ioLogik E2212 User's Manual

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www.moxa.com/product

ioLogik E2212 User's Manual

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Table of Contents

1 Introduction

The ioLogik E2212 is a stand-alone Active Ethernet I/O server that can connect sensors and on/off switches for automation applications over Ethernet and IP-based networks.

The following topics are covered in this chapter:

- **Overview**
  - Traditional Remote I/O
  - Active Ethernet I/O
  - Click&Go
  - Optional Liquid Crystal Display Module (LCM)
- **Product Features**
  - Configurable I/O channels
  - Accepts PNP or NPN sensors
- **Package List**
- **Product Specifications**
- **Physical Dimensions (Unit = mm)**
- **Hardware Reference**
  - Panel Guide
  - Pin Assignments
  - LED Indicators

Overview

The ioLogik E2212 is a member of the E2000 line of ioLogik Active Ethernet I/O servers, which are designed for intelligent, pro-active status reporting of attached sensors, transmitters, transducers, and valves over a network. It includes 2 MB of Flash ROM, 8 MB of SDRAM, and supports an optional hot-pluggable Liquid Crystal Display Module (LCM) to view and configure device settings.

Traditional Remote I/O

Ethernet remote I/O solutions have been on the market for a long time. Traditional solutions are "passive," in the sense that I/O servers wait passively to be polled by a host computer. The response time in this type of setup, however, tends to be on the order of seconds. The "passive" remote I/O structure is simply inadequate for Data Acquisition and Control (DAC) systems that require an efficient, real-time I/O solution with a response time on the order of hundredths of seconds.

Active Ethernet I/O

Moxa's **Active Ethernet I/O** line was developed specifically to address the limitations of the traditional passive approach. Rather than having the host computer poll the I/O device server over the network for the status of each I/O device, the **Active Ethernet I/O server** intelligently sends the host computer status information only under specified conditions. This is a **report by exception** approach, which greatly reduces the load on CPU and network resources. Network packets are far fewer in number and far smaller in size, since I/O information is only sent when necessary and only information from the specified I/O device is sent. Based on field tests of an ioLogik E2000 series server used in an RFID system, 50 ms is the typical response time over a 100 Mbps Ethernet network. Moxa's active I/O messaging system uses TCP or UDP for I/O messaging and supports sending messages to up to ten host computers simultaneously.

In addition to providing intelligent status reporting, Active Ethernet I/O servers are backwards compatible, with all of the functions and capabilities of traditional passive remote I/O servers.

Click&Go

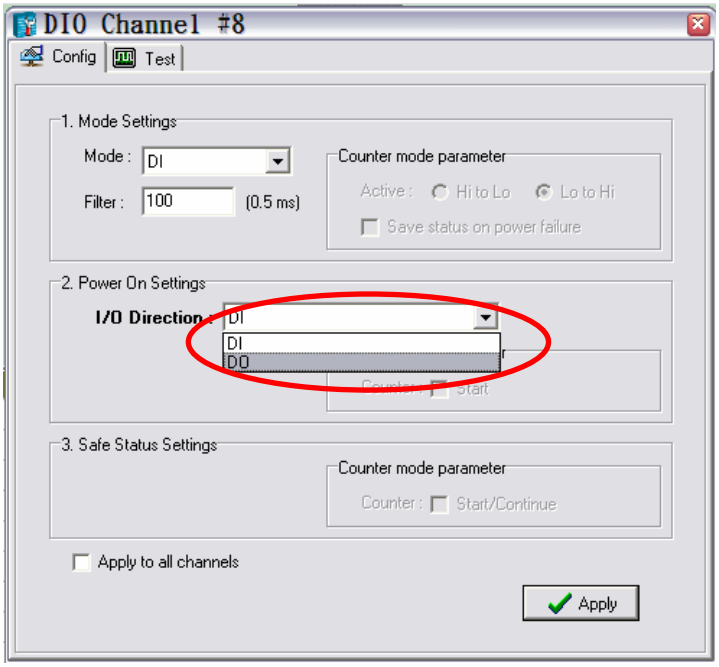
Moxa developed the Click&Go logic control interface for easy configuration and deployment of Active Ethernet I/O. Click&Go's intuitive, graphical interface lets administrators use simple IF/THEN statements as rules to determine how the Active Ethernet I/O server responds to different I/O conditions. For example, the Active Ethernet I/O server could be set to turn on an attached switch as well as send an e-mail or SNMP trap when an attached event counter reaches a certain value. Click&Go makes it easy to define a set of these rules, which will become the basis for your Active Ethernet I/O system.

Optional Liquid Crystal Display Module (LCM)

The ioLogik E2212 supports an optional hot-pluggable Liquid Crystal Display Module (LCM) for field management and configuration. The LCM can display network and I/O settings such as digital input mode and value. The ioLogik E2212's IP address and netmask may also be configured using the LCM, and one LCM can be used to maintain and configure multiple ioLogik E2212 servers.

Product Features

Configurable I/O channels

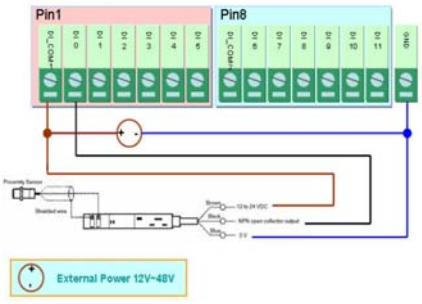


The ioLogik E2212 provides the flexibility to handle almost any field installation, with 8 fixed input channels, 8 fixed output channels, and 4 configurable input/output channels. This enables you to define custom configurations such as 12 inputs and 8 outputs, 8 inputs and 12 outputs, or 10 inputs and 10 outputs.

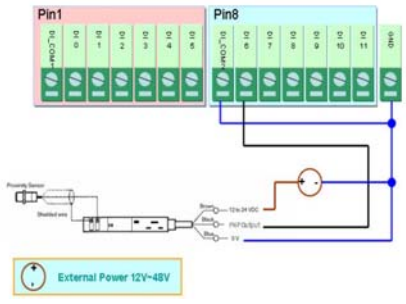
Accepts PNP or NPN sensors

Unlike traditional Ethernet I/O products, the ioLogik E2212 supports dry contact, PNP, and NPN sensors. The sensor type is determined by your wiring approach. Sensors can be wired in two different groups, so both PNP and NPN sensors can be connected to the unit at the same time.

Wet Contact with NPN sensor



Wet Contact with PNP sensor



Patented Click&Go logic for easy local control without programming

On Active Ethernet I/O servers, Moxa's Click&Go logic makes it easy to define a set of rules for local control of attached output devices. For example, you can define a rule that activates an attached switch and sends an e-mail when a sensor event occurs a certain number of times.

Instant event reporting by TCP, UDP, e-mail, or SNMP trap

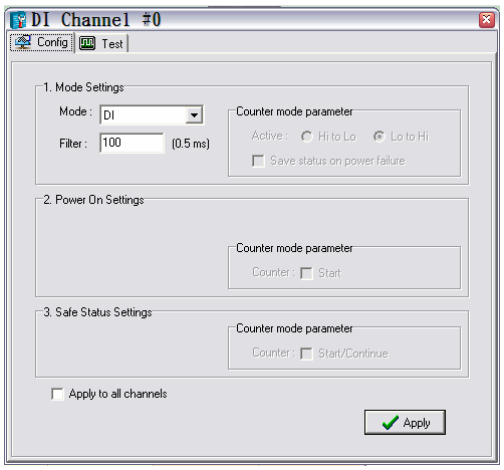
Active Ethernet I/O servers can report I/O events automatically to any network host. Reports are fully customizable and can be sent by TCP, UDP, e-mail, or SNMP trap.

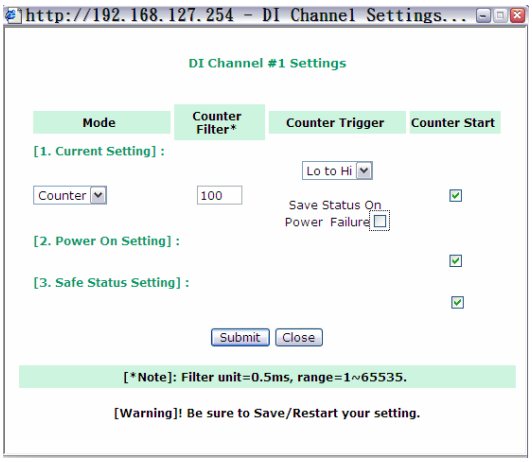
Peer-to-peer I/O for transmission of sensor signals over Ethernet without controller

The ioLogik E2212 supports Peer-to-Peer I/O operation, where sensor signals are transmitted over Ethernet to another ioLogik E2212. For typical 100 Mbps LANs, latency is only 100 ms.

Power fail counter storage memory

The ioLogik E2212 stores event counter values so that they are not lost during a power failure or disconnection.





RoHS compliance

As required by EU regulations, the ioLogik E2212 is fully RoHS-compliant.

Package List

The ioLogik E2212 is shipped with the following items:

Standard Accessories

- ioLogik E2212 Active Ethernet I/O server
- Documentation and Software CD

Optional Accessories

- LDP1602 ioLogik LCM (Liquid Crystal Display Module)

NOTE: Notify your sales representative if any of the above items are missing or damaged.

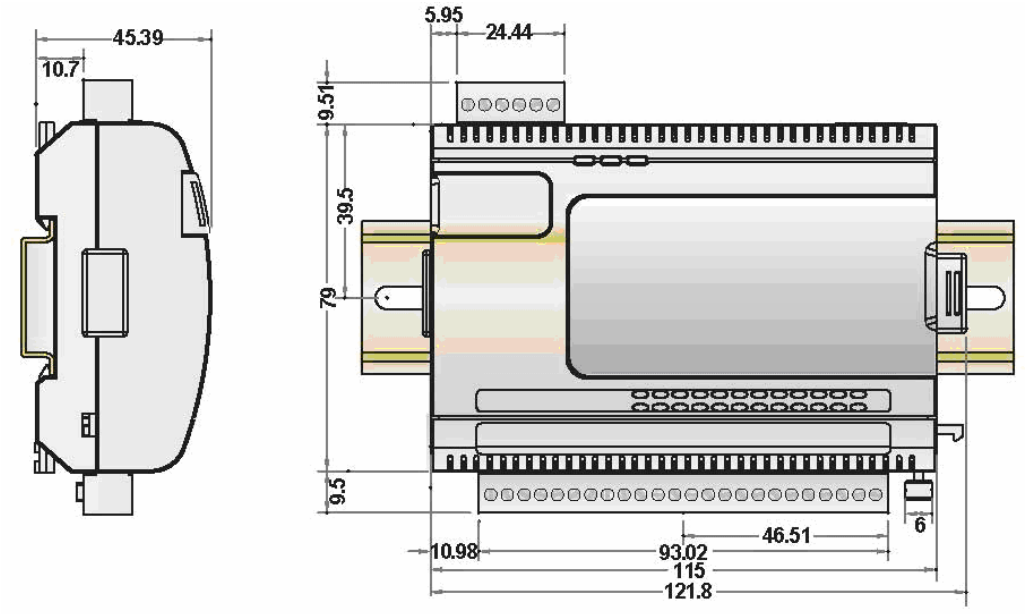
Product Specifications

LAN	
Interface	10/100BaseTx with MDI/MDIX, RJ45
Protocols	Modbus/TCP, TCP/IP, UDP, DHCP, BOOTP, SNMP(MIB for I/O and Network), HTTP, SNTP
Protection	1.5KV magnetic isolation
IP Address	Fixed, dynamic (DHCP) Default: 192.168.127.254
Serial	
Interface	RS-485 (2 wire): Data+, Data-, GND
Serial Line Protection	15 KV ESD for all signals
Serial Communication Parameters	
Parity	None
Data Bits	8
Stop Bits	1
Flow Control	None
Speed	1200 to 115200 bps
Protocol	Modbus/RTU
Digital Input	
Inputs	8 fixed points, two 6-point groups for sink/source type
I/O Mode	DI or event counter (up to 900 Hz)
DI COM Power Input	24 VDC nominal, up to 36 VDC
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)
Common Type	6 points /1 COM
Isolation	3000 VDC / 2000 Vrms
Protection	Over voltage protection: +36 VDC
Counter Power Off Storage	Yes
Digital Output	
Inputs	8 fixed points sink type
I/O Mode	DO or pulse output (up to 100 Hz)
DO Power Input	24 VDC nominal, up to 30V
Output Current Rating	Max. 200 mA per channel
Magnetic Isolation	3000 VDC / 2000 Vrms
Protection	Over voltage protection: +36 VDC Over current limit: 600 mA (typical) Over temperature shutdown: 160°C (min.)
Configurable DI/DO Channels	
Channels	4
I/O mode	DI or event counter (up to 900 Hz) DO or pulse output (up to 100 Hz)
Magnetic Isolation	3000 VDC/ 2000 Vrms
System Power Input	
Power Input	24 VDC nominal, 12VDC (min.) to 48 VDC (max.)
Power Consumption	7.5W @24 VCD
Ground Connection	DIN-rail or panel mounting sockets

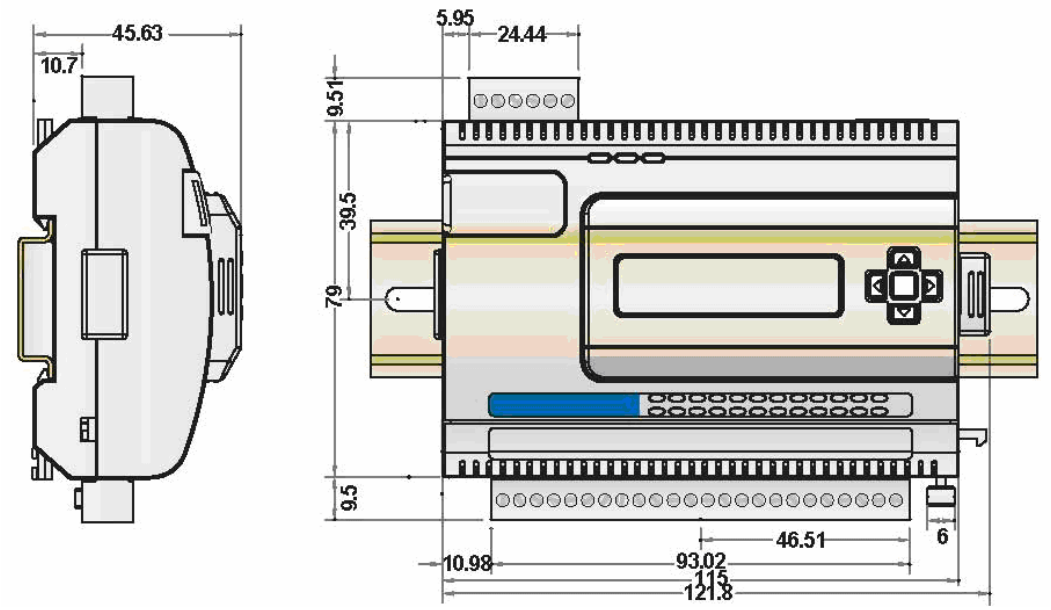
Environmental	
Operation Temperature	-10 to 60°C (14 to 140°F), 5 to 95% RH
Storage Temperature	-40 to 85°C (-40 to 185°F), 50 to 95% RH
Wiring	
I/O Cable	Max. 14 AWG
Certificaitons	Shock, Freefall, Vibration, CE Class A, Level 3, FCC Part 15, CISPR (EN55022) Class A UL-508 EC 61000-6-2, EC 61000-6-4
Accessories	
LCM	Hot-pluggable attachment for IP display, DI/DO status 16x2 character display Backlit screen 5 buttons

Physical Dimensions (Unit = mm)

Without LCM

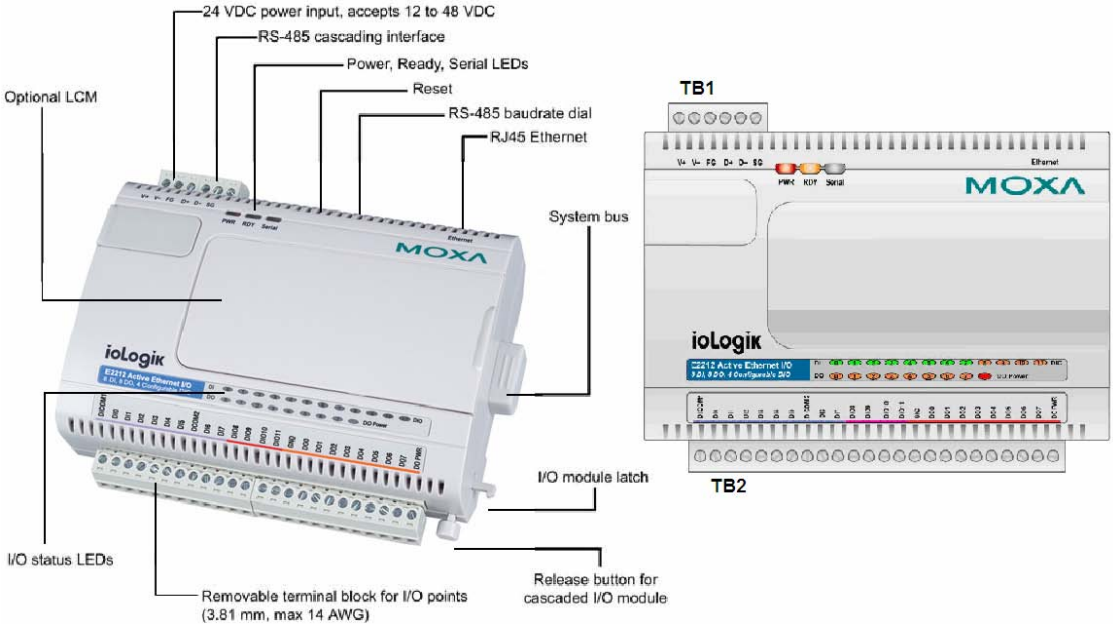


With LCM



Hardware Reference

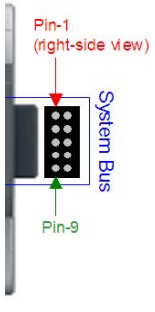
Panel Guide



NOTE: The reset button restarts the server and resets all settings to factory defaults. Use a pointed object such as a straightened paper clip to hold the reset button down for 5 sec. The RDY LED will turn red as you are holding the reset button down. The factory defaults will be loaded once the RDY LED turns green again. You may then release the reset button.

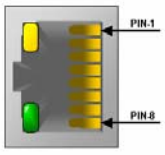
Pin Assignments

System Bus



Pin	1	2	3	4	5
Signal	V+	V-	V+	V-	NC
Pin	6	7	8	9	10
Signal	NC	Data+	SYNC	Data-	GND

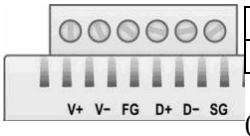
Ethernet Port



Pin	1	2	3	4
Signal	TXD^+	TXD^-	RXD^+	X

Pin	5	6	7	8
Signal	X	RXD^-	X	X

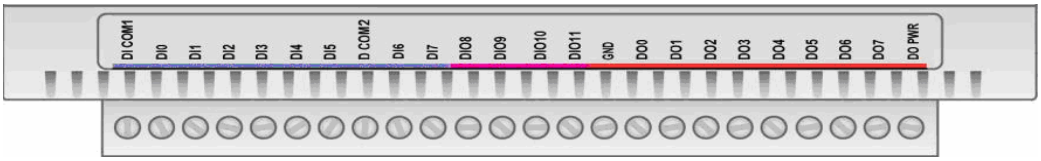
TB1 (Power Input & RS-485 Connector)



Pin	1	2	3	4	5	6
Signal	V+	V-	FG	D+	D-	SG

(V+: 12 to 48V)

TB2 (Digital Input and Output Terminal)



Pin	1	2	3	4	5	6	7	8	9
Signal	DI COM1	DI0	DI1	DI2	DI3	DI4	DI5	DI COM2	DI6

Pin	10	11	12	13	14	15	16	17	18
Signal	DI7	DIO8	DIO9	DIO10	DIO11	GND	DO0	DO1	DO2

Pin	19	20	21	22	23	24
Signal	DO3	DO4	DO5	DO6	DO7	DO PWR

LED Indicators

Ethernet		
Ethernet	Orange	Live 10Mbps Ethernet connection
	Green	Live 100Mbps Ethernet connection
	Flashing	Transmitting or receiving data
System LEDs		
PWR	Red	Power is on
Ready	Red	System error
	Green	(steady) ioLogik E2212 is functioning normally (flashing) Click&Go logic is active
	Green & red	(flashing) ioLogik E2212 is in Safe Status
Serial	(flashing)	Serial port is receiving or transmitting data
I/O LEDs		
DI × 8	Green	Status is ON
	Off	Status is OFF
DO × 8	Orange	Status is ON
	Off	Status is OFF
DIO × 4	Green	Operating as DI channel, status is ON
	Orange	Operating as DO channel, status is ON
	Off	Status is OFF
DO PWR	Red	DO power in

2
Initial Setup

This chapter describes how to install the ioLogik E2212 Active Ethernet I/O Server.

The following topics are covered in this chapter:

- **Hardware Installation**
  - Connecting the Power
  - Grounding the Unit
  - Connecting to the Network
  - Adding More I/O Channels
  - Setting the RS-485 Baudrate
  - Connecting the I/O Device
- **Software Installation**

Hardware Installation

Connecting the Power

Connect the 12 to 48 VDC power line to the ioLogik's terminal block (TB1). If power is properly supplied, the power LED will glow a solid red color until the system is ready

ATTENTION

Disconnect the power before installing and wiring!
Disconnect the power cord before installing and/or wiring your ioLogik.

Do not exceed the maximum current for the wiring!
Determine the maximum possible current for each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.
If the current exceeds the maximum rating, the wiring could overheat, causing serious damage to your equipment.

Grounding the Unit

The ioLogik is equipped with two grounding points, one on the wall mount socket and the other on the DIN-rail mount. Both grounding points are connected to the same conducting pathway.

Connecting to the Network

1. Connect the ioLogik to the host PC with an Ethernet cable. For initial configuration, it is recommended that the ioLogik E2212 be configured using a direct connection to a host computer rather than remotely over the network.
2. Set the host PC's IP address to 192.168.127.xxx. (xxx: from 001 to 253). In Windows, you may set this through the Control Panel.

Default IP Address	Default Netmask	Default Gateway
192.168.127.254	255.255.255.0	None

3. Use ioAdmin or the web console to detect the ioLogik. Once the ioLogik has been detected, modify the settings as needed for your network environment, then restart the server.

Adding More I/O Channels

A cost effective way to add more I/O channels to your ioLogik E2000 I/O server is to attach the appropriate ioLogik R2000 I/O server. The two servers can be snapped together using the RS-485 system bus connector, as shown in the following figure. For the ioLogik E2212, additional digital I/O channels are added using the ioLogik R2110. For additional details, please refer to the ioLogik R2110 user's manual.

Setting the RS-485 Baudrate

The RS-485 port on the ioLogik E2212 is reserved to chain another RS-485 I/O server. The RS-485 port can run Modbus/RTU or I/O command sets. The baudrate is set by a physical dial on the back of the ioLogik. The default settings are baudrate = 115200, parity check = N, data bits = 8, and stop bit = 1. Modbus/RTU only supports N, 8, 1, so E, 7, 1 is not supported. When using the RS-485 cascading interface, the ioLogik E2212 will have an RS-485 Unit ID of 1.

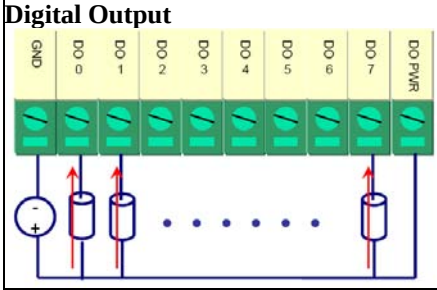
	Baudrate for RS-485 (parameters are N, 8, 1)	Dial setting and corresponding baudrate: 0:115200 1:57600 2:38400 3:19200 4:9600 5:4800 6:2400 7:1200

Remember to restart the ioLogik E2212 after making any changes to the RS-485 baud rate.

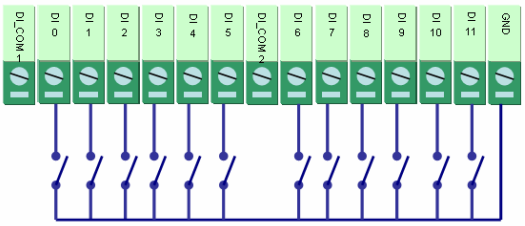
Connecting the I/O Device

With 4 channels that are configurable for digital input or digital output operation, the ioLogik E2212 offers great flexibility in connecting I/O devices. Also, unlike traditional Ethernet I/O products, the ioLogik E2212 can connect to dry contact, PNP, and NPN sensors at the same time. The sensor type determines your wiring approach, as shown in the following examples:

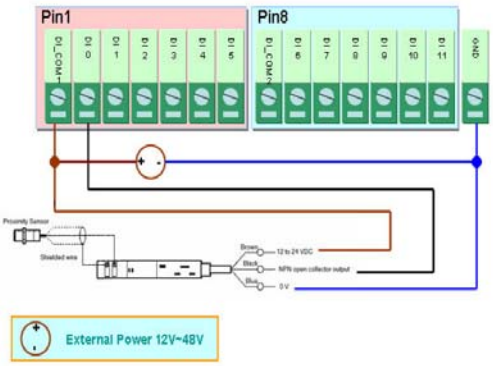
Digital Output



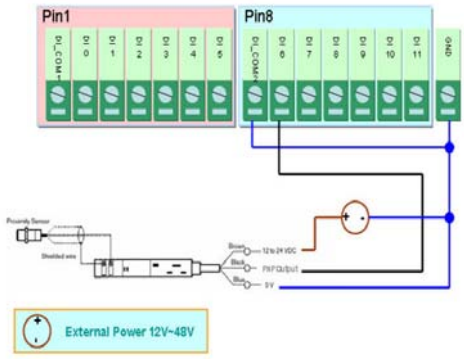
Dry Contact



Wet Contact with NPN sensor



Wet Contact with PNP sensor



ATTENTION

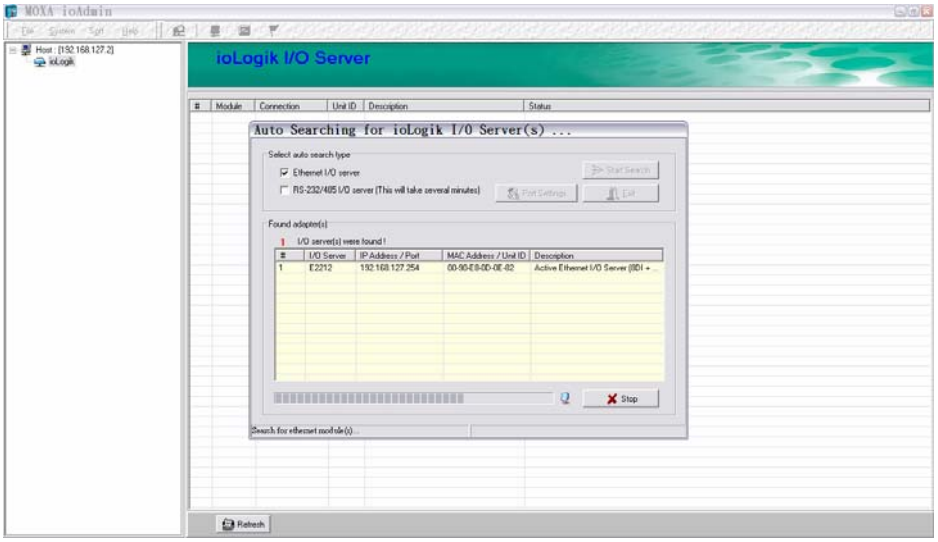
Sensor types are set in groups, with DI-0 to DI-5 forming one group and DI-6- to DI-11 forming another group (assuming that channels 8 through 11 are configured as digital input channels). If an NPN sensor is connected to DI-0, then only NPN sensors can be connected to the other DI channels in the group (i.e., DI-1 through DI-5). Likewise, if a PNP sensor is connected to DI-6, then only PNP sensors can be connected to the other DI channels in the group (i.e., DI-7 through DI-11).

Software Installation

ioAdmin is a Windows utility provided for the configuration and management of the ioLogik E2212 and attached I/O devices. It may be used from anywhere on the network to monitor and configure the ioLogik E2212. You may also configure some of the settings through the web console or optional LCM.

1. **Installation from CD**: Insert the Document and Software CD into the host computer. In the root directory of the CD, locate and run SETUP.EXE. The installation program will guide you through the installation process and install the ioAdmin utility. You can also install the MXIO DLL library or ioEventLog separately.
2. **Open ioAdmin**: After installation is finished, run ioAdmin from the Windows Start menu: **Start →Program Files →Moxa →IO Server →Utility →ioAdmin.**

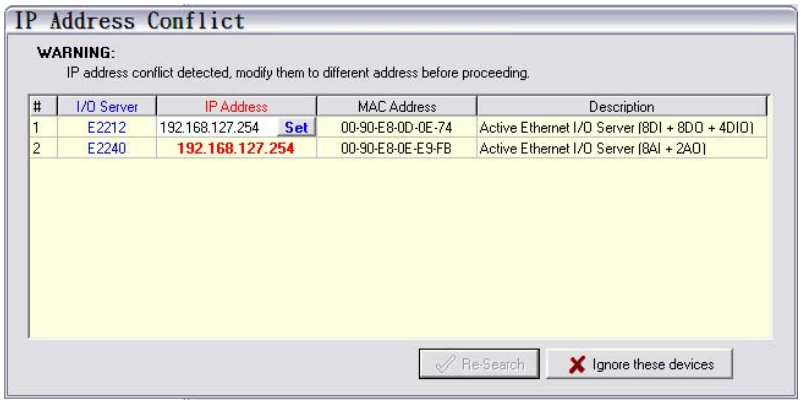
3. **Search the network for the server**: On the menu bar, select **System →Auto Scan Active Ethernet I/O Server**. A dialog window will appear. Click **Start Search** to begin searching for your unit.



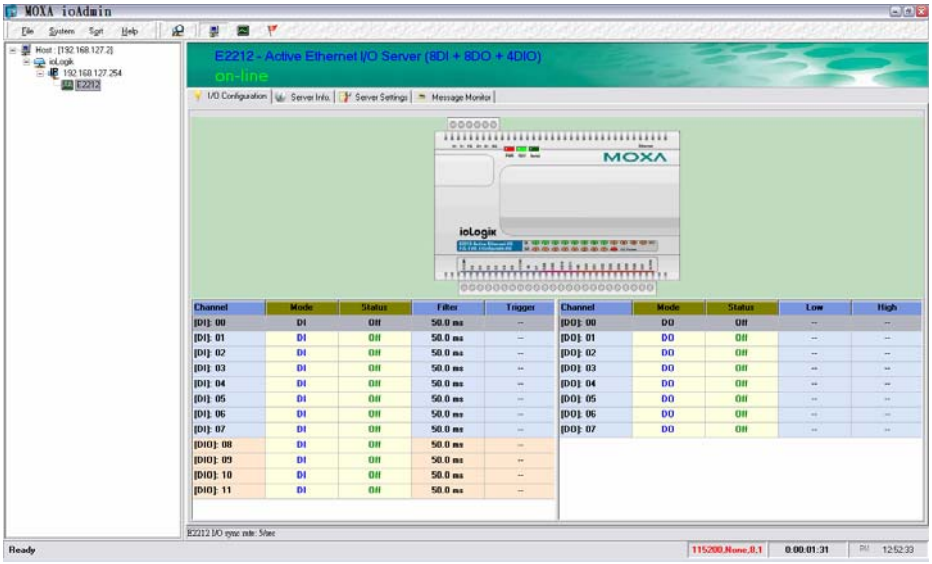
If ioAdmin is unable to find your unit, there may be a problem with your network settings.

