▶ Ethernet I/O: EtherStax® Series
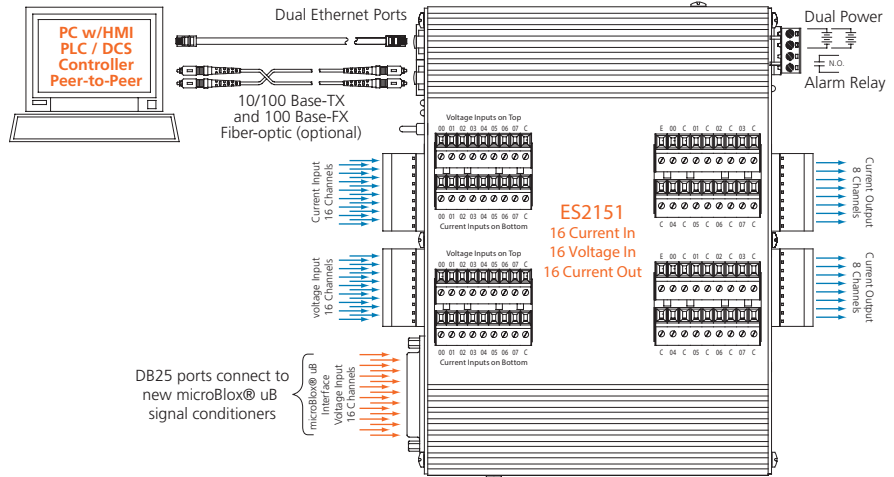
ES2151 Ethernet Analog Input/Output Modules

cULus LISTED · 24 HOUR STOCK ITEM · 2 YEAR WARRANTY

Dual Ethernet Ports

PC w/HMI
PLC / DCS
Controller
Peer-to-Peer

10/100 Base-TX
and 100 Base-FX
Fiber-optic (optional)

Current Input
16 Channels

voltage Input
16 Channels

DB25 ports connect to
new microBlox® uB
signal conditioners

Voltage inputs on Top
00 01 02 03 04 05 06 07 C
Current Inputs on Bottom
00 01 02 03 04 05 06 07 C

Voltage inputs on Top
00 01 02 03 04 05 06 07 C
Current Inputs on Bottom
00 01 02 03 04 05 06 07 C

microBlox® uB
Interface
Voltage Input
16 C hannels

ES2151
16 Current In
16 Voltage In
16 Current Out

Dual Power

N.O.

Alarm Relay

Current Output
8 Channels

Current Output
8 Channels

E 00 C 01 C 02 C 03 C
C 04 C 05 C 06 C 07 C

E 00 C 01 C 02 C 03 C
C 04 C 05 C 06 C 07 C

32 analog current/voltage inputs ◆ **16 analog current outputs** ◆ **Modbus TCP/UDP, i2o communication**

Description

These EtherStax I/O units provide a rugged, high-density, and high-speed solution to interface a large quantity of analog input signals. Units accept 16 single-ended analog voltage inputs and 16 single-ended current inputs. The ES2151 also provides 16 analog current outputs. Two DB25 ports support an alternate interface of voltage I/O from microBlox® uB input or output modules. This combination of high-density analog inputs and outputs is ideal for many sensor interface applications in remote zones.

EtherStax units are built and tested for high reliability and dependable performance in hostile environments. Available in an aluminum enclosure or as an open circuit board, both formats stack vertically to maintain a very small footprint.

Interface to microBlox® uB signal conditioning modules.

Open circuit board versions are also available.

Select from more than 100 microBlox uB input and output modules.

