



IO5202 Remote I/O

User Manual

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Atop Technologies, Inc.

2F, No. 146, Sec. 1, Tung-Hsing Rd,
30261 Chupei City, Hsinchu County
Taiwan, R.O.C.

Tel: +886-3-550-8137
Fax: +886-3-550-8131
www.atoponline.com

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Preface

This manual contains some advanced network management knowledge, instructions, examples, guidelines, and general theories. The contents are designed to help users manage the switch and use its software, a background in general theory is a must, when reading it. Please refer to the Glossary for technical terms and abbreviations.

Who Should Use This User Manual

This manual is to be used by qualified network personnel or support technicians who are familiar with network operations, and might be useful for system programmers or network planners as well. This manual also provides helpful and handy information for first time users. For any related problems, please contact your local distributor. If they are unable to assist you, please redirect your inquiries to www.atoponline.com

Warranty Period

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Table of Contents

1	Preface.....	7
1.1	Purpose of the Manual	7
1.2	Who Should Use This User Manual.....	7
1.3	Supported Platform	7
2	Introduction.....	8
2.1	Overview	8
2.1	Features	8
3	Getting Started.....	9
3.1	Packing List.....	9
3.2	Appearance, Top and Rear Panels.....	9
4	Hardware installation	10
4.1	First Time Installation	10
4.2	LED Indicator.....	10
4.3	Power Supply Pins	11
4.4	Pin Assignments for Ethernet (LAN) Port.....	11
4.5	Serial Ports.....	12
4.5.1	DB9 Pins.....	12
4.5.2	5-Pin Terminal block Pin assignment.....	13
4.5.3	20-Pin I/O Terminal block pin assignment	13
4.6	I/O Circuit Diagrams	14
4.6.1	DI (Digital Input) Circuit.....	14
4.6.2	DO (Digital Output) Circuit.....	14
4.6.3	Relay Circuit	15
4.6.4	DIO (Digital Input/Output) Circuit	15
4.6.5	DIO (Digital Input/Output) Jumper Settings	16
4.6.6	AI (Analog Input) Circuit	16
4.6.7	AO (Analog Output) Circuit	17
4.7	I/O Wiring	18
4.7.1	DI (Digital Input) Dry Contact	18
4.7.2	DI (Digital Input) Wet Contact (NPN)	19
4.7.3	DI (Digital Input) Wet Contact (PNP).....	20
4.7.4	DO (Digital Output) Contact.....	21
4.7.5	Relay Contact	21
4.7.6	AI (Analog Input) Contact	22
4.7.7	AO (Analog Output) Contact	22
4.8	Factory Default Settings.....	23
4.8.1	Network Default Settings.....	23
4.8.2	Other Default Settings.....	23
5	Configuration and Setup	24
5.1	Configuration of Network Parameters through Device Management Utility.....	24
5.2	Configuring through Web Interface	27
5.3	Configuring Automatic IP Assignment with DHCP	29
5.4	System Status	29
5.4.1	Overview	29
5.5	Network Settings	30
5.6	Serial	31
5.6.1	COM	31
5.7	I/O Settings.....	33

5.7.1	Digital Input (DI).....	33
5.7.1.1	DI Detail Settings	34
5.7.2	Digital Output (DO).....	35
5.7.2.1	DO Detail Settings	36
5.7.3	Analog Input (AI)	38
5.7.4	Analog Output (AO)	38
5.7.4.1	AO Detail Settings	39
5.8	MQTT	41
5.8.1	MQTT Settings.....	41
5.8.2	MQTT Status.....	44
5.9	SNMP/ALERT Settings	46
5.10	E-mail Settings	48
5.11	Log Settings	49
5.11.1	System Log Settings.....	49
5.11.2	COM Log Settings	50
5.11.3	System Log	50
5.11.4	COM Log.....	51
5.12	System Setup	52
5.12.1	Date/Time Settings	52
5.12.2	Admin Settings.....	53
5.12.3	Firmware Upgrade	54
5.12.4	Backup/Restore Configuration	55
5.12.5	Ping.....	56
5.13	Reboot.....	58

Table of Figures

Figure 4.1	- LED Indicator on Front Panel of IO5202	10
Figure 4.2	- 5.08mm 3-Pin Lockable Terminal Block	11
Figure 4.3	- LAN Port on RJ-45 with Pin Numbering	11
Figure 4.4	- Serial Port on DB9 (9-Pin D-Sub) with Pin Assignments	12
Figure 4.5	- Serial Port on TB5 (5-Pin 3.81mm Terminal Block) with Pin Assignments	13
Figure 4.6	- Schematic Diagram of DI (Digital Input) Circuit.....	14
Figure 4.7	- Schematic Diagram of DO (Digital Output) Circuit	14
Figure 4.8	- Schematic Diagram of Relay Circuit.....	15
Figure 4.9	- Schematic Diagram of DIO (Digital Input/Output) Circuit	15
Figure 4.10	- DIO (Digital Input/Output) Jumper Settings	16
Figure 4.11	- Schematic diagram of AI (Analog Input) Circuit	16
Figure 4.12	- Schematic Diagram of AO (Analog Output) Circuit	17
Figure 4.13	- Wiring of DI (Digital Input) Dry Contact	18
Figure 4.14	- Wiring of DI (Digital Input) Wet Contact (NPN).....	19
Figure 4.15	- Wiring of DI (Digital Input) Wet Contact (PNP).....	20
Figure 4.16	- Wiring of DO (Digital Output) Contact	21
Figure 4.17	- Wiring of Relay Contact	21
Figure 4.18	- Wiring of AI (Analog Input) Contact	22
Figure 4.19	- Wiring of AO (Analog Output) Contact	22
Figure 5.1	- List of Device in Device Management Utility	24
Figure 5.2	- Pull-down Menu of Configuration and Network... ..	24
Figure 5.3	- Pop-up Window of Network Setting.....	25
Figure 5.4	- Authorization for Change of Network Settings	25
Figure 5.5	- Pop-up Notification Window after Authorization	25
Figure 5.6	- Pop-up Notification Window when there is the same IP address in the network	26
Figure 5.7	Authentication Required for Accessing Web Interface	27
Figure 5.8	Warning Pop-up Window for Changing or Resetting Password from Default Value	27
Figure 5.9	Overview Web Page of IO5202 Remote IO.....	28
Figure 5.10	Map of Configuring Web Page on IO5202 Remote I/O	28

Figure 5.11 - Overview Web Page	30
Figure 5.12 - Network Settings Web Page.....	31
Figure 5.13 - Serial Menu.....	31
Figure 5.14 - COM Port Settings Web Page under Serial Menu	32
Figure 5.15 - Modbus Settings under I/O Settings Web Page.....	33
Figure 5.16 - Digital Input Information Section under I/O Settings Web Page	34
Figure 5.17 - DI0 Detail Settings Section below DI Information Table under I/O Settings Web Page	35
Figure 5.18 - Digital Output Information Table under I/O Settings Web Page.....	36
Figure 5.19 - Digital Output Detail Settings Section under the Digital Output Information Table	37
Figure 5.20 - Analog Input Information Table under the I/O Settings Web Page	38
Figure 5.21 - Analog Output Information Table under the I/O Settings Web Page	39
Figure 5.22 - Analog Output Detail Settings Section under the Analog Output Table.....	40
Figure 5.24 - MQTT Settings with TLS option	42
Figure 5.25 - MQTT Settings Web Page under MQTT Menu of IO5202-A.....	43
Figure 5.26 - MQTT Settings Web Page under MQTT Menu of IO5202-E.....	44
Figure 5.27 - MQTT Status Web Page under MQTT Menu.....	45
Figure 5.28 - SNMP/ALERT Settings Web Page.....	46
Figure 5.29 - SNMP Enabled in SNMP/ALERT Settings Web Page	47
Figure 5.30 - E-mail Settings Web Page.....	48
Figure 5.31 - Log Setting Menu.....	49
Figure 5.32 - System Log Settings Web Page under Log Settings Menu	49
Figure 5.33 - COM Log Settings Web Page under Log Settings Menu	50
Figure 5.34 - System Log Web Page under Log Settings.....	51
Figure 5.35 - COM Log Web Page under Log Settings Menu	52
Figure 5.36 - System Setup Menu	52
Figure 5.37 - Date/Time Settings Web Page under System Setup	53
Figure 5.38 - Admin Settings Web Page.....	54
Figure 5.39 - Firmware Upgrade Web Page	55
Figure 5.40 – Backup/Restore Configuration Web Page	56
Figure 5.41 - Ping Web Page with Results	57
Figure 5.42 - Ping Web Page with Failed Results	57
Figure 5.43 – Reboot Web Page.....	58

List of Tables

Table 3.1 - Packing List.....	9
Table 4.1 - Description of LED Indicator of IO5202	10
Table 4.2 - Power Supply Rating.....	11
Table 4.3 - Pin Assignments for RJ-45 Connector of IO5202 Device	11
Table 4.4 - Pin Assignments of DB9 (9-Pin D-Sub) for Serial Communications	12
Table 4.5 - Pin Assignments o TB5 (5-Pin 3.81mm Terminal Block) for Serial Communications	13
Table 4.6 - Pin Assignments o TB5 (5-Pin 3.81mm Terminal Block) for Serial Communications	13
Table 4.7 Network Default Setting.....	23
Table 4.8 Security , Serial, and SNMP Default Settings	23

1 Preface

1.1 *Purpose of the Manual*

This manual supports you during the installation and configuring of IO5202 Industrial IoT Remote I/O Device, as well as it explains some technical options available with the mentioned product. As such, it contains some advanced network management knowledge, instructions, examples, guidelines and general theories designed to help users manage this device and its corresponding software. A background in general theory is necessary when reading it. Please refer to the Glossary for technical terms and abbreviations (if any).

1.2 *Who Should Use This User Manual*

This manual is to be used by qualified network personnel or support technicians who are familiar with network operations. It might be useful for system programmers or network planners as well. This manual also provides helpful and handy information for first time users. For any related problems, please contact your local distributor. If they are unable to assist you, please redirect your inquiries to www.atoponline.com.

1.3 *Supported Platform*

This manual is solely designed for IO5202 Series Remote I/O.

Note: *all the figures herein are intended for illustration purposes only. This software and certain features work only on certain Atop's devices.*

2 Introduction

2.1 Overview

As an IIoT I/O module, ATOP's IO5202 Series is a compact solution for connecting digital and analog devices and sensors, enabling you to monitor, acquire and process data from remote sensors and control digital and analog outputs. The IO5202 Series is a cost-effective solution for integrating existing applications into an IIoT framework, such as automated manufacturing, building management and control, and agricultural and irrigation systems.

For applications in which running cable can be impractical, then the IO5202 WiFi-equipped version is a cable-free solution for widely disappeared devices and sensors, which also allows for better scalability for operations that continue to evolve and grow. Offering plug-and-play simplicity, the IO5202 Series supports numerous protocols, including Modbus TCP/RTU/ASCII, MQTT and SNMP. Using the intelligent processing and publishing features of the IO5202 Series, data can be polled, logged, or even automatically pushed when I/O statuses change.

Supporting numerous configurations options to support various types of digital I/O, analog I/O, and relay scenarios, the IO5202 Series has been designed for demanding industrial applications that require compact solutions while delivering high network performance. Supporting a wide operating temperature range of $-40^{\circ}\text{C}\sim 70^{\circ}\text{C}^*$ and Industrial EMC protection, the IO5202 Series can perform under a variety of environmental conditions, such as power input voltage, shock, drop and vibration.

2.1 Features

IO5202 Remote I/O device provides the following features:

- Access data from the field and control outputs via:
 - Modbus TCP (over 2 independent 10/100Mbps RJ45 LAN ports or Wi-Fi (optional))
 - Modbus RTU/ASCII (over a serial port, with either D-Sub9 or 5-pin terminal block)
 - MQTT (publish/subscriber), MQTT over TLS (Transport Layer Security) protocol
- High-accuracy ADC/DAC and high-EMC protection
- Configuration via Web Browser/ Atop's Windows Utility (Network Management Utility)
- Rugged metal housing with IP30 protection for wall or optional DIN-Rail mount
- Wide range power supply input 9 – 48 VDC (Terminal Block)

Caution Starting here, extreme caution must be exercised.



Never install or work with electricity or cabling during periods of lightning activity. Never connect or disconnect power when hazardous gases are present.



Warning: HOT!

WARNING: Disconnect the power and allow unit to cool for 5 minutes before touching.

3 Getting Started

3.1 Packing List

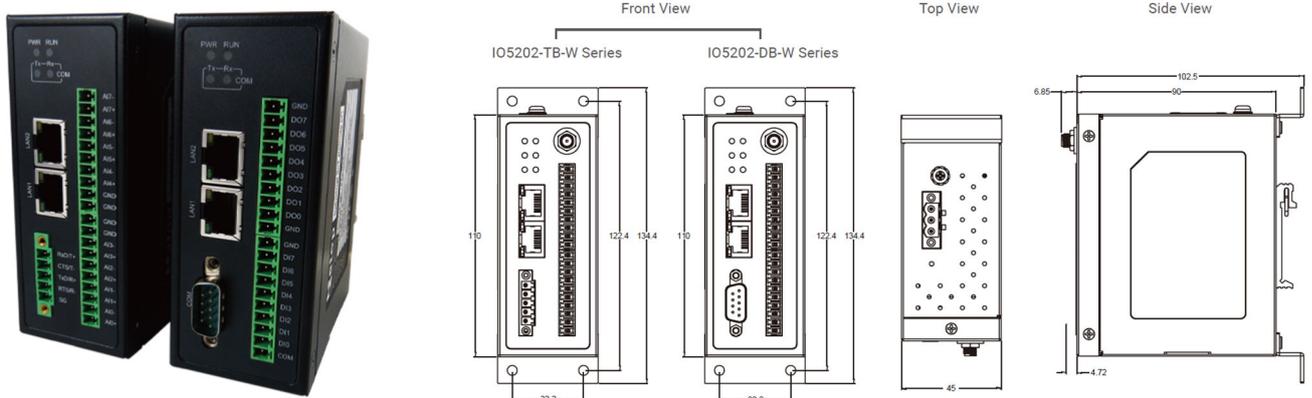
Inside the delivery package, you will find the following items.

Table 3.1 - Packing List

Item	Quantity	Description
IO5202-A-B-C-D-E-XX-Y	1	Industrial IoT Remote I/O device with <ul style="list-style-type: none"> • A digital inputs • B digital outputs • C relays • D analog inputs • E analog outputs • XX (TB or DB) Serial port connector • Y (-W or none) Wi-Fi or non-Wi-Fi
Wi-Fi Antenna	1	SMA-type, -W version only
3-pin Terminal Block	1	3-pin lockable power terminal block
20-pin Terminal Block	1	20-pin I/O terminal block
Documentation	1	Hardware installation guide and warranty card

3.2 Appearance, Top and Rear Panels

The following figures show IO5202 device's top and rear panels.



4 Hardware installation

This chapter provides reference information related to the hardware of IO5202 Remote I/O series. The user can find the descriptions of LEDs, pins, and ports or connectors on the device in related sections. Examples of schematics and circuit diagrams for connecting different inputs and/or outputs are also presented.

4.1 First Time Installation

Please follow the instructions in the below chapter for safe and effective installation.

Caution Starting here, extreme caution must be exercised.



Never install or work with electricity or cabling during periods of lightning activity. Never connect or disconnect power when hazardous gases are present.



Warning: HOT!

WARNING: Disconnect the power and allow unit to cool for 5 minutes before touching.

4.2 LED Indicator

The light emitting diodes (LEDs) on the front panel of IO5202 indicates the status of device. Figure 4.1 shows the locations and the labels of LEDs. Table 4.1 lists the descriptions of all LEDs and the meanings of their colors.

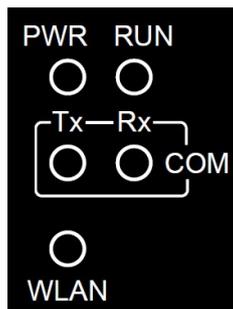


Figure 4.1 - LED Indicator on Front Panel of IO5202

Table 4.1 - Description of LED Indicator of IO5202

LED Indicator	Color	State	Description
PWR	Green	ON	PWR is connected
		OFF	PWR is disconnected
Wireless	Green	ON	Wireless Module is connected to Wi-Fi
		Blinking	Wireless Module is transmitting/receiving
		OFF	Wireless Module is not connected
RUN	Green	ON	System is booted up and running

COM	TX-Green	OFF	System is still booting up or powered off
		Blinking	COM is transmitting
		OFF	COM is not transmitting
	RX-Green	Blinking	COM is receiving
		OFF	COM is not receiving

4.3 Power Supply Pins

Figure 4.2 illustrates the lockable terminal block (TB) located on the top panel of the IO5202. This connector provides the power supply to the device from an AC/DC adaptor such as part no. US315-12. The V+ pin is the positive DC voltage and V- pin is the negative DC voltage. The F.G. pin refers to the field ground. Note that the F.G. pin is not the same as the chassis ground of the device. Electrical power supply rating for IO5202 is listed in Table 4.2.

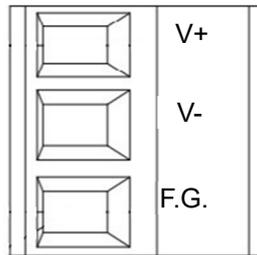


Figure 4.2 - 5.08mm 3-Pin Lockable Terminal Block

Table 4.2 - Power Supply Rating

Input Voltage	12-48 VDC
Input Current	0.6 ~ 0.2 A
Power Consumption	9.6 Watts (Max.)

