Product Datasheet - Technical Specifications

More information in our Web-Shop at ▸ **www.meilhaus.com** and in our download section.

Your contact

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www.meilhaus.com/en/infos/download.htm

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PROFIBUS-DP: REMOTE I/O

Save up to 50% compared to block and modular I/O systems. Acromag's BusWorks® modules do not require special buscouplers, racks, or power supplies.

BusWorks® I/O Modules for Profibus-DP

Acromag's BusWorks 900PB series is a high-performance line of network-ready analog and discrete I/O modules. They feature universal input/output ranges and an intelligent microcontroller to provide extreme flexibility and powerful monitoring and control capabilities. Select from a variety of analog and discrete I/O models to meet your application requirements.

Each module provides a direct network interface for your I/O signals. Unlike "block I/O" devices that combine large, expensive processor blocks with snap-on I/O terminal blocks, 900PB modules handle the network interface and I/O processing in one, compact multi-channel module. This space-saving approach is very cost-effective for systems that need to add a small quantity of I/O channels at existing control sites or network to new remote sites.

To ensure high performance, modules feature an advanced microcontroller technology. On-board address switches and automatic baud rate detection (up to 12 Mbps) simplify installation. Four-way isolation prevents ground loops and increases noise immunity. Indicator LEDs and self-diagnostics help you quickly catch problems.

Inputs
- Thermocouple
- RTD/resistance
- Millivolt
- DC current/voltage
- AC current
- Discrete level/status

Outputs
- DC voltage
- DC current
- Discrete switches

Power
- 12-36V DC

Approvals
- Profibus PNO, CE, UL/cUL Class I Div 2

12

ProfiBus-DP / RS485

PNO Certified

CE

c UL us LISTED

2 YEAR WARRANTY

BusWorks® Profibus I/O

900PB Series ProfiBus-DP I/O Modules

The 900PB series is a high-performance line of networked I/O modules. These units feature universal input/output ranges and an intelligent microcontroller to provide extreme flexibility and powerful monitoring and control capabilities. Select from a variety of analog and discrete I/O models to meet your application requirements.

Each module provides a direct network interface for your I/O signals. Unlike "block I/O" devices that combine a large and expensive processor block with snap-on I/O terminal blocks, 900PB modules handle the network interface and I/O processing in a single, compact multi-channel module. This space-saving approach is very cost-effective for systems that need to add some I/O channels at an existing control site or network new, remote sites.
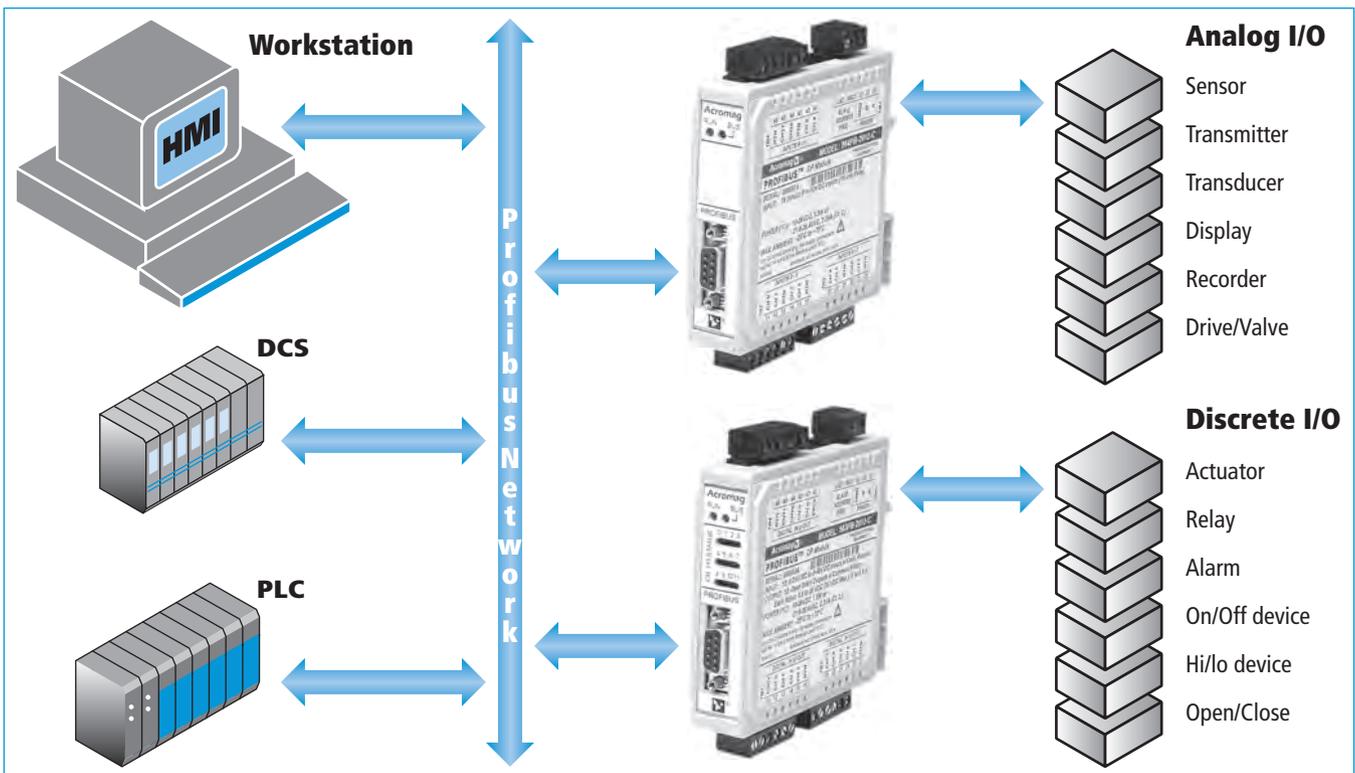
To ensure unsurpassed performance, these I/O modules employ advanced microcontroller technology. Isolated input, output, power, and network circuits increase noise/transient immunity and prevent ground loops. Status LEDs provide diagnostic feedback.

Self-diagnostics and sophisticated watchdog timers simplify maintenance and troubleshooting. The watchdog timer invokes a failsafe condition if host communication is lost. For further security, a second watchdog monitors the microcontroller for failed operations or a "lock-up" condition and automatically resets the unit.

Ready to ship within 24-hours from stock. Backed by a 2-year warranty.

■ Special Features

■ **Direct Network Interface:**
Each module has a built-in microcontroller for communication. No bus coupler required.

■ **RS485/ProfiBus Network Communication:**
Highly immune to noise and operates over long distances

■ **Industry Standard ASIC:**
Siemens SPC3 intelligent ASIC to talk ProfiBus

■ **High-Speed Data Rates:**
Half-duplex RS485 with rates up to 12M baud

■ **Auto-Baud Rate Detection:**
Baud rate is set automatically

■ **Fully Isolated:**
I/O, network, and power circuits isolated from each other for safety and noise immunity

■ **Nonvolatile Reprogrammable Memory:**
Allows the functionality of this device to be reliably reprogrammed thousands of times

■ **Self-Diagnostics & Watchdog Timers:**
Self-test simplifies maintenance. Profibus has defined failsafe mode for lost communication.

