



EtherStax™ I/O

Ethernet I/O

Modbus TCP/IP & UDP/IP

Rugged & Stackable



**Industrial Ethernet
Stackable I/O Blocks**



EtherStax™ I/O

OVERVIEW

Rugged & Stackable Ethernet I/O



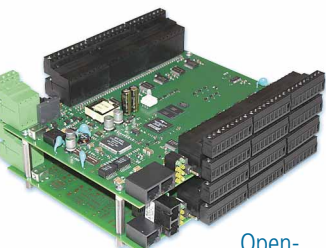
Front



Back



Stacked



Open-board model

EtherStax I/O blocks provide a ruggedized, high-density solution to interface many analog and discrete signals to your control system. A stackable aluminum housing maintains a small footprint and stands up to industrial environments. The Ethernet interface supports Modbus TCP/UDP/IP for reliable host data transfer or peer-to-peer communication. Web-based configuration simplifies setup with any web browser. For OEM systems, or those that require specialized housings, an open-board version without the enclosure is available. EtherStax are ideal for a broad range of measurement and control applications.

Rugged, Industrial-Grade Design

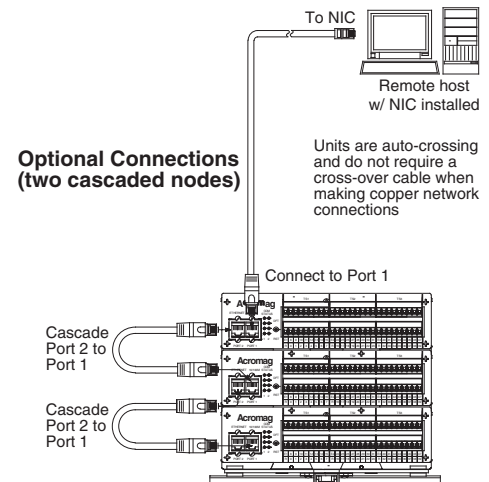
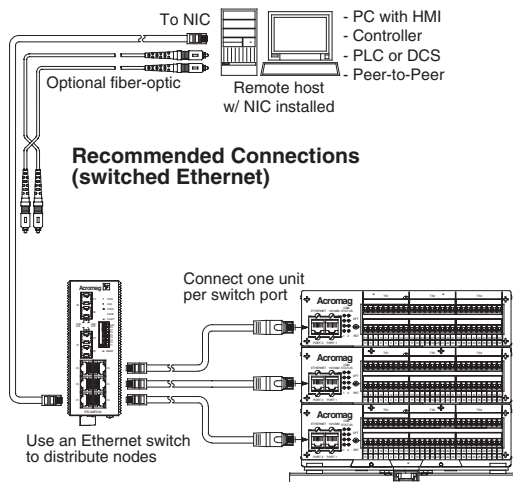
EtherStax are designed for high-reliability operation. Units feature 3-way isolation and surge protection. The I/O circuitry has over-temperature, over-voltage, and over-current protection. Redundant communication paths and DC power ensure dependable operation. If network communication is lost, outputs fail safely and a relay provides local alarming or shutdown functions.

Stackable, High-Density I/O

A variety of models offer a mix of analog and discrete I/O interfaces with up to 96 channels on a single unit. Monitor sensors, control devices, or add local alarms. The units interlock for secure stacking that consumes little space when mounted on a surface or DIN rail.

- **High-density industrial Ethernet I/O:**
Put hundreds of I/O channels in less panel space.
- **Stackable aluminum or open-board packaging:**
Choose industrial-strength or low-cost mounting.
- **Rugged, shock and vibration-resistant design:**
Mounts on machinery, DIN rail, wall, or flat surface.
- **Modbus TCP/UDP/IP or i2o peer-to-peer network:**
Reliable communication to host or between nodes.
- **Easy web configuration with copy function:**
Quickly set up units with any web browser.
- **Dual-port Ethernet hub or switch w/MDI/MDI-X:**
Get diagnostics, redundancy, and easy expansion.
- **Ready for STP, RSTP, other redundancy schemes:**
Supports dual-path communication via Cu and fiber.
- **Local failsafe SPST 5A fault relay:**
Provides alarm/shutdown if network or power fails.
- **Surge suppression and 1500Vrms isolation:**
Protects power, relay, I/O, and each Ethernet Port.
- **Redundant DC power w/internal diode coupling:**
For "bump-less" transfer to back-up power.
- **Extended operating temperature of -40 to 75°C**
- **Designed for CE and UL/cUL Class1 Div 2 ABCD**

