

Schaffhausen, April 24, 2018

Information

IS 07 /2018 – BU Industry

NEW! Signet Modbus Module for 9900 Transmitter

GF Piping Systems is introducing the Modbus Module for Signet 9900 SmartPro® Transmitters. The Modbus Module gives your 9900 Transmitter the ability to transfer Live Readings, Units of Measure, and Measurement Status information to external PLC and SCADA systems or other devices that support the Modbus Protocol. The Modbus Module supports the Serial Modbus RS485 standard which allows for up to 32 devices on a single pair of wires.

Modbus communication to control systems offers many advantages over 4 to 20 mA current loops such as multiple readings and devices on a single pair of wires, data quality indication through the availability of measurement error messages, and increased confidence that the correct measurement is being used for control through the transmission of measurement type and units of measurement information. The Modbus Module is compatible with all versions of the 9900.

Key Features

- Connect to PLCs and SCADA Systems
- Live Readings
- Primary and Secondary Readings
- Units of Measure for each Reading
- Sensor Status
- Good reading, missing sensor, missing probe, wrong sensor



3-9900.270-M1

Three Models Available:

- 3-9900.270-M1 Flying lead model for use in both Panel or Field Mount (**159200120, Available Now**)
- 3-9900.270-M2 Cable assembly easily plugs into power terminal of 9900 Transmitter for Panel Mount (**159200121, coming Soon**)
- 3-9900.270-M3 Includes M12 connector and is available for Field Mount installations (**159200122, coming Soon**)

Note: 9900 Transmitters and Universal Mounting Kit sold separately

Availability

- Accepting orders immediately on M1 (M2 and M3 coming soon)

Ordering Information

GF Code	Signet Part No.	Material Group	Description
159200120	3-9900.270-M1	340220000	9900 Modbus Module with Wire Cable Assembly
159200121	3-9900.270-M2	340220000	9900 Modbus Module with Terminal Block Assembly
159200122	3-9900.270-M3	340220000	9900 Modbus Module with M12 Connector Assembly
159200123	3-9900.270-CBL1	340220000	Replacement Wire Cable Assembly
159200124	3-9900.270-CBL2	340220000	Replacement Terminal Block Assembly
159200125	3-9900.270-CBL3	340220000	Replacement M12 Connector Assembly

Important Information

Modbus Modules can be installed on all 9900 Transmitters (Generation I or later). On Generation IV or later, Totalizer is available as a secondary measurement for flow sensors. User can select between Permanent or Resettable Totalizer in the menu. If you are not sure what model 9900 Transmitter you have, go to the OPTION menu of the 9900 Transmitter, and press the UP arrow.

Target Uses for Product

- PLC
- SCADA Systems

Target Applications

- Target applications for this product can be found:
- Wastewater Treatment
- Reverse Osmosis
- Deionization
 - Ultrapure Water
 - Two Bed System
 - Mixed Bed System
- Chemical Manufacturing / Addition
- Metal and Plastic Finishing
- Fume Scrubber
- Cooling Towers
- Media Filtration
- Aquatic Life Support

Documentation

- Included in this product release are the following:
- 9900 Modbus Module - Instruction Sheet
- 9900 Modbus Module - Installation and Programming
- 9900 Transmitter datasheet Rev L (updated with Modbus Module)
- PowerPoint Presentation
- Frequently Asked Questions (FAQ's)

Should you need any further information, feel free to contact us at :



Signet 9900 Transmitter



Member of the SmartPro® Family of Instruments



Panel Mount

Field Mount

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

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

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

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

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

Features

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



Applications

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

Specifications

General			
Input Channels		One	
Input Types	Digital (S ³ L)	Serial ASCII, TTL level, 9600 bps	
	Frequency	Range	0.5 to 1500 Hz
		Accuracy	0.5% of reading
Measurement Types		Flow, pH/ORP, Conductivity/Resistivity, Salinity, Pressure, Temperature, Level, Dissolved Oxygen, Batch or user-defined (via 8058)	
Enclosure and Display			
Case Material		PBT	
Window		Shatter-resistant glass	
Keypad		4 buttons, injection-molded silicone rubber seal	
Display		Backlit, 7 and 14-segment	
Update Rate		1 s	
LCD Contrast		5 settings	
Indicators		"Dial-type" digital bar graph. LEDs for Open Collector, Relays and Warning Indicator	
Enclosure Size		¼ DIN	
Mounting	9900-1P		
	Panel	¼ DIN, ribbed on four sides for panel mounting clip inside panel, silicon gasket included. Optional rear enclosure with flat cover available for waterproof protection when installed inside a panel.	
	Wall	Options include 9900-1P installed in pre-wired NEMA enclosure or inside of rear enclosure with hinged cover.	
	Pipe	Optional Rear Enclosure with hinged cover and 9900-1P for pipe mount installation	
Mounting	9900-1		
	Field (Integral)	Options include yellow universal or integral kits for installation with sensor	
Display Ranges			
pH		0.00 to 15.00 pH	
pH Temperature		-39.99 °C to 149.99 °C	-40 °F to 302 °F
ORP		-1999 to +1999 mV	
Flow Rate		-9999 to 99999 units per second, minute, hour or day	
Totalizer		0.00 to 99999999 units	
Conductivity		0.0000 to 99999 µS, mS, PPM and PPB (TDS), kΩ, MΩ	
Conductivity Temperature		-100 °C to 250 °C	-148 °F to 350 °F (application and sensor dependent)
Temperature		-99 °C to 350 °C	-99 °F to 350 °F
Pressure		-40 to 1000 psi	
Level		-9999 to 99999 m, cm, ft, in, %	
Volume		0 to 99999 cm ³ , m ³ , in ³ , ft ³ , gal, L, lb, kg, %	
Salinity		0 to 99.97 PPT	
Dissolved Oxygen		PPM 0-50, % SAT 0-200, 0 to 999.9 TORR	
Dissolved Oxygen Temperature		-99 °C to 350 °C	-99 °F to 350 °F
Environmental			
Ambient Operating Temperature			
Backlit LCD		-10 °C to 70 °C	14 °F to 158 °F
Storage Temperature		-15 °C to 70 °C	5 °F to 158 °F
Relative Humidity		0 to 100% condensing for field mount; 0 to 95% non-condensing for panel mount	
Maximum Altitude		4,000 m (13,123 ft)	
Enclosure Rating		NEMA 4X/IP65 (front face only on panel mount); field mount is 100% NEMA 4X/IP65	

Specifications (continued)

Electrical Requirements

Power to Sensors

Voltage	+4.9 to 5.5 VDC @ 25 °C, regulated	
Current	1.5 mA max in loop power mode (up to 2.0 mA with 24 V @ 300 Ω max. loop impedance); 20 mA max when using DC power	
Short Circuit	Protected	
Isolation	Low voltage (< 48V AC/DC) to loop with DC power connected	
No isolation when using loop power only		
Terminal Blocks	Pluggable screw type	14 AWG max wire gauge

Input Power

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

Current limiting for circuit protection

Reverse-Voltage Protection

Loop Power

No DC Power Input

	Max. Loop Impedance	50 Ω @ 12 V	325 Ω @ 18 V	600 Ω @ 24 V
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With DC Power Input or with 2nd loop, all the time

	Max. Loop Impedance	250 Ω @ 12 V	500 Ω @ 18 V	750 Ω @ 24 V
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Relay Specifications

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

Input Types

Digital (S³L) or AC frequency

4 to 20 mA input via the 8058-1

pH/ORP input via the Digital (S³L) output from the 2750/2751 pH/ORP Sensor Electronics

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

Input Specifications

Digital (S ³ L)	Serial ACSII, TTL level, 9600 bps	
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Frequency Input

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

Specifications (continued)

