ioLogik R2140 User's Manual

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www.moxa.com/product

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ioLogik R2140 User's Manual

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Introduction

The ioLogik R2140 is a stand-alone remote I/O server that can connect sensors for automation applications over an RS-485 bus.

The following topics are covered in this chapter:

- **Overview**
- **Product Features**
- **Packing List**
- **Product Specifications**
- **Physical Dimensions**
- **Hardware Reference**
  - Panel Guide
  - LED Indicators

Overview

The ioLogik R2140 is part of the R2000 series of ioLogik remote I/O servers, which are designed to link sensors, transmitters, transducers, and valves to an RS-485 bus. As a Moxa Easy View device, the ioLogik R2140 supports an optional hot-pluggable Liquid Crystal Display Module (LCM) to view device, bus and I/O settings such as analog input value and range.

Product Features

- 8 channels of mV/V/mA analog input (AI) with wire-off detection (at 4 to 20 mA)
- 2 channels of analog output (AO) for voltage or current actuator control
- Bundled Windows utility and quick programming library for VB, VC++, BCB
- Support for SCADA software such as Wonderware InTouch and GE Intellution iFix32
- Configurable power-on and safe status AO modes
- Optional hot-pluggable LCM for status display and configuration
- NIST traceable calibration

Packing List

The ioLogik R2140 is shipped with the following items:

Standard Accessories

- ioLogik R2140 remote I/O server
- Document & Software CD

Optional Accessories

- LDP1602 ioLogik Liquid Crystal Display Module (LCM)

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

Product Specifications

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	9600 to 115200 bps
Protocol	Modbus/RTU
Built-in RTC	No

Analog Input

Inputs	8
Resolution	16-bit
Input range	+/-150 mV, +/-500 mV, +/-5 V, +/-10 V, 0 to 20 mA, 4 to 20 mA
Data format	16-bit integer
Accuracy	+/- 0.1%, FSR @ 25ºC, +/- 0.3%, FSR @ -10, 60ºC
Sampling rate (all channels)	10 samples/sec (voltage); 6 samples/sec (current)
Input impedance	900 kΩ
Built-in resistor for current input	125 Ω
Optical isolation	3K VDC
Overvoltage	Can withstand continuous overvoltage (protection range -10V to 10V)

Analog Output

Outputs	2
Resolution	12-bit
Output range	0 to 10V, 4 to 20 mA
Drive voltage:	12 VDC for current output
Data format	12-bit integer
Accuracy	+/- 0.1%, FSR @ 25ºC, +/- 0.3%, FSR @ -10, 60ºC
CMR @ 50/60 Hz	95 dB min.
Zero drift	+/- 9 μV/ºC
Span drift	+/- 25 ppm/ºC
Load resistor	current load < 250 Ω voltage load > 1 MΩ

Power Requirements

Power input	24 VDC nominal, 12 to 48 VDC
Power consumption	183 mA @ 24 VDC (typ.)

Mechanical Specifications

Wiring	I/O cable max. 14 AWG

Environmental

Operating temperature	-10 to 60ºC (14 to 140ºF), 5 to 95%RH
Storage temperature	-40 to 85ºC (-40 to 185ºF), 5 to 95%RH
Shock	IEC60068-2-27
Freefall	IEC60068-2-32
Vibration	IEC60068-2-6

Agency Approvals

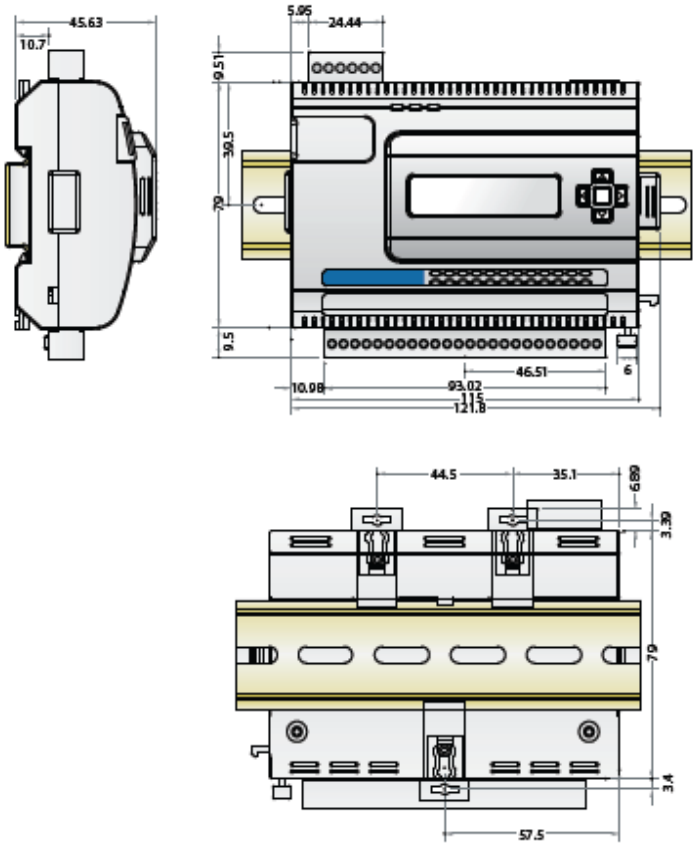
EMI	FCC Part 15, CISPR (EN55022) Class A
EMS	IEC61000-4-2 (ESD), level 2/3, IEC61000-4-3 (RS), level 2, IEC61000-4-4 (EFT), level 2, IEC61000-4-5 (Surge), level 3, IEC61000-4-6 (CS), level 2, IEC61000-4-8 (PM), level 1, IEC61000-4-11 (Dip)
Safety	UL 508

Warranty

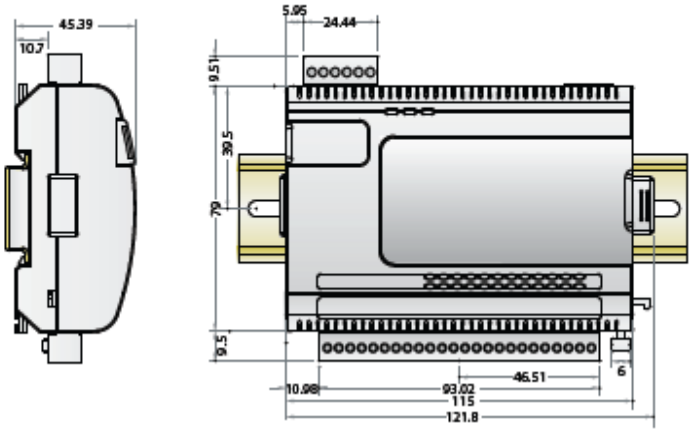
2 years

Physical Dimensions

With LCD Display Module (unit: mm)

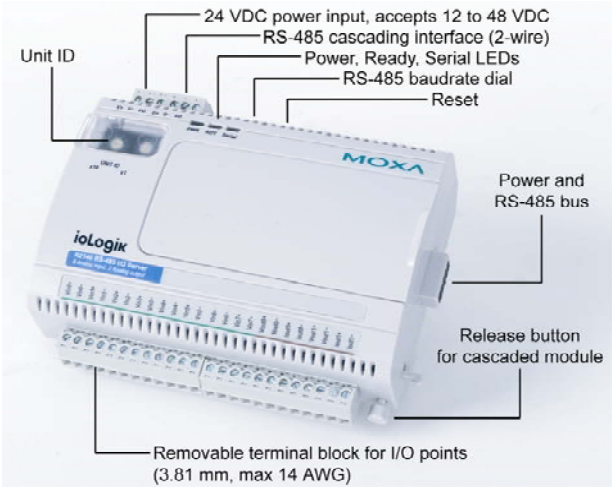


Without LCD Display Module (unit: mm)

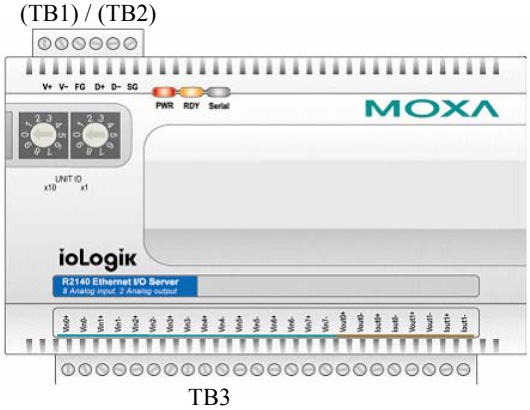


Hardware Reference

Panel Guide



(TB1) / (TB2)



TB3

NOTE – The reset button restores the factory default settings. Hold the button down for 5 seconds with a pointed object such as a straightened paper clip. The RDY LED will glow red. You may release the button after the LED turns to green.

LED Indicators

Name	Action	Description
PWR	red	Power is on
	off	Power is off
RDY	red	System error
	green	ioLogik R2140 is functioning normally
	alternating green and red	ioLogik R2140 is in Safe Status
	off	Power is off or there is a power problem.
Serial	flashing	Serial port is receiving/transmitting data

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Initial Setup

This chapter describes how to install the ioLogik R2140.

The following topics are covered:

- **Hardware Installation**
  - Connecting the Power
  - Grounding the ioLogik R2140
  - Setting the RS-485 Baudrate
  - Setting the RS-485 Unit ID
  - Modbus/RTU Devices
- **Software Installation**
- **MXIO Library**

Hardware Installation

Connecting the Power

Connect the 12 to 48 VDC power line to the ioLogik R2140'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 R2140.

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 ioLogik R2140

The ioLogik R2140 is equipped with two grounding points, one on the wall mount hole and the other on the DIN-rail mount.