4.4 Pin Assignments for Ethernet (LAN) Port

Figure 4.3 depicts the pin numbering on the Ethernet (Local Area Network) port based on RJ-45 connector of IO5202 device. Table 4.3 provides information on the description of each pin for RJ-45 connector. Note that this LAN port supports 10/100 Base-T(X) standards.

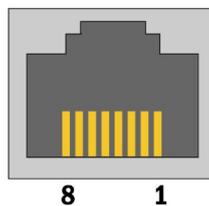


Figure 4.3 – LAN Port on RJ-45 with Pin Numbering

Table 4.3 - Pin Assignments for RJ-45 Connector of IO5202 Device

10/100 Base-T(X)								
Pin	1	2	3	4	5	6	7	8
Signal	Tx+	Tx-	Rx+			Rx-		

4.5 Serial Ports

IO5202 supports two types of serial ports or COM ports which are DB9 and TB5 connectors depending on the purchased model. Pictures and pin assignments of these two connectors are summarized in the following subsections.

4.5.1 DB9 Pins

DB9 or 9-Pin D-Sub connector is depicted in Figure 4.4. All pin assignments for supported serial protocol standards of DB9 are listed in Table 4.4. Please refer to Section 5.6 for additional information.

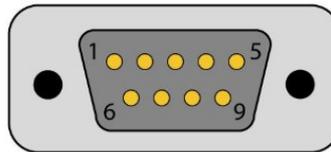


Figure 4.4 - Serial Port on DB9 (9-Pin D-Sub) with Pin Assignments

Table 4.4 - Pin Assignments of DB9 (9-Pin D-Sub) for Serial Communications

PIN	RS-232	RS-422/ RS485-4 Wire	RS-485-2 Wire
1	DCD	-	-
2	RxD	TxD+	Data+
3	TxD	RxD+	-
4	DTR	-	-
5	SG	SG	SG
6	DSR	-	-
7	RTS	RxD-	-
8	CTX	TxD-	Data-
9	RI	-	-

4.5.2 5-Pin Terminal block Pin assignment

TB5 or 5-Pin Terminal Block connector is depicted in Figure 4.5. All pin assignments for supported serial protocol standards of TB5 are listed in Table 4.5. Please refer to Section 5.6 for additional information.



Figure 4.5 - Serial Port on TB5 (5-Pin 3.81mm Terminal Block) with Pin Assignments

Table 4.5 - Pin Assignments o TB5 (5-Pin 3.81mm Terminal Block) for Serial Communications

PIN	RS-232	RS-422/ RS485-4 Wire	RS-485-2 Wire
1	RxD	TxD+	Data+
2	CTS	TxD-	Data-
3	TxD	RxD+	-
4	RTS	RxD-	-
5	SG	SG	-

4.5.3 20-Pin I/O Terminal block pin assignment

IO5202 is equipped with a 20-pin Terminal block that is used for I/O interfaces. The pin assignment of this terminal block depends on the version that you have purchased. The PIN assignments are also marked on the device’s nameplate, in order to avoid confusion.

Table 4.6 - Pin Assignments o TB5 (5-Pin 3.81mm Terminal Block) for Serial Communications

PIN	Version A 8 DI + 8 DO	Version B 8 AI	Version C 8 DIO + 4 Rly	Version D 4 AI + 6 DI + 2 Rly	Version E 4 AI + 4 AO
1	COM (DI-Wet)	AI0+	COM (DI-Wet)	AI0+	AI0+
2	DI0	AI0-	DIO0	AI0-	AI0-
3	DI1	AI1+	DIO1	AI1+	AI1+
4	DI2	AI1-	DIO2	AI1-	AI1-
5	DI3	AI2+	DIO3	AI2+	AI2+
6	DI4	AI2-	DIO4	AI2-	AI2-
7	DI5	AI3+	DIO5	AI3+	AI3+
8	DI6	AI3-	DIO6	AI3-	AI3-
9	DI7	GND	DIO7	COM (DI-Wet)	GND
10	GND	GND	GND	DI0	GND
11	GND	GND	GND	DI1	GND
12	DO0	GND	GND	DI2	GND
13	DO1	AI4+	Rly0 C	DI3	AO0+
14	DO2	AI4-	Rly0 NO	DI4	AO0-
15	DO3	AI5+	Rly1 C	DI5	AO1+
16	DO4	AI5-	Rly1 NO	GND	AO1-
17	DO5	AI6+	Rly2 C	Rly0 C	AO2+
18	DO6	AI6-	Rly2 NO	Rely0 NO	AO2-
19	DO7	AI7+	Rly3 C	Rly1 C	AO3+
20	GND	AI7-	Rely3 NO	Rely1 NO	AO3-

4.6 I/O Circuit Diagrams

This section provides reference information on circuit diagrams inside IO5202. It will be useful to you connect different input and/or output (I/O) signal to the corresponding pin(s) on IO5202 device. Note that depending on the model of your IO5202, you may have different number and type of input and output.

4.6.1 DI (Digital Input) Circuit

Figure 4.6 shows an example of schematic diagram for a digital input (DI) circuit of IO5202. In this case, the “Controller Block” on the left side of the diagram is inside the IO5202. Digital input signal that is fed into the IO5202 via pin Di1 will be sent to GPIO_Di1 pin of the Controller Block. Note that the isolation device denoted U such as optocoupler or opto-insulator is used to electrically separate the external circuit from IO5202 circuit. It can prevent high voltages from outside the IO5202 to affect the internal controller block of IO5202. The DI_COM0 is used to provide the supply voltage for the input digital signal while the GND provide the ground signal of the input signal.

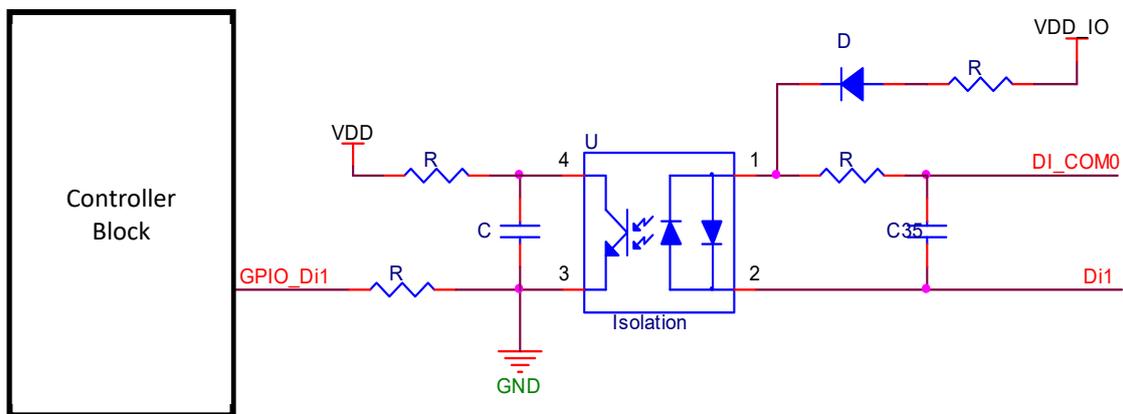


Figure 4.6 - Schematic Diagram of DI (Digital Input) Circuit

4.6.2 DO (Digital Output) Circuit

Figure 4.7 shows an example of internal circuit of digital output (DO) of IO5202. The Controller Block inside the IO5202 has GPIO_Do1 connected to a DO_D1 pin of Digital Output Controller block inside IO5202 via an Isolation device U. This separates controller block circuit from the digital output controller circuit. The digital output controller block can drive the signal to outside device via DO1 channel of the digital output port.

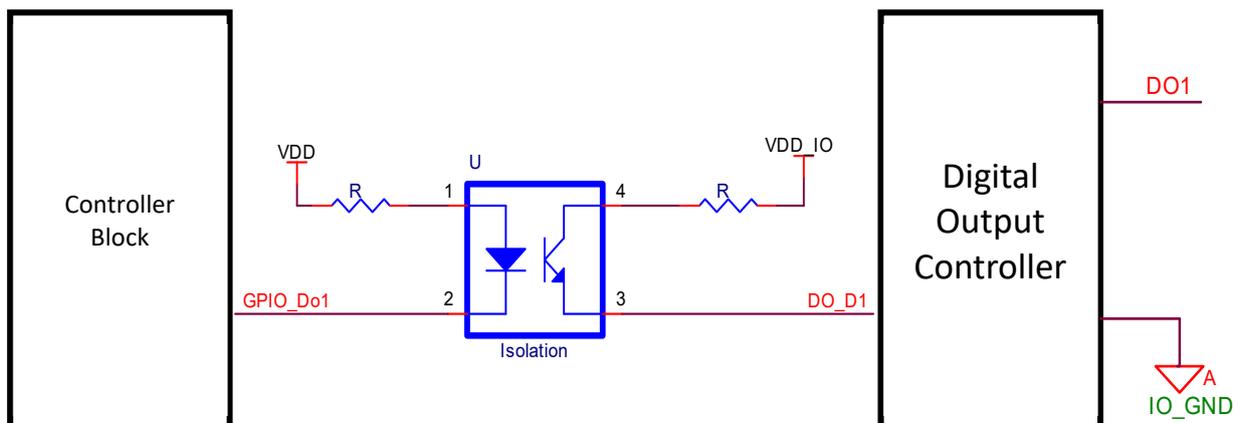


Figure 4.7 - Schematic Diagram of DO (Digital Output) Circuit

4.6.3 Relay Circuit

Figure 4.8 shows an example of relay circuit inside IO5202. The Controller Block inside the IO5202 has GPIO_Do1 connected to a transistor (Q) base such that it can control a Relay inside IO5202. When the transistor Q is turned on, the relay circuit will be closed or connect the pin 3 (Rly0_C) of the Relay to pin 4 (Rly0_NO).

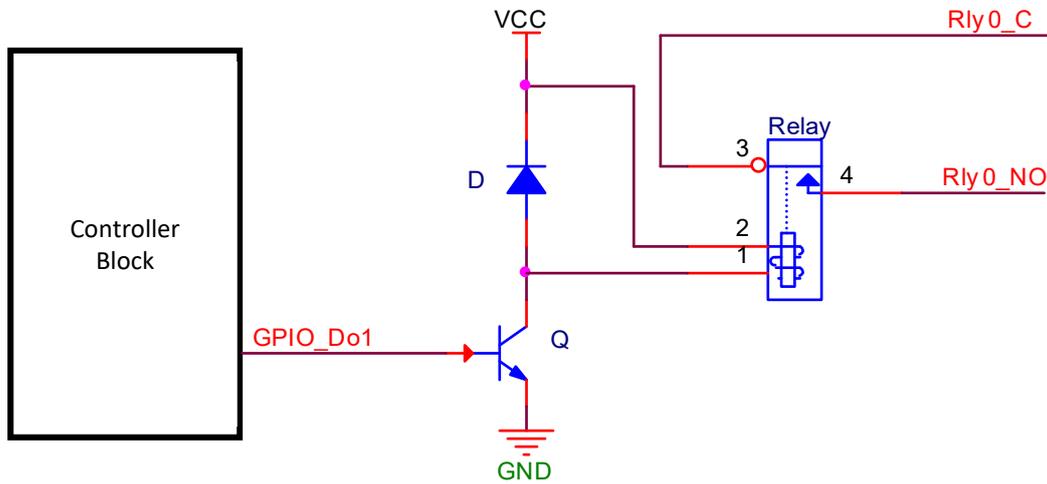


Figure 4.8 - Schematic Diagram of Relay Circuit

4.6.4 DIO (Digital Input/Output) Circuit

Figure 4.9 shows an example of internal circuit of digital input/output (DIO) of IO5202. The Controller Block inside the IO5202 has input and output pins that are connected to Digital Input/Output Switch Block. The two blocks are electrically separated by the two optocoupler or opto-insulator. The Digital Input/Output Switch Block help buffering the signal or drive the signal to the outside circuit of IO5202 via the pins such as DI_COM, DIO0, DIO1, and DIO2. There are pin-headers inside the digital input/output switch block which are used to select operating mode of each DIO channel on IO5202.

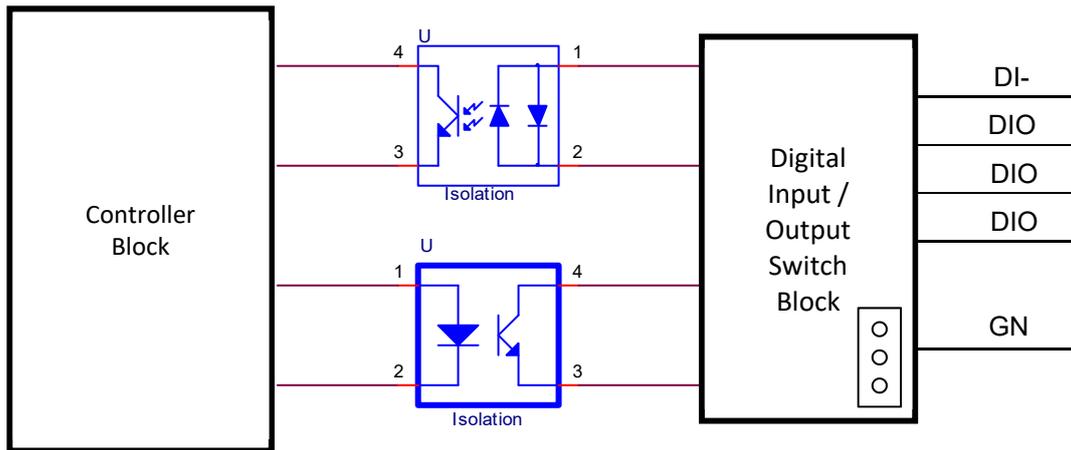
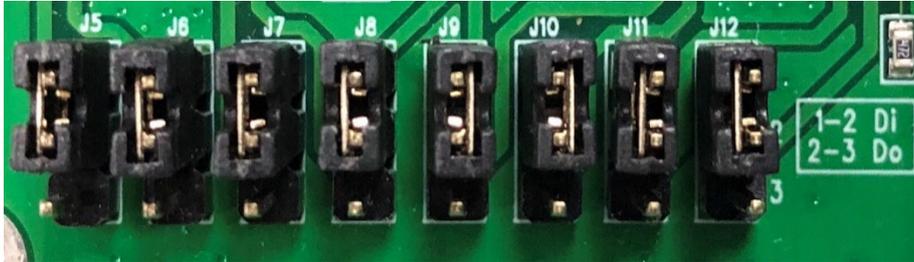


Figure 4.9 - Schematic Diagram of DIO (Digital Input/Output) Circuit

4.6.5 *DIO (Digital Input/Output) Jumper Settings*

To configure the mode of DIO, the user can locate the pin-headers on the print-circuit board (PCB) inside the chassis of IO5202 as shown in Figure 4.10. Note that these pins can be accessed when the user opened the chassis of IO5202 up. These pin-headers enable the user to use a jumper to short the pins (either pin No.1 and No.2 or pin No.2 and No.3) to manually select whether a DIO channel will be Digital Input (DI) or Digital Output (DO).



Jumper Setting

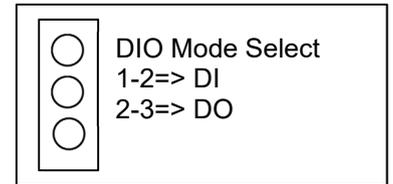


Figure 4.10 - DIO (Digital Input/Output) Jumper Settings

4.6.6 *AI (Analog Input) Circuit*

Figure 4.11 shows schematic diagram of Analog Input (AI) circuit inside the IO5202. The analog signals that arrive to analog channels (AI0, AI1, ...) are relayed through Analog MUX (multiplexer) and amplified through the amplifier circuit (AM). The amplified signal is then converted to digital signal via an internal analog-to-digital converter (ADC). The digital signal is then fed through an Isolation circuit to the Controller Block of IO5202.

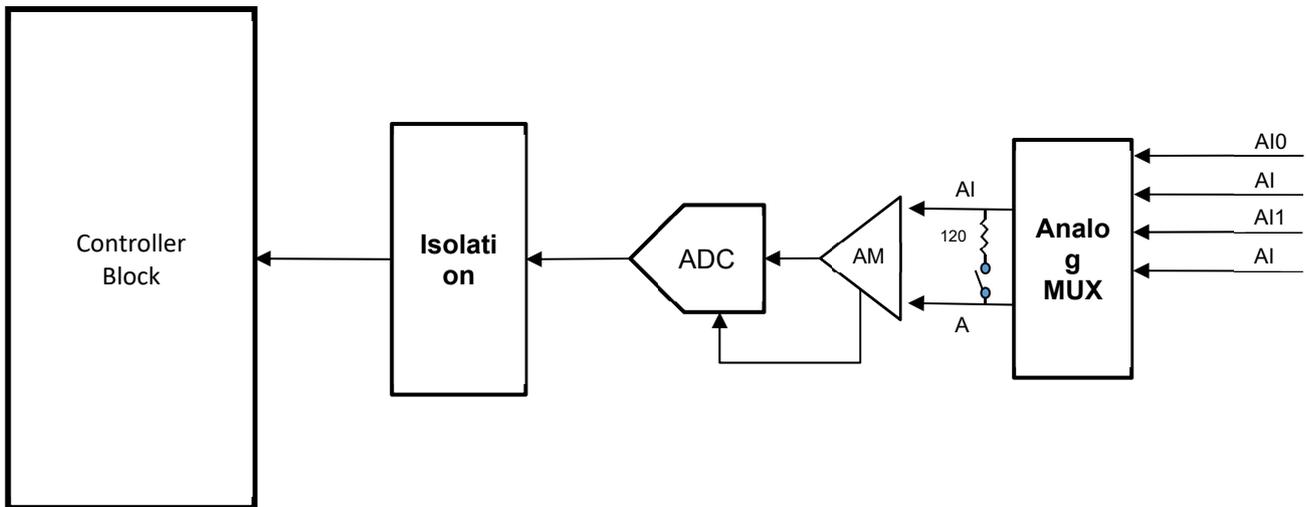


Figure 4.11 - Schematic diagram of AI (Analog Input) Circuit

4.6.7 AO (Analog Output) Circuit

Figure 4.12 shows schematic diagram of Analog Output (AO) circuit inside the IO5202. The internal Controller Block generates a digital signal that is sent through an isolation circuit to the Digital-to-Analog Converter (DAC) circuit inside the IO5202. The analog signal is then sent out to one of the desired Analog output channel (AO0, AO1,...). Note that the signal has both positive and negative paths such as AO0+ and AO0-.

