




Smart I/O

User Guide

 RLH Industries, Inc.

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Every effort has been made to ensure that the information in this manual is accurate. RLH is not responsible for printing or clerical errors. Because we are constantly seeking ways to improve our products, specifications and information contained in this document are subject to change without notice.

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1. Important Information

Intended Audience

This manual is intended for use by knowledgeable electrical/network installation, operation and repair personnel. Every effort has been made to ensure the information in this manual is accurate, however due to constant product improvement specifications and information contained in this document is subject to change without notice. For the most up to date information on this product you can visit www.fiber opticlink.com.

Conventions

Symbols for notes, attention, and caution are used throughout this manual to provide readers with additional information, advice when special attention is needed, and caution to prevent injury or equipment damage.



Notes: Helpful information to assist in installation or operation.



Attention: information essential to installation or operation.



Caution: Important information that may result in equipment damage or injury if ignored.

General Safety Practices

RLH recommends that installation and service personnel be familiar with the correct handling and use of electrical and network equipment prior to use. RLH also recommends that installation and service personnel follow all safety precautions including the use of protective personal equipment as required.

Caution - Severe Shock Hazard

- Always remove source voltage using proper lockout procedures prior to installation and service.
- Never wire any relay outputs with hot (live) connections.
- Remove the terminal block when wiring.
- Check that all equipment has been properly locked out before restarting or configuring the device..

2. Introduction

Product Description

Ethernet I/O

This Smart IO device is an Ethernet device with 4 integrated controllable relays and 4 integrated digital inputs. The device allows for web based control and monitoring of it's relays and inputs and may be integrated into distributed control and network management systems. Each of the relays and inputs can be individually configured to send customized emails notifications. The device supports a wide variety of protocols that it is compatible with over Ethernet. Supported integration protocols: SNMPv1,2c,3, SNMP Traps (SNMP 1, 2vc), Modbus TCP featuring addressable registers, and DNPv3 TCP for integration with utility and other automation control systems.

Bi-Directional Contact Closure over Ethernet

When using RLH's System Link feature, two of these devices can link up and establish a tunnel over an Ethernet network. When a link is established between two Smart IO devices the outputs at each location will mirror the input states at the opposite end. Providing bi-directional alarming between two locations over an Ethernet network.

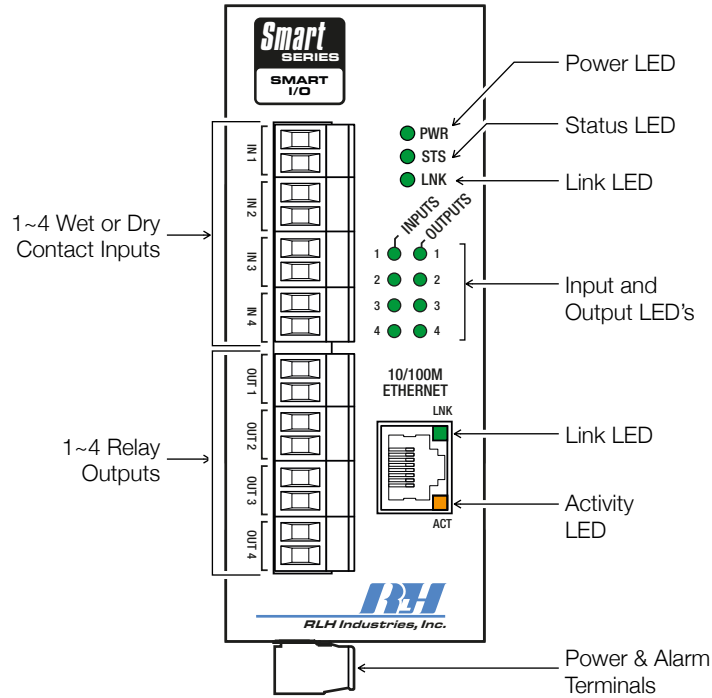
Standard Features

- ▶ Rugged Design - wide operating temp. -40°C ~ 70°C
- ▶ Intuitive embedded web interface for configuration
- ▶ 4 Inputs and 4 Relay Outputs for monitor and control applications
- ▶ System Link - Pair two units together for alarm transportation over Ethernet
- ▶ Custom email notifications for individual inputs and outputs
- ▶ Advanced SMTP integration allowing for SSL and TLS based authentication
- ▶ Integration options include: SNMPv1, 2c, 3, SNMPv1,2c Traps, Modbus TCP, and DNPv3 TCP
- ▶ Event log with time stamps
- ▶ Each input is optically isolated
- ▶ System power ranges available: 24-48VDC, 125VDC, & 12VDC
- ▶ 10/100 Fast Ethernet Port
- ▶ Limited Lifetime Warranty
- ▶ **Made in the U.S.A.**

Panel Layout

Front Panel

The front panel contains all the relay output terminals, LED's, and the Ethernet port.



Front Panel Features

LED Identification

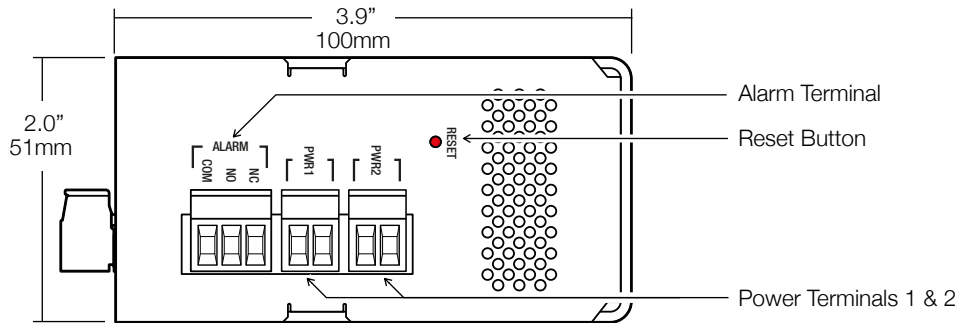
LED	Name	Color	Status	Condition
Inputs 1-4	Input Status	Green	ON	Input active (ON)
			OFF	Input OFF
Outputs 1-4	Relay Outputs	Green	ON	Relay is energized
			OFF	Relay is not energized
PWR	Power Failure	Green	ON	DC input power OK
			OFF	DC input power failed
STS	CPU Failure	Green	Blinking	CPU operating normally
			Solid (On or Off)	CPU failure
LNK	System Link	Green	ON	Paired via TCP connection
			OFF	Not paired with output unit
LNK	Ethernet Link Down	Green	ON	Ethernet link is present
			OFF	No Ethernet link present
ACT	Ethernet Activity	Orange	Blinking	Ethernet is active
			OFF	Ethernet is not active

System Alarm Contacts

- Alarms on power failure.
- Alarms when Ethernet Link Down.

Bottom Panel

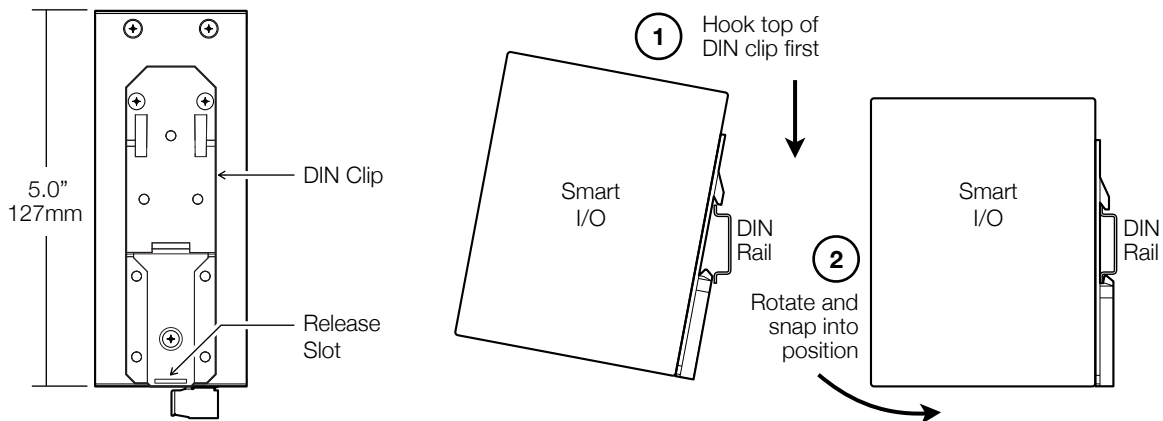
The bottom panel contains the power and alarm terminals.



Bottom Panel Features

Rear Panel

The DIN clip for mounting the system is mounted onto the rear panel. Insert a flat head screwdriver into the release slot at the bottom of the DIN clip and pull down to remove the system from the DIN rail.



Rear Panel Features

DIN Rail Mounting

3. Before Installing

Prepare for Installation

Check for shipping damage

Carefully unpack and inspect the unit. Contact RLH immediately if any components are damaged or missing.

Verify system contents

- Smart I/O unit
- User Guide
- Correct model type

Site Requirements

Site selection

Locate the Smart I/O to allow easy access to the device. Leave at least 3 inches (7.62 cm) clearance in the front. The unit is temperature hardened, but must be mounted indoors or inside an outdoor rated enclosure.

