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Industrial Automation Headquarters

Delta Electronics, Inc.
Taoyuan Technology Center
No.18, Xinglong Rd., Taoyuan District,
Taoyuan City 33068, Taiwan
TEL: 886-3-362-6301 / FAX: 886-3-371-6301

Asia

Delta Electronics (Shanghai) Co., Ltd.
No.182 Minyu Rd., Pudong Shanghai, P.R.C.
Post code : 201209
TEL: 86-21-6872-3988 / FAX: 86-21-6872-3996
Customer Service: 400-820-9595

Delta Electronics (Japan), Inc.
Tokyo Office
Industrial Automation Sales Department
2-1-14 Shibadaimon, Minato-ku
Tokyo, Japan 105-0012
TEL: 81-3-5733-1155 / FAX: 81-3-5733-1255

Delta Electronics (Korea), Inc.
Seoul Office
1511, 219, Gasan Digital 1-Ro., Geumcheon-gu,
Seoul, 08501 South Korea
TEL: 82-2-515-5305 / FAX: 82-2-515-5302

Delta Energy Systems (Singapore) Pte Ltd.
4 Kaki Bukit Avenue 1, #05-04, Singapore 417939
TEL: 65-6747-5155 / FAX: 65-6744-9228

Delta Electronics (India) Pvt. Ltd.
Plot No.43, Sector 35, HSIIDC Gurgaon,
PIN 122001, Haryana, India
TEL: 91-124-4874900 / FAX : 91-124-4874945

Delta Electronics (Thailand) PCL.
909 Soi 9, Moo 4, Bangpoo Industrial Estate (E.P.Z),
Pattana 1 Rd., T.Phraksa, A.Muang,
Samutprakarn 10280, Thailand
TEL: 66-2709-2800 / FAX : 662-709-2827

Delta Energy Systems (Australia) Pty Ltd.
Unit 20-21/45 Normanby Rd., Notting Hill Vic 3168, Australia
TEL: 61-3-9543-3720

Americas

Delta Electronics (Americas) Ltd.
Raleigh Office
P.O. Box 12173, 5101 Davis Drive,
Research Triangle Park, NC 27709, U.S.A.
TEL: 1-919-767-3813 / FAX: 1-919-767-3969

Delta Greentech (Brasil) S/A
São Paulo Office
Rua Itapeva, 26 – 3˚ Andar - Bela Vista
CEP: 01332-000 – São Paulo – SP - Brasil
TEL: 55-11-3530-8642 / 55-11-3530-8640

Delta Electronics International Mexico S.A. de C.V.
Mexico Office
Vía Dr. Gustavo Baz No. 2160, Colonia La Loma,
54060 Tlalnepantla Estado de Mexico
TEL: 52-55-2628-3015 #3050/3052

EMEA

Delta Electronics (Netherlands) BV
Eindhoven Office
De Witbogt 20, 5652 AG Eindhoven, The Netherlands
MAIL: Sales.IA.EMEA@deltaww.com
MAIL: Sales.IA.Benelux@deltaww.com

Delta Electronics (France) S.A.
ZI du bois Chaland 2 15 rue des Pyrénées,
Lisses 91056 Evry Cedex, France
MAIL: Sales.IA.FR@deltaww.com

Delta Electronics Solutions (Spain) S.L.U
Ctra. De Villaverde a Vallecas, 265 1˚ Dcha Ed.
Hormigueras – P.I. de Vallecas 28031 Madrid
C/Llull, 321-329 (Edifici CINC) | 22@Barcrelona, 08019 Barcelona
MAIL: Sales.IA.Iberia@deltaww.com

Delta Electronics (Italy) Srl
Ufficio di Milano Via Senigallia 18/2 20161 Milano (MI)
Piazza Grazioli 18 00186 Roma, Italy
MAIL: Sales.IA.Italy@deltaww.com

Delta Electronics (Germany) GmbH
Coesterweg 45, D-59494 Soest, Germany
MAIL: Sales.IA.DACH@deltaww.com

Delta Energy Systems LLC (CIS)
Vereyskaya Plaza II, office 112 Vereyskaya str.
17 121357 Moscow, Russia
MAIL: Sales.IA.RU@deltaww.com

Delta Greentech Ltd. (Turkiye)
Serifali Mevkii Barboros Bulvari Soylesi Sok
No 19 34775, Y.Dudullu-Umraniye/Istanbul
MAIL: Sales.IA.Turkey@delta-emea.com

Delta Energy Systems AG (Dubai BR)
P.O. Box 185668, Gate 7, 3rd Floor, Hamarain Centre,
Dubai, United Arab Emirates
MAIL: Sales.IA.MEA@deltaww.com

2018/03/15

DVS Layer 3 Managed Industrial GbE Modular Rack Mount Ethernet Switch User Manual

DVS Layer 3 Managed Industrial GbE Modular Rack Mount Ethernet Switch User Manual

Product Model:
DVS-G928 series

www.deltaww.com

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DVS Series Layer 3 Managed Industrial GbE Modular Rack Mount Ethernet Switch

Table of Contents

1

Chapter 1 Introduction

Table of Contents

FCC Interference Statement

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 radio frequency signal and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CE Declaration of Conformity

The DVS Layer 3 series switches are CE certificated products. They could be used in any kind of the environments under CE environment specification. For keeping more safe application, we strongly suggest to use the CE-compliant industrial enclosure products.

1.1 Feature

Thank you for purchasing the DVS Series Layer 3 Managed Industrial GbE Modular Rack Mount Ethernet Switch. The DVS series switches are equipped with the intelligent alarm, digital input function, and allow the wide range of operating temperature (-40 to 85℃). The DVS series switches are designed to support the application in any rugged environment and comply with UL, CE, FCC and CCC standards.

1.1.1 High Performance Network Technology

- 10/100/1000Base-T(RJ45 and M12), 100/1000Base-SFP Fiber, 1000Base-SFP Fiber
- IEEE 802.3/802.3u/802.3ab/802.3x/802.3z
- Auto negotiation speed
- Auto MDI/MDI-X

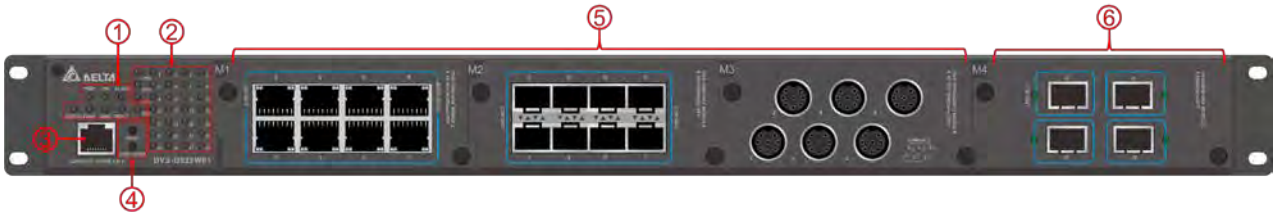
1.1.2 Industrial Grade Reliability

- 2 sets of AC/DC power input
- 2 sets of Relay Alarm

1.1.3 Robust Design

- Operating temperature: -40~85 ℃
- Storage temperature: -40~85 ℃
- Humidity: 5%~95% (non-condensing)
- Protection: IP30

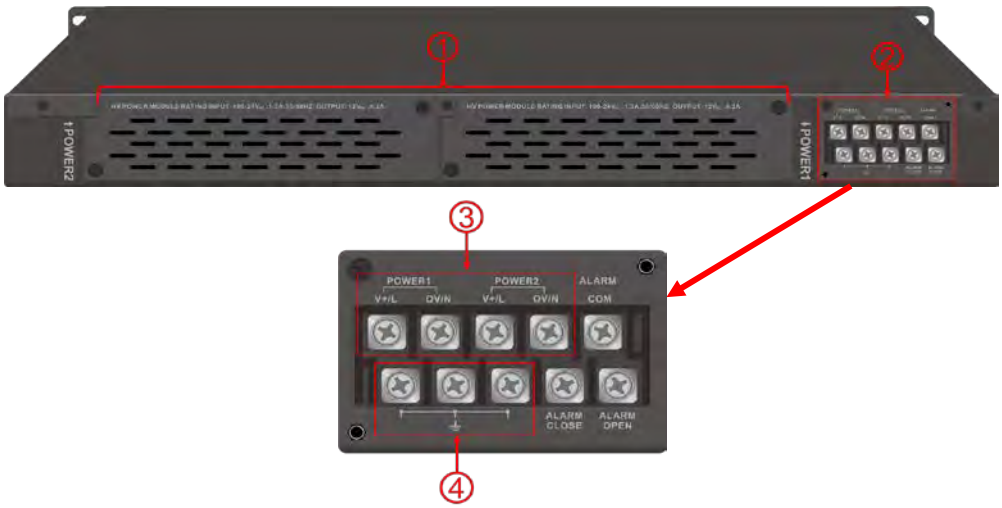
1.1.4 Front Panel Ports and LEDs



No	Description
1	System indication LEDs: STATUS/PWR1/PWR2/R.M/RING/ALARM/RESET/RMT
2	Port status LEDs: LINK/SPD/FDX/port number
3	RJ45 CONSOLE port
4	Buttons: RESET/PORT MODE (Press **RESET** for 3 seconds to reset and 5 seconds to return to factory default. To change port LED mode, press the **PORT MODE** button)
5	RJ-45/SFP/M12 module slots
6	4 port SFP module slot

1.1.5 Rear Panel

On the rear panel of the switch sit two panel module slots and one terminal block. The terminal blocks include two power pairs for redundant power supply.



No	Description
1	Power panel modules
2	Terminal block
3	Power input
4	Grounding Screw

1.2 SFP Module Installation

Insert:

Insert SFP Module into the SFP combo port.

Remove:

Pull the tab on the module, and then pull out it.

Note:
Delta has LCP-155 and LCP-1250 series SFP module. DVS switch can promise 100% compatible with Delta SFP module.

Note:
The actual link distance of a particular fiber optic link given the optical budget, the number of connectors and splices, and cabling quantity. Please measure and verify the actual link loss values once the link is established to identify any potential performance issues.

1.3 Package Checklist

- Delta DVS series Layer 3 Managed Ethernet Switch
- Protective Caps for unused RJ45 ports, M12 ports and SFP fiber ports(insert to the module)
- RS232 to RJ45 console cable
- User manual and software CD
- Instruction sheet
- Accessories package

1.4 MTBF (Mean Time Between Failures)

More than 647,420 hours.

MEMO

2

Chapter 2 User Interface Introduction

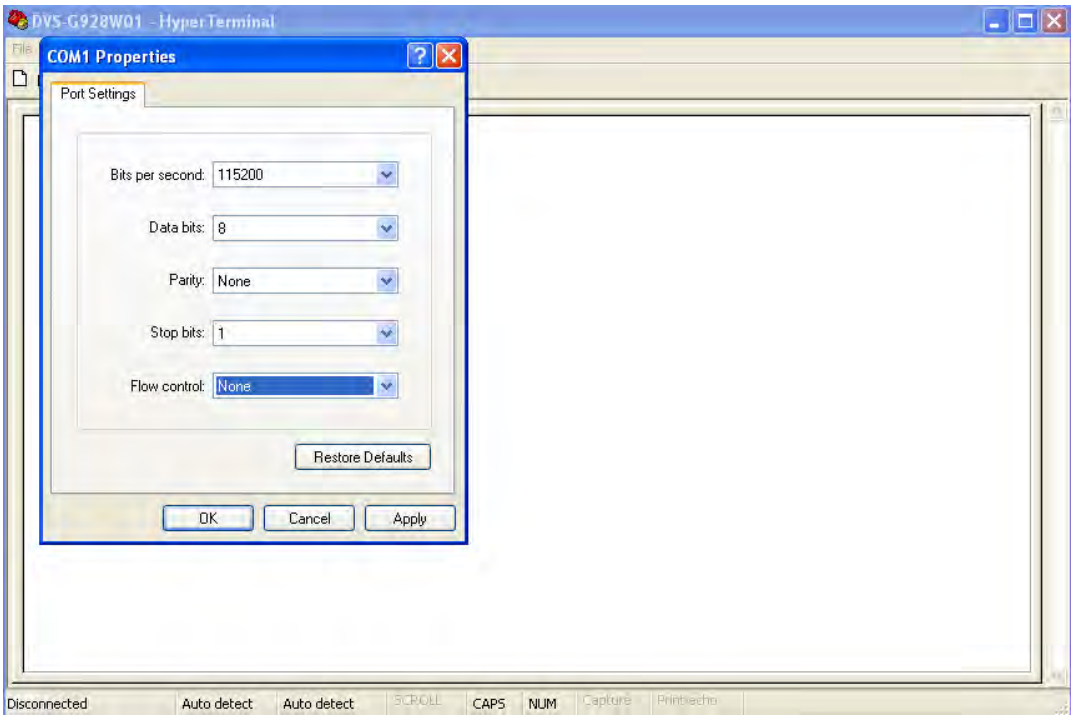
Table of Contents

2.1 RJ45 Console Configuration

A Delta Layer 3 managed switch supports configuration using the CLI interface, available on the RS232 port to RJ45 interface. You can use the terminal software to connect to a Delta Layer 3 managed switch.

1. Open the terminal software, and select an appropriate COM port for **Console Connection**, **115200** for **Baud Rate**, **8** for **Data Bits**, **None** for **Parity**, and **1** for **Stop Bits, None** for **Flow Control**.

Note:
The Windows 7 system does not support Hyper Terminal. If you need it, you can download the terminal software to use it.



2. The user name and the password are the same as Web Browser. The default user name is “admin”, and the password is blank.

- You can use “?” to list the commands.

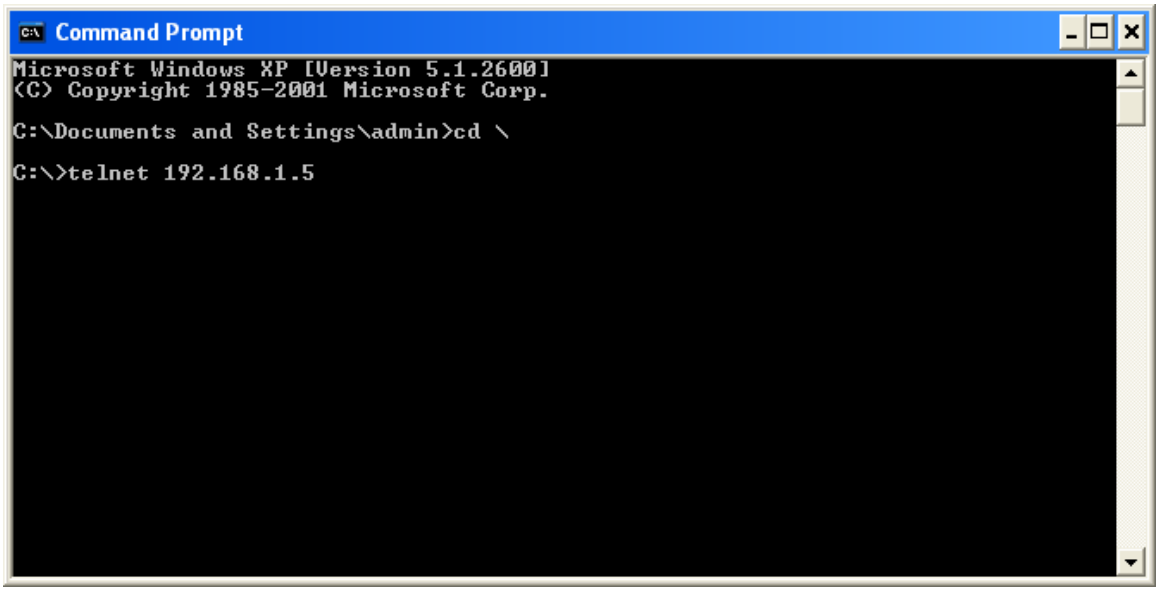
```
Welcome to DVS-G928W01 Command Line Interface.
Type 'help' or '?' to get help.
>?
General Commands:
-----------------
Help/?: Get help on a group or a specific command
Up    : Move one command level up
Logout: Exit CLI

Command Groups:
---------------
System             : System settings and reset options
IP                 : IP configuration and Ping
Port               : Port management
MAC                : MAC address table
VLAN               : Virtual LAN
PVLAN              : Private VLAN
Security           : Security management
STP                : Spanning Tree Protocol
Aggr               : Link Aggregation
LACP               : Link Aggregation Control Protocol
LLDP               : Link Layer Discovery Protocol
QoS                : Quality of Service
Mirror             : Port mirroring
Config             : Load/Save of configuration via TFTP
Firmware           : Download of firmware via TFTP
PTP                : IEEE1588 Precision Time Protocol
Loopback-Detection: Loopback-Detection
IPMC               : MLD/IGMP Snooping
Fault              : Fault Alarm Configuration
Event              : Event Selection
DHCPServer         : DHCP Server Configuration
RIP                : Routing Information Protocol
VRRP               : Virtual Router Redundancy Protocol
Redundancy Ring    : Redundancy Ring Configuration
Redundancy Chain   : Redundancy Chain Configuration
RCS                : Remote Control Security
Fastrecovery       : Fast-Recovery Configuration
SFP                : SFP Monitor Configuration
DeviceBinding      : Device Binding Configuration
Modbus             : Modebus TCP Configuration
```

2.2 Telnet Console Configuration

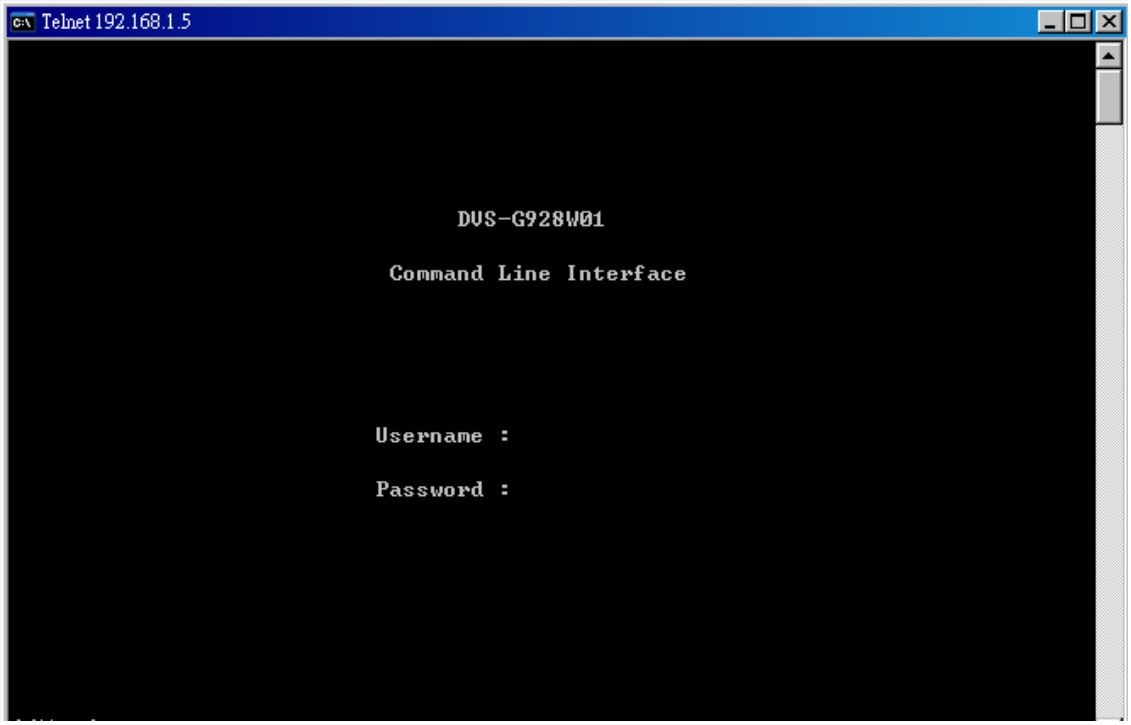
A Delta Layer 3 managed switch supports the telnet server function; it can be globally enabled or disabled. The user can use all CLI commands over a telnet session. The maximum number of inbound telnet sessions allowed on the switch can be configured to 0-5. The inactivity timeout value for the incoming Telnet sessions for the switch can be configured to 1-160 minutes. The login authentication supports the local user method or the remote user method which is configured. When the login authentication is the remote user method, it supports RADIUS and TACACS+.