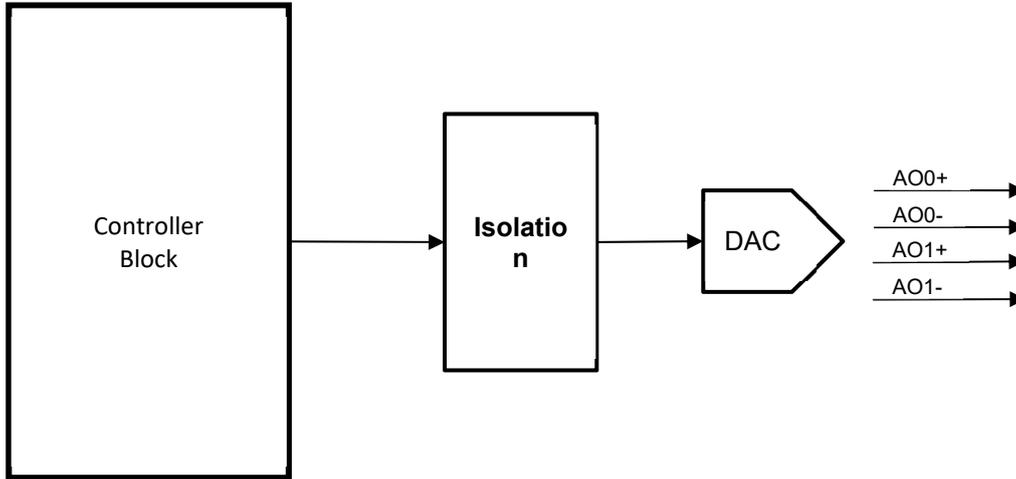


Figure 4.12 - Schematic Diagram of AO (Analog Output) Circuit

4.7 I/O Wiring

This section provides guideline on how to connect or wire different input and output (I/O) channels of the IO5202 device. Note that depending on the model of your IO5202, you may have different number and type of input and output channels.

4.7.1 DI (Digital Input) Dry Contact

Figure 4.13 shows an example of digital input (DI) dry contact in which the digital input 0 (DI0) channel is controlled by a switch that is wired to the ground (GND) pin of the DI port. An external DC power is supplied this external circuit of switch via the wiring of DI-COM pin (positive signal) and the GND pin (ground signal).

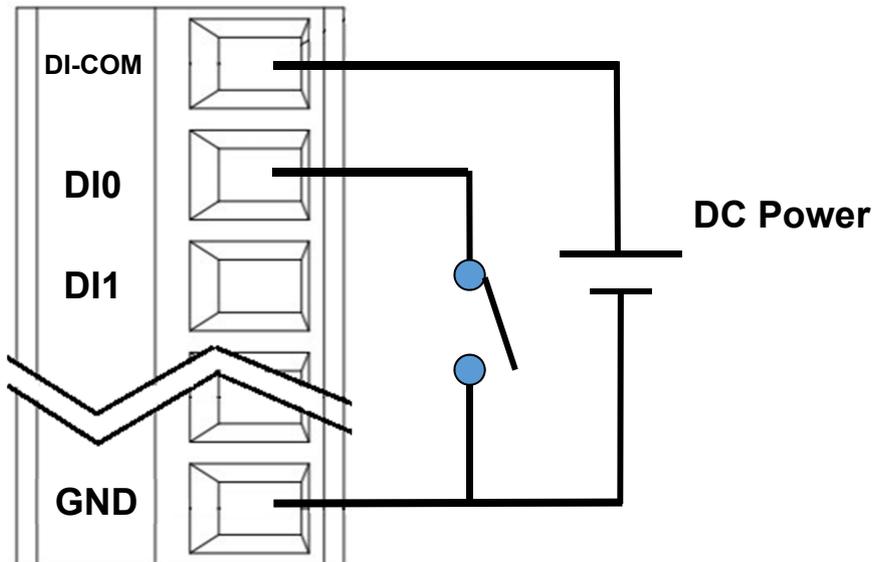


Figure 4.13 - Wiring of DI (Digital Input) Dry Contact

4.7.2 *DI (Digital Input) Wet Contact (NPN)*

Figure 4.14 shows an example of digital input (DI) wet contact (NPN) in which the digital input 0 (DI0) channel is typically connected to a 3-wire NPN sensor. Note that 3-wire NPN sensors are those industrial solid-state sensors that often have transistors inside that send or switch out digital signal as their output. The wiring of NPN sensor and external DC power supply can be shown as in Figure 4.14. The positive voltage (V+) can be the brown color, the output of the NPN sensor can be black that is connected to the digital input 0 (DI0) of the IO5202, and the ground signal of NPN sensor, GND channel on the DI port, and the negative voltage (V-) of DC power can be wired together as blue color.

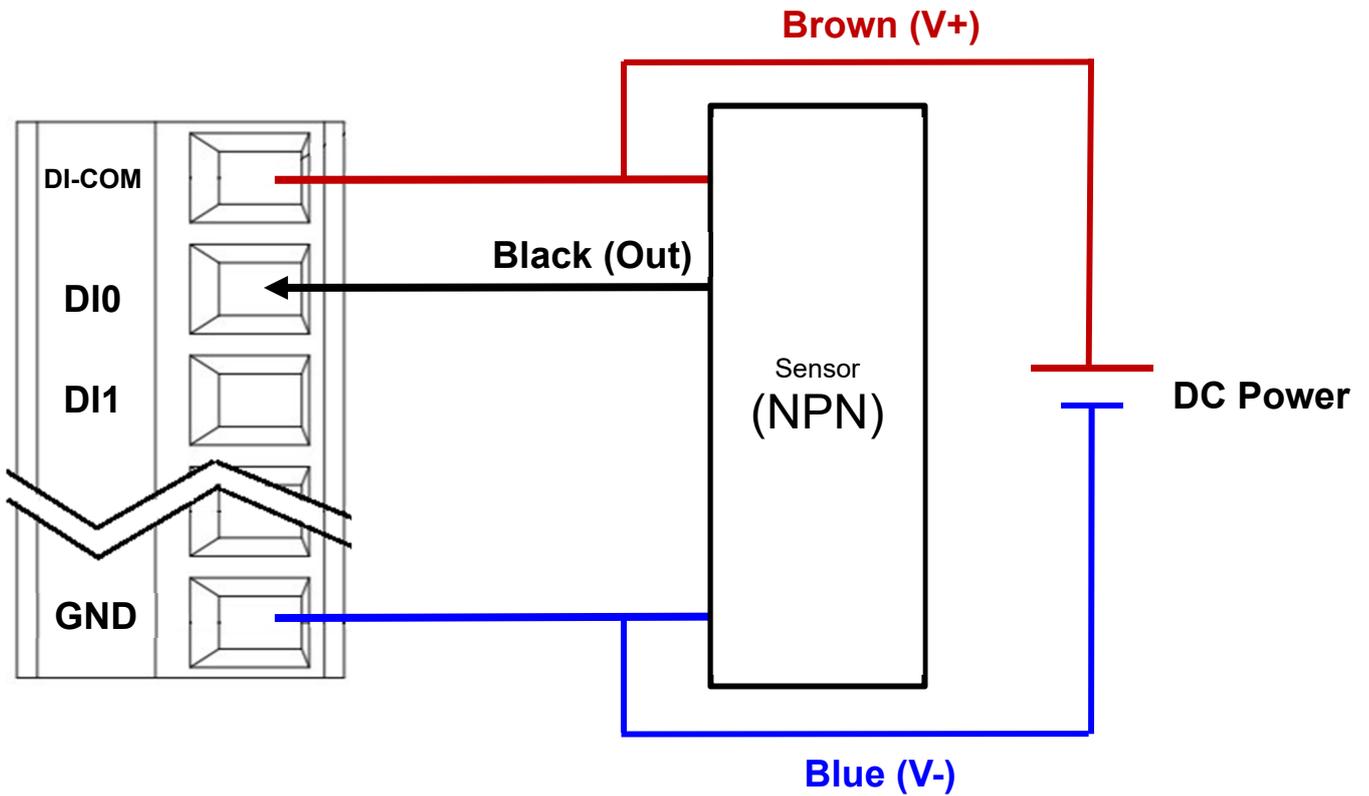


Figure 4.14 - Wiring of DI (Digital Input) Wet Contact (NPN)

4.7.3 DI (Digital Input) Wet Contact (PNP)

Figure 4.15 shows an example of digital input (DI) wet contact (PNP) in which the digital input 0 (DI0) channel is typically connected to a 3-wire PNP sensor. Note that 3-wire PNP sensors are those industrial solid-state sensors that often have transistors inside that send or switch out digital signal as their output. The wiring of PNP sensor and external DC power supply can be shown as in Figure 4.15. The positive voltage (V+) can be the brown color, the output of the PNP sensor can be black that is connected to the digital input 0 (DI0) of the IO5202, and the ground signal of PNP sensor, DI_COM channel and GND channel on the DI port, and the negative voltage (V-) of DC power can be wired together as blue color.

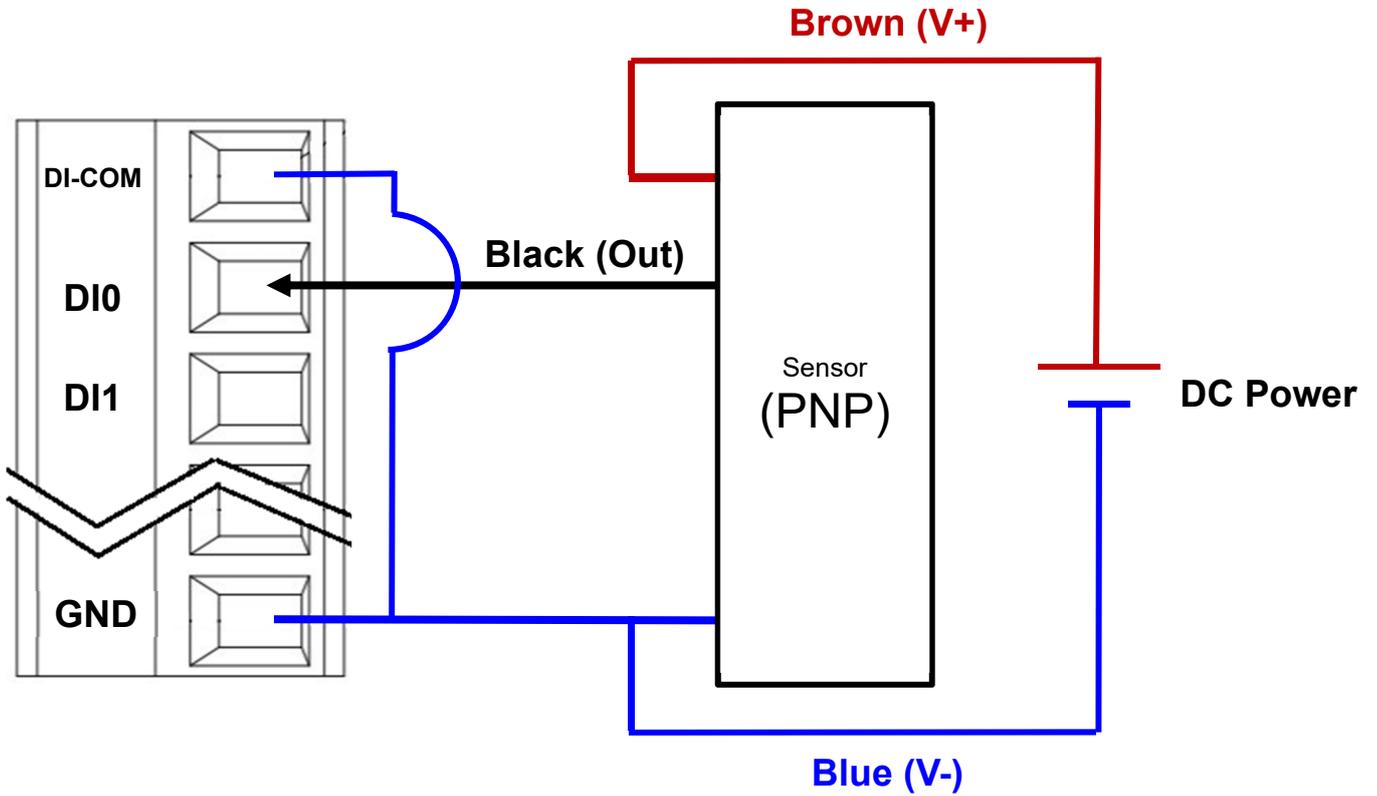


Figure 4.15 – Wiring of DI (Digital Input) Wet Contact (PNP)

4.7.4 *DO (Digital Output) Contact*

Figure 4.16 shows an example of digital output (DO) wiring of the IO5202 in which the DO0 channel is connected to positive end of the load and a DC power supply and the GND channel is connected to the negative end of the DC power supply.

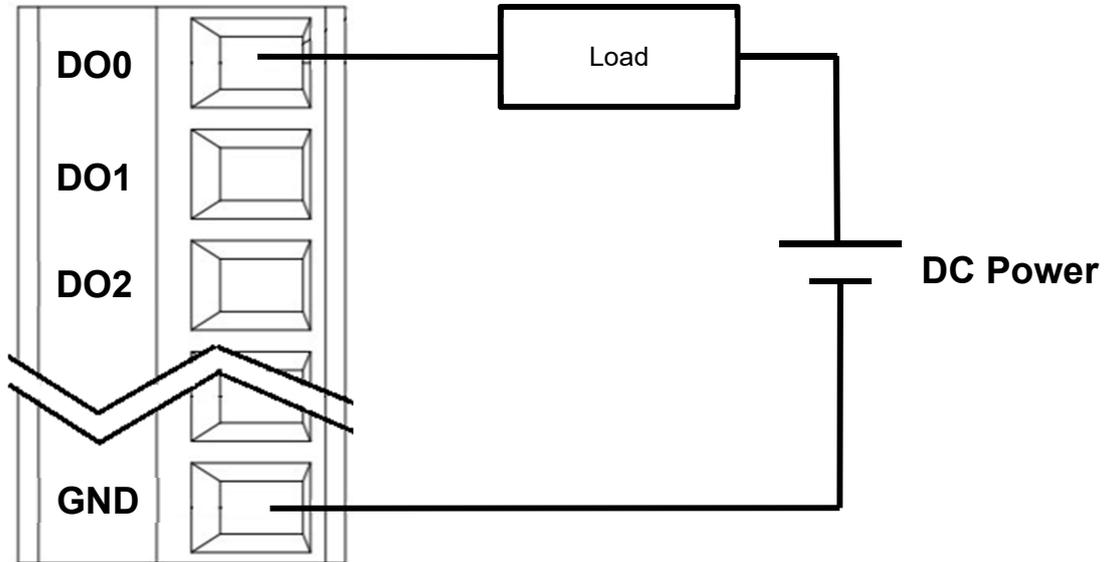


Figure 4.16 - Wiring of DO (Digital Output) Contact

4.7.5 *Relay Contact*

Figure 4.17 shows an example of relay contact wiring of the IO5202 in which the RY+ channel is connected to positive end of the load and a DC power supply and the RYC channel is connected to the negative end of the DC power supply.

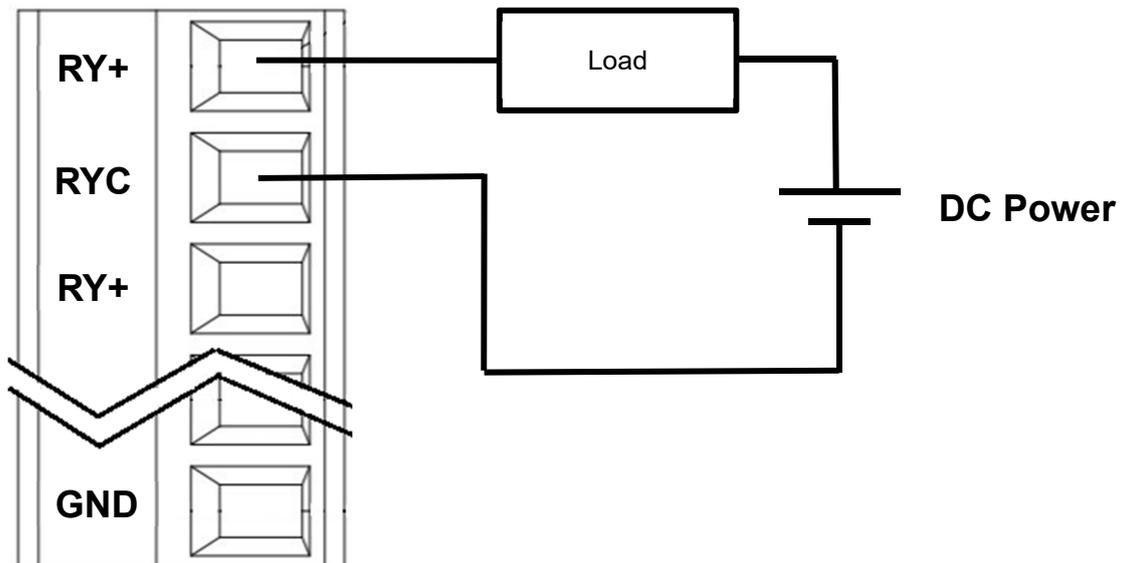


Figure 4.17 - Wiring of Relay Contact

4.7.6 *AI (Analog Input) Contact*

Figure 4.18 shows an example of analog input (AI) contact wiring of the IO5202 in which the AI+ channel is connected to positive end of the AI signal source and AI- channel is connected to the negative end of the AI signal source. Note that the signal source can be an analog output of a sensor. The analog input of IO5202 can be configured to accept either voltage signal mode or current signal mode as described in Section 0.