Typical installation environments

- NEMA 4X enclosures
- Wall mounting on plywood backboards
- RLH 19" rack mount DIN rail brackets
- Control cabinets

Required power sources

The Standard RLH Smart IO system accepts 24~56VDC. RLH also offers optional power compatibility to both Low DC (12 Volts) and High DC Power (125 Volts) for enhanced compatibility with solar and Utility battery systems.

4. Installation

Getting Started

Before starting

- Review the safety information in section [1. Important Information](#)
- Familiarize yourself with the Smart I/O as described in section [2. Introduction](#)
- Have a suitable installation environment with the correct source voltage.

Install the Smart I/O

- Mount the Smart I/O to either a wall or DIN rail depending on the application

Connect Wiring to Input Contact Terminals

Connect the wire pair to the green screw-down terminals on the front.

DO NOT APPLY VOLTAGE to the contact terminals without verifying that you have the Wet input model or the system maybe damaged.

- The contact terminals may be removed and accept wire sizes 16~26 AWG.
- Fully seat the terminal block back into the connector before operating the system

Dry Inputs

- Sourcing Input - Each input will provide a small amount of current to enable sensing of a dry contact closure.
- Check to ensure the copper pairs being used do not exceed 100 Ohms.
- Do not apply voltage to Dry Input terminals as the system may be damaged.

Wet Inputs

- Sinking Inputs - Each input is passive and is expecting to receive a voltage signal to indicate ON status.
- Ensure the DC signals voltage is within the models accepted range.
- Remove all voltage when wiring inputs.
- Wet inputs are NOT polarity sensitive. Connect + and - wire pair in any order.

Connect Wiring to Relay Output Contact Terminals

- There are 4 pairs of output contact terminals located on the front panel of the device.
- The pluggable contact terminals may be removed if needed and will accept wire sizes 16~26 AWG.
- Fully seat the terminal block back into the connector socket before operating the system

Relay Output Maximum Ratings

RLH Recommends using an external relay for applications where voltage and amperage exceed the devices built-in Relays specifications. Exceeding the maximum ratings may lead to premature failure or improper operation of the Relays.

Relay Maximum Ratings		
115VAC	1.08A	125VA
12VDC	3.00A	36 Watts
24VDC	2.50A	60 Watts
48VDC	1.25A	60 Watts
130VDC	0.46A	60 Watts
220VDC	0.27A	60 Watts

Connect Ethernet cable

- Connect the Ethernet cable to the RJ-45 Ethernet port located on the front panel of the Smart I/O. Verify the Link indicators are ON to ensure you have connectivity to your network.

Connect power

The Smart I/O has redundant power terminals to accommodate a backup power supply in the event of an outage. Follow these steps when attaching wires to power terminals located on the bottom of the module.

- Check that DC power source voltage matches the accepted voltage range of the device.
- Remove power from the DC power source prior to connecting to the Smart I/O.
- Connect the DC power cables to the terminal pairs. The system is not polarity sensitive.
- Energize the power source. The PWR LED will be ON indicating that the system has power.

Alarm wiring

Connect alarm relay monitoring equipment wire pair to the alarm contact on the bottom of the device.

- Use the NO or NC contact positions as required.
- The alarm terminal block may be removed and accepts wire sizes 16~26 AWG.
- Fully seat the terminal block back into the connector before operating the system.

Start the system

Once a local power source is connected and turned on the PWR LED will turn ON. The STS LED will be blinking to let you know the device is operating normally.

5. Establishing Connection to Device

General Connection

To initially connect to the RLH Smart I/O you must access the device by its default IP address as listed below:

Default Settings

IP Address: 192.168.2.18
Subnet: 255.255.255.0

Default IP Address

Username: admin
Password: admin

Default Username/Password

In most cases you will need to assign a temporary static IP to your workstation to initially access the RLH Smart I/O web page. The assigned temporary address should be within the same subnet as the default address.

Example Client Device Address:

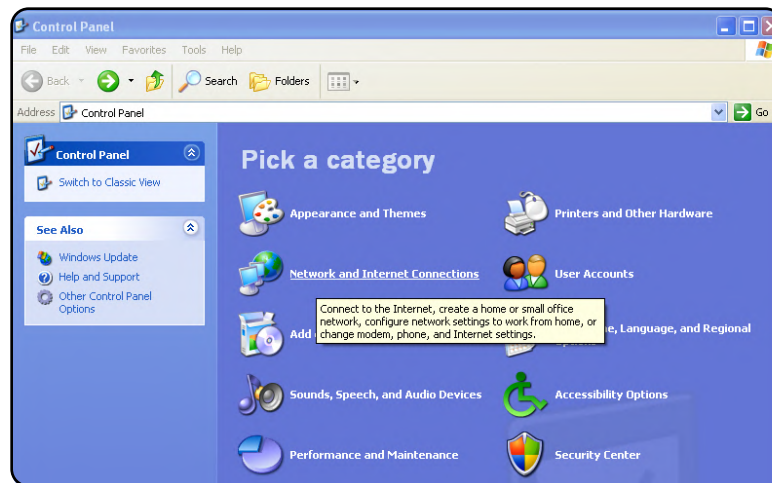
- IP: 192.168.2.10
- Subnet: 255.255.255.0

Now access the device via: <http://192.168.2.18>

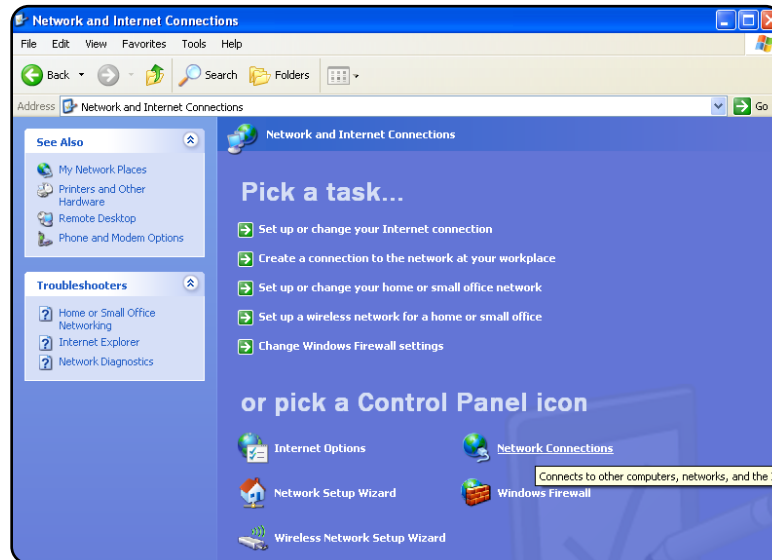
Assigning a Static IP Address

Steps for Window XP

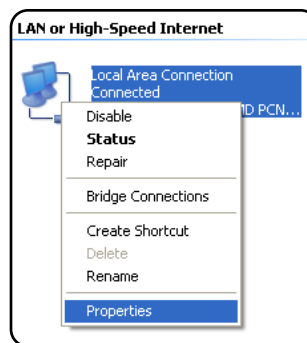
First: Go to windows XP control panel and select **Network and Internet Connections**.



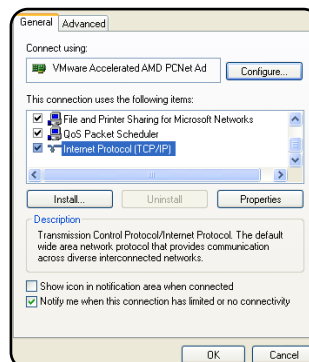
Next: Select **Network Connections**



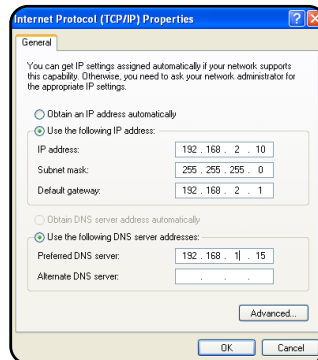
Next: Right-click on the adapter you want to set the IP for and select **Properties**.



Next: Highlight Internet Protocol (TCP/IP) and click the **Properties** button.



Next: Change the IP, Subnet mask, Default Gateway, and DNS Server Addresses. When you are finished click **OK**.



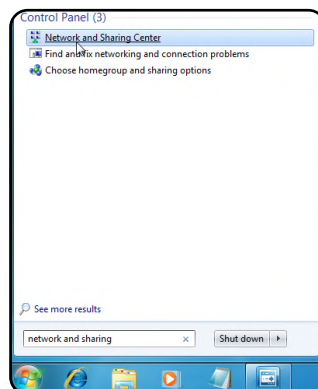
Note: You will need to close out of the Network Connection Properties screen before the changes go into effect.