Input Specifications continued

Power Supply

Rejection	±1 µA per volt
Short Circuit	Protected

Update Rate (1/frequency) + 150 ms

Output Specifications

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

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

Shipping Weights

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

Standards and Approvals

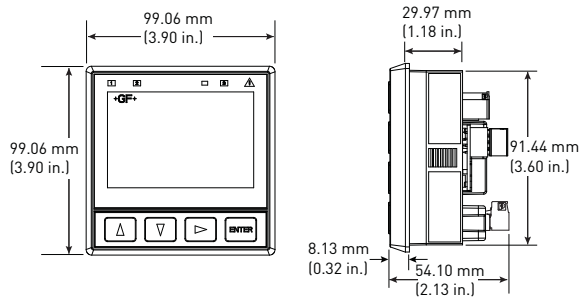
CE, UL, CUL, FCC

RoHS Compliant, China RoHS

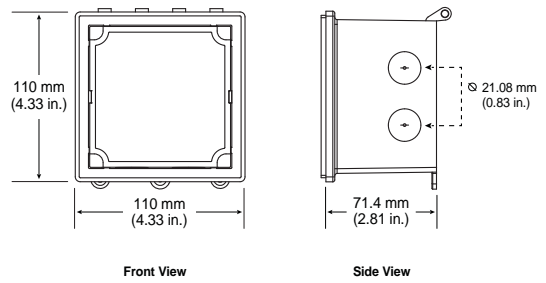
Lloyd's Register

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

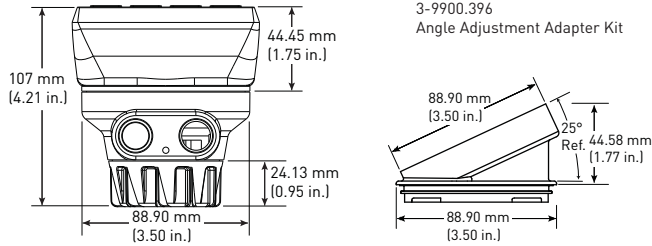
Dimensions - Panel Mount



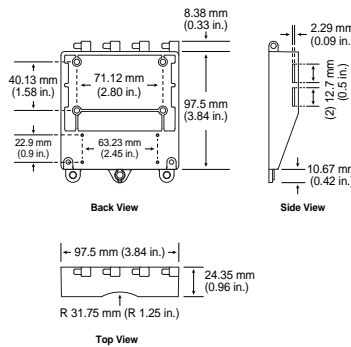
Dimensions - Rear Enclosure



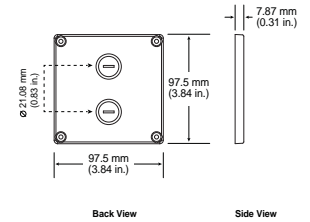
Integral Mount



Hinged Cover

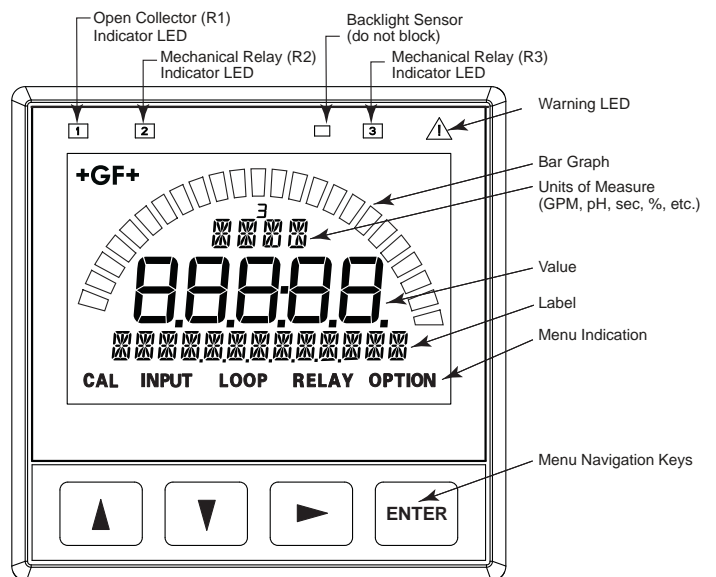


Flat Cover



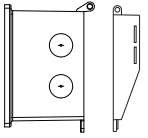


























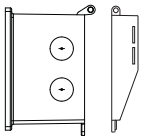





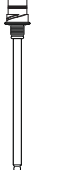





Sensor model	9900 Generation			
	I	II	III	IV
515/8510	X	X	X	X
525	X	X	X	X
U1000				X
2000	X	X	X	X
2100	X	X	X	X
2250	X	X	X	X
2350	X	X	X	X
2450	X	X	X	X
2507	X	X	X	X
2536/8512	X	X	X	X
2537-5	X	X	X	X
2540	X	X	X	X
2551	X	X	X	X
2552	X	X	X	X
2610-41	X	X	X	X
2610 + 8058	X	X	X	X
2724-2726	X	X	X	X
2734-2736	X	X	X	X
2750	X	X	X	X
2751	X	X	X	X
2756-2757	X	X	X	X
2764-2767	X	X	X	X
2774-2777	X	X	X	X
2819-2823	X	X	X	X
2839-2842	X	X	X	X
2850	X	X	X	X
4150 + 8058	X	X	X	X



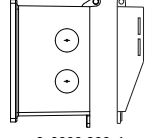











9900 Module	9900 Generation			
	I	II	III	IV
H COMM	X	X	X	X
Relay	X	X	X	X
Conductivity/Resistivity	X	X	X	X
Batch		X	X	X
4 to 20 mA Output			X	X
Modbus	X	X	X	X



All possible segments shown in this illustration. The instrument's software controls which segments are shown at any particular time. Only the bar graph segment outline and GF logo are visible when the unit is turned off.

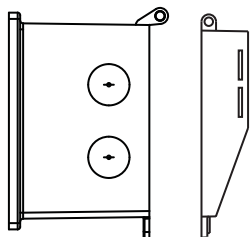
Panel Mount	Pipe, Tank, Wall Mount	Field (Integral) Mount
Signet Model 9900 Transmitter (Includes mounting bracket and panel gasket) 	Signet Model 9900 Transmitter with Rear Enclosure   3-9900.399-1	Signet Model 9900 Transmitter with Junction Box (varies with sensor and installation)      3-8050 3-8051-X 3-8052 3-9900.396 (optional)
Signet Sensors - Flow, Level, Temperature, Pressure, DO Use one input from sensor options below*		2270 with 8058 iGo Converter plus other 4 to 20 mA   2270 8058-1 iGo Converter
               515 8510 525 U1000 2000 2100 2507 2537 2540 2551 2552 2250 2350 2450 2610		
Signet Fittings - See individual sensor data sheets		All sold separately

Panel Mount	Pipe, Tank, Wall Mount	Field (Integral) Mount
Signet Model 9900 Transmitter (Includes mounting bracket and panel gasket) 	Signet Model 9900 Transmitter with Rear Enclosure   3-9900.399-1	Signet Model 9900 Transmitter with Junction Box (varies with sensor and installation)     3-8050 3-8052 3-9900.396 (optional)
Signet Sensors - pH/ORP Use one input from sensor options below* with 2750 Sensor Electronics		Signet Wet-Tap Electrode Model 2756, 2757 and 3719 Wet-Tap with 2750 Sensor Electronics    2756 2757 3719
    2756 2757 3719 3-8050		
Signet Fittings - See individual sensor data sheets		All sold separately

Panel Mount	Pipe, Tank, Wall Mount	Field (Integral) Mount
Signet Model 9900 Transmitter (Includes mounting bracket and panel gasket) 	Signet Model 9900 Transmitter with Rear Enclosure   3-9900.399-1	Signet Model 9900 Transmitter with 3-9900.396 Angle Adapter and Junction Box (varies with sensor and installation)     3-9900.396** 3-8050 3-8052
Signet Sensors - Conductivity/Resistivity and Salinity Electrodes Use one input from electrode options below* with Conductivity Module or 2850 Sensor Electronics		
       2850 2850 2850 2850 + OR 3-8050 3-8052		
Signet Fittings - See individual sensor data sheets		All sold separately

* See individual sensor datasheets for additional information

**3-9900.396 is required with the Conductivity Module and either 3-8050 or 3-8052 to provide sufficient clearance.

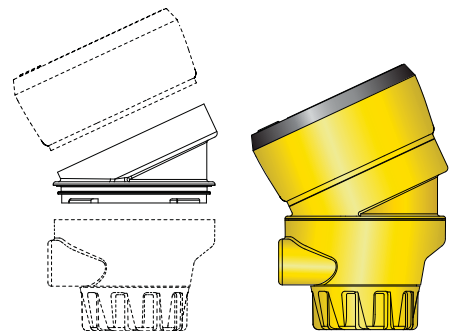


3-9900.399-1
(159 001 834)
Rear Enclosure Kit,
hinged cover



3-9900.399-2
(159 001 835)
Rear Enclosure Kit,
flat cover

3-9900-1
(159 001 696)
Field Mount
3-9900-396
(159 001 701)
Angle Adjustment
Adapter Kit
3-8051 (159 000 187)
3-8051-1 (159 001 755)
3-8051-2 (159 001 756)
Flow Sensor
Integral Mounting Kit



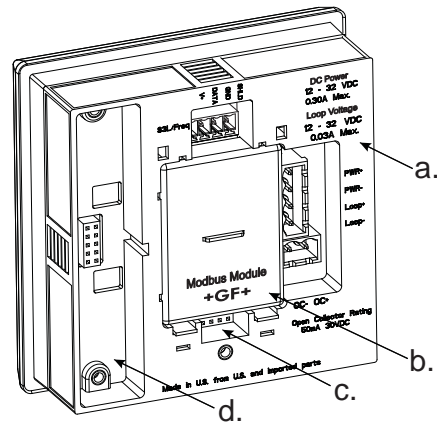
Plug in Modules

Optional modules and accessories are available for the 9900:

- Base Unit (required)
- Slot for optional H COMM or Modbus Modules
- Slot for optional Conductivity/Resistivity, Batch, or 4 to 20 mA Output Module
- Slot for optional Relay Module (not available on field mount)

Each item is ordered separately.

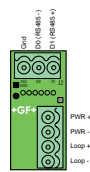
Modules are field-replaceable at any time.



3-9900.270-M1

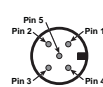


3-9900.270-M2

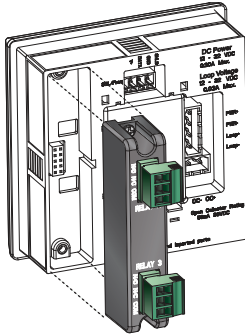


Coming Soon

3-9900.270-M3



Coming Soon



Relay Module (Panel Installations Only) (3-9900.393)

This module adds two programmable dry-contact relays to the standard Open Collector output in the base unit.

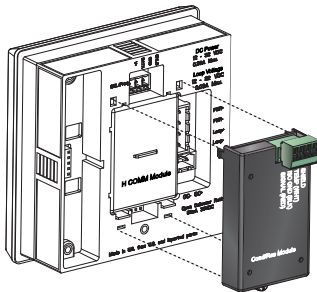
Modbus Modules (3-9900.270-MX)

These Modules allow the 9900 to communicate with Automation systems using the Modbus serial RS485 Protocol.

3-9900.270-M1 - Wire Lead Connections

Coming Soon 3-9900.270-M2 - Terminal Block Connections
(Panel Mount Only)

Coming Soon 3-9900.270-M3 - M12 Connector (Field Mount Only)



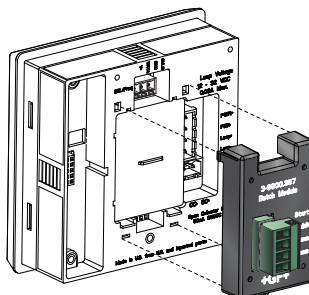
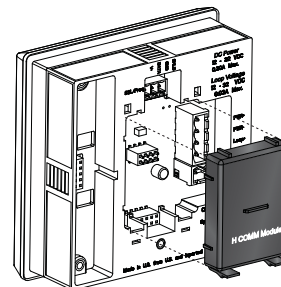
Direct Conductivity/Resistivity Module (3-9900.394)

The Direct Conductivity/Resistivity Module interfaces Signet 2819-2823 and 2839-2842 Conductivity electrodes directly to the 9900.

