



# N-Tron<sup>®</sup> Series

## 700/7000 Managed Industrial Ethernet Switch

Software Manual Firmware Version 3.9.1

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# PREFACE

**Purpose** This manual gives specific information on how to operate and use the management functions of the 700/7000 Managed Industrial Ethernet Switch.

**Audience** The manual is intended for use by network users who are responsible for operating and maintaining network equipment; consequently, it assumes a basic working knowledge of general switch functions, the Internet Protocol (IP), and Simple Network Management Protocol (SNMP).

**Trademark Acknowledgments** Red Lion Controls acknowledges and recognizes ownership of the following trademarked terms used in this document.

- Ethernet™ is a registered trademark of Xerox Corporation
- EtherNet/IP™ and CIP™ are registered trademarks of ODVA

All other company and product names are trademarks of their respective owners.

**Conventions** The following conventions are used throughout this manual to show information:



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**Note:** Emphasizes important information or calls your attention to related features or instructions.

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**Caution:** Alerts you to a potential hazard that could cause loss of data, or damage the system or equipment.

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**Warning:** Alerts you to a potential hazard that could cause personal injury.

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**FCC Statement** This product complies with Part 15 of the FCC-A Rules. Operation is subject to the following conditions:

- This device may not cause harmful Interference
- This device must accept any interference received, including interference that may cause undesired operation.

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful

interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

**Industry Canada** This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Operation is subject to the following two conditions; (1) this device digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Operation is subject to the following two conditions; (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Cet appareillage numérique de la classe A répond à toutes les exigences de l'interférence canadienne causant des règlements d'équipement. L'opération est sujette aux deux conditions suivantes: (1) ce dispositif peut ne pas causer l'interférence nocive, et (2) ce dispositif doit accepter n'importe quelle interférence reçue, y compris l'interférence qui peut causer l'opération peu désirée

**Related Publications and Document Updates** The publication details the features of the 700/7000 Managed Industrial Ethernet Switch, including the performance-related characteristics, and how to operate the switch.

This document is revised only at major releases and therefore, may not always contain the latest product information. As needed, Tech Notes and or other product documentation can be provided between major releases to describe any new information or document changes.

Also, as part of the 700/7000 Managed Industrial Ethernet Switch software, there is an online web-based help that describes all management related features.

The latest online version of this document and all product updates can be accessed at the Red Lion's N-Tron Series Support Knowledge Base page on the Red Lion web site at: [www.redlion.net](http://www.redlion.net).

Red Lion appreciates all comments that will help us to improve our documentation quality. The user can submit comments through the Red Lion Customer Service. Simply email us at [support@redlion.net](mailto:support@redlion.net).

**Revision History** The following information lists the release history of this document.

Issue / Revision Date	Content Description
January 2019	This manual is valid for software release v3.9.1. First document release with software content integrated from 700 Models Managed Industrial Ethernet Switch User Manuals & Installation Guides and 7000 Models Managed Industrial Ethernet Switch User Manuals & Installation Guides.

**Disclaimer** Portions of this document are intended solely as an outline of methodologies to be followed during the maintenance and operation of N-Tron® Series 700/7000 Managed Industrial Ethernet Switch equipment. It is not intended as a step-by-step guide or a complete set of all procedures necessary and sufficient to complete all operations.

While every effort has been made to ensure that this document is complete and accurate at the time of release, the information that it contains is subject to change. Red Lion is not responsible for any additions to or alterations of the original document. Industrial networks vary widely in their configurations, topologies, and traffic conditions. This document is intended as a general guide only. It has not been tested for all possible applications, and it may not be complete or accurate for some situations.

# GETTING STARTED

This section provides an overview of the N-Tron® Series 700/7000 Managed Industrial Ethernet Switch, and introduces some basic concepts about network switches. It also describes the basic settings required to access the web management interface.

This section includes these chapters:

["Introduction & Overview" on page 3](#)

["Web Software Configuration" on page 15](#)



# CHAPTER 1 INTRODUCTION & OVERVIEW

This chapter provides an overview of features for the switch. It includes a management agent that allows you to configure the features listed in this manual. The default configuration can be used for most of the features provided by this 700/7000 managed industrial Ethernet switch. However, there are many options that you should configure to maximize the 700/7000 managed industrial Ethernet switch performance for your particular network environment.

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## MODE OF OPERATION OVERVIEW

Each port on the switch can be configured into different modes of operation as shown in Table 1.

**Table 1: Port Operating Modes**

Copper Ports	100Base Fiber Ports	1000Base Copper/Fiber Ports
700/7000 Models		7000 Models
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 devices 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 (back-off) before attempting to transmit again.

**FULL DUPLEX** Full duplex operation allows simultaneous communication between a pair of devices 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 of the station.

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## ADVANCED FEATURES OVERVIEW

The switch provides a wide range of advanced performance enhancing features. Some of the management features are briefly described in the following paragraphs.

**PORT MIRRORING** The switch can unobtrusively mirror traffic from any port to a dedicated destination port. You can then attach a protocol analyzer or RMON probe to this port to perform traffic analysis and verify connection integrity.

**PORT TRUNKING** Ports can be combined into an aggregate connection called a trunk which acts as a single link between two switches. The additional ports dramatically increase the throughput across any connection, and provide redundancy by taking over the load if a port in the trunk should fail.

**QUALITY OF SERVICE** Quality of service (QoS) refers to resource reservation control mechanisms. Quality of service provides the ability to assign different priorities to different applications, users, or data flows. Quality of service guarantees are important if the network capacity is insufficient, especially for real-time streaming multimedia applications such as voice over IP, online games and IP-TV, since these often require fixed bit rates and are delay sensitive, and in networks where the capacity is a limited resource, for example in cellular data communication. In the absence of network congestion, QoS mechanisms are not required. In the presence of heavy network traffic, low priority frames may be discarded as they pass through a congested switch.

These QOS methods may be available depending on the switch model:

1. Force High Priority (Port Based),
2. IEEE802.1p (Tagged QOS), or
3. DSCP (differentiated services code points) (RFC 2474).

To assign a high priority to all frames received on a port, enable Force High Priority and set the port's default Port Priority to 7.

**DHCP** The Dynamic Host Configuration Protocol (DHCP) provides configuration parameters to Internet hosts. DHCP is built on a client-server model, where designated DHCP server's allocate network addresses and deliver configuration parameters to dynamically configured hosts. DHCP is specified by RFC 2131. The switch can be configured to be a DHCP client. 700/700 switches can be configured to be a DHCP server, a DHCP relay agent, or both. Refer to [DHCP on page 26](#) in Chapter 2 for configuration information.

**DHCP CLIENT** The switch will automatically obtain an IP assignment from a DHCP server, or optionally fallback to a configured IP assignment if unable to get an IP assignment from a DHCP server. Communication between the client and server can optionally go through a DHCP relay agent.

**DHCP RELAY AGENT** A DHCP Relay Agent (Option 82) enables communication between DHCP clients and servers to cross subnet and VLAN boundaries. It also allows for a device on a specific port to receive a specific IP address and if the device is replaced, the replacement receives the same IP address as the original device.

**DHCP SERVER** The DHCP Server allows DHCP clients to automatically obtain an IP assignment from the server. IP assignments can be set up as a dynamic range of IP addresses available to any client device; or specific IP addresses based on the clients MAC address, Client ID (Option 61), or Relay Agent connection (Option 82).

**VIRTUAL LAN** The switch supports Virtual Local Area Networks (VLAN). By segmenting your network into VLANs, you can:

- Eliminate broadcast storms which severely degrade performance in a flat network.
- Simplify network management for node changes/moves by remotely configuring VLAN membership for any port, rather than having to physically change the network connection.
- Provide data security by restricting all traffic to the originating VLAN, except where a connection is explicitly defined via the switch's routing service.
- Use private VLANs to restrict traffic to pass only between data ports and the uplink ports, thereby isolating adjacent ports within the same VLAN, and allowing you to limit the total number of VLANs that need to be configured.
- Use protocol VLANs to restrict traffic to specified interfaces based on protocol type.

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

VLANs facilitate easy administration of logical groups of devices that can communicate as if they were on the same LAN. **Traffic between VLANs is restricted, unless the ports are explicitly configured to be in overlapping VLANs.** Switches forward unicast, multicast, and broadcast traffic only on LAN segments that service the VLAN to which the traffic belongs.

A Default Virtual LAN (VID=1) exists to which a port, which is not a member of any other Virtual LAN, will belong. By default, all ports belong to only the default VLAN. This allows the switch to operate as a 'normal' switch when added into a network of other switches that are also using default VLAN settings.

If switch ports are configured to transmit and receive untagged frames, end devices are able to communicate throughout the 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 user to set up the switch to support devices on the network that do not support VLAN Tagged packets. The user 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.

For each switch port there is one and only one PVID (port VLAN ID) setting. If an incoming frame is untagged and untagged frames are being accepted, then that frame will inherit the tag of the PVID value for that port. Subsequent switch routing and treatment will be in accordance with that VLAN switch map. By configuring PVIDs properly and configuring for all frames to exit untagged, the switch can achieve a 'port VLAN' configuration in which all frames in and out can be untagged, thus not requiring external devices to be VLAN cognizant.

To understand how a VLAN configuration will perform, first look at the port on which the frame enters the switch, then the VLAN ID (if the frame is tagged) or the PVID (if the frame is untagged). The VLAN defined by the VID or PVID defines a VLAN group with a membership of ports. This membership determines whether a port is included or excluded as to frame egress from the switch.

The 700 models of the switch also have the ability to allow overlapping VLANs. Overlapping VLANs give 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 the 'VLAN Configuration Examples' in this document, and/or our websites' technical documents.

**Note:** RSTP on overlapping VLANs is not supported and the system will automatically disable RSTP on all but the lowest VID VLANs that have overlapping ports.

**RAPID SPANNING TREE PROTOCOL** The Rapid Spanning Tree Protocol as specified in IEEE 802.1D-2004 is supported. One Spanning Tree per non-overlapping VLAN is supported. The Rapid Spanning Tree Protocol (RSTP) supersedes the Spanning Tree Protocol (STP) which was described in IEEE 802.1D-1998.

RSTP dynamically reconfigures bridge (switch) ports in a network of arbitrarily connected bridges. This network may include redundant connections. Some ports are reconfigured to forward traffic and others to block traffic. RSTP builds a loop-free network (a spanning tree) from the forwarding ports thus preventing network storms. RSTP also provides redundancy by dynamically reconfigures ports as connections or bridges fail or are added to the network.

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 inter-operates 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 switch supports up to 5 SNMP Trap devices to which SNMP Traps will be sent. The switch supports five standard traps; Link Up, Authentication Error, Link Down, Cold Start and Warm Start. SNMP Traps will be sent to all the devices configured on the switch (when the corresponding trap is enabled) if an authentication error occurs, a port Link goes up or down, when the switch first powers up and when the switch is reset.

**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 web console and if enabled, operates dynamically upon each power up. Also, there can be manual only or manual and dynamic operation.

**Note:** “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 700 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 700 Series supports v1 and v2.

**N-RING** Red Lion’s proprietary N-Ring technology offers expanded ring topology size, detailed fault diagnostics, and a standard healing time of 30ms.

N-Ring™ is enabled by default, and the switch is *Plug and Play* for N-Ring except that initially a switch must be configured as the N-Ring Manager for a given N-Ring. Subsequently, N-Ring operates dynamically upon each power up. 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.

**N-LINK** Red Lion’s proprietary N-Link technology provides redundant coupling of an N-Ring topology to one or more other topologies, usually other N-Rings.

Each N-Link configuration requires 4 switches: N-Link Master, N-Link Slave, N-Link Primary Coupler, and N-Link Standby Coupler. N-Link will monitor the link status of the Primary and Standby Coupler links. While the Primary Coupler link is healthy, it will forward network traffic between topologies and the Standby Coupler link will block network traffic. When a problem is detected on the Primary Coupler link, the Primary Coupler link will block network traffic and the Standby Coupler link will forward network traffic between topologies. While the N-Link Master and Slave are in communication via the Control link, only one Coupler link (Primary or Standby) will forward network traffic while the other Coupler link will block network traffic.

**CIP** The CIP™ (Common Industrial Protocol) feature allows N-Tron switches to directly provide switch information and configuration access to Programmable Logic Controller (PLC) and Human Machine Interface (HMI) applications via a standardized communication protocol. For example, a PLC may be programmed to monitor port links or N-Ring status and cause a status indicator to turn red on an HMI if a port goes link down or if N-Ring has a fault. CIP is formally described in ODVA Publication Number PUB00001 (Volume 1: Common Industrial Protocol (CIP™)), and Publication Number: PUB00002 (Volume 2: Ethernet/IP Adaptation of CIP). N-Tron provides EDS and ICO files. N-TRON\_CIP\_Tags.pdf is for a particular environment, but reveals the tags available.

**LLDP** Link Layer Discovery Protocol (LLDP) is a Layer 2 discovery protocol that allows devices attached to an IEEE802 LAN to advertise to other devices the major capabilities they have and to store information they discover in a MIB that can be accessed through SNMP. LLDP is formally described in IEEE Standard - 802.1AB.

**PORT SECURITY - MAC ADDRESS BASED** The Port Security feature restricts access to a network by only permitting traffic from devices with authorized MAC addresses. Authorized MAC addresses can be dynamically learned or manually entered.

Dynamically learned MAC addresses are those that the switch detects on any port while in 'Learning' mode. A manually entered MAC address must designate the ports that the address is authorized on. Traffic from a non-authorized MAC address will be discarded and the MAC address will be shown on the intruder log.

## SYSTEM DEFAULTS

The switch's basic system defaults are provided in the table below. To reset the switch to the default settings, refer to the section on [Configuration on page 103](#).

Function	Parameter	Default	
Console Port Connection	Baud Rate	115200 bps (not configurable)	
	Data bits	8 (not configurable)	
	Stop bits	1 (not configurable)	
	Parity	none (not configurable)	
System Configuration	IP Configuration	Static	
	IP Address	192.168.1.201	
	Subnet Mask	255.255.255.0	
	Gateway	192.168.1.1	
	Name	N-TRON Switch xx:xx:xx (where xx:xx:xx is the last three octets of the MAC Address)	
	Contact	N-TRON Admin	
	Location	Mobile, AL	
SNMP Configuration	Status	Enabled	
	Read-Only Community Name	"public"	
	Read-Write Community Name	"private"	
	Trap Community Name	"public"	
	V3 Username	"initial"	
	V3 Privacy Password	"privpass"	
	V3 Authentication Password	"authpass"	
	V3 Authentication Protocol	MD5	
	Trap Version	1	
	IP Address - Trap Stations 1-5	<not configured>	
	Send Trap Notification	Power Supply	No
		Cold Start	Yes
		Authentication	Yes
	Warm Start	Yes	
	Link Status	Yes	

Function	Parameter		Default
Fault Configuration	Contact Operation (Meaning)		Close on Fault
	Signal	Power V <sub>1</sub>	Disabled
		Power V <sub>2</sub>	Disabled
		N-Link Fault	Enabled
		Port Usage Fault	Enabled
		N-Ring Broken	Enabled
		N-Ring Partial Break (Low)	Enabled
		N-Ring Partial Break (High)	Enabled
	N-Ring Multiple Managers	Enabled	
Slots Configuration	N-Tron 7900 Only	Slot A	9006TX
		Slot B	9006TX
		Slot C	9006TX
		Slot D	9006TX
DHCP Configuration	Server	Status	Disabled
		Allow Broadcast	Enabled
		Delay Broadcast	500 (milliseconds)
		ID	<Defaults to the switch name>
		Network Profile Domain Name	localdomain.com
		Network Profile Lease Time	28 Days
	Relay Agent & Local IP	Relay Status	Disabled
		Remote ID Type	IP Address
		Server 1-4 IP	None
		Port Relay Status	Disabled <All ports>
LLDP Configuration	Mode		Disabled
	Transmit Interval		30 (seconds)
	Transmit Hold Multiplier		4
	Re-Initialization Delay		2 (seconds)
	Notification Interval		5 (seconds)
	Port	Transmit	Yes <All ports>
		Receive	Yes <All ports>
		Allow Management Data	Yes <All ports>
Allow Notification		No <All ports>	

Function	Parameter		Default
Ports Configuration	Admin Status		Enabled
	Speed and Duplex	10/100Mb Copper Ports	Auto-Negotiate
		100Mb Fiber Ports	100/Full
		GigaBit (Copper or Fiber) Ports*	1000/Full
	Cross Over	10/100Mb Copper Ports	Auto
		100Mb Fiber Ports	No (not configurable)
		GigaBit (Copper or Fiber) Ports	Auto
	Flow Control		Disabled
	PVID		1
	Usage Alarm Low		0 (%)
Usage Alarm High		100 (%)	
MAC Learning Configuration	Current Mode		Learning
	Port Secured		No <All ports>
Port Mirroring Configuration	Mirror Status		Disabled
	Destination Port		<First port>
	Mirrored Data Only		Disabled
	Source Ports - Tx		None
	Source Ports - Rx		None
Port Trunking	Trunk Status		Disabled
	Trunk Ports	FX1-FX2	If present
		T3-T4	N-Tron 7506GX2
		A3-A4	N-Tron 7900
		<Last two copper ports>	All other models
QOS Configuration	Include DSCP		Enabled <All ports>
	Include 802.1p		Enabled <All ports>
	Force High Priority		Disabled <All ports>
	Port Priority		1 <All ports>

Function	Parameter	Default	
VLAN Configuration	Replace VID Tag with Default Port VID	No	
	Perform Ingress Filtering	No	
	Discard Non-Tagged for Ports	None	
	Remove Ports from Default VLAN When Added to Other VLANS	Yes	
	VLAN Groups	VLAN ID	1
		VLAN Name	Default VLAN
		Group Members	<All ports>
		Untag on Egress	<All ports>
Allow Mgmt		Yes	
Bridging Configuration	Aging Time	20 (seconds)	
	Active IP Probe Status	Disabled	
RSTP Bridge Configuration	Status	Fast (RSTP enabled)	
	Hello Time	1 (second)	
	Forward Delay	13 (seconds)	
	Max Age	16 (seconds)	
	Priority	32768	
	VLAN	1	
IGMP Configuration	IGMP Status	Enabled	
	Query Mode	Auto	
	Router Mode	Auto	
	Remove Unused Groups	Enabled	
	Manual Router Ports	None <No ports selected>	
	RFilter	Enabled <All ports>	
N-View Configuration	N-View Status	Enabled	
	N-View Internal	5 (seconds)	
	Ports	Multicast On Port?	Yes <All ports>
		Send MIB Stats?	Yes <All ports>

Function	Parameter		Default	
N-Ring Configuration	N-Ring Mode		Auto Member	
	Aging Time		20 (seconds)	
	N-Ring Port Pairs	Fixed Port Models		
		Port Pair 1		First two ports
		Port Pair 2		If they exist, first two fiber ports  If no fiber ports exist, then in order of precedence: 1. Last two 10/100/1000 Mb copper ports. if they exist or 2. Last two 10/100 Mb copper ports
		Port Pair 3		If they exist, first two SFP Gigabit ports
		Modular Models		
		Port Pair per Module		First two ports on each model
	Auto Member Mode	N-Ring Ports		Auto detect N-Ring ports based on port pairs
		VLAN ID		Auto detect
		Tagging		Auto detect
		Advanced	Keep-Alive Timeout	31 (seconds)
	Manager Mode	N-Ring Ports		<First available port pair per model by priority: Priority 1: Gigabit, Priority 2: Fiber, Priority 3: Copper
		VLAN ID		3333
		Tagging		Tagged
		Advanced	Self Health Packet Interval	10 (milliseconds)
			Maximum Missed Packets	2
			Sign-On Delay	1000 (milliseconds)
			Sign-On Match Packets	3
			Sign-On Interval	3000 (milliseconds)
		Sign-On Info Spacing Multiplier	5 (milliseconds)	



Function	Parameter		Default	
			Sign-On Info Retry Timeout	1500 (milliseconds)
			Delay Before Re-entering Broken State	3000 (milliseconds)
N-Link Configuration	N-Link Mode		Auto Configure	
	Auto Configure Mode	Default Coupler Port	<Fourth port>	E.g., TX4/P4
	Master Mode	Control Port	<Third port>	E.g., TX3/P3
		Primary Coupler Port	<Fourth port>	E.g., TX4/P4
		Partner Port	Auto detect	
	Slave Mode	Control Port	Auto detect	
		Primary Coupler Port	<Fourth port>	E.g., TX4/P4
		Partner Port	Auto detect	
CIP Configuration	CIP Status			Enabled
	Minimum Multicast RPI (RpiClass1)			300 (milliseconds)
	Minimum Unicast RPI (RpiClass3)			300 (milliseconds)
Rate Limiting Configuration	Broadcast	Pass Rate	3%	100 Mb ports
			1%	1000 Mb (1 GB) ports
	Multicast	Pass Rate	100%	<All ports>
User Configuration	Administrator	User Name		admin
		Password		admin
		Access Level		Admin

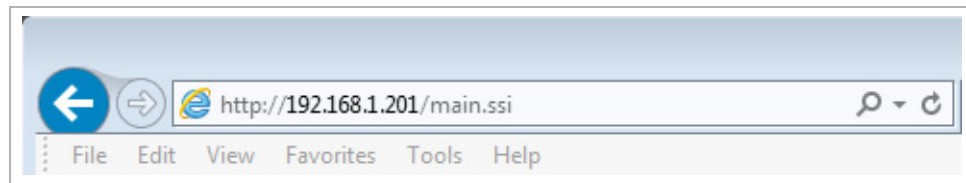
\* Gigabit SFPs support 1000 Mb speed only. Copper SFPs will auto-negotiate per the IEEE specification but they will only advertise 1000 Mb with full duplex.

## CHAPTER 2 WEB SOFTWARE CONFIGURATION

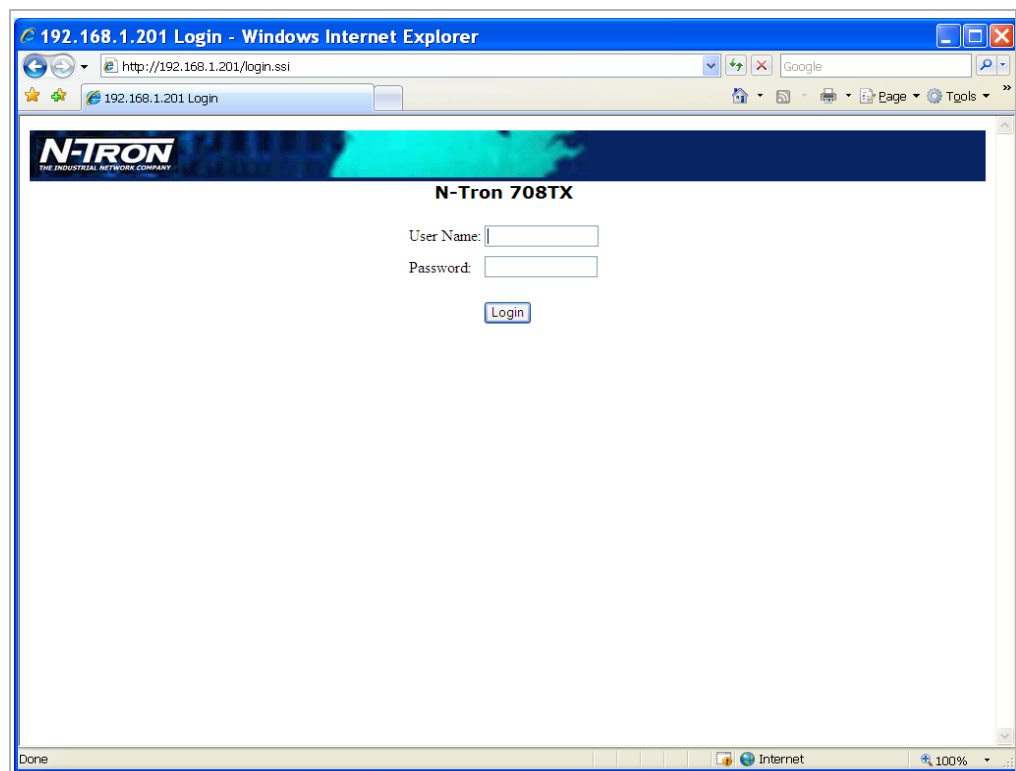
This chapter includes information on connecting to the switch and basic configuration procedures.

### ACCESSING THE WEB SOFTWARE INTERFACE

Launch a web browser and enter the IP address of the switch into the address bar.



The following login screen will appear:



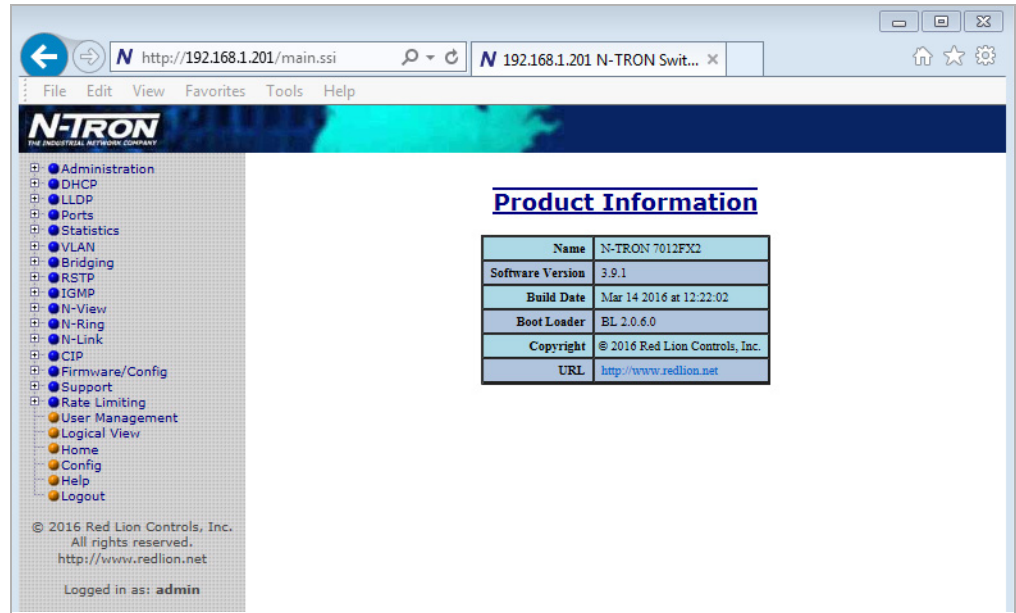
For the User Name, enter: **admin** (all lowercase).

For the password, enter: **admin** (all lowercase).



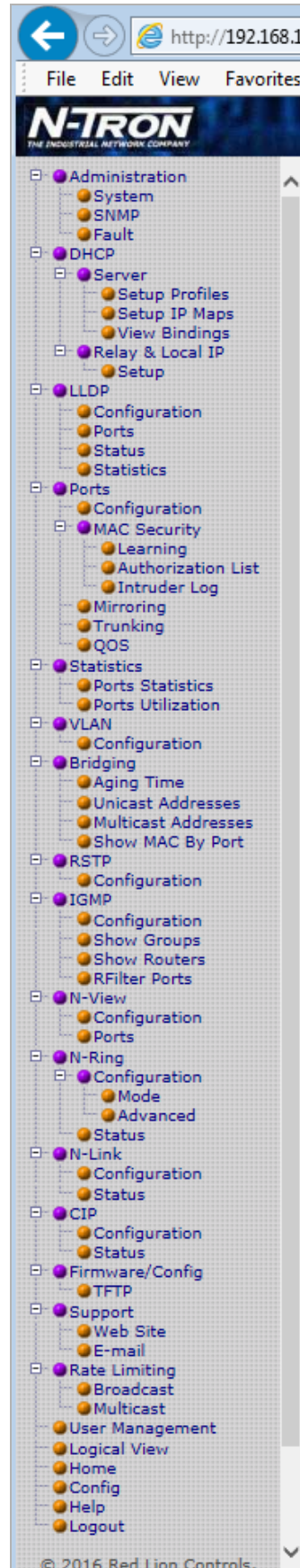
**Note:** For security purposes, it is recommended that the default password be changed according to your internal policies. Login credentials can be changed on the User Management page.

Upon successfully logging in, depending on the switch model used, a screen similar to the one below will appear:



**WEB MANAGEMENT INTERFACE HOME** When the user first logs onto a 700/7000 model switch the default home page is displayed. On the left hand side of the screen there is a list of configurable settings. In the center of the main home page the user can see some basic information like what firmware revision the switch is running. The firmware can be upgraded using TFTP.

**WEB MANAGEMENT INTERFACE MENU STRUCTURE** The web management interface structure (shown on the web management interface home page left side) in its fully expanded view of the configurable features is shown below. The pages opened by each individual selection are described in the rest of this section. In most of the descriptions, only the selected configurable feature is shown.



---

## ADMINISTRATION

**ADMINISTRATION > SYSTEM** The System tab under the Administration category, lists various information about the switch:

When the IP Configuration is in either DHCP or Static Mode:

### **IP Configuration**

Method used to obtain an IP Address, Subnet Mask and Gateway Address

### **IP Address**

Contains the current IP Address of the switch.

### **Subnet Mask**

Contains the current Subnet Mask of the switch.

### **Gateway**

Contains the current Gateway of the switch.

### **MAC Address**

MAC Address of the switch.

### **System Up Time**

This parameter represents the total time that has elapsed since the switch was turned ON or RESET.

### **Name**

The name assigned to the switch, which can have alphanumeric and special characters '#', '\_', '-', and ':'. This name may be used as the DHCP client ID.

### **Contact**

The person to contact for system issues, which should be someone within your organization.

### **Location**

The physical location of the switch.

### **Temperature\***

The temperature measured by the on board temperature sensor of the switch.

### **Upper Threshold\***

The upper temperature threshold setting of the switch. A temperature measured above this value will cause a fault.

