ioLogik R2110 Series User's Manual

RS-485 Remote I/O Server with 12 DI, 8 DO

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ioLogik R2110 User's Manual

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Introduction

The ioLogik R2110 is an *Easy View*, stand-alone, remote digital I/O server that can be used to connect sensors and on/off switches over an RS-485 connection for use in automation applications.

The following topics are covered in this chapter:

- **Overview**
- **Features of the ioLogik R2110 RS-485 Remote I/O Server**
- **Package Checklist**
- **Product Specifications**
  - All ioLogik R2000 Series Remote I/O Servers
  - Specific to the ioLogik R2110
- **Pin Assignment**
  - Terminal Blocks
  - Setting the RS-485 Communication Speed

Overview

Without LCD Display Module **With LCD Display Module**

The ioLogik R2110 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 network. The ioLogik R2110 is differentiated from other R2000 series models by its digital I/O and its *Easy View* function. As an *Easy View* device, the ioLogik R2110 supports an optional hot-pluggable LCD display module to view and configure device settings.

The ioLogik R2110 can be connected to ioLogik E2000 series servers to allow each of the field I/O points to be accessed from within a single IP environment. One ioLogik E2000 series server can connect up to 31 ioLogik R2000 series servers.

Features of the ioLogik R2110 RS-485 Remote I/O Server

- 12 DI (digital input) channels, 8 DO (digital output) channels
- Multi-functional I/O that supports DI/Event Counter and DO/Pulse Output
- Connects to RS-485 network using Modbus protocol, allowing communication with standard SCADA software (e.g. Wonderware InTouch or GE Intellution iFix32)
- Supports optional hot-pluggable LCD module for status display and configuration
- Supports remote firmware updates via RS-485
- Monitoring and configuration with ioAdmin, a graphic user interface
- Hardware detection through RS-485 network with ioAdmin
- Modbus register settings viewable with ioAdmin
- Status of each I/O accessible over RS-485 network running the MXIO DLL library (coming soon)
- Built-in watchdog timer with configurable safe DI/O channel settings
- Configurable power-on DI/O channel settings
- Uses one IP address per server

NOTE: *ioAdmin is a utility designed by MOXA for configuration and monitroing of the ioLogik R2110. See* **Chapter 3** *for detailed information about ioAdmin.*

Package Checklist

The ioLogik R2110 is shipped with the following items:

Standard Accessories

- ioLogik R2110 RS-485 I/O Server × 1
- Software CD with documentation × 1

Optional Accessories

- LDP1602 ioLogik LCD display module (16 × 2 text screen and 5 push-buttons)

NOTE: *Notify your sales representative if any of these items are missing or damaged.*

Product Specifications

ioLogik R2110

12 isolated DI channels, 8 isolated DO channels, Modbus/RTU

All ioLogik R2000 Series Remote I/O Servers

The following specifications apply to all models in the R2000 series of ioLogik Remote I/O servers:

Serial

2-wire RS-485 for module cascading, terminal block (3.81 mm), supports data+, data-

Baudrate up to 115.2 kbps

Built-in ADDC™

15 KV ESD for all serial signals

Protocols

Modbus/RTU

Windows Utilities

ioAdmin for remote configuration and monitoring

Operating Modes for Host Control

Modbus/RTU

DLL for VB, BCB, VC++ with comprehensive examples (coming soon)

Built-in Watchdog Timer

Configurable host communication watchdog timer to reset device to safe status

Configuration

Automatic detection over RS-485 with ioAdmin

Remote firmware upgrade

Export configuration settings to a file

Power Input

12 to 48 VDC, accepts 24 VDC industrial power supply,
power consumption 195 mA @ 24 VDC

Reverse polarity protection

Environmental

Operating Temp: -10 to 60°C @ 95% RH

Ground Connection

DIN-rail, and panel mount holes equipped ground connection

Terminal Block

Removable terminal block (3.81 mm) (DI/O)

Signal indication LEDs for each channel (DI/O)

Regulatory approval

Shock, free fall, vibration

CE Class A, Level 3, Criteria B

FCC Part 15, CISPR (EN55022) class A

UL 508 (pending)

Specific to the ioLogik R2110

The following specifications differentiate the ioLogik R2110 from other models in the R2000 series of ioLogik Remote I/O servers

I/O Type

12 DI, 8 DO

Digital Input

Dry contact	Logic 0: close to GND
	Logic 1: open
Wet contact	Logic 0: 0 to 3 VDC
	Logic 1: 10 to 30 VDC

Low speed counter for limit switch with filtering (in 10 ms intervals)

Excess voltage protection (withstands voltage up to +36 VDC)

Source

Optical isolation 3K VDC

Pulse wave form settings in 10 ms

Excess voltage protection (withstands voltage up to +36 VDC)

Digital Output

Sink, 24 VDC, 200 mA

Optical isolation 3K VDC

Protection over temperature shutdown: Min, 170°C
Over voltage protection: 36 VDC
Over current limit: typ. 750 mA

LCD Display Module for *Easy View* Devices (Optional Accessory)

Text 16 × 2 LCM with backlight

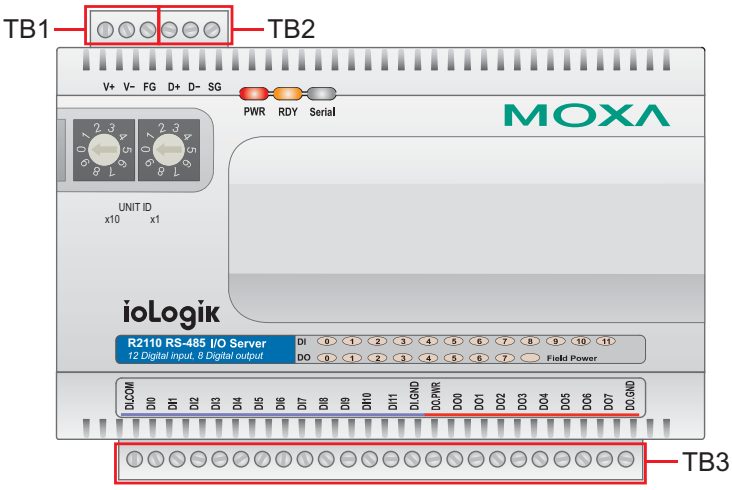
Button × 5 (up, down, right, left, center)

Hot pluggable to any ioLogik *Easy View* device

Unit ID, baudrate display, DI/O status display

Pin Assignment

Terminal Blocks



TB1	Signals
1	V+ (12 to 48 VDC)
2	V-
3	FG

TB2	Signals
1	Data+
2	Data-
3	SG

TB3	1	2	3	4	5	6	7	8
Signals	DI.COM	DI 0	DI 1	DI 2	DI 3	DI 4	DI 5	DI 6

TB3	9	10	11	12	13	14	15	16
Signals	DI 7	DI 8	DI 9	DI 10	DI 11	DI.GND	DO.PWR	DO 0

TB3	17	18	19	20	21	22	23	24
Signals	DO 1	DO 2	DO 3	DO 4	DO 5	DO 6	DO 7	DO.GND

Setting the RS-485 Communication Speed

The RS-485 port on the ioLogik R2110 is used to communicate with other RS-485 devices or to link to 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 R2110. The default settings are baudrate = 115200, parity check = N, data bits = 8, and stop bit = 1.

Setting the Baudrate

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

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Hardware Installation

In this chapter, we describe the hardware installation procedure for the ioLogik R2110 remote I/O server.

The following topics are covered in this chapter.

- **Connecting the Hardware**
  - Connecting the Power
  - Grounding the ioLogik R2110
  - Connecting to I/O Device Servers
  - LED Indicators
- **Factory Default Settings**
- **ioAdmin**
- **LCD Display Module**

Connecting the Hardware

Connecting the Power

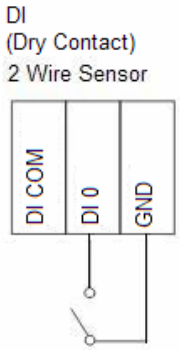
Connect the 12 to 48 VDC power line with the ioLogik R2110's terminal block. If the power is properly supplied, the power LED will glow a solid red color until the system is ready

Grounding the ioLogik R2110

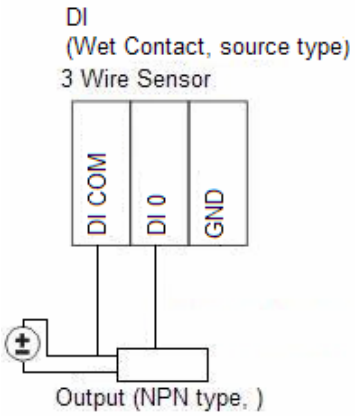
The ioLogik R2110 is equipped with two protection ground points. One is on the wall mount hole and the other is on the DIN-rail mounting rail.

Connecting to I/O Device Servers

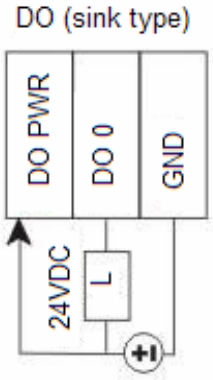
1. DI dry contact



2. DI wet contact (source type)



3. DO sink type



* DO PWR is for powering up the field power LED

LED Indicators

LED	Description	
System LEDs		
PWR	Red	The power is on.
Ready	Red	There is a system error.
	Green	The ioLogik is functioning normally.
	Off	The power is off or a power error condition exists.
	Flashing Red/Green	The ioLogik is in safe status.
Serial	Blinking	The serial port is receiving and transmitting data.
DI/O LEDs		
DI ×12 pins **DO × 8 pins** **Field PWR**	In 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 Out 0, 1, 2, 3, 4, 5, 6, 7 Field power	

Factory Default Settings

The ioLogik R2110 is configured with the following default settings:

Default RS-485 Unit ID: 1
Default communication baudrate: 115200 bps

ioAdmin

ioAdmin is a Windows utility used to configure the ioLogik R2110, export your settings, and monitor the ioLogik R2110 remotely.