Workstation — HMI — Profibus Network

DCS

PLC

Analog I/O
Sensor
Transmitter
Transducer
Display
Recorder
Drive/Valve

Discrete I/O
Actuator
Relay
Alarm
On/Off device
Hi/lo device
Open/Close

Acromag THE LEADER IN INDUSTRIAL I/O

■ Discrete I/O

These modules monitor discrete levels of various devices and/or provide on/off control capabilities depending on the model selected. Each module has up to twelve channels to save space and minimize costs. Models are available with input- or output-only, or bidirectional I/O configurations.

Inputs
■ Active-low inputs, 0 to 35V DC

Outputs
■ Sinking outputs, 0 to 35V DC, up to 500mA

Functions
■ Monitor discrete state or level
■ Control on/off, high/low, open/close switching
■ Activate audible or visual alarms

■ Analog Input

These units monitor a wide variety of industrial machinery and equipment. They accept direct sensor inputs or DC process control signals from transducers, transmitters, and other instruments.

Inputs
■ DC current   ■ Thermocouple
■ DC voltage   ■ RTD/resistance
■ DC millivolts   ■ AC current

Functions
■ Measure process variables
■ Monitor machinery and industrial devices
■ Acquire data from non-networked instruments

■ Analog Output

Analog output modules are ideal for controlling a wide variety of industrial equipment. The host defines the output of voltage or current signals to control speed, flow, temperature, frequency, level, force, torque, intensity, and many other physical properties.
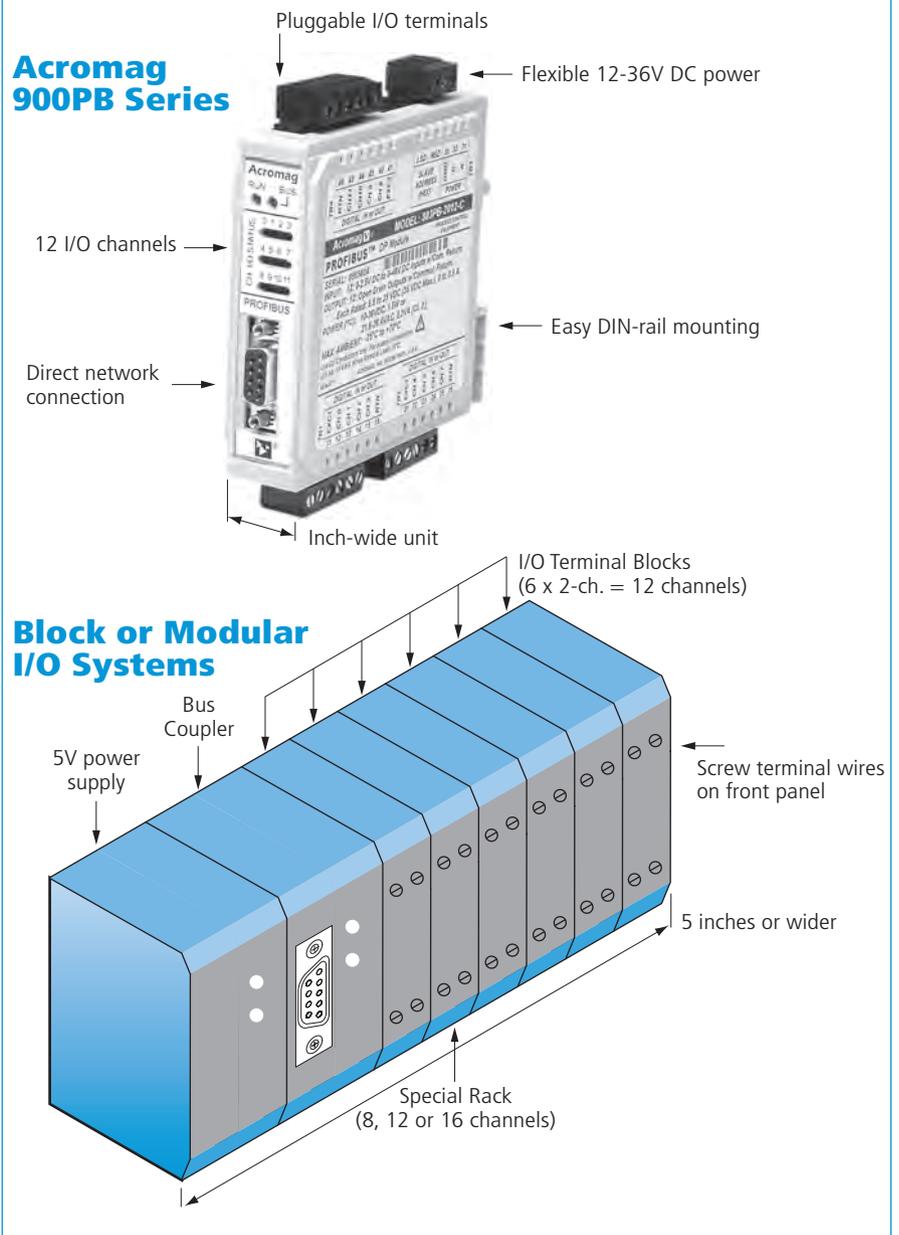
Outputs
■ DC voltage
■ DC current

Functions
■ Write data to local displays or recorders
■ Control drives, valves, and positioners

Save 50% compared to "Block I/O"

Acromag 900PB Series

- Pluggable I/O terminals
- Flexible 12-36V DC power
- 12 I/O channels
- Easy DIN-rail mounting
- Direct network connection
- Inch-wide unit

Block or Modular I/O Systems

- I/O Terminal Blocks (6 x 2-ch. = 12 channels)
- Bus Coupler
- 5V power supply
- Screw terminal wires on front panel
- 5 inches or wider
- Special Rack (8, 12 or 16 channels)

Acromag 900PB Series I/O	Block and Modular I/O Systems
Stand-alone I/O modules are very economical.	*Block I/O systems have high start-up costs.*
■ Direct connection to network	■ Expensive bus coupler required
■ Up to 12 channels on one module	■ Plug-in I/O modules or terminal blocks required
■ One inch wide for twelve channels	■ Five inches wide or more for twelve channels
■ Flexible 12-36V DC power requirement	■ May require special 5V power supply
■ Pluggable terminal blocks on top and bottom	■ Fixed wiring terminals on front of unit

BusWorks® Profibus I/O

Acromag®
THE LEADER IN INDUSTRIAL I/O
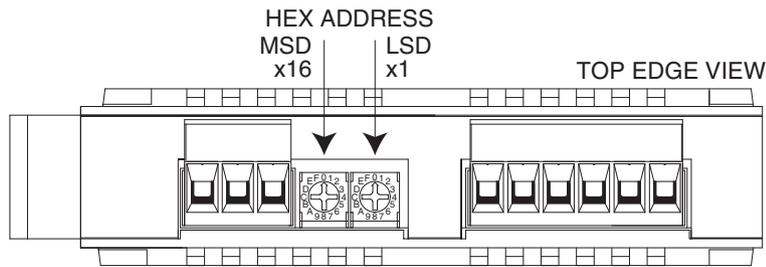
BusWorks® 900PB Series

Easy to Use

Profibus-DP networks offer several advantages. They are proven, fast (up to 12Mbps without fiber optic cable), deterministic, and ideal for transmitting analog or discrete data. I/O devices are also easy to install and maintain. More than 1000 organizations worldwide, plus the Profibus Trade Organization (PTO), help nurture a growing user base, introduce new products, and provide technical support for this network technology.

