Dimensions

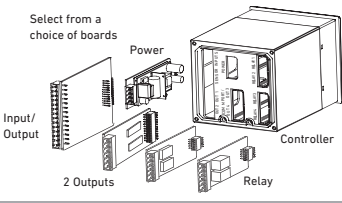


Panel Mount

**Signet 8900
Multi-Parameter Controller**

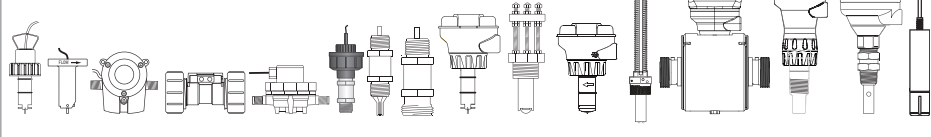


Select from a choice of boards



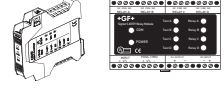
Signet Sensors
Use up to 6 inputs with one instrument from a choice of sensors

515	525	2000	2100	2250	2350
2450	2507	2536	2537	2540	2551
2552	2580	2610	2751	2850	U1000/U3000/U4000



Signet Fittings - See individual sensor data sheets

**Signet Signal Converter/
Relay Module**
8058
8059

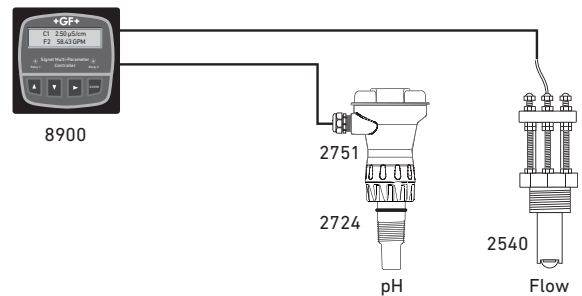


All sold separately

There are hundreds of system types that can be set up with the 8900. The examples below illustrate various sensors in different installation schemes. Wiring topology for point-to-point, daisy-chain, multi-drop, or a combination of these are listed in each example. Digital sensor outputs allow for long cable runs with high noise immunity. See Wiring section for allowable cable lengths.

Example 1

- 8900 input module: Two inputs
- Sensors connected: Signet 2751 with 2724 pH sensors and 2540 flow (frequency)
- Wiring configuration: Point-to-point

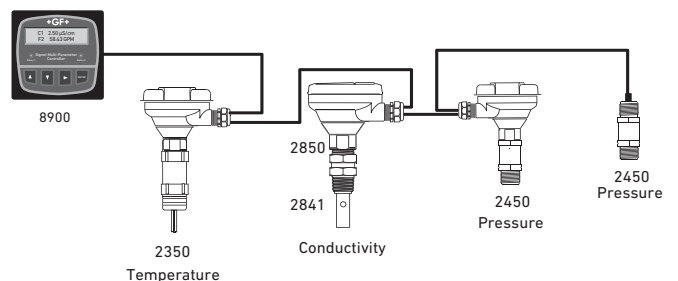


Notes

1. External relays can be used with any input module and does not consume a sensor input channel (Model 8059)
2. Model 8058 Signal Converter can be used with any input module

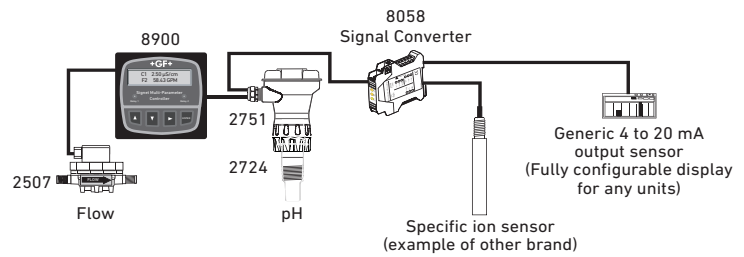
Example 2

- 8900 input module: Four inputs
- Sensors connected: Signet 2350 temperature sensor, 2850 with 2841 conductivity, and two 2450 pressure sensors
- Wiring configuration: Daisy-chain



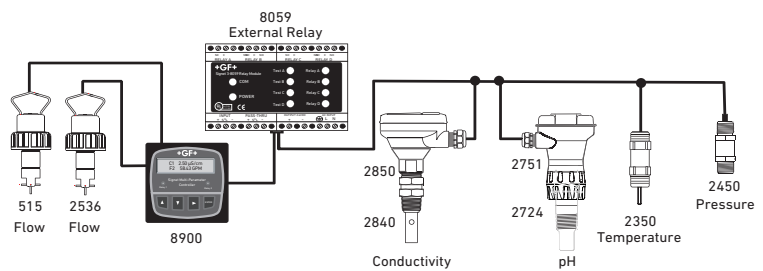
Example 3

- 8900 input module: Four inputs
- Sensors connected: Signet 2507 flow (frequency) and 2751 with 2724 pH sensors; Other manufacturers' dissolved oxygen and level sensors with 4 to 20 mA output
- External devices: Signet 8058 signal converter - 4 to 20 mA to digital (S³L)
- Wiring configuration: Combination of point-to-point and daisy-chain