### **Lower Threshold\***

The lower temperature threshold setting of the switch. A temperature measured below this value will cause a fault.

\* The following models have an on board temperature sensor and display values on the System Configuration View screen: 7010TX, 7012FX2, 7026TX, 709FX, 710FX2, 711FX3, 712FX4, 714FX6, 7506GX2, and 7900CPU.

### System Configuration View

<b>IP Configuration</b>	Static
<b>IP Address</b>	192.168.1.201
<b>Subnet Mask</b>	255.255.255.0
<b>Gateway</b>	192.168.1.1
<b>MAC Address</b>	00:07:af:ef:78:e0
<b>System Up Time</b>	0 days, 0 hours, 11 mins, 53 secs
<b>Name</b>	N-TRON Switch ef:78:e0
<b>Contact</b>	N-TRON Admin
<b>Location</b>	Mobile, AL 36609
<b>Temperature</b>	12°C, 53°F
<b>Upper Threshold</b>	100°C, 212°F
<b>Lower Threshold</b>	-60°C, -76°F

When the IP Configuration is in DHCP Mode the following information is added:

**Client ID**

Option used by DHCP clients to specify their unique identifier. The identifier may be the MAC address, switch name, or entered as a text string or hex characters.

**Fallback IP Address**

Contains the configured Fallback IP Address of the switch.

**Fallback Subnet Mask**

Contains the configured Fallback Subnet Mask of the switch.

**Fallback Gateway**

Contains the configured Fallback Gateway of the switch.

### System Configuration

<b>IP Configuration</b>	DHCP ▾
<b>Client ID</b>	MAC Address ▾ 00:07:af:ef:78:e0
<b>Fallback IP Address</b>	<input type="text" value="192.168.1.201"/>
<b>Fallback Subnet Mask</b>	<input type="text" value="255.255.255.0"/>
<b>Fallback Gateway</b>	<input type="text" value="192.168.1.1"/>
<b>Name</b>	<input type="text" value="N-TRON Switch ef:78:e"/>
<b>Contact</b>	<input type="text" value="N-TRON Admin"/>
<b>Location</b>	<input type="text" value="Mobile, AL 36609"/>
<b>Upper Threshold</b>	<input type="text" value="100"/> °C
<b>Lower Threshold</b>	<input type="text" value="-60"/> °C

By selecting Modify, you will be able to change the switch’s IP Configuration, Client ID, IP Address, Subnet Mask, Gateway, Name, Contact information, and the Location of the switch through the web management interface features, depending on the IP Configuration. It is recommended to change the TCP/IP information through the Command Line Interface (CLI) initially, but it defaults to the following:

- IP Configuration – Static**
- IP Address – 192.168.1.201**
- Subnet Mask – 255.255.255.0**
- Gateway – 192.168.1.1**

**System Configuration**

IP Configuration	Static ▾
IP Address	192.168.1.201
Subnet Mask	255.255.255.0
Gateway	192.168.1.1
Name	N-TRON Switch ef:78:e
Contact	N-TRON Admin
Location	Mobile, AL 36609
Upper Threshold	100 °C
Lower Threshold	-60 °C

If the IP Configuration mode is set to DHCP and the Fallback IP address is changed from the default IP address, then the switch will use the Fallback addresses if the IP configuration isn’t received from a DHCP server in 2 minutes after initial boot. If Fallback address is used, DHCP client will stop sending requests. If the IP Configuration is received from a DHCP server, it will never Fallback, even if the lease is lost.

**System Configuration**

IP Configuration	DHCP ▾
Client ID	MAC Address ▾ 00:07:af:ef:78:e0
Fallback IP Address	192.168.1.201
Fallback Subnet Mask	255.255.255.0
Fallback Gateway	192.168.1.1
Name	N-TRON Switch ef:78:e
Contact	N-TRON Admin
Location	Mobile, AL 36609
Upper Threshold	100 °C
Lower Threshold	-60 °C

**ADMINISTRATION > SNMP** The SNMP tab under the Administration category shows a list of IP Addresses that act as SNMP Traps. The Read-Only, Read-Write, and Trap Community Names are also shown here.

**Management Station Configuration View**

SNMP Status	Enabled
Trap Version	1

IP Address - Trap Stn.#1	Value Not Configured
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
Read-Only Community Name	public
Read-Write Community Name	private
Trap Community Name	public

SNMP Notification Trap	Send Trap?
Power Supply	No
Cold Start	Yes
Authentication	Yes
Warm Start	Yes
Link Status	Yes

By selecting Modify, you will be able to change any of the fields listed. This allows the user to set an IP address for a Trap station or change the Community Names. If the SNMP Notification Trap is enabled, systems that are listed as a Trap station will be



sent the corresponding notification trap. To restore a Trap to “Value Not Configured”, enter ‘0.0.0.0’

### Management Station Configuration

Snm Status	Enabled ▾
Trap Version	1 ▾

IP Address - Trap Stn.#1	Value Not Configured
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
Read-Only Community Name	public
Read-Write Community Name	private
Trap Community Name	public

SNMP Notification Trap	Send Trap?
Power Supply	<input type="checkbox"/>
Cold Start	<input checked="" type="checkbox"/>
Authentication	<input checked="" type="checkbox"/>
Warm Start	<input checked="" type="checkbox"/>
Link Status	<input checked="" type="checkbox"/>

**ADMINISTRATION > FAULT** The Fault tab under the Administration category provides configurable selections indicating the way to notify when a Power, N-Ring™ Manager, N-Link fault, or Port Usage Fault occurs. The notification may consist of any combination of the options: Show Web, Show LED, and Contact. Power signal faults consist of V<sub>1</sub> and V<sub>2</sub>. N-Ring Manager signal faults consist of: Broken, Partial Break (Low), Partial Break (High), and Multiple Managers. N-Link Faults are reported by the N-Link Master and by the N-Link Slave. Port Usage Fault, if enabled, triggers when actual usage is below the Usage Alarm Low setting, or above the Usage Alarm High setting (see Port Configuration View and Port Utilization View).

**Note:** Some switch models do not have a fault contact.

### Fault Configuration View

Meaning Close on Fault

Signal	Show Web	Show LED	Contact
Power V <sub>1</sub>	No	No	No
Power V <sub>2</sub>	No	No	No
N-Link Fault	Yes	Yes	Yes
Port Usage Fault	Yes	Yes	Yes

N-Ring Manager Signal	Show LED	Contact
Broken	Yes	Yes
Partial Break(Low)	Yes	Yes
Partial Break(High)	Yes	Yes
Multiple Managers	Yes	Yes

Modify Refresh

**Note:** V<sub>1</sub> and V<sub>2</sub> Power Faults are disabled in factory defaults.

By selecting Modify, the user will see a list of configurable fields for the Fault configuration. The fault relay contact can be configured to open on fault or to close on fault, with the latter being the default. Once these fields are filled in to meet the needs of the user's network, the changes may be updated by clicking the Update button at the bottom of the page.

### Modify Fault Configuration

Meaning

Close on Fault ▾  
 Open on Fault  
 Close on Fault

Signal	Show Web	Show LED	Contact
N-Link Fault	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Port Usage Fault	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

N-Ring Manager Signal	Show LED	Contact
Broken	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Partial Break(Low)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Partial Break(High)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Multiple Managers	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Update
Cancel

If a low voltage DC power supply is installed, these additional choices appear:

### Modify Fault Configuration

Meaning

Close on Fault ▾  
 Open on Fault  
 Close on Fault

Signal	Show Web	Show LED	Contact
Power V <sub>1</sub>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power V <sub>2</sub>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**HELP > ADMINISTRATION** Following the Administration link on the help page, the user or user can see some information regarding the configuration options in the Administration category on the left side of the web management interface.

The screenshot shows a web browser window with the URL `http://192.168.1.201/main.ssi`. The page title is "192.168.1.201 N-TRON Swit...". The interface includes a navigation menu on the left with the following items: Administration, DHCP, LLDP, Ports, Statistics, VLAN, Bridging, RSTP, IGMP, N-View, N-Ring, N-Link, CIP, Firmware/Config, Support, Rate Limiting, User Management, Logical View, Home, Config, Help, and Logout. The main content area displays a table of configuration categories and a detailed "Administration" section.

Administration	DHCP	LLDP	Ports
Statistics	VLAN	Bridging	RSTP
IGMP	N-View	N-Ring	N-Link
CIP	Firmware/Config	Rate Limiting	User Management
Other			

**Administration**

Administration group is divided into three categories:  
 1. System 2. SNMP 3. Fault

**System**

<b>IP Configuration:</b>	Determines the method used to obtain an IP address, Subnet Mask, and Gateway address. When Static is selected, the statically configured values are used. When DHCP is selected, DHCP protocols are used to obtain these values.
<b>Client ID:</b>	This option is used by DHCP clients to specify their unique identifier. DHCP servers use this value to index their database of address bindings. This value is expected to be unique for all clients in an administrative domain. The identifier may be the MAC address, switch name, or entered as a text string or hex characters. (Only shown in DHCP Mode)
<b>IP Address:</b>	Contains the current IP Address of the device.
<b>Subnet Mask:</b>	Contains the current Subnet Mask of the device.
<b>Gateway:</b>	Contains the current Gateway of the device.
<b>Fallback IP Address:</b>	Contains the configured Fallback IP Address of the device. (Only shown in DHCP Mode)
<b>Fallback Subnet Mask:</b>	Contains the configured Fallback Subnet Mask of the device. (Only shown in DHCP Mode)
<b>Fallback Gateway:</b>	Contains the configured Fallback Gateway of the device. (Only shown in DHCP Mode)
<b>MAC Address:</b>	MAC Address of the device.
<b>System Up Time:</b>	This parameter represents the total time elapsed since the switch was turned ON or RESET.
<b>Name:</b>	Contains the name assigned to the device, which allows alphanumeric and special characters '#', '_', '-', and '.' only. When IP Configuration is DHCP, then this is used as the Client ID (Option 61) of the DHCP Request.
<b>Contact:</b>	The person to contact for system issues, which should be someone within your organization. Only alphanumeric and special characters '#', '_', '-', and '.' are allowed.
<b>Location:</b>	The physical location of the switch. Only alphanumeric and special characters '#', '_', '-', and '.' are allowed.

**SNMP**

<b>SNMP Status:</b>	Indicates whether SNMP is enabled or disabled.
<b>Trap Version:</b>	This configurable field represents the version used when sending SNMP Traps. Versions 1 and 2 are allowed. The default is version 1.
<b>IP Address - Trap Stn.#1 - #5:</b>	These configurable fields represent the IP Addresses of the Management Stations to send SNMP Traps.
<b>Read-Only Community Name:</b>	This configurable field represents the Authorized Community Name for SNMP Get requests. Only alphanumeric characters are allowed. The default is "public".
<b>Read-Write Community Name:</b>	This configurable field represents the Authorized Community Name for SNMP Set requests. Only alphanumeric characters are allowed. The default is "private".
<b>Trap Community Name:</b>	This configurable field represents the Authorized Community Name for SNMP Traps. Only alphanumeric characters are allowed. The default is "public".
<b>SNMP Notification Traps:</b>	This allows for control of which SNMP traps will be sent by this switch. Each of the available traps: Power Supply, Cold Start, Authentication, Warm Start and Link Status can be enabled or disabled individually.

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<http://www.redlion.net>  
 Logged in as: admin

## DHCP

**DHCP > SERVER > SETUP** The Setup Profiles tab under the DHCP/Server category lists the following information about the current state of the server and the existing network profiles:  
**PROFILES**

**Server Enabled**

Indicates whether the DHCP server is active.

**Allow Broadcast**

Indicates whether the DHCP server will process broadcast messages.

**Delay Broadcast (Ms)**

The amount of time the DHCP server will delay processing a broadcast message.

**Server ID**

Descriptive name of the DHCP server.

**Profile Name**

Descriptive name of the network profile.

**Address Pool**

Range of IP addresses which the profile can use.

**Subnet Address**

The most restrictive subnet address calculated from the address pool range.

**Subnet Mask**

The most restrictive subnet mask calculated from the address pool range.

**Domain Name**

The domain name to be presented to the client.

**Has Profile IP Maps**

Indicates whether the profile has IP maps associated with it.

**Delete**

Deletes the profile along with all IP maps and bindings associated with it. The Default profile cannot be deleted.

### DHCP Server Setup

Server Enabled	Enabled
Allow Broadcast	Enabled
Delay Broadcast (Ms)	500
Server ID	N-TRON Switch fb:f8:f0
<input type="button" value="Modify"/>	

Network Profiles					
Profile Name	Address Pool	Subnet Address	Subnet Mask	Domain Name	Has Profile IP Maps
DEFAULT				localdomain.com	
<input type="button" value="Add Profile"/>					

### DHCP Server Configuration

Server Enabled	Enabled <input type="button" value="v"/>
Allow Broadcast	Enabled <input type="button" value="v"/>
Delay Broadcast (Ms)	<input type="text" value="500"/>
Server ID	N-Tron Switch fe:bd:e0

### DHCP Server Network Profile

Network Profile Name	<input type="text"/>
Address Pool Start	<input type="text"/>
Address Pool End	<input type="text"/>
Lease Time	<input type="text" value="28"/> Days <input type="text" value="0"/> Hours
<input type="button" value="Advanced &lt;&lt;"/>	
Broadcast Address *	<input type="text"/>
Domain Name *	<input type="text"/>
DNS Server 1 **	<input type="text"/>
DNS Server 2 **	<input type="text"/>
Gateway 1 **	<input type="text"/>
Gateway 2 **	<input type="text"/>

\* When field is left blank, the corresponding default profile value is used.  
 \*\* When both related fields are left blank, the corresponding default profile values are used.

**DHCP > SERVER > SETUP IP MAPS** The Setup IP Maps tab provides the way to create IP mappings with an existing network profile. There are three types of mappings that can be created: Dynamic Range, Static Range, and Single IP.

### DHCP Server Setup IP Maps

Network Profile	Binding Identifier	IP Map
	<input type="checkbox"/> Show Hex	
You must add a non Default Network Profile before adding an IP Map.		
<b>Select Mapping</b>		
<input type="button" value="Dynamic Range"/>	IP Address Range	
<input type="button" value="Static Range"/>	Option 82 Relay Agent	
<input type="button" value="Single IP"/>	Option 61 or MAC	
<input type="button" value="Refresh"/>		

The Dynamic Range type of mapping is used to create a range of dynamic IP addresses for requesting clients. The following information is required:

**Network Profile**

An existing network profile to which the IP map applies.

**Low IP**

The starting IP address of a range.

**High IP**

The ending IP address of a range.

The Static Range type of mapping is used to create a range of static IP addresses dedicated to specific ports on a relay agent switch. There are two different data entry formats available according to whether the relay agent type is for an N-Tron or for a generic switch.

To create a range of static IP addresses on an N-Tron relay agent switch:

**Network Profile**

An existing network profile to which the IP map applies.

**Relay Agent Type**

Should be set to N-Tron.

**Switch Model**

List of N-Tron models that support this feature.

**Remote ID**

A unique identifier that designates the N-Tron relay agent switch.

**Add**

Check box used to add an IP map for the corresponding port.

**Port No**

The actual port number.

**Port Name**

Descriptive name of the port.

**VLAN**

VLAN ID that the port is a member of.

**Circuit ID**

Auto-generated string based on the port name and VLAN ID.

**IP Address**

IP address to assign to the IP map

### DHCP Server Static Range

(Option 82)

Network Profile	prof_1
Relay Agent Type	<input checked="" type="radio"/> N-TRON <input type="radio"/> Generic
Switch Model	708TX
Remote ID	<input type="text"/> <input type="radio"/> Hex <input checked="" type="radio"/> MAC <input type="radio"/> IP <input type="radio"/> String

Add	Port No	Port Name	VLAN	Circuit ID	IP Address
<input type="checkbox"/>	1	TX1	1	TX1-0001	192.168.1.
<input type="checkbox"/>	2	TX2	1	TX2-0001	192.168.1.
<input type="checkbox"/>	3	TX3	1	TX3-0001	192.168.1.
<input type="checkbox"/>	4	TX4	1	TX4-0001	192.168.1.
<input type="checkbox"/>	5	TX5	1	TX5-0001	192.168.1.
<input type="checkbox"/>	6	TX6	1	TX6-0001	192.168.1.
<input type="checkbox"/>	7	TX7	1	TX7-0001	192.168.1.
<input type="checkbox"/>	8	TX8	1	TX8-0001	192.168.1.

To create a range of static IP addresses on a generic relay agent switch:

**Network Profile**

An existing network profile to which the IP map applies.

**Relay Agent Type**

Should be set to Generic.

**Port Count**

The number of ports on the particular relay agent switch.

**Add**

Check box used to add an IP map for the corresponding port.

**Port No**

The actual port number.

**Remote ID**

The identifier that corresponds to an Option 82 Remote ID sub-option used by the particular relay agent switch.

**Circuit ID**

The identifier that corresponds to an Option 82 Circuit ID sub-option used by the particular relay agent switch.

**IP Address**

IP address to assign to the IP map.



### DHCP Server Static Range

(Option 82)

Network Profile	prof_1		
Relay Agent Type	<input type="radio"/> N-TRON <input checked="" type="radio"/> Generic		
Port Count	8	Apply	

Add	Port No	Remote ID	Circuit ID	IP Address
<input type="checkbox"/>	1	<input type="text"/> <input checked="" type="radio"/> Hex <input type="radio"/> MAC <input type="radio"/> IP <input type="radio"/> String	<input type="text"/> <input checked="" type="radio"/> Hex <input type="radio"/> MAC <input type="radio"/> IP <input type="radio"/> String	192.168.2
<input type="checkbox"/>	2	<input type="text"/> <input checked="" type="radio"/> Hex <input type="radio"/> MAC <input type="radio"/> IP <input type="radio"/> String	<input type="text"/> <input checked="" type="radio"/> Hex <input type="radio"/> MAC <input type="radio"/> IP <input type="radio"/> String	192.168.2
<input type="checkbox"/>	3	<input type="text"/> <input checked="" type="radio"/> Hex <input type="radio"/> MAC <input type="radio"/> IP <input type="radio"/> String	<input type="text"/> <input checked="" type="radio"/> Hex <input type="radio"/> MAC <input type="radio"/> IP <input type="radio"/> String	192.168.2
<input type="checkbox"/>	4	<input type="text"/> <input checked="" type="radio"/> Hex <input type="radio"/> MAC <input type="radio"/> IP <input type="radio"/> String	<input type="text"/> <input checked="" type="radio"/> Hex <input type="radio"/> MAC <input type="radio"/> IP <input type="radio"/> String	192.168.2
<input type="checkbox"/>	5	<input type="text"/> <input checked="" type="radio"/> Hex <input type="radio"/> MAC <input type="radio"/> IP <input type="radio"/> String	<input type="text"/> <input checked="" type="radio"/> Hex <input type="radio"/> MAC <input type="radio"/> IP <input type="radio"/> String	192.168.2
<input type="checkbox"/>	6	<input type="text"/> <input checked="" type="radio"/> Hex <input type="radio"/> MAC <input type="radio"/> IP <input type="radio"/> String	<input type="text"/> <input checked="" type="radio"/> Hex <input type="radio"/> MAC <input type="radio"/> IP <input type="radio"/> String	192.168.2
<input type="checkbox"/>	7	<input type="text"/> <input checked="" type="radio"/> Hex <input type="radio"/> MAC <input type="radio"/> IP <input type="radio"/> String	<input type="text"/> <input checked="" type="radio"/> Hex <input type="radio"/> MAC <input type="radio"/> IP <input type="radio"/> String	192.168.2
<input type="checkbox"/>	8	<input type="text"/> <input checked="" type="radio"/> Hex <input type="radio"/> MAC <input type="radio"/> IP <input type="radio"/> String	<input type="text"/> <input checked="" type="radio"/> Hex <input type="radio"/> MAC <input type="radio"/> IP <input type="radio"/> String	192.168.2

The Single IP type of mapping is used to create a static IP address for an individual client. The following information is required:

**Network Profile**

An existing network profile to which the IP map applies.

**IP**

The static IP address to offer to a client.

**Unique ID**

The unique identifier that must match either the client identifier (Option 61) or the client's hardware address (MAC).

**Format**

Designates how the Unique ID is interpreted.

### DHCP Server Static IP (Option 61/MAC)

Network Profile	prof_1 ▼		
IP	<input type="text"/>		
Unique ID (i.e. - MAC)	<input type="text"/>	Format	MAC Address ▼ Hex Values MAC Address String

**DHCP > SERVER > VIEW BINDINGS** The View Bindings tab lists the bindings of physical switch's to IP addresses that are in use or offered:

**Network Profile**

The profile applied to the binding entry.

**Binding Identifier**

The client associated with the binding entry.

**Client Hardware Address (MAC)**

The client's MAC address.

**Client IP Address**

The actual IP address assigned to the binding entry.

**Status**

Indicates the current status of the binding entry.

**Release**

Removes the corresponding binding.



**Warning:** By releasing an IP address, it is possible to end up with two physical switches with the same IP address which may cause network disruption to that IP address.

### DHCP Server Binding List

Network Profile	Binding Identifier <input type="checkbox"/> Show Hex	Client Hardware Address (MAC)	Client IP Address	Status	
prof_1	Client ID (String) = N-Tron Switch fb:fa:40	00:07:af:fb:fa:40	192.168.2.100	Dynamic, In Use	<input type="button" value="Release"/>

DHCP > RELAY & LOCAL > SETUP The Setup tab under the DHCP/Relay & Local IP category shows the current state of the relay agent.

By selecting Modify, you can configure general settings of the relay agent, as well as, configure settings on a per port basis. The following describes these settings:

**Relay Status**

Indicates whether the DHCP relay agent is active.

**Remote ID**

The unique identifier that designates the relay agent switch.

**Server # IP**

The configured IP address of the DHCP servers.

**Port No**

The actual port number.

**Port Name**

The descriptive name of the port.

**Relay Status**

The selection to designate whether the port will perform relay agent functionality. The choices are:

- Disabled - The port will function without relay agent processing.
- Enabled - The port will relay DHCP client-originated broadcast packets to the DHCP servers.
- Assign Local IP - The port will not relay DHCP client-originated broadcast packets. Instead the relay agent will offer the port’s locally assigned IP address to the client.

**Other Data**

When the Relay Status is set to Enabled, the Circuit ID for the port can be specified. When the Relay Status is set to Assign Local IP, the IP address for the port can be specified.

### DHCP Relay Agent & Local IP Setup

Relay Status	Disabled ▾
Remote ID	IP Address ▾ 192.168.2.232
Server 1 IP	<input type="text"/>
Server 2 IP	<input type="text"/>
Server 3 IP	<input type="text"/>
Server 4 IP	<input type="text"/>

Port No	Port Name	Relay Status	Other Data	
01	TX1	Disabled ▾		
02	TX2	Disabled ▾		
03	TX3	Disabled ▾		
04	TX4	Disabled ▾		
05	TX5	Disabled ▾		
06	TX6	Disabled ▾		
07	TX7	Disabled ▾		
08	TX8	Disabled ▾		

**HELP > DHCP** Following the DHCP link on the help page, the user or user can see some information regarding the configuration options under the DHCP categories on the left side of the web management interface.

The screenshot shows the N-TRON web management interface. On the left is a navigation menu with categories like Administration, DHCP, LLDP, Ports, Statistics, VLAN, Bridging, RSTP, IGMP, N-View, N-Ring, N-Link, CIP, Firmware/Config, Support, Rate Limiting, User Management, Logical View, Home, Config, Help, and Logout. The main content area displays a table of configuration categories:

Administration	DHCP	LLDP	Ports
Statistics	VLAN	Bridging	RSTP
IGMP	N-View	N-Ring	N-Link
CIP	Firmware/Config	Rate Limiting	User Management
Other			

Below the table is the **DHCP - Dynamic Host Configuration Protocol** section. It states that the DHCP group is divided into two categories: 1. Server and 2. Relay & Local IP. The **Server - Setup Profiles** section includes a table with the following details:

<b>Server Enabled:</b>	Indicates whether the DHCP server is active. The default is Disabled.
<b>Allow Broadcast:</b>	Indicates whether the DHCP server will process broadcast messages. Typically, client requests are broadcast and relay agent requests are unicast. When enabled, the server will respond to broadcast requests. When disabled, the server will ignore broadcast requests. The default is Enabled.
<b>Delay Broadcast (Ms):</b>	The amount of time (in milliseconds) that the DHCP server will delay the processing of a broadcast message. This setting is used when clients and relay agents are on the same subnet and/or VLAN. A delay provides the opportunity for relay agent requests to be honored before client requests. This setting only applies when Allow Broadcast is Enabled. The range is 0-2500 and the default is 500.
<b>Server ID:</b>	Descriptive name of the DHCP server. The name must be unique. The default is the switch name.

The **Network Profiles** section explains that a network profile contains vital network configuration options for potential clients. It includes a table with the following details:

<b>Network Profile Name:</b>	Descriptive name of the network profile. The name must be unique and is required.
<b>Address Pool Start:</b>	Starting IP address of a pool of addresses for the network profile. IP addresses within the address pool can be used in any combination of dynamic and static IP assignments. There can only be one address pool per subnet; therefore, it is recommended to use the full range of addresses. For example, an address pool range of 192.168.1.1 to 192.168.1.254 will result in a subnet address of 192.168.1.0 and a subnet mask of 255.255.255.0.
<b>Address Pool End:</b>	Ending IP address of a pool of addresses for the network profile. IP addresses within the address pool can be used in any combination of dynamic and static IP assignments. There can only be one address pool per subnet; therefore, it is recommended to use the full range of addresses. For example, an address pool range of 192.168.1.1 to 192.168.1.254 will result in a subnet address of 192.168.1.0 and a subnet mask of 255.255.255.0.
<b>Subnet Address:</b>	The most restrictive subnet address calculated from the given address pool range. This field is read-only.
<b>Subnet Mask:</b>	The most restrictive subnet mask calculated from the given address pool range. This field is read-only.
<b>Lease Time:</b>	The lease time (in days and hours) that will be offered to a client. These fields are required. The range is 1 hour to 1000 days. The default is 28 days.
<b>Broadcast Address:</b>	The broadcast address to be offered to the client. Some examples are 192.168.1.255 and 255.255.255.255. The default network profile's broadcast address is used when this field is left blank.
<b>Domain Name:</b>	The domain name to be presented to the client. The default network profile's domain name is used when this field is left blank.
<b>DNS Server 1:</b>	The DNS server IP addresses to be presented to the client. The default network profile's DNS server addresses are used when both of these fields are left blank.
<b>DNS Server 2:</b>	The DNS server IP addresses to be presented to the client. The default network profile's DNS server addresses are used when both of these fields are left blank.
<b>Gateway 1:</b>	The gateway IP addresses to be presented to the client. The default network profile's gateway addresses are used when both of these fields are left blank.
<b>Gateway 2:</b>	The gateway IP addresses to be presented to the client. The default network profile's gateway addresses are used when both of these fields are left blank.

## LLDP

### LLDP > CONFIGURATION

**Mode:**

Enables or Disables LLDP on the Switch.

Default: Disabled

**Transmit Interval:**

Specifies the interval at which LLDP frames are transmitted.

Default = 30 seconds.

**Transmit Hold Multiplier:**

Specifies a multiplier on the Transmit Interval when calculating a Time-to-Live value.

Default = 4.

**Re-Initialization Delay:**

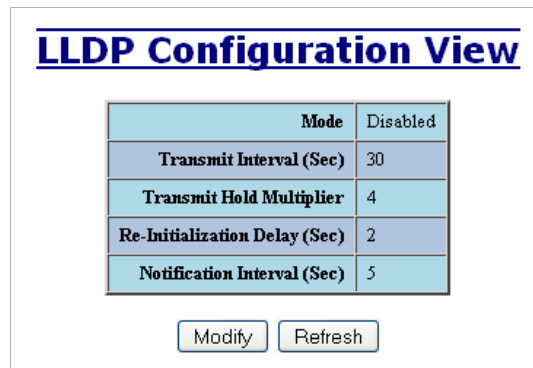
Specifies a minimum time an LLDP port will wait before re-initializing after setting the port to disable followed by setting a port to Tx-Only or Tx/Rx. This prevents excessive Notifications if someone toggles between Disabled and Enabled on LLDP Port settings.

Default = 2 Seconds.

**Notification Interval**

Specifies the interval between successive Notifications generated by the switch. If a port sends out a notification and another port tries to send out a notification, the notification will not be sent until the interval expires.

Default = 5 Seconds



**LLDP Configuration View**

Mode	Disabled
Transmit Interval (Sec)	30
Transmit Hold Multiplier	4
Re-Initialization Delay (Sec)	2
Notification Interval (Sec)	5

Modify Refresh



**Note:** A redundant network topology will have one or more blocking ports to prevent looping and broadcast storms. LLDP will not receive neighbor information into a blocked port, though the LLDP information will be transmitted out of a blocked port. Therefore, the switch that has the blocked port will not know about the neighbor on the other side of the blocked port, but the neighbor will know about the switch that has the blocked port.

**LLDP > PORTS PORTS VIEW**

**Port Name**

Descriptive name of the port on the local switch.

**Transmit**

Enables or Disables LLDP Transmission on the switch.

**Receive**

Enables or Disables Receiving of LLDP Frames from neighbor switches.

**Allow Management Data**

Allow the Transmission of Management type information. For example: IP Address of switch, Port Description, System Name and Vlan information.

**Allow Notifications**

Notifications are transmitted when local or remote data changes.