Network devices, including Acromag's 900PB I/O modules, are easily installed and configured using network management software typically provided by the supplier of the host or master controller. The startup process is shown below.

Step 1:
Set the slave address

Using two rotary switches, as shown, set the slave address between 0 and 125 (00 to 7D Hex). The factory default setting is 126 (7EH) which allows programming via the network. Once the address is set, the module may be physically connected to the network or master.

Step 2:
Add the I/O module to the network database

Each I/O module, like all slave devices, is defined by a unique software file (*.gsd file). The GSD file for each module is installed (or imported) into a network database for identification by the network management software.

Acromag GSD files are supplied at no-charge with each module. They are also available for download on the Acromag website or from the PTO at www.profibus.com.

Step 3:
Configure the module

Using the network management software, you configure each device as desired (address, ranges, sensor break detection, failure modes, etc.). When finished, the software will download the configuration to the master controller for communication.

HEX ADDRESS
MSD x16   LSD x1   TOP EDGE VIEW

Set switches to a valid slave address from 0 to 125 (00H to 7DH)

Step 1: Rotate the switches on top of each 900PB module to set the desired network address.
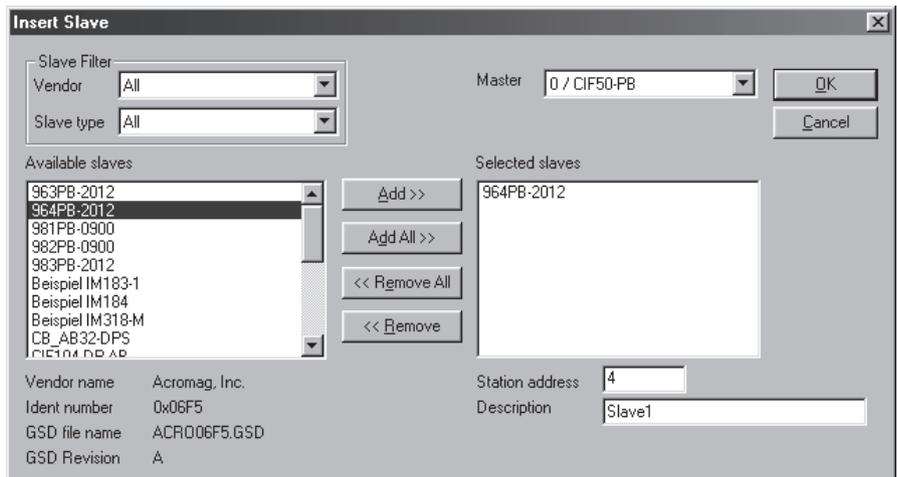
Step 2: The network management software (SyCon from Lantronix shown above) lists Profibus devices available for configuration after their GSD files are copied to the software's directory using Windows Explorer.
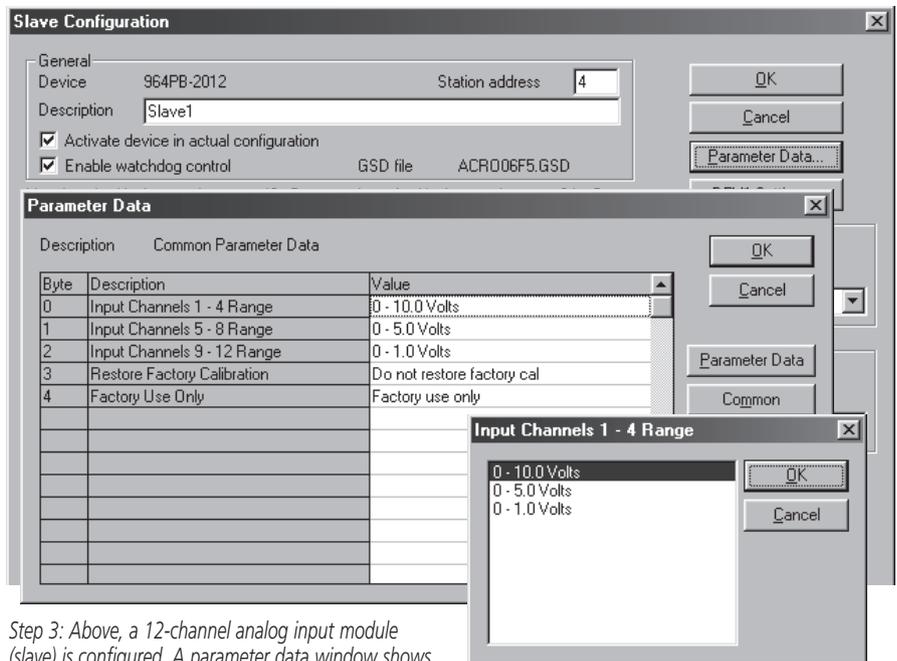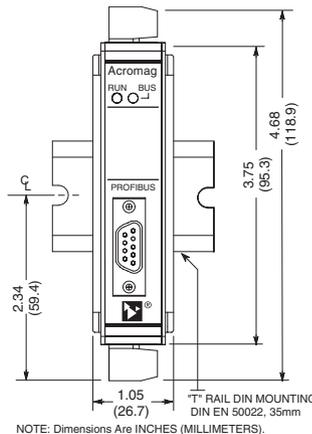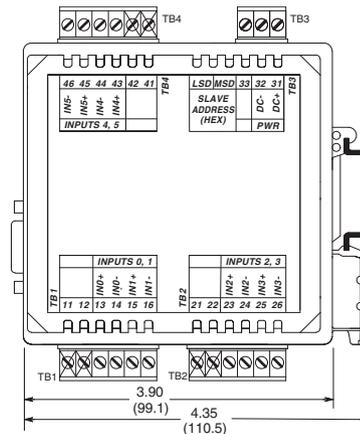

Step 3: Above, a 12-channel analog input module (slave) is configured. A parameter data window shows the user-selected voltage input ranges.

The menu above lists input range options individually selectable for each 4-channel group.