H COMM Module (HART®) (3-9900.395)

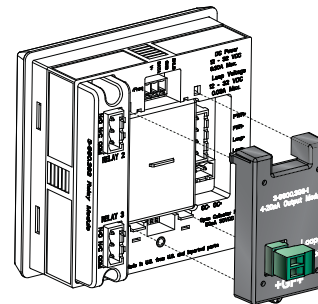
The H COMM Module enables communication between the 9900 and a HART® enabled device.

(Not available for use on 3-9900-1BC Batch Controller)



Batch Module (3-9900.397)

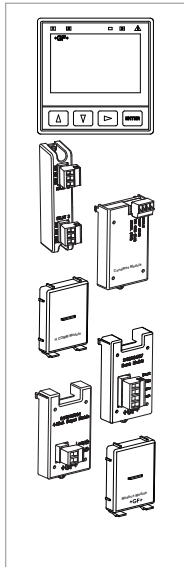
The Batch Module adds batch capability to the 9900 Transmitter (Generation II and newer). It is compatible with all Signet flow sensors.



4 to 20 mA Output Module (3-9900.398-1)

The 4 to 20 mA Output Module adds a second 4 to 20 mA Output to the 9900 Transmitter (Generation III and later). Each of the outputs can be used to output the primary and/or secondary measurement.

Ordering Information



Mfr. Part No	Code	Description
9900 Base Unit - Single Channel, Multi-Parameter, 4 to 20 mA, Open Collector, DC power		
3-9900-1P	159 001 695	9900 Panel Mount Transmitter
3-9900-1	159 001 696	9900 Field Mount Transmitter
3-9900-1BC	159 001 770	Batch Controller System
Optional Accessory Modules		
3-9900.270-M1	159 200 120	Modbus Module with Wire Cable Assembly
3-9900.270-M2	Coming Soon	Modbus Module with Terminal Block Assembly (Panel Mount Only)
3-9900.270-M3	Coming Soon	Modbus Module with M12 Connector Assembly (Field Mount Only)
3-9900.393	159 001 698	Relay Module - 2 DCR (Dry-contact relays)
3-9900.394	159 001 699	Direct Conductivity/Resistivity Module
3-9900.395	159 001 697	H COMM Module
3-9900.397	159 310 163	Batch Module
3-9900.398-1	159 001 784	4 to 20 mA Output Module*

*Module adds a second 4 to 20 mA output. One 4 to 20 mA output is included in the base unit.

Accessories and Replacement Parts

Mfr. Part No	Code	Description
6682-0204	159 001 709	Conductivity Module Plug, 4 Pos, Right Angle
6682-1102	159 001 710	DC Power Plug, 2 Pos, Right Angle
6682-1103	159 001 711	Relay Module Plug, 3 Pos, Right Angle
6682-1104	159 001 712	Loop Power Plug, 4 Pos, Right Angle
6682-3104	159 001 713	Freq/S ³ L Plug, 4 Pos, Right Angle
6682-3004	159 001 725	Terminal Block Plug
7310-1024	159 873 004	24 VDC Power Supply, 0.42 A, 10W
7310-2024	159 873 005	24 VDC Power Supply, 1.0 A, 24W
7310-4024	159 873 006	24 VDC Power Supply, 1.7 A, 40W
7310-6024	159 873 007	24 VDC Power Supply, 2.5 A, 60W
7310-7024	159 873 008	24 VDC Power Supply, 4.0 A, 96W
3-0251	159 001 724	PC COMM Configuration Tool
3-8050	159 000 184	Universal Mount Kit
3-8050.396	159 000 617	RC Filter kit (for relay use), 2 per kit
3-8051	159 000 187	Flow Sensor Integral Mounting Kit, NPT, Valox
3-8051-1	159 001 755	Flow Sensor Integral Mounting Kit, NPT, PP
3-8051-2	159 001 756	Flow Sensor Integral Mounting Kit, NPT, PVDF
3-8052	159 000 188	¾ in. Integral Mount Kit
3-8058-1	159 000 966	I-Go® Signal Converter, wire-mount
3-8058-2	159 000 967	I-Go® Signal Converter, DIN rail mount
3-9000.392-1	159 000 839	Liquid Tight Connector Kit, NPT (1 pc.)
3-9900.270-CBL1	159 200 123	Replacement Wire Cable Assembly for M1
3-9900.270-CBL2	Coming Soon	Replacement Terminal Block Assembly for M2
3-9900.270-CBL3	Coming soon	Replacement M12 Connector Assembly for M3
3-9900.390	159 001 714	Standard Connector Kit, Right Angle, 9900 Transmitter
3-9900.391	159 001 715	Optional Connector Kit, In-Line, 9900 Transmitter
3-9900.392	159 001 700	Wall Mount Accessory Kit for 9900
3-9900.396	159 001 701	Angle Adjustment Adapter Kit (for Field Mounting)
3-9900.399-1	159 001 834	Rear enclosure kit, hinged cover
3-9900.399-2	159 001 835	Rear enclosure kit, flat cover

Signet 9900 Transmitter



Member of the SmartPro® Family of Instruments



Panel Mount

Field Mount

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

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

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

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

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

Features

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



Applications

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

Specifications

General			
Input Channels		One	
Input Types	Digital (S ³ L)	Serial ASCII, TTL level, 9600 bps	
	Frequency	Range	0.5 to 1500 Hz
		Accuracy	0.5% of reading
Measurement Types		Flow, pH/ORP, Conductivity/Resistivity, Salinity, Pressure, Temperature, Level, Dissolved Oxygen, Batch or user-defined (via 8058)	
Enclosure and Display			
Case Material		PBT	
Window		Shatter-resistant glass	
Keypad		4 buttons, injection-molded silicone rubber seal	
Display		Backlit, 7 and 14-segment	
Update Rate		1 s	
LCD Contrast		5 settings	
Indicators		"Dial-type" digital bar graph. LEDs for Open Collector, Relays and Warning Indicator	
Enclosure Size		¼ DIN	
Mounting	9900-1P		
	Panel	¼ DIN, ribbed on four sides for panel mounting clip inside panel, silicon gasket included. Optional rear enclosure with flat cover available for waterproof protection when installed inside a panel.	
	Wall	Options include 9900-1P installed in pre-wired NEMA enclosure or inside of rear enclosure with hinged cover.	
	Pipe	Optional Rear Enclosure with hinged cover and 9900-1P for pipe mount installation	
Mounting	9900-1		
	Field (Integral)	Options include yellow universal or integral kits for installation with sensor	
Display Ranges			
pH		0.00 to 15.00 pH	
pH Temperature		-39.99 °C to 149.99 °C	-40 °F to 302 °F
ORP		-1999 to +1999 mV	
Flow Rate		-9999 to 99999 units per second, minute, hour or day	
Totalizer		0.00 to 99999999 units	
Conductivity		0.0000 to 99999 µS, mS, PPM and PPB (TDS), kΩ, MΩ	
Conductivity Temperature		-100 °C to 250 °C	-148 °F to 350 °F (application and sensor dependent)
Temperature		-99 °C to 350 °C	-99 °F to 350 °F
Pressure		-40 to 1000 psi	
Level		-9999 to 99999 m, cm, ft, in, %	
Volume		0 to 99999 cm ³ , m ³ , in ³ , ft ³ , gal, L, lb, kg, %	
Salinity		0 to 99.97 PPT	
Dissolved Oxygen		PPM 0-50, % SAT 0-200, 0 to 999.9 TORR	
Dissolved Oxygen Temperature		-99 °C to 350 °C	-99 °F to 350 °F
Environmental			
Ambient Operating Temperature			
Backlit LCD		-10 °C to 70 °C	14 °F to 158 °F
Storage Temperature		-15 °C to 70 °C	5 °F to 158 °F
Relative Humidity		0 to 100% condensing for field mount; 0 to 95% non-condensing for panel mount	
Maximum Altitude		4,000 m (13,123 ft)	
Enclosure Rating		NEMA 4X/IP65 (front face only on panel mount); field mount is 100% NEMA 4X/IP65	

Specifications (continued)

Electrical Requirements

Power to Sensors

Voltage	+4.9 to 5.5 VDC @ 25 °C, regulated	
Current	1.5 mA max in loop power mode (up to 2.0 mA with 24 V @ 300 Ω max. loop impedance); 20 mA max when using DC power	
Short Circuit	Protected	
Isolation	Low voltage (< 48V AC/DC) to loop with DC power connected	
No isolation when using loop power only		
Terminal Blocks	Pluggable screw type	14 AWG max wire gauge

Input Power

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

Current limiting for circuit protection

Reverse-Voltage Protection

Loop Power

No DC Power Input

	Max. Loop Impedance	50 Ω @ 12 V	325 Ω @ 18 V	600 Ω @ 24 V
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With DC Power Input or with 2nd loop, all the time

	Max. Loop Impedance	250 Ω @ 12 V	500 Ω @ 18 V	750 Ω @ 24 V
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Relay Specifications

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

Input Types

Digital (S³L) or AC frequency

4 to 20 mA input via the 8058-1

pH/ORP input via the Digital (S³L) output from the 2750/2751 pH/ORP Sensor Electronics

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

Input Specifications

Digital (S ³ L)	Serial ACSII, TTL level, 9600 bps	
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Frequency Input

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

Specifications (continued)

Input Specifications continued

Power Supply

Rejection	±1 µA per volt
Short Circuit	Protected
Update Rate	(1/frequency) + 150 ms

