RLH Industries, Inc.

Smart[4] Relay Output

User Guide

U-130 2024B-0930

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 qualified technology experts and includes references to industry standard terminology and practices. 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.fiberopticlink.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

The Smart Relay Output is an Ethernet device with 4 Integrated controllable relays. The device allows for web based control of the relays and may be integrated into distributed control and network management systems to allow those systems to controlled it's Relays. Each of the Relays can be individually configured to send customized emails and notifications when an event is triggered. The device supports a wide variety of protocols it is compatible with over Ethernet. Integration options supported are: 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.

Contact Closure Over Ethernet

The RLH Smart Relay Output may be paired with an RLH Smart Input Sensor. When using RLH's System Link feature, the two devices become linked establishing a tunnel over an Ethernet network and will transport a digital outputs being received by the Input Sensor through the Ethernet tunnel to the linked Relay Output device. The System Link feature can be set up via: One to One, Many to One, and One to Many allowing for event distribution and consolidation as needed.

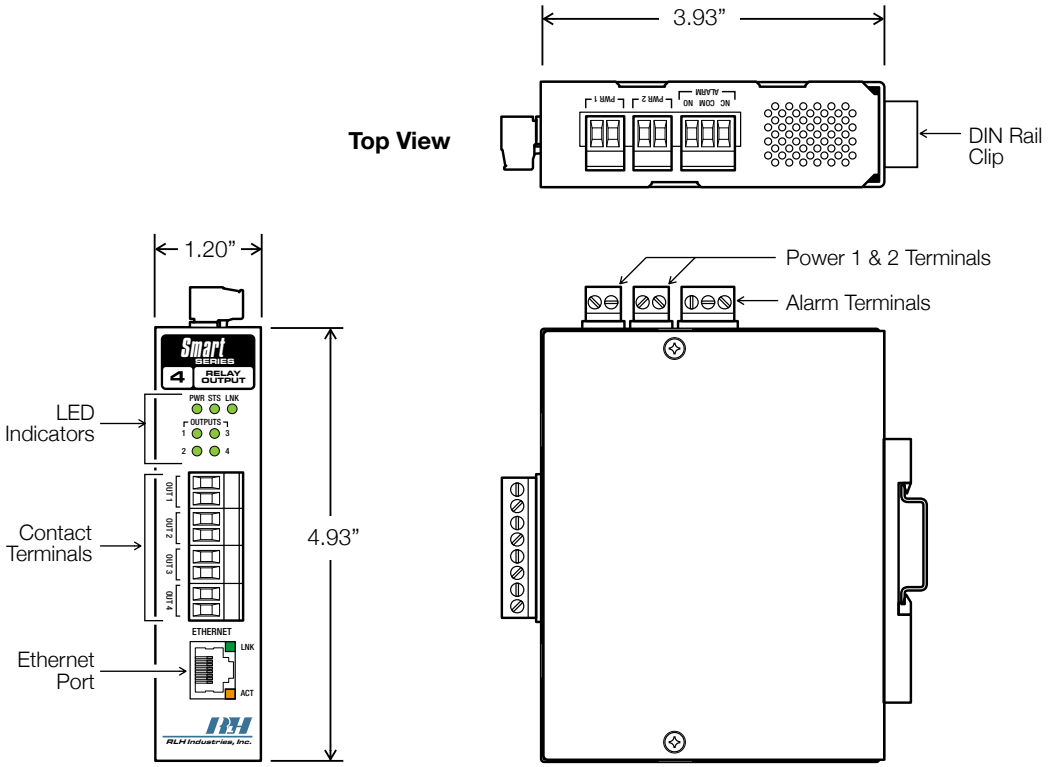
Standard Features

- Rugged Design - Operating temp. -40°C ~ 70°C
- PoE Powered device - Can be powered by any IEEE 802.3af compliant PoE source
- Intuitive embedded web interface for configuration
- System Link - Pair with a Input Sensor for Alarm Transportation over Ethernet
- Event Consolidation – Pair with up to 4 Input Sensors to consolidate remote alarms to one location
- Alarm Distribution - Multiple output units may be paired with one Input Sensor
- IGMP V2 supported to enable multicast routing in one to many configurations
- Remote Control of 4 Relays
- Custom email notifications for each output
- Each relay supports up to 3 Amps or 60 Watts
- Advanced SMTP integration allowing for SSL and TLS based authentication
- Integration options include: SNMPv1, 2c, 3, SNMPv1,2c Traps, Modbus TCP, and DNPv3 TCP
- Output event log with time stamps
- System power ranges available: 24-48VDC, 125VDC, & 12VDC
- 10/100 Fast Ethernet Port
- Limited Lifetime Warranty
- **Made in the U.S.A.**

Panel Overview

Product Layout

The product layout provides the information for dimensions, and locations of all the contact terminals, LED's, and the Ethernet port.



Front Panel Features

LED Identification

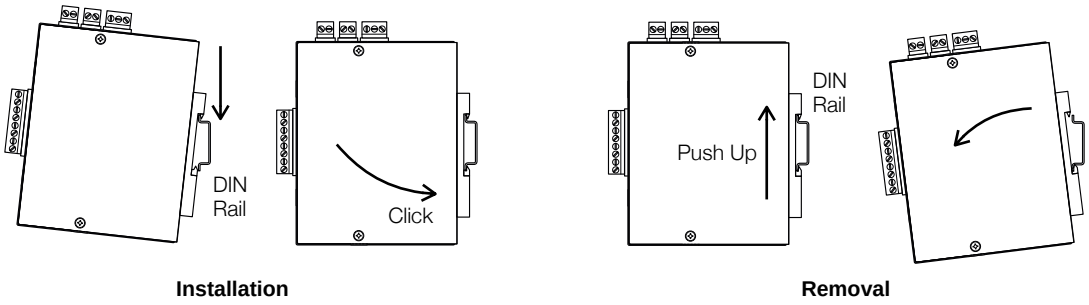
LED	Name	Color	Status	Condition
Outputs 1-4	Relay Output	Green	ON	Relay is energized
			OFF	Relay is not energized
PWR	Power Failure	Green	ON	DC input power OK
			OFF	DC input power failed
STS	CPU Failure	Green	Blinking	CPU operating normally
			Solid (On or Off)	CPU failure
LNK	System Link	Green	ON	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.
- Can be configured to alarm when the system link to a paired Input Sensor is disconnected.

DIN Rail Mounting

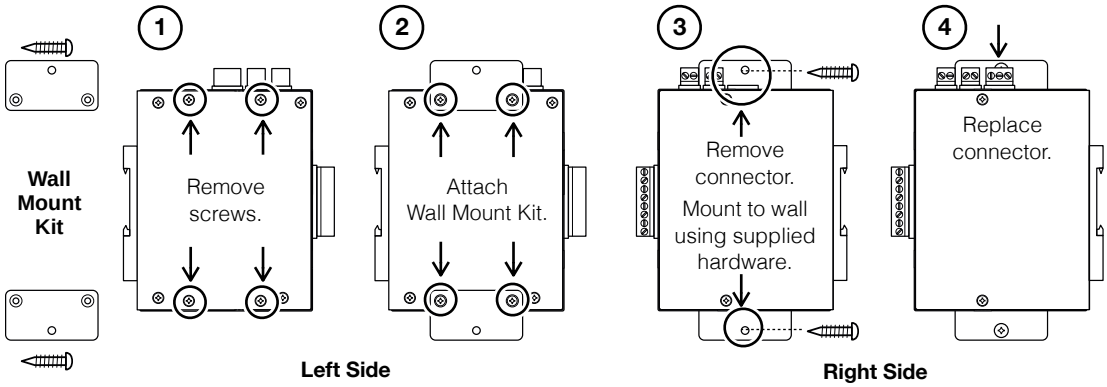
The DIN clip for mounting the system is mounted onto the rear panel. Hook the DIN clip on the top flange of the DIN rail and rotate to the locked position to install. To remove, push up to depress the spring latch and rotate off of the DIN rail.



DIN Rail Mounting

Wall Mounting

The system can be easily wall mounted by attaching the provided wall mount ears and hardware. Attach the wall mount ears by following the instructions below.



Wall Mounting

3. Before Installing

Prepare for Installation

Check for shipping damage

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

Verify system contents

- Smart Relay Output device
- DIN Clip and Wall Mount Ears.
- Correct model type for intended application.