Finally: Verify IP Address:

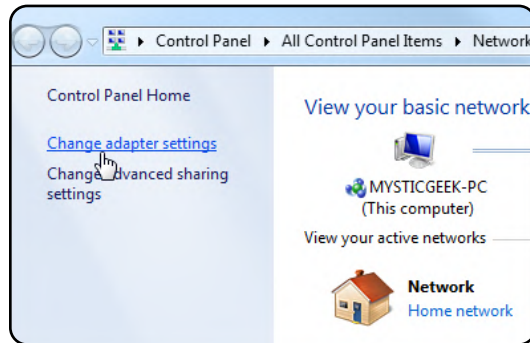
- In the Run box type in cmd and click **OK**.
- Then at the prompt type in ipconfig and hit Enter. This will show the IP address for the network adapter you changed.

Steps for Windows 7

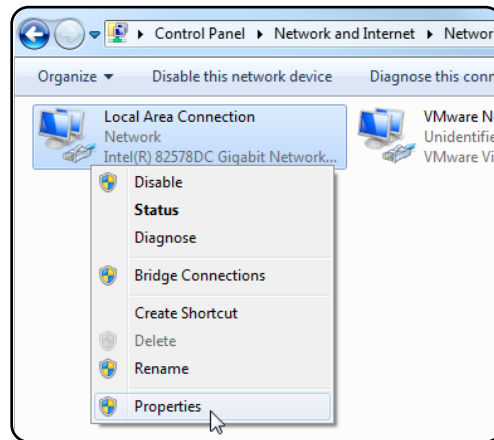
First: To a static IP address in Windows 7, type network and sharing into the Search box in the Start Menu and select **Network and Sharing Center** when it comes up.



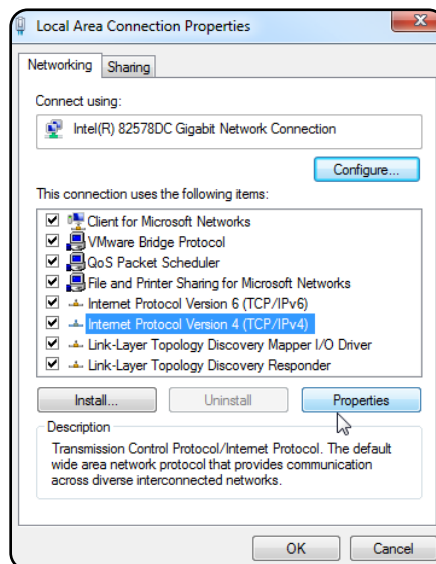
Next: When the Network and Sharing Center opens, click on **Change adapter settings**.



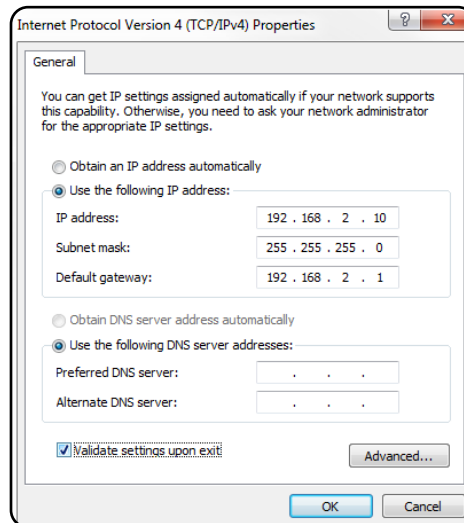
Next: Right-click on your local adapter and select **Properties**.



Next: In the Local Area Connection Properties window highlight Internet Protocol Version 4 (TCP/IPv4) then click the **Properties** button.



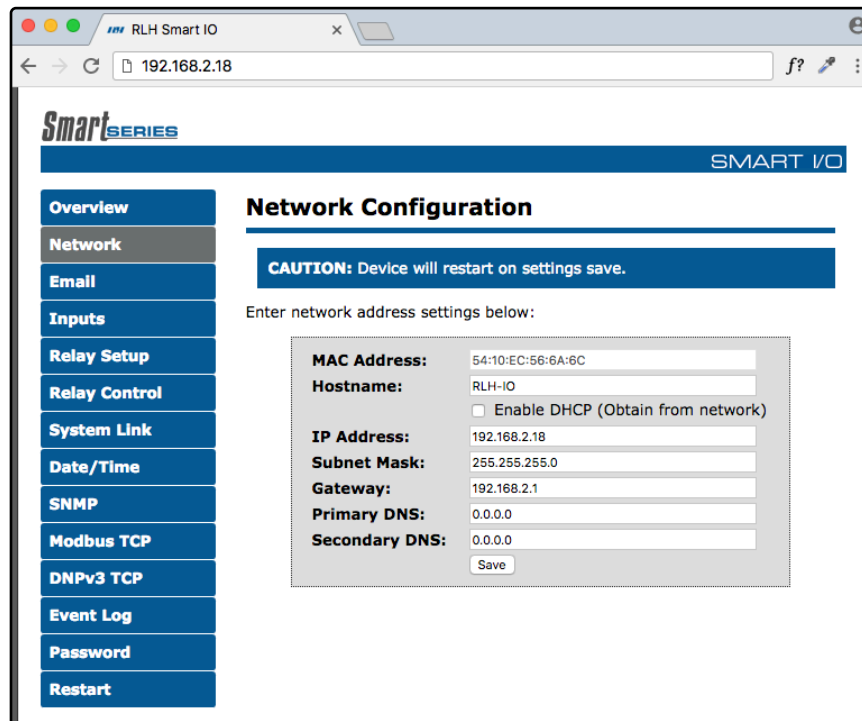
Finally: Now select the radio button **Use the following IP address** and enter in the correct IP, Subnet mask, and Default gateway that corresponds with your network setup. When you're finished click **OK**.



Note: Now you can open the command prompt and do an ipconfig to see the network adapter settings have been successfully changed.

6. Device Configuration

Network Address Configuration

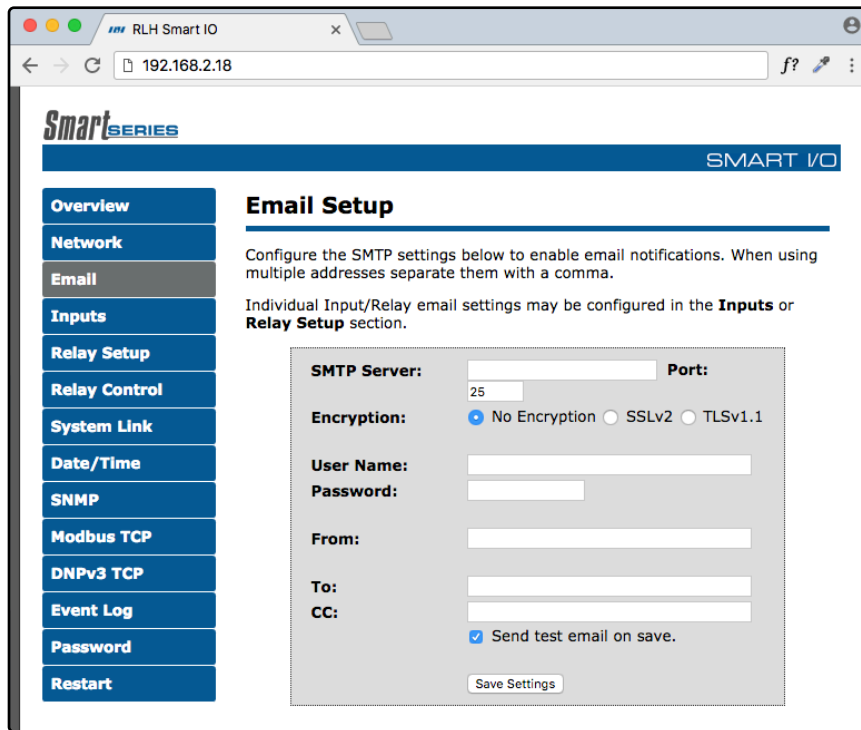


Network Address Configuration Screen

Settings	Description
Mac Address	Read only field will display the mac-address of your device
Hostname	Enter the hostname which your DNS server will register your device as
Enable DHCP	If checked, this option allows you to automatically obtain addressing information from your networks DHCP server
IP Address	Set a static IP address for which you wish to assign to the device
Subnet Mask	Set subnet mask you wish to use
Gateway	Set the default gateway the device will use
Primary DNS	This will be the first server your device connects to for translating URLs and Fully Qualified Domain Names (FQDNs)
Secondary DNS	In case of an outage in the primary DNS server the device will attempt to use the secondary DNS as a backup

Note: If unsure of the address to assign your device you may wish to consult your network administrator for the correct addressing information for your network

