Smart 4 Analog (4~20mA) Input Sensor/Output

SM4-(AI/AO)-420-1

Monitor and Control 4 Analog Inputs / Analog Outputs Over Copper or Fiber Ethernet with Real-Time Alerts

The Smart 4 Analog (4~20mA) Input Sensor and Analog Output are programmable Ethernet I/O controllers that interface with industrial process control instruments such as environmental sensors, flow meters, level transmitters, and actuators.

Each of the Analog Input and Output channels are configurable through a built-in web management portal, and can be integrated with network management systems, industrial control systems, Internet of Things (IoT) frameworks, and REST-integrated automation platforms.

The Smart 4 Analog Input Sensor and Output support TLS/SSL encryption, IEEE 802.1X via RADIUS authentication (AAA), role based access control (RBAC), and event logging. Their versatile 2-port (1xRJ45, 1xSFP) Ethernet interface offers network access redundancy and segmentation.

Each device can operate as a standalone unit, independently monitoring and controlling the value of their 4 analog inputs or 4 outputs, or pair together over a secure TLS/SSL-encrypted tunnel.

This System Pairing feature allows Input Sensors to transmit 4~20mA signals across an Ethernet network to one or multiple remote locations.

Smart 4 Analog (4~20mA) Input and Output

Features

System
- 4 independent channels for monitoring and controlling 4 Analog (4~20mA) Inputs / Outputs
- 30kHz analog bandwidth ensures precise signal acquisition of high-frequency 4~20mA signals
- Supports loop-powered 4~20mA operation for connected 2-wire, 3-wire, and 4-wire transmitters

Environment
- Hardened to operate in -40°C to +70°C (-40°F to +158°F)
- DIN rail or Wall Mount (Wall mount ears included)

Power
- 12-48VDC and 125VDC models available with redundant power terminals
- Self-limiting analog input signal overcurrent (24mA) protection
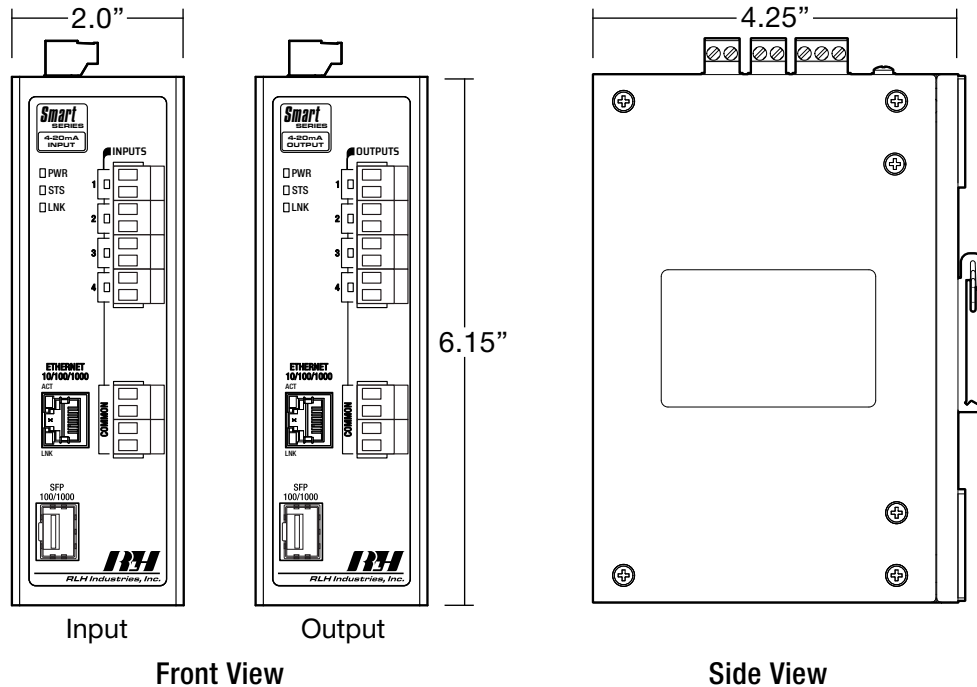
Quality
- Designed, Engineered, and Assembled in the USA
- Covered by our Lifetime Warranty