Site Requirements

Site selection

Locate the Smart Relay Output to allow easy access to the equipment. Leave at least 3 inches (7.62 cm) clearance in the front. The device 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
- T-35 DIN rail

Required power sources

The Standard RLH Smart Relay Output system accepts 24~56VDC and PoE Power from IEEE 802.3af compliant Power Sources.

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. However, when either of these options are selected the device will no longer accept PoE power.

4. Installation

Getting Started

Before starting

- Review the safety information in section **1. Important Information**
- Familiarize yourself with the Smart Relay Output as described in section **2. Introduction**
- Have a suitable installation environment with the correct source voltage.

Install the Smart Relay Output

- Mount the 4 Channel Relay Output to either a wall or DIN rail depending on the application

Connect wiring to Relay Output Contact Terminals

- There are 4 pairs of output contact terminals located on the front panel of the 4 Channel Relay Output.
- 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 a 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

- Attach the Ethernet cable to the RJ-45 Ethernet port located on the front panel of the Smart Relay Output. Verify the Link indicators are ON to ensure you have connectivity to your network.

Connect power

The Smart Relay Output 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 top 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 Relay Output.
- Connect the DC power cables to the terminal pairs. The power terminals are not polarity sensitive.
- Energize the power source. The PWR LED will be ON indicating that the system has power.

System alarm wiring

Connect alarm relay monitoring equipment wire pair to the alarm contact on the top 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 Relay Output you must access the device by its default IP address as listed below:

Default Settings

```
IP Address: 192.168.2.17
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 Relay Output web page. The assigned temporary address should be within the same subnet as the default address.

Example Client Device Address:

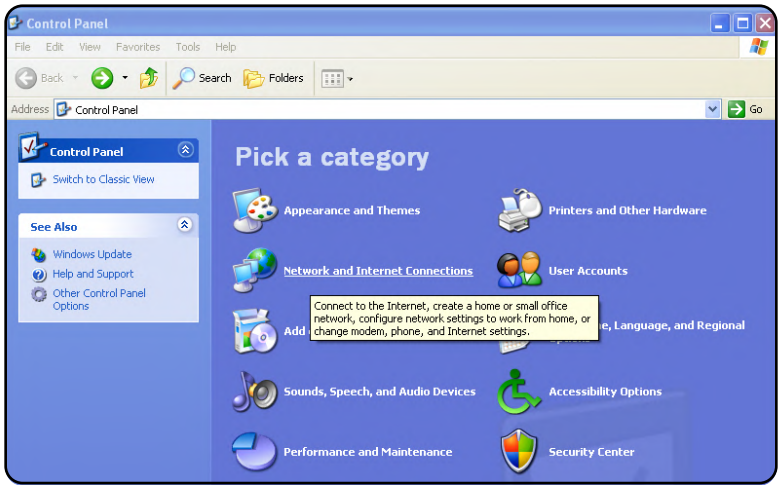
- IP: 192.168.2.10
- Subnet: 255.255.255.0

Now access the device via: http://192.168.2.17

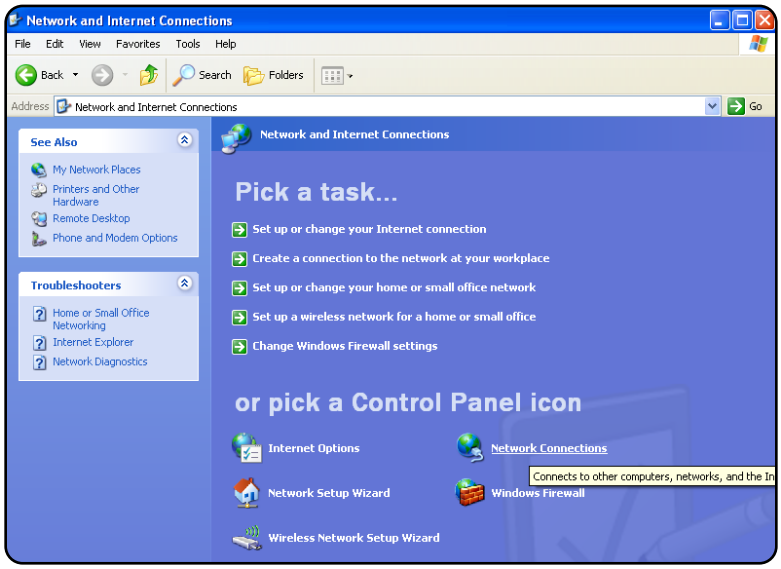
Assigning a Static IP Address

Steps for Window XP

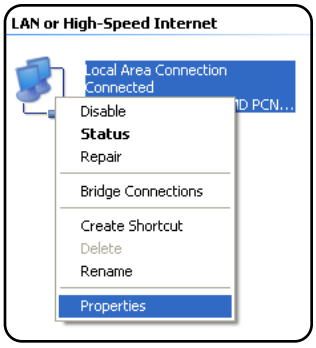
First: Go to windows XP control panel and select **`Network and Internet Connections`**.



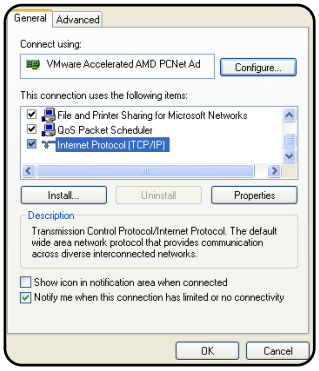
Next: Select **`Network Connections`**



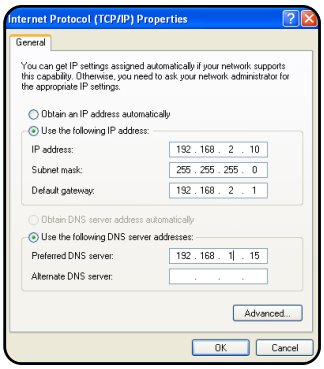
Next: Right-click on the adapter you want to set the IP for and select **`Properties`**.



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**.



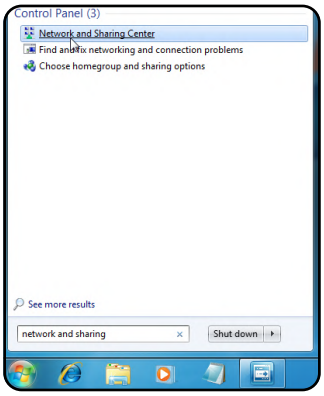
Note: You will need to close out of the Network Connection Properties screen before the changes go into effect.

Finally: Verify IP Address:

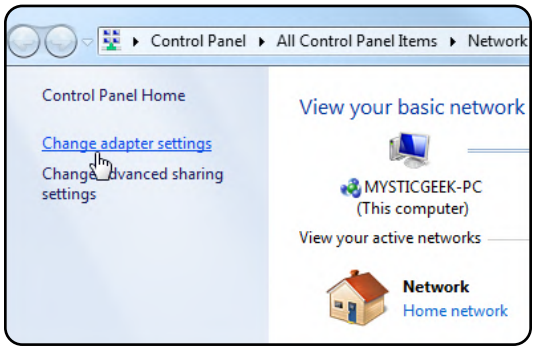
- In the Run box type in cmd and click **OK**.
- Then at the prompt type in ipconfig and hit Enter. This will show the IP address for the network adapter you changed.

Steps for Windows 7

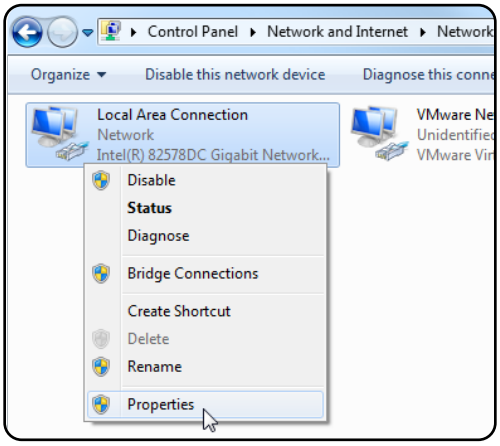
First: To a static IP address in Windows 7, type network and sharing into the Search box in the Start Menu and select **`Network and Sharing Center`** when it comes up.



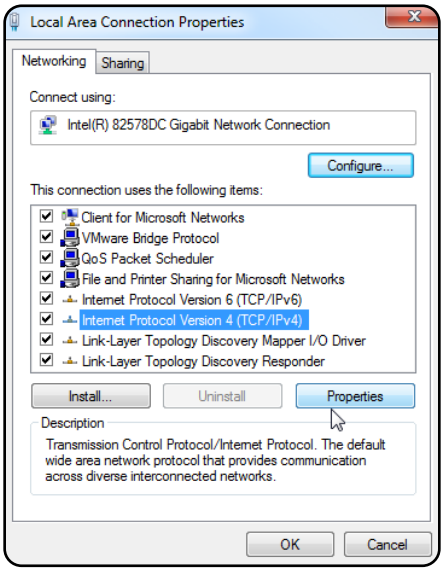
Next: When the Network and Sharing Center opens, click on **`Change adapter settings`**.



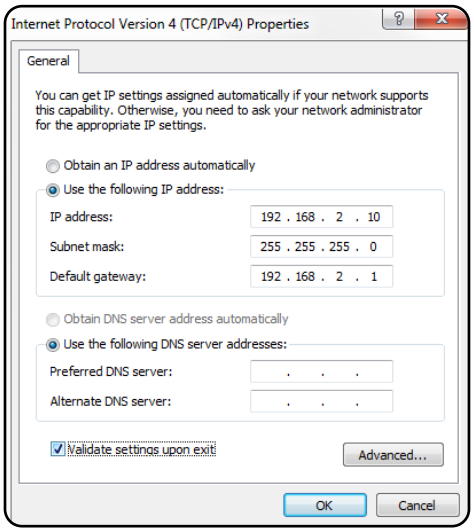
Next: Right-click on your local adapter and select **`Properties`**.



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



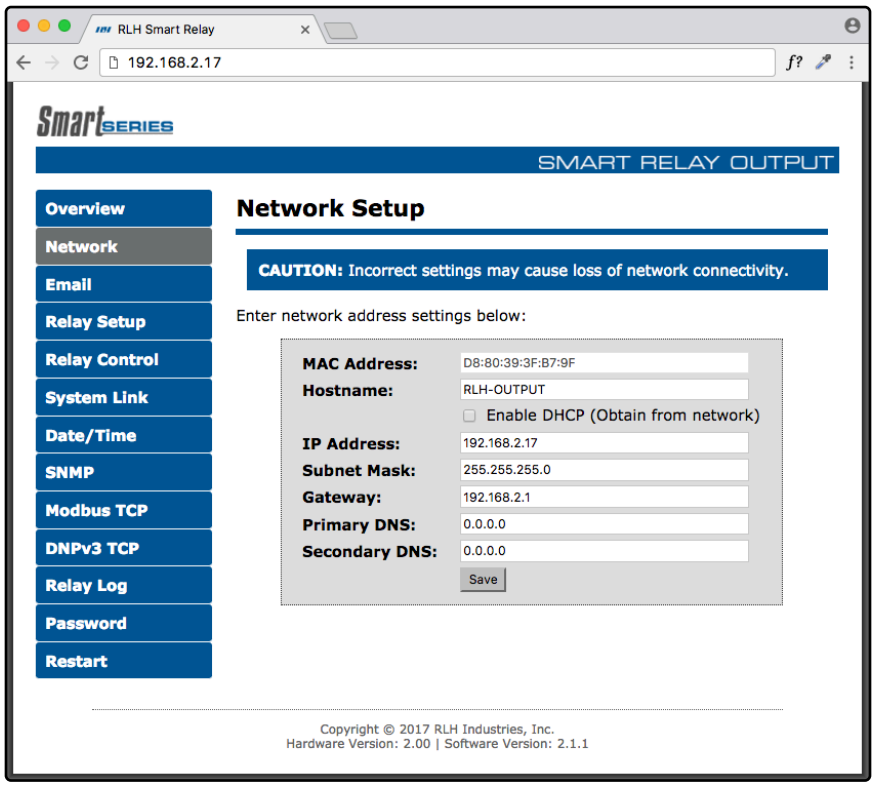
Finally: Now select the radio button **`Use the following IP address`** and enter in the correct IP, Subnet mask, and Default gateway that corresponds with your network setup. When you're finished click **`OK`**.