LCD Display Module

As an *Easy View* device, the ioLogik R2110 supports an optional detachable LCD display module for easier field maintenance. The display module is hot-pluggable and can be used to both display and modify the server settings. When plugged in, the module displays the ioLogik R2110's "home page," and pressing any button takes you into the settings and configuration.

LCD Display Module Controls:

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

The up and down buttons navigate between the current options. The right and left buttons enter and exit the submenus. On the ioLogik R2110, the center button is used only when restarting the server.

Display	Explanation / Actions
`ioLogik R2110` `ID:01 Bps:115200`	This is the default "home page" showing the unit ID and baudrate. Press the down button to begin navigating the setting options.
`<ioLogik R2110>` `server`	Enter this submenu to access the following items of information: • **serial number** • **name** • **location** • **ioLogik R2110 firmware version** • **display module firmwware version** • **model name**
`<ioLogik R2110>` `serial port`	Enter this submenu to display the RS-485 serial communication port setting: RS-485 Setting: 115200,n,8,1
`<ioLogik R2110>` `i/o SETTING`	Enter this submenu to access DI/O channel status. DI channels may be ON/OFF or CT (for event counter). DO channels may be ON/OFF or Pulse. Here are examples of settings that you might see: • **DI-00 = ON** • **DI-07 [CT] = 0** • **DO-01 = [Pulse] = 1 Hz** • **DO-03 = ON, or OFF** Press ***up***, or ***down*** to navigate through the different I/O channels without having to go back to the previous menu.
`<ioLogik R2110>` `save/restart`	Enter this submenu, then enter the **restart now** submenu to display the **restart** option. You may press the center button at that point in order to reboot the ioLogik R2110. For this device, no other options are currently available for this set of submenus.

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Configuring the ioLogik R2110 with ioAdmin

This chapter covers the following topics explains how to configure the I/O channels.

- **Overview**
- **Installing ioAdmin**
- **Searching for the ioLogik R2110**
- **Monitoring I/O Status**
- **On-line Wiring Guide**
- **Modbus/RTU**
- **Server Information**
- **Logging In**
- **Configuring Digital Input/Output Channels**
  - Testing DI/O Channels
  - Configuring Digital Input Channels
  - Configuring Digital Output Channels
  - About Power On Settings
  - About Safe Status Settings
- **Host Connection Watchdog**
- **Restarting the System**
- **Restoring Default Settings**
- **Exporting ioLogik R2110 Settings**
- **Password Protection**
- **Firmware Update**

Overview

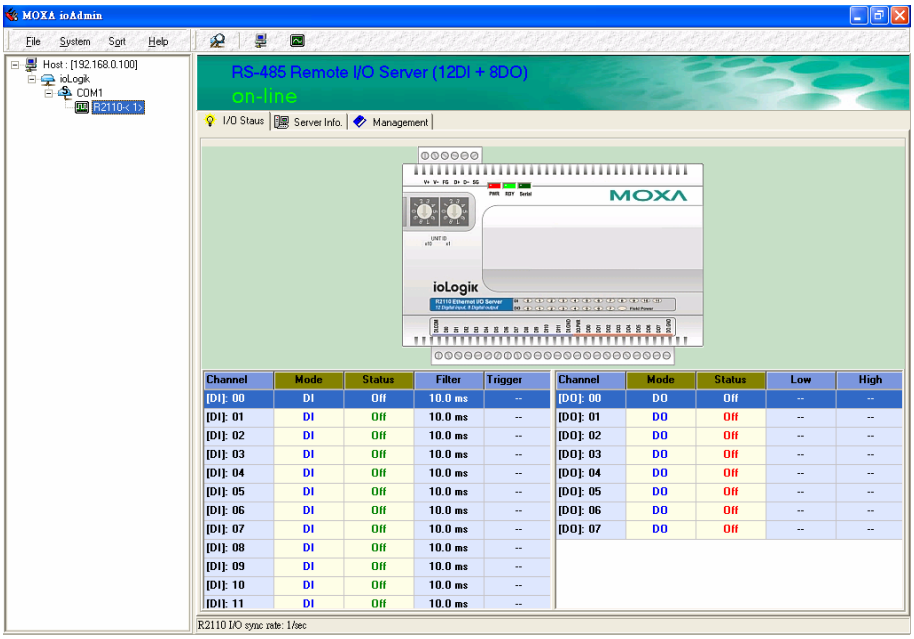
ioAdmin is a monitoring and configuration utility designed for use with ioLogik R2000 series I/O servers. It supports Windows 2000 and Windows XP and consists of the following software.

- ioAdmin
- ioLogik R2110 Wiring Guide
- MXIO DLL library (coming soon)

Installing ioAdmin

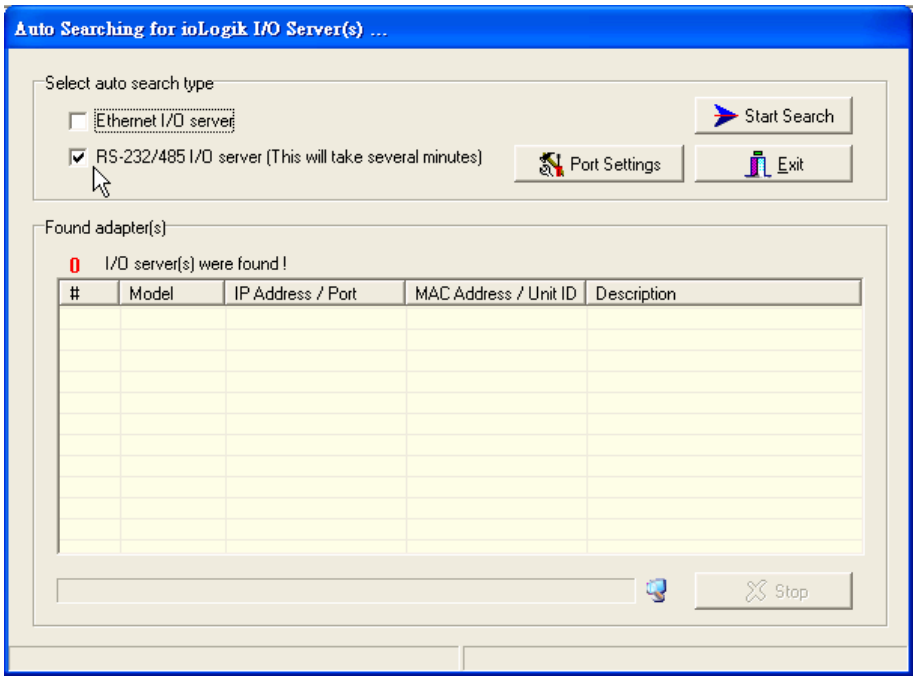
Insert the CD-ROM from the network adaptor package into the host computer. Run **SETUP.EXE**, which is located in the root directory on the CD-ROM. The installation program will guide you through the installation process and will install ioAdmin along with the MXIO DLL library.

After installation is finished, open ioAdmin from **Start → All Programs → ioLogik → Utility → ioAdmin**.

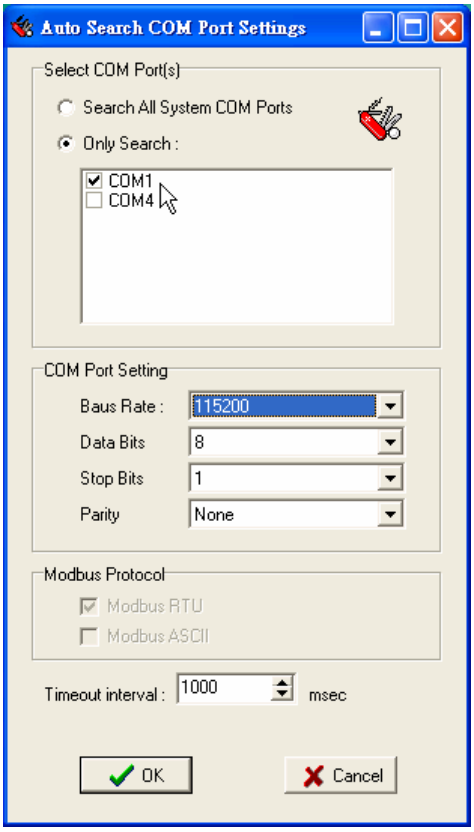


Searching for the ioLogik R2110

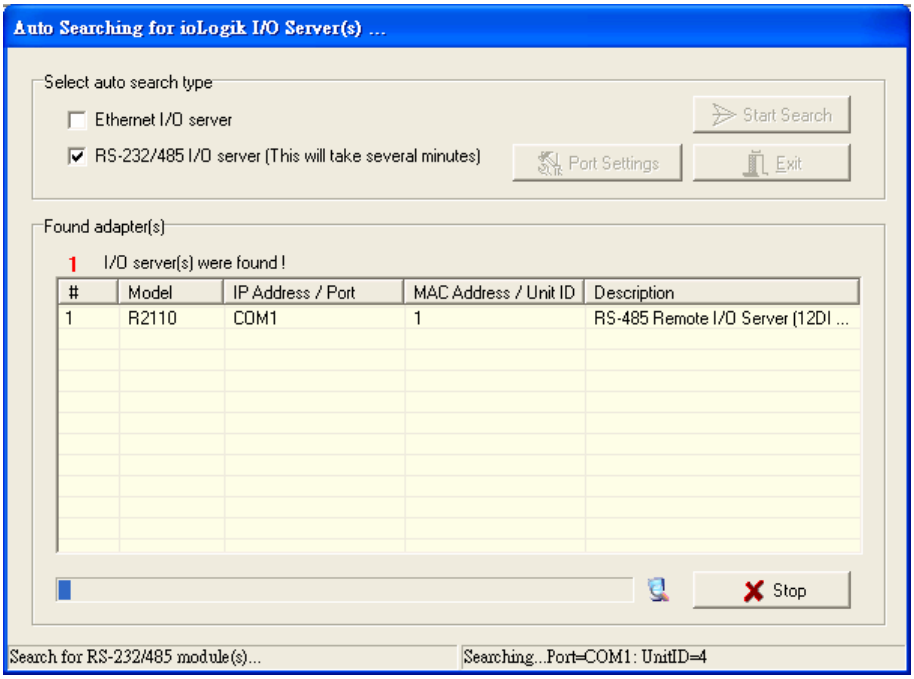
From the pull-down menu, choose **System → Auto Scan Remote I/O Server**. A system dialog window will pop up



Make sure that **RS-232/485 I/O server** is selected and click on **Port Settings** to set/verify the serial port settings before searching.