Port Name	Transmit	Receive	Allow Management Data	Allow Notification
TX1	YES	YES	YES	NO
TX2	YES	YES	YES	NO
TX3	YES	YES	YES	NO
TX4	YES	YES	YES	NO
TX5	YES	YES	YES	NO
TX6	YES	YES	YES	NO
TX7	YES	YES	YES	NO
TX8	YES	YES	YES	NO

**LLDP > STATUS LLDP PORTS NEIGHBOR VIEW**

The Status View shows the results of LLDP discovery. The LLDP Ethernet frames received from neighboring ports are composed of a collection of data units called TLVs. Each TLV contains a defined type of information such as the Chassis ID described below, which contains the MAC address of the device sending the frame. The maximum number of neighbors displayed per port is four.

**Port Name**

The name of the local port on which the neighbor information was received.

**Neighbor MAC**

MAC address of neighbor switch. Corresponds to the LLDP Chassis ID TLV.

**Neighbor IP**

IP address of neighbor switch. Corresponds to the LLDP Management Address TLV.

**Neighbor Port Description**

Description of the neighbor Port from which the LLDP frame was sent.

**Neighbor System Name**

The system's administratively assigned name on the neighbor switch.

**Neighbor VLAN PVID**

The Port VLAN identifier (PVID) associated with the neighbor port.

**Neighbor VLAN ID/Name**

A list of all VLAN's for which the neighbor port is a member.

**Neighbor TTL**

Indicates the number of seconds that the information associated with this neighbor will be valid. Time to Live (TTL).

**LLDP Ports Neighbor View**

Port Name	Neighbor MAC	Neighbor IP	Neighbor Port Description	Neighbor System Name	Neighbor Vlan PVID	Neighbor Vlan ID/Name	Neighbor TTL
TX2	00:07:af:fc:02:47	192.168.1.91	Port 7 - 10/100 Mbit TX	N-Tron Switch fc:02:40	1	0001 - Default VLAN	117
TX2	00:07:af:fb:dc:63	192.168.2.23	Port 3 - 10/100 Mbit TX	N-Tron Switch fb:dc:60	1	0001 - Default VLAN	117
TX4	00:07:af:ff:c8:e4	192.168.1.87	Port 4 - 10/100 Mbit TX	N-Tron Switch ff:c8:e0	1	0001 - Default VLAN	114
TX7	00:07:af:fc:05:07	192.168.2.27	Port 7 - 10/100 Mbit TX	N-Tron Switch fc:05:00	1	0001 - Default VLAN 3333 - N-Ring VLAN	96
TX8	00:07:af:ff:8d:e8	192.168.2.24	Port 8 - 10/100 Mbit TX	N-Tron Switch ff:8d:e0	1	0001 - Default VLAN 3333 - N-Ring VLAN	89

Refresh



**LLDP > STATISTICS LLDP LOCAL PORT STATISTICS VIEW**

**Port Name**

Descriptive name of the port on the local switch.

**Transmitted Frames**

The total number of LLDP Frames sent out from the local switch.

**Received Frames**

Total number of LLDP frames received by the local switch.

**Discarded Frames**

The total number of frames discarded due to incorrect TLV's in frame.

**Error Frames**

Total count of all LLDP frames received with one or more detectable errors.

**Neighbor Age Outs**

Total count of the times that a neighbor's information has been deleted from the switch because the Time to Live (TTL) has expired.

**LLDP Port Status**

Local Port setting (Receive-Rx/Transmit-Tx/Disable).

<b>LLDP Local Port Statistics View</b>						
<b>Port Name</b>	<b>Transmitted Frames</b>	<b>Received Frames</b>	<b>Discarded Frames</b>	<b>Error Frames</b>	<b>Neighbor Age Outs</b>	<b>LLDP Port Status</b>
TX1	0	0	0	0	0	RxTx
TX2	22	29	0	0	1	RxTx
TX3	0	0	0	0	0	RxTx
TX4	22	23	0	0	0	RxTx
TX5	0	0	0	0	0	RxTx
TX6	0	0	0	0	0	RxTx
TX7	22	46	0	0	0	RxTx
TX8	22	46	0	0	0	RxTx

**HELP > LLDP** Following the LLDP link on the help page, the user or user can see some information regarding the configuration options in the LLDP category on the left side of the web management interface.

The screenshot shows the N-Tron web management interface. On the left is a navigation menu with categories like Administration, DHCP, LLDP, Ports, Statistics, VLAN, Bridging, RSTP, IGMP, N-View, N-Ring, N-Link, CIP, Firmware/Config, Support, Rate Limiting, User Management, Logical View, Home, Config, Help, and Logout. The main content area displays the LLDP configuration page.

**LLDP - Link Layer Discovery Protocol**

LLDP is divided into four categories:  
 1. Configuration 2. Ports 3. Status 4. Statistics

**Configuration**

<b>Mode:</b>	Enables or disables LLDP on the switch. The default is Disabled.
<b>Transmit Interval:</b>	Specifies the interval at which LLDP frames are transmitted. The default is 30 seconds.
<b>Transmit Hold Multiplier:</b>	Specifies a multiplier on the Transmit Interval when calculating a Time-to-Live value. The default is 4.
<b>Re-Initialization Delay:</b>	Specifies the minimum time an LLDP port will wait before re-initializing after its setting has changed from disabled to Tx-Only or Tx/Rx. This prevents excessive notifications when LLDP Port settings are toggled. The default is 2 seconds.
<b>Notification Interval:</b>	Specifies the interval between successive notifications generated by the switch. If a port sends out a notification and another port tries to send out a notification, the subsequent notification will not be sent until the interval expires. The default is 5 seconds.

**Ports**

<b>Port Name:</b>	The descriptive name of the port.
<b>Transmit:</b>	Enables or disables LLDP transmission on the switch.
<b>Receive:</b>	Enables or disables receipt of LLDP frames from neighbor switches.
<b>Allow Management Data:</b>	Allows the transmission of management type information. Example: IP address of switch.
<b>Allow Notification:</b>	Allows a notification to be transmitted when local or remote data changes.

**Status**

The Status View shows the results of LLDP discovery. The LLDP Ethernet frames received from neighboring ports are composed of collections of data units called TLVs. Each TLV contains a defined type of information such as the Chassis ID described below, which contains the MAC address of the device sending the frame. The maximum number of neighbors displayed per port is four.

<b>Port Name:</b>	The descriptive name of the port on which the neighbor information was received.
<b>Neighbor MAC:</b>	MAC address of neighbor switch. Corresponds to the LLDP Chassis ID TLV.
<b>Neighbor IP:</b>	IP address of neighbor switch. Corresponds to the LLDP Management Address TLV.
<b>Neighbor Port Description:</b>	Description of the neighbor port from which the LLDP frame was sent.
<b>Neighbor System Name:</b>	The system's administratively assigned name on the neighbor switch.
<b>Neighbor VLAN PVID:</b>	The Port VLAN identifier (PVID) associated with the neighbor port.
<b>Neighbor VLAN ID/Name:</b>	A list of all VLANs for which the neighbor port is a member.
<b>Neighbor TTL:</b>	Indicates the number of seconds that the information associated with this neighbor will be valid. Time to Live (TTL)

**Statistics**

LLDP Local Port Statistics View

<b>Port Name:</b>	The descriptive name of the port.
<b>Transmitted Frames:</b>	The total number of LLDP frames sent out from the local switch.
<b>Received Frames:</b>	Total number of LLDP frames received by the local switch
<b>Discarded Frames:</b>	The total number of frames discarded due to incorrect TLVs in frame.
<b>Error Frames:</b>	Total count of all LLDP frames received with one or more detectable errors.

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## PORTS

**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**

This is the port index.

### **Port Name**

This field displays the name of the port. The designation of TX is for copper ports and FX is for fiber optic ports. GB is for the Gigabit ports (fiber or copper).

### **Admin Status**

This configurable field displays the existing status of the port whether it is **Enabled/Disabled**.

### **Link Status**

Current Link state of the port.

### **Auto Negotiation State**

This configurable field displays the current auto-negotiation state whether it is **Enabled/Disable**.

### **Port Speed**

This configurable field displays the speed of each 700 model port **10/100** Mbps and 7000 model port **10/100/1000** Mbps.

### **Duplex Mode**

This configurable field displays the existing mode of the port whether it is **Full Duplex/Half Duplex**.

### **Crossover Mode (7018 models only)**

This configurable field displays the existing crossover mode of the port. This can be Yes, No, or Auto. Auto is the default.

### **Flow Control State**

This configurable field displays the existing flow control status of each port. When enabled, the individual port supports half-duplex back pressure and full-duplex flow control. The default is **Disabled**.

### **Force High Priority State (700 models only)**

This configurable field displays the port priority status of each port. When enabled for a port all frames received on that port will be forced to the highest priority queue regardless of 'Default Priority' setting or priority tags within the received frames. The default is **Disabled**. In an untagged N-Ring configuration, the N-Ring ports on the N-Ring Manager and active N-Ring Members will be **Enabled**.

### **Default Priority (700 models only)**

This configurable field displays the default QoS priority for the port when an untagged frame is received. The range is **0-7**.

### **RSTP State**

The current RSTP status of a port. It may contain **Disable/Discarding/Learning/Forwarding**.

**PVID**

This configurable field displays the existing port VLAN ID setting. The allowable range is **1-4094**.

**Usage Alarm Low (%)**

The bandwidth utilization percentage below which a fault will be triggered if enabled. For half duplex the bandwidth utilization percentage is the sum of both RX and TX bandwidth utilization, and for full duplex this is the higher of TX or RX bandwidth utilization. See Port Utilization View and Port Usage Fault on Fault Configuration View.

**Usage Alarm High (%)**

The bandwidth utilization percentage above which a fault will be triggered if enabled. For half duplex the bandwidth utilization percentage is the sum of both RX and TX bandwidth utilization, and for full duplex this is the higher of TX or RX bandwidth utilization. See Port Utilization View and Port Usage Fault on Fault Configuration View.

**Port Configuration View**

Port No	Port Name	Admin Status	Link Status	Auto Nego	Port Speed	Duplex Mode	Cross Over	Flow Control	Port State	PVID	Usage Alarm Low [%]	Usage Alarm High [%]
01	TX1	Enabled	Down	Enabled	Auto	Auto	Auto	Disabled	Disabled	1	0	100
02	TX2	Enabled	Down	Enabled	Auto	Auto	Auto	Disabled	Disabled	1	0	100
03	TX3	Enabled	Down	Enabled	Auto	Auto	Auto	Disabled	Disabled	1	0	100
04	TX4	Enabled	Down	Enabled	Auto	Auto	Auto	Disabled	Disabled	1	0	100
05	TX5	Enabled	Down	Enabled	Auto	Auto	Auto	Disabled	Disabled	1	0	100
06	TX6	Enabled	Up	Enabled	100	Full	Auto	Disabled	Forwarding	1	0	100
07	TX7	Enabled	Down	Enabled	Auto	Auto	Auto	Disabled	Disabled	1	0	100
08	TX8	Enabled	Down	Enabled	Auto	Auto	Auto	Disabled	Disabled	1	0	100

Refresh

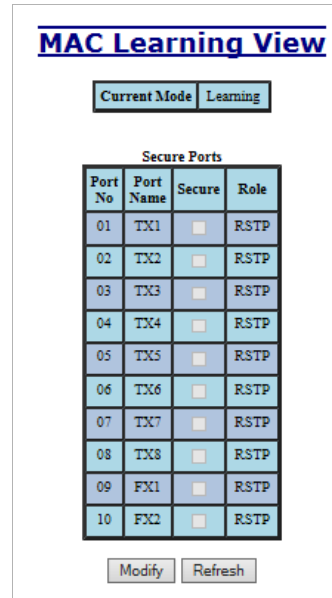
The user can click on the Port Number to configure each port individually. This allows the user to change the port's settings for the following fields which are explained above:

- Admin Status
- Speed and Duplex
- Cross Over
- Flow Control
- PVID
- Usage Alarm Low
- Usage Alarm High

**TX1 - Port Configuration**

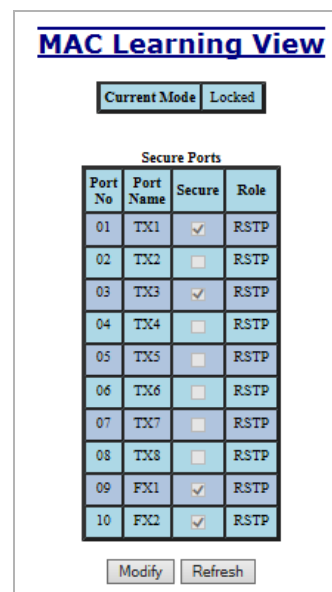
Port Name	TX1
Admin Status	Enabled
Speed And Duplex	Auto-Negotiate
Cross Over	10/Half 10/Full 100/Half 100/Full
Flow Control	100/Full
PVID	1
Usage Alarm Low [%]	0
Usage Alarm High [%]	100

**PORTS > MAC SECURITY > LEARNING** The Learning tab allows the user to control the learning or locking modes for the ports. 'Locked' is the secure mode. 'Learning' builds an internal list of authorized MAC addresses based on an approved LAN. When the current mode is 'Learning', no ports are secured.



In 'Locked' mode, 'Secured Ports' shows the ports that are presently secured.

**Note:** When N-Ring and/or N-Link are used, the N-Ring/N-Link ports will not have MAC Security enabled.



The Modify button allows the user to change the current mode and select the ports to be secured. When transitioning from 'Learning' to 'Locked', the Address Resolution Logic (ARL) table represents the authorized MAC addresses, with the addition of any manually entered addresses (refer to Authorization List section below). Transitioning from 'Locked' to 'Learning', clears the ARL for all ports.

### MAC Learning Configuration

Current Mode Learning  
Locked

Secure Ports

Port No	Port Name	Secure	Role
01	TX1	<input type="checkbox"/>	RSTP
02	TX2	<input type="checkbox"/>	RSTP
03	TX3	<input type="checkbox"/>	RSTP
04	TX4	<input type="checkbox"/>	RSTP
05	TX5	<input type="checkbox"/>	RSTP
06	TX6	<input type="checkbox"/>	RSTP
07	TX7	<input type="checkbox"/>	RSTP
08	TX8	<input type="checkbox"/>	RSTP
09	FX1	<input type="checkbox"/>	RSTP
10	FX2	<input type="checkbox"/>	RSTP

Update
Cancel

**PORTS > MAC SECURITY > AUTHORIZATION LIST** The Authorization List tab allows for manual entry or deletion of authorized MAC source addresses with associated authorized ports.

### MAC Authorization View

Entry	MAC Address	Type	Ports
1	00:07:af:ab:e0:d1	M	TX3-TX4
2	00:07:af:fb:e0:d0	M	TX1-TX2, TX6

Modify
Refresh

Selecting Modify displays the MAC Authorization Configuration page, which allows the user to add new entries, delete existing entries, or edit authorized ports of existing entries.

### MAC Authorization Configuration

Entry	MAC Address	Ports	Delete
1	00:07:af:ab:e0:d1	TX3-TX4	<span style="border: 1px solid gray; padding: 2px 5px;">Delete</span>
2	00:07:af:fb:e0:d0	TX1-TX2, TX6	<span style="border: 1px solid gray; padding: 2px 5px;">Delete</span>

Add
Done
Refresh

Selecting Delete removes the associated entry. Selecting Add displays the MAC Authorization Entry page, showing default values for the user to modify (see below). When an entry number hyperlink is selected, this same page is displayed except it shows the associated MAC address and authorized ports.

**PORTS > MAC SECURITY > INTRUDER LOG** The Intruder Log tab displays a list of unauthorized MAC addresses that attempted to access the secured switch. Each intruder entry in the log is unique, and is based on the combination of MAC address, VLAN, and port. Only the first occurrence of the intruder is listed. The log is ordered by most recent first, based on the system time. The maximum number of entries is 100. If more than 100 intruders are detected, the oldest entries are deleted. The log is not saved through a power cycle.

### Intruder Log

Entry	Mac Address	VLAN	Port	System Time	
1	00:00:00:00:03:01	7	TX7	0 days, 0 hours, 0 mins, 7 secs	Delete
2	00:00:00:00:02:01	8	TX8	0 days, 0 hours, 0 mins, 7 secs	Delete
3	00:00:00:00:01:01	1	TX1	0 days, 0 hours, 0 mins, 7 secs	Delete

Clear ALL ▾ Refresh

ALL  
 TX1  
 TX2  
 TX3  
 TX4  
 TX5  
 TX6  
 TX7  
 TX8

An entry can be individually removed from the log by selecting the associated Delete button. All entries or entries specific to a port can also be removed from the log by choosing the option in the dropdown list and then selecting the Clear button.

**PORTS > MIRRORING** The mirroring destination port retransmits (mirrors) frames transmitted by or received by the configured source ports.

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	Disabled
Destination Port	TX1
Mirrored Data Only	<input type="checkbox"/>

Source Ports

Port No	Port Name	Tx	Rx
01	TX1	<input type="checkbox"/>	<input type="checkbox"/>
02	TX2	<input type="checkbox"/>	<input type="checkbox"/>
03	TX3	<input type="checkbox"/>	<input type="checkbox"/>
04	TX4	<input type="checkbox"/>	<input type="checkbox"/>
05	TX5	<input type="checkbox"/>	<input type="checkbox"/>
06	TX6	<input type="checkbox"/>	<input type="checkbox"/>
07	TX7	<input type="checkbox"/>	<input type="checkbox"/>
08	TX8	<input type="checkbox"/>	<input type="checkbox"/>

Modify Refresh

By selecting Modify, you can enable the status of port mirroring and select source ports and the destination port that the source ports will be mirrored to. The number and type of destination ports displayed depends on the 700/7000 model in use.

### Port Mirroring Configuration

<b>Mirror Status</b>	Disabled ▾
<b>Destination Port</b>	TX1
<b>Mirrored Data Only</b>	<input type="checkbox"/>

Source Port		Tx	Rx
Port No	Port Name	<input type="checkbox"/>	<input type="checkbox"/>
	ALL	<input type="checkbox"/>	<input type="checkbox"/>
01	TX1	<input type="checkbox"/>	<input type="checkbox"/>
02	TX2	<input type="checkbox"/>	<input type="checkbox"/>
03	TX3	<input type="checkbox"/>	<input type="checkbox"/>
04	TX4	<input type="checkbox"/>	<input type="checkbox"/>
05	TX5	<input type="checkbox"/>	<input type="checkbox"/>
06	TX6	<input type="checkbox"/>	<input type="checkbox"/>
07	TX7	<input type="checkbox"/>	<input type="checkbox"/>
08	TX8	<input type="checkbox"/>	<input type="checkbox"/>

**PORTS > TRUNKING** The Trunking tab under the Ports category displays the following details:

**Trunk Ports**

This field displays the ports associated with the trunk.

**Trunk Status**

This configurable field displays the existing status of the trunk. It can be either Enabled/Disabled.

### Port Trunking Configuration View

Trunk Ports	Trunk Status
FX1-FX2	Disabled

By selecting Modify, you can select a trunk group.

### Port Trunking Configuration

Trunk Ports	Trunk Status
TX3-TX4 FX1-FX2 GB1-GB2	Disabled ▾





**Note:** RSTP must be disabled in order to use the Trunking feature.  
Two 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.

Do not use Trunking on an N-Ring manager. Do not connect the N-Ring to actively Trunking ports on an Auto Member.

**PORTS > QOS** The QOS algorithm prioritizes traffic into a Transmit Queue (TA) based on a priority assigned to all frames received on a port or fields found in the frames received by the switch. These mechanisms are:

**DSCP (RFC 2472 DSCP TOS)**

**802.1p (IEEE 802.1p COS)**

**Port Priority**

The QOS tab under the Ports category displays the following details:

**Port No (Number)**

This is the port index.

**Port Name**

This field displays the name of the port.

**Include DSCP**

This field displays the status of whether or not to include the RFC 2474 DSCP TOS (Type of Service) in the TQ assignment. When enabled, the DSCP TOS is included when evaluating traffic priority.

**Include 802.1p**

This field displays the status of whether or not to include the IEEE 802.1p COS (Class of Service) in the TQ assignment. When enabled, the IEEE 802.1p COS is included when evaluating traffic priority.

**Force High Priority**

This field displays the Force High Priority status. When enabled, the port based priority is included in the TQ assignment for all ports and all frames received on a port will use the default QOS priority for that port in the TQ assignment.

**Port Priority**

This field displays the default QOS priority for that port. This is the IEEE 802.1p COS (Class of Service) assigned to all untagged ingress frames, or all ingress frames if Force High Priority is enabled. The range is 0-7.

### QOS Configuration View

Port No	Port Name	Include DSCP	Include 802.1p	Force High Priority	Port Priority
1	TX1	Enabled	Enabled	Disabled	1
2	TX2	Enabled	Enabled	Disabled	1
3	TX3	Enabled	Enabled	Disabled	1
4	TX4	Enabled	Enabled	Disabled	1
5	TX5	Enabled	Enabled	Disabled	1
6	TX6	Enabled	Enabled	Disabled	1
7	TX7	Enabled	Enabled	Disabled	1
8	TX8	Enabled	Enabled	Disabled	1
9	FX1	Enabled	Enabled	Disabled	1
10	FX2	Enabled	Enabled	Disabled	1
11	GB1	Enabled	Enabled	Disabled	1
12	GB2	Enabled	Enabled	Disabled	1

By selecting Modify, the user can configure the ports for different QOS functionality. Once these fields are filled in to meet the needs of the user's network, the changes may be updated by clicking the Update button at the bottom of the page.

### Modify QOS Configuration

Port No	Port Name	Include DSCP	Include 802.1p	Force High Priority	Port Priority
1	TX1	Enabled ▾	Enabled ▾	Disabled ▾	1 ▾
2	TX2	Enabled ▾	Enabled ▾	Disabled ▾	1 ▾
3	TX3	Enabled ▾	Enabled ▾	Disabled ▾	1 ▾
4	TX4	Enabled ▾	Enabled ▾	Disabled ▾	1 ▾
5	TX5	Enabled ▾	Enabled ▾	Disabled ▾	1 ▾
6	TX6	Enabled ▾	Enabled ▾	Disabled ▾	1 ▾
7	TX7	Enabled ▾	Enabled ▾	Disabled ▾	1 ▾
8	TX8	Enabled ▾	Enabled ▾	Disabled ▾	1 ▾
9	FX1	Enabled ▾	Enabled ▾	Disabled ▾	1 ▾
10	FX2	Enabled ▾	Enabled ▾	Disabled ▾	1 ▾
11	GB1	Enabled ▾	Enabled ▾	Disabled ▾	1 ▾
12	GB2	Enabled ▾	Enabled ▾	Disabled ▾	1 ▾

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

The screenshot shows the N-Tron web management interface. On the left is a navigation menu with categories like Administration, DHCP, LLDP, Ports, Statistics, VLAN, Bridging, RSTP, IGMP, N-View, N-Ring, N-Link, CIP, Firmware/Config, Support, Rate Limiting, User Management, Logical View, Home, Config, Help, and Logout. The main content area displays a table of configuration options:

Administration	DHCP	LLDP	Ports
Statistics	VLAN	Bridging	RSTP
IGMP	N-View	N-Ring	N-Link
CIP	Firmware/Config	Rate Limiting	User Management
Other			

Below the table, the 'Ports' section is detailed:

**Ports**

Ports group is divided into five categories:  
1. Configuration 2. MAC Security 3. Mirroring 4. Trunking 5. QOS

**Configuration**

<b>Port No:</b>	The number of the port.
<b>Port Name:</b>	The descriptive name of the port.
<b>Admin Status:</b>	This configurable field displays the existing status of the port whether it is Enabled/Disabled.
<b>Link Status:</b>	Current link state.
<b>Auto Nego:</b>	This configurable field displays the current auto-negotiation state whether it is Enabled/Disabled.
<b>Port Speed:</b>	This configurable field displays the speed of each port 10/100 Mbps.
<b>Duplex Mode:</b>	This configurable field displays the existing mode of the port whether it is Full Duplex/Half Duplex.
<b>Cross Over:</b>	This configurable field displays the existing crossover mode of the port.
<b>Flow Control:</b>	This configurable field displays the existing flow control status of each port. When enabled, the individual port supports half-duplex back pressure and full-duplex flow control. The default is Disabled.
<b>Port State:</b>	The current status of a port. It may contain: Disabled, Discarding, Learning, Forwarding, and Blocking.
<b>PVID:</b>	This configurable field displays the existing port VLAN ID setting. This is the VLAN ID assigned to ingress untagged frames, or all ingress frames if "Replace VID with Default Port VID" is enabled. The allowable range is 1-4094.
<b>Usage Alarm Low [%]:</b>	The bandwidth utilization percentage below which a fault will be triggered if enabled. For half duplex the bandwidth utilization percentage is the sum of both RX and TX bandwidth utilization, and for full duplex this is the higher of TX or RX bandwidth utilization. See Port Utilization View and Port Usage Fault on Fault Configuration View.
<b>Usage Alarm High [%]:</b>	The bandwidth utilization percentage above which a fault will be triggered if enabled. For half duplex the bandwidth utilization percentage is the sum of both RX and TX bandwidth utilization, and for full duplex this is the higher of TX or RX bandwidth utilization. See Port Utilization View and Port Usage Fault on Fault Configuration View.

Clicking the hyperlink of each port allows configuration. Refresh button shows updated values (if any) through any other interfaces.

**MAC Security**

The MAC Security group is divided into three categories:  
1. Learning 2. Authorization List 3. Intruder Log

**Learning Parameters**

<b>Current Mode:</b>	This configurable field displays the current mode of MAC Security: Learning or Locked. Transitioning from locked to learning clears the Address Resolution Logic (ARL) table on all ports. When transitioning from learning to locked, the ARL represents the authorized MAC addresses by port and VLAN, with the addition of the manually entered list (below), if any.
<b>Secured Ports:</b>	The ports that are secured at present.

**Authorization List Parameters**

<b>Entry:</b>	The entry number.
<b>MAC Address:</b>	These are the manually entered authorized host MAC addresses. The limit of the total authorized entries, including learned and manually entered, is 4000 entries

## STATISTICS

**STATISTICS > PORTS > 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 the 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.

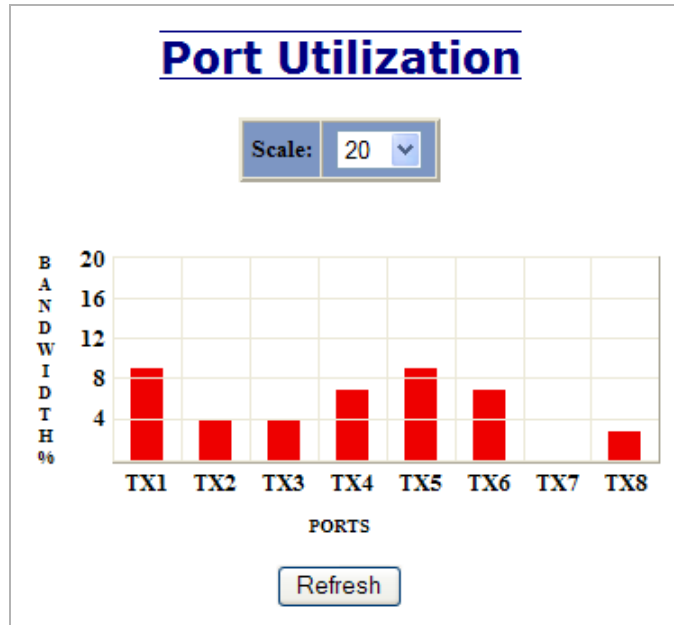
### Port Statistics

Port TX8 ▼

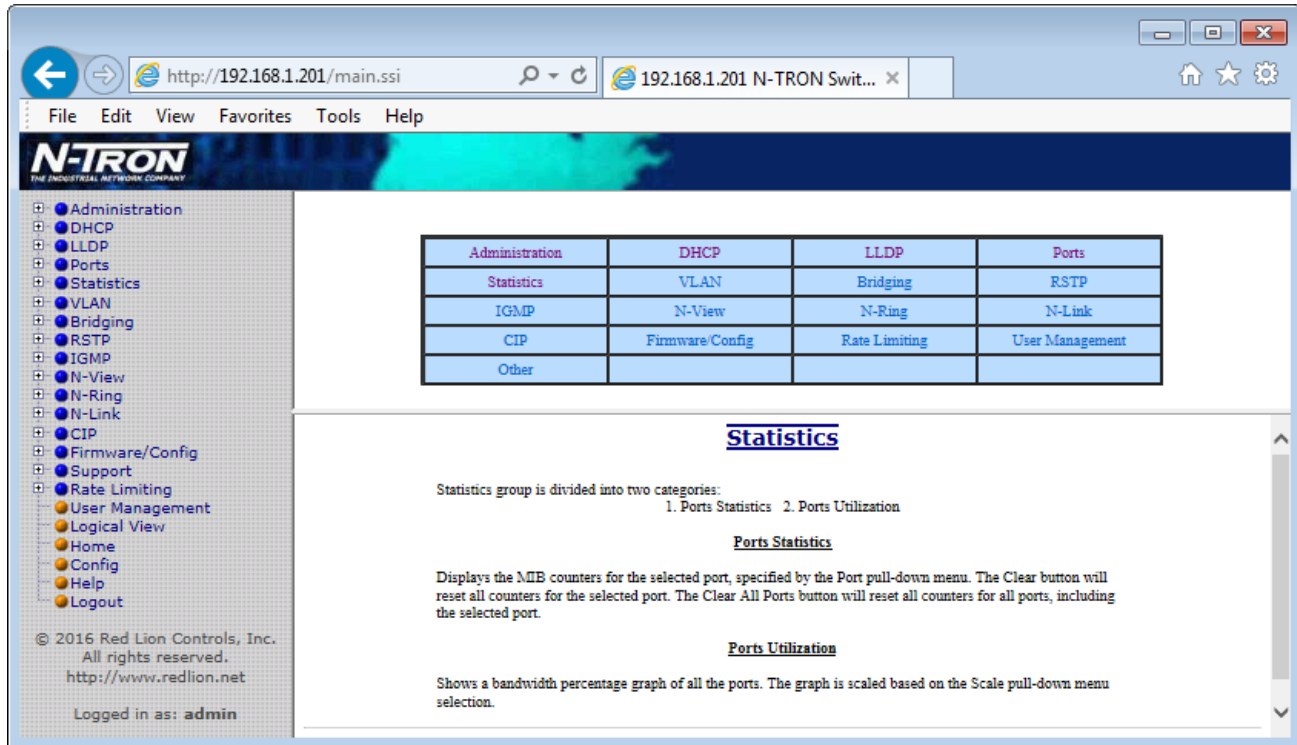
Statistics For Port TX8

S.No	Counter Type	Value
1	Tx Octets	0
2	Tx Dropped Packets	0
3	Tx Broadcast Packets	0
4	Tx Multicast Packets	0
5	Tx Unicast Packets	0
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	Rx 64 Packets	0
15	Rx 65 to 127 Packets	0
16	Rx 128 to 255 Packets	0
17	Rx 256 to 511 Packets	0
18	Rx 512 to 1023 Packets	0
19	Rx 1024 to 1522 Packets	0
20	Rx Octets	0
21	Rx Dropped Packets	0
22	Rx Broadcast Packets	0
23	Rx Multicast Packets	0
24	Rx Unicast Packets	0
25	Rx Undersize Packets	0
26	Rx Oversize Packets	0
27	Rx Jabbers	0
28	Rx Alignment Errors	0
29	Rx Good Octets	0
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

**STATISTICS > PORTS > UTILIZATION** Ports Utilization shows all the ports on the switch and will display a bar graph showing the approximate percentage of bandwidth being used. The available Scale options are: 5, 10, 20, 50 or 100. Red Lion recommends the use of N-View in order to get a precise bandwidth usage figure.