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

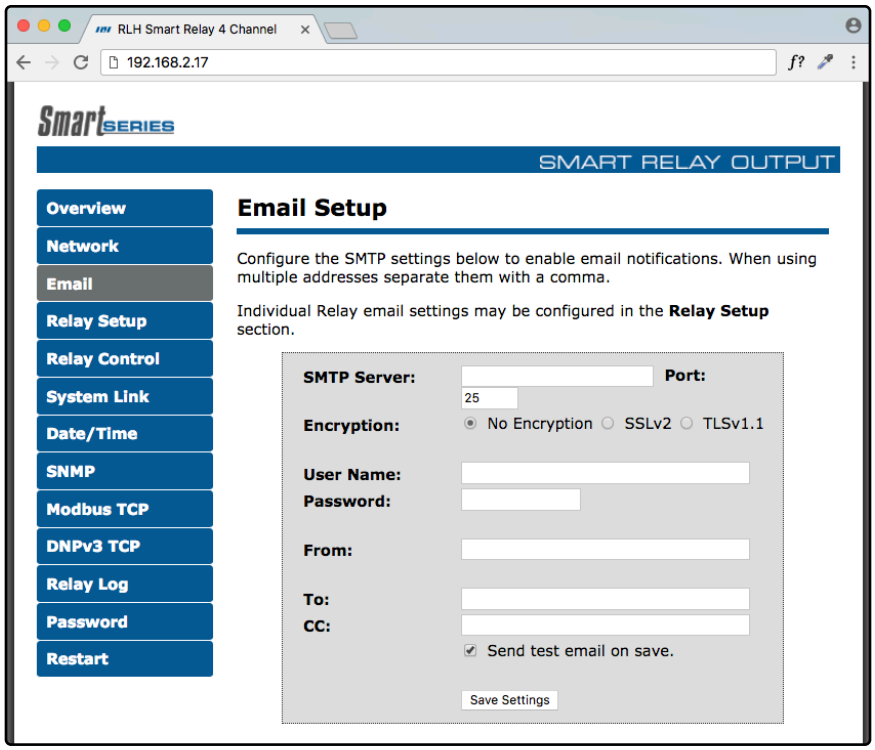


Network Address Configuration Screen

Settings	Description
Mac Address	Read only field will display the mac-address of your device.
Host Name	Enter the host name 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



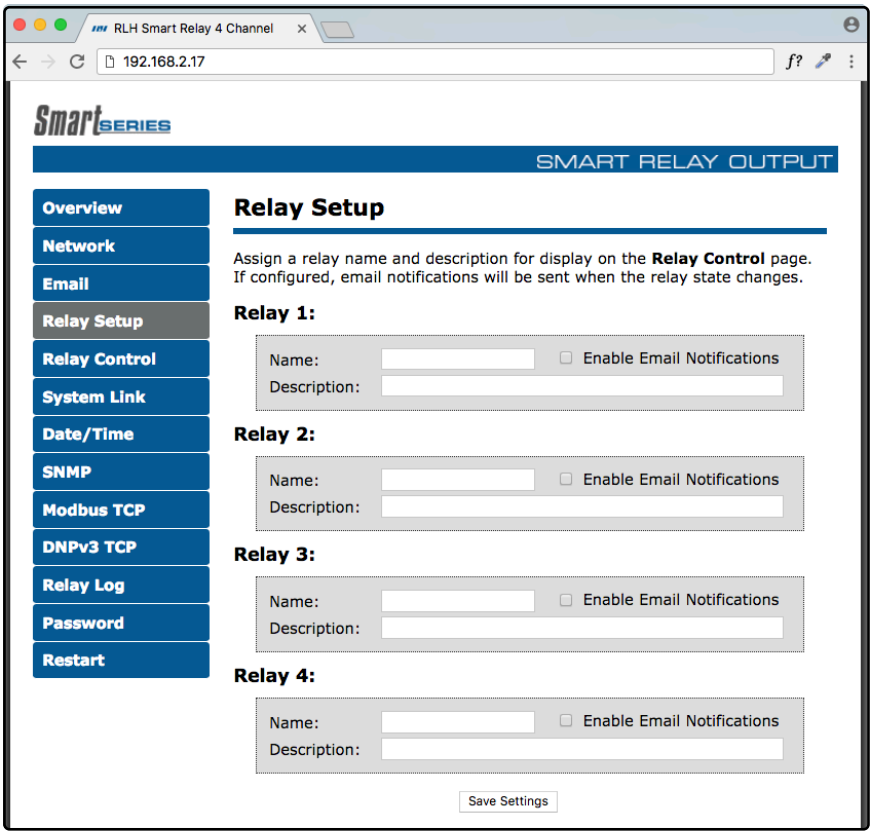
SMTP/Email Configuration Screen

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 when the "Save Settings" button is clicked.

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

Relay Setup

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

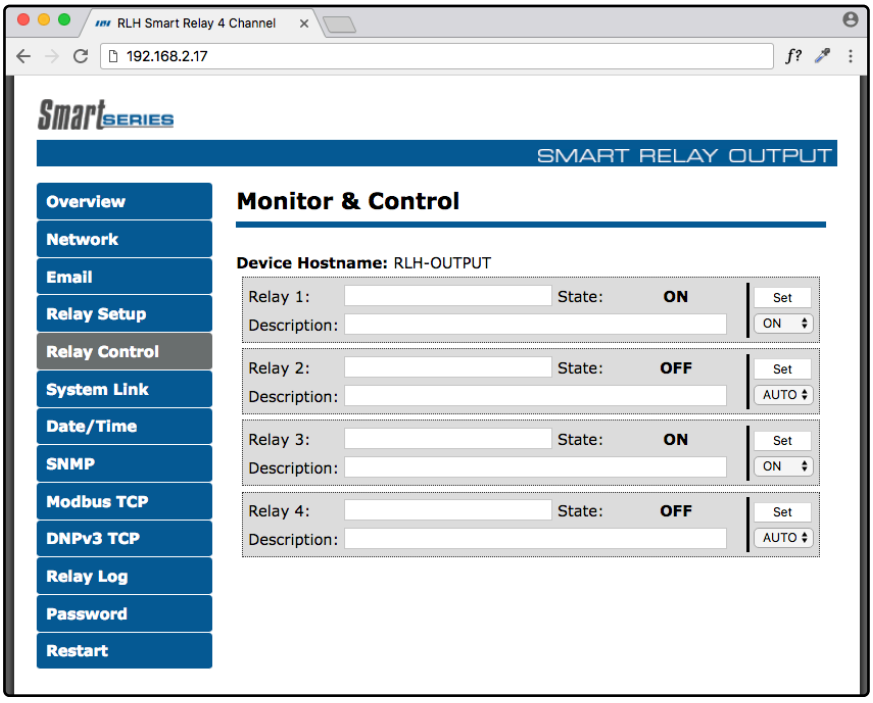


Relay Setup Screen

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

Relay Control

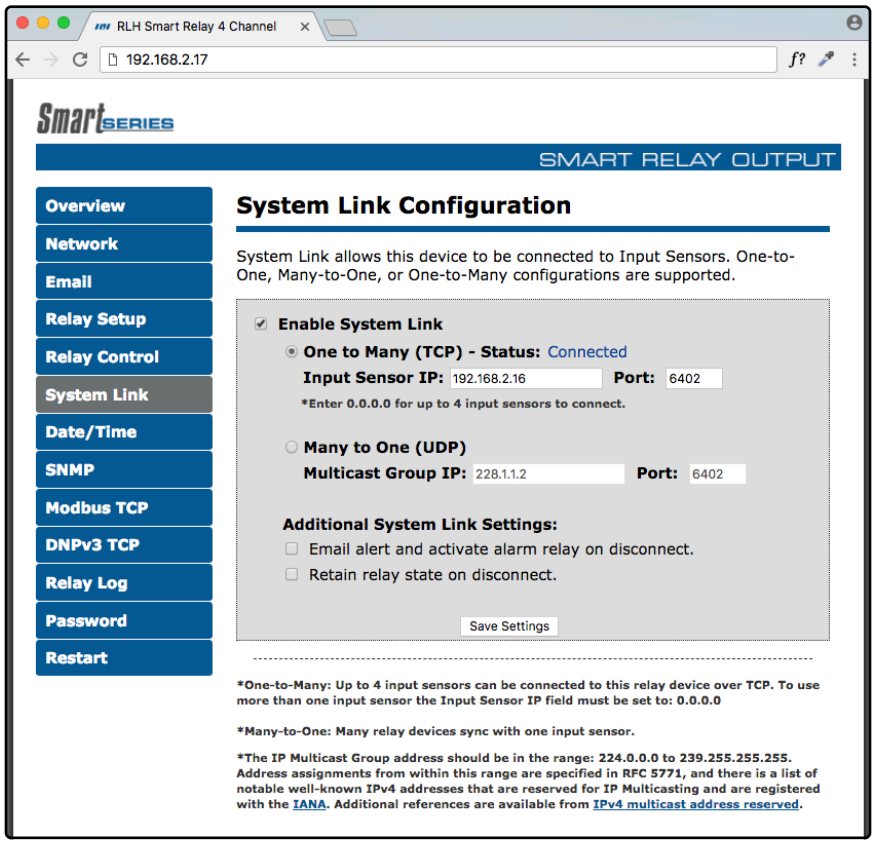
Displays the relay name, description, and state. Also allows control of each relays mode of operation.



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	**ON**	Energizes the relay
	OFF	De-Energizes the relay
	AUTO	Enables the Relay to be controlled by a Linked Input Sensor.

System Link Configuration



System Link Screen

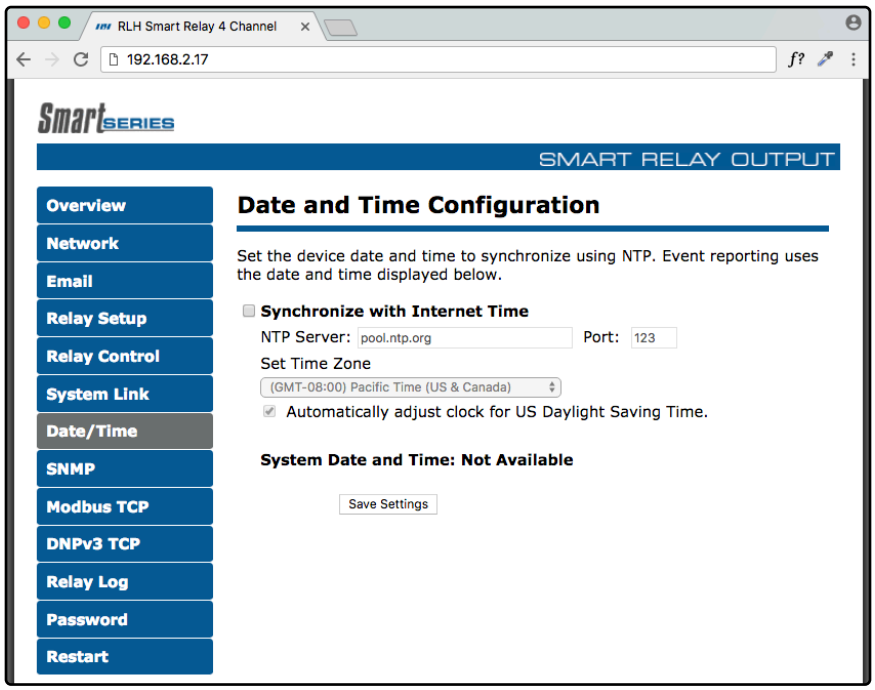
Settings	Description
`Enable System Link`	When checked this unit will synchronize with the input device(s) as configured below.
`One to Many (TCP)`	When selected the device will use TCP to link up with the paired input device(s). The current connection status is shown here.
	`Input Sensor IP` Enter the address of the output unit you wish to link to. *Enter Value: 0.0.0.0 when being linked with multiple Input sensors.*
	`Port` Enter which port number you wish to use for TCP communication.
	Note: When using multiple inputs units with one output unit make sure none of the inputs are synchronizing the same input number. This can cause a conflict with the output device and result with the intended output relay not operating as expected.