When you click on **Start Search**, ioAdmin will begin searching up to 99 ports for your ioLogik R2110. The timeout interval is for RS-485 communication and defaults to 2000 ms. As soon as your ioLogik R2110 appears as shown below, you may click **Stop**. Otherwise, ioAdmin will continue to search all 99 ports.



ATTENTION

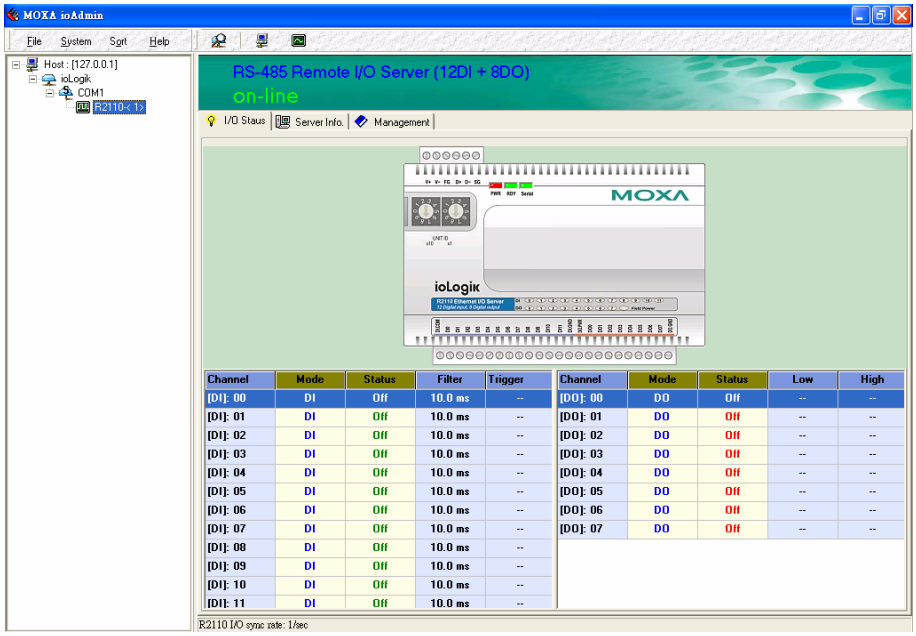
If ioAdmin is unable to find your ioLogik R2110, make sure that the baudrates match. See **Chapter 2** for setting or viewing the baudrate on your ioLogik R2110.

ATTENTION

Even if ioAdmin is unable to find your ioLogik R2110, you may still access the On-line Wiring Guide. Please refer to the **On-line Wiring Guide** section for details.

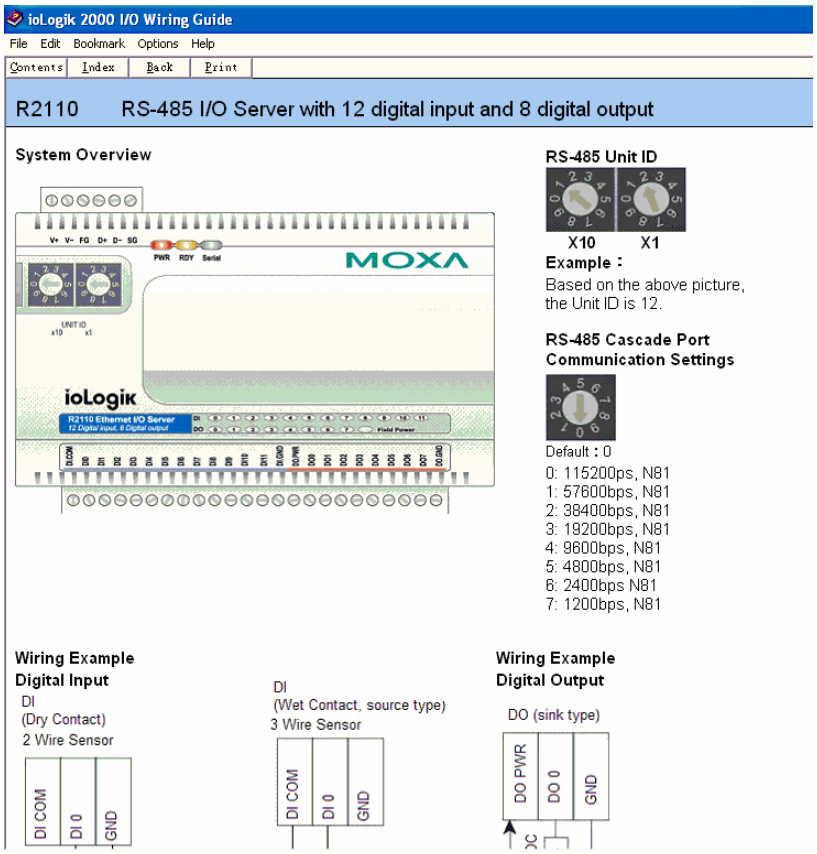
Monitoring I/O Status

Once the ioLogik R2110 is found by ioAdmin, you may monitor I/O status from the first tab of ioAdmin. You can also configure each DI/O channel from this tab after first logging in under the Management tab. See the **Configuring Digital Input/Output Channels section** for more information.

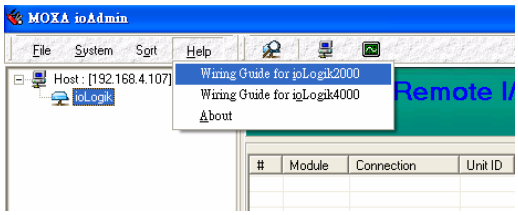


On-line Wiring Guide

To access the On-line Wiring Guide, right click on the ioLogik R2110 graphic, then left click on **Wiring Guide**. This displays a help file showing the wiring information and electrical characteristics of the ioLogik R2110.



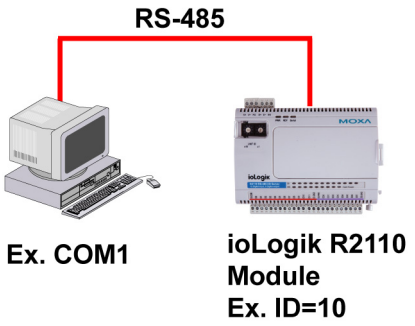
If ioAdmin was unable to find your ioLogik R2110, you may still access the On-line Wiring Guide through the Help menu on the menu bar.



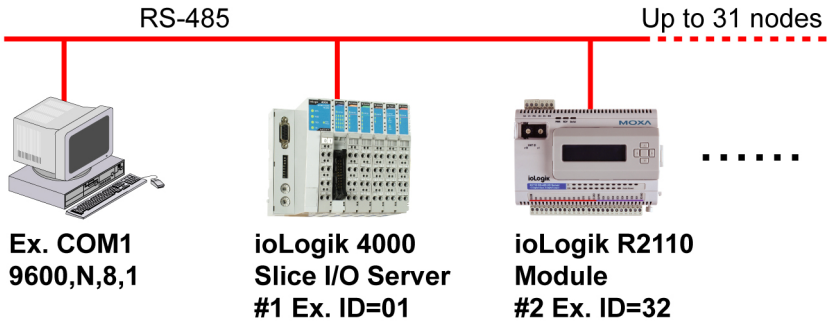
Modbus/RTU

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

Connecting One Serial I/O Device

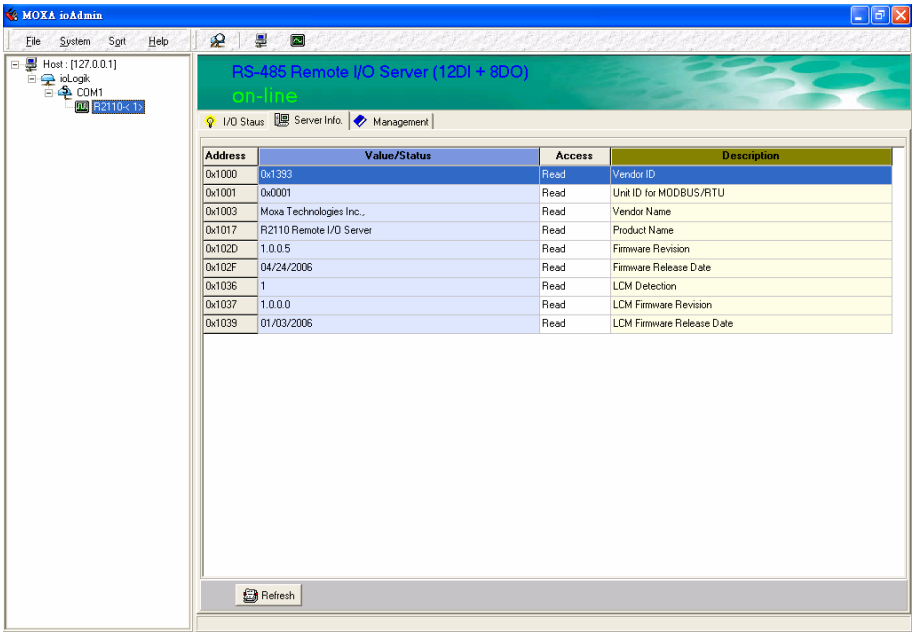


Connecting Multiple RS-485 I/O Devices



Server Information

The Server Information tab provides the Modbus addresses for all system configurations. This helps you verify the access authority of each address. The screen also displays a clear explanation of each item.