Input Ranges
±5V, ±10V, ±20mA, 0-20mA, 4-20mA DC

Output Ranges
0-20mA, 4-20mA DC
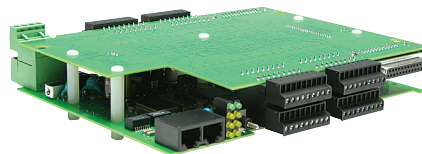
Ethernet Communication
10/100Base-T(X) and 100Base-FX, Automatic MDI/MDI-X on all copper ports, Modbus TCP/IP or UDP/IP protocol i2o peer-to-peer

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

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

Key Features & Benefits

■ 48-channel high-density combination of analog inputs and outputs

■ DB25 ports for alternate voltage I/O from microBlox® uB signal conditioning backpanels

■ 4-way isolation and surge suppression

■ High-resolution 16-bit A/D and D/A's

■ High-speed scanning for 10 millisecond update of all 48 channels

■ Automatic zero/span calibration

■ Built-in loop-back circuit verifies outputs

■ On-demand self-test verifies calibration

■ Web browser configuration

■ 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

■ Peer-to-peer i2o communication with percent-of-span and timed updates

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Performance Specifications

◆ General Specifications

See Page 7 for communication and other specs.

◆ Analog Field Inputs

Input Channel Configuration
16 single-ended analog voltage inputs and
16 single-ended analog current inputs.

Input Ranges (select on per-channel basis)
±5V, ±10V, ±20mA, 0-20mA, or 4-20mA DC.

Input Scaling (per-channel basis)
Floating Point Format: IEEE-754.

Input Resolution
16-bit maximum, 0.00166% (1 part in 60,000).

Input Accuracy
Current Input: Better than 0.1% of range.
Voltage Input: Better than 0.05% of range.

Input Impedance
Voltage: 4M ohms minimum.

Current: 100 ohms.

Input Scan Groups and Scan Times
Eight user-enabled 4-channel scan groups. 770μS
update/group (5mS for all 32 channels) with averaging, loopback, and totalization functions disabled.

Input Overvoltage Protection
Bipolar Transient Voltage Suppressers (TVS),
18V clamp level typical.

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

Sample Averaging (user-configurable)
0-500 samples. One register for all channels.

◆ Analog Field Outputs

Output Channel Configuration
16 current outputs.
9-16V DC external excitation required.

Output Ranges (per-channel basis)
0-20mA or 4-20mA DC sourced.
User-configured on a per-channel basis.

Maximum Output Load at Excitation
265 ohms @ 9V.
400 ohms @ 12V.
540 ohms @ 15V.

Output Resolution and Accuracy
Resolution: 13-bit maximum, 0.0122%.
Accuracy: Better than 0.1% of range.

◆ Local Alarm Output

Configuration
Failsafe or non-failsafe (user-configurable) relay trips on power or link-loss failure.

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

Rating
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.

◆ i2o Peer-to-Peer Communication

Each port of 8 input channels can be mapped to output ports of two ES215x units. Updates based on time (100mS resolution) or percent of range change (0.1% resolution).

◆ Ethernet Interface

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

Network Connector [10/100 Base-T(X)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 with SC connector. 2km communication distance. Full/half-duplex, selectable.

Protocols
Modbus TCP/IP, UDP/IP, i2o peer-to-peer.

Addressing
StaticIP, DHCP, BootP.

Ethernet Modbus TCP/IP Sockets/Sessions
1-10 socket/sessions user-configurable.

Ethernet Redundancy
Compatible with STP, RSTP, or any ring scheme.

◆ Environmental

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

Power Requirements
18-36V DC. Redundant, diode-coupled terminals.
4.8W (copper ports), 5.8W (fiber-optic ports).

Isolation
I/O, power, relay and Ethernet port-to-port.
Peak: 1500V AC, ANSI/ISA-82.01-1988.
Continuous: 250V AC, 354V DC (150V AC ch-ch).

◆ 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
UL/cUL Listed.

Hazardous Locations: Class I; Div 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

◆ EtherStax I/O Units

ES2151-0000
Current/voltage inputs, current outputs,
two Cu ports, IP20 enclosure

ES2151-0010
Current/voltage inputs, current outputs,
two Cu ports, open board (no IP20 enclosure)

ES2151-1000
Current/voltage inputs, current outputs,
Cu & fiber ports, IP20 enclosure

ES2151-1010
Current/voltage inputs, current outputs,
Cu & fiber ports, open board (no IP20 enclosure)

◆ Accessories

microBlox® uB Modules and Backpanels
See Page 32.

Industrial Ethernet Switches
See Page 33.

Hardware Accessories and Power Supplies
See Page 34.

Software Support
See Page 36.

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