Ethernet I/O: BusWorks® Series

Easy Peer-to-Peer Modbus TCP/IP 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 BusWorks 900EN 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.

No complicated controllers. No software. No programming.
Acromag's 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.

BusWorks 900EN Series I/O Modules

Up to 12 channels per module and reliable, failsafe communication
Monitor up to a dozen devices with a single pair of I/O modules. Discrete I/O modules have twelve channels that you can set up as inputs or as outputs in four-channel groups. This allows bi-directional communication between two modules. Analog input modules measure up to six current, voltage, thermocouple, or RTD sensor signals. This data is then transmitted to a six-channel analog output module providing DC current or voltage output signals.

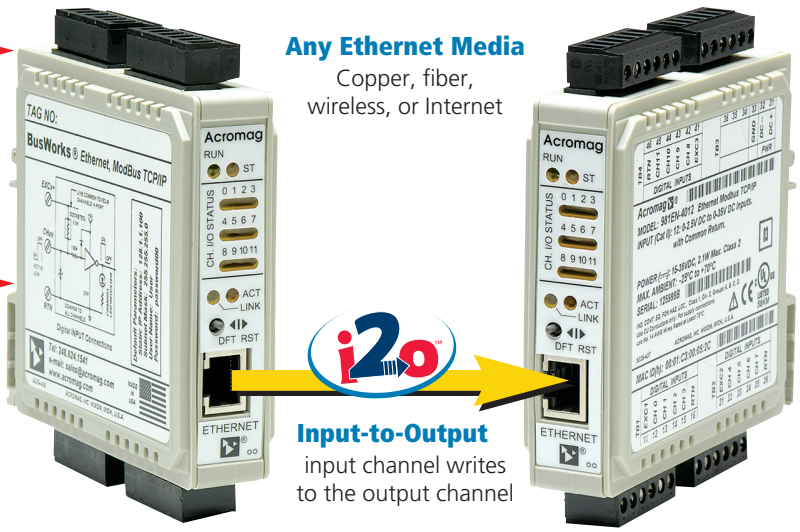
Wire-saving Applications
Our i2o technology lets an input module speak directly to an output module. It is ideal for non-critical projects that don't need a PLC or PC master. Reproduce remote signals based on timed or event updates.

- 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

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

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

(uni-directional or bi-directional communication)

EtherStax I/O® also supports i2o

Ethernet I/O: BusWorks® XT Series

Acromag i2o® Technology for Peer-to-Peer Communication

XT Series Modbus TCP/IP Modules with i2o

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

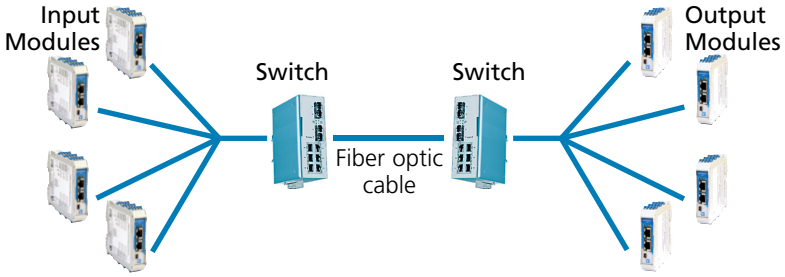
XT1541
8 analog voltage outputs,
4 discrete I/O

Installation #1: Copper Ethernet network

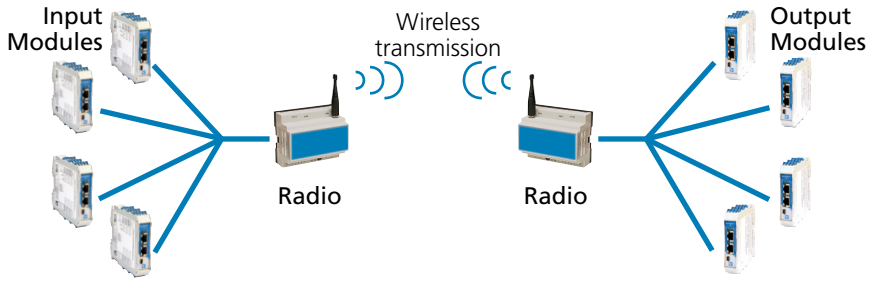
NOTE:
Buy XT modules in pairs. For example:

