English

GF 9950 Modbus Module

3-9950-395.090 Rev 3 11/24

Installation and Programming

Description

The Modbus Module, 3-9950.305-M (159 001 905), allows the 9950-X SmartPro family of transmitters to connect to a Modbus master compatible device or network. The Modbus Module supports RTU modes over serial RS485 communication links. The Modbus Module has an internal programmable network termination for the communication link enabled by Modbus command.

Specifications

- Modbus RTU mode
- 1200, 2400, 4800, 9600, 19200. 38400, 57600, and 115000 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, 95 is default Modbus Address.
- Data Bits. RTU Mode 8 Data bits.
- Stop Bits. RTU Mode 1 Stop bit.
- Endian can be selected as either Big Endian, or Little Endian, Big Endian is the Default.

Selectable internal terminating resistor for Modbus communication, default is resistor disconnected.

Start Up Communication Parameters

The Modbus start up communication parameters for:
- 9950-1/-2 Gen 3 or Gen 4 Transmitter
- 9950-3/-4/-5/-6 Chlorine Controller
- 9950-10/-11 Six-Channel Transmitter

are set via the 9950 Modbus menu located in the OPTIONS menu.

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.

Setting	Default Value
Modbus Address	95
Modbus Network Termination	Off
Modbus Mode	RTU
Baud Rate	19200
Parity	Even
Endian	Big Endian

- English
- 中文

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.

GF 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).

Safety Information

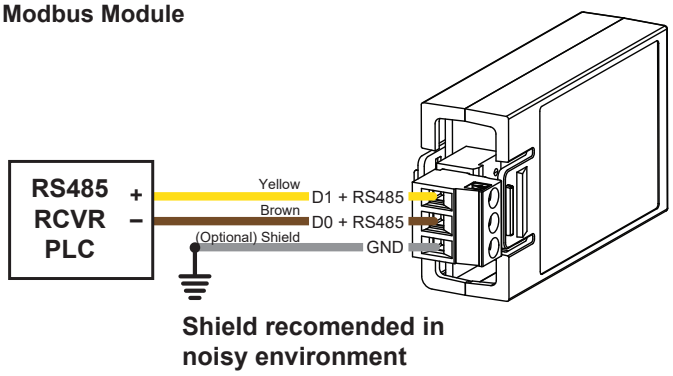
CAUTION
Exercise care when installing module.
Do not bend connecting pins.
Align pins and connectors then push module firmly into place.

- 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.

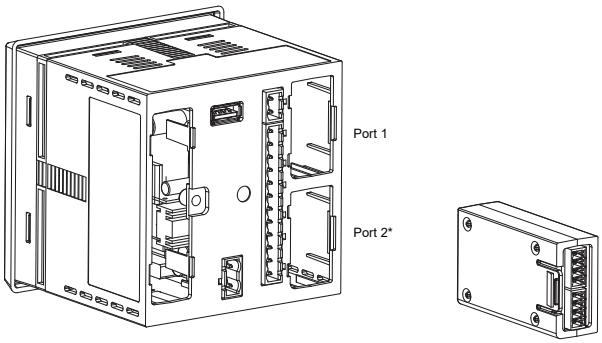
	Caution / Warning / Danger Indicates a potential hazard. Failure to follow all warnings may lead to equipment damage, injury, or death
	Electrostatic Discharge (ESD) / Electrocution Danger Alerts user to risk of potential damage to product by ESD, and/or risk of potential of injury or death via electrocution.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

Wiring

Modbus Module



Shield recomended in noisy environment



3-9950

***NOTE**: It is advised to insert the Modbus Module into module Port 2, however the module will work in either module port 1 or 2.

Installation

For future reference, for each installation, it is recommended to record the part number and serial number of each of the components listed here:

Facility Tag Number or System ID (user assigned):_____

Base unit	3-9950-____	S/N _____
Relay Module	3-9950.393-____	S/N _____
Single Channel Cond./Resist. Module	3-9950.394-____	S/N _____
Dual Channel 4-20 Current Loop Out. Module	3-9950.398-____	S/N _____
Dual Channel Conductivity Module	3-9950.394-2	S/N _____
Modbus Module	3-9950.395-M	S/N _____

Modbus Menus

OPTION Menu

MODBUS MODULE NONE	Select the location of the Modbus Module, None (Default), Module 1, or Module 2 Important: You must select the location of the Modbus Module for proper operation.
MODBUS COMMUNICATION SETTINGS ->	Press the Right Arrow key to change the settings of the Modbus Module

Modbus Communication Setting Menu

MODBUS ADDRESS 95	Set the Modbus address of the 9950. The default address is 95
NETWORK TERMINATION NO	The 9950 Modbus Module has an electronic termination network. The Termination can be activated by setting the value to Yes. The default value is No (the termination is off).
MODBUS BAUD RATE 19.2 K	Set the baud rate of the Modbus network. The default value is 19.2K baud, 19200 baud.
MODBUS PARITY EVEN	Set the parity of the Modbus network. The default value is Even parity.
MODBUS ENDIAN BIG	Set the arrangement for how the 9950 transmits floating point, real, numbers. The default value is Big Endian.
RESET TO DEFAULT NO	Reset all Modbus setting to the default values.
ACTIVATE SETTINGS NO	Activate setting send all the change to the default parameter to the Modbus module. If you do not activate the setting the configured setting will not take effect until after the 9950 is power cycled.