Flexible network connections: Independently switched or daisy-chain cascaded nodes



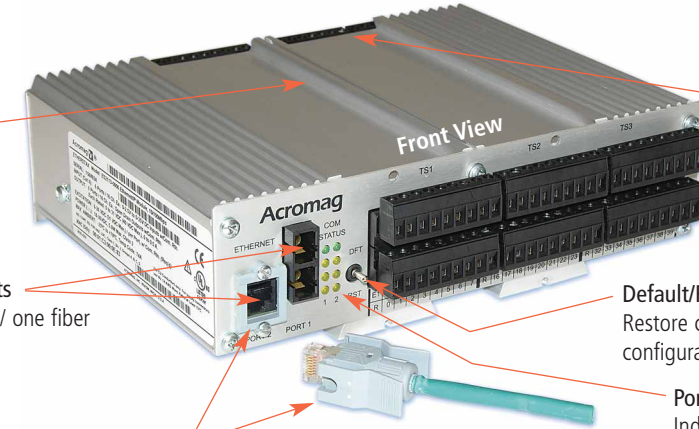
Ethernet I/O Blocks

FEATURES

High-strength aluminum packaging
Dove-tailed grooves on top for stacking and interlocking units

Dual Ethernet ports
Two Cu or one Cu / one fiber

Locking Ethernet connection
RJ45 clip frame provides secure media connections resistant to shock and vibration when used with compatible cables.



High-density industrial I/O
Up to 96 channels per unit with pluggable terminal blocks.

Default/Reset toggle switch
Restore communication to factory configuration or reset the unit.

Port status LEDs
Indicate switch/hub mode, link, activity, 10/100Mbps, port faults

7.25" Depth
2.444" Height

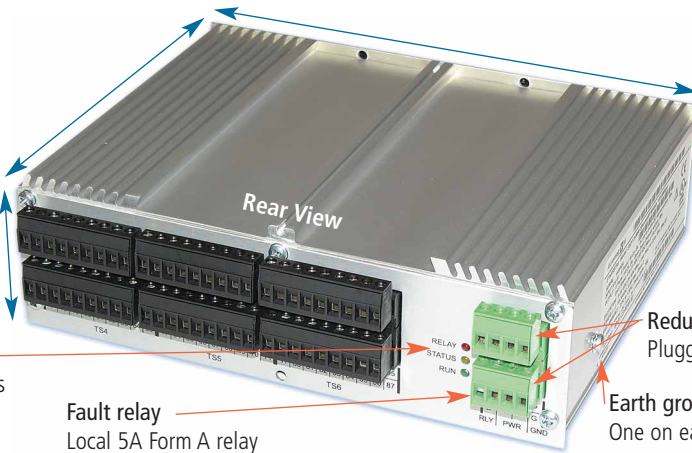
Status LEDs
Power, I/O, relay status

Fault relay
Local 5A Form A relay

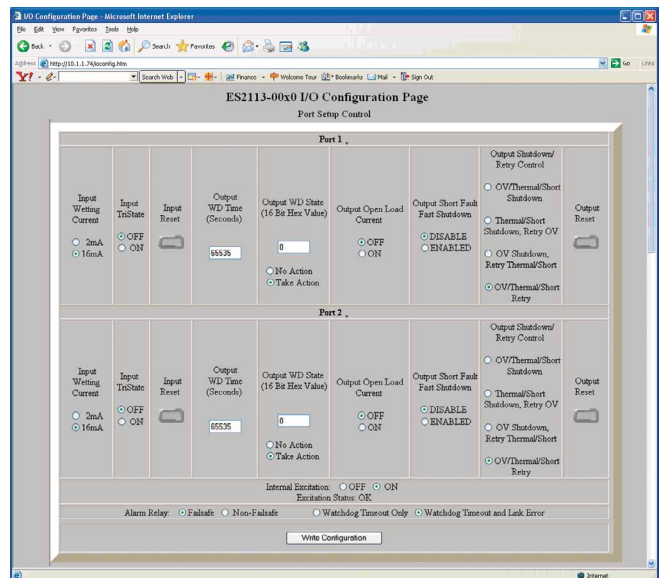
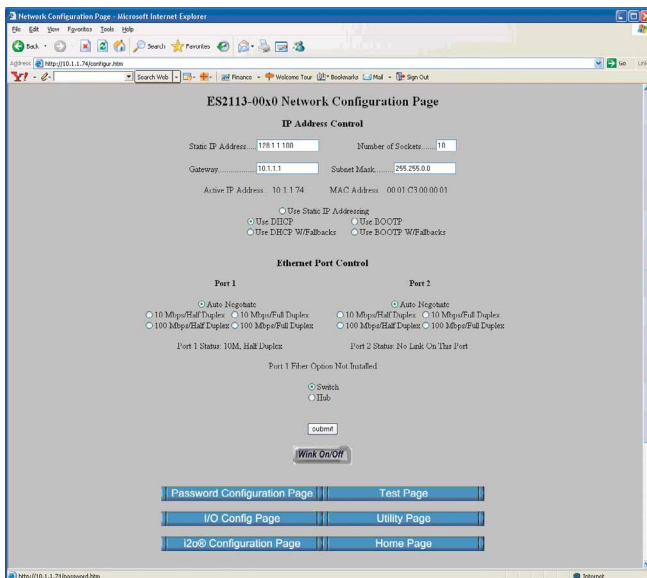
8.226" Width