Logging In

Initially, you will have limited access to DI/O channel settings and other functions. For example, you will not be able to test or configure the DI/O channels when first powering on the ioLogik R2110. In order to obtain full access to configuration settings and other functions, you will need to first log in under the Management tab, regardless of whether or not you have set up password. (If there is no password, you may leave the password field blank.) Be sure to do log in first after any power on or restart if you wish to have access to all functions.

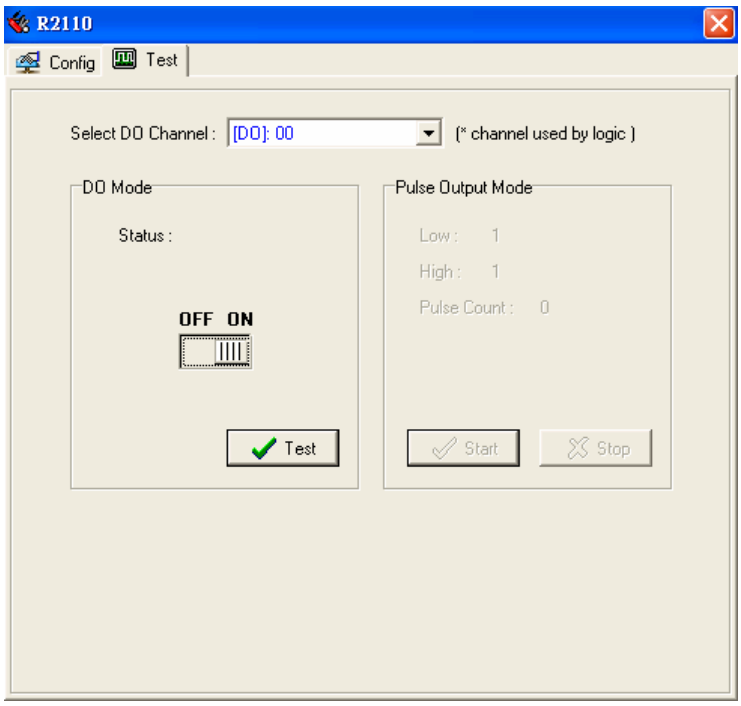
Configuring Digital Input/Output Channels

ioAdmin allows easy testing and configuration of the ioLogik R2110's DI/O channels. Simply double click on the channel that you wish to configure. You will be able to test the channel, select the mode, adjust the mode settings, and adjust the power on and safe status settings.

Testing DI/O Channels

You may test each DI/O channel with ioAdmin. The settings are as follows:

DI-DI: depends on the device
DI-Counter: activate or stop event counting
DO-DO: change status of the DO to ON or OFF
DO-Pulse: activate, or stop pulse generation



Configuring Digital Input Channels

The ioLogik R2110 is equipped with 12 digital inputs that can be set individually to **DI** or **Event Counter** mode. In DI mode, the specification is as follows:

Dry contact

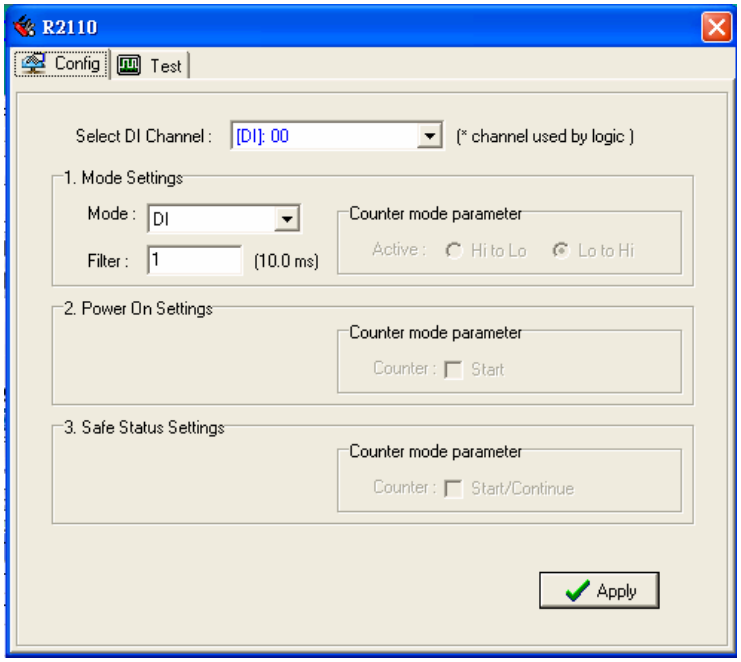
Logic 0 (OFF): short to GND

Logic 1 (ON): open

Wet contact

Logic 0 (OFF): 0 to 3V

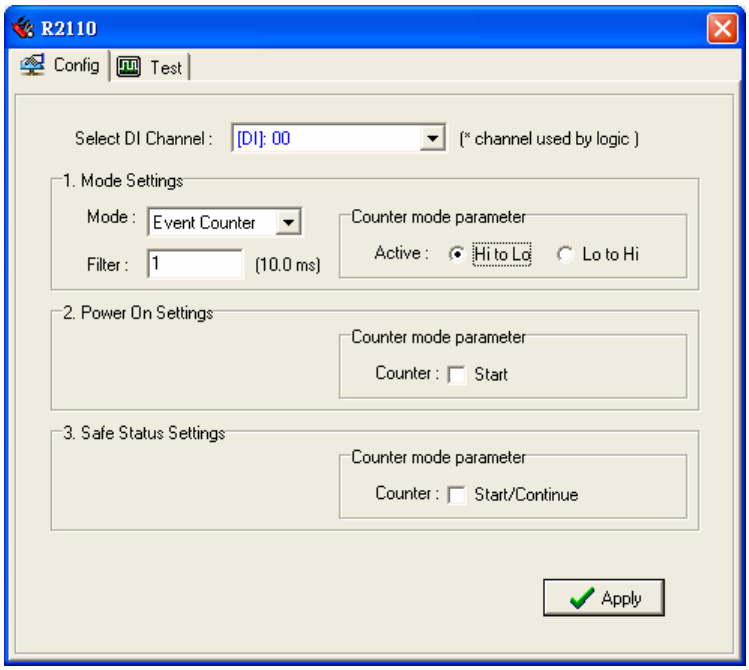
Logic 1 (ON): 10 to 30V



In Event Counter mode, the ioLogik R2110's DI can connect to the limit switch or the proximity switch and can count the time based on the ON/OFF status. You can set the trigger for two modes, Lo to Hi, or Hi to Lo. When setting the trigger as Lo to Hi, the counter value increases when the switch is pushed. When setting the trigger as Hi to Lo, the counter value increases when the switch is pushed and released.

To eliminate the problem of bouncing with the switch, the ioLogik R2110 provides software filtering. It is configurable in multiples of 10 ms. For example, a setting of **2** would mean a 20 ms filter (2 x 10 ms). The maximum value allowed by the software filter is 65535.

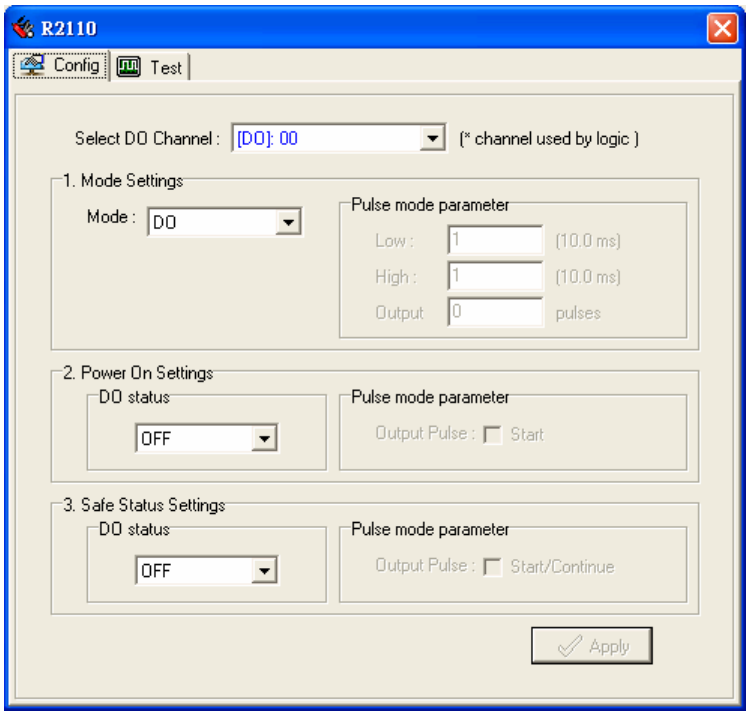
Setting the filter to "0" causes the system to filter all signals.