Connecting Multiple ioLogik E2000 Units

If multiple ioLogik E2000 units are installed on the same network, remember that each unit has the same default IP address. You will need to assign a different IP address to each unit to avoid IP conflicts. ioAdmin automatically detects IP conflicts and gives you a chance to modify each unit's IP address in the "IP Address" columns. Click the "Set" button to reboot the corresponding unit with its new IP address. Click the "Re-Search" button to refresh the list of units found by ioAdmin.



4. **Monitoring I/O status**: Once your unit has been found by ioAdmin, you may view the status of all attached I/O devices on ioAdmin's main screen.



You may now use ioAdmin to setup or configure your unit. Please refer to Chapter 3 for additional information on using ioAdmin.

3
Using ioAdmin

In this chapter, we explain how to use ioAdmin to configure your ioLogik.

The following topics are covered in this chapter:

- **Introduction to ioAdmin**
- **Features of ioAdmin**
- **ioAdmin Main Screen**
  - Main Screen Overview
  - Wiring Guide
- **Menu Items**
  - File
  - System
  - Sort
  - Help
  - Quick Links
- **Main Window**
  - I/O Configuration Tab (General)
  - Server Info Tab
  - Server Settings Tab (General)
  - Message Monitor Tab
- **ioAdmin Administrator Functions**
  - I/O Configuration Tab (Administrator)
  - Server Settings Tab (Administrator)
  - Network Tab
  - Firmware Update Tab
  - Watchdog Tab
  - Click&Go Logic Tab
- **Server Context Menu**
- **Using TFTP to Import/Export Configuration**
- **Using ioEventLog**
  - Installing ioEventLog
  - Basic Functions
  - Configuration
  - Opening Log Files
  - Checking Connected Devices
  - Clearing the Log

Introduction to ioAdmin

ioLogik Ethernet I/O Servers may be managed and configured over the Ethernet with ioAdmin, a Windows utility provided with your ioLogik E2212. ioAdmin's graphical-user interface gives you easy access to all status information and settings.

The ioLogik E2212 also supports configuration by web console and by optional LCM, but full configuration and management is only available through ioAdmin.

A new feature in ioAdmin automatically detects IP conflicts between ioLogik E2000 units. If ioAdmin detects an IP conflict, a window will appear that allows you to resolve the IP conflict immediately and restart each unit.

ioAdmin also includes Click&Go logic control for the configuration of your Active Ethernet I/O system.

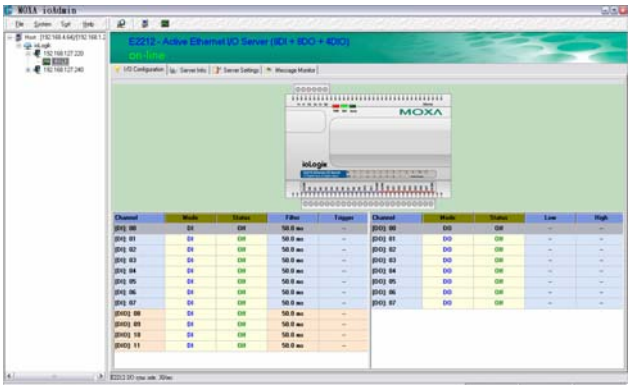
ioAdmin consists of following software:

- ioAdmin with Click&Go Logic
- ioLogik 2000 Wiring Guide
- ioLogik 4000 Wiring Guide

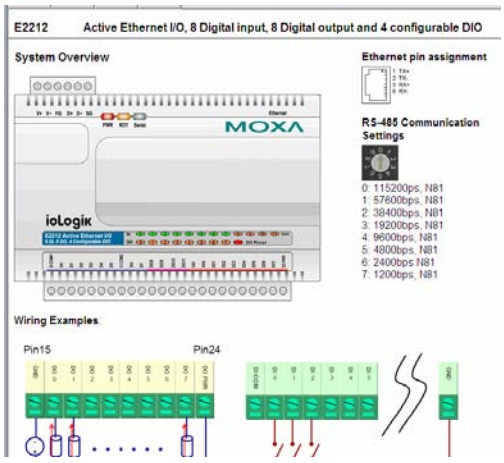
Features of ioAdmin

Remote management
Over the Ethernet network, ioAdmin allows users to

- find and configure multiple ioLogik servers.
- monitor and configure attached I/O devices.
- test I/O devices.
- reset the server.



On-line Wiring Guide
A wiring guide can be opened from within ioAdmin for your convenience. The easily accessible wiring guide can save administrators much time while planning or troubleshooting.



Configuration File

ioAdmin allows the entire configuration of the ioLogik E2212 to be saved as a file. The file is viewable as text and can serve three purposes:

- as a record or backup of configuration
- as a template for the configuration of other servers
- as a quick reference guide for you to configure Modbus drivers in a SCADA system

The file includes the following information:

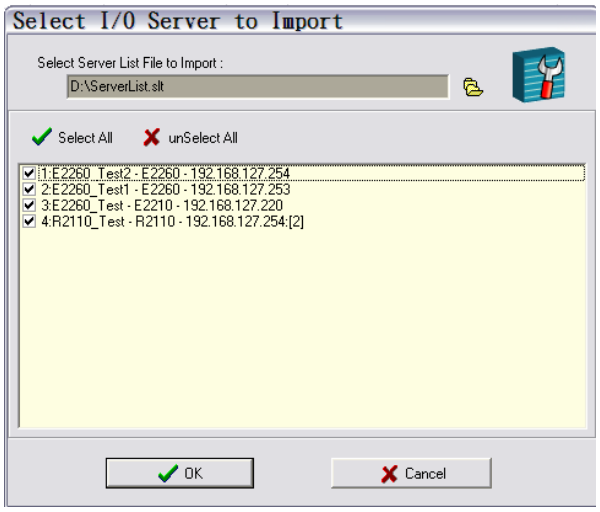
- file title, date, and time
- model information
- Modbus address

```
ioLogik E2212 Network I/O Server Configuration
==============================================
Date: 2007/5/21
Time: PM 04:05:39
Firmware: V1.0 Build07050112

[1. Model]
----------
MOD_TYPE=E2212 - Active Ethernet I/O Server (8DI + 8DO + 4DIO)
MOD_LOC=
MOD_NAME=

[2. I/O Configurations]
-----------------------
DIO00=0,(DI)
DIO01=0,(DI)
DIO02=0,(DI)
DIO03=0,(DI)

DI00=0,(DI),            DI00_FILTER=100,(50.00ms)
DI01=0,(DI),            DI01_FILTER=100,(50.00ms)
DI02=0,(DI),            DI02_FILTER=100,(50.00ms)
DI03=0,(DI),            DI03_FILTER=100,(50.00ms)
DI04=0,(DI),            DI04_FILTER=100,(50.00ms)
DI05=0,(DI),            DI05_FILTER=100,(50.00ms)
DI06=0,(DI),            DI06_FILTER=100,(50.00ms)
DI07=0,(DI),            DI07_FILTER=100,(50.00ms)
DI08=0,(DI),            DI08_FILTER=100,(50.00ms)
DI09=0,(DI),            DI09_FILTER=100,(50.00ms)
DI10=0,(DI),            DI10_FILTER=100,(50.00ms)
DI11=0,(DI),            DI11_FILTER=100,(50.00ms)

DO00=0,(DO),            DO00_PWN=0,(Off),       DO00_SAFE=0,(Off)
DO01=0,(DO),            DO01_PWN=0,(Off),       DO01_SAFE=0,(Off)
DO02=0,(DO),            DO02_PWN=0,(Off),       DO02_SAFE=0,(Off)
DO03=0,(DO),            DO03_PWN=0,(Off),       DO03_SAFE=0,(Off)
DO04=0,(DO),            DO04_PWN=0,(Off),       DO04_SAFE=0,(Off)
DO05=0,(DO),            DO05_PWN=0,(Off),       DO05_SAFE=0,(Off)
```

Server Management List

ioAdmin can import and export a list of ioLogik servers that are being managed. This file can make it easier to manage all devices on the network, and includes the following information:

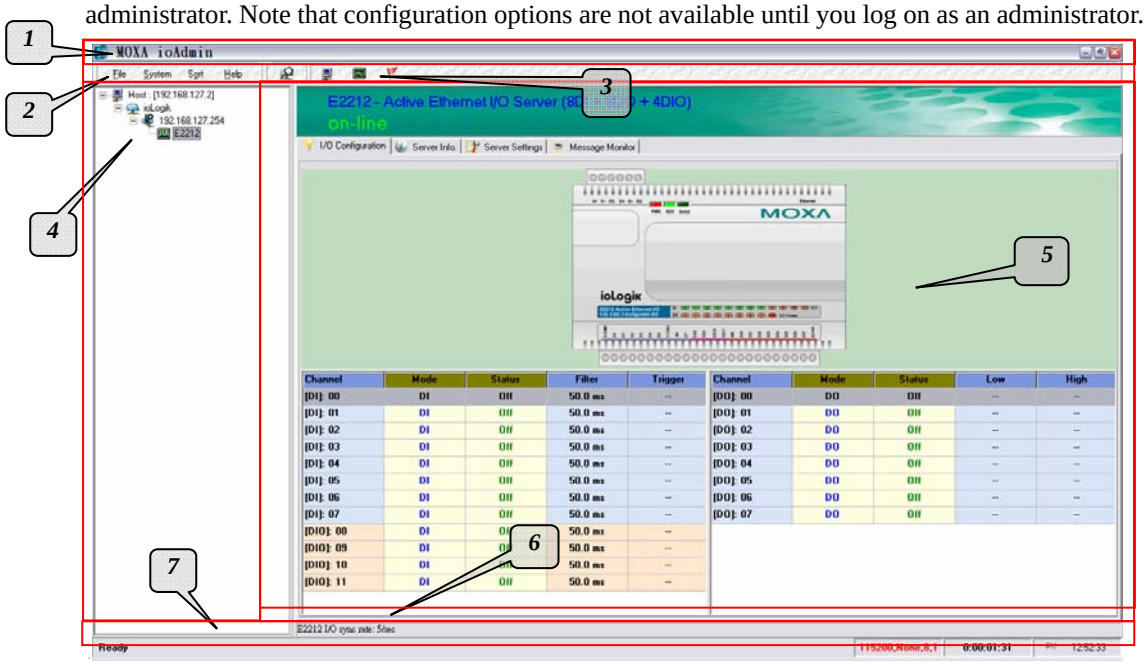
- server name
- module type
- IP address
- unit ID



ioAdmin Main Screen

Main Screen Overview

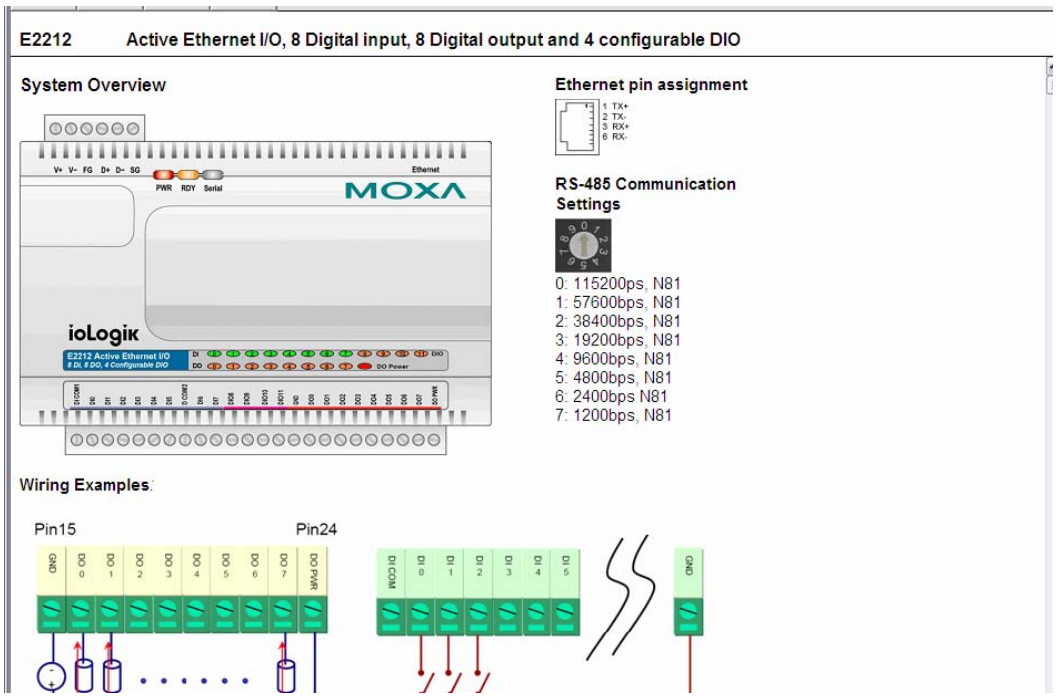
This is ioAdmin's main screen. The main window defaults to the I/O Configuration tab, which displays a figure of your unit with the status of every I/O channel. The other tabs in the main window take you to server and network settings, and further functions are available when you log on as an administrator. Note that configuration options are not available until you log on as an administrator.



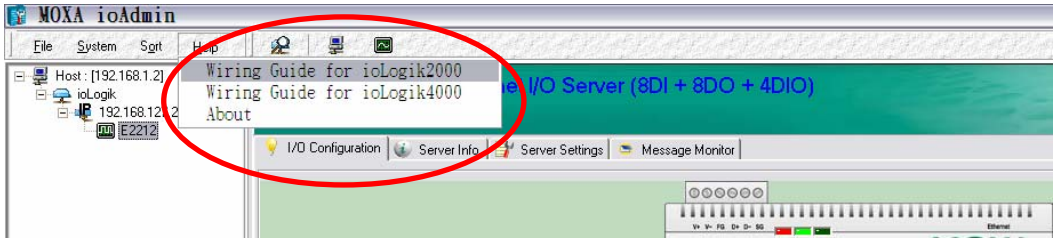
ioAdmin Main Screen	
1.	Title
2.	Menu bar
3.	Quick link
4.	Navigation panel
5.	Main window
6.	Sync. rate status
7.	Status bar

Wiring Guide

ioAdmin provides a wiring guide for the ioLogik E2212. You may access the wiring guide by right-clicking the ioLogik figure in the I/O Configuration tab. Select "Wiring Guide" in the submenu to open a help file showing the unit's wiring information and electrical characteristics.



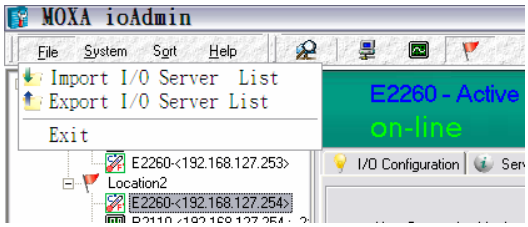
You may also access the On-line Wiring Guide through the Help menu on the menu bar.



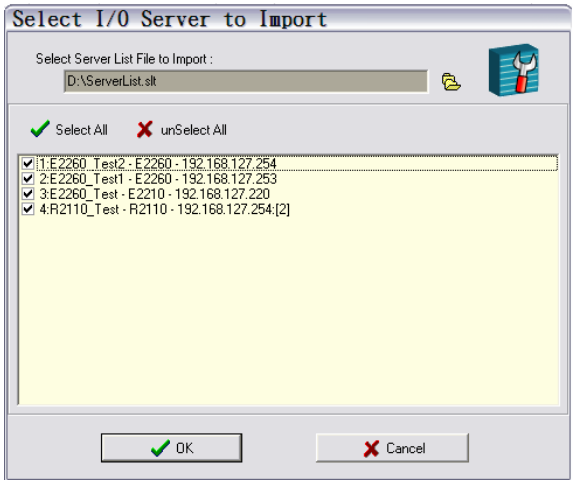
Menu Items

File

From the **File** menu, you can export the list of I/O servers that are currently displayed in the navigation panel. You also can import a list of I/O servers into ioAdmin.



When importing a server list, you will be prompted to select which servers on the list need to be imported.



The file will have a .SLT extension and can be opened as a text file. The server list will provide the following information for each server:

- server name
- module type
- IP address
- unit ID

System

Several operations are possible from the **System** menu.

Auto Scan Active Ethernet I/O Server will search for ioLogik servers on the network. When connecting for the first time or recovering from a network disconnection, you can use this command to find I/O servers that are on the network.

Network Interface allows you to select a network to use, if the PC has multiple network adapters installed.

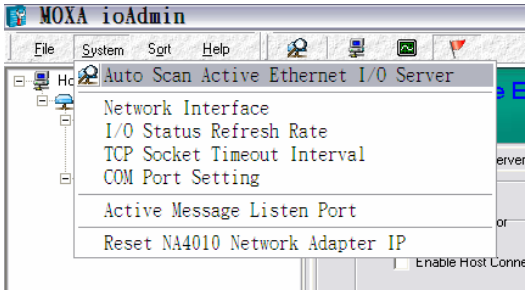
I/O Status Refresh Rate is used to adjust how often the I/O server is polled for device status. The current rate is displayed on the status bar at the bottom of the window. Note that higher sync rates result in higher loads on the network.

TCP Socket Timeout Interval allows you to select the preferred timeout value for TCP socket communication.

COM Port Setting is used to set the parameters for Modbus communication, such as baudrate, data bits, and timeout interval. For most applications, this will involve connecting to ioLogik R-Series devices.

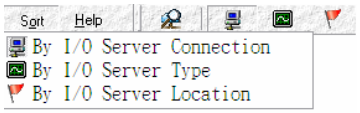
Active Message Listen Port specifies the port number to use for Active Ethernet I/O messages. If your network uses a firewall, you can coordinate this setting with your firewall settings to ensure that active messages get through.

Reset NA4010 Network Adapter IP is used to re-assign an IP address to the NA-4010 network adapter, for ioLogik 4000 systems.



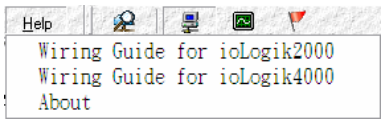
Sort

The **Sort** menu allows the server list in the navigation panel to be sorted by connection, type, and location.



Help

In the **Help** menu, you can view wiring guides and information about ioAdmin.



Quick Links

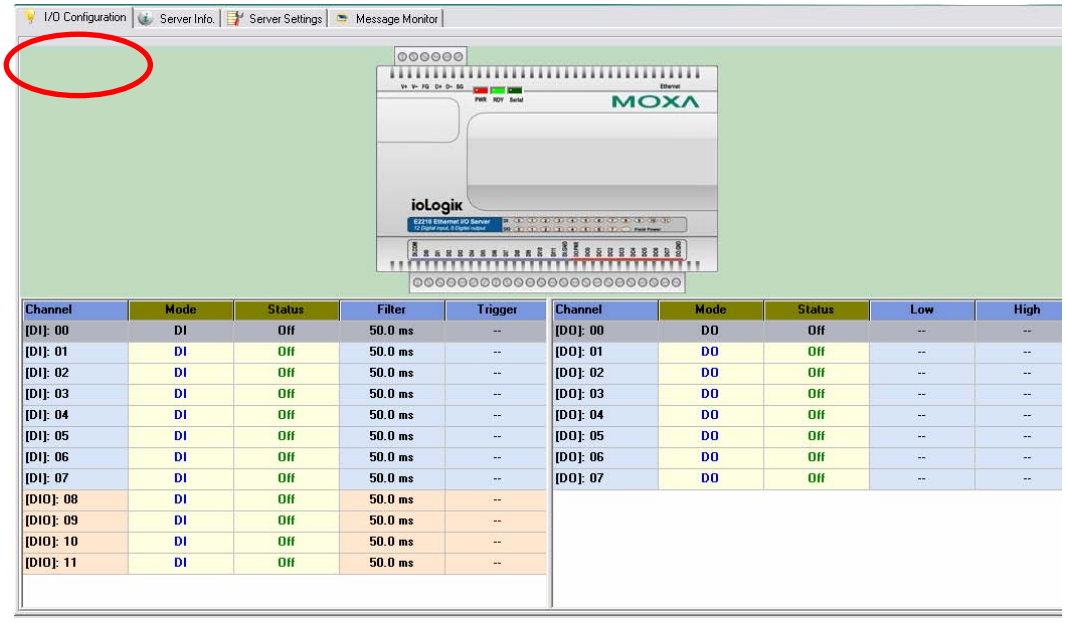
Quick links are provided to search for I/O servers on the network and sort the server list.

	Search network for I/O servers
	Sort by connection
	Sort by I/O server type
	Sort by location

Main Window

I/O Configuration Tab (General)

The **I/O Configuration** tab shows the status of every I/O channel. This is the default tab when you first open ioAdmin. DI channels are listed on the left and DO channels are listed on the right. The four selectable channels will be listed on the left or the right according to the selected mode.

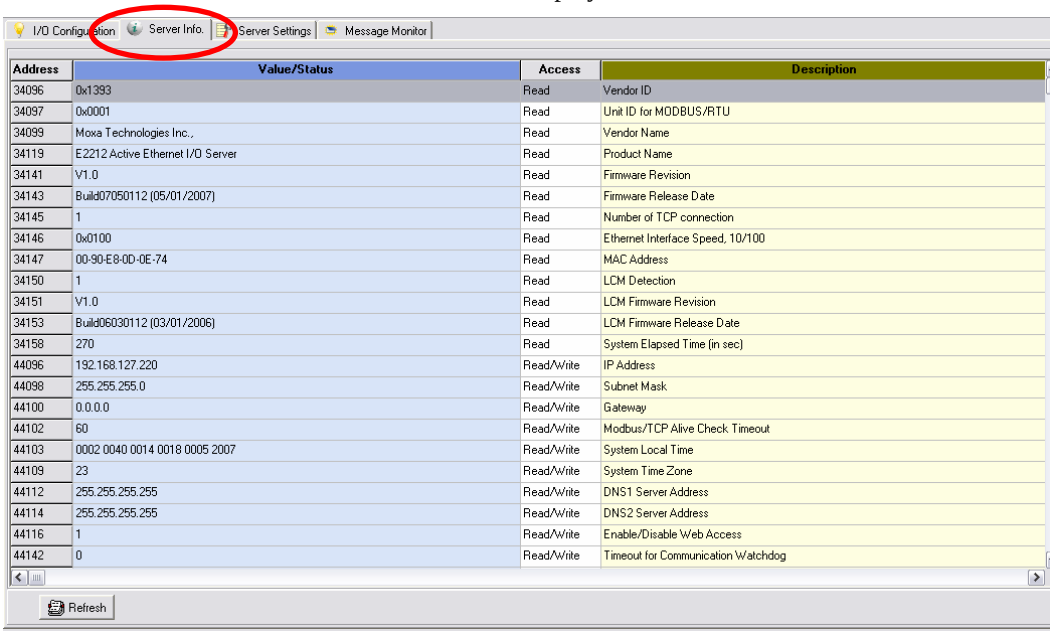


Channel	Mode	Status	Filter	Trigger
[DI]: 00	DI	Off	50.0 ms	--
[DI]: 01	DI	Off	50.0 ms	--
[DI]: 02	DI	Off	50.0 ms	--
[DI]: 03	DI	Off	50.0 ms	--
[DI]: 04	DI	Off	50.0 ms	--
[DI]: 05	DI	Off	50.0 ms	--
[DI]: 06	DI	Off	50.0 ms	--
[DI]: 07	DI	Off	50.0 ms	--
[DIO]: 08	DI	Off	50.0 ms	--
[DIO]: 09	DI	Off	50.0 ms	--
[DIO]: 10	DI	Off	50.0 ms	--
[DIO]: 11	DI	Off	50.0 ms	--

Channel	Mode	Status	Low	High
[DO]: 00	DO	Off	--	--
[DO]: 01	DO	Off	--	--
[DO]: 02	DO	Off	--	--
[DO]: 03	DO	Off	--	--
[DO]: 04	DO	Off	--	--
[DO]: 05	DO	Off	--	--
[DO]: 06	DO	Off	--	--
[DO]: 07	DO	Off	--	--

Server Info Tab

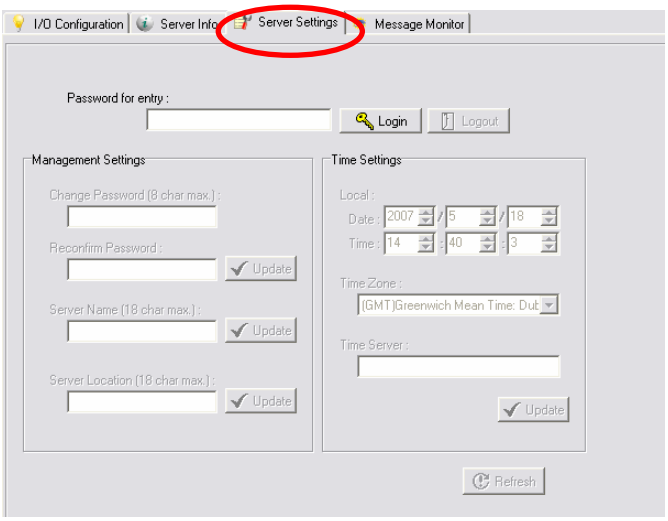
Server information, such as firmware version, is displayed in the **Server Info** tab.



Address	Value/Status	Access	Description
34096	0x1393	Read	Vendor ID
34097	0x0001	Read	Unit ID for MODBUS/RTU
34099	Moxa Technologies Inc.,	Read	Vendor Name
34119	E2212 Active Ethernet I/O Server	Read	Product Name
34141	V1.0	Read	Firmware Revision
34143	Build07050112 (05/01/2007)	Read	Firmware Release Date
34145	1	Read	Number of TCP connection
34146	0x0100	Read	Ethernet Interface Speed, 10/100
34147	00-90-E8-0D-0E-74	Read	MAC Address
34150	1	Read	LCM Detection
34151	V1.0	Read	LCM Firmware Revision
34153	Build06030112 (03/01/2006)	Read	LCM Firmware Release Date
34158	270	Read	System Elapsed Time (in sec)
44096	192.168.127.220	Read/Write	IP Address
44098	255.255.255.0	Read/Write	Subnet Mask
44100	0.0.0.0	Read/Write	Gateway
44102	60	Read/Write	Modbus/TCP Alive Check Timeout
44103	0002 0040 0014 0018 0005 2007	Read/Write	System Local Time
44109	23	Read/Write	System Time Zone
44112	255.255.255.255	Read/Write	DNS1 Server Address
44114	255.255.255.255	Read/Write	DNS2 Server Address
44116	1	Read/Write	Enable/Disable Web Access
44142	0	Read/Write	Timeout for Communication Watchdog

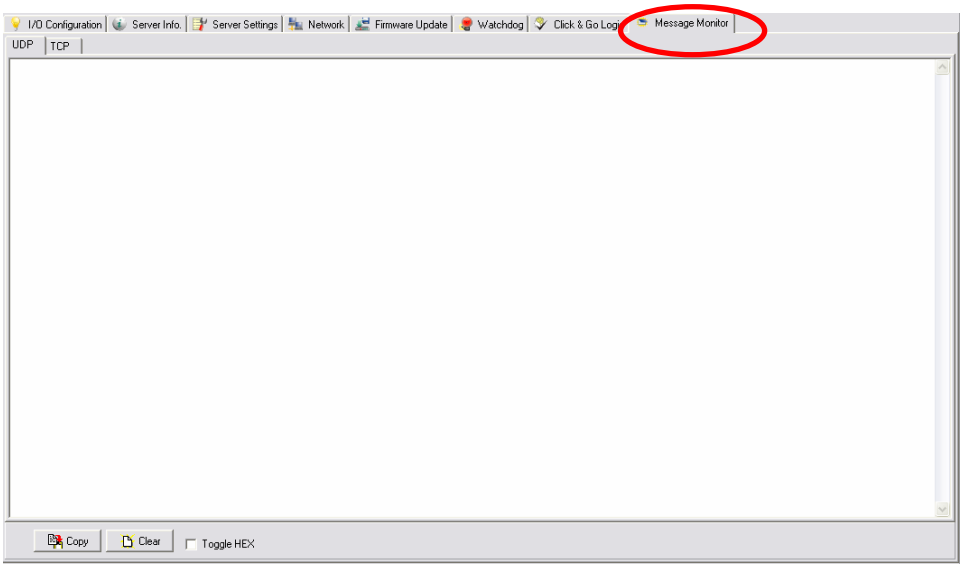
Server Settings Tab (General)

The **Server Settings** tab is where you log in as an administrator. This is required in order to gain access to the ioLogik E2212 configuration options. If no administrator password has been set up, simply click **Login** and leave the **Password** for entry field blank. Please refer to the ioAdmin Administrator Functions section later on in this chapter for more detail.



Message Monitor Tab

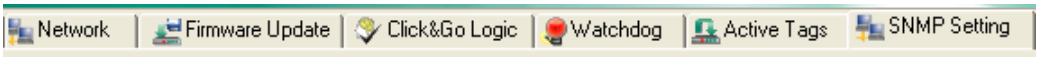
The **Message Monitor** tab will display any TCP/UDP messages received from the ioLogik E2212. When you install the unit for the first time, the ruleset will not have been defined yet, so there will be no messages in the Message Monitor Tab. When a ruleset has been defined and activated, any TCP/UDP messages that have been triggered by sensor events will be shown in the Message Monitor tab. Please refer to Chapter 5 for information on how to define rules for active I/O messaging.



Messages can be displayed in ASCII or in HEX. To display messages in HEX, make sure that "Toggle HEX" is checked.

ioAdmin Administrator Functions

For full access to all configuration options, log in as an administrator in the Server Settings tab. This is required whenever you start up ioAdmin or boot up/restart the ioLogik. When you install the ioLogik E2212 for the first time, the password will be blank and you may simply click **Login**. Additional functions will available after logging in, including the following new tabs:



When making configuration changes, you will need to click **Update** or **Apply** to save the changes. Some changes will require that the unit be restarted in order to take effect.

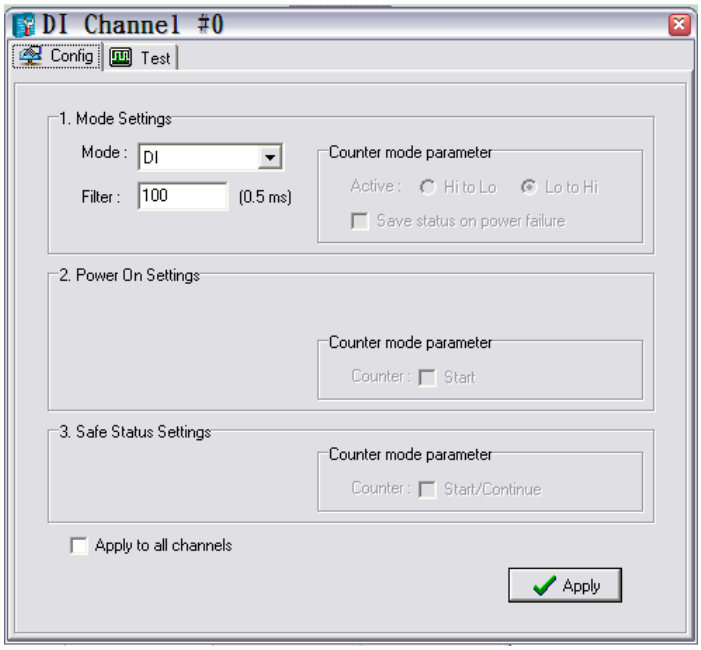
ATTENTION

You MUST log in to access any administrator function, including Network, Communication Watchdog Timer, and Firmware Update tabs. If you forget the password, you may hold down the reset button to clear the password and load factory defaults. **This will result in the loss of all configuration settings and your Click&Go Logic active I/O messaging program!**

I/O Configuration Tab (Administrator)

When logged on as an administrator, you may double click on a channel in the **I/O Configuration** tab to configure that channel's settings. A window will open with configuration options for that channel. After the channel has been configured as desired, click **Apply** to implement the new settings.