Modbus Remote Update

MODBUS REMOTE UPDATE NO	Setting Modbus Remote update to Yes allows remote Modbus device to change the settings on the 9950. Setting Modbus Remote Update to No prevents remote devices from make any changes to the 9950. Remote device will still be able to read all of the Modbus parameters.

Modbus Register Map

Live Reading (All Register Base = 1)

Register	Size	Read/Write	Data Type	Description
40001	2	Read	UDINT	Channel 1 Status (includes System Status)
40003	2	Read	Float	Primary measurement on Channel 1
40005	2	Read	Float	Secondary measurement on Channel 1
40007	1	Read	UINT	Measurement type of Channel 1 0 = Factory, 1 = None, 2 = Flow, 3 = pH, 4 = ORP, 5 = Conductivity/Resistivity, 6 = Pressure, 7 = Level, 8 = Temperature, 9 = 4-20 mA Input, 10 = Salinity, 11 = Dissolved Oxygen, 12 = Free Chlorine, 14 = Chlorine Dioxide
40008	1	Read	UINT	Units of Measure Code for Primary measurement on Channel 1
40009	1	Read	UINT	Units of Measure Code for Secondary measurement on Channel 1
40010	2	Read	UDINT	Channel 2 Status (includes System Status)
40012	2	Read	Float	Primary measurement on Channel 2
40014	2	Read	Float	Secondary measurement on Channel 2
40016	1	Read	UINT	Measurement type of Channel 2 0 = Factory, 1 = None, 2 = Flow, 3 = pH, 4 = ORP, 5 = Conductivity/Resistivity, 6 = Pressure, 7 = Level, 8 = Temperature, 9 = 4-20 mA Input, 10 = Salinity, 11 = Dissolved Oxygen, 12 = Free Chlorine, 14 = Chlorine Dioxide
40017	1	Read	UINT	Units of Measure Code for Primary measurement on Channel 2
40018	1	Read	UINT	Units of Measure Code for Secondary measurement on Channel 2
40019	2	Read	UDINT	Channel 3 Status (includes System Status)
40021	2	Read	Float	Primary measurement on Channel 3
40023	2	Read	Float	Secondary measurement on Channel 3
40025	1	Read	UINT	Measurement type of Channel 3 0 = Factory, 1 = None, 2 = Flow, 3 = pH, 4 = ORP, 5 = Conductivity/Resistivity, 6 = Pressure, 7 = Level, 8 = Temperature, 9 = 4-20 mA Input, 10 = Salinity, 11 = Dissolved Oxygen, 12 = Free Chlorine, 14 = Chlorine Dioxide
40026	1	Read	UINT	Units of Measure Code for Primary measurement on Channel 3
40027	1	Read	UINT	Units of Measure Code for Secondary measurement on Channel 3
40028	2	Read	UDINT	Channel 4 Status (includes System Status)
40030	2	Read	Float	Primary measurement on Channel 4
40032	2	Read	Float	Secondary measurement on Channel 4
40034	1	Read	UINT	Measurement type of Channel 4 0 = Factory, 1 = None, 2 = Flow, 3 = pH, 4 = ORP, 5 = Conductivity/Resistivity, 6 = Pressure, 7 = Level, 8 = Temperature, 9 = 4-20 mA Input, 10 = Salinity, 11 = Dissolved Oxygen, 12 = Free Chlorine, 14 = Chlorine Dioxide
40035	1	Read	UINT	Units of Measure Code for Primary measurement on Channel 4
40036	1	Read	UINT	Units of Measure Code for Secondary measurement on Channel 4
40037	2	Read	UDINT	Channel 5 Status (includes System Status)
40039	2	Read	Float	Primary measurement on Channel 5
40041	2	Read	Float	Secondary measurement on Channel 5
40043	1	Read	UINT	Measurement type of Channel 5 0 = Factory, 1 = None, 2 = Flow, 3 = pH, 4 = ORP, 5 = Conductivity/Resistivity, 6 = Pressure, 7 = Level, 8 = Temperature, 9 = 4-20 mA Input, 10 = Salinity, 11 = Dissolved Oxygen, 12 = Free Chlorine, 14 = Chlorine Dioxide
40044	1	Read	UINT	Units of Measure Code for Primary measurement on Channel 5
40045	1	Read	UINT	Units of Measure Code for Secondary measurement on Channel 5

