**N-TRON**
*THE INDUSTRIAL NETWORK COMPANY*

# 9000 Series Industrial Gigabit Ethernet Switch

# User Manual & Installation Guide

# Industrial Gigabit Ethernet Switch Installation Guide

## 9000 Series



The N-TRON® 9000 Series Gigabit Ethernet Capable Industrial Ethernet Switch offers outstanding performance and ease of use. It is ideally suited for connecting Ethernet enabled industrial and or security equipment and is a fully managed switch.

## PRODUCT FEATURES

• Full IEEE 802.3 Compliance
• Full IEEE 1613 Compliance (Electric Power Stations)
• NEMA TS1/TS2 Compliance (Traffic Control systems)
• ABS Type Approval (Maritime and Offshore Applications)
• Scaleable Switch with 4 I/O Slots
• Up to Twenty-four 10/100 BaseTX RJ-45 Ports
• Two Optional 1000BaseSX Ports, LC style
• Extended Environmental Specifications
• Autosensing 10/100BaseTX, Duplex, and MDIX
• Offers Rapid Spanning Tree Protocol
• Trunk with other N-Tron trunking capable switches
• Store & Forward Technology
• Plug and Play IGMP Support
• Rugged Din-Rail Enclosure
• Redundant Power Inputs (10-30 VDC)
• Full SNMP
• Web Browsing and N-View™ Switch Monitoring

## MODULE / SLOT OPTIONS

• 9000 CPU Module – Standard CPU Module
• 9002 CPU Module – CPU Module with 2 Gigabit Fiber Ports
• 9006 TX – 6 Port 10/100 Base-TX Copper Module
• 9004 FX – 4 Port 100 Base-FX Fiber Module
• 9002 FX – 2 Port 100 Base-FX Fiber Module

## MANAGEMENT FEATURES

• IGMP Snooping
• VLAN
• QoS
• Trunking
• Mirroring
• 802.1D-2004 Rapid Spanning Tree

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## Warning

Do not perform any services on the unit unless qualified to do so.  Do not substitute unauthorized parts or make unauthorized modifications to the unit.

Do not operate the unit with the top cover removed, as this could create a shock or fire hazard.

Do not block the air vents on the sides or the top of the unit.

Do not operate the equipment in the presence of flammable gasses or fumes.  Operating electrical equipment in such an environment constitutes a definite safety hazard.

Do not operate the equipment in a manner not specified by this manual.

## Safety Warnings

**GENERAL SAFETY**

**WARNING:**  If the equipment is used in the manner not specified by N-Tron Corp., the protection provided by the equipment may be impaired.

**LASER SAFETY** (FXE Models -40, -80 and 9002CPU-LX -40, -80)

**CAUTION:** CLASS 1 LASER PRODUCT. Do not stare into the laser!

**Contact Information**
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Mobile, AL  36609
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FAX: (251) 342-6353
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## ENVIRONMENTAL SAFETY

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

## ELECTRICAL SAFETY

**WARNING:** Disconnect the power cable before removing any modules, or any enclosure panel.

**WARNING:** Do not operate the unit with the any cover removed.

**WARNING:** Properly ground the unit before connecting anything else to the unit. Units not properly grounded may result in a safety risk and could be hazardous and may void the warranty. See the grounding technique section of this user manual for proper ways to ground the unit.

**WARNING:** Do not work on equipment or cables during periods of lightning activity.

**WARNING:** Do not perform any services on the unit unless qualified to do so.

**WARNING:** Do not block the air vents.

**WARNING:** Observe proper DC Voltage polarity when installing power input cables. Reversing voltage polarity can cause permanent damage to the unit and void the warranty.


**9000 Series Hazardous Location Installation Requirements**

1. **WARNING:** Explosion hazard, do not disconnect while circuit is live, unless area is known to be non-hazardous.

2. **WARNING:** Install only in accordance with Local & National Codes of Authorities Having Jurisdiction.

3. **WARNING:** This equipment is suitable for use in Class I, Div. 2, Groups A, B, C, D or Non-Hazardous Locations Only.

4. **WARNING:** Explosion Hazard – Substitution of Components May Impair Suitability For Class I, Div. 2.

5. Power must be supplied by an isolating source, and a 5.0 A max rated UL recognized fuse must be installed immediately before the unit.

6. Class I, Div 2 installations require that all devices connected to this product must be UL listed for the area in which it is installed.

7. Only UL listed wiring with temperature ratings greater than 90°C permitted for Class I, Div 2 installations operating at temperatures up to 70°C ambient.

8. Limited Operating Voltage: 12-30V for Class I, Div 2 installations.

9. Maximum operating voltage of power source shall not exceed 60 VDC including battery charging float voltage.

## PACKAGE CONTENTS

Please make sure the 9000 Series Gigabit Ethernet Switch package contains the following items:
1. 9000 Series Gigabit Ethernet Switch with modules or filler panels
2. Product CD

Contact your carrier if any items are damaged.

## INSTALLATION

Read the following warning before beginning the installation:

## WARNING

Never install or work on electrical equipment or cabling during periods of lightning activity. Never connect or disconnect power when hazardous gasses are present.



Disconnect the power cable before removing any enclosure panel.
Do not operate the unit with any covers removed

## UNPACKING

Remove all the equipment from the packaging, and store the packaging in a safe place. File any damage claims with the carrier.

## CLEANING

Clean only with a damp cloth.

## SERVICING

The 9000 Series is a modular based Gigabit Ethernet Switch with up to 4 slots for ports and one slot for the CPU module. Please follow the steps below for adding, removing, or swapping modules in the 9000 series switch. Technicians performing the following steps should wear proper anti-static equipment to protect the circuit boards. **WARNING: The 9000 series switch is NOT hot swappable. Removing or adding modules while the power is still on can damage the equipment.**

**Adding or Replacing a Module:**
1. Remove power from the switch.
2. Unscrew the two thumb screws for the filler panel or module that you are replacing.
3. Using both hands pull on both thumb screws to slide the filler panel or module you are replacing off the 9000BP.
4. Align the new module such that it slides on the rails and firmly push it into the unit.
5. Screw both thumb screws down till they are finger tight.
6. Reapply the power and configure the slots on the 9000 either through the web management interface or the serial management interface.
7. In order to verify the settings have been configured and saved correctly, you may want to view the Logical View page in the found in the web browser interface. The dynamic illustration displayed on the Logical View page must match the physical switch configuration respectively in order for the switch to function correctly. If not, please repeat the steps listed above.
8. Validation of the configuration and each physical cable segment may be obtained by using
9. N-View™ OPC Server software. The software is freely distributed on the ProductCD and our web site (http://www.ntron.com/pdf/setup_nviewopc.zip). Once N-ViewOPC is installed, you should view the Ports Counter page view each connected port. You may find it helpful to copy [Alt]+[PrintScreen] the Port Counter information for each port and paste [Control]+[V] into a Windows document for further review. Please consult your N-View OPC Server manual for additional information.

NOTE: Modules should be installed in slot order (from left to right). So in a 2 slot configuration Slots A and B are populated. Empty slots must be covered with a 9000-FP to meet emission standards.

**Replacing a CPU Module:**
1. Remove power from the switch.
2. Unscrew the two thumb screws for the CPU module that you are replacing.
3. Using both hands pull on both thumb screws to slide the CPU module out of the 9000BP.
4. Align the new CPU Module such that it slides on the rails and firmly push it into the unit.
5. Screw both thumb screws down till they are finger tight.
6. Reapply the power to the switch.

NOTE: All configuration settings are saved to the NVRAM which is stored locally on the CPU Module. If you replace the CPU Module all settings will move with the CPU Module. You can save and download a custom configuration to a TFTP or an FTP server. The switch's MAC Address and IP Address will also move with the CPU Module.

## DIN-Rail Mounting

Install the unit on a standard 35mm Din-Rail. Recess the unit to allow at least 5" of horizontal clearance for fiber cable bend radius.
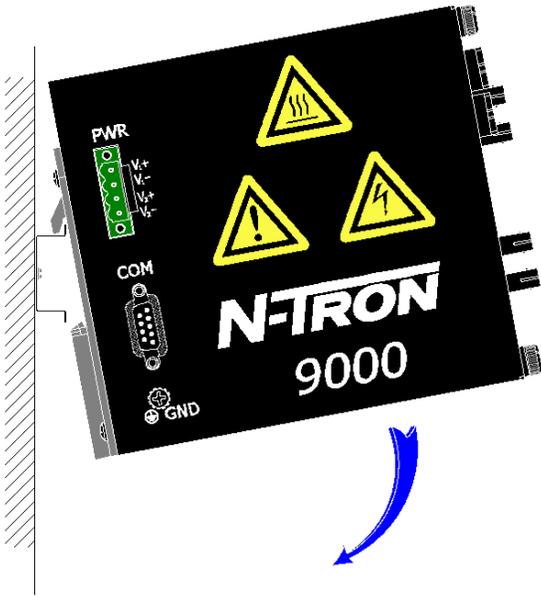


To mount the unit to the 35mm din-rail, place top edge of the bracket on the back of the unit against the din-rail at a 45° upward angle. Lower the bottom of the unit until it snaps into place.
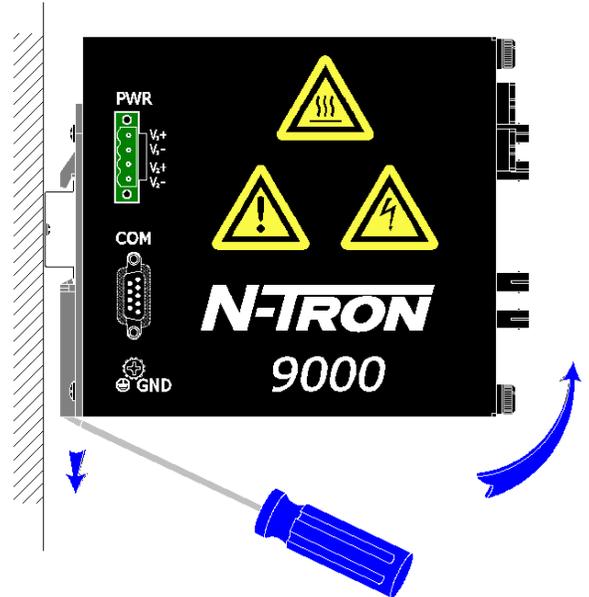
To remove the unit from the 35mm din-rail, place a flat head screwdriver into the release clip at the bottom of the unit, and push down on the clip until it disengages from the bottom of the unit from the din-rail. Lift the bottom of the unit up at an approximate 45° upward angle to completely remove the unit.
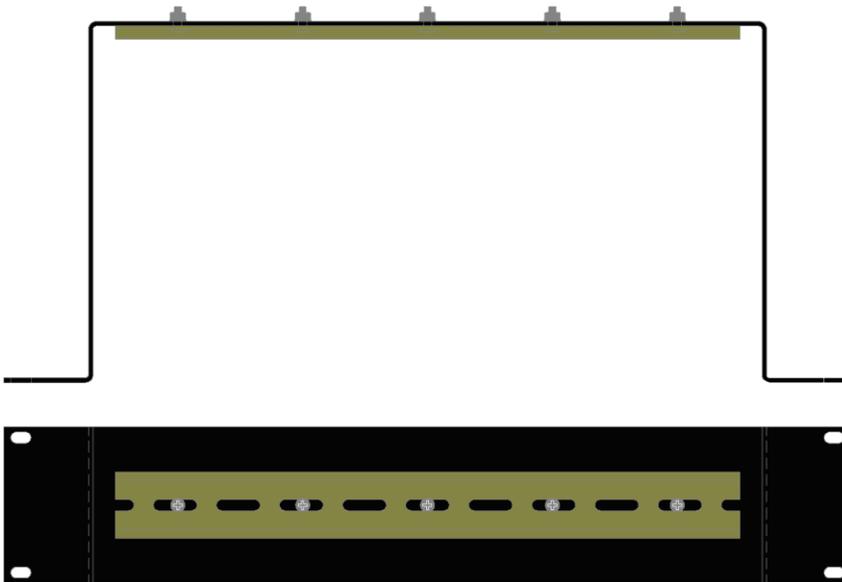


Most N-Tron products are designed to be mounted on industry standard 35mm DIN-Rail. However, DIN-Rail mounting may not be suitable for all applications. Our Universal Rack Mount Kit (P/N: URMK) may be used to mount the 9000 Series to standard 19" racks as an option.

## Panel Mount Mounting

Install the unit directly on a wall or sturdy panel such as a bulkhead. Recess the unit to allow at least 5" of horizontal clearance for fiber cable bend radius.
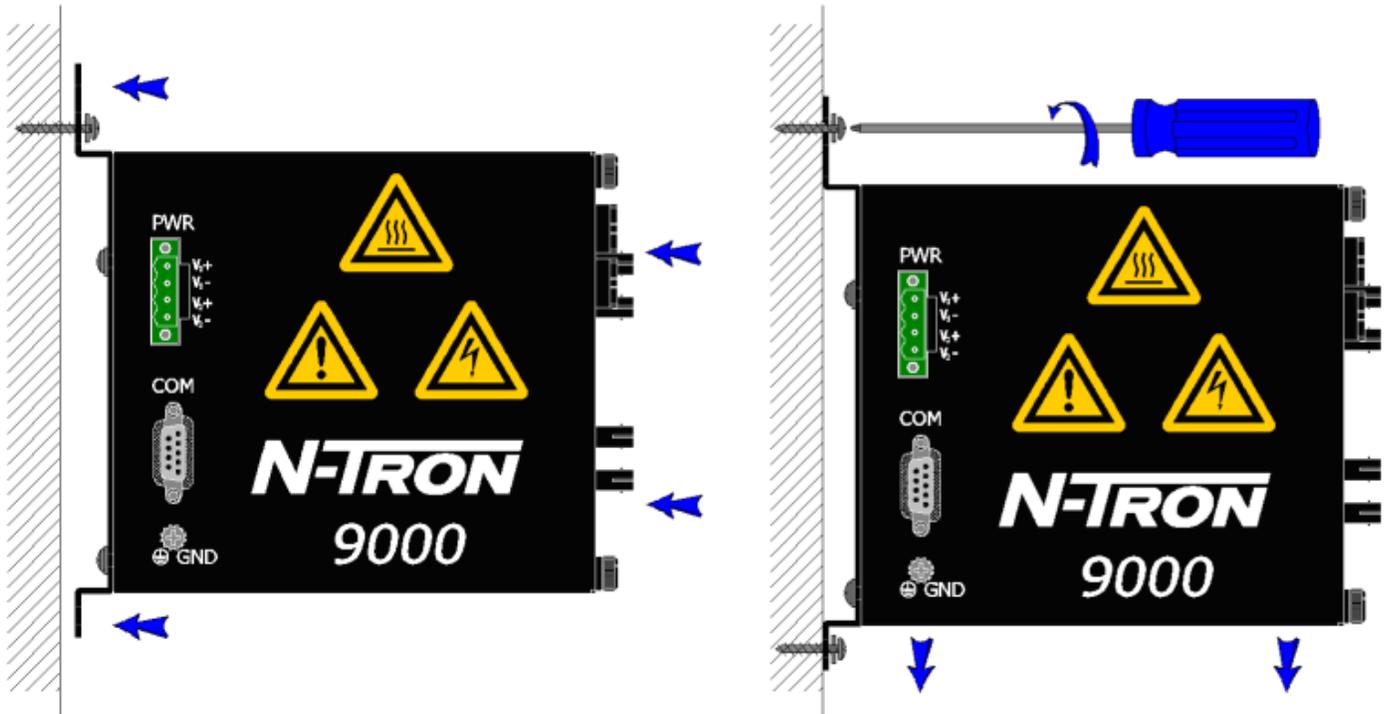


To bulkhead mount the unit, place top edge of the bracket on the back of the unit against two screws at a 45° upward angle. Lower the bottom of the unit until it is flush with the wall, and secure the bottom of the unit with two more screws.
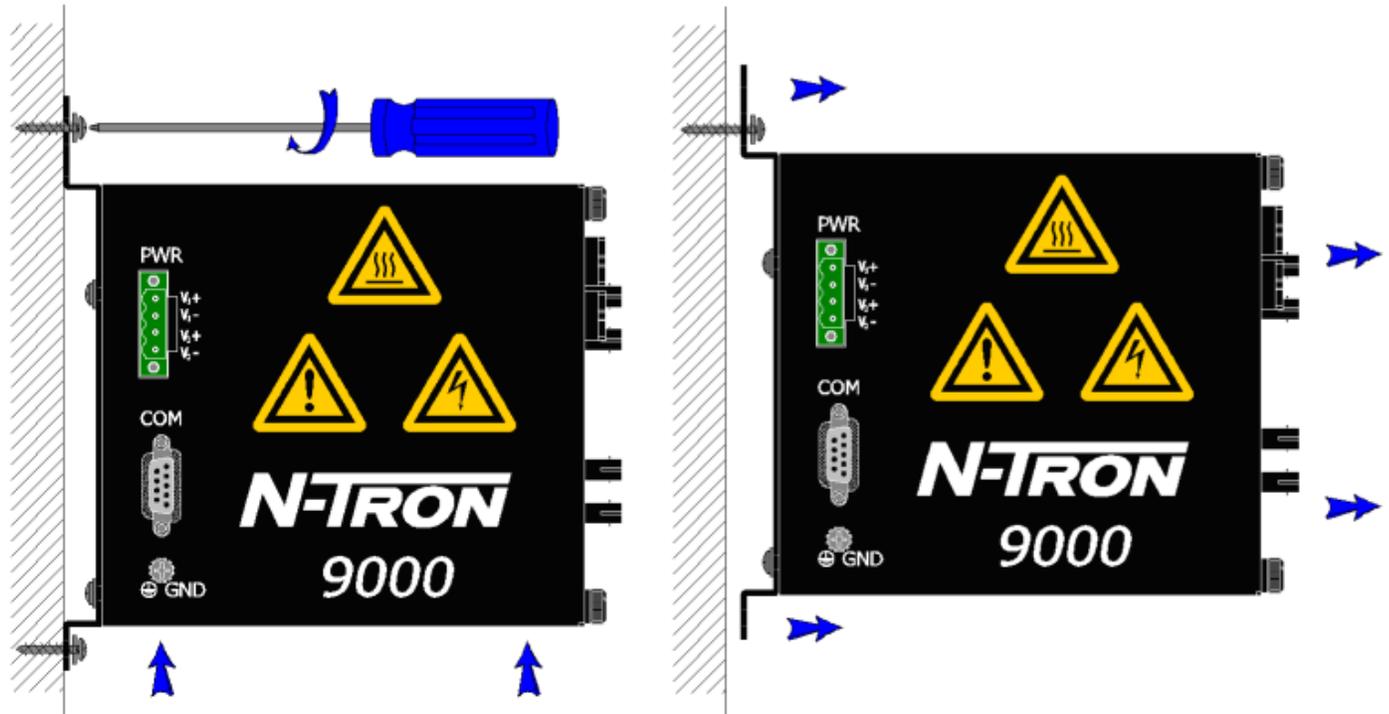


To remove the unit from a wall, remove the bottom two screws that secure it to the wall and slide the unit up until the top two screws will fit through the larger holes on the unit. The switch should then freely come away from the wall.

**FRONT PANEL**
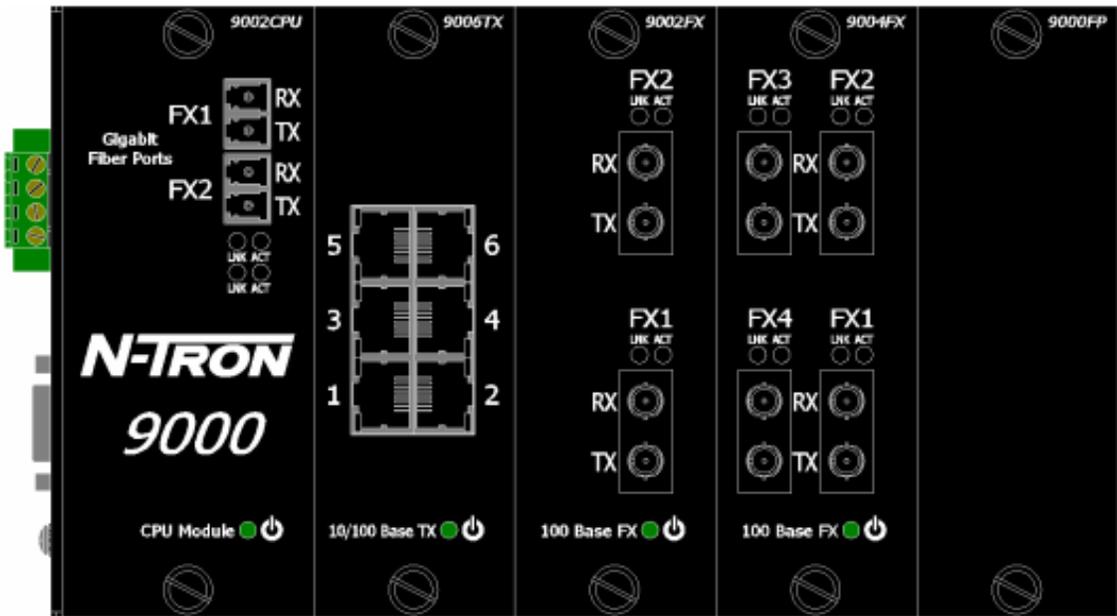


**From Top to Bottom:**

| | |
|---|---|
| **Gigabit Ports** | 1000 Base-SX Connections |
| **Fiber Ports** | 100 Base-FX Connections |
| **RJ45 Ports** | Auto sensing 10/100 Base-TX Connections |
| ⏻ | Green LED lights when Power is supplied to the module |

NOTE: The RJ45 data port has two LED's located at the side of the connector. The bottom LED indicates LINK status, and the top LED indicates ACTIVITY.

**LED's:** The table below describes the operating modes:

| LED | Color | Description |
|---|---|---|
| ⏻ | GREEN | Power is Applied |
| | OFF | Power is OFF |
| **LNK** | GREEN | 10/100/1000Mb Link between ports |
| | OFF | No Link between ports |
| **ACT** | GREEN | Data is active between ports |
| | OFF | Data is inactive between ports |

**APPLYING POWER (Side View)**



- Unscrew & Remove the DC Voltage Input Plug from the Power Input Header
- Install the DC Power Cables into the Plug (observing polarity).
- Plug the Voltage Input Plug back into the Power Input Header.
- Tightening torque for the terminal block power plug is **0.5 Nm/0.368 Pound Foot.**
- Verify the Power LED stays ON (GREEN).

**Note:** Only 1 power supply must be connected to power for minimal operation. For redundant power operation, $V_1$ and $V_2$ inputs must be connected to separate DC Voltage sources. This device will draw current from both sources simultaneously. Use 16-28 gauge wire when connecting to the power supply.

Recommended 24V DC Power Supplies, similar to: N-Tron's P/N **NTPS-24-5**

- Input AC 100V…240V
- Output DC 24V…28V
- Output Current 5A
- Peak Current 7.5A for 4 sec.

- Power 120W
- Peak Power 180W (max 4 sec.)
- 35 mm DIN-Rail Mountable
- Dimensions: 1.57"W x 4.88"H x 4.61"D

# N-TRON SWITCH GROUNDING TECHNIQUES

The grounding philosophy of any control system is an integral part of the design. N-Tron switches are designed to be grounded, but the user has been given the flexibility to float the switch when required. The best noise immunity and emissions (i.e. CE) are obtained when the N-Tron switch chassis is connected to earth ground via a drain wire. Some N-Tron switches have metal din-rail brackets that can ground the switch if the din-rail is grounded. In some cases, N-Tron switches with metal brackets can be supplied with optional plastic brackets if isolation is required.
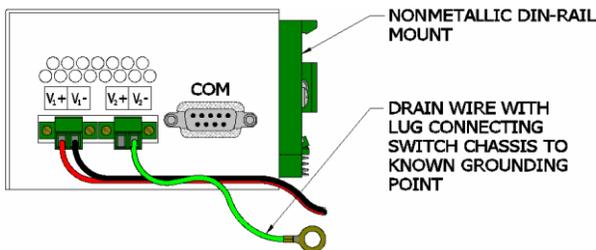


Both V- legs of the power input connector are connected to chassis internally on the PCB. Connecting a drain wire to earth ground from one of the V- terminal plugs as shown here will ground the switch and the chassis. The power leads from the power source should be limited to 3 meters or less in length.

As an alternate, users can run a drain wire & lug from any of the Din-Rail screws or empty PEM nuts on the enclosure. When using an unused PEM nut to connect a ground lug via a machine screw, care should be taken to limit the penetration of the outer skin by less than 1/4 in. Failure to do so may cause irreversible damage to the internal components of the switch.

Note: Before applying power to the grounded switch, you must use a volt meter to verify there is no voltage difference between the power supply's negative output terminal and the switch chassis grounding point.
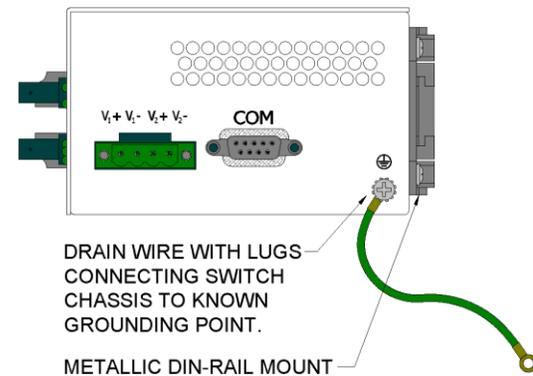


If the use of shielded cables is required, it is generally recommended to only connect the shield at one end to prevent ground loops and interfere with low level signals (i.e. thermocouples, RTD, etc.). Cat5e cables manufactured to EIA-568A or 568B specifications are required for use with N-Tron Switches.



In the event all Cat5e patch cable distances are small (i.e. All Ethernet devices are located the same local cabinet and/or referenced to the same earth ground), it is permissible to use fully shielded cables terminated to chassis ground at both ends in systems void of low level analog signals.

# CAT5 CABLE SPECIFICATIONS

Please reference the illustration below for your Cat5 cable specifications:
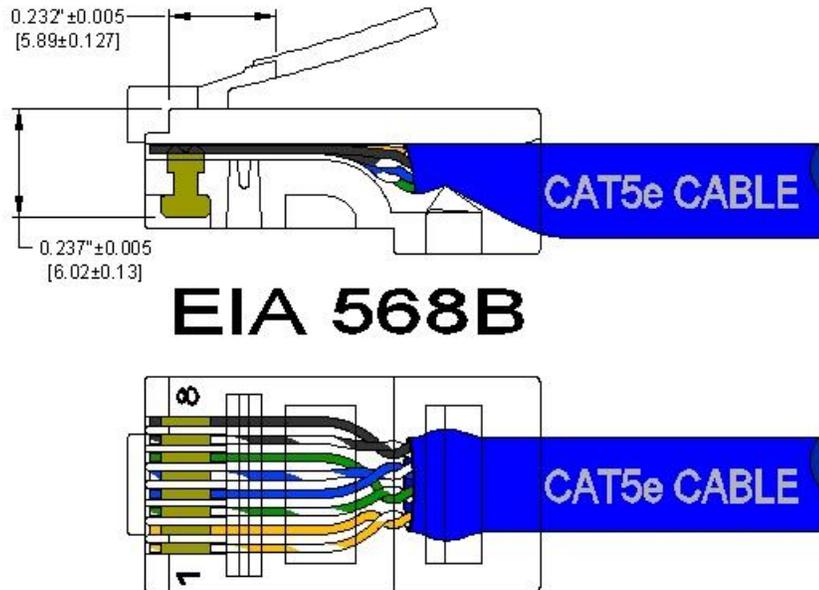
## CONNECTING THE UNIT

For FX/FXE units, remove the dust cap from the fiber optic connectors and connect the fiber optic cables. The TX port on the FX/FXE models should be connected to the RX port of the far end station. The RX port on the FX/FXE versions should be connected to the TX port of the far end station.

For 10/100 Base-TX ports, plug a Category 5E twisted pair cable into the RJ45 connector. Connect the other end to the far end station. Verify that the LNK LED's are ON once the connection has been completed. To connect any other port to another Switch or Repeater, use a standard Category 5 straight through or crossover cable.

N-Tron recommends the use of pre-manufactured Cat5E cables to ensure the best performance. If this is not an option and users must terminate their own ends on the Cat5E cables; one of the two color coded standards shown to the right should be utilized. If a user does not follow one of these two color code standards then the performance and maximum cable distance will be reduced significantly, and may prevent the switch from establishing a link.



EIA 568A          EIA 568B
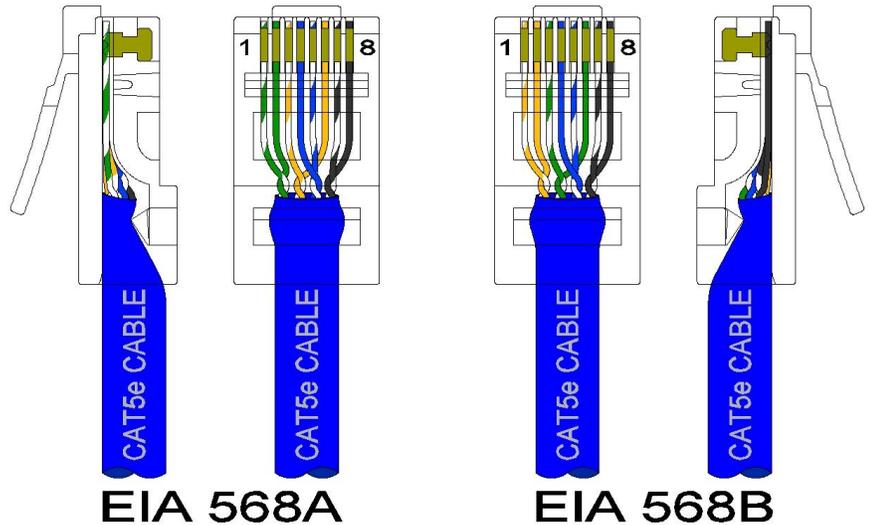
**Warning:** In absence of RSTP or Proprietary Ring control on the specific ports connected, creating a port to port connection on the same switch (i.e. loop) is an illegal operation and will created a broadcast storm which will crash the network!