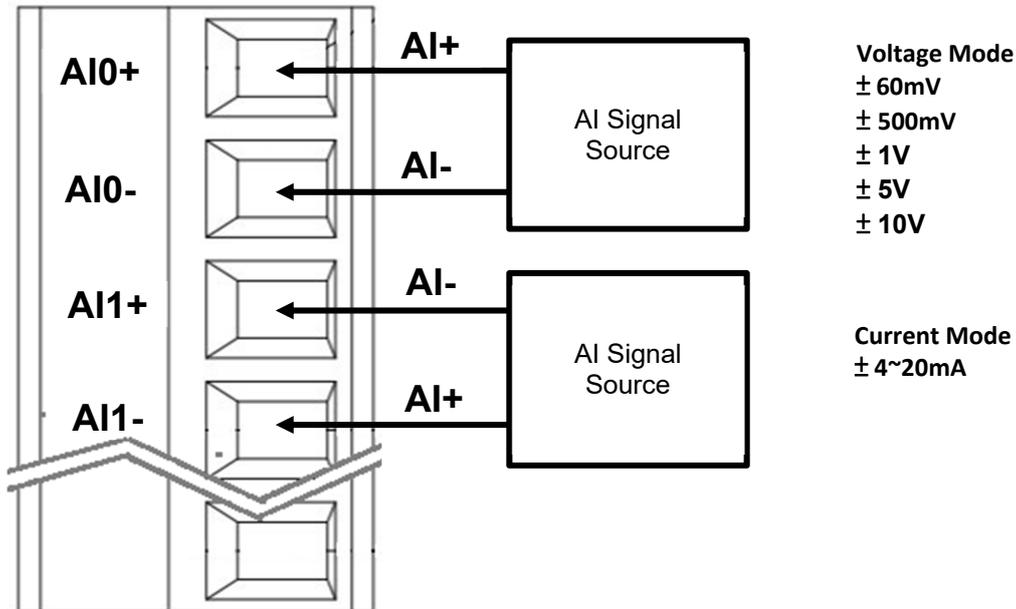


Figure 4.18 - Wiring of AI (Analog Input) Contact

4.7.7 *AO (Analog Output) Contact*

Figure 4.19 shows an example of analog output (AO) contact wiring of the IO5202 in which the AO+ channel is connected to positive end of the load and AO- channel is connected to the negative end of the load. Note that the output signal from IO5202 can be configured as either voltage signal mode or current signal mode with corresponding ranges as described in Section 5.7.4.

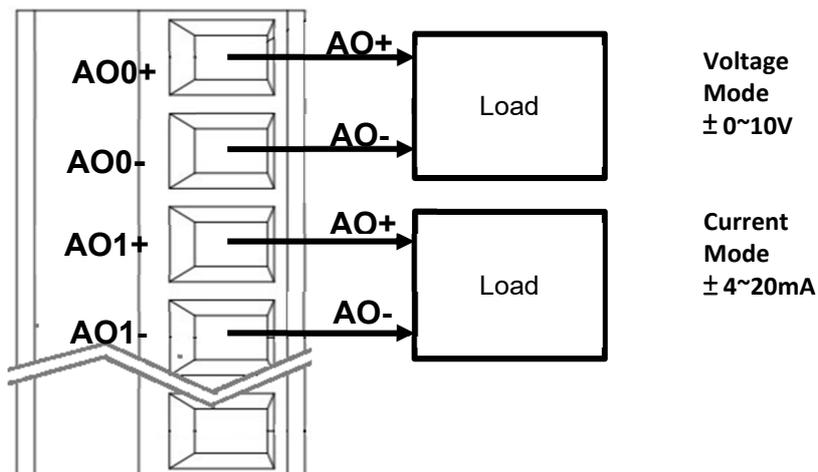


Figure 4.19 - Wiring of AO (Analog Output) Contact

4.8 *Factory Default Settings*

IO5202 comes with the following default setting.

4.8.1 *Network Default Settings*

The IO5202 Remote I/O is equipped with one or more LAN interfaces (depending on the series) with two default IP addresses. Its default network parameters are listed in Table 4.7.

Table 4.7 Network Default Setting

Interface	Device IP	Subnet Mask	Gateway IP	DNS
LAN1	10.0.50.100	255.255.0.0	10.0.0.254	255.255.255.255
LAN2	192.168.1.1	255.255.255.0	192.168.1.254	

4.8.2 *Other Default Settings*

The IO5202 Remote IO comes with other default settings for security and communication protocols.

Table 4.8 Security , Serial, and SNMP Default Settings

Parameter	Default Values
Security	
User Name	admin
Password	default
Serial	
COM1	RS-232, 9600 bps, 8 data bits, No Parity bit, 1 stop bit, No Flow Control Packet Delimiter timer: Auto
SNMP	
SysName of SNMP	System
SysLocation of SNMP	Location
SysContact of SNMP	Contact
SNMP	Disabled
Read Community	public
Write Community	private
SNMP Trap Server	0.0.0.0

Note: Press the “Reset” button on the top panel for 5 seconds or follow the procedure in Section 5.13, to restore the IO5202 Remote I/O to the factory default settings.

5 Configuration and Setup

It is strongly recommended for the user to set the Network Parameters through **Device Management Utility**® first. Other device-specific configurations can later be carried out via Atop’s user-friendly Web-Interface.

5.1 Configuration of Network Parameters through Device Management Utility

Please install Atop’s configuration utility program called **Device Management Utility**® that comes with the Product CD or can be downloaded from our website www.atoponline.com. For more information on how to install **Device Management Utility**®, please refer to the manual. After you start **Device Management Utility**®, if the IO5202 Remote IO is already connected to the same subnet as your PC, the device can be accessed via broadcast packets. **Device Management Utility**® will automatically detect your IO5202 device and list it on **Device Management Utility**®’s window. Alternatively, if you did not see your IO5202 device on your network, press “**Rescan**” icon, a list of devices, including your IO5202 device currently connected to the network will be shown in the window of **Device Management Utility**® as shown in Figure 5.1.

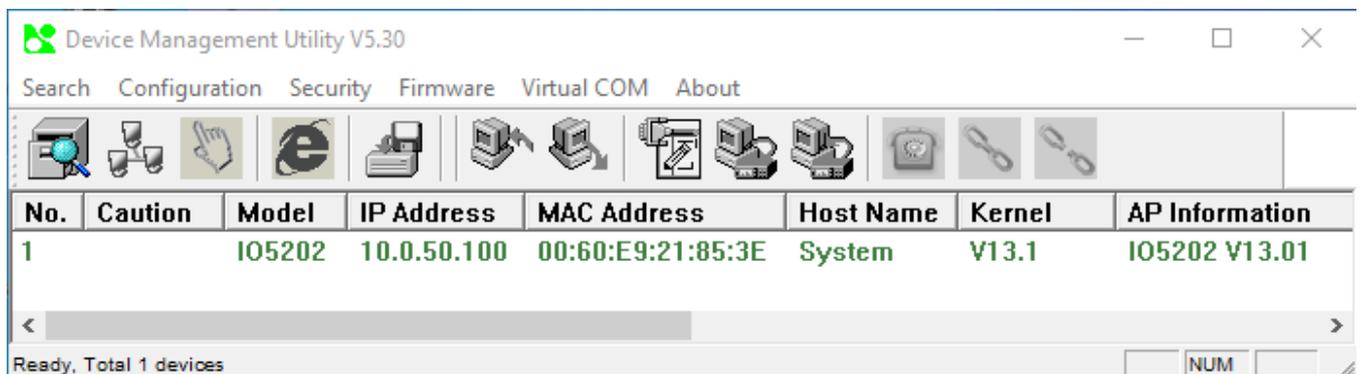


Figure 5.1 - List of Device in Device Management Utility

Note: This figure is for illustration purpose only. Actual values/settings may vary between devices.

Sometime the IO5202 device might not be in the same subnet as your PC; therefore, you will have to use Atop's utility to locate it in your virtual environment. To configure each device, first click to select the desired IO5202 device (default IP: 10.0.50.100) in the list of **Device Management Utility**®, and then click “**Configuration → Network...**” (or Ctrl+N) menu on **Device Management Utility**® as shown in Figure 5.2 or click on the second icon called **Network** on the menu icon bar, and a pop-up window will appear as shown in Figure 5.3.

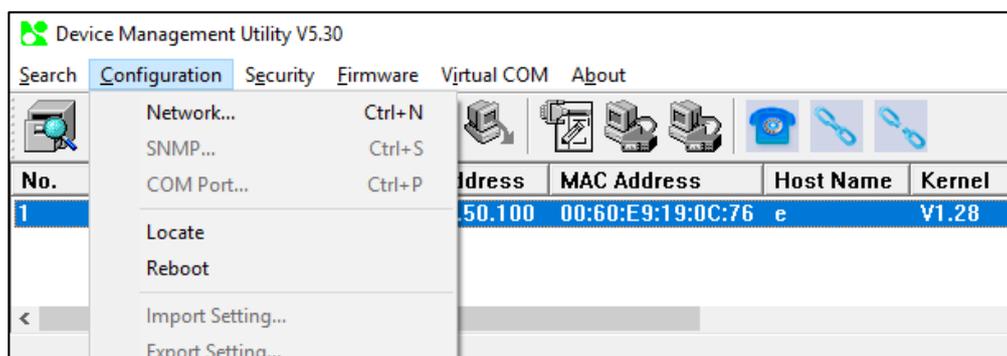


Figure 5.2 - Pull-down Menu of Configuration and Network...

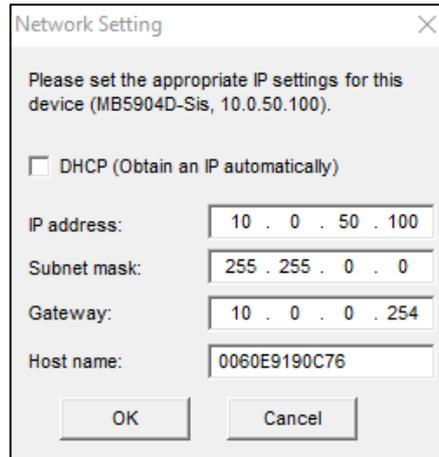


Figure 5.3 - Pop-up Window of Network Setting

You may proceed then to change the IP address to avoid any IP address conflict with other hosts on your LAN or to connect the device to your existing LAN as shown in Figure 5.3. The system will prompt you for a credential to authorize the changes. It will ask you for the **Username** and the **Password** as shown in Figure 5.4. The default username is “**admin**”, while the default password is “**default**”. After clicking on the **Authorize** button, a notification window will pop-up as shown in Figure 5.5 and some device may be restarted. After the device is restarted (for some model), it will beep twice to indicate that the unit is running normally. Then, the IO5202 device can be found on a new IP address. It may be listed automatically by the **Device Management Utility**© or it can be found by clicking on the “**Rescan**” icon. Note that if you did not change the IP address but changed other parameter, you may encounter another notification window as shown in Figure 5.6.

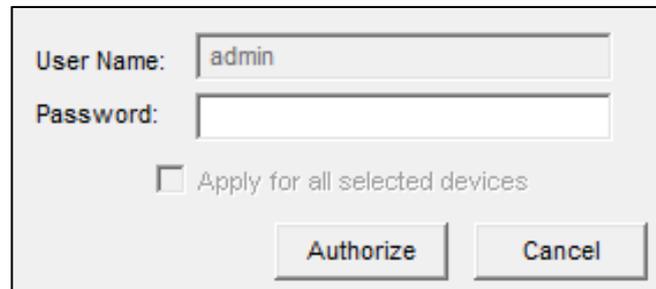


Figure 5.4 - Authorization for Change of Network Settings

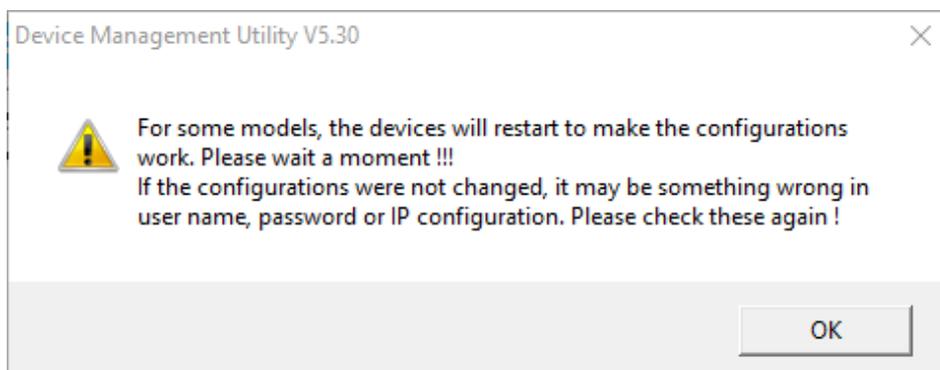


Figure 5.5 - Pop-up Notification Window after Authorization

Please consult your system administrator if you do not know your network’s subnet mask and gateway address.

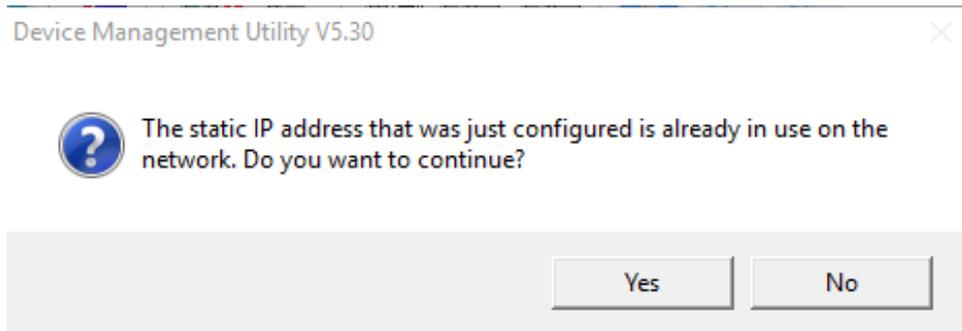


Figure 5.6 – Pop-up Notification Window when there is the same IP address in the network

5.2 *Configuring through Web Interface*

Every IO5202 Remote IO is equipped with a built-in web server in the firmware. Therefore, the device can be accessed by using a web browser for configuring by entering the device's IP address (default IP address is 10.0.50.100) in the URL field of your web browser. An authentication will be required and you will have to enter the username (Default value is "admin") and password (Default value is "default") for accessing the web interface as shown in Figure 5.7. Note that you may encounter a warning pop-up window that urges you to change or reset your password to be different from the default value as shown in Figure 5.8. Figure 5.9 illustrates the overview page of the web interface. Figure 5.10 lists all the menus and submenus for web configuration. Please see Section 0 for default values.

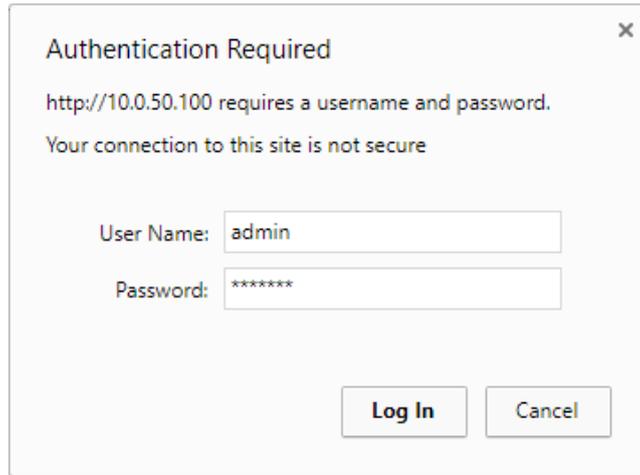


Figure 5.7 Authentication Required for Accessing Web Interface

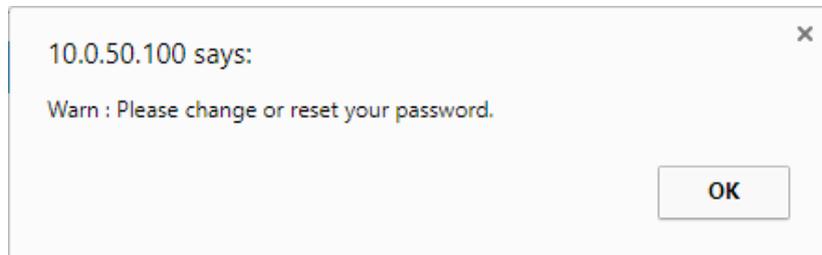


Figure 5.8 Warning Pop-up Window for Changing or Resetting Password from Default Value



- System Status
 - Overview
 - Network Settings
- + Serial
- I/O Settings
- Wi-Fi
- + MQTT
 - SNMP/ALERT Settings
 - E-mail Settings
- + Log Settings
- + System Setup
 - Reboot

System Status > Overview
IO5202 IO52

Overview

The general information of ATOP - Remote IO

Device Information	
Model Name	IO5202
Device Name	Remote_IO
Kernel Version	1.22
AP Version	1.25
Bootloader Version	10.00

IO Board B(Analog input board)					
Name	Channels	Function	Modbus Start Addr.	R/W	Data Type
AI	8	04	0	R	INT

Network Information		
LAN1	MAC Address	00:60:e9:21:85:3e
	IP Address	10.0.50.100
LAN2	MAC Address	00:60:e9:21:85:3f
	IP Address	192.168.1.1

Figure 5.9 Overview Web Page of IO5202 Remote IO.