Example 4

- 8900 input module: Six inputs
- Sensors connected: Signet 2350 temperature sensor, 2850 with 2840 conductivity, 2450 pressure, 2751 with 2724 pH, and 515 and 2536 flow (frequency) sensors
- External devices: Signet 8059 external relay module
- Wiring configuration: Combination of point-to-point and Multi-drop



Wiring Options

- **Point-to-point** wiring is direct wiring of individual devices into the controller. This wiring topology is applicable for all inputs.
- **Daisy-chain** wiring allows sequential connection from one device to the next by using junction boxes. This wiring topology is applicable for digital (S³L) inputs only.
- **Multi-drop** wiring allows drops from a single bus cable. Junction boxes can be used for the 3-way junctions that are formed with this wiring scheme. This wiring topology is applicable for digital (S³L) inputs only.

Please refer to Wiring, Installation, and Accessories sections for more information.

Installation of Modules with the Base Unit

3-8900

One base unit is required to build a functional 8900. It is offered with a backlit LCD display. Programming the unit is done simply via the push-button keypad.

The unit can be tailored to display in English, German, French, Spanish, Italian, and Portuguese. The two line display allows for easy programming, navigation, and viewing of each channel.

1. I/O module

One I/O module is required to build a functional 8900. I/O modules are offered for 2, 4, or 6 sensor inputs with or without two mA or voltage outputs. Users can select two additional outputs via the output module.

2. Power module

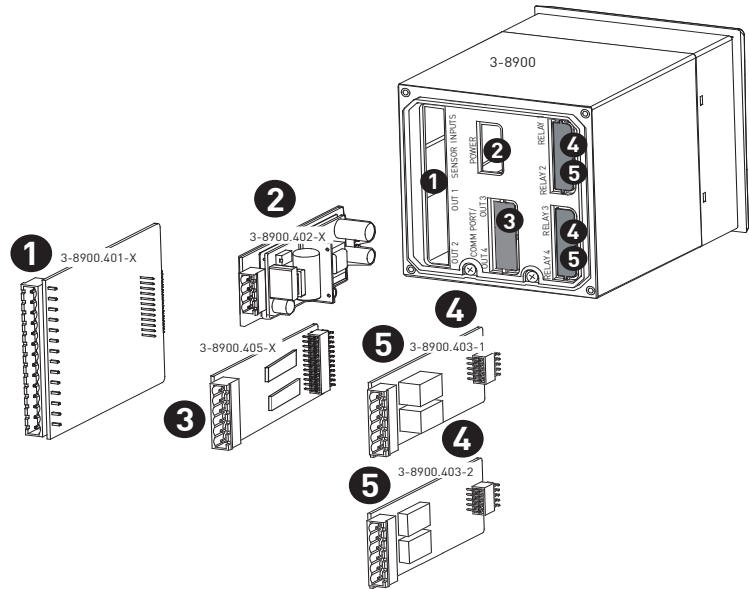
One power module is required to build a functional 8900. The power module is offered for universal 100/240 VAC or 12 to 24 VDC. This module can be powered by optional external relays (see ordering information for more details).

3. Output module

Output modules are optional when building an 8900. This module can be used in addition to other outputs that are available in the I/O modules. Active current is powered by the 8900. Passive outputs require an external 12 to 24 VDC power supply. All outputs are assignable to any input channel.

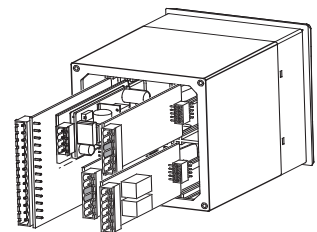
4. & 5. Relay modules

Relay modules are optional when building an 8900. Relay modes of operation include off, low, high, window, USP, totalizer volume, advanced, proportional pulse, pulse width modulation, volumetric pulse, % reject, % recovery and % passage. The advanced relay option for "AND/OR" logic is used for up to 3 conditions. For instance, a relay will go to high/low if "a" is true and "b" or "c" is false. One or two relay modules can be installed into the 8900. One additional external relay module can also be used at the same time (See optional external relay ordering information.) All relays are assignable to any input channel.



Installation of Modules:

Modules simply plug in by sliding into the base unit on rails. They are held securely in place by the rear cover. Changes and upgrades can be made in the field at any time.