Email / SMTP Server Configuration

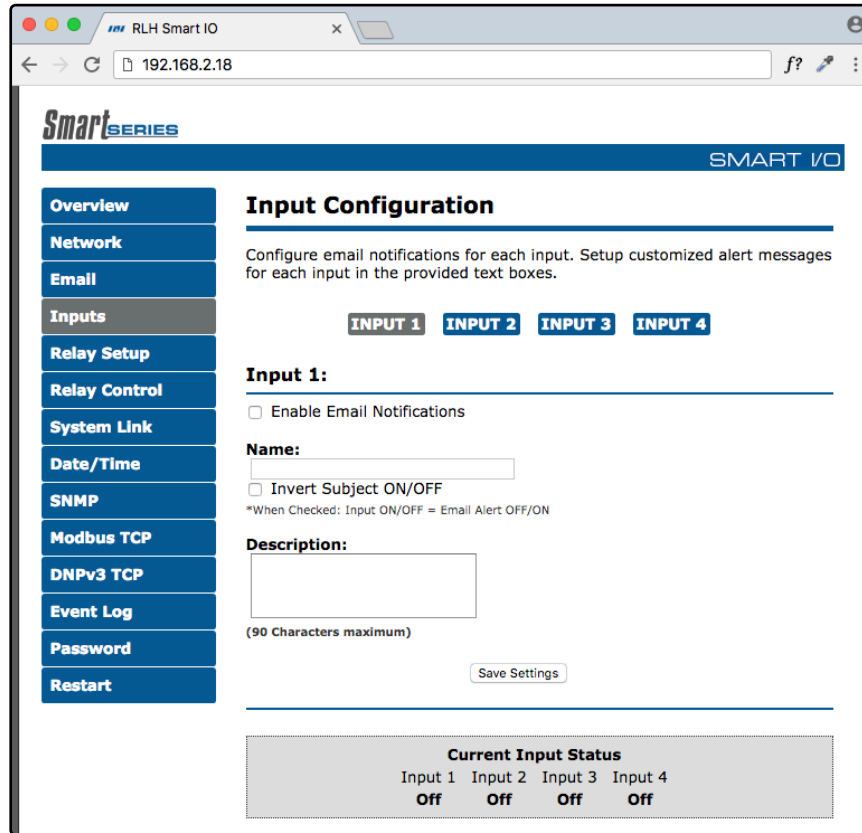


SMTP/Email Configuration Screen

Settings	Description
SMTP Server	Enter the FQDN or the IP address of the email server you wish to use
Port	Set to 25 by default.
Encryption	None - No encryption will be used when communicating with SMTP server SSL (V2) - Encryption will be used when communicating with SMTP server TLS (V1.1) - Encryption will be used when communicating with the SMTP server
Username	Enter in your SMTP server username
Password	Enter your SMTP server password
From	This will be the from address the device uses in email notifications
To	Email Address for the To field for SMTP notifications
CC	Email Address for the CC field for SMTP notifications
Checkbox (Send Test Email)	If checked the device will send a test email after the settings are saved

Note: SSL connections will support up to 1024 Bit certificates.

Input Configuration

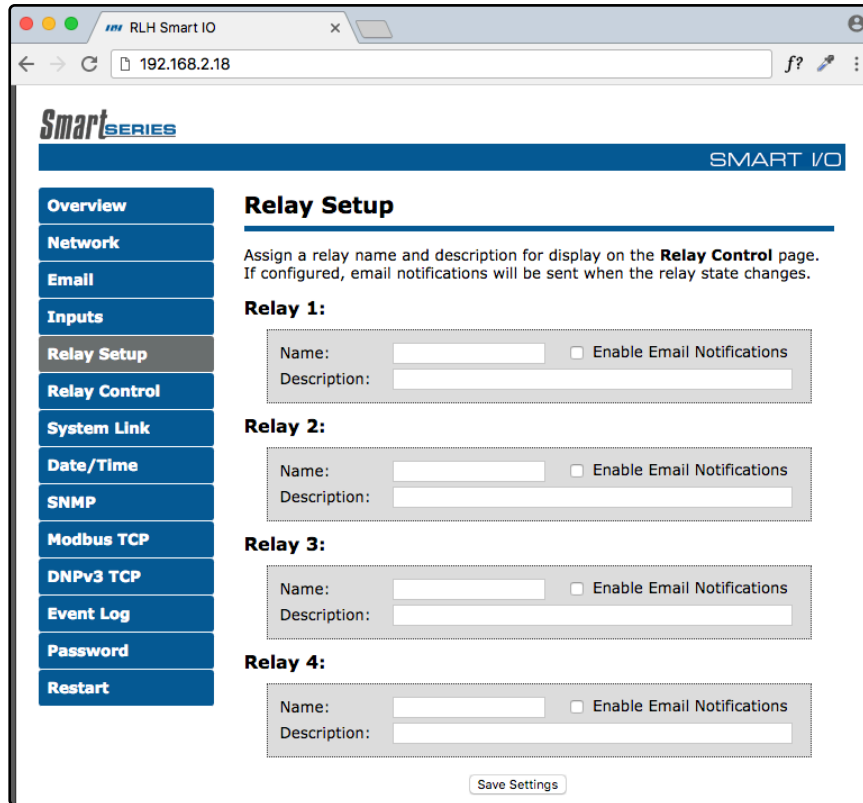


Input Configuration Screen

Settings	Description
Enable Email Notifications	When checked notifications are sent when the input changes state Email Notifications will include: Input Name, Input Description, Input Status, Hostname of the Device, Time and Date (if enabled)
Name	This field provides a name for the individual input The entered name will be present in the subject line of all email notifications for this input <i>Example: Main Entry Door Alarm - ON</i>
Reverse Subject ON/OFF	When enabled the email notification will state the alarm is ON when the input turns OFF, and that the alarm is OFF when the input turns ON
Description	This field allows the user to enter a custom message that is included in the body of the email notification <i>Example: Generator Output Alarm has turned ON! Please contact On-Call electrician immediately upon receipt of this email (714) 777-7777</i>
Current Input Status	This display shows the current On/Off status of each input

Relay Setup

The Relay Setup page allows you to assign names, descriptions, and enable email notifications for each relay.

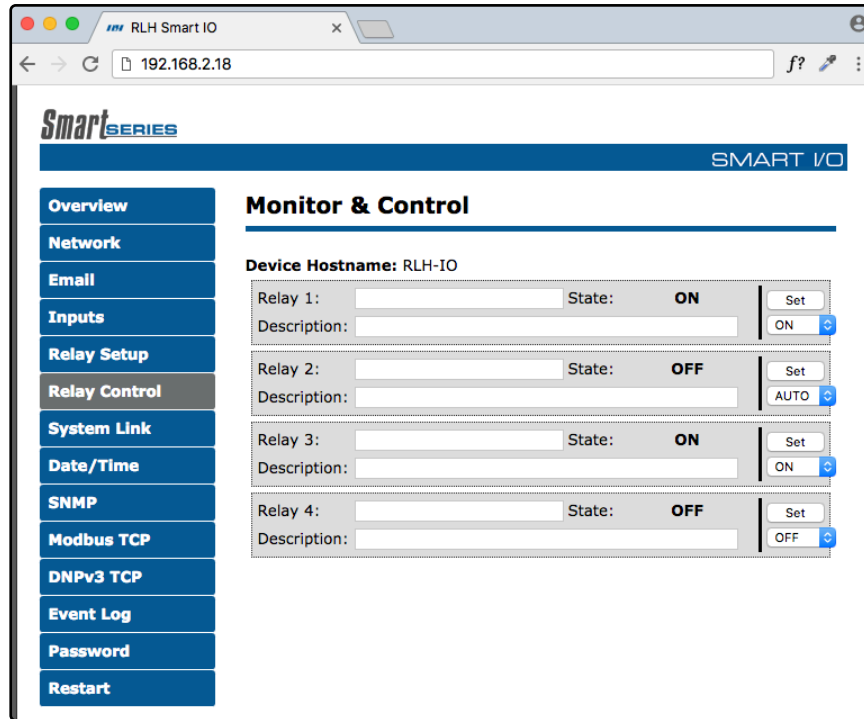


Relay Setup Screen

Settings	Description
Name	Assign a name to each relay
Enable Email Notifications	Enable email notifications when the relay changes state. Email notifications will include the device Hostname, relay name, relay description, relay status, and a time stamp if NTP is configured
Description	Provide a description for each relay
Save Settings	Apply the new setting information by clicking the button at the bottom of the page

Relay Control

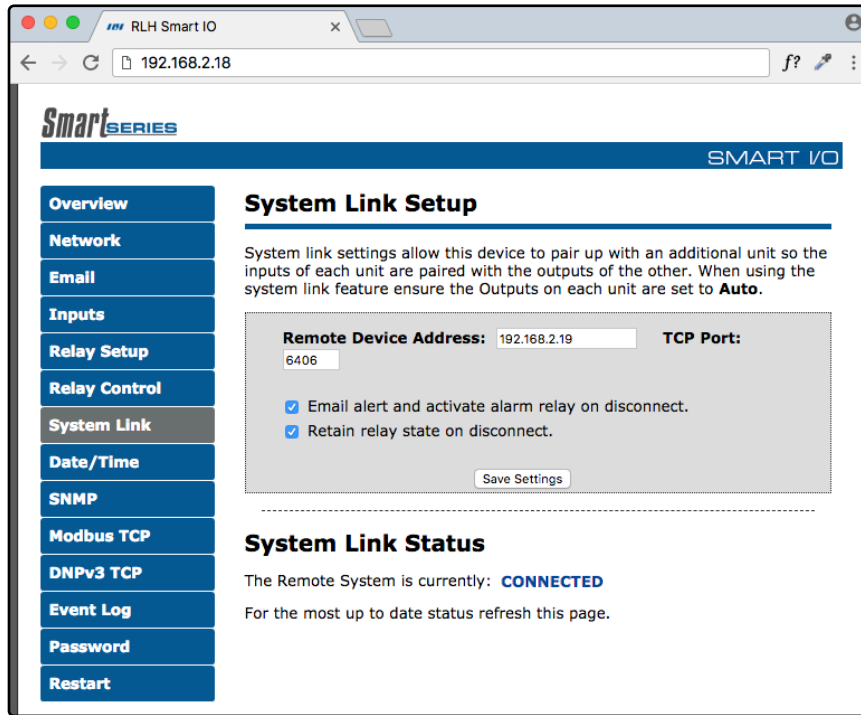
Displays the relay name, description, and state. Also allows control of each relays mode of operation.