Configuring Digital Input Channels



The ioLogik E2212 provides up to 12 digital input (DI) channels, with 8 fixed DI channels (DI-0 to DI-7) and 4 channels that can be configured as DI or DO channels (DIO-8 to DIO-11). Software filtering is used to control switch bounces. The filter is configurable in multiples of 0.5 ms and accepts values between 1 and 65535. For example, a setting of **2** would mean a 1 ms filter (2 × 0.5 ms).

Alias Name

Click the **Alias Name** tab to customize the channel name. You may use names with up to 16 characters. If you have already set the Alias Name on the I/O Configuration page, the channel name will appear in Click&Go, Active message, and Web.

A DI channel can be set to "DI" or "Event Counter" mode. In DI mode, the specifications are as follows:

Type	Logic 0	Logic 1
Dry contact	close to GND	open
Wet contact	0 to 3 V	10 to 30 V

In Event Counter mode, the channel accepts limit or proximity switches and counts events according to the ON/OFF status. When "Lo to Hi" is selected, the counter value increases when the attached switch is pushed. When "Hi to Lo" is selected, the counter value increases when the switch is pushed and released.

By default, the Event Counter value will be reset to zero if power is disconnected. If you select **Save status on power failure**, the Event Counter value will be saved when power is disconnected. When power is reconnected, the value will be as you left it. You can set **Power On Settings** to have counting resume immediately.

The Event Counter starts counting events when specified by a Modbus command or a Click&Go Logic rule. You can also specify counting to begin automatically when the ioLogik is powered on. To activate this function, select **Start** under **Counter mode parameter** in the **Power On Settings**.

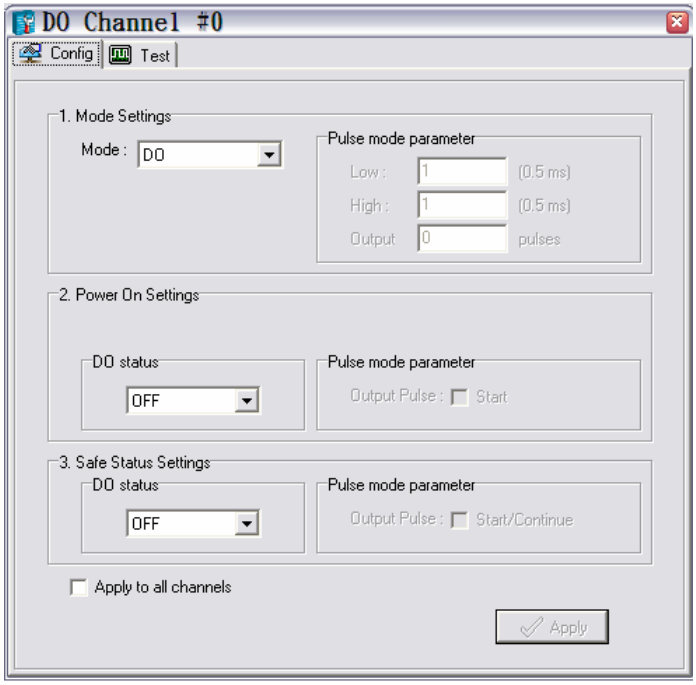
You can control how an Event Counter channel behaves during a network disconnection with the **Safe Status Settings** and the Host Connection Watchdog. When the Host Connection Watchdog is enabled, a network disconnection will activate the Safe Status Settings. The Event Counter channel can be configured to continue counting by selecting **Start/Continue** under **Counter mode parameter**. If **Start/Continue** is not selected, the Event Counter channel will suspend counting. If the Host Connection Watchdog is not enabled, then the Safe Status Settings will be ignored and the Event Counter channel will continue counting during a network disconnection.

ATTENTION

The Host Connection Watchdog is disabled by default and must be enabled for Safe Status Settings to take effect.

The **Apply to all channels** option applies all settings to DI channels, including DIO channels that are operating as DI channels.

Configuring Digital Output Channels



The ioLogik E2212 provides up to 12 digital output (DO) channels with 8 fixed DO channels (DO-0 to DO-7) and 4 channels that can be configured as DI or DO channels (DIO-8 to DIO-11).

A DO channel can be set to "DO" or "Pulse Output" mode. In DO mode, the specifications are as follows.

Type	Logic 0	Logic 1
DO mode	open	short

In Pulse Output mode, the selected digital output channel will generate a square wave as specified in the pulse mode parameters. The low and high level widths are specified in multiples of 0.5ms, with a maximum setting of 65,535 (32,767 ms).For example, you would enter 1000 for a width of 500 ms,. If the low width value is 5000 and the high width value is 5000, the pulse output would be a square wave with a 5-second pulse cycle. For the number of pulses, you can specify between 1 and 4,294,967,295 pulses or enter "0" for continuous pulse output.

When the ioLogik is first powered on, the status for each DO channel will be set to "OFF" by default. This behavior can be modified using the **Power On Settings**. You can set a DO channel to turn "ON" when the ioLogik is powered on, or to commence pulse output.

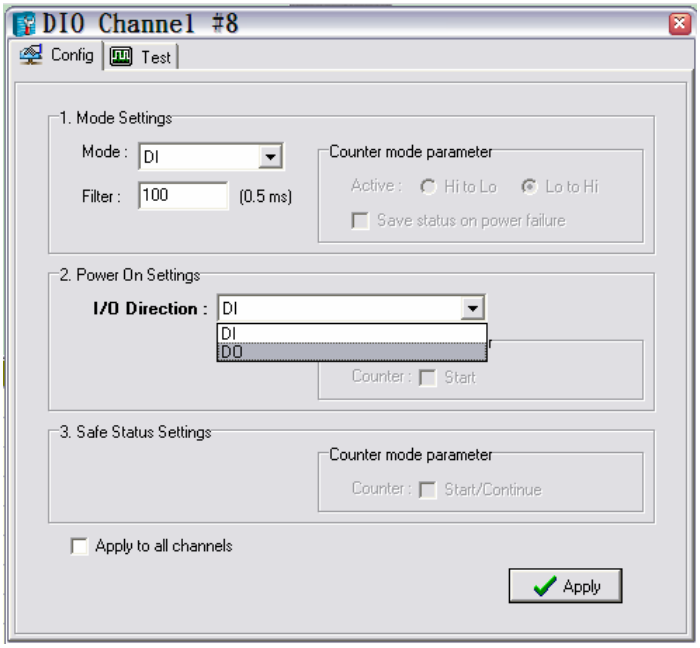
You can control how a DO channel acts when the network is disconnected by using the **Safe Status Settings** and the Host Connection Watchdog. When the Host Connection Watchdog is enabled, a network disconnection will activate the Safe Status Settings. The DO channel can be configured to turn on, turn off, or commence pulse output. If the Host Connection Watchdog is not enabled, then the DO channel status will remain unchanged during a network disconnection.

ATTENTION

The Host Connection Watchdog is disabled by default and must be enabled for Safe Status Settings to take effect.

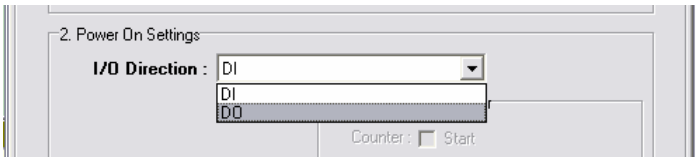
The **Apply to all channels** option applies all settings to DO channels, including DIO channels that are operating as DO channels.

Configuring Selectable DIO Channels



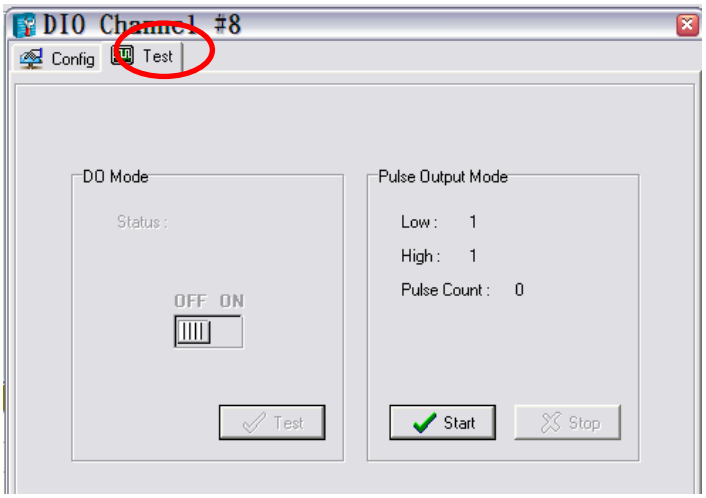
Channels DIO-8 to DIO-11 support both DI and DO channel operation. When the ioLogik E2212 is powered on, each DIO channel will be configured to act as either a DI or DO channel, according to the **Power On Settings**. When acting as a DI channel, configuration is the same as for fixed DI channels. When acting as a DO channel, configuration is the same as for fixed DO channels.

To switch to between DI and DO channel operation, select the desired mode in the **I/O Direction** field under **Power On Settings**. After clicking **Apply**, you will need to restart the ioLogik E2212 for the new setting to take effect.



Testing DI and DO Channels

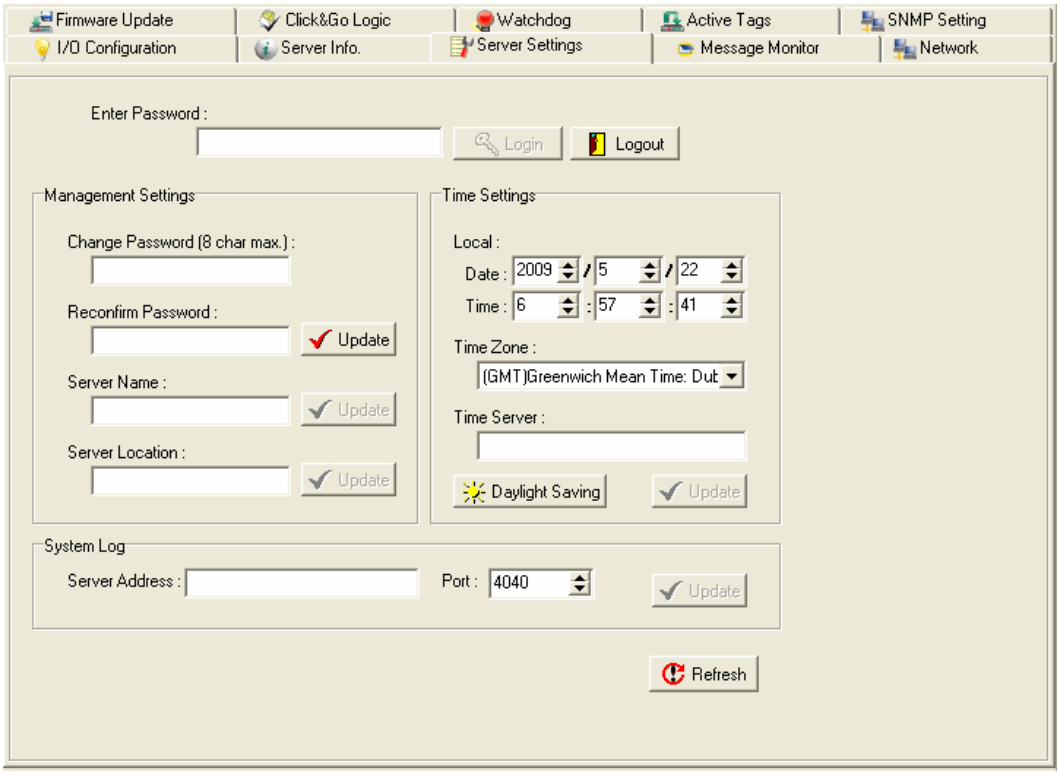
You can test each channel by opening the channel's configuration window and selecting the Test tab.



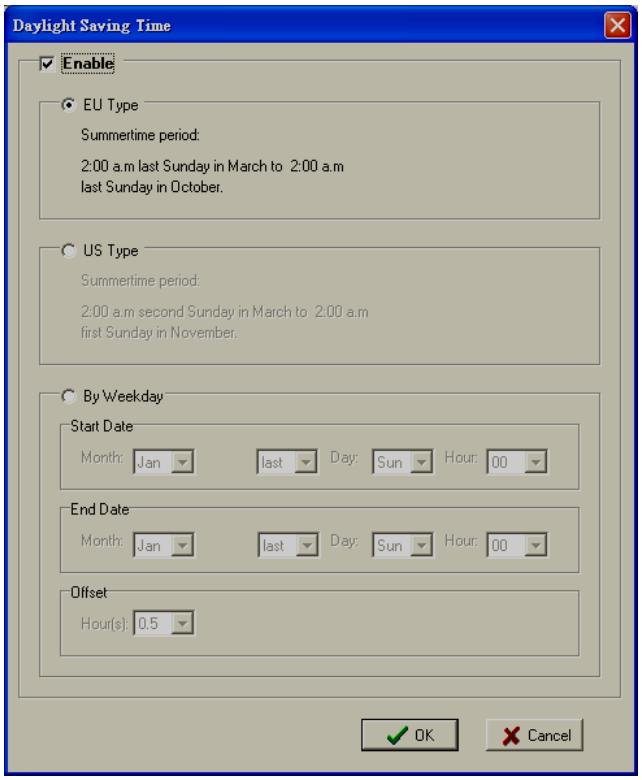
In the Test tab, you can see how a channel's status affects or is affected by the attached device. For DO channels, you can set the on/off status or start and stop pulse output. For DI channels, you can monitor the attached device's on/off status, or count switch press events.

Server Settings Tab (Administrator)

You may set the password, server name, location, date, time, time zone, and time server in the Server Settings tab. ioAdmin supports long server names and a location description up to 58 characters.



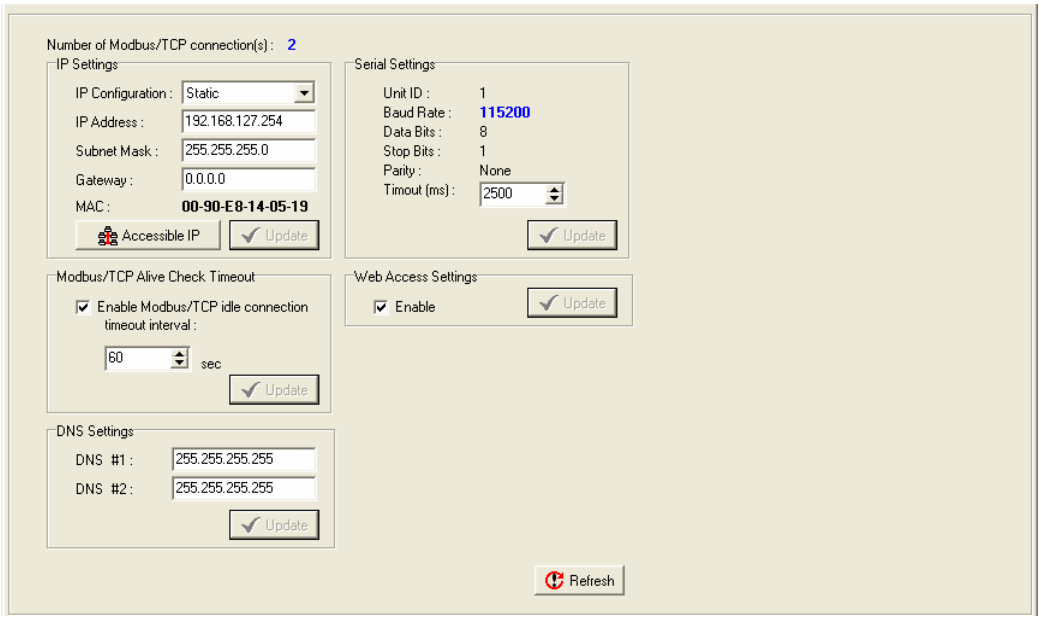
You may set up the Daylight Saving schedule by clicking the "Daylight Saving" button. You may choose EU type, US type, or User defined type. User defined type allows you to define the days and offset hours.



If you will be using ioEventLog to receive server status reports, such as for warm or cold starts, you need to specify the IP address and port number for the PC that will be running ioEventLog in the "System Log" field. The default port number is 4040. For additional information, please refer to the ioEventLog section later in this chapter.

Network Tab

The **Network** tab is available after you log in as an administrator. You may configure IP settings, Modbus/TCP Alive Check Timeout settings, DNS settings, Serial settings, and Web Access settings for the ioLogik.



IP Settings

You can set up a static or dynamic IP address for the ioLogik, as well as the subnet mask and gateway address. Click **Accessible IP** if you wish to allow only certain IP addresses to have network access to the ioLogik and attached sensors. Access will be granted only to the IP addresses that you list in the Accessible IP screen. Any requests from sources that are not on the accessible IP list will be unable to use Modbus/TCP or ioAdmin to access the ioLogik.

Modbus/TCP Alive Check Timeout Settings

The Modbus/TCP Alive Check Timeout is designed to avoid TCP connection failure. If the network host is unable to respond due to hardware failure or a network problem, the ioLogik will continue to wait for a response from the host. This will cause the TCP port to be occupied indefinitely by the host. When **Modbus/TCP idle connection timeout interval** is enabled, the ioLogik will automatically close the TCP connection when there is no TCP activity for the specified time.

DNS Settings

Use this field to specify the IP addresses for one or two DNS servers. DNS servers may be used to find available e-mail addresses when setting up Click & Go rules.

Serial Settings

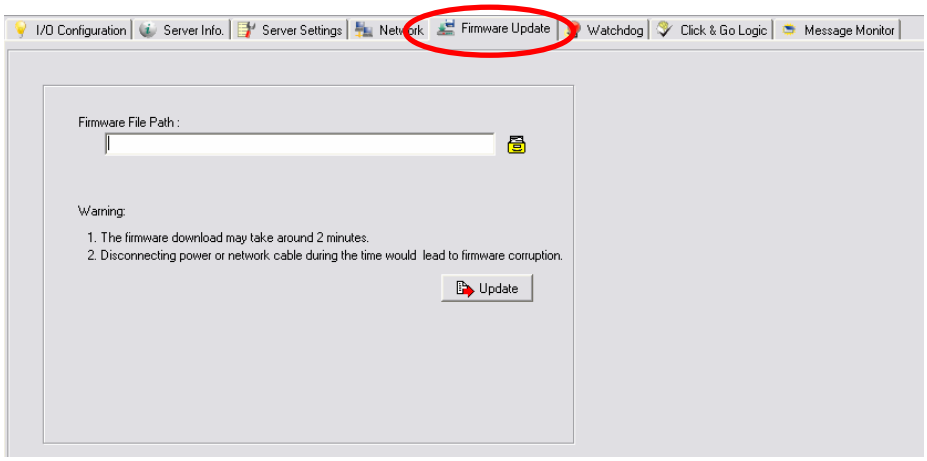
You may view the reserved RS-485 communication parameters here, and you may set the timeout value for breaks in RS-485 communication. Note that the other serial communication parameters cannot be modified. If you wish to adjust the baudrate, you will need to use the physical dial on the back panel of the ioLogik.

Web Access Settings

This field enables and disables the web console, which allows the ioLogik to be configured from a web browser. If this field is not enabled, you will not be able to open the web console.

Firmware Update Tab

The **Firmware Update** tab is available after you log in as an administrator. Enter the path to the firmware file or click on the icon to browse for the file. Click **Update** to update the ioLogik firmware. The wizard will lead you through the process until the ioLogik is restarted.



ATTENTION

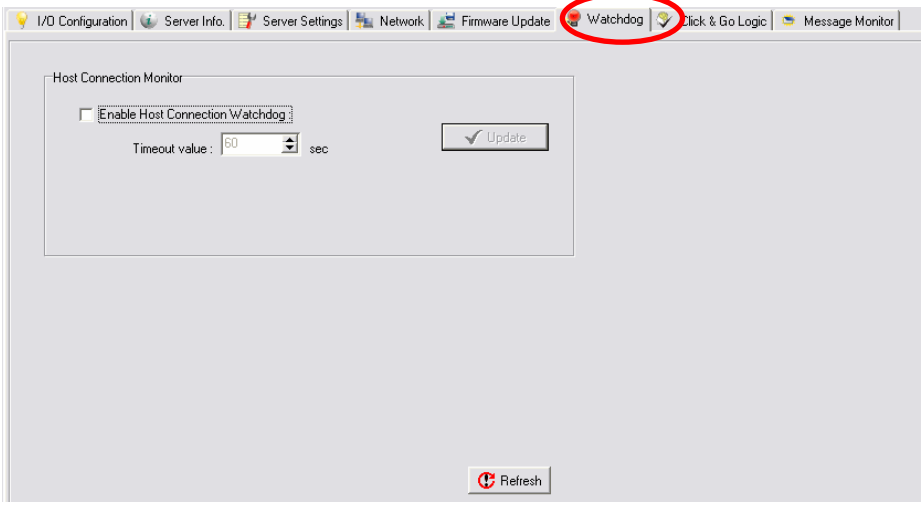
Do not interrupt the firmware update process! An interruption in the process may result in your device becoming unrecoverable.

After the firmware is updated, the ioLogik will restart and you will have to log in again to access administrator functions.

The firmware on any attached I/O expansion module, such as an ioLogik R2000 server, must be updated over the RS-485 bus. Firmware on cascaded modules cannot be updated over Ethernet.

Watchdog Tab

The **Watchdog** tab is available after you log in as an administrator. When enabled, the **Host Connection Watchdog** monitors the network connection. If the connection is lost for the specified **Timeout value**, the Watchdog will display a warning and activate the Safe Status settings for each DO channel and Event Counter channel. By default, the Watchdog is disabled. To enable the Watchdog, make sure that **Enable Host Connection Watchdog** is checked, set the **Timeout value**, and click **Update**.

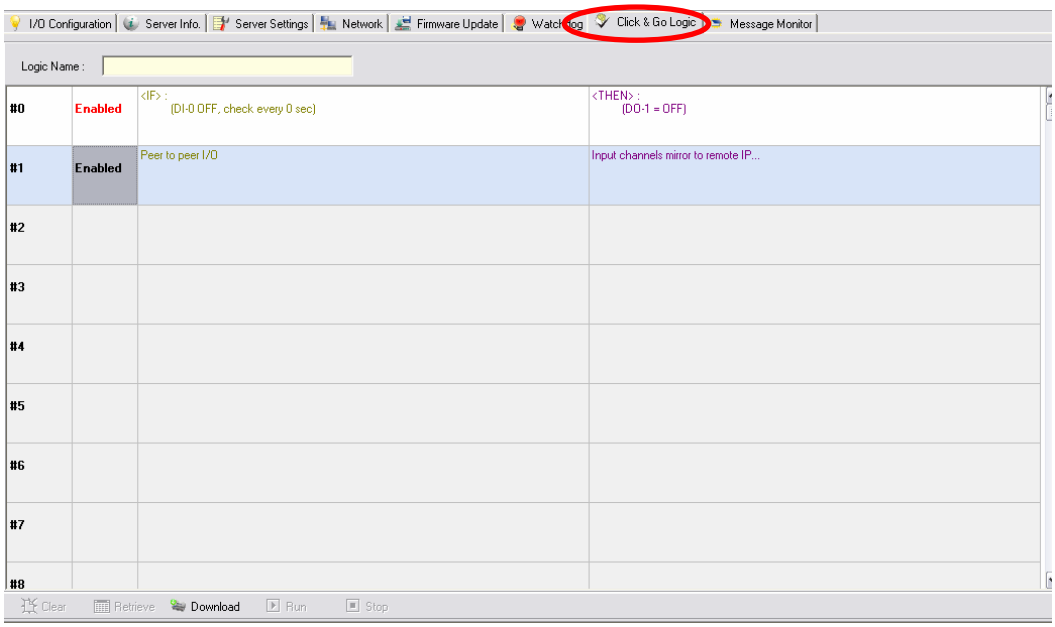


After the Watchdog is enabled, a warning will be displayed on the Watchdog tab if the network connection is lost.

After you restore the network connection, click **Clear Alarm** to reset the Watchdog and return to normal operation.

Click&Go Logic Tab

The Click&Go Logic tab is available after logging in as an administrator. This is where the ioLogik's Active Ethernet I/O system is configured. With a set of rules (known as a ruleset) defined through Click&Go, the ioLogik can report I/O status to a host as soon as user-defined I/O conditions have been met. Please refer to Click&Go V2 User's Manual for more detailed information on defining rules.

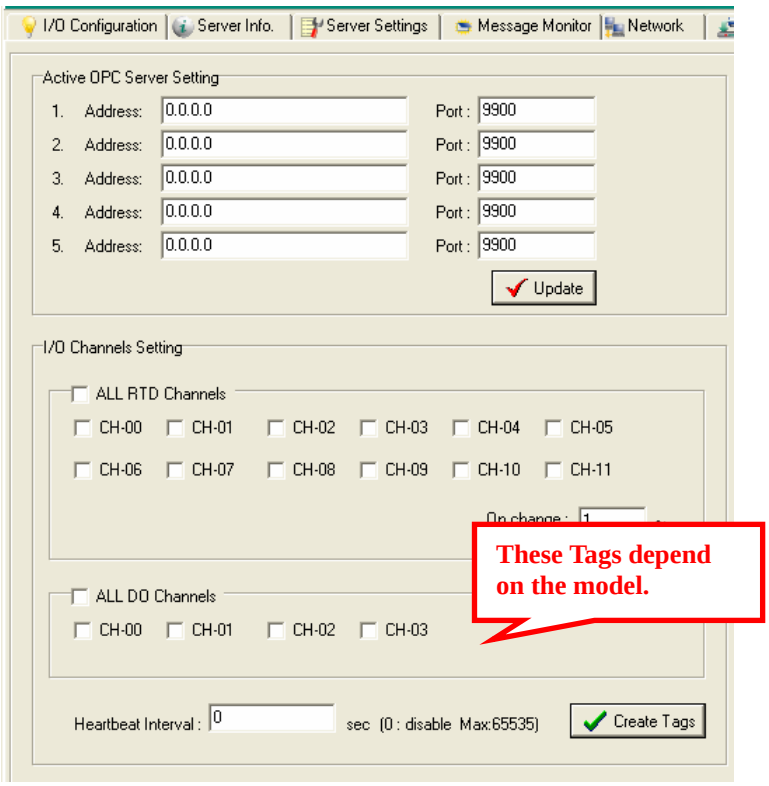


Changes in the Click&Go Logic tab are not effective until the ioLogik E2212 is restarted, just like changes made in other tabs. After logging back in as an administrator and returning to the Click&Go Logic tab, click **Download** to view the current ruleset. Click **Run** to activate the ruleset and **Stop** to deactivate it.

When a DI or DO channel is used in a Click&Go Logic rules, the channel's range and units will become fixed and may not be modified.

Active Tags Tab

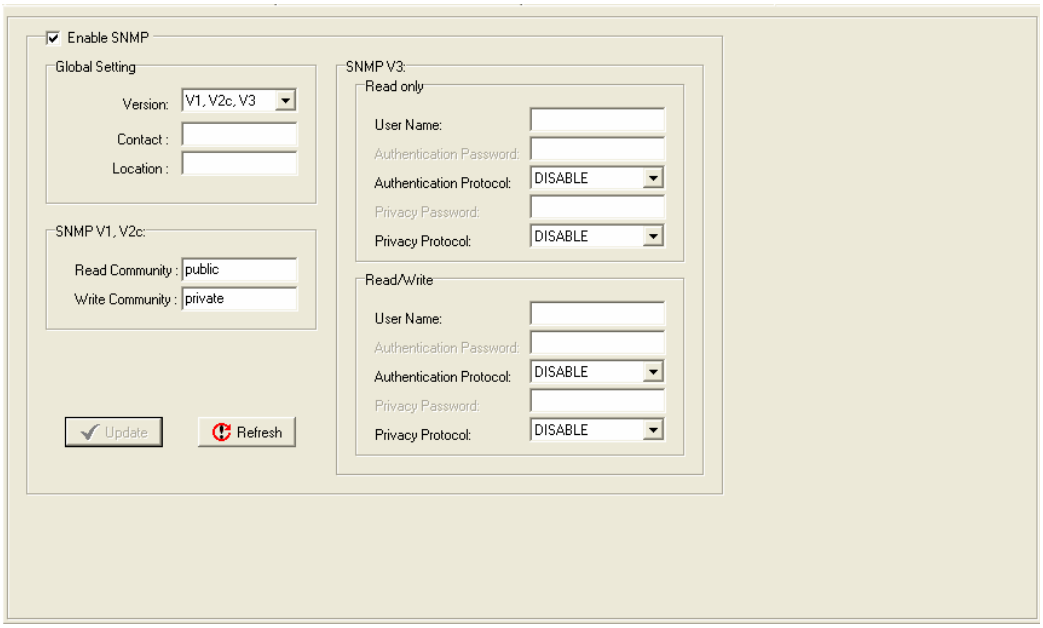
When logged in as an administrator, fill in the IP address in the **Active Tags** tab to configure Active OPC Address and Port settings. ioLogik Active Ethernet I/O can support up to 5 IPs at the same time. The Active OPC Server Address can be filled in using the IP address. The default port number is 9900. The port number should be the same as the setting in Active OPC Server's "Active Tag Listen Port". After the OPC setting and Channel Tags have been configured as desired, click **Create Tags**. The ioLogik Active Ethernet I/O will reboot in order for the settings to take effect.



The Heartbeat Interval is the time between each instance Active OPC server is informed that ioLogik is still working. The tags for Analog Value, such as AI, AO, RTD, TC, are synchronized with pre-defined percentages that are filled in the **On Change** column. The updated DI/DO/Relay tags can be synchronized by changing the status. If counter mode is used, **Advanced Settings** allows you to synchronize time by 100 to 60,000 ms. Please refer to the Active OPC Server section for more details about how to use Active OPC server.

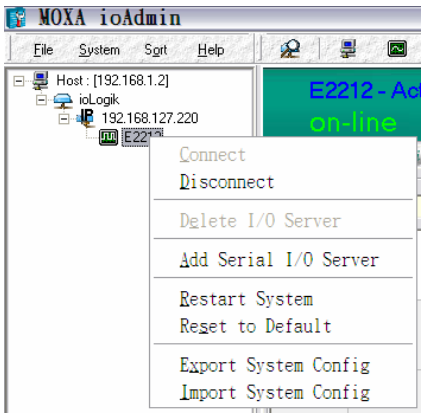
SNMP Settings Tab

The ioLogik Ethernet I/O supports SNMP V1, V2c, and V3 (Simple Network Management Protocol) to monitor network and I/O devices with SNMP Network Management software. It is useful in building automation and telecom applications. Use these fields to enable SNMP and set the read and write community strings for SNMP V3.



Server Context Menu

The Server context menu is accessed by right clicking on the server model name in the navigation panel.



Connect

Select this command to try connecting over the network to the selected ioLogik.

Disconnect

Select this command to drop the network connection with the selected ioLogik.

Delete I/O Server

Select this command to remove the selected ioLogik.

Add Serial I/O Server

Select this command to add an ioLogik I/O server by specifying its Unit ID.

Restart System

Select this command to restart the selected ioLogik. You will need to be logged in as an administrator to use this command.