Output Specifications

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

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

Shipping Weights

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

Standards and Approvals

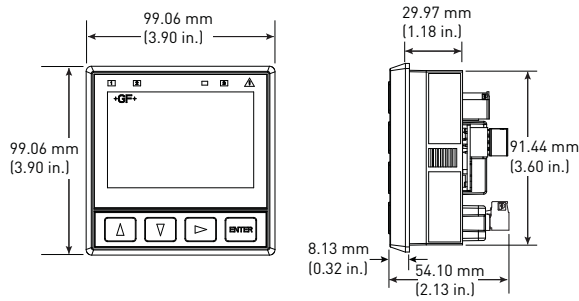
CE, UL, CUL, FCC

RoHS Compliant, China RoHS

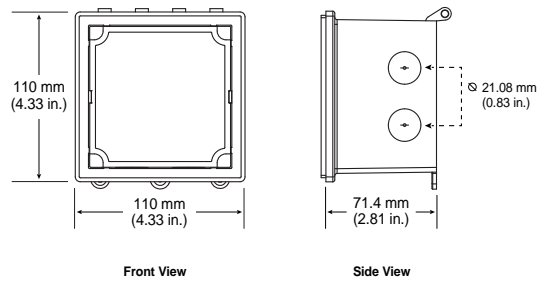
Lloyd's Register

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

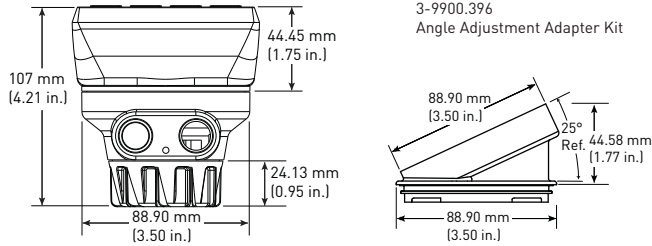
Dimensions - Panel Mount



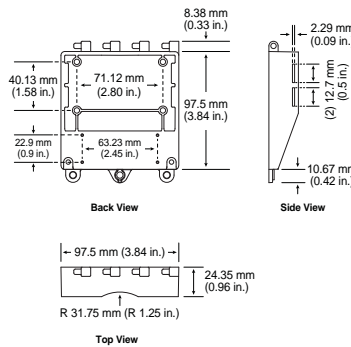
Dimensions - Rear Enclosure



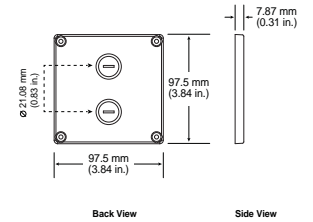
Integral Mount



Hinged Cover

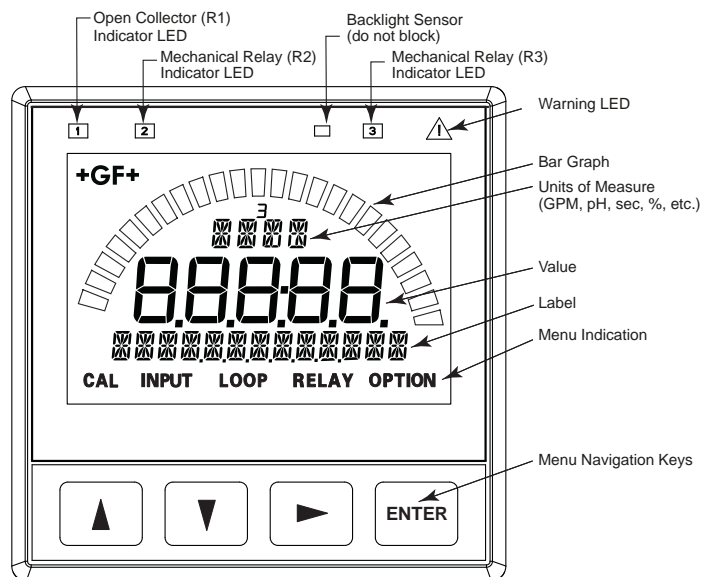


Flat Cover



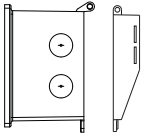





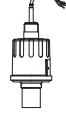




















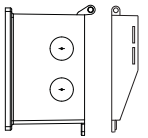





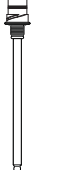





Sensor model	9900 Generation			
	I	II	III	IV
515/8510	X	X	X	X
525	X	X	X	X
U1000				X
2000	X	X	X	X
2100	X	X	X	X
2250	X	X	X	X
2350	X	X	X	X
2450	X	X	X	X
2507	X	X	X	X
2536/8512	X	X	X	X
2537-5	X	X	X	X
2540	X	X	X	X
2551	X	X	X	X
2552	X	X	X	X
2610-41	X	X	X	X
2610 + 8058	X	X	X	X
2724-2726	X	X	X	X
2734-2736	X	X	X	X
2750	X	X	X	X
2751	X	X	X	X
2756-2757	X	X	X	X
2764-2767	X	X	X	X
2774-2777	X	X	X	X
2819-2823	X	X	X	X
2839-2842	X	X	X	X
2850	X	X	X	X
4150 + 8058	X	X	X	X



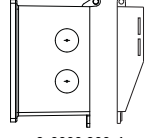











9900 Module	9900 Generation			
	I	II	III	IV
H COMM	X	X	X	X
Relay	X	X	X	X
Conductivity/Resistivity	X	X	X	X
Batch		X	X	X
4 to 20 mA Output			X	X
Modbus	X	X	X	X



All possible segments shown in this illustration. The instrument's software controls which segments are shown at any particular time. Only the bar graph segment outline and GF logo are visible when the unit is turned off.

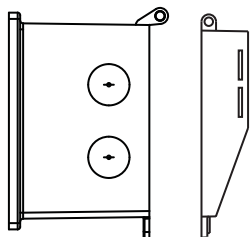
Panel Mount	Pipe, Tank, Wall Mount	Field (Integral) Mount
Signet Model 9900 Transmitter (Includes mounting bracket and panel gasket) 	Signet Model 9900 Transmitter with Rear Enclosure   3-9900.399-1	Signet Model 9900 Transmitter with Junction Box (varies with sensor and installation)      3-8050 3-8051-X 3-8052 3-9900.396 (optional)
Signet Sensors - Flow, Level, Temperature, Pressure, DO Use one input from sensor options below*		2270 with 8058 iGo Converter plus other 4 to 20 mA   2270 8058-1 iGo Converter
               515 8510 525 U1000 2000 2100 2507 2537 2540 2551 2552 2250 2350 2450 2610		
Signet Fittings - See individual sensor data sheets		All sold separately

Panel Mount	Pipe, Tank, Wall Mount	Field (Integral) Mount
Signet Model 9900 Transmitter (Includes mounting bracket and panel gasket) 	Signet Model 9900 Transmitter with Rear Enclosure   3-9900.399-1	Signet Model 9900 Transmitter with Junction Box (varies with sensor and installation)     3-8050 3-8052 3-9900.396 (optional)
Signet Sensors - pH/ORP Use one input from sensor options below* with 2750 Sensor Electronics		Signet Wet-Tap Electrode Model 2756, 2757 and 3719 Wet-Tap with 2750 Sensor Electronics    2756 2757 3719
    2756 2757 3719 3-8050		
Signet Fittings - See individual sensor data sheets		All sold separately

Panel Mount	Pipe, Tank, Wall Mount	Field (Integral) Mount
Signet Model 9900 Transmitter (Includes mounting bracket and panel gasket) 	Signet Model 9900 Transmitter with Rear Enclosure   3-9900.399-1	Signet Model 9900 Transmitter with 3-9900.396 Angle Adapter and Junction Box (varies with sensor and installation)     3-9900.396** 3-8050 3-8052
Signet Sensors - Conductivity/Resistivity and Salinity Electrodes Use one input from electrode options below* with Conductivity Module or 2850 Sensor Electronics		
       2850 2850 2850 2850 + OR 3-8050 3-8052		
Signet Fittings - See individual sensor data sheets		All sold separately

* See individual sensor datasheets for additional information

**3-9900.396 is required with the Conductivity Module and either 3-8050 or 3-8052 to provide sufficient clearance.



3-9900.399-1
(159 001 834)
Rear Enclosure Kit,
hinged cover

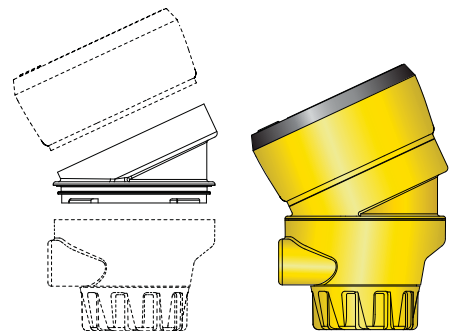


3-9900.399-2
(159 001 835)
Rear Enclosure Kit,
flat cover

3-9900-1
(159 001 696)
Field Mount

3-9900-396
(159 001 701)
Angle Adjustment
Adapter Kit

3-8051 (159 000 187)
3-8051-1 (159 001 755)
3-8051-2 (159 001 756)
Flow Sensor
Integral Mounting Kit



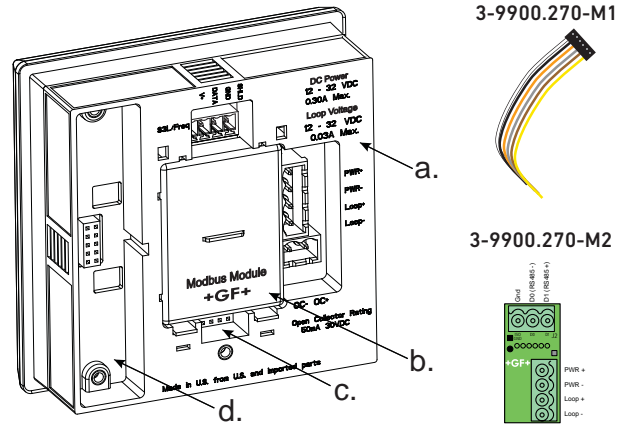
Plug in Modules

Optional modules and accessories are available for the 9900:

- Base Unit (required)
- Slot for optional H COMM or Modbus Modules
- Slot for optional Conductivity/Resistivity, Batch, or 4 to 20 mA Output Module
- Slot for optional Relay Module (not available on field mount)

Each item is ordered separately.

