Acromag®
THE LEADER IN INDUSTRIAL I/O

Monitoring and Control Solutions

Modbus TCP/IP Network Modules

i2o® Peer-to-Peer Communication

i2o® Multicast Communication

i2o® Peer-to-Peer + Multicast

Link your inputs to your outputs without a PLC, PC or master CPU.

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Bulletin # 8400595b

Busworks® Modbus TCP/IP I/O Modules

Easy Peer-to-Peer Communication with Acromag i2o®

i2o® Input-to-output Communication

Acromag's i2o technology provides the easiest way to link your inputs to your outputs without a PLC, PC or master CPU.

With i2o, many Ethernet I/O modules have the ability to operate like a long-distance transmitter. You can convert your sensor inputs at Point A to process control signals at Point B. Or, monitor a discrete device at one site by reproducing the discrete level with a relay output at another location.

Use your existing Ethernet lines to save time and wiring expenses

You can connect the input modules to the output modules using your existing copper/fiber infrastructure or with a single new cable. Multiple I/O modules can be multiplexed through a switch or wireless radios.

BusWorks NT Series I/O Modules

No complicated controllers. No software. No programming.

Acromag's NT, 900EN & Etherstax Ethernet I/O modules have a built-in web page making it simple to configure using your standard web browser. Just click a few menu settings, enter the IP addresses, and you are done. Fast and easy. Acromag's XT Ethernet I/O modules are USB configured with Acromag software. You save as a file for easy download.

Wire-saving Applications

Our i2o technology lets an input module speak directly to an output module. It is ideal for non-critical projects that don't need a PLC or PC master. Reproduce remote signals based on timed or event updates.

- Remote monitoring of process variables (temperature, pressure, level, flow) and discrete devices
- Remote data display, recording, alarms, or control
- Signal splitters
- Analyzer system monitoring
- Power and water utility monitoring
- Tank level, pump, and valve control
- Remote monitoring of motor loads and contactor status
- Remote control switching stations
- Environmental control systems
- Process shutdown, alarming, and annunciator systems
- RFID systems
- Modbus TCP/IP communication only

Peer-to-Peer Modbus TCP/IP Communication

Analog Inputs
4-20mA, 0-10V DC. thermocouple, RTD/resistance

Discrete Inputs
on/off, high/low, open/close, momentary push-buttons

Any Ethernet Media
Copper, fiber, wireless, or Internet

Input-to-Output
input channel writes to the output channel

(uni-directional or bi-directional communication)

Analog Outputs
proportional 4-20mA or 0-10V DC

Discrete Outputs
on/off, high/low, open/close

EtherStax I/O® also supports i2o

**Contact factory for pairing advice.*

Easy Multicast Communication with Acromag i2o®

i2o® Multicast Modbus TCP/IP Communication

Acromag's NT Ethernet Series features i2o peer-to-peer and multicast technology.

Ethernet-based Configuration

NTE Ethernet I/O modules have a built-in web server for convenient configuration without installing any software.

