ioLogik E1200 Series

Remote Ethernet I/O with 2-port Ethernet Switch

> Built-in 2-port Ethernet switch for daisy-chain topologies
> Free support of Moxa's push-based Active OPC Server Lite
  ▪ Seamlessly connect to any SCADA system
  ▪ Save 80% on network bandwidth
  ▪ I/O response that's seven times faster
> User-defined Modbus/TCP addressing
> MXIO programming library for Windows and WinCE VB/VC.NET and Linux C APIs
> Web configuration with Import/Export function

CE FC

: Introduction

Star-topology for Ethernet Automation

Ethernet requires infrastructure equipment such as switches for connecting a variety of different devices to the network. This is unlike most field-bus automation networks that use a daisy-chain topology, which presents a bit of a problem for Ethernet automation applications since when connecting to Ethernet, meters and gauges must be formed in a "star" configuration. The ioLogik E1200 series provides an alternative to spending the time and money needed to figure out the best way to hook up your Ethernet switches. Since each E1200 unit has two built-in Ethernet switches, the E1200 solution is tailor-made for a daisy-chain type configuration.

MOXA®
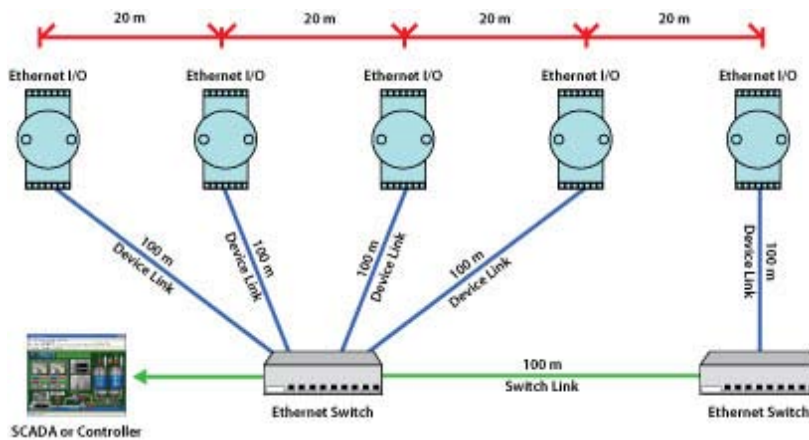
Daisy-chained Ethernet I/O Connection

A new daisy-chained Ethernet I/O concept is now available. The ioLogik E1200 industrial remote Ethernet I/O has two embedded Ethernet switch ports that allow information to flow to another local Ethernet device or connect to the next ioLogik in the daisy-chain. Applications such as factory automation, security and surveillance systems, and tunnel monitoring, can make use of daisy-chained Ethernet for building multi-drop I/O networks over standard Ethernet cables. Many industrial automation users are familiar with the multi-drop configuration

typically used in fieldbus applications. The daisy-chain function on the remote Ethernet I/O ioLogik E1200 not only increases the connection between machines and panels, but also lowers the cost of buying separate Ethernet switches, and at the same time reduces labor fees and cabling by a large percentage. For example, if a production facility contains 700 stations (20 points per station), the wiring cost reduction can reach 15% of the total implementation cost.
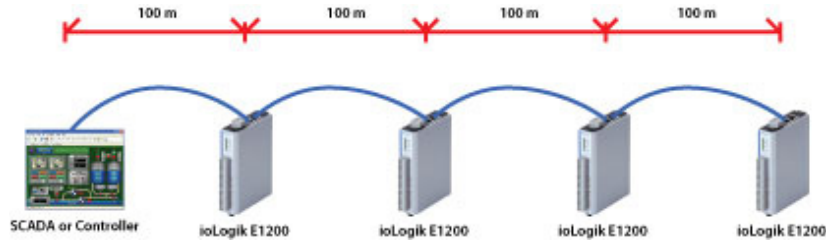
Efficient Ethernet Device Connectivity

The ioLogik E1200's built-in Ethernet switch ports can be cascaded to other Ethernet devices at the same location. A typical situation is a remote site that has a few sensors, devices, and Internet connectivity. Take a roadside cabinet as an example. The IP camera monitors activity on the street and an Ethernet I/O device handles environmental monitoring, intrusion, and alarms, and triggers the camera to take snapshots when needed.