1. Open a Command Prompt window and input “telnet 192.168.1.X” to login to a Delta switch.



2. After entering a user name and a password, you can use the CLI command to control the switch.

Note:
1. The IP Address by default is 192.168.1.5
2. The default user name is “admin” and the password is blank.



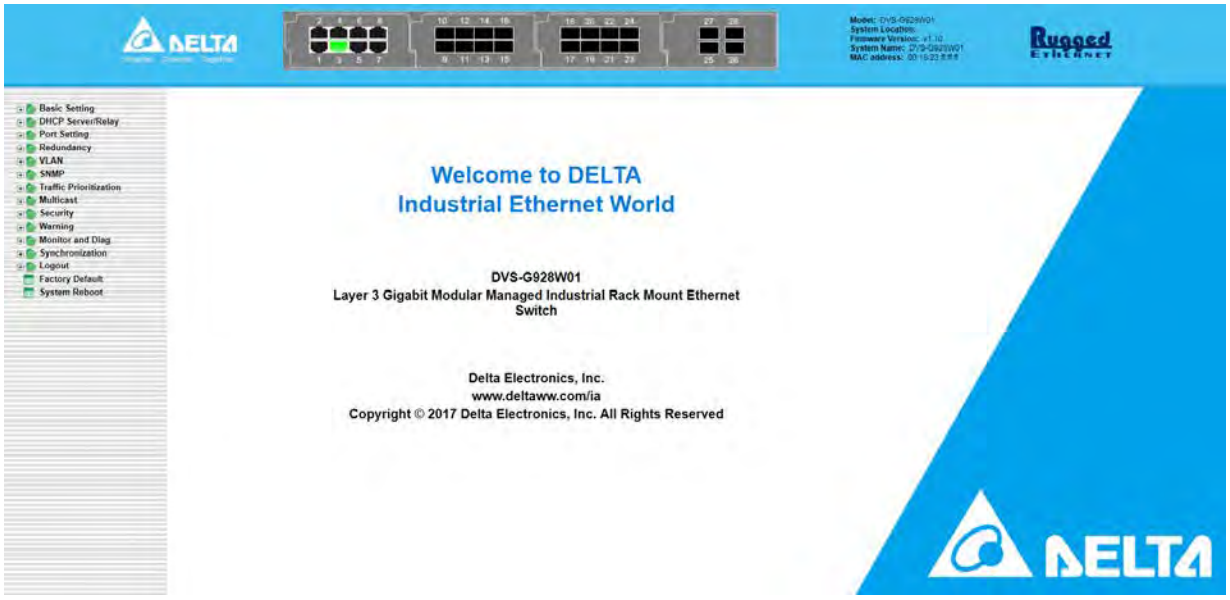
2.3 Web Browser Configuration

A Delta Layer 3 managed switch supports a friendly GUI for normal users to configure the switch. You can monitor the port status of a Delta PoE managed switch, and configure the settings of each function via the web interface.

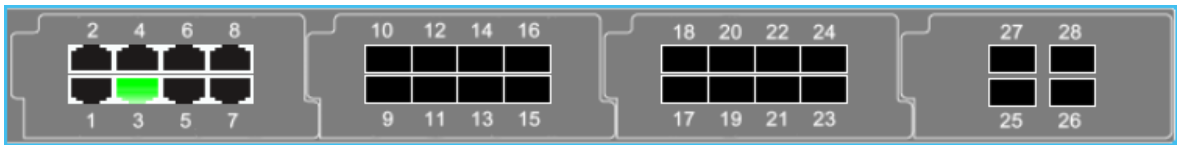
1. Open a web browser and connect to the default IP address 192.168.1.5. Enter a user name and a password. (The default user name is “admin” and the password is blank.)

Note:
1. The default user name “admin” is in the lowercase not uppercase.
2. By default, IE5.0 or later version does not allow Java Applets to open sockets.
You need to explicitly modify the browser setting in order to enable Java Applets to use network ports.

2. You can use the menu tree in the left side frame to find the function you want to configure. And configure the detailed settings in the right side frame.



3. The port status and the LED status on the switch can be monitored in the top frame.



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3

Chapter 3 Featured Functions

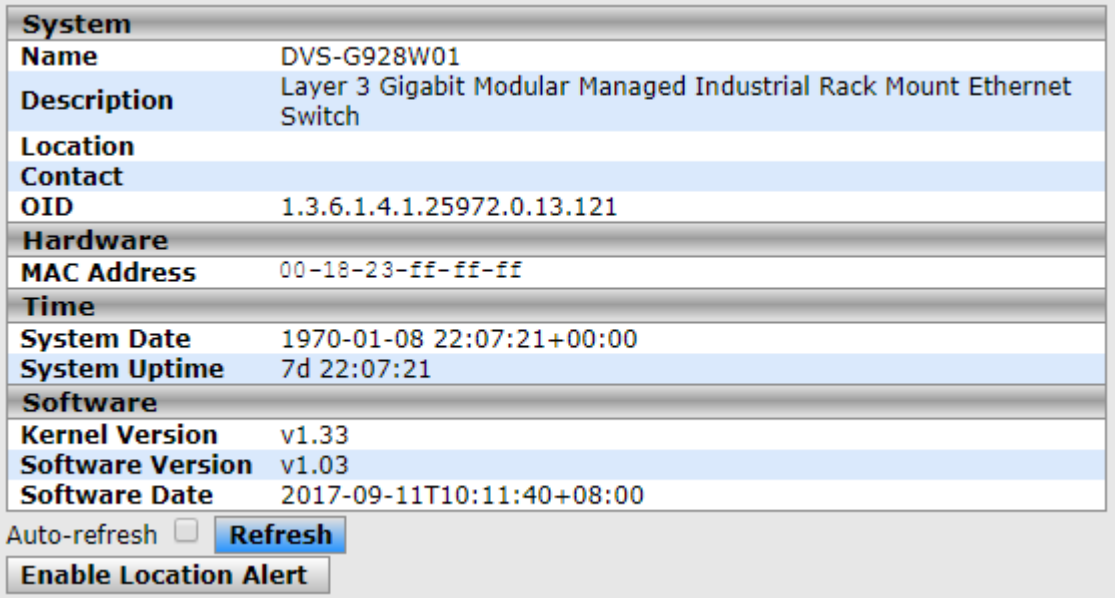
Table of Contents

3.1 Basic Setting

The basic setting group includes the most common settings, and an administrator can maintain the control of the Delta switch in this group.

3.1.1 System Information

System Information includes the basic switch status items and the version .It also displayed in the banner of the GUI. These informations can help the administrator identify the switch in the network.



- **System**

Description	Factory default
Name	
The system name of the switch.	Fixed
Description	
The device description of the switch.	Fixed
Location	
The system location of the switch.	Fixed
Contact	
The system contact of the switch.	Fixed
OID	
The based object ID for the Management Information Base (MIB) of the switch.	Fixed

- **Hardware**

Description	Factory default
MAC Address	
The MAC address of the switch.	Fixed

- **Time**

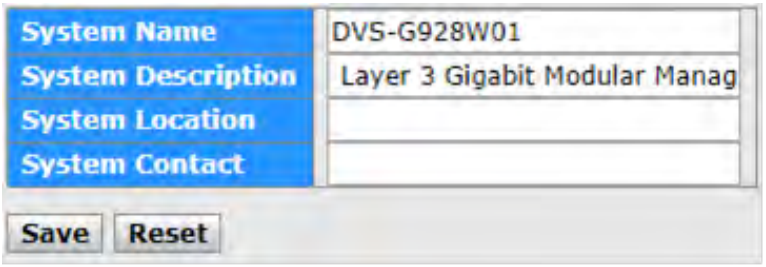
Description	Factory default
System Date	
The current date and time.	Fixed
System Up Time	
The time of hours, minutes, and seconds since the switch was last started.	Fixed

- **Software**

Description	Factory default
Kernel Version	
The kernel version of the switch.	Model Name
Software Version	
The software version of the switch.	Boot Version
Software Date	
The software version released date of the switch.	Software Version

3.1.2 Basic Setting

The Basic Setting will help you customerizing the system information.These informations will display in the System Information when you change it.



- **Basic Setting**

Description	Factory default
System Name	
The system name of the switch.	Product Name
System Description	
The device description of the switch.	Product Description
System Location	
The system location of the switch.	None
System Contact	
The system contact of the switch.	None

3.1.3 Admin Password

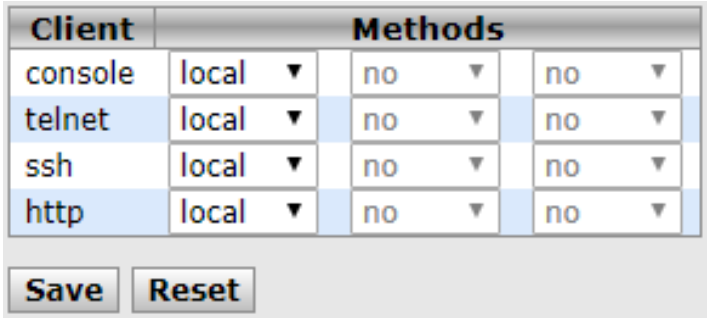
Only the admin of the Delta switch can modify system username and password.

- **Admin Password**

Description	Factory default
Old User Name	
The current system username of the switch.	admin
Old Password	
The current password of the switch. The default password is blank.	None
New User Name	
The new system User name. The allowed string length is 0 to 31, and only ASCII characters from 32 to 126 are allowed. The default password is blank.	None
New Password	
The new system password. The allowed string length is 0 to 31, and only ASCII characters from 32 to 126 are allowed.	None
Confirm New Password	
Re-type the new password.	None

3.1.4 Auth Method

A Delta Layer-3 Switch provides three authentication methods: Local, RADIUS, and TACACS+. If there is no RADIUS or TACACS+ server in your network environment, you can use the local authentication method for the login authentication.



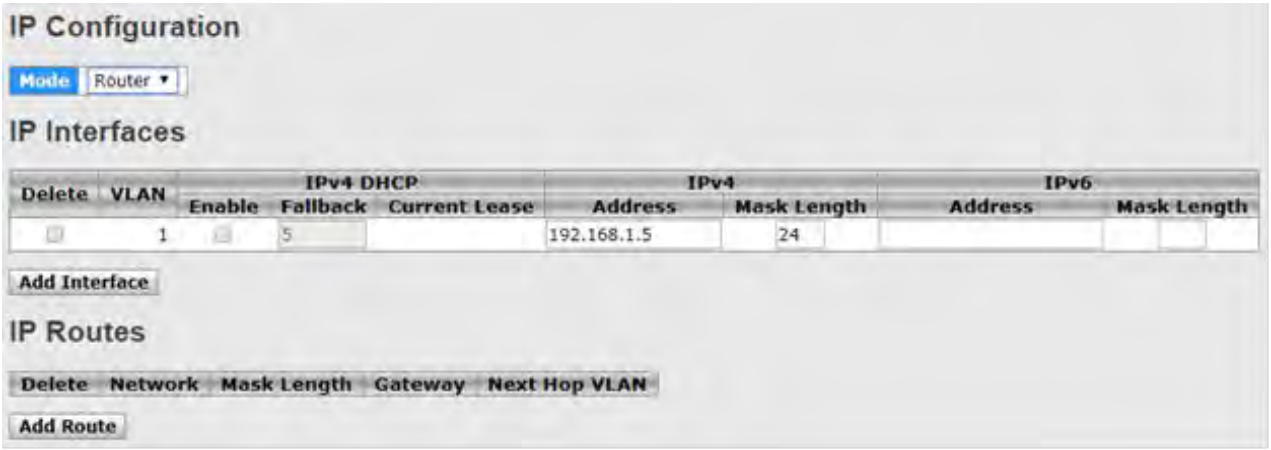
- **Auth Method**

Description	Factory default
Client	
The management client for which the configuration below applies.	Fixed
Authentication Method	
Method can be set to one of the following values: • No: Authentication is disabled and login is not possible. • Local: A locally stored user ID and a password are used for the authentication. This is the default setting. You need to set up a user account on the Local User Management page. • RADIUS: The user ID and the password are authenticated through a RADIUS server. • TACACS+: The user ID and the password are authenticated through a TACACS+ server.	Local
Fallback	
If there is not any confiugured authentication server consist, the local user database is used for authentication. **Note:** This is only possible if the Authentication Method is set to a value other than 'none' or 'local'.	None

3.1.5 IP Setting

You can configure a static IP address, a subnet mask and a default gateway for the switch. Or you can enable DHCP mode for receiving a dynamic IP address, a subnet mask and a default gateway.

Note:
The default Current Network Configuration Protocol is None. And the default IP address is **192.168.1.5**.



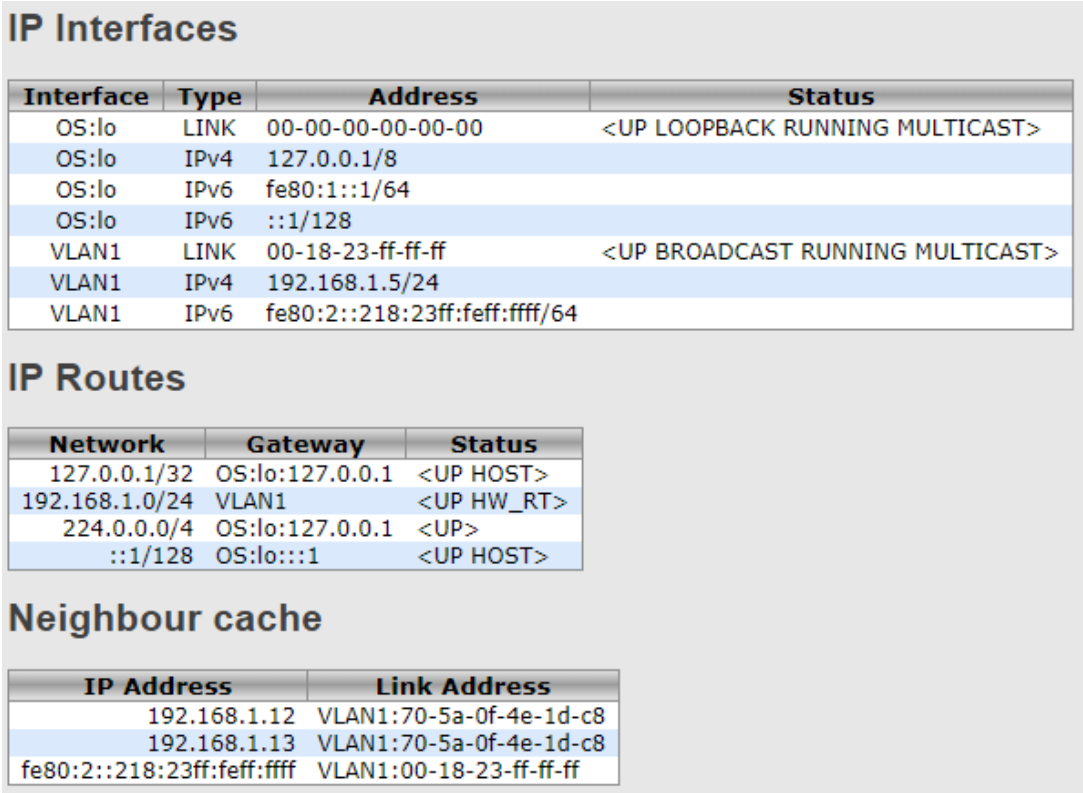
- **IP Setting**

Description	Factory default
Mode	
Configure whether the IP stack should act as a host or a router. In Host mode, IP traffic between interfaces will not be routed. In Router mode traffic is routed between all interfaces.	Router

Description	Factory default
IP Interface	
You can configure the information of IPv4 and IPv6 in this section. IPv4 DHCP configurations include: • **Enable:** check to enable IPv4 DHCP function. • **Fallback:** specifies the number of seconds for trying to obtain a DHCP lease. • **Current Lease:** For DHCP interfaces with an active lease, the column shows the current interface address, as provided by the DHCP server. IPv4 configurations include: • **Address:** shows the IPv4 address of the interface in dotted decimal notation. If DHCP is enabled, this field is not used. The field may also be left blank if IPv4 operation on the interface is not desired. • **Mask Length:** the IPv4 network mask, in number of bits (prefix length). Valid values are between 0 and 30 bits for an IPv4 address. If DHCP is enabled, this field is not used. The field may also be left blank if IPv4 operation on the interface is not desired. IPv6 configurations include: • **Address:** shows the address of the interface. A IPv6 address is in 128-bit records represented as eight fields of up to four hexadecimal digits with a colon separating each field (:). For example, fe80::21:cff:fe03:4dc7. The symbol :: is a special syntax that can be used as a shorthand way of representing multiple 16-bit groups of contiguous zeros; but it can appear only once. It can also represent a legally valid IPv4 address. For example: 192.1.2.34. The field may be left blank if IPv6 operation on the interface is not desired. • **Mask Length:** the IPv6 network mask, in number of bits (prefix length). Valid values are between 1 and 128 bits for a IPv6 address. The field may be left blank if IPv6 operation on the interface is not desired.	
Input the IP address of the IPv4 network interface.  **Note:** After you change the IP address and clicking Apply, we suggest you to login again, and making sure the URL is the latest IP address.	192.168.1.5
IP Routes	
• **Delete:** Select this option to delete an existing IP route. • **Network:** The destination IP network or host address of this route. Valid format is dotted decimal notation or a valid IPv6 notation. A default route can use the value 0.0.0.0 or IPv6 notation. • **Mask Length:** The destination IP network or host mask, in number of bits (prefix length). It defines how much of a network address that must match, in order to qualify for this route. Valid values are between 0 and 32 bits respectively 128 for IPv6 routes. Only a default route will have a mask length of 0 (as it will match anything). • **Gateway:** The IP address of the IP gateway. Valid format is dotted decimal notation or a valid IPv6 notation. Gateway and Network must be of the same type. • **Next Hop VLAN:** The VLAN ID (VID) of the specific IPv6 interface associated with the gateway. The given VID ranges from 1 to 4094 and will be effective only when the corresponding IPv6 interface is valid. If the IPv6 gateway address is link-local, it must specify the next hop VLAN for the gateway. If the IPv6 gateway address is not link-local, system ignores the next hop VLAN for the gateway.	0.0.0.0

3.1.6 IP Status

This page will show the IP details of the device based on the settings you made in the IP Setting section.



IP Interfaces

Interface	Type	Address	Status
OS:lo	LINK	00-00-00-00-00-00	<UP LOOPBACK RUNNING MULTICAST>
OS:lo	IPv4	127.0.0.1/8	
OS:lo	IPv6	fe80:1::1/64	
OS:lo	IPv6	::1/128	
VLAN1	LINK	00-18-23-ff-ff-ff	<UP BROADCAST RUNNING MULTICAST>
VLAN1	IPv4	192.168.1.5/24	
VLAN1	IPv6	fe80:2::218:23ff:feff:ffff/64	

IP Routes

Network	Gateway	Status
127.0.0.1/32	OS:lo:127.0.0.1	<UP HOST>
192.168.1.0/24	VLAN1	<UP HW_RT>
224.0.0.0/4	OS:lo:127.0.0.1	<UP>
::1/128	OS:lo:::1	<UP HOST>

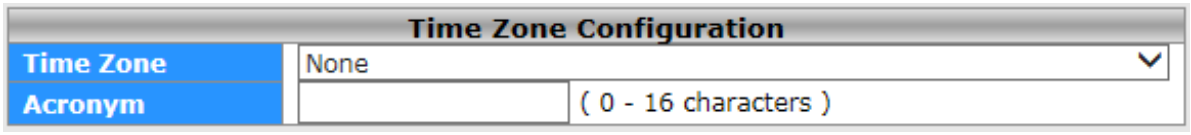
Neighbour cache

IP Address	Link Address
192.168.1.12	VLAN1:70-5a-0f-4e-1d-c8
192.168.1.13	VLAN1:70-5a-0f-4e-1d-c8
fe80:2::218:23ff:feff:ffff	VLAN1:00-18-23-ff-ff-ff

3.1.7 Daylight Saving Time

The Delta switch support Daylight Saving Time.It can used to automatically set the Delta switch's forward according to national standards.