Profibus-DP / RS485

PNO Certified

2 YEAR WARRANTY

961PB, 962PB Analog Input:

6-Channel Differential Input: DC Current or DC Voltage Signals

Models
961PB: 6 DC current input channels
962PB: 6 DC voltage input channels

■ Description

These modules provide an isolated Profibus-DP network interface for six analog input channels. Differential inputs eliminate ground loops and thus the need for isolators in many applications. Multi-range inputs accept signals from a variety of sensor and devices. High-resolution, low noise, A/D converters deliver high accuracy and reliability.

Input Ranges
DC Current (user-selectable ranges)
0 to 1mA, 0 to 11mA, 0 to 20mA, 4 to 20mA
0 to 20 amps AC (with optional AC sensor)

DC Voltage (user-selectable ranges)
±78mV to ±10V DC (eight range options)

Network Communication
Profibus-DP, RS-485 network up to 12Mbaud

Power Requirement
12 to 36V DC supply required

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

NOTE: Dimensions Are INCHES (MILLIMETERS).

■ Special Features

■ Standard Profibus-DP network communication with industry-standard ASIC (Siemens SPC3)

■ 6-input stand-alone module is very economical

■ Differential inputs eliminate ground loops

■ Universal inputs support a variety of sensors

■ High-resolution 16-bit Σ–Δ A/D converters ensure precise, high accuracy measurements

■ Compact packaging with pluggable terminals saves space and simplifies wiring

■ Wide operational temperature range permits installation in extreme environments

■ Performance

■ General Specifications
See Page 47 for communication and other specs.

■ Input
Configuration
Input ranges are selectable for a 3-channel group.

Accuracy
Better than ±0.05% of span for nominal input ranges.

Analog to Digital Converter (A/D)
16-bit Σ–Δ converter.

Resolution
0.005% or 1 part in 20000.

Noise Rejection
Normal Mode: Better than 40dB @ 60Hz.
Common Mode: Better than 140dB @ 60Hz.

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

DC Current Input impedance
24.9 ohms.

DC Voltage Input impedance
Greater than 110.5K ohms.

■ Environmental
Ambient Temperature
Operating: -25 to 70°C (-13 to 158°F).
Storage: -40 to 85°C (-40 to 185°F).

Relative Humidity
5 to 95%, non-condensing.

Isolation
1500V AC for 60 seconds or 250V AC continuous.
3-way isolation between I/O, network, and power.

■ Ordering Info

Models
961PB-2006
DC current input module, 6 differential channels
962PB-2006
DC voltage input module, 6 differential channels
NOTE: Modules include GSD files on CD-ROM.

Accessories (see Page 48)
5020-350
AC current sensor. Used with 961PB DC current input models. One sensor per channel is required.
See page 205.
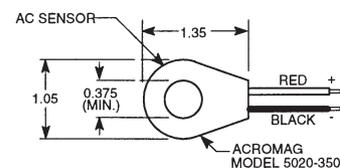
PS5R-D24
Power supply (24V DC, 2.1A).
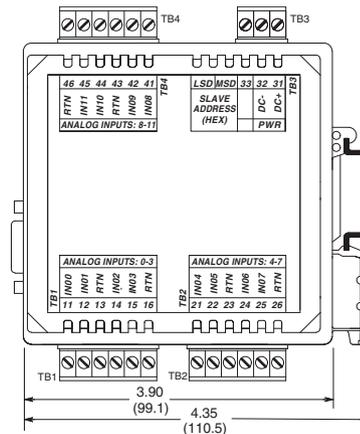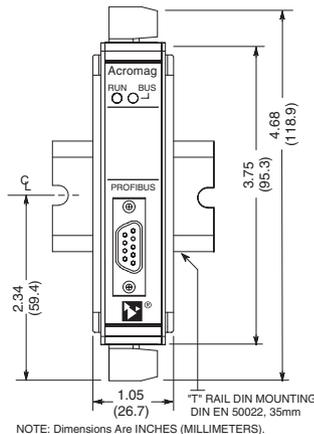See Power Supplies on Page 199.

TBK-B03
Optional terminal block kit, barrier strip style, 4 pcs.

TBK-S03
Optional terminal block kit, spring clamp style, 4 pcs.

Acromag THE LEADER IN INDUSTRIAL I/O

Profibus-DP / RS485

PNO Certified

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c UL us LISTED

2 YEAR WARRANTY

NOTE: Dimensions Are INCHES (MILLIMETERS).

963/964PB Analog Input:

12-Channel Single-Ended Input: DC Current or DC Voltage Signals

Models
963PB: 12 DC current input channels
964PB: 12 DC voltage input channels

■ Description
These modules provide an isolated Profibus-DP network interface for twelve analog input channels. Compact design saves space and lowers system costs. Multi-range inputs accept signals from a variety of sensors and devices. High-resolution, low noise, A/D converters deliver high accuracy and reliability.

Input Ranges
DC Current (user-selectable ranges)
0 to 1mA, 0 to 11mA, 0 to 20mA, 4 to 20mA
0 to 20 amps AC (with optional AC sensor)

DC Voltage (user-selectable ranges)
±1V, ±5V, or ±10V DC

Network Communication
Profibus-DP, RS-485 network up to 12Mbaud

Power Requirement
12 to 36V DC supply required

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

■ Special Features
■ Standard Profibus-DP network communication with industry-standard ASIC (Siemens SPC3)

■ 12-input module has very low cost per channel

■ Universal DC inputs support a wide variety of industrial sensors and signals

■ High-resolution 16-bit Σ–Δ A/D converters ensure precise, high accuracy measurements

■ Compact packaging with pluggable terminals saves space and simplifies wiring

■ Wide operational temperature range permits installation in extreme environments

■ Performance

■ General Specifications
See Page 47 for communication and other specs.

■ Input
Configuration
Input ranges are selectable on each terminal block for a group of four input channels (4-channel basis).

Accuracy
Better than ±0.05% of span for nominal input ranges.

Analog to Digital Converter (A/D)
16-bit Σ–Δ converter.

Resolution
0.005% or 1 part in 20000, typical.

Noise Rejection
Normal Mode: Better than 40dB @ 60Hz.
Common Mode: Better than 140dB @ 60Hz.

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

DC Current Input impedance
49.9 ohms.

DC Voltage Input impedance
Greater than 110.5K ohms.

■ Environmental
Ambient Temperature
Operating: -25 to 70°C (-13 to 158°F).
Storage: -40 to 85°C (-40 to 185°F).

Relative Humidity
5 to 95%, non-condensing.

Isolation
1500V AC for 60 seconds or 250V AC continuous.
3-way isolation between I/O, network, and power.
Inputs share a common.

■ Ordering Info

Models
963PB-2012
DC current input module, 12 single-ended channels

964PB-2012
DC voltage input module, 12 single-ended channels

NOTE: Modules include GSD files on CD-ROM.

Accessories
5020-350
AC current sensor. Used with 963PB DC current input models. One sensor per channel is required.
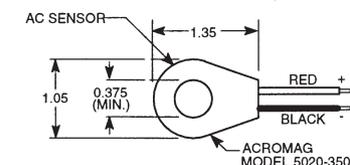See page 205.

