comnet
Communication Networks

INSTALLATION AND OPERATION MANUAL

CNFE3FX1TX2C[/M] Series

CONTACT OVER ETHERNET MODULES

This manual serves the following ComNet Model Numbers:

CNFE3FX1TX2C8TX
CNFE3FX1TX2C8RX
CNFE3FX1TX2C4DX
CNFE3FX1TX2C8TX/M
CNFE3FX1TX2C8RX/M
CNFE3FX1TX2C4DX/M

The ComNet CNFE3FX1TX2C[/M] series is an industrially hardened three-port intelligent switch with light management functionality and an integrated contact closure server. The 100BASE-FX port supports conventional CAT-5e/CAT-6 copper or optical transmission media by selection of the appropriate ComNet SFP* module. A summary fault alarm provides indication via a form c relay in the event of loss of optical link or operating power. The 10/100BASE-TX ports support both auto-negotiation and automatic MDI/MDI-X crossover for full and half-duplex operation; manual MDI/MDI-X switching is not required. The integrated contact closure server is available with 4 or 8 channels and supports individual user selectable wet or dry inputs. Form A relay outputs feature individual user selection of normally open or normally closed operation via the built-in web GUI. The contact server supports 4 modes of operation including one-to-one, one-to-many, many-to-one and stand-alone.

The internal/self-contained 9 to 36 VDC or 24 VAC power supply features redundant power inputs, for the highest possible reliability. The simple to install, CNFE3FX1TX2C/M Series is DIN-rail or panel-mountable, and is ideal for mission-critical applications where very high levels of reliability and network availability are of the utmost importance.

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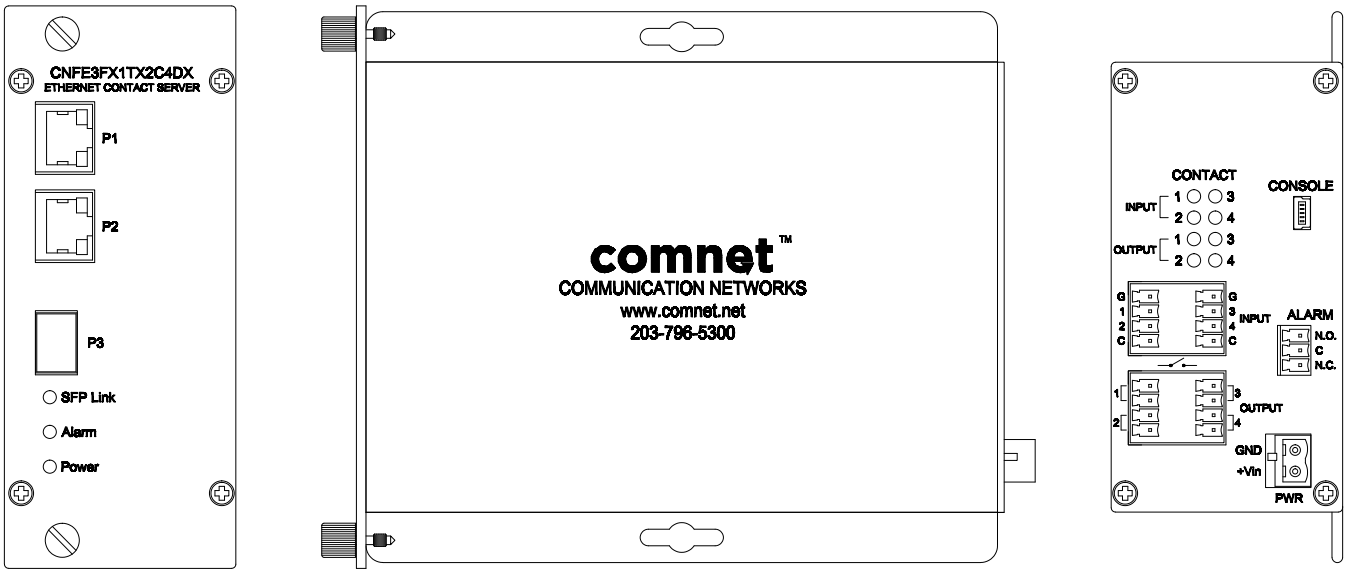
Hardware description

The ComNet CNFE3FX1TX2C/M series is an industrially hardened three-port intelligent switch with light management functionality and an integrated contact closure server. The 100BASE-FX port supports conventional CAT-5e/CAT-6 copper or optical transmission media by selection of the appropriate ComNet SFP module. A summary fault alarm provides indication via a form c relay in the event of loss of optical link or operating power. The 10/100BASE-TX ports support both auto-negotiation and automatic MDI/MDI-X crossover for full and half-duplex operation; manual MDI/MDI-X switching is not required. The integrated contact closure server is available with 4 or 8 channels and supports individual user selectable wet or dry inputs. Form A relay outputs feature individual user selection of normally open or normally closed operation via the built-in web GUI. The contact server supports 4 modes of operation including one-to-one, one-to-many, many-to-one and stand-alone.

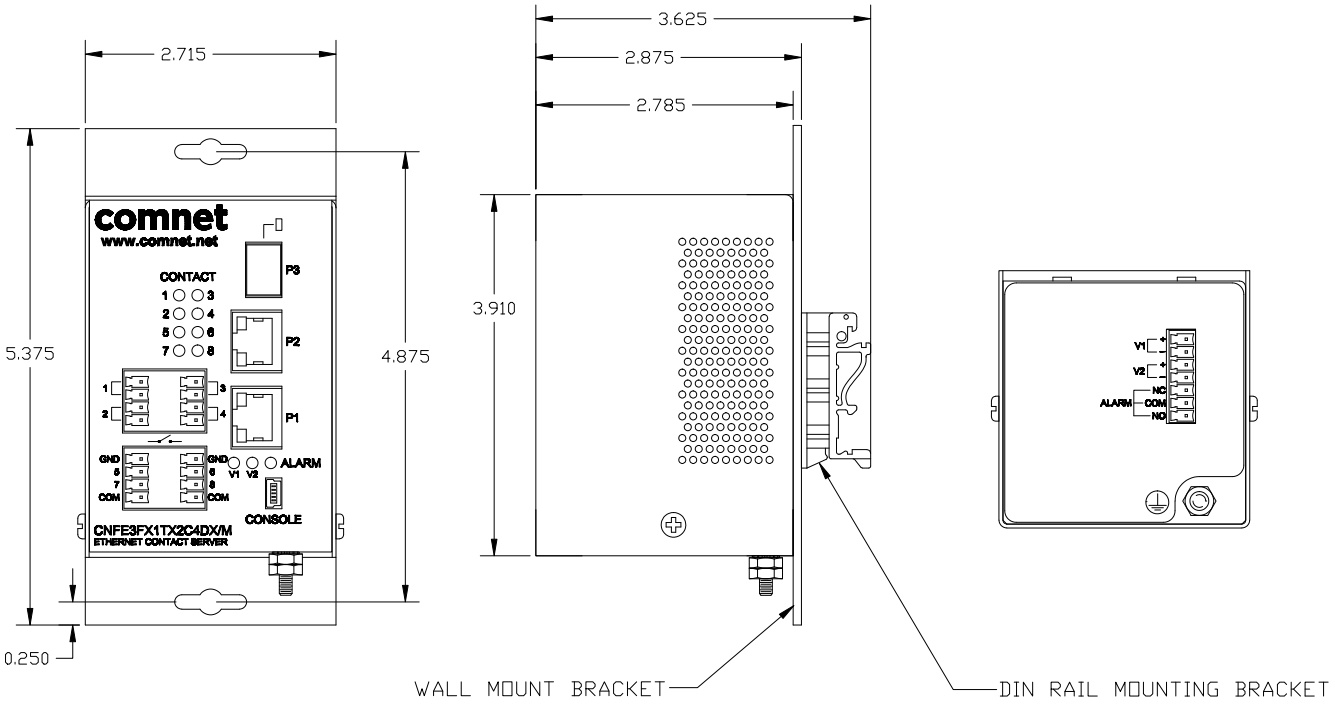
Distances depend on which SFP (Small Form Pluggable) module is used. The two RJ45 Ethernet connectors auto-negotiate or the configuration may be forced. The optical interface is fixed at 100Mbs.