Relay Control Screen

Settings	Description
Relay #	Displays the configured relay name
State	Displays ON for an Energized Relay, OFF for a De-Energized Relay
Description	Displays the configured Relay description
set	<p>ON Energizes the relay</p> <p>OFF De-Energizes the relay</p> <p>AUTO Enables the Relay to be controlled by a Linked Input Sensor</p>

System Link Configuration

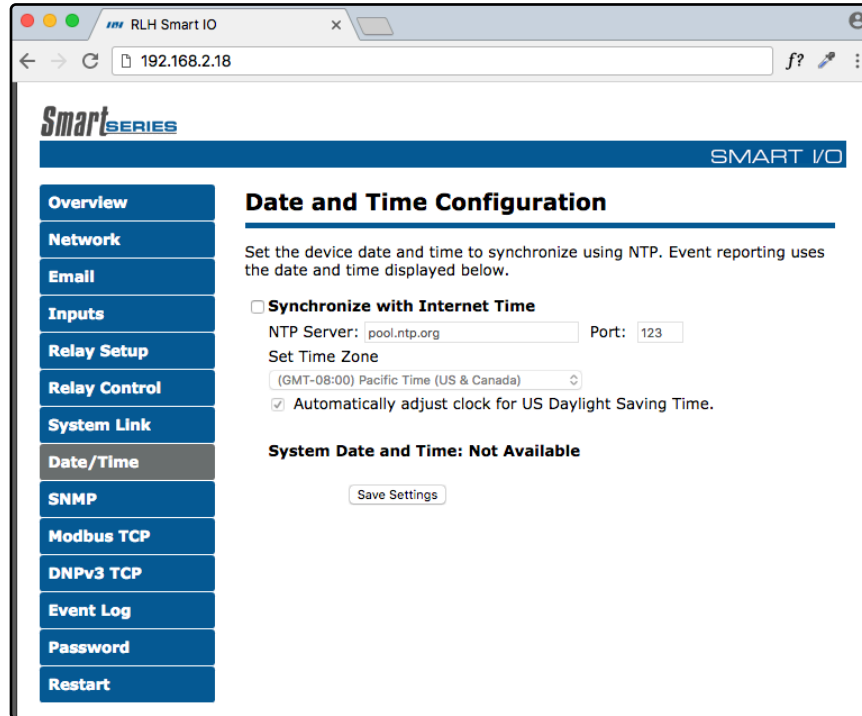


System Link Screen

Settings	Description
System Link	When selected the device will use TCP to link up with one paired Smart I/O device The connection status is shown below the Target Device Address field
Remote Device Address	Enter the address of the Smart I/O unit you wish to link the device to <i>The address 192.168.2.18 is default for the Smart I/O device</i>
TCP Port	Enter which port number you wish to use for TCP communication <i>Port: 6402 is default for the Smart I/O device</i>
Enable System Alarm When Link is down	If the Smart I/O loses it's link to the paired device the system alarm relay near the power terminals will activate
Retain Relay State when System Link is Broken	When the Smart I/O device loses it's link to the paired device and the relays will remain in their current state
System Link Status	CONNECTED Linked with the target device DISCONNECTED Not linked with the target device
Note: If having trouble establishing a link between the devices, please verify the IP and Port of each end device and verify that a communication path does exist between the two. If a firewall exists between linked devices ensure port forwarding is in place.	

Date/Time – NTP vs Local Time

Ensuring that your device has the correct time values is necessary to have the correct time stamp for each event. This portion of the configuration allows you to configure the device to synchronize it's time with a network time server.

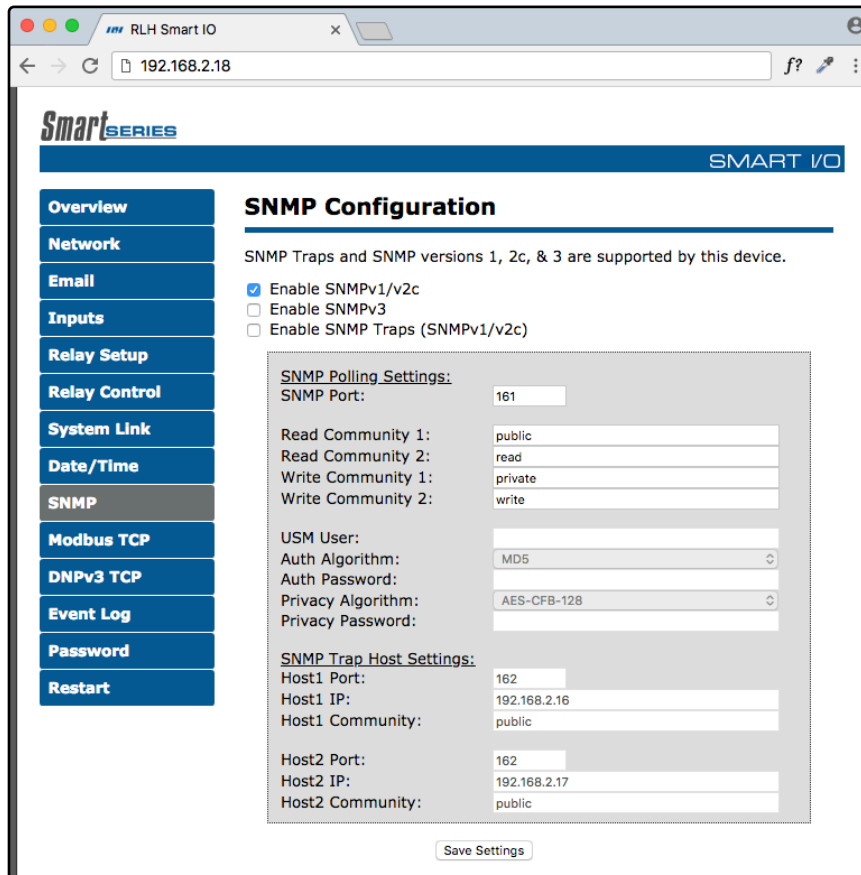


Date and Time Configuration Screen

Settings	Description
NTP Server	Enter the NTP Server IP or URL you wish to use
Port	Default NTP Port is 123
Time Zone	Select your time zone
Adjust Daylight Savings Time	Check this box to enable DST time corrections for your time zone

SNMP Community Configuration

RLH Smart Series devices are compatible with SNMP Polling, versions 1, 2c, & 3. They also support SNMP Traps, versions 1 and 2. The latest MIB table is available online at www.fiberoptick.com

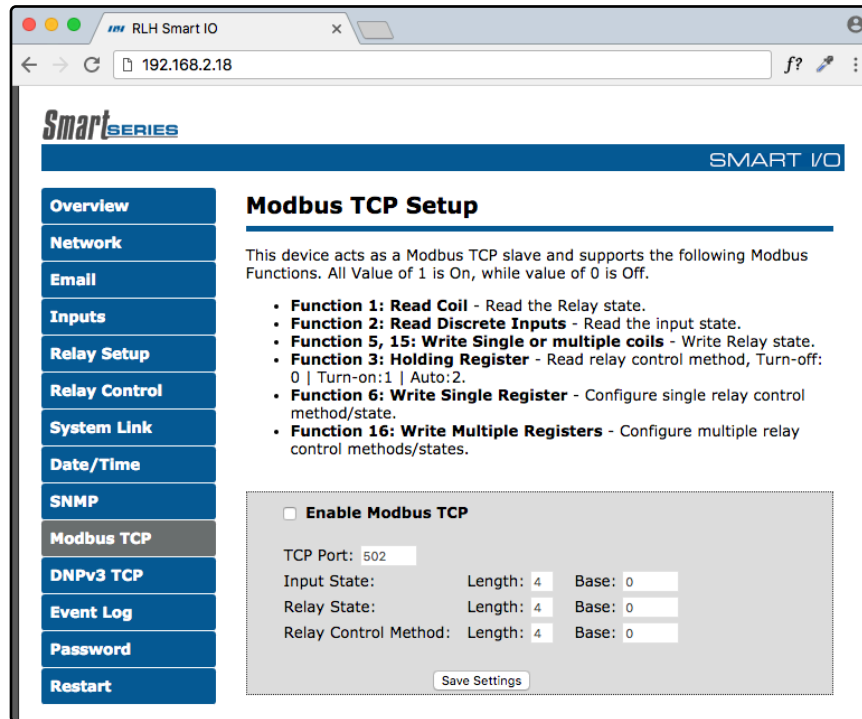


SNMP Community Configuration Screen

Settings	Description	
SNMPv3 Options	USM User	Enter in the desired username
	Auth Algorithm	Select MD5, SHA1, or No_Auth
	Privacy Algorithm	Select AES-CFB-128 or No Priv
SNMP Trap Host Settings (Host1 / Host2)	Host Port	Select the SNMP port the device will use to send SNMP Traps, Default is 162
	Host IP	Enter the IP address of the Host that will receive the SNMP Traps
	Host Community	Enter the community name to associate with the SNMP traps sent from this device
Note: SNMP Traps currently only support SNMP versions 1 & 2		

Modbus TCP

The RLH Smart I/O acts as a Modbus TCP slave and supports 1 connection. The default Modbus TCP port used is 502, and the supported Modbus functions are 1, 2, 3, 6, and 16.