- System Status
 - Overview
 - Network Settings
- Serial
 - COM1
- I/O Settings
- Wi-Fi
- MQTT
 - MQTT Settings
 - MQTT Status
- SNMP/ALERT Settings
- E-mail Settings
- Log Settings
 - System Log Settings
 - COM Log Settings
 - System Log
 - COM log
- System Setup
 - Date/Time Settings
 - Admin Settings
 - Firmware Upgrade
 - Backup/Restore Configuration
 - Ping
- Reboot

Figure 5.10 Map of Configuring Web Page on IO5202 Remote I/O

This approach (web interface) for configuring your device is the most user-friendly. It is the most recommended and the most common method used for IO5202 Remote I/O Series. Please go to its corresponding section for a detailed explanation.

5.3 *Configuring Automatic IP Assignment with DHCP*

A DHCP server can automatically assign IP addresses, Subnet Mask and Network Gateway to LAN interface. You can simply check the “**DHCP (Obtain an IP Automatically)**” checkbox in the Network Setting dialog as shown in Figure 5.3 using Atop’s **Device Management Utility**© and then restart the device. Once restarted, the IP address will be configured automatically.

5.4 *System Status*

After the successful login to the IO5202 device the user will be presented with the **Overview** web page under the **System Status** menu.

5.4.1 *Overview*

The **Overview** sub-menu under **System Status** menu contains a summary of the device’s information, i.e., Model Name, Device Name, Kernel Version, AP Version, Bootloader Version, IO Board Configuration, and Network Information. An example of Overview page is shown in Figure 5.11. The description for each field on the web page is as follows:

- **Device Information**
 - **Model Name:** This shows the device’s model
 - **Device Name:** This field shows a given name of the device in which the default value is the MAC address of the LAN interface.
 - **Kernel Version:** This is the value of the version of the kernel firmware of the device.
 - **AP Version:** This is the value of the version of the application firmware of the device.
 - **Bootloader Version:** This is the version of the program that loads the operating system of the device.
- **IO Board**
 - This section of the page shows current summary of I/O information. This part may vary due to the configuration of the IO extension board on the device. It may have digital input (DI), digital output (DO), analog input (AI) or analog output (AO) ports.
- **Network Information** shows information about the wired network interface on the device.
 - **LAN:** This will display the current MAC Address, and IP Address of the Ethernet interface.

System Status > Overview		IO5202 IO52			
Overview					
The general information of ATOP - Remote IO					
<i>Device Information</i>					
Model Name	IO5202				
Device Name	Remote_IO				
Kernel Version	1.22				
AP Version	1.25				
Bootloader Version	10.00				
<i>IO Board B(Analog input board)</i>					
Name	Channels	Function	Modbus Start Addr.	R/W	Data Type
AI	8	04	0	R	INT
<i>Network Information</i>					
LAN1	MAC Address	00:60:e9:21:85:3e			
	IP Address	10.0.50.100			
LAN2	MAC Address	00:60:e9:21:85:3f			
	IP Address	192.168.1.1			

Figure 5.11 - Overview Web Page

5.5 Network Settings

In this section, both network interfaces and related network settings of the IO5202 device can be configured. There are four sets of parameters which are **LAN1 Settings**, **LAN2 Settings**, **Default Gateway**, and **DNS Server** that can be entered as shown in Figure 5.12. First, **LAN1 Settings** part will allow you to configure the **IP Address**, **Subnet Mask**, and **Default Gateway** for your wired LAN1 network. You can check the box behind **DHCP** option to obtain an IP address automatically. If you checked the box, the rest of the options for **LAN1 Settings** will be greyed out or disabled. Second, **LAN2 Settings** is the same as LAN1 Settings but for the second Ethernet interface. Third, **Default Gateway** part is where you can select the default gateway network for your serial device server. You can either select **LAN1** or **LAN2** by clicking on the corresponding radio button. Fourth, **DNS Server** part is where you can specify the IP Address of your **Preferred DNS** (Domain Name Server) and **Alternate DNS**. If the IO5202 device is connected to the Internet and should connect to other servers over the Internet to get some services such as Network Time Protocol (NTP) server, you will need to configure the DNS server in order to be able to resolve the host name of the NTP server. Please consult your network administrator or internet service provider (ISP) to obtain local DNS's IP addresses.

> Network Settings
IO5202 IO52

Network Settings

LAN1 Settings

DHCP	<input type="checkbox"/> Enable
IP Address	<input type="text" value="10.0.50.100"/>
Subnet Mask	<input type="text" value="255.255.0.0"/>
Gateway	<input type="text" value="10.0.0.254"/>

LAN2 Settings

DHCP	<input type="checkbox"/> Enable
IP Address	<input type="text" value="192.168.1.1"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>
Gateway	<input type="text" value="192.168.1.254"/>

Default Gateway

Default Gateway Select	<input checked="" type="radio"/> LAN1 <input type="radio"/> LAN2
------------------------	--

DNS Server

Preferred DNS	<input type="text" value="0.0.0.0"/>
Alternate DNS	<input type="text" value="0.0.0.0"/>

Figure 5.12 - Network Settings Web Page

After finishing the network settings (or IPv4 settings) configuration, please click the **Save & Apply** button to save all changes that have been made. Finally, the web browser will be redirected to the **Overview** page as shown in Figure 5.11. If you would like to discard any setting, please click the **Cancel** button.

5.6 Serial

Since IO5202 is an Industrial I/O Device, it supports serial communication with COM port. Figure 5.13 shows the **Serial** menu on the left frame of the web interface of IO5202. The following subsections will describe how to configure these COM ports.

- Serial

COM1

Figure 5.13 - Serial Menu

5.6.1 COM

Figure 5.14 shows the **Serial Settings** of **COM** port under Serial menu. Note that these settings need to match the parameters on the serial port of the serial device connected to the IO5202. Each option is described as follows.

Serial > COM1IO5202 IO52

COM 1 Port Settings

To configure COM 1 port parameters.

<i>Serial Settings</i>	
Serial Interface	<input checked="" type="radio"/> RS232 <input type="radio"/> RS422/RS485(4-Wire) <input type="radio"/> RS485
Baud Rate	9600 ▼ bps
Parity	<input checked="" type="radio"/> None <input type="radio"/> Odd <input type="radio"/> Even <input type="radio"/> Mark <input type="radio"/> Space
Data bits	<input type="radio"/> 7 bits <input checked="" type="radio"/> 8 bits
Stop bits	<input checked="" type="radio"/> 1 bits <input type="radio"/> 2 bits

Figure 5.14 - COM Port Settings Web Page under Serial Menu

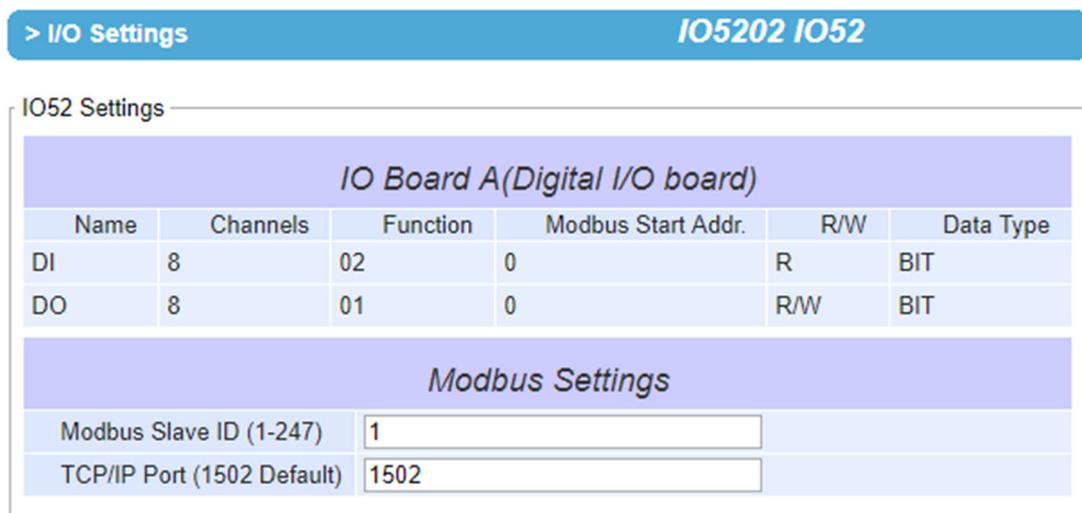
- **Serial Interface:** This option allows selection between **RS-232**, **RS-422/ RS-485 (4-Wire)** , and **RS-485** standards.
- **Baud Rate:** The user can select one of the baud rates (from 1200 to 230400 bps) from the drop-down list.
- **Parity:** The available Parity options are **None**, **Odd**, **Even**, **Mark**, or **Space**.
- **Data Bits:** The setting for Data Bits can be **5 bits**, **6 bits**, **7 bits**, or **8 bits**.
- **Stop Bits:** The number of Stop Bits can be either **1 bit** or **2 bits**.

After finish configuring the COM Port **Serial Settings**, please click on **Save & Apply** button to keep the change that you have made. Note that after click **Save & Apply**, the web browser will be refreshed and remain on the **Serial Settings** page. If you want to cancel the change and reset all changes back to their original values, just click the **Cancel** button.

5.7 I/O Settings

IO5202 can support a number of Digital Input (DI), Digital Output (DO), Relays (Rly), Analog Input (AI) and Analog Output (AO) ports.

There are 5 combinations of I/O extension board called A, B, C, D and E. For example, I/O Board A is the Digital Input and Output board, while Board I/O Board B is the Analog Input Board. This configuration depends on the purchased model of IO5202. The user can check for the detail information of IO extension board in the Overview or I/O Settings web page of the Web UI. Because the I/O status of IO5202 is mainly displayed via Modbus protocol, the user has to configure the Modbus settings if the user wants to use the Modbus protocol. Figure 5.15 shows the two parameters that must be set for the Modbus protocol that is the Modbus Slave ID and TCP/IP Port.



IO Board A(Digital I/O board)					
Name	Channels	Function	Modbus Start Addr.	R/W	Data Type
DI	8	02	0	R	BIT
DO	8	01	0	R/W	BIT

Modbus Settings	
Modbus Slave ID (1-247)	<input type="text" value="1"/>
TCP/IP Port (1502 Default)	<input type="text" value="1502"/>

Figure 5.15 - Modbus Settings under I/O Settings Web Page

Description of information under the I/O Settings web page is listed as followings:

- **Name:** This is the name of the I/O port which can be DI, DO, AI or AO.
- **Channels:** This provide the number of pins or channels that a particular I/O has such as 8 channels.
- **Function:** This field represents Modbus function as a code. Function code 01 is for writing, while code 02 is for reading.
- **Modbus Start Addr.:** The I/O status will be displayed at the starting address given in this field.
- **R/W:** This indicates the permission of I/O read (R) or write (W) via Modbus protocol.
- **Data Type:** This field indicates the data type for Modbus which can be bit.
- **Modbus Slave:** This field allows the user to configure the Modbus identification (ID) of Modbus general settings, The Modbus slave ID is set to the default value of 1. It can be the integer number from 1 to 247.
- **TCP/IP Port:** This field allows the user to configure the Modbus's TCP/IP port. The default port number is 1502.

In the following subsections, different I/O settings will be described.

5.7.1 Digital Input (DI)

IO5202 model with DI port can transfer input voltage to digital signal. There will be a DI Information table under the Modbus Settings section if an extension board has DI port as shown in Figure 5.16. The description of each field in the table is provided as followings:

- **Channel:** This field is the name or label of the DI channel.
- **Function Code:** The function code of DI is 02 (Read Discrete Inputs).
- **Modbus Addr.:** The Modbus address for particular DI channel. It can vary from 0 to 8, which can be configured through the Modbus Start Address field (next field).
- **DI Modbus Start Address:** This field will allow the user to set the DI Modbus starting address. The DI status will be mapped to the address set here. The default starting address is 0 which will be mapped to DI channel number 0. The

successive DI channels will have the incremental Modbus address based on this starting address, i.e. DI1 will have the Modbus address of 1.

- **Counter Modbus Start Address:** This field will allow the user to configure the Counter Modbus starting address. The Counter values will be map to the given address. The default value is 10. The Counter function will be introduced in the next subsection.

<i>DI Information</i>		
Channel	Function Code	Modbus Addr.
DI0	02 Read Discrete Inputs	0
DI1	02 Read Discrete Inputs	1
DI2	02 Read Discrete Inputs	2
DI3	02 Read Discrete Inputs	3
DI4	02 Read Discrete Inputs	4
DI5	02 Read Discrete Inputs	5
DI6	02 Read Discrete Inputs	6
DI7	02 Read Discrete Inputs	7
DI Modbus Start Address <input type="text" value="0"/>		
Counter Modbus Start Address <input type="text" value="10"/>		

Figure 5.16 - Digital Input Information Section under I/O Settings Web Page

5.7.1.1 DI Detail Settings

DI counter as mentioned in previous subsection is a value presents how many times counter is triggered. If the user clicked on one of the DI channel on the table, the DI Detail Settings for that particular channel will show up as shown in Figure 5.17 for an example of DI0. The description of each field in the DI Detail Settings is provided as followings:

- **Counter Modbus Address:** This field will represent the Modbus’s register address of the Counter. The counter value can be read form the address listed here.
- **Filter:** This field is the interval that the system will check for the DI status. The default value is 100 milliseconds (ms).
- **Counter Trigger:** This option is the condition that the counter will be triggered. There are 3 possible conditions which are Lo to Hi, Hi to Lo and both. The default setting is Lo to Hi.
- **Scale Gain:** This field provides a setting for scale gain in which the counter value can be scaled up or has a multiplicative factor (called gain). The result after scaling will be a new value = Counter x Gain + Offset. The default value for Scale Gain is 1.
- **Scale Offset:** This field provides a setting for scale offset in which the counter value can be adjusted by a number called Offset as described in previous field. The default value for the Scale Offset is 0.
- **Close Setting:** This button hides the detail settings section. Note that this button does NOT save the settings.

DI Information		
Channel	Function Code	Modbus Addr.
DI0	02 Read Discrete Inputs	0
DI1	02 Read Discrete Inputs	1
DI2	02 Read Discrete Inputs	2
DI3	02 Read Discrete Inputs	3
DI4	02 Read Discrete Inputs	4
DI5	02 Read Discrete Inputs	5
DI6	02 Read Discrete Inputs	6
DI7	02 Read Discrete Inputs	7

DI Modbus Start Address	<input type="text" value="0"/>
Counter Modbus Start Address	<input type="text" value="10"/>

DI0 Detail Settings	
Counter Modbus Address	04 Read Inputs Registers - 10
Filter	<input type="text" value="100"/> (ms)
Counter Trigger	<input type="text" value="Lo to Hi"/> ▼
Scale Gain	<input type="text" value="1"/>
Scale Offset	<input type="text" value="0"/>

Figure 5.17 - DI0 Detail Settings Section below DI Information Table under I/O Settings Web Page

5.7.2 Digital Output (DO)

IO5202 model with DO port can output digital signal through one of its digital output channels. An example of DO Information table is shown in Figure 5.18. The description of each field in the table is provided as followings:

- **Channel:** This field is the name or label of the DO channel.
- **Mode:** This field displays the current mode of the digital output (DO). The DO has 3 configurable modes: DO, Pulse and Mirror. This option can be set in the DO Detail Settings section under the information table described in the next subsection.

Note: it is recommended to use Pulse off/ Pulse on width always ≥ 10 ms.

- **Function Code:** This field indicates the function code of each DO channel. The function code of DO channel is 01 (Read Coils).
- **Modbus Addr.:** The Modbus address for particular DO channel. It can vary from 0 to 8, which can be configured through the Modbus Start Address field (next field).
- **DO Modbus Start Address:** This field will allow the user to set the DO Modbus starting address. The DO status will be map to the address set here. The default starting address is 0 which will be mapped to DO channel number 0. The successive DO channels will have the incremental Modbus address based on this starting address, i.e. DO1 will have the Modbus address of 1.
- **Pulse Count Modbus Start Address:** This field allows the user to set the Modbus starting address for Pulse Count. The pulse count values will be mapped to the address with function code 04. The default Modbus starting address is 20. Note that Pulse function will be introduced in the next subsection.
- **Pulse Enable Modbus Start Address:** This field allows the user to set the Modbus starting address for Pulse Enable. The Pulse enable/disable will be mapped to the address with function code 01. The default Modbus starting address is 20. The Pulse can be enabled or disabled by changing the value on the Modbus address.

- Pulse Width Modbus Start Address:** This field allows the user to set the Modbus starting address for Pulse Width. The Pulse width values will be mapped to the address with function code 03. The default Modbus starting address is 20. The on/off width of the Pulse can be adjusted by changing the value on the Modbus address.