Hardware Features

» 2 × Redundant DC power inputs
» Operating Temperature: -40 – 75°C
» Storage Temperature: -40 – 85°C
» Operating Humidity: 5% – 95%, non-condensing
» 2 × 10/100Base-T(X) Fast Ethernet port
» 1 × 100 Base-X SFP
» 4 × Dry Contact Inputs
» 4 × Form A Relays
» 1 × Form A Alarm Relay
» USB Console Port 115.2K baud 8N1
» Dimensions: Mini units w/ wall mount adapter plate 5.4 × 2.7 × 2.9 in (13.7 × 6.7 × 7.4 cm)
Mini units w/ DIN rail mount clips 3.9 × 2.7 × 3.6 in (9.9 × 6.7 × 9.1 cm)



Mechanical Drawing of ComFit CNFE3FX1TX2C MODULE including contact connector pin-out



Mechanical Drawing of Mini CNFE3FX1TX2C/M MODULE including contact connector pin-out

Module Input/Output Mapping

Module LEDs

LED	Color	Status	Description
PWR1	Green	On	DC Power Input 1 Good
		Off	No power detected
PWR2	Green	On	DC Power Input 2 Good
		Off	No power detected
STATUS	Green	On	Initialization passed
	Red	On	Failed
10/100Base-T(X) Ethernet ports			
LNK/ACT	Green	On	Port link up
		Blinking	Data transmitting
100 Mbps indicator	Amber	On	Port speed is 100 Mbps
SFP			
LNK/ACT	Green	On	Port link up
		Blinking	Data transmitted

Software Features

» Supports SNMPv1/v2c
» Event notification by SNMP trap and Alarm Relay Output
» Web-based GUI and USB Console CLI configuration
» Enable/disable ports
» IGMPv3 Multicast host
» Static MAC lock (per port)
» Static multicast MAC routing
» Field firmware upgrade capable
» Port Guardian physical port lockout feature
» Active ping check with SNMP trap & port shutdown capability
» Port Statistics
» Remote Reset
» Factory default reset

Cables

Ethernet Cables

The CNFE3FX1TX2C4DX switches have standard Ethernet ports. According to the link type, the switches use CAT 3, 4, 5, & 5e UTP cables to connect to any other network device (PCs, servers, switches, routers, or hubs). Please refer to the following table for cable specifications.

Cable Types and Specifications

Cable	Type	Max. Length	Connector
10BASE-T	Cat. 3, 4, 5 100Ω	UTP 100m (328ft)	RJ-45
100BASE-TX	Cat. 5 100Ω UTP	UTP 100m (328ft)	RJ-45
1000BASE-TX	Cat. 5/Cat. 5e 100Ω UTP	UTP 100m (328ft)	RJ-45

10/100BASE-T(X) Pin Assignments

With 100BASE-T(X)/10BASE-T cable, pins 1 and 2 are used for transmitting data, and pins 3 and 6 are used for receiving data.

10/100 Base-T RJ-45 Pin Assignments

Pin Number	Assignment
1	TD+
2	TD-
3	RD+
4	Not used
5	Not used
6	RD-
7	Not used
8	Not used

Console Cable

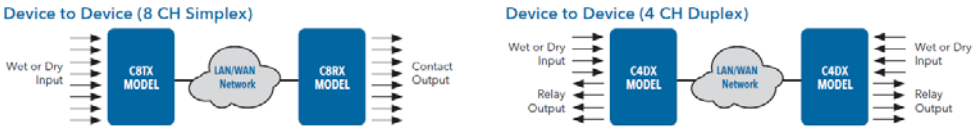
Each CNFE3FX1TX2C4DX switch can have the initial network settings configured by the management console port. You can connect them to a PC with USB Ports using the supplied USB to USB Mini B male plug cable.

SFP

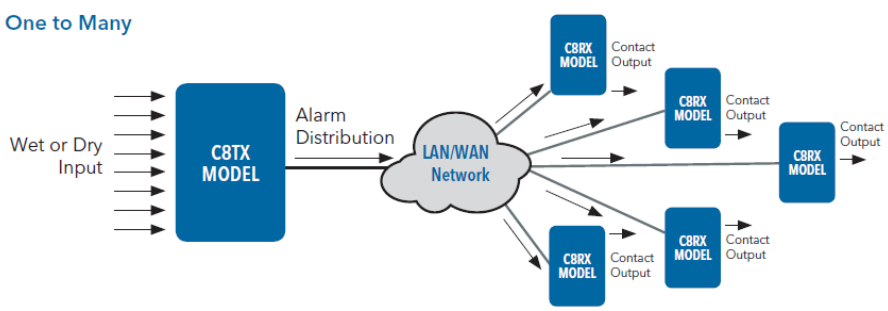
The CNFE3FX1TX2C4DX has a fiber optic port that utilizes an SFP connector. ComNet offers a wide selection of SFP modules that offer different fiber type, connector type and distances. Please remember that the TX port of Switch A should be connected to the RX port of Switch B.

Application Examples

One to One UDP connection



One to Many Multicast UDP example



WEB Management

Attention: While installing and upgrading firmware, please DO NOT power off equipment while the firmware is upgrading!

Configuration by Web Browser

This section provides instruction on configuration through the Web browser.

About Web-based Management

An embedded HTML web site resides in the flash memory on the CPU board. It contains advanced management features and allows you to manage the switch from anywhere on the network through a standard web browser such as Microsoft Internet Explorer.

The Web-Based Management function supports Internet Explorer 5.0 or later.

Preparing for Web Management

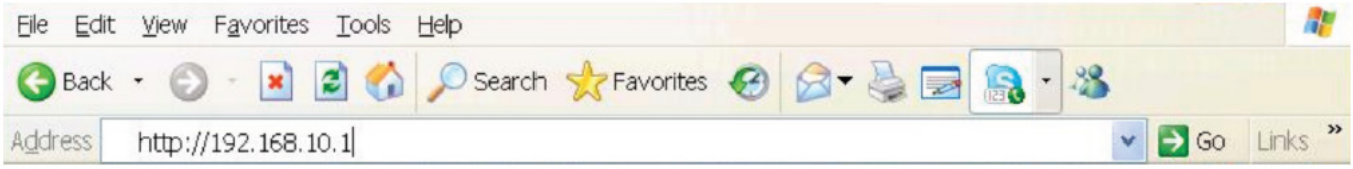
The default value is as below:

IP Address: 192.168.10.1 Subnet Mask: 255.255.255.0 Default Gateway: 192.168.10.254 User Name: admin Password: admin

System Login

1. Launch your Web Browser.

2. Type http:// and the IP address of the switch. Press Enter.



3. The login screen appears.

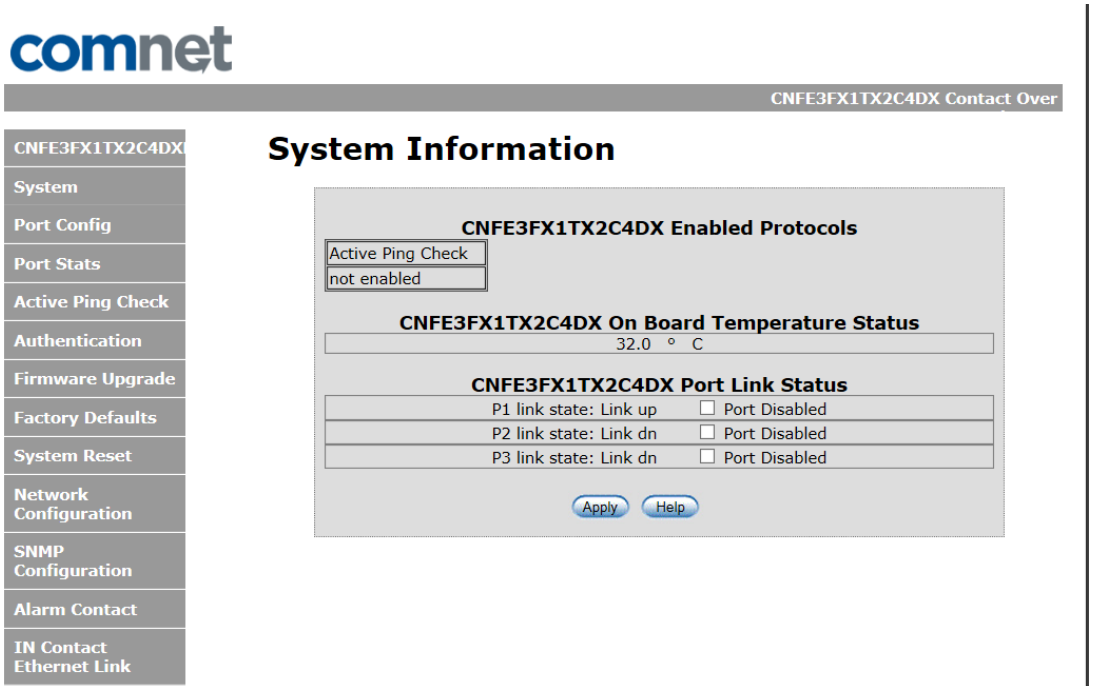
4. Enter username and password. The default username and password is admin.