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



## VLAN

### VLAN > CONFIGURATION

#### Replace VID Tag with Default Port VID

Specifies whether or not to replace the ingress frames' VID tag with the port's designated VID (PVID).

#### Perform Ingress Filtering

Specifies whether or not to filter out ingress frames when a VID violation is detected.

#### Discard Non-Tagged for Ports

Specifies whether or not non-tagged ingress frames are dropped by the selected ports.

### VLAN Configuration View

Replace VID With Default Port VID	<input type="checkbox"/>
Perform Ingress Filtering	<input type="checkbox"/>
Discard Non-Tagged For Ports	(None)
Remove Ports From Default VLAN When Added To Other VLANs	<input checked="" type="checkbox"/>

VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt
0001	Default VLAN	TX1-TX8	TX1-TX8	<input checked="" type="checkbox"/>

For convenience:

- Ports are deleted from VLAN1 as each port is added to another group.
- Ports are added to VLAN1 if a deletion leaves a port with no group.
- If it is desired to have a port in VLAN1 and also in other VLANs configure group1 last to achieve that.



**Note:** RSTP on overlapping VLANs is not supported and the system will automatically disable RSTP on all but the lowest VID VLANs that have overlapping ports.

### VLAN Configuration

Replace VID Tag With Default Port VID	<input type="checkbox"/>
Perform Ingress Filtering	<input type="checkbox"/>
Discard Non-Tagged For Ports	<input type="checkbox"/> TX1 <input type="checkbox"/> TX2 <input type="checkbox"/> TX3 <input type="checkbox"/> TX4 <input type="checkbox"/> TX5 <input type="checkbox"/> TX6 <input type="checkbox"/> TX7 <input type="checkbox"/> TX8
	<input type="button" value="Select All"/> <input type="button" value="Select None"/>
Remove Ports From Default VLAN When Added To Other VLANs	<input checked="" type="checkbox"/>
<input type="button" value="Update"/> <input type="button" value="Cancel"/>	

VLAN Groups					
VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt	Delete
0001	Default VLAN	TX1-TX8	TX1-TX8	<input checked="" type="checkbox"/>	
<input type="button" value="Add"/>					

**VLAN > GROUP  
 CONFIGURATION**

**ID**

This field displays the VLAN ID. The range is **1-4094**.

**Name**

This configurable field displays the name of the VLAN, which accepts alphanumeric and special characters (#, \_, -, .) only.

**Allow Management**

Specifies whether or not all ports in this VLAN are management ports.

**Change PVID of Member Ports**

Specifies whether or not the PVID of the member ports is set to this VLAN ID.

**Port No**

This is the port index.

**Port Name**

Descriptive name of the port

**Group Member**

Specifies whether or not the port is included in the group.

**Untag on Egress**

Specifies whether or not egress frames are tagged by the designated port.



### Tagged VLAN Group Configuration

ID	<input type="text"/>
Name	<input type="text"/>
Allow Management	<input checked="" type="checkbox"/>
Change PVID Of Member Ports	<input checked="" type="checkbox"/>

**Group Ports**

Port No	Port Name	Group Member	Untag On Egress
01	TX1	<input type="checkbox"/>	<input type="checkbox"/>
02	TX2	<input type="checkbox"/>	<input type="checkbox"/>
03	TX3	<input type="checkbox"/>	<input type="checkbox"/>
04	TX4	<input type="checkbox"/>	<input type="checkbox"/>
05	TX5	<input type="checkbox"/>	<input type="checkbox"/>
06	TX6	<input type="checkbox"/>	<input type="checkbox"/>
07	TX7	<input type="checkbox"/>	<input type="checkbox"/>
08	TX8	<input type="checkbox"/>	<input type="checkbox"/>
09	FX1	<input type="checkbox"/>	<input type="checkbox"/>
10	FX2	<input type="checkbox"/>	<input type="checkbox"/>
11	GB1	<input type="checkbox"/>	<input type="checkbox"/>
12	GB2	<input type="checkbox"/>	<input type="checkbox"/>

**HELP > VLAN** Following the VLAN link on the help page, the user or user can see some information regarding the configuration options in the VLAN category on the left side of the web management interface.

The screenshot shows the N-Tron web management interface. The browser address bar displays `http://192.168.1.201/main.ssi`. The left sidebar contains a navigation menu with the following items: Administration, DHCP, LLDP, Ports, Statistics, VLAN, Bridging, RSTP, IGMP, N-View, N-Ring, N-Link, CIP, Firmware/Config, Support, Rate Limiting, User Management, Logical View, Home, Config, Help, and Logout. The main content area features a table of configuration options:

Administration	DHCP	LLDP	Ports
Statistics	VLAN	Bridging	RSTP
IGMP	N-View	N-Ring	N-Link
CIP	Firmware Config	Rate Limiting	User Management
Other			

Below this table is the **VLAN - Virtual Local Area Network** section, which is divided into two sub-sections:

**Configuration**

<b>Replace VID with Default Port VID:</b>	Specifies whether or not to replace the incoming VID tag with the port's designated VID.
<b>Perform Ingress Filtering:</b>	Specifies whether or not to filter out ingress frames when a VID violation is detected.
<b>Discard Non-Tagged for Ports:</b>	Specifies whether or not non-tagged ingress frames are dropped by the selected ports.
<b>Remove Ports From Default VLAN When Added To Other VLANs:</b>	Specifies whether or not to remove ports from Default VLAN when they are added to another VLAN.

**Group Configuration**

<b>VLAN ID:</b>	This field displays the VLAN ID. The range should be 1-4094.
<b>VLAN Name:</b>	This configurable field displays the name of the VLAN, which accepts alphanumeric and special characters '#', '_', '-', and '.' only.
<b>Allow Management:</b>	Specifies whether or not all ports in this VLAN are management ports.
<b>Change PVID of Member Ports:</b>	Specifies whether or not the PVID of the member ports is set to this VLAN ID.
<b>Port No:</b>	The number of the port.
<b>Port Name:</b>	The descriptive name of the port.
<b>Group Member:</b>	Specifies whether or not the port is included in the group.
<b>Untag on Egress:</b>	Specifies whether or not egress frames are tagged by the designated port.

At the bottom left of the interface, the copyright information reads: © 2016 Red Lion Controls, Inc. All rights reserved. <http://www.redlion.net>. The user is logged in as `admin`.

## BRIDGING

**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.

After selecting Modify, the user will be presented with a page that allows the number to be entered and updated. The default aging time is 20 seconds.



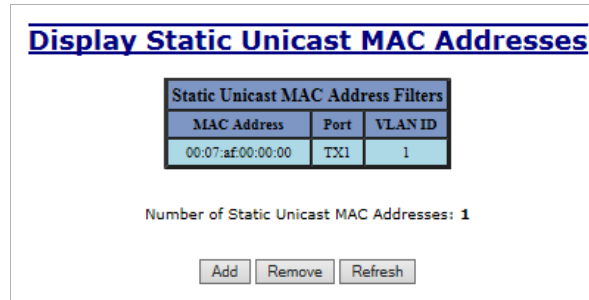
**Note:** If the switch is an active participant of an N-Ring, then the N-Ring Aging Time will be used instead of the Bridging Aging Time.

**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.

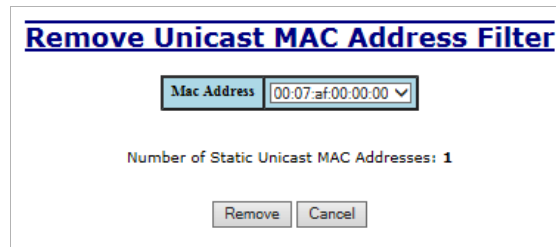
MAC Address	Port	VLAN ID

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

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

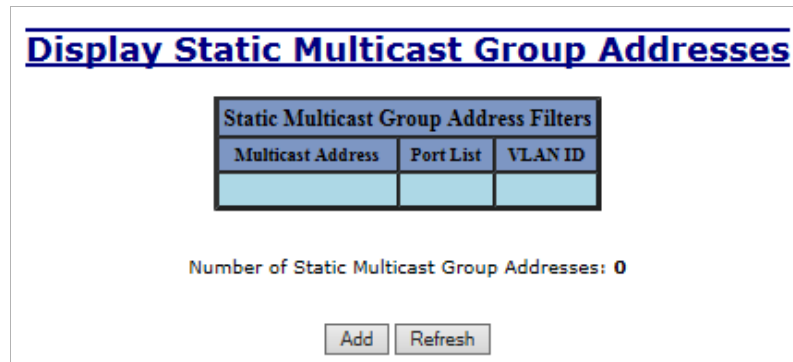


Following the Remove button on the example above, an user can select a static MAC address from the list using a pull-down menu. After selecting the MAC address, the user needs to press the Remove button on the page to remove the entry.



**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.



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

### Add Multicast Group Address Filter

Multicast Address	<input type="text" value="01:07:AF:00:00:00"/>
Port List	<input checked="" type="checkbox"/> TX1 <input checked="" type="checkbox"/> TX2 <input checked="" type="checkbox"/> TX3 <input checked="" type="checkbox"/> TX4 <input type="checkbox"/> TX5 <input type="checkbox"/> TX6 <input type="checkbox"/> TX7 <input type="checkbox"/> TX8 <input type="button" value="Select All"/> <input type="button" value="Select None"/>
VLAN ID	<input type="text" value="1"/>



**Note:** If there are multiple ports on different VLANs, the switch 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.

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 Addresses

Static Multicast Group Address Filters		
Multicast Address	Port List	VLAN ID
01:07:af:00:00:00	TX1-TX4	1

Number of Static Multicast Group Addresses: **1**

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

### Remove Multicast Group Address Filter

Mac Address	<input type="text" value="01:07:af:00:00:00"/> ▼
-------------	--

Number of Static Multicast Group Addresses: **1**



**Note:** If there are multiple ports on different VLANs, the switch 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 > SHOW MAC BY PORT**

This feature shows the MAC addresses of devices connected to each switch port and the IP Addresses associated with the MACs. The browser page 'View MAC by Port' shows the MAC for the device found on each port, and the IP for the MAC presented if available. If more than one device is on that port, then the lowest alphanumeric of those MAC addresses is shown and underlined.

## View MAC By Port

Active IP Probe Disabled  
Modify

MACs By Port				
Port No	Port Name	MAC Address	IP	Manual Entry
01	TX1	00:07:af:00:00:00	192.168.1.209	<span style="border: 1px solid black; padding: 2px 5px;">Delete IP</span>
02	TX2			
03	TX3			
04	TX4			
05	TX5			
06	TX6			
07	TX7			
08	TX8	34:e6:d7:14:20:ba	192.168.1.214	
09	FX1			
10	FX2			
11	GB1			
12	GB2			

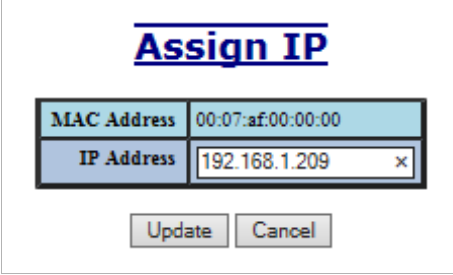
Refresh

The 'Active IP Probe' field is configurable using the 'Modify' button, and also displays the existing Enabled or Disabled status of this feature. The default is disabled. When disabled the switch generates no Ethernet traffic for this purpose, but can still present some information gathered passively.

The 'IP' field shows an Auto-detected or manually entered IP address. If there is a MAC address for the port and an IP address was not discovered there is an 'Assign IP' button to allow the user to enter an IP address. If 'Active IP Probe' is enabled, manually entered IP values are underlined and validated. A validated IP for that MAC is presented in green and if validation fails the IP will be red and underlined.

**Note:** Some devices do not have an IP Address, and that some devices that do have an IP Address may not respond to the methods used to detect their IP Address.

Invoking the 'Assign IP' button on the example above, the user will be presented with a form in which to enter a manually assigned IP, as below:



The image shows a dialog box titled "Assign IP" with a blue header. It contains two input fields: "MAC Address" with the value "00:07:af:00:00:00" and "IP Address" with the value "192.168.1.209" and a clear button (x). Below the fields are two buttons: "Update" and "Cancel".

<u>Assign IP</u>	
MAC Address	00:07:af:00:00:00
IP Address	192.168.1.209 x
<input type="button" value="Update"/> <input type="button" value="Cancel"/>	

When an IP has been manually entered a button is provided to 'Delete IP', and invoking it will allow the user to delete the manual association of an IP to that MAC.

**HELP > BRIDGING** Following the Bridging link on the help page, the user or user can see some information regarding the configuration options in the Bridging category on the left side of the web management interface.

The screenshot shows the N-Tron web management interface. The browser address bar displays `http://192.168.1.201/main.ssi`. The left sidebar contains a navigation menu with the following items: Administration, DHCP, LLDP, Ports, Statistics, VLAN, Bridging (selected), RSTP, IGMP, N-View, N-Ring, N-Link, CIP, Firmware/Config, Support, Rate Limiting, User Management, Logical View, Home, Config, Help, and Logout. The main content area features a table of configuration categories:

Administration	DHCP	LLDP	Ports
Statistics	VLAN	Bridging	RSTP
IGMP	N-View	N-Ring	N-Link
CIP	Firmware/Config	Rate Limiting	User Management
Other			

The **Bridging** section is expanded, showing the following information:

**Bridging group** is divided into four categories:  
 1. Aging Time 2. Unicast Addresses 3. Multicast Addresses 4. Show MAC by Port

**Aging Time**  
 This configurable field displays the aging time for dynamically learned MAC addresses. The inactive members will be removed from the Hardware Address Entry Table after this time period. The aging time range should be 5-100000 seconds. The default aging time is 20 seconds.

**Unicast Addresses**  
 This page shows the existing static Unicast MAC Addresses

<b>MAC Address:</b>	The static MAC address to be configured to the device.
<b>Port:</b>	Port which the static Unicast MAC address is to be configured.
<b>VLAN ID:</b>	VLAN in which the MAC address is assigned. The range is 1-4094.

**Multicast Addresses**  
 This page shows the existing static Multicast Group Addresses

<b>Multicast Address:</b>	The static Multicast group address to be configured to the device.
<b>Port List:</b>	List of ports associated with this Multicast group address.
<b>VLAN ID:</b>	VLAN in which the Multicast group address is assigned. The range is 1-4094.

**Show MAC by Port**  
 This feature shows the MAC address of a device connected to each switch port and the IP Address associated with that MAC.

<b>Active IP Probe:</b>	This field is configurable using the Modify button, and also displays the existing Enabled or Disabled status of this feature. The default is Disabled. When disabled the switch generates no Ethernet traffic, but can still present some information gathered passively.
<b>Port No:</b>	The number of the port.
<b>Port Name:</b>	The descriptive name of the port.
<b>MAC Address:</b>	The MAC Address of the device on that port. If more than one device is on that port, then the lowest alphanumeric of those MAC addresses is shown and underlined. Note that the lowest MAC known at a port is not necessarily the nearest neighbor.
<b>IP:</b>	Auto-detected or manually entered IP address. If the feature is enabled, manually entered IP values are underlined and validated. A validated IP for that MAC will be presented in green and if validation fails (or the feature is disabled) the IP will be red and underlined. Note that some devices do not have an IP Address, and that some devices that do have an IP Address may not respond to the methods used to detect their IP Address.
<b>Manual Entry:</b>	When there is a MAC address for the port, and an IP was not dynamically determined, a button is provided here to "Assign IP" manually. When an IP has been manually entered a button is provided here to "Delete IP", and invoking it will delete the manual association of an IP to that MAC.

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## RSTP

**RSTP > CONFIGURATION** The 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 user can choose which VLAN to configure RSTP on. Once the VLAN is selected, the user may configure the bridge by clicking on the 'This Bridge Configuration' link in the middle of the page.

### RSTP Configuration View

VLAN 1 - Default VLAN ▾

**RSTP Root Bridge Configuration**

Root Priority	Designated Root	Path Cost	Port	Max Age	Hello Time	Forward Delay
32768	80:00:00:07:af:ee:56:51	0	0	16	1	13

**This Bridge Configuration**

Hello Time (Sec)	Forward Delay (Sec)	Max Age (Sec)	Priority	RSTP Status	Topology Change	Topology Count
1	13	16	32768	Fast	False	0

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

### RSTP Bridge Configuration For VLAN 1

VLAN	0001 - Default VLAN
Hello Time	<input style="width: 80%;" type="text" value="1"/>
Forward Delay	<input style="width: 80%;" type="text" value="13"/>
Max Age	<input style="width: 80%;" type="text" value="16"/>
Priority	<span style="border: 1px solid black; padding: 2px;">32768 ▾</span>
Status	<span style="border: 1px solid black; padding: 2px;">Fast ▾</span>

Click [here](#) to view the RSTP port Configuration at VLAN 1



**Note:** It is recommended that RSTP networks consist of RSTP capable switches. Trunking must be disabled in order to use RSTP. Do not create redundant links unless either RSTP or N-Ring is enabled. RSTP on overlapping VLANs is not supported and the system will automatically disable RSTP on all but the lowest VID VLANs that have overlapping ports.

Following the link for the view RSTP Port Configuration at VLAN#, the user 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 example below, TX3 is a redundant port with port TX2, therefore TX2 is forwarding and TX3 is discarding.

**RSTP Configuration View For VLAN 1**

Bridge Port Configuration									
Port No	Port Name	Port State	Path Cost	Priority	STP BPDU	Auto Edge	Admin Edge	Designated Bridge	Designated Port
01	TX1	Disabled	200000	128	No	Enabled	Disabled	00:00:00:00:00:00:00:00	00:01
02	TX2	Disabled	200000	128	No	Enabled	Disabled	00:00:00:00:00:00:00:00	00:02
03	TX3	Disabled	200000	128	No	Enabled	Disabled	00:00:00:00:00:00:00:00	00:03
04	TX4	Disabled	200000	128	No	Enabled	Disabled	00:00:00:00:00:00:00:00	00:04
05	TX5	Disabled	200000	128	No	Enabled	Disabled	00:00:00:00:00:00:00:00	00:05
06	TX6	Disabled	200000	128	No	Enabled	Disabled	00:00:00:00:00:00:00:00	00:06
07	TX7	Disabled	200000	128	No	Enabled	Disabled	00:00:00:00:00:00:00:00	00:07
08	TX8	Forwarding	200000	128	No	Enabled	Disabled	80:00:00:07:af:ef:78:e1	00:08
09	FX1	Disabled	200000	128	No	Enabled	Disabled	00:00:00:00:00:00:00:00	00:09
10	FX2	Disabled	200000	128	No	Enabled	Disabled	00:00:00:00:00:00:00:00	00:0a
11	GB1	Disabled	20000	128	No	Enabled	Disabled	00:00:00:00:00:00:00:00	00:0b
12	GB2	Disabled	20000	128	No	Enabled	Disabled	00:00:00:00:00:00:00:00	00:0c

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

**RSTP Bridge Port Configuration**

VLAN	0001 - Default VLAN
Port Name	TX1
Path Cost	<input type="text" value="0"/>
Priority	128 ▼
Admin Edge	Disabled ▼
Auto Edge	Enabled ▼

**HELP > RSTP** Following the RSTP link on the help page, the user or user can see some information regarding the configuration options in the RSTP category on the left side of the web management interface.

The screenshot shows the N-Tron web management interface. The browser address bar displays `http://192.168.1.201/main.ssi`. The left sidebar contains a navigation menu with the following items: Administration, DHCP, LLDP, Ports, Statistics, VLAN, Bridging, RSTP, IGMP, N-View, N-Ring, N-Link, CIP, Firmware/Config, Support, Rate Limiting, User Management, Logical View, Home, Config, Help, and Logout. The main content area features a table of configuration categories:

Administration	DHCP	LLDP	Ports
Statistics	VLAN	Bridging	RSTP
IGMP	N-View	N-Ring	N-Link
CIP	Firmware/Config	Rate Limiting	User Management
Other			

The main content area is titled **RSTP - Rapid Spanning Tree Protocol**. It includes the following text:

The VLAN pull-down menu is used to select which VLAN to configure.

Note: In order to accommodate legacy devices, use these values for RSTP: Auto Edge Disabled, Hello Time 2, Forward Delay 15, and Max Age 20.

**RSTP Root Bridge Configuration**

<b>Root Priority:</b>	Priority of the root bridge.
<b>Designated Root:</b>	The unique Bridge Identifier of the bridge recorded as the root in the Root Identifier parameter of Configuration BPDUs transmitted by the Designated Bridge for the LAN.
<b>Path Cost:</b>	The cost of the path to the root offered by the Designated Port on the LAN.
<b>Port:</b>	The Port Identifier of the Bridge Port believed to be the Designated Port for the LAN.
<b>Max Age:</b>	The maximum age of received protocol information before it is discarded.
<b>Hello Time:</b>	The time interval between the transmission of Configuration BPDUs by a bridge that is attempting to become the Root or is the Root.
<b>Forward Delay:</b>	The time spent in the Listening State while moving from the Blocking State to the Learning State.

**This Bridge Configuration**

<b>Hello Time:</b>	This configurable field shows the value of the Hello Time parameter when the bridge is the Root or is attempting to become the Root. The range is generally 1-10, but consult the user manual for other constraints. The default value is 1 second.
<b>Forward Delay:</b>	The time spent in the Listening State while moving from the Blocking State to the Learning State. The range is generally 4-30, but consult the user manual for other constraints. The default value is 13 seconds.
<b>Max Age:</b>	The value of the Max Age parameter when the bridge is the Root or is attempting to become the Root. The range is generally 6-40, but consult the user manual for other constraints. The default value is 16 seconds.
<b>Priority:</b>	This configurable field shows the existing priority of the selected VLAN. The range should be 0-61440. The default value is 32768.
<b>RSTP Status:</b>	This configurable field shows the existing status of RSTP protocol, whether it is Fast Force STP/Disable.
<b>Topology Change:</b>	This will be true when topology change is detected.
<b>Topology Count:</b>	Number of topology changes.

**Bridge Port Configuration**

<b>Port No:</b>	The number of the port.
<b>Port Name:</b>	The descriptive name of the port.
<b>Port State:</b>	This field shows the current RSTP status for each port. It may be Disabled, Discarding, Learning or Forwarding.
<b>Path Cost:</b>	This field shows existing path cost of a port. If configured to 0, the path cost will be automatically calculated using the actual speed of the port; otherwise the configured value will be used. The configured range should be 0-200000000.
<b>Priority:</b>	This configurable field shows existing priority of a port. The range should be 0-255.
<b>STP BPDU:</b>	This field shows that the older slower STP timing is being used as configured or because an old STP BPDU has been received on this port.
<b>Auto Edge:</b>	This configurable field specifies the use of faster timeout in awaiting BPDUs. It may have to be disabled for a very large network.

## IGMP

**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
Remove Unused Groups	<input checked="" type="checkbox"/>
Manual Router Ports	(None)
N-Ring Router Ports	(None)
N-Link Router Port	(None)
Active Querier IP	192.168.1.201

Modify Refresh

By selecting Modify, the user will see a list of configurable fields for the IGMP configuration. Once these fields are filled in to meet the needs of the user's network, the changes may be updated by clicking the Update button at the bottom of the page.

**IGMP Configuration**

IGMP Status	Enabled ▾
Query Mode	Auto ▾
Router Mode	Auto ▾
Remove Unused Groups	<input checked="" type="checkbox"/>
Manual Router Ports	<input type="checkbox"/> TX1 <input type="checkbox"/> TX2 <input type="checkbox"/> TX3 <input type="checkbox"/> TX4 <input type="checkbox"/> TX5 <input type="checkbox"/> TX6 <input type="checkbox"/> FX1 <input type="checkbox"/> FX2 Select All Select None

Update Cancel

The IGMP Status pull-down allows the user to enable or disable IGMP completely.

The screenshot shows the 'IGMP Configuration' form. The 'Query Mode' dropdown menu is open, showing options: Disabled, Enabled (highlighted), and Auto. Other fields include IGMP Status (Enabled), Router Mode (Auto), Remove Unused Groups (checked), and Manual Router Ports (TX1-TX6, FX1-FX2) with 'Select All' and 'Select None' buttons. 'Update' and 'Cancel' buttons are at the bottom.

The Query Mode pull-down allows the user to set query mode for Automatic (the default), On (always), or Off (never):

The screenshot shows the 'IGMP Configuration' form. The 'Router Mode' dropdown menu is open, showing options: Auto (highlighted), Off, and On. Other fields include IGMP Status (Enabled), Query Mode (Auto), Remove Unused Groups (checked), and Manual Router Ports (TX1-TX6, FX1-FX2) with 'Select All' and 'Select None' buttons. 'Update' and 'Cancel' buttons are at the bottom.

The Router Mode pull-down allows the user to choose router mode. 'Auto' allows for dynamically detected and manually set router ports. 'Manual' allows only for manually set router ports. 'None' allows no router ports.

The screenshot shows the 'IGMP Configuration' form. The 'Router Mode' dropdown menu is open, showing options: Auto (highlighted), Manual, and None. In the 'Manual Router Ports' section, TX1, TX3, TX6, and FX2 are checked. Other fields include IGMP Status (Enabled), Query Mode (Auto), Remove Unused Groups (checked), and 'Select All' and 'Select None' buttons. 'Update' and 'Cancel' buttons are at the bottom.

If **Remove Unused Groups** is checked then unused IGMP Groups will be removed and traffic with those multicast addresses will be treated as normal multicast. If unchecked, then unused IGMP Groups are not removed and traffic with those multicast addresses will be limited. The default is checked.

**Note:** IGMP Groups are not retained through a power cycle.

The screenshot shows the 'IGMP Configuration' page. The 'IGMP Status' is set to 'Enabled', 'Query Mode' is 'Auto', and 'Router Mode' is 'Auto'. The 'Remove Unused Groups' checkbox is checked. Under 'Manual Router Ports', there are checkboxes for TX1, TX2, TX3, TX4, TX5, TX6, FX1, and FX2, all of which are currently unchecked. There are 'Select All' and 'Select None' buttons below the checkboxes. At the bottom of the form are 'Update' and 'Cancel' buttons.

The user can specify the manual router ports:

The screenshot shows the 'IGMP Configuration' page. The 'IGMP Status' is 'Enabled', 'Query Mode' is 'Auto', and 'Router Mode' is 'Manual'. The 'Remove Unused Groups' checkbox is checked. Under 'Manual Router Ports', the checkboxes for TX1, TX3, TX6, and FX2 are checked, while TX2, TX4, TX5, and FX1 are unchecked. There are 'Select All' and 'Select None' buttons below the checkboxes. At the bottom of the form are 'Update' and 'Cancel' buttons.

**IGMP > SHOW GROUPS** The Show Groups tab under the IGMP category will display a list of IGMP groups based on the Group IP and its associated port number.

The screenshot shows the 'IGMP Group View' page. At the top, it displays 'Total Number Of Active IP Group Memberships' as 2. Below this is a table with the following data:

Group IP	Port Name	VLAN ID
224.0.0.252	TX6	1
239.255.255.250	TX6	1

Below the table is a 'Refresh' button.

**IGMP > SHOW ROUTERS** The Show Routers 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	VLAN ID
192.9.9.3	TX6	1
192.168.1.231	TX8	1
192.168.1.242	TX8	1
192.168.1.232	TX8	1

**IGMP > RFILTER PORTS** 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 No	Port Name	Rfilter State
01	TX1	Enabled
02	TX2	Enabled
03	TX3	Enabled
04	TX4	Enabled
05	TX5	Enabled
06	TX6	Enabled
07	TX7	Enabled
08	TX8	Enabled
09	FX1	Enabled
10	FX2	Enabled
11	GB1	Enabled
12	GB2	Enabled

### MODIFYING RFILTER PORT SETTINGS

**IGMP RFilter Configuration**

Port No	Port Name	Rfilter Enabled?
01	TX1	<input checked="" type="checkbox"/>
02	TX2	<input checked="" type="checkbox"/>
03	TX3	<input checked="" type="checkbox"/>
04	TX4	<input checked="" type="checkbox"/>
05	TX5	<input checked="" type="checkbox"/>
06	TX6	<input checked="" type="checkbox"/>
07	TX7	<input checked="" type="checkbox"/>
08	TX8	<input checked="" type="checkbox"/>
09	FX1	<input checked="" type="checkbox"/>
10	FX2	<input checked="" type="checkbox"/>
11	GB1	<input checked="" type="checkbox"/>
12	GB2	<input checked="" type="checkbox"/>



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

The screenshot shows a web browser window with the URL `http://192.168.1.201/main.ssi`. The page title is "192.168.1.201 N-TRON Swit...". The navigation menu on the left includes: Administration, DHCP, LLDP, Ports, Statistics, VLAN, Bridging, RSTP, IGMP, N-View, N-Ring, N-Link, CIP, Firmware/Config, Support, Rate Limiting, User Management, Logical View, Home, Config, Help, and Logout. The main content area displays the "IGMP - Internet Group Management Protocol" page. It includes a table of configuration options and detailed descriptions for each category: Configuration, Show Groups, Show Routers, and RFilter Ports.