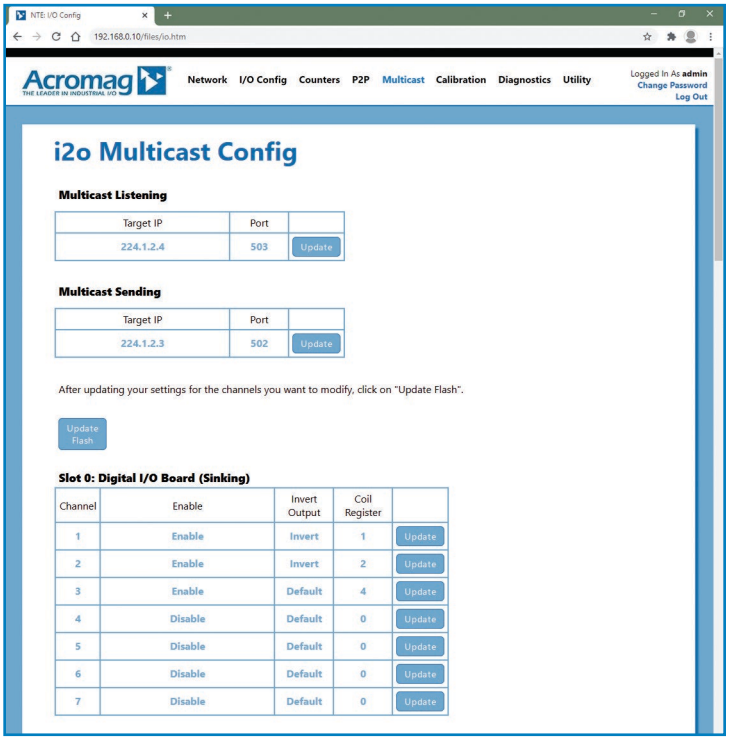
Multicast Advantages

- Multicast communication capability
- One-to-many group messaging – no host or master controller required
- Multicast listening – receive from target IP address
- Multicast sending – transmit to target IP address

i2o Multicast Applications

Our i2o technology lets an input module speak directly to an output module. It is ideal for non-critical projects that don't need a PLC or PC master. Reproduce remote signals based on timed or event updates.

- Front end solutions for PLC, RTU, recorders, displays and DCS that don't have network communication available
- Data acquisition systems
- Alarm Systems
- Remote switching systems
- Signal splitter applications
- Tank level monitoring or pump controls
- Power/status monitoring through AC currents or contacts
- Load shedding applications



*Contact factory for pairing advice.

Busworks® Modbus TCP/IP I/O Modules

Acromag i2o® Technology for Peer-to-Peer Communication

NT Series Modbus TCP/IP with Multicast i2o®

Go to on-line ordering page >

Analog Input Modules

NTE2211
8 differential current, 2 DIO sinking

NTE2221
16 single-ended current input

NTE2231
8 differential voltage, 2 DIO sinking

NTE2241
16 single-ended voltage inputs

Analog Output Modules

NTE2311
8 current outputs

NTE2321
8 voltage outputs

Discrete I/O Modules

NTE2111
16 active high input, sinking output

NTE2121
16 active low input, sourcing output

NTE2131
6 discrete inputs, 6 mechanical relay outputs

NTE2141
6 AC inputs, 6 DC I/O

Combination I/O Modules

NTE2511
4 current inputs, 2 current outputs, 4 discrete I/O

NTE2512
4 current inputs, 4 discrete I/O

NTE2531
4 voltage inputs, 2 current outputs, 4 discrete I/O

NTE2532
4 voltage inputs, 4 discrete I/O

Temperature Input I/O Modules

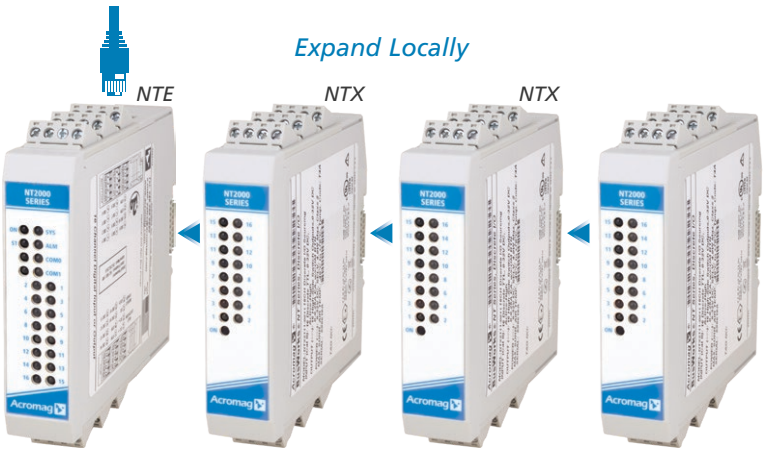
NTE2611
8 thermocouple/mV inputs, 2 discrete I/O

NTE2621
4 RTD inputs, 2 discrete I/O sinking

Note:
Buy NT modules in pairs.