5. Select Enter or OK button, then the main interface of the Web-based management appears.

Main Index page

System Information

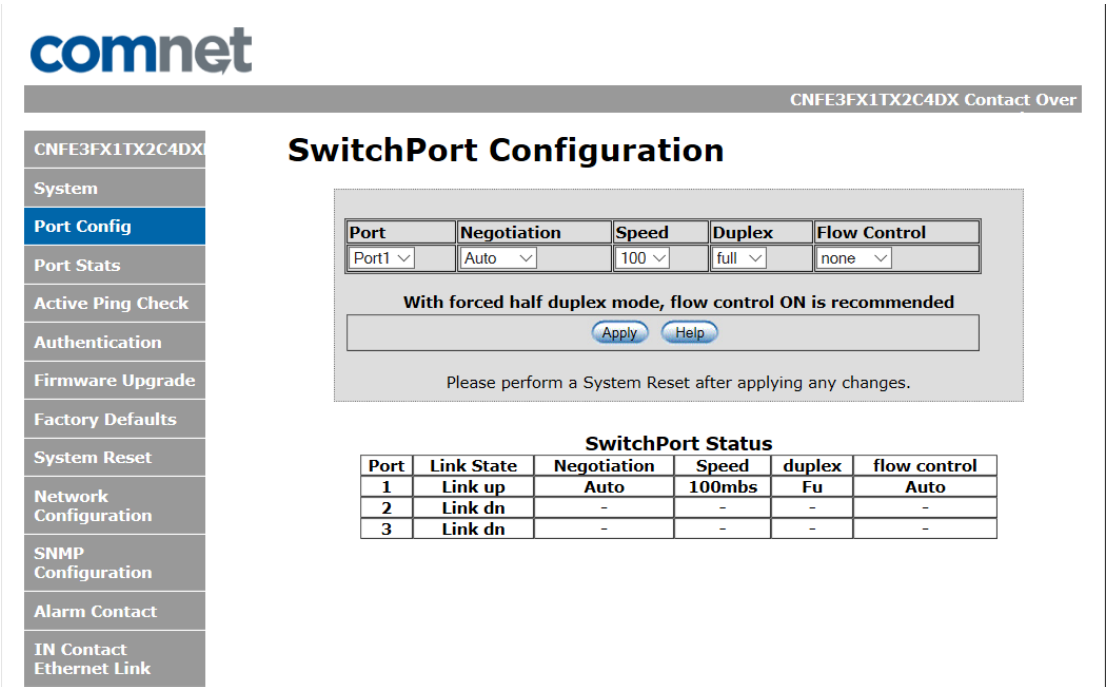
The switch system information is provided here



Label	Description
Enabled protocols	Summary table of enabled protocols
Temperature	Unit's internal board temperature reading
Port link status	Link status and port disable

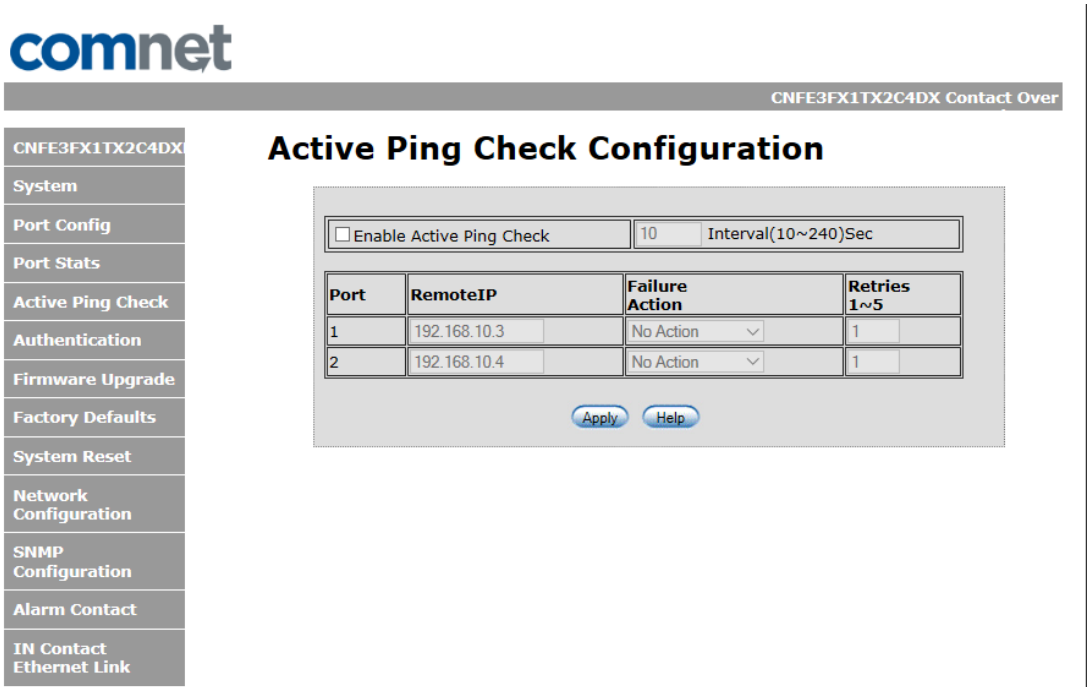
Switch Port Configuration

Unless you have reason to change this setting, it is recommended to leave the negotiation set to auto. The link segment requires forcing the settings. Both ends of the link need to have the same selection.



Active Ping Check Configuration

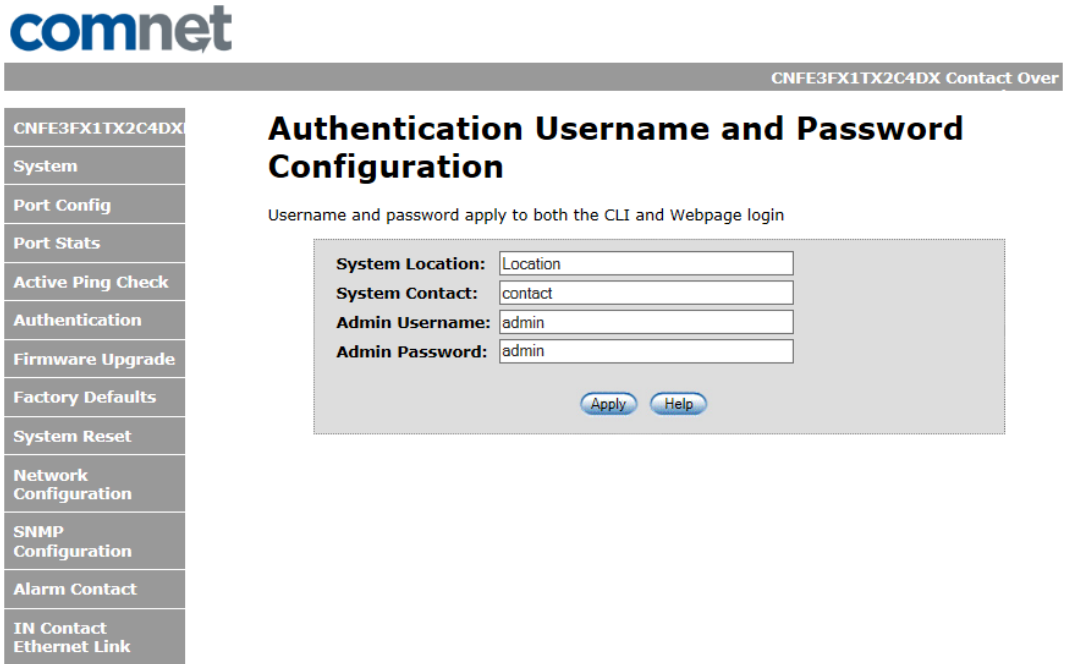
The active ping check function allows the switch to check that a configured IP address is alive on each of the RJ45 ports. If the specified IP address becomes unreachable then the switch will perform the action selected in the Failure Action menu.



Label	Description
Enable	Select to enable the active ping check function
Interval	Active ping check interval in seconds
Remote IP	Configure IP addresses of remote device to ping
Failure action	Configure action to take upon failure No Action - No action taken SNMP Trap - Issue an SNMP trap Power Down - Turn off the RJ45 port PwrDwn & Trap - Issue an SNMP trap and then turn off the RJ45 port
Retries	Number of times to retry the ping check on failure before proceeding with the selected failure action.

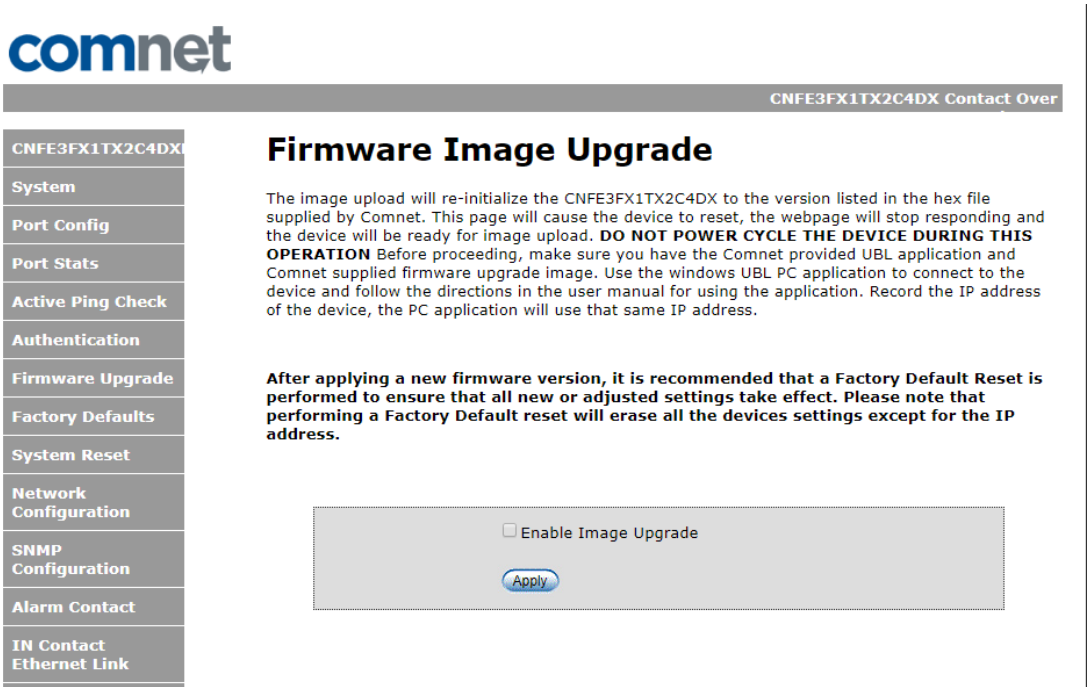
Authentication Username and Password Configuration

The username and password entered here are also used in the CLI.