## SERIAL INTERFACE

The 9000 series switches provide an EIA-232 interface accessed via a 9 pin female connector (labeled 'COM' on the unit). This is used to access the Command Line Interpreter (CLI). The pin-outs are shown below:



DB9 FEMALE
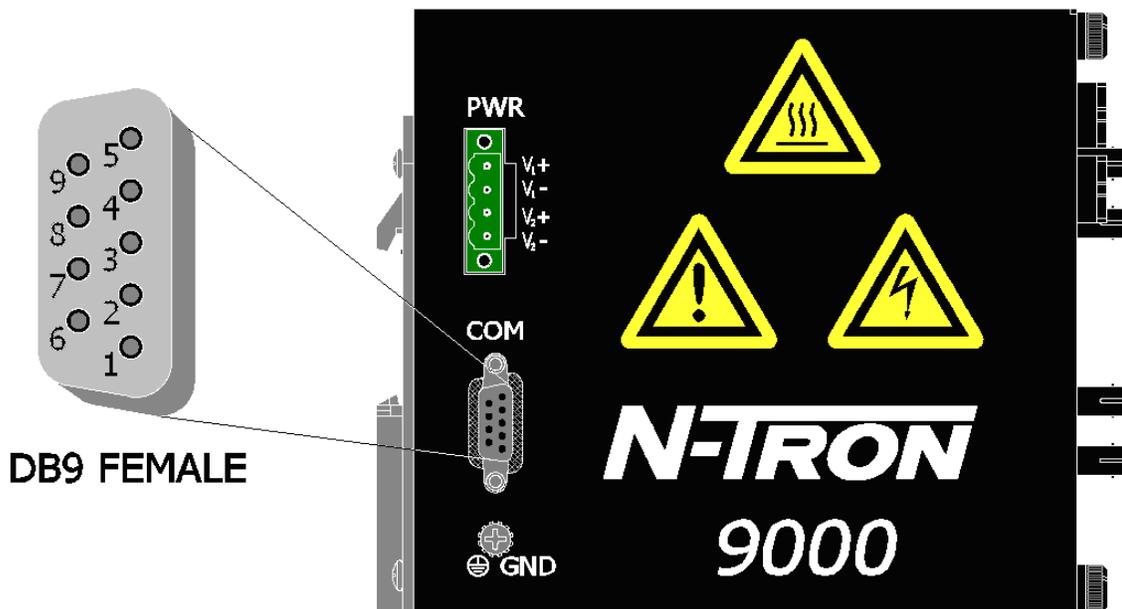
**Serial Cable**

Connect the serial COM port of your PC and the 9000 Series Switch using a standard straight through cable. You will require a cable with a 9-pin or 25-pin sub-D female connector for the PC end, and a 9-pin male sub-D connector for the 9000 Series end.

The following table shows the pin-out and the connections for both types of cable:

| PC Port | 25-Pin Female | 9-Pin Female | 9000 series 9-Pin Male | |
|---|---|---|---|---|
| **Signal Name** | **Pin #** | **Pin #** | **Pin #** | **Signal Name** |
| TXD | 2 | 3 | 3 | RXD |
| RXD | 3 | 2 | 2 | TXD |
| GND | 7 | 5 | 5 | GND |

Shielded cables and null modems are readily available from Radio Shack or a variety of computer stores.

**HyperTerminal**

The following configuration should be used in HyperTerminal:

Port Settings:      115200
Data Bits:          8
Parity:             None
Stop bits:          1
Flow Control:       None

**Overview of Advanced Features**

**Mode of Operation**

Each port on the switch can be configured into different modes of operation as shown below:

| Copper Ports: | 100Base Fiber Ports: | 1000Base Fiber Ports: |
|---|---|---|
| - Half Duplex | - Full Duplex | - Full Duplex |
| - Full Duplex | | |
| - Auto Negotiation | | |

**Half Duplex**

In half duplex mode, the CSMA/CD media access method is the means by which two or more stations share a common transmission medium. To transmit, a station waits (defers) for a quiet period on the medium (that is, no other station is transmitting) and then sends the intended message in bit-serial form. If, after initiating a transmission, the message collides with that of another station, then each transmitting station intentionally transmits for an additional predefined period to ensure propagation of the collision throughout the system. The station remains silent for a random amount of time (backoff) before attempting to transmit again.

**Full Duplex**

Full duplex operation allows simultaneous communication between a pair of stations using point-to-point media (dedicated channel). Full duplex operation does not require that transmitters defer, nor do they monitor or react to receive activity, as there is no contention for a shared medium in this mode.

**Auto Negotiation**

In Auto Negotiation mode the port / hardware detects the mode of operation of the station that is connected to this port and sets its mode to match the mode that of the station.

**Port Security**

Port Security provides a mechanism to detect any intruder in the network. When security is enabled on the port, the port stops learning new MAC addresses on that port and if it receives any packet with a source MAC address that is not in the address table, the packet will be discarded.

**Port Mirroring**

A Mirroring Port is a dedicated port that is configured to receive the copies of Ethernet frames that are being transmitted out and also being received in from any other port that is being monitored.

**Port Trunking**

Port Trunking is the ability to group one or more network ports to increase the bandwidth between two machines (switch or any work station). This feature allows grouping of high-speed connectivity and provides redundant connection between switches, so that trunk can act as a single link between the switches.

**Priority Tagging (QoS)**

IEEE 802.1p priority tagging is supported for two classes of services along with bandwidth support per priority level. Transparent mode is supported through configuration wherein if the field is set, the tag bits are ignored. The User can configure up to 8 different priority levels per port. Also priority overriding (overriding the tagged filed) can be enabled or disabled by the user.

**Virtual LAN**

The switch provides support for setting up both tagged Virtual LANs and port based Virtual LANs. A port may belong to any number of Virtual LANs. The VLAN membership of a station is determined by the VLAN(s) that have been defined for the port to which the station is connected. If a station should move from one port to another, it loses its current VLAN membership and inherits that of the new port it is connected to.

A Default Virtual LAN exists to which a port, which is not a member of any other Virtual LAN, will belong. This allows the switch to operate as a 'normal' Bridge when it is used in a network. A port is automatically removed from the Default VLAN when it is reconfigured to belong to another Virtual LAN.

Using Tagged VLANs the switch has the ability to take non-tagged packets in some ports, add a VLAN tag to the packet and send it out tagged ports on the switch. The VLANs can also be configured to accept tagged packets in tagged ports, strip the tags off the packets, and send the packets back out other untagged ports. This allows a network administrator to set up the switch so he can support devices on the network that do not support VLAN Tagged packets. The administrator can also set up the ports to discard any packets that are tagged or to discard any packets that are untagged based on a hybrid VLAN of both tagged and untagged ports, and using the VLAN Ingress Filter on the switch.

The 9000 Series switch also has the ability to allow overlapping VLANs. Overlapping VLANs gives the user the ability to have one or more ports share two or more VLAN groups. For more information and examples on how this could be implemented please see our website's technical documents.


**Rapid Spanning Tree Protocol**

The rapid spanning tree protocol as specified in IEEE 802.1D-2004 is supported. One Spanning Tree per a unit is supported. Besides a Spanning Tree per VLAN is also supported.

The Rapid Spanning Tree Protocol (RSTP) supersedes the Spanning Tree Protocol (STP) which was described in IEEE 802.1D-1998. The RSTP is used to configure a simply connected active network topology  from the arbitrarily connected bridges of a bridged network. Bridges effectively connect just the LANs to which their forwarding ports are attached. Ports that are in a blocking state do not forward frames. The bridges in the network exchange sufficient information to automatically derive a spanning tree.

RSTP allows for much quicker learning of network topology changes than the older STP. RSTP supports new and improved features such as rapid transition to forwarding state. RSTP also sends out new BPDUs every hello time instead of just relaying them. RSTP interoperates with older STP switches by falling back to the older STP when the older BPDUs are detected on bridge ports. The user can also manually configure bridge ports to use the older STP when desired.

**SNMP Traps**

The 9000 Series switch supports up to 5 SNMP Trap Stations to which SNMP Traps will be sent. The switch supports three standard traps; Link Up, Link Down, and Cold Start. SNMP Traps will be sent to all the stations configured on the switch if a port Link goes up or down, and when the switch first powers up.

**IGMP Snooping**

IGMP Snooping is enabled by default, and the switch is *Plug and Play* for IGMP.  IGMP snooping provides intelligent network support for multicast applications.  In particular, unneeded traffic is reduced. IGMP Snooping is configured via the console and if enabled, then operates dynamically upon each power up.  Also, there can be manual only or manual and dynamic operation.  Note that "static multicast group address" can be used whether IGMP Snooping is enabled or not.

IGMP Snooping will function dynamically without user intervention.  If some of the devices in the LAN do not understand IGMP, then manual settings are provided to accommodate them.  The Internet Group Management Protocol (IGMP) is a protocol that provides a way for a computer to report its multicast group membership to adjacent 'routers'.  In this case N-Tron 9000 series switches provide *router-like functionality*.  Multicasting allows one computer to send content to multiple other computers that have identified themselves as interested in receiving the originating computer's content.  Multicasting can be used to transmit only to an audience that has joined (and not left) a multicast group membership.  IGMP version 2 is formally described in the Internet Engineering Task Force (IETF) Request for Comments (RFC) 2236.  IGMP version 1 is formally described in the Internet Engineering Task Force (IETF) Request for Comments (RFC) 1112. The 9000 series supports v1 and v2.

**N-Ring™**

N-Ring is enabled by default, and the switch is *Plug and Play* for N-Ring except that initially one must enable an N-Ring enabled device to be the N-Ring Manager for a given N-Ring.  Subsequently, N-Ring operates dynamically upon each power up.  Using N-Tron's proprietary N-Ring technology offers expanded ring size capacity, detailed fault diagnostics, and a standard healing time of 30ms. The N-Ring Manager periodically checks the health of the N-Ring via health check packets. If the N-Ring Manager stops receiving the health check packets, it times out and converts the N-Ring to a backbone within 30ms. When using all N-Ring enabled switches in the ring, a detailed ring map and fault location chart is also provided on the N-Ring Manager's web browser.  N-Ring status is also sent from the N-Ring Manager to the N-View™ OPC Server to identify the health status of the ring. Up to 250 N-Ring enabled switches can participate in one N-Ring topology.  Switches that do not have N-Ring capability may be used in an N-Ring, however the ring map and fault location chart cannot be as detailed at these locations.

## TROUBLESHOOTING

1. Make sure the ⏻ (Power LED) is ON.

2. Make sure you are supplying sufficient current for the version chosen. Note: The Inrush current will exceed the steady state current by ~ 2X.

3. Verify that Link LED's are ON for connected ports.

4. Verify cabling used between stations.

5. Verify that cabling is Category 5E or greater for 100Mbit Operation.

## SUPPORT

Contact N-Tron Corp. at:
TEL: 251-342-2164
FAX: 251-342-6353
www.n-tron.com

## FCC STATEMENT

This product complies with Part 15 of the FCC-A Rules.
Operation is subject to the following conditions:
(1) This device may not cause harmful interference
(2) This device must accept any interference received, including interference that may cause undesired operation.

# Web Software Configuration

## Web Management

Enter the switch's IP address in any web browser and login to the web management feature of the 9000 Series.

**Default:**
      User Name: *admin*
      Password: *admin*
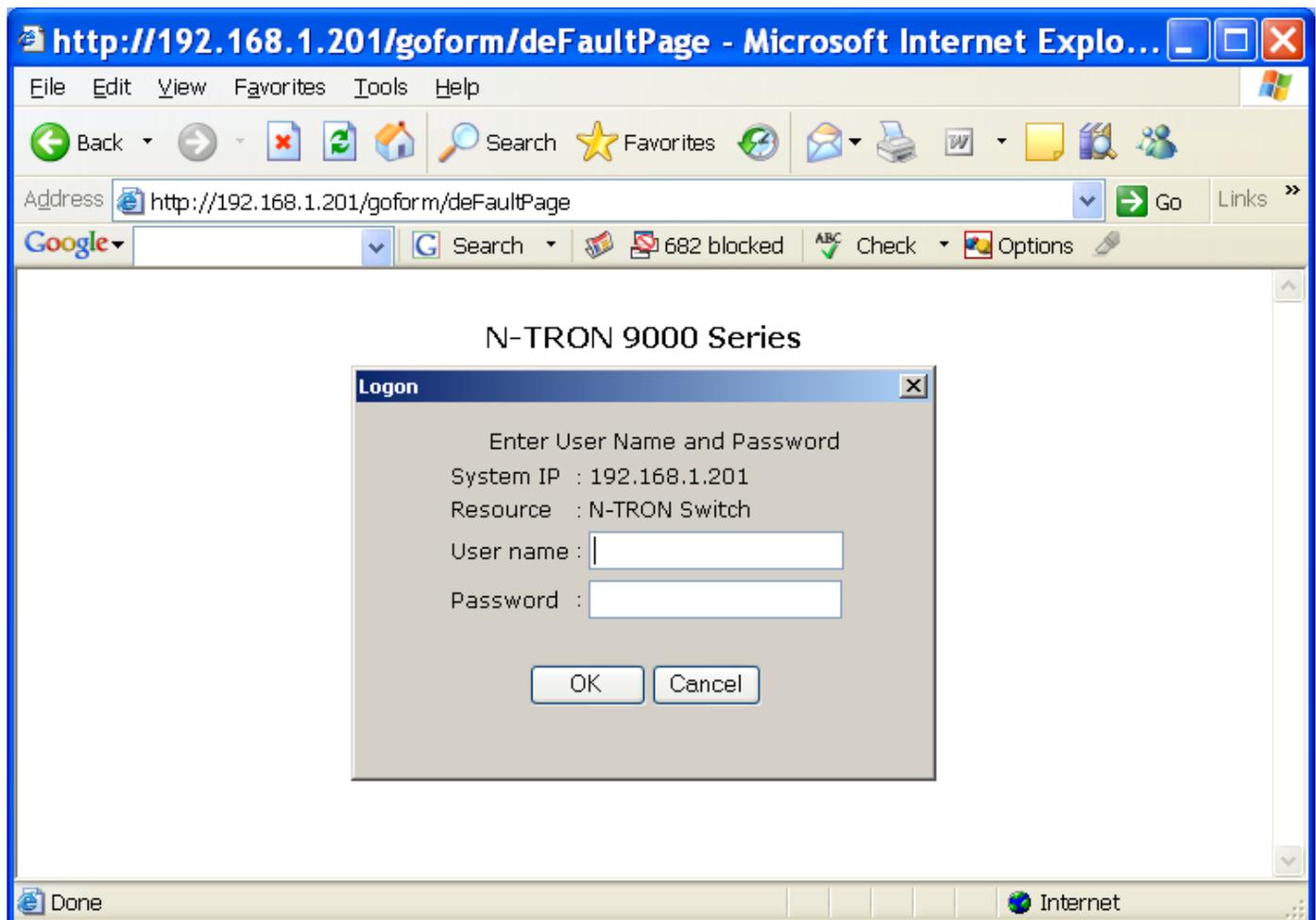
# Web Management - Home

When the administrator first logs onto a 9000 Series switch the default home page will be displayed. On the left hand side of the screen there is a list of configurable settings that the 9000 Series switch will support. This section of the manual will go through each and every choice listed on the left hand side of the screen and explain how to configure those settings. In the center of the main home page the administrator can see some basic information like what firmware revision the switch is running. The firmware can be upgraded at a later time in the field using TFTP or FTP.
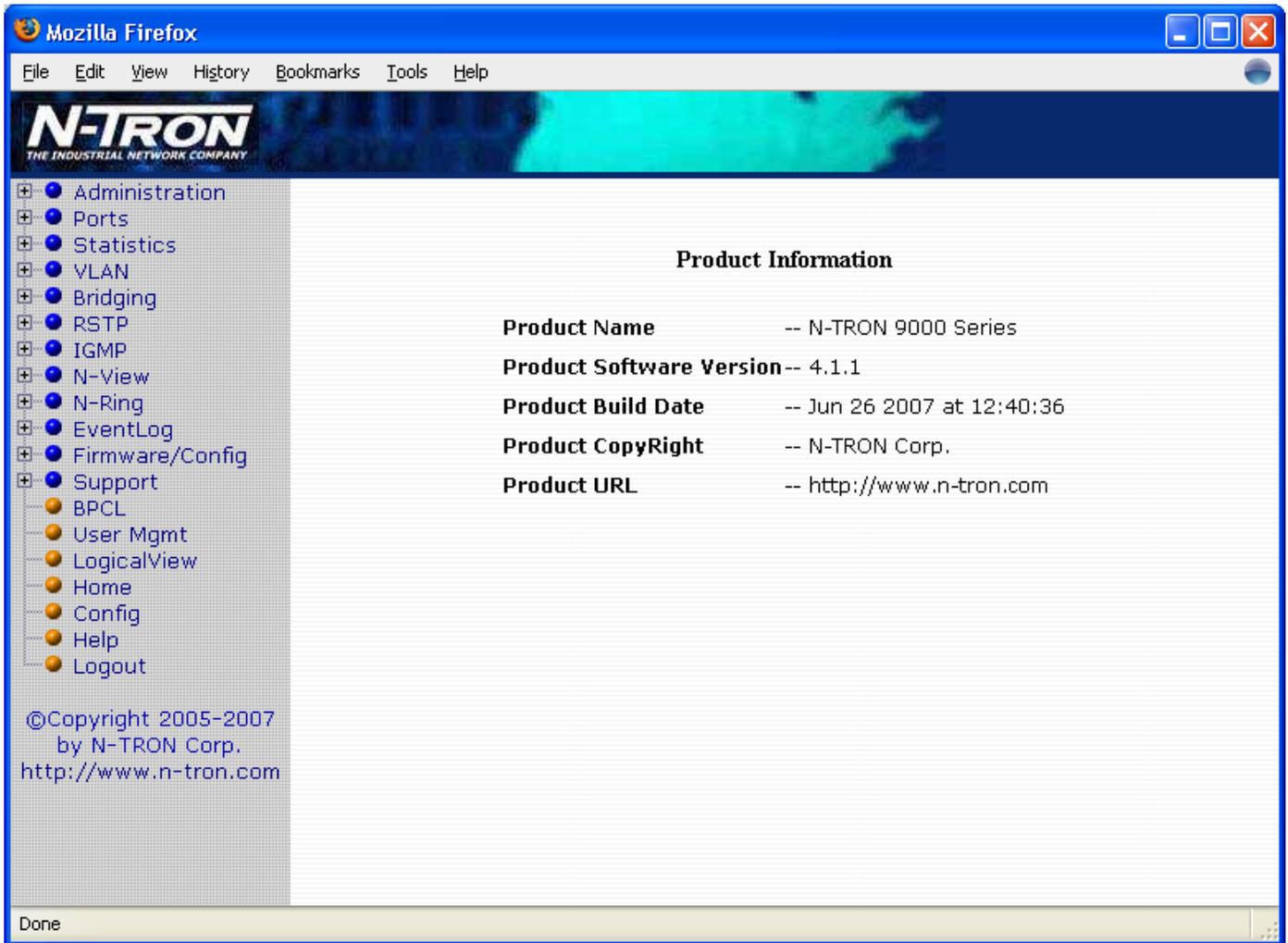
# Web Management – Menu Structure

To the left, there is a menu which is shown fully opened below.  The pages opened by each of the individual selections are described in the rest of this section.  The use of each of these pages is also described in this section.  In most of the descriptions, only the right side of the page is shown.
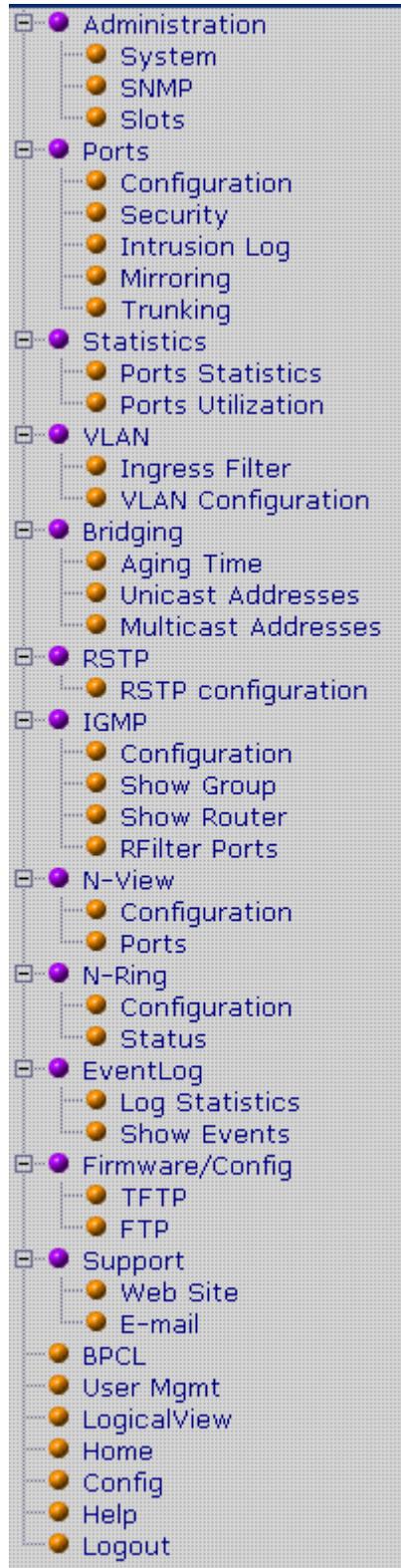
# Administration – System

The System tab under the Administration category lists the following information about the switch:
- IP Address
- Subnet Mask
- Default Gateway
- MAC Address
- System Up Time
- Name
- Contact Information
- Location

| System Configuration View | |
| --- | --- |
| IP Address | 192.168.1.201 |
| Subnet Mask | 255.255.255.0 |
| Gateway | 192.168.1.1 |
| MAC Address | 00:07:af:00:c2:00 |
| Sys Up Time | 0 days:1 hours:41 mins:20 secs |
| Name | N-TRON Switch |
| Contact | N-TRON Admin |
| Location | Mobile, AL 36609 |

[ Modify ] [ Refresh ]

By selecting the modify button you will be able to change the switch's IP Address, Subnet Mask, Default Gateway, Name, Contact information, and the Location of the switch through the web management features. It is recommended to change the TCP/IP information through the Command Line Interface (CLI) initially, but it defaults to the following:

- IP Address – 192.168.1.201
- Subnet Mask – 255.255.255.0
- Default Gateway – 192.168.1.1

| System Configuration | |
| --- | --- |
| IP Address | 192.168.1.201 |
| Net Mask | 255.255.255.0 |
| Gateway | 192.168.1.1 |
| Name | N-TRON Switch |
| Contact | N-TRON Admin |
| Location | Mobile, AL 36609 |

[ Update ] [ Cancel ]

**NOTE:**
The Gateway must belong to the network as described by the IP Address and the Subnet Mask.

# Administration – SNMP

The SNMP tab under the administration category shows a list of IP Addresses that act as SNMP Traps. The Get, Set, and Trap Community Names are also shown here.

| Management Station Configuration View | |
|---|---|
| IP Address - Trap Stn.#1 | 192.168.1.2 |
| IP Address - Trap Stn.#2 | Value Not Configured |
| IP Address - Trap Stn.#3 | Value Not Configured |
| IP Address - Trap Stn.#4 | Value Not Configured |
| IP Address - Trap Stn.#5 | Value Not Configured |
| Get Community Name | public |
| Set Community Name | private |
| Trap Community Name | public |

[ Modify ] [ Refresh ]

By selecting the modify button you will be able to change any of the fields listed. This allows the user to set an IP address for an SNMP Trap or change the Community Names. Systems that are listed as an SNMP Trap will be sent basic networking changes made to the switch such as ports going down or being linked. To restore a Trap to "Value Not Configured", enter '0.0.0.0'.

| Management Station Configuration | |
|---|---|
| IP Address - Trap Stn.#1 | 192.168.1.2 |
| IP Address - Trap Stn.#2 | Value Not Configured |
| IP Address - Trap Stn.#3 | Value Not Configured |
| IP Address - Trap Stn.#4 | Value Not Configured |
| IP Address - Trap Stn.#5 | Value Not Configured |
| Get Community Name | public |
| Set Community Name | private |
| Trap Community Name | public |

[ Update ] [ Cancel ]

# Administration – Slots

The Slots tab under the administration category allows users to change the configuration of the slots that are populated in the 9000 Back Plane. The switch may not operate correctly if the slots are not configured properly. You must click Update if you wish to keep the changes.

**System Slot Configuration**

| | |
|---|---|
| Slot A | 9006TX |
| Slot B | 9004FX |
| Slot C | 9002FX |
| Slot D | EMPTY |
| CPU Slot E | CPU & GFX |

Update    Cancel

Following the Update button, the user may be prompted to Save and Restart the switch in order for changes to take effect. The switch will save the running configuration into the NVRAM and then cycle power automatically. Once the switch comes back online the settings will be updated.

**Save and Restart**

Click to save and restart for changes to take effect.

Save & Restart

# Ports – Configuration

The Configuration tab under the Ports category will show a detailed overview of all the active ports on the switch.  The overview will display the following information:

Port Number
Port Name
Admin Status
Link Status
Auto Negotiation State
Port Speed
Duplex Mode
Flow Control State
Back Pressure State
Priority State
Priority Level
RSTP State
PVID

## Ports Configuration View

| Port No | Port Name | Admin Status | Link Status | Auto Nego | Port Speed | Duplex Mode | Flow Control | Back Pressure | Priority State | Priority Level | RSTP State | PVID |
|---------|-----------|--------------|-------------|-----------|------------|-------------|--------------|---------------|----------------|----------------|------------|------|
| 1 | A1 | Enable | Down | Enable | 10 | Half | Disable | Disable | Disable | 1 | Disable | 1 |
| 2 | A2 | Enable | Down | Enable | 10 | Half | Disable | Disable | Disable | 1 | Disable | 1 |
| 3 | A3 | Enable | Down | Enable | 10 | Half | Disable | Disable | Disable | 1 | Disable | 1 |
| 4 | A4 | Enable | Down | Enable | 10 | Half | Disable | Disable | Disable | 1 | Disable | 1 |
| 5 | A5 | Enable | Down | Enable | 10 | Half | Disable | Disable | Disable | 1 | Disable | 1 |
| 6 | A6 | Enable | Down | Enable | 10 | Half | Disable | Disable | Disable | 1 | Disable | 1 |
| 7 | B1 | Enable | Down | Enable | 10 | Half | Disable | Disable | Disable | 1 | Disable | 1 |
| 8 | B2 | Enable | Down | Enable | 10 | Half | Disable | Disable | Disable | 1 | Disable | 1 |
| 9 | B3 | Enable | Down | Enable | 10 | Half | Disable | Disable | Disable | 1 | Blocking | 1 |
| 10 | B4 | Enable | Down | Enable | 10 | Half | Disable | Disable | Disable | 1 | Blocking | 1 |
| 11 | B5 | Enable | Up | Enable | 100 | Full | Disable | Disable | Disable | 1 | Forward | 1 |
| 12 | B6 | Enable | Up | Enable | 100 | Full | Disable | Disable | Disable | 1 | Forward | 1 |
| 13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 14 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 16 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 22 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 23 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 24 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 25 | E1 | Enable | Down | Disable | 1000 | Full | Disable | Disable | Disable | 1 | Disable | 1 |
| 26 | E2 | Enable | Down | Disable | 1000 | Full | Disable | Disable | Disable | 1 | Disable | 1 |

[ Refresh ]

# Ports – Configuration, Continued…

The User can click on the Port Number to configure each port individually.  This will allow the user to change the port's settings for the following fields:

Admin Status
Speed and Duplex
Flow Control
Back Pressure
State of Priority
Priority Level
PVID

# Ports – Security

The Security tab under the Ports category will show a list of all the active ports and the security Lock State for each port.

| Port Name | Lock State | Port Name | Lock State |
|-----------|-----------|-----------|-----------|
| A1 | Disable | C2 | Disable |
| A2 | Disable | -- | -- |
| A3 | Disable | -- | -- |
| A4 | Disable | -- | -- |
| A5 | Disable | -- | -- |
| A6 | Disable | -- | -- |
| B1 | Disable | -- | -- |
| B2 | Disable | -- | -- |
| B3 | Disable | -- | -- |
| B4 | Disable | -- | -- |
| -- | -- | -- | -- |
| -- | -- | E1 | Disable |
| C1 | Disable | E2 | Disable |

**Port Security Configuration View**

Refresh

Administrators can change the Port Security by a per port basis.  If the Port is enabled through this the port will be locked and will only allow known MAC addresses to communicate through the port. Unknown MAC addresses will be logged in the Intrusion Log.

**Port Security Configuration for Port A1**

Enable : ○

Disable : ◉

Update  Cancel

# Ports – Intrusion Log

The Intrusion Log tab under the Ports category will show a list of intruders along with their MAC addresses.  The log will show what Port the intruder attempted to access your network on and log the system time when it occurred.  The log can be easily cleared.

# Ports – Mirroring

A mirroring port is a dedicated port that is configured to receive the copies of Ethernet frames that are being transmitted out and also being received in from any other port that is being monitored.

The Mirroring tab under the Ports category displays the status including the list of Source Ports and the Destination Port that the Sources are being mirrored to.

**Port Mirroring Configuration View**

| Mirror Status | Not Configured |
|---|---|
| Source Port List | -- |
| Destination Port | -- |

[ Configure ]  [ Refresh ]

Following the Configure button, you can enable the status of port mirroring and select source ports and the destination port that the source ports will be mirrored to.

**Configure Mirroring**

Source Port List : [         ]

Destination Port : [ A1 ▾ ]

| A1 |
| A2 |
| A3 |
| A4 |
| A5 |
| A6 |
| B1 |
| B2 |
| B3 |
| B4 |
| C1 |
| C2 |

[ Update ]  [ Ca... ]

**NOTE: Since the gigabit ports cannot be destination ports, they are not available on the pulldown menu.**

# Ports – Trunking

The Trunking tab under the Ports category displays a list of trunks configured on the switch and the following details regarding each trunk:

Trunk ID
Trunk Name
Trunk Ports
Trunk State



By selecting the Create button, you can add a trunk group.