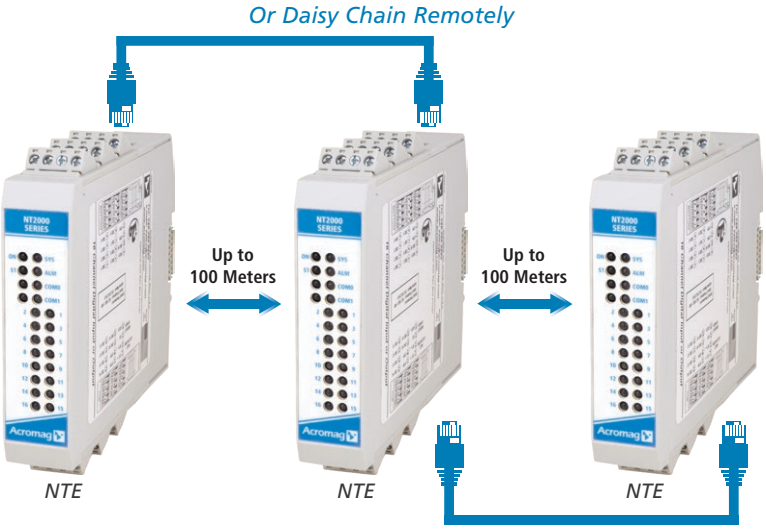
For example:
AI with AO
DIO with DO or DIO
Combo with Combo*

Expand Locally

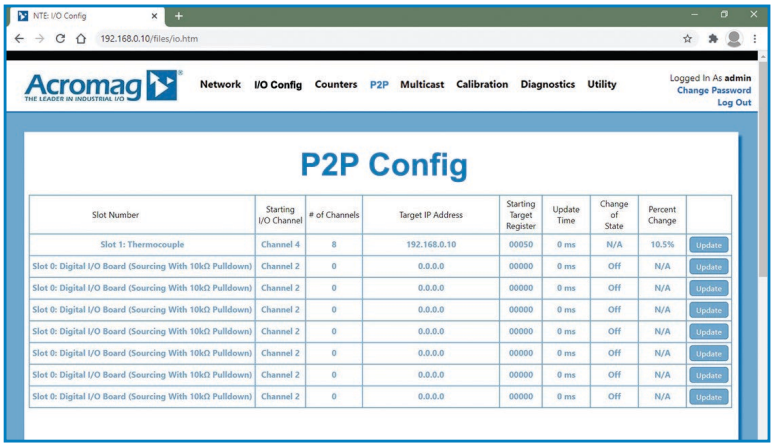


Link up to three NTX expansion I/O modules to an NTE Ethernet I/O module over the integrated DIN rail I/O bus connectors.

Or Daisy Chain Remotely



Connect NTE Ethernet I/O modules with a daisy-chain topology using the internal dual-port switch to simplify network cabling.



P2P Config

Slot Number	Starting I/O Channel	# of Channels	Target IP Address	Starting Target Register	Update Time	Change of State	Percent Change	
Slot 1: Thermocouple	Channel 4	8	192.168.0.10	00050	0 ms	N/A	10.5%	Update
Slot 0: Digital I/O Board (Sourcing With 10kΩ Pulldown)	Channel 2	0	0.0.0.0	00000	0 ms	Off	N/A	Update
Slot 0: Digital I/O Board (Sourcing With 10kΩ Pulldown)	Channel 2	0	0.0.0.0	00000	0 ms	Off	N/A	Update
Slot 0: Digital I/O Board (Sourcing With 10kΩ Pulldown)	Channel 2	0	0.0.0.0	00000	0 ms	Off	N/A	Update
Slot 0: Digital I/O Board (Sourcing With 10kΩ Pulldown)	Channel 2	0	0.0.0.0	00000	0 ms	Off	N/A	Update
Slot 0: Digital I/O Board (Sourcing With 10kΩ Pulldown)	Channel 2	0	0.0.0.0	00000	0 ms	Off	N/A	Update
Slot 0: Digital I/O Board (Sourcing With 10kΩ Pulldown)	Channel 2	0	0.0.0.0	00000	0 ms	Off	N/A	Update
Slot 0: Digital I/O Board (Sourcing With 10kΩ Pulldown)	Channel 2	0	0.0.0.0	00000	0 ms	Off	N/A	Update

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Contact factory for pairing advice.