Setting the RS-485 Baudrate

The RS-485 port on the ioLogik R2140 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 R2140. The default settings are baudrate = 115200, parity check = N, data bits = 8, and stop bit = 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 to 9 are not used)

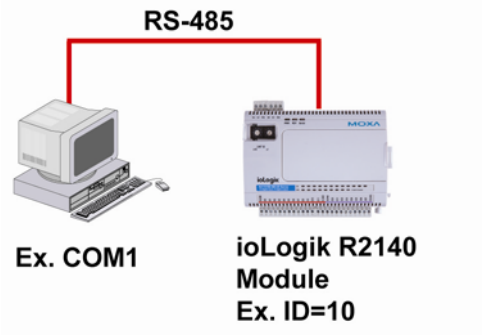
Setting the RS-485 Unit ID

The ioLogik R2140 needs to be assigned a Unit ID in order to use the RS-485 bus. You may assign a number from 1 to 31. Unit ID 0 is reserved for the first devices on the RS-485 bus, such as a PC or PLC.

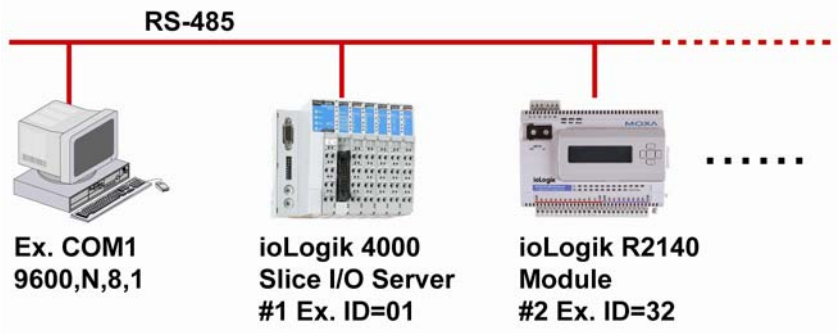
Modbus/RTU Devices

The RS-485 port runs Modbus/RTU and can connect to any Modbus device. You may use different methods to connect different combinations of ioLogik R2000 servers, I/O devices, and other servers. Some examples are shown below:

Connecting One Serial I/O Device



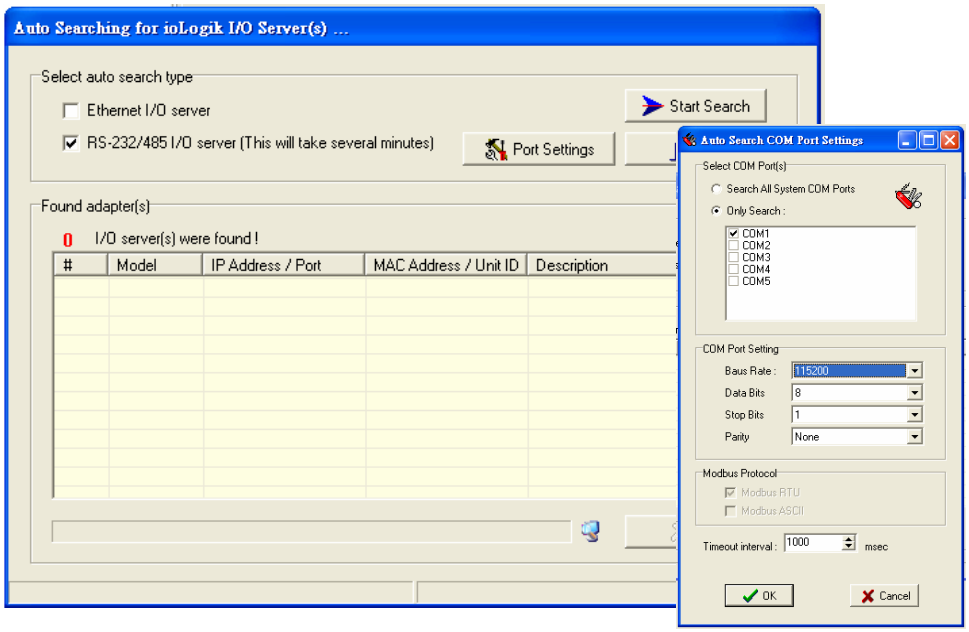
Connecting Multiple RS-485 I/O Devices



Software Installation

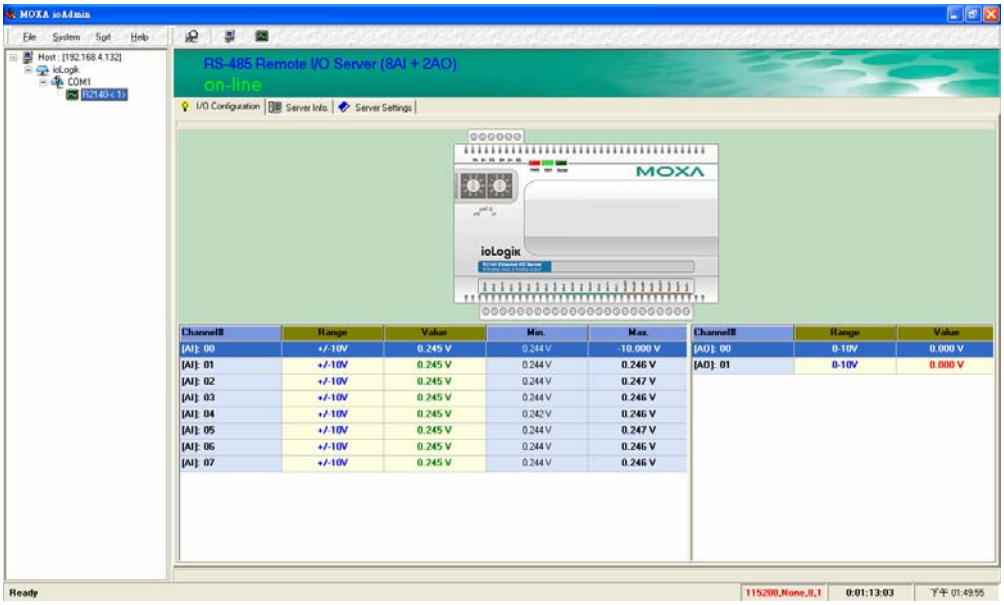
ioAdmin is a Windows utility that is provided with the ioLogik for configuration and management of the I/O server and attached I/O devices. It may be used from anywhere on the RS-485 bus to monitor and configure the ioLogic R2140. You may also configure some of the settings through the optional LCM.

1. **Install ioAdmin from the CD-ROM**: Insert the included CD into the host computer. Run SETUP.EXE, which is located in the "..\Software\Admin"directory. The installation program will guide you through the installation process.
2. **Open ioAdmin**: After installation is finished, run **ioAdmin** from **Start → Program Files → ioLogik → Utility → ioAdmin**.
3. **Search for the server**: On the menu bar, select **System → Auto Scan Remote I/O Server**. A dialog window will pop up. Make sure that "RS-232/485 I/O server" is selected and click on "Port Settings" to set/verify the serial port. Click **Start Search** to begin searching for the ioLogik R2140. It will take several minutes to scan all ports and devices.



You may click "Stop" as soon as your ioLogik R2140 appears on the list. Otherwise, ioAdmin will continue to searching all 99 RS-485 Unit IDs.

4. **Monitor status of I/O devices**: Once the ioLogik R2140 is found by ioAdmin, you may view the status of all I/O devices on ioAdmin's main screen.



You may now use ioAdmin to setup or configure your the ioLogik R2140.

MXIO Library

MOXA provides a Windows library for the ioLogik R2140. To install the library, run SETUP.EXE, which is located in the "..\Software\MXIO2012\"directory. The program will guide you through the installation process.

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Using ioAdmin

This chapter goes over the functions available in ioAdmin, the main configuration and management utility for the ioLogik R2140.

The following topics are covered:

- **Introduction to ioAdmin**
- **Features of ioAdmin**
- **ioAdmin Main Screen**
  - Main Screen Overview
  - Wiring Guide
  - I/O Configuration Tab (General)
  - Server Info Tab
  - Server Settings Tab (General)
- **ioAdmin Administrator Functions**
  - I/O Configuration Tab (Administrator)
  - Server Settings Tab (Administrator)
  - Firmware Update Tab
  - Watchdog Tab
  - Server Context Menu

Introduction to ioAdmin

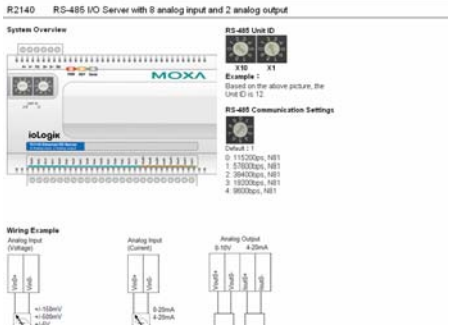
ioLogik remote I/O servers may be managed and configured over the RS-485 bus by ioAdmin, a Windows 2000/XP utility provided with your ioLogik R2140. ioAdmin's graphical-user interface gives you easy access to all status information and settings.