PS5R-D24
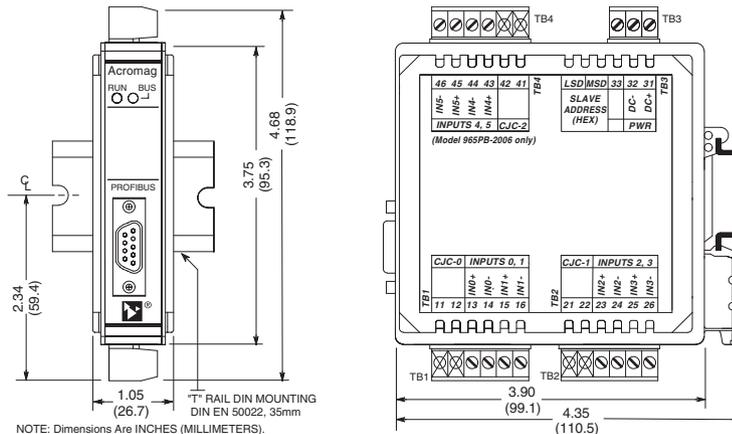Power supply (24V DC, 2.1A).
See Power Supplies on Page 199.

TBK-B03
Optional terminal block kit, barrier strip style, 4 pcs.

TBK-S03
Optional terminal block kit, spring clamp style, 4 pcs.

Profibus-DP / RS485

PNO Certified

2 YEAR WARRANTY

NOTE: Dimensions Are INCHES (MILLIMETERS).

965PB Analog Input:

4 or 6-Channel Input: Thermocouple or Millivolt Signals

■ Description

These modules provide an isolated Profibus-DP network interface for up to six input channels. Differential inputs eliminate ground noise and each terminal block includes a cold junction compensation (CJC) sensor for more precise temperature measurements. Multi-range inputs accept signals from a variety of sensors and devices. High-resolution, low noise, A/D converters deliver high accuracy and reliability.

Input Ranges

Thermocouple (user-selectable type)
Type J, K, T, R, S, E, B, or N

DC Millivolts (user-selectable range)
±100mV or ±1V DC

Network Communication

Profibus-DP, RS-485 network up to 12Mbaud

Power Requirement

12 to 36V DC supply required

Approvals

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

■ Special Features

■ Standard Profibus-DP network communication with industry-standard ASIC (Siemens SPC3)

■ 6-input stand-alone module is very economical

■ Universal inputs support a variety of sensors

■ Built-in CJC sensor on each terminal block produces more precise temperature measurements

■ Thermocouple break detection (upscale or downscale) identifies sensor wiring failures

■ High-resolution 16-bit Σ–Δ A/D converters ensure precise, high accuracy measurements

■ Compact packaging with pluggable terminals saves space and simplifies wiring

■ Wide operational temperature range permits installation in extreme environments

■ Performance

■ General Specifications

See Page 47 for communication and other specs.

■ Input

Configuration
Input ranges are selectable for a 3-channel group.

Accuracy

Input	Input Range	Accuracy (typical)
Type J	-210 to 760°C	±0.5°C
Type K	-200 to 1372°C	±0.5°C
Type T	-260 to 400°C	±0.5°C
Type R	-50 to 1768°C	±1.0°C
Type S	-50 to 1768°C	±1.0°C
Type E	-200 to 1000°C	±0.5°C
Type B	260 to 1820°C	±1.0°C
Type N	-230 to -170°C	±1.0°C
Type N	-170 to 1300°C	±0.5°C
Voltage	±100mV or ±1V DC	±0.1% of span

Cold Junction Compensation (CJC) Accuracy
±0.5°C.

Thermocouple Break Detection
Upscale or downscale selection applies to all channels.

Analog to Digital Converter (A/D)
16-bit Σ–Δ converter.

Noise Rejection
Normal Mode: Better than 40dB @ 60Hz.
Common Mode: Better than 140dB @ 60Hz.

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

■ Environmental

Ambient Temperature
Operating: -25 to 70°C (-13 to 158°F).
Storage: -40 to 85°C (-40 to 185°F).

Relative Humidity
5 to 95%, non-condensing.

Isolation
1500V AC for 60 seconds or 250V AC continuous.
3-way isolation between I/O, network, and power.

■ Ordering Info

Models
965PB-2004
4-channel thermocouple/millivolt input module
965PB-2006
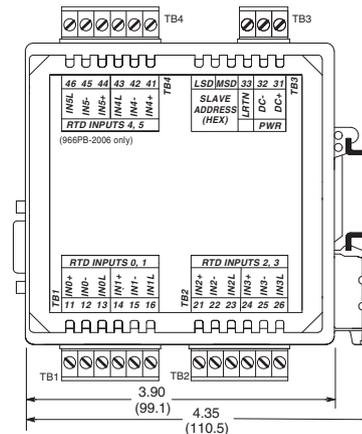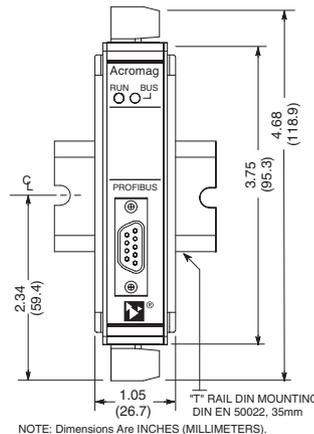6-channel thermocouple/millivolt input module
NOTE: Modules include GSD files on CD-ROM.

Accessories (see Page 48)
PS5R-D24
Power supply (24V DC, 2.1A).
See Power Supplies on Page 199.

PNO Certified

CE

c UL us LISTED

2 YEAR WARRANTY

NOTE: Dimensions Are INCHES (MILLIMETERS).

966PB
Analog Input:

4 or 6-Channel Input: RTD or Resistance Signals

■ Description

These modules provide an isolated Profibus-DP network interface for up to six input channels. Multi-range inputs accept signals from a variety of sensors and devices. High-resolution, low noise, A/D converters deliver high accuracy and reliability. 3-way isolation further improves the system performance.

Input Ranges
RTD (user-selectable type)
2-wire and 3-wire RTDs are supported.
Platinum 100 ohm (alpha = 1.3850 or 1.3911)
Nickel 120 ohm
Copper 10 ohm

Resistance
0 to 500 ohms

Network Communication
Profibus-DP, RS-485 network up to 12Mbaud

Power Requirement
12 to 36V DC supply required

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

■ Special Features

■ Standard Profibus-DP network communication with industry-standard ASIC (Siemens SPC3)

■ 6-input stand-alone module has much lower start-up cost than multi-piece block I/O systems

■ Versatile RTD or ohmic inputs support a wide variety of industrial sensors and devices

■ RTD break detection (upscale or downscale) identifies sensor wiring failures

■ High-resolution 16-bit Σ–Δ A/D converters ensure precise, high accuracy measurements

■ Compact packaging with pluggable terminals saves space and simplifies wiring

■ Wide operational temperature range permits installation in extreme environments

■ Performance

■ General Specifications
See Page 47 for communication and other specs.