Firmware Upgrade

Upgrade Firmware allows you to update the firmware of the switch. Before updating, have your Windows firmware update application ready and the firmware image is available. Many features are not available during the firmware update process so please, observe the network topology before upgrading.



Details on how to upload the new image is located in Firmware Upgrade section.

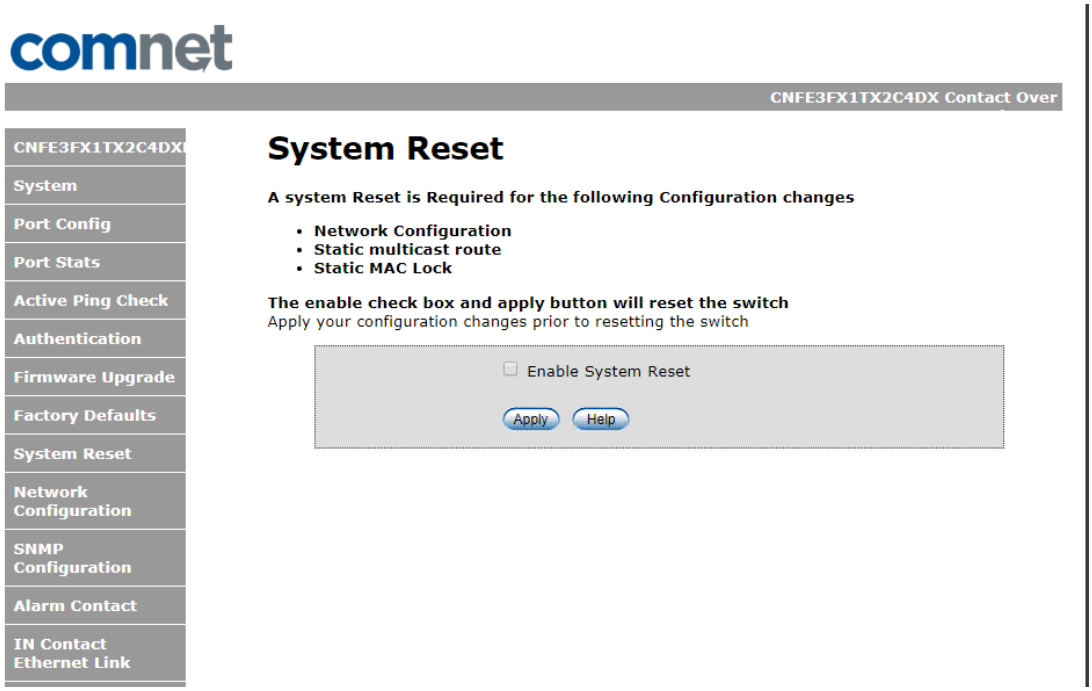
After applying a new firmware version, it is recommended that a Factory Default Reset is performed to ensure that all new or adjusted settings take effect. Please note that performing a Factory Default reset will erase all the devices settings except for the IP address.

Warning: Do not enable the firmware update process unless you have a firmware file available and are ready to upgrade the unit. Once this processed is started it cannot be cancelled and if a new firmware is not uploaded to the unit it will be necessary to return the unit to the factory for re-programming.

Factory Defaults

This function restores the system configuration back to the factory default values. All parameters will revert back to the original factory default values except the network configuration settings.

System Reset



This feature will perform a system reset.

Some system configuration changes require a system reset to take effect:

-File System updates

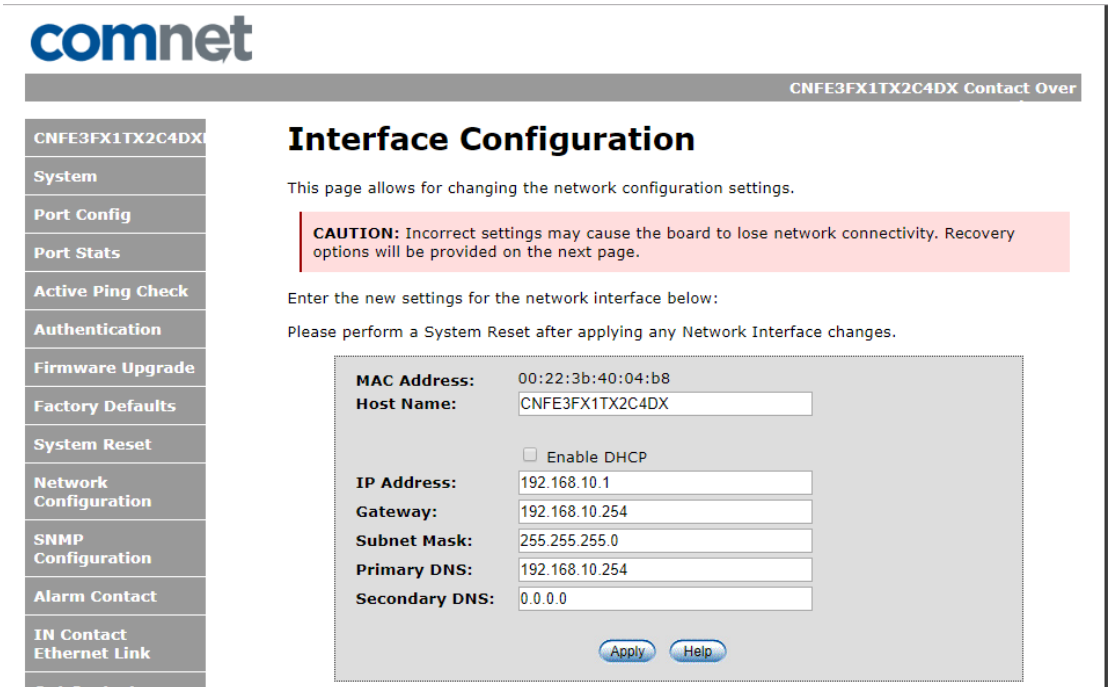
-Network configuration changes

- Static Mac Lock changes

- Static Mcast routing

After a system reset there may be a delay of up to 15 seconds before the device becomes responsive again.

Network Interface Configuration



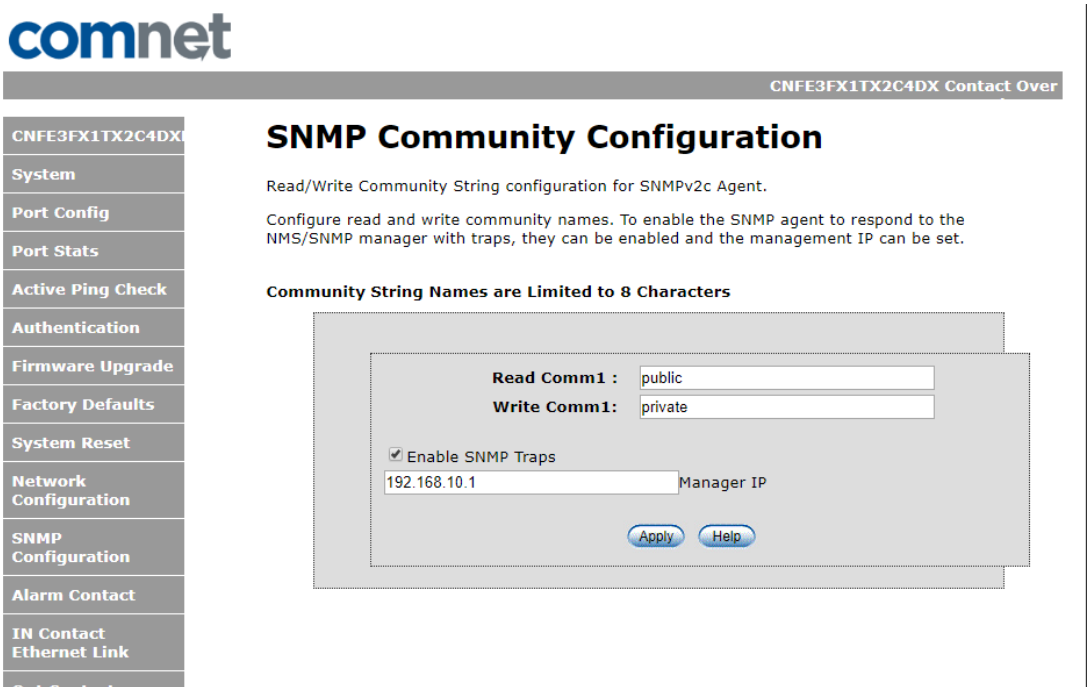
Label	Description
Host Name	Assign a name to the device (this is used for CLI and SNMP functions)
Enable DHCP	To enable or disable the DHCP client function. When DHCP client function is enabled, the switch will be assigned the IP address from the network DHCP server. The default IP address will be replaced by the IP address which the DHCP server has assigned.
IP Address	Assign the IP address that the switch will use. If DHCP client Function is enabled, you do not need to assign the IP address.
Gateway	Assign the network gateway for the switch.
Subnet MaskPrimary DNS	Assign the subnet mask for the switch.
Primary DNS	Assign the primary DNS IP address
Secondary DNS	Assign the secondary DNS IP address
Apply	Select Apply to set the configurations.