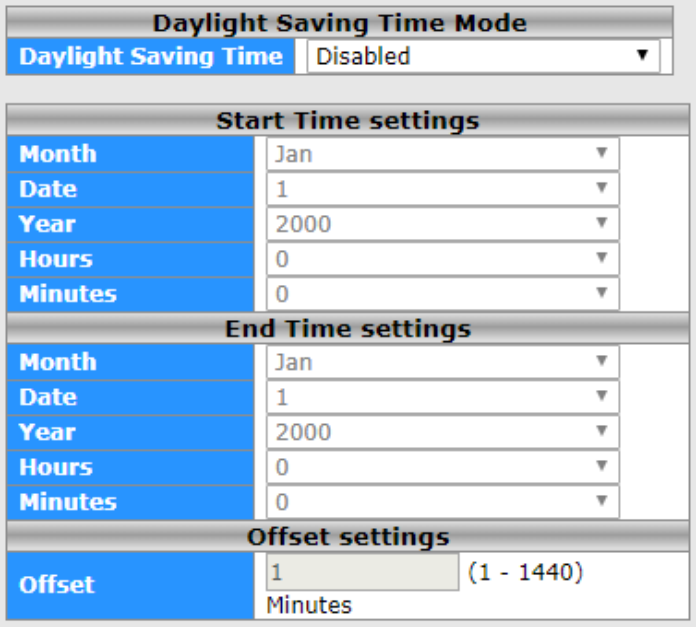
- **Time Zone Configuration**



Time Zone Configuration	
Time Zone	None
Acronym	(0 - 16 characters)

Description	Factory default
Time Zone	
Lists various Time Zones world wide. Select appropriate Time Zone from the drop down and click Save to set.	None
Acronym	
User can set the acronym of the time zone. This is a User configurable acronym to identify the time zone. (Range : Up to 16 alpha-numeric characters and can contain '-', '_' or '.')	None

- **Daylight Saving Time Mode**



Description	Factory default
Daylight Saving Time Mode	
Specify the clock forward or backward according to the configurations set below for a defined Daylight Saving Time duration. • **Disable:** Disable the Daylight Saving Time configuration. • **Recurring:** Configure the Daylight Saving Time duration to repeat the configuration every year • **Non-Recurring: C**onfigure the Daylight Saving Time duration for single time configuration.	Disable
Start Time Settings	
Enter the daylight saving time (DST) start time. • **Week:** Select the starting week number. • **Day:** Select the starting day. • **Month:** Select the starting month. • **Hours:** Select the starting hour. • **Minutes:** Select the starting minute. **Note:** If you select the daylight saving mode as “Disable”, the configuration will also be disabled.	Fixed
End Time settings	
Enter the daylight saving time (DST) end time. • **Week:** Select the starting week number. • **Day:** Select the starting day. • **Month:** Select the starting month. • **Hours:** Select the starting hour. • **Minutes:** Select the starting minute. **Note:** If you select the daylight saving mode as “Disable”, the configuration will also be disabled.	Fixed

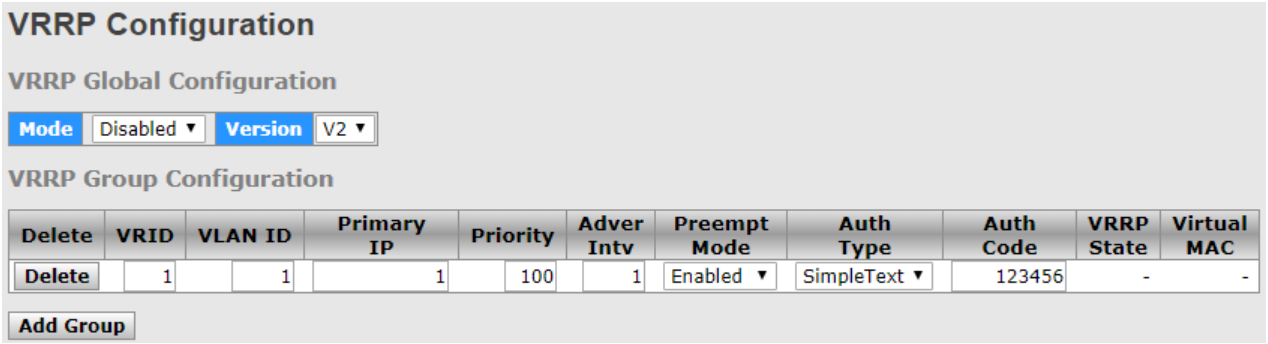
Description	Factory default
Offset settings	
Set up the offset time. **Note:** If you select the daylight saving mode as “Disable”, the configurations will also be disabled.	Fixed

3.1.8 RIP

RIP (Routing Information Protocol) is one of the protocols which may be used by routers to exchange network topology information. It is characterized as an “interior” gateway protocol, and is typically used in small to medium-sized networks. A router running RIP sends the contents of its routing table to each of its adjacent routers every 30 seconds. When a route is removed from the routing table it is flagged as unusable by the receiving routers after 180 seconds, and removed from their tables after an additional 120 seconds. You can choose to enable or disable RIP in the section.

3.1.9 VRRP

A VRRP (Virtual Router Redundancy Protocol) is a computer networking protocol aimed to eliminate the single point of failure by automatically assigning available IP routers to participating hosts. Using a virtual router ID (VRID) address and virtual router IP (VRIP) address to represent itself, a virtual router consists of two or more physical routers, including one master router and one or more backup routers. All routers in the virtual router group share the same VRID and VRIP. The master router provides primary routing and the backup routers monitor the status of the master router and become active if the master router fails.



- **VRRP Configuration**

Description	Factory default
VRRP Global	
• **Mode :** user can enable or disable VRRP Function. • **Version :** support VRRP V2 / V3.	Disable/V2
VRRP Group	
For each VRRP Group, we provide several options: • **VRID:** Virtual Router ID, from 1 to 254. • **VLAN ID:** input VLAN ID, from 1 to 4096. • **Primary IP:** Input Virtual IP. • **Priority:** Priority, from 1 to 254.	Fixed

Description	Factory default
• **Adver Intv:** Advertisement packet forwarding interval. • **Preempt Mode:** Controls whether a (starting or restarting) higher-priority Backup router preempts a lower-priority Master router. Values are True to allow preemption and False to prohibit preemption. • **Auth Type:** user can setting NoAuth / Simple Text. • **Auth Code:** Enter the authorization code for the VRRP group. • **VRRP State:** show VRRP Master / Backup Status. • **Virtual MAC:** show Virtual MAC Address. **Note:** If you select the VRRP mode as “Disable”, the configuration will also be disabled.	

3.1.10 HTTPS

Hypertext Transfer Protocol Secure (HTTPS) is a protocol for secure communication. It enables the transmission of HTTP over an encrypted Secure Sockets Layer (SSL) or Transport Layer Security (TLS) connection. So HTTPS can help protect the communication between a computer and a switch from eavesdroppers and man-in-the-middle (MITM) attacks.

If you want to configure the switch to access an HTTPS connection from a computer, the switch needs a public key certificate. You can configure the switch to generate a key or download it to the switch.

- **HTTPS Configuration**

Description	Factory default
Mode	
Specify whether the web management interface can be accessed from a web browser over an HTTPS connection. • **Disable**: The web management interface can not be accessed over an HTTPS connection. You need to use a Telnet, SSH, or console connection to access the switch. • **Enable**: The web management interface can be accessed over an HTTPS connection. **Note:** If you want to enable the HTTPS Admin mode, you need to use Generate Key, then apply Generate Certificate, please refer to **Certificate Management**.	Disable

After you enable the HTTPS connection, you can type **https://Delta switch’s IP address** into the web browser to establish an HTTPS connection.

For example, if a switch’s IP address is 192.168.1.5, the complete address is https://192.168.1.5.

3.1.11 SSH

You can configure an SSH configuration on this page.

- **SSH Configuration**

Description	Factory default
Mode	
Specify the status of SSH. • **Disable**: SSH is disabled. This is the default setting. • **Enable**: SSH is enabled.	Disable

3.1.12 LLDP

LLDP (Link Layer Discover Protocol) provides a method for switches, routers and access points to advertise their identification, configuration and capabilities to the neighboring devices that store the data in a MIB, and to learn information about the neighboring devices.

LLDP-MED (Link Layer Discovery Protocol for Media Endpoint Devices) is an extension of LLDP in that it operates between endpoint devices such as IP phones or switches.

LLDP-Media Endpoint Discovery (LLDP-MED) is an enhancement of LLDP with the following features:

- **Auto Discovery:** Autodiscovery of LAN policies (such as VLAN, Layer 2 priority, and DiffServ settings) and capability to enable a plug and play networking
- **Device Location:** Device location discovery for the creation of location databases
- **Power Management:** Extended and automated power management of Power over Ethernet (PoE) endpoints
- **Inventory Management:** Inventory management, which lets network administrators track network devices and determine their characteristics such as the manufacturer, the software and hardware versions, and the serial and asset numbers

3.1.12.1 Configuration

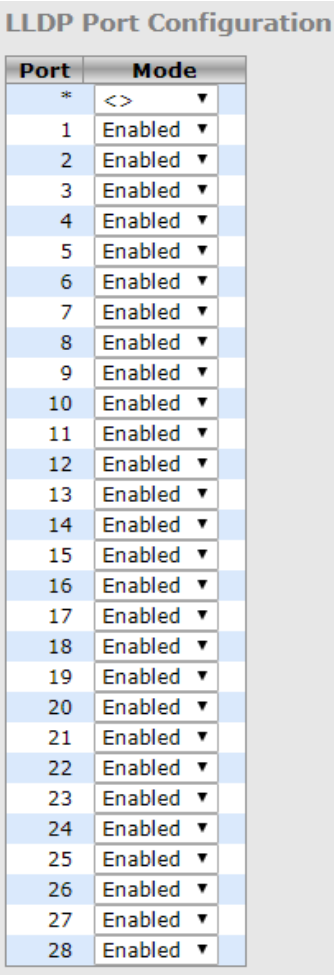
This page allows the user to inspect and configure the current LLDP port settings.

- **LLDP Parameter**

Description	Factory default
Tx Interval	
Entering the transmit interval of LLDP message in seconds. The values are 5 to 32678.	Disable

- **LLDP Port Configuration**

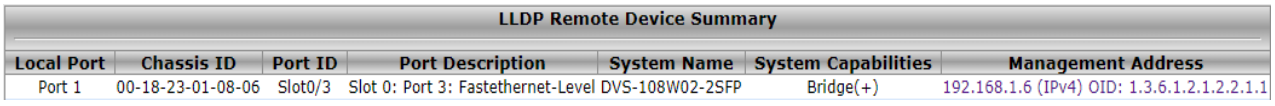
The default of the LLDP status is enabling. If you want to configure other settings, please refer to the following table.



Description	Factory default
Port	
This field displays the interface number.	*interface number*
Mode	
Specify the status of LLDP on the switch: • **Enabled:** LLDP is enabled. You can configure LLDP, and the settings take effect after you have applied them. • **Disabled:** LLDP is disabled. You can still configure LLDP, but the settings do not take effect after you have applied them.	Enabled

3.1.12.2 LLDP Neighbours

You can view the LLDP neighbor statistics for an individual interface or all interfaces.



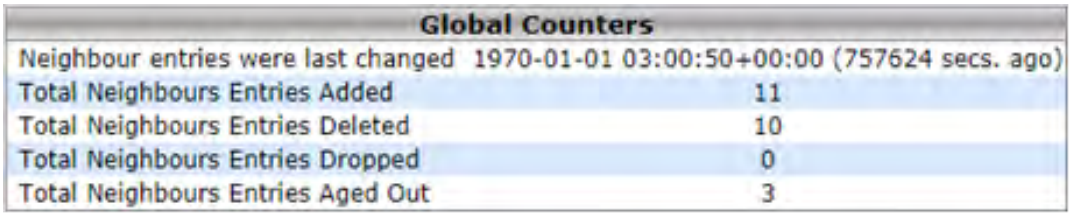
- **LLDP Neighbour Information**

Item	Description
Local Port	The interface on the switch that receives the LLDP information from the remote neighbor.
Chassis ID	The chassis ID of the remote neighbor.
Port ID	The Port ID is the identification of the neighbor port.
Port Description	Port Description is the port description advertised by the neighbor unit.
System Name	System Name is the name advertised by the neighbor unit.
System Capabilities	The fields can display the following information: Router, Bridge, Telephone, DOCSIS Cable Device, WLAN Access Point, Repeater, Station Only, Reserved or Other. Notice: When a capability is enabled, the capability is followed by (+). If the capability is disabled, the capability is followed by (-).
Management Address	Management Address is the neighbor unit's address that is used for higher layer entities to assist the discovery by the network management. This could for instance hold the neighbor's IP address.

3.1.12.3 Port Statistics

You can view the LLDP neighbor statistics for an individual interface or all interfaces.

- **LLDP Global Counters:** These statistics are total quantities of LLDP traffic for the switch.



Global Counters	
Neighbour entries were last changed	1970-01-01 03:00:50+00:00 (757624 secs. ago)
Total Neighbours Entries Added	11
Total Neighbours Entries Deleted	10
Total Neighbours Entries Dropped	0
Total Neighbours Entries Aged Out	3

Item	Description
Neighbour entries were last changed	Shows the time when the last entry was deleted or added.
Total Neighbours Entries Added	Shows the number of new entries added since switch reboot
Total Neighbours Entries Deleted	Shows the number of new entries deleted since switch reboot
Total Neighbours Entries Dropped	Shows the number of LLDP frames dropped due to full entry table
Total Neighbours Entries Aged Out	Shows the number of entries deleted due to expired time-to-live

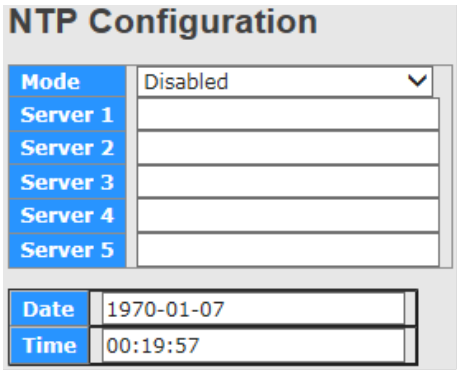
- **LLDP Statistics Local Counters:** The statistics of the fields are for each individual interface.

Local Port	Tx Frames	Rx Frames	Rx Errors	Frames Discarded	TLVs Discarded	TLVs Unrecognized	Org. Discarded	Age-Outs
1	0	0	0	0	0	0	0	0
2	108	111	0	0	0	0	111	1
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
9	8	7	0	0	0	0	7	1
10	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0
18	245	175	0	0	0	0	175	1
19	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0
27	25255	25256	0	0	0	0	25256	0
28	0	0	0	0	0	0	0	0

Item	Description
Local Port	The interface on the switch that receives the LLDP information from the remote neighbor.
Tx Frames	The number of LLDP frames transmitted on the port.
Rx Frames	The number of LLDP frames received on the port
Rx Errors	The number of received LLDP frames containing errors
Framed Discarded	If a port receives an LLDP frame, and the switch's internal table is full, the LLDP frame will be counted and discarded.
TLVs Discarded	Each LLDP frame containing multiple pieces of information, known as TLVs (Type Length Value). If a TLV is malformed, it will be counted and discarded.
TLVs Unrecognized	The number of well-formed TLVs, but with an unknown type value.
Org. Discarded	The number of organizationally TLVs received
Age-Outs	If no new LLDP frame is received during the age-out time, the LLDP information will be removed, and the value of the age-out counter will be incremented.

3.1.13 NTP

NTP Configuration lets a user configure the time of the switch which can be gotten from the NTP server. And it also can be configured manually.

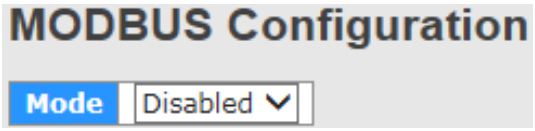


- **NTP Configuration**

Description	Factory default
Mode	
Specify whether the switch works as a SNTP client or a SNTP server. • **Disable**: The switch does not operat in NTP mode. • **Client**: The switch works as an SNTP client mode. • **Server**: The switch works as an SNTP Server mode.	Disable
Server	
Specify a type of SNTP server IP address.	None
Date	
The date parameter format is DD/MM/YYYY. When an SNTP client is disabled, you can manually set the date. When an SNTP client is enabled, the field is grayed out.	YYYY-MM-DD
Time	
The time parameter format is HH:MM:SS. When an SNTP client is disabled, you can manually set the time. When an SNTP client is enabled, the field is grayed out.	HH:MM:SS

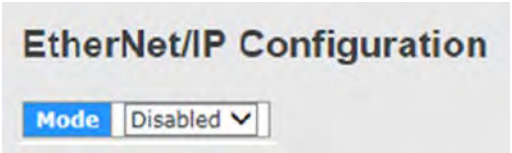
3.1.14 MODBUS TCP

The module status of MODBUS TCP is used to enable/disable the MODBUS TCP feature. If you need to set parameters, please refer to Appendix B MODBUS TCP Map.



3.1.15 EtherNet/IP

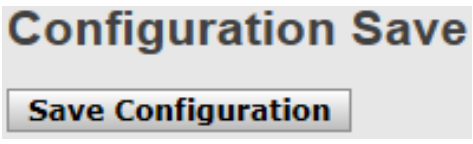
The module status of EtherNet/IP is used to enable/disable the EtherNet/IP feature. If you need to set parameters, please refer to Appendix C EtherNet/IP.



Note:
Since Ethernet/IP devices can generate a lot of multicast traffic, users are recommended to enable IGMP snooping to avoid overloading.

3.1.16 Backup

The Delta switch supports uploading the configuration to a local host.



3.1.17 Restore

The Delta switch supports downloading the configuration from a local host.

3.1.18 Upgrade Firmware

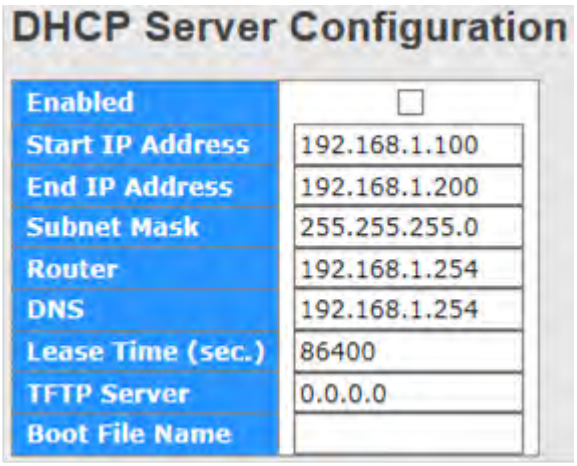
The Delta switch supports uploading the firmware from a local host to the Delta switch.

3.2 DHCP Server / Relay

The Delta switch can function as a DHCP server, DHCP relay and DHCP L2 relay. If there is no DHCP server in your network, then you can enable a DHCP server function on the Delta switch. If there is a DHCP server in your network, then you can configure the Delta switch as a DHCP relay. If there is already a DHCP server and a DHCP relay in your network, or there are L2 devices between DHCP clients and relay agents, then you can configure the Delta switch as a DHCP L2 relay in this network.

3.2.1 Settings

If the DHCP server is enabled on the switch, it can assign an IP address which is in the same network as the switch to the client.