■ Input
Configuration
Input ranges are selectable for a 3-channel group.

Accuracy

Input Type	Input Range	Accuracy (typical)
Pt 100 ohm	-200 to 850°C	±0.25°C
Ni 120 ohm	-80 to 320°C	±0.25°C
Cu 10 ohm	-200 to 260°C	±1.25°C
Resistance	0 to 500 ohms	±0.05 ohms

RTD Break Detection
Upscale or downscale selection applies to all channels.

Analog to Digital Converter (A/D)
16-bit Σ–Δ converter.

Noise Rejection
Normal Mode: Better than 40dB @ 60Hz.
Common Mode: Better than 130dB @ 60Hz.

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

Excitation Current
1mA DC typical, all RTD types.

■ Environmental

Ambient Temperature
Operating: -25 to 70°C (-13 to 158°F).
Storage: -40 to 85°C (-40 to 185°F).

Relative Humidity
5 to 95%, non-condensing.

Isolation
1500V AC for 60 seconds or 250V AC continuous.
3-way isolation between I/O, network, and power.
Inputs share a common.

■ Ordering Info

Models
966PB-2004
4-channel RTD/resistance input module

966PB-2006
6-channel RTD/resistance input module

NOTE: Modules include GSD files on CD-ROM.

Accessories (see Page 48)
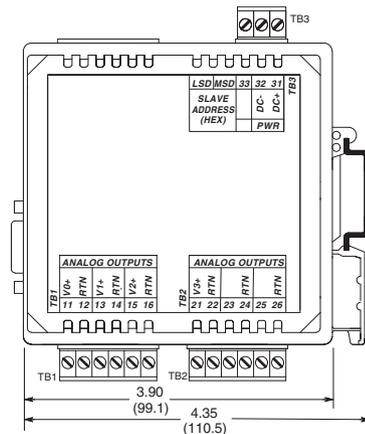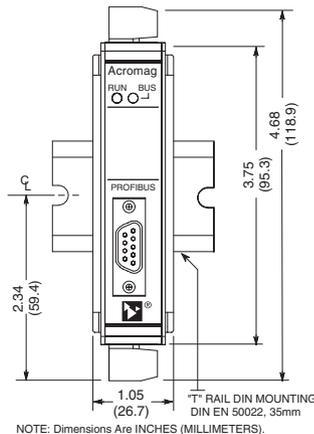**PS5R-D24**
Power supply (24V DC, 2.1A).
See Power Supplies on Page 199.

TBK-B03
Optional terminal block kit, barrier strip style, 4 pcs.

TBK-S03
Optional terminal block kit, spring clamp style, 4 pcs.

Acromag® THE LEADER IN INDUSTRIAL I/O

Profibus-DP / RS485

PNO Certified

CE

c(UL)us LISTED

2 YEAR WARRANTY

NOTE: Dimensions Are INCHES (MILLIMETERS).

972/973PB Analog Output:

4 or 6-Channel Output: DC Current or DC Voltage Signals

Models
972PB: DC current output channels
973PB: DC voltage output channels

■ Description

These modules provide up to six channels of analog output. Multi-range outputs support a wide variety of industrial devices. They can drive displays and recorders, control drives, or send analog signals to other systems. High-resolution, low noise, D/A converters deliver high accuracy and reliability. 3-way isolation further improves system performance.

Output Ranges
DC Current (user-selectable ranges)
0 to 1mA, 0 to 20mA, or 4 to 20mA

DC Voltage (user-selectable ranges)
0 to 1V, 0 to 5V, or 0 to 10V DC

Network Communication
Profibus-DP, RS-485 network up to 12Mbaud

Power Requirement
16 to 36V DC supply required

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

■ Special Features

■ Standard Profibus-DP network communication with industry-standard ASIC (Siemens SPC3)

■ 6-input stand-alone module has much lower start-up cost than multi-piece block I/O systems

■ Universal DC outputs support a wide variety of signals and industrial devices

■ Three selectable failsafe modes (0%, last-state, or pre-defined) help prevent unsafe conditions

■ Compact packaging with pluggable terminals saves space and simplifies wiring

■ Wide operational temperature range permits installation in extreme environments

■ Performance

■ General Specifications
See Page 47 for communication and other specs.

Configuration
Output ranges are selectable on a channel to channel basis.

■ Output
Accuracy
Better than ±0.1% of span, typical.
1.6% for 0 to 1mA range. 0.8% for 0 to 1V range.

Digital to Analog Converter (D/A)
12-bit converter.

Current Output Compliance
12V minimum, 13V typical.

Current Output Load Resistance Range
0 to 625 ohms, typical.

Voltage Output Source Current
0 to 10mA DC, maximum.

■ Environmental
Ambient Temperature
Operating:
    972PB-200x models -25 to 60°C (-13 to 158°F).
    973PB-200x models: -25 to 70°C (-13 to 140°F).
Storage: -40 to 85°C (-40 to 185°F).

Relative Humidity
5 to 95%, non-condensing.

Isolation
1500V AC for 60 seconds or 250V AC continuous.
3-way isolation between I/O, network, and power.
Outputs share a common.

■ Ordering Info

Models
972PB-2004
DC current output module, 4 channels

972PB-2006
DC current output module, 6 channels

973PB-2004
DC voltage output module, 4 channels

973PB-2006
DC voltage output module, 6 channels

NOTE: Modules include GSD files on CD-ROM.

Accessories (see Page 48)
PS5R-D24
Power supply (24V DC, 2.1A).
See Power Supplies on Page 199.

TBK-B03
Optional terminal block kit, barrier strip style, 4 pcs.

TBK-S03
Optional terminal block kit, spring clamp style, 4 pcs.

Acromag
THE LEADER IN INDUSTRIAL I/O

Profibus-DP / RS485

PNO Certified

CE

c UL us LISTED

2 YEAR WARRANTY

NOTE: Dimensions Are INCHES (MILLIMETERS).

"T" RAIL DIN MOUNTING DIN EN 50022, 35mm

981/982/983PB Discrete I/O:

12-Channel I/O: Active-Low Inputs, Sinking Outputs (Low-Side Switching)

Models
981PB: 12 input channels
982PB: 12 output channels
983PB: 12 input/output channels

■ Description

These modules provide an isolated Profibus-DP network interface for twelve discrete input and/or output channels. The outputs provide direct on/off, high/low, or open/close control of industrial devices. The inputs sense the status of motors, pumps, valves and other equipment. The 983PB model with tandem I/O provides output level control and status verification in one unit.