**NOTE:** *RSTP must be disabled in order to use the Trunking Feature.*
*N-Ring™ Managers cannot have trunking enabled.*
*A maximum of 4 ports of the same speed can constitute a valid trunk.*
*Only 1 Trunk per switch can be created.*

*All trunk ports must be at the same speed and duplex mode. If a port is not linked, there could be difficulty as to similar speed and duplex mode. It is best to hard code speed and duplex mode for each trunking link, at both ends.*

## Ports – Trunking, Continued…

Once the Trunk Group is created you will see detailed information for that trunk group, but it should have a disabled state by default.

**Port Trunk Configuration View**

| Trunk ID | Trunk Name | Trunk Ports | Trunk State |
|----------|-----------|-------------|-------------|
| 1 | trunk1 | E1-E2 | Disable |

[ Create ] [ Delete ] [ State ] [ Refresh ]

In order to enable the Trunk Group you need to click on the State Button above.  The following page should load asking for the Trunk ID and what the Trunk State is.

**Trunk State Configuration**

| Trunk ID | : | 1 |
|----------|---|---|
| Trunk State | : | Enable |

[ Update ] [ Cancel ]

**NOTE:** *RSTP must be disabled in order to use the Trunking Feature.*
*N-Ring™ Managers cannot have trunking enabled.*

*A maximum of 4 ports of the same speed can constitute a valid trunk.*
*Only 1 Trunk per switch can be created.*

*All trunk ports must be at the same speed and duplex mode.  If a port is not linked, there could be difficulty as to similar speed and duplex mode.  It is best to hard code speed and duplex mode for each trunking link, at both ends.*

# Statistics – Port Statistics

The Ports Statistics tab under the Statistics category displays a list of MIB Parameters. Each port has a separate counter for each parameter. This gives users the ability to see what kind of packets are going over which ports. At the bottom of each page for each port there are two buttons. Refresh will update the statistics for that port number and Clear will reset all the counters for that port number.

Port B4

### Statistics at Port no: B4

| S.No | Counter Type | Value |
|------|------|------|
| 1 | Tx Octets | 5532011 |
| 2 | Tx Dropped Packets | 0 |
| 3 | Tx Broadcast Packets | 7 |
| 4 | Tx Multicast Packets | 22420 |
| 5 | Tx Unicast Packets | 4137 |
| 6 | Tx Collisions | 0 |
| 7 | Tx Single Collision | 0 |
| 8 | Tx Multiple Collision | 0 |
| 9 | Tx Deferred Transmit | 0 |
| 10 | Tx Late Collision | 0 |
| 11 | Tx Excessive Collision | 0 |
| 12 | Tx Frame In Disc | 0 |
| 13 | Tx Pause Packets | 0 |
| 14 | 64 Packets | 5407 |
| 15 | 65 to 127 Packets | 4737 |
| 16 | 128 to 255 Packets | 18628 |
| 17 | 256 to 511 Packets | 816 |
| 18 | 512 to 1023 Packets | 562 |
| 19 | 1024 to 1522 Packets | 809 |
| 20 | Rx Octets | 567638 |
| 21 | Rx Dropped Packets | 0 |
| 22 | Rx Broadcast Packets | 478 |
| 23 | Rx Multicast Packets | 81 |
| 24 | Rx Unicast Packets | 3836 |
| 25 | Rx Undersize Packets | 0 |
| 26 | Rx Oversize Packets | 0 |
| 27 | Rx Jabbers | 0 |
| 28 | Rx Alignment Errors | 0 |
| 29 | Rx Good Octets | 567638 |
| 30 | Rx SA Changes | 0 |
| 31 | Rx FCS Errors | 0 |
| 32 | Rx Pause Packets | 0 |
| 33 | Rx Fragments | 0 |
| 34 | Rx Excessive Disc Size | 0 |
| 35 | Rx Symbol Error | 0 |

Refresh   Clear

# Statistics – Ports Utilization

      The Ports Utilization tab under the Statistics category shows all the ports on the switch and will display a bar graph showing the percentage of bandwidth being used. These figures and bars are for a general feeling of what the bandwidth usage is.  N-Tron recommends the use of N-View™ in order to get a precise bandwidth usage figure.
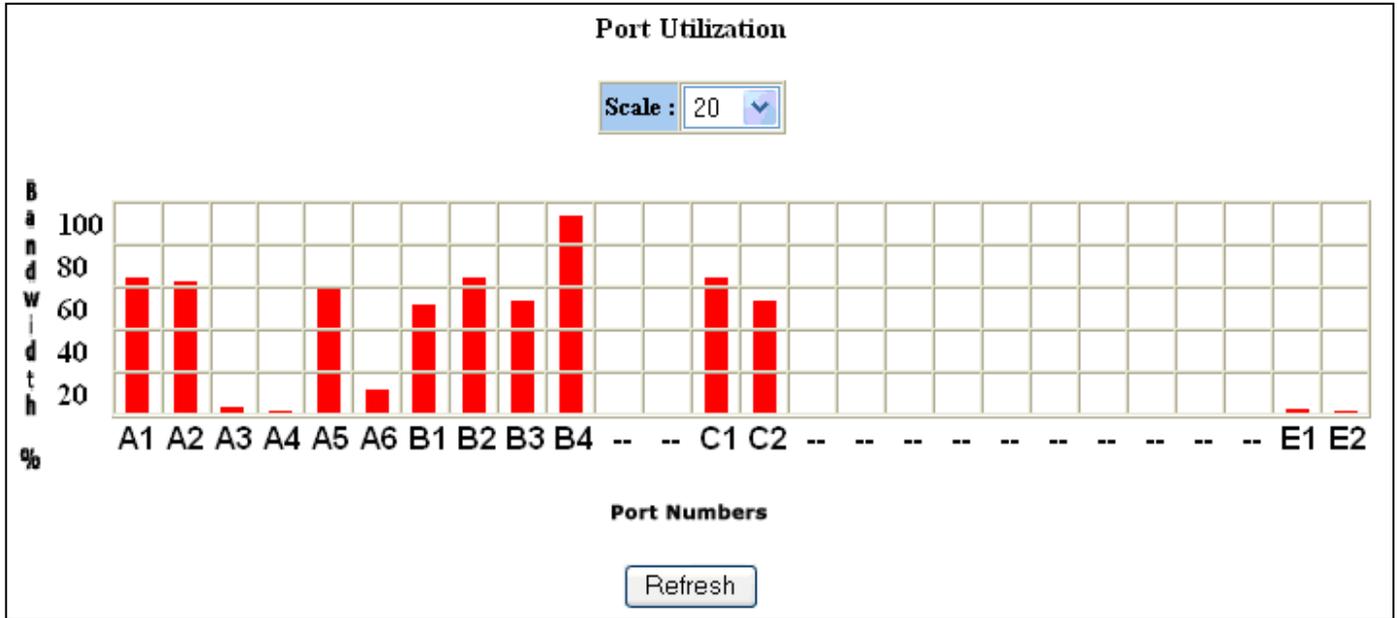
# VLAN – Ingress Filter

The Ingress Filter tab under the VLAN category shows all the ports on the switch and if the Ingress Filter Rule is enabled or disabled for each port.

**VLAN Ingress Filter Configuration View**

| Port Name | Ingress Filter Rule | Port Name | Ingress Filter Rule |
|-----------|--------------------|-----------|--------------------|
| A1 | Disable | C2 | Disable |
| A2 | Disable | -- | -- |
| A3 | Disable | -- | -- |
| A4 | Disable | -- | -- |
| A5 | Disable | -- | -- |
| A6 | Disable | -- | -- |
| B1 | Disable | -- | -- |
| B2 | Disable | -- | -- |
| B3 | Disable | -- | -- |
| B4 | Disable | -- | -- |
| -- | -- | -- | -- |
| -- | -- | E1 | Disable |
| C1 | Disable | E2 | Disable |

Modify    Refresh

To change the Ingress Filter Rule simply click on the Modify button on the page above, select the port number from the pull-down menu that you wish to modify and then choose to either enable or disable the Ingress Filter Rule.

**VLAN Ingress Filter Configuration**

| Port Name | ALL ▾ |
|-----------|-------|
| Ingress Filter Rule | |

ALL
A1
A2
A3
A4
A5
A6
B1
B2
B3
B4
C1
C2
E1
E2

Update

**NOTE:** *The Ingress Filter will automatically be turned on for respective ports when tagged VLANs are created, but may not automatically turn off if you change a tagged VLAN to a port based VLAN.*

# VLAN – Port Based

The Port Based tab under the VLAN category shows all the VLANs that are configured on the switch and details about the VLANs such as port numbers and tagged VLAN settings.

**VLAN Configuration View**

("Click on **VLAN ID** number to modify the existing values ")

| VLAN Status : Enable | | | | | | |
|---|---|---|---|---|---|---|
| VLAN ID | VLAN Name | Untagged Port(s) | Tagged Port(s) | Mgmt Port | Admit | Mirror Port |
| 1 | Default VLAN | A1-A6,B1-B4,C1-C2,E1-E2 | -- | YES | All | 0 |

Total Number of vlans configured : 1

[Add] [Delete] [Refresh]

To add a VLAN simply click on the Add button on the page above and fill in the desired fields. The example below would set up a basic port based VLAN for ports A1-A6.

**VLAN Creation**

| | |
|---|---|
| VLAN ID | 2 |
| VLAN Name | vlan2 |
| Untagged Port List | A1-A6 |
| Tagged Port List | |
| Management Port | YES |
| Admit | All |
| Mirror Port | NA |

[Update] [Cancel]

**(See VLAN Configuration Examples on Page 140)**

**Note:** *When implementing overlapping VLANs, RSTP can only be enabled on one of the VLANs that is overlapping others.  RSTP can not be implemented on a VLAN that contains other VLANs within that one.  Changing anything on a VLAN will turn on RSTP on all VLANs as a precautionary measure.*

## VLAN – Port Based, Continued…

Now the page will display the new VLAN and moved ports A1-A6 from the default VLAN down to vlan2 that was just created.

| VLAN Configuration View |
| --- |

("Click on **VLAN ID** number to modify the existing values ")

| VLAN ID | VLAN Name | Untagged Port(s) | Tagged Port(s) | Mgmt Port | Admit | Mirror Port |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | Default VLAN | B1-B4,C1-C2,E1-E2 | -- | YES | All | 0 |
| 2 | vlan2 | A1-A6 | -- | YES | All | 0 |

Total Number of vlans configured : **2**

[Add] [Delete] [Refresh]

To delete or remove VLANs that are no longer wanted simply click on the Delete button on the main Port Based VLAN page. That button will load the page where the user can enter the VLAN ID that he or she wishes to delete.

**VLAN Deletion**

VLAN ID [2]

[Update] [Cancel]

**(See VLAN Configuration Examples on Page 140)**

**Note:** *When implementing overlapping VLANs, RSTP can only be enabled on one of the VLANs that is overlapping others. RSTP can not be implemented on a VLAN that contains other VLANs within that one. Changing anything on a VLAN will turn on RSTP on all VLANs as a precautionary measure.*

# VLAN – Port Based, Continued…

Once the VLAN is deleted it will no longer appear on the main page and all the ports are now back under the default VLAN. When a port based VLAN is created the PVID (Port VLAN ID) will change automatically to be members of the new VLAN they are a part of. If you delete this VLAN the PVIDs will not automatically return to the default VLAN. Users should keep this in mind when removing VLANs, and may need to manual change the PVIDs for any affected ports.

## VLAN Configuration View

("Click on **VLAN ID** number to modify the existing values ")

**VLAN Status : Enable**

| VLAN ID | VLAN Name | Untagged Port(s) | Tagged Port(s) | Mgmt Port | Admit | Mirror Port |
|---------|-----------|------------------|----------------|-----------|-------|-------------|
| 1 | Default VLAN | A1-A6,B1-B4,C1-C2,E1-E2 | -- | YES | All | 0 |

Total Number of vlans configured : 1

[ Add ] [ Delete ] [ Refresh ]

**Note:** *When implementing overlapping VLANs, RSTP can only be enabled on one of the VLANs that is overlapping others. RSTP can not be implemented on a VLAN that contains other VLANs within that one. Changing anything on a VLAN will turn on RSTP on all VLANs as a precautionary measure.*

# Bridging – Aging Time

The Aging Time tab under the Bridging category will display the currently configured Aging Time. This page allows users to modify this variable to meet their needs.
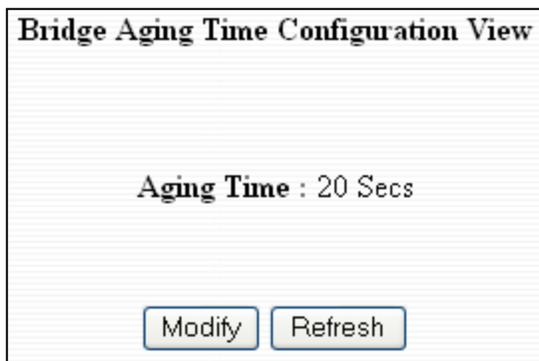
**Bridge Aging Time Configuration View**

Aging Time : 20 Secs

[Modify] [Refresh]

After selecting the Modify button the user will be presented with a page that allows the number to be entered into and updated. The default aging time is 20 seconds.
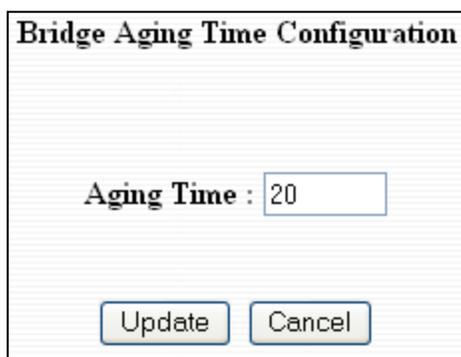
**Bridge Aging Time Configuration**

Aging Time : [20]

[Update] [Cancel]

# Bridging – Unicast Addresses

The Unicast Addresses tab under the Bridging category will display a list of MAC addresses that are associated with each respective port number.  This can be used to statically assign a MAC address access to a single port on the switch.

**Display Static Unicast MAC Address(es)**

| MAC Address | Port Name | Mirroring |
|---|---|---|

Number of Static Unicast MAC Address(es) is **0**

[Add] [Delete] [Refresh]

Following the Add button on the page above, the administrator must enter a valid MAC address and associate it with a port number on the switch.  Once the administrator hits the Update button the changes will take effect instantly.

**Add Static Unicast MAC Address**

| | |
|---|---|
| MAC Address : | 00:07:AF:00:00:00 |
| Port Name : | A1 |
| Mirroring : | Enable |

[Update] [Cancel]

Once a static MAC address has been added, it will be displayed in a list on the main page under Unicast MACs tab.

**Display Static Unicast MAC Address(es)**

| MAC Address | Port Name | Mirroring |
|---|---|---|
| 00:07:af:00:00:00 | A1 | Enable |

Number of Static Unicast MAC Address(es) is **1**

[Add] [Delete] [Refresh]

## Bridging – Unicast Addresses, Continued…

Following the Delete button on the page above, an administrator can select a static MAC address from the list using a pull-down menu. After selecting the MAC address the administrator needs to press the Delete button on this page to remove the entry

.

# Bridging – Multicast Addresses

The Multicast Addresses tab under the Bridging category will display a list of Multicast Group Addresses that are associated with respective port numbers. This may be used to statically assign a Multicast Group Address access to a group of ports on the switch. These are egress filters.

Display Static Multicast Group Address(es)

| Multicast Address | Port List |
| --- | --- |

Total Number of Static Multicast Group Address(es) is **0**

Add    Delete    Refresh

Following the Add button on the page above, the administrator must enter a valid Multicast Group Address and associate it with a port number or list on the switch. Once the administrator clicks on the Update button, the changes will take effect instantly.

Add Static Multicast Group Address

| Multicast Address : | 01:07:AF:00:00:00 |
| --- | --- |
| Port List | : A1-A4 |

Update    Cancel

**Note:** *If there are multiple ports on different VLANs, the 9000 will apply the static multicast address to the lowest VLAN-ID that is associated with one of the ports assigned to the static multicast address. So if the lowest VLAN-ID contains all the ports assigned to the static multicast address (an umbrella VLAN), it will function for all those ports with no problems. This can be achieved with overlapping VLANs.*

# Bridging – Multicast Addresses, Continued…

After adding a Multicast Group Address it will appear on the main list and will show the associated ports that go along with that address.

**Display Static Multicast Group Address(es)**

| Multicast Address | Port List |
| --- | --- |
| 01:07:af:00:00:00 | A1-A4 |

Total Number of Static Multicast Group Address(es) is 1

[Add] [Delete] [Refresh]

Following the Delete button on the page above, the administrator will be presented with a list of Multicast Group Addresses that are configured on the switch. Using the pull-down menu the administrator should select the desired port to be removed. Then click on the Delete button at the bottom of the page.

**Delete Static Multicast Group Address**

MAC Address : 01:07:af:00:00:00 ▾

[Delete] [Cancel]

**Note:** *If there are multiple ports on different VLANs, the 9000 will apply the static multicast address to the lowest VLAN-ID that is associated with one of the ports assigned to the static multicast address. So if the lowest VLAN-ID contains all the ports assigned to the static multicast address (an umbrella VLAN), it will function for all those ports with no problems. This can be achieved with overlapping VLANs.*

# RSTP – RSTP Configuration

       The RSTP Configuration tab under the RSTP category will display the RSTP information for the first VLAN.  Using the pull-down menu at the top of the page an administrator can choose which VLAN to configure RSTP on.  Once the VLAN is selected the administrator may configure the bridge by clicking on the Configuration button in the middle of the page.



       The configuration screen for the VLAN that was previously selected will look like the example below.  Here the administrator can make changes such as the Hello Time, the Forward Delay, the Max Age, the priority, and the Status of RSTP on that VLAN.  Following the link for the view RSTP Port Configuration at VLAN# the administrator or user can see the current RSTP status of the ports on that VLAN.



**NOTES:**
1. *Trunking must be disabled in order to use RSTP.*
2. *N-Ring™ Manager cannot have RSTP enabled.*
3. *RSTP & N-Ring™ are different modes and cannot have redundant links along those lines. See the examples on the following sheet.*
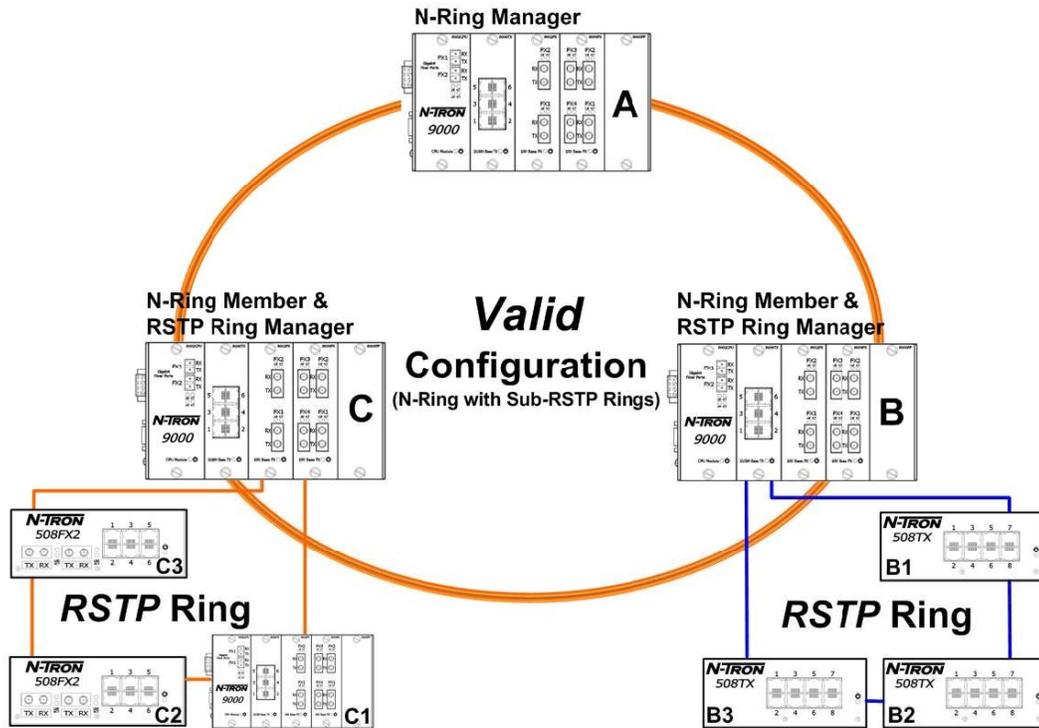
It is valid to have RSTP rings linked to non-N-Ring™ ports of active N-Ring Members, as above.
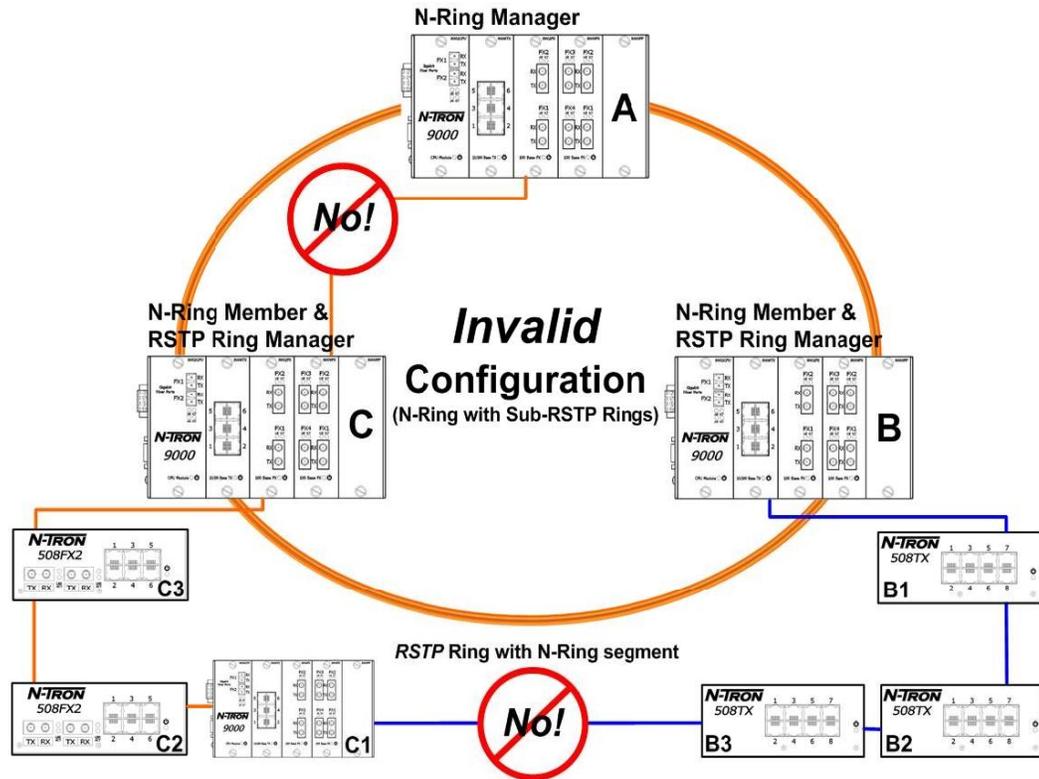


As marked above, it is not valid to expect RSTP to block redundant N-Ring links nor for N-Ring to block redundant RSTP links.

# RSTP – RSTP Configuration, Continued…

Following the link for the view RSTP Port Configuration at VLAN# the administrator or user can see the current RSTP status of the ports on that VLAN.  This will show information such as the Path Cost and the Port State.  If the switch sees a redundant path it will put the port with the highest Path Cost into Blocking mode where it will discard packets coming in on that port. In the below example, B1 is a redundant port with port A2, therefore A2 is forwarding and B1 is discarding.

## RSTP Port Configuration View for VLAN 1

| Port No | Port Name | Port State | Path Cost | Priority | STP BPDU | AutoEdge | AdminEdge | Designated Bridge | Designated Port |
|---|---|---|---|---|---|---|---|---|---|
| 1 | A1 | Disabled | 2000000 | 128 | No | Enabled | Disabled | 00:00:00:00:00:00:00:00 | 00:01 |
| 2 | A2 | Forwarding | 200000 | 128 | No | Enabled | Disabled | 80:00:00:07:af:00:c2:01 | 00:02 |
| 3 | A3 | Disabled | 2000000 | 128 | No | Enabled | Disabled | 00:00:00:00:00:00:00:00 | 00:03 |
| 4 | A4 | Disabled | 2000000 | 128 | No | Enabled | Disabled | 00:00:00:00:00:00:00:00 | 00:04 |
| 5 | A5 | Disabled | 2000000 | 128 | No | Enabled | Disabled | 00:00:00:00:00:00:00:00 | 00:05 |
| 6 | A6 | Disabled | 2000000 | 128 | No | Enabled | Disabled | 00:00:00:00:00:00:00:00 | 00:06 |
| 7 | B1 | Discarding | 200000 | 128 | No | Enabled | Disabled | 80:00:00:07:af:00:c2:01 | 00:02 |
| 8 | B2 | Disabled | 200000 | 128 | No | Enabled | Disabled | 00:00:00:00:00:00:00:00 | 00:08 |
| 9 | B3 | Disabled | 200000 | 128 | No | Enabled | Disabled | 00:00:00:00:00:00:00:00 | 00:09 |
| 10 | B4 | Forwarding | 200000 | 128 | No | Enabled | Disabled | 80:00:00:07:af:00:c2:01 | 00:0a |
| 11 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 12 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 13 | C1 | Disabled | 200000 | 128 | No | Enabled | Disabled | 00:00:00:00:00:00:00:00 | 00:0d |
| 14 | C2 | Disabled | 200000 | 128 | No | Enabled | Disabled | 00:00:00:00:00:00:00:00 | 00:0e |
| 15 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 16 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 18 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 19 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 21 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 22 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 23 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 24 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 25 | E1 | Disabled | 20000 | 128 | No | Enabled | Disabled | 00:00:00:00:00:00:00:00 | 00:19 |
| 26 | E2 | Disabled | 20000 | 128 | No | Enabled | Disabled | 00:00:00:00:00:00:00:00 | 00:1a |

[<<Back]  [Refresh]

# RSTP – RSTP Configuration, Continued…

   If the administrator selects one of the ports on the previous screen he or she can change the Port's Path Cost, Port's Priority and the status of Admin Edge and Auto Edge.

Port RSTP Configuration for Port A1 on VLAN 1

Port Path Cost : 2000000

Port priority    : 128

Admin Edge    : Disable

Auto Edge    : Enable

Update    Cancel

# IGMP – Configuration

The Configuration tab under the IGMP category will display the IGMP basic configuration settings. By default IGMP is enabled.

| IGMP Configuration View | |
|---|---|
| **IGMP Status** | Enabled |
| **Query Mode** | Auto |
| **Router Mode** | Auto |
| **Manual Router Ports** | |

Modify    Refresh

Following the Modify button on the previous page, the administrator will see a list of configurable fields for the IGMP configuration. Once these fields are filled in to meet the needs of the administrator's network the changes may be saved by clicking the Update button at the bottom of the page.

| IGMP Configuration | |
|---|---|
| **IGMP Status** | Enable |
| **Query Mode** | Auto |
| **Router Mode** | Auto |
| **Manual Router Ports** | |
| **Router Add/Delete** | Add |

Update    Cancel

# IGMP – Show Group and Show Router

The Show Group tab under the IGMP category will display a list of IGMP groups based on the Group IP and the port number that it is associated with.

**IGMP Group View**

| Group IP | Port Name | VLAN ID |
|---|---|---|
| 239.255.255.250 | B1 | 1 |

Refresh

The Show Router tab under the IGMP category will display a list of Auto-detected Router IPs and the port numbers that they are associated with.

**Auto-Detected Routers View**

| Router IP | Port Name |
|---|---|
| 192.168.1.220 | E1 |
| 192.168.1.220 | E2 |
| 192.168.1.250 | A1 |

Refresh

# IGMP – RFilter

The 'rfilter' (**Router Multicast Data Filter**) function allows you to choose whether or not DATA frames with KNOWN group multicast addresses are sent to the 'router' ports (links to other switches). Control packets (Join, Leave) will be sent to the router(s) regardless of this setting. "KNOWN" is known from dynamic IGMP Snooping operations.

The factory default is that the Router Multicast Data Filter is enabled for all ports, so any router ports do NOT get DATA frames with KNOWN multicast destination addresses unless a join to a specific multicast address has been received on that port. **Joins override an rfilter.**

If rfilter is disabled router ports do get DATA frames with KNOWN multicast destination addresses

Rfilter can be set for individual ports: any, all, or none. For each port, rfilter will have an impact only if that port is manually or dynamically chosen as a router port.