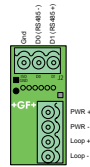
Modules are field-replaceable at any time.



3-9900.270-M1

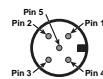


3-9900.270-M2

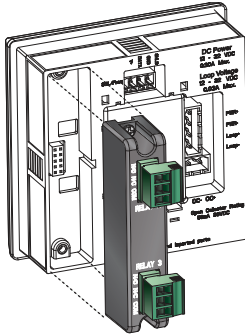


Coming Soon

3-9900.270-M3

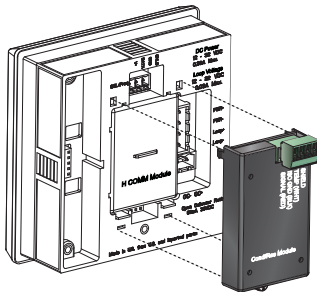


Coming Soon



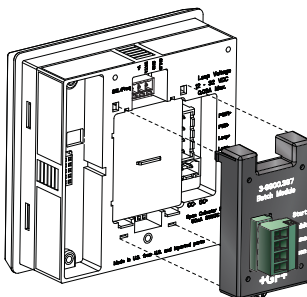
Relay Module (Panel Installations Only) (3-9900.393)

This module adds two programmable dry-contact relays to the standard Open Collector output in the base unit.



Direct Conductivity/Resistivity Module (3-9900.394)

The Direct Conductivity/Resistivity Module interfaces Signet 2819-2823 and 2839-2842 Conductivity electrodes directly to the 9900.



Batch Module (3-9900.397)

The Batch Module adds batch capability to the 9900 Transmitter (Generation II and newer). It is compatible with all Signet flow sensors.

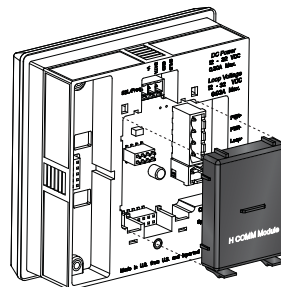
Modbus Modules (3-9900.270-MX)

These Modules allow the 9900 to communicate with Automation systems using the Modbus serial RS485 Protocol.

3-9900.270-M1 - Wire Lead Connections

Coming Soon 3-9900.270-M2 - Terminal Block Connections
(Panel Mount Only)

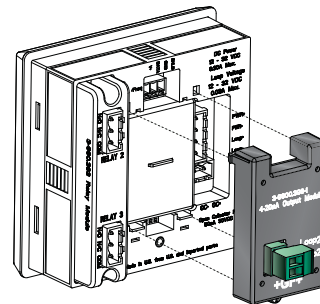
Coming Soon 3-9900.270-M3 - M12 Connector (Field Mount Only)



H COMM Module (HART®) (3-9900.395)

The H COMM Module enables communication between the 9900 and a HART® enabled device.

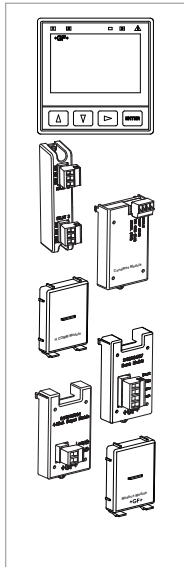
(Not available for use on 3-9900-1BC Batch Controller)



4 to 20 mA Output Module (3-9900.398-1)

The 4 to 20 mA Output Module adds a second 4 to 20 mA Output to the 9900 Transmitter (Generation III and later). Each of the outputs can be used to output the primary and/or secondary measurement.

Ordering Information



Mfr. Part No	Code	Description
9900 Base Unit - Single Channel, Multi-Parameter, 4 to 20 mA, Open Collector, DC power		
3-9900-1P	159 001 695	9900 Panel Mount Transmitter
3-9900-1	159 001 696	9900 Field Mount Transmitter
3-9900-1BC	159 001 770	Batch Controller System
Optional Accessory Modules		
3-9900.270-M1	159 200 120	Modbus Module with Wire Cable Assembly
3-9900.270-M2	Coming Soon	Modbus Module with Terminal Block Assembly (Panel Mount Only)
3-9900.270-M3	Coming Soon	Modbus Module with M12 Connector Assembly (Field Mount Only)
3-9900.393	159 001 698	Relay Module - 2 DCR (Dry-contact relays)
3-9900.394	159 001 699	Direct Conductivity/Resistivity Module
3-9900.395	159 001 697	H COMM Module
3-9900.397	159 310 163	Batch Module
3-9900.398-1	159 001 784	4 to 20 mA Output Module*

*Module adds a second 4 to 20 mA output. One 4 to 20 mA output is included in the base unit.

Accessories and Replacement Parts

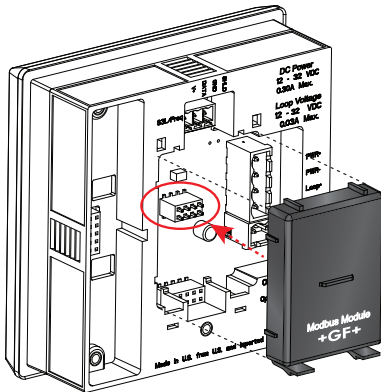
Mfr. Part No	Code	Description
6682-0204	159 001 709	Conductivity Module Plug, 4 Pos, Right Angle
6682-1102	159 001 710	DC Power Plug, 2 Pos, Right Angle
6682-1103	159 001 711	Relay Module Plug, 3 Pos, Right Angle
6682-1104	159 001 712	Loop Power Plug, 4 Pos, Right Angle
6682-3104	159 001 713	Freq/S ³ L Plug, 4 Pos, Right Angle
6682-3004	159 001 725	Terminal Block Plug
7310-1024	159 873 004	24 VDC Power Supply, 0.42 A, 10W
7310-2024	159 873 005	24 VDC Power Supply, 1.0 A, 24W
7310-4024	159 873 006	24 VDC Power Supply, 1.7 A, 40W
7310-6024	159 873 007	24 VDC Power Supply, 2.5 A, 60W
7310-7024	159 873 008	24 VDC Power Supply, 4.0 A, 96W
3-0251	159 001 724	PC COMM Configuration Tool
3-8050	159 000 184	Universal Mount Kit
3-8050.396	159 000 617	RC Filter kit (for relay use), 2 per kit
3-8051	159 000 187	Flow Sensor Integral Mounting Kit, NPT, Valox
3-8051-1	159 001 755	Flow Sensor Integral Mounting Kit, NPT, PP
3-8051-2	159 001 756	Flow Sensor Integral Mounting Kit, NPT, PVDF
3-8052	159 000 188	¾ in. Integral Mount Kit
3-8058-1	159 000 966	I-Go® Signal Converter, wire-mount
3-8058-2	159 000 967	I-Go® Signal Converter, DIN rail mount
3-9000.392-1	159 000 839	Liquid Tight Connector Kit, NPT (1 pc.)
3-9900.270-CBL1	159 200 123	Replacement Wire Cable Assembly for M1
3-9900.270-CBL2	Coming Soon	Replacement Terminal Block Assembly for M2
3-9900.270-CBL3	Coming soon	Replacement M12 Connector Assembly for M3
3-9900.390	159 001 714	Standard Connector Kit, Right Angle, 9900 Transmitter
3-9900.391	159 001 715	Optional Connector Kit, In-Line, 9900 Transmitter
3-9900.392	159 001 700	Wall Mount Accessory Kit for 9900
3-9900.396	159 001 701	Angle Adjustment Adapter Kit (for Field Mounting)
3-9900.399-1	159 001 834	Rear enclosure kit, hinged cover
3-9900.399-2	159 001 835	Rear enclosure kit, flat cover

Signet 9900 Modbus Module



3-9900.270.090 Rev 0 01/18

Installation and Programming



Description

The Modbus Module 3-9900.270-MX allows the Signet 9900 SmartPro® Transmitter to connect to a Modbus master compatible device. The Modbus Module supports RTU or ASCII modes over serial RS485 communication links.

The Modbus Module has an internal programmable network termination for the communication link enabled by Modbus command.

System Overview

Installation

If the 9900 Base Unit will be mounted in a panel, plug-in modules may be installed either before or after the base unit is mounted.

If the 9900 Base Unit will be mounted using the accessory wall mount kit (3-9900.392), install plug-in modules first.

If the Direct Conductivity/Resistivity Module or Current Loop Module will be included in your unit, install the Modbus module first and then install Conductivity/Resistivity Module over the Modbus Module.

To install the Modbus module, carefully align the module pins into its plug (see illustration) and push the module straight in until the tabs on the bottom edge snap into place.

To uninstall, squeeze tabs, grasp the module and pull straight out.

Specifications

- Modbus RTU and ASCII modes, RTU is Default Mode.
- 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200 Baud rates, 19200 is default Baud rate
- Parity can be selected as Even, Odd, or None, Even is default Parity
- Modbus Address 1 to 247, 34 is default Modbus Address
- Data Bits, automatically selected based on Mode. RTU Mode 8 Data bits, ASCII Mode 7 Data bits.
- Stop Bits, automatically selected based on Mode, RTU Mode 1 Stop bit, ASCII Mode 2 Stop bits.
- Power 12 to 24 VDC Nominal 10.6 to 32 VDC max regulated.



Important! Do not exceed 32 VDC or permanent damage to the Modbus Module will occur.



- [English](#)
- [Deutsch](#)
- [Français](#)
- [Español](#)
- [中文](#)



Start Up Communication Parameters

Start Up Communication Parameters

The Modbus communication parameters for 9900 Gen 1 through Gen 4 transmitters are set via Modbus. The Modbus module is shipped from the factory, and can be reset in the field, with the following communication parameters. See the Communication Setting Programming flow chart below.