The sampling rate of the counter is 50 Hz. This function is designed for low speed switching, not for motor control. You may also configure how the counter is handled when the ioLogik R2110 is powered on or in safe status. If **Start** is checked off in the Power On Settings, the counter will begin counting events as soon as the ioLogikR2110 is powered on. If **Start/Continue** is checked off, the counter will start or continue counting events when the ioLogik R2110 switches to safe status as configured by the Host Connection Watchdog.

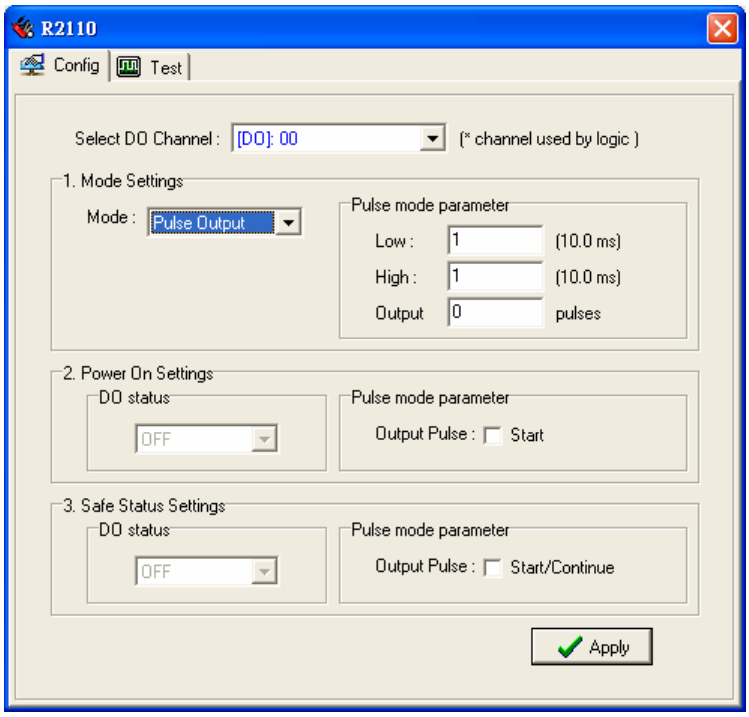
Configuring Digital Output Channels

The ioLogik R2110 is equipped with 8 digital output (sink) channels that can be set individually to **DO** or **Pulse Output** mode. In DO mode, the specification is Logic 0 (OFF)=open; Logic 1 (ON)=short:



You may also configure whether the DO status is set to ON or OFF when the ioLogik 2110 is powered on or in safe status, under the Power On Settings and the Safe Status Settings.

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 parameters are in multiples of 10.0 ms, so a setting of **100** for both Low and High would generate a square wave with a 2-second cycle in total (Low wave is 100 x 10ms, or 1000 ms, and High wave is 100 x 10 ms, or 1000 ms, for a total of 2000 ms or 2 sec). The Output parameter configures the number of pulses to send. Setting it for 0 pulses tells the system to send an unlimited number of pulses. The maximum value for the Low and High parameters is 65535, and the maximum value for the Output parameter is 2^{32}.



You may also configure how the output pulse is handled when the ioLogik R2110 is powered on or in safe status. If **Start** is checked off in the Power On Settings, the output pulse will commence as soon as the ioLogikR2110 is powered on. If **Start/Continue** is checked off, the output pulse will start or continue when the ioLogik R2110 switches to safe status as configured by the Host Connection Watchdog.

About Power On Settings

ioAdmin allows you to configure the status or behavior of each DI/O channel when the ioLogik R2110 is initially powered on. You can access this setting by double-clicking on any channel in the I/O Status tab. For DI channels in Event Counter mode, you can configure whether or not counting begins at power up. For DO channels in DO mode, you can configure whether or not the DO is set to OFF or ON at power up. For DO channels in Output Pulse mode, you can configure whether or not the output pulse commences at power up.

About Safe Status Settings

With the ioLogik R2110, you have control over how your DI/O channels respond during a break in RS-485 communication, rather than having all activity simply cease. This is done through the Safe Status settings and the Host Connection Watchdog.

Safe Status is controlled by the ioLogik R2110's Host Connection Watchdog and is activated after a break in RS-485 communication for a specified time interval. When the ioLogik R2110 enters Safe Status (i.e. after the break in RS-485 communication), your DI/O channel will respond as configured in its Safe Status settings.

For example, you could configure a DO channel to start output pulses at Safe Status. When the Host Connection Watchdog determines that a break in RS-485 communication has occurred, it activates Safe Status, and that DO channel will begin output pulses. You could configure a DI channel that is in Event Counter mode to continue counting events in Safe Status, so that even after a break in communication, that DI channel will continue counting events.

If the Host Connection Watchdog is not enabled, the ioLogikR2110 will never enter Safe Status. This means that if the Host Connection Watchdog is not enabled, your Safe Status settings will have no effect.

To configure a DI/O channel's Safe Status settings, double-click on the channel in the I/O Status tab. For DI channels in Event Counter mode, you can configure whether or not counting starts or continues when Safe Status has been activated. For DO channels in DO mode, you can configure whether or not the DO is set to OFF or ON at Safe Status. For DO channels in Output Pulse mode, you can configure whether or not the output pulse commences or continues at Safe Status.

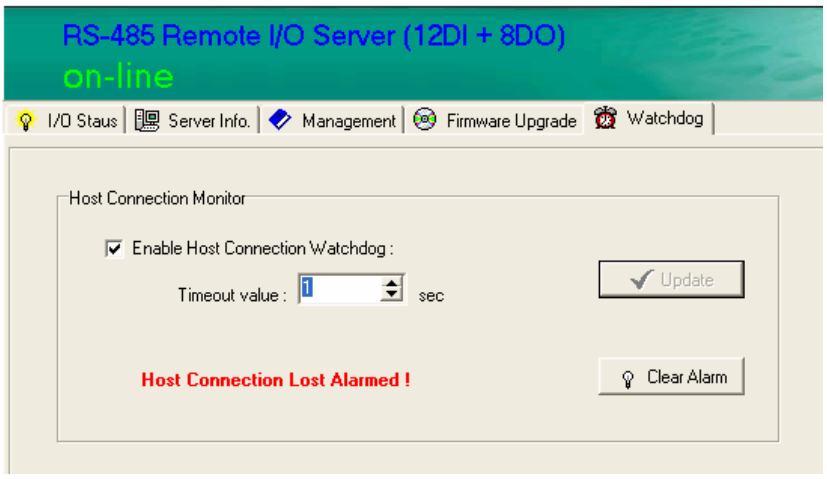
Host Connection Watchdog

The activates Safe Status when RS-485 communication between the PC and the ioLogik R2110 has been disrupted for a configurable amount of time. You may configure the Watchdog by going to the Watchdog tab.

By default, the Watchdog is disabled. When the Watchdog is enabled and a timeout occurs, the ioLogik R2110 will enter Safe Status, and you may configure how each DI/O channel responds in the channel's Safe Status settings.

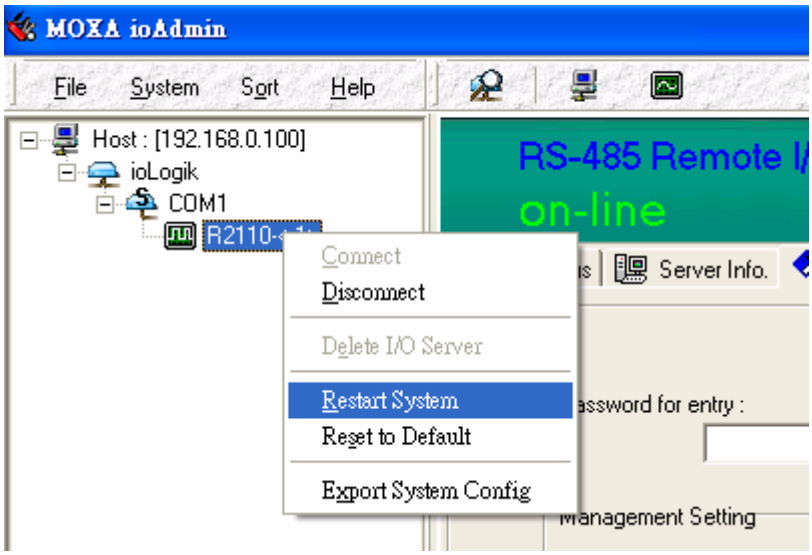
To enable the Watchdog, check off **Enable Host Connection Watchdog**, set the Timeout value, and restart the server. With Watchdog enabled, the ioLogik R2110 will first wait after a RS-485 communications disruption before entering Safe Status. The amount of time it will wait is set by the Timeout value.

When a timeout occurs, a warning will be visible in the Watchdog tab, stating **Host Connection Lost Alarmed!** You may click on **Clear Alarm** to reset the Watchdog and deactivate Safe Status. If there is another disruption in communication, the Watchdog will activate Safe Status again.