Features of ioAdmin

Remote Management
Over the RS-485 bus, 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
An on-line 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 configuration of the ioLogik R2140 to be saved as a file. The file is viewable as text and can serve

- 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 configuration file includes the following information:

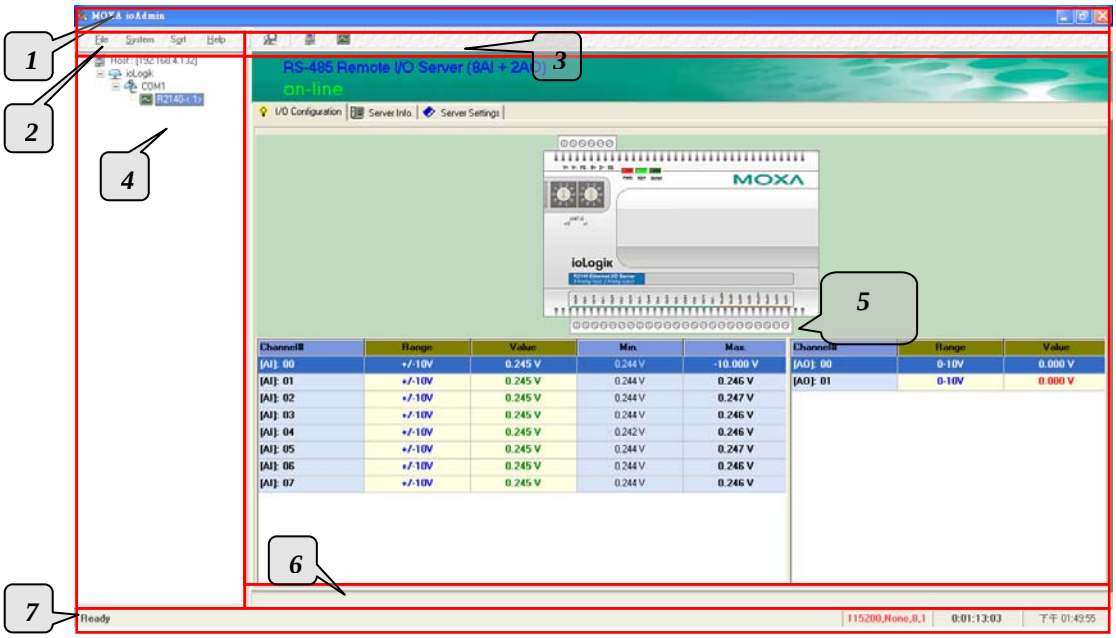
1. Title, file date and time
2. Model information
3. Modbus address table

```
ioLogik R2140 Network I/O Server Configuration
==============================================
Date: 2006/11/2
Time: 08:49:40 AM

[1. Model]
----------
MOD_TYPE=R2140 - RS-485 Remote I/O Server (8AI + 2AO)
MOD_LOC=
MOD_NAME=

[2. I/O Configurations]
-----------------------
AI00=0,(+/-150mV)
AI01=0,(+/-150mV)
AI02=1,(+/-500mV)
AI03=2,(+/-5V)
AI04=3,(+/-10V)
AI05=4,(0-20mA)
AI06=5,(4-20mA)
AI07=0,(+/-150mV)

AO00=0,(0-10V),            AO00_PWN=0,(RAW),   AO00_SAFE=0,(RAW)
AO01=0,(0-10V),            AO01_PWN=0,(RAW),   AO01_SAFE=0,(RAW)

[3. Modbus address table]
-------------------------
CHANNEL      I/O TYPE      MODBUS REFERENCE    MODBUS ADDRESS
(Dec, Hex)
AI00         Input         30001               0000, 0x0000
AI01         Input         30002               0001, 0x0001
AI02         Input         30003               0002, 0x0002
AI03         Input         30004               0003, 0x0003
AI04         Input         30005               0004, 0x0004
AI05         Input         30006               0005, 0x0005
AI06         Input         30007               0006, 0x0006
AI07         Input         30008               0007, 0x0007
AO00         Output        40001               0000, 0x0000
AO01         Output        40002               0001, 0x0001

<END>
```

ioAdmin Main Screen

Main Screen Overview

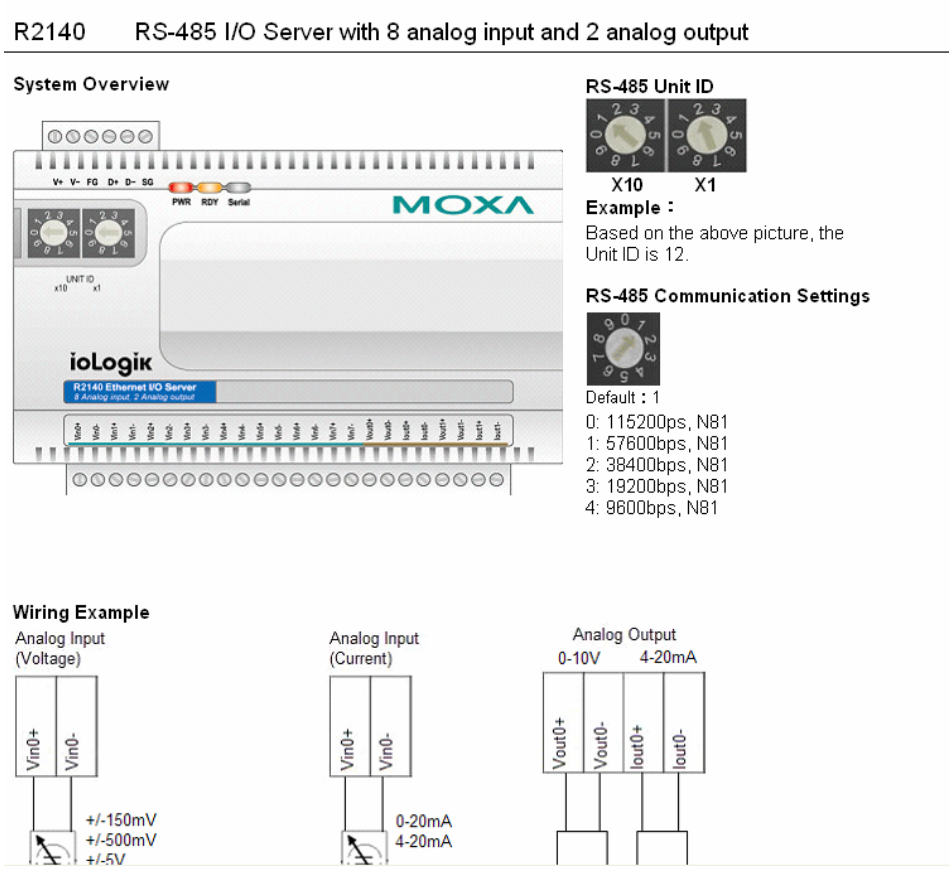
ioAdmin's main screen is shown below. The main window defaults to the I/O Configuration tab, which displays a graphic of the ioLogik R2140 and the status of every I/O channel below it. The other tabs in the main window take you to server and bus settings, and further functions are available when you log on as an administrator. Note that you must log on as an administrator to gain access to configuration options.



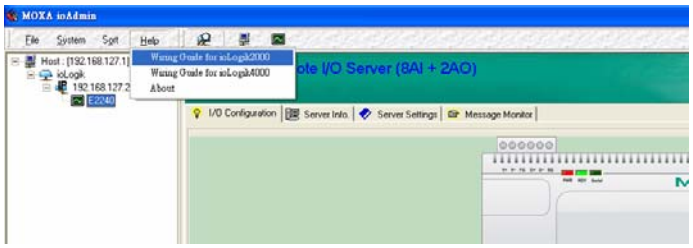
ioAdmin Main Screen	
1.	Title
2.	Menu bar
3.	Quick link
4.	Navigation panel
5.	Main window
6.	Sync. rate status
7.	Status bar

Wiring Guide

ioAdmin provides a wiring guide for the ioLogik R2140. You may view the wiring guide by right-clicking the graphic of the ioLogik R2140 in the I/O Configuration tab. Select "Wiring Guide" in the submenu to open a help file showing the wiring information and electrical characteristics of the ioLogik R2140.

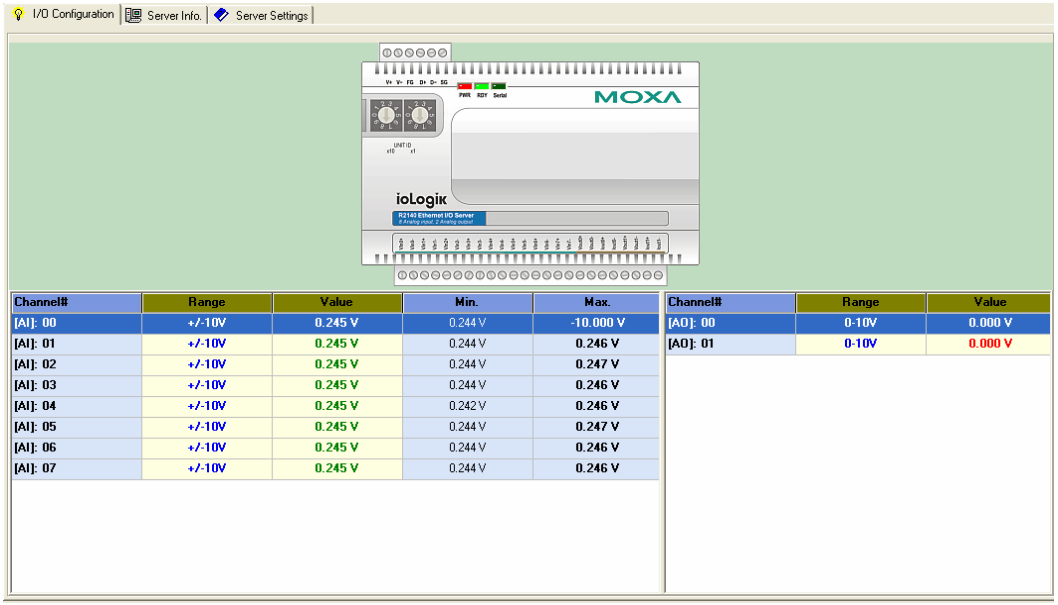


You may also access the wiring guide through the Help menu on the menu bar.



I/O Configuration Tab (General)

The I/O Configuration tab shows the status of every I/O channel underneath a graphic of the ioLogik R2140. This is the default tab when you first open ioAdmin.