Setting	Default Value
Modbus Address	34
Modbus Network Termination	Off
Modbus Mode	RTU
Baud Rate	19200
Parity	Even

Warranty Information

Refer to your local Georg Fischer Sales office for the most current warranty statement.

All warranty and non-warranty repairs being returned must include a fully completed Service Form and goods must be returned to your local GF Sales office or distributor. Product returned without a Service Form may not be warranty replaced or repaired.

Signet products with limited shelf-life (e.g. pH, ORP, chlorine electrodes, calibration solutions; e.g. pH buffers, turbidity standards or other solutions) are warranted out of box but not warranted against any damage, due to process or application failures (e.g. high temperature, chemical poisoning, dry-out) or mishandling (e.g. broken glass, damaged membrane, freezing and/or extreme temperatures).

Product Registration

Thank you for purchasing the Signet line of Georg Fischer measurement products.

If you would like to register your product(s), you can now register online in one of the following ways:

- Visit our website www.gfsignet.com. Under **Service and Support** click on **Product Registration Form**
- If this is a pdf manual (digital copy), [click here](#)

Safety Information



CAUTION

Exercise care when installing module.
Do not bend connecting pins.
Align pins and connectors then push module firmly into place.

Avoid Electrostatic Discharge (ESD)

- Minimize handling of module to reduce the possibility of damage due to ESD.
- Handle module by the edges.
- Never touch any exposed circuitry or contacts.
- Wear an anti-static wristband, stand on an anti-static mat, or keep one hand touching a properly grounded pipe or other properly grounded piece of metal when handling module.

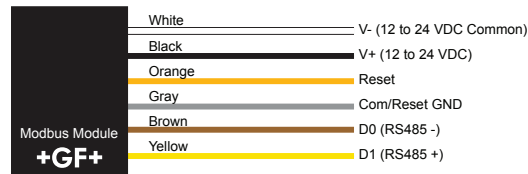
	Caution / Warning / Danger Indicates a potential hazard. Failure to follow all warnings may lead to equipment damage, injury, or death
	Electrostatic Discharge (ESD) / Electrocutation Danger Alerts user to risk of potential damage to product by ESD, and/or risk of potential of injury or death via electrocution.
	Personal Protective Equipment (PPE) Always utilize the most appropriate PPE during installation and service of Signet products.

Power and Output Wiring

Three versions of the Modbus module are available to accommodate installation site requirements.

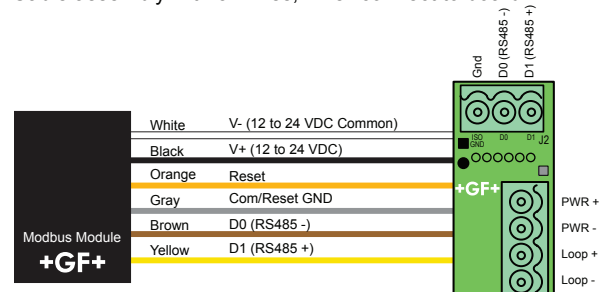
3-9900.270-M1 version: Wire Cable

Cable assembly with 6" Wires - pig tail



3-9900.270-M2 version: Terminal board (Panel Mount Only)

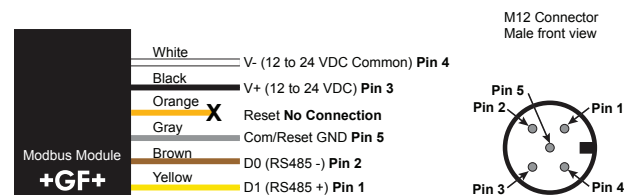
Cable assembly with 3" wires, inner-connect to board



Coming Soon

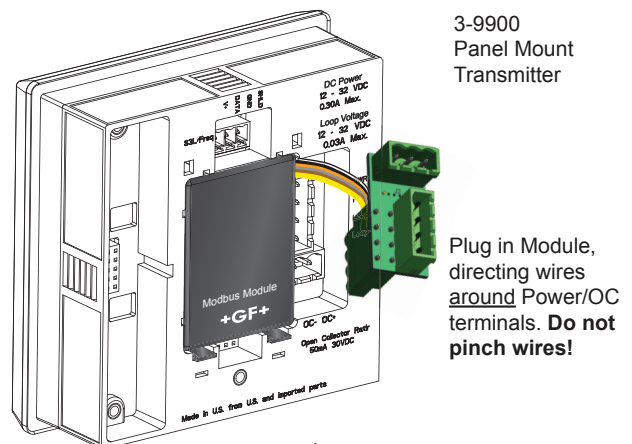
3-9900.270-M3 version: with M12 Connector (Field Mount Only)

Cable assembly with 6" wires with M12 Connector



Coming Soon

Example showing M2 version



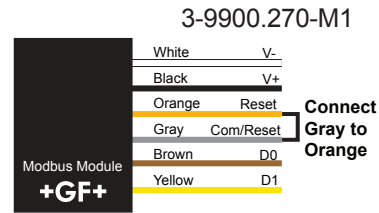
For M2 panel installation. Restrain terminal block assembly prior to shipping.

Reset

To Reset 3-9900.270-M1

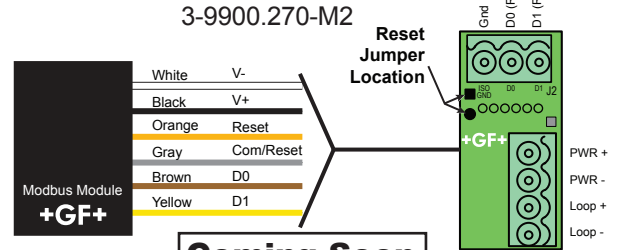
Connect the orange wire to the gray wire as shown. Cycle power on the unit and then disconnect the orange and gray wires.

Note: cover the wire ends with an insulator such as electrical tape to prevent damage to the 9900 or other devices.



To Reset 3-9900.270-M2

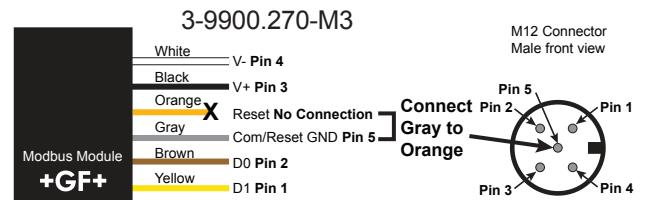
Connect the Jumper J1 across the two pins as shown. Cycle power on the unit then remove the jumper. You can store the jumper on the printed circuit board by connecting the Jumper onto one of the pins.



Coming Soon

To Reset 3-9900.270-M3

Connect the orange wire to the gray wire as shown. Cycle power on the unit and then disconnect the orange and gray wires. Note: cover the wire ends with an insulator such as electrical tape to prevent damage to the 9900 or other devices.

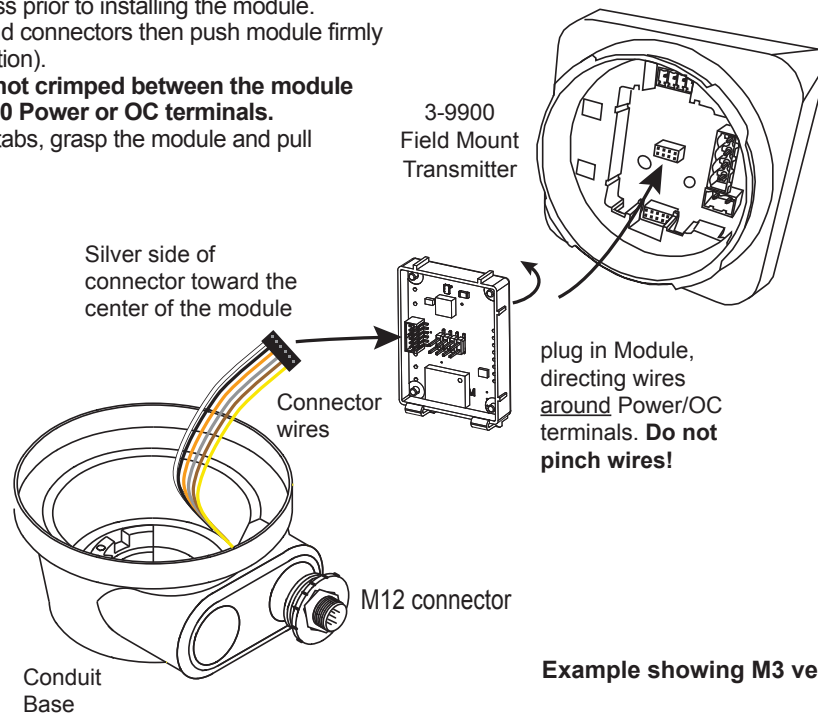


Coming Soon

Installation

- If the 9900 Base Unit will be mounted in a panel, plug-in modules may be installed either before or after the base unit is mounted.
- If the 9900 Base Unit will be mounted using the accessory wall mount kit (3-9900.392), install plug-in modules first.
- If the Direct Conductivity/Resistivity Module or Current Loop Module will be included in your unit, install the Modbus module first and then install Conductivity/Resistivity Module over the Modbus Module.
- Attach the output connector to the terminal block on the Modbus Module prior to installing in the 9900. When inserting the Modbus module with the wiring connector ensure the wires are not pinched by the power or open collector terminal blocks of the 9900.

1. Disconnect power from the 9900.
2. Attach the wire harness prior to installing the module.
3. Carefully align pins and connectors then push module firmly into place (see illustration).
4. **Ensure the cable is not crimped between the module housing and the 9900 Power or OC terminals.**
5. To uninstall, squeeze tabs, grasp the module and pull straight out.