The traditional approach for this kind of remote monitoring application requires an additional switch or hub for connecting the Ethernet I/O device to the IP camera. A better approach is to connect another Ethernet device such as a PLC controller or an IPC in the same cabinet and use the industrial switch embedded in the ioLogik E1200. Not only does this solution reduce the number of failure points associated with an additional switch or hub, but it also reduces the amount of wiring needed for power, signals, and the network. Space inside the cabinet can also be saved.
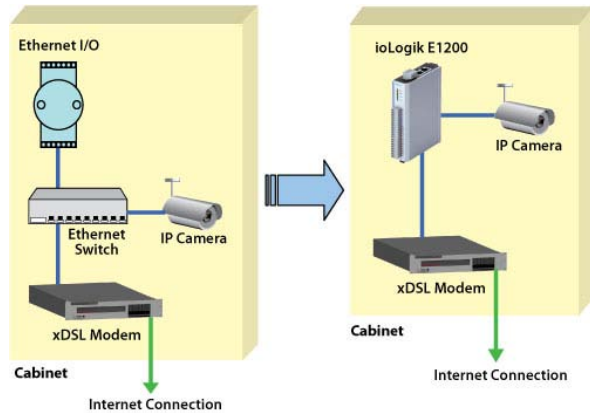
: Smart I/O Connectivity

Several approaches are available for controlling the ioLogik E1200 over an Ethernet network. As a traditional I/O solution, the ioLogik E1200 allows a central SCADA system or field controller to poll the I/O channel status via the standard, open Modbus/TCP protocol. Except for the default fixed Modbus/TCP address, the ioLogik E1200 provides the capability of letting users define the address by themselves. In

addition, the MXIO(.NET) library makes it easy for programmers to integrate their own software to the ioLogik in the field. Moreover, the ioLogik E1200 can leverage the benefits of the active technology of the ioLogik E2000 series with the free Active OPC Server package to seamlessly connect to any Windows-based SCADA system.
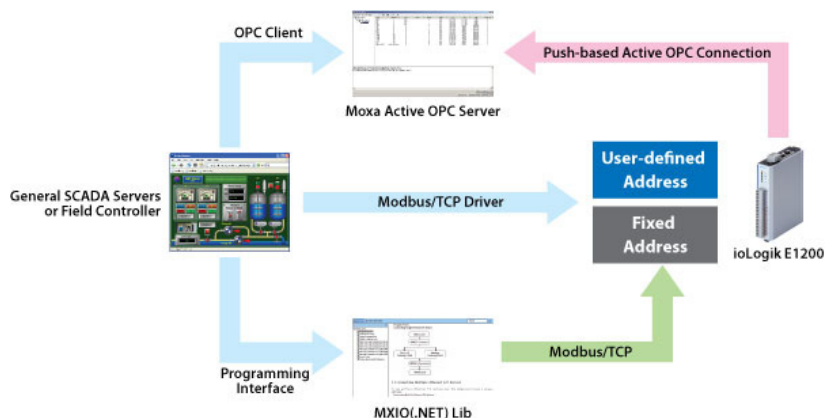
: OPC Connection to SCADA

Free Push-based Active OPC Server Lite Package

Active OPC Server Lite is a free software package provided by Moxa that operates as an OPC driver for an HMI or SCADA system. General OPC servers typically use the "poll/response," or so-called "pull" architecture, to connect to Ethernet I/O devices, which involves an HMI/SCADA system continuously sending out commands to collect relevant data. Moxa's Active OPC Server Lite, with its non-polling

architecture, supports the standard OPC protocol, but also offers active (or "push") communication with Moxa's ioLogik series of Ethernet I/O products to HMI/SCADA systems, providing instant I/O status reports with "Active Tags." The event-driven active tags result in an I/O response time that is 7 times faster than other OPC Server packages, and results in an apparent 80% reduction in network traffic.
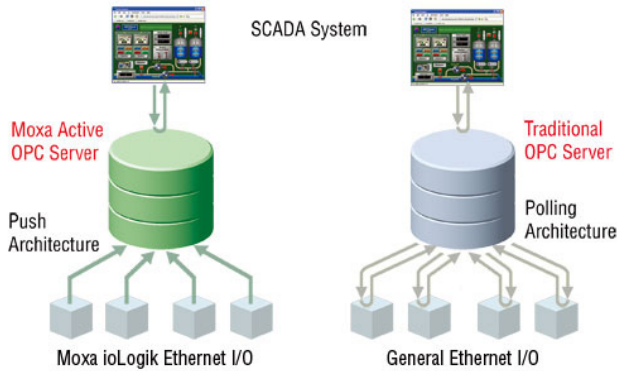
Critical Tests Say It Best

Test 1: Network Traffic Comparison
This test used 32 ioLogik E2210 units with 640 DI/O points. As shown in the figure, Active Ethernet I/O can save 80% on bandwidth consumption compared to passive Ethernet I/O.