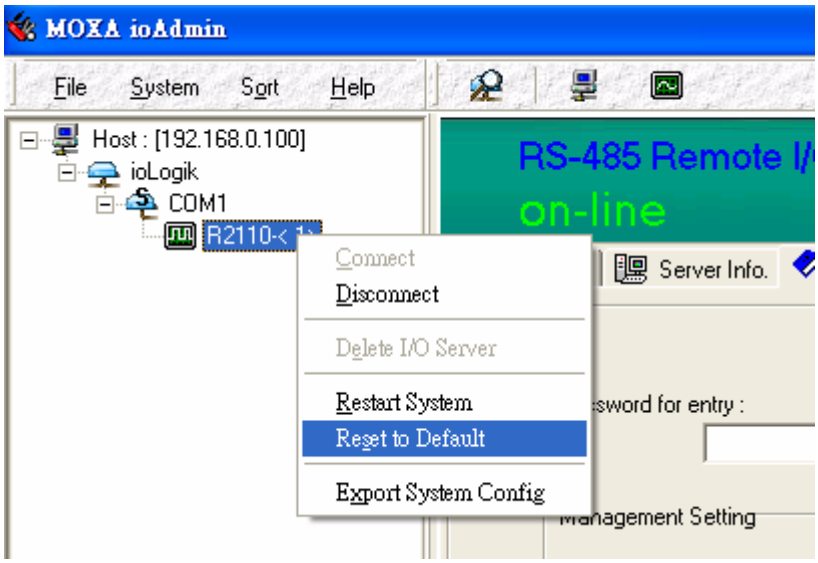
Restarting the System

You may use the Restart System command to restart the ioLogik R2110 from a remote site.



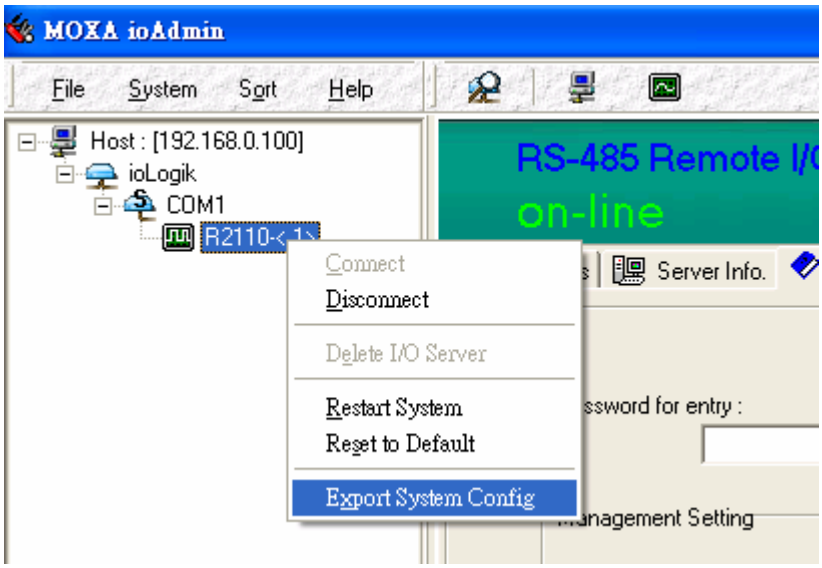
Restoring Default Settings

You may use ioAdmin to reset the system to factory defaults.



Exporting ioLogik R2110 Settings

ioLogik R2110 settings can be exported to a text file for backup.




```
ioLogik 2000 RS-485 I/O Server Configuration
============================================
Date: 2006/6/25
Time: 下午 11:21:33

1. Model
--------
IOLOGIK R2110 - RS-485 Remote I/O Server (12DI + 8DO)

2. System and I/O Configurations
--------------------------------
DI00 DI       -n/a-
DI01 DI       -n/a-
DI02 DI       -n/a-
DI03 DI       -n/a-
DI04 DI       -n/a-
DI05 DI       -n/a-
DI06 DI       -n/a-
DI07 DI       -n/a-
DI08 DI       -n/a-
DI09 DI       -n/a-
DI10 DI       -n/a-
DI11 DI       -n/a-
DO00 DO       PWR ON=Off, Safe status=Off
DO01 DO       PWR ON=Off, Safe status=On
DO02 DO       PWR ON=Off, Safe status=Off
DO03 DO       PWR ON=Off, Safe status=Off
DO04 DO       PWR ON=Off, Safe status=Off
DO05 DO       PWR ON=Off, Safe status=Off
DO06 DO       PWR ON=Off, Safe status=Off
DO07 DO       PWR ON=Off, Safe status=Off
```

```
3. Modbus address table
-----------------------
Channel No.   I/O type Modbus reference  Modbus address (Dec, Hex)
DI00          Input    10001             0000, 0x0000
DI01          Input    10002             0001, 0x0001
DI02          Input    10003             0002, 0x0002
DI03          Input    10004             0003, 0x0003
DI04          Input    10005             0004, 0x0004
DI05          Input    10006             0005, 0x0005
DI06          Input    10007             0006, 0x0006
DI07          Input    10008             0007, 0x0007
DI08          Input    10009             0008, 0x0008
DI09          Input    10010             0009, 0x0009
DI10          Input    10011             0010, 0x000A
DI11          Input    10012             0011, 0x000B
DO00          Output   00001             0000, 0x0000
DO01          Output   00002             0001, 0x0001
DO02          Output   00003             0002, 0x0002
DO03          Output   00004             0003, 0x0003
DO04          Output   00005             0004, 0x0004
DO05          Output   00006             0005, 0x0005
DO06          Output   00007             0006, 0x0006
DO07          Output   00008             0007, 0x0007

<END>
```

Password Protection

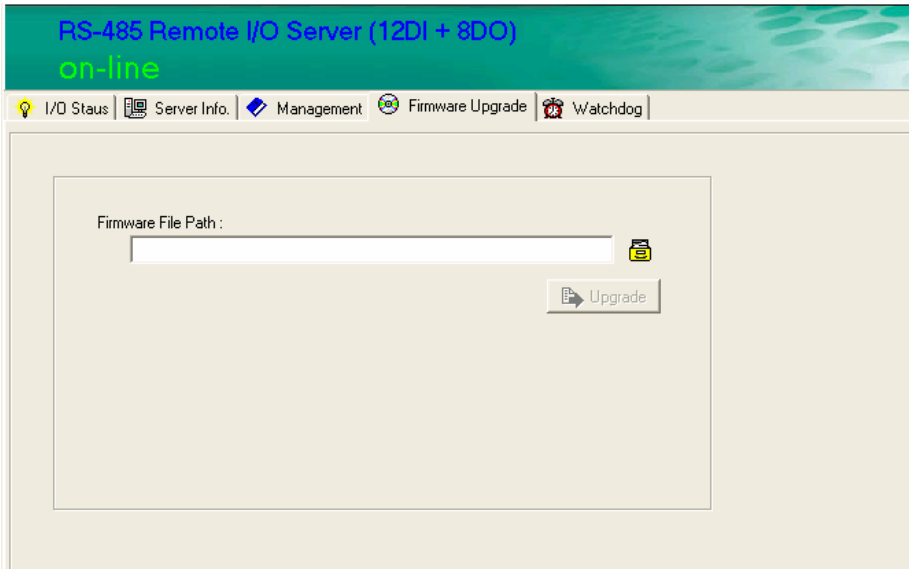
The ioLogik R2110 can be protected by password under the Management tab. The login and password restrict access to configuration and other functions, such as Host Connection Watchdog or firmware updates. If you forget the password, press ***Reset*** to clear the password and reset all settings back to their factory defaults.

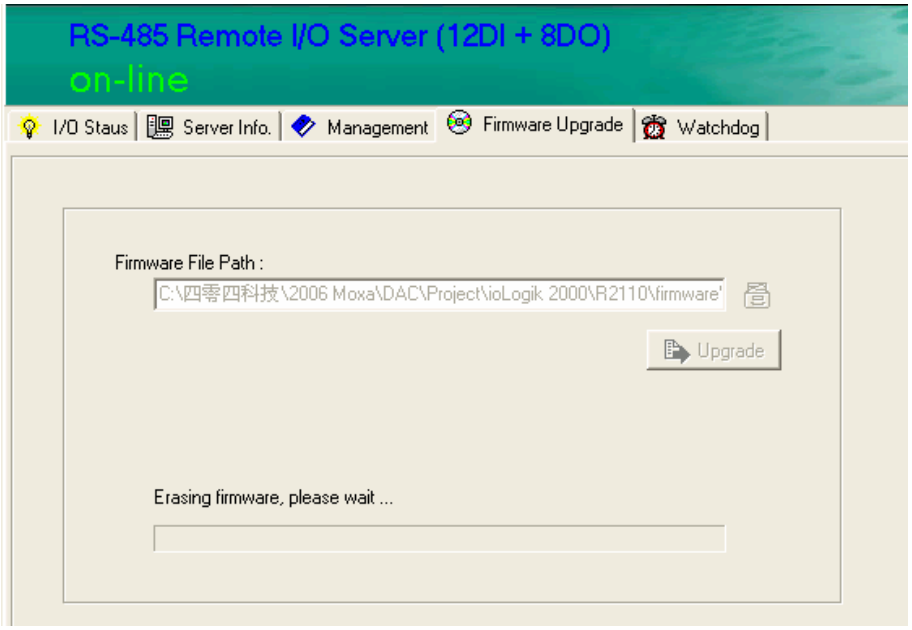
NOTE: *The Reset button is located at the top of the ioLogik R2110. Hold the reset button down for 5 seconds to reboot the system back to factory defaults.*

Firmware Update

Once you have logged in under the Management tab, you can use ioAdmin to remotely download firmware for the ioLogik R2110. You can download the newest firmware at Moxa's website. The file name of the firmware will be in this format: *XXXX*.2kp.