Note: System Link Configuration settings chart is continued on the next page.

Settings	Description	
Many to One (UDP)	When selected the Output device will use Multicast UDP to receive the input sensor updates.	
	Multicast Group IP	Enter the address of the multicast group you wish to link this input unit to. *The address: 228.1.1.2 port: 6402 is the default multicast address & port for both the Input and Output devices.* **Caution** – *Only 1 input device should be joined to a multicast group. The address entered must be within the IANA multicast address range.*
	Port	Enter which port number you wish to use for Multicast UDP messages.
	Notes: (1) Choose this option for linking multiple output units to one input device. (2) IGMP v2 is supported by Smart Series Input/Output devices to allow multicast routing if necessary.	
Email Alert and Active Alarm Relay is on disconnect	When selected email notifications and the alarm relay will activate on system link connection / disconnection.	
Retain Relay State when System Link is Broken	When the Relay Output device loses its link to the input device and the relays will remain in their current state.	

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.

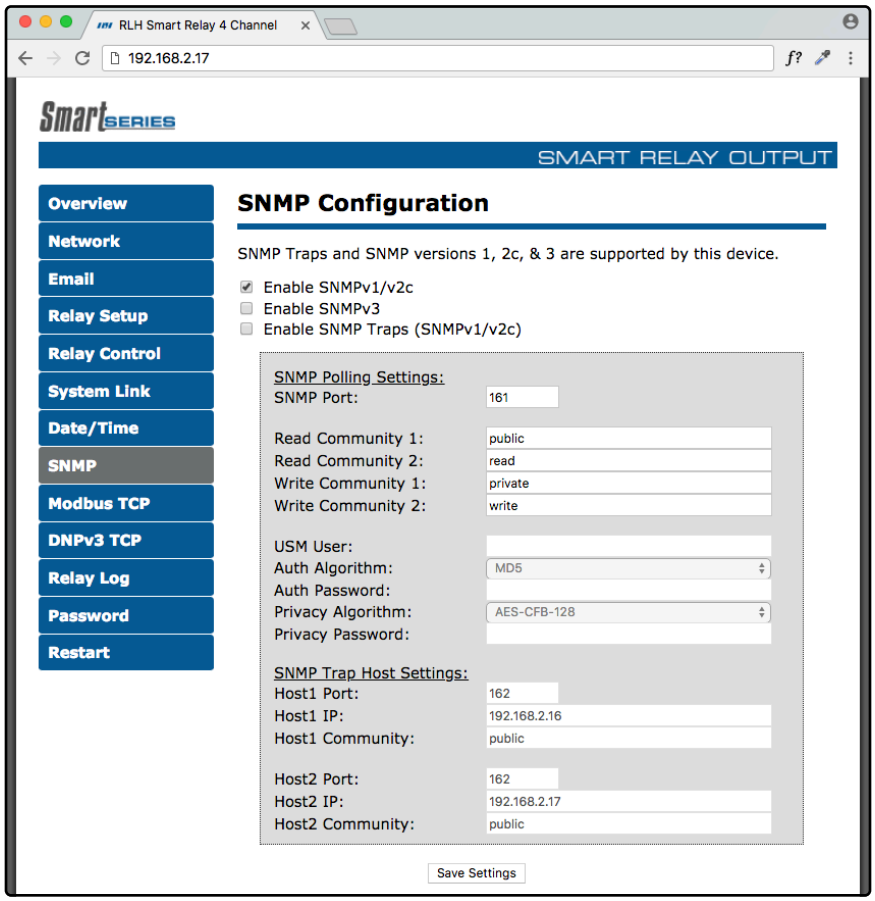


Date and Time Configuration Screen

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.fiberopticlink.com

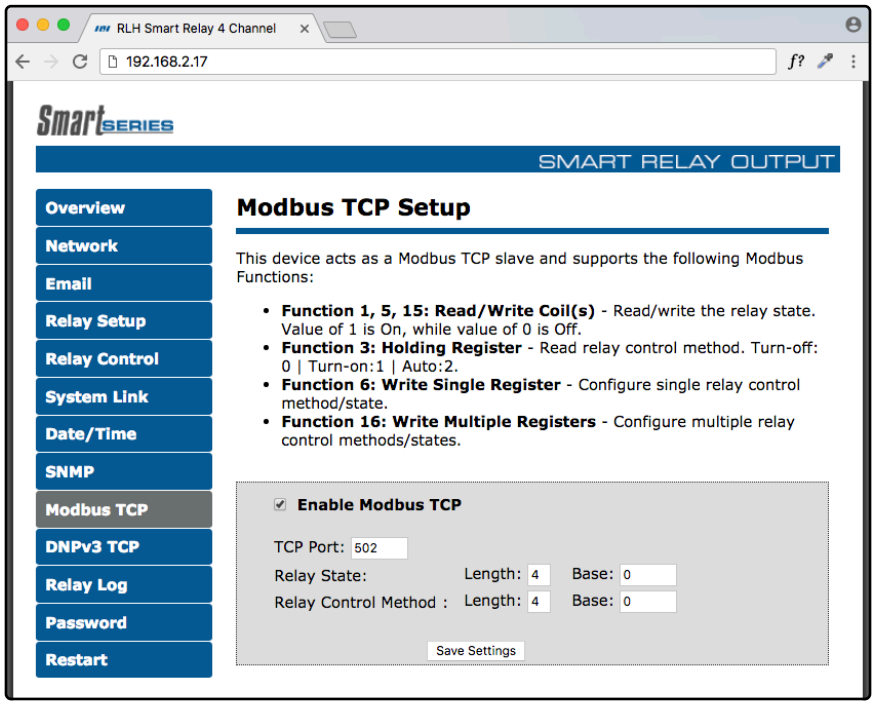


SNMP Community Configuration Screen

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 Relay Output acts as a Modbus TCP slave and supports 1 connection.



Enable/Disable Modbus TCP Screen

Settings	Description
TCP Port	Set desired TCP Port for use with Modbus TCP (Default Port is 502)
Relay State	Configure Length and Base registers the Relay State will be held in.
Length	The amount of registers the Modbus Query will be allowed to read starting from the configured base address.