Modbus Register Map

Live Reading

Register	Size	Read/Write	Data Type	Description
40001	2	Read	UINT	Status
40003	2	Read	Float	Primary Reading
40005	2	Read	Float	Secondary Reading
40007	1	Read	UINT	Measurement Type
40008	1	Read	UINT	Primary Units of Measure Code
40009	1	Read	UINT	Secondary Units of Measure Code

Communication Settings

Register	Size	Read/Write	Data Type	Description
49001	1	Read/Write	UINT	Modbus Address 1 to 247 (Default 34)
49002	1	Read/Write	UINT	Network Termination, 1 = ON 0 = Off (Default 0)
49003	1	Read/Write	UINT	Modbus Mode 0 Modbus RTU 1 Modbus ASCII (Default 0)
49004	1	Read/Write	UINT	Baud Rate 0 = 1200, 1 = 2400, 2 = 4800, 3 = 9600, 4 = 19200, 5 = 38400, 6 = 57600, 7 = 115200 (Default 4)
49005	1	Read/Write	UINT	Parity 0 = No Parity, 1 = Odd Parity, 2 = Even Parity (Default 2)
49006	1	Read/Write	UINT	Floating Point Big Endian = 0, Little Endian = 1 (Default 1)
49007	1	Read/Write	UINT	Write 0 (zero) to save registers, Write Modbus Address to save registers and reboot

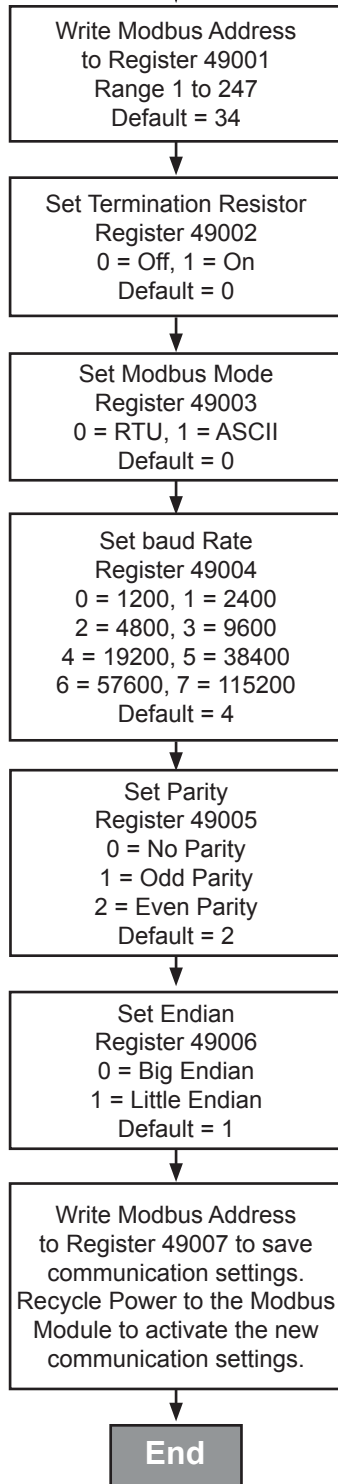
Communication Diagnostic Registers

Register	Size	Read/Write	Data Type	Description
49104	1	Read	UINT	9900 HSB Transactions
49105	1	Read	UINT	Second Counter
49106	1	Read	UINT	Bus Message Counter
49107	1	Read	UINT	Bus Message Error Counter
49108	1	Read	UINT	Slave Exception Counter
49109	1	Read	UINT	Slave Message Counter
49110	1	Read	UINT	Slave No Response Counter
49111	1	Read	UINT	Slave NAK Counter
49112	1	Read	UINT	Slave Busy Counter
49113	1	Read	UINT	Bus Character Overrun Counter

Device Identification

49501	15	Read	STR	Vendor Name "Georg Fischer Signet"
49516	10	Read	STR	Product Code "3-9900-1x"
49526	10	Read	STR	Major/Minor Revision 9900 Transmitter "xx-xxX"
49536	15	Read	STR	Vendor URL "www.gfps.com"
49551	10	Read	STR	Product Name "SmartPro"
49561	10	Read	STR	Model Name "9900"
49571	10	Read/Write	STR	User Application Name
49581	5	Read/Write	STR	Tag Name
49586	5	Read/Write	STR	Location
49591	5	Read	STR	9900 Serial Number "1204240438" Leading "6" dropped
49596	5	Read	STR	Modbus Module Serial Number "111317"
49601	1	Read	UINT	Manufacture Code 0x0032
49602	2	Read	UINT	Module Version 0x30010004 Version 1.00.04

Communication Settings Programming

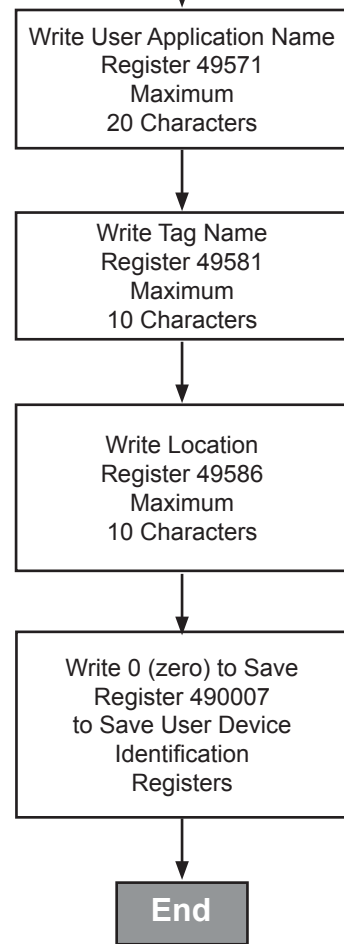


Note:

If RTU is selected
Data Bits = 8 and Stop Bits = 1

If ASCII Mode is selected
Data Bits = 7 and Stop Bits = 2

User Tag Programming



Programming Map

Readings / Sensors

Instrument Type	Measurement Type Reg 40007	Primary Reg 40003	Secondary Reg 40005
Factory ¹	0x0000	NA	NA
Flow	0x4201	Flow	Totalizer ²
pH	0x5102	pH	Temperature
ORP	0x5103	ORP	Raw mV
Cond/Res	0x5704	Cond/Res	Temperature
Pressure	0x4105	Pressure	NA
Level/Volume	0x5C06	Level	Volume
Temperature	0x4007	Temperature	NA
4 to 20 mA Input	0x0008	Scaled Input	Raw mA
Salinity	0x5A09	Salinity	Temperature
Dissolved Oxygen	0x510B	Dissolved Oxygen	Temperature
Batch	No Modbus Operation in Batch Mode		

1. Factory and Batch Instrument types do not update the Primary or Secondary readings.
2. Secondary readings for flow are only available in 9900 Generation 4 or greater transmitters.
In Generation 4 transmitters the user can set the secondary reading to be either the permanent or resettable transmitter.

Status Register

Registers 40001 – 40002

Register.Bit	Description
40001.0	Sensor reading is Good, no errors
40001.1	Wrong Sensor Connected
40001.2	Check Sensor
40001.3	Missing Sensor
40001.4	Sensor Error
40001.5	Secondary Reading is Totalizer
40001.6	Secondary Reading not Available
40001.7	Reset to Default Jumper Active
40001.8	9900 Communication Active
40001.9	Manufacturing Area Protected
40001.10	Device using Default Communication Parameters
40001.11 – 40002.15	Not Used

Format (Byte Orders)

Floats

Register	Data	Bytes
IEEE754 Float	0x570A4318	
Result	152.34	
49006	0	Big Endian
40003	0x570A	C D
40004	0x4318	A B
49006	1	Little Endian
40003	0x4318	A B
40004	0x570A	C D

Programming Map

Unit of Measure	Code	Description
Flow (Primary)		
GPS	22	Gallons per Second
GPM	16	Gallons per Minute
GPH	136	Gallons per Hour
GPD	235	Gallon per Day
LPS	24	Liters per Second
LPM	17	Liters per Minute
LPH	138	Liters per Hour
M3/M	131	Cubic Meters per Minute
M3/H	19	Cubic Meters per Hour
M3/D	29	Cubic Meters per Day
FT3/M	15	Cubic Feet per Minute
FT3/H	130	Cubic Feet per Hour
FT3/D	27	Cubic Feet per Day
MG/D	23	Million Gallons per Day
ML/D	25	Million Liters per Day
BPM	133	Barrels per Minute
BPH	134 242	Barrels per Hour
BPD	135	Barrels per Day
FT/S	20	Feet per Second
M/S	21	Meters per Second
All Others	252	All other flow units
Flow Totalization (Secondary)		
All Units	240	
pH (Primary)		
pH	59	pH
pH Temperature (Secondary) Important Requires power cycle to update		
Temperature C	32	Degrees Celsius
Temperature F	33	Degrees Fahrenheit
ORP (Primary and Secondary)		
mV	36	Millivolts
Conductivity (Primary)		
uS	67	microSiemens
mS	66	milliSiemens
PPM	139	Parts per Million
PPB	169	Parts per Billion
KOhms	163	Kilo Ohms
MOhms	170	Mega Ohms

Programming Map

Unit of Measure	Code	Description
Conductivity Temperature (Secondary)		
Temperature C	32	Degrees Celsius
Temperature F	33	Degrees Fahrenheit
Pressure		
PSI	6	Pounds per Square Inch
Bar	7	Bars
KPa	12	Kilopascals
Level/Volume (Level)		
FT	44	Feet
IN	47	Inches
M	45	Meters
CM	48	Centimeters
Level/Volume (Volume)		
FT3	112	Cubic Feet
IN3	113	Cubic Inches
M3	43	Cubic Meters
CM3	240	Cubic Centimeters
GAL	40	Gallons
LIT	41	Liters
Lb	63	Pounds
KG	61	Kilograms
Temperature		
C	32	Degrees Celsius
F	33	Degrees Fahrenheit
4 to 20 mA Input		
Scaled Input	252	Scaled 4 – 20 mA Input
Raw mA	251	Raw 4 – 29 mA Input Current
Salinity (Primary)		
PPT	244	Parts per Thousand
Salinity Temperature (Secondary) Important requires power cycle to update		
C	32	Degrees Celsius
F	33	Degrees Fahrenheit
Dissolved Oxygen (Primary)		
PPM	139	Parts per Million
% SAT	57	Percent
TOR	13	Torr
Dissolved Oxygen Temperature (Secondary)		
C	32	Degrees Celsius
F	33	Degrees Fahrenheit

Ordering Information

Part Number	Code	Description
3-9900.270-M1	159 200 120	Modbus Module with Wire Cable Assembly
3-9900.270-M2	Coming Soon	Modbus Module with Terminal Block Assembly
3-9900.270-M3	Coming Soon	Modbus Module with M12 Connector Assembly
3-9900.270-CBL1	159 200 123	Replacement Wire Cable Assembly for M1
3-9900.270-CBL2	Coming Soon	Replacement Terminal Block Assembly for M2
3-9900.270-CBL3	Coming soon	Replacement M12 Connector Assembly for M3



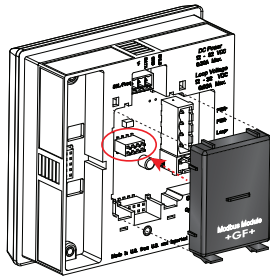
Signet 9900 Modbus Module



3-9900.270.091 Rev 0 02/18



Instruction Sheet



3-9900-1P Panel Mount

The Signet 9900 Modbus Module allows the Signet 9900 SmartPro® Transmitter to connect to a Modbus master compatible device. The Modbus Module supports RTU or ASCII modes over serial RS485 communication links.