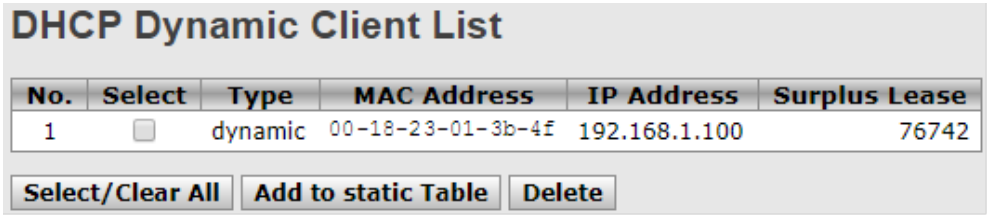
- **DHCP Server Configuration**

Description	Factory default
Enabled	
Specify the status of the DHCP server on the switch: • **Unchecked**: The DHCP server is disabled. • **Checked**: The DHCP server is enabled.	Unchecked
Start IP Address	
Enter the start IP address of the DHCP server pool.	192.168.1.100

Description	Factory default
End IP Address	
Enter the end IP address of the DHCP server pool.	192.168.1.200
Subnet mask	
Enter the IP subnet mask for the DHCP pool.	255.255.255.0
Router	
Specify the default gateway IP address. The information will be included in the DHCP offer packet.	192.168.1.254
DNS	
Specify the DNS server IP address. The information will be included in the DHCP offer packet.	192.168.1.254
Lease Time	
Enter the duration by entering the seconds.	86400
TFTP Server	
Enter the TFTP server address.	0.0.0.0
Boot File Name	
Specify the boot file name.	None

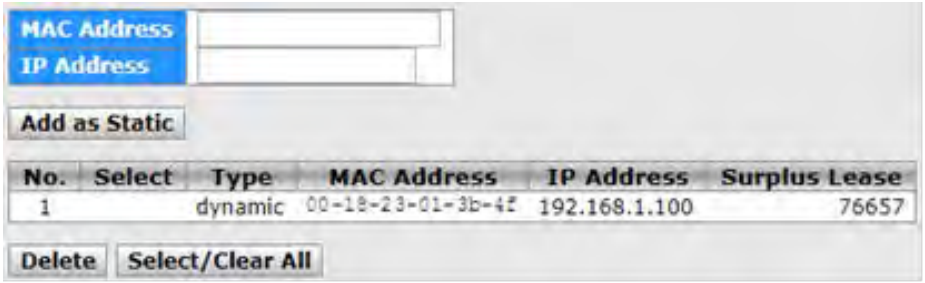
3.2.2 DHCP Dynamic Client List

If the DHCP server function is activated, you can see the DHCP client's information which is get the IP address from the DHCP server on this page.



3.2.3 DHCP Client List

A Delta switch supports the specific IP address which is in the assigned dynamic IP range to the specific port.

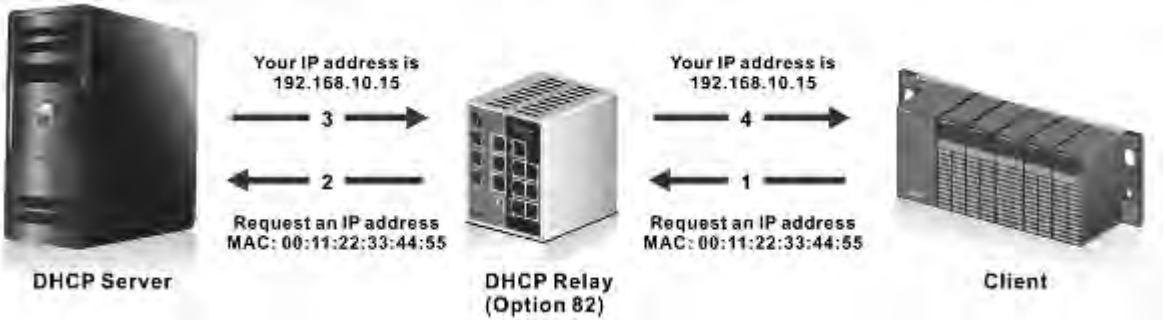


If you select a dynamic client from the DHCP Dynamic Client List to add to static Table, then it will appear in the DHCP Client List.

3.2.4 DHCP Relay Agent

A DHCP Relay can make broadcast messages to be sent over routers. And a DHCP relay can receive a DHCP broadcast

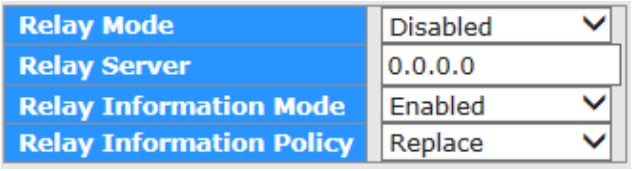
request packet and forward it to a specified server. The operating theory is shown in the figure below.



Notice:
When a DHCP request packet comes, the DHCP relay receives it and then sends it to all VLANs. But according to RFC 2131, when a unicast DHCP request packet renews, it will be sent to a DHCP server directly without passing a DHCP relay, so it is recommended to make sure that the DHCP client can ping the server after getting an IP address.

3.2.4.1 Relay

The DHCP relay sends a unicast DHCP packet to the specified server(s). You can enable or disable a DHCP relay function, and configure the parameters on the switch.



- **DHCP Relay Configuration**

Description	Factory default
Relay Mode	
Specify the status of the DHCP relay on the switch: • **Disable**: The DHCP relay is disabled. This is the default setting. • **Enable**: The DHCP relay is enabled.	Disable
Relay Server	
Specify the DHCP relay server IP address.	0.0.0.0
Relay Information Mode	
Specify the DHCP relay information mode option operation. • **Disable**: Enable DHCP relay information mode operation. • **Enable**: Disable DHCP relay information mode operation.	Enabled
Relay Information Policy	
Specify the DHCP relay information option policy. • **Replace**: Replace the original relay information when a DHCP message that already contains it is received. • **Keep**: Keep the original relay information when a DHCP message that already contains it is received. • **Drop**: Drop the package when a DHCP message that already contains relay information is received.	Replace

3.2.4.2 Relay Statistics

- **Server Statistics**

Server Statistics

Transmit to Server	Transmit Error	Receive from Server	Receive Missing Agent Option	Receive Missing Circuit ID	Receive Missing Remote ID	Receive Bad Circuit ID	Receive Bad Remote ID
0	0	0	0	0	0	0	0

Item	Description
Transmit to Server	The number of packets that are relayed from client to server.
Transmit Error	The number of packets that resulted in errors while being sent to clients.
Receive from Server	The number of packets received from server.
Receive Missing Agent Option	The number of packets received without agent information options.
Receive Missing Circuit ID	The number of packets received with the Circuit ID option missing.
Receive Missing Remote ID	The number of packets received with the Remote ID option missing.
Receive Bad Circuit ID	The number of packets whose Circuit ID option did not match known circuit ID.
Receive Bad Remote ID	The number of packets whose Remote ID option did not match known Remote ID.

- **Client Statistics**

Client Statistics

Transmit to Client	Transmit Error	Receive from Client	Receive Agent Option	Replace Agent Option	Keep Agent Option	Drop Agent Option
0	0	0	0	0	0	0

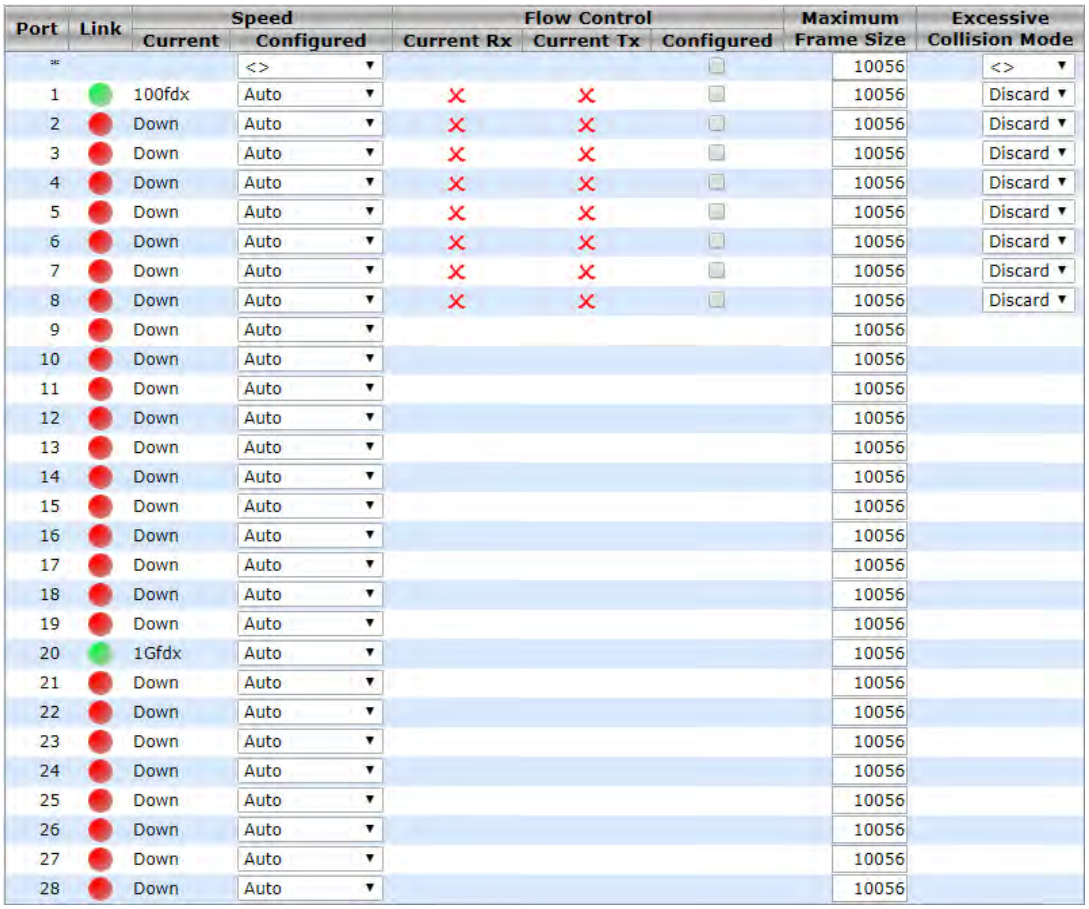
Item	Description
Transmit to Client	The number of relayed packets from server to client.
Transmit Error	The number of packets that resulted in error while being sent to servers.
Receive from Client	The number of received packets from server.
Receive Agent Option	The number of received packets with relay agent information option.
Replace Agent Option	The number of packets which were replaced with relay agent information option.
Keep Agent Option	The number of packets whose relay agent information was retained.
Drop Agent Option	The number of packets that were dropped which were received with relay agent information.

3.3 Port Setting

You can configure the basic port settings and LAG settings of a Delta switch in the Port Settings group.

3.3.1 Port Control

You can configure and monitor the port status on this page.



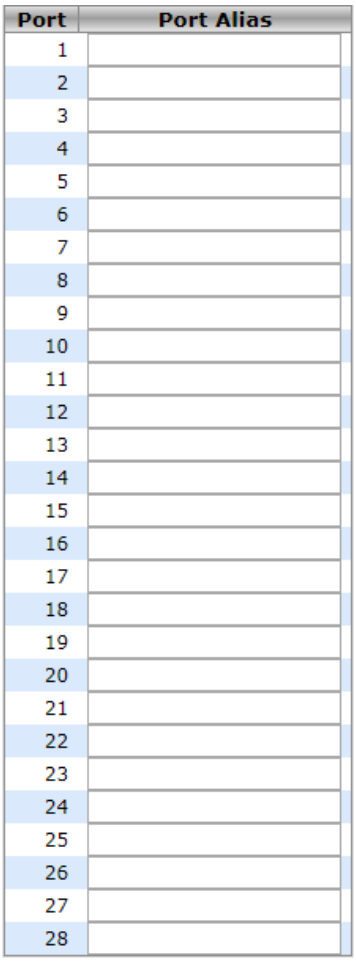
Port	Link	Speed		Flow Control			Maximum	Excessive
		Current	Configured	Current Rx	Current Tx	Configured	Frame Size	Collision Mode
*			<>				10056	<>
1		100fdx	Auto	✗	✗		10056	Discard
2		Down	Auto	✗	✗		10056	Discard
3		Down	Auto	✗	✗		10056	Discard
4		Down	Auto	✗	✗		10056	Discard
5		Down	Auto	✗	✗		10056	Discard
6		Down	Auto	✗	✗		10056	Discard
7		Down	Auto	✗	✗		10056	Discard
8		Down	Auto	✗	✗		10056	Discard
9		Down	Auto				10056	
10		Down	Auto				10056	
11		Down	Auto				10056	
12		Down	Auto				10056	
13		Down	Auto				10056	
14		Down	Auto				10056	
15		Down	Auto				10056	
16		Down	Auto				10056	
17		Down	Auto				10056	
18		Down	Auto				10056	
19		Down	Auto				10056	
20		1Gfdx	Auto				10056	
21		Down	Auto				10056	
22		Down	Auto				10056	
23		Down	Auto				10056	
24		Down	Auto				10056	
25		Down	Auto				10056	
26		Down	Auto				10056	
27		Down	Auto				10056	
28		Down	Auto				10056	

Description	Factory default
Port	
This field displays the interface number.	*interface number*
Link	
This field displays the connection of the interface graphically. • **Green**: There is a network device connecting to the interface. • **Red**: No network device is connecting to the interface.	Link down
Speed	
This field displays the actual port speed capability and configured the port capability. • **Current**: This field displays the actual port speed and the duplex mode. • **Configured**: Specify the speed capability of each interface. **Note:** 1. When you configure the Port "*" to Auto, 100 Mbps HDX, 100 Mbps FDX and 1G Mbps FDX, it meaning configure to all interface the same speed. 2. If you select the “Disable”, it will disable the switch port operation.	Current: None Configured: Auto
Flow Control	
This field displays whether the flow control is enabled for the port: • **Current Rx**: Indicates whether pause frames on the port are obeyed. • **Current Tx**: Indicates whether pause frames on the port are transmitted. • **Configured**: Specify the flow control is enabled or not.	Unchecked

Description	Factory default
Maximum Frame	
The field displays whether the maximum frame is configured for the port. The allowed range is 1518 bytes to 9600 bytes.	10056
Excessive Collision Mode	
Configure port transmit collision behavior. • **Discard:** Discard frame after 16 collisions (default). • **Restart:** Restart backoff algorithm after 16 collisions.	Discard

3.3.2 Port Alias

You can create an alias on a physical interface. It will help you to manage the network topology more easily.

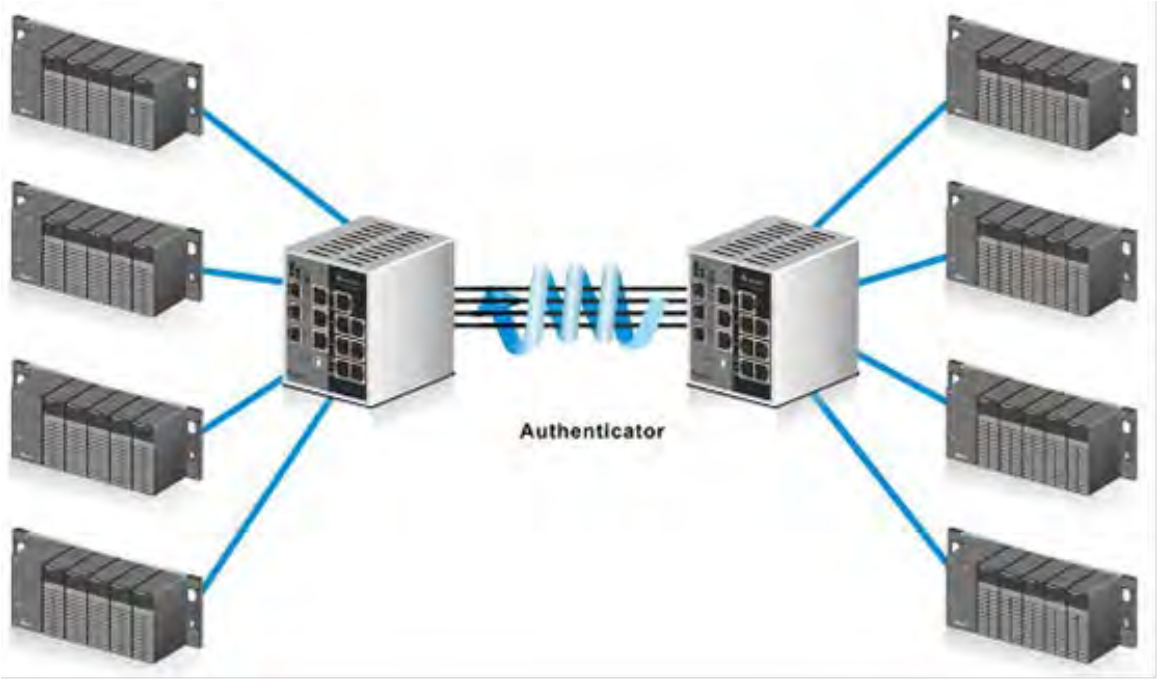


Port	Port Alias
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	

Description	Factory default
Port	
This field displays the interface number.	*interface number*
Port Alias	
Specify an alias for the port to help administrator differentiate between difference ports.	None

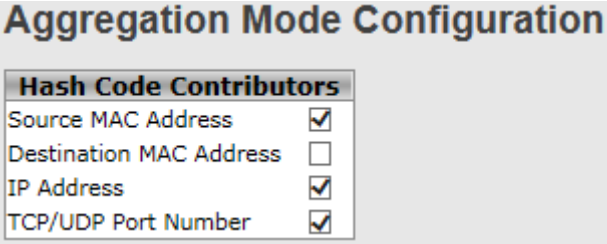
3.3.3 Port Trunk

Port Trunking can help you aggregate more links to form one link group.If there are 4 ports in a trunk group, and one port fails, then the other seven ports will provide backups and share the traffic automatically. If all ports on these two switches are configured as 100BaseTX and full duplex, then the potential bandwidth of the connection can be 400Mbps.The function theory is shown in the figure below.