Redundant DC Power
Pluggable terminals

Earth ground terminal
One on each side



Network and I/O Configuration Screens



Ethernet I/O Blocks

APPLICATIONS

Ideal for remote I/O or control rooms

With a variety of I/O configurations and flexible signal ranges, EtherStax serves many industries.

End-user Industries:

- Power gen & distribution
- Water & wastewater
- Oil & gas refining
- Food, dairy, beverage
- Chemical & petrochem
- Metals processing
- Pharmaceutical
- Military & Aerospace

System Integrators:

- SCADA applications
- Building & energy mgmt
- Factory automation
- Specialty machinery

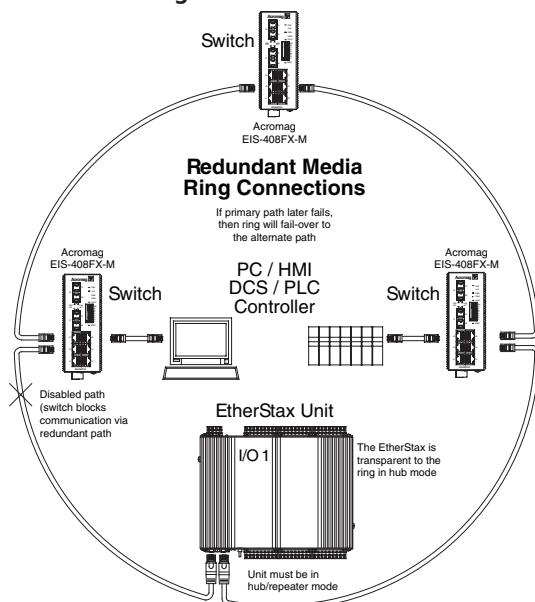
OEM Machinery:

- Engine & turbine controls
- Packaging equipment
- Semiconductor fab
- Switch gear equipment
- Boilers & furnaces
- Material handling

Distributed I/O for Batch Processing

EtherStax I/O interfaces sensors, actuators, displays and other instruments to a PLC, DCS, or PC over your Ethernet network. Analog inputs monitor temperature, level, flow, pressure, voltage, current, and myriad process variables. Analog outputs control drives, pumps, valves, motors, and heaters, or write to displays and recorders. Discrete inputs detect open/close and change-of-state while discrete outputs perform on/off control.

Redundant Ring Connections



SCADA and Remote I/O

In addition to all the functions already mentioned, EtherStax are ideal for supervisory control and data acquisition at remote sites. Units tolerate -40 to 75°C allowing outdoor mounting. Flexible, redundant power supports battery operation. Multi-media capability enables use of copper, fiber-optic, or wireless Ethernet networks to eliminate the high cost of leased lines.

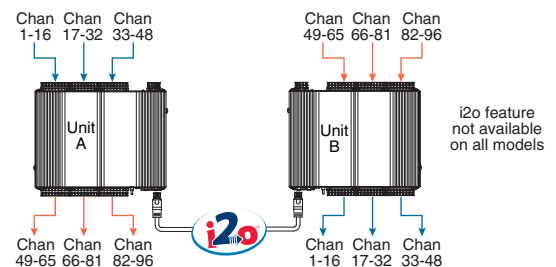
Discrete Manufacturing

EtherStax models with high-density discrete I/O provide a cost-efficient solution for automated operations such as machining, assembly, and packaging. These compact units can mount on machinery without worry of electrical noise, high voltage surges, or vibration affecting performance. EtherStax have a high level of immunity and resistance to transient signals from solenoids, motors, and magnetic fields.