Reduce Bandwidth Consumption by 80%
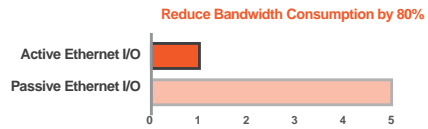
Test 2: I/O Status Response Time
This test used 128 ioLogik E2210 units with 2,560 I/O points. As shown in the figure, the active architecture is 7 times better than the passive architecture in response time when the I/O status changes.

7 Times Faster
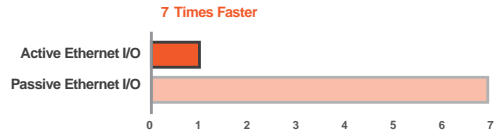
Dynamic IP/WAN Connection

Active OPC Server Lite and ioLogik products provide the flexibility of configuring the ioLogik E1200 to use dynamic IP addresses. The ioLogik E1200 connects directly to the Active OPC Server Lite instead of being polled, which makes dynamic IP addressing and WAN Access

to the Ethernet I/O device possible, and adds even greater flexibility by allowing connections across firewalls. I/O devices for traditional data acquisition applications are not capable of using this approach.
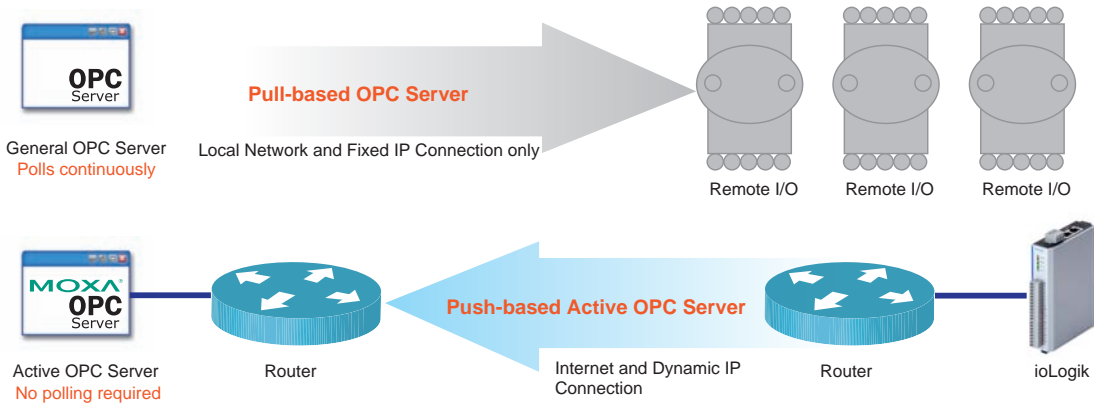
Patented Automatic Tag Generation

Patented "Auto Tag Generation" eliminates the headache of specifying target IP addresses, I/O channels, and data formats one by one, or editing and importing configuration text files since Active OPC Server Lite creates the tags for the target ioLogik automatically. One of the biggest payoffs is that users will no longer need to be trained to install and configure your OPC system, since setting up Active OPC Server Lite is done automatically with a single click of the mouse.
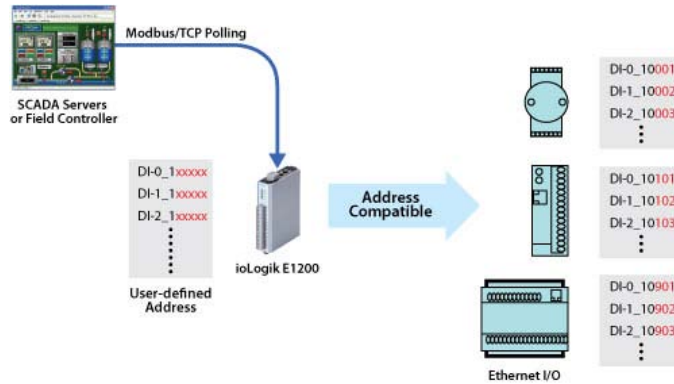
OPC Server
General OPC Server

5 steps for channels, interfaces, and protocol definition: takes **20** seconds.

13 steps for device, IP address, and other communication parameters: takes **30** seconds.

1 step for looking up address table: takes **100** seconds.

It takes 2.5 min. to create only 1 tag

MOXA OPC Server
Active OPC Server

Select channels and press ✓Create Tags button to update configuration: takes 5 seconds.