Base	The register value that will store Output 1 Status, Outputs 2, 3, and 4 will be sequentially stored counting up from the configured base address.
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 value that will store Output 1 Control method, Outputs 2, 3, and 4 will be sequentially stored counting up from the configured base address.

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 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.

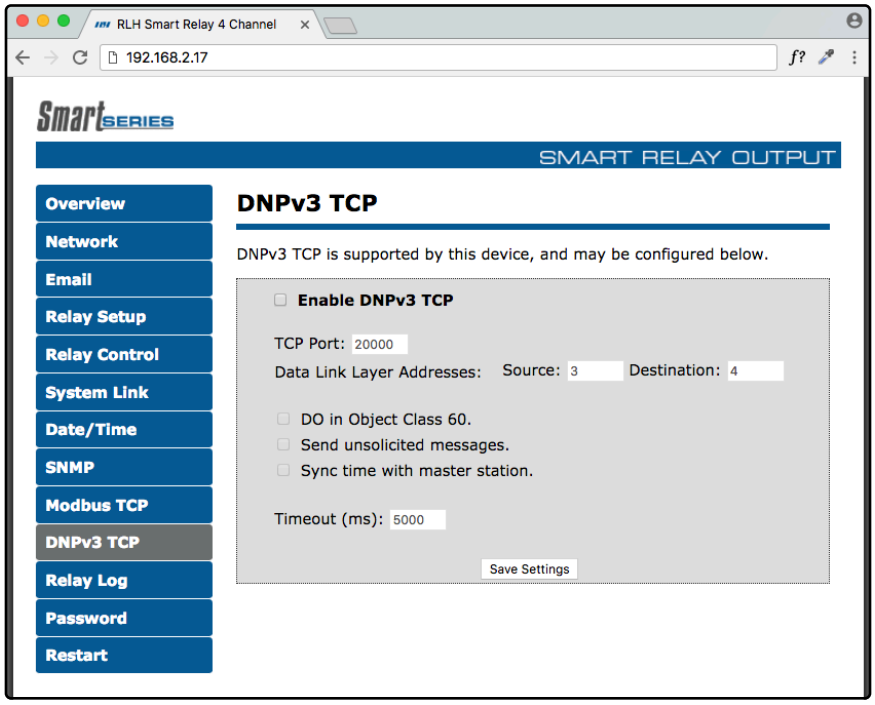
0 - AUTO: The relay turns ON/OFF according to the linked Input Sensor states.
1 - OFF: De-Energize relay.
2 - ON: Energize relay.

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 Relay Output acts as an 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 Relay Output 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 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 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)**
10	1	Binary Output – Packed Format without Status	1	0x06 - All Points 0x00 – 8 Bit Start/Stop 0x01 – 16 Start/Stop	129 (0x81)	0x07
10	2	Binary Output – With Status	1	0x06 - All Points 0x00 – 8 Bit Start/Stop 0x01 – 16 Start/Stop	129 (0x81)	0x17
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

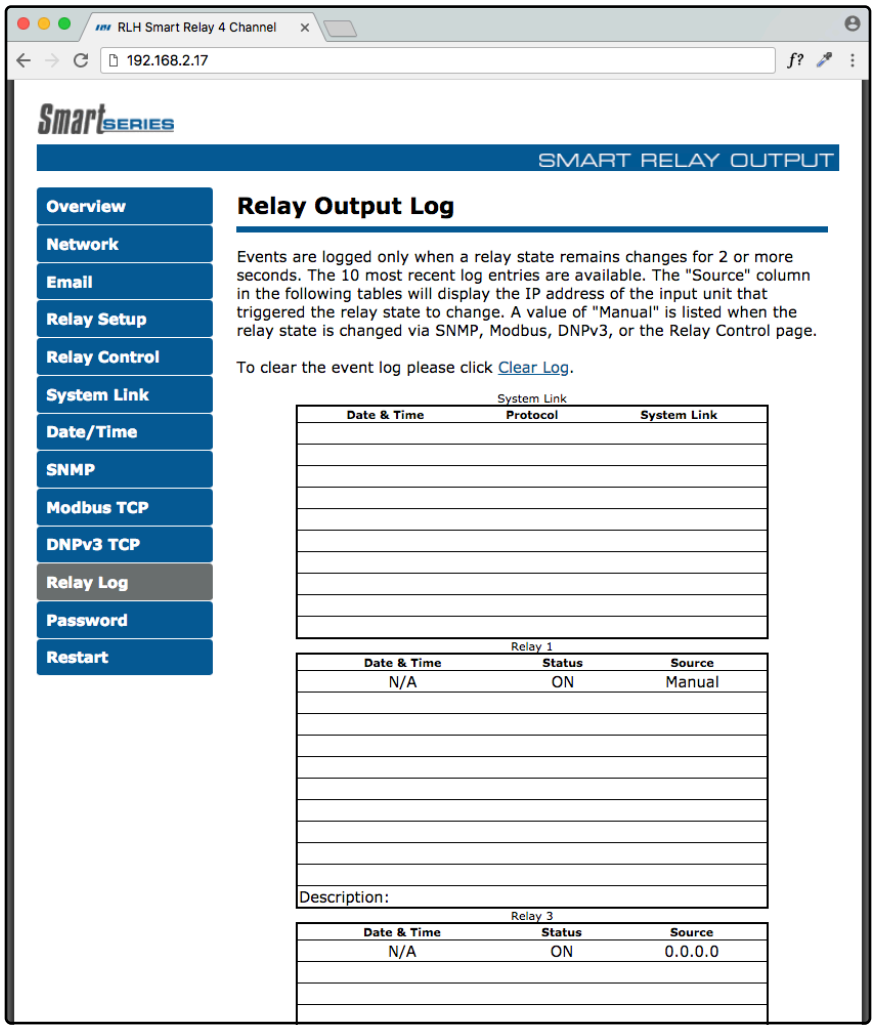
DNPv3 Control Relay Output Block (CROB) Table

This DNPv3 Control Relay Output Block (CROB) Table provides the control code information for use with the DNPv3 Implementation Object table shown on the previous page.

	Control Code	Relay Action:
Control Relay Output Blocks (CROB)	**Count > 1**	Supported
	Latch ON (lon)	Energize Relay – Stay ON
	Latch OFF (loff)	De-Energize Relay – Stay OFF
	Pulse ON	Energize Relay – For Length of provided Pulse “ontime”.
	Pulse OFF	De-Energize Relay – For Length of provided Pulse “offtime”.
	Trip	Energize Relay – For Length of provided in “ontime” command.
	Close	Energize Relay – For Length of provided in “ontime” command.
	Queue	Supported

Relay Output Log

The output log page records the time and date of the last 10 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.