Acromag i2o® Technology for Peer-to-Peer Communication

XT Series Modbus TCP/IP Modules with i2o

Go to on-line ordering page >

Analog Input Modules

XT1211
8 differential current inputs

XT1221
8 differential voltage inputs

XT1231
16 single-ended current inputs

XT1241
16 single-ended voltage inputs

Discrete I/O Modules

XT1111
16-channel sinking outputs

XT1121
16-channel sourcing outputs

Combination I/O Modules

XT1531
4 analog current outputs,
4 discrete I/O

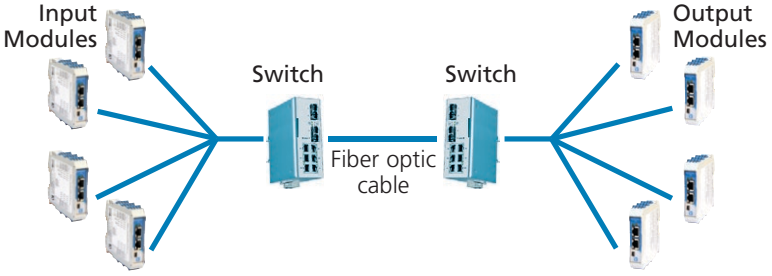
XT1541
8 analog voltage outputs,
4 discrete I/O

Installation #1: Copper Ethernet network

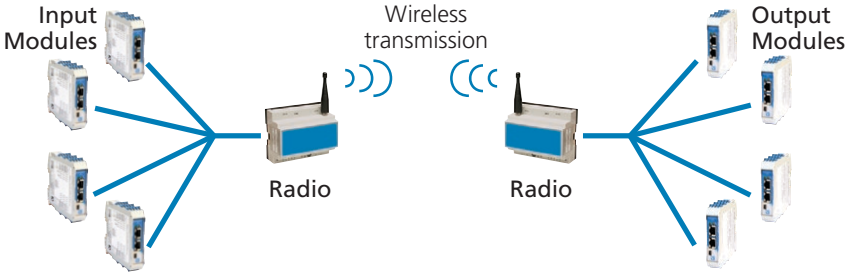
Note:
Buy XT modules in pairs.

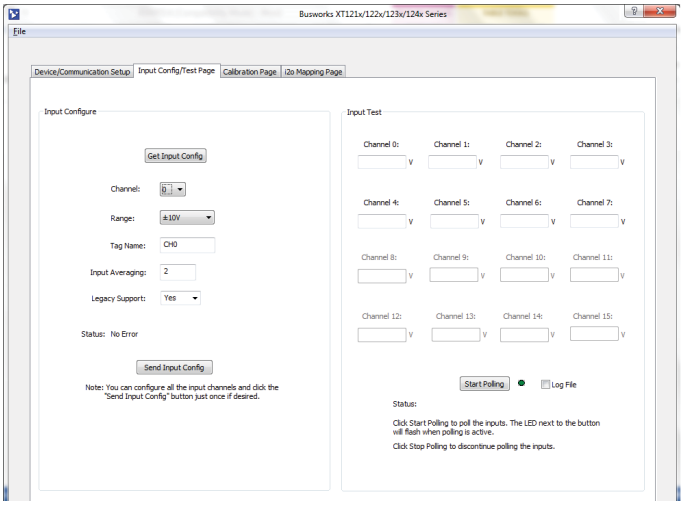
For example:
AI with AO
DIO with DO or DIO
Combo with Combo*