Default configuration:

**IGMP RFilter Configuration View**

| Port Name | RFilter State | Port Name | RFilter State |
|-----------|---------------|-----------|---------------|
| A1 | Enabled | C2 | Enabled |
| A2 | Enabled | C3 | Enabled |
| A3 | Enabled | C4 | Enabled |
| A4 | Enabled | C5 | Enabled |
| A5 | Enabled | C6 | Enabled |
| A6 | Enabled | D1 | Enabled |
| B1 | Enabled | D2 | Enabled |
| B2 | Enabled | D3 | Enabled |
| B3 | Enabled | D4 | Enabled |
| B4 | Enabled | D5 | Enabled |
| B5 | Enabled | D6 | Enabled |
| B6 | Enabled | E1 | Enabled |
| C1 | Enabled | E2 | Enabled |

[ Modify ] [ Refresh ]

Modifying rfilter port settings:



IGMP RFilter Configuration

| Port Name | RFilter Enabled? | Port Name | RFilter Enabled? |
|-----------|------------------|-----------|------------------|
| A1 | ☑ | C2 | ☑ |
| A2 | ☑ | C3 | ☑ |
| A3 | ☑ | C4 | ☑ |
| A4 | ☑ | C5 | ☑ |
| A5 | ☑ | C6 | ☑ |
| A6 | ☑ | D1 | ☑ |
| B1 | ☐ | D2 | ☑ |
| B2 | ☐ | D3 | ☑ |
| B3 | ☐ | D4 | ☑ |
| B4 | ☐ | D5 | ☑ |
| B5 | ☑ | D6 | ☑ |
| B6 | ☑ | E1 | ☑ |
| C1 | ☑ | E2 | ☑ |

[Update] [Cancel]

# N-Ring™ – Configuration

The Configuration tab under the N-Ring category will display the N-Ring basic configuration settings.  By default N-Ring is in AutoMember mode and the N-Ring Agingtime is 20 seconds.
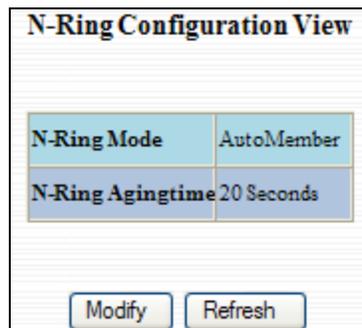
**N-Ring Configuration View**

| | |
|---|---|
| **N-Ring Mode** | AutoMember |
| **N-Ring Agingtime** | 20 Seconds |

[ Modify ]  [ Refresh ]

Following the Modify button, the administrator will see a list of configurable fields for the N-Ring configuration, as below.
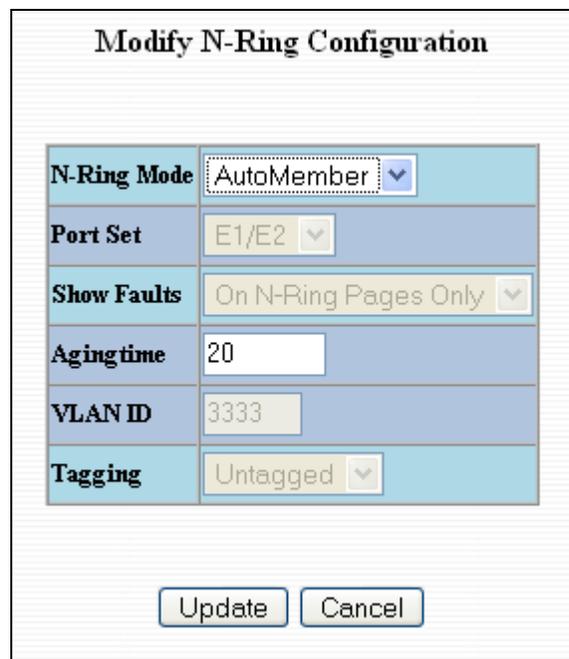
**Modify N-Ring Configuration**

| | |
|---|---|
| **N-Ring Mode** | AutoMember |
| **Port Set** | E1/E2 |
| **Show Faults** | On N-Ring Pages Only |
| **Agingtime** | 20 |
| **VLAN ID** | 3333 |
| **Tagging** | Untagged |

[ Update ]  [ Cancel ]

The N-Ring Agingtime has a default of 20 seconds and is separate from the Bridging Aging Time.  N-Ring Aging time is used for the whole switch if the switch is an N-Ring Manager or becomes an active N-Ring Member, and in either case N-Ring status includes for example:
*"Switch is currently using N-Ring Aging Time = 20 Seconds"*

Once these fields are filled in to meet the needs of the administrator's network the changes may be saved by clicking the Update button at the bottom of the page.

**NOTES:**
1. *N-Ring Manager cannot have RSTP or Trunking enabled.*
2. *RSTP & N-Ring are different modes and cannot have redundant links along those lines.  See the examples in the RSTP configuration section.*
3. *Do not use Trunking on a switch that is directly in an active N-Ring.*
4. *Any one 9000 can only participate in one N-Ring.*
5. *N-Ring copper ports must be run at 100Mb full duplex, including the default 'autonegotiate' as long as all switches in the ring support 100Mb full duplex.*

# N-Ring™ Configuration (continued)

The "N-Ring Mode" is one of three, as below:



If N-Ring Mode is "Manager", then a pull-down allows selection as available of ports A1 and A2, or E1 and E2 as N-Ring ports.

# N-Ring™ Configuration (continued)

If N-Ring Mode is "Manager", then a pull-down allows selection of displaying N-Ring Summary Status on all web pages or on N-Ring pages only:

**Modify N-Ring Configuration**

| | |
|---|---|
| N-Ring Mode | Manager |
| Port Set | A1/A2 |
| Show Faults | On N-Ring Pages Only |
| | On N-Ring Pages Only |
| | On All Web Pages |
| Aging time | |
| VLAN ID | 3333 |
| Tagging | Untagged |

Update    Cancel

## N-Ring™ Configuration (continued)

If N-Ring Mode is "Manager", then VLAN ID can be set to a unique vlan id (1 ~ 4094). Default is 3333.

If N-Ring Mode is "Manager", then a pull-down allows selection as to whether the N-Ring ports are members of the VLANs Tagged or Untagged ports. Default is Tagged.



Once these fields are filled in to meet the needs of the administrator's network the changes may be saved by clicking the Update button at the bottom of the page.

**NOTES:**
*1. Since VLANs are implemented for security reasons as well as traffic flow, N-Ring only makes minimal changes. It is up to the administrator to ensure that VLANs are configured correctly on the N-Ring manager and all N-Ring members.*
*~~1.~~2. When the N-Ring manager and all N-Ring Members are in defaults, changing the N-Ring manager to use a Tagged VLAN requires no user interaction to allow non-ring traffic to pass through the ring. This works because changing to a Tagged VLAN does not remove the ring ports from the default VLAN.*
*~~2.~~3. When the N-Ring manager and all N-Ring Members are in defaults, changing the N-Ring manager to use an Untagged VLAN other than VID 1, requires the administrator to add non-ring ports to the N-Ring VLAN to allow non-ring traffic to pass through the ring. This occurs because the N-Ring ports must be removed from VID 1 because an untagged port may only be a member of one VLAN.*

# N-Ring™ – Status

The Status tab under the N-Ring category will display the N-Ring status.

Below is an example of N-Ring Status from a switch in defaults (N-Ring Auto Member) that is not an N-Ring Manager and has not become an "Active" N-Ring Member:

**N-Ring Status View**

Switch is in Auto Member Detection Mode

Refresh

Below is an example of N-Ring Status from an "Active" N-Ring Member:

**N-Ring Status View**

Switch is an N-Ring Member

| N-Ring Manager Address |
|---|
| 00:07:af:ff:f6:c0 |

| Active N-Ring Ports | |
|---|---|
| A1 | A2 |

Switch is currently using N-Ring Aging Time = 20 Seconds

Refresh

Below is an example of N-Ring™ Status from an N-Ring Manager with a healthy N-Ring:

| | | | N-Ring OK | | |
|---|---|---|---|---|---|

**N-Ring Status View**

Switch is an N-Ring Manager, using N-Ring Aging Time = 20 Seconds

Refresh every [6] secs.   Update   Pause   Print...

12 Active Members Detected In Current N-Ring (12 reporting)

| Switch No | MAC Address | IP Address | Subnet Mask | Name | Ports |
|---|---|---|---|---|---|
| RM | 00:07:af:ff:e4:a0 | 192.168.1.227 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 1 | 00:07:af:ff:ef:60 | 192.168.1.224 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 2 | 00:07:af:ff:e6:a0 | 192.168.1.217 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 3 | 00:07:af:ff:ef:80 | 192.168.1.221 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 4 | 00:07:af:ff:e4:c0 | 192.168.1.241 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 5 | 00:07:af:ff:d5:e0 | 192.168.1.229 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 6 | 00:07:af:ff:d7:00 | 192.168.1.228 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 7 | 00:07:af:ff:e6:c0 | 192.168.1.223 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 8 | 00:07:af:ff:d5:20 | 192.168.1.231 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 9 | 00:07:af:ff:e5:e0 | 192.168.1.238 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 10 | 00:07:af:ff:e3:c0 | 192.168.1.239 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 11 | 00:07:af:ff:d5:40 | 192.168.1.230 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 12 | 00:07:af:ff:e3:e0 | 192.168.1.215 | 255.255.255.0 | N-TRON Switch | A2 A1 |

Below is an example of N-Ring™ Status from an N-Ring Manager with a faulted N-Ring.  The red fields on the N-Ring Map show problems.  Ports that are red indicate that the port is not linked.  MAC addresses that are red indicate that there is no communication to that switch.  The red "Ring Broken" line shows where the N-Ring is broken.

| N-Ring Fault |
|:---:|

### N-Ring Status View

Switch is an N-Ring Manager, using N-Ring Aging Time = 20 Seconds

Refresh every 6 secs.    [Update]    [Pause]    [Print...]

The total number of Active N-Ring Members is unknown. (11 reporting)
Switch order may be incorrect and all switches may not be shown.

| Switch No | MAC Address | IP Address | Subnet Mask | Name | Ports |
|---|---|---|---|---|---|
| RM | 00:07:af:ff:e4:a0 | 192.168.1.227 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 1 | 00:07:af:ff:ef:60 | 192.168.1.224 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 2 | 00:07:af:ff:e6:a0 | 192.168.1.217 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 3 | 00:07:af:ff:ef:80 | 192.168.1.221 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 4 | 00:07:af:ff:e4:c0 | 192.168.1.241 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 5 | 00:07:af:ff:d5:e0 | 192.168.1.229 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 6 | 00:07:af:ff:d7:00 | 192.168.1.228 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 7 | 00:07:af:ff:e6:c0 | 192.168.1.223 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 8 | 00:07:af:ff:d5:20 | 192.168.1.231 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 9 | 00:07:af:ff:e5:e0 | 192.168.1.238 | 255.255.255.0 | N-TRON Switch | A2 A1 |
| 10 | 00:07:af:ff:e3:c0 | 192.168.1.239 | 255.255.255.0 | N-TRON Switch | A2 **A1** |
| 11 | 00:07:af:ff:d5:40 | 192.168.1.230 | 255.255.255.0 | N-TRON Switch | **A2 A1** |
| | | ~~~~~ Ring Broken ~~~~~ | | | |
| 12 | 00:07:af:ff:e3:e0 | 192.168.1.215 | 255.255.255.0 | N-TRON Switch | **A2** A1 |

In rare cases an N-Ring™ can have a "Partial Fault". An example of this is to have a break in just one fiber in a duplex channel fiber pair. The screenshot below shows N-Ring Manager Status when a 'Higher' N-Ring Port (A2 or E2) is not receiving self health frames all the way around the N-Ring, though the other (low A1/E1) N-Ring port is:

**N-Ring Partial Fault (A2 is not receiving self health from A1)**

### N-Ring Status View

Switch is an N-Ring Manager, using N-Ring Aging Time = 20 seconds

Refresh every [6] secs. [Update] [Pause] [Print...]

0 Active Members Detected In Current N-Ring (0 reporting)

| Switch No | MAC Address | IP Address | Subnet Mask | Name | Ports |
|---|---|---|---|---|---|
| RM | 00:07:af:00:b1:40 | 192.168.1.135 | 255.255.255.0 | N-TRON Switch | A2 A1 |

The screenshot below shows N-Ring Manager Status when a 'Lower' N-Ring Port (A1 or E1) is not receiving self health frames all the way around the N-Ring, though the other (high A2/E2) N-Ring port is:

**N-Ring Partial Fault (A1 is not receiving self health from A2)**

### N-Ring Status View

Switch is an N-Ring Manager, using N-Ring Aging Time = 20 seconds

Refresh every [6] secs. [Update] [Pause] [Print...]

0 Active Members Detected In Current N-Ring (0 reporting)

| Switch No | MAC Address | IP Address | Subnet Mask | Name | Ports |
|---|---|---|---|---|---|
| RM | 00:07:af:00:b1:40 | 192.168.1.135 | 255.255.255.0 | N-TRON Switch | A2 A1 |

# NView™ – Configuration

The Configuration tab under the NView category will display two basic variables for NView, the status and the interval between packets.
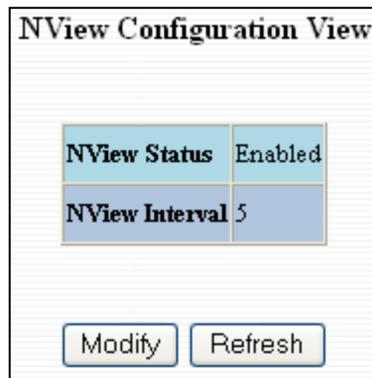


Following the Modify button on the above example, the administrator can modify the variable to change the frequency with which NView reports information.  Increasing the interval will slow the update rate. Decreasing the interval will allow NView to report more frequently.  Additionally, you may Disable or Enable NView altogether.
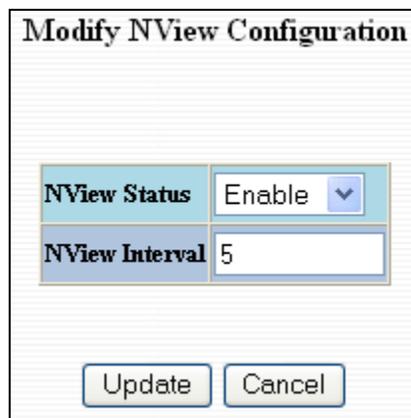
# NView™ – Ports

The Ports tab under the NView category will display a list of all the configured ports on the 9000 unit along with the ports transmitting multicast packets and MIB stats respectively.

**NView Ports View**

| Port Name | Multicast on Port? | Send MIB Stats? |
|-----------|--------------------|-----------------|
| A1 | YES | YES |
| A2 | YES | YES |
| A3 | YES | YES |
| A4 | YES | YES |
| A5 | YES | YES |
| A6 | YES | YES |
| B1 | YES | YES |
| B2 | YES | YES |
| B3 | YES | YES |
| B4 | YES | YES |
| -- | -- | -- |
| -- | -- | -- |
| C1 | YES | YES |
| C2 | YES | YES |
| -- | -- | -- |
| -- | -- | -- |
| -- | -- | -- |
| -- | -- | -- |
| -- | -- | -- |
| -- | -- | -- |
| -- | -- | -- |
| -- | -- | -- |
| -- | -- | -- |
| -- | -- | -- |
| E1 | YES | YES |
| E2 | YES | YES |

[ Modify ] [ Refresh ]

# NView™ – Ports, Continued…

Following the Modify button on the previous example, the administrator can modify these two variables to enable or disable multicast out of the port and if MIB stats are sent out for those ports.

| Port Name | Multicast on Port? | Send MIB Stats? |
|:---:|:---:|:---:|
| **Modify NView Ports** | | |
| A1 | ☑ | ☑ |
| A2 | ☑ | ☑ |
| A3 | ☑ | ☑ |
| A4 | ☑ | ☑ |
| A5 | ☑ | ☑ |
| A6 | ☑ | ☑ |
| B1 | ☑ | ☑ |
| B2 | ☑ | ☑ |
| B3 | ☑ | ☑ |
| B4 | ☑ | ☑ |
| -- | ☑ | ☑ |
| -- | ☑ | ☑ |
| C1 | ☑ | ☑ |
| C2 | ☑ | ☑ |
| -- | ☑ | ☑ |
| -- | ☑ | ☑ |
| -- | ☑ | ☑ |
| -- | ☑ | ☑ |
| -- | ☑ | ☑ |
| -- | ☑ | ☑ |
| -- | ☑ | ☑ |
| -- | ☑ | ☑ |
| -- | ☑ | ☑ |
| -- | ☑ | ☑ |
| E1 | ☑ | ☑ |
| E2 | ☑ | ☑ |

[ Update ] [ Cancel ]

# EventLog – Log Statistics

The Log Statistics tab under the EventLog category will show a list of how many times a type of event took place. On the bottom of the page it should also list the maximum log size which can be modified. There are 5 types of events that the 9000 will categorize messages in. If the log level is set to 1, the 9000 will log all 5 types of events. If the log level is set to 5 it will only record the Critical types (the 5th level).

**Event Log Configuration View**

**Total No of Events :9**

| Event Type | Count |
| --- | --- |
| Informational | 5 |
| Warning | 1 |
| Minor | 0 |
| Severe | 3 |
| Critical | 0 |

| Log Size | 100 |
| --- | --- |
| Log Level | 1 |

Modify    Refresh

Following the Modify button on the previous example, the administrator can modify these two variables to adjust for how large he or she wants the log file to be and the log level.

**Event Log Configuration**

Event Log Size    : 100

Event Log Level : 1

Update    Cancel

# EventLog – Show Events

The Show Events tab under the EventLog category will show a list of events that have occurred in the order in which they occurred. There is a time stamp for each event and they are categorized by the severity of the event.

### Events View

| S.No | Code No | Source Name | Severity | Event Description | Time Stamp |
|------|---------|-------------|----------|-------------------|------------|
| 1 | 98 | Network/Ports | Informational | Port10 Link Up | 00:00:00:00:26:05 |
| 2 | 99 | Network/Ports | Severe | Port10 Link Down | 00:00:00:00:26:01 |
| 3 | 27 | Bridging | Warning | Entry does not exists in the AET | 00:00:00:00:18:35 |
| 4 | 98 | Network/Ports | Informational | Port10 Link Up | 00:00:00:00:00:04 |
| 5 | 116 | Image Loader | Severe | Error connecting to control socket | 00:00:00:00:53:09 |
| 6 | 98 | Network/Ports | Informational | Port10 Link Up | 00:00:00:00:12:00 |
| 7 | 99 | Network/Ports | Severe | Port12 Link Down | 00:00:00:00:11:57 |
| 8 | 98 | Network/Ports | Informational | Port12 Link Up | 00:00:00:00:00:05 |
| 9 | 98 | Network/Ports | Informational | Port12 Link Up | 00:00:00:00:00:05 |

Total Number of Events Logged:9

[Clear Events]  [Refresh]

# Firmware/Config – TFTP

The TFTP tab under the Firmware/Config category gives the administrator the ability to upload or download a config file for a 9000 Series switch. This gives administrators the ability to backup their configurations to a server offsite in case they need to reload their custom configurations at a later time. Administrators are also given the ability to flash the switch in the field allowing them to update the firmware in the field without losing their current configurations and without having to send the unit back in to N-Tron for updates in the future. It is important not to cycle power on the switch or interrupt the data connection between the TFTP server and the switch while you are flashing or uploading or downloading a config file. The switch will not stop working if this does occur, but the administrator will have to retransfer the file.

**Firmware Download/Config Upload/Download - TFTP**

| | |
|---|---|
| Server IP Address | 192.168.1.2 |
| File Name | config |
| Transfer Type | Image Download |

[ Action ]

**Firmware/Config through TFTP Status**

Downloading the image through TFTP......Please wait..

The Image has been downloaded successfully......

Click to restart for changes to take effect.

[ Restart ]

# Firmware/Config – FTP

        The FTP tab under the Firmware/Config category gives the administrator the ability to upload or download a config file for a 9000 Series switch. This gives administrators the ability to backup their configurations to a server offsite in case they need to reload their custom configurations at a later time. Administrators are also given the ability to flash the switch in the field allowing them to update the firmware in the field without losing their current configurations and without having to send the unit back in to N-Tron for updates in the future. It is important not to cycle power on the switch or interrupt the data connection between the FTP server and the switch while you are flashing or uploading or downloading a config file. The switch will not stop working if this does occur, but the administrator will have to retransfer the file.

**Firmware Download/Config Upload/Download - FTP**

| | |
|---|---|
| User Name | anonymous |
| Password | |
| Server IP | 192.168.1.2 |
| File Name | config |
| Mode | Binary |
| Transfer Type | Image Download |

Action

**Firmware/Config through FTP Status**

Downloading the image through FTP......Please wait..

The Image has been downloaded successfully......

# Support – Web Site and E-mail

If at any point in time you get confused or would like additional support directly from N-Tron, you may visit N-Tron's web site, or e-mail N-Tron directory with the links provided for more information.

# BPCL – Broadcast Packet Count Limit Configuration

The BPCL link will display all the ports that are installed in the 9000 Series unit and will list the BPCL Percentage for each port. These are egress filters. A modify button is provided to change these fields.

**Broadcast Packet Count Limit Configuration View**

| Port Name | BPCL [%] | Port Name | BPCL [%] |
|-----------|----------|-----------|----------|
| A1 | 3 | -- | -- |
| A2 | 3 | -- | -- |
| A3 | 3 | -- | -- |
| A4 | 3 | -- | -- |
| A5 | 3 | -- | -- |
| A6 | 3 | -- | -- |
| B1 | 3 | -- | -- |
| B2 | 3 | -- | -- |
| B3 | 3 | -- | -- |
| B4 | 3 | -- | -- |
| B5 | 3 | -- | -- |
| B6 | 3 | E1 | 3 |
| -- | -- | E2 | 3 |

[ Modify ] [ Refresh ]

Following the Modify button on the previous example, the administrator can modify the BPCL Percentage for each port. The default BPCL is 3% for all ports.

**Broadcast Packet Count Limit Configuration**

Port Name : A1
BPCL Percentage : 3

[ Update ] [ Cancel ]

# User Mgmt – Adding Users

The User Management link will display a list of all the users who have access to the management features of the switch and their access permissions.

Following the Add button on the previous example, the administrator can add another user and assign the user a username, a password, and the user's permissions (user/administrator).

A page should display after the administrator clicks the Add button stating that the user was successfully added.

**NOTE:** *There is a maximum number of 5 users per switch. User permissions have the right to view switch configurations and to view current port settings, but cannot make any changes to these settings. Admin permissions have the right to change and view any switch configuration and to change and view any current port settings.*

# User Mgmt – Removing Users

In order to remove a user, simply click on the Remove button at the bottom of the page.

Following the Remove button on the last page, the administrator can remove a user by entering in the user's name and clicking the Remove button.

A page should follow stating that the user was successfully removed from the list.

# Logical View

The 9000 Web Management offers a logical view of the switch. Here a user or administrator can see a graphical depiction of the 9000 switch with the installed modules that have been configured in it. Ports that are linked will turn green, while ports that are not linked will show up as black. The example below shows only port 4 on the 9006TX module is linked. The other ports are currently in the down state (not being used).
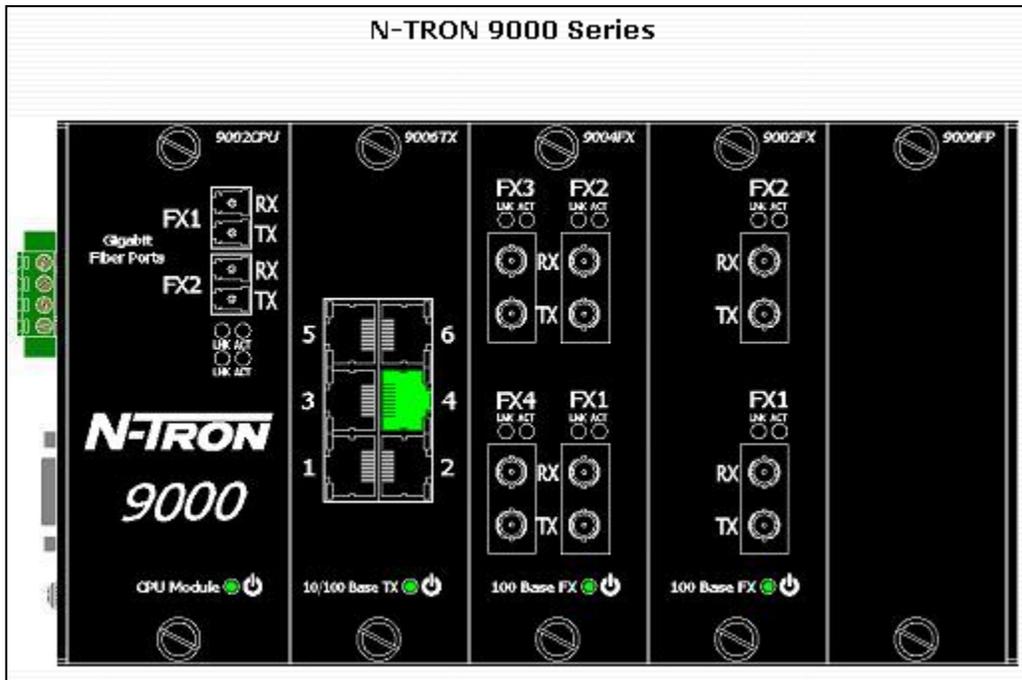
# Configuration – Save or Reset

       The Configuration section of the web management gives an administrator the ability to save a running configuration into the NVRAM.  This step is needed in order for the switch to remember any changes after a power cycle.

The Reset Configuration button will reload N-Tron's factory default configuration settings.  Doing so will re-configure the 9000 Series switch to factory defaults.

In many cases it is desirable to restore factory defaults but retain the IP, Slot Configuration, Subnet Mask, and Gateway Address settings.  A choice is provided to this end.

**Configuration Save or Reset**

Save Configuration    Click this button to save the current configuration.

Reset Configuration    Click this button to restore all factory defaults.

Reset (Keep IP & Slots)    Click this button to restore factory defaults except for Slots configuration, and IP, Subnet and Gateway addresses.

# Help – Overview



When the Help link is clicked on, you will see the Overview page that will have some basic definitions and more specific choices at the top of the screen. Although this page is not as detailed as the manual is, it gives you a basic feel for different features the 9000 offers.

# Help – Administration



Selecting the Administration link on the help page, the administrator or user can see some information regarding the configuration options in the Administration category on the left side of the web management.

# Help – Ports



Following the Ports link on the help page, the administrator or user can see some information regarding the configuration options in the Ports category on the left side of the web management.

# Help – Statistics



Following the Statistics link on the help page, the administrator or user can see some information regarding the configuration options in the Statistics category on the left side of the web management.

# Help – VLAN



Using the VLAN link on the help page, the administrator or user can see some information regarding the configuration options in the VLAN category on the left side of the web management.

# Help – BPCL



Using the BPCL the link on the help page, the administrator or user can see some information regarding the configuration options in the BPCL category on the left side of the web management.

# Help – IGMP



Following the IGMP link on the help page, the administrator or user can see some information regarding the configuration options in the IGMP category on the left side of the web management.

# Help – Bridging



Using the Bridging link on the help page, the administrator or user can see some information regarding the configuration options in the Bridging category on the left side of the web management.

# Help – RSTP



Using the RSTP link on the help page, the administrator or user can see some information regarding the configuration options in the RSTP category on the left side of the web management.

# Help – Event Log
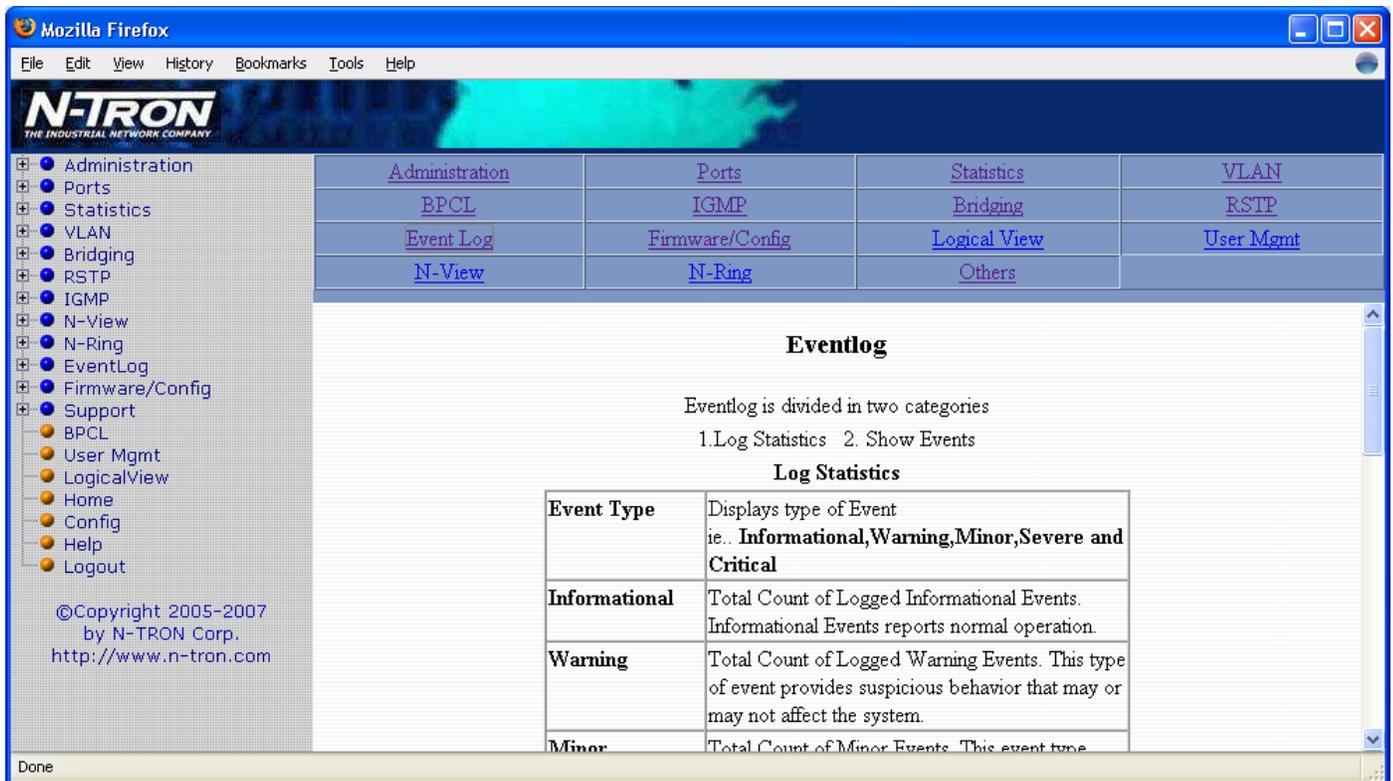


     Using the Event Log link on the help page, the administrator or user can see some information regarding the configuration options in the Event Log category on the left side of the web management.

