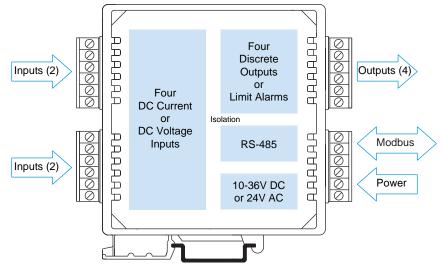
BusWorks 900MB Series

Modbus/RS-485



DC Current/Voltage Input Module



913/914MB Multi-Channel Analog Input Modules

DC Current, DC Voltage or AC Current Input

Limit Alarms or Discrete Outputs

Models

913MB: 4 current input channels **914MB**: 4 voltage input channels

Input Ranges

0 to 20mA DC, ±10V DC, 0 to 20A AC (with 5020-350 sensor)

Output

Four output channels: Open-drain MOSFETs (1A DC loads) 0 to 35V DC

Network Communication Modbus-RTU high-speed RS-485

Power Requirement

10 to 36V DC, 24V AC

Approvals

CE marked. UL, cUL listed Class I; Division 2; Groups A, B, C, D.

Description

This signal conditioner is a four-channel analog input module with four discrete outputs. It provides isolation between input, output, power, and network circuits. Network communication adheres to the industry-standard RS-485 Modbus RTU protocol. AC and DC power sources are supported with nonpolarized, diode-coupled terminals.

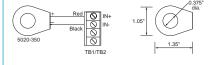
The inputs accommodate wide DC voltage or current ranges. Flexible discrete outputs operate as alarms or on/off controllers. As limit alarms, each discrete output can be configured with high and/or low setpoints exclusively tied to an analog input channel. Alarm trips function without host communication enabling low-cost stand-alone alarms, as well as local backup for the primary control system. Otherwise, on/off control is based on commands issued by the host system.

Combining flexible transmitter functions, mixed signal I/O, alarm support, and a network interface in a single package, makes this instrument extremely powerful. Multi-channel design adds cost-efficiency and allows high-density mounting. Plus, safe, rugged construction makes these modules reliable for use in both control room and distributed field I/O applications. Custom module configurations are also possible (consult factory for details).

Special Features

- Standard Modbus RTU protocol with high-speed RS-485 communication (up to 115K bps)
- 16-bit sigma-delta A/D yields 0.1% of range resolution and accuracy
- Four inputs in a single inch-wide module reduces system costs and saves panel space
- Four discrete outputs enable local limit alarms or host-controlled on/off switching
- Heavy-duty 1A solid-state relays provide dependable on/off control of industrial devices
- Self-calibration lowers maintenance costs by reducing periodic manual calibration checks
- Watchdog timers provide a configurable failsafe output state for use when host I/O communication is lost
- Four-way isolation eliminates potential ground loops between power, input, output, and network circuitry
- Self-diagnostics monitor microcontroller activity to detect operational failures (lock-up) and execute a reset to restore communication

AC Current Sensor Model 5020-350



For 913MB. Order separately (one per channel).

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BusWorks[®] Moo

BusWorks[®] Modbus I/O



Performance Specifications

General Input

Resolution 0.005% or 1 part in 20,000.

Noise Rejection Normal mode: 40dB @ 60Hz, typical. Common mode: 140dB @ 60Hz, typical.

Input Filter Bandwidth -3dB at 3Hz, typical.

Input Conversion Rate 180ms per channel.

Current Input (913MB)

DC Current Input Ranges Range user-configured. Range selected applies to all channels.

0 to 1mA, 0 to 20mA, 4 to 20mA, 0 to 11.17mA (for use with 5020-350 AC sensor).

DC Current Input Resistance 49.9 ohms.

DC Current Input Accuracy ±0.1% of input range.

Voltage Input (914MB)

DC Voltage Input Ranges Range user-configured. Range selected applies to all channels.

±10V, ±5V, ±2.5V, ±1.25V, ±625mV, ±313mV, ±156mV, ±78mV

Input Impedance 110.5K ohms.

DC Voltage Input Accuracy

±0.1% of input range.

Discrete Output

Output Type Four independent open drain MOSFET switches with a common return that operate as low-side switches.

Output Voltage Range 0 to 35V DC. External voltage source required.

Output Current Range 0 to 1A DC continuous for each output.

Output OFF Leakage Current 50µA maximum.

Output ON Resistance 0.15 ohms maximum.

Output Response Time

4.1ms typical, from receipt of command to gate transition of the output MOSFET.

Operation

Digital outputs are set to their OFF state following a software or power-on reset. Outputs can optionally be set to user-defined states following a watchdog timeout. Watchdog timeout output control takes precedence over limit alarm control. Alarm control takes precedence over host control.