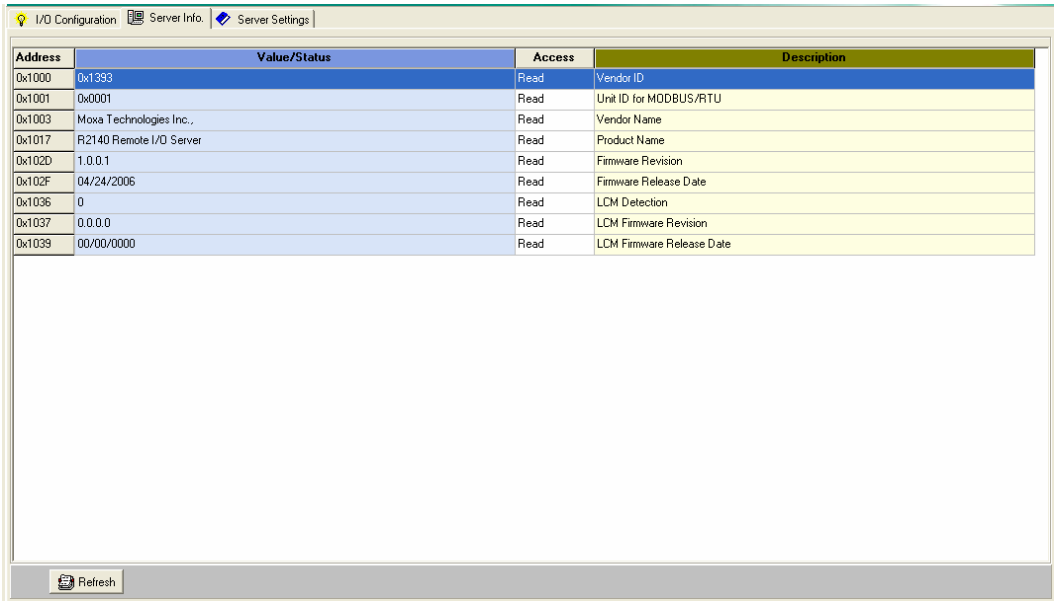


Channel#	Range	Value	Min.	Max.
[AI]: 00	+/-10V	0.245 V	0.244 V	-10.000 V
[AI]: 01	+/-10V	0.245 V	0.244 V	0.246 V
[AI]: 02	+/-10V	0.245 V	0.244 V	0.247 V
[AI]: 03	+/-10V	0.245 V	0.244 V	0.246 V
[AI]: 04	+/-10V	0.245 V	0.242 V	0.246 V
[AI]: 05	+/-10V	0.245 V	0.244 V	0.247 V
[AI]: 06	+/-10V	0.245 V	0.244 V	0.246 V
[AI]: 07	+/-10V	0.245 V	0.244 V	0.246 V

Channel#	Range	Value
[AO]: 00	0-10V	0.000 V
[AO]: 01	0-10V	0.000 V

Server Info Tab

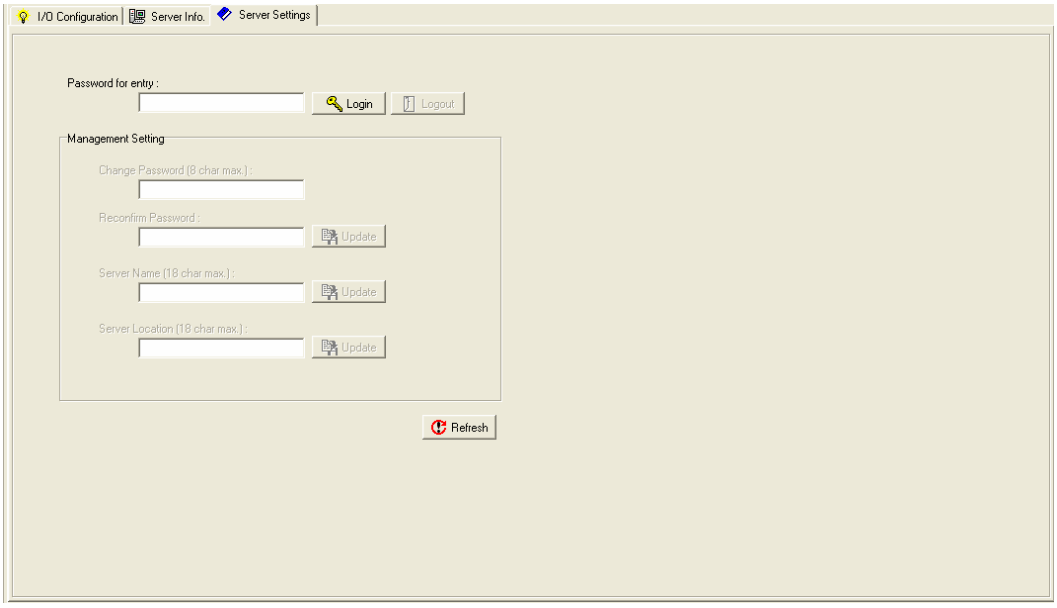
Server information, such as firmware version, is displayed in the Server Info tab.



Address	Value/Status	Access	Description
0x1000	0x1393	Read	Vendor ID
0x1001	0x0001	Read	Unit ID for MODBUS/RTU
0x1003	Moxa Technologies Inc.,	Read	Vendor Name
0x1017	R2140 Remote I/O Server	Read	Product Name
0x102D	1.0.0.1	Read	Firmware Revision
0x102F	04/24/2006	Read	Firmware Release Date
0x1036	0	Read	LCM Detection
0x1037	0.0.0.0	Read	LCM Firmware Revision
0x1039	00/00/0000	Read	LCM Firmware Release Date

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 R2140 configuration options. If no administrator password has been set up, simply click on **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.



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 R2140. When you install the ioLogik R2140 for the first time, the password will be blank and you may simply click on **Login**. Additional functions will available after logging in, including the following new tabs:

When making configuration changes, you will need to click on **Update** or on **Apply** to save the changes. Some changes will not take effect until the ioLogik R2140 is restarted. You will be given the option to restart the server if necessary.

ATTENTION

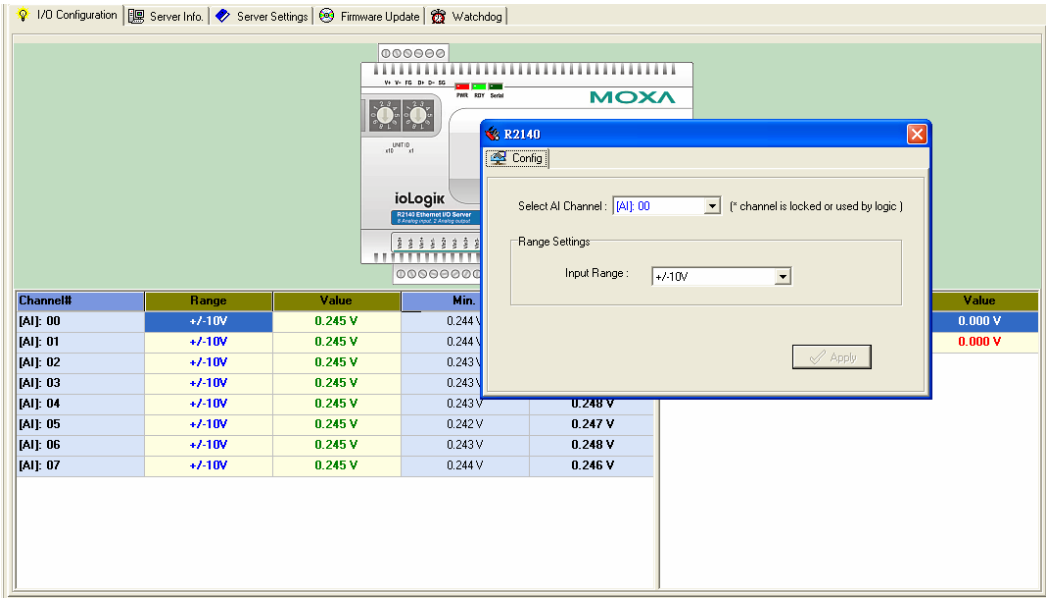
You must log in to access administrator functions such as the Watchdog and Firmware Update tabs. If you forget the password, you may hold down the Reset button on the ioLogik R2140 to clear the password and load factory defaults. **This will result in the loss of all configuration settings!**

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.

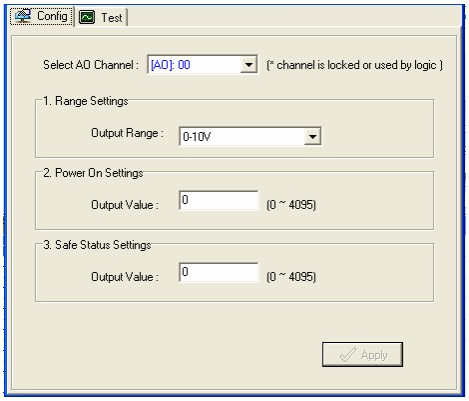
Configuring Analog Input Channels

The ioLogik R2140 is equipped with 8 AI (analog input) channels that can be set individually to +/-150 mV, +/-500 mV, +/-5V, +/-10V, 0-20 mA, and 4-20 mA.



Configuring Analog Output Channels

The ioLogik R2140 is equipped with 2 AO (analog output) channels that can be set individually to 0-10V, 4-20 mA.

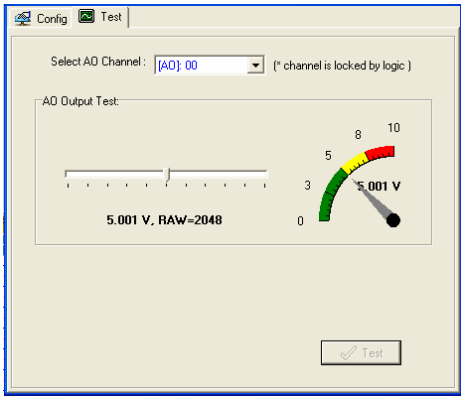


Power On Settings: Use this field to set the initial value for the AO channel when the ioLogik R2140 is powered on. The **Power On Settings** field uses raw data values. If you do not know how to translate the raw data values into real values, use the **Test** function for assistance.

Safe Status Settings: Use this field to specify how the AO channel responds to a break in RS-485 communication. When the connection is lost for the amount of time specified in the Host Connection Watchdog, the ioLogik R2140 enters Safe Status, and the AO channel's Safe Status settings will go into effect. Note that the Host Connection Watchdog is disabled by default. If the

Host Connection Watchdog is disabled, the ioLogik R2140 will never enter Safe Status and the Safe Status settings will have no effect.