# Help – Firmware/Config
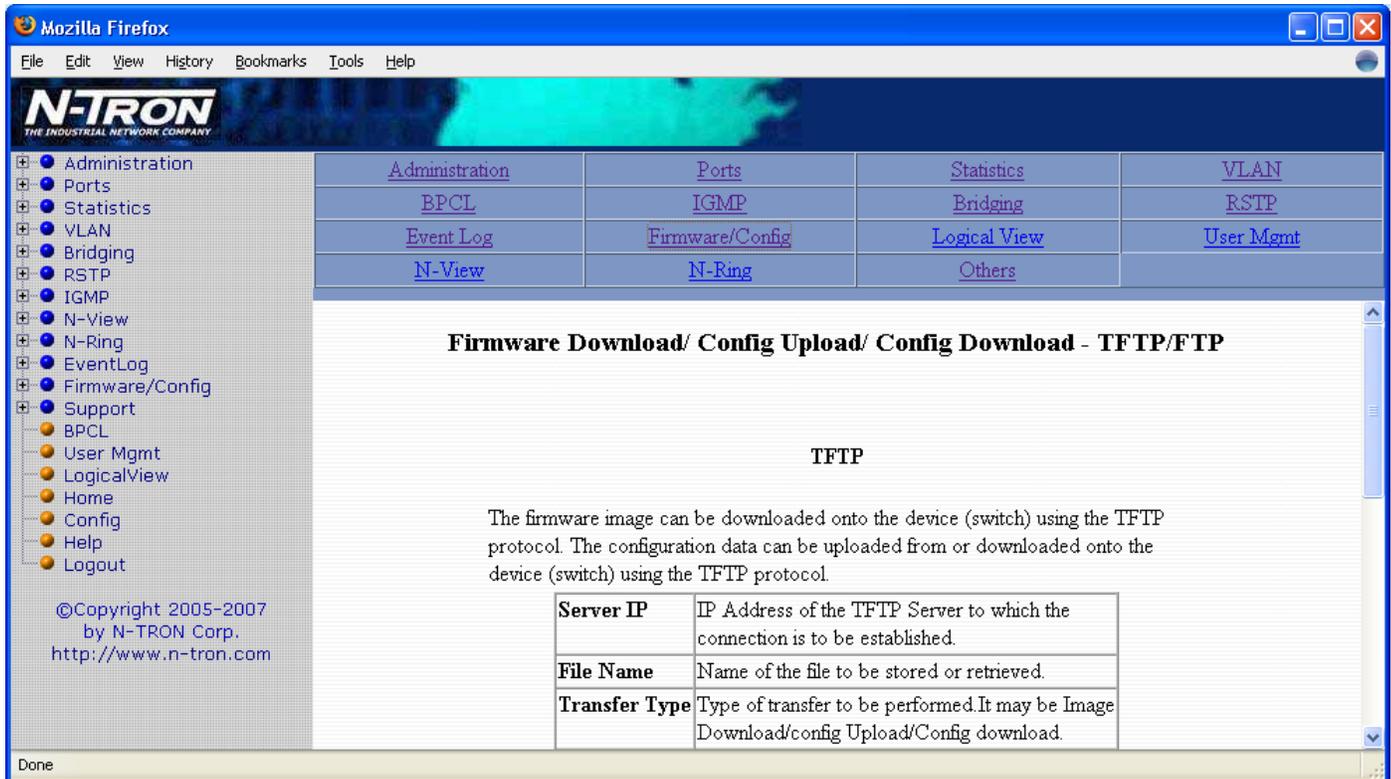


Using the Firmware/Config link on the help page, the administrator or user can see some information regarding the configuration options in the Firmware/Config category on the left side of the web management.

# Help – Logical View
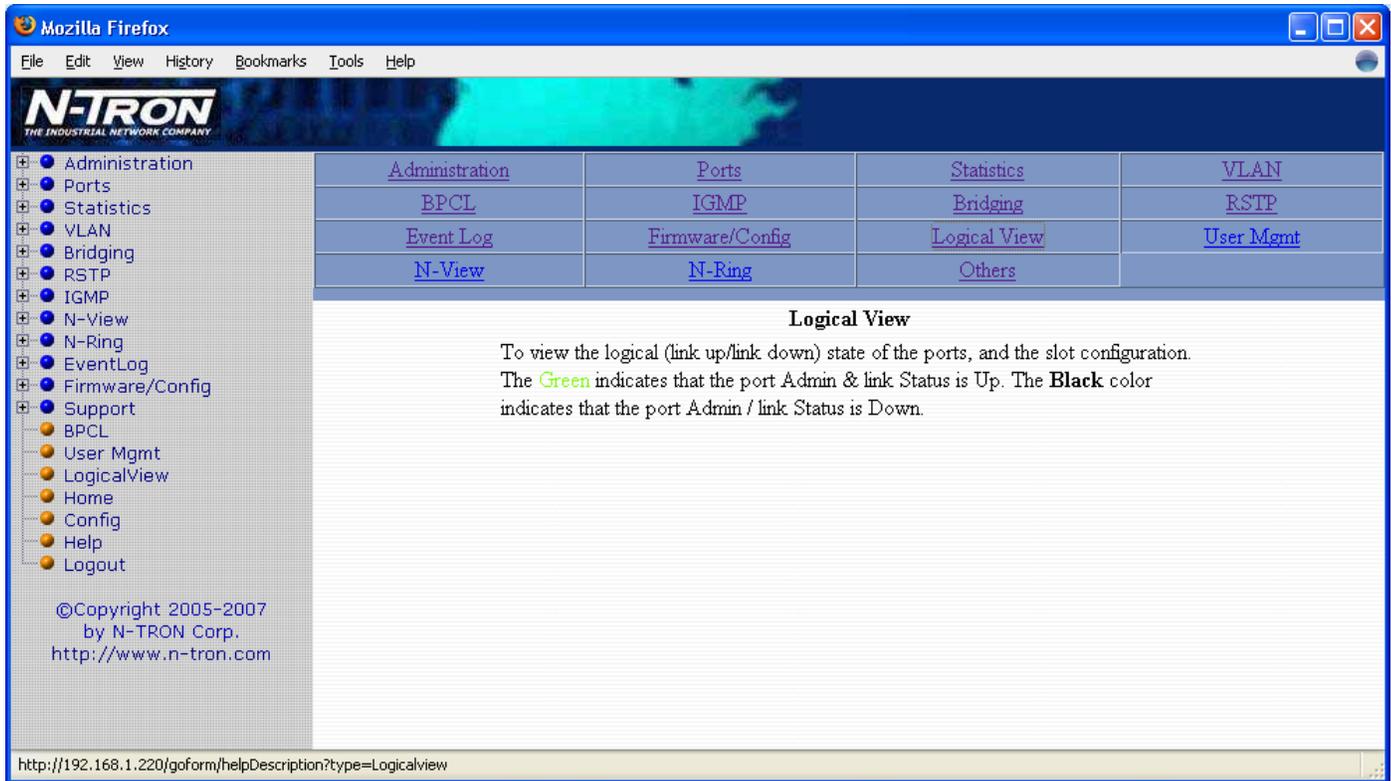


Using the Logical View link on the help page, the administrator or user can see some information regarding the configuration options in the Logical View category on the left side of the web management.

# Help – User Mgmt



Using the User Mgmt link on the help page, the administrator or user can see some information regarding the configuration options in the User Mgmt category on the left side of the web management.

# Help – N-View™
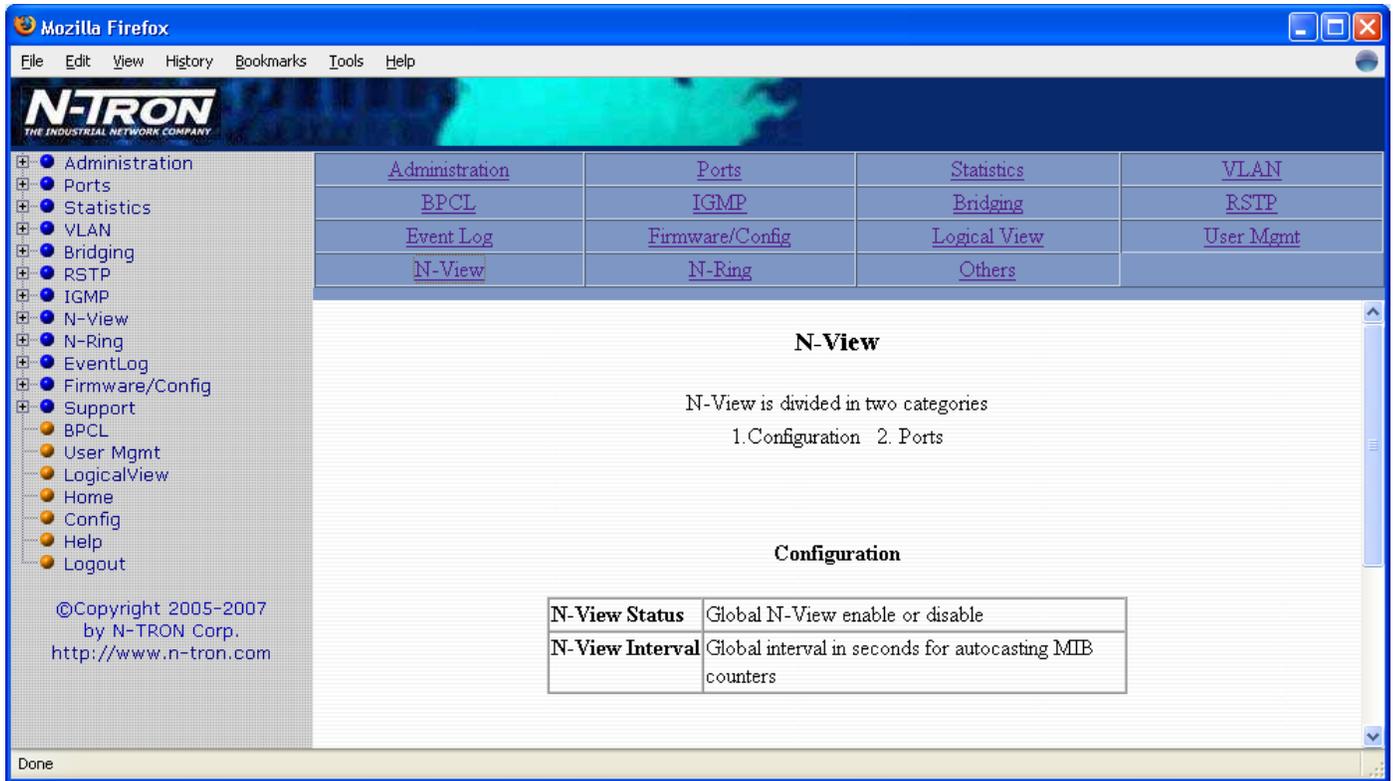


     Using the N-View link on the help page, the administrator or user can see some information regarding the configuration options in the NView category on the left side of the web management.

# Help – N-Ring™



Using the N-Ring link on the help page, the administrator or user can see some information regarding the configuration options in the N-Ring category on the left side of the web management.

# Help – Others
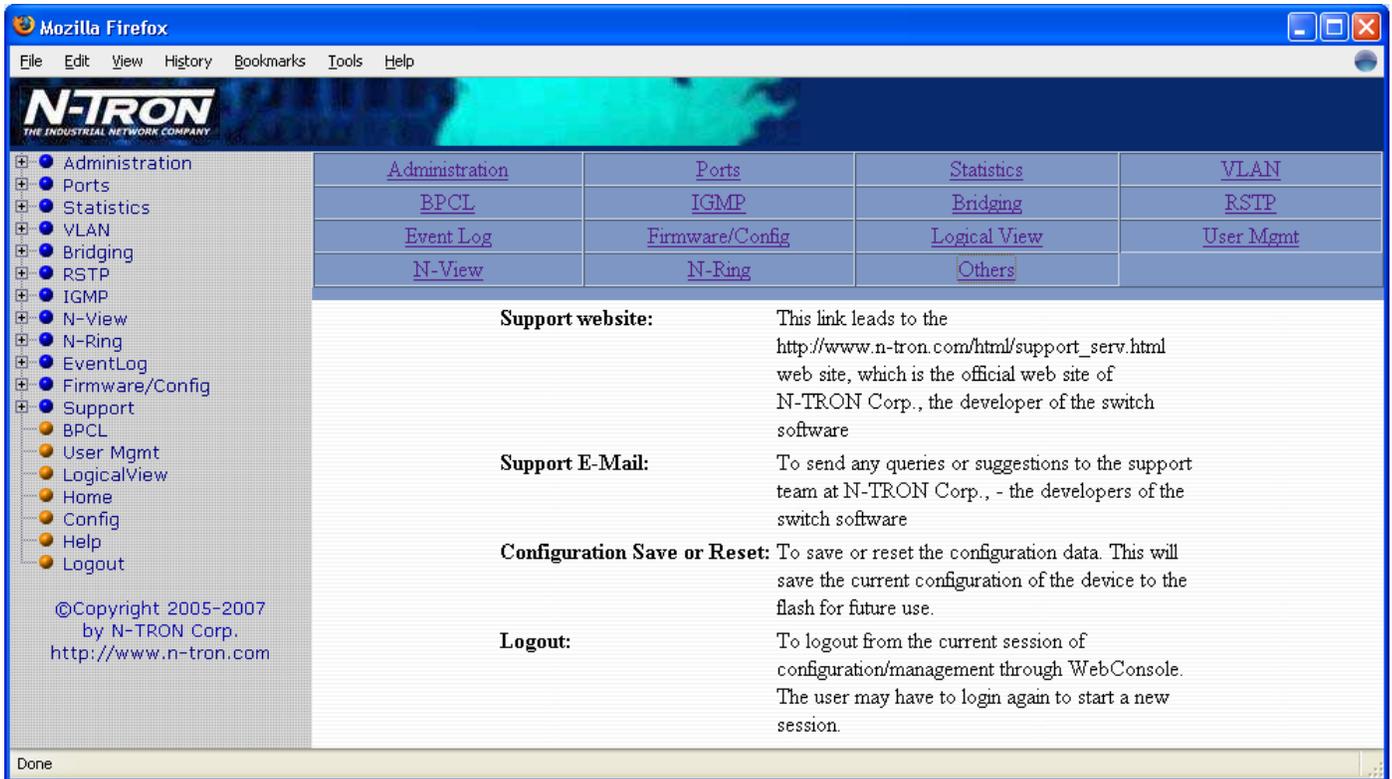


Following the Others link on the help page, the administrator or user can see some information regarding other links or categories on the left hand side of the web manager, as above.

# CLI Commands

## Clear

| Command Name | **clear** |
|---|---|
| Description | Clears the screen.  The cleared screen shows only the command-line prompt and the cursor. |
| Syntax | **clear** |
| Parameters | **None** |
| Examples | `N-TRON/Admin#[1]> clear`<br>*The entire screen will be cleared…*<br>*…*<br>*…*<br>*…*<br>*…*<br>`N-TRON/Admin#[2]>` |
| NOTES | |

## "?" (HELP)

| Command Name | **"?"** |
|---|---|
| Description | Without <keywords>, this command will list all the available commands. This is the same as the default behavior of the **help** command.<br><br>If <keywords> is specified and if they match a specific command, the **usage** of the command will be displayed; otherwise, if <keywords> matches the prefix of a command(s), the name of the command(s) will be listed.<br><br>If **?** is preceded by another **?**, the usage and description of this command will be displayed. |
| Syntax | **?**<br>*<matched keywords>* **?**<br>*<command>* **?** |
| Parameters | **matched keywords**<br>Prefixes of the command.<br>**command**<br> Name of the any command supported by CLI |
| Examples | `N-TRON/Admin#[1]> ?`<br>*The above command displays all the available commands.*<br><br>`N-TRON/Admin#[2]> abcd ?`<br>`Unknown command supplied as parameter.`<br><br>`N-TRON/Admin#[3]> clear ?`<br>`Usage:  clear`<br><br>`N-TRON/Admin#[4]> system ?`<br>`System/`<br><br>`N-TRON/Admin#[5]> ? ?`<br><br>*This displays the usage of "?" as shown below*<br>`[<keywords>] ?` |
| NOTES | |

## Top

| Command Name | top |
| --- | --- |
| Description | Changes the context to the topmost (global) level.  If already at the topmost context, the command is simply ignored |
| Syntax | **top** |
| Parameters | **None** |
| Examples | N-TRON/Admin#[1]system> show<br><br>N-TRON/Admin#[2]system/show> top<br><br>N-TRON/Admin#[3]> top<br><br>N-TRON/Admin#[4]> |
| NOTES | |

## Up

| Command Name | up |
| --- | --- |
| Description | Changes the context to the next higher level.  If already at the topmost context, the command is simply ignored |
| Syntax | **up** |
| Parameters | **None** |
| Examples | N-TRON/Admin#[1]> system show<br><br>N-TRON/Admin#[2]system/show> up<br><br>N-TRON/Admin#[3]system> up<br><br>N-TRON/Admin#[4]> up<br>N-TRON/Admin#[5]> |
| NOTES | |

## Logout

| Command Name | logout |
| --- | --- |
| Description | Logs out the user from a CLI session.  In case of a remote session, the session will be terminated after the user is logged out. |
| Syntax | **logout** |
| Parameters | **None** |
| Examples | N-TRON/Admin#[1] logout<br><br>Hit <ENTER> to login: |
| NOTES | |

## History

| Command Name | history |
| --- | --- |
| Description | Lists all the commands in the history list for the current session, identifying each command with a reference number. |
| Syntax | **history** |
| Parameters | –**reverse**<br>  reverse the order of display to be the most recent entry first.<br>–**maxsize**<br>  set the maximum no. of entries that will be maintained in the list to the given value.<br>–**clear**<br>  remove all entries in the command history list. |
| Examples | N-TRON/Admin#[1]> history<br>*The above command displays previously entered commands.* |
| NOTES | |

| Command Name | **!** |
|---|---|
| Description | Repeats the command in the history list identified by <command-reference>. <br> **!!** – repeats the last command executed. <br> **!**<n> – repeats the command in the history list associated with reference number <n>. <br> **!**<str> – repeats the most recent command that begins with the string <str>. <br> Any non-whitespace characters that follow are appended to the referenced command prior to its execution. |
| Syntax | **!**<*n*> <br><br> **!**<str> |
| Parameters | **N** <br> It is the reference number of the command from history list that has to be repeated. <br> **str** <br> The most recent command from the history list that begins with keyword **str.** |
| Examples | ```
N-TRON/Admin#[1]> !!
Referenced command is not in the history list.

N-TRON/Admin#[2]> !1
Referenced command is not in the history list.

N-TRON/Admin#[3]> !s
Referenced command is not in the history list.

N-TRON/Admin#[4]> whoami
admin    with privilege of Administrator
``` <br> *here comes the usage of "!" command* <br> ```
N-TRON/Admin#[5]> !w
whoami
admin    with privilege of Administrator

N-TRON/Admin#[6]> !2
``` <br> *The above command will execute the second command, which is available in history list.* <br><br> N-TRON/Admin#[7]> !system <br> *The above command will execute the latest command in the history list that starts with system.* |
| NOTES | |

| Command Name | $ |
|---|---|
| Description | This command copies the command identified by reference number <command no> from the history list into the next command line allowing the user to edit the command for corrections or changes. |
| Syntax | **$**<n> |
| Parameters | **n**<br>The reference number of the command in the history list that has to be edited. |
| Examples | ```N-TRON/Admin#[1]> whoaim```<br>*As shown above the command whoaim was entered instead of whoami. To edit the already entered command do as follows.*<br><br>```N-TRON/Admin#[2]> $1```<br>```N-TRON/Admin#[2]> whoaim```<br>*Now we can edit the command at the command prompt.* |
| NOTES | After entering '$1' at the prompt, it displays the previously entered command. |

**Whoami**

| Command Name | **whoami** |
|---|---|
| Description | This command displays the current operating mode of the user. |
| Syntax | **whoami** |
| Parameters | **None** |
| Examples | *eg.1*<br>```N-TRON/Admin#[5]>whoami```<br>```admin    with privilege of Administrator```<br><br>*eg.2*<br>```N-TRON/User#[5]> whoami```<br>```user    with privilege of User``` |
| NOTES | |

**Ping**

| Command Name | **ping** |
|---|---|
| Description | To issue the ping request to a specified host. |
| Syntax | **ping** *<hostip-address> [count]* |
| Parameters | **hostip-address**<br>IP Address of the host to give the ping request.<br>count<br>Count the number of times to give the ping request (range 5-50). |
| Example | ```ping 10.1.6.15```<br>```ping 10.1.6.15 10``` |
| Notes | |

# System Configuration Commands

### Set Mode IP config

| Command Name | **system set modeipconfig** |
|---|---|
| Description | To set the IP address mode of the system |
| Syntax | **system set modeipconfig** *<manual/dhcp/bootp>* |
| Parameters | **manual**<br>    Uses a static IP address scheme (default mode)<br>**dhcp**<br>    Pulls an IP address from a DHCP server on the LAN<br>**bootp**<br>    Pulls an IP address from a Bootp server on boot up |
| Example | `N-TRON/Admin#[1]> system set modeipconfig dhcp` |
| NOTES | Bootp is an older version of DHCP, DHCP is recommended for a dynamic address scheme. |

### Set IP/Subnet/Gateway Addresses of the system

| Command Name | **system set ip** |
|---|---|
| Description | To set the IP address of the system |
| Syntax | **system set ip** *<IP-address> <subnet>[ <gateway>]* |
| Parameters | **IP Address**<br>    The IP address of the system in dotted decimal notation<br>**Subnet**<br>    The subnet of the above specified IP Address<br>**Gateway**<br>    The gateway address of the system. |
| Example | `N-TRON/Admin#[1]> system set ip 10.1.1.158 255.0.0.0`<br>`N-TRON/Admin#[2]> system set ip 10.1.6.150`<br>`255.255.255.0 10.1.6.150` |
| NOTES | The IP address should be a valid IP address (excluding Class D & Class E type) |

### Get IP Address of the system

| Command Name | **system get ip** |
|---|---|
| Description | To display the IP/Subnet/Gateway addresses of the device |
| Syntax | **system get ip** |
| Parameters | **None** |
| Example | `N-TRON/Admin#[1]> system get ip` |
| NOTES | |

### Set System Name

| Command Name | **system set sysname** |
|---|---|
| Description | To set the system name |
| Syntax | **system set sysname**  *<Name-of-the-system>* |
| Parameters | **Name-of-the-system**<br>    The system name to be used |
| Example | `N-TRON/Admin#[1]> system set sysname N-Tron`<br>`N-TRON/Admin#[2]> system set sysname "N-Tron Switch"` |
| Notes | Please ensure to use " " for supplying arguments with spaces |

### Get System Name

| Command Name | **system get sysname** |
|---|---|
| Description | To display the name of the system |
| Syntax | **system get sysname** |
| Parameters | **None** |
| Example | `N-TRON/Admin#[1]> system get sysname`<br><br>`System Name   : N-TRON Switch` |
| Notes | |

### Get Gateway Address of the System

| Command Name | **system get gateway** |
|---|---|
| Description | To display the gateway address of the system |
| Syntax | **system get gateway** |
| Parameters | **None** |
| Example | `N-TRON/Admin#[4]> system get gateway`<br><br>`System Gateway Address    : 192.168.1.1` |
| Notes | |

### Get Mac Address of the System

| Command Name | **system get sysmac** |
|---|---|
| Description | To display the mac address of the device |
| Syntax | **system get sysmac** |
| Parameters | **None** |
| Example | `N-TRON/Admin#[1]> system get sysmac`<br><br>`System MAC Address    : 00:07:af:00:00:00` |
| Notes | |

### Get Netmask of the System

| Command Name | **system get netmask** |
|---|---|
| Description | To display the netmask/subnet of the device |
| Syntax | **system get netmask** |
| Parameters | **None** |
| Example | `N-TRON/Admin#[8]> system get netmask`<br><br>`System Subnet    : 255.255.255.0` |
| Notes | |

### Get System Contact

| Command Name | **system get syscontact** |
|---|---|
| Description | To get the contact person name of the device. |
| Syntax | **system get syscontact** |
| Parameters | **None** |
| Example | `N-TRON/Admin#[10]> system get syscontact`<br><br>`System Contact    : N-TRON Admin` |
| Notes | |

### Set System Contact

| Command Name | **system set syscontact** |
|---|---|
| Description | To set the contact details for the system |
| Syntax | **system set syscontact**  *<Contact-for-the-system>* |
| Parameters | **Contact-for-the-system**<br>The details of the person to be contacted for this system in case of any queries or problems |
| Example | `N-TRON/Admin#[1]> system set syscontact `admin@N-Tron.com<br>`N-TRON/Admin#[2]> system set syscontact "Support Team"` |
| Notes | Please ensure to use " " for supplying arguments with spaces |

### Get System Location

| Command Name | **system get syslocation** |
|---|---|
| Description | To display the system location details. |
| Syntax | **system get syslocation** |
| Parameters | **None** |
| Example | `N-Tron/Admin#[1]> system get syslocation` |
| Notes | |

## Set System Location

| Command Name | **system set syslocation** |
|---|---|
| Description | To set the location details of the system |
| Syntax | **system set syslocation** *<Location-of-the-system>* |
| Parameters | **Location-of-the-system** <br> The details of where the system is located |
| Example | N-TRON/Admin#[1]> system set syslocation "San Jose" <br> N-TRON/Admin#[2]> system set syslocation Hyderabad |
| Notes | Please ensure to use " " for supplying arguments with spaces |

## Get System Uptime

| Command Name | **system get sysuptime** |
|---|---|
| Description | To get the uptime of the device. |
| Syntax | **system get sysuptime** |
| Parameters | **None** |
| Example | N-TRON/Admin#[1]> system get sysuptime <br><br> System Up Time   : 9 days:17 hours:8 mins:40 secs |
| Notes | |

## Get Number of Ports present in the System

| Command Name | **system get portcount** |
|---|---|
| Description | To get the number of ports present in the device. |
| Syntax | **system get portcount** |
| Parameters | **None** |
| Example | N-TRON/Admin#[1]> system get portcount |
| Notes | |

## Set IP Address of an SNMP Management Stations

| Command Name | **system set snmpmgmtip** |
|---|---|
| Description | To set the IP address of an SNMP management station |
| Syntax | **system set snmpmgmtip** *<Station-number, IP-address>* |
| Parameters | **Station-number** <br> The SNMP management station number <br> **IP-Address** <br> The IP address of the SNMP management station in dotted decimal notation |
| Example | N-TRON/Admin#[1]> system set snmpmgmtip 2 10.1.5.100 <br><br> N-TRON/Admin#[2]> system set snmpmgmtip 5 10.1.6.150 |
| NOTES | The IP address should be a valid IP address (excluding Class D & Class E type). To restore a Station Trap to "Value Not Configured", enter '0.0.0.0'. |

## Set SNMP Get Community name

| Command Name | **system set snmpgetcommunity** |
|---|---|
| Description | To set the community name for performing snmpget operation |
| Syntax | **system set snmpgetcommunity** *<Community-Name>* |
| Parameters | **Community-Name** <br> The name of the community to be used for performing snmpget operation |
| Example | N-TRON/Admin#[1]> system set snmpgetcommunity public <br><br> N-TRON/Admin#[1]> system set snmpgetcommunity "N-Tron Systems" |
| Notes | Please ensure to use " " for supplying arguments with spaces |

## Set SNMP Set Community name

| Command Name | **system set snmpsetcommunity** |
| --- | --- |
| Description | To set the community name for performing snmpset operation |
| Syntax | **system set snmpsetcommunity** *<Community-Name>* |
| Parameters | **Community-Name** <br> The name of the community to be used for performing snmpset operation |
| Example | `N-TRON/Admin#[1]> system set snmpsetcommunity private` <br><br> `N-TRON/Admin#[1]> system set snmpsetcommunity "N-Tron_Systems"` |
| Notes | Arguments cannot have spaces.  You can use an underscore ('_') instead of a space. |

## Set SNMP Trap Community name

| Command Name | **system set snmptrapcommunity** |
| --- | --- |
| Description | To set the community name for raising snmp trap |
| Syntax | **system set snmptrapcommunity** *<Community-Name>* |
| Parameters | **Community-Name** <br> The name of the community to be used for raising snmp trap |
| Example | `N-TRON/Admin#[1]> system set snmptrapcommunity private` <br><br> `N-TRON/Admin#[1]> system set snmptrapcommunity "N-Tron_Systems"` |
| Notes | Arguments cannot have spaces.  You can use an underscore ('_') instead of a space. |

## Show all configuration parameters

| Command Name | **system show config** |
| --- | --- |
| Description | Displays the software version, the MAC address, status of gigabit ports, and other switch information |
| Syntax | **system show config** |
| Parameters | **None** |
| Example | ```
N-TRON/Admin#[32]system/show> system show config

System Configuration   :
Product Configuration  : 9002CPU
Software Version       : 4.1.1
MAC Address            : 00:07:af:ff:d8:80
IP Configuration Mode  : manual
System IP Address      : 192.168.1.220
Subnet Mask            : 255.255.255.0
Gateway Address        : 192.168.1.1
System Name            : N-TRON Switch
System Contact         : N-TRON Admin
System Location        : Mobile, AL 36609
System Up Time         : 0 days:0 hours:55 mins:59 secs