3.3.3.1 Configuration

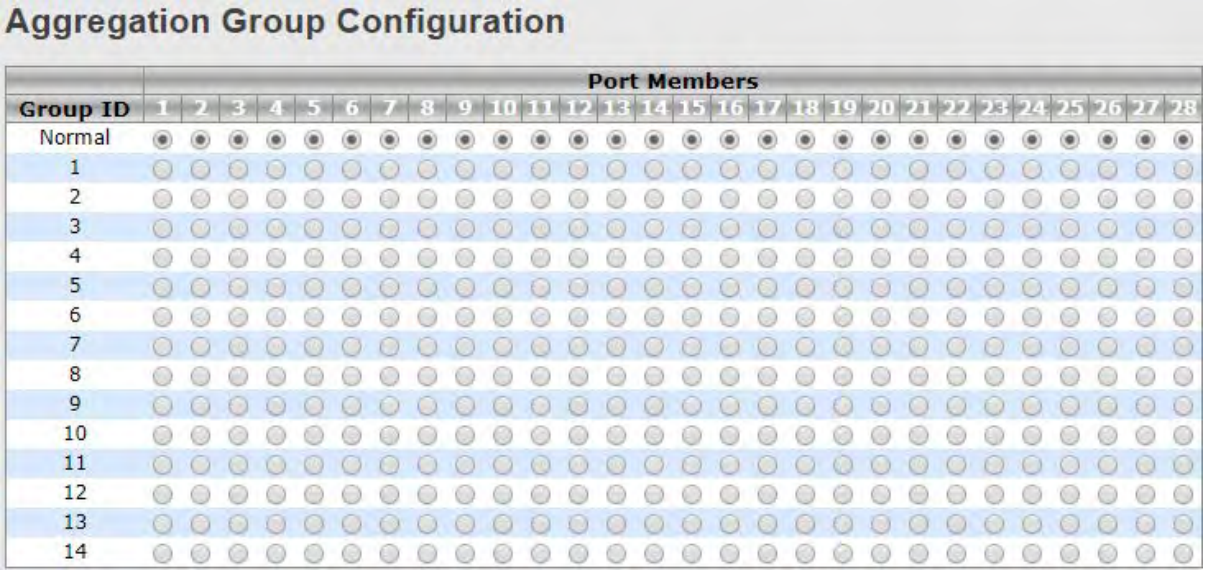
- **Aggregation Mode Configuration**



Description	Factory default
Source MAC Address	
Specify the Source MAC Address to calculate the source port for the frame. • **Checked**: Enabled the use of the Source MAC address. • **Unchecked**: Disabled the use of the Source MAC address.	Checked
Destination MAC Address	
Specify the Source MAC Address to calculate the destination port for the frame. • **Checked**: Enabled the use of the Destination MAC address. • **Unchecked**: Disabled the use of the Destination MAC address.	Unchecked
IP Address	
Specify the IP Address to calculate the destination port for the frame. • **Checked**: Enabled the use of the IP address. • **Unchecked**: Disabled the use of the IP address.	Checked

Description	Factory default
TCP/UDP Port Number	
Specify the TCP/UDP port number to calculate the destination port for the frame. • **Checked**: Enabled the use of the TCP/UDP port number. • **Unchecked**: Disabled the use of the TCP/UDP port number.	Checked

- **Aggregation Group Configuration**

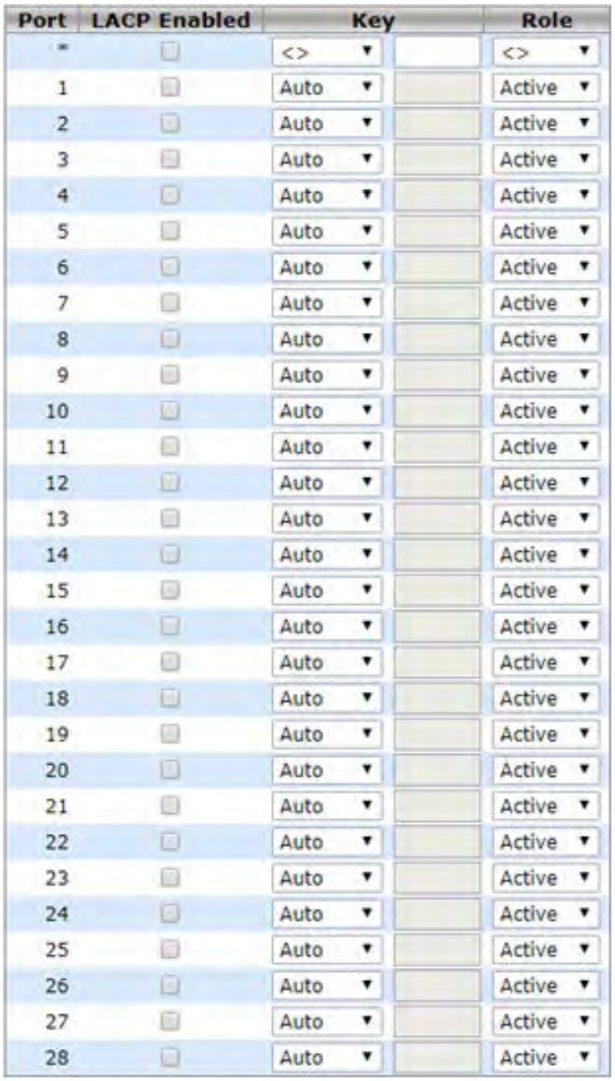


Description	Factory default
Group ID	
This field displays the group ID number. The Group ID "Normal" indicates there is no aggregation. Only one group ID is valid per port.	*Group number*
Port Members	
Select one or more interfaces by clicking the square.	Normal

3.3.3.2 LACP Configuration

Link aggregation groups (LAGs) let you combine multiple full-duplex Ethernet links into a single logical link. LAG increases fault tolerance and provide traffic sharing. You can assign LAG VLAN membership after you have added interfaces as members of a LAG.

After you have added interfaces to a LAG and enabled the LAG, Link Aggregation Control Protocol (LACP) can automatically configure a port channel link between the switch and another device.



Port	LACP Enabled	Key		Role
*	☐	<>		<>
1	☐	Auto		Active
2	☐	Auto		Active
3	☐	Auto		Active
4	☐	Auto		Active
5	☐	Auto		Active
6	☐	Auto		Active
7	☐	Auto		Active
8	☐	Auto		Active
9	☐	Auto		Active
10	☐	Auto		Active
11	☐	Auto		Active
12	☐	Auto		Active
13	☐	Auto		Active
14	☐	Auto		Active
15	☐	Auto		Active
16	☐	Auto		Active
17	☐	Auto		Active
18	☐	Auto		Active
19	☐	Auto		Active
20	☐	Auto		Active
21	☐	Auto		Active
22	☐	Auto		Active
23	☐	Auto		Active
24	☐	Auto		Active
25	☐	Auto		Active
26	☐	Auto		Active
27	☐	Auto		Active
28	☐	Auto		Active

- **LACP Port Configuration**

Description	Factory default
Port	
This field displays the interface number.	*Interface number*
LACP Enabled	
Specify whether the static mode of the LAG ID is enabled.	Unchecked
Key	
Specify whether the key of the LACP mode. • **Auto**: Enabled the key as appropriate by the physical link speed, 10Mb = 1, 100Mb = 2, 1Gb = 3 • Specific: User-defined value can be entered.	Auto
Role	
Specify the role of the LACP activity status. • **Activ**e: It will transmit LACP packets in per second • Passive: It will wait for a LACP packet from a partner (speak if spoken to).	Active

3.3.3.3 System Status

The System Status is displayed on this page.

Aggr ID	Partner System ID	Partner Key	Last Changed	Local Ports
No ports enabled or no existing partners				

Item	Description
Aggr ID	The Aggregation ID associated with this aggregation instance. For LLAG the id is shown as 'isid:aggr-id' and for GLAGs as 'aggr-id'
Partner System ID	The system ID (MAC address) of the aggregation partner.
Partner Key	The Key that the partner has assigned to this aggregation ID.
Last Changed	The time since this aggregation changed.
Local Ports	Shows which ports are a part of this aggregation for this switch/stack. The format is: "Switch ID:Port".

3.3.3.4 Port Status

The Port Status is displayed on this page.

Port	LACP	Key	Aggr ID	Partner System ID	Partner Port
1	No	-	-	-	-
2	No	-	-	-	-
3	No	-	-	-	-
4	No	-	-	-	-
5	No	-	-	-	-
6	No	-	-	-	-
7	No	-	-	-	-
8	No	-	-	-	-
9	No	-	-	-	-
10	No	-	-	-	-
11	No	-	-	-	-
12	No	-	-	-	-
13	No	-	-	-	-
14	No	-	-	-	-
15	No	-	-	-	-
16	No	-	-	-	-
17	No	-	-	-	-
18	No	-	-	-	-
19	No	-	-	-	-
20	No	-	-	-	-
21	No	-	-	-	-
22	No	-	-	-	-
23	No	-	-	-	-
24	No	-	-	-	-
25	No	-	-	-	-
26	No	-	-	-	-
27	No	-	-	-	-
28	No	-	-	-	-

Item	Description
Port	This field displays the interface number.
LACP	The system ID (MAC address) of the aggregation partner.
Key	The Key that the partner has assigned to this aggregation ID.

Item	Description
Aggr ID	The time since this aggregation changed.
Partner System ID	Shows which ports are a part of this aggregation for this switch/stack. The format is: "Switch ID:Port".
Partner Port	The partner port number connected to this port.

3.3.3.5 Port Statistics

The Port Statistics is displayed on this page.

Port	LACP Received	LACP Transmitted	Discarded Unknown	Discarded Illegal
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0

Item	Description
Port	This field displays the interface number.
LACP Received	This field displays how many LACP frames have been received at each port.
LACP Transmitted	This field displays how many LACP frames have been sent from each port.
Discarded	This field displays how many unknown or illegal LACP frames have been discarded at each port.

3.3.4 Loopback-Detection

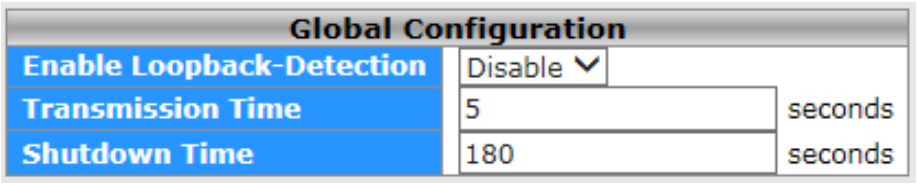
A loopback error occurs when the keep-alive packet is looped back to the port that sent the keep-alive packet.A Delta managed switch provide the Loopback-Detection function to detect the error in the network environment.

Notice:
We suggest that the Loopback-Detection function and redundancy protocol should not enable at the same time because the operating theory of these two functions are conflict.

3.3.4.1 Configuration

- **Global Configuration**

The module status of Loopback- Detection Global Configuration is used to enable/disable the Loopback-Detection feature.

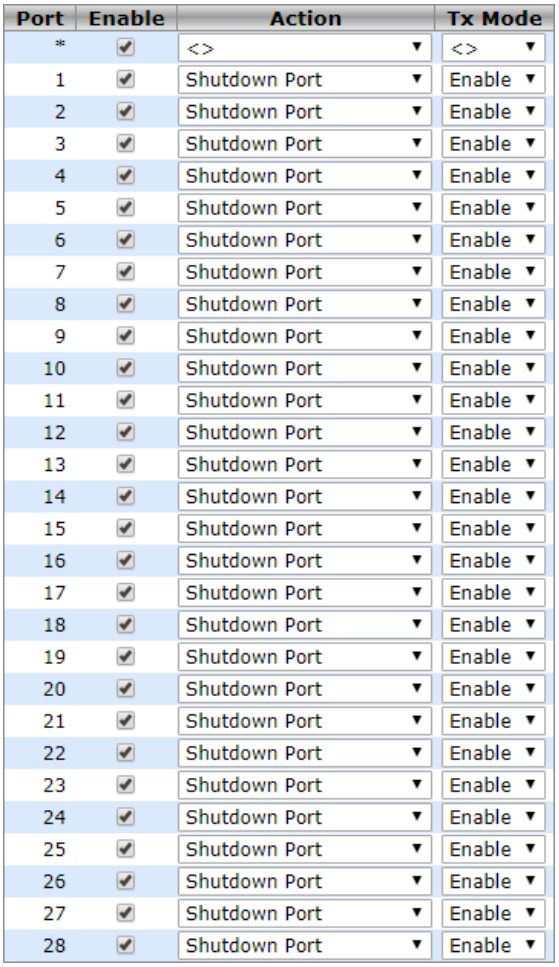


Description	Factory default
Enable Loopback-Detection	
Specify whether the status in global configuration is activated or not.	Disable
Transmission Time	
The interval between each loop protection PDU sent on each port valid values are 1 to 10 seconds.	5
Shutdown Time	
The period (in seconds) for which a port will be kept disabled in the event of a loop is detected (and the port action shuts down the port). Valid values are 0 to 604800 seconds (7 days). A value of zero will keep a port disabled (until next device restart).	180

- **Port Configuration**

The parameters of Loopback-Detection should be set for each port.

Notice:
If you need to configure Loopback-Detection Port Configuration, you must enable the Loopback-Detection Global mode.



Port	Enable	Action	Tx Mode
*	☑	<>	<>
1	☑	Shutdown Port	Enable
2	☑	Shutdown Port	Enable
3	☑	Shutdown Port	Enable
4	☑	Shutdown Port	Enable
5	☑	Shutdown Port	Enable
6	☑	Shutdown Port	Enable
7	☑	Shutdown Port	Enable
8	☑	Shutdown Port	Enable
9	☑	Shutdown Port	Enable
10	☑	Shutdown Port	Enable
11	☑	Shutdown Port	Enable
12	☑	Shutdown Port	Enable
13	☑	Shutdown Port	Enable
14	☑	Shutdown Port	Enable
15	☑	Shutdown Port	Enable
16	☑	Shutdown Port	Enable
17	☑	Shutdown Port	Enable
18	☑	Shutdown Port	Enable
19	☑	Shutdown Port	Enable
20	☑	Shutdown Port	Enable
21	☑	Shutdown Port	Enable
22	☑	Shutdown Port	Enable
23	☑	Shutdown Port	Enable
24	☑	Shutdown Port	Enable
25	☑	Shutdown Port	Enable
26	☑	Shutdown Port	Enable
27	☑	Shutdown Port	Enable
28	☑	Shutdown Port	Enable

Description	Factory default
Port	
The interface number.	*interface number*
Enable	
Enable/Disable the Loopback-Detection feature on the port.	Checked
Action	
Configures the action to take when a loop is detected. Valid values include: • Shutdown Port • Shutdown Port and Log • Log Only	Shutdown Port
Tx Mode	
Specify whether the port is actively generating loop protection PDUs, or whether it is just passively looking for looped PDUs.	Enable

3.3.4.2 Status

The Loopback-Detection Status is displayed on this page.

Port	Action	Transmit	Loops	Status	Loop	Time of Last Loop
No ports enabled						

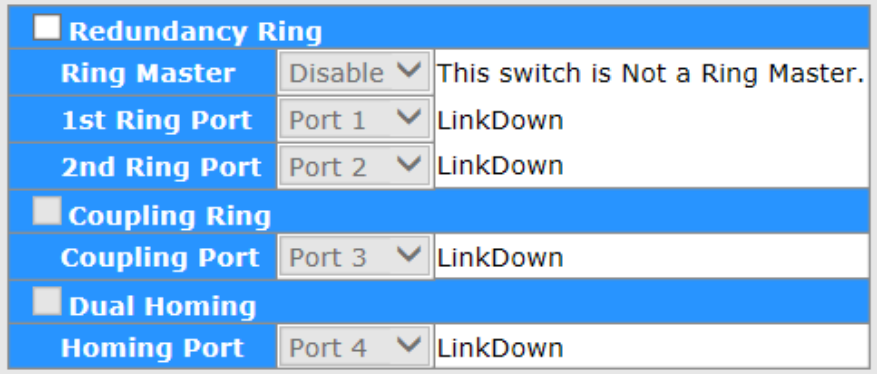
3.4 Redundancy

In some network environments, users need to set up redundant loops in the network to provide a backup path for disconnection or a network device breakdown. But if there are many network devices in the network, then each host needs to spend more time and cross many network devices to associate with each other. And sometimes the disconnection happens in a busy network, so the network must recover in a short time. Setting up redundancy on your network helps protect critical links against failure, protects against network loops, and keeps network downtime at a minimum. For example, if the Delta switch is used as a key communication component of a production line, several minutes of downtime may cause a big loss in production and revenue.

3.4.1 Redundancy Ring

The Redundany Ring topology consists of nodes having two ports participating in Redundancy Ring.

It can reduce unexpected damage caused by network topology change. It supports three of ring topology: Ring, Coupling Ring and Dual Homing.



Description	Factory default
Redundancy Ring	
Specify whether the Redundancy Ring mode is enabled or not.	Unchecked
Ring Master	
The master node manages the ring network, and there can only be one master node in a ring network.	Disable
1st Ring Port	
On the master node, it is the primary port.	Port1
2nd Ring Port	
On the master node, it is the backup port.	Port2
Coupling Ring	
Specify whether the Coupling Ring mode is enabled or not.	Disable
Coupling Port	
Select the specific port as a Coupling Port.	Port1
Dual Homing	
Specify whether the Dual Homing mode is enabled or not.	Disable
Homing Port	
Select the specific port as a Homing Port.	Port1

Notice:
We don't suggest you to set one switch as a Ring Master and a Coupling Ring at the same time due to heavy load.

3.4.2 Redundancy Chain

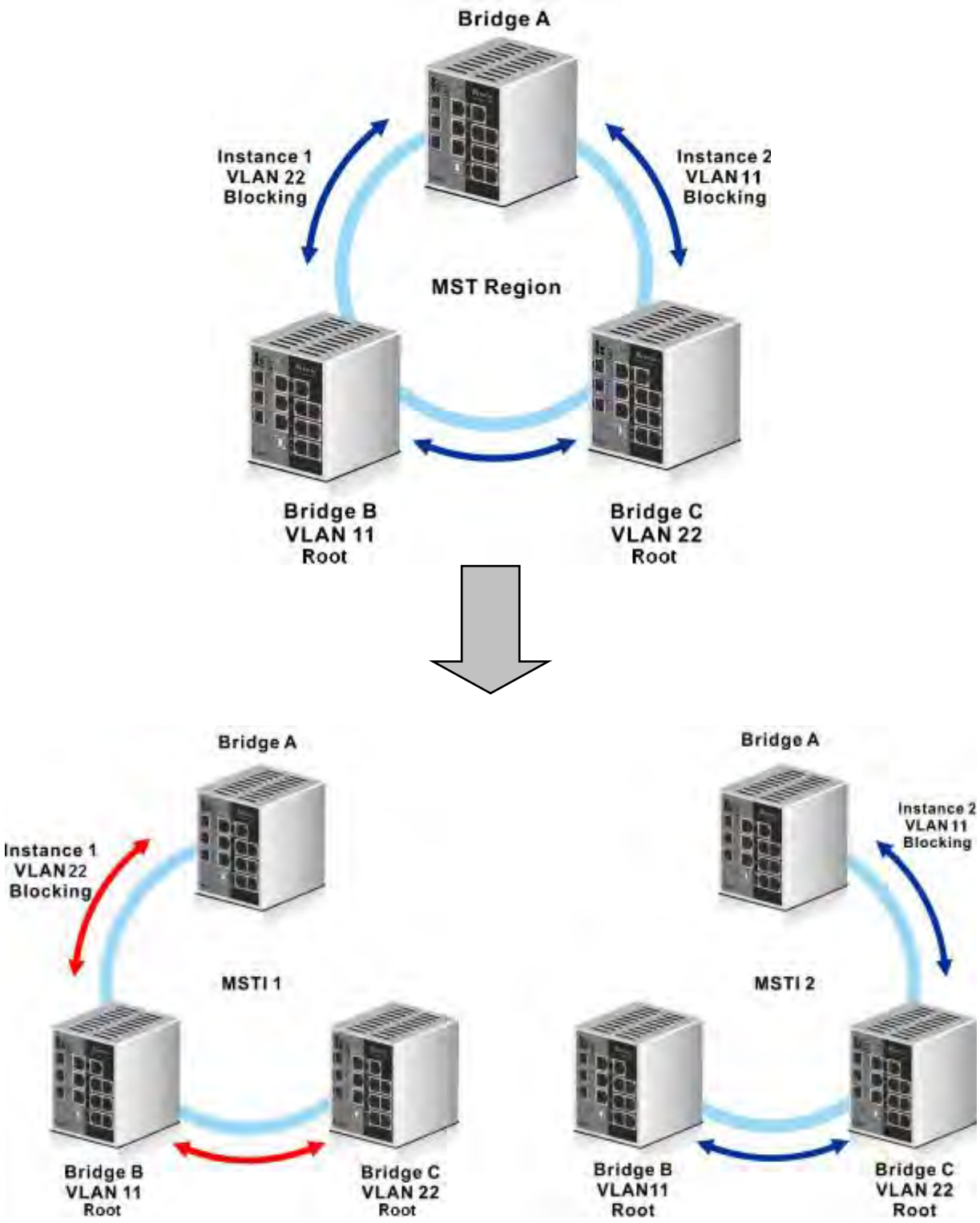
The Redundany Chain topology consists of nodes having two ports participating in Redundancy Chain.

It can reduce unexpected damage caused by network topology change, and allows multiple redundant network rings of different redundancy protocols to join and function as a larger and more robust compound network topology.