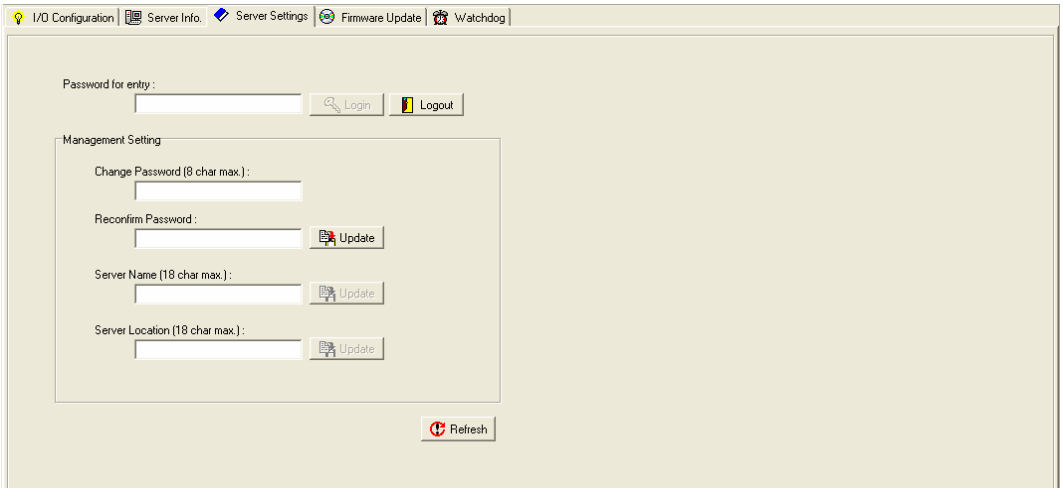
Test I/O: You can test the AO channel in the **Test** tab,



Note that the slider shows both the raw data value and the V/mA value. You may use this as a guide when entering values for the Power On and Safe Status settings.

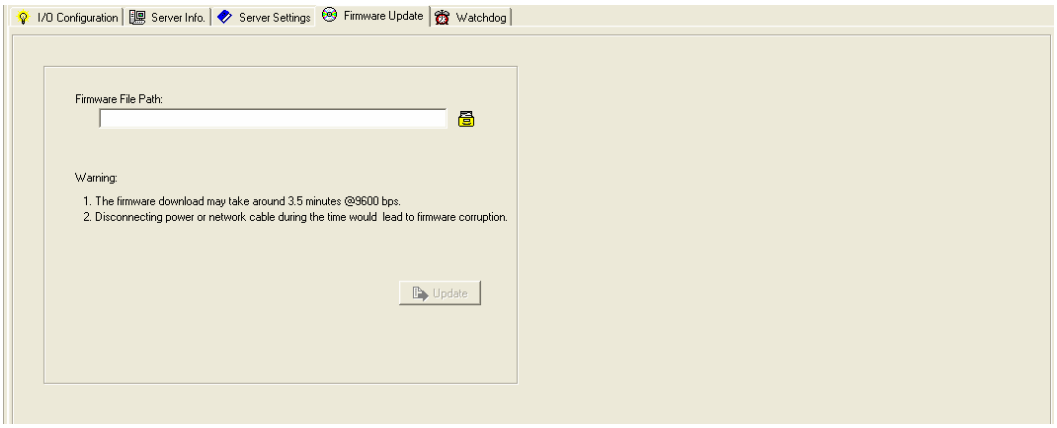
Server Settings Tab (Administrator)

You may set up a password, server name, and location in the Server Settings tab.



Firmware Update Tab

The ioLogik R2140 supports remote firmware updates through the Firmware Update tab. Enter the path to the firmware file or click on the icon to browse for the file. Click on **Update** to update the firmware. The wizard will lead you through the process until the server is restarted.



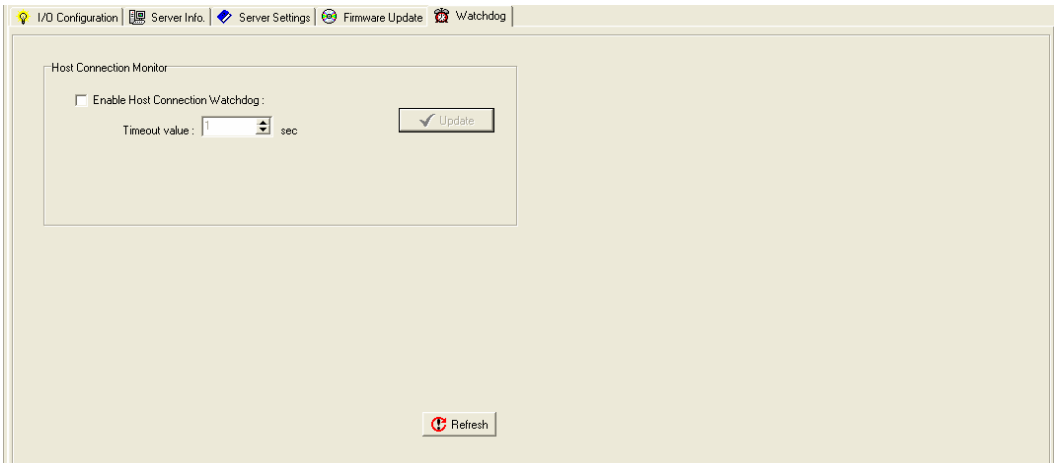
WARNING

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.

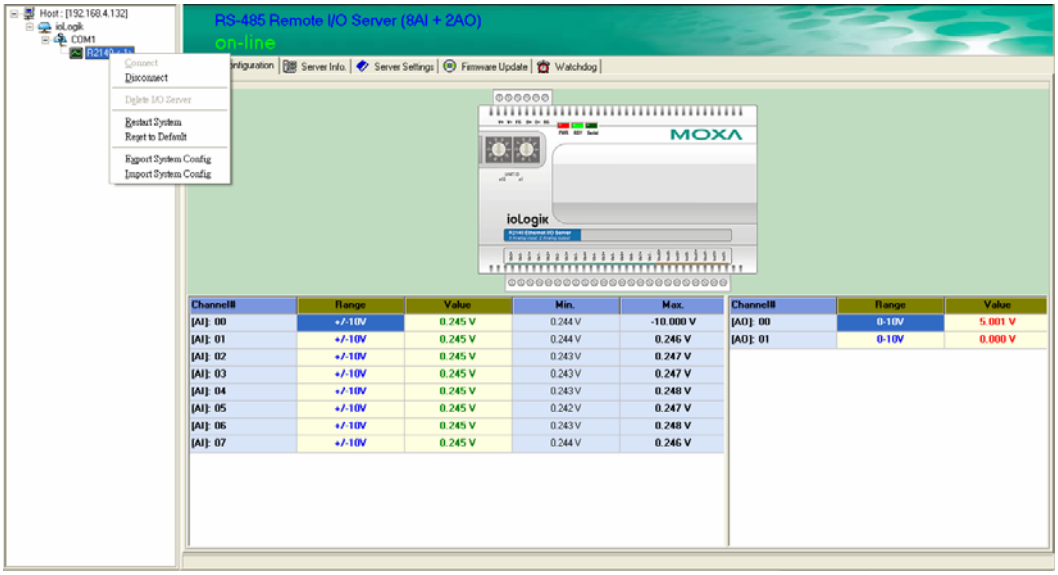
Watchdog Tab

The Watchdog tab is where you configure the Host Connection Watchdog, which is used with the Safe Status settings to define each AO channel's response to a lost RS-485 connection. When the ioLogik R2140 loses its RS-485 connection for the specified amount of time, the Host Connection Watchdog will initiate Safe Status and all AO channels will reset to their Safe Status settings. By default, the Watchdog is disabled, which means that the Safe Status settings will not have any effect. To enable the Watchdog, check off **Enable Host Connection Watchdog**, set the Timeout value, and restart the server.



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 re-establishing a connection over the RS-485 bus between ioAdmin and the selected ioLogik server.

Disconnect

Select this command to drop the RS-485 connection between ioAdmin and the selected ioLogik server.

Delete I/O Server

Select this command to remove the selected server from ioAdmin's list of available servers.

Add Serial I/O Server

Select this command to manually add a server.

Restart System

Select this command to restart the ioLogik R2140 from a remote site

Reset to Default

Select this command to reset all settings, including console password, to factory default values.

Export System Config

Select this command to export the configuration of the ioLogik R2140 to a text file. It is strongly recommended you use this method to back up your configuration after you have finished configuring the ioLogik R2140 for your application.

Below is an example of the exported configuration file. The file includes information on the model, I/O configuration, and Modbus addresses.

```
ioLogik R2140 Network I/O Server Configuration
==============================================
Date: 2006/11/2
Time: 08:49:40 AM

[1. Model]
----------
MOD_TYPE=R2140 - RS-485 Remote I/O Server (8AI + 2AO)
MOD_LOC=
MOD_NAME=

[2. I/O Configurations]
-----------------------
AI00=0,(+/-150mV)
AI01=0,(+/-150mV)
AI02=1,(+/-500mV)
AI03=2,(+/-5V)
AI04=3,(+/-10V)
AI05=4,(0-20mA)
AI06=5,(4-20mA)
AI07=0,(+/-150mV)

AO00=0,(0-10V),          AO00_PWN=0,(RAW),   AO00_SAFE=0,(RAW)
AO01=0,(0-10V),          AO01_PWN=0,(RAW),   AO01_SAFE=0,(RAW)

[3. Modbus address table]
-------------------------
CHANNEL    I/O TYPE      MODBUS REFERENCE    MODBUS ADDRESS (Dec, Hex)
AI00       Input         30001               0000, 0x0000
AI01       Input         30002               0001, 0x0001
AI02       Input         30003               0002, 0x0002
AI03       Input         30004               0003, 0x0003
AI04       Input         30005               0004, 0x0004
AI05       Input         30006               0005, 0x0005
AI06       Input         30007               0006, 0x0006
AI07       Input         30008               0007, 0x0007
AO00       Output        40001               0000, 0x0000
AO01       Output        40002               0001, 0x0001

<END>
```

Import System Config

Select this command to reload a configuration that was exported to a text file. You will need to restart the ioLogik R2140 in order for the new configuration to take effect. This command may be used to restore a configuration after loading the factory defaults, or to duplicate a configuration to multiple ioLogik R2140 servers.

The ioLogik R2140 imports information on the model and I/O configuration.