Note: A system reset must be performed after making changes to the network settings.

SMNP

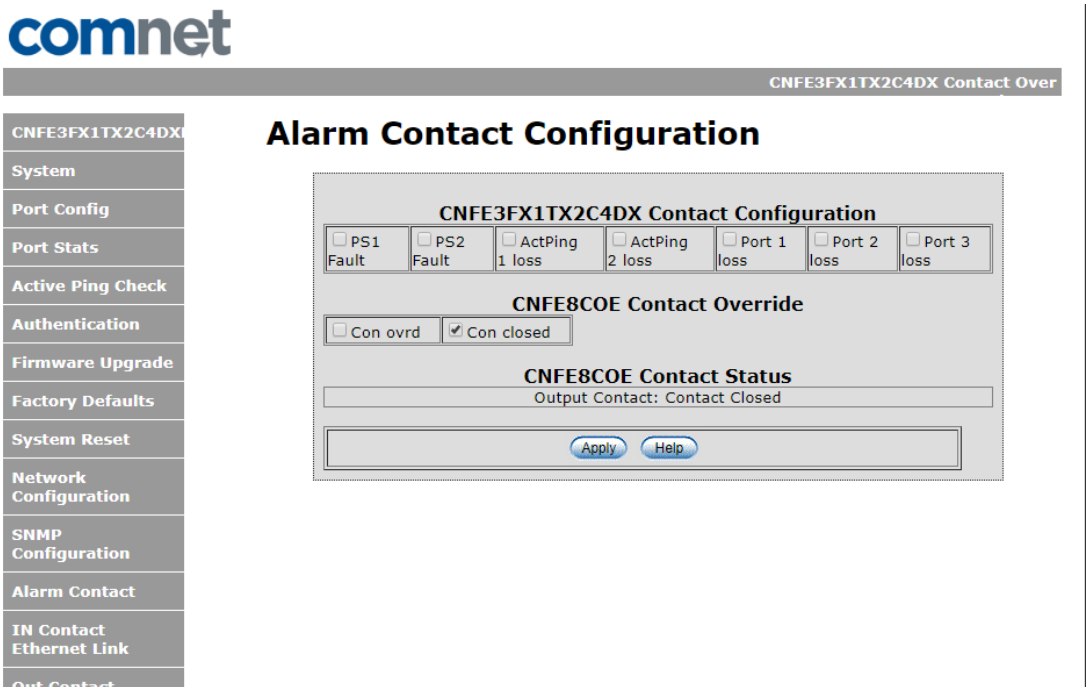
Simple Network Management Protocol (SNMP) is the protocol developed to manage nodes (servers, workstations, routers, switches and hubs etc.) on an IP network. SNMP enables network administrators to manage network performance, find and solve network problems, and plan for network growth. Network management systems learn of problems by receiving traps or change notices from network devices implementing SNMP.

SNMP - Config



Label	Description
SNMP V1/V2c Community	The switch supports one Read and one Write SNMP community string. Community string names are limited to 8 characters. To disable a community string leave its entry blank.
SNMP trap enable	Enable SNMP traps to be sent to the manager
Manager IP address	IP address of the management software
Apply	Select Apply to activate the configurations.
Help	Show help file.

Alarm Contact



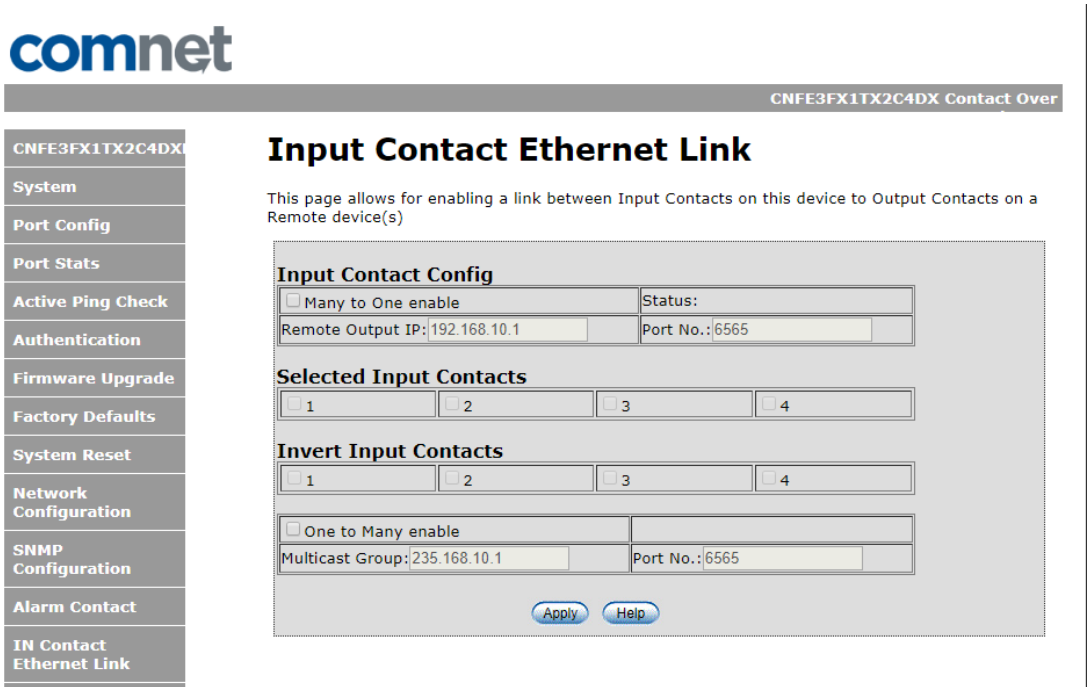
CNFE3FX1TX2C4DX Contact Configuration, allows for the setting of what happens when specific instances occur during the operation of the unit allowing for the triggering of the alarm contact.

CNFE3FX1TX2C4DX Contact Override, allows for the override and force setting of the alarm contact for testing and troubleshooting purposes.

CNFE3FX1TX2C4DX Contact Status shows the current status of the output of the alarm contact.

In Contact Ethernet Link

Allows for enabling a link between Input Contacts on a Host device to Output Contacts on a Remote device(s). Device's input contacts can be configured either One to One, or One to Many.



One to One:

Enabling this option, the Remote Output IP must match the IP Address of the device you wish to communicate with. This is also true for the Port Number. As well as enabling the One to One option the desired input contacts must be selected from the Selected Input Contacts section.

One to Many:

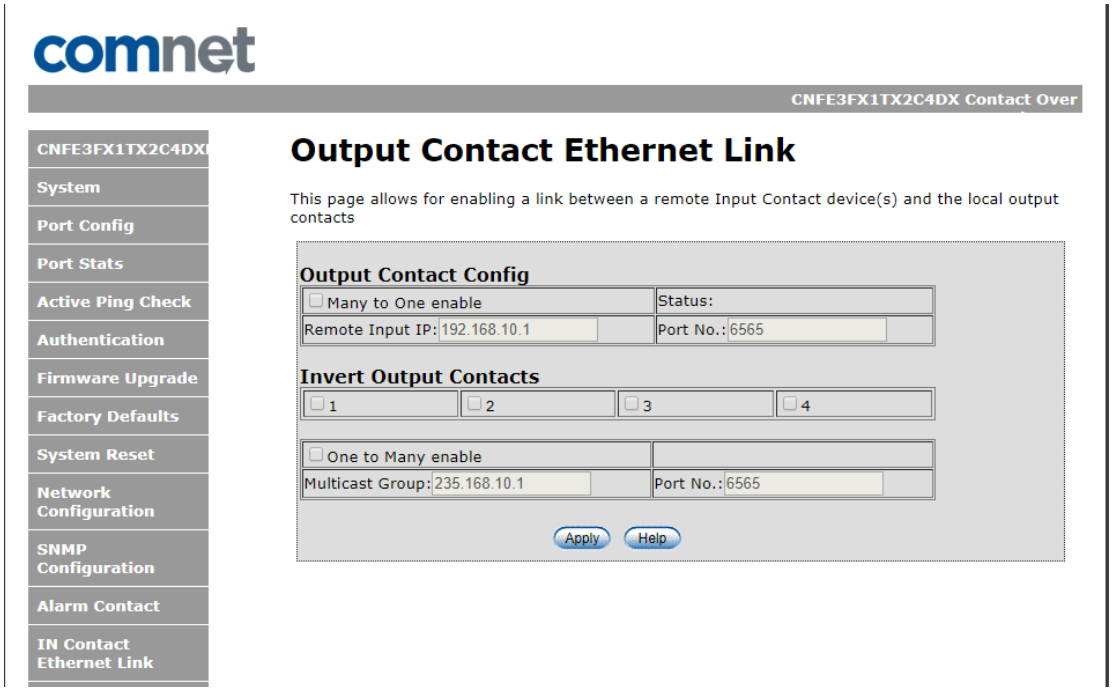
Enabling this option, allows for the use of multicasting the contacts between a group of devices within the same multicast group. For this work the Multicast Group and Port Number must match the same Multicast Group and Port Number as the Output Contact Configuration. As well as enabling the One to Many option the desired input contacts must be selected from the Selected Input Contacts section.