Firmware Upgrade Screens





A

Modbus/RTU Address Mappings

ioLogik R2110 Modbus Mapping

0xxxx Read/Write Coils (Support 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	CH0 DO Power-On Value 0: Off 1: On
00010	0x0009	1 bit	CH1 DO Power-On Value 0: Off 1: On
00011	0x000A	1 bit	CH2 DO Power-On Value 0: Off 1: On
00012	0x000B	1 bit	CH3 DO Power-On Value 0: Off 1: On
00013	0x000C	1 bit	CH4 DO Power-On Value 0: Off 1: On
00014	0x000D	1 bit	CH5 DO Power-On Value 0: Off 1: On
00015	0x000E	1 bit	CH6 DO Power-On Value 0: Off 1: On
00016	0x000F	1 bit	CH7 DO Power-On Value 0: Off 1: On
00017	0x0010	1 bit	CH0 DO Safe Value 0: Off 1: On
00018	0x0011	1 bit	CH1 DO Safe Value 0: Off 1: On
00019	0x0012	1 bit	CH2 DO Safe Value 0: Off 1: On
00020	0x0013	1 bit	CH3 DO Safe Value 0: Off 1: On
00021	0x0014	1 bit	CH4 DO Safe Value 0: Off 1: On
00022	0x0015	1 bit	CH5 DO Safe Value 0: Off 1: On
00023	0x0016	1 bit	CH6 DO Safe Value 0: Off 1: On
00024	0x0017	1 bit	CH7 DO Safe Value 0: Off 1: On
00025	0x0018	1 bit	CH0 DO Pulse Operate Status 0: Off 1: On
00026	0x0019	1 bit	CH1 DO Pulse Operate Status 0: Off 1: On
00027	0x001A	1 bit	CH2 DO Pulse Operate Status 0: Off 1: On
00028	0x001B	1 bit	CH3 DO Pulse Operate Status 0: Off 1: On
00029	0x001C	1 bit	CH4 DO Pulse Operate Status 0: Off 1: On
00030	0x001D	1 bit	CH5 DO Pulse Operate Status 0: Off 1: On
00031	0x001E	1 bit	CH6 DO Pulse Operate Status 0: Off 1: On
00032	0x001F	1 bit	CH7 DO Pulse Operate Status 0: Off 1: On
00033	0x0020	1 bit	CH0 DO Power-On Pulse Operate Status 0: Off 1: On
00034	0x0021	1 bit	CH1 DO Power-On Pulse Operate Status 0: Off 1: On

Reference	Address	Data Type	Description
00035	0x0022	1 bit	CH2 DO Power-On Pulse Operate Status 0: Off 1: On
00036	0x0023	1 bit	CH3 DO Power-On Pulse Operate Status 0: Off 1: On
00037	0x0024	1 bit	CH4 DO Power-On Pulse Operate Status 0: Off 1: On
00038	0x0025	1 bit	CH5 DO Power-On Pulse Operate Status 0: Off 1: On
00039	0x0026	1 bit	CH6 DO Power-On Pulse Operate Status 0: Off 1: On
00040	0x0027	1 bit	CH7 DO Power-On Pulse Operate Status 0: Off 1: On
00041	0x0028	1 bit	CH0 DO Safe Pulse Operate Status 0: Off 1: On
00042	0x0029	1 bit	CH1 DO Safe Pulse Operate Status 0: Off 1: On
00043	0x002A	1 bit	CH2 DO Safe Pulse Operate Status 0: Off 1: On
00044	0x002B	1 bit	CH3 DO Safe Pulse Operate Status 0: Off 1: On
00045	0x002C	1 bit	CH4 DO Safe Pulse Operate Status 0: Off 1: On
00046	0x002D	1 bit	CH5 DO Safe Pulse Operate Status 0: Off 1: On
00047	0x002E	1 bit	CH6 DO Safe Pulse Operate Status 0: Off 1: On
00048	0x002F	1 bit	CH7 DO Safe Pulse Operate Status 0: Off 1: On
00049	0x0030	1 bit	CH0 DI Counter Status 0: Off 1: On
00040	0x0031	1 bit	CH1 DI Counter Status 0: Off 1: On
00041	0x0032	1 bit	CH2 DI Counter Status 0: Off 1: On
00042	0x0033	1 bit	CH3 DI Counter Status 0: Off 1: On
00043	0x0034	1 bit	CH4 DI Counter Status 0: Off 1: On
00044	0x0035	1 bit	CH5 DI Counter Status 0: Off 1: On
00045	0x0036	1 bit	CH6 DI Counter Status 0: Off 1: On
00056	0x0037	1 bit	CH7 DI Counter Status 0: Off 1: On
00057	0x0038	1 bit	CH8 DI Counter Status 0: Off 1: On
00058	0x0039	1 bit	CH9 DI Counter Status 0: Off 1: On
00059	0x003A	1 bit	CH10 DI Counter Status 0: Off 1: On
00060	0x003B	1 bit	CH11 DI Counter Status 0: Off 1: On
00061	0x003C	1 bit	CH0 DI Clear Counter Value read always: 0 Write: 1: Clear counter value 0: return Illegal Data Value
00062	0x003D	1 bit	CH1 DI Clear Counter Value read always: 0 Write: 1: Clear counter value 0: return Illegal Data Value
00063	0x003E	1 bit	CH2 DI Clear Counter Value read always: 0 Write: 1: Clear counter value 0: return Illegal Data Value
00064	0x003F	1 bit	CH3 DI Clear Counter Value read always: 0 Write: 1: Clear counter value 0: return Illegal Data Value
00065	0x0040	1 bit	CH4 DI Clear Counter Value read always: 0 Write: 1: Clear counter value 0: return Illegal Data Value
00066	0x0041	1 bit	CH5 DI Clear Counter Value read always: 0 Write: 1: Clear counter value 0: return Illegal Data Value
00067	0x0042	1 bit	CH6 DI Clear Counter Value read always: 0 Write: 1: Clear counter value 0: return Illegal Data Value
00068	0x0043	1 bit	CH7 DI Clear Counter Value read always: 0 Write: 1: Clear counter value 0: return Illegal Data Value

Reference	Address	Data Type	Description
00069	0x0044	1 bit	CH8 DI Clear Counter Value read always: 0 Write: 1: Clear counter value 0: return Illegal Data Value
00070	0x0045	1 bit	CH9 DI Clear Counter Value read always: 0 Write: 1: Clear counter value 0: return Illegal Data Value
00071	0x0046	1 bit	CH10 DI Clear Counter Value read always: 0 Write: 1: Clear counter value 0: return Illegal Data Value
00072	0x0047	1 bit	CH11 DI Clear Counter Value read always: 0 Write: 1: Clear counter value 0: return Illegal Data Value
00073	0x0048	1 bit	CH0 DI Counter Overflow Status Read: 0: Normal 1: Overflow Write: 0: clear overflow status 1: return Illegal Data Value
00074	0x0049	1 bit	CH1 DI Counter Overflow Status Read: 0: Normal 1: Overflow Write: 0: clear overflow status 1 : return Illegal Data Value
00075	0x004A	1 bit	CH2 DI Counter Overflow Status Read: 0: Normal 1: Overflow Write: 0: clear overflow status 1: return Illegal Data Value
00076	0x004B	1 bit	CH3 DI Counter Overflow Status Read: 0: Normal 1: Overflow Write: 0 : clear overflow status 1: return Illegal Data Value
00077	0x004C	1 bit	CH4 DI Counter Overflow Status Read: 0: Normal 1: Overflow Write: 0: clear overflow status 1: return Illegal Data Value
00078	0x004D	1 bit	CH5 DI Counter Overflow Status Read: 0: Normal 1: Overflow Write: 0: clear overflow status 1: return Illegal Data Value
00079	0x004E	1 bit	CH6 DI Counter Overflow Status Read: 0: Normal 1: Overflow Write: 0: clear overflow status 1: return Illegal Data Value
00080	0x004F	1 bit	CH7 DI Counter Overflow Status Read: 0: Normal 1: Overflow Write: 0: clear overflow status 1: return Illegal Data Value

Reference	Address	Data Type	Description
00081	0x0050	1 bit	CH8 DI Counter Overflow Status Read: 0: Normal 1: Overflow Write: 0: clear overflow status 1: return Illegal Data Value
00082	0x0051	1 bit	CH9 DI Counter Overflow Status Read: 0: Normal 1: Overflow Write: 0: clear overflow status 1: return Illegal Data Value
00083	0x0052	1 bit	CH10 DI Counter Overflow Status Read: 0: Normal 1: Overflow Write: 0: clear overflow status 1: return Illegal Data Value
00084	0x0053	1 bit	CH11 DI Counter Overflow Status Read: 0: Normal 1: Overflow Write: 0: clear overflow status 1: return Illegal Data Value
00085	0x0054	1 bit	CH0 DI Counter Trigger : 0=Low to High, 1=High to Low
00086	0x0055	1 bit	CH1 DI Counter Trigger : 0=Low to High, 1=High to Low
00087	0x0056	1 bit	CH2 DI Counter Trigger : 0=Low to High, 1=High to Low
00088	0x0057	1 bit	CH3 DI Counter Trigger : 0=Low to High, 1=High to Low
00089	0x0058	1 bit	CH4 DI Counter Trigger : 0=Low to High, 1=High to Low
00090	0x0059	1 bit	CH5 DI Counter Trigger : 0=Low to High, 1=High to Low
00091	0x005A	1 bit	CH6 DI Counter Trigger : 0=Low to High, 1=High to Low
00092	0x005B	1 bit	CH7 DI Counter Trigger : 0=Low to High, 1=High to Low
00093	0x005C	1 bit	CH8 DI Counter Trigger : 0=Low to High, 1=High to Low
00094	0x005D	1 bit	CH9 DI Counter Trigger : 0=Low to High, 1=High to Low
00095	0x005E	1 bit	CH10 DI Counter Trigger : 0=Low to High, 1=High to Low
00096	0x005F	1 bit	CH11 DI Counter Trigger : 0=Low to High, 1=High to Low
00097	0x0060	1 bit	CH0 DI Counter Power-On Status 0: Off 1: On
00098	0x0061	1 bit	CH1 DI Counter Power-On Status 0: Off 1: On
00099	0x0062	1 bit	CH2 DI Counter Power-On Status 0: Off 1: On
00100	0x0063	1 bit	CH3 DI Counter Power-On Status 0: Off 1: On
00101	0x0064	1 bit	CH4 DI Counter Power-On Status 0: Off 1: On
00102	0x0065	1 bit	CH5 DI Counter Power-On Status 0: Off 1: On
00103	0x0066	1 bit	CH6 DI Counter Power-On Status 0: Off 1: On
00104	0x0067	1 bit	CH7 DI Counter Power-On Status 0: Off 1: On
00105	0x0068	1 bit	CH8 DI Counter Power-On Status 0: Off 1: On
00106	0x0069	1 bit	CH9 DI Counter Power-On Status 0: Off 1: On
00107	0x006A	1 bit	CH10 DI Counter Power-On Status 0: Off 1: On
00108	0x006B	1 bit	CH11 DI Counter Power-On Status 0: Off 1: On
00109	0x006C	1 bit	CH0 DI Counter Safe Status 0: Off 1: On
00110	0x006D	1 bit	CH1 DI Counter Safe Status 0: Off 1: On
00111	0x006E	1 bit	CH2 DI Counter Safe Status 0: Off 1: On
00112	0x006F	1 bit	CH3 DI Counter Safe Status 0: Off 1: On
00113	0x0070	1 bit	CH4 DI Counter Safe Status 0: Off 1: On
00114	0x0071	1 bit	CH5 DI Counter Safe Status 0: Off 1: On
00115	0x0072	1 bit	CH6 DI Counter Safe Status 0: Off 1: On