4

Cascading with Other I/O Servers

The ioLogik R2140 can act both as a standalone I/O server and as an extension module to other I/O servers. This chapter explains how to use the ioLogik R2140 as an extension module to ioLogik E2000 I/O servers.

The following topics are covered:

- **Introduction**
- **Cascading System Bus**
- **Hardware Installation**
- **Using ioAdmin with Cascaded I/O Servers**
  - Adding One I/O Server
  - Adding Two or More I/O Servers
  - Removing Cascaded I/O Servers
- **Limitations**

Introduction

The ioLogik R2140 can serve as an extension module to provide additional I/O channels to an ioLogik E2210 or E2240 Ethernet I/O server. Up to 31 units can be chained or cascaded together using each unit's built-in connectors.

Cascading System Bus

The I/O servers connect to each other over the cascading system bus, which uses RS-485 and Modbus protocols. Pin assignments for the female system bus connector are shown below. This is the connector that protrudes from the right side of the unit.

Pin	Signals	Pin	Signals
1	V+ (24V)	2	V-
3	V+ (24V)	4	V-
5	N.C.	6	N.C.
7	Date+	8	SYNC
9	Date-	10	GND

Hardware Installation

To install the ioLogik R2140 as an extension module, simply snap it into place alongside the ioLogik E2000 and the two units will lock together. Press the release button to detach the unit.

Power is provided through the ioLogik E2000's system bus. Depending on the power requirements of your application, external power can also be supplied to the unit through the unit's power terminals.

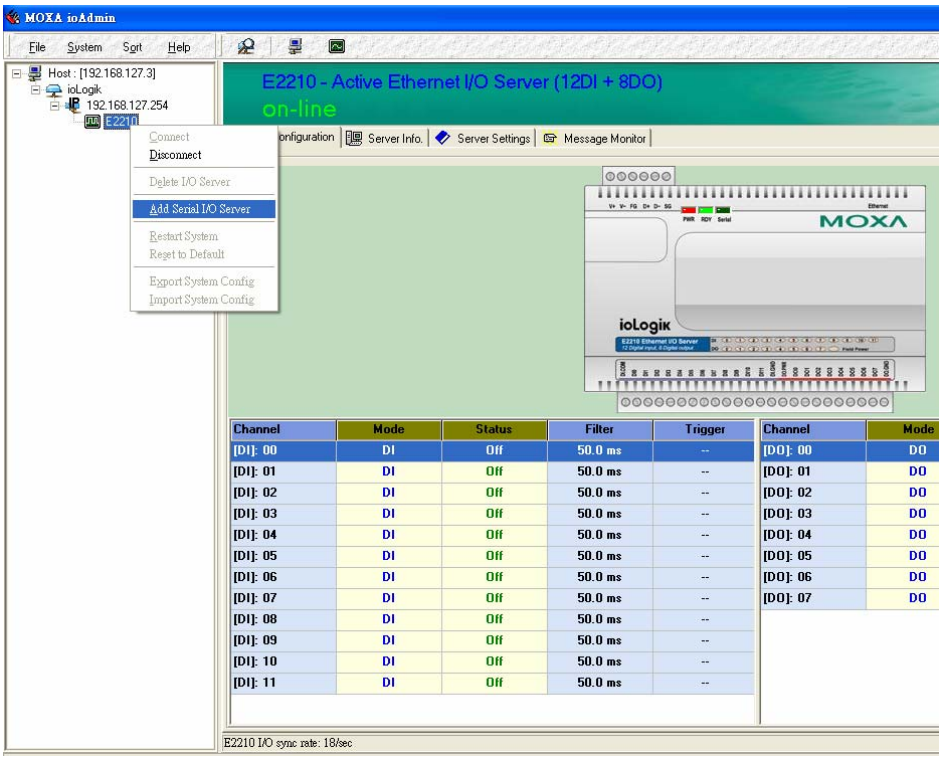
Using ioAdmin with Cascaded I/O Servers

Adding One I/O Server

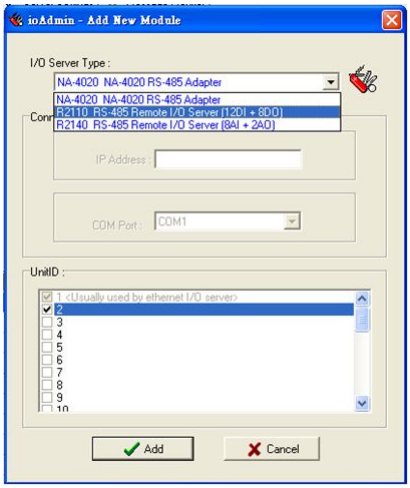
ioAdmin can be used to access the I/O channels of all cascaded I/O servers. In the following instructions, the ioLogik E2210 and R2110 are used as examples:

1. Verify that the E2210 has been installed and has been opened in ioAdmin. Snap the E2210 and R2110 together. Set the unit ID for the R2110 ("2" in this example).

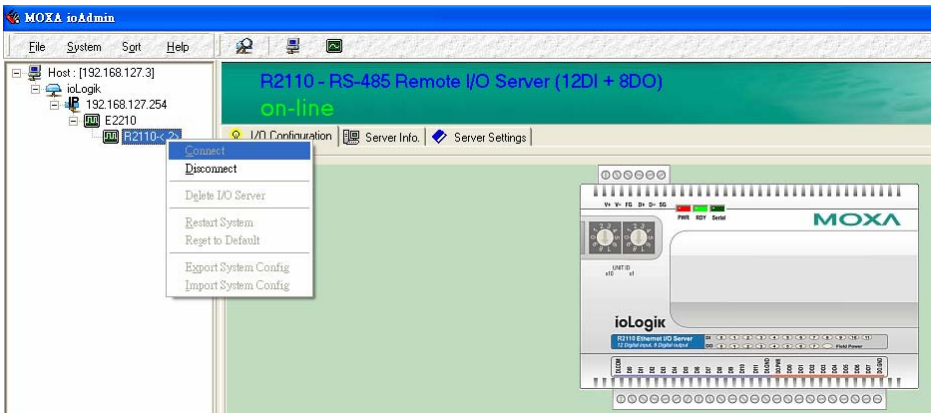
2. In ioAdmin, click the E2210 in the navigation panel and select "Add Serial I/O Server" in the context menu.



3. Select the appropriate I/O Server type and UnitID ("R2110 RS-485" and "2" in this example). Click "Add".



4. The R2110 will appear with its unit ID under the E2210 in ioAdmin's navigation panel. If the R2110 appears off-line, open its context menu in the navigation panel and select "Connect" to bring it on-line. Once the R2110 is on-line, you will be able to use ioAdmin to monitor and control its I/O channels.

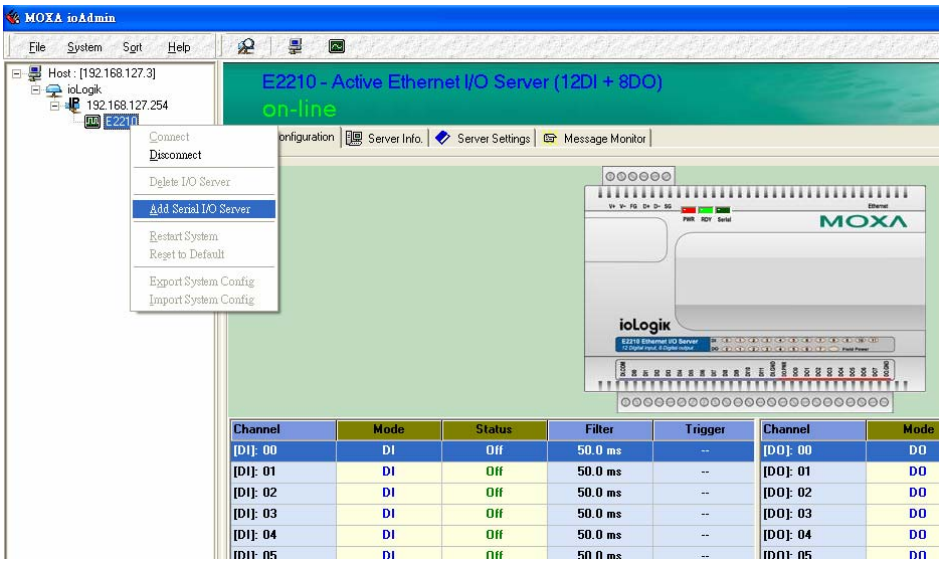


Adding Two or More I/O Servers

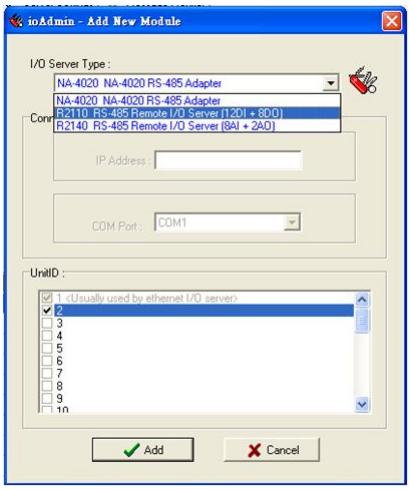
Multiple I/O servers can be cascaded together for even more I/O channels. The following instructions show how multiple cascaded I/O servers are accessed in ioAdmin, using the ioLogik E2210, R2110, and R2140 as examples:

1. Verify that the E2210 has been installed and has been opened in ioAdmin. Snap the R2110 onto the E2210, then snap the R2140 onto the R2110. Set the unit IDs for the R2110 and R2140 ("2" and "3" in this example).

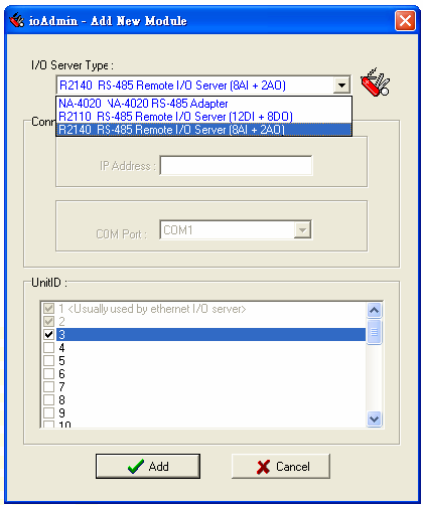
2. In ioAdmin, click the E2210 in the navigation panel and select "Add Serial I/O Server" in the context menu.