It takes 5 seconds to create 20 or more tags

ioLogik

: User-defined Modbus Addressing

To control an input or output channel of a remote Ethernet I/O device running the most general Modbus/TCP protocol requires specifying the Modbus address of those input and output channels. This can take quite a bit of effort since you may need to look up the address and data type in the user's manual for address mapping, and can also cause problems once the I/O channels change or a device is replaced.

The ioLogik E1200's user-defined Modbus addressing offers the flexibility to make the Modbus address dynamic, and the address can be configured to be compatible with other Modbus devices. When a system is being replicated, or the filed I/O is being replaced, the user-defined Modbus eliminates the effort of reconfiguring the PC control software or field controller.

Modbus/TCP Polling

SCADA Servers or Field Controller

DI-0_1xxxxx
DI-1_1xxxxx
DI-2_1xxxxx

User-defined Address

ioLogik E1200

Address Compatible

DI-0_10001
DI-1_10002
DI-2_10003

DI-0_10101
DI-1_10102
DI-2_10103

DI-0_10901
DI-1_10902
DI-2_10903

Ethernet I/O

: Mechanical Design

DIN and Wall Mountable

The ioLogik E1200 is designed with a vertical form factor, and can be used with both DIN-Rail and Wall Mounting.

Stress-relief for Solid Wiring

A stress-relief connector at the bottom of the ioLogik E1200 helps prevent the wiring from being pulled out.

: Specifications

LAN

Ethernet: 2 x 10/100 Mbps switch ports, RJ45

Protection: 1.5 KV magnetic isolation

Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, HTTP

Analog Input (for ioLogik E1240)

Type: Differential input

Resolution: 16 bits

I/O Mode: Voltage / Current

Input Range: 0 to 10 VDC, 4 to 20 mA

Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C

Sampling Rate (all channels): 12 samples/sec

Input Impedance: 10M ohms (minimum)

Built-in Resistor for Current Input: 120 ohms

Digital Input (for ioLogik E1210/E1212/E1214)

Sensor Type: NPN, PNP, and Dry contact

I/O Mode: DI or Event Counter

Dry Contact:
• Logic 0: short to GND
• Logic 1: open

Wet Contact:
• Logic 0: 0 to 3 VDC
• Logic 1: 10 to 30 VDC (DI COM to DI)

Isolation: 3K VDC or 2K Vrms

Counter/Frequency: 250 Hz, power off storage

Digital Output (for ioLogik E1211/E1212)

I/O Mode: DO or Pulse Output (up to 500 Hz)

Pulse Wave Width/Frequency: 1 ms/500 Hz

Over-voltage Protection: 45 VDC

Over-current Limit: 600 mA per channel

Over-temperature Shutdown: 175°C (typical), 150°C (min.)

Output Current Rating: Max. 200 mA per channel

Isolation: 3K VDC or 2K Vrms

Relay Output (for ioLogik E1214)

Type: Form A (N.O.) relay outputs, 5A

Contact Rating: 5 A @ 30 VDC, 5 A @ 250 VAC, 5 A @ 110 VAC

Inductance Load: 2 A

Resistance Load: 5 A

Breakdown Voltage: 500 VAC

Relay On/Off Time: 1500 ms (Max.)

Initial Insulation Resistance: 1G min. @ 500 VDC

Expected Life: 100,000 times (Typical)

Initial Contact Resistance: 30 milli-ohms (Max.)

Pulse Output: 0.3 Hz at rated load

Power Requirements

Power Input: 24 VDC nominal, 12 to 36 VDC

Power Consumption: 130 mA typical @ 24 VDC

Physical Characteristics

Wiring: I/O cable max. 14AWG

Dimensions: 27.8 x 124 x 84 mm (1.09 x 4.88 x 3.31 in)

Weight:
ioLogik E1210: 171 g
ioLogik E1211: 187 g
ioLogik E1212: 171 g
ioLogik E1214: 177 g
ioLogik E1240: 179 g