Modbus Register Map

Live Reading (All Register Base = 1)

Register	Size	Read/Write	Data Type	Description
40046	2	Read	UDINT	Channel 6 Status (includes System Status)
40048	2	Read	Float	Primary measurement on Channel 6
40050	2	Read	Float	Secondary measurement on Channel 6
40052	1	Read	UINT	Measurement type of Channel 6 0 = Factory, 1 = None, 2 = Flow, 3 = pH, 4 = ORP, 5 = Conductivity/Resistivity, 6 = Pressure, 7 = Level, 8 = Temperature, 9 = 4-20 mA Input, 10 = Salinity, 11 = Dissolved Oxygen, 12 = Free Chlorine, 14 = Chlorine Dioxide
40053	1	Read	UINT	Units of Measure Code for Primary measurement on Channel 6
40054	1	Read	UINT	Units of Measure Code for Secondary measurement on Channel 6

Live Readings: Binary Inputs

Register	Size	Read/Write	Data Type	Description
40201	2	Read	UDINT	Binary Input Module Status (includes System Status)
40203	1	Read	UINT	Binary Inputs 1-4 (unused inputs are always 0) Bit 0 = Binary Input 1, Bit 1 = Binary Input 2, Bit 2 = Binary Input 3, Bit 3 = Binary Input 4

Live Readings: Derived Functions

Register	Size	Read/Write	Data Type	Description
40301	2	Read	UDINT	Derived Function 1 Status (includes System Status)
40303	2	Read	Float	Derived Function 1 Value
40305	2	Read	UDINT	Derived Function 2 Status (includes System Status)
40307	2	Read	Float	Derived Function 2 Value
40309	2	Read	UDINT	Derived Function 3 Status (includes System Status)
40311	2	Read	Float	Derived Function 3 Value
40313	2	Read	UDINT	Derived Function 4 Status (includes System Status)
40315	2	Read	Float	Derived Function 3 Value

Live Readings: Current Loop Outputs

Register	Size	Read/Write	Data Type	Description
40401	2	Read	UDINT	Current Loop 1 Status (includes System Status)
40403	2	Read	Float	Current Loop 1 Output in milliamps (1.0 = 1 mA)
40405	2	Read	UDINT	Current Loop 2 Status (includes System Status)
40407	2	Read	Float	Current Loop 2 Output in milliamps (1.0 = 1 mA)
40409	2	Read	UDINT	Current Loop MOD1 A Status (includes System Status)
40411	2	Read	Float	Current Loop MOD1 A Output in milliamps (1.0 = 1 mA)
40413	2	Read	UDINT	Current Loop MOD1 B Status (includes System Status)
40415	2	Read	Float	Current Loop MOD1 B Output in milliamps (1.0 = 1 mA)
40417	2	Read	UDINT	Current Loop MOD2 A Status (includes System Status)
40419	2	Read	Float	Current Loop MOD2 A Output in milliamps (1.0 = 1 mA)
40421	2	Read	UDINT	Current Loop MOD2 B Status (includes System Status)
40423	2	Read	Float	Current Loop MOD2 B Output in milliamps (1.0 = 1 mA)

Programming Map

Live Readings: Relays

Register	Size	Read/Write	Data Type	Description
40501	2	Read	UDINT	Relay 1 Status (includes System Status)
40503	1	Read	UINT	Relay 1 State, 0 = Off, 1 = On
40504	2	Read	Float	Relay 1 Value: Proportional Pulse Mode: Frequency, PWM Mode: Percentage On
40506	2	Read	UDINT	Relay 2 Status (includes System Status)
40508	1	Read	UINT	Relay 2 State, 0 = Off, 1 = On
40509	2	Read	Float	Relay 2 Value: Proportional Pulse Mode: Frequency, PWM Mode: Percentage On
40511	2	Read	UDINT	Relay 3 Status (includes System Status)
40513	1	Read	UINT	Relay 3 State, 0 = Off, 1 = On
40514	2	Read	Float	Relay 3 Value: Proportional Pulse Mode: Frequency, PWM Mode: Percentage On
40516	2	Read	UDINT	Relay 4 Status (includes System Status)
40518	1	Read	UINT	Relay 4 State, 0 = Off, 1 = On
40519	2	Read	Float	Relay 4 Value: Proportional Pulse Mode: Frequency, PWM Mode: Percentage On"
40521	2	Read	UDINT	Relay A (S³L) Status (includes System Status)
40523	1	Read	UINT	Relay A (S³L) State, 0 = Off, 1 = On
40524	2	Read	Float	Relay A (S³L) Value: Not Used, returns 0
40526	2	Read	UDINT	Relay B (S³L) Status (includes System Status)
40528	1	Read	UINT	Relay B (S³L) State, 0 = Off, 1 = On
40529	2	Read	Float	Relay B (S³L) Value: Not Used, returns 0
40531	2	Read	UDINT	Relay C (S³L) Status (includes System Status)
40533	1	Read	UINT	Relay C (S³L) State, 0 = Off, 1 = On
40534	2	Read	Float	Relay C (S³L) Value: Not Used, returns 0
40536	2	Read	UDINT	Relay D (S³L) Status (includes System Status)
40538	1	Read	UINT	Relay D (S³L) State, 0 = Off, 1 = On
40539	2	Read	Float	Relay D (S³L) Value: Not Used, returns 0