Total Number of Ports  : 26
Port # 1 - 24          : 10/100 Mbps Copper and/or 100
                         Mbps Fiber
Port # 25              : 1000 Base LX Transceiver
Port # 26              : 1000 Base LX Transceiver
``` |
| Notes | |

**Show all configuration parameters related to SNMP manager**

| Command Name | **system show snmpinfo** |
|---|---|
| Description | To show all the configuration parameters related to snmp manager |
| Syntax | **system show snmpinfo** |
| Parameters | **None** |
| Example | N-TRON/Admin#[33]system/show> snmpinfo<br><br>System SNMP Configuration :<br>IP Address - Trap Station#1    : 192.168.1.2<br>IP Address - Trap Station#2    : Value Not Configured<br>IP Address - Trap Station#3    : Value Not Configured<br>IP Address - Trap Station#4    : Value Not Configured<br>IP Address - Trap Station#5    : Value Not Configured<br>SNMP Get Community Name        : public<br>SNMP Set Community Name        : private<br>SNMP Trap Community Name       : public |
| Notes | |

**System Restart**

| Command Name | **system  restart** |
|---|---|
| Description | To restart (reboot) the device |
| Syntax | **system restart** |
| Parameters | **None** |
| Example | N-TRON/Admin#[1]> system restart<br><br>Do you Want to Restart the System Now:  [y/n]y<br>Do you Want to Save the Configuration:  [y/n]y<br>................<br>................ |
| Notes | |

# User Management Commands

### Show System Users

| Command Name | **system show users** |
|---|---|
| Description | Shows a list of users and their permissions on the system |
| Syntax | **system show users** |
| Parameters | **None** |
| Example | `N-TRON/Admin#[1]> system show users`<br><br>`Serial  Username          Access Permissions`<br>`------  --------          ------------------`<br>` 1      admin             admin`<br>` 2      ntron             user` |
| NOTES | |

### Add a System User

| Command Name | **system add user** |
|---|---|
| Description | To add a user to the system |
| Syntax | **system add user** <username> [access permission] |
| Parameters | **Username**<br>    A string of at least 3 characters and no more then 15 characters<br>**Access permission**<br>    "user" or "admin" permission rights<br>**Password**<br>    Administrator will be prompted for a password of 3 to 15 characters in length. |
| Example | `N-TRON/Admin#[1]> system add user ntron user`<br>`Enter User Password :****` |
| NOTES | Users with User permissions can not make changes to the switch, but can view configuration settings and port settings.  Users with admin permissions have the ability to change settings on the switch and can add more users.  There is a limit of 5 users per switch with any combination of permissions. |

### Modify a User's Access Permissions

| Command Name | **system modify useraccess** |
|---|---|
| Description | To change a user's permissions |
| Syntax | **system modify useraccess <username> <access permission>** |
| Parameters | **Username**<br>    The user's username that is to be modified.<br>**Access permission**<br>    "user" or "admin" permission rights |
| Example | `N-TRON/Admin#[1]> system modify useraccess ntron admin` |
| NOTES | User must have admin permissions to use this command |

### Modify a User's Password

| Command Name | **system modify userpassword** |
|---|---|
| Description | To change a user's password |
| Syntax | **system modify userpassword** <username> |
| Parameters | **Username**<br>    The user's username that is to be modified<br>**Password**<br>    The new password for the user |
| Example | `N-TRON/Admin#[1]system/modify> userpassword ntron`<br>`Enter New Password :*****`<br>`Confirm New Password :*****`<br>`Password has been modified successfully` |
| Notes | A user with user permissions can operate this command, but will be prompted for the old password before being prompted for the new password. |

### Remove a System User

| Command Name | **system remove user** |
|---|---|
| Description | To remove a user from the users list |
| Syntax | **system remove user <username>** |
| Parameters | **username**<br>    The user's username that is to be removed |
| Example | ```
N-TRON/Admin#[1]> system remove user ntron
Do you really want to delete the above user:  [y/n]y
User successfully deleted
``` |
| Notes | Only users with admin permissions can operate this command. |

# Image Loader Commands

## Download Image through COM port

| | |
|---|---|
| Command Name | **image download** |
| Description | To download new firmware image through the serial port on the switch. |
| Syntax | **image download** |
| Parameters | **None** |
| Examples | `N-TRON/Admin#[1]> image download` |
| NOTES | Uses XModem protocol when transferring the file.  N-Tron® recommends that you use TFTP or FTP when updating the firmware.  TFTP and FTP are both much faster. |

# TFTP Commands

## Set the TFTP configuration parameter

| | |
|---|---|
| Command Name | **tftp set** |
| Description | To set the TFTP configuration parameters TFTP Server IP Address and Remote File name. |
| Syntax | **tftp set serverparam <ip-address> <remote-file-name>** |
| Parameters | **ip-address**<br>    TFTP Server IP Address in dotted decimal notation for establishing the connection to transfer the file.<br>**remote-file-name**<br>    Name of the remote file (*including complete path*) to be retrieved from the TFTP Server. |
| Examples | *eg.1*<br>`N-TRON/Admin#[1]> tftp set serverparam 10.1.1.151 flash`<br><br>*eg.2*<br>`N-TRON/Admin#[1]> tftp set serverparam 10.1.1.151 /usr/local/tftp/flash` |
| NOTES | Please ensure that TFTP ServerIP is a valid IP Address by pinging it. |

## Show TFTP configuration parameters

| | |
|---|---|
| Command Name | **tftp show** |
| Description | To display the present values of all the TFTP related configuration parameters. |
| Syntax | **tftp show** |
| Parameters | **None** |
| Examples | `N-TRON/Admin#[1]> tftp show` |
| NOTES | Displays the Server IP Address and Filename. |

## Download file from TFTP server

| | |
|---|---|
| Command Name | **tftp action get** |
| Description | To download a specified file from the TFTP server. |
| Syntax | **tftp action get** |
| Parameters | **None** |
| Examples | `N-TRON/Admin#[1]> tftp action get` |
| NOTES | Check whether the server is up or not<br>Check that the connection is established.<br>Check if the file exists or not.<br>Check the number of bytes downloaded |

# FTP Commands

### Set Username

| Command Name | **ftp set username** |
|---|---|
| Description | To set the user name which will be used to log into the FTP server |
| Syntax | **ftp set username** *<Username>* |
| Parameters | **Username**<br>    The user name for logging on to the FTP server |
| Example | *eg.1*<br>`N-TRON/Admin#[1]> ftp set username ntron`<br>*eg.2*<br>`N-TRON/Admin#[1]> ftp set username admin` |
| Notes | The user name should be a valid one; else logging into FTP server will fail. |

### Set Password

| Command Name | **ftp set password** |
|---|---|
| Description | To set the password for the above user name |
| Syntax | **ftp set password** |
| Parameters | **Password**<br>    Password for the above user required to log into the FTP server |
| Example | `N-TRON/Admin#[1]> ftp set password`<br>`Enter the password : ******` |
| Notes | The password should be a valid one for the user; else logging into the FTP server will fail. |

### Set IP Address of FTP server

| Command Name | **ftp set serverip** |
|---|---|
| Description | To set the IP address of the FTP server to be used for establishing the FTP connection for transfer of files/data |
| Syntax | **ftp set serverip** *<Server-IP-address>* |
| Parameters | **Server-IP-address**<br>    The IP address of the FTP server in decimal dotted notation for establishing a FTP connection |
| Example | *eg.1*<br>`N-TRON/Admin#[1]> ftp set serverip 10.1.1.100`<br>*eg.2*<br>`N-TRON/Admin#[1]> ftp set serverip 15.1.1.150` |
| Notes | The IP address of the FTP server should be a valid IP address (excluding Class D & Class E types). The IP address should also be a valid FTP server IP in order to ensure successful connection establishment. |

### Set Name of the Remote File

| Command Name | **ftp set remotefile** |
|---|---|
| Description | To set the name of the remote file which has to be retrieved from the FTP server |
| Syntax | **ftp set remotefile** *<Remote-file-name>* |
| Parameters | **Remote-file-name**<br>    Name of the file to retrieved from the FTP server including the complete path |
| Example | *eg.1*<br>`N-TRON/Admin#[1]> ftp set remotefile Flash`<br>*eg.2*<br>`N-TRON/Admin#[1]> ftp set remotefile /usr/local/ftp/flash` |
| Notes | The file name (including the complete path) should be a valid name else retrieval of the file would fail. |

## Display FTP related configuration parameters

| Command Name | **ftp show** |
| --- | --- |
| Description | To display the present value of all the FTP related configuration parameters |
| Syntax | **ftp show** |
| Parameters | **None** |
| Example | `N-TRON/Admin#[1]> ftp show` |
| Notes | |

## Perform the configuration file transfer action

| Command Name | **ftp <get\|put> config** |
| --- | --- |
| Description | To perform the desired File Transfer action (either get or put). Get retrieves a remote file from the FTP server and put stores a local file at the FTP server |
| Syntax | **ftp get config**<br>**ftp put config** |
| Parameters | **Action-command**<br>The desired File transfer action (either get or put) |
| Example | *eg.1*<br>`N-TRON/Admin#[1]> ftp get config`<br>*eg.2*<br>`N-TRON/Admin#[1]> ftp put config` |
| Notes | The action name should be either get or put |

## Perform the image file transfer action

| Command Name | **ftp get image** |
| --- | --- |
| Description | To perform the desired File Transfer action. Get retrieves a remote file from the FTP server |
| Syntax | **ftp get image** |
| Parameters | **None** |
| Example | `N-TRON/Admin#[1]> ftp get image` |
| Notes | Can only get an image from a server |

# Port Manager Commands

### Get the link state of a given port

| Command Name | port get linkstate |
|---|---|
| Description | This command is used to get the present link state of a given port. Whenever there is an active connection, link state (operational state) is up; else link state is down. |
| Syntax | **port get linkstate** *<port-no>* |
| Parameters | **port-no**<br>　　Port number. (1 ~ 26). |
| Examples | ```N-TRON/Admin#[1]> port get linkstate 3```<br>```Link state of [3] port is: [down]```<br><br>```N-TRON/Admin#[2]> port get linkstate 1```<br>```Link state of [1] port is: [up]``` |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 26) |

### Get admin status of the port

| Command Name | port get adminstatus |
|---|---|
| Description | This command is used to the get present adminstatus of a given port. Adminstatus is used to enable or disable the port operations even though there are active connections. |
| Syntax | **port get adminstatus** *<port-no>* |
| Parameters | **port-no**<br>　　Port number. (1 ~ 26). |
| Examples | ```N-TRON/Admin#[1]> port get adminstatus  4```<br>```Admin state of [4] port is: [enable]```<br><br>```N-TRON/Admin#[2]> port get adminstatus 9```<br>```Admin state of [9] port is: [disable]``` |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 26) |

### Set admin status of a port

| Command Name | port set adminstatus |
|---|---|
| Description | This command is used to set the adminstatus of a given port to enable or disable. If the adminstatus is disabled, the port cannot process the received packets. |
| Syntax | **port set adminstatus** *<port-no><enable \| disable>* |
| Parameters | 1. **port-no**<br>　　Port number. (1 ~ 26).<br>2. **adminstatus**<br>　　adminstatus is either enable or disable. |
| Examples | ```N-TRON/Admin#[1]> port set adminstatus 4 enable```<br><br>```N-TRON/Admin#[2]> port set adminstatus 8 disable``` |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 24) |

## Show port statistics

| | |
|---|---|
| Command Name | **port show stats** |
| Description | This command is used to get the port statistics of a given port for all available counters. |
| Syntax | **port show stats** *<port-no>* |
| Parameters | **port-no**<br>    Port number. (1 ~ 26). |
| Examples | ```
N-TRON/Admin#[1]> port show stats 5
---------------------------------------------
            COUNTER TYPE  :[]
---------------------------------------------
COUNTER NAME            COUNTER VALUE
---------------------------------------------
byteFrames              28072
64 byte Frames          272
64-127 byte Frames      24
128-255 byte Frames     43
256-511 byte Frames     43
512-1023 byte Frames    0
1024-1518 byte Frames   0
1519-1522 byte Frames   0
… … … …
``` |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 26) |

## Get total number of good frames received

| | |
|---|---|
| Command Name | **port get totalgoodframes** |
| Description | Gets the total number of good frames received on the switch. |
| Syntax | **port get totalgoodframes** |
| Parameters | None |
| Examples | *eg.1*<br>```
N-TRON/Admin#[1]> port get totalgoodframes
Total no of good frames: [12456]
``` |
| NOTES | |

## Get port speed

| | |
|---|---|
| Command Name | **port get speed** |
| Description | Gets the port speed  in megabits. |
| Syntax | **port get speed** *<port-no>* |
| Parameters | **port-no**<br>    Port number. (1 ~ 26). |
| Examples | ```
N-TRON/Admin#[1]> port get speed 4
port speed of port no [4] is : [10]
N-TRON/Admin#[2]> port get speed 5
port speed of port no [5] is : [100]
``` |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 26) |

## Set Port Speed

| | |
|---|---|
| Command Name | **port set speed** |
| Description | Sets the port speed of a given port. |
| Syntax | **port set speed** *<port-no><speed>* |
| Parameters | **port-no**<br>    Port number. (1 ~ 26)<br>**speed**<br>    Speed of the port. Speed must either 10, 100, 1000 megabits per sec. |
| Examples | ```
N-TRON/Admin#[1]> port set speed 5 10

N-TRON/Admin#[2]> port set speed 9 100
``` |
| NOTES | |

## Get the port duplex mode

| | |
|---|---|
| Command Name | **port get duplexmode** |
| Description | Gets the port Duplex mode (FULL_DUPLEX / HALF_DUPLEX)   for a |

| | given port number . |
|---|---|
| Syntax | **port get duplexmode** *<port-no>* |
| Parameters | **port-no** <br>     Port number. (1 ~ 26) |
| Examples | ```<br>N-TRON/Admin#[1]> port get duplexmode 4<br>Duplex mode of [4] port is: [half]<br>N-TRON/Admin#[2]> port get duplexmode 23<br>Duplex mode of [23] port is: [full]<br>``` |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 26) |

### Set the port duplex mode

| Command Name | **port set duplexmode** |
|---|---|
| Description | Sets the port duplex mode (HALF_DUPLEX / FULL_DUPLEX) for a given port number. |
| Syntax | **port set duplexmode** *<port-no>* *<full | half>* |
| Parameters | **port-no** <br>      Port number. (1~24) <br> **full | half** <br>     Duplex mode of the port.  Duplex mode must be either <br>     FULL_DUPLEX or HALF_DUPLEX. |
| Examples | ```<br>N-TRON/Admin#[1]> port set duplexmode 4 full<br>N-TRON/Admin#[2]> port set duplexmode 4 half<br>``` |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 24) |

### Set the Lockstate of a given port

| Command Name | **port set lockstate** |
|---|---|
| Description | Sets the lock state of a given port to either enable or disable. If the port lock is enabled, the switch can process the data packets only from locked MAC addresses. Other data packets will not be processed. |
| Syntax | **port set lockstate** *<port-no>*  *<enable | disable>* |
| Parameters | **port-no** <br>      port number (1 ~ 26) <br> **enable | disable** <br>     Lock enable or disable |
| Examples | ```<br>N-TRON/Admin#[1]> port set lockstate 5 disable<br>N-TRON/Admin#[2]> port set lockstate 8 enable<br>``` |
| NOTES | Once the port is locked, all the MACs that are learned on that port are treated as static MACs.  This means the switch can process the packets from those MACs only.  It will discard all packets from other MACs. Because the MAC is set for that port, it will only be addressable via that port. |

### Get Lock State

| Command Name | **port get lockstate** |
|---|---|
| Description | Gets the lock state for a given port. |
| Syntax | **port get lockstate** *<port-no>* |
| Parameters | **port-no** <br>      port number (1 ~ 26). |
| Examples | ```<br>N-TRON/Admin#[1]> port get lockstate 6<br>LockState  : [enable]<br>N-TRON/Admin#[2]> port get lockstate 24<br>LockState  : [disable]<br>``` |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 26) |

### Get Auto-negotiation State

| Command Name | **port get autonego** |
|---|---|
| Description | Gets the auto negotiation mode for a given port. |
| Syntax | **port get autonego** *<port-no>* |
| Parameters | **port-no** |

| | Port number (1 ~ 24). |
|---|---|
| Examples | `N-TRON/Admin#[1]> port get autonego 6`<br>`Auto negotiation mode is : [enabled]`<br>`N-TRON/Admin#[2]> port get autonego 24`<br>`Auto negotiation mode is : [disabled]` |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 24) |

### Set Auto-negotiation State

| Command Name | **port set autonego** |
|---|---|
| Description | Sets the auto negotiation mode of a given port to either enable or disable. If the port auto negotiation mode is enabled, the switch can automatically adjusts it speed and duplex mode to the incoming speed and duplexmode. |
| Syntax | **port set autonego** *<port-no><enable \| disable>* |
| Parameters | **port-no**<br>     port number (1 ~ 24)<br>**enable \| disable**<br>     Auto negotiation enable or disable |
| Examples | `N-TRON/Admin#[1]> port set  autonego 6 enable`<br>`Auto negotiation mode of port[6] is : [enabled]`<br>`N-TRON/Admin#[2]> port set  autonego 24 disable`<br>`Auto negotiation mode of port[6] is : [disabled]` |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 24) |

### Set Priority State

| Command Name | **port set prioritystate** |
|---|---|
| Description | Enables or Disables the Priority State on a per port basis. |
| Syntax | **port set prioritystate** *<enable \| disable><port-no>* |
| Parameters | **port-no**<br>     port number (1 ~ 26)<br>**enable \| disable**<br>     Priority State enable or disable |
| Examples | `N-TRON/Admin#[1]> port set prioritystate enable 6` |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 26) |

### Set Flow Control

| Command Name | **port set flowcontrol** |
|---|---|
| Description | Enable or Disable flow control (typically refers to 100Base). When enabled a pause frame will be sent to help control the flow. |
| Syntax | **port set flowcontrol** *<port-no><enable \| disable>* |
| Parameters | **port-no**<br>     port number (1 ~ 24)<br>**enable \| disable**<br>     Flow Control enable or disable |
| Examples | `N-TRON/Admin#[1]> port set flowcontrol 6 enable` |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 24) |

### Set Name

| Command Name | **port set name** |
|---|---|
| Description | Changes the name of the port. This change will only be visible in the CLI. |
| Syntax | **port set name** *<port-no><name>* |
| Parameters | **port-no**   port number (1 ~ 26)<br>**name**     A string that describes the port |
| Examples | `N-TRON/Admin#[1]> port set name 6 waterplant` |
| NOTES | This will be reset if you change a slot configuration. |

### Set PVID

| Command Name | **port set pvid** |
|---|---|
| Description | Set a port's VLAN-ID. |
| Syntax | **port set pvid** *<port-no><pvid-number>* |
| Parameters | **port-no**<br>     port number (1 ~ 26) |

|  | **pvid-number** |
|  | The VLAN-ID number of the VLAN that this port will be a member of |
| Examples | `N-TRON/Admin#[1]> port set pvid 6 2` |
| NOTES | A port can be a member to several VLANs, but can only have one PVID |

### Set Backpressure

| Command Name | **port set backpressure** |
| --- | --- |
| Description | Enables or disables backpressure on a given port. This is normally used on 10Base setups and is a controlled by the hardware. |
| Syntax | **port set backpressure** *<port-no><enable | disable>* |
| Parameters | **port-no** |
|  | port number (1 ~ 24) |
|  | **enable | disable** |
|  | Backpressure enable or disable |
| Examples | `N-TRON/Admin#[1]> port set backpressure 6 enable` |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 24) |

### Set Intruderstate

| Command Name | **port set intruderstate** |
| --- | --- |
| Description | Enables or Disables the intruder log. |
| Syntax | **port set intruderstate** *<enable | disable>* |
| Parameters | **enable | disable** |
|  | Enable or disable the intruder log |
| Examples | `N-TRON/Admin#[1]> port set intruderstate enable` |
| NOTES | This must be enabled for the intruder log to log anything. |

### Set Priority Level

| Command Name | **port set prioritylevel** |
| --- | --- |
| Description | Sets the priority level of a given port. |
| Syntax | **port set prioritylevel** *<port-no><level>* |
| Parameters | **port-no** |
|  | port number (1 ~ 26) |
|  | **level** |
|  | priority level (0 ~ 7) |
| Examples | `N-TRON/Admin#[1]> port set prioritylevel 6 7` |
| NOTES | Priority State should be enabled to use this feature. |

### Show Configuration

| Command Name | **port show config** |
| --- | --- |
| Description | Displays basic configuration settings on given ports. |
| Syntax | **port show config** *<port-no | all>* |
| Parameters | **port-no | all** |
|  | port number (1 ~ 26), you may enter all to see all the ports at once. |
| Examples | `N-TRON/Admin#[1]> port show config all` |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 26) |

### Show Intruders

| Command Name | **port show intruder** |
| --- | --- |
| Description | Displays a list of MAC addresses that were not allowed on the network. |
| Syntax | **port show intruder** |
| Parameters | None |
| Examples | `N-TRON/Admin#[1]> port show intruder` |
| NOTES | Intruder log must be enabled before this will log anything. |

### Show Link Utilization

| Command Name | **port show linkutilization** |
|---|---|
| Description | Shows the utilization statistics for all the ports including %bandwidth, %in, %out, RX bytes, and TX bytes for each port. |
| Syntax | **port show linkutilization** |
| Parameters | None |
| Examples | N-TRON/Admin#[1]> port show linkutilization |
| NOTES | %Bandwidth is the %in or %out value that is higher, not the average value. |

### Get Flow Control

| Command Name | **port get flowcontrol** |
|---|---|
| Description | Displays the current flow control settings on a given port. |
| Syntax | **port get flowcontrol** *<port-no>* |
| Parameters | **port-no**<br>        port number (1 ~ 24) |
| Examples | N-TRON/Admin#[1]> port get flowcontrol 6 |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 24) |

### Get Name

| Command Name | **port get name** |
|---|---|
| Description | Displays the name of a given port. |
| Syntax | **port get name** *<port-no>* |
| Parameters | **port-no**<br>        port number (1 ~ 26) |
| Examples | N-TRON/Admin#[1]> port get name 6 |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 26) |

### Get State Of  Priority

| Command Name | **port get stateofpriority** |
|---|---|
| Description | Displays the priority state of a given port number. |
| Syntax | **port get stateofpriority** *<port-no>* |
| Parameters | **port-no**<br>        port number (1 ~ 26) |
| Examples | N-TRON/Admin#[1]> port get stateofpriority 6<br>Priority State of Port[6] is : [disabled] |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 26) |

### Get Intruder State

| Command Name | **port get intruderstate** |
|---|---|
| Description | Displays whether the intruder log is enabled or disabled. |
| Syntax | **port get intruderstate** |
| Parameters | None |
| Examples | N-TRON/Admin#[1]> port get intruderstate<br>Intruder Log : Disabled |
| NOTES | |

### Get Priority Level

| Command Name | **port get prioritylevel** |
|---|---|
| Description | Displays the priority level on a given port. |
| Syntax | **port get prioritylevel** *<port-no>* |
| Parameters | **port-no**<br>        port number (1 ~ 26) |
| Examples | N-TRON/Admin#[1]> port get prioritylevel 6<br>Priority Level of Port[6] is : [1] |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 26) |

### Get STP Status

| Command Name | **port get STP Status** |
|---|---|
| Description | Displays the Spanning Tree Protocol Status on a given port. |
| Syntax | **port get stpstatus** *<port-no>* |
| Parameters | **port-no** <br>     port number (1 ~ 26) |
| Examples | `N-TRON/Admin#[1]> port get stpstatus 6` <br> `Stp state of [6] port is : [Forward]` |
| NOTES | STP states include: Listening, Learning, Blocking, & Forwarding |

### Get Back Pressure

| Command Name | **port get backpressure** |
|---|---|
| Description | Displays the backpressure information on a given port number (enabled or disabled). |
| Syntax | **port get backpressure** *<port-no>* |
| Parameters | **port-no** <br>     port number (1 ~ 24) |
| Examples | `N-TRON/Admin#[1]> port get backpressure 6` <br> `Back Pressure is DISABLED` |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 24) |

### Get PVID

| Command Name | **port get pvid** |
|---|---|
| Description | Displays a given port's VLAN-ID. |
| Syntax | **port get pvid** *<port-no>* |
| Parameters | **port-no** <br>     port number (1 ~ 26) |
| Examples | `N-TRON/Admin#[1]> port get pvid 6` <br> `PVID of port 6 is 4.` |
| NOTES | Check whether *port-no* is in the valid range. (1 ~ 26) |

### Clear Counters

| Command Name | **port clear counters** |
|---|---|
| Description | Clears all the numbers in the counters for a given port. These are counters for RX bytes and TX bytes and so on. |
| Syntax | **port clear counters** *<port-no>* |
| Parameters | **port-no** <br>     port number (1 ~ 24) |
| Examples | `N-TRON/Admin#[1]> port clear counters 6` <br> `Counters of Port[6] are : [cleared]` |
| NOTES | This will clear all data in the port specific counters. This data cannot be recovered after this step. |

### Clear Intruder Log

| Command Name | **port clear intruderlog** |
|---|---|
| Description | This command will clear all intruders out of the intruder log. |
| Syntax | **port clear intruderlog** |
| Parameters | None |
| Examples | `N-TRON/Admin#[1]> port clear intruderlog` |
| NOTES | This will clear all data from the intruder log. This data can not be recovered after this step. |

# Trunk related commands

## Enable or Disable Trunking

| Command Name | trunk set <enable \| disable> |
|---|---|
| Description | To enable or disable the trunk that is already created. |
| Syntax | **trunk set enable**<br>**trunk set disable** |
| Parameters | |
| Examples | `N-TRON/Admin#[1]> trunk set enable`<br>`Trunking is activated.`<br>`N-TRON/Admin#[1]> trunk set disable`<br>`Trunking is deactivated.` |
| NOTES | RSTP must be disabled in order to use Trunking. All trunk ports must be at the same speed and duplex mode. It is best to hard code speed and duplex mode for each trunking link, at both ends. |

## Modify Trunk

| Command Name | trunk modify |
|---|---|
| Description | To add new required ports to the trunk in order to withstand high traffic. |
| Syntax | **trunk modify <port-list> [-name <trunk-name>]** |
| Parameters | **port-list**<br>    Port numbers to be in the trunk.<br>**trunk-name**<br>    Name given to a trunk |
| Examples | `N-TRON/Admin#[1]> trunk modify 1-4 -name trunk1` |
| NOTES | A maximum of 4 ports can be in a trunk. All trunk ports must be at the same speed and duplex mode. If a port is not linked, there could be difficulty matching similar speed and duplex mode. It is best to hard code speed and duplex mode for each trunking link, at both ends. |

## Create Trunk

| Command Name | trunk create |
|---|---|
| Description | To create a trunk. A trunk is used to get more bandwidth to withstand high traffic. |
| Syntax | **trunk create  <port-list> [-name <trunk-name>]** |
| Parameters | **port-list**<br>    Port numbers to be added to the trunk.<br>**trunk-name**<br>    Name given to a trunk |
| Examples | `N-TRON/Admin#[1]> trunk create 4-7 -name trunk1` |
| NOTES | RSTP must be disabled in order to use Trunking. Only 1 trunk can be created per switch. A maximum of 4 ports can be in a trunk. All trunk ports must be at the same speed and duplex mode. If a port is not linked, there could be difficulty matching similar speed and duplex mode. It is best to hard code speed and duplex mode for each trunking link, at both ends. |

### Delete Trunk

| Command Name | **trunk delete** |
|---|---|
| Description | To delete the trunk . |
| Syntax | **trunk delete** |
| Parameters | |
| Examples | `N-TRON/Admin#[1]> trunk delete`<br>`Trunk has been deleted.` |
| NOTES | |

### Show Trunk Information

| Command Name | **trunk show** |
|---|---|
| Description | To show all the trunks information. |
| Syntax | **trunk show** |
| Parameters | **None** |
| Examples | `N-TRON/Admin#[1]> trunk show`<br>`----------------------------------`<br>`|TRUNK NAME|TRUNK PORTS|TRUNK STATE |`<br>`----------------------------------`<br>`|trunk1    | 2-4       |    DISABLE |`<br>`----------------------------------` |
| NOTES | |

# Mirroring related commands

### Set Mirror config

| Command Name | **mirror set config** |
|---|---|
| Description | To the mirroring feature of the switch, for specified ports. |
| Syntax | **mirror set config** <dest-port> <src-ports> |
| Parameters | **dest-port**<br>    Destination port is the snooper port onto which the selected<br>    source ports traffic is to be mirrored.<br>    The gigabit ports cannot be destination ports.<br>**src-ports**<br>    List of ports to be monitored. |
| Examples | `N-TRON/Admin#[1]> mirror set config 1 2-5` |
| NOTES | A mirroring port is a dedicated port that is configured to receive the copies of Ethernet frames that are being transmitted out and also being received in from any other port that is being monitored. |

### Enable or Disable Port Mirroring

| Command Name | **mirror set <enable | disable>** |
|---|---|
| Description | Enables or disables network monitoring or port mirroring. It treats source port as the Ethernet port and the destination port as a monitoring port. |
| Syntax | **mirror set enable** |
| Parameters | **None** |
| Examples | `N-TRON/Admin#[1]> mirror set enable`<br>`mirror enabled`<br>`N-TRON/Admin#[1]> mirror set disable`<br>`mirror disabled` |
| NOTES | |

### Show Mirror config

| Command Name | **mirror show** |
|---|---|
| Description | To show all the mirror information. |
| Syntax | **mirror show** |
| Parameters | **None** |
| Examples | `N-TRON/Admin#[1]> mirror show`<br>`-------------------------------------------`<br>`\| DEST PORT \| SOURCE PORTS \| MIRROR STATE \|`<br>`-------------------------------------------`<br>`\| 5          \|          2-4 \|     ENABLED \|`<br>`-------------------------------------------` |
| NOTES | |

# VLAN Related Commands

## Add VLAN Entry

| Command Name | **vlan add** |
|---|---|
| Description | To create a Port based Virtual LAN |
| Syntax | **vlan add** *<vlan id> <mgmt port>*<br>*-untagged <port mask> | -tagged <port mask>*<br>*[-name <vlan name>]*<br>*[-admit <tagged-only\|all>] [-mirror <port-no>]* |
| Parameters | **vlan-id**<br>    Unique vlan id (2 ~ 4094).<br>**mgmt port**<br>    Either 1 or 0. '1' sets this vlan as a management vlan.<br>**vlan name**<br>    Unique vlan name, which can be used to identify the<br>    group. The name may include characters and numbers,<br>    but should start with an alphabetic. Maximum number of<br>    characters must not exceed 25.<br>**-untagged port mask**<br>    List of ports that are to be included under this VLAN.  Commas<br>    can be used to separate individual ports (2,5,9) and the range can<br>    be specified using a hyphen (10-15).  The port numbers cannot<br>    exceed the maximum number of ports on the board.<br>**-tagged port mask**<br>    Tagged port mask values can be specified in the same way as that of<br>    an untagged port mask.<br>**-admit**<br>    Allow tagged-only or all (untagged and tagged) packets.<br>**port-no**<br>    Optional parameter.  Port number that data should be mirrored to. |
| Examples | `N-TRON/Admin#[1]> vlan add 2 1 -untagged 1-12 -name`<br>`vlan2 -admit all`<br>`N-TRON/Admin#[2]> vlan add 3 1 -tagged 13-24 -name "vlan`<br>`3" -admit tagged-only` |
| NOTES | Ensure that the ports included in the tagged port list do not exist in the untagged ports-list field.  Changing anything on a VLAN will turn on RSTP on all VLANs as a precautionary measure. |

## Show List of Configured VLANs

| Command Name | **vlan show config** |
|---|---|
| Description | Displays the list of configured VLANs |
| Syntax | **vlan show config** |
| Parameters | **None** |
| Examples | `N-TRON/Admin#[1]> vlan show config` |
| NOTES | It displays the information of the default vlan if no vlan is configured. |