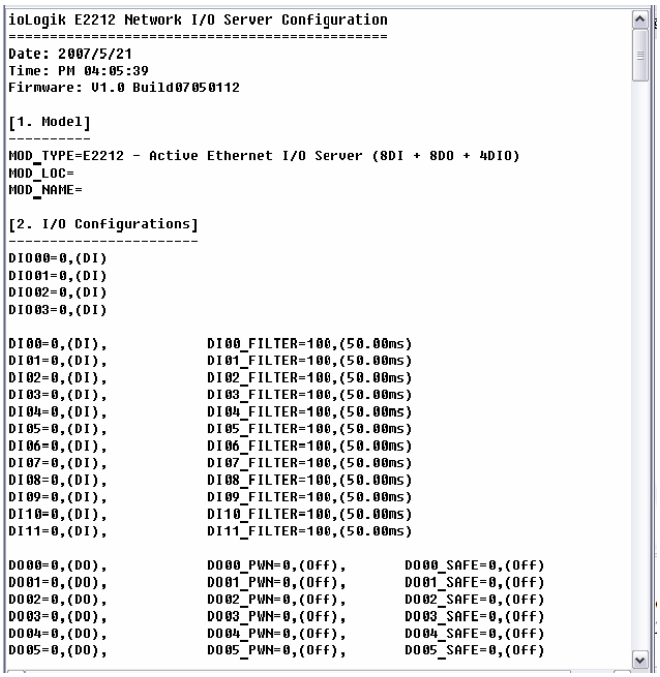
Reset to Default

Select this command to reset all settings on the selected ioLogik, including console password, to factory default values. You will need to be logged in as an administrator to use this command.

Export System Config

Select this command to export the selected ioLogik's configuration to a text file. You will need to be logged in as an administrator to use this command. It is strongly recommended you use this method to back up your configuration after you have finished configuring the ioLogik for your application.

The following is a sample configuration file:



```
ioLogik E2212 Network I/O Server Configuration
==============================================
Date: 2007/5/21
Time: PM 04:05:39
Firmware: V1.0 Build07050112

[1. Model]
----------
MOD_TYPE=E2212 - Active Ethernet I/O Server (8DI + 8DO + 4DIO)
MOD_LOC=
MOD_NAME=

[2. I/O Configurations]
-----------------------
DIO00=0,(DI)
DIO01=0,(DI)
DIO02=0,(DI)
DIO03=0,(DI)

DI00=0,(DI),            DI00_FILTER=100,(50.00ms)
DI01=0,(DI),            DI01_FILTER=100,(50.00ms)
DI02=0,(DI),            DI02_FILTER=100,(50.00ms)
DI03=0,(DI),            DI03_FILTER=100,(50.00ms)
DI04=0,(DI),            DI04_FILTER=100,(50.00ms)
DI05=0,(DI),            DI05_FILTER=100,(50.00ms)
DI06=0,(DI),            DI06_FILTER=100,(50.00ms)
DI07=0,(DI),            DI07_FILTER=100,(50.00ms)
DI08=0,(DI),            DI08_FILTER=100,(50.00ms)
DI09=0,(DI),            DI09_FILTER=100,(50.00ms)
DI10=0,(DI),            DI10_FILTER=100,(50.00ms)
DI11=0,(DI),            DI11_FILTER=100,(50.00ms)

DO00=0,(DO),            DO00_PWN=0,(Off),       DO00_SAFE=0,(Off)
DO01=0,(DO),            DO01_PWN=0,(Off),       DO01_SAFE=0,(Off)
DO02=0,(DO),            DO02_PWN=0,(Off),       DO02_SAFE=0,(Off)
DO03=0,(DO),            DO03_PWN=0,(Off),       DO03_SAFE=0,(Off)
DO04=0,(DO),            DO04_PWN=0,(Off),       DO04_SAFE=0,(Off)
DO05=0,(DO),            DO05_PWN=0,(Off),       DO05_SAFE=0,(Off)
```

Import System Config

Select this command to load a configuration for the selected ioLogik from a configuration text file. You will need to be logged in as an administrator to use this command. The new configuration will not take effect until the ioLogik has been restarted. This command may be used to restore a configuration after loading the factory defaults, or to duplicate a configuration to multiple ioLogik units.

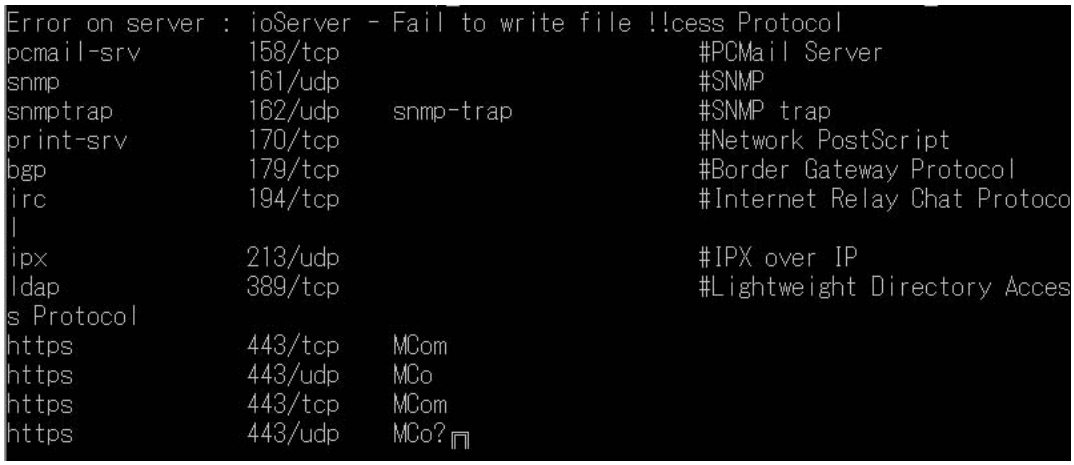
Using TFTP to Import/Export Configuration

TFTP (Trivial File Transfer Protocol) was defined in 1980 to provide basic FTP functionality in a very simple protocol. Due to TFTP's simplicity, it can be implemented using a very small amount of memory, an important consideration when it was first developed. ioLogik E2000 I/O servers support the use of TFTP to import or export configuration files.

The following is an example using Windows TFTP and an ioLogik E2212 with an IP address of 192.168.127.254:

1. Enter "TFTP 192.168.127.254 GET ik2212.txt" to get the ioLogik's configuration file.
2. Enter "TFTP 192.168.127.254 PUT ik2212.txt" to load a configuration file onto the ioLogik

You must use "**ik2212.txt**" as the destination filename when copying a configuration file to the ioLogik E2000 unit. Otherwise, you will receive an error message as shown below:



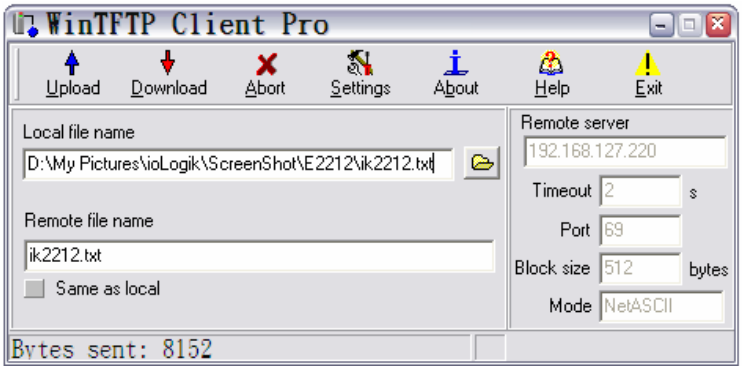
You can use TFTP in a batch file to transfer configuration files for different units. For example, you might have two configuration files that need to be copied to two different servers: **ik2212_1.txt** for 192.168.127.253, and **ik2212_2.txt** for 192.168.127.254. A batch file could be written as follows:

tftp 192.168.127.253 put ik2212_1.txt ik2212.txt

tftp 192.168.127.254 put ik2212_2.txt ik2212.txt

ATTENTION

You can also run TFTP client software, open the configuration file, and enter the remote server's IP. Note that both ASCII and Octet mode are supported. When the download process is complete, the I/O server will reboot.



Using ioEventLog

Installing ioEventLog

ioEventLog is a Windows utility provided for the monitoring of the ioLogik E2212 and attached I/O devices. It may be used from anywhere on the network to monitor the ioLogik E2212.

1. **Installation from CD:** Insert the Document and Software CD into the host computer. Run SETUP.EXE, which is located in the root directory. The installation program will guide you through the installation process and install the ioEventLog utility.
2. **Open ioEventLog:** After installation is finished, run ioEventLog from **Start → Program Files → Moxa → IO Server → Utility → ioEventLog.**

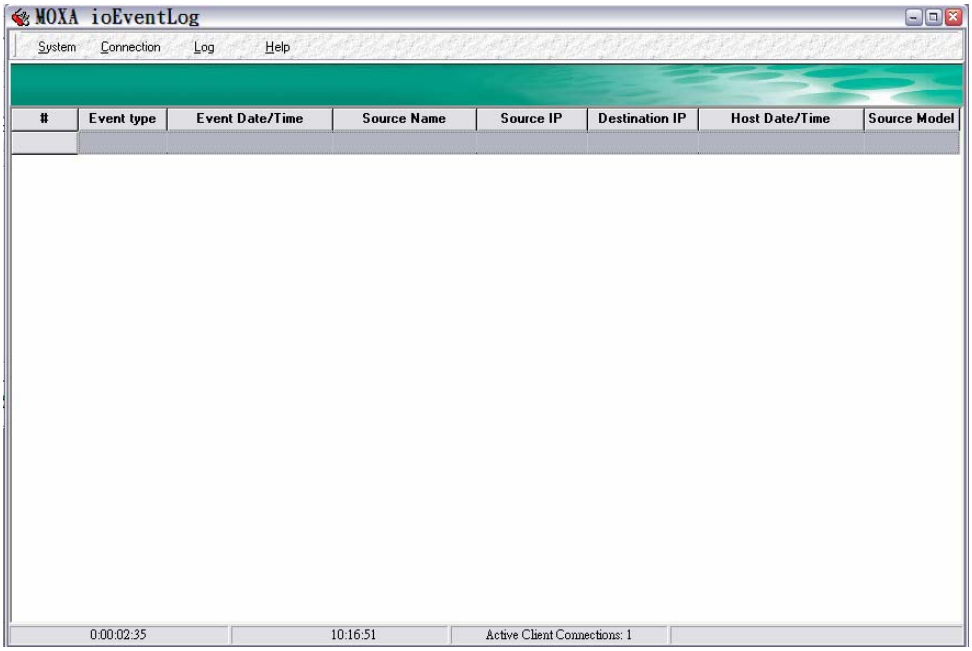
Basic Functions

ioEventLog is installed along with ioAdmin form the Document and Software CD. It is designed to help you keep a record of ioLogik status events over the network. The log is stored on the Windows PC. You will need to set up your ioLogik server to send status events to the PC's IP address. The following events are monitored:

- cold start
- warm start

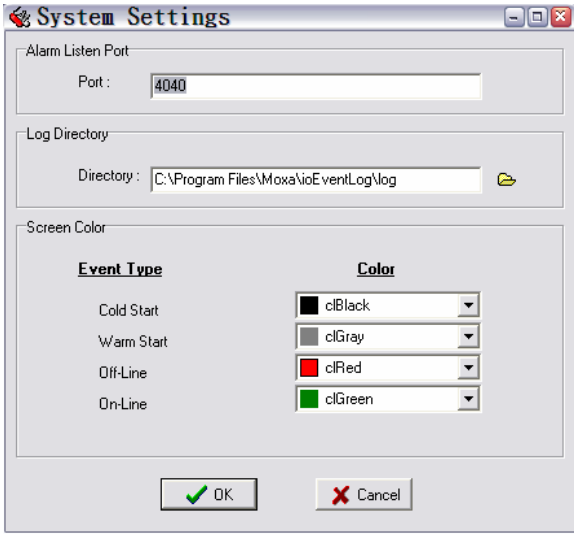
For each event, the following information is provided. The log can be sorted by any of these fields:

- event type
- event date and time
- ioLogik server source name
- source IP
- destination IP
- host date and time
- source model



Configuration

In the System menu, select **Settings** to configure ioEventLog.



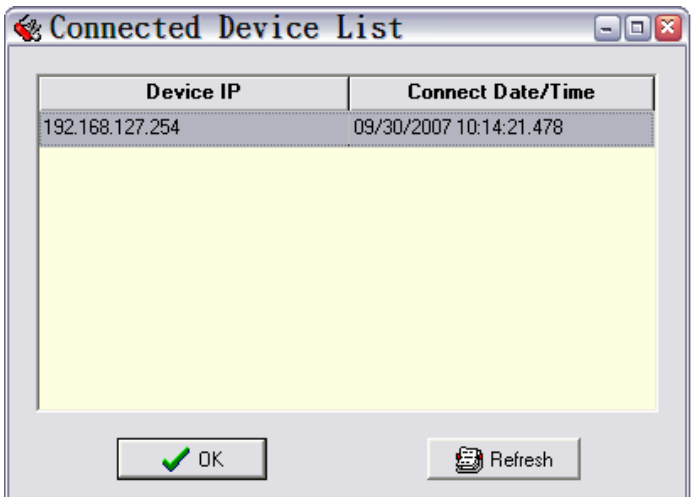
The **Alarm Listen Port** is the TCP port number that will be monitored for status events. You can modify this setting as necessary to receive signals through a firewall. It will need to match the settings for the ioLogik server that is being monitored.

The **Log Directory** is where the log files will be stored. The default directory is C:\Program Files\Moxa\ioEventLog\log. A separate log file is created for each day, with file names assigned automatically.

You can also select the color of each event type in the log.

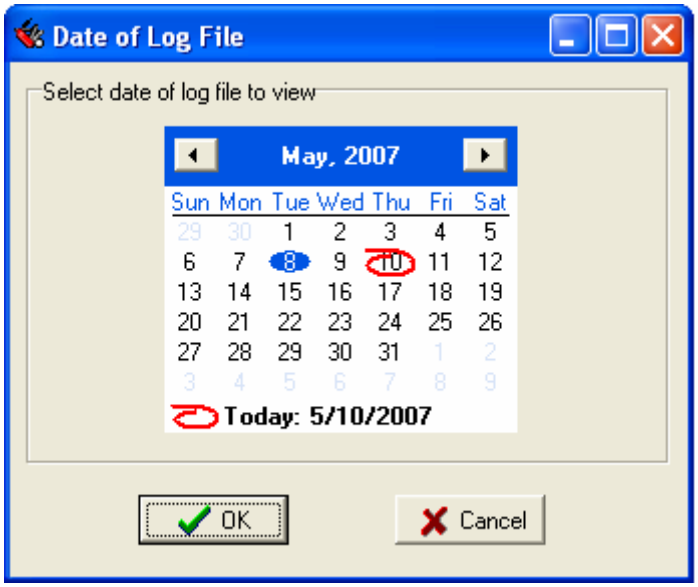
Checking Connected Devices

You can see which I/O servers are already connected to ioEventLog by selecting **Connected Device List** from the **Connection** menu. You will be prompted to view which devices are connected.



Opening Log Files

You can view previously saved logs by selecting **Open** from the Log menu. You will be prompted for the data that you wish to view.



The logs for the day that you select will be displayed in the Alarm Log Viewer window.

Clearing the Log

If you wish to clear the log, you can select Clear from Log menu. This will clear all events for the current day. The cleared events will not be saved in that day's logs. After the logs are cleared, new events will be displayed and recorded as usual.

4
Web Console Configuration

The ioLogik E2212's built in web console can be used to configure many of the ioLogik's settings. The following topics are covered:

- **Introduction to the Web Console**
- **Basic Settings**
- **Network Settings**
  - General Settings
  - Ethernet Configurations
  - RS-485 Settings
- **I/O Settings**
  - DI Channels
  - DO Channels
- **System Management**
  - Accessible IP Settings
  - SNMP Agent
  - Network Connection
  - Firmware Update
  - Import System Config
  - Export System Config
  - LCM
  - Change Password
  - Load Factory Default
  - Save/Restart

Introduction to the Web Console

The ioLogik web console is a browser-based configuration utility. When the ioLogik is connected to your network, you may enter the server's IP address in your web browser to access the web console. Note that although most configuration options are available in the web console, some settings are only available through ioAdmin. Furthermore, the web console can be disabled under Web Access Settings in ioAdmin. If you are unable to access the web console, check the Web Access Settings in ioAdmin.

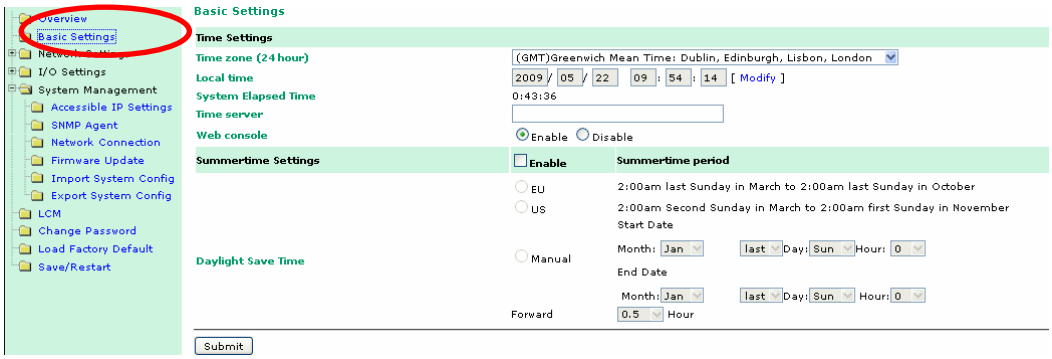
The left panel is the navigation panel and contains an expandable menu tree for navigating among the various settings and categories. When you click on a menu item in the navigation panel, the main window will display the corresponding options for that item. Configuration changes can then be made in the main window. For example, if you click **Basic Settings** in the navigation panel, the main window will show a page of basic settings that you can configure.

You must click **Submit** after making configuration changes. The Submit button will be located at the bottom of every page that has configurable settings. If you navigate to another page without clicking the Submit button, your changes will not be retained.

Submitted changes will not take effect until they are saved and the ioLogik is restarted! You may save and restart the server in one step by clicking on the Save/Restart button after you submit a change. If you need to make several changes before restarting, you may save your changes without restarting by selecting Save/Restart in the navigation panel. If you restart the ioLogik without saving your configuration, the ioLogik will discard all submitted changes.

Basic Settings

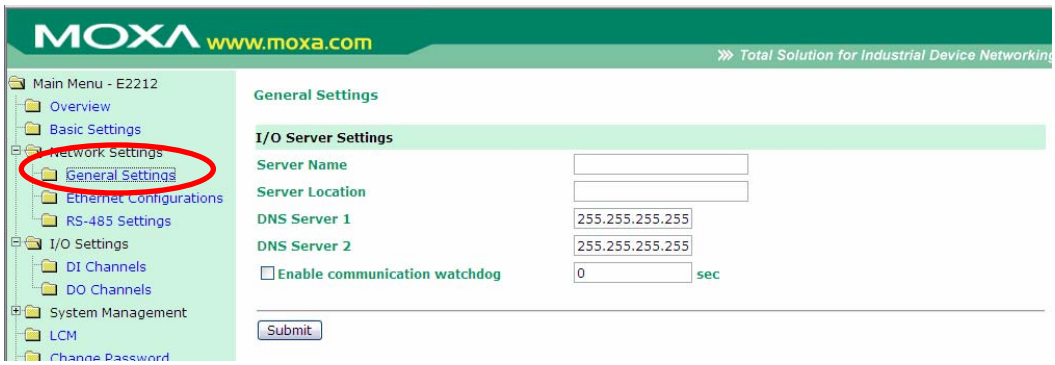
On the **Basic Settings** page, you may set the ioLogik's system time or provide the IP address of a time server for time synchronization.



Network Settings

General Settings

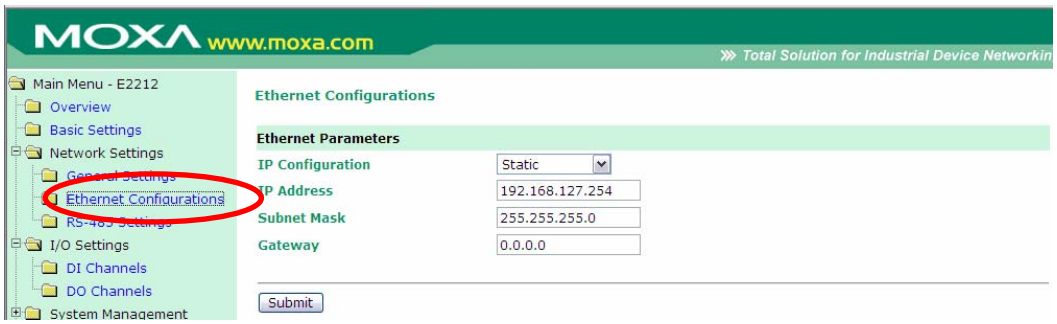
On the **General Settings** page, you may assign a server name and location to assist you in differentiating between different I/O servers. You may also enable the Host Communication Watchdog and define the timeout value.



When enabled, the **communication watchdog** monitors the network connection. If the connection is lost for the specified number of seconds, the watchdog will activate the Safe Status settings for each DO channel and Event Counter channel. By default, the watchdog is disabled. To enable the Watchdog, select **Enable communication watchdog** and set the timeout value.

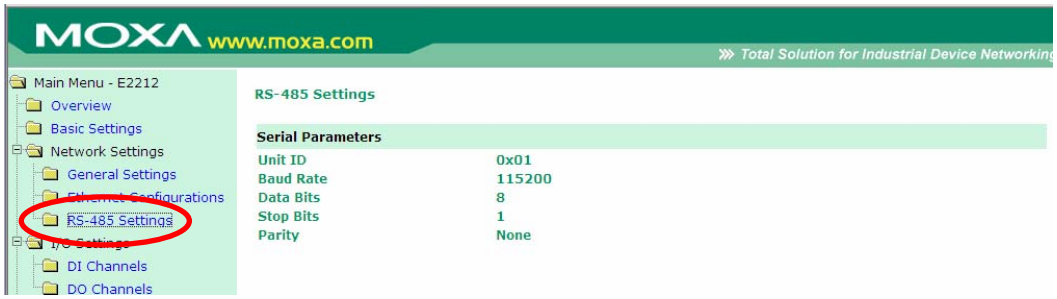
Ethernet Configurations

On the **Ethernet Configurations** page, you may set up a static or dynamic IP address for the ioLogik, as well as the subnet mask and gateway address.



RS-485 Settings

On the **RS-485 Settings** page, you may view the serial communication parameters, but no configuration changes are allowed. The baudrate can only be configured using the physical dial on the back of the unit. This is a reserved function.

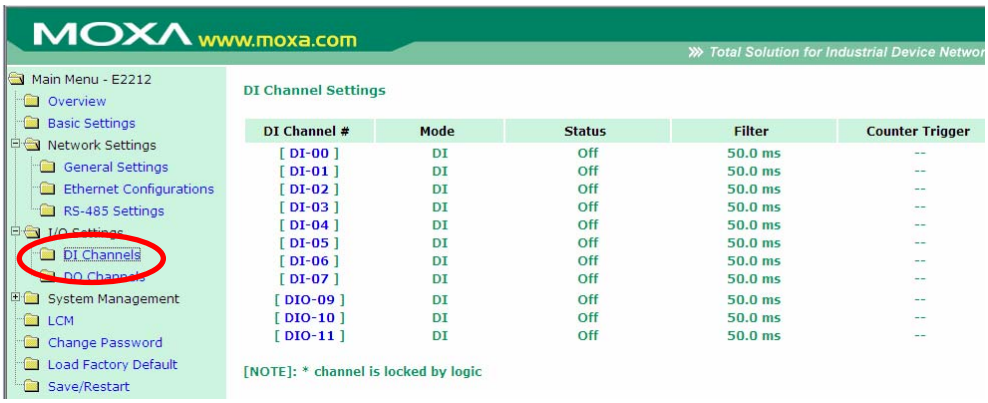


I/O Settings

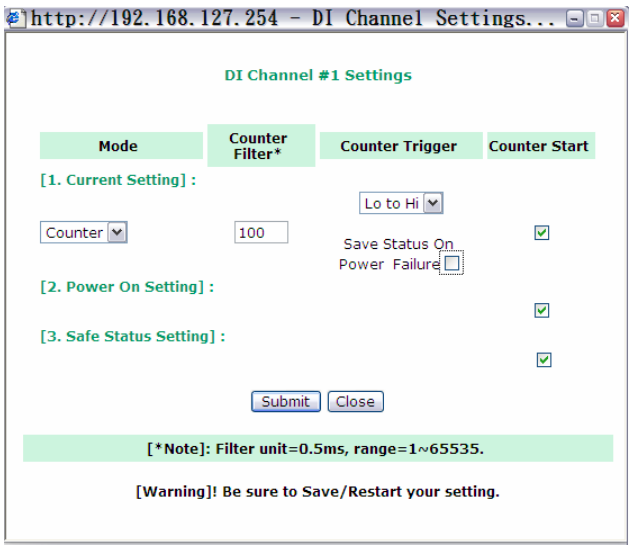
You can view the settings for DI and DO channels in the web console. DIO channels will be listed according to the configured channel type (DI or DO). The DIO channel type can only be changed using ioAdmin and cannot be changed from within the web console. Please refer to Chapter 3 for additional information on using ioAdmin.

DI Channels

On the **DI Channels** page, you may view the status of each DI (digital input) channel. Both fixed DI channels and DIO channels that are acting as DI channels will be displayed.



You may click on a channel for that channel's configuration options. DI channels can operate in DI mode or Event Counter mode. Software filtering is used to control switch bounces. The filter is configurable in multiples of 0.5 ms and accepts values between 1 and 65535. For example, a setting of **2** would mean a 1 ms filter (2 × 0.5 ms). For Event Counter channels, make sure that the filter is not set to 0, otherwise the counter will never be activated.



A DI channel can be set to "DI" or "Event Counter" mode. In DI mode, the specifications are as follows:

Type	Logic 0	Logic 1
Dry contact	close to GND	open
Wet contact	0 to 3 V	10 to 30 V

In Event Counter mode, the channel accepts limit or proximity switches and counts events according to the ON/OFF status. When "Lo to Hi" is selected, the counter value increases when the attached switch is pushed. When "Hi to Lo" is selected, the counter value increases when the switch is pushed and released.

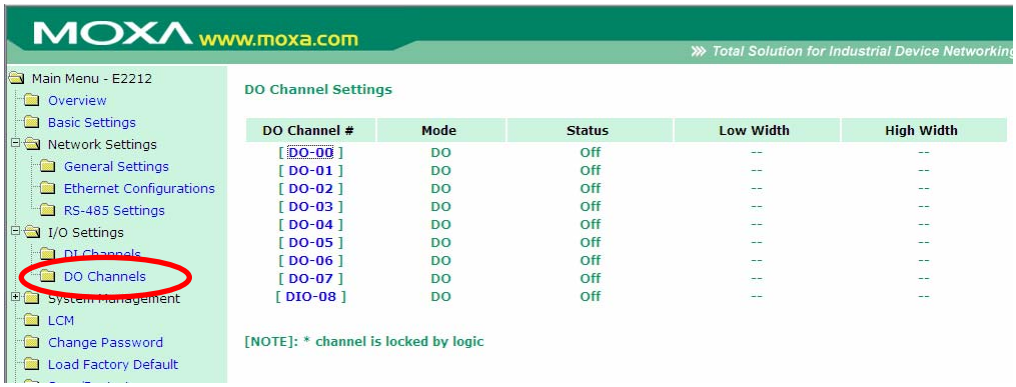
By default, the Event Counter value will be reset to zero if power is disconnected. If you select **Save Status on Power Failure**, the Event Counter value will be saved when power is disconnected. When power is reconnected, the value will be as you left it. You can set **Power On Setting** to have counting resume immediately.

DI channels that are in Event Counter mode can begin counting automatically when the ioLogik is powered on. To activate this function, enable **Power On Setting.** If **Power On Setting** is not enabled, the channel will only start counting events when specified by a Modbus command or Click&Go Logic rule.

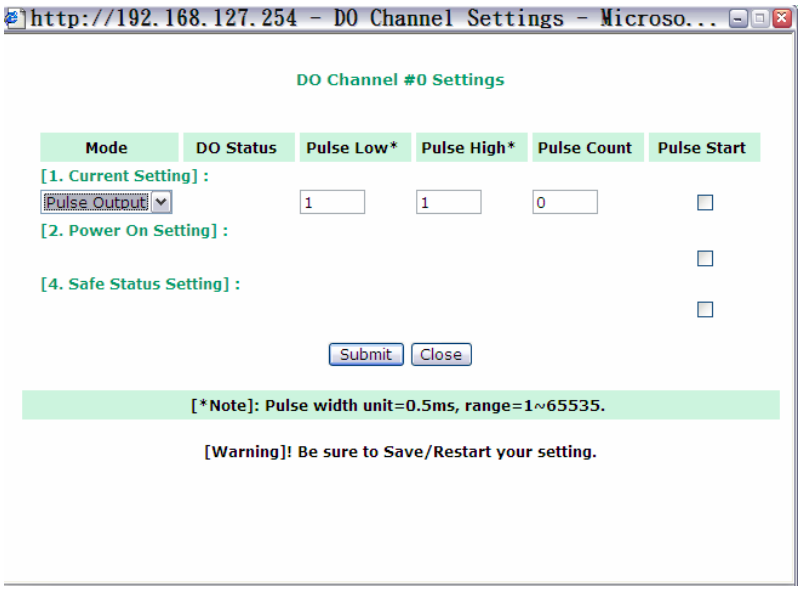
You can control how an Event Counter channel behaves during a network disconnection with the **Safe Status Setting** and the Host Connection Watchdog. With the Watchdog disabled, the Event Counter continues counting events even when there is a network disconnection. With the Watchdog enabled, the **Safe Status Setting** specifies whether the Event Counter continues or suspends counting when there is a network disconnection. Counting will continue if **Safe Status Setting** is enabled; counting will be suspended if **Safe Status Setting** is not enabled.

DO Channels

On the **DO Channels** page, you may view the status of each DO (digital output) channel. Both fixed DO channels and DIO channels that are acting as DO channels will be displayed.



You may click on a channel for that channel's configuration options. DO Channels can operate in DO mode or Pulse Output mode. In DO mode, output is either on or off. In Pulse Output mode, a configurable square wave is generated.



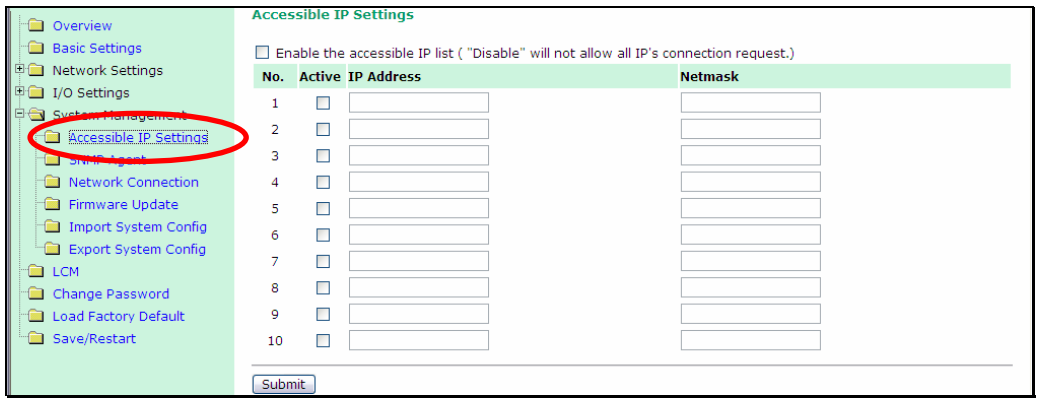
By default, DO and Pulse Output channels are set to "off" when the ioLogik is powered on. You can set a channel to automatically turn on or begin pulse output when the ioLogik is powered on, by enabling **Power On Setting.**

You can control how a DO or Pulse Output channel behaves during a network disconnection with the **Safe Status Setting** and the Host Connection Watchdog. With the Watchdog disabled, there is no change to the channel's status when there is a network disconnection. With the Watchdog enabled, the **Safe Status Setting** determines whether the channel will turn off, on, or begin pulse output when there is a network disconnection. The channel will turn on or begin pulse output if **Safe Status Setting** is enabled; the channel will turn off if **Safe Status Setting** is not enabled.