Installation #2: Fiber optic connection

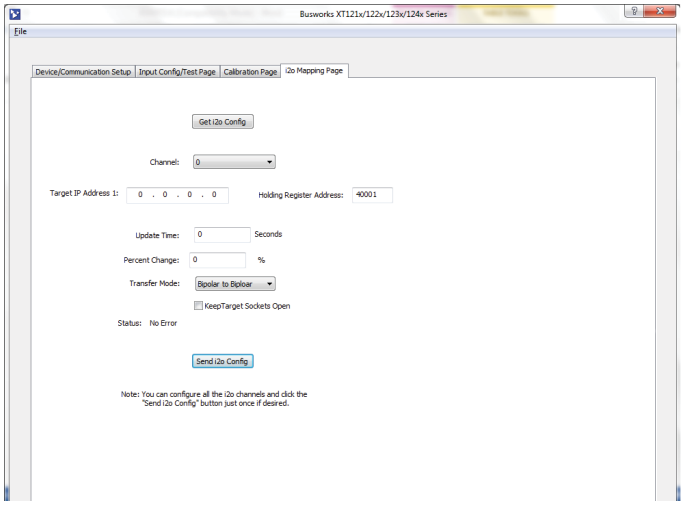


Installation #3: Wireless connection (telemetry systems)





XT Module input configuration screen



XT Module i2o mapping screen

*Contact factory for pairing advice.

Busworks® Modbus TCP/IP I/O Modules

Acromag i2o® Technology for Peer-to-Peer Communication

900EN Series Modbus TCP/IP with i2o®

Go to on-line ordering page >

Analog Input Modules

961EN-4006 / 962EN-4006
6 differential current/voltage inputs

965EN-4006
6 thermocouple/mV inputs

966EN-4006
6 RTD/resistance inputs

967EN / 968EN
8 differential current/voltage inputs

Analog Output Modules

972EN-4xxx
4 or 6 current outputs

973EN-4xxx
4 or 6 voltage outputs

Discrete I/O Modules

982EN-4012
12 solid-state relay outputs

983EN-4012
12 solid-state input/outputs

Combination I/O Modules

951EN-4012
4 analog current inputs,
2 analog current outputs, 6 discrete I/O

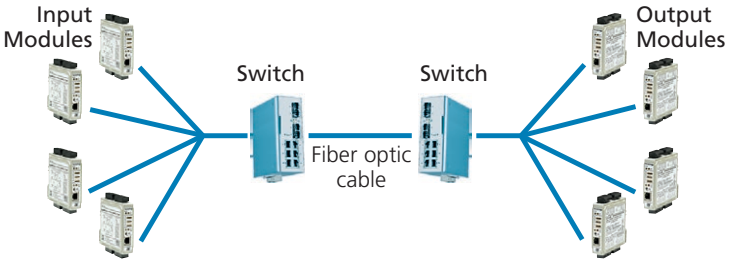
952EN-4012
4 analog voltage inputs,
2 analog current outputs, 6 discrete I/O

Installation #1: Copper Ethernet network

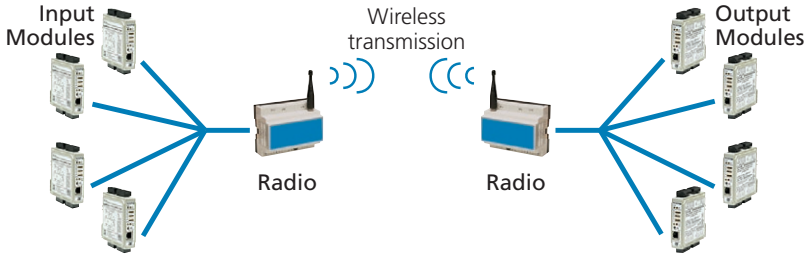
Note:
Buy 900EN modules in pairs.