Selected Input Contacts:

These check boxes allow for the enabling and disabling of the input contacts on the Host device.

Out Contact Ethernet Link

Allows for enabling a link between a remote Input Contact device(s) and the local output contacts. Device's output contacts can be configured either One to One, or One to Many.



One to One:

Enabling this option, the Remote Output IP must match the IP Address of the device you wish to communicate with. This is also true for the Port Number.

One to Many:

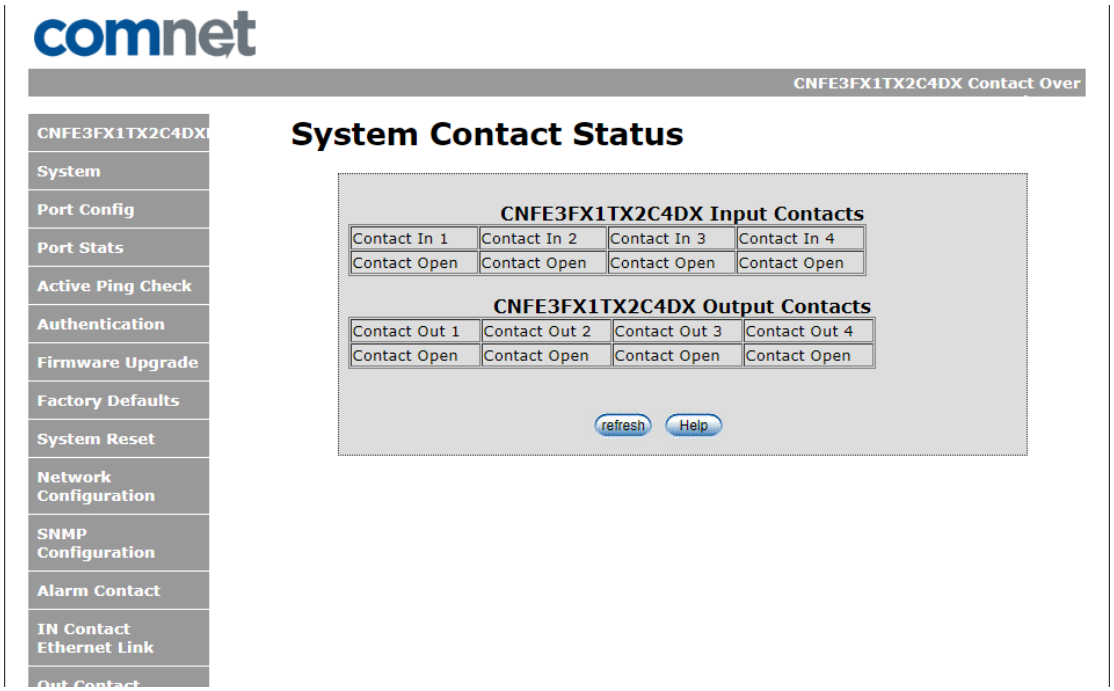
Enabling this option, allows for the use of multicasting the contacts between a group of devices within the same multicast group. For this work the Multicast Group and Port Number must match the same Multicast Group and Port Number as the Input Contact Configuration.

Retain Remote Data:

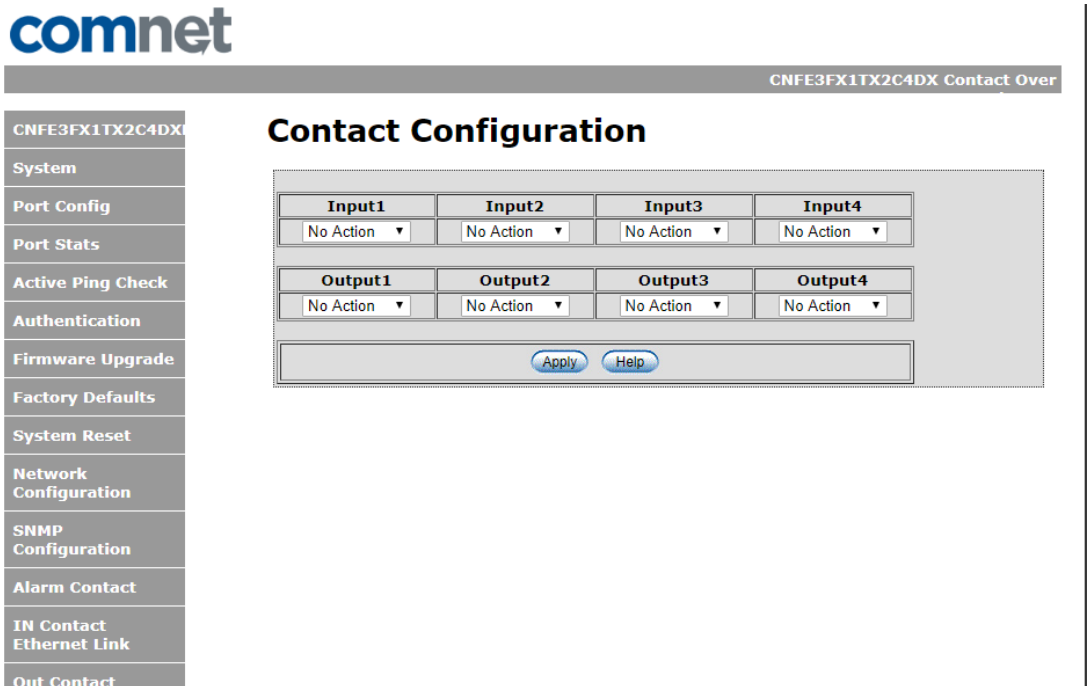
Enabling this option allows for the retention of the last data state when a link is lost and will hold until a new link is enabled.

Contact Status

Allows for a display of the current overview of the current states for the input and output contacts.

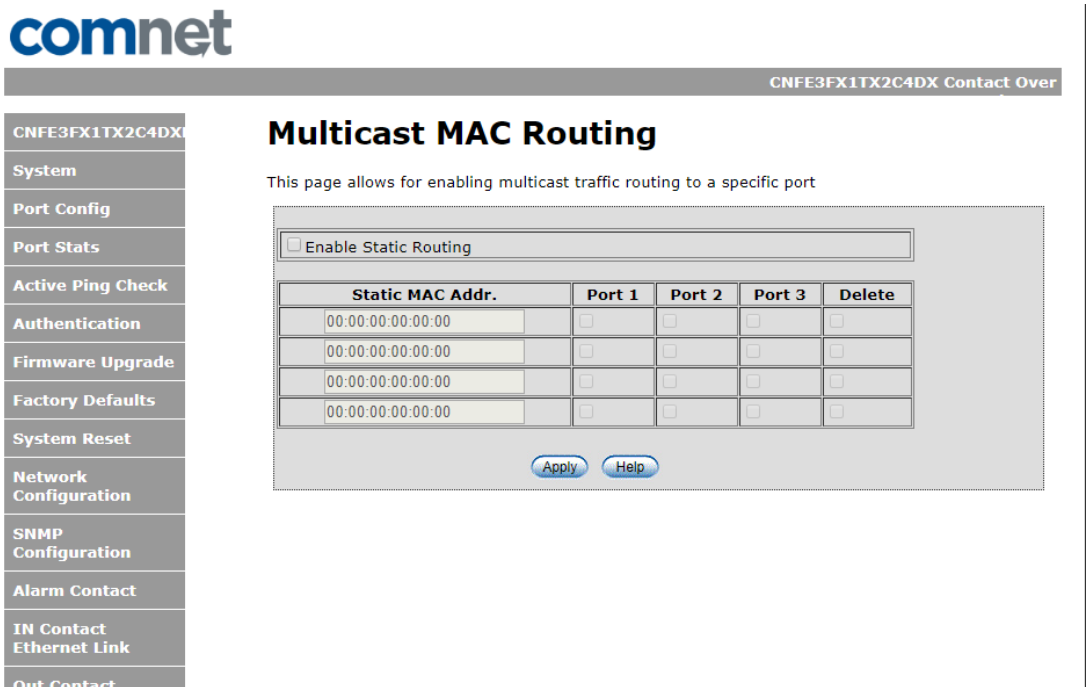


Contact Configuration



Contact Configuration allows for the configuration of each port for both input and output to trigger SMNP Traps.

