

Ethernet I/O: EtherStax® Series

ES2117 Ethernet Discrete I/O Modules



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

Dual Ethernet Ports

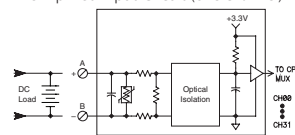
10/100 Base-TX and
100 Base-FX
Fiber-optic (optional)

Optocoupler
Inputs 0-15

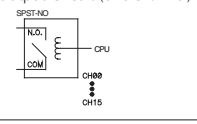
Mech Relay
Outputs 0-7

ES2117 with 48 Discrete I/O

Simplified Input Circuit (one channel)



Simplified Output Circuit (one channel)



Dual Power

Alarm Relay

Optocoupler
Inputs 16-31

Mech Relay
Outputs 8-15

48 Channel-Isolated Discrete I/O (32 DC inputs, 16 AC/DC outputs) ♦ Modbus TCP/IP, i2o peer-to-peer

Description

EtherStax I/O blocks provide a ruggedized, high-density solution to interface a large quantity of isolated discrete I/O signals to your control system. A stackable aluminum housing maintains a small footprint and stands up to harsh, industrial environments. Web-based configuration simplifies setup with any web browser.

Input Range

20-36V DC

Output Range

Outputs: 2A @ 250V AC or 110V DC SPST
Alarm: 2A @ 240V AC or 125V DC SPST

Ethernet Communication

10/100Base-T(X) and 100Base-FX
Modbus TCP/IP or UDP/IP protocol
Acromag i2o® peer-to-peer technology

Power Requirement

18 to 36V DC (redundancy-ready)

Approvals

CE, UL, & cUL listed:
Class 1; Division 2; Groups A, B, C, D.

- Fully isolated between all circuits: Inputs, outputs, alarm, network ports, enclosure, and power are isolated from each other for safety and noise immunity.
- High-density stackable unit: Stacked mounting puts a lot of I/O in a very small footprint to save panel space.
- Modbus TCP/IP or UDP/IP protocol: I/O functions as slave to host controller.
- Peer-to-peer i2o communication: Inputs to one unit automatically actuate outputs on another over Ethernet link.
- Channel-to channel input isolation: Inputs provide high or low-side sensing for AC or DC circuits.
- Automatic change of state detection: Inputs detect quick momentary changes of state that occur between polling.
- Logic inversion (i2o only): Active high inputs can switch remote peer-to-peer outputs on or off.
- Change-of-state or timed updates: Event-driven updates transmit data in less than 10ms between peers with i2o.
- 10 Modbus TCP/IP sockets/sessions: Multiple masters can talk to unit at same time.
- Local alarm function: Dedicated failsafe relay is controlled via watchdog timer and link-loss conditions.
- Heavy-duty 2A relays: 16 SPST outputs provide high/low-side 2A switching up to 250V AC or 110VDC
- Programmable outputs: Normally open relays are configurable to energize or de-energize on power-up.
- Built-in slave relays: Inputs can control outputs on same unit to provide slave relay interface.
- Self-test checks I/O operation: Unit checks internal I/O communication and allows verification via web browser.
- Watchdog timers: Communication fault sends output to a pre-defined state or holds the last value.



Open circuit board versions also available.

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Acromag 
THE LEADER IN INDUSTRIAL I/O



Performance Specifications

◆ General Specifications

See Page 7 for communication and other specs.

◆ Inputs

Configuration

32 individually isolated, buffered inputs grouped in two 16-ch ports. Active-high operation.

Input Voltage Range

20-32V DC, 36V DC max.

Max voltage/operating temperature:

36V DC @ 65°C max.

Input Signal Threshold and Hysteresis

OFF-ON: 13V min, 20V max, 16V DC typical.

ON-OFF: 11V max, 7V min, 9V DC typical.

Input Impedance

6k ohms

Input Isolation:

Channel-to-channel: 150V AC isolation rating.

Port-to-port: 250V AC safety isolation rating.

Input Response Time

Less than 5ms.

Peer-to-peer (i2o) communication

Change-of-state updates: Less than 10ms events.

Timed updates: Configurable for 1-90 seconds.

◆ Outputs

Configuration

One 16-ch port of isolated SPST-NO mech. relays.

Maximum Switching Voltage / Load Rating

250V AC, 110V DC @ 2A.

Mechanical Life

20 million operations minimum.

Electrical Life (@ 20 cycles per minute)

100k operations minimum at 2A.

Contact Resistance (Initial)

30 milliohms, maximum.

Output Response Time

Less than 5ms.

Minimum Load

100µA/100mV DC.

◆ 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.

Maximum Switching Voltage/Load Rating

240V AC, 125V DC @ 2A

100K operations minimum.

◆ 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-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 and Addressing

Modbus TCP/IP or UDP/IP. i2o peer-to-peer.

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: -40 to 65°C

Storage: -40 to 85°C (-40 to 185°F).

Power Requirements

18-36V DC. Redundant, diode-coupled terminals.

4.7W (copper ports), 6.0W (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).

See User Manual for full temperature specs.

◆ 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 (pending)

CE marked and 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

All units have 32 inputs, 16 AC/DC outputs and i2o peer-to-peer communication capability.

ES2117-0000

20-36V DC inputs, two Cu ports, IP20 enclosure

ES2117-0010

20-36V DC inputs, two Cu ports, open board

ES2117-1000

20-36V DC inputs, Cu & fiber ports, IP20

ES2117-1010

20-36V DC 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.