DO Information			
Channel	Mode	Function Code	Modbus Addr.
DO0	DO	01 Read Coils	0
DO1	DO	01 Read Coils	1
DO2	DO	01 Read Coils	2
DO3	DO	01 Read Coils	3
DO4	DO	01 Read Coils	4
DO5	DO	01 Read Coils	5
DO6	DO	01 Read Coils	6
DO7	DO	01 Read Coils	7
DO Modbus Start Address		<input type="text" value="0"/>	
Pulse Count Modbus Start Address(04)		<input type="text" value="20"/>	
Pulse Enable Modbus Start Address(01)		<input type="text" value="20"/>	
Pulse Width Modbus Start Address(03)		<input type="text" value="20"/>	

Figure 5.18 - Digital Output Information Table under I/O Settings Web Page

5.7.2.1 DO Detail Settings

If the user clicked on one of the DO channel on the table, the DO Detail Settings for that particular channel will show up as shown in Figure 5.19 for an example of DO 0. The description of each field in the DO Detail Settings is provided as followings:

- Pulse Count Modbus Address:** indicates the current DO channel's pulse count function code and address.
- Pulse Enable Modbus Address:** indicates the current DO channel's pulse enable function code and address.
- Pulse On Width Modbus Address:** indicates the current DO channel's pulse on width function code and address.
- Pulse Off Width Modbus Address:** indicates the current DO channel's pulse off width function code and address.
- Mode:** This field allows the user to choose the mode of digital output (DO). There are three selectable modes for DO which are DO, Pulse and Mirror. The DO mode can output digital signal. The Pulse mode can generate a square wave with On width and Off width. The Mirror mode can replicate the digital input (DI) happening on another input in the same way or inverted its signal. The default mode is set to DO mode.
- Pulse Enable:** allows to enable or disable the pulse output for the current DO channel. Default setting is enabled.
- Pulse Power On:** This check box will determine whether the Pulse Output will start as soon as the IO5202 is powered on. The default setting is disabled.
- Pulse On Width:** allows to set the duration of pulse output ON time. The default value is 100 milliseconds (ms).
- Pulse Off Width:** allows to set the duration of pulse output OFF time. The default value is 100 milliseconds (ms). **Note:** it is recommended to use Pulse off/ Pulse on width always ≥ 10 ms.
- Mirror DI ID:** This field has a drop-down list of available digital input (DI) channel that can be mirrored. The signal on selected DI channel will be replicated to the current DO channel. The default value is channel 0.
- Mirror Frequency:** This field enables the user to choose the checking frequency for the mirror channel from the drop-down list. The default value is 0, which means that do not check.
- Mirror Behavior:** The option allows the user to configure whether the mirror signal will be inverted. There are two options to choose from: Open-to-Open or Open-to-Close. The Open-to-Open option means that if DI is 0, then DO is off and if DI is 1, then DO is on. On the other hand, the Open-to-Close option will reverse the behavior of the signal. The default setting is Open-to-Open.

<i>DO Information</i>			
Channel	Mode	Function Code	Modbus Addr.
DO0	DO	01 Read Coils	0
DO1	DO	01 Read Coils	1
DO2	DO	01 Read Coils	2
DO3	DO	01 Read Coils	3
DO4	DO	01 Read Coils	4
DO5	DO	01 Read Coils	5
DO6	DO	01 Read Coils	6
DO7	DO	01 Read Coils	7
DO Modbus Start Address		<input type="text" value="0"/>	
Pulse Count Modbus Start Address(04)		<input type="text" value="20"/>	
Pulse Enable Modbus Start Address(01)		<input type="text" value="20"/>	
Pulse Width Modbus Start Address(03)		<input type="text" value="20"/>	
<i>DO 0 Detail Settings</i>			
Pulse Count Modbus Address		04 Read Inputs Registers - 20	
Pulse Enable Modbus Address		01 Read Coils - 20	
Pulse On Width Modbus Address		03 Holding Registers - 20	
Pulse Off Width Modbus Address		03 Holding Registers - 21	
Mode	<input type="text" value="DO"/>		
Pulse Enable	<input type="checkbox"/> Enable		
Pulse Power On	<input type="checkbox"/> Enable		
Pulse On Width	<input type="text" value="100"/>	(ms)	
Pulse Off Width	<input type="text" value="100"/>	(ms)	
Mirror DI ID	<input type="text" value="0"/>		
Mirror Frequency	<input type="text" value="0"/>	(Hz)	
Mirror Behavior	<input type="text" value="Open to Open"/>		
<input type="button" value="Close Setting"/>			

Figure 5.19 - Digital Output Detail Settings Section under the Digital Output Information Table

5.7.3 Analog Input (AI)

IO5202 model with AI port can receive analog signal through one of its analog input channels. An example of AI Information table is shown in Figure 5.20. The description of each field in the table is provided as followings:

- **Channel:** This field is the name or label of the AI channel.
- **Range:** For each channel, the user can select the input voltage range. There are 5 selectable ranges which are: +/- 60 (mv), +/- 500 (mv), +/- 1000 (mv), +/- 5k (mv) and +/- 10k (mv). The more accurate the range is selected, the less deviation the signal will be read. Note that only voltage input is associated with this setting and the default setting is +/- 5k (mv). The Current range of the input signal is always from 4mA to 20mA.
- **Function Code:** This field indicates the function code of each AI channel. The function code of AI channel is 04 (Read Input Registers).
- **Modbus Addr.:** This field indicates the Modbus address for particular AI channel. It can vary from 0 to 8, which can be configured through the Modbus Start Address field (next field).
- **Modbus Start Address:** This field will allow the user to set the AI Modbus starting address. The AI status will be mapped to the address set here. The default starting address is 0 which will be mapped to AI channel number 0. The successive AI channels will have the incremental Modbus address based on this starting address, i.e. AI1 will have the Modbus address of 1.
- **Input:** This option enables the user to choose analog signal input type whether it will be Voltage or Current signal. The default setting is Voltage.

AI Information			
Channel	Range	Function Code	Modbus Addr.
AI0	+/- 60 (mV) ▼	04 Read Inputs Registers	0
AI1	+/- 5k (mV) ▼	04 Read Inputs Registers	1
AI2	+/- 5k (mV) ▼	04 Read Inputs Registers	2
AI3	+/- 5k (mV) ▼	04 Read Inputs Registers	3
Modbus Start Address		0	
Input		Voltage (mV) ▼	

Figure 5.20 - Analog Input Information Table under the I/O Settings Web Page

5.7.4 Analog Output (AO)

IO5202 model with AO port can transmit analog signal through one of its analog output channels. An example of AO Information table is shown in Figure 5.21. The description of each field in the table is provided as followings:

- **Channel:** This field is the name or label of the AO channel.
- **Mode:** This field displays the current mode of the analog output (AO). The AO has two configurable modes: AO, and Mirror. This option can be set in the AO Detail Settings section under the information table described in the next subsection.
- **Function Code:** indicates function code of each AO channel. Function code of AO channel is 03 (Holding Registers).
- **Modbus Addr.:** This field indicates the Modbus address for particular AO channel. It can vary from 0 to 8, which can be configured through the Modbus Start Address field (next field).
- **Modbus Start Address:** This field will allow the user to set the AO Modbus starting address. The AO status will be mapped to the address set here. The default starting address is 0 which will be mapped to AO channel number 0. The successive AO channels will have the incremental Modbus address based on this starting address, i.e. AO1 will have the Modbus address of 1.
- **Output:** This option allows the user to choose the type of output signal from the AO channel. The output signal type can be either voltage (mV) or current (μ A). The default setting is Voltage.

AO Information			
Channel	Mode	Function Code	Modbus Addr.
AO0	AO	03 Holding Registers	0
AO1	AO	03 Holding Registers	1
AO2	AO	03 Holding Registers	2
AO3	AO	03 Holding Registers	3
Modbus Start Address		0	
Output		Current (uA) ▼	

Figure 5.21 - Analog Output Information Table under the I/O Settings Web Page

5.7.4.1 AO Detail Settings

If the user clicked on one of the AO channel on the table, the AO Detail Settings for that particular channel will show up as shown in Figure 5.22 for an example of AO 0. The description of each field in the AO Detail Settings is provided as followings:

- **Mode:** This option enable the user to choose the AO mode. There are two selectable modes: AO and Mirror. The AO mode mean the channel will output analog signal, while the Mirror mode can replicate the analog input (AI) happening on another input in the same way or inverted its signal. The default mode is set to DO mode.
- **Mirror AI ID:** This field has a drop-down list of available analog input (DI) channel that can be mirrored. The signal on selected AI channel will be replicated to the current AO channel. The default value is channel 0.
- **Mirror Frequency:** This field enables the user to choose the checking frequency for the mirror channel from the drop-down list. The default value is 0, which means that do not check.
- **Mirror Scale Enable:** This check box will allow the user to enable or disable the Mirror scale. If this option is enabled. The AO value mirrored from another AI will be scaled according to the minimum and maximum values indicated in the next four fields. For example, if AI0 signal is a voltage type and has a range of +/- 10 V and the AO0 signal type is set to voltage signal with a maximum scale of 5 V and a minimum scale of 0 V. The user should see a 3.75 V at this AO0 when the AI0 is 5 V. Note that this output is calculated from the following steps:
 - $(\text{Input} - \text{Min. Input}) / (\text{Max. Input} - \text{Min. Input}) = (\text{Output} - \text{Min. Output}) / (\text{Max. Output} - \text{Min. Output})$
 - $(5V - (-10V)) / (10V - (-10V)) = (\text{Output} - 0V) / (5V - 0V)$
 - $\text{Output} = 5 * (15/20) = 3.75V$

If this option is disable, the AO channel will output the same signal as the specified AI channel without any scaling. The default value for this option is disabled.

- **Mirror Scale Current Minimum:** This field allows the user to set the minimum current value for the signal scaling. The possible value is from 4000μA to 20000μ. The default value is 0. If the value set in the field is lesser or greater than the limits, it will be set to either minimum or the maximum value.
- **Mirror Scale Current Maximum:** This field allows the user to set the maximum current value for the signal scaling. The possible value is from 4000μA to 20000μ. The default value is 0. If the value set in the field is lesser or greater than the limits, it will be set to either minimum or the maximum value.
- **Mirror Scale Voltage Minimum:** This field allows the user to set the minimum voltage value for the signal scaling. The possible value is from -10000mV to +10000mV. The default value is 0. If the value set in the field is lesser or greater than the limits, it will be set to either minimum or the maximum value.
- **Mirror Scale Voltage Maximum:** This field allows the user to set the maximum voltage value for the signal scaling. The possible value is from -10000mV to +10000mV. The default value is 0. If the value set in the field is lesser or greater than the limits, it will be set to either minimum or the maximum value.

AO Information			
Channel	Mode	Function Code	Modbus Addr.
AO0	AO	03 Holding Registers	0
AO1	AO	03 Holding Registers	1
AO2	AO	03 Holding Registers	2
AO3	AO	03 Holding Registers	3

Modbus Start Address	<input type="text" value="0"/>
Output	<input type="text" value="Current (uA)"/>

AO 0 Detail Settings	
Mode	<input type="text" value="AO"/>
Mirror AI ID	<input type="text" value="0"/>
Mirror Frequency	<input type="text" value="0"/> (Hz)
Mirror Scale Enable	<input type="checkbox"/> Enable
Mirror Scale Current Minimum	<input type="text" value="0"/> (4000uA~20000uA)
Mirror Scale Current Maximum	<input type="text" value="0"/> (4000uA~20000uA)
Mirror Scale Voltage Minimum	<input type="text" value="0"/> (-10000mV~10000mV)
Mirror Scale Voltage Maximum	<input type="text" value="0"/> (-10000mV~10000mV)

Figure 5.22 - Analog Output Detail Settings Section under the Analog Output Table

5.8 *MQTT*

IO5202 not only supports Modbus protocol for data communications but it also supports MQTT (Message Queuing Telemetry Transport) protocol via Internet. It is often used as an underlying communications protocol for Internet of Things (IoTs). It is one of the machine-to-machine (M2M) type of protocols. MQTT is a publish/subscribe based network protocol that is suitable for devices with limited network bandwidth and computational resources (memory and storage). It is said to be a lightweight protocol that requires small footprint for code. There are typically three entities in the MQTT protocol: the message broker or queue (MQTT host in this manual), the publisher, and the subscriber. The message broker or queue is usually located on the Internet. A sensor or host which provides data for other to consume is usually called the publisher. The publisher will post a small data or information on a topic (similar to a mailbox) on the message broker or queue (MQTT host). Then, any subscriber who subscribes or listens to the same topic (mailbox) can retrieve the data or information from the message broker or queue (MQTT host) on the internet.

5.8.1 *MQTT Settings*

To configure and use the MQTT protocol on the IO5202 device, the user can setup required information for MQTT protocol on the **MQTT Settings** web page under the **MQTT** menu. The web page may have different settings for input or output (interfaces) depending on the model of IO5202. The example of IO5202-A model is shown in Figure 5.24 where there are digital input (DI) and digital output (DO) sections under the MQTT Settings section. Another example is for the IO5202-E model is shown in Figure 5.25 where there are analog input (AI) and analog output (AO) sections under the MQTT Settings section. Description of each field on **MQTT Settings** web page is listed below.

- **Host IP:** The MQTT host IP or host name. This is a remote MQTT broker that provides messaging broker/queue service.
- **Port:** The port number used by MQTT protocol or MQTT host port.
- **Quality of Service:** The Quality of Service (QoS) level is an agreement between the sender of a message and the receiver of a message that defines the guarantee of delivery for a specific message. There are three QoS levels in MQTT protocol: Level 0 – At most once, Level 1 – At least once and Level 2 – Exactly once. Level 0 guarantees a best-effort delivery with no guarantee of delivery while level 1 guarantees that a message is delivered at least one time to the receiver. Finally, Level 2 which is the highest level of service in MQTT guarantees that each message is received only once by the intended recipients. This is possible by a two-level handshake mechanism. QoS level 2 is the safest and slowest quality of service level. The IO5202 is set the default value for QoS at level 2.
- **Publish Interval:** There are five selectable intervals: None, 1 second, 30 seconds, 1 minute and 1 hour. The default value is set to None.
- **DI Publish When Changed:** If there is DI (Digital Input) ports on the IO5202 device, this field will be used to enable/disable MQTT publish operation. That is when the digital input (DI) pin of the IO5202 is changed, the IO5202 will use the MQTT protocol to publish its data to the MQTT host (MQTT broker) which is set by the Host IP field above. The default setting for this field is “Enable”.
- **AI Publish with Percent Changed (%):** If there is AI (Analog Input) ports on the IO5202, this field will allow the user to select the tolerance percentage when there is a change in analog signal of the analog input port. If the change in the input signal exceeds the threshold set here, the IO5202 will publish a data to the MQTT host. There are four ranges: None, 10%, 20% and 50%. Note that None means do not publish. The default value for this field is 10%.
- **Retain:** This option in Figure 5.23 allows the retained flag of the MQTT message to be set to true when the Enable box is checked. Note that the retained message will be stored on the MQTT broker and only one retained message per topic. When a new MQTT client subscribed to the topic, the MQTT client will receive the retained message immediately.
- **Use TLS:** This option in Figure 5.23 allows MQTT protocol to use TLS (Transport Layer Security). Checking the box to enable TLS protocol to encrypt the MQTT data.
- **Insecure:** When this Insecure option in Figure 5.23 is enabled (by checking the Enabled box), the MQTT protocol will not check that the server certificate hostname matches the remote hostname. Note that using insecure option will only disable the verification of the hostname in the certificate presented by the broker. It does not remove the need to have a copy of the CA certificate that signed the broker’s certificate.
- **TLS option:** This pull-down list in Figure 5.23 provides the list of supported TLS protocol version for MQTT. The available version that can be selected are: tlsv1.2, tlsv1.1, or tlsv1. The default setting is tlsv1.2 if available at the broker.
- **Server Certificate:** This textbox in Figure 5.23 is enabled when the Use TLS option is enabled. The user can paste CA certificates into this textbox.

- **Client Certificate:** This textbox in Figure 5.23 is enabled when the Use TLS option is enabled. The user can paste client certificate into this textbox.
- **Client Private Key:** This textbox in Figure 5.23 is enabled when the Use TLS option is enabled. The user can paste client private key into this textbox.
- **Topic:** There are list of Topic fields under AI or DI Settings part of the web page (depending on the IO5202 model) after the MQTT Settings part. These are the MQTT's topics which must be the same as the topic on the MQTT host (MQTT broker). Note that the topic is usually a short text that can be identified by both publisher and subscriber. IO5202 device with MQTT configuration will publish input whether DI or AI with the topics set here. On the other hand, the IO5202 device will receive data from MQTT host with the given topics and output the data to its DO or AO ports. For example, if DI0 is configured with a topic named "io5202_di_0", then whenever DI0 is changed, the IO5202 will publish its DI0 status to an MQTT host. On the contrary, if any of the DO or AO port is set to receive data from an MQTT host, IO5202 will adjust its DO or AO port accordingly. The default values of the Topics are blank.
- **Save:** Save button allows the user to save the current settings. Note that this **Save** operation does not imply the start of connection to the MQTT host.
- **Cancel:** Cancel button clears all the information in all field of this web page to the default value.