Administration	DHCP	LLDP	Ports
Statistics	VLAN	Bridging	RSTP
IGMP	N-View	N-Ring	N-Link
CIP	Firmware/Config	Rate Limiting	User Management
Other			

### IGMP - Internet Group Management Protocol

IGMP group consists of four categories:  
1. Configuration 2. Show Groups 3. Show Routers 4. RFilter Ports

#### Configuration

<b>IGMP Status:</b>	Indicates whether IGMP is enabled or disabled.
<b>Query Mode:</b>	Specifies the query mode to be used. The default is Auto. Auto - Multiple switches will ensure that only one switch is the active querier. On - This switch is always an active querier. Off - This switch never queries.
<b>Router Mode:</b>	Specifies the router mode to be used. The default is Auto. Auto - Allows for dynamically detected and manually set router ports. Manual - Allows only for manually set router ports. None - Allows no router ports.
<b>Remove Unused Groups:</b>	If checked then unused IGMP Groups will be removed and traffic with those multicast addresses will be treated as normal multicast. If unchecked, then unused IGMP Groups are not removed and traffic with those multicast addresses will be limited. The default is checked. Note that IGMP Groups are not retained through a power cycle.
<b>Manual Router Ports:</b>	Port or ports that are specified as router ports manually.
<b>N-Ring Router Ports:</b>	On an N-Ring Manager, the ring ports are informatively shown as router ports.
<b>N-Link Router Port:</b>	On N-Link Master, Slave, and Coupler switches, the coupler port is informatively shown as a router port.
<b>Active Querier IP:</b>	IP of the Active Querier is informatively shown.

#### Show Groups

<b>Total Number of Active IP Group Memberships:</b>	Total Number of Active Group IP Memberships based on the dotted quad view and counting each joined port.
<b>Group IP:</b>	Dynamically created Multicast group IP address.
<b>Port Name:</b>	The descriptive name of the port.
<b>VLAN ID:</b>	VLAN in which the Group IP is assigned. The range is 1-4094.

#### Show Routers

<b>Router IP:</b>	Auto-detected router IP address.
<b>Port Name:</b>	The descriptive name of the port.
<b>VLAN ID:</b>	VLAN in which the Router IP is assigned. The range is 1-4094.

#### RFilter Ports

<b>Port No:</b>	The number of the port.
<b>Port Name:</b>	The descriptive name of the port.
<b>RFilter State:</b>	Status of whether RFilter is enabled or disabled for a port. If IGMP is enabled and a port is a 'router port', then RFilter enabled stops IGMP group data from egressing on the port unless a join to that specific IGMP group has come into the port. IGMP controls (Join, Leave, Query) are still sent.

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## N-VIEW™

**N-VIEW > CONFIGURATION** The Configuration tab under the N-View category will display two basic variables for N-View, the status and the interval between packets.

**N-View Configuration View**

N-View Status	Enabled
N-View Interval	5

Modify Refresh

By selecting Modify on the above example, the user can modify the variable to change the frequency with which N-View reports information. Increasing the interval will slow the update rate. Decreasing the interval will allow N-View to report more frequently. Additionally, you may Disable or Enable N-View altogether.

**Modify N-View Configuration**

N-View Status	Enabled
N-View Interval	5

Update Cancel

**N-VIEW > PORTS** The Ports tab under the N-View category will display a list of all the switch ports along with the ports transmitting multicast packets and MIB stats respectively.

**N-View Ports View**

Port Name	Multicast On Port?	Send MIB Stats?
TX1	YES	YES
TX2	YES	YES
TX3	YES	YES
TX4	YES	YES
TX5	YES	YES
TX6	YES	YES
TX7	YES	YES
TX8	YES	YES
FX1	YES	YES
FX2	YES	YES
GB1	YES	YES
GB2	YES	YES

Modify Refresh

By selecting Modify on the above example, the user can modify these two variables to enable or disable multicast out of a port and if MIB statistics are sent out for those ports.

### Modify N-View Ports

Port Name	Multicast On Port?	Send MIB Stats?
TX1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TX2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TX3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TX4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TX5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TX6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TX7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TX8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
FX1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
FX2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GB1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GB2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

**HELP > N-VIEW** Following the N-View link on the help page, the user or user can see some information regarding the configuration options in the N-View category on the left side of the web management interface.

The screenshot shows the N-Tron web management interface. The browser address bar displays `http://192.168.1.201/main.ssi`. The left sidebar contains a navigation menu with the following items: Administration, DHCP, LLDP, Ports, Statistics, VLAN, Bridging, RSTP, IGMP, N-View (selected), N-Ring, N-Link, CIP, Firmware/Config, Support, Rate Limiting, User Management, Logical View, Home, Config, Help, and Logout. The main content area features a table of menu items:

Administration	DHCP	LLDP	Ports
Statistics	VLAN	Bridging	RSTP
IGMP	N-View	N-Ring	N-Link
CIP	Firmware/Config	Rate Limiting	User Management
Other			

Below the table, the **N-View** configuration page is displayed. It states: "N-View group consists of two categories: 1. Configuration 2. Ports".

**Configuration**

N-View Status:	Global N-View status of enabled or disabled.
N-View Interval:	Global interval in seconds for autocasting MIB counters.

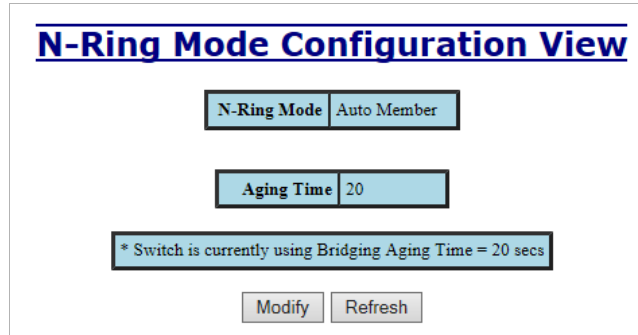
**Ports**

Port Name:	The descriptive name of the port.
Multicast on Port?:	Specifies whether or not to send autocast packets on this port.
Send MIB Stats?:	Specifies whether or not to send this port's MIB counters inside autocast packets.

At the bottom left of the interface, it says: © 2016 Red Lion Controls, Inc. All rights reserved. http://www.redlion.net. Logged in as: admin.

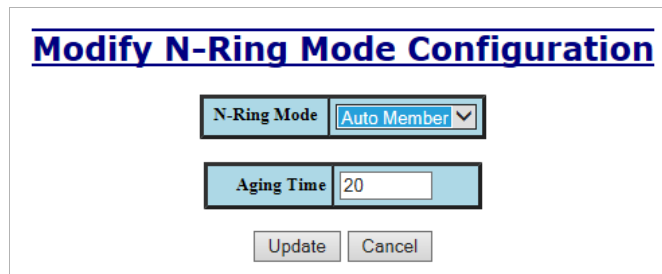
## N-RING™

**N-RING > CONFIGURATION** This tab displays the N-Ring basic configuration settings. By default, N-Ring is in Auto Member mode and the N-Ring Aging Time is 20 seconds.



The screenshot shows the 'N-Ring Mode Configuration View' interface. It features a title bar with the text 'N-Ring Mode Configuration View'. Below the title bar, there are two main configuration fields: 'N-Ring Mode' set to 'Auto Member' and 'Aging Time' set to '20'. A status message below these fields reads '\* Switch is currently using Bridging Aging Time = 20 secs'. At the bottom of the configuration area, there are two buttons: 'Modify' and 'Refresh'.

By selecting Modify on the above example, the user will see a list of configurable fields for the N-Ring configuration, as below.



The screenshot shows the 'Modify N-Ring Mode Configuration' interface. It features a title bar with the text 'Modify N-Ring Mode Configuration'. Below the title bar, there are two main configuration fields: 'N-Ring Mode' set to 'Auto Member' (with a dropdown arrow) and 'Aging Time' set to '20'. At the bottom of the configuration area, there are two buttons: 'Update' and 'Cancel'.

### N-RING AGING TIME

The N-Ring Aging Time has a default of 20 seconds and is separate from the Bridging Aging Time. N-Ring Aging Time overrides the Bridging Aging Time when the switch is an N-Ring Manager or becomes an active N-Ring Member.

### CONFIGURATION NOTES

- N-Ring Manager cannot have RSTP or Trunking enabled.
- RSTP & N-Ring are different modes and cannot share links or segments along those lines.
- See the examples in the RSTP configuration section.
- Do not use Trunking on an N-Ring manager. Do not connect the N-Ring to actively Trunking ports on an Auto Member.
- Do not create redundant links unless either RSTP or N-Ring is enabled.
- Any one 700/7000 can only participate in one N-Ring.
- 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 MODE

The “N-Ring Mode” is one of three: Auto Member, Manager or Disabled.

Modify N-Ring Mode Configuration	
N-Ring Mode	Disabled Auto Member Manager
Aging Time	20
Update Cancel	

If N-Ring Mode is “Manager”, then a pull-down allows selection of ports available for use as N-Ring ports. The port sets vary depending on the switch model.

(Model 708FX2 shown below)

Modify N-Ring Mode Configuration	
N-Ring Mode	Manager
Aging Time	20
N-Ring Ports	TX1 / TX2 TX7 / TX8
VLAN ID	3333
Tagging	Tagged
Update Cancel	

(Model 7012FX2 shown below)

Modify N-Ring Mode Configuration	
N-Ring Mode	Manager
Aging Time	20
N-Ring Ports	TX1 / TX2 FX1 / FX2 GB1 / GB2
VLAN ID	3333
Tagging	Tagged
Update Cancel	

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 VLAN’s Tagged or Untagged ports. Default is Tagged.

Modify N-Ring Mode Configuration	
N-Ring Mode	Manager
Aging Time	20
N-Ring Ports	TX1 / TX2
VLAN ID	3333
Tagging	Tagged
<input type="button" value="Update"/> <input type="button" value="Cancel"/>	



**Note:** Since VLANs are implemented for security reasons as well as traffic flow, N-Ring only makes minimal changes. It is up to the user to ensure that VLANs are configured correctly on the N-Ring manager and all N-Ring members.



**Note:** 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.



**Note:** 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 user 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 > ADVANCED CONFIGURATION

If switch is an N-Ring Member, the following settings will be shown:

#### N-RING MODE

Current N-Ring mode of switch.

#### KEEP-ALIVE TIMEOUT

Keep-Alive timeout is used when switch is active in an N-Ring. The range is **5-1000000** seconds.

N-Ring Advanced Configuration View	
N-Ring Mode	Auto Member
Keep-Alive Timeout (Secs)	31
<input type="button" value="Modify"/> <input type="button" value="Refresh"/>	

**Modify N-Ring Advanced Configuration**

N-Ring Mode Auto Member

Keep-Alive Timeout (Secs) 31

Update Cancel

If switch is an N-Ring Manager, the following advanced configuration data will be shown:

**N-RING MODE**

Current N-Ring mode of switch.

**SELF HEALTH PACKET INTERVAL:**

The amount of time to wait in milliseconds before sending Self-Health packets. The default is 10.

**MAXIMUM MISSED PACKETS**

The number of missed Self-Health packets that constitute a fault. The default is 2.

**SIGN-ON DELAY**

The amount of time to wait in milliseconds before requesting initial sign-on information from ring members. The default is 1000.

**SIGN-ON MATCH PACKETS**

The number of times the switch count must match before starting the sign-on process. The default is 3.

**SIGN-ON INTERVAL**

The interval of time to wait in milliseconds before requesting subsequent sign-on information from ring members when the ring is broken. The default is 3000.

**SIGN-ON INFO SPACING MULTIPLIER**

The amount of time to wait in milliseconds, scaled by switch number, before sending information to the ring manager. The default is 5.

**SIGN-ON INFO RETRY TIMEOUT**

The amount of time the ring member will wait in milliseconds for the ring manager to acknowledge receipt of the member's information before the member tries to re-send the information. The default is 1500.

**DELAY BEFORE RE-ENTERING BROKEN STATE**

The amount of time, in milliseconds, that must elapse before the ring is allowed to go back into the broken state. The default is 3000.

N-Ring OK

### N-Ring Advanced Configuration View

N-Ring Mode | Manager

Self Health Packet Interval (Msecs)	10
Maximum Missed Packets	2
Sign-On Delay (Msecs)	1000
Sign-On Match Packets	3
Sign-On Interval (Msecs)	3000
Sign-On Info Spacing Multiplier (Msecs)	5
Sign-On Info Retry Timeout (Msecs)	1500
Delay Before Re-Entering Broken State (Msecs)	3000

Modify | Refresh

N-Ring OK

### Modify N-Ring Advanced Configuration

N-Ring Mode | Manager

Self Health Packet Interval (Msecs)	<input type="text" value="10"/>
Maximum Missed Packets	<input type="text" value="2"/>
Sign-On Delay (Msecs)	<input type="text" value="1000"/>
Sign-On Match Packets	<input type="text" value="3"/>
Sign-On Interval (Msecs)	<input type="text" value="3000"/>
Sign-On Info Spacing Multiplier (Msecs)	<input type="text" value="5"/>
Sign-On Info Retry Timeout (Msecs)	<input type="text" value="1500"/>
Delay Before Re-Entering Broken State (Msecs)	<input type="text" value="3000"/>

Update | Cancel



**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**

N-Ring Mode Auto Member

Switch is in Auto Member Detection Mode

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

**N-Ring Status View**

N-Ring Mode Auto Member

Switch is an N-Ring Member

N-Ring Manager Address  
00:07:aff:af:00

Active N-Ring Ports  
TX1 TX2

\* Switch is currently using N-Ring Aging Time = 20 secs

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  secs.

---

14 Active Members Detected In Current N-Ring (14 reporting)

Switch No	MAC Address	IP Address	Subnet Mask	Name	Ports
RM	00:07:aff:8a:80	192.168.1.108	255.255.255.0	N-Tron Switch	TX2 TX1
1	00:07:aff:c9:20	192.168.1.245	255.255.255.0	N-Tron Switch	TX2 TX1
2	00:07:aff:c8:80	192.168.1.226	255.255.255.0	N-Tron Switch	TX2 TX1
3	00:07:aff:8a:60	192.168.1.104	255.255.255.0	N-Tron Switch	TX2 TX1
4	00:07:aff:b8:00	192.168.1.225	255.255.255.0	N-Tron Switch	TX2 TX1

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  secs.           