Enable/Disable Modbus TCP Screen

Settings	Description
TCP Port	Set desired TCP Port for use with Modbus TCP (Default Port is 502)
Input State	Configure length and base registers the input status will be held in
Relay State	Configure length and base registers the Relay State will be held in
Relay Control Method	Configure Length and Base registers the Control Method will be stored in
Length	The amount of registers the Modbus Query will be allowed to read starting from the configured base address
Base	The register starting value, each function will store it's addresses sequentially counting up from this starting value

Function 1: Read Coil

Read the current state of the contact (energized or de-energized). Maximum address length of the query is 4.
The Value 1 = ON (Relay Energized)
The Value 0 = OFF

Example using default configuration

Address	Value Range	Note
00001	0 - OFF 1 - ON	Relay 1 Status
00002	0 - OFF 1 - ON	Relay 2 Status
00003	0 - OFF 1 - ON	Relay 3 Status
00004	0 - OFF 1 - ON	Relay 4 Status

Function 2: Read Discrete Input

Read the current state of the Input. Maximum address length of the query should be set to 4.
0 - OFF: The relay has been manually set to OFF.
1 - ON: The relay has been manually set to ON.

Example using default configuration

Address	Value Range	Note
00001	0 - OFF 1 - ON	Input Status 1
00002	0 - OFF 1 - ON	Input Status 2
00003	0 - OFF 1 - ON	Input Status 3
00004	0 - OFF 1 - ON	Input Status 4

Function 3: Holding Register

Read current configuration of contact control mode.
0 - AUTO: The relay turns ON/OFF according to the status of the linked Input Sensor.
1 - OFF: The relay has been manually set to OFF.
2 - ON: The relay has been manually set to ON.

Example using default configuration

Address	Value Range	Note
40001	0 - Auto 1 - OFF 2 - ON	Read Control Mode
40002	0 - Auto 1 - OFF 2 - ON	Read Control Mode
40003	0 - Auto 1 - OFF 2 - ON	Read Control Mode
40004	0 - Auto 1 - OFF 2 - ON	Read Control Mode

Function 6: Write Single Register

Use this function to turn ON or OFF a single relay. Also it allows you to set the relay to be control by the linked Input Sensor.

0 - AUTO: The relay turns on/off according to the linked Input Sensor states.

1 - OFF: De-Energize relay.

2 - ON: Energize relay.

Example using default configuration

Address	Value Range			Note
40001	0 – Auto	1 – OFF	2 - ON	Set Control Mode
40002	0 – Auto	1 – OFF	2 - ON	Set Control Mode
40003	0 – Auto	1 – OFF	2 - ON	Set Control Mode
40004	0 – Auto	1 – OFF	2 - ON	Set Control Mode

Note: ModBus TCP Register chart is continued on the next page.

Function 16: Write Multiple Register

Configure multiple relays to turn ON or OFF or set them to auto.

0 - AUTO: The relay turns ON/OFF according to the linked Input Sensor states.

1 - OFF: De-Energize relay.

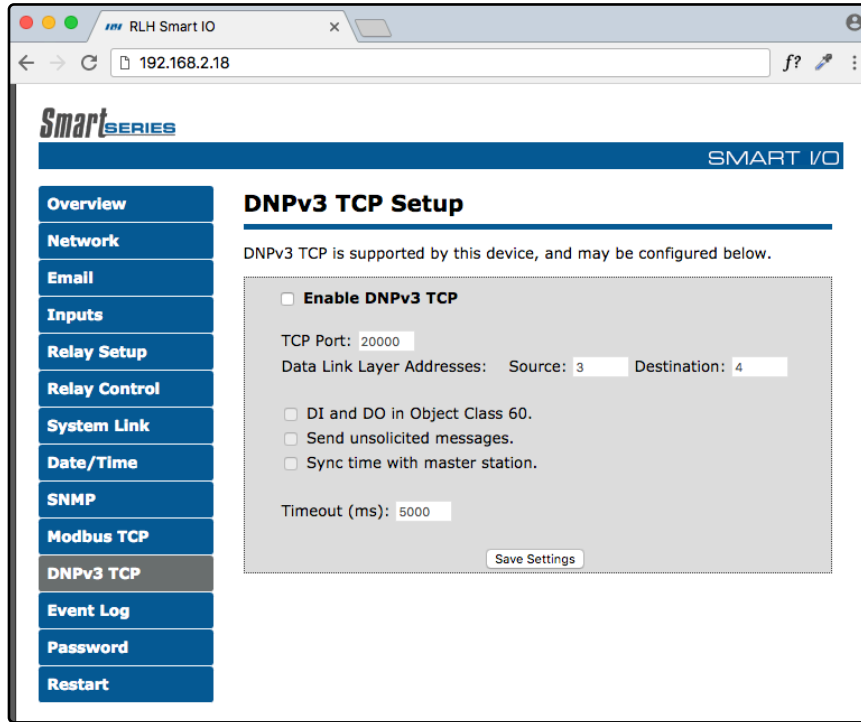
2 - ON: Energize relay.

Example using default configuration

Address	Value Range			Note
40001	0 – Auto	1 – OFF	2 - ON	Set Control Mode
40002	0 – Auto	1 – OFF	2 - ON	Set Control Mode
40003	0 – Auto	1 – OFF	2 - ON	Set Control Mode
40004	0 – Auto	1 – OFF	2 - ON	Set Control Mode

DNPv3 TCP

The RLH Smart IO acts as a Outstation Device. Either responding to request from a Master Station or sending unsolicited updates to a Master Station.



DNPv3 TCP Screen

Settings	Description
TCP Port	TCP Port for use with DNPv3 TCP (Default Port is 20000)
Data Link Layer Addresses	Both a Master and outstation require a link layer address
Source	This is the Link Layer address of the device
Destination	Link layer address of the remote master station system
DO in Object Class 60	Must be enabled for Integrity Data Polling - Class 0123
Send unsolicited messages	Relay Outputs initiate message to master station on state change
Sync time with master station	Syncs system clock with Master station time
Timeout (ms)	Period in milliseconds the device will wait for a response

Note: DNPv3 TCP function code descriptions are continued on the next page.

DNPv3 Device Profile

The RLH Smart IO is classified as an Outstation Device with the following characteristics.

DNPv3 Characteristics	
DNP Timeout is configurable and applies to:	Application Confirm
	Complete Application Response
Responds to Read Data Function:	Binary Inputs = 0, 1, 2, 3
	Binary Inputs OFF = 0x01
	Binary Inputs ON = 0x81
	Binary Outputs = 0, 1, 2, 3
	Binary Outputs OFF = 0x01
	Binary Outputs ON = 0x81
Responds to Function Code:	15: Initialize data
	16: Initialize application, which will restore the device to its factory default settings
Master Station:	Expects binary input and output change events as configured in the scan settings, unless configured as unsolicited

Note: DNP Implementation Table is continued on the next page.

DNPv3 Implementation Object Table

This DNPv3 Implementation Object table describes the objects, function codes and qualifiers used in this device.

