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 two, 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 ±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 ±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 2 to 6 channels**
- **Simultaneous BTU Calculations with Heating & Cooling Totalizers per calculation**

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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^3L)	Serial ASCII, TTL level 9600 bps	
	Frequency	0.5% of reading	
Measurement Types		Flow, pH, ORP, Conductivity/Resistivity, Pressure, Temperature, Level, or 3rd 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	

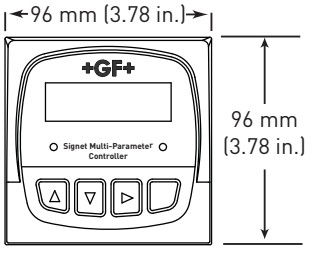
Specifications (continued)

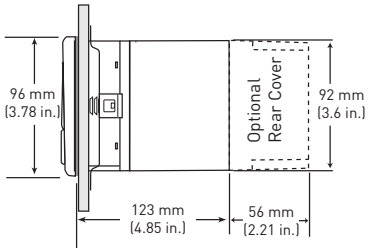
Electrical			
Power Requirements (AC or DC via Power Modules)			
Universal AC	100 to 240 VAC ±10%, regulated 50-60 Hz, 24 VA max.		
DC	12 to 24 VDC, ±10%, regulated recommended, 7 Watts max.		
Output Power to Sensors	5 VDC up to 40 mA total		
Terminal type	Screw-clamp, removable via plug-in modules		
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	±32 µA over entire operating temperature range		
Passive 4 to 20 mA			
Voltage	12 to 24 VDC, ±10%, regulated		
Max. Impedance	250 Ω @ 12 VDC	500 Ω @ 18 VDC	750 Ω @ 24 VDC
Active 4 to 20 mA			
Max. 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 kΩ 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	±20 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, ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety.	

Dimensions

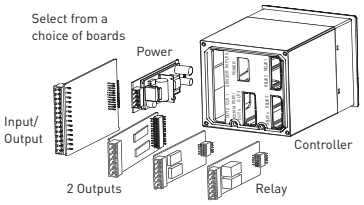




System Overview

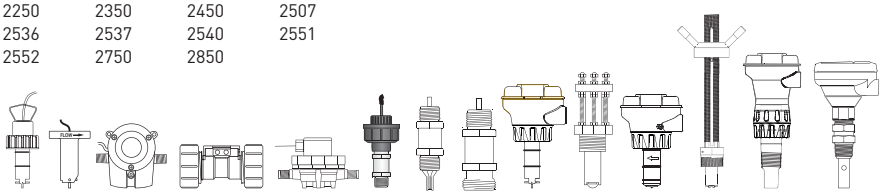
Panel Mount

Signet 8900
Multi-Parameter Controller

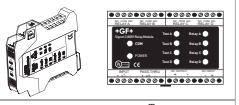


Signet Sensors
Use up to 6 inputs with one instrument from a choice of sensors

515	525	2000	2100
2250	2350	2450	2507
2536	2537	2540	2551
2552	2750	2850	

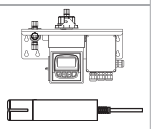


Signet Signal Converter/ Relay Module
8058
8059



4150 Turbidimeter

2610 Dissolved Oxygen Sensor



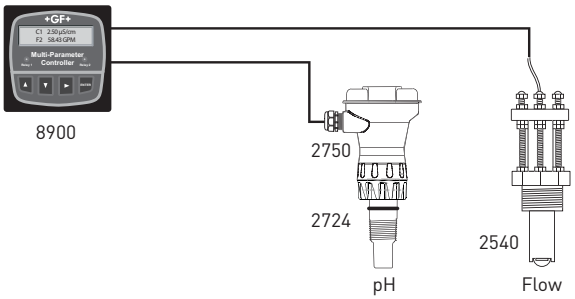
Signet Fittings - See individual sensor data sheets

All sold separately

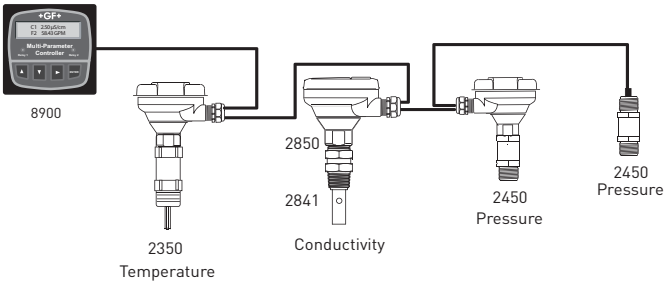
There are hundreds of system types that can be set up with the 8900. The examples below illustrate various sensors in different installation schemes. Wiring topology for point-to-point, daisy-chain, multi-drop, or a combination of these are listed in each example. Digital sensor outputs allow for long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

Example 1
- 8900 input module: Two inputs
- Sensors connected: Signet 2750 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