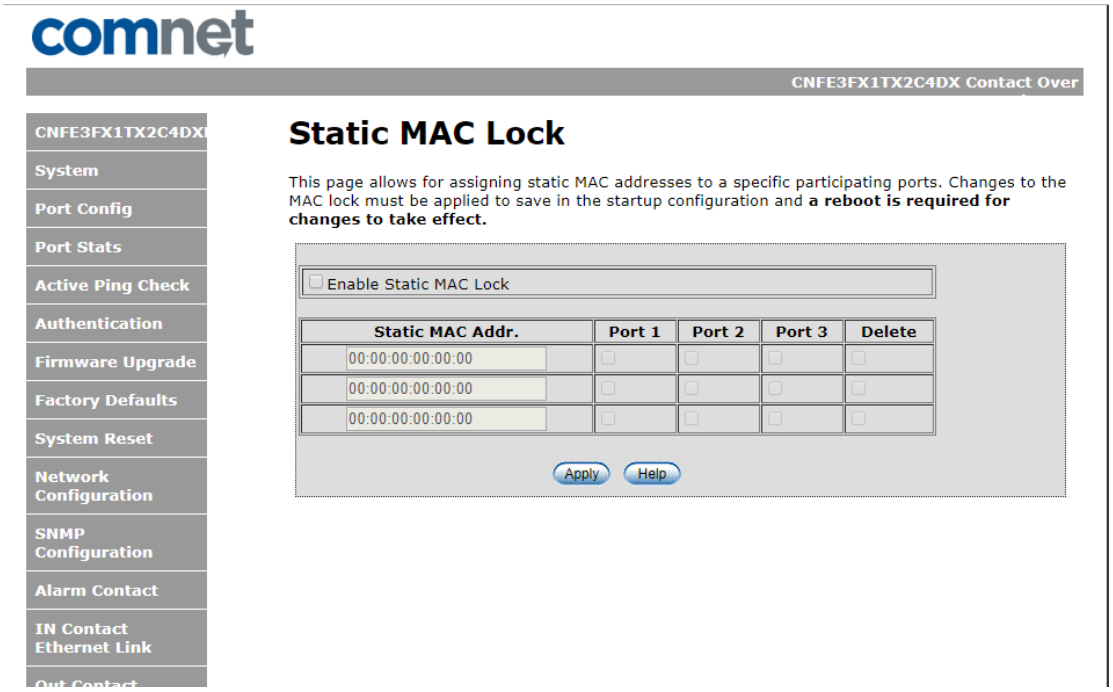
Static Multicast Routing Per Port



Label	Description
Enable	Enable static multicast MAC routing
MAC Addr.	Destination Multicast MAC address of the stream
Port Number	Ports to be included in the multicast route
Apply	Select Apply to activate the configurations.
Help	Show help file.

Note: A system reset must be performed after making changes to the MAC routing settings.

Static MAC Lock Configuration



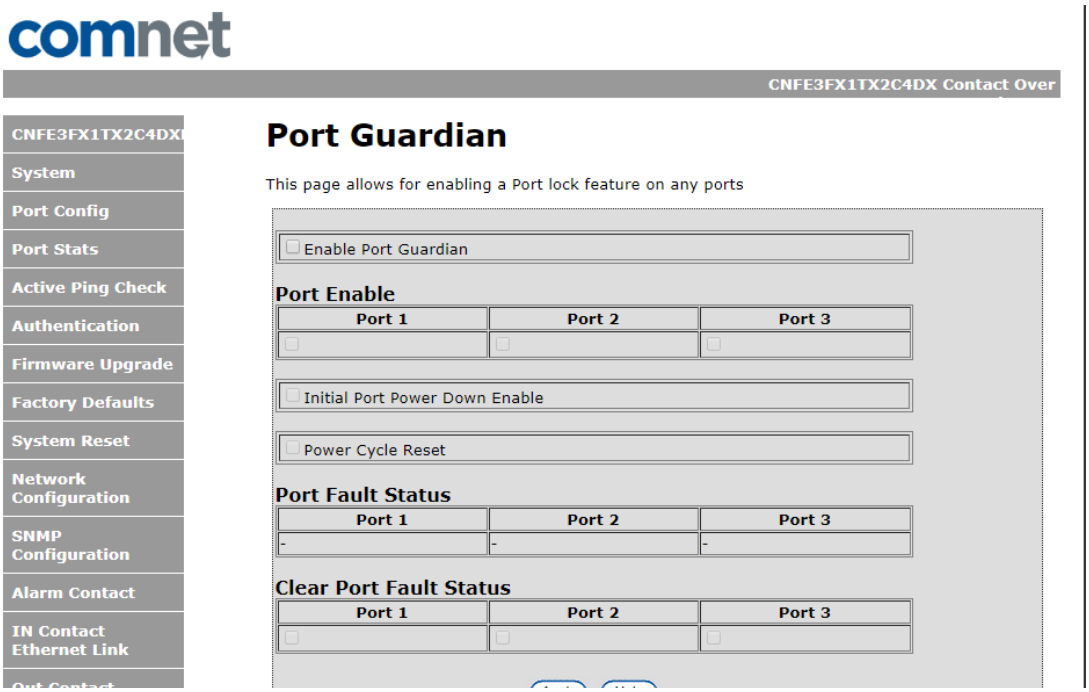
Label	Description
Enable	Enable static MAC locking
MAC Addr.	MAC address of the device that is allowed to forward and receive traffic. Packets will be dropped for MAC addresses not listed in the table stream
Port Number	Ports to be included in the locked list
Apply	Select Apply to activate the configurations.
Help	Show help file.

Note: A system reset must be performed after making changes to the static MAC lock settings.

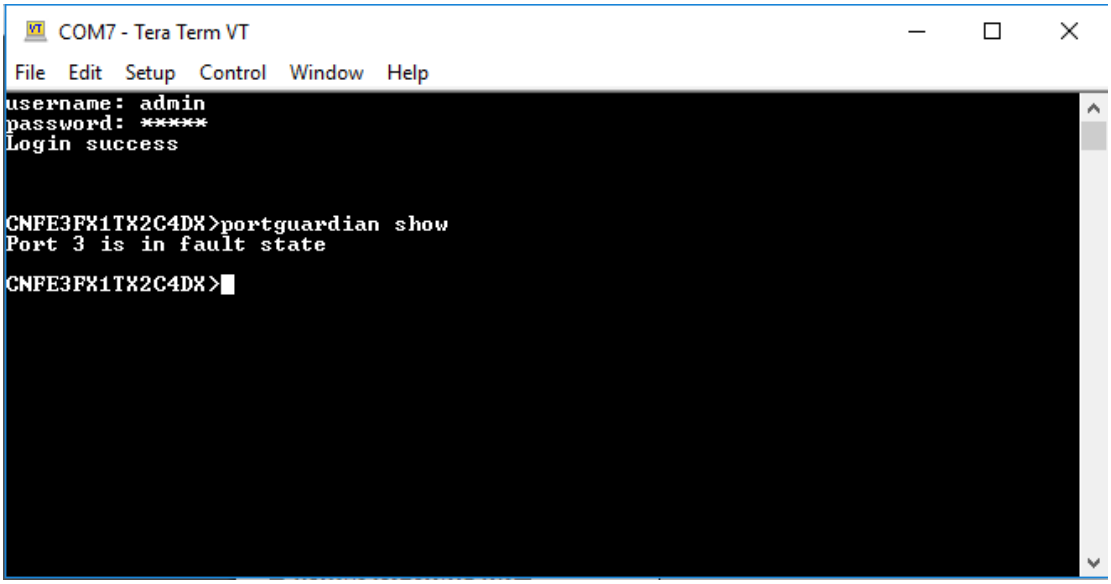
Port Guardian

The Port Guardian feature provides a high security managed port lock out mode and when enabled will power down the port as soon as a link loss status is detected when a cable is disconnected. This provides high security against network attack by an intruder who accesses the edge device and disconnects it to then try and connect their own intrusion device (laptop, network sniffer etc.).

To reset a port from a lock out state the network administrator can issue an SNMP reset or can reset a port by using the CLI via the USB serial port. In PoE models a reset can also be initiated by using one of the contact inputs.



Port Guardian – CLI Reset



Command	Description
portguardian show	Will display any ports that are currently in port lockout fault state.

Command	Description
portguardian clear	Will clear any ports that were previously in port lockout fault state.

Command Line Interface Management

Configuration by Command Line Interface (CLI).

About CLI Management

Besides WEB-base management, the CNGE4+2SMS also supports CLI management for network configuration. You can use USB console to manage the switch by CLI.