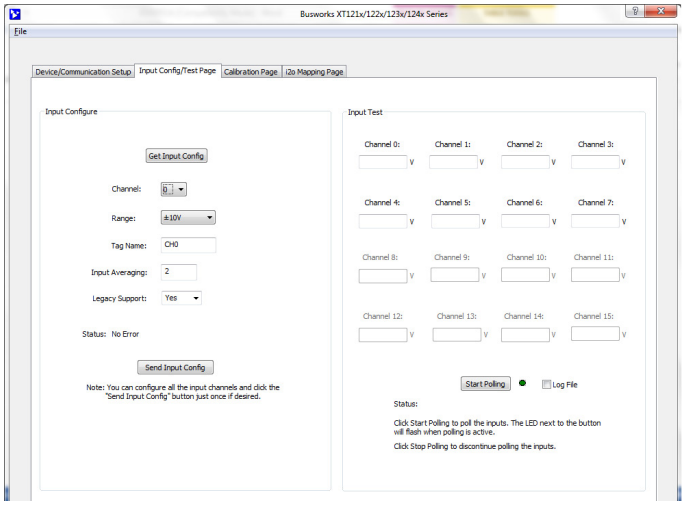
AI with AO
DIO with DO or DIO
Combo with Combo

Installation #2: Fiber optic connection

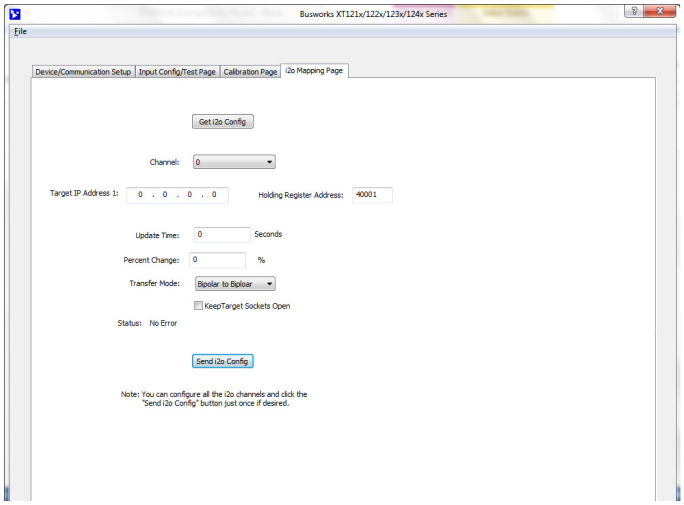


Installation #3: Wireless connection (telemetry systems)





XT Module input configuration screen



XT Module i2o mapping screen

Ethernet I/O: BusWorks® Series

Acromag i2o® Technology for Peer-to-Peer Communication

900EN Series Modbus TCP/IP with i2o®

Analog Input Modules

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

965EN-4006
6 thermocouple/mV inputs

966EN-4004
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

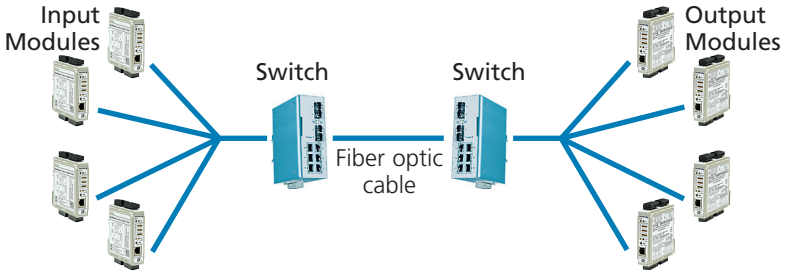
952EN-4012
4 analog voltage inputs,
2 analog current outputs, 6 discrete I/O

Installation #1: Copper Ethernet network

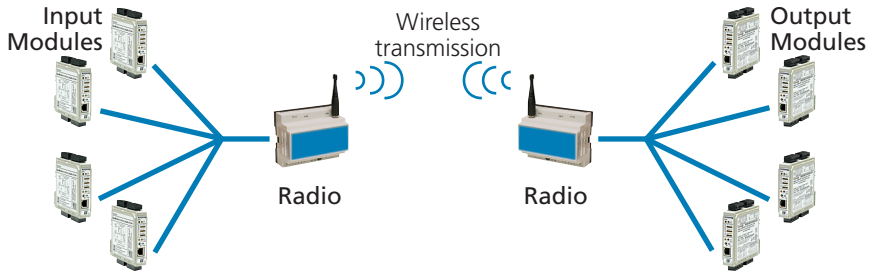
NOTE:
Buy 900EN modules in pairs.
For example:

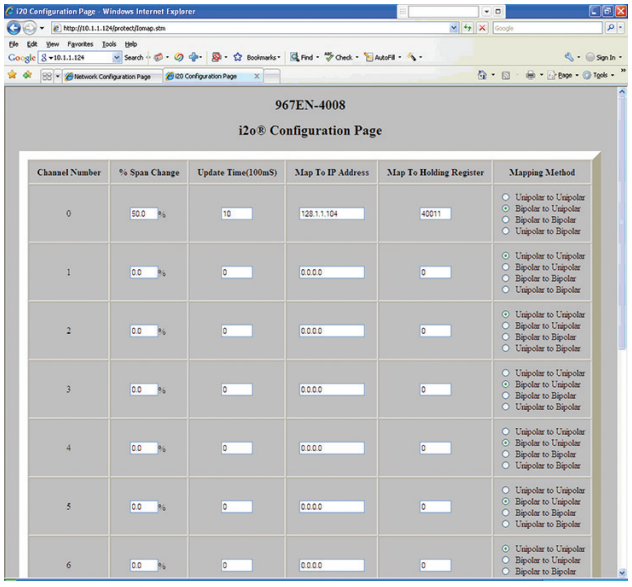
AI with AO
DIO with DO or DIO
Combo with Combo

Installation #2: Fiber optic connection

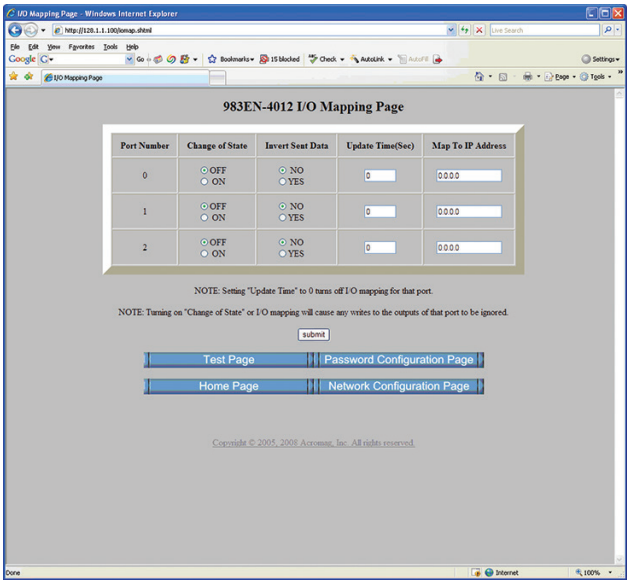


Installation #3: Wireless connection (telemetry systems)





Analog input module configuration screen



Discrete I/O module configuration screen

Acromag i2o® Technology for Peer-to-Peer Communication

ES2000 Series Modbus TCP/IP Units with i2o

◆ 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

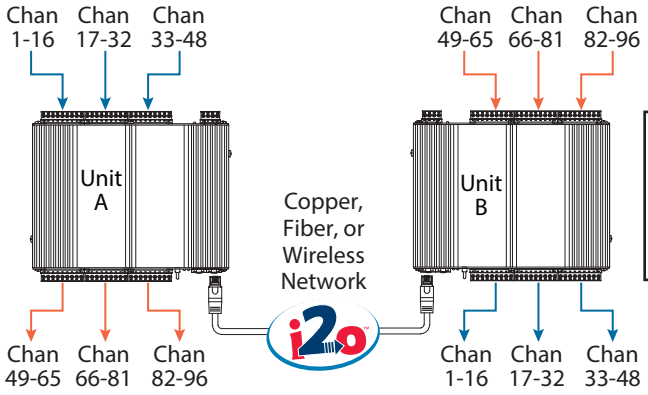
ES2152
16 analog current inputs,
16 analog voltage or microBlox™ uB inputs,
16 analog voltage or microBlox™ uB outputs

◆ Discrete I/O Modules

ES2113
96 solid-state input/outputs

ES2117
32 solid-state inputs
16 relay outputs

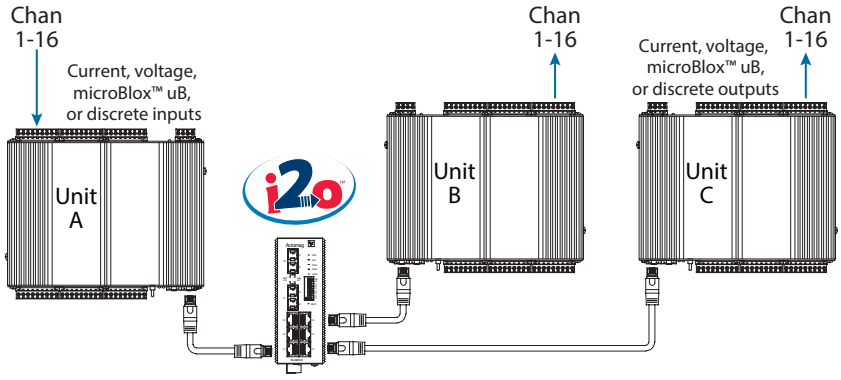
Installation #1: Peer-to-Peer Bi-directional Communication



NOTE: Buy 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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