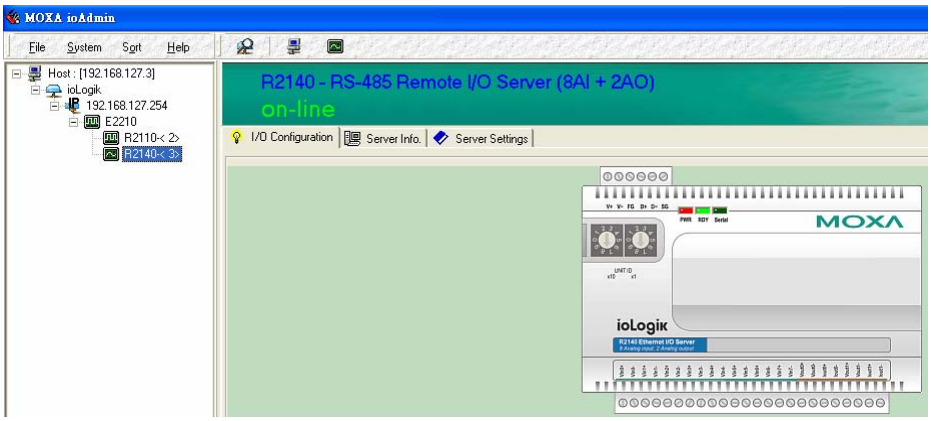
3. Select the appropriate I/O Server type and UnitID ("R2110 RS-485" and "2" in this example). Click "Add".



4. Repeat steps 2 and 3 using the appropriate selections for the R2140.

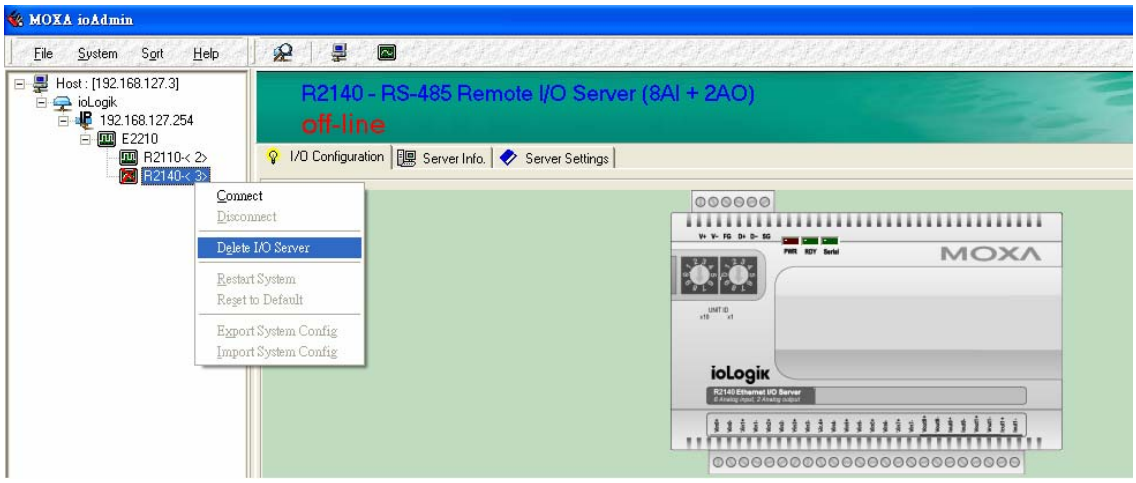


5. Both the R2110 and R2140 will appear with their unit IDs under the E2210 in ioAdmin's navigation panel. If a server appears off-line, open its context menu in the navigation panel and select "Connect" to bring it on-line. Once all I/O servers are on-line, you will be able to use ioAdmin to monitor and control each server's I/O channels.



Removing Cascaded I/O Servers

To remove a cascaded I/O server in ioAdmin, click the desired server in the navigation panel and "Delete I/O Server" in the context menu.



Limitations

There are some limitations when using the ioLogik R2140 as an extension module to ioLogik E2000 servers. Although each I/O channel on a cascaded module can be monitored and controlled over Ethernet, the module will not support the following items:

- Click&Go
- Active messaging
- SNMP trap messages
- E-mail messages
- Import/export configuration file
- Upgrade firmware

A

Liquid Crystal Display Module (LCM)

As an *Easy View* device, the ioLogik R2140 supports an optional detachable Liquid Crystal Display Module (LCM) for easier field maintenance. The LCM is hot-pluggable and can be used to view the server's current settings. When plugged in, the LCM displays the ioLogik R2140 "home page," and pressing any button takes you to the configuration menu.

LCM Controls

The up and down buttons navigate between the current options. The right and left buttons enter and exit the submenus. On the ioLogik R2140, the center button is used only when 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" is in the upper right hand corner of the display indicates that the current field can be modified. If the "e" is not displayed, the current field may only be viewed.

LCM Options

Display	Explanation / Actions
<ioLogik R2140> ID:01 bps:115200	This is the default "home page" showing the unit ID and baudrate. Press the down button to begin navigating the menus.
<ioLogik R2140> server	Enter this submenu to display information about the specific server you are viewing: ● serial number ● name ● location ● R2140 f/w ver ● lcm f/w ver ● model name
<ioLogik R2140> serial port	Enter this submenu to display the RS-485 cascade port settings.

Display	Explanation / Actions
<ioLogik R2140> i/o setting	Enter this submenu to view I/O channel status. Press up or down to navigate through the different I/O channels without having to go back to the previous menu.
<ioLogik R2140> 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 reboot the I/O server. The **disable** option has no effect.

B

Modbus/RTU Address Mappings

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

Reference	Address	Data Type	Description
00001	0x0000	1bit	Reset CH0 AI Min Value Read: always 0 Write: 1: reset AI Min value 0: return Illegal Data Value
00002	0x0001	1bit	Reset CH1 AI Min Value Read: always 0 Write : 1: reset AI Min value 0: return Illegal Data Value
00003	0x0002	1bit	Reset CH2 AI Min Value Read: always 0 Write : 1: reset AI Min value 0: return Illegal Data Value
00004	0x0003	1bit	Reset CH3 AI Min Value Read: always 0 Write : 1: reset AI Min value 0: return Illegal Data Value
00005	0x0004	1bit	Reset CH4 AI Min Value Read: always 0 Write : 1: reset AI Min value 0: return Illegal Data Value
00006	0x0005	1bit	Reset CH5 AI Min Value Read: always 0 Write : 1: reset AI Min value 0: return Illegal Data Value
00007	0x0006	1bit	Reset CH6 AI Min Value Read: always 0 Write : 1: reset AI Min value 0: return Illegal Data Value
00008	0x0007	1bit	Reset CH7 AI Min Value Read: always 0 Write : 1: reset AI Min value 0: return Illegal Data Value
00009	0x0008	1bit	Reset CH0 AI Max Value Read: always 0 Write : 1: reset AI Max value 0: return Illegal Data Value

Reference	Address	Data Type	Description
00010	0x0009	1bit	Reset CH1 AI Max Value Read: always 0 Write : 1: reset AI Max value 0: return Illegal Data Value
00011	0x000A	1bit	Reset CH2 AI Max Value Read: always 0 Write : 1: reset AI Max value 0: return Illegal Data Value
00012	0x000B	1bit	Reset CH3 AI Max Value Read: always 0 Write : 1: reset AI Max value 0: return Illegal Data Value
00013	0x000C	1bit	Reset CH4 AI Max Value Read: always 0 Write : 1: reset AI Max value 0: return Illegal Data Value
00014	0x000D	1bit	Reset CH5 AI Max Value Read: always 0 Write : 1: reset AI Max value 0: return Illegal Data Value
00015	0x000E	1bit	Reset CH6 AI Max Value Read: always 0 Write : 1: reset AI Max value 0: return Illegal Data Value
00016	0x000F	1bit	Reset CH7 AI Max Value Read: always 0 Write : 1: reset AI Max value 0: return Illegal Data Value

3xxxx Read only Registers (Support function 4)

Reference	Address	Data Type	Description
30001	0x0000	1 word	CH0 Read AI Value
30002	0x0001	1 word	CH1 Read AI Value
30003	0x0002	1 word	CH2 Read AI Value
30004	0x0003	1 word	CH3 Read AI Value
30005	0x0004	1 word	CH4 Read AI Value
30006	0x0005	1 word	CH5 Read AI Value
30007	0x0006	1 word	CH6 Read AI Value
30008	0x0007	1 word	CH7 Read AI Value
30009	0x0008	1 word	CH0 Read AI Min Value
30010	0x0009	1 word	CH1 Read AI Min Value
30011	0x000A	1 word	CH2 Read AI Min Value
30012	0x000B	1 word	CH3 Read AI Min Value
30013	0x000C	1 word	CH4 Read AI Min Value
30014	0x000D	1 word	CH5 Read AI Min Value
30015	0x000E	1 word	CH6 Read AI Min Value
30016	0x000F	1 word	CH7 Read AI Min Value
30017	0x0010	1 word	CH0 Read AI Max Value
30018	0x0011	1 word	CH1 Read AI Max Value
30019	0x0012	1 word	CH2 Read AI Max Value

Reference	Address	Data Type	Description
30020	0x0013	1 word	CH3 Read AI Max Value
30021	0x0014	1 word	CH4 Read AI Max Value
30022	0x0015	1 word	CH5 Read AI Max Value
30023	0x0016	1 word	CH6 Read AI Max Value
30024	0x0017	1 word	CH7 Read AI Max Value