System Management

Accessible IP Settings

On the **Accessible IP Settings** page, you may control network access to the ioLogik by allowing only specified IP addresses. When the accessible IP list is enabled, a host's IP address must be listed in order to have access to the ioLogik.



You may add a specific address or range of addresses by using a combination of IP address and netmask, as follows:

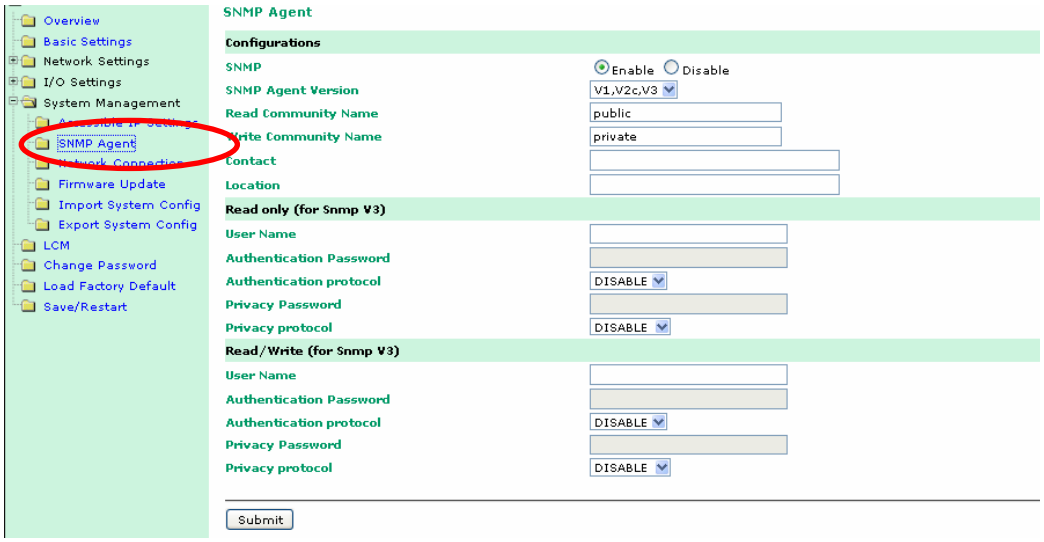
- **To allow access to a specific IP address**
  Enter the IP address in the corresponding field; enter **255.255.255.255** for the netmask
- **To allow access to hosts on a specific subnet**
  For both the IP address and netmask, use **0** for the last digit (e.g., **192.168.1.0** and **255.255.255.0**).
- **To allow unrestricted access**
  Deselect the Enable the accessible IP list option.

The following table shows additional configuration examples.

Allowed Hosts	IP address	Netmask
Any host	Disable	Disable
192.168.1.120	192.168.1.120	255.255.255.255
192.168.1.1 to 192.168.1.254	192.168.1.0	255.255.255.0
192.168.0.1 to 192.168.255.254	192.168.0.0	255.255.0.0
192.168.1.1 to 192.168.1.126	192.168.1.0	255.255.255.128
192.168.1.129 to 192.168.1.254	192.168.1.128	255.255.255.128

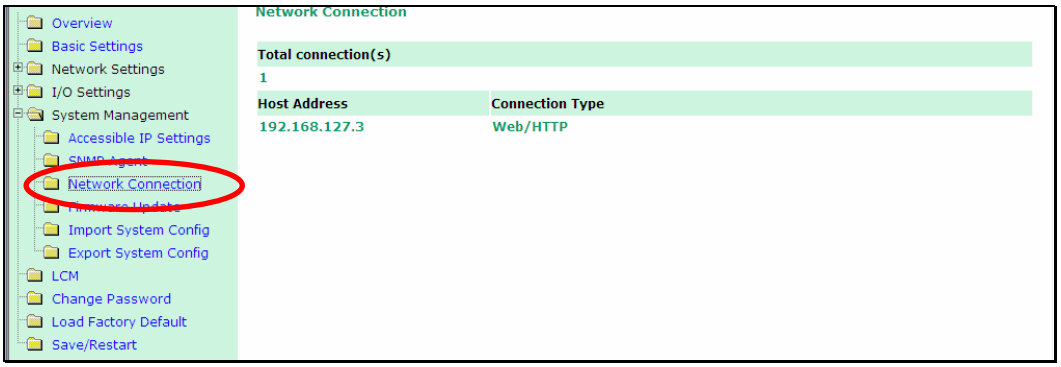
SNMP Agent

On the SNMP Agent page, you may enable SNMP and set the read and write settings. The ioLogik Ethernet I/O device supports SNMP v1, v2c, and V3 (Simple Network Management Protocol) to allow monitoring of network and I/O devices with SNMP Network Management software. It is useful in building automation and telecom applications. Use these fields to enable SNMP and set the read and write community strings for SNMP v1 and v2c, or use authentication for SNMP v3.



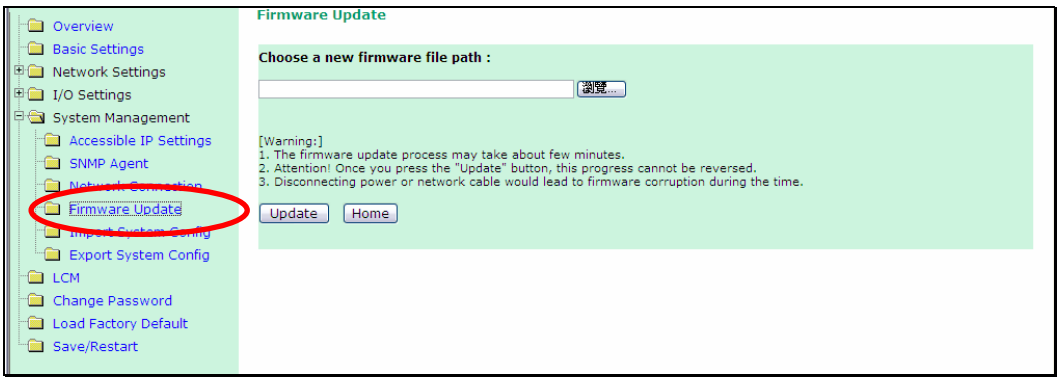
Network Connection

On the **Network Connection** page, you may view the TCP connections from other hosts. This may assist you in the management of your devices.



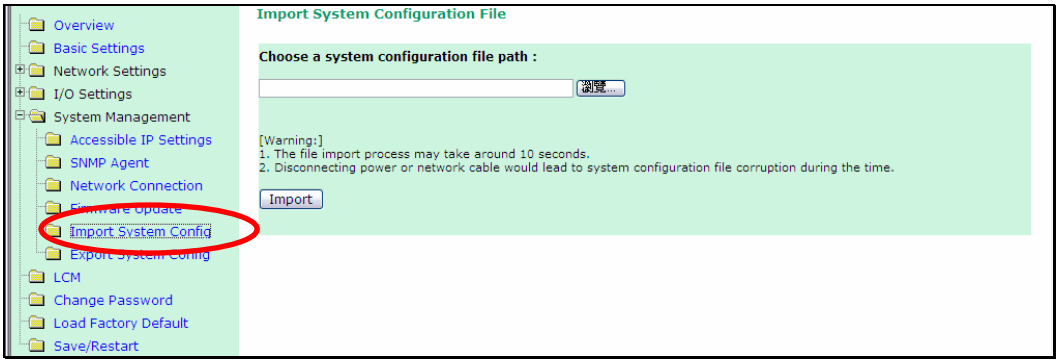
Firmware Update

On the **Firmware Update** page, you may load new or updated firmware onto the ioLogik.



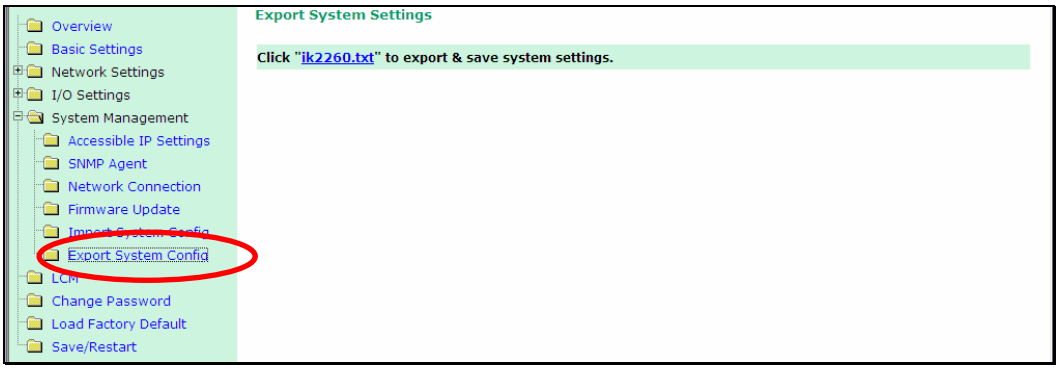
Import System Config

On the **Import System Config** page, you may import a configuration onto the ioLogik server. The configuration file can be generated by ioAdmin or through the web console. This function can be used to duplicate settings between ioLogik servers. You will be prompted for the location of the configuration file (i.e., "ik2212.txt").



Export System Config

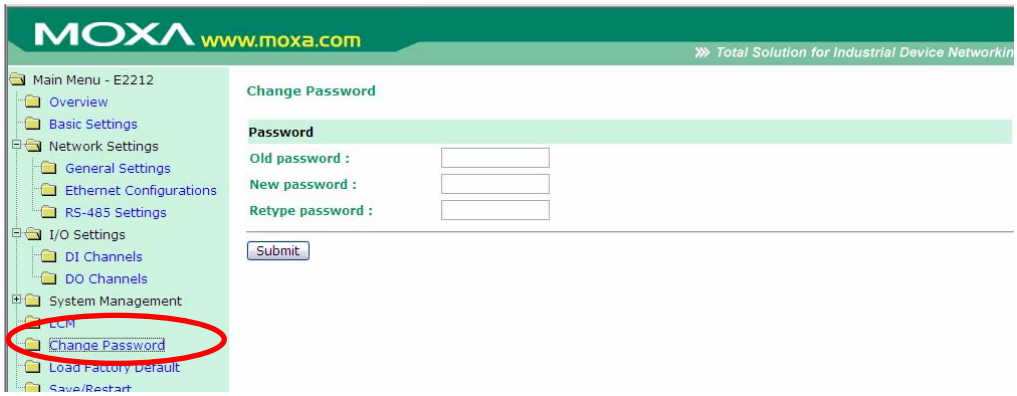
On the **Export System Config** page, you may save the ioLogik's configuration into a file for backup or import into another ioLogik server.



LCM

If you have installed the optional LCM, you may view the status and firmware details on the LCM page.

Change Password



For all changes to the ioLogik E2212's password protection settings, you will first need to enter the old password. Leave this blank if you are setting up password protection for the first time. To set up a new password or change the existing password, enter your desired password under both **New password** and **Confirm password**. To remove password protection, leave **New password** and **Confirm password** blank.

ATTENTION

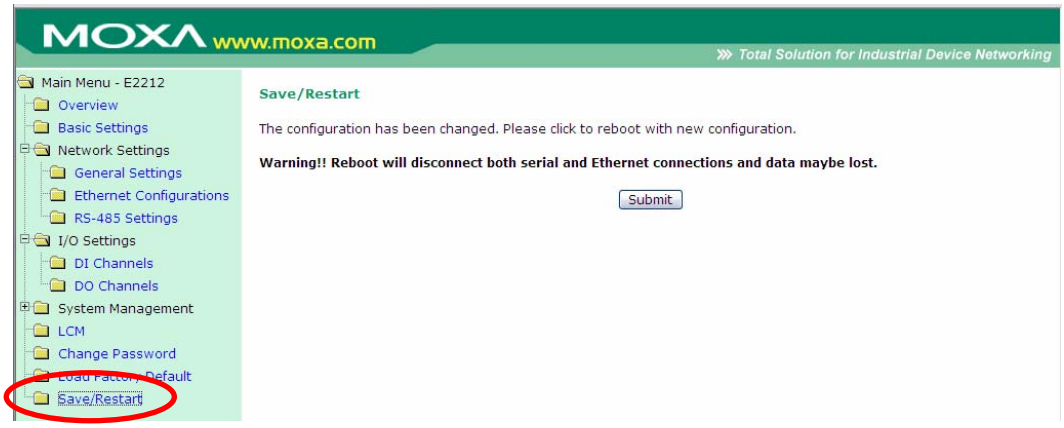
If you forget the password, the ONLY way to configure the **ioLogik** is by using the reset button to load the factory defaults.
Before you set a password for the first time, it is a good idea to export the configuration to a file when you have finished setting up your ioLogik. Your configuration can then be easily imported back into the ioLogik. This will be useful if the ioLogik has been reset to factory defaults due to a forgotten password or for other reasons.

Load Factory Default

This function will reset the ioLogik to factory default settings. All previous settings including the console password will be lost.

Save/Restart

If you change the configuration, do not forget to reboot the system.



5
Active OPC Server Lite

In this chapter, we explain how to use ioAdmin to configure your ioLogik product.

The following topics are covered in this chapter:

- **OLE for Process Control**
- **Introduction to Active OPC Server Lite**
- **Active OPC Server Lite – From Pull to Push**
- **Features of Active OPC Server Lite**
- **Active OPC Server Lite Specifications**
  - Installation of Active OPC Server Lite
  - Installation of OPC Core Components
- **Active OPC Server Lite**
  - Main Screen Overview
- **Menu Items**
  - File
  - System
  - Sort
  - Quick Links
- **Tag Generation**
  - Push Tag Configuration from ioAdmin
  - Advanced Settings
  - Heartbeat Interval
  - Read/Write Privilege
  - OPC Test Client

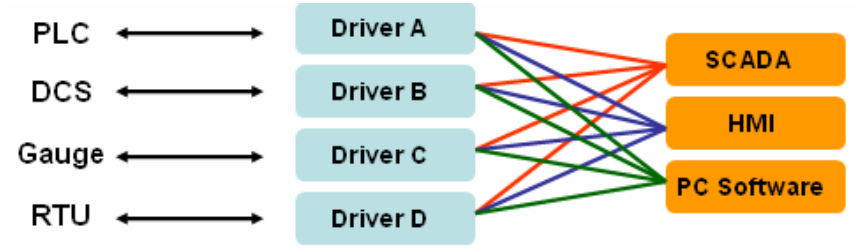
OLE for Process Control

OPC (originally OLE for process control) is an industry standard created with the collaboration of a number of leading worldwide automation hardware and software suppliers, working in cooperation with Microsoft. The standard defines methods for exchanging real-time automation data between PC-based clients using Microsoft operating systems. The organization that manages this standard is the OPC Foundation.

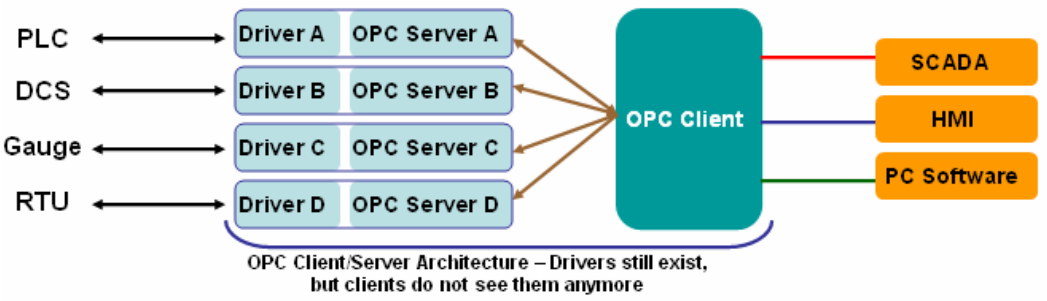
The OPC Specification is a non-proprietary technical specification that defines a set of standard interfaces based upon Microsoft's OLE/COM/DCOM platform and .NET technology. The application of the OPC standard interface makes possible interoperability between automation/control applications, field systems/devices and business/office applications.

Traditionally, each software or application developer was required to write a custom interface, or server/driver, to exchange data with hardware field devices. OPC eliminates this requirement by defining a common, high performance interface that permits this work to be done once, and then easily reused by HMI, SCADA, Control and custom applications.

[Drivers must be installed several times to connect to different devices]



[OPC Client/Server creates a common interface connecting to different devices]



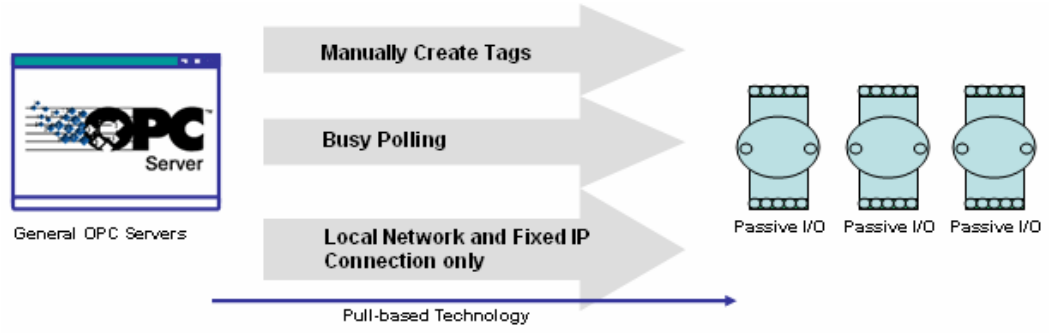
Introduction to Active OPC Server Lite

Moxa Active OPC Server Lite is a software package operated as an OPC driver of an HMI or SCADA system. It offers seamless connection from Moxa ioLogik series products to the SCADA systems, including the most popular Wonderware, Citect, and iFix. Active OPC Server Lite meets the latest standard of OPC DA3.0 that allows connections to various kinds of devices and host OPC machines.

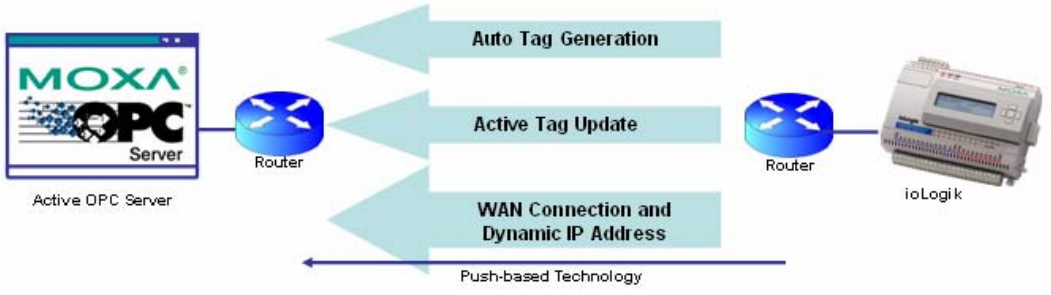
Active OPC Server Lite – From Pull to Push

When first looking up the I/O divices' Modbus table, users need to create one tag within 19 or more steps including specifying the IP address, selection of the protocols, and define the data type. The procedure is repeated over and over again until all the devices and tags are created. A technician can expect to take 1 minute to create just one tag. But what if there are 400 tags in the OPC system? Also, the more tags are used, the higher CPU loading will be taken.

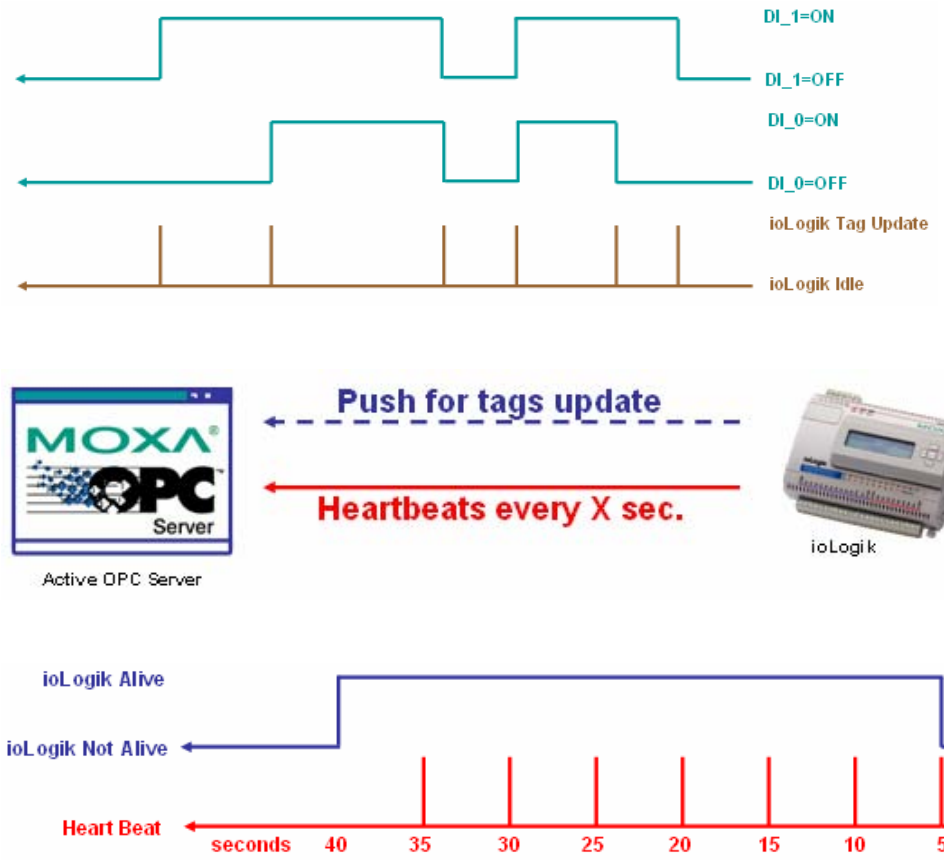
The general OPC also requires the connected I/O devices to use fixed IP address, if there are applications running on a public network (usually dynamic IPs) or portable measurements, there is no way to connect to an I/O device using OPC. This architecture is also called "pull" technology because the OPC server always polls the I/O devices from tag creation, IP connection and the tag status update.



Moxa Active Ethernet I/O – ioLogik series products provide the I/O status report via TCP/UDP message, e-mail or SNMP traps. These benefits have now expanded to the OPC technology. Without asking any questions, even the IP address, settings of a tag are automatically created by the ioLogik itself to notify which tag should be created. Users need only to launch the Active OPC Server program, and those I/O channels selected by a user will be "pushed" from an ioLogik to Active OPC Server.



The "push" technology also includes the update for the tags. When the I/O the status changes, there will be updates from the ioLogik to Active OPC Server Lite. Compared to constantly polling (pull-based) the status, this feature efficiently reduces the network bandwidth usage and speeds up the response time with event-driven, push-based status updates. At the same time, the heartbeat function visual confirms that ioLogik is "alive" and working.



Features of Active OPC Server Lite

Automatic tag generation

Without specifying IP addresses, I/O channels, and data formats one by one or editing and importing any configuration text files, Active OPC Server Lite creates the tags for the target ioLogik automatically. These tags are not fixed but created by users. After selecting the channels required to be update to Active OPC Server Lite, it will generate the tag configuration without asking any questions. Training for installation and configuration should be required to implement a general OPC Server package. For ioLogik users, learning the OPC technology, looking up Modbus address, configuring data format, assigning target IP and so on are not required.

Active tag update with heartbeat detection

ioLogik uses "Active" technology to update the I/O status. This includes the tag status update to Active OPC Server Lite. Compared to traditional OPC Servers, this mechanism reduces Ethernet bandwidth usage by 80%. At the same time, it increases the response time of the I/O channels 7 timers faster than before. The SCADA PC can now also be load balanced for its CPU time because it simply waits for updates instead of polling the I/O channel all the time.

Dynamic IP Address Support

Active OPC Server also delivers the flexibility of using dynamic IP addresses on the ioLogik. As for the traditional data acquisition application, I/O devices are not capable of using this approach. The flexibility of connections through firewall is also expanded.

Active OPC Server Lite Specifications

Hardware Requirements	
CPU	Intel Pentium (Pentium 4 and above)
RAM	512 MB (1024 MB recommended)
Network Interface	10/100Mb Ethernet
Software Requirements	
Operating System	Microsoft Windows 2000, XP or later
Editor(Not necessary)	Microsoft Office 2003 (Access 2003) or later
OPC Server Specifications	
OPC Data Access	1.0a, 2.0, 2.05a, 3.0
Max. tags	256
ioLogik Support	
Product Model	ioLogik E2210, E2212, E2214, E2240, E2242, E2260, E2262
Firmware version	V3.0 or above
ioAdmin version	V3.0 or above

Installation of Active OPC Server Lite

Active OPC Server Lite can be found in the **Document and Software CD**, or downloaded from Moxa Website. The following steps show how to install Active OPC Server Lite from the CD.

1. **Installation from CD**: Insert the Document and Software CD into the host computer. In the Software\AOPCLite directory of the CD, locate and run SETUP.EXE. The installation program will guide you through the installation process and install the Active OPC Server Lite utility.
2. **Open Active OPC Server Lite**: After installation is finished, run Active OPC Server Lite from the Windows Start menu: **Start →Program Files →MOXA →IO Server →ActiveOPC→ActiveOPC.**

Installation of OPC Core Components

OPC Core Components provides the necessary connection library of Active OPC Server Lite. This package must be installed in the computer where Active OPC Server Lite is.

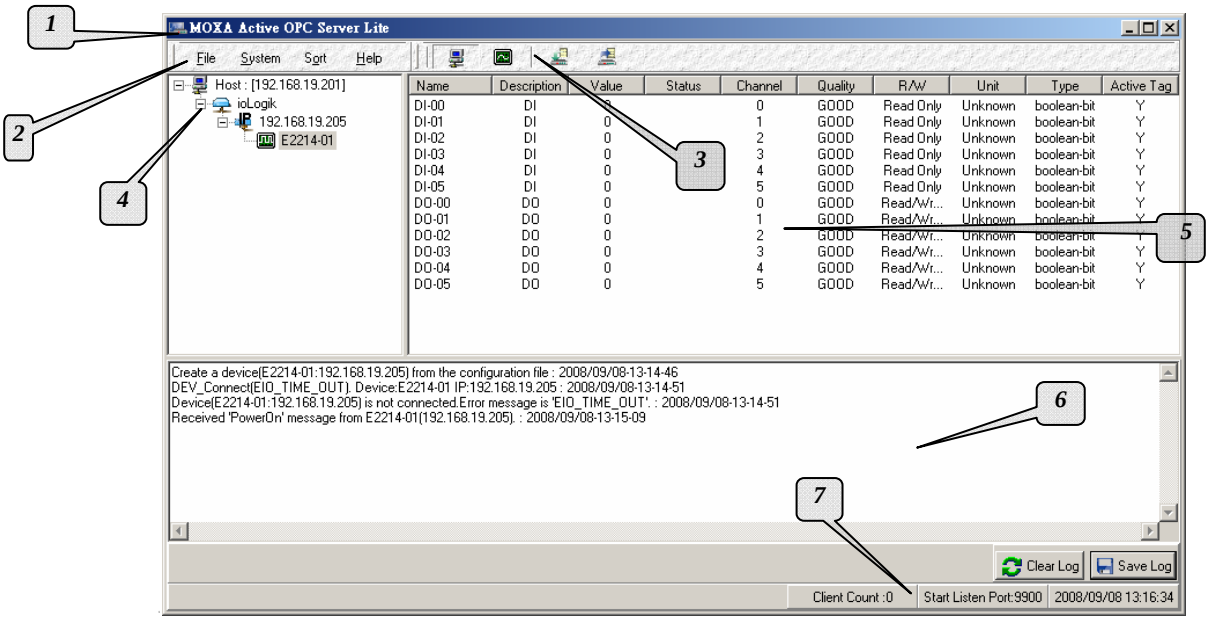
1. After Active OPC Server Lite installation is finished, run Setup OPC Core Components from the Windows Start menu: **Start →Program Files →MOXA →IO Server→ActiveOPC→Setup OPC Core Components**

The installation program will guide you through the installation process.

Active OPC Server Lite

Main Screen Overview

Active OPC Server Lite's main screen displays a figure of the mapped ioLogik with the status of every I/O tag. Note that configuration and tags are not available until you have the ioLogik to create the tags.

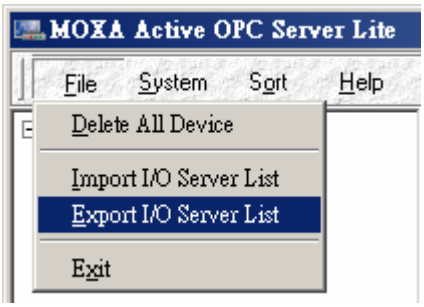


Active OPC Server Lite Main Screen
1. Title
2. Menu bar
3. Quick link
4. Navigation panel
5. Tag Window
6. Log Monitor
7. Status bar

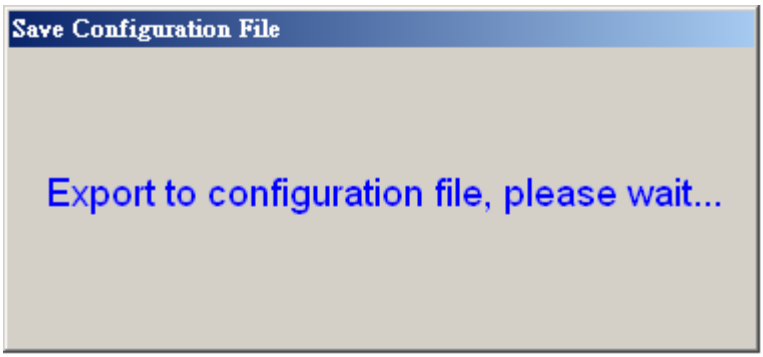
Menu Items

File

From the **File** menu, you can export the list of the ioLogik that are currently displayed in the navigation panel. You also can import a list into Active OPC Server Lite.

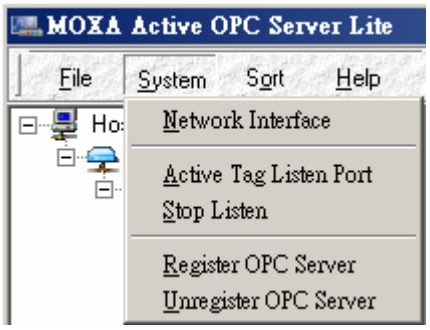


The file will have **.mdb** extension and can be opened using Microsoft Office - Access. The server list includes the current tag information of the mapped ioLogik. Saving the configuration when exiting the Active OPC Server is also recommended.



System

Several operations can be accessed from the **System** menu.



Network Interface allows you to select a network to use, if the PC has multiple network adaptors installed.

Active Tag Listen Port allows you to select the preferred TCP socket port for tag generation from ioAdmin.

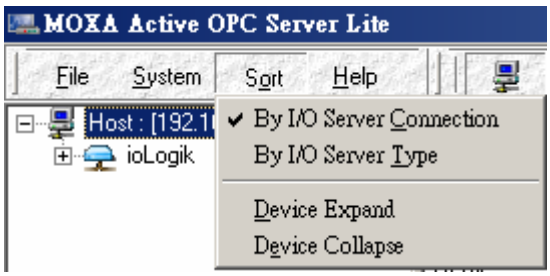
Stop Listen allows you to stop getting tag generation messages and I/O status updates.

Register OPC Server is used to register the DCOM components to the Windows system. After Active OPC Server Lite is installed, it will automatically configure the DCOM.

Unregister OPC Server is used to cancel the registration of the DCOM components from the Windows system.

Sort

The **Sort** menu allows the server list in the navigation panel to be sorted by connection and type (model).