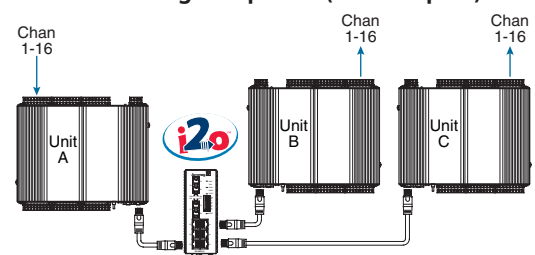
Ethernet-Enable your OEM Machinery

Make your machines Internet-ready with EtherStax and monitor operation from any PC with an Ethernet link. The rugged aluminum housing can bolt directly to your equipment. Alternatively, the open-board version can mount in a NEMA enclosure or inside your machine. Resistant to shock and vibration, EtherStax units provide dependable operation even on moving machinery.

Peer-to-Peer Bi-Directional Communication



Peer-to-Peer Signal Splitter (dual outputs)

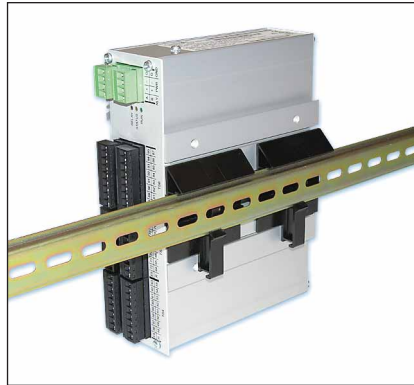


Rugged & Stackable Solution

Mounting support to meet your needs



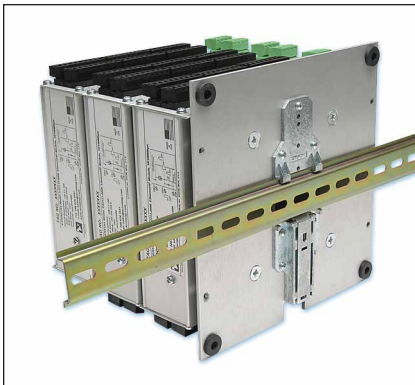
Interlocked units without mounting kit.



ESA-DIN-VMK kit (vertical terminals).



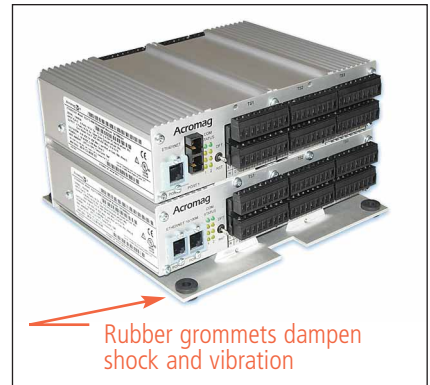
ESA-DIN-VMK supports two stacked units.



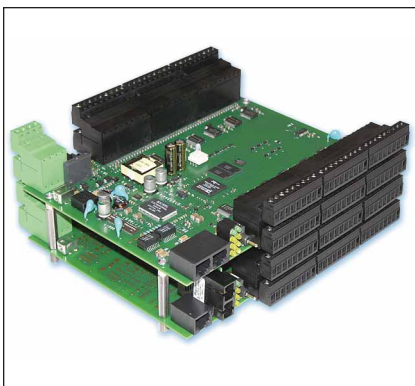
ESA-DIN-HMK kit (horizontal terminals).



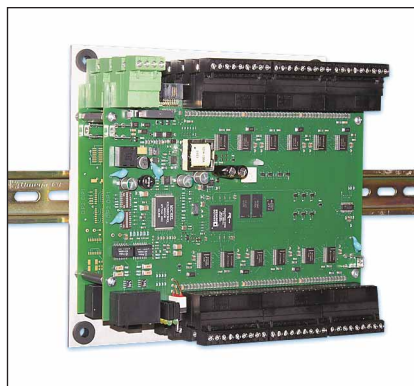
ESA-DIN-HMK supports three stacked units.



ESA-SMK surface/machine mounting kit.



ESA-OMK open board stacking kit. One kit supplies standoffs to stack two units.



Units stacked with ESA-OMK kit can mount on a DIN rail with ESA-DIN-HMK kit plate.



Side-by-side 19-inch rack mounting with ESA-DIN-HMK kit on a DIN rail.