Live Readings: Module Status

Register	Size	Read/Write	Data Type	Description
40601	2	Read	UDINT	Module 1 Status (includes System Status)
40603	2	Read	UDINT	Module 2 Status (includes System Status)

Live Readings: Channels 1 - 6 Registers

Register	Size	Read/Write	Data Type	Description
40901	1	Read/Write	UINT	Channel 1 Control Register
40902	1	Read/Write	UINT	Channel 2 Control Register
40903	1	Read/Write	UINT	Channel 3 Control Register
40904	1	Read/Write	UINT	Channel 4 Control Register
40905	1	Read/Write	UINT	Channel 5 Control Register
40906	1	Read/Write	UINT	Channel 6 Control Register

Programming Map

Communication Settings

Register	Size	Read/Write	Data Type	Description
49001	1	Read/Write	UINT	Modbus Address[1] 1 to 247 (Default 95)
49002	1	Read/Write	UINT	Network Termination, 1 = ON 0 = Off (Default 0)
49003	1	Read	UINT	Modbus Mode 0 = Modbus RTU (Default 0)
49004	1	Read/Write	UINT	Baud Rate[1] 0 = 1200, 1 = 2400, 2 = 4800, 3 = 9600, 4 = 19200, 5 = 38400, 6 = 57600, 7 = 115200 (Default 4)
49005	1	Read/Write	UINT	Parity[1] 0 = No Parity, 1 = Odd Parity, 2 = Even Parity (Default 2)
49006	1	Read/Write	UINT	Endian[2] 0 = Big Endian, 1 = Little Endian (Default 0)
49030	1	Write	UINT	Write 0 (zero) to save registers and activate new settings

[1] Requires Write to Register to activate and save.
[2] Endian changes as soon as Write to Register occurs but is not saved; explict Write to Register is required to save change.

Communication Diagnostic Registers

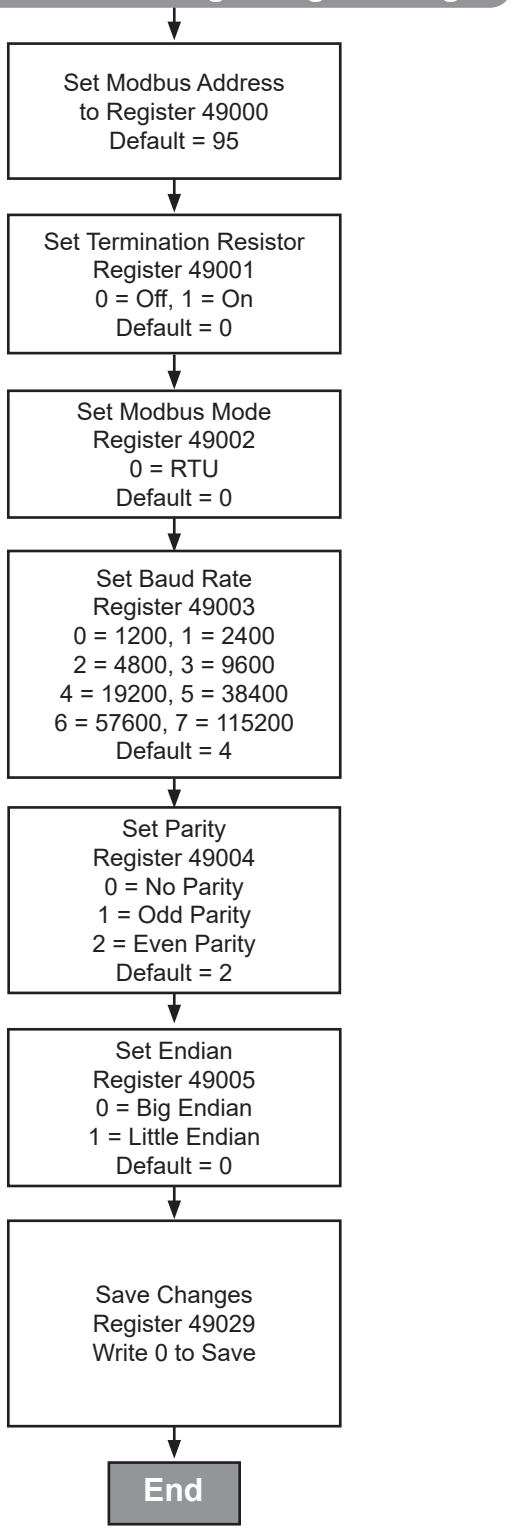
Register	Size	Read/Write	Data Type	Description
49101	1	Read	UINT	The number of messages the slave has detected
49102	1	Read	UINT	The number of CRC errors detected by slave
49103	1	Read	UINT	The quantity of Modbus exception responses returned by the slave
49104	1	Read	UINT	The quantity of messages addressed to the slave
49105	1	Read	UINT	The quantity of messages addressed to the slave for which it returned no respond
49106	1	Read	UINT	The quantity of messages addressed to the slave for which it returned a negative acknolwedgement response
49107	1	Read	UINT	Returns the quantity of messages addressed to the slave for which it returned a Slave Device Busy exception response.
49108	1	Write	UINT	Returns the quantity of messages addressed to the slave that it could not handle due to a character overrun condition
49109	2	Read	UINT	0 to 1 transition clears the diagnostic counters
49111	1	Read	UINT	Number of seconds since power up
49112	1	Read	UINT	Number of messages received from 9950 interface
49113	1	Read	UINT	Number of messages from 9950 interface that contained errors
49114	1	Read	UINT	Number of messages received from Modbus interface
49115	1	Read	UINT	Number of messages from Mobdus interface that contained errors