Quick Links

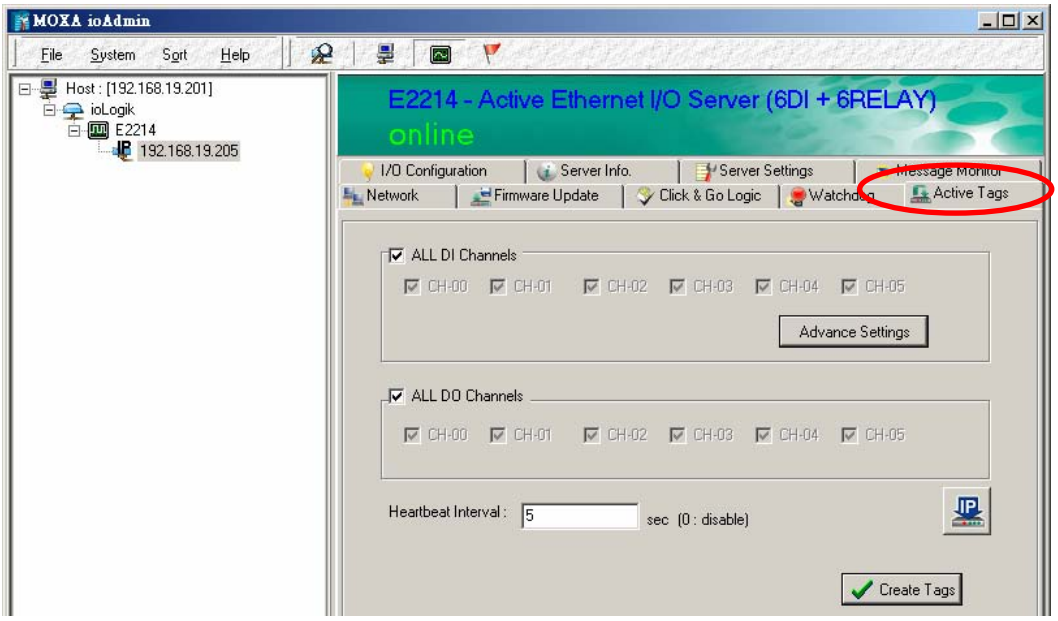
Quick links are provided to sort the server list and import/export configuration.

	Sort by connection
	Sort by server type
	Import configuration
	Export configuration

Tag Generation

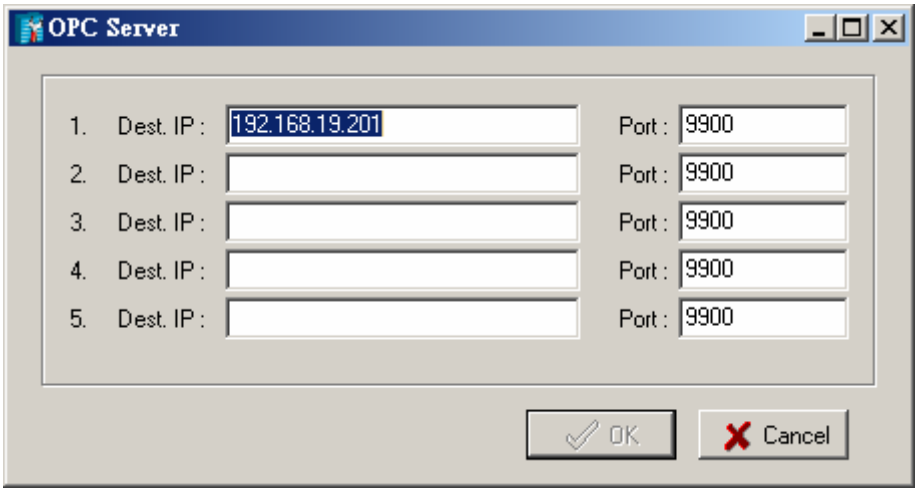
Push Tag Configuration from ioAdmin

Tag configuration of an ioLogik is specified by ioAdmin configuration utility. Start the ioAdmin, log in as an administrator and go to the **Active Tags**.



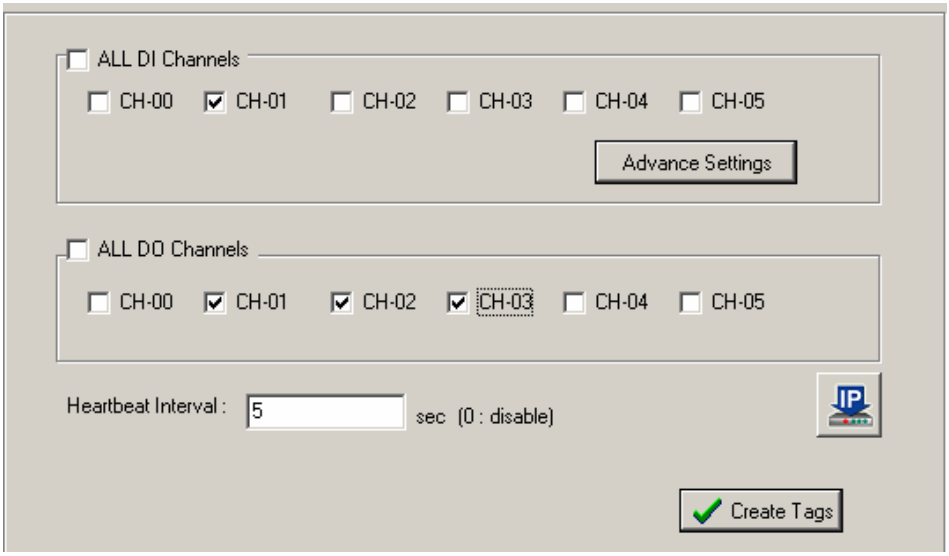
Following are the steps to create the tags.

1. Click on the **Set OPC Server Address** () button to specify the IP address of Active OPC Server Lite.



2. Click **Yes** to restart the ioLogik.

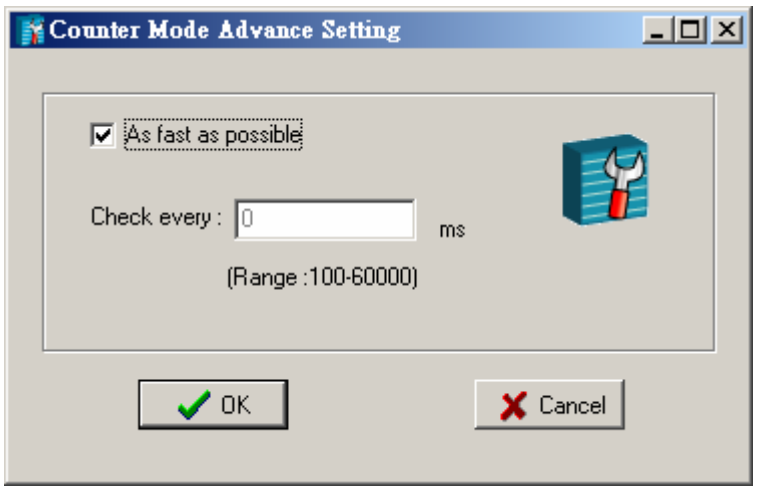
3. Specify the channels needed to be monitored by Active OPC Server Lite.



4. Click on the Create Tags button to push the tag configuration to Active OPC Server Lite.
5. Start the Active OPC Server Lite from Windows Start Menu. In the log monitor, a message will appear to confirm that the configuration was received. After that, tags are automatically created.

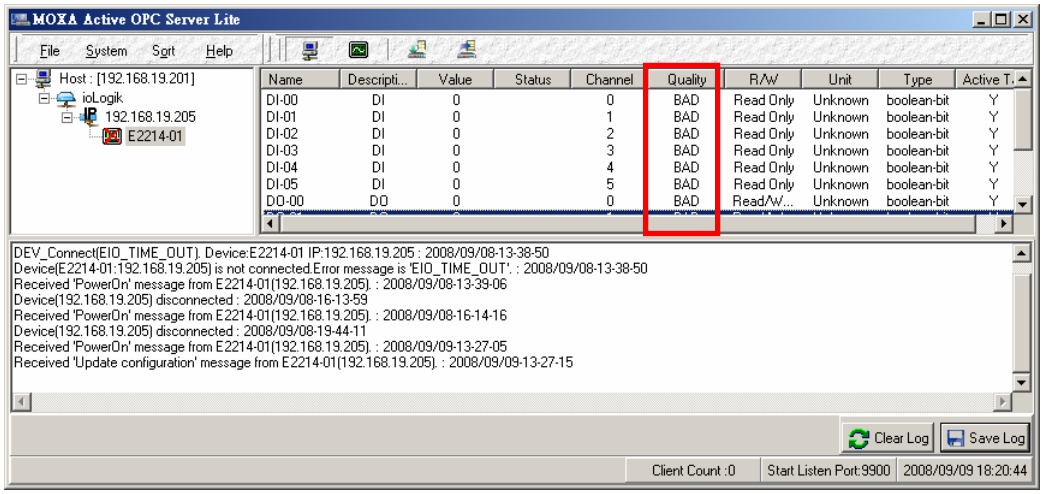
Advanced Settings

Advanced settings of the tags define the period that an ioLogik checks for the counter input status.. By default, the status is checked as soon as it changes. Users can define the interval starting from 100 ms to 60 seconds.



Heartbeat Interval

Tags are event-driven and updated only when the status of an I/O channel changes, so when the status remains unchanged, there will not be an update to Active OPC Server Lite. To ensure the ioLogik is connected and alive, **Heartbeat Interval** can be used to determine the connection status between the ioLogik and Active OPC Server Lite. If the heartbeat interval is set and the network between the ioLogik and Active OPC Server Lite is down, Active OPC Server Lite will detect the stop of the heartbeat and the Quality column will show **BAD** to indicate the loss of the connection. Default interval is set to 0 seconds, which disables the heartbeat. The maximum interval is 65,535 seconds.



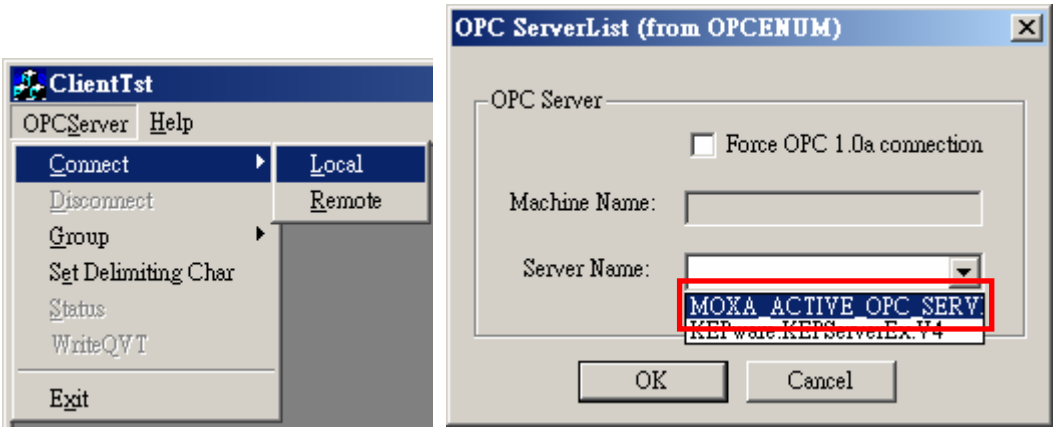
Read/Write Privilege

An input channel can only be read while an output channel is read/write acceptable showing on the Active OPC Server Lite. Note that if an output channel has been used in the Click&Go logic, the tags for that channel are read-only.

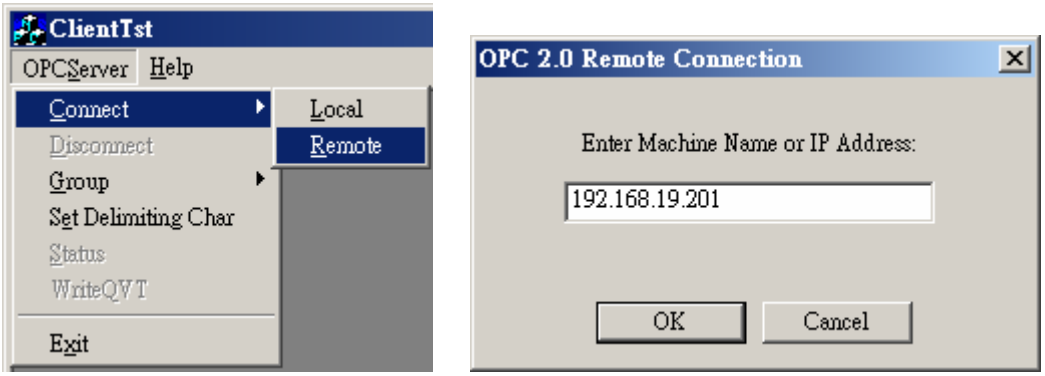
OPC Test Client

An OPC client software is embedded into the Active OPC Server Lite package for test purposes. After configuring the tags on the Active OPC Server Lite, this **ClientTest** can be launched from the Windows Start menu: **Start →Program Files →MOXA →IO Server →ActiveOPC→ClientTest**.

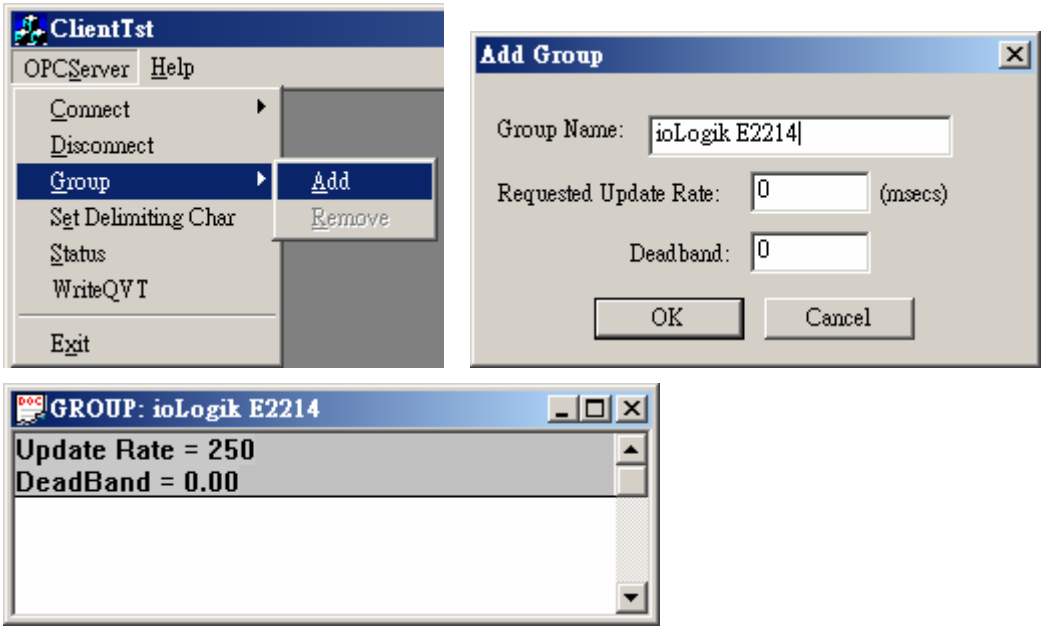
If Active OPC Server Lite is installed locally in the same PC, select **Connect → Local** from the menu bar. Specify the **MOXA ACTIVE OPC SERVER** in the **Server Name** column.



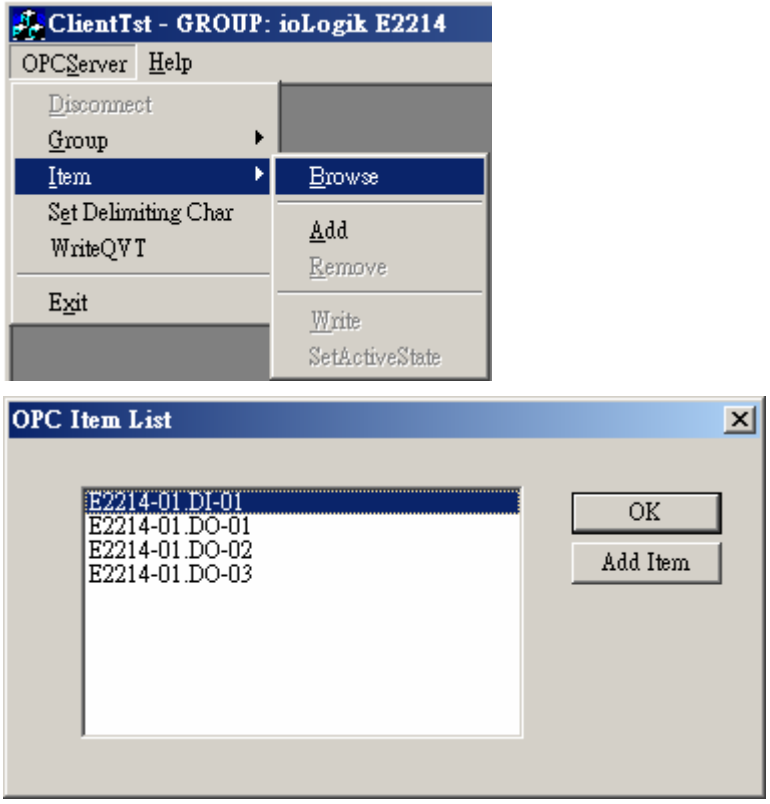
If the Active OPC Server Lite is installed on a remote PC, select **Connect → Remote** from the menu bar. Input the host name (i.e. Moxa_Client) or IP address and specify **MOXA ACTIVE OPC SERVER** in the **Server Name** column.

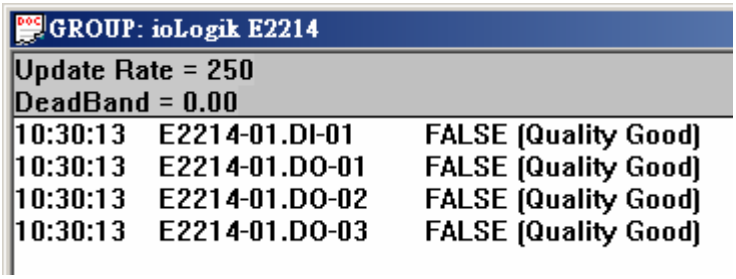


Click on the **Group → Add** and specify the **Group Name** (user-defined). A blank tag monitoring screen will start.

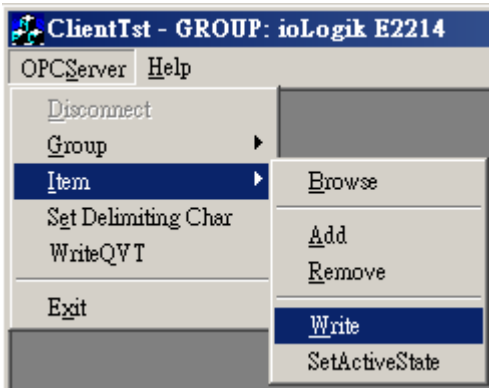


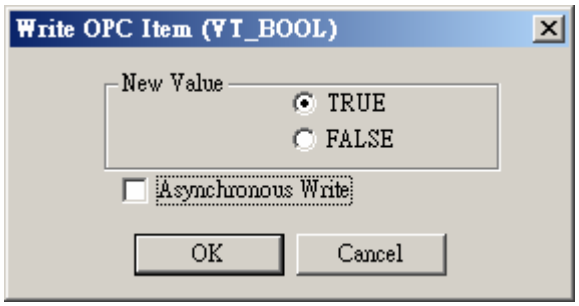
Click **Item → Browse** and select the channel needed to be monitored.





To write to the output channel, specify an output channel first. Then, select **Item → Write** from the menu bar.





A

Liquid Crystal Display Module (LCM)

The ioLogik E2212 supports an optional detachable Liquid Crystal Display Module (LCM) for easier field maintenance. The LCM is hot-pluggable and can be used to configure the network settings or display other settings. When plugged in, the LCM displays the ioLogik "home page," and pressing any button takes you into the settings and configuration.

LCM Controls

The up and down buttons navigate between the current options. The right and left buttons enter and exit the submenus. The center button is used when modifying settings or restarting the server.

Button	Function
Up	go to the previous item
Down	go to the next item
Left	exit the current submenu and return to the previous menu (go up one level)
Right	enter the selected submenu (go down one level)
Center	enter/exit editing mode

An "e" in the upper right hand corner of the display indicates that the parameter can be modified. Press the center button on the LCM to modify that parameter's settings.

LCM Options

Display	Explanation / Actions
<ioLogik E2212>	This is the default "home page" showing the IP address. Press the down button to view the submenus.
<ioLogik E2212> server	Enter this submenu to display information about the specific server you are viewing: ● serial number ● name ● location ● e2212 f/w ver ● lcm f/w ver ● model name

Display	Explanation / Actions
<ioLogik E2212> network	Enter this submenu to display information and settings for the network: ● ethernet link ● mac address ● ip mode ● ip address ● netmask ● gateway ● dns server-1 ● dns server-2
<ioLogik E2212> click&go	Enter this submenu to display information about the Click&Go Logic ruleset currently loaded on the ioLogik: ● name ● status
<ioLogik E2212> serial port	Enter this submenu to display the RS-485 cascade port settings.
<ioLogik E2212> i/o setting	Enter this submenu to access I/O channel status. Here are examples of settings that you might see: ● DI-00 [di]=off ● DO-00 [pulse]=stop Press up or down to navigate through the different I/O channels without having to go back to the previous menu.
<ioLogik E2212> console	Enter this submenu to see if the web console is enabled or disabled.
<ioLogik E2212> ping	Select this option to enter an IP address to ping. If you get a "timeout" error, it indicates that the ioLogik cannot reach that IP address. Otherwise, the display will show the response time.
<ioLogik E2212> save/restart	Enter this submenu to display the restart now submenu. Enter the restart now submenu to display the restart option. Press the center button to modify this option, then select "enable" to save changes and reboot the I/O server. The disable option has no effect.

ATTENTION

Any configuration changes that are made through the LCM will not take effect until the ioLogik is restarted.

B
Modbus/TCP Address Mappings

E2212 Modbus Mapping

0xxxx Read/Write Coils (Functions 1, 5, 15)

Reference	Address	Data Type	Description
00001	0x0000	1 bit	CH0 DO value 0: off 1: on
00002	0x0001	1 bit	CH1 DO value 0: off 1: on
00003	0x0002	1 bit	CH2 DO value 0: off 1: on
00004	0x0003	1 bit	CH3 DO value 0: off 1: on
00005	0x0004	1 bit	CH4 DO value 0: off 1: on
00006	0x0005	1 bit	CH5 DO value 0: off 1: on
00007	0x0006	1 bit	CH6 DO value 0: off 1: on
00008	0x0007	1 bit	CH7 DO value 0: off 1: on
00009	0x0008	1 bit	CH8 DO value 0: off 1: on
00010	0x0009	1 bit	CH9 DO value 0: off 1: on
00011	0x000A	1 bit	CH10 DO value 0: off 1: on
00012	0x000B	1 bit	CH11 DO value 0: off 1: on
00013	0x000C	1 bit	CH0 DO power-on value 0: off 1: on
00014	0x000D	1 bit	CH1 DO power-on value 0: off 1: on

Reference	Address	Data Type	Description
00015	0x000E	1 bit	CH2 DO power-on value 0: off 1: on
00016	0x000F	1 bit	CH3 DO power-on value 0: off 1: on
00017	0x0010	1 bit	CH4 DO power-on value 0: off 1: on
00018	0x0011	1 bit	CH5 DO power-on value 0: off 1: on
00019	0x0012	1 bit	CH6 DO power-on value 0: off 1: on
00020	0x0013	1 bit	CH7 DO power-on value 0: off 1: on
00021	0x0014	1 bit	CH8 DO power-on value 0: off 1: on
00022	0x0015	1 bit	CH9 DO power-on value 0: off 1: on
00023	0x0016	1 bit	CH10 DO power-on value 0: off 1: on
00024	0x0017	1 bit	CH11 DO power-on value 0: off 1: on
00025	0x0018	1 bit	CH0 DO safe value 0: off 1: on
00026	0x0019	1 bit	CH1 DO safe value 0: off 1: on
00027	0x001A	1 bit	CH2 DO safe value 0: off 1: on
00028	0x001B	1 bit	CH3 DO safe value 0: off 1: on
00029	0x001C	1 bit	CH4 DO safe value 0: off 1: on
00030	0x001D	1 bit	CH5 DO safe value 0: off 1: on
00031	0x001E	1 bit	CH6 DO safe value 0: off 1: on
00032	0x001F	1 bit	CH7 DO safe value 0: off 1: on
00033	0x0020	1 bit	CH8 DO safe value 0: off 1: on
00034	0x0021	1 bit	CH9 DO safe value 0: off 1: on
00035	0x0022	1 bit	CH10 DO safe value 0: off 1: on

Reference	Address	Data Type	Description
00036	0x0023	1 bit	CH11 DO safe value 0: off 1: on
00037	0x0024	1 bit	CH0 DO pulse operate status 0: off 1: on
00038	0x0025	1 bit	CH1 DO pulse operate status 0: off 1: on
00039	0x0026	1 bit	CH2 DO pulse operate status 0: off 1: on
00040	0x0027	1 bit	CH3 DO pulse operate status 0: off 1: on
00041	0x0028	1 bit	CH4 DO pulse operate status 0: off 1: on
00042	0x0029	1 bit	CH5 DO pulse operate status 0: off 1: on
00043	0x002A	1 bit	CH6 DO pulse operate status 0: off 1: on
00044	0x002B	1 bit	CH7 DO pulse operate status 0: off 1: on
00045	0x002C	1 bit	CH8 DO pulse operate status 0: off 1: on
00046	0x002D	1 bit	CH9 DO pulse operate status 0: off 1: on
00047	0x002E	1 bit	CH10 DO pulse operate status 0: off 1: on
00048	0x002F	1 bit	CH11 DO pulse operate status 0: off 1: on
00049	0x0030	1 bit	CH0 DO power-on pulse operate status 0: off 1: on
00050	0x0031	1 bit	CH1 DO power-on pulse operate status 0: off 1: on
00051	0x0032	1 bit	CH2 DO power-on pulse operate status 0: off 1: on
00052	0x0033	1 bit	CH3 DO power-on pulse operate status 0: off 1: on
00053	0x0034	1 bit	CH4 DO power-on pulse operate status 0: off 1: on
00054	0x0035	1 bit	CH5 DO power-on pulse operate status 0: off 1: on
00055	0x0036	1 bit	CH6 DO power-on pulse operate status 0: off 1: on
00056	0x0037	1 bit	CH7 DO power-on pulse operate status 0: off 1: on

Reference	Address	Data Type	Description
00057	0x0038	1 bit	CH8 DO power-on pulse operate status 0: off 1: on
00058	0x0039	1 bit	CH9 DO power-on pulse operate status 0: off 1: on
00059	0x003A	1 bit	CH10 DO power-on pulse operate status 0: off 1: on
00060	0x003B	1 bit	CH11 DO power-on pulse operate status 0: off 1: on
00061	0x003C	1 bit	CH0 DO safe pulse operate status 0: off 1: on
00062	0x003D	1 bit	CH1 DO safe pulse operate status 0: off 1: on
00063	0x003E	1 bit	CH2 DO safe pulse operate status 0: off 1: on
00064	0x003F	1 bit	CH3 DO safe pulse operate status 0: off 1: on
00065	0x0040	1 bit	CH4 DO safe pulse operate status 0: off 1: on
00066	0x0041	1 bit	CH5 DO safe pulse operate status 0: off 1: on
00067	0x0042	1 bit	CH6 DO safe pulse operate status 0: off 1: on
00068	0x0043	1 bit	CH7 DO safe pulse operate status 0: off 1: on
00069	0x0044	1 bit	CH8 DO safe pulse operate status 0: off 1: on
00070	0x0045	1 bit	CH9 DO safe pulse operate status 0: off 1: on
00071	0x0046	1 bit	CH10 DO safe pulse operate status 0: off 1: on
00072	0x0047	1 bit	CH11 DO safe pulse operate status 0: off 1: on
00073	0x0048	1 bit	CH0 DI counter status 0: off 1: on
00074	0x0049	1 bit	CH1 DI counter status 0: off 1: on
00075	0x004A	1 bit	CH2 DI counter status 0: off 1: on
00076	0x004B	1 bit	CH3 DI counter status 0: off 1: on
00077	0x004C	1 bit	CH4 DI counter status 0: off 1: on

Reference	Address	Data Type	Description
00078	0x004D	1 bit	CH5 DI counter status 0: off 1: on
00079	0x004E	1 bit	CH6 DI counter status 0: off 1: on
00080	0x004F	1 bit	CH7 DI counter status 0: off 1: on
00081	0x0050	1 bit	CH8 DI counter status 0: off 1: on
00082	0x0051	1 bit	CH9 DI counter status 0: off 1: on
00083	0x0052	1 bit	CH10 DI counter status 0: off 1: on
00084	0x0053	1 bit	CH11 DI counter status 0: off 1: on
00085	0x0054	1 bit	CH0 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value
00086	0x0055	1 bit	CH1 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value
00087	0x0056	1 bit	CH2 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value
00088	0x0057	1 bit	CH3 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value

Reference	Address	Data Type	Description
00089	0x0058	1 bit	CH4 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value
00090	0x0059	1 bit	CH5 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value
00091	0x005A	1 bit	CH6 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value
00092	0x005B	1 bit	CH7 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value
00093	0x005C	1 bit	CH8 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value
00094	0x005D	1 bit	CH9 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value
00095	0x005E	1 bit	CH10 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value

Reference	Address	Data Type	Description
00096	0x005F	1 bit	CH11 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value
00097	0x0060	1 bit	CH0 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value
00098	0x0061	1 bit	CH1 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value
00099	0x0062	1 bit	CH2 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value
00100	0x0063	1 bit	CH3 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value
00101	0x0064	1 bit	CH4 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value
00102	0x0065	1 bit	CH5 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value

Reference	Address	Data Type	Description
00103	0x0066	1 bit	CH6 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value
00104	0x0067	1 bit	CH7 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value
00105	0x0068	1 bit	CH8 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value
00106	0x0069	1 bit	CH9 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value
00107	0x006A	1 bit	CH10 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value
00108	0x006B	1 bit	CH11 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value
00109	0x006C	1 bit	CH0 DI count trigger
00110	0x006D	1 bit	CH1 DI count trigger
00111	0x006E	1 bit	CH2 DI count trigger
00112	0x006F	1 bit	CH3 DI count trigger
00113	0x0070	1 bit	CH4 DI count trigger
00114	0x0071	1 bit	CH5 DI count trigger
00115	0x0072	1 bit	CH6 DI count trigger

Reference	Address	Data Type	Description
00116	0x0073	1 bit	CH7 DI count trigger
00117	0x0074	1 bit	CH8 DI count trigger
00118	0x0075	1 bit	CH9 DI count trigger
00119	0x0076	1 bit	CH10 DI count trigger
00120	0x0077	1 bit	CH11 DI count trigger
00121	0x0078	1 bit	CH0 DI power-on status 0: off 1: on
00122	0x0079	1 bit	CH1 DI power-on status 0: off 1: on
00123	0x007A	1 bit	CH2 DI power-on status 0: off 1: on
00124	0x007B	1 bit	CH3 DI power-on status 0: off 1: on
00125	0x007C	1 bit	CH4 DI power-on status 0: off 1: on
00126	0x007D	1 bit	CH5 DI power-on status 0: off 1: on
00127	0x007E	1 bit	CH6 DI power-on status 0: off 1: on
00128	0x007F	1 bit	CH7 DI power-on status 0: off 1: on
00129	0x0080	1 bit	CH8 DI power-on status 0: off 1: on
00130	0x0081	1 bit	CH9 DI power-on status 0: off 1: on
00131	0x0082	1 bit	CH10 DI power-on status 0: off 1: on
00132	0x0083	1 bit	CH11 DI power-on status 0: off 1: on
00133	0x0084	1 bit	CH0 DI safe operate status 0: off 1: on
00134	0x0085	1 bit	CH1 DI safe operate status 0: off 1: on
00135	0x0086	1 bit	CH2 DI safe operate status 0: off 1: on
00136	0x0087	1 bit	CH3 DI safe operate status 0: off 1: on
00137	0x0088	1 bit	CH4 DI safe operate status 0: off 1: on
00138	0x0089	1 bit	CH5 DI safe operate status 0: off 1: on