---

The total number of Active N-Ring Members is unknown. (13 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:aff:8a:c0	192.168.1.101	255.255.255.0	N-Tron Switch	FX2 FX1
1	00:07:aff:c8:60	192.168.1.249	255.255.255.0	N-Tron Switch	FX2 FX1
2	00:07:aff:c9:20	192.168.1.245	255.255.255.0	N-Tron Switch	FX2 FX1
3	00:07:aff:8a:80	192.168.1.108	255.255.255.0	N-Tron Switch	FX2 FX1
4	00:07:aff:6d:00	192.168.1.211	255.255.255.0	N-Tron Switch	FX2 FX1
5	00:07:aff:75:80	192.168.1.207	255.255.255.0	N-Tron Switch	FX2 FX1
6	00:07:aff:75:60	192.168.1.205	255.255.255.0	N-Tron Switch	FX2 FX1
7	00:07:aff:75:e0	192.168.1.203	255.255.255.0	N-Tron Switch	FX2 <span style="color: red;">FX1</span>
8	00:07:aff:76:00	192.168.1.234	255.255.255.0	N-Tron Switch	FX2 <span style="color: red;">FX1</span>
~~~~~ Ring Broken ~~~~~					
9	00:07:aff:6c:e0	192.168.1.210	255.255.255.0	N-Tron Switch	<span style="color: red;">FX2</span> FX1
10	00:07:aff:75:c0	192.168.1.237	255.255.255.0	N-Tron Switch	FX2 FX1
11	00:07:aff:75:a0	192.168.1.206	255.255.255.0	N-Tron Switch	FX2 FX1
12	00:07:aff:c8:80	192.168.1.213	255.255.255.0	N-Tron Switch	FX2 FX1
13	00:07:aff:8f:c0	192.168.1.246	255.255.255.0	N-Tron Switch	FX2 FX1
14	00:07:aff:8a:20	192.168.1.102	255.255.255.0	N-Tron Switch	FX2 FX1

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 (TX2, TX8/FX2) on a 708 model or (TX2, TX8/FX2, or GB2) on a 7018 model is not receiving self health frames all the way around the N-Ring, though the other (low TX1, TX7/FX1) N-Ring port on a 708 model or (low TX1, TX7/FX1, or GB1) on a 7018 model is:

N-Ring Partial Fault (TX2 is not receiving self health from TX1)

## N-Ring Status View

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

Refresh every  secs.

---

1 Active Members Detected In Current N-Ring (1 reporting)

Switch No	MAC Address	IP Address	Subnet Mask	Name	Ports
RM	<a href="#">00:07:af:ff:af:00</a>	192.168.1.238	255.255.255.0	N-Tron Switch	TX2 TX1
1	<a href="#">00:07:af:ff:ae:e0</a>	192.168.1.228	255.255.255.0	N-Tron Switch	TX1 TX2

The screenshot below shows N-Ring Manager Status when a ‘Lower’ N-Ring Port (TX1 or TX7/FX1) on a 708 model or Port (TX1, TX7/FX1, or GB1) on a 7018 model is not receiving self health frames all the way around the N-Ring, though the other (high TX2 of TX8/FX2) on a 708 model or (high TX2, TX8/FX2, or GB2) on a 7018 model N-Ring port is:

N-Ring Partial Fault (TX1 is not receiving self health from TX2)

## N-Ring Status View

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

Refresh every  secs.

---

1 Active Members Detected In Current N-Ring (1 reporting)

Switch No	MAC Address	IP Address	Subnet Mask	Name	Ports
RM	<a href="#">00:07:af:ff:af:00</a>	192.168.1.238	255.255.255.0	N-Tron Switch	TX2 TX1
1	<a href="#">00:07:af:ff:ae:e0</a>	192.168.1.228	255.255.255.0	N-Tron Switch	TX1 TX2

**HELP > N-RING** Following the N-Ring link on the help page, the user or user can see some information regarding the configuration options in the N-Ring category on the left side of the web management interface.

The screenshot shows the N-Tron web management interface. The browser address bar displays `http://192.168.1.201/main.ssi`. The interface includes a navigation menu on the left with the following items: Administration, DHCP, LLDP, Ports, Statistics, VLAN, Bridging, RSTP, IGMP, N-View, N-Ring, N-Link, CIP, Firmware/Config, Support, Rate Limiting, User Management, Logical View, Home, Config, Help, and Logout. The main content area displays the N-Ring configuration page.

**N-Ring**

N-Ring is divided into two categories:  
 1. Configuration 2. Status

N-Ring Configuration is divided into two categories:  
 1. Mode 2. Advanced

**Configuration - Mode**

If N-Ring mode is Manager, the following data will be shown:

<b>N-Ring Mode:</b>	"Manager" - Switch is currently operating as an N-Ring Manager.
<b>Aging Time:</b>	Aging time used when switch is active in an N-Ring. The range is 5-1000000 seconds.
<b>N-Ring Ports:</b>	Port set used as N-Ring ports on this switch. The user can select an existing port set.
<b>VLAN ID:</b>	VLAN in which N-Ring ports are assigned. The VLAN ID is configurable and the range is 1-4094.
<b>Tagging:</b>	Selection as to whether the N-Ring ports are members of the VLAN's Tagged or Untagged ports. NOTE: It is recommended to use Tagged on N-Ring ports.

If N-Ring mode is Auto Member, the following data will be shown:

<b>N-Ring Mode:</b>	"Auto Member" - Switch is currently operating as an N-Ring Auto Member.
<b>Aging Time:</b>	Aging time used when switch is active in an N-Ring. The range is 5-1000000 seconds.

**Configuration - Advanced**

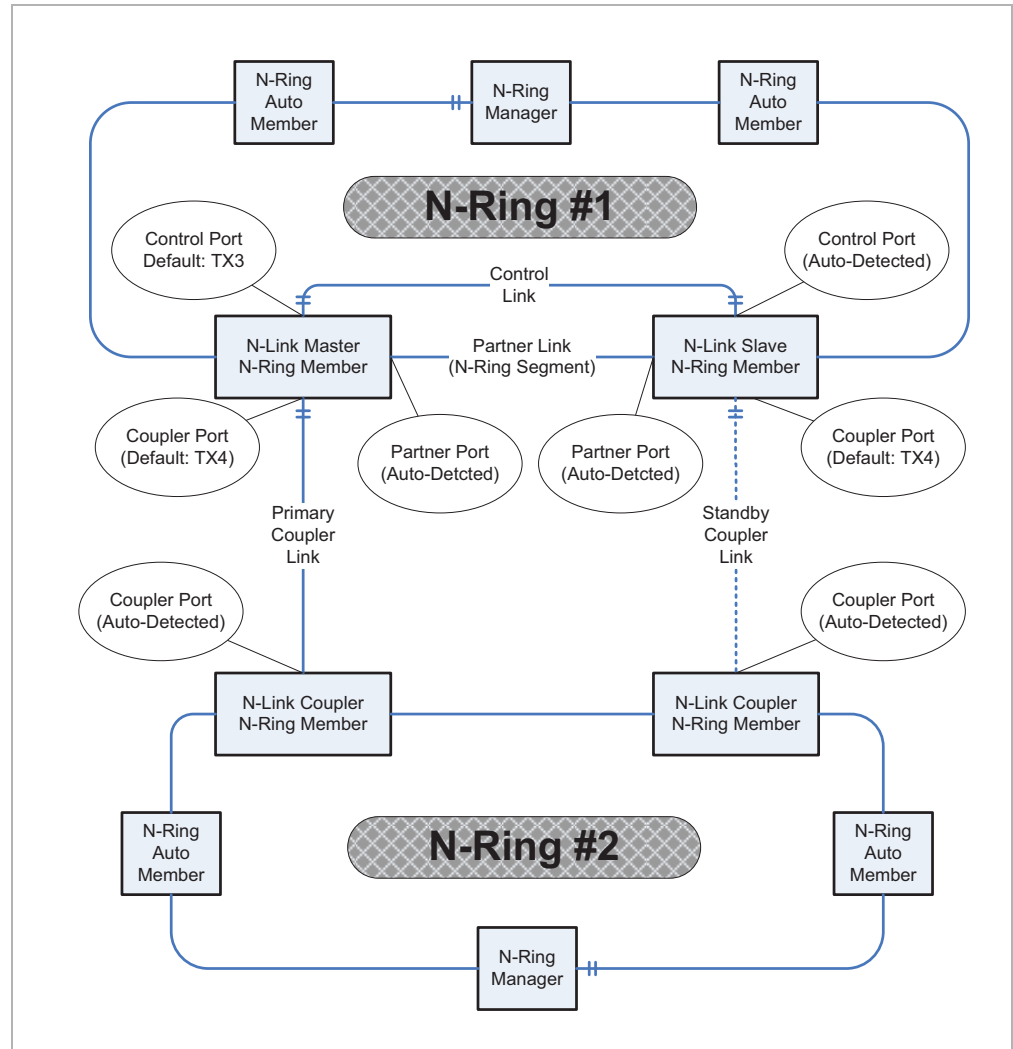
If N-Ring mode is Manager, the following advanced configuration data will be shown:

<b>N-Ring Mode:</b>	"Manager" - Switch is currently operating as an N-Ring Manager.
<b>Self Health Packet Interval:</b>	The amount of time to wait in milliseconds before sending Self-Health packets. The default is 10.
<b>Maximum Missed Packets:</b>	The number of consecutive missed Self-Health packets that constitute a fault. The default is 2.
<b>Sign-On Delay:</b>	The amount of time to wait in milliseconds before requesting initial sign-on information from ring members. The default is 1000.
<b>Sign-On Match Packets:</b>	The number of times the switch count must match before starting the sign-on process. The default is 3.
<b>Sign-On Interval:</b>	The interval of time to wait in milliseconds before requesting subsequent sign-on information from ring members when the ring is broken. The default is 3000.
<b>Sign-On Info Spacing Multiplier:</b>	The amount of time to wait in milliseconds, scaled by switch number, before sending information to the ring manager. The default is 5.
<b>Sign-On Info Retry Timeout:</b>	The amount of time the ring member will wait in milliseconds for the ring manager to acknowledge receipt of the member's information before the member tries to re-send the information. The default is 1500.
<b>Delay Before Re-Entering Broken State:</b>	The amount of time, in milliseconds, that must elapse before the ring is allowed to go back into the broken state. The default is 3000.

## N-LINK™

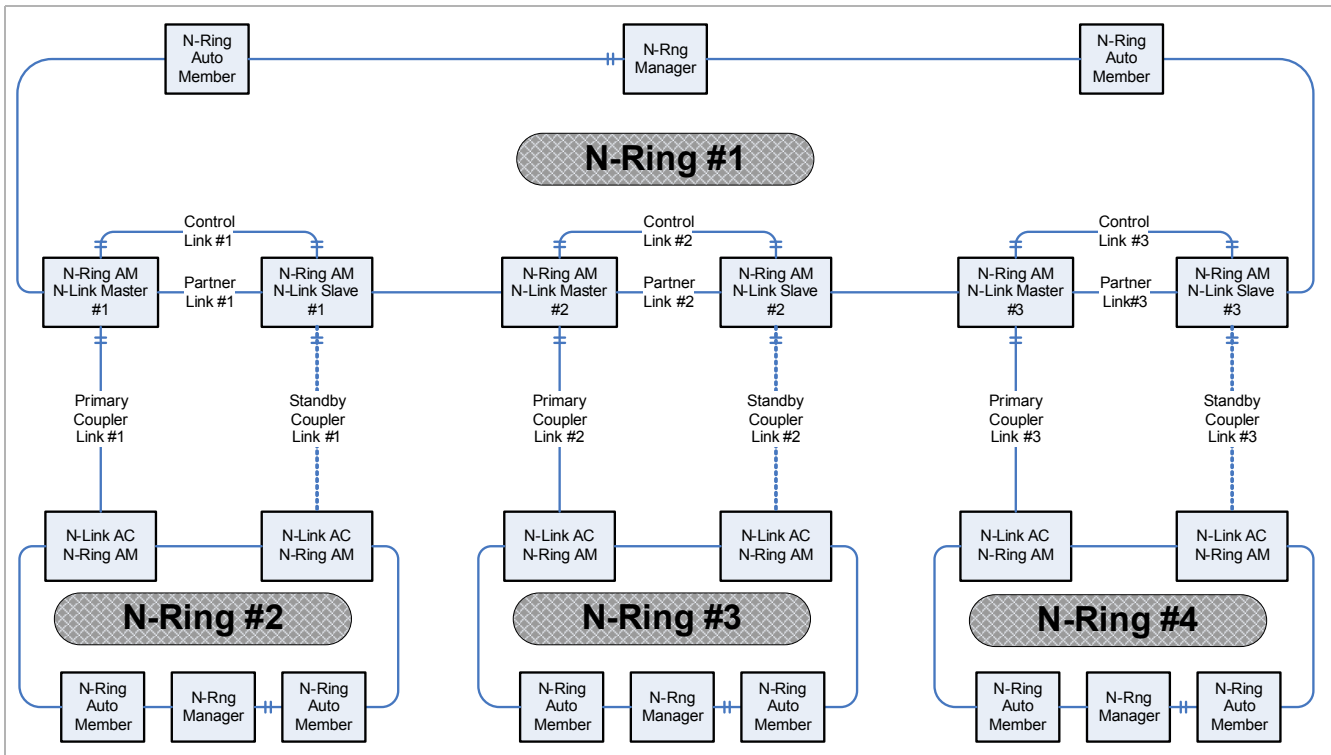
**N-LINK > CONFIGURATION** The purpose of N-Link is to provide a way to redundantly couple an N-Ring topology to one or more other topologies, usually other N-Ring topologies. Each N-Link configuration requires 4 switches: N-Link Master, N-Link Slave, N-Link Primary Coupler, and N-Link Standby Coupler.

### STANDARD N-LINK CONFIGURATION (EXAMPLE)



For convenience, a diagram similar to the above is provided in the switch's browser help for N-Link.

### COMPLEX N-LINK CONFIGURATION (EXAMPLE)



#### CONFIGURATION NOTES

- The Master and Slave must be part of the N-Ring topology.
- If using default configuration choices, the user only needs to configure the N-Link Master. The N-Link Slave and both Coupler switches will auto-detect any needed configuration.
- If not using default configuration choices, the user may also need to configure the Default Coupler port on the N-Link Slave.
- There must be a direct link between the Master and Slave Control ports. Use of media converters or other switches is not supported.
- There must be a direct link between the Master and Slave Partner ports. Use of media converters or other switches is not supported.
- There must be at least one other switch, besides the Master and Slave, that supports N-Link on the N-Ring.
- N-Link will only support a single point of failure. Multiple points of failure and misconfiguration are not supported and may cause a network storm under some circumstances.

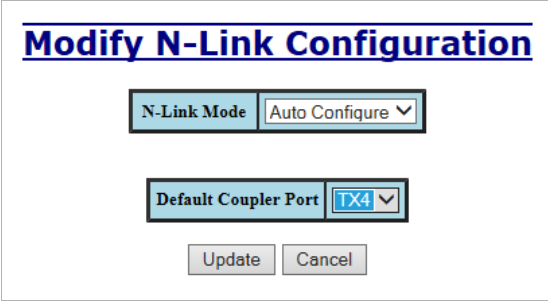
#### CONFIGURATION STEPS TO REDUNDANTLY COUPLE 2 N-RING NETWORKS

1. Ensure the Coupler and Control cables are disconnected at this point.
2. Get Both N-Rings working with a status of OK.
3. Configure N-Link Slave: Ensure that the N-Link Slave is set to Auto Configure and select a Default Coupler Port. Save Configuration.

4. Configure N-Link Master: Select the Control and Coupler ports. Save the Configuration.
5. Connect the Control Link cable. Ensure that the Slave switch status now shows a state of “Slave”
6. Connect the Coupler Link cables.
7. Check N-Link status by selecting the N-Link Status View page.

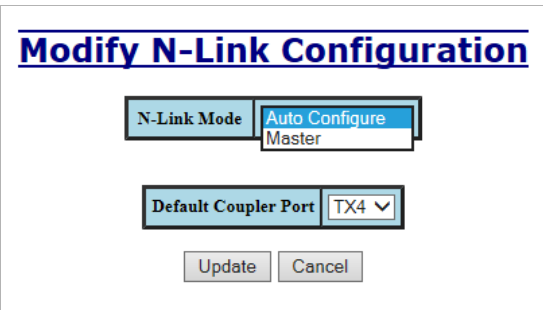
#### MODIFYING N-LINK CONFIGURATION

1. The Configuration tab under the N-Link category will display the configuration settings. By default, N-Link is in Auto Configure mode and will use TX4 as the Default Coupler port.
2. By selecting Modify on the above example, the user will see a list of configurable fields for the N-Link configuration, as below.



The screenshot shows a web interface titled "Modify N-Link Configuration". It features two dropdown menus. The first is labeled "N-Link Mode" and is currently set to "Auto Configure". The second is labeled "Default Coupler Port" and is currently set to "TX4". Below these menus are two buttons: "Update" and "Cancel".

3. The port configured as the Default Coupler Port will be used as the Standby Coupler port if the switch detects an N-Link Master and becomes an N-Link Slave.
4. Once these fields are filled in to meet the needs of the user’s network, the changes may be saved by clicking the Update button at the bottom of the page.
5. The “N-Link Mode” is one of two choices, as below:



The screenshot shows the same "Modify N-Link Configuration" dialog box. In this view, the "N-Link Mode" dropdown menu is set to "Master". The "Default Coupler Port" remains set to "TX4". The "Update" and "Cancel" buttons are still present at the bottom.

6. If N-Link mode is “Master”, then the user must configure the Control Port (default: TX3) and the Primary Coupler Port (default: TX4).

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

**N-LINK > STATUS** The Status tab under the N-Link category will display the N-Link status.

If the switch is an N-Link Master or Slave, the following switch status and partner status information will be shown. Fields with a red background designate a fault condition.

**Table 2-1 Switch N-Link Status**

Status Field	Description
State:	Current N-Link mode of switch.
Control Port:	The port being used to convey control information. There must be a direct link between the Master and Slave Control ports. Use of media converters or other switches is not supported.
Partner Port:	The port being used for normal communication between the N-Link Master and N-Link Slave switch. There must be a direct link between the Master and Slave Partner ports. Use of media converters or other switches is not supported. This port will be detected automatically.
Coupler Port:	The port being used to establish a redundant path for Ethernet data transmission.
Coupler Port State:	Blocking, Forwarding.
Status:	No errors will show "OK", otherwise a description of the Faults detected.

**Table 2-2 Switch N-Link Partner Information**

Status Field	Description
State:	Current N-Link mode of switch.
MAC:	The MAC Address of the N-Link Partner switch.
Coupler Port State:	Blocking, Forwarding.
Status:	No errors will show "OK", otherwise a description of the Faults detected.

If switch is an N-Link Auto Configure and not a Slave, the Coupler port, if known, will be shown.



**Table 2-3 Switch N-Link Auto Configure Information**

Status Field	Description
N-Link State:	Current N-Link mode of switch.
Coupler Port:	The port used to establish a redundant path for Ethernet data transmission. This port will be detected automatically.

Below is an example of N-Link Status from a switch in defaults (N-Link Auto Configure) that is not an N-Link Master and has not become an N-Link Slave or an N-Link Coupler.

<u>N-Link Status View</u>	
N-Link State	Auto Configure
Coupler Port	(None)

Below is an example of N-Link Status from an N-Link Coupler switch:

<u>N-Link Status View</u>	
N-Link State	Auto Configure
Coupler Port	TX4

Below is an example of N-Link Status from an N-Link Master switch:

<u>N-Link Status View</u>	
State	Master
Control Port	TX3
Partner Port	TX1
Coupler Port	TX4
Coupler Port State	Forwarding
Status	OK
N-Link Partner Information	
State	Slave
MAC	00:07:affe:afc0
Coupler Port State	Blocking
Status	OK

Below is an example of N-Link Status from an N-Link Slave switch:

N-Link Status View	
State	Slave
Control Port	TX3
Partner Port	TX2
Coupler Port	TX4
Coupler Port State	Blocking
Status	OK

N-Link Partner Information	
State	Master
MAC	00:07:affe:c4:40
Coupler Port State	Forwarding
Status	OK

Below is an example of N-Link Status from an N-Link Master and Slave where the Primary Coupler link is broken:

N-Link Status View	
State	Master
Control Port	TX3
Partner Port	TX1
Coupler Port	TX4
Coupler Port State	Forwarding
Status	OK

N-Link Partner Information	
State	Slave
MAC	00:07:affe:af:c0
Coupler Port State	Blocking
Status	Redundancy lost. Standby Coupler failure.

N-Link Status View	
State	Slave
Control Port	TX3
Partner Port	TX2
Coupler Port	TX4
Coupler Port State	Blocking
Status	Redundancy lost. Standby Coupler failure.

N-Link Partner Information	
State	Master
MAC	00:07:affe:c4:40
Coupler Port State	Forwarding
Status	OK

Below is an example of N-Link Status from an N-Link Master and Slave where the Standby Coupler link is broken:

### N-Link Status View

State	Master
Control Port	TX3
Partner Port	(None)
Coupler Port	TX4
Coupler Port State	Forwarding
Status	Partner port is not known.

N-Link Partner Information	
State	Slave
MAC	00:07:aff9:c:e0
Coupler Port State	Blocking
Status	Partner port is not known.

### N-Link Status View

State	Slave
Control Port	TX3
Partner Port	(None)
Coupler Port	TX4
Coupler Port State	Blocking
Status	Partner port is not known.

N-Link Partner Information	
State	Master
MAC	00:07:aff3:8:a0
Coupler Port State	Forwarding
Status	Partner port is not known.

Below is an example of N-Link Status from an N-Link Master and Slave where the Control link is broken:

### N-Link Status View

State	Master
Control Port	TX3
Partner Port	TX1
Coupler Port	TX4
Coupler Port State	Forwarding
Status	Redundancy lost. Control failure.

N-Link Partner Information	
State	Unknown
MAC	00:07:affe:af:c0
Coupler Port State	Unknown
Status	Unknown

### N-Link Status View

State	Slave
Control Port	TX3
Partner Port	TX2
Coupler Port	TX4
Coupler Port State	Blocking
Status	Redundancy lost. Control failure.

N-Link Partner Information	
State	Unknown
MAC	00:07:affe:c4:40
Coupler Port State	Unknown
Status	Unknown

Below is an example of N-Link Status from an N-Link Master and Slave where the Partner link is broken:

<b>N-Link Status View</b>	
State	Master
Control Port	TX3
Partner Port	(None)
Coupler Port	TX4
Coupler Port State	Forwarding
Status	Partner port is not known.

<b>N-Link Partner Information</b>	
State	Slave
MAC	00:07:aff:9c:e0
Coupler Port State	Blocking
Status	Partner port is not known.

<b>N-Link Status View</b>	
State	Slave
Control Port	TX3
Partner Port	(None)
Coupler Port	TX4
Coupler Port State	Blocking
Status	Partner port is not known.

<b>N-Link Partner Information</b>	
State	Master
MAC	00:07:aff:38:a0
Coupler Port State	Forwarding
Status	Partner port is not known.

**HELP > N-LINK** Following the N-Link link on the help page, the user or user can see some information regarding the configuration options in the N-Link category on the left side of the web management interface.

The screenshot shows the N-Tron web management interface. The browser address bar displays `http://192.168.1.201/main.ssi`. The interface features a navigation menu on the left with the following items: Administration, DHCP, LLDP, Ports, Statistics, VLAN, Bridging, RSTP, IGMP, N-View, N-Ring, N-Link, CIP, Firmware/Config, Support, Rate Limiting, User Management, Logical View, Home, Config, Help, and Logout. The main content area is titled "N-Link" and contains the following information:

N-Link is divided into two categories: 1. Configuration 2. Status

**Configuration**

If switch is an N-Link Master, the following data will be shown:

<b>N-Link Mode:</b>	The N-Link mode of switch.
<b>Control Port:</b>	The Control Port is used to convey N-Link control information. There must be a direct link between the Master and Slave Control ports. Use of media converters or other switches is not supported. The default is TX3.
<b>Primary Coupler Port:</b>	The Coupler Port is used to establish a redundant path for Ethernet data transmission. If the Role of the switch is Master the port will be a Primary Coupler. The default is TX4.

If switch is an N-Link Auto Configure, the following data will be shown:

<b>N-Link Mode:</b>	The N-Link mode of switch.
<b>Default Coupler Port:</b>	The Coupler Port is used to establish a redundant path for Ethernet data transmission. If the Role of the switch is Slave the port will be a Standby Coupler. The default is TX4.

**Status**

If switch is an N-Link Master or Slave, the switch Status and Partner information will be shown. (Red background designates a fault condition.)

<b>State:</b>	Current N-Link mode of switch.
<b>Control Port:</b>	The port being used to convey control information. There must be a direct link between the Master and Slave Control ports. Use of media converters or other switches is not supported.
<b>Partner Port:</b>	The port being used for normal communication between the N-Link Master and N-Link Slave switch. There must be a direct link between the Master and Slave Partner ports. Use of media converters or other switches is not supported. This port will be detected automatically.
<b>Coupler Port:</b>	The port being used to establish a redundant path for Ethernet data transmission.
<b>Coupler Port State:</b>	Blocking, Forwarding.
<b>Status:</b>	No errors will show "OK", otherwise a description of the Faults detected.

N-Link Partner Information

<b>State:</b>	Current N-Link mode of switch.
<b>MAC:</b>	The MAC Address of the N-Link Partner switch.
<b>Coupler Port State:</b>	Blocking, Forwarding.
<b>Status:</b>	No errors will show "OK", otherwise a description of the Faults detected.

If switch is an N-Link Auto Configure and not a Slave, the Coupler port will be shown.

<b>N-Link State:</b>	Current N-Link mode of switch.
<b>Coupler Port:</b>	The port used to establish a redundant path for Ethernet data transmission. This port will be detected automatically.

**CIP™**

**CIP > CONFIGURATION** The Configuration tab under the CIP category displays basic variables for CIP, and the status:

**CIP STATUS**

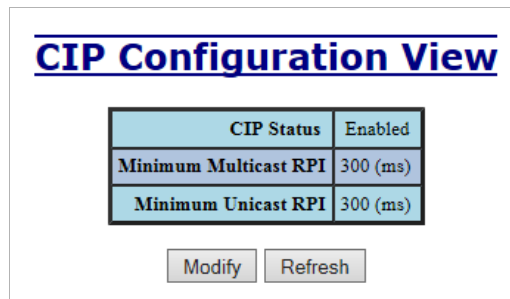
Enables or Disables CIP on the Switch. Default: Enabled.

**MINIMUM MULTICAST RPI:**

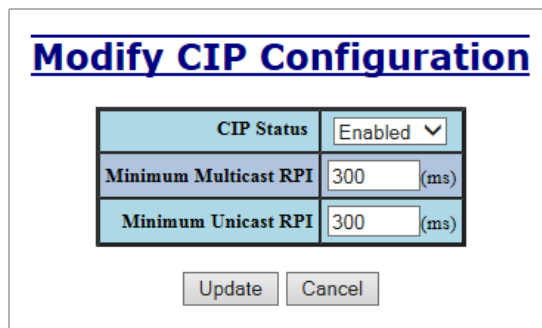
The minimum Requested Packet Interval for Class 1 (multicast) connections, in milliseconds. Requests for less than this value will be rejected. Default = 1 second.

**MINIMUM UNICAST RPI:**

The minimum Requested Packet Interval for Class 3 (unicast) connections, in milliseconds. Requests for less than this value will be rejected. Default = 1 second.



By selecting Modify on the above example, the user can modify the variables. Additionally, you may Disable or Enable CIP altogether.



**CIP > STATUS** The Status tab under the CIP category will display the CIP status.

The following switch status and partner status information will be shown:

**Table 2-4 Switch CIP Identity Information**

Status Field	Description
Product Name:	Switch Model Number.
Vendor:	This is N-Tron's ODVA Ethernet/IP Vendor ID (1006).
Device Type:	The ODVA Device Type is Communications Adapter (= 0x0C hex).
Major Revision:	The Major Revision of the CIP implementation.

Status Field	Description
Minor Revision:	The Minor Revision of the CIP implementation.
Serial Number (hex):	CIP Serial number, unique across all N-Tron CIP devices. This is the last 4 octets of the base switch MAC.

**Table 2-5 Switch CIP Connection Partner Information**

Status Field	Description
Number of Multicast Connections:	Current number of CIP Ethernet/IP class 1 (multicast) connections.
Number of Unicast Connections:	Current number of CIP Ethernet/IP class 3 (unicast) connections.

### CIP Status View

CIP Status	Enabled
------------	---------

Identity Information	
Product Name	N-Tron 708TX
Vendor	1006 (N-TRON)
Device Type	0x0C (hex) (Communications Adapter)
Major Revision	1
Minor Revision	7
Serial Number	0xAFEE5650 (hex)

Connection Information	
Number of Multicast Connections	0
Number of Unicast Connections	0

**HELP > CIP** Following the CIP link on the help page, the user or user can see some information regarding the configuration options in the CIP category on the left side of the web management interface.

The screenshot shows a web browser window at <http://192.168.1.201/main.ssi>. The N-Tron logo is visible at the top left. A navigation menu on the left lists various system functions, with 'CIP' selected. The main content area displays a table of configuration options:

Administration	DHCP	LLDP	Ports
Statistics	VLAN	Bridging	RSTP
IGMP	N-View	N-Ring	N-Link
CIP	Firmware/Config	Rate Limiting	User Management
Other			

Below the table, the section **CIP - Common Industrial Protocol** is shown. It states that CIP is divided into two categories: 1. Configuration and 2. Status.

**Configuration**

<b>CIP Status:</b>	Indicates whether CIP is enabled or disabled.
<b>Minimum Multicast RPI:</b>	The minimum Requested Packet Interval for Class 1 (multicast) connections, in milliseconds. Requests for less than this value will be rejected.
<b>Minimum Unicast RPI:</b>	The minimum Requested Packet Interval for Class 3 (unicast) connections, in milliseconds. Requests for less than this value will be rejected.

**Status**

<b>CIP Status:</b>	Indicates whether CIP is enabled or disabled.
--------------------	-----------------------------------------------

**Identity Information:**

<b>Product Name:</b>	Switch Model Number.
<b>Vendor:</b>	This is N-Tron's ODVA EtherNet/IP Vendor ID (1006).
<b>Device Type:</b>	The ODVA Device Type is Communications Adapter (= 0x0C hex).
<b>Major Revision:</b>	The Major Revision of the CIP implementation.
<b>Minor Revision:</b>	The Minor Revision of the CIP implementation.
<b>Serial Number:</b>	CIP Serial number, unique across all N-Tron CIP devices. This is the last 4 octets of the base switch MAC.

**Connection Information:**

<b>Number of Multicast Connections:</b>	Current number of CIP Ethernet/IP class 1 (multicast) connections.
<b>Number of Unicast Connections:</b>	Current number of CIP Ethernet/IP class 3 (unicast) connections.

At the bottom left of the page, it says: © 2016 Red Lion Controls, Inc. All rights reserved. <http://www.redlion.net>. Logged in as: admin.



## FIRMWARE/CONFIG

**FIRMWARE/CONFIG > TFTP** The TFTP tab under the Firmware/Config category gives an administrator the ability to upload or download a settings configuration file for a 700/7000 model switch. This allows an user to backup their configurations in case they need to reload their custom configurations at a later time. An administrator can also download an Image or Boot Image file to the switch via TFTP, allowing them to update the firmware without losing their current configurations and without having to send the unit back to Red Lion for updates. It is important not to cycle power on the switch or interrupt the data connection between the TFTP server and the switch while downloading or uploading a file. The switch will not stop working if this does occur, but the user will have to re-transfer the file.

**TFTP - Firmware/Config**

Server IP Address	192.168.1.205
File Name	700Series.Image
Transfer Type	Download image from server

Action Cancel

**TFTP - Firmware/Config**

Server IP Address	192.168.1.205
File Name	Upload saved config to server Download config from server Download XML config from server Download image from server Download boot image from server
Transfer Type	

Action Cancel

**Download Image**

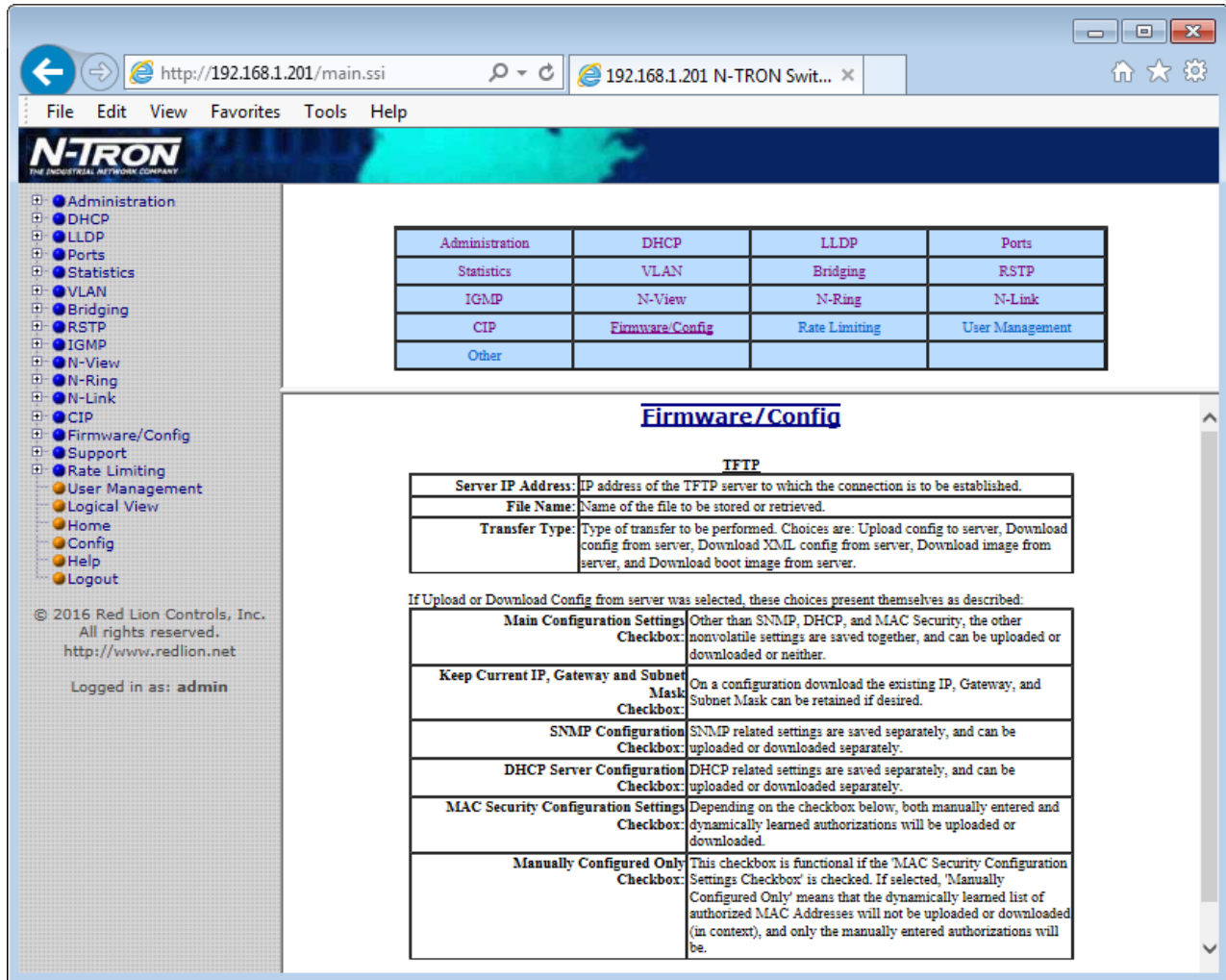
Transferring "Image" from server (192.168.1.12).

Image transferred successfully.

**Resetting switch (192.168.1.228)**

**Please wait...**

**HELP > FIRMWARE/CONFIG** Following the Firmware/Config link on the help page, the user or user can see some information regarding the configuration options in the Firmware/Config category on the left side of the web management interface.



## RATE LIMITING

**RATE LIMITING >** The Rate Limiting link will display the Broadcast Packet Count Limiting (BPCL) Configuration for all installed ports. Rate Limiting defaults to 3%.

**Broadcast Rate Limit View**

Port Name	Broadcast Pass Rate [%]
TX1	3
TX2	3
TX3	3
TX4	3
TX5	3
TX6	3
TX7	3
TX8	3

Modify Refresh

By selecting Modify on the above example, the user can modify the BPCL Percentage for each port.

**Broadcast Rate Limit Configuration**

Port Name	Broadcast Pass Rate [%]
TX1	

Update Cancel

... have been made that have not been saved

**RATE LIMITING > MULTICAST** The Rate Limiting link will display the Multicast Packet Count Limiting (MPCL) Configuration for all installed ports. Rate Limiting defaults to 3%.

**Multicast Rate Limit View**

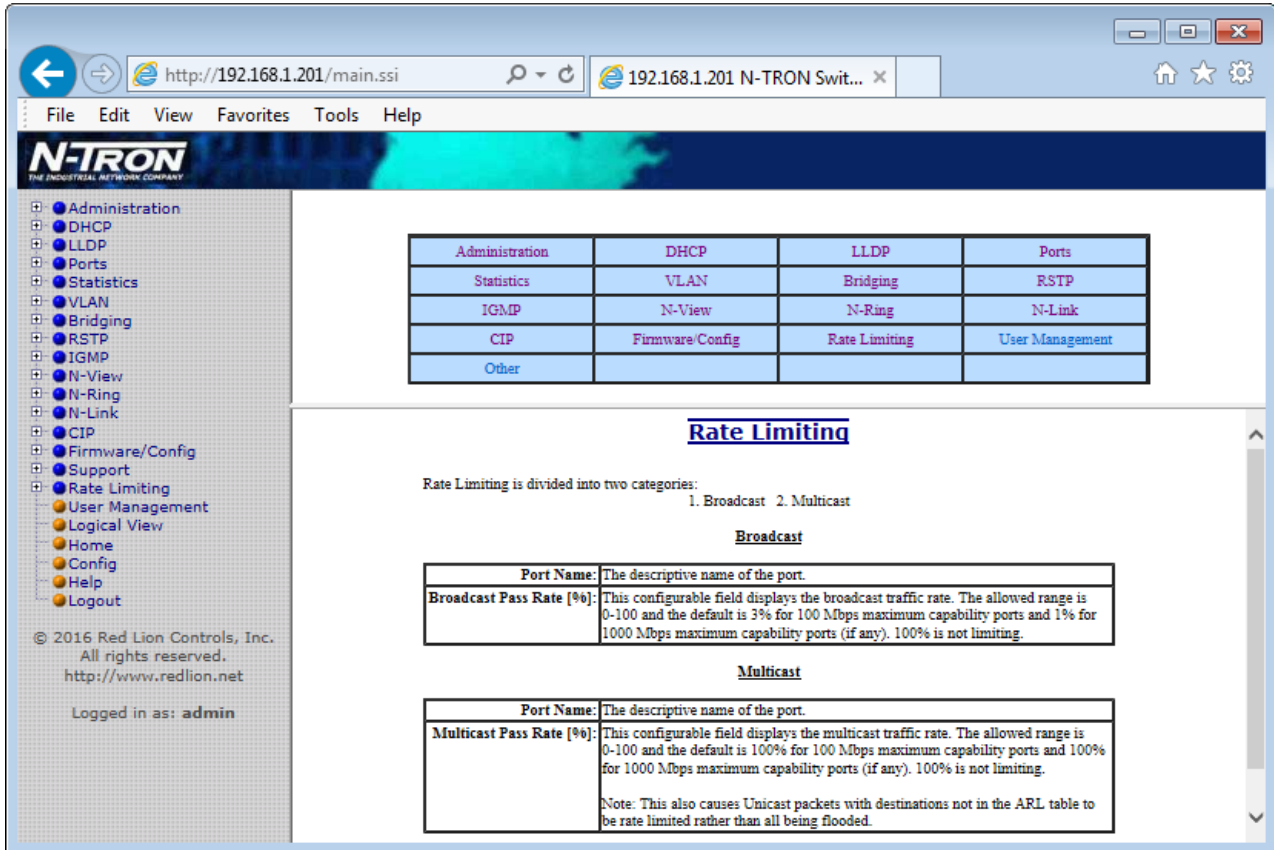
Port Name	Multicast Pass Rate [%]
TX1	100
TX2	100
TX3	100
TX4	100
TX5	100
TX6	100
TX7	100
TX8	100
FX1	100
FX2	100
GB1	100
GB2	100

By selecting Modify on the above example, the user can modify the MPCL Percentage for each port.

**Multicast Rate Limit Configuration**


Port Name	Multicast Pass Rate [%]
TX1	
TX2	
TX3	
TX4	
TX5	
TX6	
TX7	
TX8	
FX1	
FX2	
GB1	
GB2	
All	

**HELP > RATE LIMITING** Following the Rate Limiting link on the help page, the user or user can see some information regarding the configuration options in the Broadcast and Multicast rate limiting category on the left side of the web management interface.



## USER MANAGEMENT

**USER MANAGEMENT > AUTHORIZED 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.

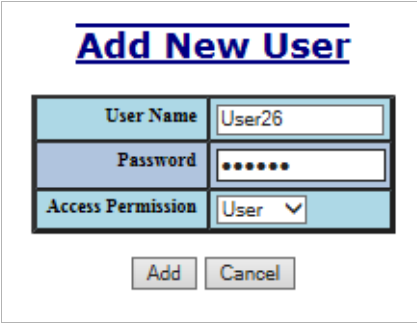


**Authorized Users**

No.	User Name	Access Permission
01	admin	admin

Add Remove Refresh

**USER MANAGEMENT > ADD USER** Following the Add button on the above example, the user can add another user and assign the user a username, a password, and the user's permissions (user/user).



**Add New User**

User Name	User26
Password	*****
Access Permission	User

Add Cancel

The new user will be added to the table of Authorized Users.

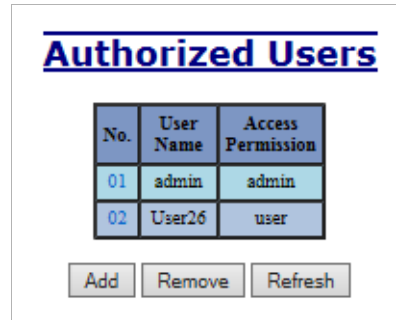


**Authorized Users**

No.	User Name	Access Permission
01	admin	admin
02	User26	user

Add Remove Refresh

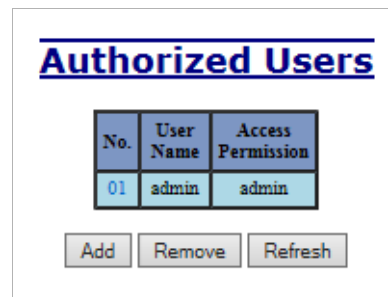
**USER MANAGEMENT >** In order to remove a user, simply click on the Remove button at the bottom of the  
**REMOVE USER** page.



Following the Remove button on the above example, the user can remove a user by entering in the user's name and clicking the Remove button.



The user will be removed from the table of Authorized Users.



**Note:** There are a maximum number of 5 users per switch. User access permissions grants the right to view switch configurations and to view port settings, but not to make changes to these settings. Admin access permissions grants the right to change and view switch configurations and to change and view port settings.

**HELP > USER MANAGEMENT** Following the User Management link on the help page, the user or user can see some information regarding the configuration options in the User Management category on the left side of the web management interface.

The screenshot shows a web browser window with the URL `http://192.168.1.201/main.ssi`. The browser title is "192.168.1.201 N-TRON Swit...". The page features the N-Tron logo and a navigation menu on the left. The main content area displays a table of configuration options and a section titled "User Management".

Administration	DHCP	LLDP	Ports
Statistics	VLAN	Bridging	RSTP
IGMP	N-View	N-Ring	N-Link
CIP	Firmware/Config	Rate Limiting	User Management
Other			

**User Management**

The User Management screen allows users to view, add and remove system user accounts.

User Management	
No.:	User table index
User Name:	User name string
Access Permission:	A user can have Admin (read/write) or User (read-only) privileges.

- Usernames may include all alphanumeric characters, "\_" and "-" and must be 3 to 15 characters long.  
- Passwords may include all printable characters except "." and spaces and must be 3 to 15 characters long.

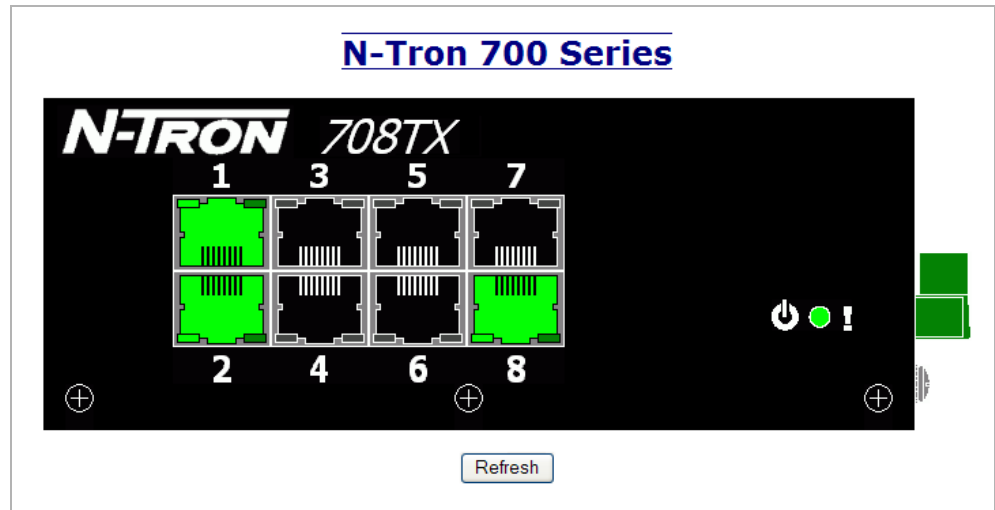
© 2016 Red Lion Controls, Inc.  
All rights reserved.  
<http://www.redlion.net>  
Logged in as: admin



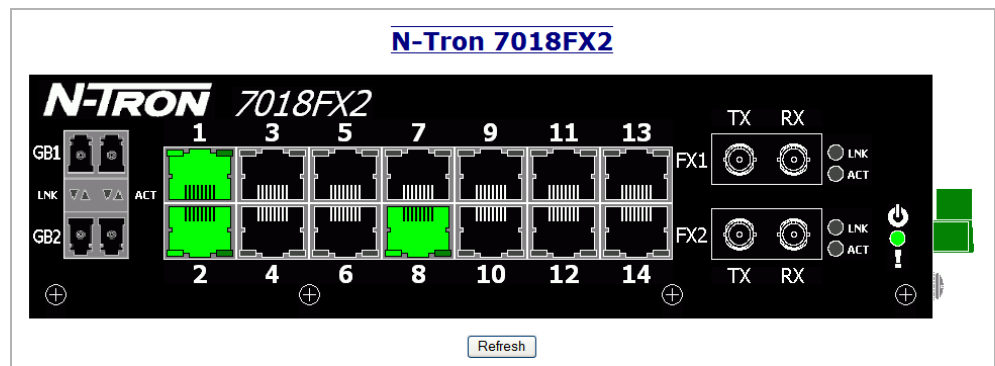
## LOGICAL VIEW

The Web Management interface offers a logical view of the switch. Here a user or user can see a graphical depiction of the switch. Ports that are linked will appear in green, while ports that are not linked will appear in black.

**700 MODEL** The example below of an N-Tron Series 708TX model shows ports 1, 2, and 8 linked. The other ports are currently in the down state (not linked).



**7018 MODEL** The example below of an N-Tron Series 7018FX2 model shows ports 1, 2, and 8 linked. The other ports are currently in the down state (not linked).



## CONFIGURATION

The Configuration section of the web management interface gives an user the ability to save a running configuration into the NVRAM. This allows the switch to remember any changes after a power cycle.

**CONFIGURATION > SAVE** The “Save” button will save all current changes made to the configuration for use after the next power cycle.

**CONFIGURATION > RESET** The “Reset” button will discard all unsaved changes, reset the switch and load the most recently saved configuration settings.

**CONFIGURATION > FACTORY** The “Factory” button will reload the factory default configuration settings. In many cases it is desirable to restore factory defaults but retain certain settings. Check boxes are provided to select the desired behavior.

The screenshot shows a web interface titled "Configuration Save Or Reset". It is divided into three sections by horizontal lines. The first section has the heading "Configuration Save Or Reset" in blue, underlined text. Below it is the instruction "Click 'Save' button to save changes to the configuration." followed by a "Save" button. The second section has the instruction "Click 'Reset' button to reset the switch and load the most recently saved configuration." followed by a "Reset" button. The third section has the instruction "Click 'Factory' button to reset switch to factory defaults." followed by five checked checkboxes with the following labels: "Keep current IP address, subnet mask, and gateway.", "Keep current user names and passwords.", "Keep currently stored SNMP settings.", "Keep currently stored DHCP Server settings.", and "Keep currently stored MAC Security settings." Below these checkboxes is a "Factory" button.

## HELP

**HELP > OVERVIEW** When the Help link is clicked on, you will see the Overview page containing some basic definitions and more specific choices in the table at the top of the screen. Although this screen page is not as detailed as information contained in the manual, it provides a basic feel for the different switch features. The Help screen displayed with each menu tree item, when selected from the Help Overview page, is provided within the manual pages documenting each menu tree item.

The screenshot shows the N-TRON WebConsole interface. On the left is a navigation menu with items like Administration, DHCP, LLDP, Ports, Statistics, VLAN, Bridging, RSTP, IGMP, N-View, N-Ring, N-Link, CIP, Firmware/Config, TFTP, Support, Rate Limiting, Broadcast, Multicast, User Management, Logical View, Home, Config, Help, and Logout. The main content area displays the 'Overview' page. At the top of the main content is a table listing various menu items. Below the table is the 'Overview' section, which provides information on configuring and monitoring the device's parameters. It lists major software functions and defines various UI controls like Button Field, Radio Button, Label Field, List Field, and Text Field. It also lists buttons in the WebConsole: Modify, Refresh, Update, Cancel, and Done.

Administration	DHCP	LLDP	Ports
Statistics	VLAN	Bridging	RSTP
IGMP	N-View	N-Ring	N-Link
CIP	Firmware/Config	Rate Limiting	User Management
Other			

**Overview**

This Help provides information on configuring and monitoring the manageable parameters of the device. The major software functions provided by N-TRON WebConsole are:

- Services to user's requests:** This function of the software is responsible for servicing the user requests remotely by using HTTP protocol.
- Graphical Representation:** This function of the software shows the graphical representation of the parameters of each port on the device.

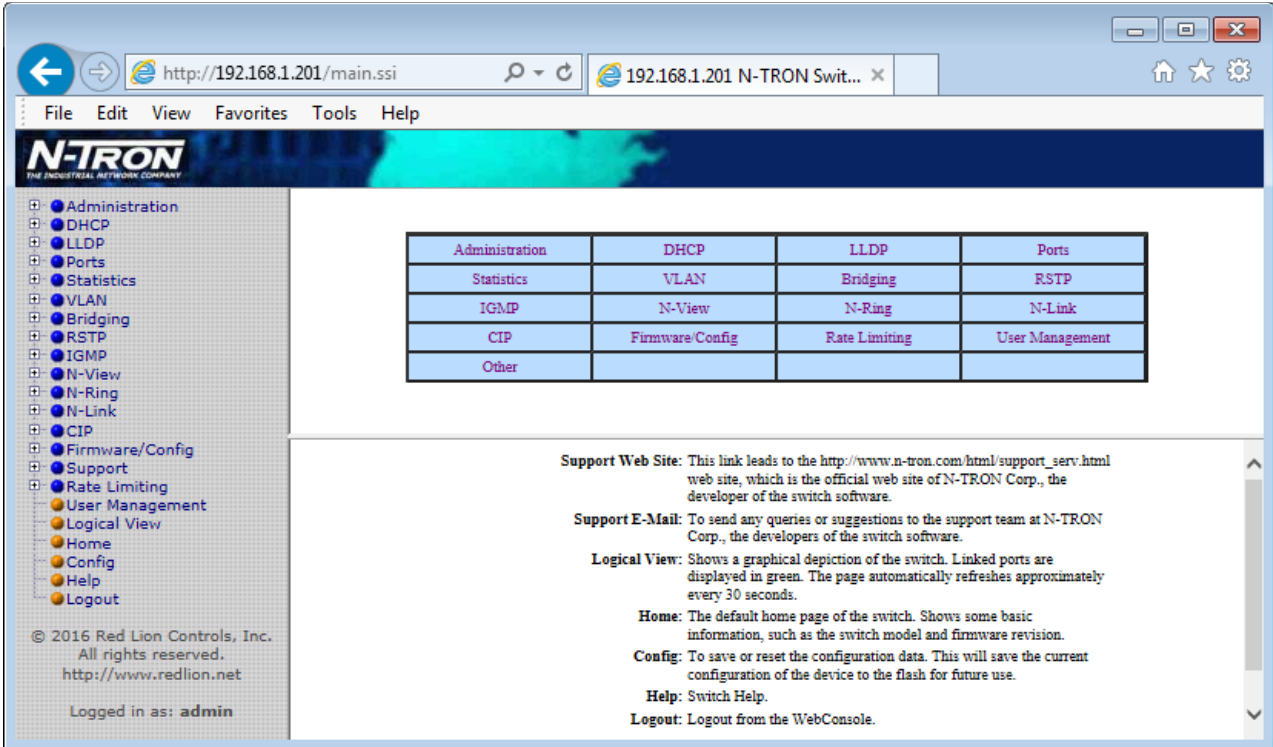
**Controls in WebConsole**

- Button Field:** A field that the user can click to perform operations.
- Radio Button:** This field provides a list of choices.
- Label Field:** A field that displays strings. This is a read-only field.
- List Field:** This field provides a list with scrolling capability (a table).
- Text Field:** A field to enter keyboard input.

**Buttons in WebConsole**

- Modify:** Click to change the existing configuration. This will lead to the modification of configuration parameters for the respective feature.
- Refresh:** Click to get the latest configuration from the device.
- Update:** Click to apply the new configuration changes.
- Cancel:** Click to skip the configuration changes and return to the previous page.
- Done:** Return to the previous page.

**HELP > OTHER** Following the Other link on the help page, the user or administrator can see some information regarding other links or categories on the left hand side of the web manager.



---

## SERVICE AND SUPPORT

**SERVICE > INFORMATION** We sincerely hope that you never experience a problem with any of our products. If you do need service, call Red Lion at 1-877-432-9908 for Technical Support. A trained specialist will help you determine the source of the problem. Many problems are easily resolved with a single phone call. If it is necessary to return a unit to us, an RMA (Return Materials Authorization) can be obtained on the [Red Lion website](#).

Red Lion tracks the flow of returned material with our RO system to ensure speedy service. You must include this RO number on the outside of the box so that your return can be processed immediately.

Be sure to have your original purchase order number and date purchased available.

We suggest that you give us a repair purchase order number in case the repair is not covered under our warranty. You will not be billed if the repair is covered under warranty.

Please supply us with as many details about the problem as you can. The information you supply will be written on the RO form and supplied to the repair department before your unit arrives. This helps us to provide you with the best service, in the fastest manner. Repairs are completed as soon as possible. If you need a quicker turnaround, ship the unit to us by air freight. We give priority service to equipment that arrives by overnight delivery.

We apologize for any inconvenience that the need for repair may cause you. We hope that our rapid service meets your needs. If you have any suggestions to help us improve our service, please give us a call. We appreciate your ideas and will respond to them.

### **For Your Convenience:**

Please fill in the following and keep this manual with your Red Lion system for future reference:

P.O. #: \_\_\_\_\_ Date Purchased: \_\_\_\_\_

Purchased From: \_\_\_\_\_

Serial Number: \_\_\_\_\_

## PRODUCT > SUPPORT

Inside US: +1 877 432-9908	Red Lion Controls
Outside US: +1 717 767-6511	20 Willow Springs Circle
Fax: +1 (717) 764-0839	York, PA 17406
E-mail: <a href="mailto:support@redlion.net">support@redlion.net</a>	Website: <a href="http://www.redlion.net">www.redlion.net</a>
Hours: 8:00 am to 6:00 pm EST	

# COMMAND LINE INTERFACE

This section provides a detailed description of the Command Line Interface, along with examples for the commands.

This section includes these chapters:

["Using the Command Line Interface" on page 109](#)

["CLI General Commands" on page 113](#)

["CLI System Management Commands" on page 117](#)

["CLI Configuration Commands" on page 121](#)



## CHAPTER 3 USING THE COMMAND LINE INTERFACE

This chapter describes how to access and use the Command Line Interface (CLI).

The switch can be managed by entering command keywords and parameters at the switch's command-line interface (CLI). The CLI can be accessed over a direct connection to the switch's serial port or over a network connection using Telnet or Secure Shell (SSH).

**CONSOLE CONNECTION** To access the switch console through the serial port, perform these steps:

1. At the console prompt, enter the user name and password. (The default user name is "admin" and corresponding passwords of "admin". When the user name and password is entered, the CLI displays the console prompt N-TRON/Admin> and enters user access mode.
2. Enter the necessary commands to complete your desired tasks.
3. When finished, exit the session with the "logout" command.

**TELNET CONNECTION** Telnet operates over the IP transport protocol. In this environment, your management station and any network device you want to manage over the network must have a valid IP address. Valid IP addresses consist of four numbers, 0 to 255, separated by periods. Each address consists of a network portion and host portion. For example, the IP address assigned to this switch, 10.1.0.1, consists of a network portion (10.1.0) and a host portion (1).



---

Note: The IP address for this switch is obtained via DHCP by default.

---

To access the switch through a Telnet session, you must first set the IP address and gateway of the switch using the SysIP command as described in [Chapter 5 CLI System Management Commands](#).

If your network is connected to another network outside your location or to the Internet, you need to apply for a registered IP address. However, if you are attached to an isolated network, then you can use any IP address that matches the network segment to which you are attached.

After you configure the switch with an IP address, you can open a Telnet session by performing these steps:

1. From the remote host, enter the Telnet command and the IP address of the device you want to access.
2. At the prompt, enter the user name and system password. The CLI will display the "Vty-*n*#" prompt for the user to show that you are using admin access mode where *n* indicates the number of the current Telnet session.
3. Enter the necessary commands to complete your desired tasks.
4. When finished, exit the session with the "logout" command.



---

## ENTERING COMMANDS

This section describes how to enter CLI commands.

**KEYWORDS AND ARGUMENTS** A CLI command is a series of keywords and arguments. Keywords identify a command, and arguments specify configuration parameters. For example, in the command “cip -show,” **cip** is a keyword, **-show** is an argument that specifies the desired action to show the CIP™ configuration.

You can enter commands as follows:

- To enter a simple command, enter the command keyword.
- To enter multiple commands, enter each command in the required order. For example, to enable the CIP configuration, and display the configuration, enter:

```
N-TRON/Admin> cip enable  
N-TRON/Admin> cip -show
```

- To enter commands that require parameters, enter the required parameters after the command keyword. For example, to change the current static IP configuration, subnet mask, and gateway enter:

```
N-TRON/Admin> sysip -i 192.168.2.119 -s 255.255.252.0 -g 192.168.1.1
```

**MINIMUM ABBREVIATION** The CLI will accept a minimum number of characters that uniquely identify a command. For example, the command “configure” can be entered as **con**. If an entry is ambiguous, the system will prompt for further input.

**SHOWING COMMANDS** If you enter a “?” at the command prompt, the system will display the first level of keywords or command groups. You can also display a list of valid keywords for a specific command. For example, the command “**igmp ?**” displays a list of possible igmp commands:

```
N-TRON/Admin> igmp ?
```

**CONFIGURATION COMMANDS** Configuration commands are used to modify switch settings. These commands modify the running configuration only and are not saved when the switch is rebooted. To store the running configuration in non-volatile storage, use the **config save** command.

**COMMAND LINE PROCESSING** Commands are not case sensitive. You can abbreviate commands and parameters as long as they contain enough letters to differentiate them from any other currently available commands or parameters. You can use the Tab key to complete partial commands, or enter a partial command followed by the “?” character to display a list of possible matches. You can also use the following editing keystrokes for command-line processing:

Keystroke	Function
Ctrl-A	Shifts cursor to start of command line.
Ctrl-B	Shifts cursor to the left one character.
Ctrl-C	Terminates the current task and displays the command prompt.
Ctrl-E	Shifts cursor to end of command line.
Ctrl-F	Shifts cursor to the right one character.
Ctrl-K	Deletes all characters from the cursor to the end of the line.
Ctrl-L	Repeats current command line on a new line.
Ctrl-N	Enters the next command line in the history buffer.
Ctrl-P	Enters the last command.
Ctrl-R	Repeats current command line on a new line.
Ctrl-U	Deletes from the cursor to the beginning of the line.
Ctrl-W	Deletes the last word typed.
Esc-B	Moves the cursor back one word.
Esc-D	Deletes from the cursor to the end of the word.
Esc-F	Moves the cursor forward one word.
Delete key or backspace key	Erases a mistake when entering a command.

**CLI COMMAND GROUPS** The system CLI commands most frequently used with these switches can be broken down into the functional groups shown below.

Command Group	Description	Page
General	Basic commands for entering access mode using login, restarting the system, or quitting the CLI - logout	<a href="#">page 113</a>
System Management	These commands are used to set the system IP configuration mode, system configuration, and monitor system errors.	<a href="#">page 117</a>
CLI Configuration Commands	Show or set the Mirror, SNMP, IGMP, N-Ring™, N-View™ or CIP Configuration. Show, add or delete ARL entries. Save or reset configuration settings. Show or clear system errors	<a href="#">page 121</a>



# CHAPTER 4 CLI GENERAL COMMANDS

These commands are used to control the command access mode, configuration mode, and other basic functions.

Command	Function
? (Help)	Shows a list of all commands or to get help on a specific command.
Logout	Logout of console interface.
Ping	Confirms connectivity with a Host.
Reset	Restarts (reboot) the switch.
Sysinfo	Shows the switch system information.

**? (Help)** Show a list of all commands or get help on a specific command.

Without *cmd*, this command will list all the available commands.

If *cmd* is specified and if it matches a specific command, the **usage** of the command will be displayed; otherwise, if *cmd* matches the prefix of a command, the name of the command will be listed.

If ? is preceded by another ?, the usage and description of this command will be displayed.

**SYNTAX**

? [cmd]

**PARAMETERS**

cmd

The command for which to get help.

**DEFAULT SETTING**

None

**EXAMPLE**

```
N-TRON/Admin> ?
The above command displays all the available commands.

N-TRON/Admin> abcd ?
Unknown Command: "abcd"

Type "?" for a list of available commands.

N-TRON/Admin> logout ?
Logout
Log out of console interface.

SYNTAX:
Logout
```

```
N-TRON/Admin> ? pi
Ping
  Ping a host.
...
N-TRON/Admin> ??
?
  Show a list of all commands or get help on a specific command.

SYNTAX:
  ? [cmd]

OPTIONS:
  cmd : The command for which to get help.
```

**Logout** Used to log out of the console interface and end a command session.

**SYNTAX**

**logout**

**PARAMETERS**

None

**DEFAULT SETTING**

None

**EXAMPLE**

```
N-TRON/Admin> logout
```

**Ping** Use to ping a host to confirm connectivity.

**SYNTAX**

**ping [-t] [-n count] [-w timeout] target\_name**

**PARAMETERS**

**target name**

IP address or host name

**-t**

Ping the specified host until stopped.

To see statistics and continue - type Space;

To stop - type Control-C.

**-n count**

Number of echo requests to send.

**-w timeout**

Timeout in milliseconds to wait for each reply.

#### DEFAULT SETTING

None

#### EXAMPLE

```
N-TRON/Admin> ping 192.168.1.119
...
N-TRON/Admin> ping -n 6 192.168.1.119
...
N-TRON/Admin> ping -t 192.168.1.119
...
N-TRON/Admin> ping -w 2000 192.168.1.119

Reply from 192.168.1.119: time=970ms
Reply from 192.168.1.119: time<10ms
Reply from 192.168.1.119: time<10ms

Ping statistics for 192.168.1.119:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss)
    Approximate round trip times in milliseconds:
        Minimum = 0ms, Maximum = 970ms, Average = 320ms
```

**Reset** Used to reset (reboot) the switch.

#### SYNTAX

**reset**

#### PARAMETERS

None

#### DEFAULT SETTING

None

#### EXAMPLE

```
N-TRON/Admin> reset

Preparing for reset.
Cleaning up...
  Browser will be redirected to 192.168.1.250.
  Disabling SNMP...
  Disabling DHCP...
  Disabling CIP...
Locking out other processes...
Disable preemption...
Resetting device...
```

**Show System Information** Used to display the system information of the switch.

**SYNTAX**

**sysinfo**

**PARAMETERS**

None

**DEFAULT SETTING**

None

**EXAMPLE (708TX MODEL SHOWN)**

```
N-TRON/Admin> sysinfo

+++++
+
+ N-Tron 700/7018 Series
+
+++++
+
+ Model:          708TX
+ Boot Loader:    BL 2.0.5.1 (0x02000501)
+ OS Version:     2.0.5
+ Build Date:     Mar 16 2009 at 11:19:27
+ Copyright:      Copyright (c) 2008-2009 N-Tron Corporation All rights reserved.
+
+ Processor:      66 MHz (66000000)
+ SDRAM Size:     16 MB
+ Flash Size:     8 MB
+ File System:    6422528 Bytes, 1432576 Free, 4989952 Used, 0 Bad
+ MAC Address:    00:07:af:fe:af:c0
+ IP Address:     192.168.1.201
+ Subnet Mask:    255.255.255.0
+ Gateway:        192.168.1.1
+
+++++
```

## CHAPTER 5 CLI SYSTEM MANAGEMENT COMMANDS

These commands are used to set the system IP configuration mode, system configuration, and monitor system errors.

Command	Function
Syserr	Show or clear the last system error.
Sysip	Set or show system IP configuration mode, IP address, subnet mask and gateway of this switch.
System	Show or set System configuration

### Network System Error

This command is used to show or clear the last System Error.

If the clear parameter is not specified, this command will display the last system error.

#### SYNTAX

**syserr** [clear]

#### PARAMETERS

##### Clear

Clear the last system error.

#### DEFAULT SETTING

None

#### EXAMPLE

```
N-TRON/Admin> syserr  
Last System Error: None.
```

```
N-TRON/Admin> syserr clear  
Last System Error: Cleared.
```



**sysip** This command is used to show or set the system IP configuration mode, IP address, subnet mask, and gateway.

If no parameters are specified, this command will show the system IP addresses. A static IP, subnet mask, or gateway can be set while in either DHCP or static configuration mode as they will be used as the IP fallback when in DHCP mode. If the Static IP is set to the default system IP address, IP fallback will not occur. All system addresses must be formatted as: xxx.xxx.xxx.xxx.

#### SYNTAX

**sysip** [-c config\_mode] [-i static\_ip] [-s static\_subnet\_mask] [-g static\_gateway]

#### PARAMETERS

**-c config\_mode**

s(tatic) or d(hcp).

**-i static\_ip**

Static IP address (for static config mode and IP fallback).

**-s static\_subnet\_mask**

Static sub net mask (for static config mode and IP fallback).

**-g static\_gateway**

Static gateway address (for static config mode and IP fallback).

#### DEFAULT SETTING

None

#### EXAMPLE

```

N-TRON/Admin> sysip

IP Configuration Mode : Static
Static IP Address   : 192.168.1.225
Static subnet Mask  : 255.255.255.0
Static gateway     : 192.168.1.1

N-TRON/Admin> sysip -c dhcp

IP Configuration Mode : DHCP (has been changed)
Fallback IP Address   : 192.168.1.225
Fallback Subnet Mask  : 255.255.255.0
Fallback Gateway     : 192.168.1.1

Press <ENTER> to Save Changes and Restart the System Now
...
N-TRON/Admin> sysip -i 192.168.2.119 -s 255.255.252.0 -g 192.168.1.1

IP Configuration Mode : Static
Static IP Address   : 192.168.2.119 (has been changed)
Static Subnet Mask  : 255.255.252.0 (has been changed)
Static Gateway     : 192.168.1.1 (has been changed)

Press <ENTER> to Save Changes and Restart the System Now
...

```



Note: If the mode is set to DHCP and IP fallback occurs, DHCP requests will stop. If the mode is set to DHCP and the IP Configuration is retrieved from a DHCP server, IP fallback will not occur, even if the lease is lost.

**system** This command is used to show or set System configuration.

If no parameters are specified, this command will show the System configuration (same as -show parameter).

#### SYNTAX

**system** [-show] [-name label] [-browser state]

#### PARAMETERS

##### -show

Show configuration.

##### -name label

Set the switch name.

##### -browser state

Set the browser access status to e(nabled) or d(isabled)

#### DEFAULT SETTING

None

#### EXAMPLE

```
N-TRON/Admin> system -name "Private switch" -browser disabled
```

```
IP Configuration : Static
Client ID (hex)   : 0007affbfa40 (7018 models only)
IP Address       : 192.168.1.201
Subnet Mask      : 255.255.255.0
Gateway         : 192.168.1.1
MAC Address      : 00:07:af:fb:fa:40
System Up Time   : 0 days, 17 hours, 10 mins, 56 secs
Name            : Private switch
Contact         : N-Tron Admin
Location        : Mobile, AL 36609
Browser Access   : Disabled
```

Changes have been made that have not been saved.

.....



Note: A switch name may only contain alphanumeric, space, '.', '-', '\_', and '#' characters, and may not begin with a number, space, or underscore. A name with embedded space characters must be enclosed in quotes.



## CHAPTER 6 CLI CONFIGURATION COMMANDS

This chapter describes the following configuration commands:

- [Configuration Device Operations](#)
- [Save or Reset Configuration Settings](#)
- [Show, Add or Delete ARL Entries](#)
- [Show or Set CIP™ Configuration](#)
- [Show or Set IGMP Configuration](#)
- [Show or Set Mirror Configuration](#)
- [Show or Set N-Ring™ Configuration](#)
- [Show or Set N-View™ Configuration](#)
- [Show or Set Port Configuration](#)
- [Show or Set SNMP Configuration](#)

**CONFIGURATION DEVICE OPERATIONS** Use the `cfgdev` command to show, compare or erase information on the configuration device. This command is applicable only to models with configuration device capability: 7010TX, 7012FX2, 7026TX, 709FX, 710FX2, 711FX3, 712FX4, 714FX6, 7506GX2 and 7900CPU.

### SYNTAX

**CfgDev** info | format [-m model] | compare | erase

### PARAMETERS

#### Info

Show information about the configuration device.

#### Compare

Compare the configuration of the switch to the configuration device.

#### Erase

Erase the switch configuration the configuration device.

### DEFAULT SETTING

None

### EXAMPLE

```
N-TRON/Factory> cfgdev info
```

```
Port A: 0xd080  
Board ID: 0x0005 (5)
```

```
Configuration device information:  
Name      : SDS128M
```

```

Model      : 3
Version    : 1
Page Size  : 200
Total Size : 127008768
Max Clock (Hz) : 400000
Write Cycles (ns): 5000000
Flags      : 0x00000001
    
```

```
N-TRON/Factory> cfgdev compare
```

```

Comparing switch configuration to the configuration device...
The configurations are different.
    
```

```
N-TRON/Factory> cfgdev erase
```

```
Erasing configuration device...
```

```
Configuration device erase completed.
```

**SAVE OR RESET CONFIGURATION SETTINGS** Use the config command to save or reset the configuration settings.

**SYNTAX**

```
config -s[ave] | r[eset]
```

**PARAMETERS**

**-save**

Save current running configuration settings.

**-reset**

Reset configuration settings to factory defaults.

**DEFAULT SETTING**

None

**EXAMPLE**

```
N-TRON/Admin> config save
```

```
Save Settings...
```

```
Settings have been saved.
```

```
N-TRON/Admin> config reset
```

```
Resetting to factory defaults...
```

```
Load factory default settings [y/n]?y
```

```
Keep IP, subnet mask, and gateway addresses [y/n]?y
```

```
Keep current user names and passwords [y/n]?y
```

```
...
```

**SHOW, ADD OR DELETE ARL ENTIRES** Use the arl command to show, add or delete ARL entires. If no parameters are specified, this command will show the ARL entries (same as -show parameter).

**SYNTAX**

**arl** -show | showmct | add mac port cpu static vid | del[ete] mac vid

**PARAMETERS**

**-show**

Show entire ARL table.

**-showmct**

Show entire ARL MCT (Multicast Index) table.

**-add**

Add MAC Address.

**-mac**

MAC Address.

**-port**

Port Number.

**-cpu**

1 = Send to CPU also.

**-static**

1 = This is a static address; 0 = Non-Static.

**-vid**

VLAN ID (0-4095).

**DEFAULT SETTING**

None

**EXAMPLE**

```
N-TRON/Admin> arl -show

No. Val Age Pri Mod Usr Sta VLAN   MAC      Port(s)
-----
 1  1  1  0  0  0  1  1 00:07:af:ff:b8:00 CPU
 2  1  0  0  0  0  0  1 00:19:b9:03:aa:77 TX3

N-TRON/Admin> arl showmct

No. Idx Val Port Mask  Port(s)
-----
 1  0  1 0x00000000 (None)
 2  1  1 0x00000001 TX1

N-TRON/Admin> arl add 00:19:b9:03:aa:79 3 0 1 1

N-TRON/Admin> arl del 00:19:b9:03:aa:79 1
```

**SHOW OR SET CIP™ CONFIGURATION** Use the `cip` command to show or set the CIP configuration. If no parameters are specified, this command will show the CIP configuration (same as `-show` parameter).

**SYNTAX**

`cip [-e[nable]] [-d[isable]] [-show]`

**PARAMETERS**

**-cip -show**

Show CIP configuration.

**-cip [-e[nable]] [-d[isable]]**

Set the CIP status to e(nabled) or d(isabled).

**DEFAULT SETTING**

None

**EXAMPLE**

```

N-TRON/Admin> cip -show

CIP Configuration:
-----
Status:           Enabled
EthIp Interval:   10 ms
Cache Interval:   2000 ms

Identity Information:
-----
Product Name:     N-TRON 708FX2
Vendor:           1006 (N-TRON)
Device Type:      0x0C (Communications Adapter)
Major Revision:   1
Minor Revision:   1
Serial Number:    0xAFFBF8F0

Connection Information:
-----
Multicast Connections: 0
Unicast Connections:  0

N-TRON/Admin> cip -disable
Changing CIP configuration...