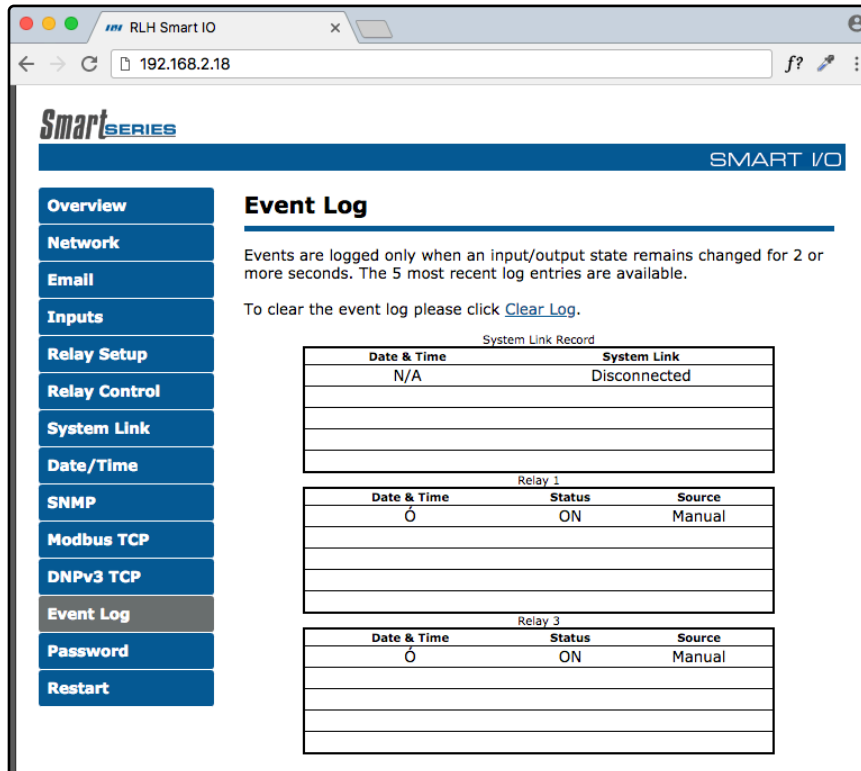
Object			Request (Slave Must Parse)		Response (Master Must Parse)	
Object	Variation	Description	Func. Code	Qualifier (Hex)	Func. Code	Qualifier (Hex)
1	1	Binary Inputs – <i>Packed Format without Status</i>	1	0x06 - All Points 0x00 – 8 Bit Start/Stop 0x01 – 16 Start/Stop 0x07 – 8 Bit Single Field 0x08 – 16 Bit Single Field	129 (0x81)	0x07
1	2	Binary Inputs – <i>With Status</i>	1	0x06 - All Points 0x00 – 8 Bit Start/Stop 0x01 – 16 Start/Stop 0x07 – 8 Bit Single Field 0x08 – 16 Bit Single Field	129 (0x81)	0x00
2	1	Binary Input Change Event – <i>Without Time</i>	1	0x06 - All Points 0x07 – 8 Bit Single Field 0x08 – 16 Bit Single Field	129 (0x81)	0x17
2	2	Binary Input Event – <i>With Time</i>	1	0x06 - All Points 0x07 – 8 Bit Single Field 0x08 – 16 Bit Single Field	129 (0x81)	0x17
10	1	Binary Output – <i>Packed Format without Status</i>	1	0x06 - All Points 0x00 – 8 Bit Start/Stop 0x01 – 16 Start/Stop	129 (0x81)	0x07
10	2	Binary Output – <i>With Status</i>	1	0x06 - All Points 0x00 – 8 Bit Start/Stop 0x01 – 16 Start/Stop	129 (0x81)	0x17

Note: DNP Implementation Object Table is continued on the next page.

Object			Request (Slave Must Parse)		Response (Master Must Parse)	
Object	Variation	Description	Func. Code	Qualifier (Hex)	Func. Code	Qualifier (Hex)
See Control Relay Output Block (CROB) Table on next page for control Code Information						
12	1	Select	3	0x17 8 Bit Single 0x28 16 Bit Single	129 (0x81)	Echo of Request
12	1	Operate	4	0x17 8 Bit Single 0x28 16 Bit Single	129 (0x81)	Echo of Request
12	1	Select Then Operate (Select Before Operate)	3 & 4	0x17 8 Bit Single 0x28 16 Bit Single	129 (0x81)	Echo of Request
12	1	Direct Operate	5	0x17 8 Bit Single 0x28 16 Bit Single	129 (0x81)	Echo of Request
12	1	Direct Operate – No Response	6	0x17 8 Bit Single 0x28 16 Bit Single	129 (0x81)	Echo of Request
50	01	Synchronize Time and Date - Absolute Time		0x07		
60	01	Class 0 Data		0x06 - All Points 0x07 – 8 Bit Single Field 0x08 – 16 Bit Single Field	129 (0x81)	0x00
60	02	Class 1 Data		0x06 - All Points 0x07 – 8 Bit Single Field 0x08 – 16 Bit Single Field	129 (0x81)	0x00
60	03	Class 2 Data		0x06 - All Points 0x07 – 8 Bit Single Field 0x08 – 16 Bit Single Field	129 (0x81)	0x00
60	04	Class 3 Data		0x06 - All Points 0x07 – 8 Bit Single Field 0x08 – 16 Bit Single Field	129 (0x81)	0x00

Event Log

The output log page records the time and date of the last 5 ON or OFF events. The source field will list either the **IP address** or **Manual** which indicates how the event was triggered. The **IP Address** refers to the address of a linked input device causing the event and **Manual** would be Web Control, SNMP, DNPv3 TCP or Modbus TCP causing the event. The log page also displays the description information entered for each output.

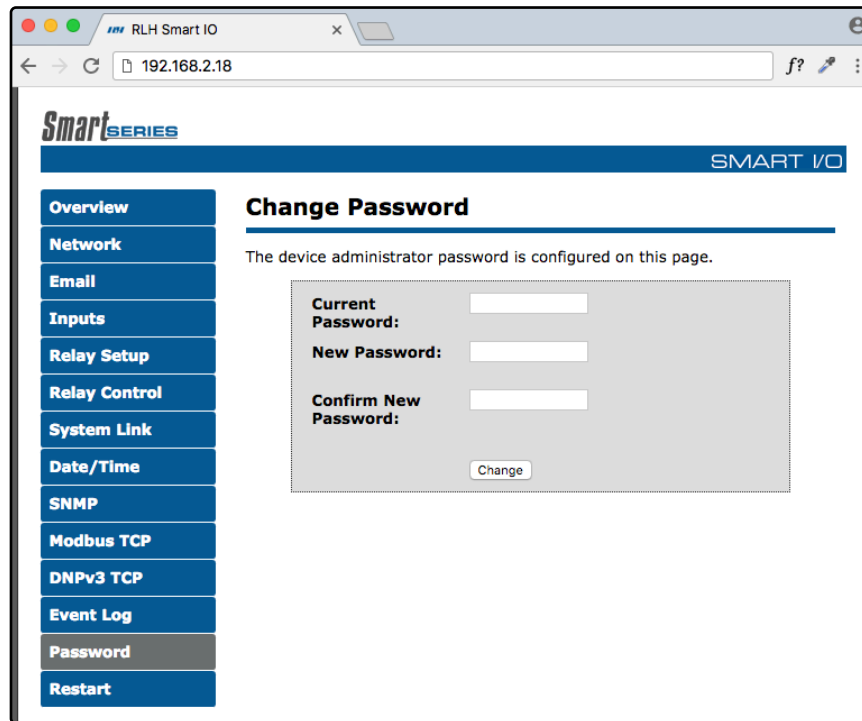


Event Log Screen

Administration Tasks

Change Password

To change the default administration password you will need to enter your current password and your new password twice. Ensure that you use a memorable password as the only way to recover a lost password is by resetting the device to its factory defaults.



Change Password Screen

Rebooting

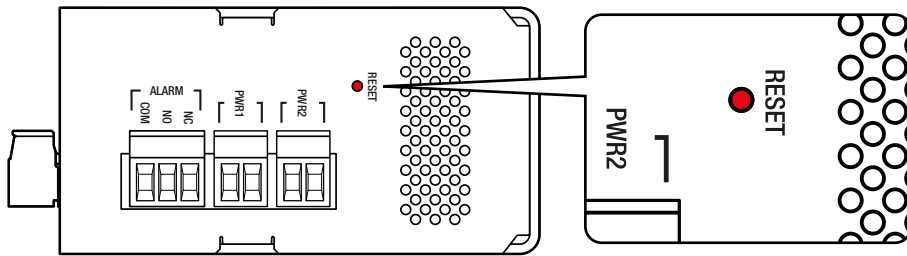
Navigate to the “reset” tab. Here you will need to enter the administrative password to restart the device.

Set to Factory Defaults

To set the device to factory defaults you have two options. Hard reset or software factory reset through the web browser.

Hard Reset

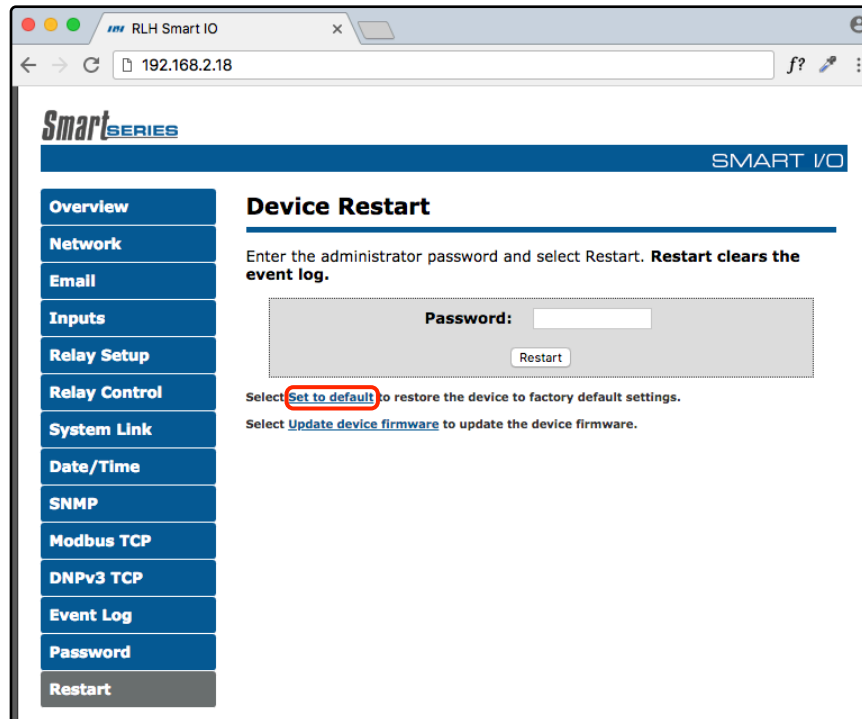
- When resetting remove the pluggable contact terminal blocks.
- On the underside of the device next to the power terminals and system alarm contact you will see an opening labeled reset.
- **Warning:** This next step will clear all current configurations and restart the device.
- Insert a non-conductive object into the reset hole and depress the button for 5 seconds.
- The device will then restart to indicate it has gone through the factory default reset process.



