



Standard model includes cage clamp terminal blocks. Optional terminals are available (see ordering information).

963/964EN Analog Input

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

Models

963EN: 12 DC current input channels

964EN: 12 DC voltage input channels

Description

These modules provide an isolated Ethernet 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

Ethernet Modbus/TCP 10/100Mbps network

Power Requirement

15 to 36V DC supply required

Approvals

CE marked. UL, cUL listed (pending).

Class I; Division 2; Groups A, B, C, D (pending).

Special Features

- Configurable from standard web browser
- Modbus/TCP communication with automatic 10/100Mbps data rate negotiation
- 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 11 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 $\pm 0.05\%$ 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

963EN-4012

DC current input module, 12 single-ended channels

964EN-4012

DC voltage input module, 12 single-ended channels

Accessories (See Pages 12-14)

900EN-S005

Ethernet switch, 5-port

5035-355

Ethernet cable, CAT5, 3 feet long

5035-360

Ethernet crossover cable, CAT5E, 5 feet long, shielded

5020-350

AC current sensor. Used with 963EN DC current input models. One sensor per channel is required.

PS5R-D24

Power supply (24V DC, 2.1A).

TBK-B03

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

TBK-S03

Optional terminal block kit, spring clamp style, 4 pcs.



General Operation and Performance Specifications

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

■ Communication

Connector

Shielded RJ-45 sockets, 8-pin, 10BaseT/100BaseTX.

Wiring

Wired MDI. Unit does NOT support auto-crossover.

Protocol

Modbus TCP/IP with web browser configuration.

IP Address

Default static IP address is 128.1.1.100.

Port

Up to 10 sockets supported.

Data Rate

Auto-sensed, 10Mbps or 100Mbps.

Duplex

Auto-negotiated, full or half-duplex.

Compliance

IEEE 802.3, 802.3u, 802.3x.

Modbus TCP/IP Protocol Support

Up to 10 sockets may be selected. Web page for configuration and control is built-in with Ethernet access via a standard web browser.

Rx/Tx Memory

8K bytes internal SRAM memory for receive and transmit buffers (FIFO).

Communication Distance

Distance between network devices is generally limited to 100 meters using recommended cable. Distances may be extended using hubs and switches.

Address

IP address is automatically acquired at startup. Unit may be configured to retrieve this address from the network server using BOOTP (Bootstrap Protocol), or via DHCP (Dynamic Configuration Protocol). A static IP address is user-programmable. A default toggle switch sets the static IP address to the default factory address of 128.1.1.100.

■ 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.