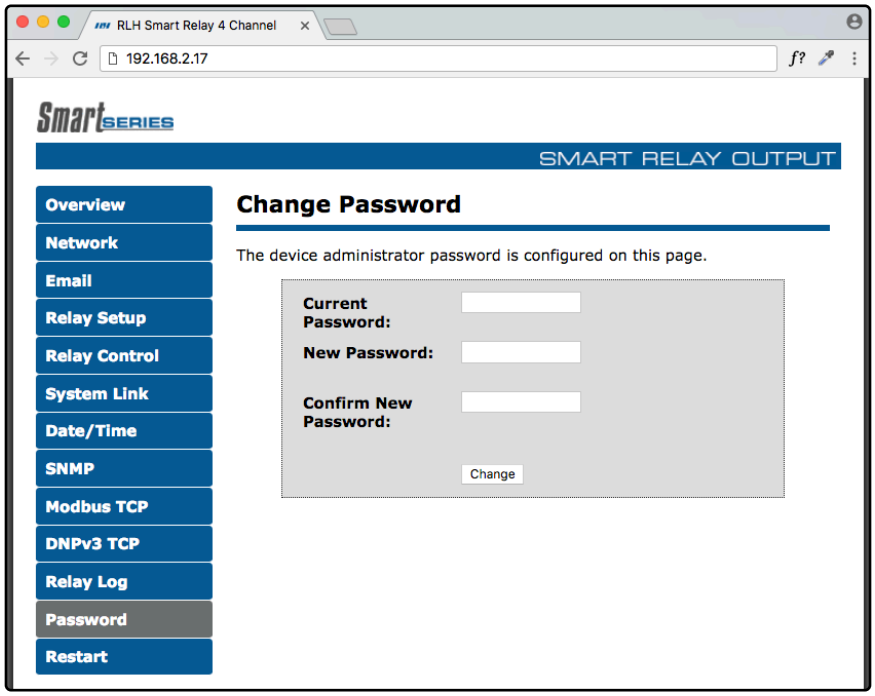


Relay Output Log Screen

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.

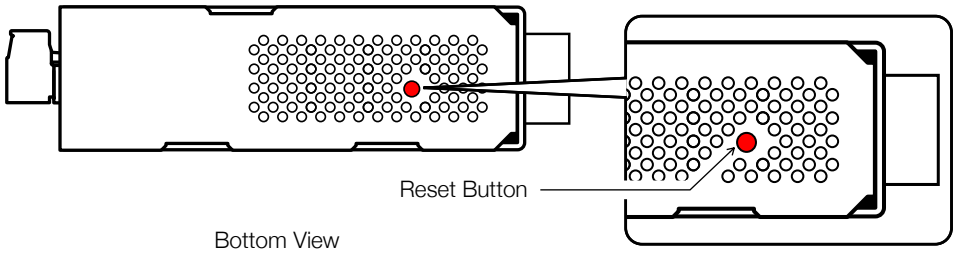
Set to Factory Defaults

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

Note: Administration Tasks instructions are continued on the next page.

Hard Reset

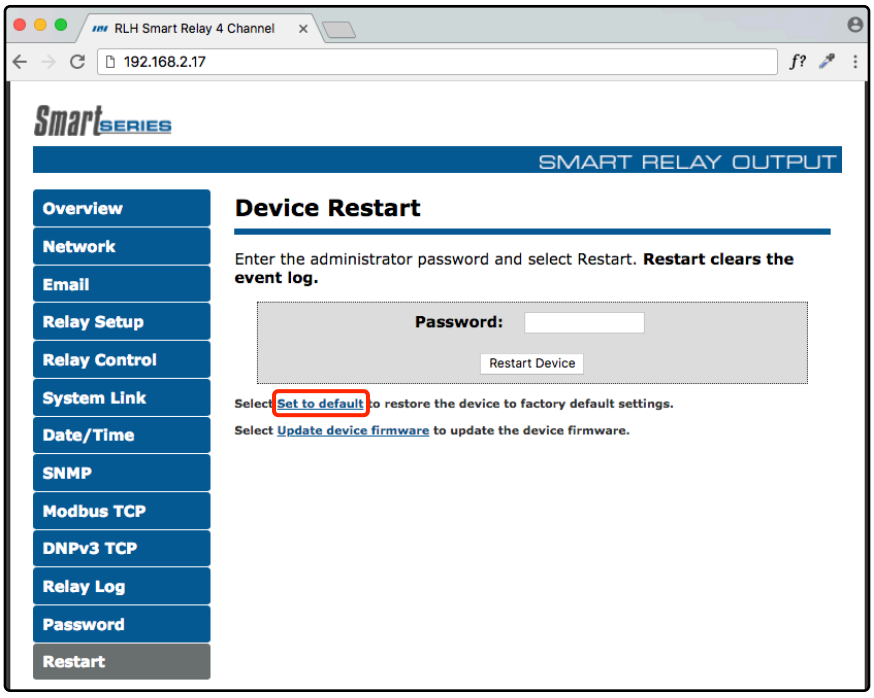
- When resetting remove the pluggable contact terminal blocks.
- On the underside of the device next to the power terminals and system alarm contact you will see an opening labeled reset.
- **Warning**: This next step will clear all current configurations and restart the device.
- Insert a non-conductive 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 Detail

Software Factory Reset

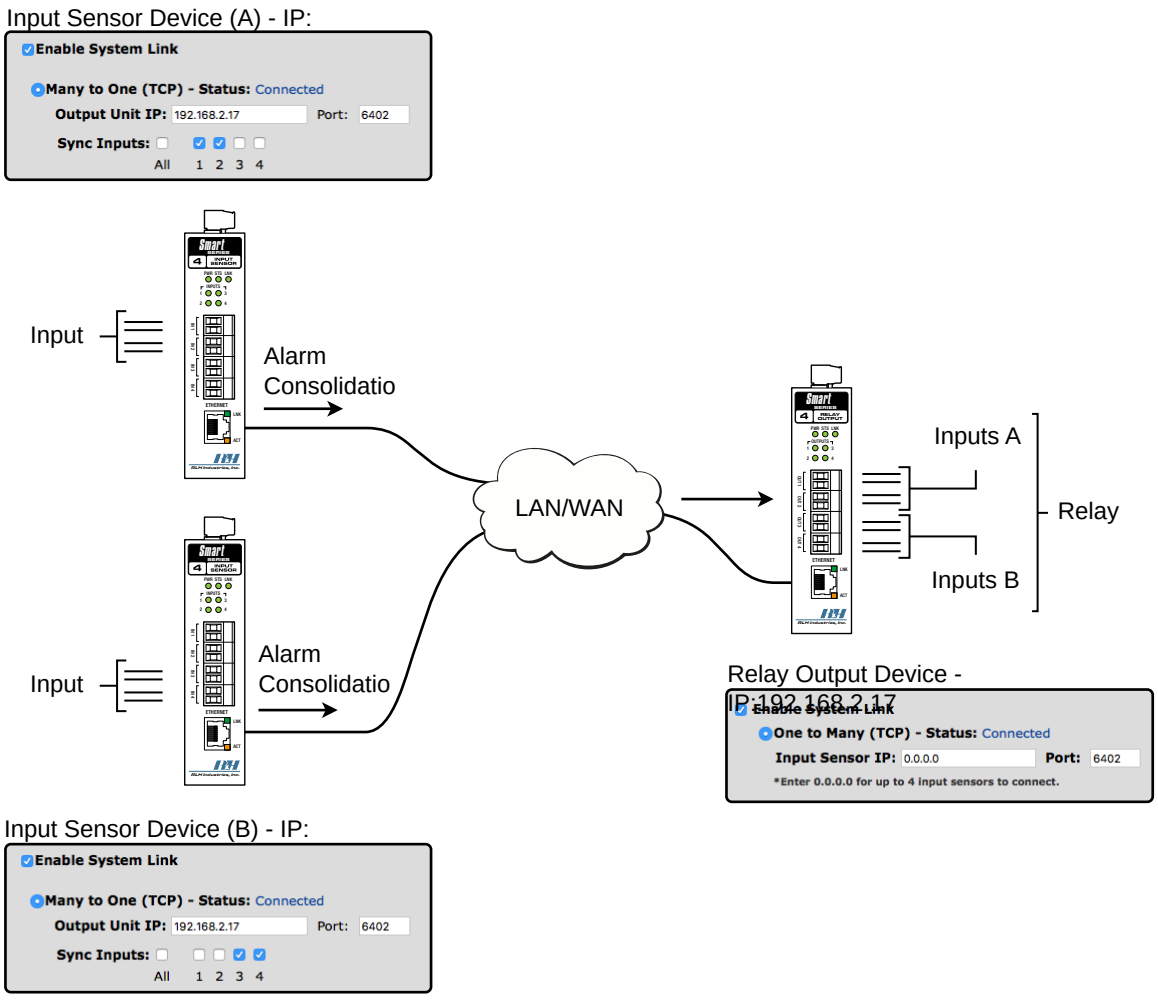
- Login to the web browser and view the reset page.
- On the bottom right of the reset page you will see, in smaller font, a **`Set to default`** option (highlighted in the screen image on the next page). Click on the link.
- **Warning**: This next step will clear all current configurations and restart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



Restart the Device Screen

7. Configuration Example

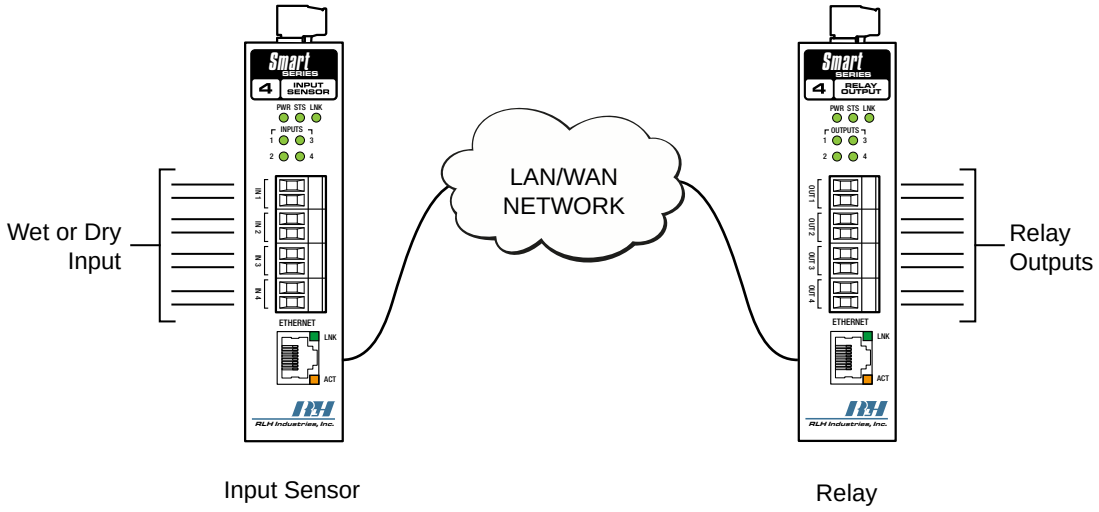
Event Consolidation - Many Inputs to One Output



Many Inputs to One Output Example

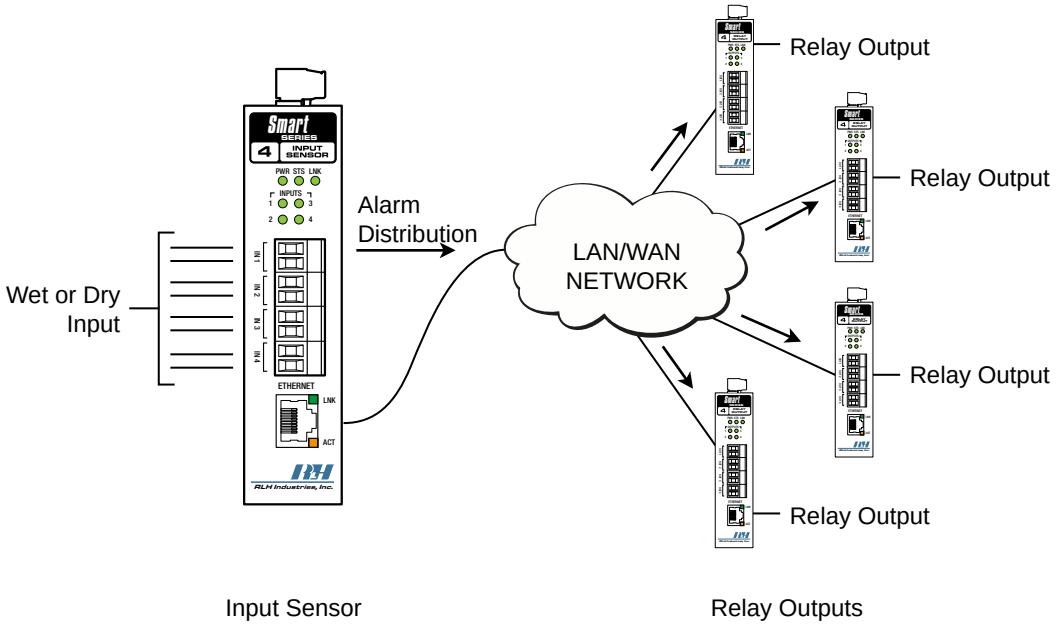
8. Application Examples

Contact Closure over Ethernet - One to One (TCP)



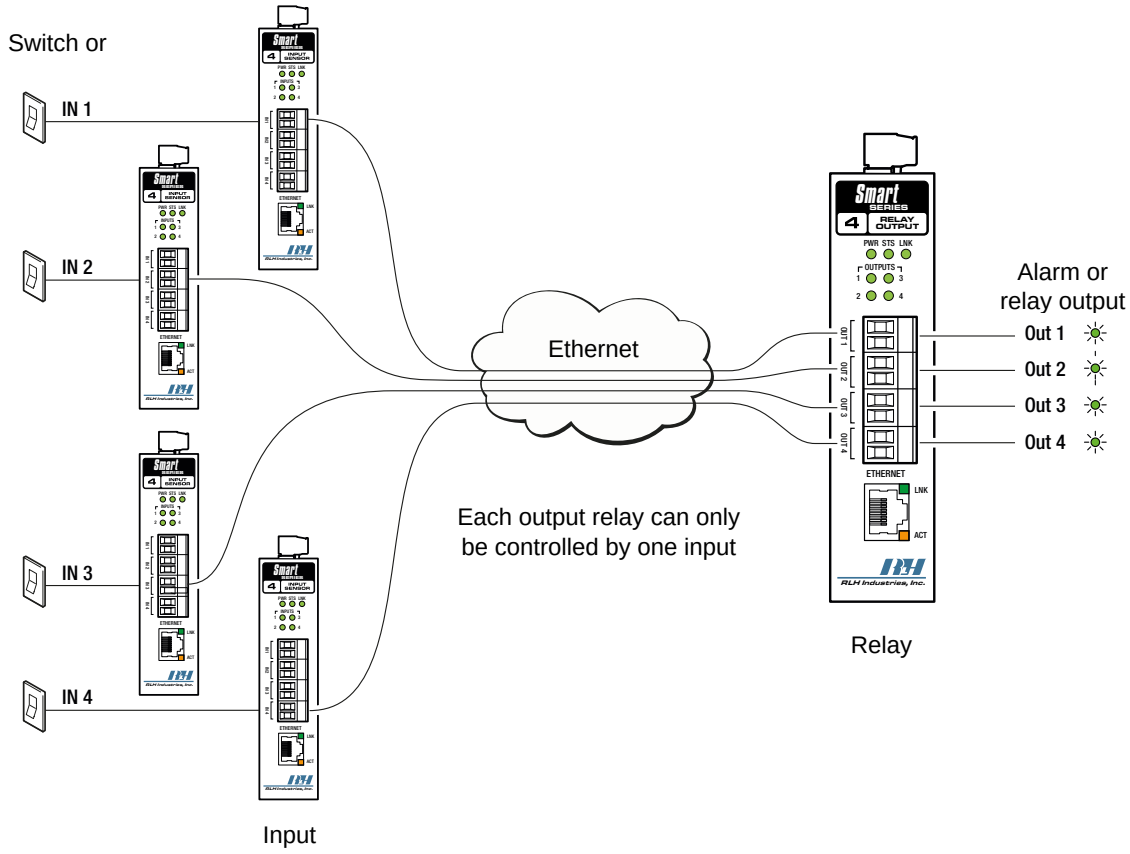
One to One (TCP) Example

Contact Closure over Ethernet - One to Many (UDP)



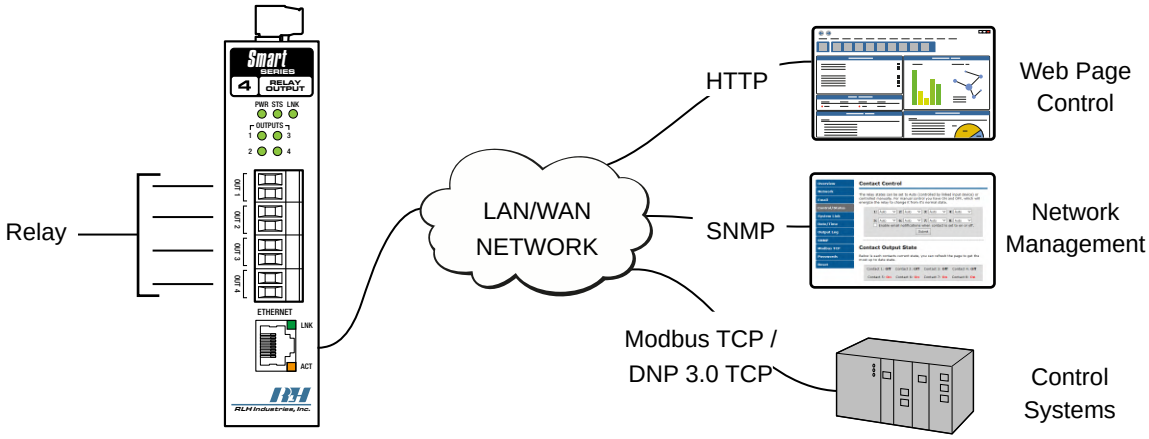
One to Many (UDP) Example

Event Consolidation - Many Inputs to One Output



Many Inputs to One Output Example

Remote Relay Control



Remote Relay Control Example

9. Specifications

Power Voltage	Standard Model	24~48VDC	
	-A Model	125VDC	PoE Powering Disabled
	-B Model	12VDC	PoE Powering Disabled