MQTT > MQTT Settings
IO5202 IO52

MQTT Settings

MQTT Settings	
Host IP	<input type="text"/>
Port	<input type="text" value="1883"/>
Quality of Service	<input type="text" value="1 - at least once"/> ▾
Publish Interval	<input type="text" value="None"/> ▾
AI Publish with Percent Changed(%)	<input type="text" value="10%"/> ▾
Retain	<input type="checkbox"/> Enable
Use TLS	<input type="checkbox"/> Enable
Insecure	<input type="checkbox"/> Enable
TLS option	<input type="text" value="Default"/> ▾
Server Certificate	<div style="border: 1px solid #ccc; padding: 5px; min-height: 40px;">-----BEGIN CERTIFICATE-----</div>
Client Certificate	<div style="border: 1px solid #ccc; padding: 5px; min-height: 40px;">-----BEGIN CERTIFICATE-----</div>
Client Private Key	<div style="border: 1px solid #ccc; padding: 5px; min-height: 40px;">-----BEGIN PRIVATE KEY-----</div>

Figure 5.23 - MQTT Settings with TLS option

MQTT > MQTT Settings **IO5202 IO52**

Mqtt Settings

<i>MQTT Settings</i>	
Host IP	<input type="text"/>
Port	<input type="text" value="1883"/>
Quality of Service	<input type="text" value="2 - exactly once"/>
Publish Interval	<input type="text" value="None"/>
DI Publish When Changed	<input checked="" type="checkbox"/>

<i>DI Settings</i>		
Channel	DI Topic	Counter Topic
DI 0	<input type="text"/>	<input type="text"/>
DI 1	<input type="text"/>	<input type="text"/>
DI 2	<input type="text"/>	<input type="text"/>
DI 3	<input type="text"/>	<input type="text"/>
DI 4	<input type="text"/>	<input type="text"/>
DI 5	<input type="text"/>	<input type="text"/>
DI 6	<input type="text"/>	<input type="text"/>
DI 7	<input type="text"/>	<input type="text"/>

<i>DO Settings</i>		
Channel	DO Topic	Pulse Count Topic
DO 0	<input type="text"/>	<input type="text"/>
DO 1	<input type="text"/>	<input type="text"/>
DO 2	<input type="text"/>	<input type="text"/>
DO 3	<input type="text"/>	<input type="text"/>
DO 4	<input type="text"/>	<input type="text"/>
DO 5	<input type="text"/>	<input type="text"/>
DO 6	<input type="text"/>	<input type="text"/>
DO 7	<input type="text"/>	<input type="text"/>

Figure 5.24 - MQTT Settings Web Page under MQTT Menu of IO5202-A

MQTT > MQTT Settings
IO5202 IO52

Mqtt Settings

MQTT Settings	
Host IP	<input type="text"/>
Port	<input type="text" value="1883"/>
Quality of Service	<input type="text" value="2 - exactly once"/>
Publish Interval	<input type="text" value="None"/>
AI Publish with Percent Changed(%)	<input type="text" value="10%"/>

AI Settings	
Channel	AI Topic
AI 0	<input type="text"/>
AI 1	<input type="text"/>
AI 2	<input type="text"/>
AI 3	<input type="text"/>

AO Settings	
Channel	AO Topic
AO 0	<input type="text"/>
AO 1	<input type="text"/>
AO 2	<input type="text"/>
AO 3	<input type="text"/>

Figure 5.25 - MQTT Settings Web Page under MQTT Menu of IO5202-E

5.8.2 MQTT Status

The user can check the current status of MQTT protocol on this web page as shown in Figure 5.26. The user can also control the connectivity state of the MQTT protocol using the command buttons at the bottom of the page. You can reconnect or disconnect the MQTT protocol using either **Reconnect** or **Disconnect** buttons. For latest status, you can click on the **Refresh** button. Description of each field on the MQTT Status web page can be found in previous subsection. Additional descriptions are listed below.

- **Status:** The connection between MQTT host and IO5202.
- **Reconnect:** Reconnect to host, usually click when disconnect or settings changed.
- **Disconnect:** Disconnect with host.
- **Refresh:** Refresh web interface to check status.

MQTT > MQTT Status IO5202 IO52

MQTT Status

<i>Current Status</i>	
Host IP	
Port	1883
Quality of Service	1 - at least once
Publish Interval	None
AI Publish With Percent Changed	10 %
Retain	Disabled
TLS	Disabled
Status	disconnect

Figure 5.26 - MQTT Status Web Page under MQTT Menu

5.9 *SNMP/ALERT Settings*

The Simple Network Management Protocol (SNMP) is used by network management software to monitor devices in a network, to retrieve network status information of the devices, and to configure network parameters of the devices. The **SNMP/ALERT Settings** page showed in Figure 5.27 allows user to configure IO5202 device so that it can be viewed by third-party SNMP software, and allows IO5202 to send alert events to administrator and SNMP trap server.

> SNMP/ALERT Settings
IO5202 IO52

SNMP/ALERT Settings

The SNMP is used in network management systems to monitor network-attached devices for conditions that warrant administrative attention.

Basic Data Objects

System Contact	<input type="text" value="contact"/>
System Name	<input type="text" value="System"/>
System Location	<input type="text" value="location"/>
SNMP	<input type="checkbox"/> Enable
SNMP Trap Server	
SNMP Trap Server	<input type="text" value="0.0.0.0"/>

Event alert settings

Alert Type	Email	SNMP Trap
Cold start	<input type="checkbox"/>	<input type="checkbox"/>
Warm start	<input type="checkbox"/>	<input type="checkbox"/>
Authenticate failed	<input type="checkbox"/>	<input type="checkbox"/>
IP Address changed	<input type="checkbox"/>	<input type="checkbox"/>
Password changed	<input type="checkbox"/>	<input type="checkbox"/>

Figure 5.27 - SNMP/ALERT Settings Web Page

IO5202 provides three basic SNMP fields under the **Basic Data Objects** part which are: “**System Contact**” usually used to specify the device’s contact information in case of emergency (default value is “contact”), “**System Name**” usually used to identify this device (default value is “System”), and “**System Location**” usually used to specify the device location (default value is “location”).

To make the device’s information available for public viewing/editing, you can enable the **SNMP** function by checking the **Enable** box and fill in the two passphrases (or SNMP Community Strings) below it. Note that when the SNMP is unchecked, three setting option lines will show up as depicted in Figure 5.28. By filling in the passphrase for the “**Read Community**”, IO5202 device allows other network management software to read its information. By filling in the passphrase for the “**Write Community**”, IO5202 device allows other network management software to read/modify its information. The default IO5202’s SNMP Community Strings (or passphrases) for **Read Community** and **Write Community** as shown in Figure 5.28 are “public” and “private”, respectively.

> SNMP/ALERT Settings IO5202 IO52

SNMP/ALERT Settings

The SNMP is used in network management systems to monitor network-attached devices for conditions that warrant administrative attention.

Basic Data Objects	
System Contact	<input type="text" value="contact"/>
System Name	<input type="text" value="System"/>
System Location	<input type="text" value="location"/>
SNMP	<input checked="" type="checkbox"/> Enable
SNMP Version	<input type="text" value="v1 / v2c"/>
Read Community	<input type="text" value="public"/>
Write Community	<input type="text" value="private"/>
SNMP Trap Server	
SNMP Trap Server	<input type="text" value="0.0.0.0"/>

Event alert settings

Alert Type	Email	SNMP Trap
Cold start	<input type="checkbox"/>	<input type="checkbox"/>
Warm start	<input type="checkbox"/>	<input type="checkbox"/>
Authenticate failed	<input type="checkbox"/>	<input type="checkbox"/>
IP Address changed	<input type="checkbox"/>	<input type="checkbox"/>
Password changed	<input type="checkbox"/>	<input type="checkbox"/>

Figure 5.28 - SNMP Enabled in SNMP/ALERT Settings Web Page

Additionally, you can setup a **SNMP Trap Server** in the network to receive and collect all alert messages from IO5202. To configure IO5202 to dispatch alert messages originated from any unexpected incidents, you can fill in the IP Address of the **SNMP Trap Server** in the field shown in Figure 5.28. Note that any changes in these settings will take effect after the IO5202 device is restarted.

Under the **SNMP Trap Server part**, there is a list of **Alert Type** under **Event alert** settings box in Figure 5.28. There can be up to two possible actions for each alert event: Email and SNMP Trap. You can enable the associated action(s) of each alert event by checking the box under the column of **Email** and/or **SNMP Trap**. When the **Email** box is checked and the corresponding event occurs, it will trigger an action for IO5202 to send an e-mail alert to designated addresses configured in the E-Mail Settings (described in the next section). When the **SNMP Trap** box is checked and the corresponding event occurs, it will trigger an action for IO5202 to send a trap alert to the designated SNMP Trap server (specified in the above paragraph). There are five events that will trigger the alarm from IO5202 as listed in Figure 5.28. However, some event can only be reported by e-mail. These alerts are useful for security control or security monitoring of the IO5202 device:

- **Cold Start:** This event occurs when there is a power interruption.
- **Warm Start:** This event occurs when the device resets.
- **Authentication Failure:** This event occurs when an incorrect username and/or password are entered which could indicate an unauthorized access to the IO5202.
- **IP Address Changed:** This event occurs when the IO5202 device's IP address is changed.
- **Password Changed:** This event occurs when the administrator password is changed.

After finish configuring the **SNMP/Alert Settings**, please click on **Save & Apply** button to keep the change that you have made and to apply your setting. When the saving and applying are finished, the web browser will remain on the **SNMP/Alert**

Settings page. If you want to cancel the change and reset all changes back to their original values, just click the **Cancel** button.

5.10 E-mail Settings

When IO5202 device raises an alert and/or a warning message, it can send an e-mail to an administrator's mailbox. This **E-mail Settings** page allows you to set up the IO5202 to be able to send an e-mail. Figure 5.29 below shows the **E-mail Settings** page in which there are two configurable parts: **E-mail Address Settings** and **E-mail Server**. First for the **E-mail Address Settings** part, a **Sender's** e-mail address is required to be filled in the **Sender's** text box which will be used in the **From** field of the e-mail. Note that the maximum length of sender email address is 48 characters. Then, for the **Receiver's** text box you can enter multiple recipients which will be used in the "To" field of the e-mail. Note that to fill in multiple receiver e-mail addresses in the **Receiver's** text box, please separate each e-mail address with semicolon (;).

E-mail Address Settings	
Sender	<input type="text"/>
Receiver	<input type="text"/> Use a semicolon (;) to delimit the receiver's e-mail address.

E-mail Server	
SMTP Server	<input type="text"/>
Authentication	<input type="checkbox"/> SMTP server authentication required. <input checked="" type="checkbox"/> Enable TLS/SSL
User name	<input type="text"/>
Password	<input type="text"/>

Figure 5.29 - E-mail Settings Web Page

Second for the **E-mail Server** part, you must enter an **IP address** or **Host Name** of a **Mail Server** which is in your local network in the **SMTP Server's** text box. Note that the maximum length of SMTP server address is 31 characters. If your Mail Server (or Simple Mail Transfer Protocol (SMTP) Server) requires a user authentication, you must check the "SMTP server authentication required" box in the **Authentication** option. After enabling this option, you can fill in the **Username** and the **Password** below. Please consult your local network administrator for the **IP address** of your **Mail Server** and the required **Username** and **Password**.

	<p>Attention</p> <p>It is also important to setup Default Gateway and DNS Servers in the Network Settings properly so that IO5202 can lookup domain names and route the e-mails to the proper default gateway. Please see the Default Gateway and DNS Server Settings in Section 5.5.</p>
---	---

After finish configuring the **E-mail Settings**, please click on **Save & Apply** button to keep the change that you have made and to apply your setting. When the saving and applying are finished, the web browser will remain on the **E-mail Settings** page. If you want to cancel the change and reset all changes back to their original values, just click the **Cancel** button

5.11 Log Settings

Under the Log Settings menu of web interface of IO5202 series Industrial Remote I/O, you can configure various data logging for the device. The menu of Log Settings consists of the following web page: System Log Settings, COM Log Settings, System Log, and COM log as shown in Figure 5.30.



Figure 5.30 - Log Setting Menu

5.11.1 System Log Settings

The Syslog function is turned on by default and cannot be turned off for IO5202. It is used to keep log for system events and report to an external Syslog server if necessary. The **System Log Settings** page under the **Log Settings** menu. Description of each option is provided as follows.

System Log Settings	
Enable Log Event to Flash	<input checked="" type="checkbox"/>
Enable Syslog Server	<input checked="" type="checkbox"/>
IP Address	<input type="text" value="255.255.255.255"/>
Syslog Server Service Port	<input type="text" value="65535"/> (1~65535, default=514)

Figure 5.31 - System Log Settings Web Page under Log Settings Menu

- **Enable Log Event to Flash:** When the check box is enabled, IO5202 will write log events to the local flash. Otherwise the log events would be cleared when the device restarts because they are stored in the RAM by default.
- **Enable Syslog Server:** When the check box is enabled, it will allow IO5202 to send Syslog events to the remote Syslog server with the specified IP address (next option). All the data sent/received from serial interface will be logged and sent to Syslog Server.
- **(Syslog Server) IP Address:** The user must specify the IP address of a remote Syslog Server in this field.
- **Syslog Server Service Port:** This option allows user to specify the remote Syslog Server Port number between 1 and 65535. Note that the default port number is 514.

After finish configuring the **Log Settings**, please click on **Save & Apply** button to keep the change that you have made and to apply your setting. When the saving and applying are finished, the web browser will remain on the **Log Settings** page. If you want to cancel the change and reset all changes back to their original values, just click the **Cancel** button.

5.11.2 COM Log Settings

Transmitted data through COM port could be logged for recording or debugging purposes. Additionally, the logs could be reported to an external Syslog server as well. Figure 5.32 below shows the **COM Log Settings** page under the **Log Settings** menu. Description of each option is explained as follows.

COM Log Settings	
<input checked="" type="checkbox"/> Log Data Contents	Types <input type="radio"/> HEX <input checked="" type="radio"/> ASCII
COM Ports	<input checked="" type="checkbox"/> COM1
Enable Syslog Server	<input checked="" type="checkbox"/> Enable
IP Address	<input type="text" value="255.255.255.255"/>
Syslog Server Service Port	<input type="text" value="65535"/> (1~65535, default=514)

Figure 5.32 - COM Log Settings Web Page under Log Settings Menu

- **Log Data Contents:** if this option is enabled, the COM logging function will log the content's data that is being transmitted and received in raw bytes. If this option is disabled, COM logging function will only log the length of data to reduce system load.

Note: IO5202 can store up to 100 KBytes internally. A request or a response will be in one line, and the data longer than 512 bytes will go into another line. You can retrieve logs by using a **FTP Client**. The FTP login is the same as the Web UI login. Logs are located in `/var/log/logcomxx` (xx is the port number). When the reserved space is full, new logs will replace old logs. We strongly recommend sending COM logs to a remote Syslog server.

- **Data Types:** There are two radio buttons which are hexadecimal (**HEX**) and **ASCII** for user to select the desired logged data's format.
- **COM Ports:** The user can select which port(s) will be logged by checking the corresponding boxes.
- **Enable Syslog Server:** Enabling this option would allow user to send COM logs to a remote Syslog server. It is possible to send COM logs to the same Syslog server used previously for event logging.
- **IP Address:** When the Syslog Server is enabled in the previous option, please specify the remote Syslog server's IP address in this field.
- **Syslog Server Service Port:** This option allows user to specify the remote Syslog Server Port number between 1 and 65535. Note that the default port number is 514.

After finish configuring the **COM Log Settings**, please click on **Save & Apply** button to keep the change that you have made and to apply your setting. When the saving and applying are finished, the web browser will remain on the **COM Log Settings** page. If you want to cancel the change and reset all changes back to their original values, just click the **Cancel** button.

5.11.3 System Log

This page displays the current event log or system log stored in the IO5202 device. Figure below shows an example of logged event. Each record of the **System Log** consists of **Time**, **Severity**, and **Message** description.

System Log

System Log

Severity: ALL

Modules: All ADH DIAG TG

Refresh Export Log Clear Log

Show 10 entries Search:

#	Time	Sev.	Message
0	Jan 04, 2005 00:08:41	INFO	[Sys] System Start
1	Jan 04, 2005 00:29:37	INFO	[Sys] System Start
2	Jan 04, 2005 00:55:49	INFO	[Sys] System Start

....

Showing 1 to 10 of 21 entries

Previous 1 2 3 Next

Figure 5.33 - System Log Web Page under Log Settings

At the end of the **System Log** page, there are three hyperlinks which can be used to navigate through all records. You can click on the “**Previous**” link to go to the last page of the log and click on the “**Next**” button to go to the next page. At the top of the **System Log** table, there are three buttons: **Refresh**, **Export System Log**, and **Clear System Log**. To display the latest event, you can click on “**Refresh**” button. When you click on the **Export System Log** button, a log file will be saved on to your PC. By clicking on “**Clear System Log**” button, you can clear all events stored in the device and the **System Log** will be empty. A message “No data available in table” will be displayed in the middle of the table. Moreover, you can choose from the drop-down list of 10 or 25 entries for the Show entries. Finally, you can search over the **System Log** by entering a keyword in the **Search** box.

5.11.4 COM Log

This page displays the current COM data log stored in the device. The desired **COM** port number can be selected from the **COM x Log** drop-down list in Figure 5.34, which allows it to display logs from different COM ports. An example of **COM 1 Log** is shown in Figure 5.34. Each record of the log consists of **Time**, **COM Index**, Direction (**T/R**) and **Data**.