Input Range
0 to 35V DC

Output Range
0 to 35V DC

Network Communication
Profibus-DP, RS-485 network up to 12Mbaud

Power Requirement
12 to 36V DC supply required

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

■ Special Features

■ Standard Profibus-DP network communication with industry-standard ASIC (Siemens SPC3)

■ 12-channel stand-alone module has far lower start-up cost than multi-piece block I/O systems

■ 0-35V DC solid-state logic interface can monitor or control a wide variety of devices

■ Bidirectional I/O models facilitate loopback monitoring of the output state

■ Socketed SIP resistors provide input and output 5.6K ohm pull-ups to the excitation supply

■ Three selectable failsafe modes (off, last-state, or pre-defined) help prevent unsafe conditions

■ Compact packaging with pluggable terminals saves space and simplifies wiring

■ Wide operational temperature range permits installation in extreme environments

■ Performance

■ General Specifications

See Page 47 for communication and other specs.

■ Input (981 & 983 models)
Input Type
Twelve active-low, buffered inputs, with a common connection. Built-in 5.6K ohm pullups to excitation terminal socketed for 4-channel groups.

Input Signal Voltage Range
0 to 35V DC, maximum.

Input Impedance
100K ohms, typical.

Input Signal Threshold
TTL compatible with 100mV of hysteresis, typical.

■ Output (982 & 983 models)
Output Type
12 independent, open-drain, DMOS MOSFET switches.

Output Voltage Range
0 to 35V DC max. (0 to 500mA/channel continuous).

Output ON Resistance
0.28 ohms maximum.

■ Environmental
Ambient Temperature
Operating: -25 to 70°C (-13 to 158F).
Storage: -40 to 85°C (-40 to 185°F).

Relative Humidity
5 to 95%, non-condensing.

Isolation
1500V AC for 60 seconds or 250V AC continuous.
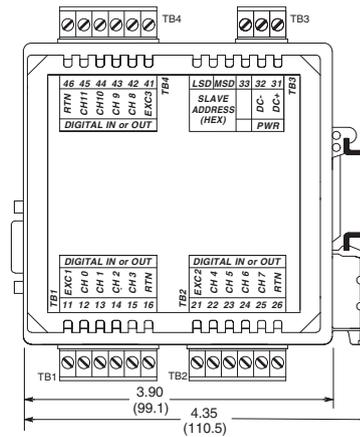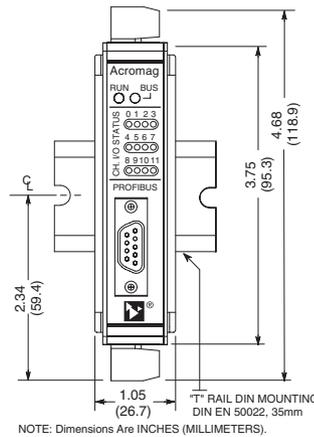3-way isolation between I/O, network, and power.

■ Ordering Information

Models
981PB-2012
Discrete input module, 12 channels

982PB-2012
Discrete output module, 12 channels

983PB-2012
Discrete input/output module, 12 channels

NOTE: Modules include GSD files on CD-ROM.

Accessories (see Page 48)
PS5R-D24
Power supply (24V DC, 2.1A).
See Power Supplies on Page 199.

TBK-B03
Optional terminal block kit, barrier strip style, 4 pcs.

TBK-S03
Optional terminal block kit, spring clamp style, 4 pcs.

Acromag
THE LEADER IN INDUSTRIAL I/O

900PB Series

General Operation and Performance Specifications

The following specifications are common to all 900PB Series I/O modules.

■ Communication

Interface Standard
Isolated, 3-wire RS-485 multi-drop, half-duplex, asynchronous.

Command/Response Protocol
Standard ProfiBus DP (Master/Slave) protocol per European Norm EN50170.

Baud Rate
Supports rates of 9600, 19.2K, 44.45K, 93.75K, 187.5K, 500K, 1.5M, and 12M bits per second, auto-detected.

Communication Distance
Up to 1200 meters without a repeater using Type A wire (<30pF/m).

1200m @ 115Kbps or less
1000m @ 187.5Kbps
400m @ 500Kbps
200m @ 1.5Mbps
100m @ 12Mbps

Address
Set via two rotary hexadecimal switches or via the Set Slave Address command. Valid setting is 0-125. Address 126 (7EH) is factory default address.

Maximum Message Size
Up to 32 bytes recommended, extendable up to 244 bytes of data/node/message, plus 11 bytes of overhead (data frame).

Network Capacity
Multi-drop up to 31 modules, plus a host, without a repeater. Up to 125 modules plus a host if four repeaters are used (one for every 31 nodes).

■ Environmental

Isolation
I/O channel, power, and network circuits are isolated from each other for common-mode voltages up to 250VAC, or 354V DC off DC power ground, on a continuous basis (will withstand 1500VAC dielectric strength test for one minute without breakdown). Complies with test requirements of ANSI/ISA-82.01-1988 for voltage rating specified.

■ Electromagnetic Compatibility (EMC)

Immunity per European Norm EN50082-1.
Emissions per European Norm EN50081-1.
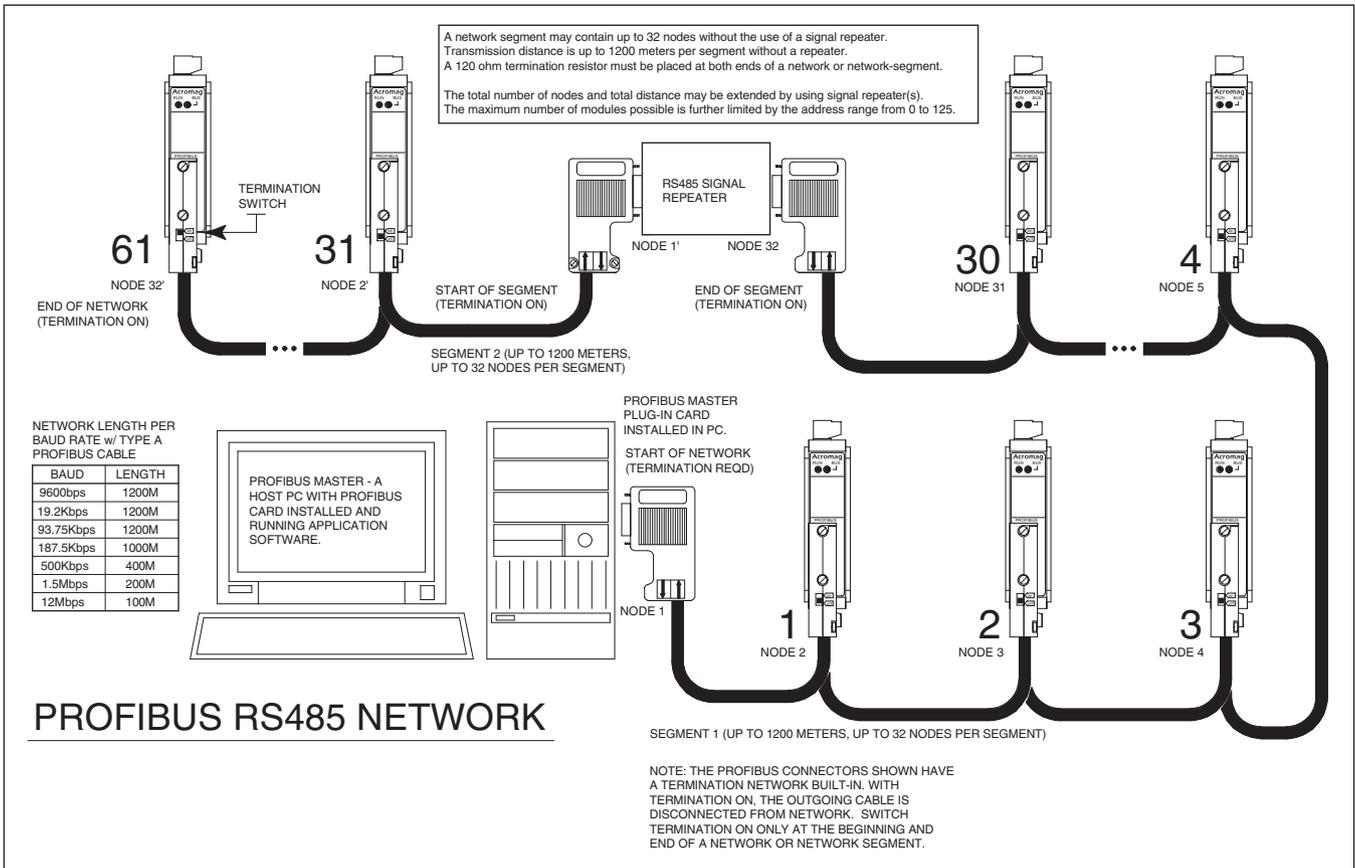
Electrostatic Discharge (ESD) Immunity
Per EN61000-4-2.