Device Identification Settings

Register	Size	Read/Write	Data Type	Description
49501	15	Read	String	Vendor name
49516	10	Read	String	Product code
49591	5	Read	String	10-character serial number of transmitter

Programming Map

Communication Settings Programming



Readings / Sensors

Instrument Type	Measurement Type Channel 1 Reg 40007 Channel 2 Reg 40016 Channel 3 Reg 40025 Channel 4 Reg 40034 Channel 5 Reg 40043 Channel 6 Reg 40052	Primary Channel 1 Reg 40003 Channel 2 Reg 40012 Channel 3 Reg 40021 Channel 4 Reg 40030 Channel 5 Reg 40039 Channel 6 Reg 40048	Secondary Channel 1 Reg 40005 Channel 2 Reg 40014 Channel 3 Reg 40023 Channel 4 Reg 40032 Channel 5 Reg 40041 Channel 6 Reg 40050
Factory[1]	0	NA	NA
None[1]	1	NA	NA
Flow	2	Flow	Totalizer[2]
pH	3	pH	Temperature
ORP	4	ORP	Raw mV
Cond/Res	5	Cond/Res	Temperature
Pressure	6	Pressure	NA
Level/Volume	7	Level	Volume
Temperature	8	Temperature	NA
4 to 20 mA Input	9	Scaled Input	Raw mA
Salinity	10	Salinity	Temperature
Dissolved Oxygen	11	Dissolved Oxygen	Temperature
Free Chlorine	12	Free Chlorine	Temperature[3]
Chlorine Dioxide	14	Chlroine Dioxide	Temperature[3]

[1] Factory and None types do not update the Primary or Secondary readings.

[2] The Totalizer is the Totalizer set to be displayed in the view menu. This can be changes in the Input Menu, Totalizer Display. The totalizer type, permanent or resettable, is indicated in the Channel Status Register bits 19 and 20.

[3] Free Chlorine and Chlorine Dioxide are only supported in the 9950-3 Chlorine Controller.

Programming Map

Channel Status Registers
- **Channel 1 Registers 40001**
- **Channel 2 Registers 40010**
- **Channel 3 Registers 40021**
- **Channel 4 Registers 40028**
- **Channel 5 Registers 40037**
- **Channel 6 Registers 40046**

Register.Bit	Description
400xx.0	Sensor Reading is Good, No Errors
400xx.1	Wrong Sensor Connected or Wrong Module Connected
400xx.2	Check Sensor
400xx.3	Missing Sensor or Missing Module
400xx.4	Sensor Error
400xx.5	Secondary Reading is Totalizer
400xx.6	Secondary Reading Not Available
400xx.7	Not Used (Always zero)
400xx.8	9950 Communication Active
400xx.9	Not Used (Always one)
400xx.10	Device Using Default Communication Parameters
400xx.11	No Flow Detected (Flow), Expired Cap (Dissolved Oxygen), Broken Glass (pH 2751)
400xx.12	Missing Cap (Dissolved Oxygen), Missing Probe (pH, ORP, and Conductivity)
400xx.13	Sensor Busy (pH 2751, Conductivity 2850)
400xx.14	Sensor Range Error (Flow, pH, Conductivity, Pressure, 4-20 mA Input, Salinity), Temperature Out of Range (Chlorine Versions only)
400xx.15	Not Used (Always zero)
400xx.16	Wrong Probe (pH, Chlorine or ORP)
400xx.17	Permanent Totalizer Rolled Over
400xx.18	Resettable Totalizer Rolled Over (Flow)
400xx.19	Secondary Reading is Permanent Totalizer (Flow)
400xx.20	Secondary Reading is Resettable Totalizer (Flow)
400xx.21	Secondary Reading is Temperature
400xx.22	Calibration in Process
400xx.23	Outputs are Held
400xx.24	System Reset/Power Up
400xx.25	Not Used (Always zero)
400xx.26	Read Only Mode
400xx.27 – 400xx.31	Not Used