Description	Factory default
Enable	
Specify whether the Redundancy Chain mode is enabled or not.	Unchecked
Uplink Port	
Specify the priority of the specific port as an Uplink Port.	Port1
Edge Port	
The edge port status of the interface: • Checked: The interface is an edge port. • Unchecked: The interface is not an edge port.	Unchecked

3.4.3 MSTP

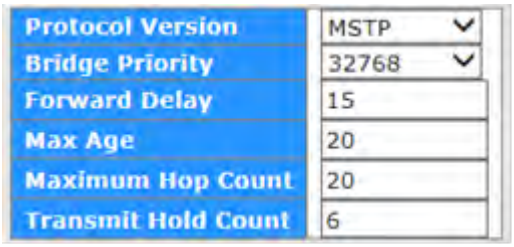
Multiple Spanning Tree Protocol (MSTP) is an extension protocol of RSTP. It can provide an independent spanning tree for different VLANs. MSTP builds a separate Multiple Spanning Tree (MST) for each instance. And MST Region may include multiple MSTP instances. The operating theory is shown in the figure below.



3.4.3.1 Bridge Settings

This page allows you to configure RSTP system settings. The settings are used by all RSTP Bridge instances in the Switch Stack.

- **Basic Settings**

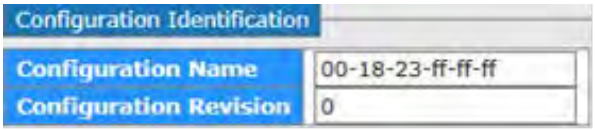


Description	Factory default
Protocol Version	
Specify the version of the STP protocol: • **STP:** Spanning Tree Protocol. • **RSTP:** Rapid Spanning Tree Protocol. • **MSTP:** Multiple Spanning Tree Protocol.	MSTP
Bridge Priority	
Controls the bridge priority. Lower numeric values have better priority. The bridge priority plus the MSTI instance number, concatenated with the 6-byte MAC address of the switch forms a Bridge Identifier. For MSTP operation, this is the priority of the CIST. Otherwise, this is the priority of the STP/RSTP bridge.	32768
Forward Delay	
The delay used by STP bridges to transit root and designated ports to forwarding (used in STP compatible mode). The range of valid values is 4 to 30 seconds.	15
Max Age	
The maximum time the information transmitted by the root bridge is considered valid. The range of valid values is 6 to 40 seconds, and Max Age must be <= (FwdDelay-1)*2.	20
Maximum Hop Count	
This defines the initial value of remaining hops for MSTI information generated at the boundary of an MSTI region. It defines how many bridges a root bridge can distribute its BPDU information to. The range of valid values is 4 to 30 seconds, and MaxAge must be <= (FwdDelay-1)*2.	20
Transmit Hold Count	
The number of BPDU's a bridge port can send per second. When exceeded, transmission of the next BPDU will be delayed. Valid values are in the range 1 to 10 BPDU's per second.	6

3.4.3.2 MSTI Mapping

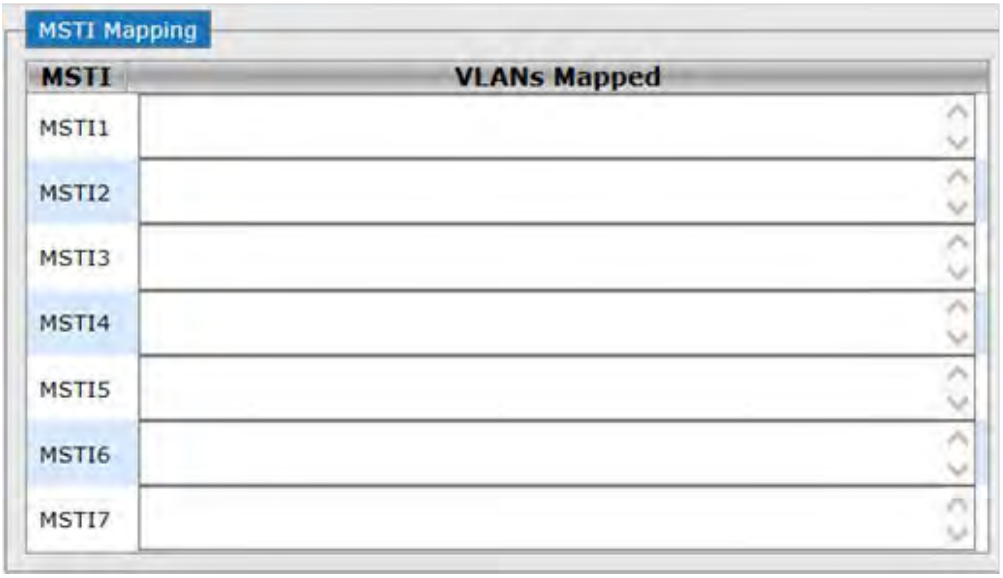
This page allows the user to inspect the current STP MSTI bridge instance priority configurations, and possibly change them as well.

- **Configuration Identification**



Description	Factory default
Configuration Name:	
Specify the name identifiying the VLAN to MSTI mapping. The name is at most 32 characters.	*MAC address*
Configuration Revision	
Specify the revision of the MSTI configuration named above. This must be an integer between 0 and 65535.	0

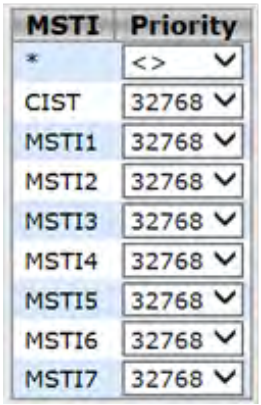
- **MSTI Mapping**



Description	Factory default
MSTI	
The bridge instance. The CIST is not available for explicit mapping, as it will receive the VLANs not explicitly mapped.	*Instance number*
VLANs Mapping	
The list of VLAN's mapped to the MSTI. One VLAN can only be mapped to one MSTI. An unused MSTI should just be left empty.	0

3.4.3.3 MSTI Priorities

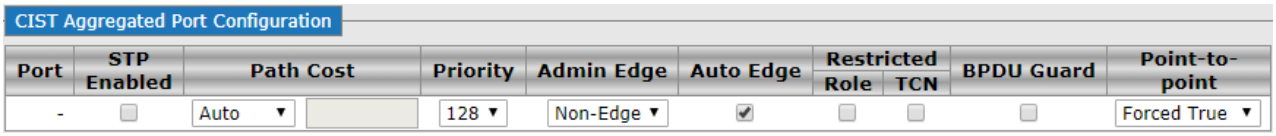
This page allows the user to inspect the current bridge instance priority configurations, and possibly change them as well.



Description	Factory default
MSTI	
The bridge instance. The CIST is the default instance, which is always active.	*Instance number*
Priority	
The list of VLAN's mapped to the MSTI. One VLAN can only be mapped to one MSTI. An unused MSTI should just be left empty.	0

3.4.3.4 CIST Ports

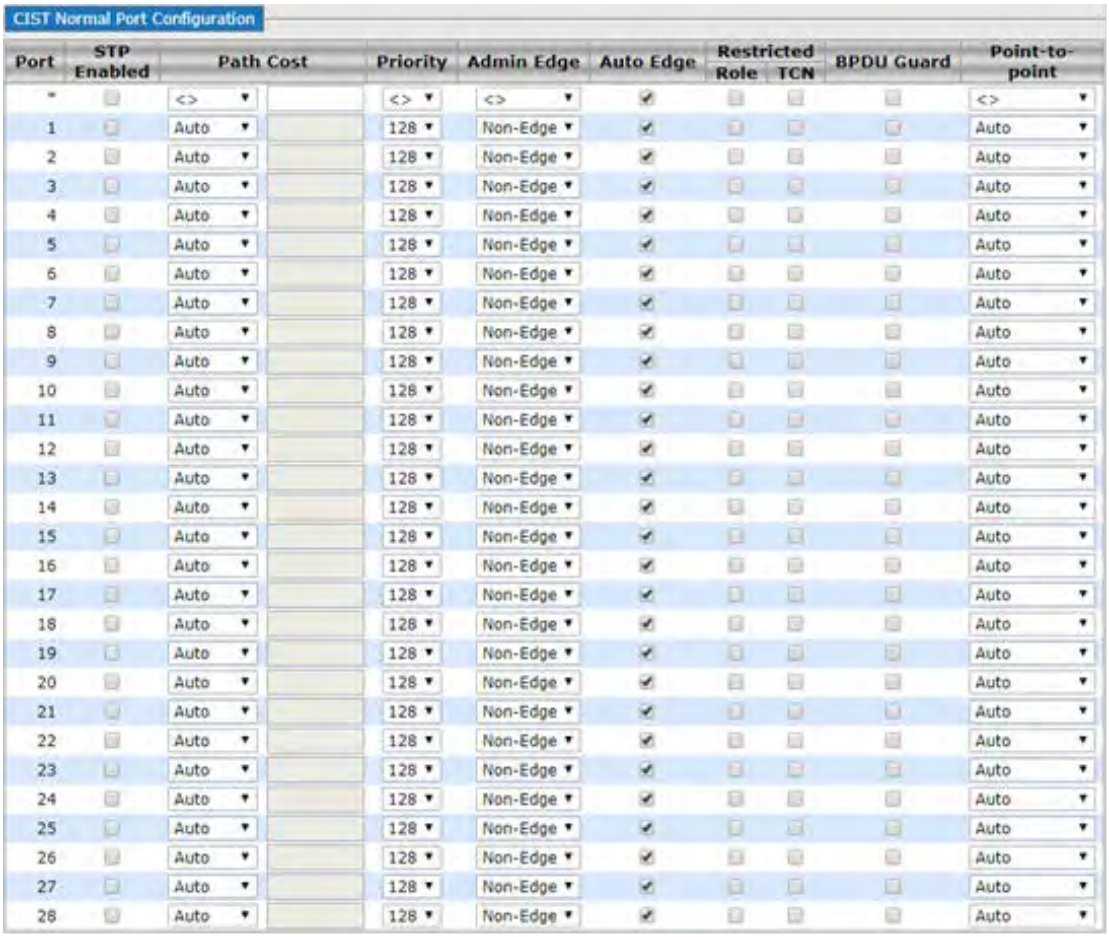
- **CIST Aggrgated Port Configuration**



Description	Factory default
Port	
The switch port number of the logical STP port.	*None*
STP Enabled	
Specify whether the STP mode is enabled or not. • **Checked:** STP is enabled. • **Unchecked:** STP is disabled.	Unchecked
Path Cost	
Leave the existing path cost, or enters a new path cost that is used for the interface in the CIST. • Auto: It will set the path cost as appropriate by the physical link speed, using the 802.1D recommended values • Specific: Enter a number in the range of 1 to 200,000,000. Enter a blank (that is, remove the number and make sure that there is no space character in the field) to reset the path cost.	Auto
Priority	
Enter the priority for the interface in the CIST. Enter a value between 0 and 240 that is a multiple of 16. The default priority is 128.	128
Admin Edge	
Controls whether the operEdge flag should start as beeing set or cleared. (The initial operEdge state when a port is initialized).	Non-Edge
Auto Edge	
Controls whether the bridge should enable automatic edge detection on the bridge port.	Checked
Restricted	
Specify whether the restricted role or TCN guard restricted is enabled or not.	Unchecked
BPDU Guard	
Specify whether the BPDU guard is enabled or not.	Unchecked
Point-to-point	
Specify the point-to-point status of the interface in the CIST: • **ForceTrue:** The interface has a point-to-point connection to a switch, bridge, or end node, irrespective of the actual connection.	Auto

Description	Factory default
• **ForceFalse:** The interface does not have a point-to-point connection to a switch, bridge, or end node, irrespective of the actual connection. • **Auto:** The type of connection is automatically detected.	

- **CIST Normal Port Configuration**



Description	Factory default
Port	
The switch port number of the logical STP port.	*None*
STP Enabled	
Specify whether the STP mode is enabled or not. • **Checked:** STP is enabled. • **Unchecked:** STP is disabled.	Unchecked
Path Cost	
Leave the existing path cost, or enters a new path cost that is used for the interface in the CIST. • Auto: It will set the path cost as appropriate by the physical link speed, using the 802.1D recommended values • Specific: Enter a number in the range of 1 to 200,000,000. Enter a blank (that is, remove the number and make sure that there is no space character in the field) to reset the path cost.	Auto

Description	Factory default
Priority	
Enter the priority for the interface in the CIST. Enter a value between 0 and 240 that is a multiple of 16. The default priority is 128.	128
Admin Edge	
Controls whether the operEdge flag should start as beeing set or cleared. (The initial operEdge state when a port is initialized).	Non-Edge
Auto Edge	
Controls whether the bridge should enable automatic edge detection on the bridge port.	Checked
Restricted	
Specify whether the restricted role or TCN guard restricted is enabled or not.	Unchecked
BPDU Guard	
Specify whether the BPDU guard is enabled or not.	Unchecked
Point-to-point	
Specify the point-to-point status of the interface in the CIST: • **ForceTrue:** The interface has a point-to-point connection to a switch, bridge, or end node, irrespective of the actual connection. • **ForceFalse:** The interface does not have a point-to-point connection to a switch, bridge, or end node, irrespective of the actual connection. • **Auto:** The type of connection is automatically detected.	Auto

3.4.3.5 MSTI Ports

- **Select MSTI**

You can select the MSTI instance number from the drop-down list then click “Get” to go the MSTI Normal Ports Configuration.

- **MSTI Normal Ports Configuration**

MSTI Normal Ports Configuration

Port	Path Cost		Priority
*	<>		<>
1	Auto		128
2	Auto		128
3	Auto		128
4	Auto		128
5	Auto		128
6	Auto		128
7	Auto		128
8	Auto		128
9	Auto		128
10	Auto		128
11	Auto		128
12	Auto		128
13	Auto		128
14	Auto		128
15	Auto		128
16	Auto		128
17	Auto		128
18	Auto		128
19	Auto		128
20	Auto		128
21	Auto		128
22	Auto		128
23	Auto		128
24	Auto		128
25	Auto		128
26	Auto		128
27	Auto		128
28	Auto		128

Description	Factory default
Port	
This field displays the interface number or port channel number.	*interface number*
Path Cost	
Leave the existing path cost, or enters a new path cost that is used for the interface in the CIST. • Auto: It will set the path cost as appropriate by the physical link speed, using the 802.1D recommended values • Specific: Enter a number in the range of 1 to 200,000,000. Enter a blank (that is, remove the number and make sure that there is no space character in the field) to reset the path cost.	Auto
Priority	
Enter the priority for the interface in the CIST. Enter a value between 0 and 240 that is a multiple of 16. The default priority is 128.	128

3.4.3.6 Bridge Status

MSTI	Bridge ID	Root			Topology Flag	Topology Change Last
		ID	Port	Cost		
CIST	32768.00-18-23-FF-FF-FF	32768.00-18-23-FF-FF-FF	-	0	Steady	-

Item	Description
MSTI	The Bridge Instance. This is also a link to the STP Detailed Bridge Status.
Bridge ID	The Bridge ID of this Bridge instance.
Root ID	The Bridge ID of the currently elected root bridge.
Root Port	The switch port currently assigned the root port role.
Root Cost	Root Path Cost. For the Root Bridge this is zero. For all other Bridges, it is the sum of the Port Path Costs on the least cost path to the Root Bridge.
Topology Flag	The current state of the Topology Change Flag for this Bridge instance.
Topology Change Last	The time since last Topology Change occurred.

3.4.3.7 Port Status

Port	CIST Role	CIST State	Uptime
1	Non-STP	Forwarding	-
2	Non-STP	Forwarding	-
3	Non-STP	Forwarding	-
4	Non-STP	Forwarding	-
5	Non-STP	Forwarding	-
6	Non-STP	Forwarding	-
7	Non-STP	Forwarding	-
8	Non-STP	Forwarding	-
9	Non-STP	Forwarding	-
10	Non-STP	Forwarding	-
11	Non-STP	Forwarding	-
12	Non-STP	Forwarding	-
13	Non-STP	Forwarding	-
14	Non-STP	Forwarding	-
15	Non-STP	Forwarding	-
16	Non-STP	Forwarding	-
17	Non-STP	Forwarding	-
18	Non-STP	Forwarding	-
19	Non-STP	Forwarding	-
20	Non-STP	Forwarding	-
21	Non-STP	Forwarding	-
22	Non-STP	Forwarding	-
23	Non-STP	Forwarding	-
24	Non-STP	Forwarding	-
25	Non-STP	Forwarding	-
26	Non-STP	Forwarding	-
27	Non-STP	Forwarding	-
28	Non-STP	Forwarding	-

Item	Description
Port	This field shows the interface number.
CIST Role	The current STP port role of the CIST port. The port role can be one of the following values: AlternatePort BackupPort RootPort DesignatedPort.
CIST State	The current STP port state of the CIST port. The port state can be one of the following values: Blocking Learning Forwarding.
Uptime	The time since the bridge port was last initialized.

3.4.3.8 Port Statistics

Port	Transmitted				Received				Discarded	
	MSTP	RSTP	STP	TCN	MSTP	RSTP	STP	TCN	Unknown	Illegal
No ports enabled										

Item	Description
Port	This field shows the interface number.
Transmitted	This field shows the number of MSTP/RSTP/STP/TCN configuration BPDU's transmitted on the port.
Received	This field shows the number of MSTP/RSTP/STP/TCN configuration BPDU's received on the port.
Discarded	The number of unknown/illegal Spanning Tree BPDU's received (and discarded) on the port.

3.4.4 Fast Recovery

The Fast Recovery Mode can be set to connect multiple ports to one or more switches. The DVS Layer 3 switch with its fast recovery mode will provide redundant links.

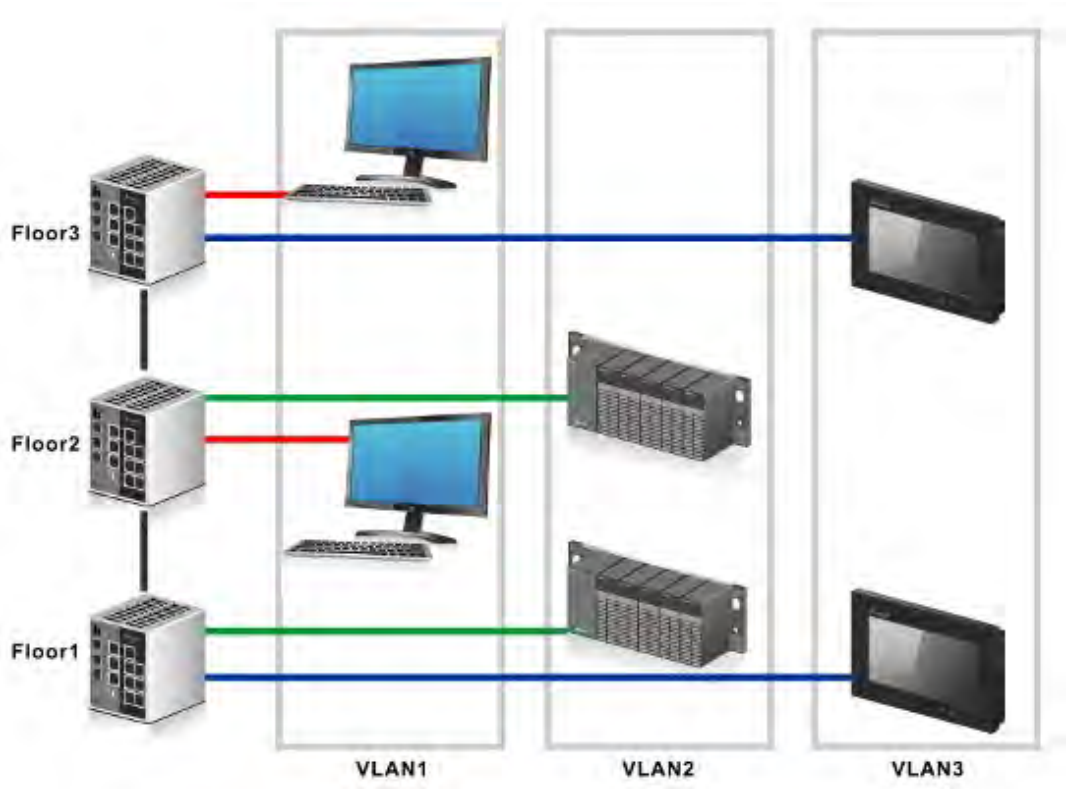
Fast Recovery mode supports 28 priorities, only the first priority will be the act port, the other ports configured with other priority will be the backup ports.

