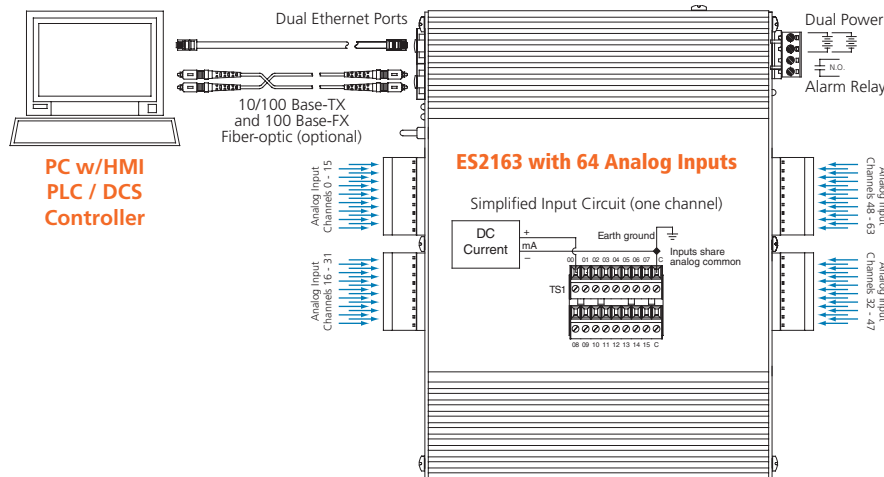# Ethernet I/O: EtherStax® Series

ES2163 Ethernet Analog Input Modules

64-channel single-ended analog current input ◆ **Modbus TCP/IP or UDP/IP communication**

Description

These EtherStax I/O modules provide a rugged, high-density, and high-speed solution to interface a large quantity of analog input signals to SCADA and distributed I/O systems. Each unit converts up to 64 single-ended analog current signals from various sensors and instruments for transmission to an Ethernet-based control network. Typical applications include process control, automated manufacturing, remote data acquisition, test and measurement, embedded computing, and supervisory monitoring systems.

EtherStax units are built and tested to deliver high reliability and dependable performance in hostile environments. Many features help increase reliability, improve performance and protect from harsh environments. Available in an aluminum enclosure or as an open circuit board, both formats stack vertically to maintain a very small footprint.

Input Ranges
±20mA, 0-20mA, 4-20mA DC

Ethernet Communication
10/100Base-T(X) and 100Base-FX, Automatic MDI/MDI-X on all copper ports, Modbus TCP/IP or UDP/IP protocol

Power Requirement
18 to 36V DC (redundancy-ready)

Approvals
CE, UL/cUL:
Zone 2, Class 1, Division 2, Groups ABCD

Open circuit board versions are also available.

Key Features & Benefits

- 64 single-ended analog current inputs
- 4-way isolation and surge suppression
- High-resolution 16-bit A/D
- High-speed scanning with 10 millisecond update of all 64 channels
- Automatic zero/span calibration
- On-demand self-test verifies calibration
- Configurable from any web browser
- User-configurable sample averaging and integration/totalization function with non-volatile registers
- Dual-format data registers support 16-bit integers or 32-bit floating point
- Scaling registers on all channels

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Performance Specifications

◆ General Specifications
See Page 7 for communication and other specs.

◆ Analog Field Inputs
Input Channel Configuration
64 single-ended analog inputs. 32 channels on front and rear panels of unit.

DC Current Input Ranges
±20mA, 0-20mA, or 4-20mA DC (default). User-configured on a per-channel basis.

Input Scaling (per-channel basis)
Floating Point Format: IEEE-754 32-bit configurable for 12 digits with 4 decimal places.

16-bit Signed Integer Format: All channels represented as ±30,000.

Input Resolution and Accuracy
Resolution: 15-bit maximum, 0.003%.
Accuracy: Better than 0.1% of range.

Input Impedance
100 ohms.

Input Scan Groups and Scan Times
Eight user-enabled 8-channel scan groups.
10mS (100Hz) update of all 64 channels.

First 8-channel group updates in 1.80mS (555Hz). Each additional 8-channel group adds 1.20mS to the update time.

Sample Averaging
0 to 500 samples, user-configurable.

Input Overvoltage Protection
Bipolar Transient Voltage Suppressors (TVS), 14V working voltage.

Noise Rejection
Common Mode (50-60Hz): Better than 72dB.

◆ Local Alarm Output
Configuration
Failsafe or non-failsafe (software-configurable) relay trips on power or link-loss failure.

Type
SPST-NO, 1 Form A, Class I, Division II approved.

Rating
5A @ 24V DC/250V AC, 6000 cycles resistive.
3A @ 24V DC/250V AC, 100,000 cycles general.
2A @ 24V DC/250V AC, Hazardous locations.

Maximum Switching Voltage and Power
250V AC / 750VA, 125V DC / 90W.

◆ Ethernet Interface
Internal Switch or Hub/Repeater
Dual-port Ethernet switch. Web-configurable as a true switch (default mode) or low-latency hub.

Network Connector (10/100 Base-TX Copper)
One or two 8-pin RJ-45 connectors. Automatic MDI/MDI-X. 100m communication distance.

Network Connector (100 Base-FX Fiber-optic)
One multi-mode duplex SC connector. Full-duplex only. 2km communication distance.

Protocols and Addressing
Modbus TCP/IP or UDP/IP. StaticIP, DHCP, BootP. Configurable IP addresses.

Ethernet Modbus TCP/IP Sockets/Sessions
1-10 socket/sessions programmable via web page.

Ethernet Redundancy
Compatible with STP, RSTP, proprietary schemes.

◆ Environmental
Operating and Storage Temperature
Operating Range: -40 to 70°C (-40 to 158°F).
Storage Range: -40 to 85°C (-40 to 185°F).

Power Requirements
18-36V DC. Redundant, diode-coupled terminals.
4.4W (copper ports), 5.5W (fiber-optic ports).

Ambient Temperature Effect
Less than 35ppm/°C (0.0035%/°C).

Isolation
I/O, power, relay and Ethernet port-to-port.
Peak: 1500V AC, ANSI/ISA-82.01-1988.
Continuous: 250V AC, 354V DC.

◆ Enclosure and Physical
Housing Classification and Dimensions
IP20: 8.226" x 2.444" x 7.25", 4 lbs. packed.
PCB: 7.920" x 1.875" x 7.25", 1.65 lbs. packed.

Safety Approvals
CE marked and UL/cUL Listed.

Hazardous Locations: Class I; Division 2; A, B, C, D. Open board units: UL Recognized.

Shock and Vibration Immunity (in enclosure)
Mechanical Shock: 50g (3ms), 30g (11ms).

Random Vibration: 5g, (5-500Hz).

Ordering Information

◆ Models
ES2163-0000
Current inputs, two Cu ports, IP20 enclosure
ES2163-0010
Current inputs, two Cu ports, open board
ES2163-1000
Current inputs, Cu & fiber ports, IP20 enclosure
ES2163-1010
Current inputs, Cu & fiber ports, open board

◆ Accessories
Industrial Ethernet Switches
See Page 33.

Hardware Accessories and Power Supplies
See Page 34.

Software Support
See Page 36.