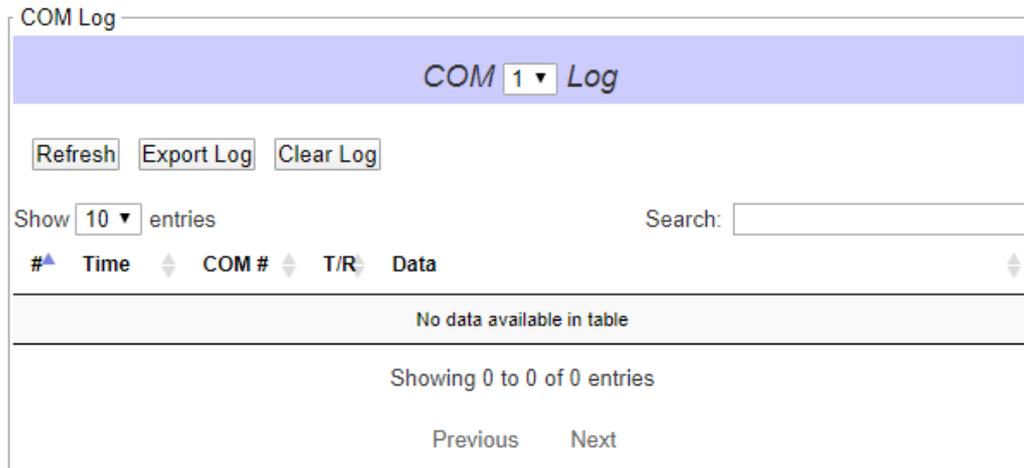


Figure 5.34 - COM Log Web Page under Log Settings Menu

Under the COM x Log header, there are three buttons: **Refresh**, **Export Data Log**, and **Clear Data Log**. First, the **Refresh** button can be used to update the COM Log table below with the latest information. Second, the **Export Data Log** button will enable the user to save the log data onto their PC. The default file name of the exported data log will be “**DataLog.txt**”. Finally, the **Clear Data Log** button will clear all events stored in the device and the COM Datalog will be empty with a message “No data available in table”. At the end of the **COM Datalog** page, there are two hyperlinks which can be used to navigate through all records. You can click on the “**Previous**” link to go to the previous page of the log and click on the “**Next**” link to go to the next page.

5.12 System Setup

Under the **System Setup** menu of web interface of IO5202 series Industrial Serial Device Server, you can perform a number of administration tasks for the device. It consists of **Date/Time Settings**, **Admin Settings**, **Firmware Upgrade**, **Backup/Restore Setting**, and **Ping**. Each of this sub-menu will be described in the following subsections.

- System Setup

[Date/Time Settings](#)

[Admin Settings](#)

[Firmware Upgrade](#)

[Backup/Restore Configuration](#)

[Ping](#)

Figure 5.35 - System Setup Menu

5.12.1 Date/Time Settings

Date and time can be set manually or using Network Time Protocol (NTP) to automatically synchronize date and time of IO5202 with a Time Server. Figure 4.81 shows the **Date/Time Settings** page. The first part of the page is the latest **Current Date/Time** which is in the format of **DD/Month/YYYY HH:MM:SS**. The second part of the page is the **Time Zone Settings**. You can select your local **Time Zone** from the drop-down list. The third part of the page is the **NTP Server Settings**. In this part, you can either enable the local NTP service inside IO5202 by checking the option **Local NTP Service** below **NTP Settings** part or automatically synchronize with a time server or NTP server. To enable automatic time synchronization, please check the box behind the **Sync with NTP Server** option. Then proceed to enter the **IP address** or **host name** for the **NTP Server**. Note that if a host name is entered, the DNS server must be configured properly (see detail in Section). The fourth part is the **Daylight Saving Time Settings** that can be enabled when **Enable Daylight Saving Time** box is checked. When it is enabled, the user can select the detailed setting of the daylight saving period, such as **Start Date** and **End Date** with **Offset**. Finally, the last part of the page is the **Manual Time Settings** where you can set **Date** and **Time** using corresponding drop-down lists in Figure 4.81.

System Setup > Date/Time Settings
IO5202 IO52

Date/Time Settings

The NTP (Network Time Protocol) is used to synchronize the date/time from the NTP server.

Current Date/Time

31 / Jan / 2005 17:57:20

Time Zone Settings

Time Zone (GMT-12:00) Eniwetok, Kwajalein

NTP Settings

Local NTP Service

Sync with NTP Server

NTP Server

Daylight Saving Time Settings

Enable Daylight Saving Time

Start Date -- / -- / -- / -- (Month / Week / Date / Hour)

End Date -- / -- / -- / -- (Month / Week / Date / Hour)

Offset 0 hour(s)

Manual Time Settings

Date -- / -- / --

Time -- : -- : --

Figure 5.36 - Date/Time Settings Web Page under System Setup



Attention

It is also important to setup Default Gateway and DNS Servers in the Network Settings properly (See Section 5.5), so IO5202 can lookup DNS names and point to the proper NTP server.

After finish configuring the **Date/Time Settings**, please click on **Save & Apply** button to keep the change that you have made and to apply your setting. When the saving and applying are finished, the web browser will remain on the **Date/Time Settings** page. If you want to cancel the change and reset all changes back to their original values, just click the **Cancel** button.

5.12.2 Admin Settings

The IO5202 Series allows user and password management through this **Admin Settings** page under **System Setup** menu. By default, the user name is “**admin**” and the password is “**default**”. To set or change their values, you can enter the information in the **User name**, the **Old password**, the **New password** and the **Repeat new password** fields under the **Account Settings** part as shown in Figure 5.37. At the end of the **Admin Settings** web page, there is the **Web mode** part which allows the user to select the radio button of normal **HTTP** or **HTTPS** for secure communication with the device’s web user interface (Web UI).

System Setup > Admin Settings IO5202 IO52

Admin Settings
Set up the login user name and password.

Account Settings	
User name	<input type="text" value="admin"/>
Old password	<input type="text"/>
New password	<input type="text"/>
Repeat new password	<input type="text"/>

Web mode	
Web Mode	<input checked="" type="radio"/> HTTP <input type="radio"/> HTTPS

Access control	
SSH	<input checked="" type="checkbox"/> Enable
Telnet	<input checked="" type="checkbox"/> Enable

Figure 5.37 - Admin Settings Web Page

After finish configuring the **Admin Settings**, please click on **Save & Apply** button to keep the change that you have made and to apply your setting. Another pop-up window will be displayed to re-authenticate the user to access the Web UI of IO5202. You must re-enter the username and the password to login to the IO5202. When the saving, applying, and re-authentication are finished, the web browser will remain on the **Admin Settings** page. If you want to cancel the change and reset all changes back to their original values, just click the **Cancel** button.

5.12.3 Firmware Upgrade

Updated firmware for IO5202 is provided by Atop from time to time (for more information please visit Atop News & Events webpage) to fix bugs and optimize performance. It is very important that the device must **NOT be turned off or powered off during the firmware upgrading, (please be patient as this whole process might take up to 5 minutes)**. Before upgrading the firmware, please make sure that the device has a reliable power source that will not be powered off or restarted during the firmware upgrading process.

To upgrade a new firmware to IO5202, please download the latest firmware for your IO5202 model from the download tab on the IO5202 product page or from the Download page under the Support link on Atop's main webpage. Then, copy the new firmware file to your local computer. Note that the firmware file is a binary file with ".dld" extension. Next, open the Web UI and select **Firmware Upgrade** page under the **System Setup** menu. Then, click "**Browse...**" button as shown in Figure 5.38 to find and choose the new firmware file. Then, click "**Upload**" button to start the firmware upgrade process. The program will show the upload status. Please wait until the uploading process is finished (the amount of time varies depending on the equipment used). Finally, the IO5202 device will then proceed to restart itself. In some cases, you might require to re-configure your IO5202 device. To restore your backup configuration from a file, please see the procedure in the next subsection.

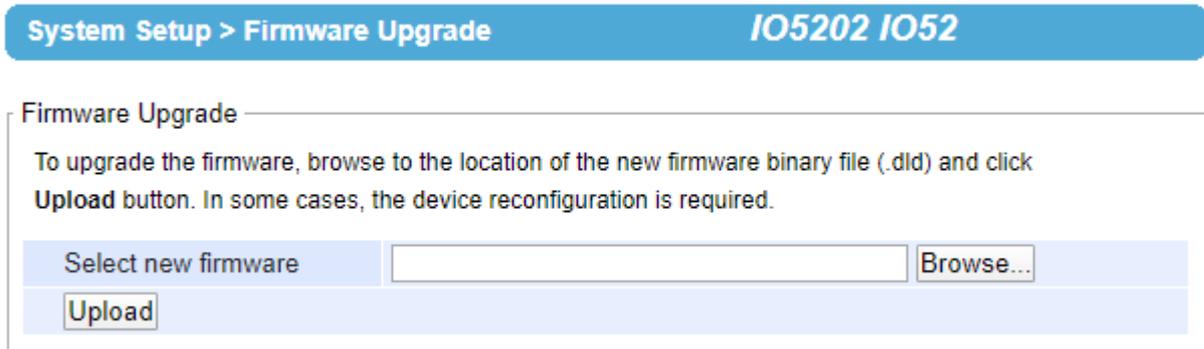


Figure 5.38 - Firmware Upgrade Web Page

5.12.4 Backup/Restore Configuration

Once all the configurations are set and the device is working properly, the user should back up the current configuration of IO5202. The backup configuration file can be used when the new firmware is uploaded and the device is reset to a factory default setting. This is done to prevent accidental loading of incompatible old settings. The backup configuration file could also be used to efficiently deploy multiple IO5202 Series devices of similar settings by uploading these settings to all devices.

To back up configuration, click “**Backup**” button under the **Backup Configuration** part as shown in Figure 5.39, and a backup file (ModelName-MACAddress.dat) will be automatically saved on your computer. It is important NOT to manually modify the saved configuration file by any editor. Any modification to the file may corrupt the file and it may not be used for later restoration. Please contact Atop authorized distributors for more information on this subject.

To restore the backup configuration, click “**Browse**” button under the **Restore Configuration** part as shown in Figure 5.39 to locate the backup configuration file on the user’s computer. Then, click on “**Upload**” button to upload the backup configuration file to the device. Once the backup configuration file is successfully uploaded, the device will restart. Note that the time needed for this process may vary on the equipment used.

If you need to restore the IO5202 device to its factory default configuration, you can click on the “**Restore**” button under the **Restore Factory Default** section as shown in Figure 5.39.

System Setup > Backup/Restore IO5202 IO52

Backup/Restore Configuration

Backup Configuration

Click **Backup** to save the current configuration to your computer.

Restore Configuration

Browse a backed up configuration and click **Upload** to restore the device's configuration.

Restore Factory Default

Click **Restore** to restore factory default configuration.

Figure 5.39 – Backup/Restore Configuration Web Page

5.12.5 Ping

The Web UI of IO5202 has an interface to call **Ping** which is a network diagnostic utility for testing reachability. You can use the **Ping** function to determine whether IO5202 can reach the gateway or other devices in the network. To use the **Ping**, enter a destination IP address in the text box behind the **Ping To** and click **Start** button. This process usually takes around 20 seconds. Figure 5.40 represents a successful ping without packet loss from IO5202 to the address 10.0.50.100 and back, while Figure 5.41 indicates that the connecting device at the address 10.0.50.101 is unreachable in which no packets have returned from the transmitted ping packets.

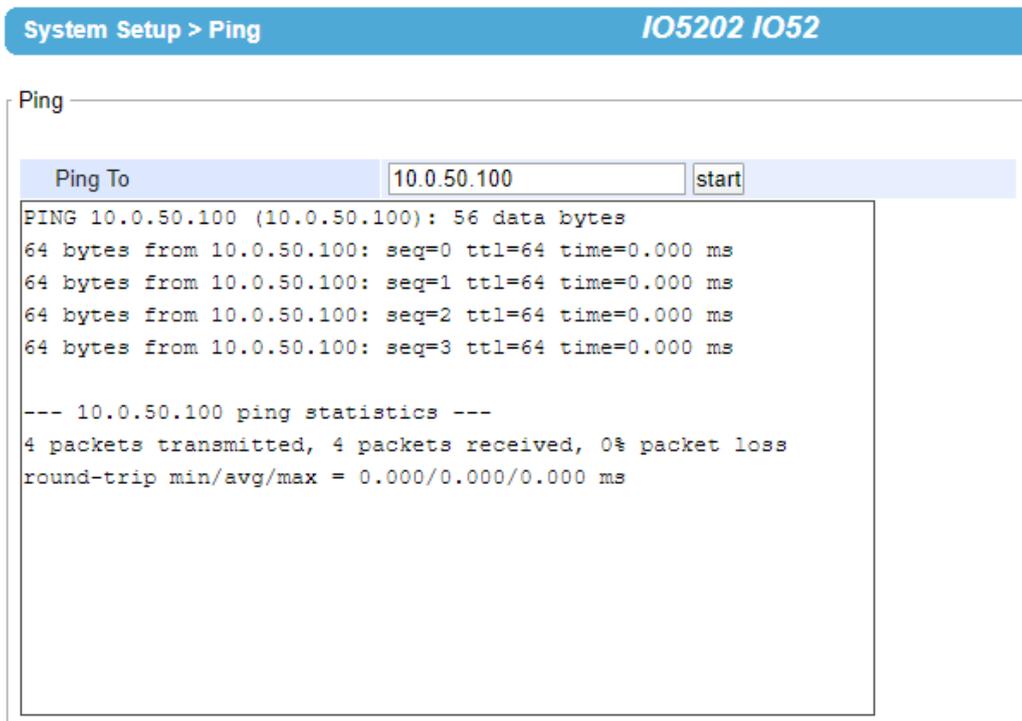


Figure 5.40 - Ping Web Page with Results

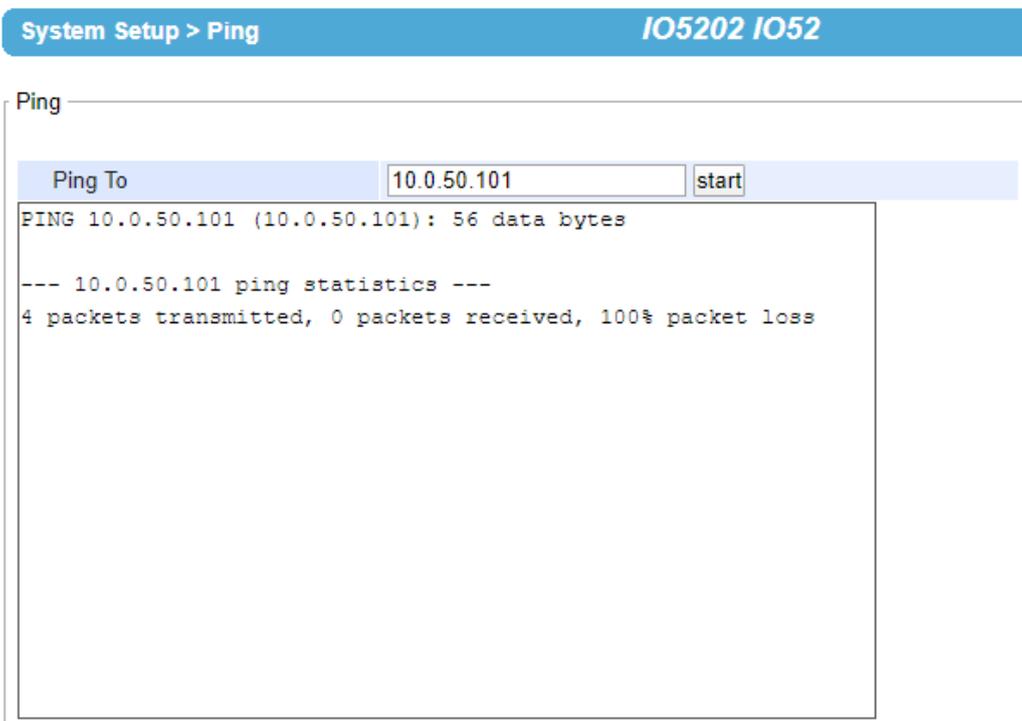


Figure 5.41 - Ping Web Page with Failed Results

5.13 Reboot

To manually reboot the IO5202 device, click on the “**Reboot**” button at the end of the **Reboot** page as shown in Figure 5.42. The device will then restart. When the rebooting process is finished, you will hear the beep sound twice from the device and you might need to refresh your web browser to log into the web interface of the IO5202 again.

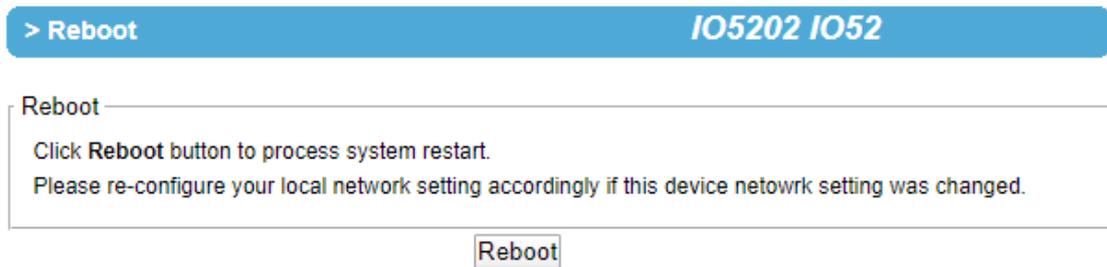


Figure 5.42 – Reboot Web Page



Atop Technologies, Inc.

www.atoponline.com

**TAIWAN HEADQUARTER and
INTERNATIONAL SALES:**

2F, No. 146, Sec. 1, Tung-Hsing Rd,
30261 Chupei City, Hsinchu County
Taiwan, R.O.C.
Tel: +886-3-550-8137
Fax: +886-3-550-8131
sales@atop.com.tw

ATOP CHINA BRANCH:

3F, 75th, No. 1066 Building,
Qingzhou North Road,
Shanghai, China
Tel: +86-21-64956231