Enable	Recovery Priority
1	Not included
2	Not included
3	Not included
4	Not included
5	Not included
6	Not included
7	Not included
8	Not included
9	Not included
10	Not included
11	Not included
12	Not included
13	Not included
14	Not included
15	Not included
16	Not included
17	Not included
18	Not included
19	Not included
20	Not included
21	Not included
22	Not included
23	Not included
24	Not included
25	Not included
26	Not included
27	Not included
28	Not included

3.5 Virtual LANs

Virtual LAN (VLAN) is a logical group network. VLANs electronically separate interfaces on the same switch into different broadcast domains so that broadcast packets are not sent to all the interfaces on a single switch. VLAN allows the switch manager to isolate network traffic so that only members of the VLAN can receive traffic from the same VLAN members. VLAN also allows a user to access the network from a different place or switch. So VLAN provide security and flexibility.

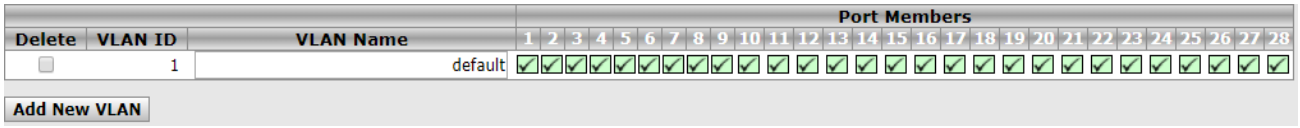
For example: Configure department A, B, C to VLAN 1, 2, 3. Users can only access the resource which belongs to their department, so the resource in their department can be protected. And they can access the resource in a different floor, even though in a different place. So they do not need to stay in a fixed place to access the resource which belongs to their department.



3.5.1 VLAN Membership

VLAN Membership is used to define VLAN groups and the VLAN information will be stored in the VLAN membership table. A Delta Layer 3 switch supports up to 64 VLANs. VLAN 1 is the default VLAN, and all interfaces are untagged members by the default setting.

Note:
If you need to access the switch via the port, we suggest that you make sure that the port you use is the untagged port of VLAN 1 (the default VLAN).



Description	Factory default
Delete	
Check to delete the entry. It will be deleted during the next save	Unchecked

Description	Factory default
VLAN ID	
Enter the identifier for the new VLAN. The range can be set in the range of 1 to 4094.	1
VLAN Name	
Enter a name for the VLAN. The name can be up to 32 alphanumeric characters long, including blanks.	None
Port Members	
If the interface is not a member of VLAN, the square must keep blank. The port currently is not the static member of the VLAN, but it can be added dynamically by other protocols, for example by GVRP.	Checked

- **Add New VLAN**

Enter the identifier and a name for the VLAN, and the range of VLAN ID is from 1 to 4095. You can add and configure all interfaces as members to the specific VLAN

3.5.2 Ports

- **Ethertype for Custom S-ports**

Description	Factory default
Entertype for Custom S-ports	
Specify the ether type used for Custom S-ports. This is a global setting for all the Custom S-ports.	0x88A8

- **Ports Configuration**

Ports Configuration is used to defined all interface with three difference type:

- Unware: It can be used for 802.1 QinQ, and the TPID of frame will be set to 0x8100.
- C-port: The TPID of frame will be set to 0x8100.
- S-port: The TPID of frame will be set to 0x88A8
- S-custom-port: The TPID of received frame will be set to 0x88A8, and the transceived frame will be set to a customize value which from the Ethertype for Custom S-port.

Port	Port Type	Ingress Filtering	Frame Type	Port VLAN		Tx Tag
				Mode	ID	
*	<>	☐	<>	<>	1	<>
1	Unaware	☐	All	Specific	1	Untag_pvid
2	Unaware	☐	All	Specific	1	Untag_pvid
3	Unaware	☐	All	Specific	1	Untag_pvid
4	Unaware	☐	All	Specific	1	Untag_pvid
5	Unaware	☐	All	Specific	1	Untag_pvid
6	Unaware	☐	All	Specific	1	Untag_pvid
7	Unaware	☐	All	Specific	1	Untag_pvid
8	Unaware	☐	All	Specific	1	Untag_pvid
9	Unaware	☐	All	Specific	1	Untag_pvid
10	Unaware	☐	All	Specific	1	Untag_pvid
11	Unaware	☐	All	Specific	1	Untag_pvid
12	Unaware	☐	All	Specific	1	Untag_pvid
13	Unaware	☐	All	Specific	1	Untag_pvid
14	Unaware	☐	All	Specific	1	Untag_pvid
15	Unaware	☐	All	Specific	1	Untag_pvid
16	Unaware	☐	All	Specific	1	Untag_pvid
17	Unaware	☐	All	Specific	1	Untag_pvid
18	Unaware	☐	All	Specific	1	Untag_pvid
19	Unaware	☐	All	Specific	1	Untag_pvid
20	Unaware	☐	All	Specific	1	Untag_pvid
21	Unaware	☐	All	Specific	1	Untag_pvid
22	Unaware	☐	All	Specific	1	Untag_pvid
23	Unaware	☐	All	Specific	1	Untag_pvid
24	Unaware	☐	All	Specific	1	Untag_pvid
25	Unaware	☐	All	Specific	1	Untag_pvid
26	Unaware	☐	All	Specific	1	Untag_pvid
27	Unaware	☐	All	Specific	1	Untag_pvid
28	Unaware	☐	All	Specific	1	Untag_pvid

Description	Factory default
Port	
This field displays the interface number or port channel number	*interface number*
Port Typa	
Specify the interface type: • **Unware:** All frames are classified to the Port VLAN ID and tags are not removed. • **C-port:** Customer Port • **S-port:** Service Port • **S-custom-port:** Custom Service port.	Unware
Ingress Filtering	
Specify whether the ingress filtering is applied: • **Checked:** The ingress filtering is enabled for the interface. • **Unchecked:** The ingress filtering is disabled for the interface. All frames are forwarded.	Unchecked

Description	Factory default
Frame Type	
Specify whether the port accepts all frames or only tagged/untagged frames. • **All:** The port accepts all frames. • **Tagged**: The port only accepts tagged frame, and the untagged will be discarded. • **Untagged:** The port only accepts untagged frame.	All
Port VLAN_Mode	
Specify the mode of the interface. • **None:** This mode is normally used for ports connected to VLAN aware switches. Tx tag should be set to Untag_pvid when this mode is used. • **Specific:** If Specific (the default value) is selected, a Port VLAN ID can be configured.	Specific
Port VLAN_ID	
Specify the the VLAN identifier for the port. **Note:** If you want to change the default PVID of an interface, create VLAN and then includes the interface as a member.	1
Tx Tag	
Specify the egress tagging rule of a port. • **Untag_pvid**: All VLANs except the configured PVID will be tagged. • **Tag_all**: All VLANs are tagged. • **Untag_all:** All VLANs are untagged.	Untag_pvid

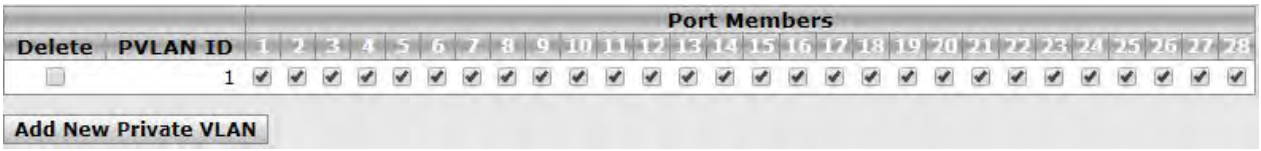
3.5.3 Private VLAN

The Private VLAN membership configurations for the switch can be monitored and modified here. Private VLANs can be added or deleted here. Port members of each Private VLAN can be added or removed here. Private VLANs are based on the source port mask, and there are no connections to VLANs. This means that VLAN IDs and Private VLAN IDs can be identical.

A port must be a member of both a VLAN and a Private VLAN to be able to forward packets. By default, all ports are VLAN unaware and members of VLAN 1 and Private VLAN 1.

A VLAN unaware port can only be a member of one VLAN, but it can be a member of multiple Private VLANs.

3.5.3.1 PVLAN Membership



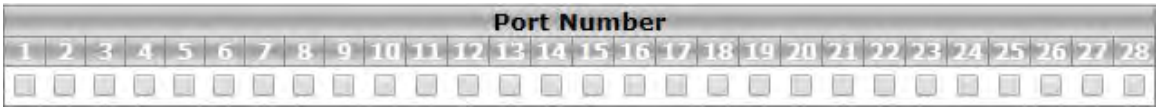
Description	Factory default
Delete	
Check to delete the entry. It will be deleted during the next save.	Unchecked
PVLAN ID	
Enter the identifier for the new Private VLAN	1

Description	Factory default
Port Members	
If the interface is not a member of VLAN, the square must keep blank. The port currently is not the static member of the VLAN, but it can be added dynamically by other protocols, for example by GVRP.	Checked

- **Add New Private VLAN**

Enter the identifier and a name for the Private VLAN, and the range is from 1 to 4095. You can add and configure all interfaces as members to the specific Private VLAN.

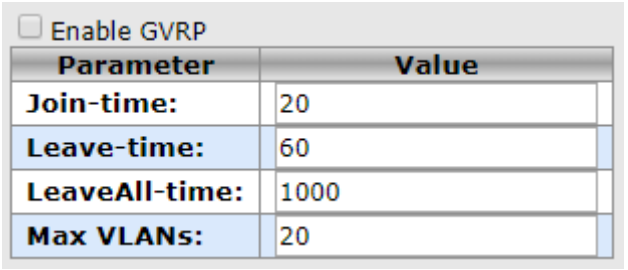
3.5.3.2 Port Isolation



Description	Factory default
Port Number	
Specify whether the interface is enabled or not. • **Checked:** The interface is enabled. • **Unchecked:** The interface is disabled.	Unchecked

3.5.4 GVRP Config

GVRP is a GARP application that provides IEEE 802.1Q-compliant VLAN pruning and dynamic VLAN creation on 802.1Q trunk ports. With GVRP, the switch can exchange VLAN configuration information with other GVRP switches, prune unnecessary broadcast and unknown unicast traffic, and dynamically create and manage VLANs on switches connected through 802.1Q trunk ports.



Description	Factory default
GVRP	
User can enable / disable GVRP Function	None
Join-time	
The value in the range 1-20 in the units of centi seconds, i.e. in units of one hundredth of a second.	20
Leave-time	
The value in the range 60-300 in the units of centi seconds, i.e. in units of one hundredth of a second.	60
LeaveAll-time	
The value in the range 1000-5000 in the units of centi seconds, i.e. in units of one hundredth of a second.	1000

Description	Factory default
Max Number of VLANs	
When GVRP is enabled a maximum number of VLANs supported by GVRP is specified. By default this number is 20. This number can only be changed when GVRP is turned off.	20

3.6 SNMP

Simple Network Management Protocol (SNMP) is an application protocol used for exchanging management information between network devices. SNMP is a member of the TCP/IP protocol suite. SNMP V1, V2 and V3 are supported on the Delta switch, and it is enabled by default.

A Delta switch supports standard public MIBs for standard functionality and private MIBs that provide additional functionality. You can use SNMP to enable or disable authentication traps, cold-start and warm-start functionality traps, link up and link down traps, Spanning Tree Protocol (STP) traps, SFP traps, and password and IP address change traps.

3.6.1 System

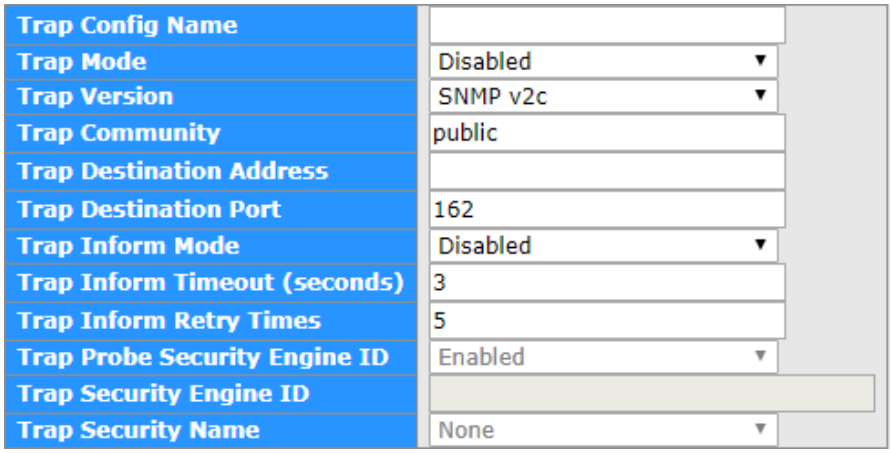
- **System Configuration**

Description	Factory default
Mode	
Specify whether the SNMP mode is enabled or not. • **Enabled:** SNMP is enabled. • **Disabled:** SNMP is disabled.	Enabled
Version	
Specify the SNMP version that is used for the trap community: • **SNMP v1**: Uses SNMPv1 to send traps to the trap community. • **SNMP v2c**: Uses SNMPv2c to send traps to the trap community. • **SNMP v3**: Uses SNMPv3 to send traps to the trap community.	SNMP v2c
Read Community	
Entering the community read access string to permit access to SNMP agent. The string length is 0 to 255, and the content is the ASCII characters from 33 to 126.	public
Write Commnunity	
Entering the community read access string to permit access to SNMP agent. The string length is 0 to 255, and the content is the ASCII characters from 33 to 126.	private
Engine ID	
Entering the SNMPv3 engine ID. The string must contain an even number between 10 and 64 hexadecimal digits, but all-zeros and all-'F's are not allowed. Change of the Engine ID will clear all original local users.	Fixed

3.6.2 Trap

- **Trap Configuration**

If network engineers need to get information from an SNMP agent (network device), they usually use the SNMP software to poll information and get a response from an agent. But the SNMP Trap is the unsolicited trap which sends from the agent to the NMS (Network Management System).The operating theory is shown in the figure below.



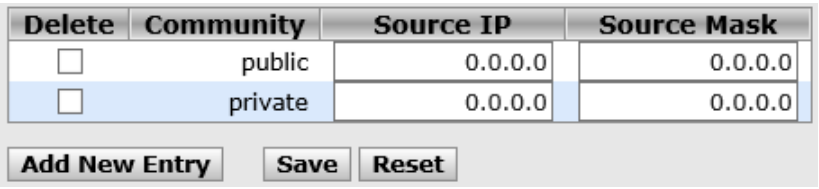
Description	Factory default
Trap Mode	
Specify whether the Trap mode is enabled or not. • **Enabled:** Trap mode is enabled. • **Disabled:** Trap mode is disabled.	Disabled
Trap Version	
Specify the SNMP Trap version that is used for the trap community. • **SNMP v1**: Uses SNMPv1 to send traps to the trap community. • **SNMP v2c**: Uses SNMPv2c to send traps to the trap community. • **SNMP v3**: Uses SNMPv3 to send traps to the trap community.	SNMP v1
Trap Community	
Specify the community access string when send SNMP trap packet. The allowed string length is 0 to 255, and the allowed content is the ASCII characters from 33 to 126.	public
Trap Destination Address	
Entering the SNMP trap destination address in IPv6 format.	None
Trap Destination Port	
This is the SNMP Trap destination port used by the SNMP Trap option for event notification. You can optionally change the IP port on which to send the SNMP trap, this must be the actual port on which the SNMP trap host listens. The typical, well-known port for SNMP traps is 162 (default).	162
Trap Inform Mode	
Specify whether the Trap Link-up and Link-down is enabled or not. • Enabled: Enable Trap Inform Mode. • Disabled: Disable Trap Inform Mode. **Note:** It's only be activated the configuration when you select the Trap version to SNMPv2c.	Enabled

Description	Factory default
Trap Inform Timeout (seconds)	
Entering the Trap Inform Timeout. The range is 0 to 2147. **Note:** It's only be activated the configuration when you select the Trap version to SNMPv2c.	3
Trap Inform Retry Times	
Entering the Trap Inform Retry Times. The range is 0 to 255. **Note:** It's only be activated the configuration when you select the Trap version to SNMPv2c.	5
Trap Probe Security Engine ID	
Indicates the SNMP trap probe security engine ID mode of operation. Possible values are: • Enabled: Enable SNMP trap probe security engine ID mode of operation. • Disabled: Disable SNMP trap probe security engine ID mode of operation. When is enabled, the ID will be probed automatically. Otherwise, the ID specified in this field is used. **Note:** It's only be activated the configuration when you select the Trap version to SNMPv3.	Enabled
Trap Security Engine ID	
Indicates the SNMP trap security engine ID. SNMPv3 sends traps and informs use USM for authentication and privacy. A unique engine ID for these traps and informs is needed. When "Trap Probe Security Engine ID" is enabled, the ID will be probed automatically. Otherwise, the ID specified in this field is used. The string must contain an even number (in hexadecimal format) with number of digits between 10 and 64, but all-zeros and all-'F's are not allowed. **Note:** It's only be activated the configuration when you select the Trap version to SNMPv3.	None
Trap Security Name	
Indicates the SNMP trap security name. SNMPv3 traps and informs using USM for authentication and privacy. A unique security name is needed when traps and informs are enabled. **Note:** It's only be activated the configuration when you select the Trap version to SNMPv3.	None

3.6.3 Communities

Configure SNMPv3 communities table on this page. The entry index key is Community.

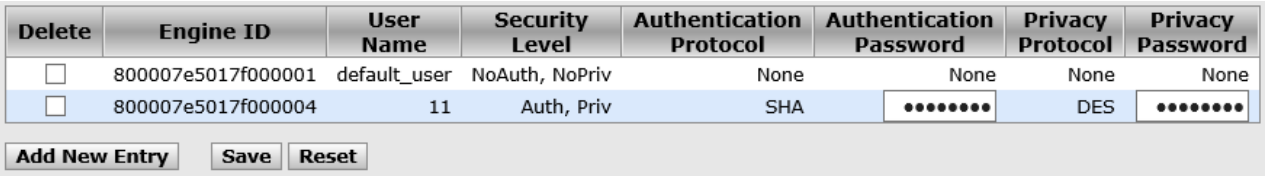
Click " Add New Entry" to add a new communities.



Description	Factory default
Delete	
Check to delete the entry. It will be deleted during the next save.	Unchecked
Community	
Entering the community access string to permit access to SNMPv3 agent. The allowed string length is 1 to 32, and the allowed content is the ASCII characters from 33 to 126.	None
Source IP	
Entering the SNMP access source address.	0.0.0.0
Source Mask	
Entering the SNMP access source address mask.	0.0.0.0

3.6.4 Users

Configure SNMPv3 users table on this page. The entry index keys are Engine ID and User Name.