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

Address	Data Type	Description
0x0000	1 word	CH0 AO Value (0 ~ 4095)
0x0001	1 word	CH1 AO Value (0 ~ 4095)
0x0002	1 word	CH0 AO PowerOn Value (0 ~ 4095)
0x0003	1 word	CH1 AO PowerOn Value (0 ~ 4095)
0x0004	1 word	CH0 AO Safe Value (0 ~ 4095)
0x0005	1 word	CH1 AO Safe Value (0 ~ 4095)
0x0006	1 word	CH0 AO Range 0: 0-10 VDC 1: 4-20 mA Others: return Illegal Data Value
0x0007	1 word	CH1 AO Range 0: 0-10 VDC 1: 4-20 mA Others: return Illegal Data Value
0x0008	1 word	CH0 AO PowerOn Range 0: 0-10 VDC 1: 4-20 mA Others: return Illegal Data Value
0x0009	1 word	CH1 AO PowerOn Range 0: 0-10 VDC 1: 4-20 mA Others: return Illegal Data Value
0x000A	1 word	CH0 AO Safe Range 0: 0-10 VDC 1: 4-20 mA Others: return Illegal Data Value
0x000B	1 word	CH1 AO Safe Range 0: 0-10 VDC 1: 4-20 mA Others: return Illegal Data Value
0x000C	1 word	CH0 AI Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value

Address	Data Type	Description
0x000D	1 word	CH1 AI Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x000E	1 word	CH2 AI Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x000F	1 word	CH3 AI Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x0010	1 word	CH4 AI Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x0011	1 word	CH5 AI Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x0012	1 word	CH6 AI Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value

Address	Data Type	Description
0x0013	1 word	CH7 AI Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x0014	1 word	CH0 AI PowerOn Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x0015	1 word	CH1 AI PowerOn Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x0016	1 word	CH2 AI PowerOn Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x0017	1 word	CH3 AI PowerOn Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x0018	1 word	CH4 AI PowerOn Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value

Address	Data Type	Description
0x0019	1 word	CH5 AI PowerOn Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x001A	1 word	CH6 AI PowerOn Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x001B	1 word	CH7 AI PowerOn Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x001C	1 word	CH0 AI Safe Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x001D	1 word	CH1 AI Safe Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x001E	1 word	CH2 AI Safe Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value

Address	Data Type	Description
0x001F	1 word	CH3 AI Safe Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x0020	1 word	CH4 AI Safe Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x0021	1 word	CH5 AI Safe Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x0022	1 word	CH6 AI Safe Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value
0x0023	1 word	CH7 AI Safe Range 00: +/-150 mV 01: +/-500 mV 02: +/-5V 03: +/-10V 04: 0-20 mA 05: 4-20 mA Others: return Illegal Data Value

Function 8

Address	Data Field(Request)	Data Field (Response)	Description
0x0001	0x0000	Echo Request Data	Reboot
0x0001	0xFF00	Echo Request Data	Reset to factory default

C

Factory Default Settings

The ioLogik R2140 is configured with the following factory defaults:

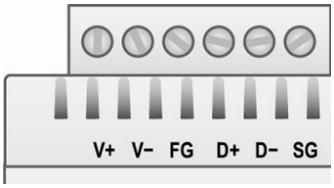
RS-485 Unit ID:	**1**
Default baud rate:	**115,200bps**
Communication watchdog:	**Disable**
AI Input Range:	**-10 to 10V**
AO Output Range:	**0 to 10V**
AO Safe Status:	**Off, 0V**
Power on status:	**Off, 0V**
Password:	**NONE**
Server Name:	**NONE**
Server Location:	**NONE**

D

Pinouts and Cable Wiring

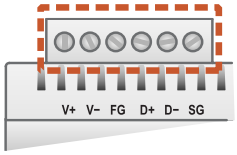
Serial Port Pinouts

R2140 RS-485 Modbus Adapter Pin Assignment



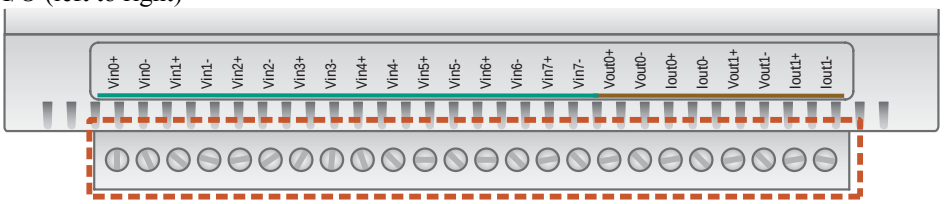
Pin Assignment of Terminal Blocks

Power/RS-485



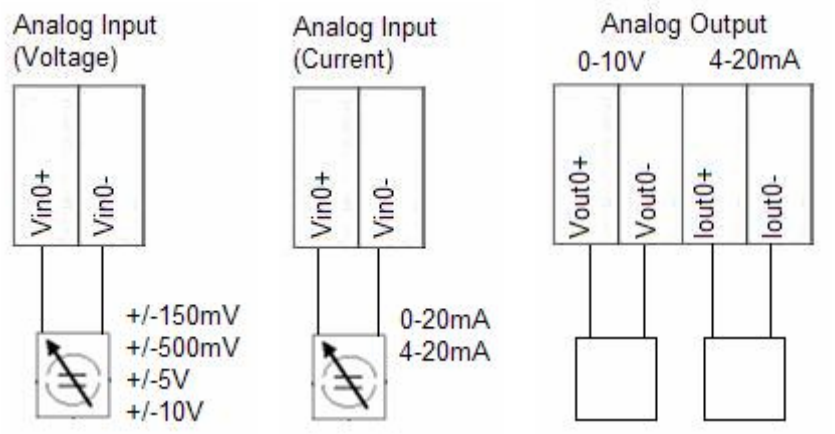
Pin	1	2	3	4	5	6
Signal	V+	V-	FG	D+	D-	SG

I/O (left to right)



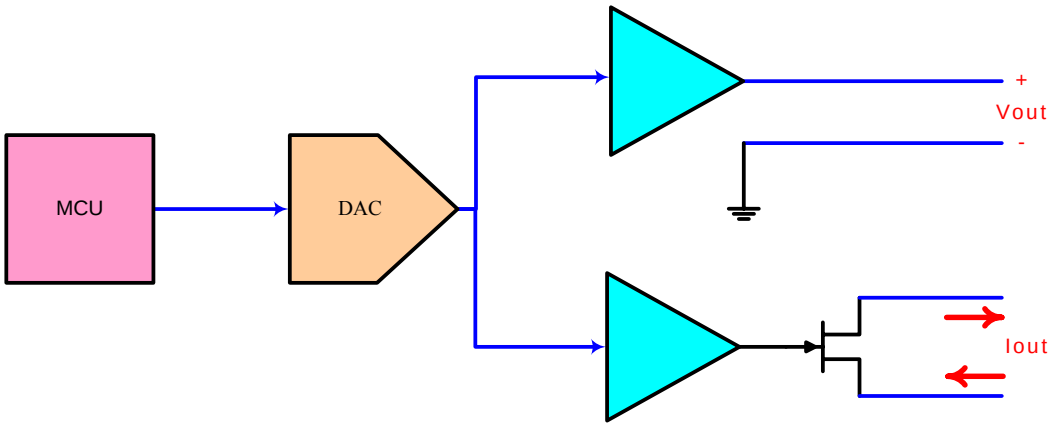
Pin	1	2	3	4	5	6	7	8	9	10	11	12
Signal	Vin0+	Vin0-	Vin1+	Vin1-	Vin2+	Vin2-	Vin3+	Vin3-	Vin4+	Vin4-	Vin5+	Vin5-
Pin	13	14	15	16	17	18	19	20	21	22	23	24
Signal	Vin6+	Vin6-	Vin7+	Vin7-	Vout0+	Vout0-	Iout0+	Iout0-	Vout1+	Vout1-	Iout1+	Iout1-

I/O Device Wiring

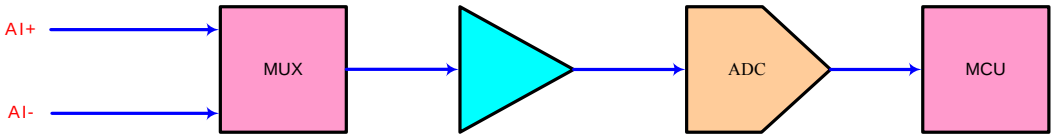


Function Diagram

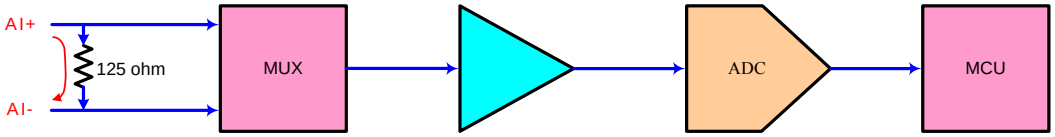
AO Schematic



AIN Schematic (voltage mode)



IIN Schematic (current mode)



E

Service Information

This appendix shows you how to contact MOXA for information about the ioLogik R2140, and other products, and how to report problems.

In this appendix, we cover the following topics.

- **MOXA Internet Services**
- **Problem Report Form**
- **Product Return Procedure**

MOXA Internet Services

Customer satisfaction is our top priority. To ensure that customers receive the full benefit of our products, MOXA Internet Services has been set up to provide technical support, driver updates, product information, and user's manual updates.

The following services are provided

Technical Support E-mail Address

support@moxa.com

Website for Product Information

http://www.moxa.com

Problem Report Form

MOXA ioLogik R2140 Remote I/O Server

Customer name:	
Company:	
Tel:	**Fax:**
Email:	**Date:**

MOXA Product: ioLogik R2140

Serial Number: _____

Problem Description: Please describe the symptoms of the problem as clearly as possible, including any error messages you see. A clearly written description of the problem will allow us to reproduce the symptoms, and will expedite the repair of your product.

Product Return Procedure

For product repair, exchange, or refund, the customer must complete each of the following:

- Provide evidence of original purchase.
- Obtain a Product Return Agreement (PRA) from the sales representative or dealer.
- Fill out the Problem Report Form (PRF) with as much detail as possible to minimize repair time.
- Carefully pack the product in an anti-static package and send it, pre-paid, to the dealer. The PRA should be visible on the outside of the package and should include a description of the problem along with the return address and telephone number.