Power Consumption	6 Watts (Maximum)		
PoE Powered Device	IEEE 802.3af compliant		
Wire Connectors	Screw down terminal block, 16~26AWG		
Outputs 1~4	Normally Open or Normally Closed Relays (SPST)		
System Status Alarm	Normally Open/Closed Relay (SPDT)		
Relay Maximum Rating	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
System Link Response Time*	One-To-One (TCP)	Typical 8ms, Maximum 45ms	
	One-To-Many (UDP)	< 15ms	
	Many-To-One (TCP)	< 250ms	
	* Specifications listed are based on direct connections. Network overhead should be considered when calculating overall system response times.		
Data Interface	Ethernet (RJ-45)		
Data Rate	10/100Mbps IEEE 802.3 Compliant		
Surge Protection	Varistor (MOVs) and automatic resettable fuse (PTC Thermistor)		
DC Input Isolation	1.5kV		
Construction	Steel and aluminum alloy, powder coated		
Physical Dimensions	H 4.93" x W 1.20" x D 3.93" (125mm x 31mm x 100mm) Not including connectors or DIN rail bracket		
Mounting Style	Standard DIN rail (T-35) or wall mount (with included ears)		
Operating Temperature	-40˚F to +158˚F (-40˚C to +70˚C)		
Humidity	95%		
MTBF	175,000 Hrs (Circuit Board Level)		
Warranty	Limited Lifetime		

10. Ordering Information

System Models

Part Number	Description	Dimensions
SM-OUT4-NO-2	Smart Series 4 Channel Relay Output Normally open contacts	H 5.0 in. x W 1.2 in. x D 3.9 in. (127mm x 31mm x 100mm)
SM-OUT4-NC-2	Smart Series 4 Channel Relay Output Normally closed contacts	H 5.0 in. x W 1.2 in. x D 3.9 in. (127mm x 31mm x 100mm)

- Add **-A** to the end of the part number for 125VDC input power option.
- Add **-B** to the end of the part number for 12VDC input power option.
- Please contact your RLH sales representative for pricing and delivery information.

11. 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
Phone:	(714) 532-1672 Toll Free 1-800-877-1672 Toll Free 1-866-DO-FIBER
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Email:	info@fiberopticlink.com
Web site:	www.fiberopticlink.com