CIP Configuration:
-----
Status:           Disabled
EthIp Interval:   10 ms
Cache Interval:   2000 ms

Identity Information:
-----
Product Name:     N-TRON 708FX2
Vendor:           1006 (N-TRON)
Device Type:      0x0C (Communications Adapter)
Major Revision:   1
Minor Revision:   1
Serial Number:    0xAFFBF8F0

Connection Information:
-----
Multicast Connections: 0
Unicast Connections:  0
N-TRON/Admin>
  
```

**SHOW OR SET IGMP CONFIGURATION** Use the IGMP command to show or set IGMP configuration. If no parameters are specified, this command will show the IGMP configuration (same as -show parameter).

**SYNTAX**

**igmp** [-show] [-status state]

**PARAMETERS**

**-show**

Show configuration.

**-status state**

Set the IGMP status to e(nabled) or d(isabled).

**DEFAULT SETTING**

None

**EXAMPLE**

---

```
N-TRON/Admin> igmp -show
```

```
IGMP Status      : Enabled
IGMP Version     : 2
Query Mode       : Auto
CIP Querier Status : 2, Active-Auto
Active Querier IP : 192.168.1.250
Router Mode      : Auto
Manual Router Ports : (None)
IGMP Number of Groups : 1
IGMP Resource Usage % : 1
```

```
N-TRON/Admin> igmp -status disabled
```

```
IGMP Status      : Disabled
IGMP Version     : 2
Query Mode       : Auto
CIP Querier Status : 2, Active-Auto
Active Querier IP : 192.168.1.250
Router Mode      : Auto
Manual Router Ports : (None)
IGMP Number of Groups : 1
IGMP Resource Usage % : 1
```

```
N-TRON/Admin>
```

---



**SHOW OR SET MIRROR CONFIGURATION** Use the mirror command to show or set Mirror configuration. If no parameters are specified, this command will show the Mirror configuration (same as -show parameter).

**SYNTAX**

**mirror** [-show] [-status state] [-dp portno] [-tx portlist] [-rx portlist]

**PARAMETERS**

**-show**

Show configuration.

**-status state**

Set the mirror status to e(nabled) or d(isabled).

**-dp portno**

Set the destination port number for mirrored frames.

**-tx portlist**

Set the source ports to mirror frames that are transmitted.

**-rx portlist**

Set the source ports to mirror frames that are received.

Note: The portlist parameter consists of port numbers and ranges, separated by commas. It may not contain space characters. Use "all" to set all ports as source ports, and use "none" to clear all ports from source ports.

**DEFAULT SETTING**

None

**EXAMPLE**

---

```
N-TRON/Admin> mirror -show
```

```
Mirror Status : Disabled
Destination Port : TX1
Tx Source Ports : (None)
Rx Source Ports : (None)
```

```
N-TRON/Admin> mirror -status enabled -dp 6 -tx 1,3-5 -rx 1,3,5
```

```
Mirror Status : Enabled
Destination Port : TX6
Tx Source Ports : TX1, TX3-TX5
Rx Source Ports : TX1, TX3, TX5
```

```
Changes have been made that have not been saved.
```

```
...
```

---

**SHOW OR SET N-RING™ CONFIGURATION** Use the nring command to show or set N-Ring configuration. If no parameters are specified, this command will show the N-Ring configuration (same as -show parameter).

**SYNTAX**

**nring** [-show] [-mode d | a | m] [-ports set\_id]

**PARAMETERS**

**-show**

Show configuration.

**-mode**

Set the N-Ring mode.

d = disabled, a = auto member, m = manager

**-ports set\_id**

Set the ring ports for N-Ring manager mode.

Specify port set identifier or use “?” to list available port sets.

**DEFAULT SETTING**

None

**EXAMPLE**

```
N-TRON/Admin> nring -show
```

```
N-Ring Mode : Auto Member  
Aging Time : 20
```

```
N-TRON/Admin> nring -ports ?
```

```
ID   Port Set  
--   -  
1    TX1 / TX2  
2    TX7 / TX8
```

```
N-TRON/Admin> nring -mode m -ports 2
```

```
Do you Want to Save Changes and Restart the System Now [y/n]?
```

```
...
```

**SHOW OR SET N-VIEW™ CONFIGURATION** Use the nview command to show or set N-View configuration. If no parameters are specified, this command will show the N-View configuration (same as -show parameter).

**SYNTAX**

**nview** [-show] [-status state]

**PARAMETERS**

**-show**

Show configuration.

**-status state**

Set the N-View status to e(nabled) or d(isabled).

**DEFAULT SETTING**

None

**EXAMPLE**

---

```
N-TRON/Admin> nview -show
```

```
N-View Status : Enabled  
N-View Interval : 5
```

```
N-TRON/Admin> nview -status disabled
```

```
N-View Status : Disabled  
N-View Interval : 5
```

```
Changes have been made that have not been saved.
```

```
...
```

---

**SHOW OR SET PORT CONFIGURATION** Use the port command to show or set a port configuration.

**SYNTAX**

**port** [-show] [-admin state] [-sd auto | 10h | 10f | 100h | 100f | 1000h | 1000f]  
[-flow state] [-fhp state] [-dp prio] [-dscp state] [-8021p state] [-pvid vid]  
[-ual percent] [-uah percent] [-security state] portno

**PARAMETERS**

**portno**

Port number to configure or show. Specify "all" to show all ports.

**-show**

Show configuration.

**-admin state**

Set the admin status for the port to e(nabled) or d(isabled).

**-sd**

Set the speed and duplex mode for the port.

auto = enable auto-negotiation

**-flow state**

Set the flow control for the port to e(nabled) or d(isabled).

**-fhp state**

Set force high priority for the port to e(nabled) or d(isabled).

**-dp**

Set the default QOS priority for the port. The range is 0-7.

**-dscp state**

Set the DSCP Priority for the port to e(nabled) or d(isabled).

**-8021p state**

Set the 802.1p Priority for the port to e(nabled) or d(isabled).

**-pvid**

Set the VLAN ID for the port. The range is 1-4094.

**-ual percent**

Set the usage alarm low percentage. The range is 0-100.

**-uah percent**

Set the usage alarm high percentage. The range is 0-100.

**-security state**

Set the security status for all supported ports to e(nabled) or d(isabled).

**DEFAULT SETTING**

None

**EXAMPLE**

```
N-TRON/Admin> port -sd 100f -flow enabled -dp 7 -pvid 2 5
```

Port No	Port Name	Admin Status	Link Stat	Auto Nego	Port Spd	Dupl Mode	Flow Control	Force High Pri	Def Pri	Port State	PVID
5	T X5	Enabled	Down	Disabled	100	Full	Enabled	Disabled	7	Disabled	2

Changes have been made that have not been saved.  
 . . .

**SHOW OR SET SNMP CONFIGURATION** Use the SNMP command to show or set SNMP configuration. If no parameters are specified, this command will show the SNMP configuration (same as -show parameter).

**SYNTAX**

**snmp** [-show] [-ro name] [-rw name] [-trap name] [-v number]

**PARAMETERS**

**-show**

Show configuration.

**-ro name**

Set the Authorized Community Name for SNMP Get requests.

**-rw name**

Set the Authorized Community Name for SNMP Set requests.

**-trap name**

Set the Authorized Community Name for SNMP Traps.

**-v number**

Set the Version Number for SNMP Traps to either 1 or 2.

**Note:** The Community names may only contain alphanumeric, space, '-', '\_', and '#' characters, and may not begin with a number, space, or underscore. A name with embedded space characters must be enclosed in quotes. The maximum length is 15 characters.

**DEFAULT SETTING**

None

**EXAMPLE**

```
N-TRON/Admin> snmp -ro users
```

```
IP Address - Trap Stn.#1 : Value Not Configured
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
Read-Only Community Name : users
Read-Write Community Name : private
Trap Community Name      : public
```

Changes have been made that have not been saved.  
 . . .

# CHAPTER 7 VLAN CONFIGURATION

This chapter includes the following VLAN configuration procedures and examples:

- [Add a VLAN](#)
- [Delete a VLAN](#)
- [VLAN Configuration Examples](#)
- [Port - Based VLAN](#)
- [Tagged VLAN \(Tagged Only\)](#)
- [Tagged VLAN \(All\)](#)
- [Hybrid VLAN](#)
- [Overlapping VLAN](#)
- [VLAN with Multicast Filtering](#)

---

## ADD/DELETE VLANS

**ADD A VLAN** This procedure is provided to guide you in adding a VLAN to your switch.

1. Navigate to the VLAN Configuration View screen (the factory default screen is shown for a 7018 model).

**VLAN Configuration View**

Replace VID With Default Port VID	<input type="checkbox"/>
Perform Ingress Filtering	<input type="checkbox"/>
Discard Non-Tagged For Ports	(None)

VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt
0001	Default VLAN	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8, TX9, TX10, TX11, TX12, TX13, TX14, FX1, FX2, GB1, GB2	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8, TX9, TX10, TX11, TX12, TX13, TX14, FX1, FX2, GB1, GB2	<input checked="" type="checkbox"/>

2. Click the Modify button to add a new VLAN. The VLAN Configuration screen appears.

### VLAN Configuration

<b>Replace VID Tag With Default Port VID</b>	<input type="checkbox"/>	
<b>Perform Ingress Filtering</b>	<input type="checkbox"/>	
<b>Discard Non-Tagged For Ports</b>	<input type="checkbox"/> TX1 <input type="checkbox"/> TX2 <input type="checkbox"/> TX3 <input type="checkbox"/> TX4 <input type="checkbox"/> TX5 <input type="checkbox"/> TX6 <input type="checkbox"/> TX7 <input type="checkbox"/> TX8 <input type="checkbox"/> TX9 <input type="checkbox"/> TX10 <input type="checkbox"/> TX11 <input type="checkbox"/> TX12 <input type="checkbox"/> TX13 <input type="checkbox"/> TX14 <input type="checkbox"/> TX15 <input type="checkbox"/> TX16	
	<input type="button" value="Select All"/> <input type="button" value="Select None"/>	
	<b>Remove Ports From Default VLAN When Added To Other VLANs</b>	<input checked="" type="checkbox"/>
	<input type="button" value="Update"/> <input type="button" value="Cancel"/>	

VLAN Groups					
VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt	Delete
<a href="#">0001</a>	Default VLAN	TX1-TX16	TX1-TX16	<input checked="" type="checkbox"/>	
<input type="button" value="Add"/>					

- Click Add in the VLAN Groups area of the VLAN Configuration screen. The Tagged VLAN Group Configuration screen is displayed.

### Tagged VLAN Group Configuration

ID	<input type="text" value="2"/>
Name	<input type="text" value="New VLAN"/>
Allow Management	<input type="checkbox"/>
Change PVID Of Member Ports	<input checked="" type="checkbox"/>

Group Ports

Port No	Port Name	Group Member	Untag On Egress
01	TX1	<input type="checkbox"/>	<input type="checkbox"/>
02	TX2	<input type="checkbox"/>	<input type="checkbox"/>
03	TX3	<input checked="" type="checkbox"/>	<input type="checkbox"/>
04	TX4	<input checked="" type="checkbox"/>	<input type="checkbox"/>
05	TX5	<input type="checkbox"/>	<input type="checkbox"/>
06	TX6	<input type="checkbox"/>	<input type="checkbox"/>
07	TX7	<input type="checkbox"/>	<input type="checkbox"/>
08	TX8	<input type="checkbox"/>	<input type="checkbox"/>
09	TX9	<input type="checkbox"/>	<input type="checkbox"/>
10	TX10	<input type="checkbox"/>	<input type="checkbox"/>
11	TX11	<input type="checkbox"/>	<input type="checkbox"/>
12	TX12	<input type="checkbox"/>	<input type="checkbox"/>
13	TX13	<input type="checkbox"/>	<input type="checkbox"/>
14	TX14	<input type="checkbox"/>	<input type="checkbox"/>
15	FX1	<input type="checkbox"/>	<input type="checkbox"/>
16	FX2	<input type="checkbox"/>	<input type="checkbox"/>
17	GB1	<input type="checkbox"/>	<input type="checkbox"/>
18	GB2	<input type="checkbox"/>	<input type="checkbox"/>

4. Enter a numeric VLAN identifier in the ID field (required).
5. Enter a name for the new VLAN in the Name field.



Note: "N-Ring VLAN" is a reserved name with a special meaning and cannot be used to name a newly added VLAN.

6. Click "Allow Management" box if desired.
7. Click "Change PVID of Member Ports" if desired.
8. Select the port(s) to include in the VLAN by clicking on the corresponding check box in the "Group Member" column.
9. Select the port(s) in the VLAN to untag on egress by clicking on the corresponding check box in the "Untag On Egress" column. Ethernet frames that exit this port will not contain a VLAN field in them.
10. Click the "Update" button to add the VLAN or click the "Cancel" button to exit without completing the VLAN add.



11. The result of adding a VLAN is displayed in the VLAN Configuration View screen. In the example provided, the New VLAN does not overlap the “Default VLAN”.

### VLAN Configuration View

Replace VID With Default Port VID	<input type="checkbox"/>
Perform Ingress Filtering	<input type="checkbox"/>
Discard Non-Tagged For Ports	(None)
Remove Ports From Default VLAN When Added To Other VLANs	<input checked="" type="checkbox"/>

VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt
0001	Default VLAN	TX1-TX2, TX5-TX16	TX1-TX2, TX5-TX16	<input checked="" type="checkbox"/>
0002	New VLAN	TX3-TX4	(None)	<input type="checkbox"/>

---

**NOTE:** Changes have been made that have not been [saved](#).

12. The ports of “New VLAN” (TX3, TX4 in this example) may be added back to “Default VLAN” to create overlapping VLANs.

### VLAN Configuration View

Replace VID With Default Port VID	<input type="checkbox"/>
Perform Ingress Filtering	<input type="checkbox"/>
Discard Non-Tagged For Ports	(None)
Remove Ports From Default VLAN When Added To Other VLANs	<input checked="" type="checkbox"/>

VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt
0001	Default VLAN	TX1-TX16	TX1-TX2, TX5-TX16	<input checked="" type="checkbox"/>
0002	New VLAN	TX3-TX4	(None)	<input type="checkbox"/>



Note: Notice the ports in “New VLAN” are not marked as “Untag on Egress” and therefore ensure a VLAN tag is in each egressing Ethernet frame.

13. Save the new VLAN configuration of the switch by clicking on the saved link and then the **Save** button in order for the new configuration to survive a device power cycle.

**DELETE A VLAN**

1. Navigate to the VLAN Configuration View screen and the **Modify** button.

**VLAN Configuration**

Replace VID Tag With Default Port VID

Perform Ingress Filtering

Discard Non-Tagged For Ports

TX1    TX2    TX3    TX4  
 TX5    TX6    TX7    TX8  
 TX9    TX10    TX11    TX12  
 TX13    TX14    FX1    FX2  
 GB1    GB2

Update   Cancel

VLAN Groups					
VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt	Delete
0001	Default VLAN	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8, TX9, TX10, TX11, TX12, TX13, TX14, FX1, FX2, GB1, GB2	TX1, TX2, TX5, TX6, TX7, TX8, TX9, TX10, TX11, TX12, TX13, TX14, FX1, FX2, GB1, GB2	<input checked="" type="checkbox"/>	
0002	New VLAN	TX3, TX4	(None)	<input type="checkbox"/>	Delete
Add					

Done   Refresh

2. Click the **Delete** button corresponding to the VLAN you want to delete.

**VLAN Configuration**

Replace VID Tag With Default Port VID

Perform Ingress Filtering

Discard Non-Tagged For Ports

TX1    TX2    TX3    TX4  
 TX5    TX6    TX7    TX8  
 TX9    TX10    TX11    TX12  
 TX13    TX14    FX1    FX2  
 GB1    GB2

Windows Internet Explorer

VLAN ID: 2

Are you sure you want to delete this VLAN?

OK   Cancel

VLAN Groups					
VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt	Delete
0001	Default VLAN	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8, TX9, TX10, TX11, TX12, TX13, TX14, FX1, FX2, GB1, GB2	TX1, TX2, TX5, TX6, TX7, TX8, TX9, TX10, TX11, TX12, TX13, TX14, FX1, FX2, GB1, GB2	<input checked="" type="checkbox"/>	
0002	New VLAN	TX3, TX4	(None)	<input type="checkbox"/>	Delete
Add					

Done   Refresh

3. Click OK in the confirmation pop-up screen to remove the selected VLAN or Cancel.

- Save the new VLAN configuration of the switch by clicking on the saved link and then the Save button for the new configuration to survive a device power cycle.

### VLAN Configuration

Replace VID Tag With Default Port VID	<input type="checkbox"/>
Perform Ingress Filtering	<input type="checkbox"/>
Discard Non-Tagged For Ports	<input type="checkbox"/> TX1 <input type="checkbox"/> TX2 <input type="checkbox"/> TX3 <input type="checkbox"/> TX4 <input type="checkbox"/> TX5 <input type="checkbox"/> TX6 <input type="checkbox"/> TX7 <input type="checkbox"/> TX8 <input type="checkbox"/> TX9 <input type="checkbox"/> TX10 <input type="checkbox"/> TX11 <input type="checkbox"/> TX12 <input type="checkbox"/> TX13 <input type="checkbox"/> TX14 <input type="checkbox"/> FX1 <input type="checkbox"/> FX2 <input type="checkbox"/> GB1 <input type="checkbox"/> GB2
	<input type="button" value="Update"/> <input type="button" value="Cancel"/>

VLAN Groups					
VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt	Delete
0001	Default VLAN	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8, TX9, TX10, TX11, TX12, TX13, TX14, FX1, FX2, GB1, GB2	TX1, TX2, TX5, TX6, TX7, TX8, TX9, TX10, TX11, TX12, TX13, TX14, FX1, FX2, GB1, GB2	<input checked="" type="checkbox"/>	
<input type="button" value="Add"/>					

## VLAN CONFIGURATION EXAMPLES

A VLAN is an administratively configured LAN segment that limits the traffic in multiple broadcast domains. Instead of physically reconnecting a device to a different LAN, network users can accomplish this task by configuring a VLAN compliant switch to create logical network segments.

Tagged VLAN allows switch segmentation to span across multiple managed switches. This type of VLAN is ideal for LANs that consist of various types of communication groups such as Office LANs, Controls Systems, and IP Cameras. When used properly, it will effectively isolate two or more groups from each other in a logical manner. This means that Broadcast, Multicast, and Unicast frames in one VLAN will not interfere with another isolated VLAN group.

The examples in this section are shown as configured on a 708TX switch, but other 700 Series and 7000 Series models may be configured similarly.

### PORT - BASED VLAN Basic understanding of Port-Based VLANs

#### VLAN Configuration View

Replace VID With Default Port VID	<input type="checkbox"/>
Perform Ingress Filtering	<input type="checkbox"/>
Discard Non-Tagged For Ports	(None)

VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt
0001	Default VLAN	TX3, TX4, TX5, TX6, TX7, TX8	TX3, TX4, TX5, TX6, TX7, TX8	<input checked="" type="checkbox"/>
0002	VLAN-2	TX1, TX2	TX1, TX2	<input type="checkbox"/>

#### Port Configuration View

Port No	Port Name	PVID
01	TX1	2
02	TX2	2
03	TX3	1
04	TX4	1
05	TX5	1
06	TX6	1
07	TX7	1
08	TX8	1

Receiving Port #	Tagged VID in packet	Destination Address	Transmitting Port #s	Notes
TX1	Untagged	MAC on port TX2	TX2	Unicast Traffic
TX1	Untagged	Unknown MAC	TX2	Floods VLAN 2
TX1	VID 4	MAC on port TX2	--	Packet Discarded
TX3	Untagged	MAC on port TX5	TX5	Unicast Traffic
TX3	Untagged	Unknown MAC	TX4-TX8	Floods VLAN 1
TX3	VID 4	MAC on port TX6	--	Packet Discarded

**TAGGED VLAN (TAGGED ONLY)** Basic understanding of tagged VLANs (Admit - Tagged Only)

### VLAN Configuration View Port Configuration View

Replace VID With Default Port VID	<input type="checkbox"/>
Perform Ingress Filtering	<input type="checkbox"/>
Discard Non-Tagged For Ports	TX1, TX2, TX3, TX5, TX6, TX7, TX8

VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt
0001	Default VLAN	TX3, TX5, TX6, TX7, TX8	(None)	<input type="checkbox"/>
0002	VLAN-2	TX1, TX2	(None)	<input type="checkbox"/>
0003	VLAN-3	TX4	(None)	<input checked="" type="checkbox"/>

Port No	Port Name	PVID
01	TX1	1
02	TX2	1
03	TX3	1
04	TX4	3
05	TX5	1
06	TX6	1
07	TX7	1
08	TX8	1

Receiving Port #	Tagged VID in packet	Destination Address	Transmitting Port #s	Notes
TX1	Untagged	MAC on port TX2	--	Packet Discarded
TX1	VID 2	MAC on port TX2	TX2	Unicast Traffic
TX1	VID 4	MAC on port TX2	--	Packet Discarded
TX1	VID 2	MAC on port TX5	TX2	Floods VLAN 2
TX3	Untagged	MAC on port TX1	--	Packet Discarded
TX3	VID 1	MAC on port TX6	TX6	Unicast Traffic
TX3	VID 1	Unknown MAC	TX5-TX8	Floods VLAN 1
TX3	VID 4	MAC on port TX8	--	Packet Discarded

**TAGGED VLAN (ALL)** Basic understanding of tagged VLANs (Admit - All)

**VLAN Configuration View Port Configuration View**

Replace VID With Default Port VID	<input type="checkbox"/>
Perform Ingress Filtering	<input type="checkbox"/>
Discard Non-Tagged For Ports	(None)

VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt
0001	Default VLAN	TX3, TX4, TX5, TX6, TX7, TX8	(None)	<input checked="" type="checkbox"/>
0002	VLAN-2	TX1, TX2	(None)	<input type="checkbox"/>

Port No	Port Name	PVID
01	TX1	2
02	TX2	2
03	TX3	1
04	TX4	1
05	TX5	1
06	TX6	1
07	TX7	1
08	TX8	1

Receiving Port #	Tagged VID in packet	Destination Address	Transmitting Port #s	Notes
TX1	Untagged	MAC on port TX2	TX2	Adds VID 2 to packet
TX1	VID 2	MAC on port TX2	TX2	Unicast Traffic
TX1	VID 4	MAC on port TX2	--	Packet Discarded
TX1	VID 2	Unknown MAC	TX2	Floods VLAN 2
TX3	Untagged	Unknown MAC	TX4-TX8	Adds VID 1 to packet & Floods VLAN 1
TX3	VID 1	MAC on port TX6	TX6	Unicast Traffic
TX3	VID 1	Unknown MAC	TX4-TX8	Floods VLAN 1
TX3	VID 4	MAC on port TX7	--	Packet Discarded

**HYBRID VLAN** Basic understanding of Hybrid VLANs

**VLAN Configuration View**    **Port Configuration View**

Replace VID With Default Port VID	<input type="checkbox"/>
Perform Ingress Filtering	<input type="checkbox"/>
Discard Non-Tagged For Ports	(None)

Port No	Port Name	PVID
01	TX1	2
02	TX2	2
03	TX3	1
04	TX4	1
05	TX5	1
06	TX6	1
07	TX7	1
08	TX8	1

VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt
0001	Default VLAN	TX3, TX4, TX5, TX6, TX7, TX8	TX3, TX4, TX5, TX6, TX7, TX8	<input checked="" type="checkbox"/>
0002	VLAN-2	TX1, TX2, TX3, TX4	TX1, TX2	<input type="checkbox"/>

Receiving Port #	Tagged VID in packet	Destination Address	Transmitting Port #s	Notes
TX1	Untagged	MAC on port TX2	TX2	Unicast Traffic
TX1	Untagged	MAC on port TX3	TX3	Adds VID 2 in the packet
TX1	VID 4	MAC on port TX2	--	Packet Discarded
TX1	VID 4	MAC on port TX3	--	Packet Discarded
TX1	VID 2	MAC on port TX2	TX2	Strips VID off packet
TX3	Untagged	MAC on port TX6	TX6	Unicast Traffic
TX3	Untagged	Unknown MAC	TX4-TX8	Floods VLAN 1
TX3	VID 4	MAC on port TX5	--	Packet Discarded
TX3	VID 4	MAC on port TX4	--	Packet Discarded
TX3	VID 2	MAC on port TX4	TX4	Does not strip VID off packet
TX3	VID 2	MAC on port TX1	TX1	Strips VID off packet

**OVERLAPPING VLAN** Basic understanding of Overlapping VLANs.

### VLAN Configuration View Port Configuration View

Replace VID With Default Port VID	<input type="checkbox"/>
Perform Ingress Filtering	<input type="checkbox"/>
Discard Non-Tagged For Ports	(None)

VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt
0001	Default VLAN	(None)	(None)	<input type="checkbox"/>
0002	VLAN-2	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8	<input type="checkbox"/>
0003	VLAN-3	TX2, TX3, TX4, TX5, TX6, TX7, TX8	TX2, TX3, TX4, TX5, TX6, TX7, TX8	<input checked="" type="checkbox"/>
0004	VLAN-4	TX1, TX2	TX1, TX2	<input type="checkbox"/>

Port No	Port Name	PVID
<a href="#">01</a>	TX1	4
<a href="#">02</a>	TX2	2
<a href="#">03</a>	TX3	3
<a href="#">04</a>	TX4	3
<a href="#">05</a>	TX5	3
<a href="#">06</a>	TX6	3
<a href="#">07</a>	TX7	3
<a href="#">08</a>	TX8	3

Receiving Port #	Tagged VID in packet	Destination Address	Transmitting Port #s	Notes
TX1	Untagged	MAC on port TX2, VID=4	TX2	Unicast Traffic
TX1	Untagged	MAC on port TX3	TX2	Floods VLAN 4
TX1	VID 4	MAC on port TX2, VID=4	TX2	Strips VID off packet
TX1	VID 4	Unknown MAC	TX2	Strips VID off packet & Floods VLAN 4
TX2	Untagged	MAC on port TX1, VID=2	TX1	Unicast Traffic
TX2	Untagged	MAC on port TX5, VID=2	TX5	Unicast Traffic
TX2	VID 2 or 3	MAC on port TX5, VID=2 and 3	TX5	Strips VID off packet (or floods if MAC is unknown for VID)
TX2	Untagged	Unknown MAC	TX1, TX3-TX8	Floods VLAN 2
TX3	Untagged	MAC on port TX1, VID=3	TX2, TX4-TX8	Floods VLAN 3
TX3	Untagged	MAC on port TX2, VID=3	TX2	Unicast Traffic
TX3	Untagged	MAC on port TX5, VID=3	TX5	Unicast Traffic
TX3	VID 2 or 3	MAC on port TX2, VID=2 and 3	TX2	Strips VID off packet (or floods if MAC is unknown for VID)



**VLAN WITH MULTICAST FILTERING** Basic understanding of VLANs with Multicast Filtering

**Top of Form**

VLAN Configuration View					Port Configuration View		
Replace VID With Default Port VID <input type="checkbox"/>					Port No   Port Name   PVID		
Perform Ingress Filtering <input type="checkbox"/>					01	TX1	4
Discard Non-Tagged For Ports (None)					02	TX2	2
VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt	03	TX3	3
0001	Default VLAN	(None)	(None)	<input type="checkbox"/>	04	TX4	3
0002	VLAN-2	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8	<input type="checkbox"/>	05	TX5	3
0003	VLAN-3	TX2, TX3, TX4, TX5, TX6, TX7, TX8	TX2, TX3, TX4, TX5, TX6, TX7, TX8	<input checked="" type="checkbox"/>	06	TX6	3
0004	VLAN-4	TX1, TX2	TX1, TX2	<input type="checkbox"/>	07	TX7	3
					08	TX8	3

**Bottom of Form**

Static Multicast Group Address Filters		
Multicast Address	Port List	VLAN ID
01:00:00:00:00:01	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8	2
01:00:00:00:00:02	TX1, TX6, TX8	3

Receiving Port #	Tagged VID in packet	Destination Address	Transmitting Port #s	Notes
TX1	Untagged	01:00:00:00:00:01	TX2	Goes to ports TX1-TX8, but TX1 can only send to TX2 (VLAN 4)
TX3	Untagged	01:00:00:00:00:02	TX6, TX8	Goes to ports TX2, TX6-TX8 (VLAN 3) but filter keeps it on ports TX6 and TX8 only
TX2	Untagged	01:00:00:00:00:01	TX1, TX3-TX8	Goes to ports TX1-TX8, but won't go back out the port it came in on
TX2	Untagged	01:00:00:00:00:02	TX1, TX3-TX8	Goes to ports TX1, TX3-TX8
TX3	Untagged	01:00:00:00:00:01	TX2, TX4-TX8	Goes to ports TX2, TX4-TX8
TX6	Untagged	01:00:00:00:00:02	TX8	Goes to port TX8
TX3	Untagged	01:00:00:00:00:02	TX6, TX8	Goes to ports TX6 and TX8



Note: If there are multiple ports on different VLANs, the 7018 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 is achievable with Overlapping VLANs.

For further information and examples on Overlapping VLANs, see:

<http://www.redlion.net/overlappingportvlan.pdf>