Reference	Address	Data Type	Description
00139	0x008A	1 bit	CH6 DI safe operate status 0: off 1: on
00140	0x008B	1 bit	CH7 DI safe operate status 0: off 1: on
00141	0x008C	1 bit	CH8 DI safe operate status 0: off 1: on
00142	0x008D	1 bit	CH9 DI safe operate status 0: off 1: on
00143	0x008E	1 bit	CH10 DI safe operate status 0: off 1: on
00144	0x008F	1 bit	CH11 DI safe operate status 0: off 1: on
00145	0x0090	1 bit	CH0 DI set channel Power-off storage enable on/off 1: on 0: off
00146	0x0091	1 bit	CH1 DI set channel Power-off storage enable on/off 1: on 0: off
00147	0x0092	1 bit	CH2 DI set channel Power-off storage enable on/off 1: on 0: off
00148	0x0093	1 bit	CH3 DI set channel Power-off storage enable on/off 1: on 0: off
00149	0x0094	1 bit	CH4 DI set channel Power-off storage enable on/off 1: on 0: off
00150	0x0095	1 bit	CH5 DI set channel Power-off storage enable on/off 1: on 0: off
00151	0x0096	1 bit	CH6 DI set channel Power-off storage enable on/off 1: on 0: off
00152	0x0097	1 bit	CH7 DI set channel Power-off storage enable on/off 1: on 0: off
00153	0x0098	1 bit	CH8 DI set channel Power-off storage enable on/off 1: on 0: off
00154	0x0099	1 bit	CH9 DI set channel Power-off storage enable on/off 1: on 0: off

Reference	Address	Data Type	Description
00155	0x009A	1 bit	CH10 DI set channel Power-off storage enable on/off 1: on 0: off
00156	0x009B	1 bit	CH11 DI set channel Power-off storage enable on/off 1: on 0: off
00157	0x009C	1 bit	DIO 0 1: output DO mode 0: input DI mode
00158	0x009D	1 bit	DIO 1 1: output DO mode 0: input DI mode
00159	0x009E	1 bit	DIO 2 1: output DO mode 0: input DI mode
00160	0x009F	1 bit	DIO 3 1: output DO mode 0: input DI mode

1xxxx Read Only Coils (Function 2)

Reference	Address	Data Type	Description
10001	0x0000	1 bit	CH0 DI value
10002	0x0001	1 bit	CH1 DI value
10003	0x0002	1 bit	CH2 DI value
10004	0x0003	1 bit	CH3 DI value
10005	0x0004	1 bit	CH4 DI value
10006	0x0005	1 bit	CH5 DI value
10007	0x0006	1 bit	CH6 DI value
10008	0x0007	1 bit	CH7 DI value
10009	0x0008	1 bit	CH8 DI value
10010	0x0009	1 bit	CH9 DI value
10011	0x000A	1 bit	CH10 DI value
10012	0x000B	1 bit	CH11 DI value
10013	0x000C	1 bit	Non-active
10014	0x000D	1 bit	Non-active
10015	0x000E	1 bit	Non-active
10016	0x000F	1 bit	Non-active

3xxxx Read Only Registers (Function 4)

Reference	Address	Data Type	Description
30001	0x0000	1 word	CH0 DI count value hi-byte
30002	0x0001	1 word	CH0 DI count value lo-byte
30003	0x0002	1 word	CH1 DI count value hi-byte
30004	0x0003	1 word	CH1 DI count value lo-byte
30005	0x0004	1 word	CH2 DI count value hi-byte
30006	0x0005	1 word	CH2 DI count value lo-byte
30007	0x0006	1 word	CH3 DI count value hi-byte
30008	0x0007	1 word	CH3 DI count value lo-byte
30009	0x0008	1 word	CH4 DI count value hi-byte
30010	0x0009	1 word	CH4 DI count value lo-byte
30011	0x000A	1 word	CH5 DI count value hi-byte
30012	0x000B	1 word	CH5 DI count value lo-byte
30013	0x000C	1 word	CH6 DI count value hi-byte
30014	0x000D	1 word	CH6 DI count value lo-byte
30015	0x000E	1 word	CH7 DI count value hi-byte
30016	0x000F	1 word	CH7 DI count value lo-byte
30017	0x0010	1 word	CH8 DI count value hi-byte
30018	0x0011	1 word	CH8 DI count value lo-byte
30019	0x0012	1 word	CH9 DI count value hi-byte
30020	0x0013	1 word	CH9 DI count value lo-byte

Reference	Address	Data Type	Description
30021	0x0014	1 word	CH10 DI count value hi-byte
30022	0x0015	1 word	CH10 DI count value lo-byte
30023	0x0016	1 word	CH11 DI count value hi-byte
30024	0x0017	1 word	CH11 DI count value lo-byte
312289	0x3000	1 word	CH0 DI value
312290	0x3001	1 word	CH1 DI value
312291	0x3002	1 word	CH2 DI value
312292	0x3003	1 word	CH3 DI value
312293	0x3004	1 word	CH4 DI value
312294	0x3005	1 word	CH5 DI value
312295	0x3006	1 word	CH6 DI value
312296	0x3007	1 word	CH7 DI value
312297	0x3008	1 word	CH8 DI value
312298	0x3009	1 word	CH9 DI value
312299	0x300A	1 word	CH10 DI value
312300	0x300B	1 word	CH11 DI value

4xxxx Read/Write Registers (Functions 3, 6, 16)

Reference	Address	Data Type	Description
40001	0x0000	word	CH0 DO pulse output count value hi-word
40002	0x0001	word	CH0 DO pulse output count value lo-word
40003	0x0002	word	CH1 DO pulse output count value hi-word
40004	0x0003	word	CH1 DO pulse output count value lo- word
40005	0x0004	word	CH2 DO pulse output count value hi- word
40006	0x0005	word	CH2 DO pulse output count value lo- word
40007	0x0006	word	CH3 DO pulse output count value hi- word
40008	0x0007	word	CH3 DO pulse output count value lo- word
40009	0x0008	word	CH4 DO pulse output count value hi- word
40010	0x0009	word	CH4 DO pulse output count value lo- word
40011	0x000A	word	CH5 DO pulse output count value hi- word
40012	0x000B	word	CH5 DO pulse output count value lo- word
40013	0x000C	word	CH6 DO pulse output count value hi- word
40014	0x000D	word	CH6 DO pulse output count value lo- word
40015	0x000E	word	CH7 DO pulse output count value hi- word
40016	0x000F	word	CH7 DO pulse output count value lo- word
40017	0x0010	word	CH8 DO pulse output count value hi- word
40018	0x0011	word	CH8 DO pulse output count value lo- word
40019	0x0012	word	CH9 DO pulse output count value hi- word
40020	0x0013	word	CH9 DO pulse output count value lo- word
40021	0x0014	word	CH10 DO pulse output count value hi- word
40022	0x0015	word	CH10 DO pulse output count value lo- word

40023	0x0016	word	CH11 DO pulse output count value hi- word
40024	0x0017	word	CH11 DO pulse output count value lo- word
40025	0x0018	word	CH0 DO pulse low signal width
40026	0x0019	word	CH1 DO pulse low signal width
40027	0x001A	word	CH2 DO pulse low signal width
40028	0x001B	word	CH3 DO pulse low signal width
40029	0x001C	word	CH4 DO pulse low signal width
40030	0x001D	word	CH5 DO pulse low signal width
40031	0x001E	word	CH6 DO pulse low signal width
40032	0x001F	word	CH7 DO pulse low signal width
40033	0x0020	word	CH8 DO pulse low signal width
40034	0x0021	word	CH9 DO pulse low signal width
40035	0x0022	word	CH10 DO pulse low signal width
40036	0x0023	word	CH11 DO pulse low signal width
40037	0x0024	word	CH0 DO pulse high signal width
40038	0x0025	word	CH1 DO pulse high signal width
40039	0x0026	word	CH2 DO pulse high signal width
40040	0x0027	word	CH3 DO pulse high signal width
40041	0x0028	word	CH4 DO pulse high signal width
40042	0x0029	word	CH5 DO pulse high signal width
40043	0x002A	word	CH6 DO pulse high signal width
40044	0x002B	word	CH7 DO pulse high signal width
40045	0x002C	word	CH8 DO pulse high signal width
40046	0x002D	word	CH9 DO pulse high signal width
40047	0x002E	word	CH10 DO pulse high signal width
40048	0x002F	word	CH11 DO pulse high signal width
40049	0x0030	word	CH0 DO mode 0: DO 1: pulse
40050	0x0031	word	CH1 DO mode 0: DO 1: pulse
40051	0x0032	word	CH2 DO mode 0: DO 1: pulse
40052	0x0033	word	CH3 DO mode 0: DO 1: pulse
40053	0x0034	word	CH4 DO mode 0: DO 1: pulse
40054	0x0035	word	CH5 DO mode 0: DO 1: pulse
40055	0x0036	word	CH6 DO mode 0: DO 1: pulse
40056	0x0037	word	CH7 DO mode 0: DO 1: pulse

40057	0x0038	word	CH8 DO mode 0: DO 1: pulse
40058	0x0039	word	CH9 DO mode 0: DO 1: pulse
40059	0x003A	word	CH10 DO mode 0: DO 1: pulse
40060	0x003B	word	CH11 DO mode 0: DO 1: pulse
40061	0x003C	word	CH0 DI count filter
40062	0x003D	word	CH1 DI count filter
40063	0x003E	word	CH2 DI count filter
40064	0x003F	word	CH3 DI count filter
40065	0x0040	word	CH4 DI count filter
40066	0x0041	word	CH5 DI count filter
40067	0x0042	word	CH6 DI count filter
40068	0x0043	word	CH7 DI count filter
40069	0x0044	word	CH8 DI count filter
40070	0x0045	word	CH9 DI count filter
40071	0x0046	word	CH10 DI count filter
40072	0x0047	word	CH11 DI count filter
40073	0x0048	word	CH0 DI mode 0: DI 1: count Other: return illegal data value
40074	0x0049	word	CH1 DI mode 0: DI 1: count Other: return illegal data value
40075	0x004A	word	CH2 DI mode 0: DI 1: count Other: return illegal data value
40076	0x004B	word	CH3 DI mode 0: DI 1: count Other: return illegal data value
40077	0x004C	word	CH4 DI mode 0: DI 1: count Other: return illegal data value

40078	0x004D	word	CH5 DI mode 0: DI 1: count Other: return illegal data value
40079	0x004E	word	CH6 DI mode 0: DI 1: count Other: return illegal data value
40080	0x004F	word	CH7 DI mode 0: DI 1: count Other: return illegal data value
40081	0x0050	word	CH8 DI mode 0: DI 1: count Other: return illegal data value
40082	0x0051	word	CH9 DI mode 0: DI 1: count Other: return illegal data value
40083	0x0052	word	CH10 DI mode 0: DI 1: count Other: return illegal data value
40084	0x0053	word	CH11 DI mode 0: DI 1: count Other: return illegal data value
For Citect SCADA compatibility, I/O data can be WORD accessed as well			
40085	0x0054	1 word	CH0 DO value 0: off 1: on
40086	0x0055	1 word	CH1 DO value 0: off 1: on
40087	0x0056	1 word	CH2 DO value 0: off 1: on
40088	0x0057	1 word	CH3 DO value 0: off 1: on
40089	0x0058	1 word	CH4 DO value 0: off 1: on
40090	0x0059	1 word	CH5 DO value 0: off 1: on
40091	0x005A	1 word	CH6 DO value 0: off 1: on

40092	0x005B	1 word	CH7 DO value 0: off 1: on
40093	0x005C	1 word	CH8 DO value 0: off 1: on
40094	0x005D	1 word	CH9 DO value 0: off 1: on
40095	0x005E	1 word	CH10 DO value 0: off 1: on
40096	0x005F	1 word	CH11 DO value 0: off 1: on
40097	0x0060	1 word	CH0 DO power on value 0: off 1: on
40098	0x0061	1 word	CH1 DO power on value 0: off 1: on
40099	0x0062	1 word	CH2 DO power on value 0: off 1: on
40100	0x0063	1 word	CH3 DO power on value 0: off 1: on
40101	0x0064	1 word	CH4 DO power on value 0: off 1: on
40102	0x0065	1 word	CH5 DO power on value 0: off 1: on
40103	0x0066	1 word	CH6 DO power on value 0: off 1: on
40104	0x0067	1 word	CH7 DO power on value 0: off 1: on
40105	0x0068	1 word	CH8 DO power on value 0: off 1: on
40106	0x0069	1 word	CH9 DO power on value 0: off 1: on
40107	0x006A	1 word	CH10 DO power on value 0: off 1: on
40108	0x006B	1 word	CH11 DO power on value 0: off 1: on
40109	0x006C	1 word	CH0 DO safe mode value 0: off 1: on
40110	0x006D	1 word	CH1 DO safe mode value 0: off 1: on
40111	0x006E	1 word	CH2 DO safe mode value 0: off 1: on
40112	0x006F	1 word	CH3 DO safe mode value 0: off 1: on

40113	0x0070	1 word	CH4 DO safe mode value 0: off 1: on
40114	0x0071	1 word	CH5 DO safe mode value 0: off 1: on
40115	0x0072	1 word	CH6 DO safe mode value 0: off 1: on
40116	0x0073	1 word	CH7 DO safe mode value 0: off 1: on
40117	0x0074	1 word	CH8 DO safe mode value 0: off 1: on
40118	0x0075	1 word	CH9 DO safe mode value 0: off 1: on
40119	0x0076	1 word	CH10 DO safe mode value 0: off 1: on
40120	0x0077	1 word	CH11 DO safe mode value 0: off 1: on
40121	0x0078	1 word	CH0 DO pulse operate status 0: stop 1: start
40122	0x0079	1 word	CH1 DO pulse operate status 0: stop 1: start
40123	0x007A	1 word	CH2 DO pulse operate status 0: stop 1: start
40124	0x007B	1 word	CH3 DO pulse operate status 0: stop 1: start
40125	0x007C	1 word	CH4 DO pulse operate status 0: stop 1: start
40126	0x007D	1 word	CH5 DO pulse operate status 0: stop 1: start
40127	0x007E	1 word	CH6 DO pulse operate status 0: stop 1: start
40128	0x007F	1 word	CH7 DO pulse operate status 0: stop 1: start
40129	0x0080	1 word	CH8 DO pulse operate status 0: stop 1: start
40130	0x0081	1 word	CH9 DO pulse operate status 0: stop 1: start
40131	0x0082	1 word	CH10 DO pulse operate status 0: stop 1: start
40132	0x0083	1 word	CH11 DO pulse operate status 0: stop 1: start
40133	0x0084	1 word	CH0 DO power-on pulse operate status 0: stop 1: start

40134	0x0085	1 word	CH1 DO power-on pulse operate status 0: stop 1: start
40135	0x0086	1 word	CH2 DO power-on pulse operate status 0: stop 1: start
40136	0x0087	1 word	CH3 DO power-on pulse operate status 0: stop 1: start
40137	0x0088	1 word	CH4 DO power-on pulse operate status 0: stop 1: start
40138	0x0089	1 word	CH5 DO power-on pulse operate status 0: stop 1: start
40139	0x008A	1 word	CH6 DO power-on pulse operate status 0: stop 1: start
40140	0x008B	1 word	CH7 DO power-on pulse operate status 0: stop 1: start
40141	0x008C	1 word	CH8 DO power-on pulse operate status 0: stop 1: start
40142	0x008D	1 word	CH9 DO power-on pulse operate status 0: stop 1: start
40143	0x008E	1 word	CH10 DO power-on pulse operate status 0: stop 1: start
40144	0x008F	1 word	CH11 DO power-on pulse operate status 0: stop 1: start
40145	0x0090	1 word	CH0 DO safe mode pulse operate status 0: stop 1: start
40146	0x0091	1 word	CH1 DO safe mode pulse operate status 0: stop 1: start
40147	0x0092	1 word	CH2 DO safe mode pulse operate status 0: stop 1: start
40148	0x0093	1 word	CH3 DO safe mode pulse operate status 0: stop 1: start
40149	0x0094	1 word	CH4 DO safe mode pulse operate status 0: stop 1: start
40150	0x0095	1 word	CH5 DO safe mode pulse operate status 0: stop 1: start
40151	0x0096	1 word	CH6 DO safe mode pulse operate status 0: stop 1: start
40152	0x0097	1 word	CH7 DO safe mode pulse operate status 0: stop 1: start
40153	0x0098	1 word	CH8 DO safe mode pulse operate status 0: stop 1: start
40154	0x0099	1 word	CH9 DO safe mode pulse operate status 0: stop 1: start

40155	0x009A	1 word	CH10 DO safe mode pulse operate status 0: stop 1: start
40156	0x009B	1 word	CH11 DO safe mode pulse operate status 0: stop 1: start
40157	0x009C	1 word	CH0 DI counter operate status 0: stop 1: start
40158	0x009D	1 word	CH1 DI counter operate status 0: stop 1: start
40159	0x009E	1 word	CH2 DI counter operate status 0: stop 1: start
40160	0x009F	1 word	CH3 DI counter operate status 0: stop 1: start
40161	0x0A0	1 word	CH4 DI counter operate status 0: stop 1: start
40162	0x00A1	1 word	CH5 DI counter operate status 0: stop 1: start
40163	0x00A2	1 word	CH6 DI counter operate status 0: stop 1: start
40164	0x00A3	1 word	CH7 DI counter operate status 0: stop 1: start
40165	0x00A4	1 word	CH8 DI counter operate status 0: stop 1: start
40166	0x00A5	1 word	CH9 DI counter operate status 0: stop 1: start
40167	0x00A6	1 word	CH10 DI counter operate status 0: stop 1: start
40168	0x00A7	1 word	CH11 DI counter operate status 0: stop 1: start
40169	0x00A8	1 word	CH0 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value(0x03)
40170	0x00A9	1 word	CH1 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value(0x03)

40171	0x00AA	1 word	CH2 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value(0x03)
40172	0x00AB	1 word	CH3 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value(0x03)
40173	0x00AC	1 word	CH4 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value(0x03)
40174	0x00AD	1 word	CH5 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value(0x03)
40175	0x00AE	1 word	CH6 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value(0x03)
40176	0x00AF	1 word	CH7 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value(0x03)
40177	0x00B0	1 word	CH8 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value(0x03)

40178	0x00B1	1 word	CH9 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value(0x03)
40179	0x00B2	1 word	CH10 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value (0x03)
40180	0x00B3	1 word	CH11 DI clear count value Read: 0: no action Write: 1: clear counter value 0: return illegal data value (0x03)
40181	0x00B4	1 word	CH0 DI overflow status Read: 0: normal 1: overflow Write : 0: clear overflow status 1: return illegal data value (0x03)
40182	0x00B5	1 word	CH1 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value (0x03)
40183	0x00B6	1 word	CH2 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value (0x03)
40184	0x00B7	1 word	CH3 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value (0x03)

40185	0x00B8	1 word	CH4 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value (0x03)
40186	0x00B9	1 word	CH5 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value (0x03)
40187	0x00BA	1 word	CH6 DI overflow status Read: 0: Normal 1: Overflow Write: 0: clear overflow status 1: return illegal data value (0x03)
40188	0x00BB	1 word	CH7 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value (0x03)
40189	0x00BC	1 word	CH8 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value (0x03)
40190	0x00BD	1 word	CH9 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value (0x03)
40191	0x00BE	1 word	CH10 DI overflow Status Read : 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value (0x03)

40192	0x00BF	1 word	CH11 DI overflow status Read: 0: normal 1: overflow Write: 0: clear overflow status 1: return illegal data value (0x03)
40193	0x00C0	1 word	CH0 DI counter trigger 0=low to high, 1=high to low
40194	0x00C1	1 word	CH1 DI counter trigger 0=low to high, 1=high to low
40195	0x00C2	1 word	CH2 DI counter trigger 0=low to high, 1=high to low
40196	0x00C3	1 word	CH3 DI counter trigger 0=low to high, 1=high to low
40197	0x00C4	1 word	CH4 DI counter trigger 0=low to high, 1=high to low
40198	0x00C5	1 word	CH5 DI counter trigger 0=low to high, 1=high to low
40199	0x00C6	1 word	CH6 DI counter trigger 0=low to high, 1=high to low
40200	0x00C7	1 word	CH7 DI counter trigger 0=low to high, 1=high to low
40201	0x00C8	1 word	CH8 DI counter trigger 0=low to high, 1=high to low
40202	0x00C9	1 word	CH9 DI counter trigger 0=low to high, 1=high to low
40203	0x00CA	1 word	CH10 DI counter trigger 0=low to high, 1=high to low
40204	0x00CB	1 word	CH11 DI counter trigger 0=low to high, 1=high to low
40205	0x00CC	1 word	CH0 DI power-on counter operate status 0: stop 1: start
40206	0x00CD	1 word	CH1 DI power-on counter operate status 0: stop 1: start
40207	0x00CE	1 word	CH2 DI power-on counter operate status 0: stop 1: start
40208	0x00CF	1 word	CH3 DI power-on counter operate status 0: stop 1: start
40209	0x00D0	1 word	CH4 DI power-on counter operate status 0: stop 1: start
40210	0x00D1	1 word	CH5 DI power-on counter operate status 0: stop 1: start

40211	0x00D2	1 word	CH6 DI power-on counter operate status 0: stop 1: start
40212	0x00D3	1 word	CH7 DI power-on counter operate status 0: stop 1: start
40213	0x00D4	1 word	CH8 DI power-on counter operate status 0: stop 1: start
40214	0x00D5	1 word	CH9 DI power-on counter operate status 0: stop 1: start
40215	0x00D6	1 word	CH10 DI power-on counter operate status 0: stop 1: start
40216	0x00D7	1 word	CH11 DI power-on counter operate status 0: stop 1: start
40217	0x00D8	1 word	CH0 DI safe mode counter operate status 0: stop 1: start
40218	0x00D9	1 word	CH1 DI safe mode counter operate status 0: stop 1: start
40219	0x00DA	1 word	CH2 DI safe mode counter operate status 0: stop 1: start
40220	0x00DB	1 word	CH3 DI safe mode counter operate status 0: stop 1: start
40221	0x00DC	1 word	CH4 DI safe mode counter operate status 0: stop 1: start
40222	0x00DD	1 word	CH5 DI safe mode counter operate status 0: stop 1: start
40223	0x00DE	1 word	CH6 DI safe mode counter operate status 0: stop 1: start
40224	0x00DF	1 word	CH7 DI safe mode counter operate status 0: stop 1: start
40225	0x00E0	1 word	CH8 DI safe mode counter operate status 0: stop 1: start
40226	0x00E1	1 word	CH9 DI safe mode counter operate status 0: stop 1: start
40227	0x00E2	1 word	CH10 DI safe mode counter operate status 0: stop 1: start
40228	0x00E3	1 word	CH11 DI safe mode counter operate status 0: stop 1: start
40229	0x00E4	1 word	CH0 DI set channel Power-off storage enable ON/OFF 1: on 0: off
40230	0x00E5	1 word	CH1 DI set channel Power-off storage enable ON/OFF 1: on 0: off

40231	0x00E6	1 word	CH2 DI set channel Power-off storage enable ON/OFF 1: on 0: off
40232	0x00E7	1 word	CH3 DI set channel Power-off storage enable ON/OFF 1: on 0: off
40233	0x00E8	1 word	CH4 DI set channel Power-off storage enable ON/OFF 1: on 0: off
40234	0x00E9	1 word	CH5 DI set channel Power-off storage enable ON/OFF 1: on 0: off
40235	0x00EA	1 word	CH6 DI set channel Power-off storage enable ON/OFF 1: on 0: off
40236	0x00EB	1 word	CH7 DI set channel Power-off storage enable ON/OFF 1: on 0: off
40237	0x00EC	1 word	CH8 DI set channel Power-off storage enable ON/OFF 1: on 0: off
40238	0x00ED	1 word	CH9 DI set channel Power-off storage enable ON/OFF 1: on 0: off
40239	0x00EE	1 word	CH10 DI set channel Power-off storage enable ON/OFF 1: on 0: off
40240	0x00EF	1 word	CH11 DI set channel Power-off storage enable ON/OFF 1: on 0: off
40241	0x00F0	1 word	DIO 0 1: output DO mode 0: input DI mode
40242	0x00F1	1 word	DIO 1 1: output DO mode 0: input DI mode
40243	0x00F2	1 word	DIO 2 1: output DO mode 0: input DI mode
40244	0x00F3	1 word	DIO 3 1: output DO mode 0: input DI mode
40377	0x0178	word	Internal Register 00 Value

40378	0x0179	word	Internal Register 01 Value
40379	0x017A	word	Internal Register 02 Value
40380	0x017B	word	Internal Register 03 Value
40381	0x017C	word	Internal Register 04 Value
40382	0x017D	word	Internal Register 05 Value
40383	0x017E	word	Internal Register 06 Value
40384	0x017F	word	Internal Register 07 Value
40385	0x0180	word	Internal Register 08 Value
40386	0x0181	word	Internal Register 09 Value
40387	0x0182	word	Internal Register 10 Value
40388	0x0183	word	Internal Register 11 Value
40389	0x0184	word	Internal Register 12 Value
40390	0x0185	word	Internal Register 13 Value
40391	0x0186	word	Internal Register 14 Value
40392	0x0187	word	Internal Register 15 Value
40393	0x0188	word	Internal Register 16 Value
40394	0x0189	word	Internal Register 17 Value
40395	0x018A	word	Internal Register 18 Value
40396	0x018B	word	Internal Register 19 Value
40397	0x018C	word	Internal Register 20 Value
40398	0x018D	word	Internal Register 21 Value
40399	0x018E	word	Internal Register 22 Value
40400	0x018F	word	Internal Register 23 Value

C
Used Network Port Numbers

E2212 Network Port Usage

Port	Type	Usage
68	UDP	BOOTPC
68	UDP	DHCP
69	UDP	Export/import file
80	TCP	Web Server
161	TCP	SNMP
502	TCP	Modbus Communication
4800	UDP	Auto search
9020	TCP	Peer-to-Peer function
9000	TCP	Active Message (Default)
9000	UDP	Active Message (Default)
9900	TCP	Active Tags updates (default)
4040	TCP	ioEventLog

D

SNMP Agents with MIB II, RS-232-like Groups

RFC1213 MIB II Supported SNMP Variables

The following SNMP variables are built into the ioLogik firmware and are compliant with RFC1213 MIB II.

System MIB		
SysDescr	SysContact	SysServices
SysObjectID	SysName	
SysUpTime	SysLocation	

Interfaces MIB		
ifNumber	ifOperStatus	ifOutOctets
ifIndex	ifLastChange	ifOutUcastPkts
ifDescr	ifInOctets	ifOutNUcastPkts
ifType	ifInUcastPkts	ifOutDiscards
ifMtu	ifInNUcastPkts	ifOutErrors
ifSpeed	ifInDiscards	ifOutQLen
ifPhysAddress	ifInErrors	ifSpecific
ifAdminStatus	ifInUnknownProtos	

IP MIB		
ipForwarding	ipReasmFails	ipRouteNextHop
IpDefaultTTL	ipFragOKs	ipRouteType
ipInreceives	ipFragFails	ipRouteProto
ipInHdrErrors	ipFragCreates	ipRouteAge
ipInAddrErrors	ipAdEntAddr	ipRouteMask
ipforwDatagrams	ipAdEntIfIndex	ipRouteMetric5
ipInUnknownProtos	ipAdEntNetMask	ipRouteInfo
ipInDiscards	ipAdEntBcastAddr	ipNetToMediaIfIndex

IP MIB		
ipInDelivers	ipAdEntReasmMaxSize	ipNetToMediaPhysAddress
ipOutRequests	ipRouteDest	ipNetToMediaNetAddress
ipOutDiscards	ipRouteIfIndex	ipNetToMediaType
ipOutNoRoutes	ipRouteMetric1	ipRoutingDiscards
ipReasmtimeout	ipRouteMetric2	
ipReasmReqds	ipRouteMetric3	
ipReasmOKs	ipRouteMetric4	
IcmpInmsgs	IcmpIntimestamps	IcmpOutRedirects
IcmpInErrors	IcmpTimestampReps	IcmpOutechos
IcmpInDestUnreachs	IcmpInAddrMasks	IcmpOutEchoReps
IcmpIntimeExcds	IcmpOutMsgs	IcmpOuttimestamps
IcmpInParmProbs	IcmpOutErrors	IcmpOutTimestampReps
IcmpInSrcQuenchs	IcmpOutDestUnreachs	IcmpOutAddrMasks
IcmpInRedirects	IcmpOutTimeExcds	IcmpOutaddrMaskReps
IcmpInEchos	IcmpOutParmProbs	
IcmpInEchoReps	IcmpOutSrcQuenchs	

UDP MIB		
UdpInDatagrams	UdpInErrors	UdpLocalAddress
UdpNoPorts	UdpOutDatagrams	UdpLocalPort

Address Translation MIB		
AtIfIndex	AtNetAddress	
AtPhysAddress	AtNetAddress	

TCP MIB		
tcpRtoAlgorithm	tcpEstabResets	tcpConnLocalPort
tcpRtoMin	tcpCurrEstab	tcpConnremAddress
tcpRtoMax	tcpInSegs	tcpConnremPort
tcpMaxConn	tcpOutsegs	tcpInErrs
tcpActiveOpens	tcpRetransSegs	tcpoutRsts
tcpPassiveOpens	tcpconnstate	
tcpAttempFails	tcpconnLocalAddress	

SNMP MIB		
snmpInPkts	snmpIngenErrs	snmpOutBadValues
snmpOutPkts	nnmpInTotalReqVars	snmpOutGenErrs
snmpInBadVersions	snmpIntotalSetVars	snmpOutGetRequests
snmpInBadCommunityNames	snmpInGetRequests	snmpOutGetNexts
snmpInBadCommunityUses	snmpInGetNexts	snmpOutSetrequests
snmpInASNParseErrs	snmpInSetRequests	snmpOutGetResponses
snmpInTooBigs	snmpIngetResponses	snmpOutTraps
snmpInNoSuchNames	snmpInTraps	snmpEnableAuthenTraps
snmpInBadValues	snmpOutTooBigs	
snmpInReadOnlys	snmpOutNoSuchNames	

Private MIB File and SNMP Variables

Moxa also provides an SNMP to I/O MIB file that can help you monitor I/O status with SNMP software. You can find the MIB file on the Document and Software CD.