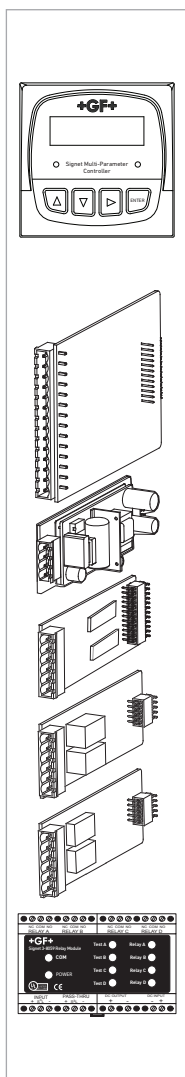


Ordering Notes

- 1) Building a functional unit requires a base unit, I/O module, and power module.
- 2) Output options are available on I/O modules and additional output modules can be used. The 8900 can support up to four outputs.
- 3) The 8900 can support up to eight relays. Up to two internal relay modules can be used simultaneously; additional external relays can also be used.
- 4) A maximum total of two frequency sensors can be used with any input card.
- 5) A total of six digit inputs or four digital inputs with two frequency inputs can be used.
- 6) The 8900 boards are field replaceable.
- 7) The 8900 can be reconfigured with new sensor types by simple reprogramming.

Ordering Information

To build a functional 8900 controller, choose the base unit, power module, and input/output (I/O) module. Additional outputs and relays are available, if needed.



Base Units, Required		
3-8900	159 000 868	Base unit with back-lit LCD
I/O (input/output) Modules, Required; Choose One		
3-8900.401-1	159 000 870	Dual (2) Input (no outputs)
3-8900.401-2	159 000 871	Dual (2) Input with Two Passive* Loop Outputs
3-8900.401-3	159 000 872	Dual (2) Input with Two Active Loop Outputs
3-8900.401-4	159 000 873	Dual (2) Input with Two Voltage Outputs
3-8900.401-5	159 000 874	Quad (4) Input (no outputs)
3-8900.401-6	159 000 875	Quad (4) Input with Two Passive* Loop Outputs
3-8900.401-7	159 000 876	Quad (4) Input with Two Active Loop Outputs
3-8900.401-8	159 000 877	Quad (4) Input with Two Voltage Outputs
3-8900.401-9	159 000 968	Six Inputs (no outputs)
3-8900.401-11	159 000 970	Six Inputs with Two Active Loop Outputs
Power Modules, Required; Choose One		
3-8900.402-1	159 000 878	110/220 VAC Power Module, ±10%, regulated
3-8900.402-2	159 000 879	12 to 24 VDC Power Module, ±10%, regulated
Optional Output Modules - Choose One		
3-8900.405-1	159 000 883	Two Passive* Current Loop Outputs
3-8900.405-2	159 000 884	Two Active Current Loop Outputs
Optional Relay Modules - Choose One or Two		
3-8900.403-1	159 000 880	Two Dry Contact Relays
3-8900.403-2	159 000 881	Two Solid State Relays
Optional External Relays - Choose One**		
3-8059-4	159 000 772	Four Dry Contact Relays; requires 12 to 24 VDC ±10%, regulated
3-8059-4AC	159 000 773	Four Dry Contact Relays; requires 100 to 240 VAC ±10%, regulated; supplies power to the 12 to 24 VDC ±10%, regulated power host device

* Passive outputs require an external power source

** See individual product page for the 8059 External Relay Modules.

Accessories and Replacement Parts

Mfr. Part No.	Code	Description
Mounting		
3-8050.392	159 000 640	¼ DIN Retrofit Adapter
3-8050.395	159 000 186	Splashproof Rear Cover
3-0000.596-1	159 000 892	¼ DIN Wall Mount Bracket, 6½ in. (use if no rear cover is installed)
3-0000.596-2	159 000 893	¼ DIN Wall Mount Bracket, 9 in. (use if rear cover is installed)
3-5000.399	198 840 224	Panel Adapter, 5 x 5 in. to ¼ DIN
3-5000.598	198 840 225	Surface Mount Bracket
3-9900.396	159 001 701	Angle Adjustment Adapter Kit
Power Supplies		
7310-1024	159 873 004	24 VDC Power Supply, 10W, 0.42 A,
7310-2024	159 873 005	24 VDC Power Supply, 24W, 1.0 A
7310-4024	159 873 006	24 VDC Power Supply, 40W, 1.7 A
7310-6024	159 873 007	24 VDC Power Supply, 60W, 2.5 A
7310-7024	159 873 008	24 VDC Power Supply, 96W, 4.0 A
Miscellaneous		
3-8050.396	159 000 617	RC Filter Kit (for relay use), 2 per kit