Reset Button on Bottom

Software Factory Reset

- Login to the web browser and view the reset page.
- On the bottom right of the reset page you will see, in smaller font, a **set to default** option (highlighted in red below). Click on the link.
- **Warning:** This next step will clear all current configurations and restart the device.
- On the next screen you will need to click the **Restore** button.

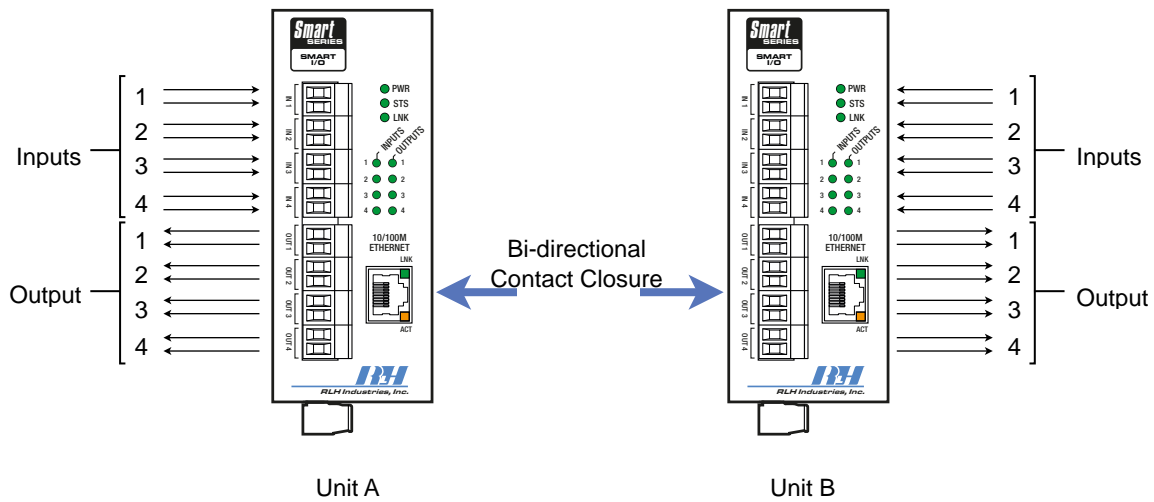


Restart the Device Screen

7. Application Examples

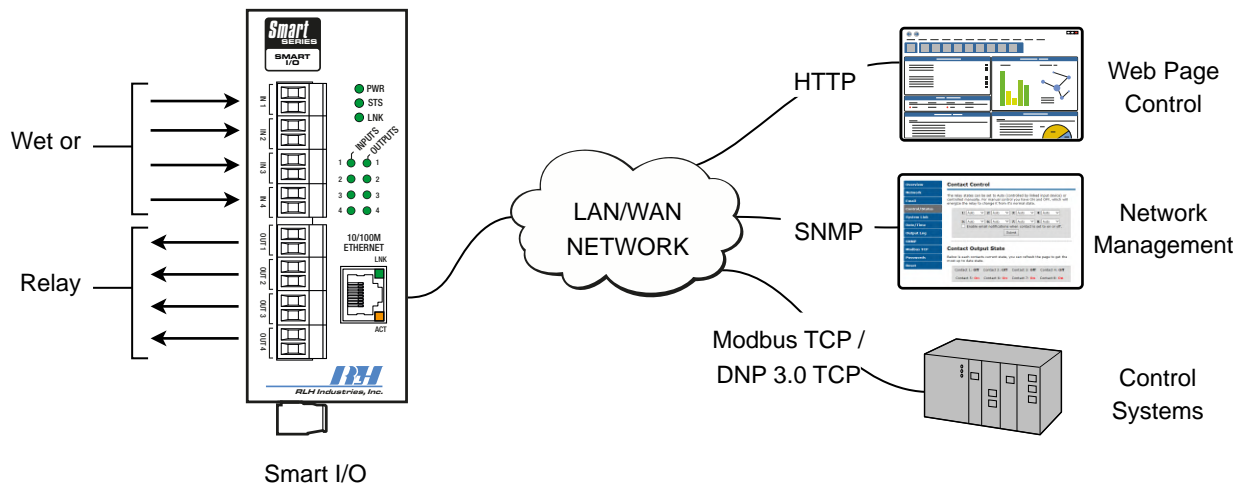
Contact Closure over Ethernet

In this application Inputs (1-4) on Unit A are paired with the Outputs (1-4) on Unit B, and the Inputs (1-4) on Unit B are paired with the Outputs (1-4) on Unit A.



System Link Example

Remote I/O



Standalone Example

8. Specifications

Power Requirements	Standard Model	24~48VDC	250mA minimum (Polarity Insensitive)
	-A Model	125VDC	
Wire Connectors	Screw down terminal block, 16~26AWG		
Inputs 1~4 Polarity Insensitive	-DR-2 Model	Dry (0-100 ohms)	Optical isolation 3.5kV
	-24-2 Model	Wet (8~27VDC / 5mA)	Optical isolation 3.5kV
	-48-2 Model	Wet (20~52VDC / 5mA)	Optical isolation 3.5kV
Outputs 1~4	SM-IO-NO-XX-2, Normally Open (SPST)		
	SM-IO-NC-XX-2, Normally Closed (SPST)		
Output Relay Ratings	Max. Power 60W / 125VA		
	Max. Voltage 220VDC / 250VAC		
	Max. Current 2A AC/DC		
System Status Alarm	Normally Open/Closed Relay (SPDT)		
Relay Response Time	Maximum <45ms, Typical <15ms		
Data Interface	Ethernet (RJ-45)		
Data Rate	10/100Mbps IEEE 802.3 Compliant		
Surge Protection	Automatic resettable solid state current limiters		
DC Input Isolation	1.5kV		
Construction	Steel and aluminum alloy, powder coated		
Physical Dimensions	H 5.0" x W 2.0" x D 3.9" (127mm x 51mm x 100mm) Not including connectors or DIN rail bracket		
Mounting Style	Standard DIN rail (TS-35) or wall mount.		
Operating Temperature	-40°F to +158°F (-40°C to +70°C)		
Humidity	95%		
MTBF	175,000 Hrs (Circuit Board Level)		
Warranty	Limited Lifetime	Visit www.fiberopticlink.com for warranty details	

9. Ordering Information

System Models

Description	Inputs	Dimensions	Part Number
RLH Smart I/O Relays Normally Open	Wet Input (24-48VDC)	H 5.0 in. x W 2.0 in. x D 3.9 in. (127mm x 51mm x 100mm)	SM-IO-NO-48-2
	Wet Input (12-24VDC)	H 5.0 in. x W 2.0 in. x D 3.9 in. (127mm x 51mm x 100mm)	SM-IO-NO-24-2
	Dry Input	H 5.0 in. x W 2.0 in. x D 3.9 in. (127mm x 51mm x 100mm)	SM-IO-NO-DR-2
RLH Smart I/O Relays Normally Closed	Wet Input (24-48VDC)	H 5.0 in. x W 2.0 in. x D 3.9 in. (127mm x 51mm x 100mm)	SM-IO-NC-48-2
	Wet Input (12-24VDC)	H 5.0 in. x W 2.0 in. x D 3.9 in. (127mm x 51mm x 100mm)	SM-IO-NC-24-2
	Dry Input	H 5.0 in. x W 2.0 in. x D 3.9 in. (127mm x 51mm x 100mm)	SM-IO-NC-DR-2

- ▶ Please contact your RLH sales representative for pricing and delivery information
- ▶ Add **-A** to the end of the part number for 125VDC input power option.

10. Support

Technical Support

Email:	support@fiberopticlink.com
24/7 technical support:	Toll Free 1-855-RLH-24X7 Toll Free 1-855-754-2497

Contact Information

Corporate Headquarters:	RLH Industries, Inc. 936 N. Main Street Orange, CA 92867 USA
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Fax:	(714) 532-1885
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Specifications subject to change without notice.