Ethernet IO
- 2-Port Gigabit Ethernet Interface featuring 1xRJ45 port (Copper) and 1xSFP port (Fiber Optics)
- User-friendly embedded web management portal
- Transport 4~20mA between Smart Series units via System Pairing
- NMS and SCADA/DCS integration options include: SNMPv1/v2c/v3, Modbus TCP, and DNP3 TCP
- SNMP-driven 4~20mA oversight with Trap Notifications and Receiver
- MQTT stack for Publish/Subscribe telemetry messaging
- RESTful API with GET/POST/PUT request support
- Encrypted, custom email alert generation
- Time-stamped Event Log tool with Export-to-CSV feature

Dimensions

Input	Output

Front View

Side View

2.0"

6.15"

4.25"

Ethernet I/O Specifications

Analog Inputs 1~4 (Differential Inputs)	**Operating Range**	0~20mA (DC)
	Impedance	250 Ohms
	Protection	24mA
Analog Outputs 1~4 (Single-ended, Unipolar)	**Loop Voltage**	23.7VDC
	Max. Loop Resistance	1000 Ohms
	Max. Output Signal	20mA
Ethernet Interface	**1x** RJ45 Port (10/100/1G), **1x** SFP Port (100/1G)	*Data Transmission is auto-negotiated

Compliant IEEE Standards	**IEEE 802.3** 10Base-T (Ethernet)	**IEEE 802.3u** 100Base-TX/FX (Fast Ethernet)
	IEEE 802.3ab/z 1000Base-T/X (Gigabit Ethernet)	**IEEE 802.1X** (Port-Based Network Access Control)

Network Protocols	HTTP/HTTPS, SMTP, DHCP, DNS, NTP, IEEE 802.1X/RADIUS, TLS/SSL Encryption
	SNMPv1/v2c/v3, Modbus TCP, DNP3, MQTT, RESTful API

System Pairing Topologies	**One-to-One:**	**1x** Smart 4 Analog (4~20mA) Input Sensor to **1x** Smart 4 Analog (4~20mA) Output
	One-to-Many:	**1x** Smart 4 Analog (4~20mA) Input Sensor to >**1x** Smart 4 Analog (4~20mA) Output
	Many-to-One:	>**1x** Smart 4 Analog (4~20mA) Input Sensor to **1x** Smart 4 Analog (4~20mA) Output

System Pairing Latency	**One-to-One:**	(TCP) Typical 8ms, Maximum 45ms
	One-to-Many:	(TCP) <250ms
	Many-to-One:	(TCP) <250ms
	* Latency specification listed is based on direct connections between Input Sensors and Outputs	

General Specifications

LED Indicators	Power, CPU Status, System Pairing, Analog (4~20mA) Inputs / Outputs 1~4, Ethernet Link/Activity		
Power	Power Input	12-48VDC (11-53VDC)	
	-A powering option	125VDC (42~160V)	
	Dual Redundant Power Inputs - Polarity insensitive		
	Power Consumption	8 Watts Maximum	
DC Input Isolation (In/Out)	1.5kV	*For -A power option models only	
Overcurrent Protection	1.0A	Automatic Recovery	
System Status Alarm	Relay Type:	Mechanical, SPDT Relay, Form C, Normally Open/NO or Normally Closed/NC	
	Operational Limits:	Max. Power	Max. Voltage	Max. Current
		60W / 125VA	220VDC / 250VAC	2A AC/DC
Operating Temperature	-40℃ to +70℃ (-40℉ to +158℉)		
Storage Temperature	-40℃ to +85℃ (-40℉ to +185℉)		
Humidity	95% non-condensing		
Dimensions	4.93"(H) x 2.0"W) x 3.93"(D) (125mm x 51mm x 100mm) - not including DIN clip		
Weight	1.6 lbs. (0.73kg)		
Mounting	Standard T-35 DIN rail clip and wall mount ears (Included)		
Compliance	RoHS and REACH		
Warranty	Lifetime - Visit www.fiberopticlink.com for warranty information and coverage details		

Ordering Information

Description	Part Number
Smart 4 Analog Input Sensor, 4x 4~20mA Inputs, Powered by 12-48VDC	**SM4-AI-420-1**
Smart 4 Analog Output, 4x 4~20mA Outputs, Powered by 12-48VDC	**SM4-AO-420-1**

- Add **-A** to the end of the part number for 125 VDC input power option

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