Moxa IO MIB		
totalChannelNumber	DI07-Status	DO06-LowWidth
serverModel	DI07-Filter	DO06-HighWidth
system Time	DI07-Tigger	DO06-PulseStart
firmwareVersion	DO00-Index	DO07-Index
DI00-Filter	DI07-Filter	DO07-Type
DI00-Index	DI07-Index	DO07-Mode
DI00-Type	DO00-Mode	DO07-Status
DI00-Mode	DO00-Status	DO01-PulseStart
DI00- Status	DO00-LowWidth	DO07-LowWidth
DI00-Filter	DO00-HighWidth	DO07-HighWidth
DI00-Tigger	DO00-PulseStart	DO07-PulseStart
DI01-Index	DO01-Index	DIO08-Index
DI01-Type	DO01-Type	DIO08-Type
DI01-Mode	DO01-Mode	DIO08-Mode
DI01-Status	DO01-Status	DIO08-Status
DI01-Filter	DO01-LowWidth	DIO08-Filter
DI02-Tigger	DO01-HighWidth	DIO08-Tigger
DI02-Index	DO01-PulseStart	DIO08-LowWidth
DI02-Type	DO02-Index	DIO08-HighWdith
DI03-Mode	DO02-Type	DIO08-PulseStart

Moxa IO MIB		
DI02-Status	DO02-Mode	DIO09-Index
DI02-Filter	DO02-Status	DIO09-Type
DI02-Tigger	DO02-LowWidth	DIO09-Mode
DI03-Index	DO02-HighWidth	DIO09-Status
DI03-Type	DO02-PulseStart	DIO09-Filter
DI03-Mode	DO03-Index	DIO09-Tigger
DI03-Status	DO03-Type	DIO09-LowWidth
DI03-Filter	DO03-Mode	DIO09-HighWidth
DI03-Tigger	DO03-Status	DIO09-PulseStart
DI04-Index	DO03-LowWidth	DIO10-Index
DI04-Type	DO03-HighWidth	DIO10-Type
DI04-Mode	DO03-PulseStart	DIO10-Mode
DI04-Status	DO04-Index	DIO10-Status
DI04-Filter	DO04-Type	DIO10-Filter
DI04-Tigger	DO04-Mode	DIO10-Tigger
DI05-Index	DO04-Status	DIO10-LowWidth
DI05-Type	DO04-LowWidth	DIO10-HighWidth
DI05-Mode	DO04-HighWidth	DIO10-PulseStart
DI05-Status	DO04-PulseStart	DIO11-Index
DI05-Filter	DO05-Index	DIO11-Type
DI05-Tigger	DO05-Type	DIO11-Mode
DI06-Index	DO05-Mode	DIO11-Status
DI06-Type	DO05-Status	DIO11-Filter
DI06-Mode	DO05-LowWidth	DIO11-Tigger
DI06-Status	DO05-HighWidth	DIO11-LowWidth
DI06-Filter	DO05-PulseStart	DIO11-HighWidth
DI06-Tigger	DO06-Index	DIO11-PulseStart
DI07-Index	DO06-Type	
DI07-Type	DO06-Mode	
DI07-Mode	DO06-Status	

E
CGI Commands

Using a web browser or standard http protocol, it will be easy for a Security SCADA system to monitor and control an ioLogik via CGI commands.

Syntax to get the settings is as follows. Starting with the ioLogik's IP or URL, specify **getParam.cgi** with a question mark. Then specify the command with another question mark as the ending. Those commands are case sensitive and the **&** sign is used to combine multiple commands.

http://IP/getParam.cgi?command _channel=?&command _channel=?&.....(Max 200 char)

Commands to get system information	**Commands to get system information**
DATE	FWR_V
TIME	MOD_NAME
IP	SN_NUM
LOC	MAC_ADDR
DESC	

Commands to get DI information	**Commands to get DI information**
DIMode_00 (0:DI, 1:COUNTER)	DIMode_01 (0:DI, 1:COUNTER)
DIStatus_00 (0:OFF, 1:ON)	DIStatus_01 (0:OFF, 1:ON)
DIFilter_00	DIFilter_01
DITrigger_00 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)	DITrigger_01 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)
DICntStart_00 (0:STOP, 1:START)	DICntStart_01 (0:STOP, 1:START)
DICNT_00	DICNT_01
DIMode_02 (0:DI, 1:COUNTER)	DIMode_03 (0:DI, 1:COUNTER)
DIStatus_02 (0:OFF, 1:ON)	DIStatus_03 (0:OFF, 1:ON)
DIFilter_02	DIFilter_03
DITrigger_02 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)	DITrigger_03 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)
DICntStart_02	DICntStart_03

(0:STOP, 1:START)	(0:STOP, 1:START)
DICNT_02	DICNT_03
DIMode_04 (0:DI, 1:COUNTER)	DIMode_05 (0:DI, 1:COUNTER)
DIStatus_04 (0:OFF, 1:ON)	DIStatus_05 (0:OFF, 1:ON)
DIFilter_04	DIFilter_05
DITrigger_04 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)	DITrigger_05 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)
DICntStart_04 (0:STOP, 1:START)	DICntStart_05 (0:STOP, 1:START)
DICNT_04	DICNT_05
DIMode_06 (0:DI, 1:COUNTER)	DIMode_07 (0:DI, 1:COUNTER)
DIStatus_06 (0:OFF, 1:ON)	DIStatus_07 (0:OFF, 1:ON)
DIFilter_06	DIFilter_07
DITrigger_06 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)	DITrigger_07 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)
DICntStart_06 (0:STOP, 1:START)	DICntStart_07 (0:STOP, 1:START)
DICNT_06	DICNT_07
DIMode_08 (0:DI, 1:COUNTER)	DIMode_09 (0:DI, 1:COUNTER)
DIStatus_08 (0:OFF, 1:ON)	DIStatus_09 (0:OFF, 1:ON)
DIFilter_08	DIFilter_09
DITrigger_08 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)	DITrigger_09 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)
DICntStart_08 (0:STOP, 1:START)	DICntStart_09 (0:STOP, 1:START)
DICNT_08	DICNT_09
DIMode_10 (0:DI, 1:COUNTER)	DIMode_11 (0:DI, 1:COUNTER)
DIStatus_10 (0:OFF, 1:ON)	DIStatus_11 (0:OFF, 1:ON)
DIFilter_10	DIFilter_11
DITrigger_10 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)	DITrigger_11 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)
DICntStart_10 (0:STOP, 1:START)	DICntStart_11(0:STOP, 1:START)
DICNT_10	DICNT_11

Commands to get DO information	Commands to get DO information
DOMode_00 (0:DO, 1:PULSE OUTPUT)	DOMode_01 (0:DO, 1:PULSE OUTPUT)
DOStatus_00 (0:OFF, 1:ON)	DOStatus_01 (0:OFF, 1:ON)
DOLowWidth_00	DOLowWidth_01
DOHighWidth_00	DOHighWidth_01
DOPulseStart_00 (0:STOP, 1:START)	DOPulseStart_01 (0:STOP, 1:START)
DOMode_02 (0:DO, 1:PULSE OUTPUT)	DOMode_03 (0:DO, 1:PULSE OUTPUT)
DOStatus_02 (0:OFF, 1:ON)	DOStatus_03 (0:OFF, 1:ON)
DOLowWidth_02	DOLowWidth_03
DOHighWidth_02	DOHighWidth_03
DOPulseStart_02 (0:STOP, 1:START)	DOPulseStart_03 (0:STOP, 1:START)
DOMode_04 (0:DO, 1:PULSE OUTPUT)	DOMode_05 (0:DO, 1:PULSE OUTPUT)
DOStatus_04 (0:OFF, 1:ON)	DOStatus_05 (0:OFF, 1:ON)
DOLowWidth_04	DOLowWidth_05
DOHighWidth_04	DOHighWidth_05
DOPulseStart_04 (0:STOP, 1:START)	DOPulseStart_05 (0:STOP, 1:START)
DOMode_06 (0:DO, 1:PULSE OUTPUT)	DOMode_07 (0:DO, 1:PULSE OUTPUT)
DOStatus_06 (0:OFF, 1:ON)	DOStatus_07 (0:OFF, 1:ON)
DOLowWidth_06	DOLowWidth_07
DOHighWidth_06	DOHighWidth_07
DOPulseStart_06 (0:STOP, 1:START)	DOPulseStart_07 (0:STOP, 1:START)

Syntax to get the settings is as follows. Starting with the ioLogik's IP or URL, specify **setParam.cgi** with a question mark. Then specify the command with another question mark as the ending. Those commands are case sensitive and the **&** sign is used to combine multiple commands.

http://IP/setParam.cgi?command _channel=value&command _channel=value&..(Max 200 char)

Commands to set DI channels	Commands to set DI channels
DIMode_00 (0:DI, 1:COUNTER)	DIMode_01 (0:DI, 1:COUNTER)
DIFilter_00	DIFilter_01
DITrigger_00 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)	DITrigger_01 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)
DICntStart_00 (0:STOP, 1:START)	DICntStart_01 (0:STOP, 1:START)
DIMode_02 (0:DI, 1:COUNTER)	DIMode_03 (0:DI, 1:COUNTER)
DIFilter_02	DIFilter_03
DITrigger_02 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)	DITrigger_03 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)
DICntStart_02 (0:STOP, 1:START)	DICntStart_03 (0:STOP, 1:START)
DIMode_04 (0:DI, 1:COUNTER)	DIMode_05 (0:DI, 1:COUNTER)
DIFilter_04	DIFilter_05
DITrigger_04 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)	DITrigger_05 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)
DICntStart_04 (0:STOP, 1:START)	DICntStart_05 (0:STOP, 1:START)
DIMode_06 (0:DI, 1:COUNTER)	DIMode_07 (0:DI, 1:COUNTER)
DIFilter_06	DIFilter_07
DITrigger_06 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)	DITrigger_07 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)
DICntStart_06 (0:STOP, 1:START)	DICntStart_07 (0:STOP, 1:START)
DIMode_08 (0:DI, 1:COUNTER)	DIMode_09 (0:DI, 1:COUNTER)
DIFilter_08	DIFilter_09
DITrigger_08 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)	DITrigger_09 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)
DICntStart_08 (0:STOP, 1:START)	DICntStart_09 (0:STOP, 1:START)
DIMode_10 (0:DI, 1:COUNTER)	DIMode_11 (0:DI, 1:COUNTER)
DIFilter_10	DIFilter_11

DITrigger_10 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)	DITrigger_11 (0:LOW TO HIGH, 1:HIGH TO LOW, 2:BOTH)
DICntStart_10 (0:STOP, 1:START)	DICntStart_11 (0:STOP, 1:START)

Commands to set DO channels	**Commands to set DO channels**
DOMode_00 (0:DO, 1:PULSE OUTPUT)	DOMode_01 (0:DO, 1:PULSE OUTPUT)
DOStatus_00 (0:OFF, 1:ON)	DOStatus_01 (0:OFF, 1:ON)
DOLowWidth_00	DOLowWidth_01
DOHighWidth_00	DOHighWidth_01
DOPulseStart_00 (0:STOP, 1:START)	DOPulseStart_01 (0:STOP, 1:START)
DOMode_02 (0:DO, 1:PULSE OUTPUT)	DOMode_03 (0:DO, 1:PULSE OUTPUT)
DOStatus_02 (0:OFF, 1:ON)	DOStatus_03 (0:OFF, 1:ON)
DOLowWidth_02	DOLowWidth_03
DOHighWidth_02	DOHighWidth_03
DOPulseStart_02 (0:STOP, 1:START)	DOPulseStart_03 (0:STOP, 1:START)
DOMode_04 (0:DO, 1:PULSE OUTPUT)	DOMode_05 (0:DO, 1:PULSE OUTPUT)
DOStatus_04 (0:OFF, 1:ON)	DOStatus_05 (0:OFF, 1:ON)
DOLowWidth_04	DOLowWidth_05
DOHighWidth_04	DOHighWidth_05
DOPulseStart_04 (0:STOP, 1:START)	DOPulseStart_05 (0:STOP, 1:START)
DOMode_06 (0:DO, 1:PULSE OUTPUT)	DOMode_07 (0:DO, 1:PULSE OUTPUT)
DOStatus_06 (0:OFF, 1:ON)	DOStatus_07 (0:OFF, 1:ON)
DOLowWidth_06	DOLowWidth_07
DOHighWidth_06	DOHighWidth_07
DOPulseStart_06 (0:STOP, 1:START)	DOPulseStart_07 (0:STOP, 1:START)
DOMode_08 (0:DO, 1:PULSE OUTPUT)	DOMode_09 (0:DO, 1:PULSE OUTPUT)
DOStatus_08 (0:OFF, 1:ON)	DOStatus_09 (0:OFF, 1:ON)
DOLowWidth_08	DOLowWidth_09
DOHighWidth_08	DOHighWidth_09
DOPulseStart_08 (0:STOP, 1:START)	DOPulseStart_09 (0:STOP, 1:START)
DOMode_10 (0:DO, 1:PULSE OUTPUT)	DOMode_11 (0:DO, 1:PULSE OUTPUT)
DOStatus_10	DOStatus_11

(0:OFF, 1:ON)	(0:OFF, 1:ON)
DOLowWidth_10	DOLowWidth_11
DOHighWidth_10	DOHighWidth_11
DOPulseStart_10 (0:STOP, 1:START)	DOPulseStart_11 (0:STOP, 1:START)

F
Factory Default Settings

The factory default settings for the ioLogik E2212 are as follows:

IP address:	192.168.127.254
Netmask:	255.255.0.0
Gateway:	None
Communication Watchdog:	Disable
Modbus/TCP Alive Check:	ON
Modbus/TCP Timeout Interval:	60 sec

DI Mode:	DI
DI Safe Status:	Off
Filter Time for Counter:	100 ×0.5mS
Counter Trigger Type:	Lo to Hi
Counter Status:	Stop

DO Mode:	DO
DO Safe Status:	Off
Pulse Low Width:	1
Pulse Hi Width:	1
No. of Pulses:	0 (continuous)

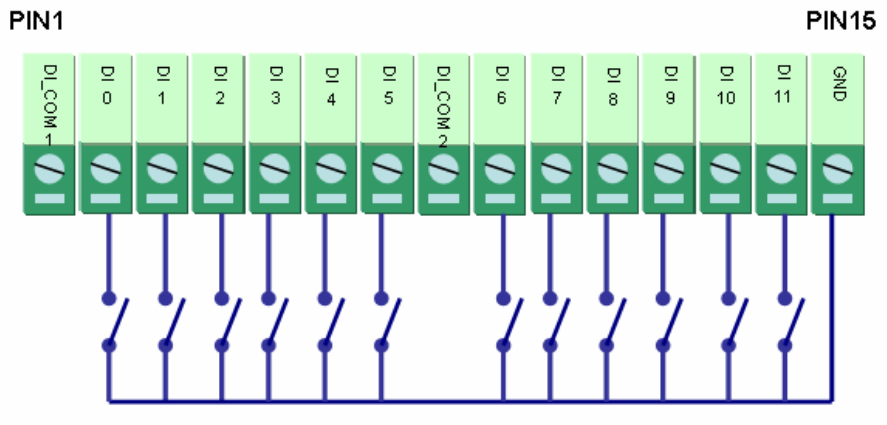
DIOChannel Type:	DI
DI Safe Status:	Off
Filter Time for Counter:	10 × 0.5mS
Counter Trigger Type:	Lo to Hi
Counter Status:	Stop
Counter status:	Stop

Password:	“empty”
Module Name:	“empty”
Module Location:	“empty:
SNMP:	Enable
Community:	Public
Contact:	“empty”
Location:	“empty”

G
Cable Wiring

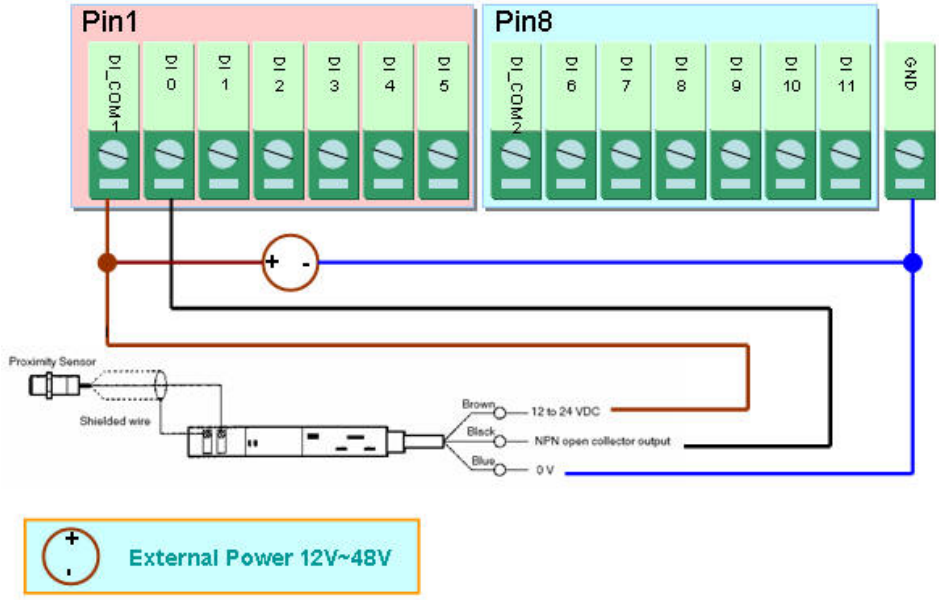
Device Wiring Diagrams

Digital Input Dry Contact

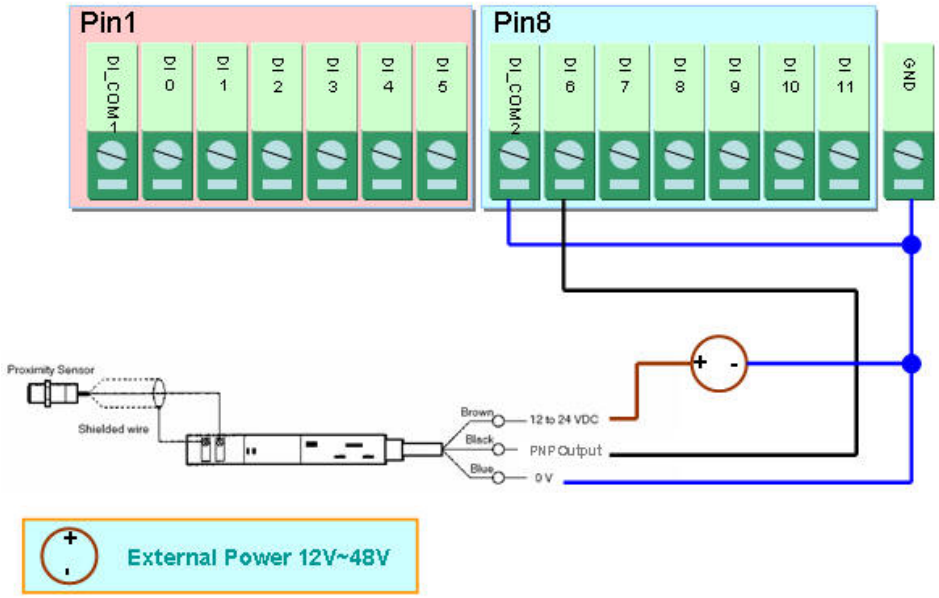


Digital Input Wet Contact

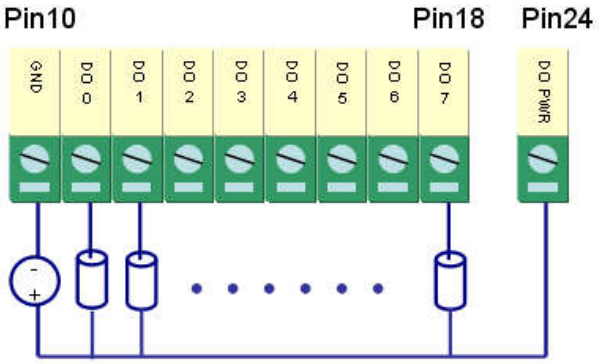
NPN Type Sensors Connection



PNP Type Sensors Connection



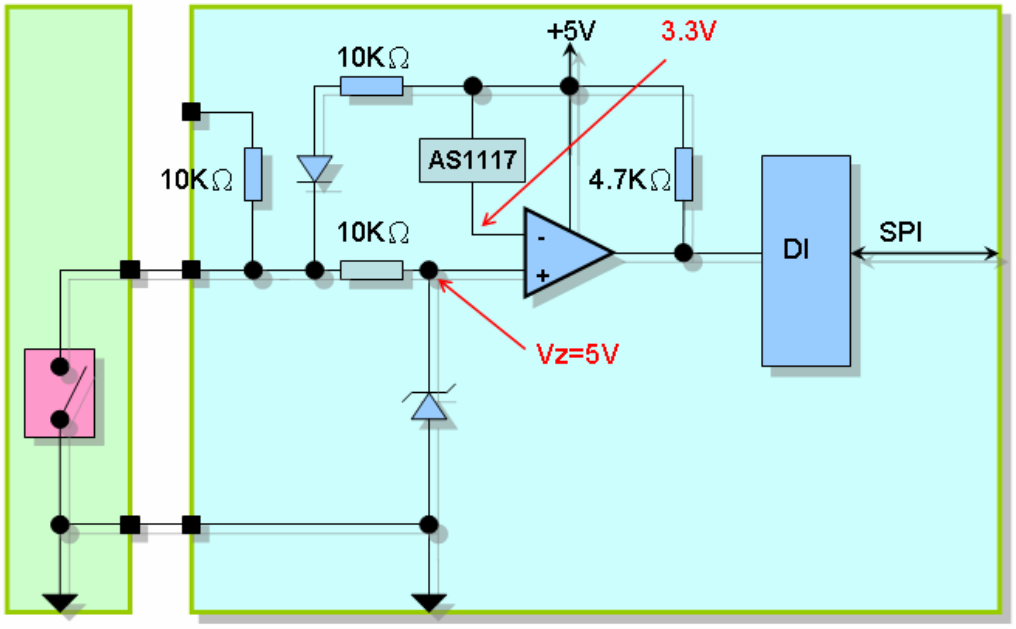
Digital Output Sink Mode



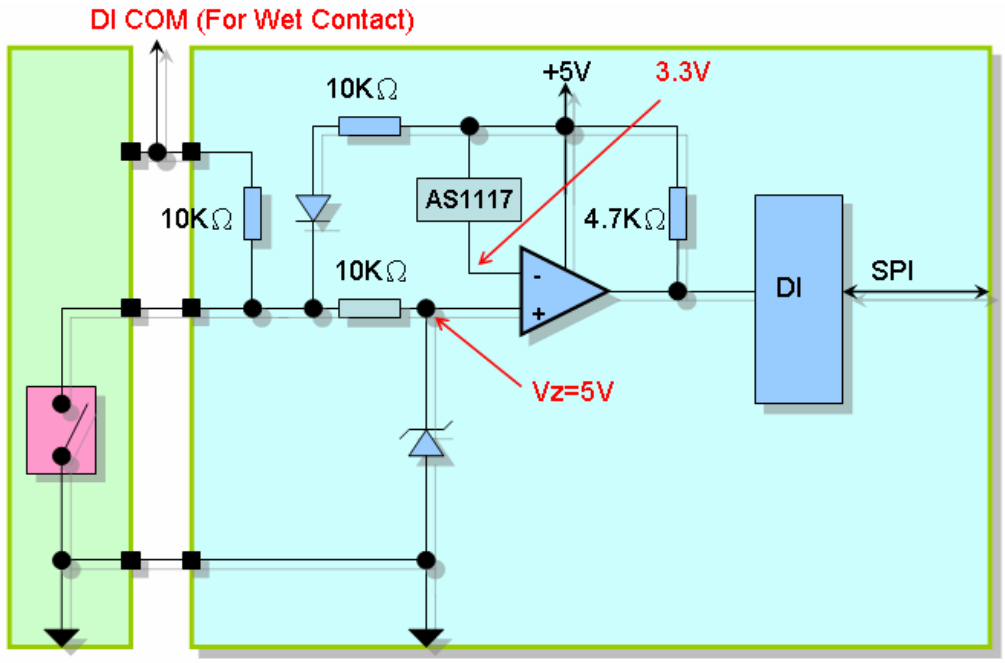
Circuit Diagrams

Digital Input Channel

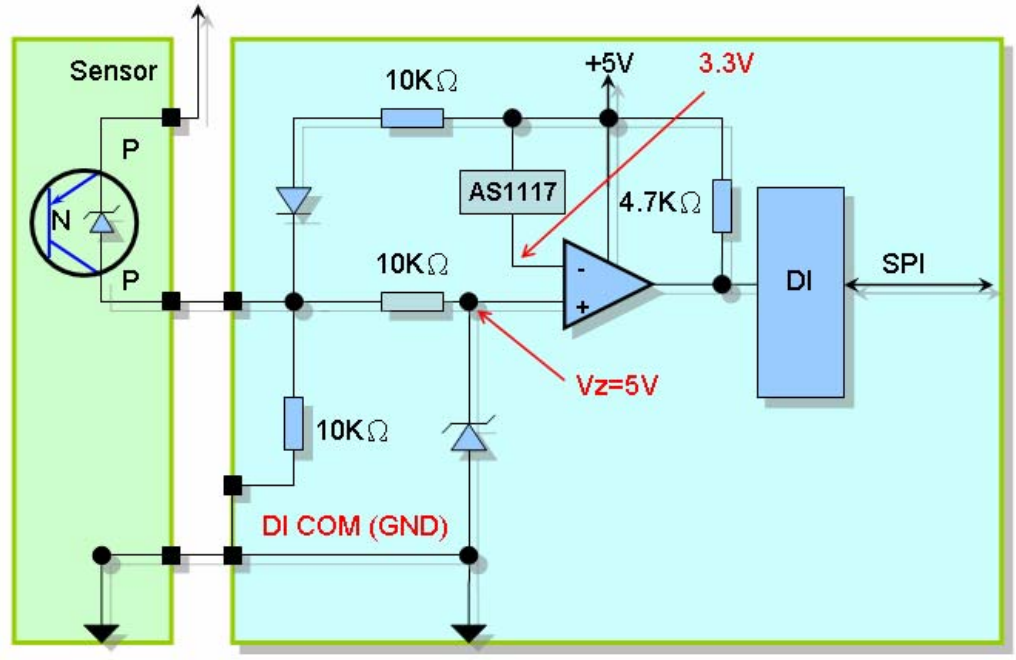
Dry Contact



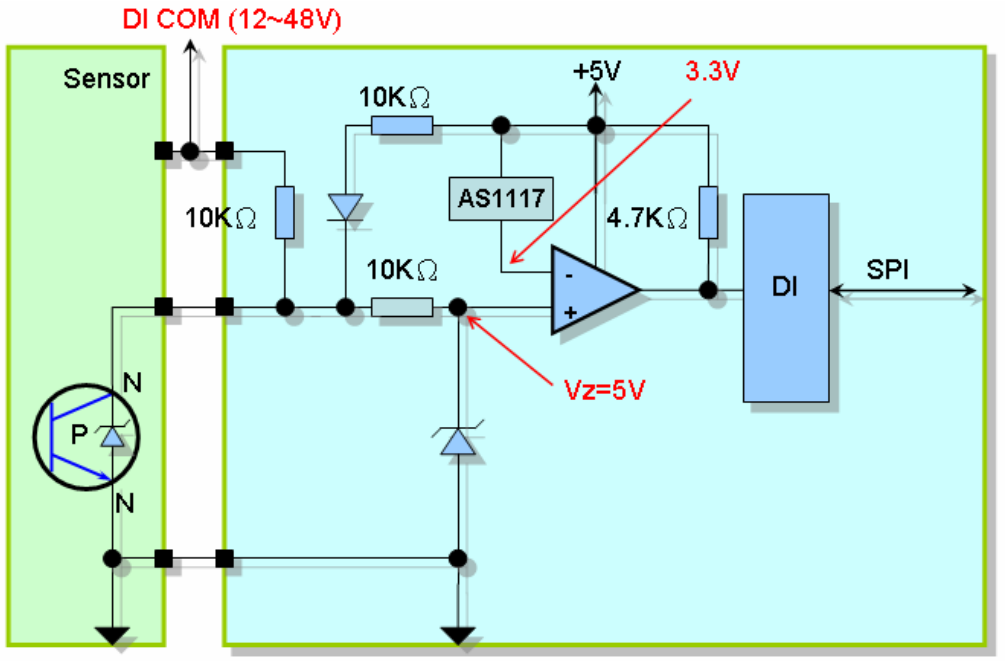
Wet Contact



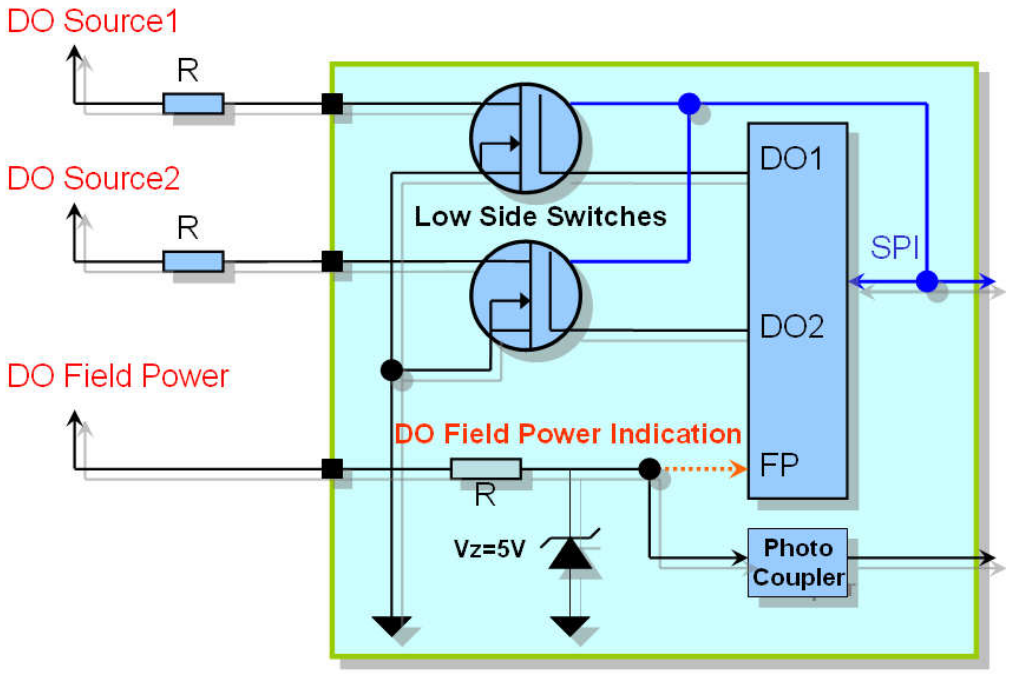
PNP Type Sensor Contact



NPN Type Sensor Contact

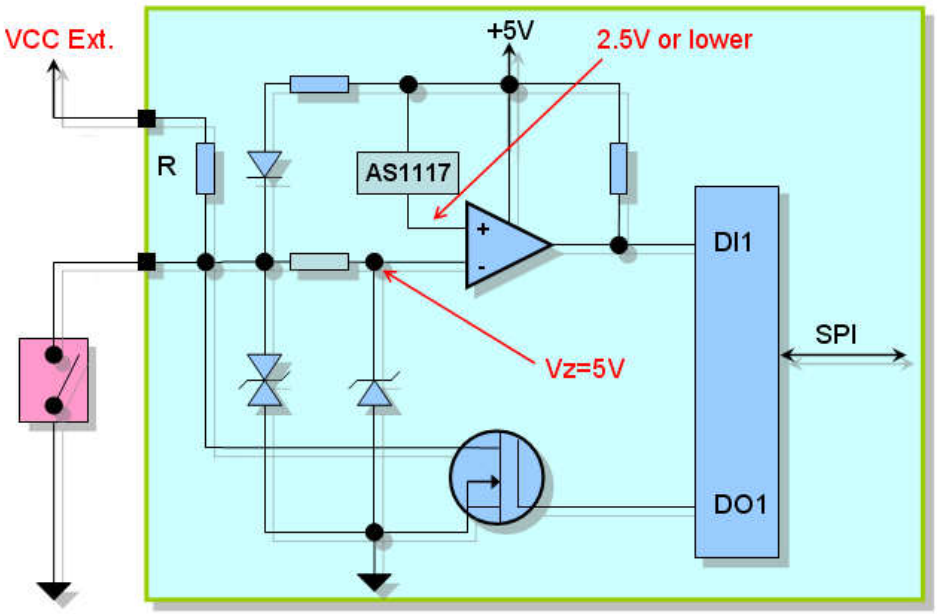


Digital Output Channel



The DO Field Power Indication is a channel for driving the DO field power LED.

Configurable DIO Channel



H

Federal Communication Commission Interference Statement

FCC Warning!

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

I

European Community (CE)

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.