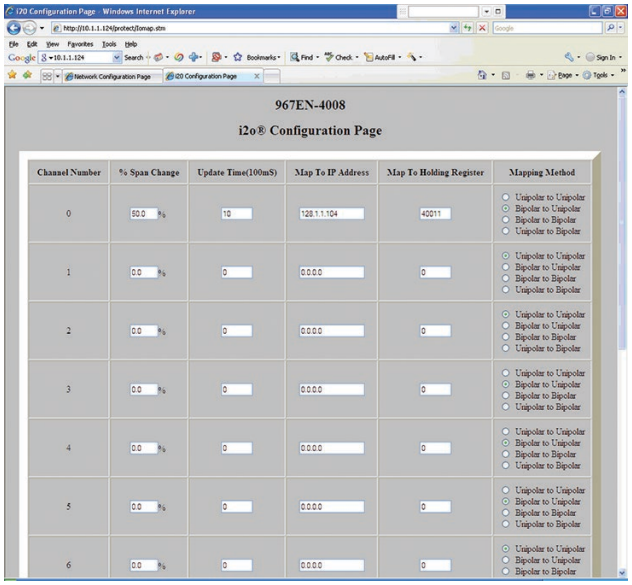
For example:
AI with AO
DIO with DO or DIO
Combo with Combo*

Installation #2: Fiber optic connection

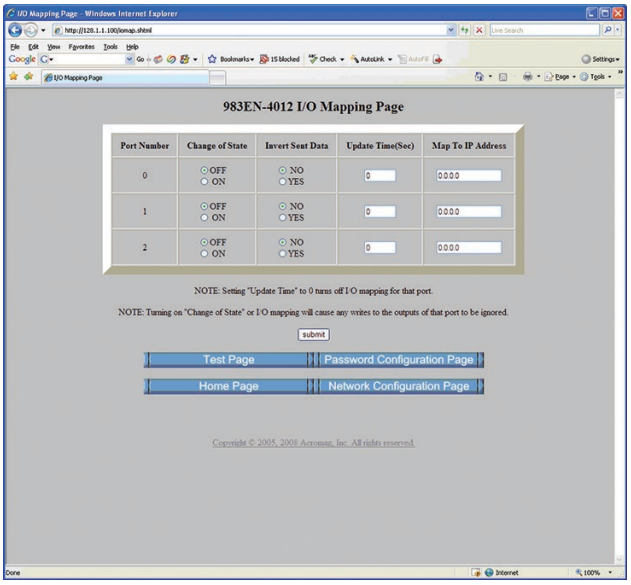


Installation #3: Wireless connection (telemetry systems)





Analog input module configuration screen



Discrete I/O module configuration screen

*Contact factory for pairing advice.

Acromag i2o® Technology for Peer-to-Peer Communication

ES2000 Series Modbus TCP/IP Units with i2o®

Go to on-line ordering page >

Analog Input Modules

ES2153
16 analog current inputs,
16 analog voltage or microBlox® uB inputs

Analog Output Modules

ES2171
16 current outputs

ES2172
16 voltage outputs

Analog I/O Modules

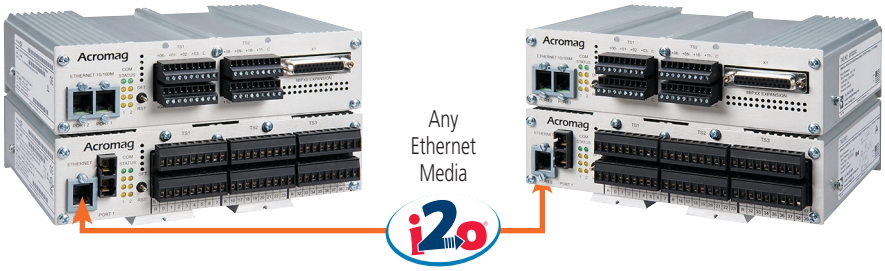
ES2151
16 analog current inputs,
16 analog voltage or microBlox® uB inputs,
16 analog current outputs

ES2152
16 analog current inputs,
16 analog voltage or microBlox® uB inputs,
16 analog voltage or microBlox® uB outputs