Communication

Supported Modbus Commands

The command/response protocol for communicating with this module adheres to the Modbus/RTU standard for the following Modbus Functions.

> Read Coil (Output) Status Read Holding Registers Read Input Registers Force Single Coil (Output) Preset Single Register Force Multiple Coils (Output) Preset Multiple Registers Report Slave ID Reset Slave

LED Indicators

LEDs indicate power, status, and discrete level/alarm.

Power and Isolation

Power Requirements 10 to 36V DC or 22 to 26V AC.

Supply Current

 Supply
 Current Draw

 10V DC
 125mA maximum

 24V DC
 50mA maximum

 24V AC
 100mA rms maximum

Isolation

1500V AC for 60 seconds or 250V AC continuous. 4-way isolation between input, network, power, and discrete I/O circuits. Inputs are isolated channel-to-channel for common mode voltage to \pm 4V DC.

Ordering Information

Models

913MB-0900 914MB-0900 DC current (913MB) or voltage (914MB) input module

Accessories

900C-SIP

Configuration Software Interface Package (includes software CD-ROM for Windows, RS-232/485 converter, and RS-485/three-wire cable)

5034-225

USB-to-RS232 adapter. See page 68 for more info. 5020-350

AC current sensor for 913MB. One for each channel. (See page 205)

TBK-B02

Optional terminal block kit, barrier strip style, 4 pcs.

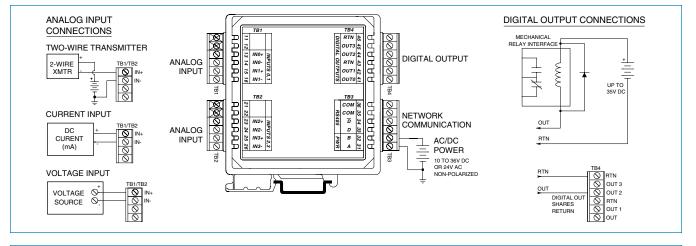
TBK-S02

Optional terminal block kit, spring clamp style, 4 pcs. PS5R-D24

PS5K-DZ

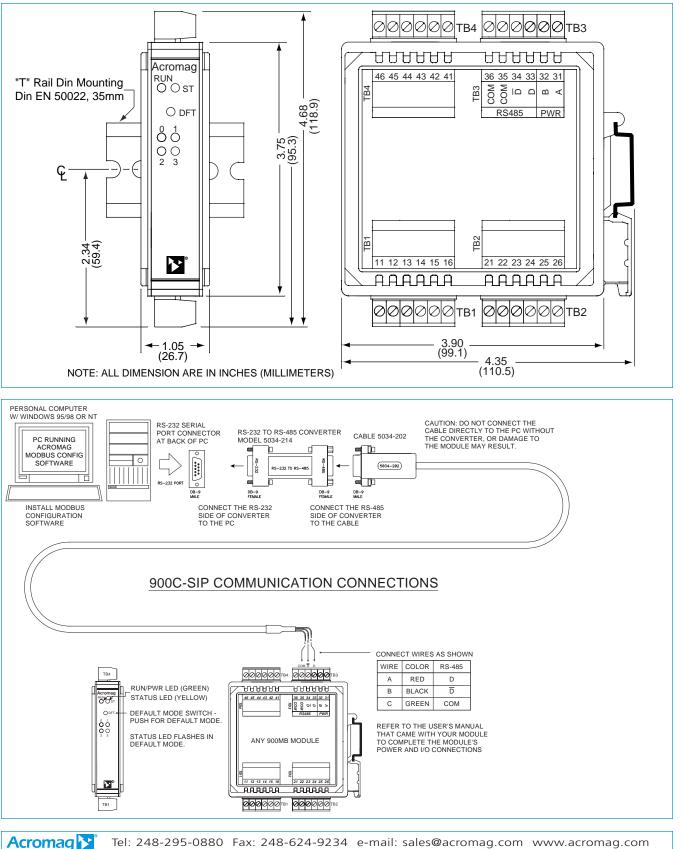
Power supply (24V DC, 2.1A). See Power Supplies on Page 199.

For more information on software, network hardware, and mounting accessories, please see Pages 69-71.



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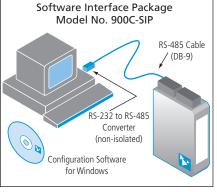
900MB Series Technical Diagrams





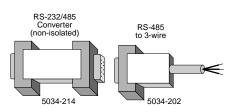


Configuration Kit



Software Interface Package

This package includes Windows® Configuration Software, an RS-232-to-485 Serial Port Converter, and an RS-485 Signal Cable. These components provide everything you need to set up a Series 900 I/O module from your desktop PC before installing it on the network.