## Display Information of a particular VLAN

| Command Name | **vlan get info** |
|---|---|
| Description | Displays the details of a particular VLAN. |
| Syntax | **vlan get info** *<vlan-id>* |
| Parameters | **vlan-id**<br>    Vlan id of the existing vlan whose individual<br>    configuration is required. |
| Examples | `N-TRON/Admin#[1]> vlan get info 2`<br>`vlan ID        : 2`<br>`vlan Name      : "vlan 2"`<br>`port list      : 1-4,11`<br>`tagged port mask: 10-15`<br>`management port : NO` |
| NOTES | |

## Modify an existing VLAN

| Command Name | vlan modify |
|---|---|
| Description | Modifies an existing VLAN. |
| Syntax | **vlan modify \<vlan id\> \<mgmt port\>**<br>       **-untagged \<port mask\> \| -tagged \<port mask\>**<br>       **[-name \<vlan name\>] [-admit \<tagged-only\|all\>]**<br>       **[-mirror \<port-no\>]** |
| Parameters | **vlan-id**<br>    unique vlan id ( 2 ~ 4094).<br>**mgmt port**<br>    Management Port, yes or no (1 or 0).<br>**-untagged port mask**<br>    List of ports that are to be included under this VLAN.<br>    Commas can be used to separate individual ports (2,5,9)<br>    and the range can be specified using a hyphen (10-15).<br>    The port numbers cannot exceed the maximum number<br>    of port on the board.<br>**-tagged port mask**<br>    Tagged port list values can be specified in the same way as that of<br>    -untagged port mask.<br>**vlan name**<br>    unique clan name, which can be used to identify.<br>**admit**<br>    tagged-only or all.  Type of packets can enter the port.<br>**port-no**<br>    Optional parameter. Port number that data should be mirrored to.. |
| Examples | `N-TRON/Admin#[1]> vlan modify 2 1 –tagged 11-12 –name "newvlan2"`<br><br>`N-TRON/Admin#[2]> vlan modify 3 1-untagged 1-10 –name "vlan 3" –admit all` |
| NOTES | Changing anything on a VLAN will turn on RSTP on all VLANs as a precautionary measure. |

## Delete VLAN

| Command Name | vlan delete |
|---|---|
| Description | Removes an existing VLAN from the list of configured VLANs. |
| Syntax | **vlan delete** *\<vlan-id\>* |
| Parameters | **vlan-id**<br>    Vlan id of the existing vlan which has to be deleted |
| Examples | `N-TRON/Admin#[1]> vlan delete 2` |
| NOTES | Please ensure that a port based vlan with the given vlan id exists.  Changing anything on a VLAN will turn on RSTP on all VLANs as a precautionary measure. |

## Set VLAN as a management VLAN

| Command Name | vlan set mgmtvlan |
|---|---|
| Description | Enable or disable a Vlan as a management vlan. User can connect and monitor the device activity of this VLAN. |
| Syntax | **vlan set mgmtvlan** *\<vlan-id\> \<enable\|disable\>* |
| Parameters | **vlan-id**<br>    Vlan id of the vlan<br>**enable\|disable**<br>    Enable or Disable management of the specified vlan. |
| Examples | `N-TRON/Admin#[1]> vlan set mgmtvlan 2 disable` |
| NOTES | Please ensure that the vlan with that vlan id already exists.  Changing anything on a VLAN will turn on RSTP on all VLANs as a precautionary measure. |

### Set VLAN to defaults

| Command Name | **vlan set default** |
|---|---|
| Description | Removes all the configured vlans and add all the ports under the Default vlan. |
| Syntax | **vlan set default** |
| Parameters | **None** |
| Examples | `N-TRON/Admin#[1]> vlan set default` |
| NOTES | Changing anything on a VLAN will turn on RSTP on all VLANs as a precautionary measure. |

### Set VLAN Ingress Filter

| Command Name | **vlan set ingressfilter** |
|---|---|
| Description | Enables or Disables an inbound filter on specified ports that will throw out any packet with the wrong VID in the VLAN tag on the packet. |
| Syntax | **vlan set ingressfilter <enable\|disable> <port-list\|all>** |
| Parameters | **enable\|disable**<br>    Enable or Disable the filter on the specified port.<br>**port-list\|all**<br>    Enter a specific port number list or specify all ports |
| Examples | `N-TRON/Admin#[1]> vlan set ingressfilter enable 1-6`<br>`N-TRON/Admin#[2]> vlan set ingressfilter enable all` |
| NOTES | The ingressfilter will automatically be turned on for tagged ports. |

### Get VLAN Ingress Filter

| Command Name | **vlan get ingressfilter** |
|---|---|
| Description | Gets inbound filter info on specified ports. |
| Syntax | **vlan get ingressfilter <all\|port-list>** |
| Parameters | **all\|port-list**<br>    Enter a specific port number list or specify all ports |
| Examples | `N-TRON/Admin#[1]> vlan get ingressfilter 1-6` |
| NOTES | |

### Get VLAN info

| Command Name | **vlan get info** |
|---|---|
| Description | Displays the current state of the configured vlans. |
| Syntax | **vlan get info <vlanid>** |
| Parameters | **vlanid**<br>    Enter a specific VLan ID |
| Examples | `N-TRON/Admin#[1]> vlan get info 1` |
| NOTES | |

# Eventlog Related Commands

### Get Eventlog count

| Command Name | **eventlog get count** |
|---|---|
| Description | To display the logged events count |
| Syntax | **eventlog get count** |
| Parameters | **None** |
| Examples | `N-TRON/Admin#[1]> eventlog get count`<br>`No. of events logged : 14` |
| NOTES | |

### Get Eventlog level

| Command Name | **eventlog get loglevel** |
|---|---|
| Description | To display the present log level |
| Syntax | **eventlog get loglevel** |
| Parameters | **None** |
| Examples | `N-TRON/Admin#[1]> eventlog get loglevel`<br>`Present log Level: 1` |
| NOTES | There are 5 levels or categories that events are classified as. Level 1 will log all 5 types into the event log. Level 5 will log on the highest level "Critical" in the event log. The log levels in order from least severe to most critical are: Informational, Warning, Minor, Severe, & Critical. |

### Get Eventlog size

| Command Name | **eventlog get logsize** |
|---|---|
| Description | To display the present log size |
| Syntax | **eventlog get logsize** |
| Parameters | **None** |
| Examples | `N-TRON/Admin#[1]> eventlog get logsize`<br>`Present Log Size: 100` |
| NOTES | |

### Set Eventlog level

| Command Name | **eventlog set loglevel** |
|---|---|
| Description | To set the log-level to a specified value for filter out the raised events. |
| Syntax | **eventlog set loglevel** *<level>* |
| Parameters | **level**<br>    The log level. The value is ranging from 1-5 |
| Examples | `N-TRON/Admin#[1]> eventlog set loglevel 3`<br>`N-TRON/Admin#[2]> eventlog set loglevel 1`<br>`N-TRON/Admin#[3]> eventlog set loglevel 2` |
| NOTES | There are 5 levels or categories that events are classified as. Level 1 will log all 5 types into the event log. Level 5 will log on the highest level "Critical" in the event log. The log levels in order from least severe to most critical are: Informational, Warning, Minor, Severe, & Critical. |

### Set Eventlog size

| Command Name | **eventlog set logsize** |
|---|---|
| Description | To set the maximum number of events to be stored in the list. |
| Syntax | **eventlog set logsize** *<size>* |
| Parameters | **size**<br>    The log size. Maximum number of events that can be stored. |
| Examples | `N-TRON/Admin#[1]> eventlog set logsize 100`<br>`N-TRON/Admin#[2]> eventlog set logsize 20` |
| NOTES | |

**Show Eventlog events**

| Command Name | **eventlog show events** |
|---|---|
| Description | To display the logged events |
| Syntax | **eventlog show events** |
| Parameters | **None** |
| Examples | N-TRON/Admin#[1]> eventlog show events |
| NOTES | |

# Bridging Related Commands

### Add Multicast MAC Address

| Command Name | bridge add multicastmac |
|---|---|
| Description | Adds a multicast mac address which is associated with a vlan. |
| Syntax | **bridge add multicastmac** *<mac-address> <port-list>* |
| Parameters | **mac-address**<br>    Multicast group address to be added to the bridge<br>**port-list**<br>    Port numbers to which the multicast group is associated |
| Examples | `N-TRON/Admin#[1]>bridge add multicastmac 01:00:5e:03:01:18 4` |
| NOTES | If there are multiple ports on different VLANs, the 9000 will apply the static broadcast address to the lowest VLAN-ID that is associated with one of the ports assigned to the static multicast address. So if the lowest VLAN-ID contains all the ports assigned to the static multicast address (an umbrella VLAN), it will function for all those ports with no problems. This can be achieved with overlapping VLANs. |

### Delete Multicast MAC Address

| Command Name | bridge delete multicastmac |
|---|---|
| Description | Removes an existing multicast mac address. |
| Syntax | **bridge delete multicastmac** <mac-address> |
| Parameters | **mac-address**<br>    Multicast group address to be removed to the bridge |
| Examples | `N-TRON/Admin#[1]> bridge delete multicastmac 01:00:5e:03:01:18` |
| NOTES | |

### Add a Unicast MAC Address

| Command Name | bridge add unicastmac |
|---|---|
| Description | Adds a unicast mac address. |
| Syntax | **bridge add unicastmac <mac address> <port number>**<br>                     **[-mirror <disable\|enable>]** |
| Parameters | **mac-address**<br>    Unique unicast mac address.<br>**port number**<br>    port number on which this mac is learned. The port number must range between 1 and maximum port numbers in switch. |
| Examples | `N-TRON/Admin#[1]> bridge add unicastmac 00-a0-ae-60-3a-70 3`<br><br>`N-TRON/Admin#[2]> bridge add unicastmac 00-10-a1-33-49-b5 6` |
| NOTES | |

### Delete Unicast MAC Address

| Command Name | bridge delete unicastmac |
|---|---|
| Description | Delete an existing unicast mac address. |
| Syntax | **bridge delete unicastmac** *<mac-address>* |
| Parameters | **mac-address**<br>    Unique unicast mac address. |
| Examples | `N-TRON/Admin#[1]> bridge delete unicastmac 00-a0-ae-60-3a-70` |
| NOTES | |

## Display List of Configured Static MAC Addresses

| | |
|---|---|
| Command Name | **bridge show staticmac** |
| Description | To view the list of configure static mac addresses |
| Syntax | **bridge show staticmac <all\|multicast\|unicast>** |
| Parameters | **<all\|multicast\|unicast>**<br>    which set of static mac addresses to show |
| Examples | `N-TRON/Admin#[1]> bridge show staticmac all`<br><br>`N-TRON/Admin#[2]> bridge show staticmac multicast`<br><br>`N-TRON/Admin#[3]> bridge show staticmac unicast` |
| NOTES | **These are egress filters.** |

## Set Aging Time

| | |
|---|---|
| Command Name | **bridge set agingtime** |
| Description | Sets the aging time for dynamically learned MAC addresses of the chipset. |
| Syntax | **bridge set agingtime** *<aging-time>* |
| Parameters | **aging-time**<br>    aging time to be set for stp.<br>    Minimum aging time can be 5 seconds.<br>    Default aging time is 20 seconds.<br>    Maximum aging time is 1000000 seconds. |
| Examples | `N-TRON/Admin#[1]> bridge set agingtime 200` |
| NOTES | |

## Display Current Aging Time

| | |
|---|---|
| Command Name | bridge show agingtime |
| Description | Displays the current aging time. |
| Syntax | **bridge show agingtime** |
| Parameters | None |
| Examples | `N-TRON/Admin#[1]> bridge show agingtime` |
| NOTES | |

## Display Mac Address by port

| | |
|---|---|
| Command Name | **bridge show macbyport** |
| Description | Displays all the MAC addresses associated with a port. |
| Syntax | **bridge show macbyport** *<port-number\|all>* |
| Parameters | **port-number**<br>    The port number must range between 1 and the maximum number of ports on the switch.<br>**all**<br>    Display MAC addresses for all ports |
| Examples | `N-TRON/Admin#[1]> bridge show macbyport 6` |
| NOTES | |

## Display port by Mac Address

| | |
|---|---|
| Command Name | **bridge show portbymac** |
| Description | Display the port number to which the mac is associated. |
| Syntax | **bridge show portbymac** *<mac-address>* |
| Parameters | **mac-address**<br>    Unique unicast mac address. |
| Examples | `N-TRON/Admin#[1]> bridge show portbymac 00-a0-ae-60-3a-70` |
| NOTES | |

**Display Mac count**

| Command Name | **bridge show maccount** |
|---|---|
| Description | Displays the total count of the static mac addresses. |
| Syntax | **bridge show maccount** |
| Parameters | **None** |
| Examples | N-TRON/Admin#[1]> bridge show maccount |
| NOTES | |

# IGMP Related Commands

### Enable IGMP

| Command Name | **igmp set enable** |
|---|---|
| Description | The igmp status is made to enable |
| Syntax | **igmp set enable** |
| Parameters | **None** |
| Examples | ```N-TRON/Admin#[1]> igmp set enable
igmp status is Enabled
N-TRON/Admin#[2]> igmp show config
        Igmp                     : Enabled
        Query Mode               : auto
        Router Mode              : auto
        Router Ports (Manual)    :``` |
| NOTES | The status can be viewed through the igmp show config command |

### Disable IGMP

| Command Name | **igmp set disable** |
|---|---|
| Description | The igmp status is made to disable |
| Syntax | **igmp set disable** |
| Parameters | **None** |
| Examples | ```N-TRON/Admin#[1]> igmp set disable
igmp status is Disabled
N-TRON/Admin#[2]> igmp show config
        Igmp                     : Disabled
        Querier                  : Enabled
        Query Mode               : auto
        Router Mode              : auto
        Router Ports (Manual)    :``` |
| NOTES | The status can be viewed through the igmp show config command |

### Show IGMP config

| Command Name | **igmp show config** |
|---|---|
| Description | The igmp  configuration is displayed |
| Syntax | **igmp show config** |
| Parameters | **None** |
| Examples | ```N-TRON/Admin#[1]> igmp show config
        Igmp                     : Disabled
        Querier                  : Enabled
        Query Mode               : auto
        Router Mode              : auto
        Router Ports (Manual)    :``` |
| NOTES | This command is used to see the config previously set by the user |

### Show IGMP group

| Command Name | **igmp show group** |
|---|---|
| Description | The igmp show group command is used to display the groups present in the group list |
| Syntax | **igmp show group** |
| Parameters | **None** |
| Examples | ```N-TRON/Admin#[1]> igmp show group
GroupIp          PortNo          VlanID
--------------------------------------
224.0.0.2        6               1
224.0.1.24       6               1``` |
| NOTES | The group display is used to check that the group ip, port no & vlan id were received correctly. |

### Show IGMP router

| Command Name | **igmp show router** |
|---|---|
| Description | The igmp show router command is used to display the auto-detected routers at present. |
| Syntax | **igmp show router** |
| Parameters | **None** |
| Examples | `N-TRON/Admin#[1]> igmp show router`<br>`RouterIp        PortNo`<br>`-----------------------`<br>`192.168.1.150       5` |
| NOTES | The router display is used to check that the router ip & port number was received correctly. |

### Set IGMP query mode

| Command Name | **igmp set qmode** |
|---|---|
| Description | Set the query mode of the switch to either on, off, or automatic. |
| Syntax | **igmp set qmode** <off \| on \| auto> |
| Parameters | **off \| on \| auto**<br>    There are three different query modes; off, on, and auto. |
| Examples | `N-TRON/Admin#[1]> igmp set qmode auto` |
| NOTES | Default: Auto |

### Set IGMP router port

| Command Name | **igmp set rtrport** |
|---|---|
| Description | Enable or disable a router port based on a port-range. |
| Syntax | **igmp set rtrport** <port-range> <enable \| disable> |
| Parameters | **port-range**<br>    enter a range of port numbers.<br>**enable \| disable**<br>    enable or disable the router port. |
| Examples | `N-TRON/Admin#[1]> igmp set rtrport 1-4 enable` |
| NOTES | |

### Set IGMP router mode

| Command Name | **igmp set rtrmode** |
|---|---|
| Description | The igmp show router command is used to display the router group present in the group list |
| Syntax | **igmp set rtrmode** <none \| manual \| auto> |
| Parameters | **none \| manual \| auto**<br>    There are three different router modes available; none, manual, and auto. |
| Examples | `N-TRON/Admin#[1]> igmp set rtrmode auto` |
| NOTES | Default: Auto |

**Show IGMP rfilter mode**

| Command Name | **igmp show rfilter** |
|---|---|
| Description | The igmp show rfilter command is used to display the rfilter status by port(s). |
| Syntax | **Usage: igmp show rfilter &lt;all\|port-list&gt;** |
| Parameters | **port-list\|all**<br>    Enter a specific port number list or specify all ports |
| Examples | ```
N-TRON/Admin#[22]> igmp show rfilter all

N-TRON/Admin#[22]igmp/show> igmp show rfilter 5


Port No.   IGMP RFilter
---------------------------
   5       DISABLE

N-TRON/Admin#[6]igmp/show> igmp show rfilter 5-7


Port No.   IGMP RFilter
---------------------------
   5       DISABLE
   6       DISABLE
   7       DISABLE
N-TRON/Admin#[7]igmp/show>
``` |
| NOTES | Default: enable |

**Set IGMP rfilter mode**

| Command Name | **igmp set rfilter** |
|---|---|
| Description | The igmp set rfilter command is used to enable or disable rfilter based on a port-range. |
| Syntax | **Usage: igmp set rfilter &lt;enable\|disable&gt; &lt;port-list\|all&gt;** |
| Parameters | **enable\|disable**<br>    Enable or Disable the filter on the specified port.<br>**port-list\|all**<br>    Enter a specific port number list or specify all ports |
| Examples | ```
N-TRON/Admin#[35]igmp/set> igmp set rfilter enable 5

IGMP RFilter enabled for port 5.

N-TRON/Admin#[36]igmp/set>
``` |
| NOTES | Default: enable |

# N-Ring™ Related Commands

| Command Name | **n-ring get agingtime** |
|---|---|
| Description | To display the N-Ring Agingtime of the device |
| Syntax | **n-ring get agingtime** |
| Parameters | **None** |
| Example | `N-TRON/Admin#[1]> n-ring get agingtime`<br><br>`N-Ring Aging Time  :  20` |
| NOTES | Default: 20 seconds and is separate from the Bridging Aging Time. N-Ring Aging time is used for the whole switch if the switch is an N-Ring Manager or becomes an active N-Ring Member. |

**N-Ring™ set agingtime**

| Command Name | **n-ring set agingtime** |
|---|---|
| Description | Sets the aging time for dynamically learned MAC addresses of the chipset when in N-Ring Manager or Active N-Ring Member modes. |
| Syntax | **n-ring set agingtime** *<aging-time>* |
| Parameters | **aging-time**<br>    aging time to be set for N-Ring.<br>    Minimum N-Ring agingtime can be 5 seconds.<br>    Default N-Ring aging time is 20 seconds.<br>    Maximum aging time is 1000000 seconds. |
| Examples | `N-TRON/Admin#[1]> n-ring set agingtime 200` |
| NOTES | Is separate from the Bridging Aging Time. N-Ring Aging time is used for the whole switch if the switch is an N-Ring Manager or becomes an active N-Ring Member. |

**N-Ring™ get webfault**

| Command Name | **n-ring get webfault** |
|---|---|
| Description | To display the browser N-Ring fault reporting mode. |
| Syntax | **n-ring get webfault** |
| Parameters | **None** |
| Example | `N-TRON/Admin#[1]> n-ring get webfault`<br><br>`N-Ring faults will be shown on N-Ring Web Pages only` |
| NOTES | |

**N-Ring™ set webfault**

| Command Name | **n-ring set webfault** |
|---|---|
| Description | Sets the browser N-Ring fault reporting mode. |
| Syntax | **n-ring set webfault** *<ring|all>* |
| Parameters | *Ring or all* |
| Examples | `N-TRON/Admin#[1]> n-ring set webfault all`<br><br>`N-Ring faults will be shown on All Web Pages` |
| NOTES | |

**N-Ring™ get interval**

| Command Name | **n-ring get interval** |
|---|---|
| Description | To display the Self-Health Packet interval and missed threshold. |
| Syntax | **n-ring get interval** |
| Parameters | **None** |
| Example | `N-TRON/Admin#[1]> n-ring get interval`<br><br>`Self Health Packet interval is 1`<br>`Maximum Missed Packets is 2` |
| NOTES | Default:  interval=1, missed=2 |

## N-Ring™ set interval

| Command Name | **n-ring set interval** |
|---|---|
| Description | Sets the Self-Health Packet interval and missed threshold. |
| Syntax | **n-ring set interval** *<interval> [missed]* |
| Parameters | **interval** and **missed** |
| Examples | ```
N-TRON/Admin#[36]n-ring/set> n-ring set interval 1 3

Self Health Packet interval set to 1
Maximum Missed Packets set to 3
``` |
| NOTES | The interval is in 10 millisecond increments.  The missed threshold sets how many missed Self-Health Packets constitute a fault. |

## N-Ring™ get mode

| Command Name | **n-ring get mode** |
|---|---|
| Description | To display the current N-Ring Mode. |
| Syntax | **n-ring get mode** |
| Parameters | **None** |
| Example | ```
N-TRON/Admin#[1]> n-ring get mode

N-Ring Mode : AutoMember
Port Set  : 100
VLAN ID :   3333
Tagging :   Untagged
``` |
| NOTES | |

## N-Ring™ set mode

| Command Name | **n-ring set mode** |
|---|---|
| Description | Sets the current N-Ring Mode. Sets ring ports, vlanid and tagging, if manager mode. |
| Syntax | **n-ring set mode** *<manager|automember|disable> [-rp <A|E>] [-vlanid <id>] [-tagging <tagged|untagged>]* |
| Parameters | **manager|automember|disable**<br>    N-Ring mode<br>**A|E**<br>    N-Ring ports, A for ports A1 and A2, while E for ports E1 and E2<br>**id**<br>    Unique vlan id (1 - 4094). Default is 3333.<br>**tagged|untagged**<br>    Determines whether the N-Ring ports are members of the VLANs<br>    Tagged or Untagged ports. |
| Examples | ```
N-TRON/Admin#[3]> n-ring set mode automember
N-Ring Mode set to automember
...............
...............
Device is Going for Reboot....