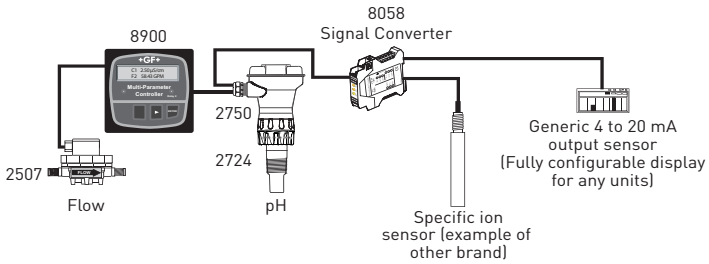


Example 2
- 8900 input module: Four inputs
- Sensors connected: Signet 2350 temperature sensor, 2850 with 2841 conductivity, and two 2450 pressure sensors
- Wiring configuration: Daisy-chain



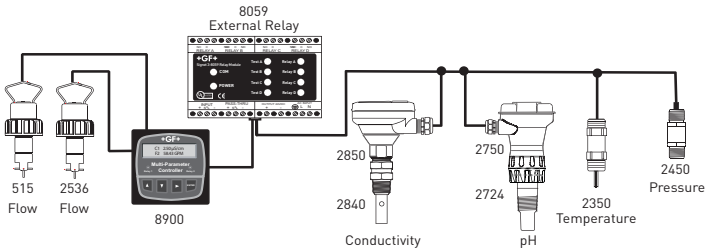
Example 3

- 8900 input module: Four inputs
- Sensors connected: Signet 2507 flow (frequency) and 2750 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 (S^3L)
- 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, 2750 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 (S^3L) 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 (S^3L) 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

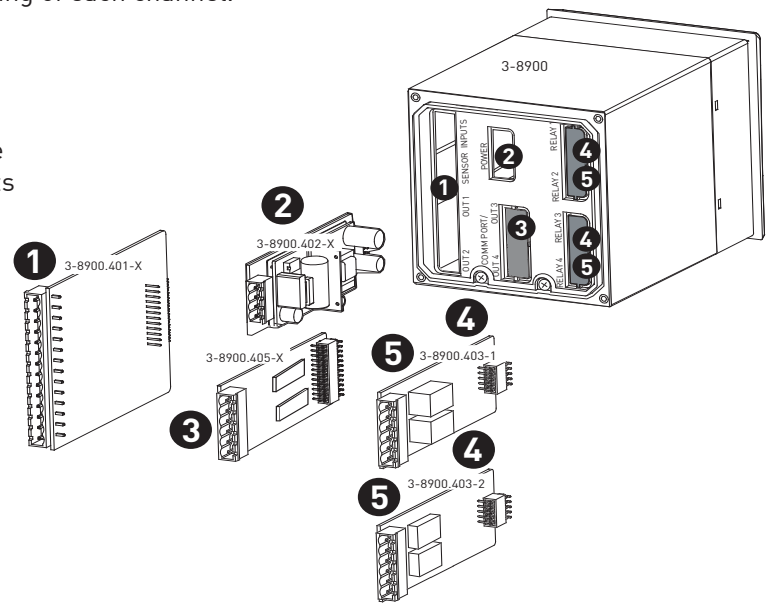
One I/O module is required to build a functional 8900. I/O modules are offered for 2, 4, or 6 sensor inputs with or without two mA or voltage outputs. Users can select two additional outputs via the output module.

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 are powered by the 8900. Passive outputs require an external 12 to 24 VDC power supply. All outputs are assignable to any input channel.

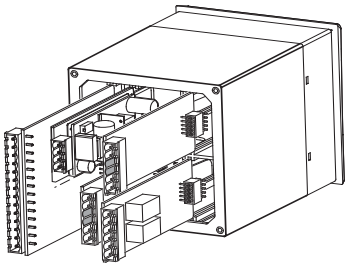


4 & 5 Relay modules

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.

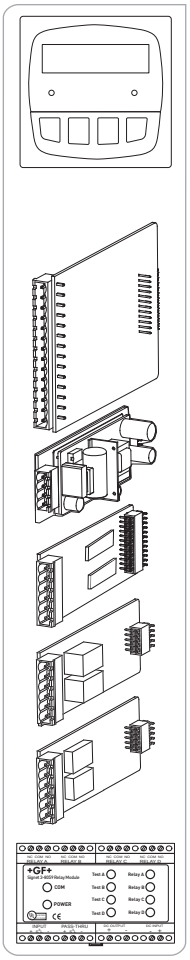


Ordering Notes

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)
3-8900.401-10	**159 000 969**	Six Inputs with Two Passive* Loop Outputs
3-8900.401-11	**159 000 970**	Six Inputs with Two Active Loop Outputs
3-8900.401-12	**159 000 971**	Six Inputs with Two Voltage 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

3-8900.099 Rev E (5/13)
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