Ordering Information

900C-SIP

Software Interface Package. Includes Configuration Software (5034-186), Non-isolated RS-232 to RS-485 Serial Port Converter (5034-214), and RS-485 Cable (5034-202).

Items can also be ordered separately below.

5034-186

Configuration Software for Windows (95/98/2000/ME/ NT4/XP) on CD-ROM.

5034-214

Non-isolated RS-232 to RS-485 Serial Port Converter, DB-9F to DB-9F.

5034-202

PS5R-D24

RS-485 to 3-wire Cable Converter, DB-9M to 3 x 12AWG RS-485 Cable, 8 ft.

Ordering Information

Network Power

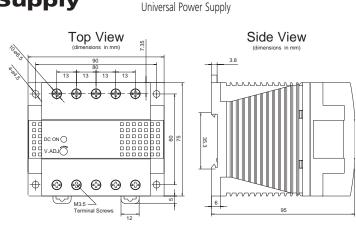


Universal 50W Power Supply

The PS5R-D24 is the ideal power source to drive your network.

Input Power Requirement Universal power 85 to 264V AC, 105 to 370V DC

Output 24V DC, 2.1A (50W)



20RM-16-DIN

DIN RAIL 3.0

DIN RAIL 16.7

16.7 inches (425mm)



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DIN-Rail Mounting

For your convenience, Acromag offers several mounting accessories to simplify your system installation. Our 19" rack-mount kit provides a clean solution for mounting your I/O modules and a power supply. Or you can buy precut DIN rail strips for mounting on any flat surface.



Ordering Information

19" rack-mount kit with DIN rail.

DIN rail strip, Type T, 3 inches (75mm) or

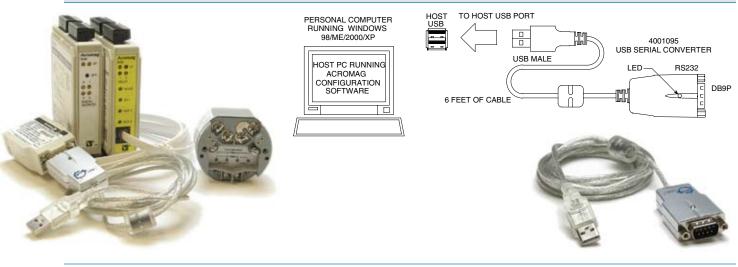


Dimensions in inches (mm).

Tel: 248-295-0880 Fax: 248-624-9234 e-mail: sales@acromag.com www.acromag.com

Accessories

Model 4001-095 USB-to-Serial Adapter



Simplifies configuration of Acromag I/O Modules + Enables configuration via USB port

Description

This device is a USB-to-serial adapter that you can use to communicate with many Acromag I/O products for setup and re-configuration for your application.

Key Features & Benefits

- Connects to I/O modules via USB (other adapters may be necessary)
- Complete RS232 control signals
- Conforms to USB Specification, Version 1.1

INTELLIPACK

SERIAL ADAPTER

MODEL 5030-913

- USB-powered
- Cable length, 6 ft., UL approved

IntelliPack 800x Series

Adapter and Cable

9-PIN CONNECTOR (DB9S)-

Performance Specifications

USB Specification Version 1.1 Data rate Up to 115.2Kbps

Environmental Standards RoHS-compliant

Basic Power Consumption 150mA

- RJ11 JACK (6 CONDUCTOR)

RJ11 PLUG

(6 CONDUCTOR)

MODEL 5030-902 (6 feet long)

PC Requirements Windows® 7 (32-/64-bit) / Vista (32-/64-bit) / XP (32-/64-bit) / Server 2003 & 2008 (32-/64-bit) / 2000 / ME / 98SE / 98

Ordering Information

NOTE: For more information visit www.acromag.com.

Adapters

4001-095 USB to serial adapter. Includes driver CD and manual. 5030-913

Serial port adapter. DB9S connector to RJ11 jack.

5034-202

RS-485 to 3-wire cable converter and cable, DB-9M to 3 x 12AWG RS-485 cable, 8 ft.

5032-287

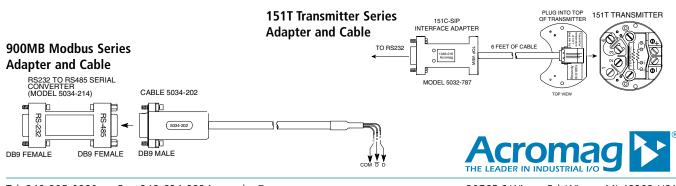
RS-232 to 151T transmitter configuration device converter and cable, 6 ft.

5034-214

Non-isolated RS-232 to RS-485 Serial Port Converter, DB-9F to DB-9F.

Cables

5030-902 Cable. 6 feet long with RJ11 plug at each end.



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