Radiated Field Immunity (RFI)
Per EN61000-4-3 and ENV50204.

Electrical Fast Transient Immunity (EFT)
Per EN61000-4-4.

Conducted RF Immunity (CRFI)
Per EN61000-4-6.

Surge Immunity
Per EN61000-4-5.

Radiated Frequency Emissions
Per EN55022 Class B.

A network segment may contain up to 32 nodes without the use of a signal repeater.
Transmission distance is up to 1200 meters per segment without a repeater.
A 120 ohm termination resistor must be placed at both ends of a network or network-segment.

The total number of nodes and total distance may be extended by using signal repeater(s).
The maximum number of modules possible is further limited by the address range from 0 to 125.

NETWORK LENGTH PER BAUD RATE w/ TYPE A PROFIBUS CABLE

BAUD	LENGTH
9600bps	1200M
19.2Kbps	1200M
93.75Kbps	1200M
187.5Kbps	1000M
500Kbps	400M
1.5Mbps	200M
12Mbps	100M

PROFIBUS MASTER - A HOST PC WITH PROFIBUS CARD INSTALLED AND RUNNING APPLICATION SOFTWARE.

PROFIBUS MASTER PLUG-IN CARD INSTALLED IN PC.

START OF NETWORK (TERMINATION REQD)

PROFIBUS RS485 NETWORK

NOTE: THE PROFIBUS CONNECTORS SHOWN HAVE A TERMINATION NETWORK BUILT-IN. WITH TERMINATION ON, THE OUTGOING CABLE IS DISCONNECTED FROM NETWORK. SWITCH TERMINATION ON ONLY AT THE BEGINNING AND END OF A NETWORK OR NETWORK SEGMENT.

Acromag
THE LEADER IN INDUSTRIAL I/O
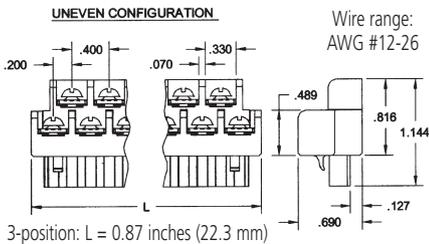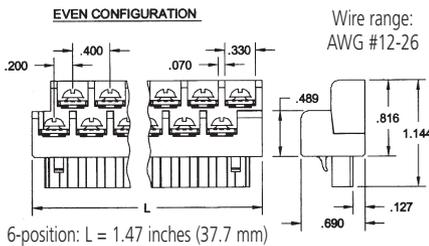
Accessories

Terminal Blocks

Barrier strip (left) and spring clamp (right).

■ Ordering Information
See individual I/O modules for compatibility.

Barrier Strip Terminal Blocks

EVEN CONFIGURATION

Wire range: AWG #12-26

6-position: L = 1.47 inches (37.7 mm)

UNEVEN CONFIGURATION

Wire range: AWG #12-26
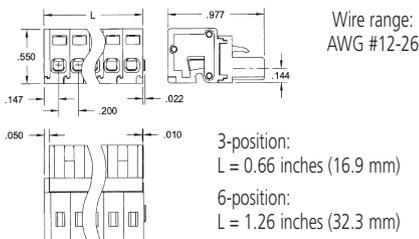
3-position: L = 0.87 inches (22.3 mm)

TBK-B01
Terminal block kit, two 6-position pieces

TBK-B02
Terminal block kit, four 6-position pieces

TBK-B03
Terminal block kit, one 3-position and three 6-position pieces

Spring Clamp Terminal Blocks

Wire range: AWG #12-26

3-position: L = 0.66 inches (16.9 mm)

6-position: L = 1.26 inches (32.3 mm)

TBK-S01
Terminal block kit, two 6-position pieces

TBK-S02
Terminal block kit, four 6-position pieces

TBK-S03
Terminal block kit, one 3-position and three 6-position pieces
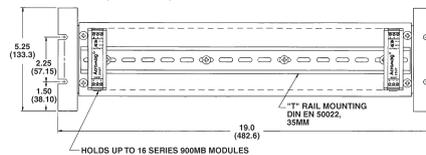
Mounting Hardware

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
20RM-16-DIN
19" rack-mount kit with DIN rail.

DIN RAIL 3.0
DIN RAIL 16.7
DIN rail strip, Type T, 3 inches (75mm) or 16.7 inches (425mm)

5.25 (133.3)
2.25 (57.15)
1.50 (38.10)

"T" RAIL MOUNTING DIN EN 50022, 35MM

19.0 (482.6)

HOLDS UP TO 16 SERIES 900MB MODULES

5.00 (127.0)

16 UNITS

Power Supplies

50W Supply
Input Power Requirement
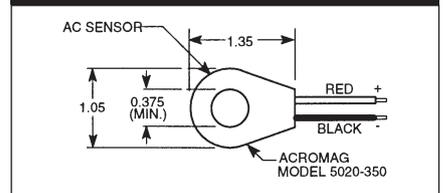85 to 264V AC or 105 to 370V DC

Output
24V DC, 2.1A (50W)

■ Ordering Information
PS5R-D24
Universal 50W power supply

See Power Supplies on Page 199 for other models and more information.

AC Current Sensor

AC SENSOR
1.35
1.05
0.375 (MIN.)
RED +
BLACK –
ACROMAG MODEL 5020-350

■ Ordering Information
5020-350
AC current sensor (See page 205)