Binary Input Status
Registers 40201

Register.Bit	Description
4020X.0	Good No Errors, Module Present
4020X.1	Wrong Module
4020X.2	Not Used
4020X.3	Missing Module
4020X.4	Not Used
4020X.5	Not Used
4020X.6	Not Used
4020X.7	Not Used, Always 0
4020X.8	9950 Communication Active
4020X.9	Not used Always 1
4020X.10	Using Default Communication Parameters
4020X.11	Not Used
4020X.12	Not Used
4020X.13	Not Used
4020X.14	Not Used
4020X.15	Not Used
4020X.16	Not Used
4020X.17	Not Used
4020X.18	Not Used
4020X.19	Not Used
4020X.20	Not Used
4020X.21	Not Used
4020X.22	Not Used
4020X.23	Not Used
4020X.24	System Reset / Power Up
4020X.25	Not Used (Always zero)
4020X.26	Read Only Mode
4020X.27 – 4020X.31	Not Used

Derived Function Status Registers
- **Derived Function 1 Status Register 40301**
- **Derived Function 2 Status Register 40305**
- **Derived Function 3 Status Register 40309**
- **Derived Function 4 Status Register 40313**

Register.Bit	Description
403xx.0	Good, No Errors
403xx.1	Divide by Zero
403xx.2	Source A Error
403xx.3	Source B Error
403xx.4	Not Used
403xx.5	Not Used
403xx.6	Not Used
403xx.7	Not used Always 0
403xx.8	9950 Communication Active
403xx.9	Not used Always 1
403xx.10	Device using Default Communication Parameters
403xx.11	Not Used
403xx.12	Not Used
403xx.13	Not Used
403xx.14	Not Used
403xx.15	Not Used
403xx.16	Not Used
403xx.17	Not Used
403xx.18	Not Used
403xx.19	Not Used
403xx.20	Not Used
403xx.21	Not Used
403xx.22	Calibration in Process
403xx.23	Outputs are Held
403xx.24	System Reset/Power Up
403xx.25	Spare (always 0)
403xx.26	Read Only Mode
403xx.27 – 403xx.31	Not Used

Loop Status Registers

- **Loop 1 Status Register 40401**
- **Loop 2 Status Register 40405**
- **Loop Module 1 A Status Register 40409**
- **Loop Module 1 B Status Register 40413**
- **Loop Module 2 A Status Register 40417**
- **Loop Module 2 B Status Register 40421**

Register.Bit	Description
404xx.0	Good, No Errors
404xx.1	Missing Module
404xx.2	Loop in Use
404xx.3	Measurement Error
404xx.4	Loop sending Error Current
404xx.5	Not Used
404xx.6	Not Used
404xx.7	Not used Always 0
404xx.8	9950 Communication Active
404xx.9	Not used Always 1
404xx.10	Device using Default Communication Parameters
404xx.11	Not Used
404xx.12	Not Used
404xx.13	Not Used
404xx.14	Not Used
404xx.15	Not Used
404xx.16	Not Used
404xx.17	Not Used
404xx.18	Not Used
404xx.19	Not Used
404xx.20	Not Used
404xx.21	Loop in Manual Mode
404xx.22	Calibration in Process
404xx.23	Outputs are Held
404xx.24	System Reset/Power Up
404xx.25	Spare (always 0)
404xx.26	Read Only Mode
404xx.27 – 404xx.31	Not Used

Programming Map

Relay Status Registers

Relay 1 Status Register 40501
Relay 2 Status Register 40506
Relay 3 Status Register 40511
Relay 4 Status Register 40516

Relay A Status Register 40521
Relay B Status Register 40526
Relay C Status Register 40531
Relay D Status Register 40536

Register.Bit	Description
405xx.0	Good, No Errors
405xx.1	Missing Module
405xx.2	Relay in Use
405xx.3	Measurement Subsource A Error
405xx.4	Measurement Subsource B Error
405xx.5	Measurement Subsource C Error
405xx.6	Not Used
405xx.7	Not used Always 0
405xx.8	9950 Communication Active
405xx.9	Not used Always 1
405xx.10	Device using Default Communication Parameters
405xx.11	Not Used
405xx.12	Not Used
405xx.13	Not Used
405xx.14	Not Used
405xx.15	Not Used
405xx.16	Not Used
405xx.17	Not Used
405xx.18	Not Used
405xx.19	Not Used
405xx.20	Not Used
405xx.21	Manual Mode
405xx.22	Calibration in Process
405xx.23	Outputs are Held
405xx.24	System Reset/Power Up
405xx.25	Spare (always 0)
405xx.26	Read Only Mode
405xx.27 – 405xx.31	Not Used