The Modbus Module has an internal programmable network termination for the communication link enabled by Modbus command.



CAUTION

Exercise care when installing module.
Do not bend connecting pins.



Avoid Electrostatic Discharge (ESD)

- Minimize handling of module to reduce the possibility of damage due to ESD.
- Handle module by the edges.
- Never touch any exposed circuitry or contacts.
- Wear an anti-static wristband, stand on an anti-static mat, or keep one hand touching a properly grounded pipe or other properly grounded piece of metal when handling module.

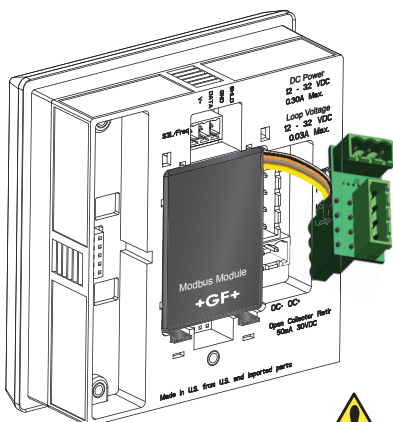


Important! Do not exceed 32 VDC or permanent damage to the Modbus Module will occur.

Installation

- If the 9900 Base Unit will be mounted in a panel, plug-in modules may be installed either before or after the base unit is mounted.
- If the 9900 Base Unit will be mounted using the accessory wall mount kit (3-9900.392), install plug-in modules first.
- If the Direct Conductivity/Resistivity Module or Current Loop Module will be included in your unit, install the Modbus module first and then install Conductivity/Resistivity Module over the Modbus Module.
- Attach the output connector to the terminal block on the Modbus Module prior to installing in the 9900. When inserting the Modbus module with the wiring connector ensure the wires are not pinched by the power or open collector terminal blocks of the 9900.
 1. Disconnect power from the 9900.
 2. Attach the wire harness prior to installing the module.
 3. Carefully align pins and connectors then push module firmly into place (see illustration).
 4. **Ensure the cable is not crimped between the module housing and the 9900 Power or OC terminals.**
 5. To uninstall, squeeze tabs, grasp the module and pull straight out.

Example showing M2 version



3-9900 Panel Mount Transmitter

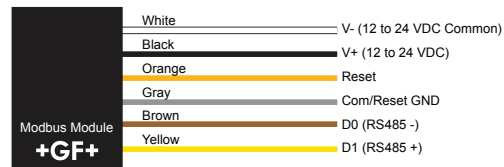
Plug in Module, directing wires around Power/OC terminals. **Do not pinch wires!**



For M2 panel installation. Restrain terminal block assembly prior to shipping.

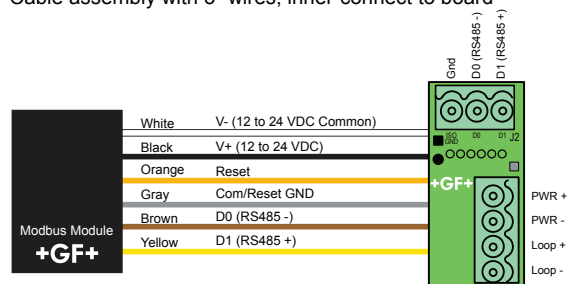
3-9900.270-M1 version: Wire Cable

Cable assembly with 6" Wires - pig tail



3-9900.270-M2 version: Terminal board (Panel Mount Only)

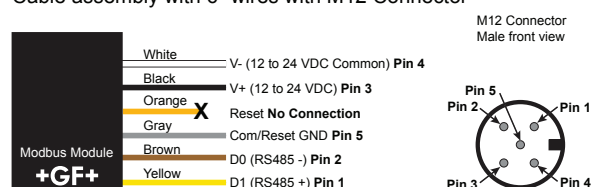
Cable assembly with 3" wires, inner-connect to board



Coming Soon

3-9900.270-M3 version: with M12 Connector (Field Mount Only)

Cable assembly with 6" wires with M12 Connector



Coming Soon

Reset

The 3-9900.270 Modbus Module can be reset back to factory defaults. The diagrams below show the reset procedure for the three versions of the Modbus Module.

Default Values

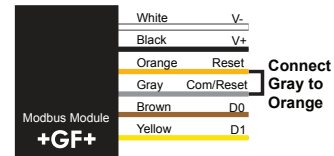
Setting	Default Value
Modbus Address	34
Modbus Network Termination	Off
Modbus Mode	RTU
Baud Rate	19200
Parity	Even

To Reset the 3-9900.270-M1

M1 Connect the Orange wire (Reset) to the Gray wire (Com/Reset GND) as shown. Cycle power on the unit and then disconnect the Orange and Gray wires.

Note: Cover wire ends with an insulator such as electrical tape to prevent damage to the 9900 or other devices.

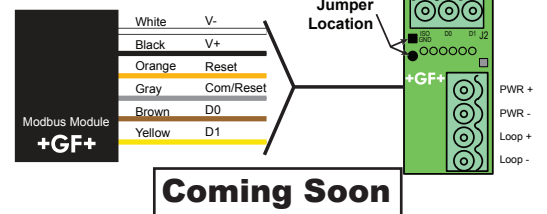
3-9900.270-M1 Reset



To Reset the 3-9900.270-M2

Place the Jumper across both pins. Cycle power on the unit. Remove the Jumper from both pins. To store the Reset jumper place it over one of the reset pins.

3-9900.270-M2 Reset

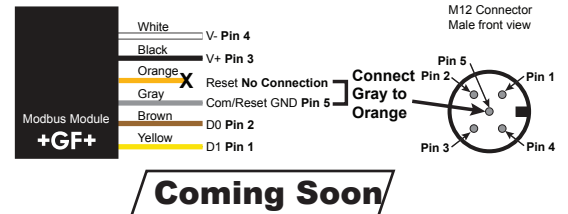


To Reset the 3-9900.270-M3

Connect the Orange wire (Reset) to the Gray wire (Com/Reset GND), M12 Pin 5. Cycle power on the unit and then disconnect the Orange and Gray wires.

Note: Cover Orange wire end with an insulator such as electrical tape to prevent damage to the 9900 or other devices.

3-9900.270-M3 Reset



Ordering Information

Mfr. Part No.	Code	Description
3-9900.270-M1	159 200 120	Modbus Module with Wire Cable Assembly
3-9900.270-M2	Coming Soon	Modbus Module with Terminal Block Assembly
3-9900.270-M3	Coming Soon	Modbus Module with M12 Connector Assembly
3-9900.270-CBL1	159 200 123	Replacement Wire Cable Assembly for M1
3-9900.270-CBL2	Coming Soon	Replacement Terminal Block Assembly for M2
3-9900.270-CBL3	Coming Soon	Replacement M12 Connector Assembly for M3

For programming information, please download the Installation and Programming manual at www.gfsignet.com



FAQ's 9900 Modbus Module

1. What is the Modbus Module?

- The Modbus Module allows any 9900 SmartPro® Transmitter to connect to a Modbus Communication network. Modbus networks are used with PLCs, Programmable Logic Controllers, SCADA Systems, Supervisory Control and Data Acquisition Systems, and other devices.

2. I use 4 to 20 mA Current Loops to connect to my PLC, what advantages does Modbus have?

- A 4 to 20 mA current loop can only send a single measurement back to the PLC, for example if a 9900 is configured for pH the 4 to 20 mA will send a current proportional to the pH value back to the PLC. Both the 9900 and the PLC need to be programmed so the range (scaling) of the 4 to 20 mA are the same. Modbus will send the pH value as a digital number, for example 7.23, along with the temperature, units of measure for both measurements, and status information. This gives you additional confidence that the readings match between the 9900 and external device. Additionally the Modbus protocol allows up to 32 devices to share the same pair of wires greatly reducing the wiring in larger systems.

3. What requirements are there for my device to connect to the Modbus Module?

- The device must support the Modbus Protocol and have a serial RS485 Modbus communication port. PLCs and other devices may include Modbus and the RS485 communication port while others will require the addition of a third party communication card. The Modbus module is not compatible with Modbus TCP or any other Ethernet based protocol without the use of a third party gateway.

4. Is the Modbus Module compatible with my 9900?

- The Modbus Module is compatible with all 9900s. Generations 1, 2, and 3 do not support transmitting the flow totalizer readings, only Generation 4 will transmit the totalizer.

5. Does the Modbus Module work with the other modules in the 9900 family?

- The Modbus Module is compatible with the Relay Module, Direct Conductivity Module, and the Current Loop Module. The HCOMM Module, HART Communication, is not compatible with the Modbus Module. The Batch Module can be installed with the Modbus Module, but no readings will be sent when the 9900 is set to the Batch instrument.