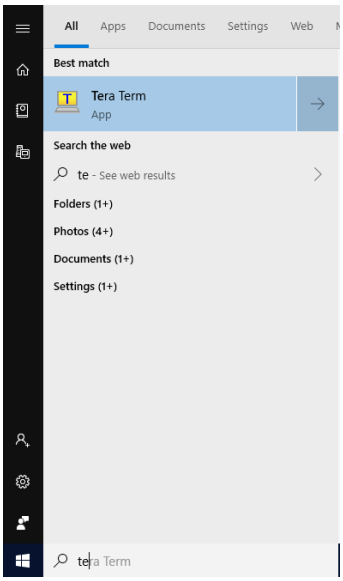
CLI Management by USB Console (115200, 8, none, 1, none)

Before configuring by USB console, use a USB mini B cable to connect the switch's Console port to your PC's USB port.

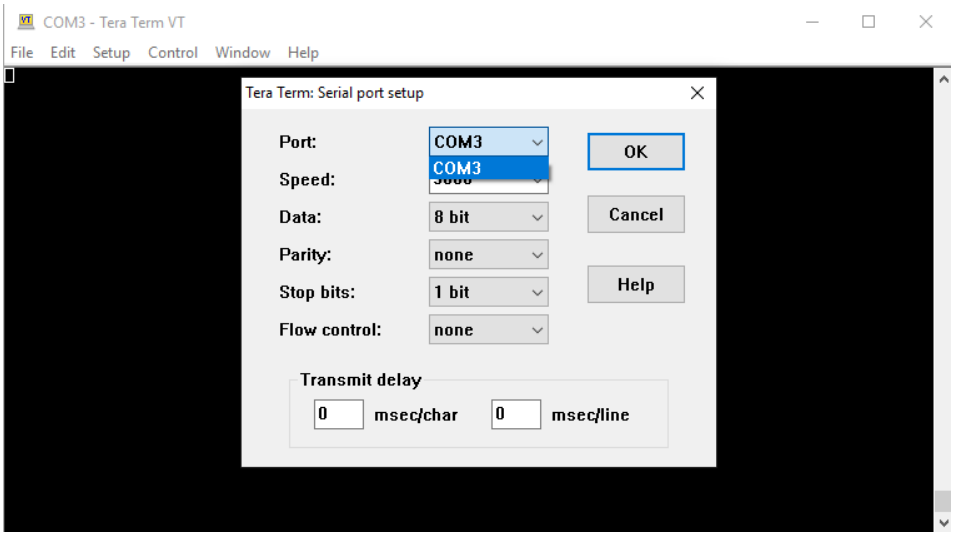
Follow the steps below to access the console via USB mini B cable.

Step 1. Connect the USB cable between the PC and the CNGE4+2SMS. If the device driver is not found, the product CD includes the windows .inf driver.

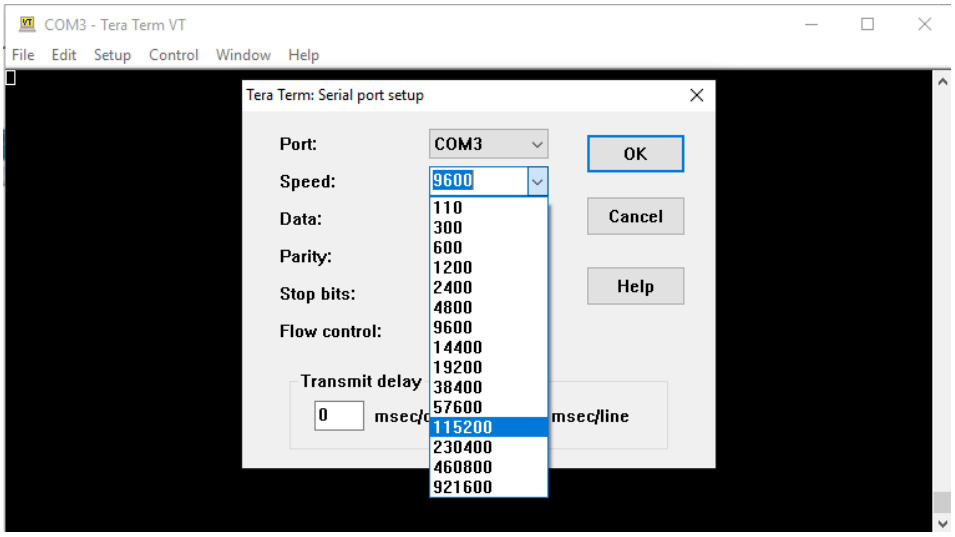
Step 2. From the Windows desktop, select on Start -> Tera Term



Step 3. Select the COM port number

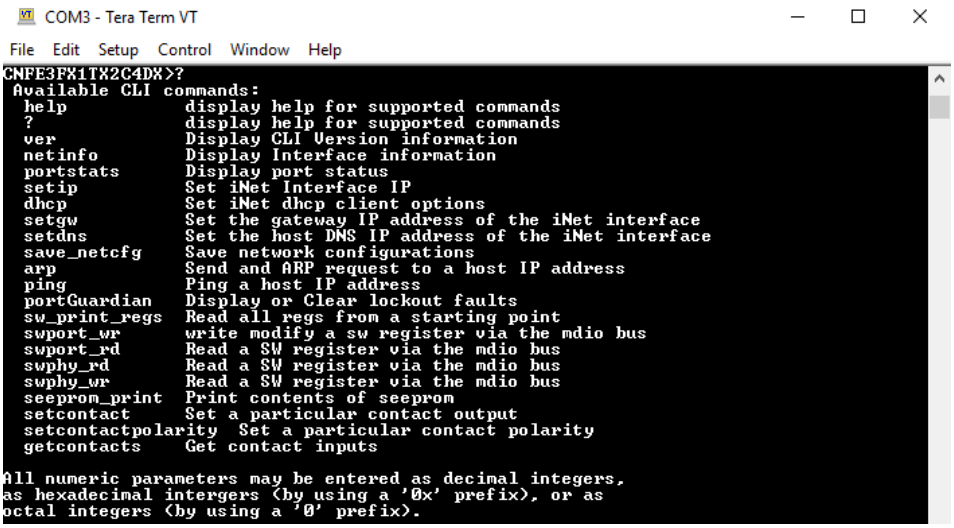


Step 4. The COM port properties setting, 115200 for Bits per second, 8 for Data bits, None for Parity, 1 for Stop bits and none for Flow control.

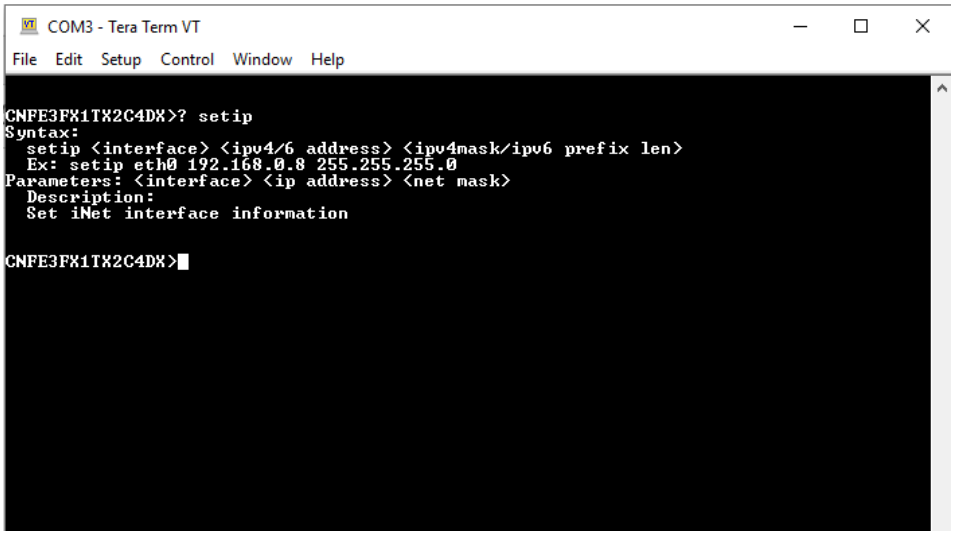


Step 5. Hit enter to initiate the connection and receive the username prompt. After entering the username and password the console will be presented with a CLI prompt.

Enter "?" or "help" to list the commands



More detailed help for each command is available using help in front of the command name.



Issuing a "netinfo" command will display the ip address of the switch

To change the network configuration using the CLI, the following commands must be used:

-setip

-setgw

-setdns

Save_netcfg if you want to save these changes in the startup configuration. Not using this command will not save the changes persistently.

Firmware Upgrade Procedure

The steps for upgrading the unit with the push boot loader are as follows;

1. Bring up the web server and open the FileSystem Upload page click the Enable Image upload check box and hit apply.

2. Open the Windows bootloader application, click the enable Ethernet check box and adjust the IP address to the target IP

3. Click the "Load Hex File" and select the new firmware file. - Click Erase - Click Program - Click Verify - Click run application Note: The "Erase-Program-Verify" button is not supported at this time. Please use the individual buttons.

Warning: Do not enable the firmware update process unless you have a firmware file available and are ready to upgrade the unit. Once this processed is started it cannot be cancelled and if a new firmware is not uploaded to the unit it will be necessary to return the unit to the factory for re-programming.

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