Module Status Registers
Module 1 Status Register 40601
Module 2 Status Register 40603

Register.Bit	Description
4060x.0	Good, No Errors
4060x.1	Missing Module
4060x.2	Module in Use
4060x.3	Measurement Subsource A Error (Relay Multiple Mode Only)
4060x.4	Measurement Subsource B Error (Relay Multiple Mode Only)
4060x.5	Measurement Subsource C Error (Relay Multiple Mode Only)
4060x.6	Not Used
4060x.7	Not used Always 0
4060x.8	9950 Communication Active
4060x.9	Not used Always 1
4060x.10	Device using Default Communication Parameters
4060x.11	Not Used
4060x.12	Not Used
4060x.13	Not Used
4060x.14	Not Used
4060x.15	Not Used
4060x.16	Not Used
4060x.17	Not Used
4060x.18	Not Used
4060x.19	Not Used
4060x.20	Not Used
4060x.21	Manual Mode
4060x.22	Calibration in Process
4060x.23	Outputs are Held
4060x.24	System Reset/Power Up
4060x.25	System Offline
4060x.26	Read Only Mode
4060x.27 – 4060x.31	Not Used

Module Status Registers

Channel 1 Control Register 40901
Channel 2 Control Register 40902
Channel 3 Control Register 40903
Channel 4 Control Register 40904
Channel 5 Control Register 40905
Channel 6 Control Register 40906

Register.Bit	Description
4090x.0	Transition (0 to 1) Reset Resettable Totalizer (Flow)
4090x.1	Transition (0 to 1) Reset Permanent Totalizer Roll Over Bit (Flow)
4090x.2	Transition (0 to 1) Reset Resettable Totalizer Roll Over Bit (Flow)
4090x.3	Not Used
4090x.4	Not Used
4090x.5	Not Used
4090x.6	Not Used
4090x.7	Not Used
4090x.8	Not Used
4090x.9	Not Used
4090x.10	Not Used
4090x.11	Not Used
4090x.12	Not Used
4090x.13	Not Used
4090x.14	Not Used
4090x.15	Transition (0 to 1) to Clear System Reset / Power Up Bit

Format (Byte Orders)

Floats

Register	Data	Bytes
IEEE-754 Float 0x570A4318		
Value 152.34		
49006	0	Big Endian
40003	0x570A	C D
40004	0x4318	A B
49006	1	Little Endian
40003	0x4318	AB
40004	0x570A	CD

Units of Measure

Unit of Measure	Code	Description
Flow (Primary)		
AF/D	27323	Acre-Feet / Day
AF/H	27067	Acre-Feet / Hour
AF/M	26811	Acre-Feet / Minute
AF/S	26555	Acre-Feet / Second
GPS	26390	Gallons per Second
GPM	26640	Gallons per Minute
GPH	27016	Gallons per Hour
GPD	27371	Gallon per Day
LPS	26392	Liters per Second
LPM	26641	Liters per Minute
LPH	27018	Liters per Hour
LPD	27313	Liters per Day
M3/S	26396	Cubic Meters per Second
M3/M	26755	Cubic Meters per Minute
M3/H	26899	Cubic Meters per Hour
M3/D	27165	Cubic Meters per Day
ml/S	26544	milliliters per Second
ml/M	26800	milliliters per Minute
ml/H	27056	milliliters per Hour
ml/D	27312	milliliters per Day
FT3/S	26394	Cubic Feet per Second
FT3/M	26639	Cubic Feet per Minute
FT3/H	27010	Cubic Feet per Hour
FT3/D	27163	Cubic Feet per Day
MG/D	27159	Million Gallons per Day
All Others	252	All other flow units
Flow Totalization (Secondary)		
AF	17679	Acre-Feet
FT3	17520	Cubic Feet
M3	17541	Cubic Meters
Gal	17448	Gallons
L	17449	Liters
mL	17650	Milliliter
All other Units	252	
pH (Primary)		
pH	20795	pH
pH Temperature (Secondary)		
Temperature C	16416	Degrees Celsius
Temperature F	16417	Degrees Fahrenheit
ORP (Primary and Secondary)		
mV	21284	Millivolts