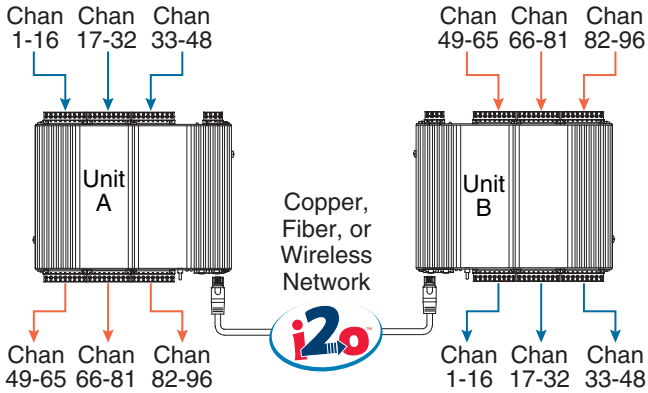
Discrete I/O Modules

ES2113
96 solid-state input/outputs

ES2117
32 solid-state inputs
16 relay outputs



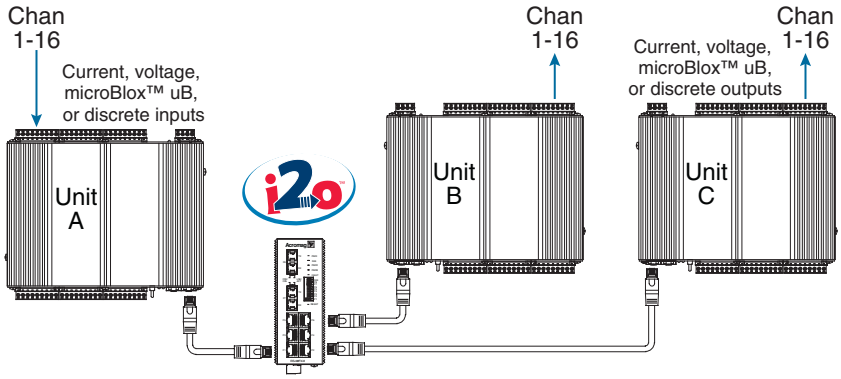
Installation #1: Peer-to-Peer Bi-directional Communication



Note:
Buy Etherstax modules in pairs.

For example:
AI with AO
AIO with AIO
DIO with DIO*

Installation #2: Peer-to-Peer Signal Splitter (dual outputs)



i2o® Configuration Page

Port Number	% Span Change	Update Time(100mS)	Map To IP Address	Map To Holding Register	Mapping Method	Map To Internal Outputs
Port 1 Voltage	0.0 0.0	150 0	128.1.1.102 0.0.0.0	40351 0	○ Unipolar to Unipolar ○ Bipolar to Unipolar ○ Bipolar to Bipolar ◉ Unipolar to Bipolar	◉ NO ○ YES
Port 2 Voltage	0.0 0.0	0 0	0.0.0.0 0.0.0.0	0 0	○ Unipolar to Unipolar ○ Bipolar to Unipolar ◉ Bipolar to Bipolar ○ Unipolar to Bipolar	◉ NO ○ YES
Port 1 Current	0.0 0.0	0 0	0.0.0.0 0.0.0.0	0 0	○ Unipolar to Unipolar ○ Bipolar to Unipolar ◉ Bipolar to Bipolar ○ Unipolar to Bipolar	
Port 2 Current	0.0 0.0	0 0	0.0.0.0 0.0.0.0	0 0	○ Unipolar to Unipolar ○ Bipolar to Unipolar ◉ Bipolar to Bipolar ○ Unipolar to Bipolar	

Analog I/O module (ES2152) configuration screen

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Because We Know I/O

You Get Personalized Support- Guaranteed

Doing business with Acromag means you can count on receiving dependable value when using our products. We guarantee to meet or exceed published product performance specifications and offer you exceptional personal service with a real person within one business day.

Products Designed for Dependable Value

Acromag's signal conditioning line features more than 100 transmitters, isolators, alarms, and computation modules. If networked I/O is required, Acromag offers analog, discrete, and temperature I/O modules for Ethernet, Modbus, Profibus, i2o® peer-to-peer or multicast communication.

Other Quality Acromag Services and Products

Embedded Processors

- FPGAs
- Embedded computers
- COM Express
- VME, VPX SBCs

Embedded I/O

- AcroPack® I/O mezzanine modules
- IndustryPack I/O modules
- PMC/XMC I/O modules
- Carrier cards

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