Reference	Address	Data Type	Description
00116	0x0073	1 bit	CH7 DI Counter Safe Status 0: Off 1: On
00117	0x0074	1 bit	CH8 DI Counter Safe Status 0: Off 1: On
00118	0x0075	1 bit	CH9 DI Counter Safe Status 0: Off 1: On
00119	0x0076	1 bit	CH10 DI Counter Safe Status 0: Off 1: On
00120	0x0077	1 bit	CH11 DI Counter Safe Status 0: Off 1: On

1xxxx Read-Only Coils (Support 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

3xxxx Read Only Registers (Support Function 4)

Reference	Address	Data Type	Description
30001	0x0000	word	CH0 DI Counter Value Hi-Byte
30002	0x0001	word	CH0 DI Counter Value Lo-Byte
30003	0x0002	word	CH1 DI Counter Value Hi-Byte
30004	0x0003	word	CH1 DI Counter Value Lo-Byte
30005	0x0004	word	CH2 DI Counter Value Hi-Byte
30006	0x0005	word	CH2 DI Counter Value Lo-Byte
30007	0x0006	word	CH3 DI Counter Value Hi-Byte
30008	0x0007	word	CH3 DI Counter Value Lo-Byte
30009	0x0008	word	CH4 DI Counter Value Hi-Byte
30010	0x0009	word	CH4 DI Counter Value Lo-Byte
30011	0x000A	word	CH5 DI Counter Value Hi-Byte
30012	0x000B	word	CH5 DI Counter Value Lo-Byte
30013	0x000C	word	CH6 DI Counter Value Hi-Byte
30014	0x000D	word	CH6 DI Counter Value Lo-Byte
30015	0x000E	word	CH7 DI Counter Value Hi-Byte
30016	0x000F	word	CH7 DI Counter Value Lo-Byte
30017	0x0010	word	CH8 DI Counter Value Hi-Byte
30018	0x0011	word	CH8 DI Counter Value Lo-Byte
30019	0x0012	word	CH9 DI Counter Value Hi-Byte
30020	0x0013	word	CH9 DI Counter Value Lo-Byte
30021	0x0014	word	CH10 DI Counter Value Hi-Byte
30022	0x0015	word	CH10 DI Counter Value Lo-Byte
30023	0x0016	word	CH11 DI Counter Value Hi-Byte
30024	0x0017	word	CH11 DI Counter Value Lo-Byte

4xxxx Read/Write Registers (Support 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	CH0 DO Pulse Low Signal Width
40018	0x0011	word	CH1 DO Pulse Low Signal Width
40019	0x0012	word	CH2 DO Pulse Low Signal Width
40020	0x0013	word	CH3 DO Pulse Low Signal Width
40021	0x0014	word	CH4 DO Pulse Low Signal Width
40022	0x0015	word	CH5 DO Pulse Low Signal Width
40023	0x0016	word	CH6 DO Pulse Low Signal Width
40024	0x0017	word	CH7 DO Pulse Low Signal Width
40025	0x0018	word	CH0 DO Pulse High Signal Width
40026	0x0019	word	CH1 DO Pulse High Signal Width
40027	0x001A	word	CH2 DO Pulse High Signal Width
40028	0x001B	word	CH3 DO Pulse High Signal Width
40029	0x001C	word	CH4 DO Pulse High Signal Width
40030	0x001D	word	CH5 DO Pulse High Signal Width
40031	0x001E	word	CH6 DO Pulse High Signal Width
40032	0x001F	word	CH7 DO Pulse High Signal Width
40033	0x0020	word	CH0 DO Mode 0: DO 1: Pulse
40034	0x0021	word	CH1 DO Mode 0: DO 1: Pulse
40035	0x0022	word	CH2 DO Mode 0: DO 1: Pulse
40036	0x0023	word	CH3 DO Mode 0: DO 1: Pulse
40037	0x0024	word	CH4 DO Mode 0: DO 1: Pulse
40038	0x0025	word	CH5 DO Mode 0: DO 1: Pulse
40039	0x0026	word	CH6 DO Mode 0: DO 1: Pulse
40040	0x0027	word	CH7 DO Mode 0: DO 1: Pulse

Reference	Address	Data Type	Description
40041	0x0028	word	CH0 DI / Counter Filter
40042	0x0029	word	CH1 DI / Counter Filter
40043	0x002A	word	CH2 DI / Counter Filter
40044	0x002B	word	CH3 DI / Counter Filter
40045	0x002C	word	CH4 DI / Counter Filter
40046	0x002D	word	CH5 DI / Counter Filter
40047	0x002E	word	CH6 DI / Counter Filter
40048	0x002F	word	CH7 DI / Counter Filter
40049	0x0030	word	CH8 DI / Counter Filter
40050	0x0031	word	CH9 DI / Counter Filter
40051	0x0032	word	CH10 DI / Counter Filter
40052	0x0033	word	CH11 DI / Counter Filter
40053	0x0034	word	CH0 DI Mode 0: DI 1: Counter Others: return Illegal Data Value
40054	0x0035	word	CH1 DI Mode 0: DI 1: Counter Others: return Illegal Data Value
40055	0x0036	word	CH2 DI Mode 0: DI 1: Counter Others: return Illegal Data Value
40056	0x0037	word	CH3 DI Mode 0: DI 1: Counter Others: return Illegal Data Value
40057	0x0038	word	CH4 DI Mode 0: DI 1: Counter Others: return Illegal Data Value
40058	0x0039	word	CH5 DI Mode 0: DI 1: Counter Others: return Illegal Data Value
40059	0x003A	word	CH6 DI Mode 0: DI 1: Counter Others: return Illegal Data Value
40060	0x003B	word	CH7 DI Mode 0: DI 1: Counter Others: return Illegal Data Value
40061	0x003C	word	CH8 DI Mode 0: DI 1: Counter Others: return Illegal Data Value
40062	0x003D	word	CH9 DI Mode 0: DI 1: Counter Others: return Illegal Data Value
40063	0x003E	word	CH10 DI Mode 0: DI 1: Counter Others: return Illegal Data Value
40064	0x003F	word	CH11 DI Mode 0: DI 1: Counter Others: return Illegal Data Value

Function 8

Sub-function	Data Field (Request)	Data Field (Response)	Description
0x0001	0x0000	Echo Request Data	Reboot
0x0001	0xFF00	Echo Request Data	Reset to Factory defaults

B

Factory Default Settings

The ioLogik R2110 is configured with the following factory defaults:

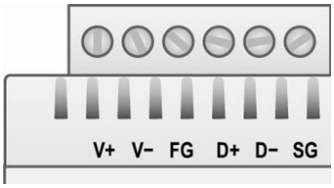
RS-485 Unit ID:	**1**
Default baudrate:	**115200 Kbps**
Communication watchdog:	**Disable**
DI Mode:	**DI**
Filter time:	**1 × 10 ms**
Trigger for counter:	**Lo to Hi**
Counter status:	**Stop**
DO Mode:	**DO**
DO Safe Status:	**Off**
Power on status:	**Off**
Low width for pulse:	**1 × 10 ms**
Hi width for pulse:	**1 × 10 ms**
Output pulses:	**0 (continuous)**
Password:	**NONE**
Module Name:	**NONE**
Module Location:	**NONE**

C

Port Pinout Diagrams

Serial Port Pinouts

ioLogik R2110 RS-485 Network Adapter Pin Assignment



D

Service Information

This appendix contains information on how to contact MOXA for information about this and other MOXA products, as well as the procedure for reporting 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 primary concern. 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

E-mail for technical support ..... support@moxa.com.tw

Websites for product information:

..... http://www.moxa.com or

..... http://www.moxa.com.tw

Problem Report Form

MOXA ioLogik R2110 RS-485 Remote I/O Server

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

Product Model: ioLogik R2110 RS-485 Remote I/O Server

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 expedite the repair of your product.

Product Return Procedure

For product repair, exchange, or refund, please follow these instructions:

- Provide evidence of original purchase.
- Obtain a Product Return Agreement (PRA) from the sales representative or dealer.
- Fill out the Problem Report Form (PRF). Include as much detail as possible to expedite diagnosis of your product.
- 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.