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

EMI: FCC Part 15, CISPR (EN55022) class A

EMS: IEC 61000-4, IEC 61000-6

Shock: IEC 60068-2-27

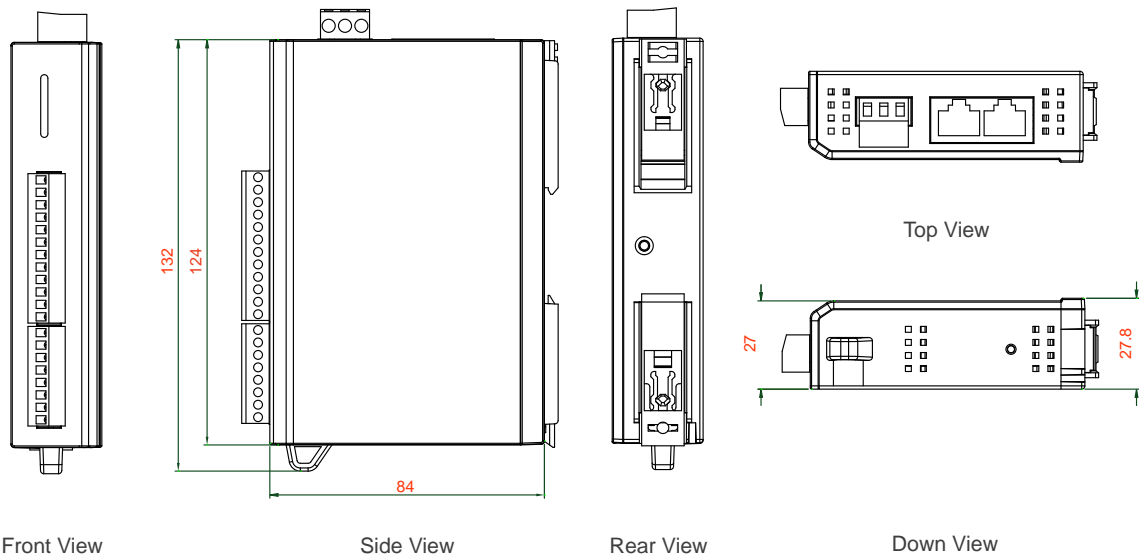**Freefall:** IEC 60068-2-32

Vibration: IEC 60068-2-6

Warranty

Warranty Period: 2 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)

Front View   Side View   Rear View   Down View

Top View

: I/O Pin Assignment

ioLogik E1210 (top to bottom)

1	COM 0	
2	DI0	
3	DI1	
4	DI2	
5	DI3	
6	GND	
7	DI4	
8	DI5	
9	DI6	
10	DI7	
11	COM 1	
12	DI8	
13	DI9	
14	DI10	
15	DI11	
16	GND	
17	DI12	
18	DI13	
19	DI14	
20	DI15	

ioLogik E1211 (top to bottom)

1		
2	DO0	
3	DO1	
4	DO2	
5	DO3	
6	GND	
7	DO4	
8	DO5	
9	DO6	
10	DO7	
11		
12	DO8	
13	DO9	
14	DO10	
15	DO11	
16	GND	
17	DO12	
18	DO13	
19	DO14	
20	DO15	

ioLogik E1212 (top to bottom)

1	COM0	
2	DI0	
3	DI1	
4	DI2	
5	DI3	
6	GND	
7	DI4	
8	DI5	
9	DI6	
10	DI7	
11	COM1	
12	DIO0	
13	DIO1	
14	DIO2	
15	DIO3	
16	GND	
17	DIO4	
18	DIO5	
19	DIO6	
20	DIO7	

ioLogik E1214 (top to bottom)

1	COM	
2	DI0	
3	DI1	
4	DI2	
5	DI3	
6	DI4	
7	DI5	
8	GND	
9	R0_NO	
10	R0_C	
11	R1_NO	
12	R1_C	
13	R2_NO	
14	R2_C	
15	R3_NO	
16	R3_C	
17	R4_NO	
18	R4_C	
19	R5_NO	
20	R5_C	

ioLogik E1240 (top to bottom)

1	AI0+	
2	AI0-	
3	AI1+	
4	AI1-	
5	AI2+	
6	AI2-	
7	AI3+	
8	AI3-	
9	AI4+	
10	AI4-	
11	AI5+	
12	AI5-	
13	AI6+	
14	AI6-	
15	AI7+	
16	AI7-	
17		
18		
19		
20		

Ordering Information

Available Models

ioLogik E1210: Remote Ethernet I/O with 2-port Ethernet switch and 16 DIs

ioLogik E1211: Remote Ethernet I/O with 2-port Ethernet switch and 16 DOs

ioLogik E1212: Remote Ethernet I/O with 2-port Ethernet switch, 8 DIs, and 8 DIOs

ioLogik E1214: Remote Ethernet I/O with 2-port Ethernet switch, 6 DIs, and 6 Relays

ioLogik E1240: Remote Ethernet I/O with 2-port Ethernet switch and 8 AIs