Rugged & Stackable Solution

General Specifications

For information about specific units, please refer to the model data sheets or manuals.

■ Inputs and Outputs

See individual model data sheets for details.

■ Enclosure and Physical

Dimensions

8.226 inches wide x 2.444 inches tall x 7.25 inches deep. Units stack together on 2.175 inch centers.

I/O Connectors

Plug-in terminal blocks rated for 15A/300V; AWG #12-24 stranded or solid copper wire.

Network Connectors

See Ethernet Interface

Enclosure Material

Extruded aluminum, 6063 T6 alloy, silver anodized finish.

Printed Circuit Boards

Military grade fire-retardent epoxy glass per IPC-4101/98.

Safety Approvals (Pending)

CE marked. UL/cUL Listed.

Hazardous Locations:

Class 1; Division 2; Groups A, B, C, and D.

■ Environmental

Operating Temperature

-40 to 75°C (-40 to 167°F).

Storage Temperature

-40 to +85°C (-40 to +185°F).

Relative Humidity

5 to 95%, non-condensing.

Power Requirements (Unit Main)

18-36V DC. Redundant, diode-coupled terminals. See individual model data sheets for power specifications.

Isolation

I/O, power, relay, and Ethernet port-to-port.

Peak: 1500V AC, ANSI/ISA-82.01-1988.

Continuous: 250V AC, 354V DC.

Installation Category

Designed for Pollution Degree 2 environment with an Installation Category II rating (over-voltage category).

Electromagnetic Interference Immunity (EMI)

I/O have resistance to inadvertent state changes with interference from switching solenoids, commutator motors, and drill motors.

Electromagnetic Compatibility (EMC)

Meets EN50082-1.

Electrostatic Discharge (ESD) Immunity

Meets EN61000-4-2.

Radiated Field Immunity (RFI)

Meets EN61000-4-3 and ENV50204.

Electrical Fast Transient Immunity (EFT)

Meets EN61000-4-4.

Conducted RF Immunity (CRFI)

Meets EN61000-4-6.

Surge Immunity

Meets EN61000-4-5.

Emissions

Meets EN50081-1.

Radiated Frequency Emissions

Meets EN55022 Class A

Shock and Vibration Immunity

Mechanical Shock: 50g, 3ms, with 3 half-sine shock pulses in each direction along 3 axes (18 shocks), and 30g, 11ms, with 3 half-sine shock pulses in each direction along 3 axes (18 shocks), per IEC60068-2-27.

Random Vibration: 5g, 5-500Hz, in 3 axes at 2 hours/axis per IEC60068-2-64.

Single surface-mounted unit in enclosure only.

■ Ethernet Interface

Network Connector (Copper)

8-pin RJ-45 sockets for 10Base-T/100Base-TX connections. Wired MDI-X by default but includes automatic MDI/MDI-X crossing.

Network Connector (Fiber)

Duplex SC-type, multi-mode transceiver for IEEE 802.3u 100Base-FX cable connections.

Protocol

Modbus TCP/IP or UDP/IP with integrated web-browser reconfiguration.

i2o Peer-to-Peer Communication

Supported on select models only.

See individual model data sheets for details.

IP Address

Default mode static IP address is 128.1.1.100.

Port

Up to 10 Modbus TCP/IP sockets supported.

Uses port 502 (reserved for Modbus).

Transient Protection

Transient voltage suppressors are applied on all ports (power, I/O, Ethernet ports).

Data Rate

Switch mode: auto-sense 10Mbps or 100Mbps on copper connections, 100Mbps on fiber-optic connection.

Hub/repeater mode: fixed at 100Mbps and auto-negotiation does not apply.

Duplex

Switch mode: auto-negotiated, full or half duplex.

Hub/repeater mode: only half-duplex and auto-negotiation does not apply.

Compliance

IEEE 802.3, 802.3u, 802.3x.

Network Distance

Distance between two devices on an Ethernet network is generally limited to 100 meters using copper cable, and 2km using multi-mode fiber optic cable. Distance may be extended using hubs and switches.

Address

IP address can be preset by the user (static) and loaded from internal non-volatile memory, or it can be automatically acquired at startup via a network server using a BOOTP (Bootstrap Protocol) or DHCP (Dynamic Host Configuration Protocol). Includes default mode toggle switch to revert unit to a "known" fixed static IP address of 128.1.1.100, useful for troubleshooting purposes.

Ordering Information

See individual model data sheets for details.