Units of Measure

Unit of Measure	Code	Description
Conductivity (Primary)		
uS	22329	microSiemens
mS	22338	milliSiemens
PPM	23179	Parts per Million
PPB	23209	Parts per Billion
KOhms/cm	21932	Kilo Ohms per Centimeter
MOhms/cm	21933	Mega Ohms per Centimeter
Conductivity Temperature (Secondary)		
Temperature C	16416	Degrees Celsius
Temperature F	16417	Degrees Fahrenheit
Pressure		
PSI	16646	Pounds per Square Inch
Bar	16647	Bars
KPa	16652	Kilopascals
Level/Volume (Level)		
FT	17708	Feet
IN	17711	Inches
M	17709	Meters
CM	17712	Centimeters
Level/Volume (Volume)		
FT3	17520	Cubic Feet
IN3	17521	Cubic Inches
M3	17451	Cubic Meters
CM3	17648	Cubic Centimeters
GAL	17448	Gallons
LIT	17449	Liters
Lb	18239	Pounds
KG	18237	Kilograms
Temperature		
C	16416	Degrees Celsius
F	16417	Degrees Fahrenheit
4 to 20 mA Input		
mA	21543	Raw 4 – 29 mA Input Current
Salinity (Primary)		
PPT	23210	Parts per Thousand
PSU	28656	Practical Salinity Unit
Salinity Temperature (Secondary)		
C	16416	Degrees Celsius
F	16417	Degrees Fahrenheit
Dissolved Oxygen (Primary)		
PPM	23179	Parts per Million
% SAT	57	Percent
TOR	16653	Torr

Units of Measure

Unit of Measure	Code	Description
Dissolved Oxygen Temperature (Secondary)		
C	16416	Degrees Celsius
F	16417	Degrees Fahrenheit
Other		
nA	21674	Nanoamp
FNU	25002	Formazin Nephelometric Units
FTU	25003	Formazin Turbidity Units
NTU	25004	Nephelometric Turbidity Units
4 to 20 mA Scaled Input		
%Sat	57	Percent Saturation
AF	17679	Acre Feet
AF/D	27323	Acre Feet per Day
AF/H	27067	Acre Feet per Hour
AF/M	26811	Acre Feet per Minute
AF/S	26555	Acre Feet per Second
Bar	16647	Bar
C	16416	Degree C
CM	17712	Centimeter
F	16417	Degree F
FNU	25002	
FT	17708	Feet
FT3	17520	Cubic Feet
F3/D	27163	Cubic Feet per Day
F3/H	27010	Cubic Feet per Hour
F3/M	26639	Cubic Feet per Minute
F3/S	26394	Cubic Feet per Second
FTU	25003	
Gal	17448	Gallons
GPD	27371	Gallons per Day
GPH	27016	Gallons per Hour
GPM	26640	Gallons per Minute
GPS	26390	Gallons per Second
IN	17711	Inches
KG	18237	Kilogram
KOhm	21932	Kilo-Ohm
KPa	16652	Kilo-Pascal
L	17449	Liters
LB	18239	Pound
Liters	17449	Liters
LPD	27313	Liters per Day
LPH	27018	Liters per Hour
LPM	26641	Liters per Minute
LPS	26392	Liters per Second
mA	21543	milliamp

Programming Map

Units of Measure

4 to 20 mA Scaled Input		
M	17709	Meters
M3	17451	Cubic Meters
M3/D	27165	Cubic Meters per Day
M3/H	26899	Cubic Meters per Hour
M3/M	26755	Cubic Meters per Minute
M3/S	26396	Cubic Meters per Second
MG/D	27159	Millions of Gallons per Day
ML/D	27161	Millions of Liters per Day
uS/cm	22328	microSiemen per Centimeter
ml	17650	milliliter
ml/D	27312	milliliter per Day
ml/H	27056	milliliter per Hour
ml/M	26800	milliliter per Minute
ml/S	26544	milliliter per Second
MOhm	21930	Mega-Ohm
mS/cm	22338	milliSiemen per Centimeter
mV	21284	millivolt
nA	21674	nanoAmp
NTU	25004	
ORP	21284	ORP
pH	20795	pH
PPB	23209	Parts per Billion
PPM	23179	Parts per Million
PPT	23210	Parts per Thousand
PSI	16646	Pounds per Square Inch
TORR	16653	
Free Chlorine/Chlorine Dioxide		
PPM	23179	Parts per Million
mg/L	170	Milligrams per Liter
Salinity		
PSU	28656	Practical Salinity Units

Ordering Information

Part Number	Code	Description
3-9950.395-M	159 001 905	Modbus Module

For installation information, please download the Installation and Programming manual at www.gfps.com

+GF+

Georg Fischer Signet LLC, 5462 N. Irwindale Avenue, Irwindale, CA 91706 U.S.A. • Tel. (626) 571-2770
For Worldwide Sales and Service, visit our website: www.gfps.com • Or call (in the U.S.): (800) 854-4090
For the most up-to-date information, please refer to our website at www.gfps.com

3-9950-395.090 Rev 3 11/24 English