N-TRON/Admin#[3]> n-ring set mode manager -rp A

N-Ring Mode set to manager
Port Set to be used is Slot A
N-Ring VLAN ID is set to: 3333
N-Ring Tagging is set to: Tagged
...............
...............
Device is Going for Reboot....
``` |
| NOTES | **NOTE:  N-Ring Manager cannot have RSTP or Trunking enabled.** |

| Command Name | **n-ring show status** |
|---|---|
| Description | Shows the current N-Ring status of the switch.  If Manager, shows ring members. Shows if Automember or active member.  If active (manager or member) shows N-Ring ports. |
| Syntax | **n-ring show status** |
| Parameters | **None** |
| Examples | <pre>On an N-Ring Manager:<br>N-TRON/Admin#[1]> n-ring show status<br><br>Switch is in N-Ring Manager Mode<br>N-Ring OK<br><br> Port 1 | Port 2<br>=================<br>  1     |  2<br><br>No:  | MAC Address      | IP Address      | Subnet Mask     | Port 1 | Port 2<br>============================================================================<br><br>1    | 00:07:af:ff:f6:40 | 192.168.1.233   | 255.255.255.0   | 1      | 2<br><br><br>On an N-Ring Active Member:<br>N-TRON/Admin#[1]> n-ring show status<br><br>Switch is a N-Ring Member<br>N-Ring Manager is 00:07:af:ff:f6:c0<br><br> Port 1 | Port 2<br>=================<br>  1     |  2<br><br>--------------------------------------------------------------------------------<br>On an N-Ring AutoMember (not active):<br><br>N-TRON/Admin#[2]n-ring/show> n-ring show status<br><br>Switch is in Auto Member Detection Mode</pre> |
| NOTES | |

| Command Name | **n-ring show switch** |
|---|---|
| Description | From the N-Ring Manager, shows info about a switch on the N-Ring. |
| Syntax | **n-ring show switch** *<MAC ADDRESS>* |
| Parameters | **<MAC ADDRESS>** |
| Examples | <pre>N-TRON/Admin#[12]n-ring/show> switch 00:07:af:ff:f6:40<br><br>Information for 00:07:af:ff:f6:40<br><br>Name           : N-TRON Switch<br>Location       : Mobile, AL 36609<br>Product Name   : N-TRON 9000 Series<br>Product Version : 4.1.1<br>IP Address     : 192.168.1.233<br>Subnet Mask    : 255.255.255.0<br>N-Ring Port 1  : 1<br>N-Ring Port 2  : 2<br><br>N-TRON/Admin#[13]n-ring/show></pre> |
| NOTES | |

**N-Ring™ set keepalive**

| Command Name | **n-ring set keepalive** |
|---|---|
| Description | Set timeout after which an N-Ring member will drop back to RSTP mode on the N-Ring ports after loosing communication with the N-Ring manager. |
| Syntax | **n-ring set keepalive** *<timeout>* |
| Parameters | **timeout** <br> Timeout in seconds |
| Examples | ```N-TRON/Admin#[10]n-ring/set> n-ring set keepalive 40``` <br><br> ```Keep-Alive Timeout set to 40``` |
| NOTES | Default is 31 seconds |

**N-Ring™ get keepalive**

| Command Name | **n-ring get keepalive** |
|---|---|
| Description | Get timeout after which an N-Ring member will drop back to RSTP mode on the N-Ring ports after loosing communication with the N-Ring manager. |
| Syntax | **n-ring set keepalive** |
| Parameters | **None** |
| Examples | ```N-TRON/Admin#[10]n-ring/get> n-ring get keepalive``` <br><br> ```Keep-Alive Timeout is 31``` |
| NOTES | |

# Configuration Related Commands

### Save Configuration

| Command Name | **config save** |
|---|---|
| Description | The configuration will be saved to the flash. |
| Syntax | **config save** |
| Parameters | **None** |
| Examples | `N-TRON/Admin#[1]> config save` |
| NOTES | |

### Load Default Configuration

| Command Name | **config erase** |
|---|---|
| Description | This command is useful to erase the configuration data |
| Syntax | **config erase** |
| Parameters | **None** |
| Examples | `N-TRON/Admin#[1]> config erase`<br><br>`Load Factory Default Setting. [y/n]y`<br>`Factory Default Configuration Successfully loaded`<br><br>`Restart the switch to effect this change` |
| NOTES | This command will reset all configurable fields back to the default settings that the switch shipped with.  This will change the IP address back to 192.168.1.201 and will change the slot configurations of the 9000 to all 9006TX modules and no gigabit fiber ports. |

### Configuration Upload

| Command Name | **config send** |
|---|---|
| Description | The configuration on the flash is grouped into a file and sent to the tftp server. |
| Syntax | **config send** *<Server-IpAddress> <File-Name>* |
| Parameters | **Server-IpAddress**<br>    IP Address of the TFTP Server, to where the switch configuration data will be uploaded.<br>**File-Name**<br>    Name of the file to be saved as. |
| Examples | `N-TRON/Admin#[1]> config send 10.1.6.151 config` |
| NOTES | The ip address should be the valid tftp server ip address ,and the target tftp server should be running. |

### Configuration Download

| Command Name | **config receive** |
|---|---|
| Description | The file name mentioned will be downloaded from the server and the same configuration is overwritten to the flash. |
| Syntax | **config receive** *<Server-IpAddress> <File-Name>* |
| Parameters | **Server-IpAddress**<br>    IP Address of the TFTP server, from where the configuration data to be retrieved.<br>**File-Name**<br>    Name of the file to be retrieved. |
| Examples | `N-TRON/Admin#[1]> config receive 10.1.6.151 config` |
| NOTES | The ip address should be the valid tftp server ip address, and the target tftp server should be running. |

# Rapid Spanning Tree Protocol Related Commands

**Set RSTP Admin Edge**

| Command Name | **rstp set adminedge** |
|---|---|
| Description | Sets the Adminedge value of a port in a Vlan. |
| Syntax | **rstp set adminedge** *<vlan id> <port no> <status>* |
| Parameters | **vlan id**<br>  Vlan Id containing the port for which the adminedge is to be set.<br>**port no**<br>  Port number in the Vlan to be set.<br>**status**<br>  Status of the adminedge of the port to be set.<br>  Values of "enable" and "disable" are valid |
| Examples | N-TRON/Admin#[1]> rstp set adminedge 1 1 disable<br>N-TRON/Admin#[2]> rstp set adminedge 2 2 enable |
| NOTES | |

**Get RSTP Admin Edge**

| Command Name | **rstp get adminedge** |
|---|---|
| Description | Gets the Adminedge value of the given port in the given Vlan-Id. |
| Syntax | **rstp get adminedge** *<vlan id> <port>* |
| Parameters | **vlan id**<br>  Vlan Id containing the port for which the adminedge is to be viewed .<br>**port**<br>  Port for which the adminedge value is to be viewed . |
| Examples | N-TRON/Admin#[1]> rstp get adminedge 1 1<br>N-TRON/Admin#[2]> rstp get adminedge 2 2 |
| NOTES | |

**Set RSTP Auto Edge**

| Command Name | **rstp set autoedge** |
|---|---|
| Description | Sets the Autoedge value of a port in a Vlan. |
| Syntax | **rstp set autoedge** *<vlan id> <port-no> <status>* |
| Parameters | **vlan id**<br>  Vlan Id containing the port for which the autoedge is to be set.<br>**port-no**<br>  Port number in the Vlan to be set.<br>**status**<br>  Status of the autoedge of the port to be set.<br>  Values of "enable" and "disable" are valid |
| Examples | N-TRON/Admin#[1]> rstp set autoedge 1 1 disable<br>N-TRON/Admin#[2]> rstp set autoedge 2 2 enable |
| NOTES | |

**Get RSTP Auto Edge**

| Command Name | **rstp get autoedge** |
|---|---|
| Description | Gets the Autoedge value of the given port in the given Vlan-Id. |
| Syntax | **rstp get autoedge** *<vlan id > <port>* |
| Parameters | **vlan id**<br>  Vlan Id containing the port for which the autoedge is to be viewed .<br>**port**<br>  Port for which the autoedge value is to be viewed . |
| Examples | N-TRON/Admin#[1]> rstp get autoedge 1 1<br>N-TRON/Admin#[2]> rstp get autoedge 2 2 |
| NOTES | |

## Set RSTP Bridge Admin Status

| | |
|---|---|
| Command Name | **rstp set bridgeadminstatus** |
| Description | Sets the Bridge Admin Status of the given Vlan-ID. |
| Syntax | **rstp set bridgeadminstatus** *<vlan id >* *<bridge adminstatus >* |
| Parameters | **vlan id**<br>   Vlan Id for which the priority to be set.<br>**bridge adminstatus**<br>   Status of the Bridge to be set.<br>   Values of "fast", "forcestp" and "disable" are valid |
| Examples | `N-TRON/Admin#[1]> rstp set bridgeadminstatus 1 disable`<br>`N-TRON/Admin#[2]> rstp set bridgeadminstatus 2 fast` |
| NOTES | |

## Get RSTP Bridge Admin Status

| | |
|---|---|
| Command Name | **rstp get bridgeadminstatus** |
| Description | Gets the Bridge Admin Status of the given Vlan-Id. |
| Syntax | **rstp get bridgeadminstatus** *<vlan-id >* |
| Parameters | **vlan-id**<br>   Vlan Id for which the admin status is to be viewed. |
| Examples | `N-TRON/Admin#[1]> rstp get bridgeadminstatus 1`<br>`N-TRON/Admin#[2]> rstp get bridgeadminstatus 2` |
| NOTES | |

## Set RSTP Bridge Forward Delay

| | |
|---|---|
| Command Name | **rstp set bridgeforwarddelay** |
| Description | To set the forward delay time for a given Vlan-Id.  Forward Delay in STP is the time a switch waits after connecting to a root bridge, before he changes the port state to forwarding from the listening and learning states. RSTP only uses this as a backup feature for legacy STP device support. |
| Syntax | **rstp set bridgeforwarddelay** *<vlan-id >* *<forwarddelay >* |
| Parameters | **vlan-id**<br>   Vlan Id for which the forward delay time to be set.<br>**forwardelay**<br>   Forward delay  Time to be set.  The valid range of the Forward delay<br>   time is  (4.0 – 30.0) secs. |
| Examples | `N-TRON/Admin#[1]> rstp set bridgeforwarddelay 1 6`<br>`N-TRON/Admin#[2]> rstp set bridgeforwarddelay 2 10` |
| NOTES | Please ensure that the forwarddelay time and vlan id values are valid.  STP switches can take up to 2x this figure before both the root switch and the STP switch changes the port modes into forwarding states. |

## Get RSTP Bridge Forward Delay

| | |
|---|---|
| Command Name | **rstp get bridgeforwarddelay** |
| Description | To get the Forward Delay Time of a given Vlan Id. |
| Syntax | **rstp get bridgeforwarddelay** *<vlan-id>* |
| Parameters | **vlan-id**<br>   Vlan Id for which the forward delay time is to be viewed. |
| Examples | `N-TRON/Admin#[1]> rstp get bridge forwarddelay 1`<br>`N-TRON/Admin#[2]> rstp get bridge forwarddelay 2` |
| NOTES | Please supply a valid Vlan Index ( being greater than zero) |

| Command Name | **rstp set bridgehellotime** |
|---|---|
| Description | To set the HelloTime for a given Vlan-Id. <br> With STP, Hello Time is the time intervals that the root bridge sends out new BPDUs to the rest of the network. Other STP capable switches will forward these BPDUs along. With RSTP every RSTP capable switch will generate new BPDUs and send them out on every Hello Time Interval. |
| Syntax | **rstp set bridgehellotime** *<vlan-id> <hellotime>* |
| Parameters | **vlan-id** <br>    Vlan Id for which the priority is to be set. <br> **hellotime** <br>    Hello Time to be set. <br>    The valid range of the Hello Time is (1.0-10.0)secs. |
| Examples | `N-TRON/Admin#[1]> rstp set bridgehellotime 1 2` <br> `N-TRON/Admin#[2]> rstp set bridgehellotime 2 5` |
| NOTES | Please ensure that the hellotime and vlan id values are valid |

**Get RSTP Bridge Hello Time**

| Command Name | **rstp get bridgehellotime** |
|---|---|
| Description | To get the Hello Time of a given Vlan Id. |
| Syntax | **rstp get bridgehellotime***<vlan-id>* |
| Parameters | **vlan-id** <br>    Vlan Id for which the hellotime is to be viewed. |
| Examples | `N-TRON/Admin#[1]> rstp get bridge hellotime 1` <br> `N-TRON/Admin#[2]> rstp get bridge hellotime 2` |
| NOTES | Please supply valid Vlan Index ( being greater than zero) |

**Set RSTP Bridge Max Age**

| Command Name | **rstp set bridgemaxage** |
|---|---|
| Description | To set the Max Age for a given Vlan-Id. RSTP Max Age is the time the switch waits after receiving a BPDU from the root bridge before declaring that there is no longer a valid path to the root bridge (therefore he attempts to become the new root bridge on the network). RSTP will only use this as a backup feature, and to allow compatibility with older STP devices. |
| Syntax | **rstp set bridgemaxage** *<vlan-id> <maxage>* |
| Parameters | **vlan-id** <br>    Vlan Id for which the priority is to be set. <br> **maxage** <br>    The Max Age to be set. <br>    The valid range for maxage is 6.0-40.0 secs. (IEEE 802.1D) |
| Examples | `N-TRON/Admin#[1]> rstp set bridgemaxage 1 7` <br> `N-TRON/Admin#[2]> rstp set bridgemaxage 2 40` |
| NOTES | Please ensure that the max age and vlan-id are valid. |

**Get RSTP Bridge Max Age**

| Command Name | **rstp get bridgemaxage** |
|---|---|
| Description | Gets the Bridge max age of the given Vlan-Id. |
| Syntax | **rstp get bridgemaxage** *<vlan-id >* |
| Parameters | **vlan-id** <br>    Vlan ID for which the maxage is to be viewed. |
| Examples | `N-TRON/Admin#[1]> rstp get bridgemaxage 1` <br> `N-TRON/Admin#[2]> rstp get bridgemaxage 2` |
| NOTES | Please supply valid vlan Index ( being greater than zero) |

## Set RSTP Bridge Priority

| Command Name | **rstp set bridgepriority** |
|---|---|
| Description | Sets the Bridge Priority. The root bridge on the network will be the one with the lowest bridge priority, or the lowest MAC address if the priorities are the same (as per IEEE 802.1D specification). |
| Syntax | **rstp set bridgepriority** *<vlan-id> <bridge priority>* |
| Parameters | **vlan-id**<br>   Vlan Id for which the priority to be set.<br>**bridge priority**<br>   Priority of the Bridge to be set.<br>   The value should range between 0 and 65535. (as per IEEE 802.1D specification) |
| Examples | `N-TRON/Admin#[1]> rstp set bridgepriority 1 1000`<br>`N-TRON/Admin#[2]> rstp set bridgepriority 2 2000` |
| NOTES | Ensure to use a valid range of Bridge priority and Vlan Index (being greater than zero) |

## Get RSTP Bridge Priority

| Command Name | **rstp get bridgepriority** |
|---|---|
| Description | Gets the Bridge Priority of the given Vlan-Id. |
| Syntax | **rstp get bridgepriority** *<vlan-id>* |
| Parameters | **vlan-id**<br>   Vlan Id for which the priority is to be viewed . |
| Examples | `N-TRON/Admin#[1]> rstp get bridgepriority 1`<br>`N-TRON/Admin#[2]> rstp get bridgepriority 2` |
| NOTES | |

## Set RSTP Port Path Cost

| Command Name | **rstp set portpathcost** |
|---|---|
| Description | To set the port path cost for a given port in the given vlan id. STP and RSTP use the path cost to determine which path to use when there are 2 or more available paths that both have the same port priority. |
| Syntax | **rstp set portpathcost** *<vlan-id> <port no> <pathcost>* |
| Parameters | **vlan-id**<br>   Vlan Id for which the pathcost is to be set.<br>**port no**<br>   The portnumber for which the path cost is to be set.<br>**pathcost**<br>   The path cost value to be set (1-200000000). |
| Examples | `N-TRON/Admin#[1]> rstp set portpathcost 1 4 100`<br>`N-TRON/Admin#[2]> rstp set portpathcost 2 6 200` |
| NOTES | Please supply a valid Vlan Index (being greater than zero), a valid Port Number, and a valid path cost. |

## Get RSTP Port Path Cost

| Command Name | **rstp get portpathcost** |
|---|---|
| Description | To get the port path cost for a given port in the given vlan id |
| Syntax | **rstp get portpathcost** *<vlan-id> <port no>* |
| Parameters | **vlan-id**<br>   Vlan Id to which the port belongs.<br>**port no**<br>   The portnumber for which the path cost is to be viewed. |
| Examples | `N-TRON/Admin#[1]> rstp get port pathcost 1 4`<br>`N-TRON/Admin#[2]> rstp get port pathcost 2 6` |
| NOTES | Please supply a valid Vlan Index (being greater than zero)and Port Number |

### Set RSTP Port Priority

| Command Name | **rstp set portpriority** |
| --- | --- |
| Description | To set the priority of the port for a given port in the given vlan-id.  STP and RSTP use the port priority to determine which port to place into forwarding mode when there are 2 or more ports to choose from. |
| Syntax | **rstp set portpriority** *<vlan-id> <port no> <port priority>* |
| Parameters | **vlan-id**<br>   Vlan Id to which the port belongs.<br>**port no**<br>    The portnumber for which the port priority is to be set.<br>**port priority**<br>   The Port priority value to be set.<br>   The valid port priority is 0-255. |
| Examples | ```
N-TRON/Admin#[1]> rstp set portpriority 1 4 100
N-TRON/Admin#[2]> rstp set portpriority 2 6 50
``` |
| NOTES | Please supply a valid Vlan Index (being greater than zero)and Port Number. If the port priority is the same on both ports then the switch will resort to the path cost to determine the best path. |

### Get RSTP Port Priority

| Command Name | **rstp get portpriority** |
| --- | --- |
| Description | To get the priority of the port for a given port in the given vlan-id |
| Syntax | **rstp get portpriority** *<vlan-id> <port no>* |
| Parameters | **vlan-id**<br>   Vlan Id to which the port belongs.<br>**port no**<br>   The portnumber for which the port priority is to be set. |
| Examples | ```
N-TRON/Admin#[1]> rstp get portpriority 1 4
N-TRON/Admin#[2]> rstp get portpriority 2 6
``` |
| NOTES | Please supply a valid Vlan Index (being greater than zero)and Port Number |

# Broadcast Packet Count Limit Commands

## Get the Broadcast Packet Count Limit for one port

| Command Name | **broadcast get percentage** |
|---|---|
| Description | Displays the broadcast packet percentage for a particular port. |
| Syntax | **broadcast get percentage** *<port-number>* |
| Parameters | **port-number**<br>The port number must range between 1 and the maximum port number in the switch. |
| Examples | ```N-TRON/Admin#[1]> broadcast get percentage 6```<br><br>```The BPCL for port number 6 is : 100``` |
| NOTES | |

## Get the Broadcast Packet Count Limit for all ports

| Command Name | **broadcast show percentage** |
|---|---|
| Description | Displays the broadcast packet percentage for all ports. |
| Syntax | **broadcast show percentage** |
| Parameters | **None** |
| Examples | ```N-TRON/Admin#[1]> broadcast show percentage```<br><br>```Broadcast Percentage Value for Ports```<br>```Port #  1 :  100      Port # 14 :  100```<br>```Port #  2 :  100      Port # 15 :  100```<br>```Port #  3 :  100      Port # 16 :  100```<br>```Port #  4 :  100      Port # 17 :  100```<br>```Port #  5 :  100      Port # 18 :  100```<br>```Port #  6 :  100      Port # 19 :  100```<br>```Port #  7 :  100      Port # 20 :  100```<br>```Port #  8 :  100      Port # 21 :  100```<br>```Port #  9 :  100      Port # 22 :  100```<br>```Port # 10 :  100      Port # 23 :  100```<br>```Port # 11 :  100      Port # 24 :  100```<br>```Port # 12 :  100      Port # 25 :  100```<br>```Port # 13 :  100      Port # 26 :  100``` |
| NOTES | **These are egress filters.** |

## Set the Broadcast Packet Count Limit

| Command Name | **broadcast set percentage** |
|---|---|
| Description | Sets the broadcast packet percentage for a particular port |
| Syntax | **broadcast set percentage** *<port-number> <%>* |
| Parameters | **port-number**<br>The port number must range between 1 and the maximum port number in the switch.<br>**%**<br>The count limit should be in the range 0 to 100 and represents the percentage. |
| Examples | ```N-TRON/Admin#[1]> broadcast set percentage 4 100``` |
| NOTES | Default is 3. |

# VLAN Configuration Examples

**Example 1 –** Basic understanding of port based VLANs

**VLAN Configuration View**

| VLAN Status : Enable | | | | | | |
|---|---|---|---|---|---|---|
| **VLAN ID** | **VLAN Name** | **Untagged Port(s)** | **Tagged Port(s)** | **Mgmt Port** | **Admit** | **Mirror Port** |
| 1 | Default VLAN | A3-A6,B1-B6,C1-C6,D1-D6 | -- | YES | All | 0 |
| 2 | VLAN -2 | A1-A2 | -- | YES | All | 0 |

**Ports Configuration View**

| Port No | Port Name | PVID |
|---|---|---|
| 1 | A1 | 2 |
| 2 | A2 | 2 |
| 3 | A3 | 1 |
| ... | … | … |
| 23 | D5 | 1 |
| 24 | D6 | 1 |

| Receiving Port # | Tagged VID in packet | Destination Address | Transmitting Port #s | Notes |
|---|---|---|---|---|
| Port A1 | Untagged | MAC on port 2 | Port A2 | Unicast Traffic |
| Port A1 | Untagged | Unknown MAC | Port A2 | Floods VLAN 2 |
| Port A1 | VID 4 | MAC on port 2 | Port A2 | Strips VID off packet |
| Port A3 | Untagged | MAC on port 5 | Port A5 | Unicast Traffic |
| Port A3 | Untagged | Unknown MAC | Port A4-D6 | Floods VLAN 1 |
| Port A3 | VID 4 | MAC on port 6 | Port A6 | Strips VID off packet |

**Example 2 –** Basic understanding of tagged VLANs (Admit – Tagged Only)

**VLAN Configuration View**

| VLAN Status : Enable | | | | | | |
|---|---|---|---|---|---|---|
| **VLAN ID** | **VLAN Name** | **Untagged Port(s)** | **Tagged Port(s)** | **Mgmt Port** | **Admit** | **Mirror Port** |
| 1 | Default VLAN | -- | A3-A6,B1-B6,C1-C6,D1-D6 | YES | Tagged Only | 0 |
| 2 | VLAN -2 | -- | A1-A2 | YES | Tagged Only | 0 |

**Ports Configuration View**

| Port No | Port Name | PVID |
|---|---|---|
| 1 | A1 | ** |
| 2 | A2 | ** |
| 3 | A3 | ** |
| ... | … | … |
| 23 | D5 | ** |
| 24 | D6 | ** |

| Receiving Port # | Tagged VID in packet | Destination Address | Transmitting Port #s | Notes |
|---|---|---|---|---|
| Port A1 | Untagged | MAC on port A2 | -- | Packet Discarded |
| Port A1 | VID 2 | MAC on port A2 | Port A2 | Unicast Traffic |
| Port A1 | VID 4 | MAC on port A2 | -- | Packet Discarded |
| Port A1 | VID 2 | MAC on port A5 | Port A2 | Floods VLAN 2 |
| Port A3 | Untagged | MAC on port A1 | -- | Packet Discarded |
| Port A3 | VID 1 | MAC on port A6 | Port A6 | Unicast Traffic |
| Port A3 | VID 1 | Unknown MAC | Port A4-D6 | Floods VLAN 1 |
| Port A3 | VID 4 | MAC on port A8 | -- | Packet Discarded |

**Example 3** – Basic understanding of tagged VLANs (Admit – All)

**VLAN Configuration View**

| VLAN Status : Enable | | | | | | |
|---|---|---|---|---|---|---|
| **VLAN ID** | **VLAN Name** | **Untagged Port(s)** | **Tagged Port(s)** | **Mgmt Port** | **Admit** | **Mirror Port** |
| 1 | Default VLAN | -- | A3-A6,B1-B6,C1-C6,D1-D6 | YES | All | 0 |
| 2 | VLAN -2 | -- | A1-A2 | YES | All | 0 |

**Ports Configuration View**

| Port No | Port Name | PVID |
|---|---|---|
| 1 | A1 | ** |
| 2 | A2 | ** |
| 3 | A3 | ** |
| ... | … | … |
| 23 | D5 | ** |
| 24 | D6 | ** |

| Receiving Port # | Tagged VID in packet | Destination Address | Transmitting Port #s | Notes |
|---|---|---|---|---|
| Port A1 | Untagged | MAC on port A2 | Port A2 | Adds VID 2 to packet |
| Port A1 | VID 2 | MAC on port A2 | Port A2 | Unicast Traffic |
| Port A1 | VID 4 | MAC on port A2 | -- | Packet Discarded |
| Port A1 | VID 2 | Unknown MAC | Port A2 | Floods VLAN 2 |
| Port A3 | Untagged | Unknown MAC | Port A4-D6 | Adds VID 1 to packet & Floods VLAN 1 |
| Port A3 | VID 1 | MAC on port A6 | Port A6 | Unicast Traffic |
| Port A3 | VID 1 | Unknown MAC | Port A4-D6 | Floods VLAN 1 |
| Port A3 | VID 4 | MAC on port B2 | -- | Packet Discarded |

**Example 4** – Basic understanding of Hybrid VLANs

**VLAN Configuration View**

| VLAN Status : Enable | | | | | | |
|---|---|---|---|---|---|---|
| **VLAN ID** | **VLAN Name** | **Untagged Port(s)** | **Tagged Port(s)** | **Mgmt Port** | **Admit** | **Mirror Port** |
| 1 | Default VLAN | A3-A6,B1-B6,C1-C6,D1-D6 | -- | YES | All | 0 |
| 2 | VLAN -2 | A1-A2 | A3-A4 | YES | All | 0 |

**Ports Configuration View**

| Port No | Port Name | PVID |
|---|---|---|
| 1 | A1 | 2 |
| 2 | A2 | 2 |
| 3 | A3 | 1 |
| ... | … | … |
| 23 | D5 | 1 |
| 24 | D6 | 1 |

| Receiving Port # | Tagged VID in packet | Destination Address | Transmitting Port #s | Notes |
|---|---|---|---|---|
| Port A1 | Untagged | MAC on port A2 | Port A2 | Unicast Traffic |
| Port A1 | Untagged | MAC on port A3 | Port A3 | Adds VID 2 in the packet |
| Port A1 | VID 4 | MAC on port A2 | -- | Packet Discarded |
| Port A1 | VID 4 | MAC on port A3 | -- | Packet Discarded |
| Port A1 | VID 2 | MAC on port A2 | Port A2 | Strips VID off packet |
| Port A3 | Untagged | MAC on port A6 | Port A6 | Unicast Traffic |
| Port A3 | Untagged | Unknown MAC | Port A4-D6 | Floods VLAN 1 |
| Port A3 | VID 4 | MAC on port A5 | -- | Packet Discarded |
| Port A3 | VID 4 | MAC on port A4 | -- | Packet Discarded |
| Port A3 | VID 2 | MAC on port A4 | Port A4 | Strips VID off packet |
| Port A3 | VID 2 | MAC on port A1 | Port A1 | Strips VID off packet |

## Example 5 – Basic understanding of Overlapping VLANs

**VLAN Configuration View**

| VLAN Status : Enable | | | | | | |
|---|---|---|---|---|---|---|
| VLAN ID | VLAN Name | Untagged Port(s) | Tagged Port(s) | Mgmt Port | Admit | Mirror Port |
| 1 | Default VLAN | -- | -- | YES | All | 0 |
| 2 | VLAN -2 | A1-A6,B1-B6,C1-C6,D1-D6 | -- | YES | All | 0 |
| 3 | VLAN -3 | A2-A6,B1-B6,C1-C6,D1-D6 | -- | YES | All | 0 |
| 4 | VLAN -4 | A1-A2 | -- | YES | All | 0 |

**Ports Configuration View**

| Port No | Port Name | PVID |
|---|---|---|
| 1 | A1 | 4 |
| 2 | A2 | 2 |
| 3 | A3 | 3 |
| ... | … | … |
| 23 | D5 | 3 |
| 24 | D6 | 3 |

| Receiving Port # | Tagged VID in packet | Destination Address | Transmitting Port #s | Notes |
|---|---|---|---|---|
| Port A1 | Untagged | MAC on port A2 | Port A2 | Unicast Traffic |
| Port A1 | Untagged | MAC on port A3 | -- | Packet Discarded |
| Port A1 | VID 4 | MAC on port A2 | Port A2 | Strips VID off packet |
| Port A1 | VID 4 | Unknown MAC | Port A2 | Strips VID off packet & Floods VLAN 4 |
| Port A2 | Untagged | MAC on port A1 | Port A1 | Unicast Traffic |
| Port A2 | Untagged | MAC on port A5 | Port A5 | Unicast Traffic |
| Port A2 | VID 2 or 3 | MAC on port A5 | Port A5 | Strips VID off packet |
| Port A2 | Untagged | Unknown MAC | Port A1,B1-D6 | Floods VLAN 2 |
| Port A3 | Untagged | MAC on port A1 | -- | Packet Discarded |
| Port A3 | Untagged | MAC on port A2 | Port A2 | Unicast Traffic |
| Port A3 | Untagged | MAC on port A5 | Port A5 | Unicast Traffic |
| Port A3 | VID 2 or 3 | MAC on port A2 | Port A2 | Strips VID off packet |

## Example 6 – Basic understanding of VLANs with Multicast Filtering

**VLAN Configuration View**

| VLAN Status : Enable | | | | | | |
|---|---|---|---|---|---|---|
| VLAN ID | VLAN Name | Untagged Port(s) | Tagged Port(s) | Mgmt Port | Admit | Mirror Port |
| 1 | Default VLAN | -- | -- | YES | All | 0 |
| 2 | VLAN -2 | A1-A6,B1-B6,C1-C6,D1-D6 | -- | YES | All | 0 |
| 3 | VLAN -3 | A2-A6,B1-B6,C1-C6,D1-D6 | -- | YES | All | 0 |
| 4 | VLAN -4 | A1-A2 | -- | YES | All | 0 |

**Ports Configuration View**

| Port No | Port Name | PVID |
|---|---|---|
| 1 | A1 | 4 |
| 2 | A2 | 2 |
| 3 | A3 | 3 |
| ... | … | … |
| 23 | D5 | 3 |
| 24 | D6 | 3 |

**Display Static Multicast Group Address(es)**

| Multicast Address | Port List |
|---|---|
| 01:00:00:00:00:01 | 1-24 |
| 01:00:00:00:00:02 | 1,6,8 |

| Receiving Port # | Tagged VID in packet | Destination Address | Transmitting Port #s | Notes |
|---|---|---|---|---|
| Port 1 | Untagged | 01:00:00:00:00:01 | Port 2 | Goes to Ports 1-24, but port 1 can only send to Port 2 (VLAN 4) |
| Port 1 | Untagged | 01:00:00:00:00:02 | -- | Packet Discarded |
| Port 2 | Untagged | 01:00:00:00:00:01 | Port 1,3-24 | Goes to Ports 1-24, but won't go back out the port it came in on |
| Port 2 | Untagged | 01:00:00:00:00:02 | Port 1,6,8 | Goes to ports 1,6,8 |
| Port 3 | Untagged | 01:00:00:00:00:01 | Port 2,4-24 | Goes to Ports 1-24, but can't talk to Port 1 since it is on a different VLAN |
| Port 3 | Untagged | 01:00:00:00:00:02 | Port 6,8 | Goes to Port 1,6,8, but can't talk to Port 1 since it is on a different VLAN |

Note: *If there are multiple ports on different VLANs, the 9000 will apply the static multicast address to the lowest VLAN-ID that is associated with one of the ports assigned to the static multicast address.  If the lowest VLAN-ID contains all the ports assigned to the static multicast address (an umbrella VLAN), it will function for all those ports with no problems.  This can be achieved with overlapping VLANs.*

# KEY SPECIFICATIONS

## Switch Properties

| | |
|---|---|
| Number of MAC Addresses: | 4,096 |
| Aging Time: | Programmable |
| Latency Type: | 2.9 µs |
| Backplane Speed: | 6.6Gb/s |
| Switching Method: | Store & Forward |

## Physical

| | |
|---|---|
| *Height:* | 5.2" (13cm) |
| *Width:* | 9.0" (22.8cm) |
| *Depth:* | 5.6" (14.2cm) |
| *Weight (max):* | 5.0 lbs |
| *Din-Rail mount:* | 35mm |

## Electrical

| | |
|---|---|
| *Redundant Input Voltage:* | 10-30 VDC |
| *Input Current (max):* | 2.5 A@24V (fully populated) |
| *Inrush @ 24VDC:* | 16.0 A for 7.5 ms |
| *Input Ripple:* | Less than 100 mV |
| *N-TRON Power Supply:* | NTPS-24-5 (5 Amp@24VDC) (NOTE: Not appropriate for use with M12, POE, and HV models.) |

## Environmental

| | |
|---|---|
| *Operating Temperature:* | -20°C to 70°C |
| *Storage Temperature:* | -40°C to 85°C |
| *Operating Humidity:* | 10% to 95% |
| (Non Condensing) | |
| *Operating Altitude:* | 0 to 10,000 ft. |

## Shock and Vibration (bulkhead mounting)

| | |
|---|---|
| *Shock:* | 200g @ 10ms |
| *Vibration/Seismic:* | 50g, 5-200Hz,Triaxial |

## Reliability

| | |
|---|---|
| *MTBF:* | >1Million Hours |

## Connectors

| | |
|---|---|
| 10/100BaseTX: | Up to Twenty-four (24) RJ-45 Copper Ports |
| 100BaseFX: | Up to Sixteen (16) SC or ST Duplex Ports |
| 1000BaseSX/LX: | Two (2) LC Duplex Ports as an option |

## Recommended Wiring Clearance:

*Front:* 4" (10.16 cm)
*Side:* 1" (2.54 cm)

## Network Media

| | |
|---|---|
| *10BaseT:* | >Cat3 Cable |
| *100BaseTX*: | >Cat5 Cable |
| 100BaseFX, 1000BaseSX: | |
| *Multimode:* | 50-62.5/125µm |
| 100BaseFXE, 1000BaseLX: | |
| *Singlemode:* | 7-10/125µm |

**Gigabit Fiber Transceiver (SFP) Characteristics**

| Fiber Length | 550m* with 50/125 µm 275m @ 62.5/125µm | 10km** | 40km** | 80km** |
|---|---|---|---|---|
| TX Power Min | -9.5dBm | -9.5dBm | -2dBm | 0dBm |
| RX Sensitivity Max | -17dBm | -20dBm | -22dBm | -24dBm |
| Wavelength | 850nm | 1310nm | 1310nm | 1550nm |
| Assumed Fiber Loss | 3.5 to 3.75 dB/km | 0.45 dB/km | 0.35 dB/km | 0.25 dB/km |
| Laser Type | VCSEL | FP | DFB | DFB |

*SX Fiber Optic Cable
** LX Fiber Optic Cable

## 100 Mb Fiber Transceiver Characteristics

| Fiber Length | 2km* | 15km** | 40km** | 80km** |
|---|---|---|---|---|
| TX Power Min | -19dBm | -15dBm | -5dBm | -5dBm |
| RX Sensitivity Max | -31dBm | -31dBm | -34dBm | -34dBm |
| Wavelength Min/Max | 1310nm | 1310nm | 1310nm | 1550nm |

\* Multimode Fiber Optic Cable
\** Singlemode Fiber Optic Cable

**Regulatory Approvals:**

**Safety:** Suitable for use in Class I, Division 2, Groups A, B, C and D Hazardous Locations, or Nonhazardous Locations only.

**EMI:** EN61000-6-4, EN55011 – Class A
FCC Title 47, Part 15, Subpart B - Class A
**EMS:** EN61000-6-2
EN61000-4-2 (ESD)
EN61000-4-3 (RS)
EN61000-4-4 (EFT)
EN61000-4-5 (Surge)
EN61000-4-6 (Conducted Disturbances)

**Conducted Low Frequency:** IEC60533

**Shock:** IEEE 1613 (250 mm)
**Vibration:** IEEE 1613 (V.S.3 20 mm/s)
IEC60068-2-6 (Test Fc)
**Cold:** IEC60068-2-1
**Dry Heat:** IEC60068-2-2
**Damp Heat:** IEC60068-2-30 (Test Db)

**GOST-R Certified.**

**Warranty:** Effective January 1, 2008, all N-TRON products carry a 3 year limited warranty from the date of purchase.

# N-TRON Limited Warranty

N-TRON, Corp. warrants to the end user that this hardware product will be free from defects in workmanship and materials, under normal use and service, for the applicable warranty period from the date of purchase from N-TRON or its authorized reseller. If a product does not operate as warranted during the applicable warranty period, N-TRON shall, at its option and expense, repair the defective product or part, deliver to customer an equivalent product or part to replace the defective item, or refund to customer the purchase price paid for the defective product. All products that are replaced will become the property of N-TRON. Replacement products may be new or reconditioned. Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer. N-TRON shall not be responsible for any custom software or firmware, configuration information, or memory data of customer contained in, stored on, or integrated with any products returned to N-TRON pursuant to any warranty.

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ADVANCE REPLACEMENT OPTION: Upon registration, this product qualifies for advance replacement. A replacement product will be shipped within three (3) days after verification by N-TRON that the product is considered defective. The shipment of advance replacement products is subject to local legal requirements and may not be available in all locations. When an advance replacement is provided and customer fails to return the original product to N-TRON within fifteen (15) days after shipment of the replacement, N-TRON will charge customer for the replacement product, at list price.

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