Description	Factory default
Delete	
Check to delete the entry. It will be deleted during the next save.	Unchecked
Engine ID	
Entering the SNMPv3 engine ID. The string must contain an even number between 10 and 64 hexadecimal digits, but all-zeros and all-'F's are not allowed. Change of the Engine ID will clear all original local users.	None
User Name	
A string identifying the user name that this entry should belong to. The allowed string length is 1 to 32, and the allowed content is the ASCII characters from 33 to 126.	None
Security Level	
Specify the security level that this entry should belong to. • NoAuth, NoPriv: None authentication and none privacy. • Auth, NoPriv: Authentication and none privacy. • Auth, Priv: Authentication and privacy. **Note:** The value of security level cannot be modified if entry already exists.	NoAuth, NoPriv
Authentication Protocol	
Specify the authentication protocol. • None: None authentication protocol • MD5: An optional flag to indicate that this user is using MD5 authentication protocol. • SHA: An optional flag to indicate that this user is using SHA authentication protocol.	None

Description	Factory default
Note: The value of security level cannot be modified if entry already exists.	
Authentication Password	
Entering the password for new entry authentication protocol with ASCII character, and the length is 33 to 126. The MD5 Protocol is 8 to 32, and the SHA protocol is 8 to 40.	None
Privacy Protocol	
Specify the privacy protocol. • None: None privacy protocol. • DES: An optional flag to indicate that this user using DES authentication protocol.	None
Privacy Password	
Entering the password for Privacy protocol with ASCII character, and the length is 33 to 126.	None

3.6.5 Groups

Delete	Security Model	Security Name	Group Name
☐	v1	public	default_ro_group
☐	v1	private	default_rw_group
☐	v2c	public	default_ro_group
☐	v2c	private	default_rw_group
☐	usm	default_user	default_rw_group

Description	Factory default
Delete	
Check to delete the entry. It will be deleted during the next save.	Unchecked
Security Model	
Specify the security model. • v1: Reserved for SNMPv1. • v2c: Reserved for SNMPv2c. • usm: User-based Security Model (USM).	v1
Security Name	
A string identifying the security name that this entry should belong to. The allowed string length is 1 to 32, and the allowed content is the ASCII characters from 33 to 126.	None
Group Name	
A string identifying the group name that this entry should belong to. The allowed string length is 1 to 32, and the allowed content is the ASCII characters from 33 to 126.	None

3.6.6 Views

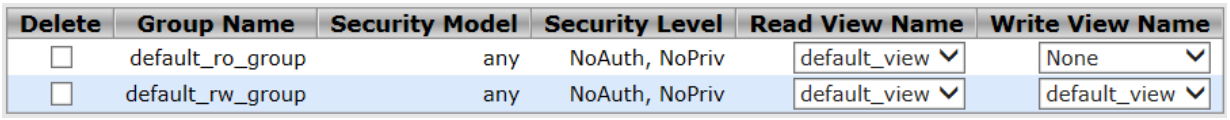
Configure SNMPv3 views table on this page. The entry index keys are View Name and OID Subtree.

Delete	View Name	View Type	OID Subtree
☐	default_view	included	.1

Description	Factory default
Delete	
Check to delete the entry. It will be deleted during the next save.	Unchecked
View Name	
A string identifying the view name that this entry should belong to. The allowed string length is 1 to 32, and the allowed content is the ASCII characters from 33 to 126.	None
View Type	
Specify the view type that this entry should belong to. • included: An optional flag to indicate that this view subtree should be included. • excluded: An optional flag to indicate that this view subtree should be excluded. General, if a view entry's view type is 'excluded', it should be exist another view entry which view type is 'included' and it's OID subtree overstep the 'excluded' view entry.	None
OID Subtree	
The OID defining the root of the subtree to add to the named view. The allowed OID length is 1 to 128. The allowed string content is digital number or asterisk(*).	None

3.6.7 Access

Configure SNMPv3 accesses table on this page. The entry index keys are Group Name, Security Model and Security Level.



Delete	Group Name	Security Model	Security Level	Read View Name	Write View Name
☐	default_ro_group	any	NoAuth, NoPriv	default_view	None
☐	default_rw_group	any	NoAuth, NoPriv	default_view	default_view

Description	Factory default
Delete	
Check to delete the entry. It will be deleted during the next save.	Unchecked
Group Name	
Specify the group name. **Note:** If you want to add another group name, you could add the name in “Groups” configuration.	None
Security Model	
Specify the security model. • any: Accepted any security model. • v1: Reserved for SNMPv1. • v2c: Reserved for SNMPv2c. • usm: User-based Security Model (USM).	any
Security Level	
Specify the security level that this entry should belong to. • NoAuth, NoPriv: None authentication and none privacy. • Auth, NoPriv: Authentication and none privacy. • Auth, Priv: Authentication and privacy.	NoAuth, NoPriv

Description	Factory default
Note: The value of security level cannot be modified if entry already exists.	
Read View Name	
The name of the MIB view which defining the MIB objects for which this request may request the current values. The allowed string length is 1 to 32, and the allowed content is the ASCII characters from 33 to 126.	None
Write View Name	
The name of the MIB view which defining the MIB objects for which this request may potentially SET new values. The allowed string length is 1 to 32, and the allowed content is the ASCII characters from 33 to 126.	None

3.7 Traffic Prioritization

The traffic prioritization allows you to make sure that the time-sensitive and system-critical data can be transferred with the minimal delay. It uses four queues that are present in UI from the high priority to the low priority.

A Delta switch supports the DSCP trust mode, the 802.1p trust mode, the queue scheduling (Support Weighted Round Robin and Strict-Priority) and 4 level priority queues. The traffic prioritization depends on 2 methods:

- **IEEE 802.1P:** a layer 2 marking scheme.
- **Differentiated Services (DiffServ):** a layer 3 marking scheme.

3.7.1 Storm Control

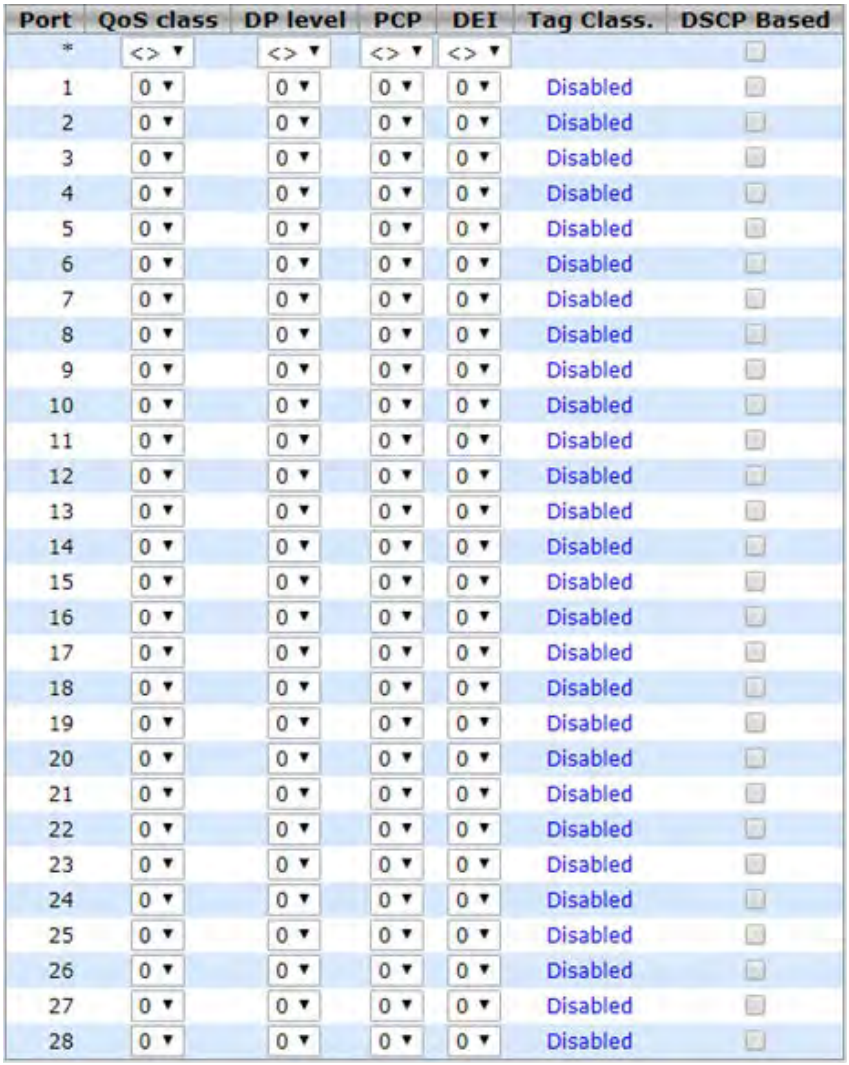
A traffic storm occurs when incoming packets flood the LAN, which causes the decreasing of the network performance. The storm control can prevent flooding packets from affecting the network performance. A Delta Layer 3 switch allows you to configure both storm control for each interface and rate limiting of each interface for incoming and outgoing traffic.

Port	Unicast Frames			Broadcast Frames			Unknown Frames		
	Enabled	Rate	Unit	Enabled	Rate	Unit	Enabled	Rate	Unit
*	☐	500	<>	☐	500	<>	☐	500	<>
1	☐	500	kbps	☐	500	kbps	☐	500	kbps
2	☐	500	kbps	☐	500	kbps	☐	500	kbps
3	☐	500	kbps	☐	500	kbps	☐	500	kbps
4	☐	500	kbps	☐	500	kbps	☐	500	kbps
5	☐	500	kbps	☐	500	kbps	☐	500	kbps
6	☐	500	kbps	☐	500	kbps	☐	500	kbps
7	☐	500	kbps	☐	500	kbps	☐	500	kbps
8	☐	500	kbps	☐	500	kbps	☐	500	kbps
9	☐	500	kbps	☐	500	kbps	☐	500	kbps
10	☐	500	kbps	☐	500	kbps	☐	500	kbps
11	☐	500	kbps	☐	500	kbps	☐	500	kbps
12	☐	500	kbps	☐	500	kbps	☐	500	kbps
13	☐	500	kbps	☐	500	kbps	☐	500	kbps
14	☐	500	kbps	☐	500	kbps	☐	500	kbps
15	☐	500	kbps	☐	500	kbps	☐	500	kbps
16	☐	500	kbps	☐	500	kbps	☐	500	kbps
17	☐	500	kbps	☐	500	kbps	☐	500	kbps
18	☐	500	kbps	☐	500	kbps	☐	500	kbps
19	☐	500	kbps	☐	500	kbps	☐	500	kbps
20	☐	500	kbps	☐	500	kbps	☐	500	kbps
21	☐	500	kbps	☐	500	kbps	☐	500	kbps
22	☐	500	kbps	☐	500	kbps	☐	500	kbps
23	☐	500	kbps	☐	500	kbps	☐	500	kbps
24	☐	500	kbps	☐	500	kbps	☐	500	kbps
25	☐	500	kbps	☐	500	kbps	☐	500	kbps
26	☐	500	kbps	☐	500	kbps	☐	500	kbps
27	☐	500	kbps	☐	500	kbps	☐	500	kbps
28	☐	500	kbps	☐	500	kbps	☐	500	kbps

Description	Factory default
Frame Type	
The settings in a particular row apply to the frame type listed here: unicast, broadcast or unknown.	Fixed
Enable	
Specify whether the frame type is enabled or not. • **Checked:** Enable the storm control of the frame type. • **Unchecked:** Disable the storm control of the frame type.	Unchecked
Rate	
The rate unit is packet per second (pps), configure the rate as 1K, 2K, 4K, 8K, 16K, 32K, 64K, 128K, 256K, 512K, or 1024K. The 1 kpps is actually 1002.1 pps.	1K

3.7.2 Port Classfication

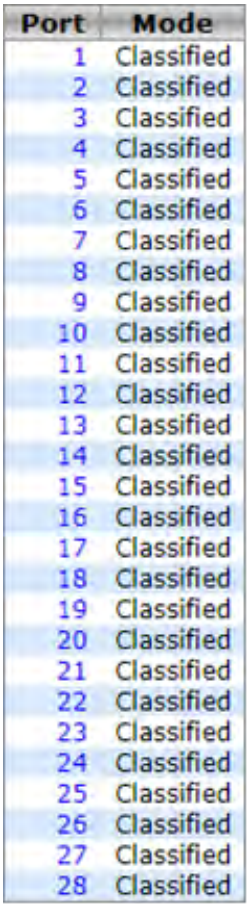
Quality of Service (QoS) provides a traffic prioritization for you to alleviate the congestion problem, and ensure that high-priority traffic is delivered first. If the bandwidth of the network is limited, you can use QoS to schedule the priority of a different service packet flow.



Port	QoS class	DP level	PCP	DEI	Tag Class.	DSCP Based
*	<>	<>	<>	<>		
1	0	0	0	0	Disabled	
2	0	0	0	0	Disabled	
3	0	0	0	0	Disabled	
4	0	0	0	0	Disabled	
5	0	0	0	0	Disabled	
6	0	0	0	0	Disabled	
7	0	0	0	0	Disabled	
8	0	0	0	0	Disabled	
9	0	0	0	0	Disabled	
10	0	0	0	0	Disabled	
11	0	0	0	0	Disabled	
12	0	0	0	0	Disabled	
13	0	0	0	0	Disabled	
14	0	0	0	0	Disabled	
15	0	0	0	0	Disabled	
16	0	0	0	0	Disabled	
17	0	0	0	0	Disabled	
18	0	0	0	0	Disabled	
19	0	0	0	0	Disabled	
20	0	0	0	0	Disabled	
21	0	0	0	0	Disabled	
22	0	0	0	0	Disabled	
23	0	0	0	0	Disabled	
24	0	0	0	0	Disabled	
25	0	0	0	0	Disabled	
26	0	0	0	0	Disabled	
27	0	0	0	0	Disabled	
28	0	0	0	0	Disabled	

Description	Factory default
Port	
The interface number.	*interface number*
QoS class	
Specify the default QoS class. • **PCP value:** 0 1 2 3 4 5 6 7 • **QoS class:** 1 0 2 3 4 5 6 7	0
DP level	
Specif the default Drop Precedence Level. All frames are classified to a DP level. If the port is VLAN aware and the frame is tagged, then the frame is classified to a DP level that is equal to the DEI value in the tag. Otherwise the frame is classified to the default DP level. If the port is VLAN aware, the frame is tagged and Tag Class is enabled, then the frame is classified to a DP level that is mapped from the PCP and DEI value in the tag. Otherwise the frame is classified to the default DP level. The classified DP level can be overruled by a QCL entry.	0
PCP	
Specify the default PCP value. All frames are classified to a PCP value. If the port is VLAN aware and the frame is tagged, then the frame is classified to the PCP value in the tag. Otherwise the frame is classified to the default PCP value	0
DEI	
Specify the default DEI value. All frames are classified to a DEI value. If the port is VLAN aware and the frame is tagged, then the frame is classified to the DEI value in the tag. Otherwise the frame is classified to the default DEI value.	0
Tag Class	
Specify the classification mode for tagged frames on this port. Disabled: Use default QoS class and DP level for tagged frames. • **Unchecked:** Use default QoS class and DP level for tagged frames. • **Checked:** Use mapped versions of PCP and DEI for tagged frames. **Note:** This setting has no effect if the port is VLAN unaware. Tagged frames received on VLAN unaware ports are always classified to the default QoS class and DP level.	interface number
DSCP Based	
Click to enable DSCP Based QoS Ingress Port Classification	Unchecked

3.7.3 Port Tag Remarking



Port	Mode
1	Classified
2	Classified
3	Classified
4	Classified
5	Classified
6	Classified
7	Classified
8	Classified
9	Classified
10	Classified
11	Classified
12	Classified
13	Classified
14	Classified
15	Classified
16	Classified
17	Classified
18	Classified
19	Classified
20	Classified
21	Classified
22	Classified
23	Classified
24	Classified
25	Classified
26	Classified
27	Classified
28	Classified

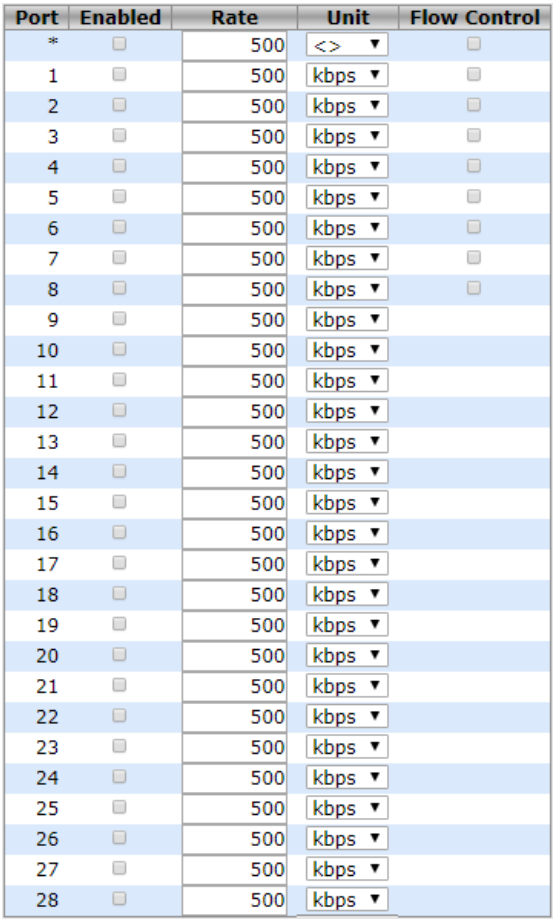
Item	Description
Port	The interface number.
Mode	The field displays the tag remarking mode for this port. • Classified: Use classified PCP/DEI values. • Default: Use default PCP/DEI values. • Mapped: Use mapped versions of QoS class and DP level.

3.7.4 Port DSCP

Port	Ingress		Egress
	Translate	Classify	Rewrite
*	☐	<>	<>
1	☐	Disable	Disable
2	☐	Disable	Disable
3	☐	Disable	Disable
4	☐	Disable	Disable
5	☐	Disable	Disable
6	☐	Disable	Disable
7	☐	Disable	Disable
8	☐	Disable	Disable
9	☐	Disable	Disable
10	☐	Disable	Disable
11	☐	Disable	Disable
12	☐	Disable	Disable
13	☐	Disable	Disable
14	☐	Disable	Disable
15	☐	Disable	Disable
16	☐	Disable	Disable
17	☐	Disable	Disable
18	☐	Disable	Disable
19	☐	Disable	Disable
20	☐	Disable	Disable
21	☐	Disable	Disable
22	☐	Disable	Disable
23	☐	Disable	Disable
24	☐	Disable	Disable
25	☐	Disable	Disable
26	☐	Disable	Disable
27	☐	Disable	Disable
28	☐	Disable	Disable

Description	Factory default
Port	
The interface number	*interface number*
Ingress_Translate	
Specify whether the Ingress Translation is enabled or not. • Checked: Enabled the Translate function. • Unchecked: Disablede the Translate function.	Unchecked
Ingress_Classify	
Specify the Ingress classify function is enabled or not. • Disable: No Ingress DSCP Classification. • DSCP=0: Classify if incoming (or translated if enabled) DSCP is 0. • Selected: Classify only selected DSCP for which classification is enabled as specified in DSCP Translation window for the specific DSCP. • All: Classify all DSCP.	Disable
Egress_Rewrite	
Specify the Engress rewrite function is enabled or not. • Disable: No Engress rewrite. • Enable: Rewrite enabled without remapping. • Remap DP Unaware: The remapped DSCP value is always taken from the 'DSCP Translation->Egress Remap DP0' table. • Remap DP Aware: the remapped DSCP value is either taken from the 'DSCP Translation->Egress Remap DP0' table or from the 'DSCP Translation->Egress Remap DP1' table.	Disable

3.7.5 Port Policing



Port	Enabled	Rate	Unit	Flow Control
*	☐	500	<>	☐
1	☐	500	kbps	☐
2	☐	500	kbps	☐
3	☐	500	kbps	☐
4	☐	500	kbps	☐
5	☐	500	kbps	☐
6	☐	500	kbps	☐
7	☐	500	kbps	☐
8	☐	500	kbps	☐
9	☐	500	kbps	
10	☐	500	kbps	
11	☐	500	kbps	
12	☐	500	kbps	
13	☐	500	kbps	
14	☐	500	kbps	
15	☐	500	kbps	
16	☐	500	kbps	
17	☐	500	kbps	
18	☐	500	kbps	
19	☐	500	kbps	
20	☐	500	kbps	
21	☐	500	kbps	
22	☐	500	kbps	
23	☐	500	kbps	
24	☐	500	kbps	
25	☐	500	kbps	
26	☐	500	kbps	
27	☐	500	kbps	
28	☐	500	kbps	

Description	Factory default
Port	
The interface number	*interface number*
Enabled	
Specify whether the QoS ingress port policer is enabled or not. • **Checked**: Enabled the QoS ingress port policer. • **Unchecked**: Disablede the QoS ingress port policer.	Unchecked
Rate	
Specify the rate of the QoS ingress port policer. This value is restricted to 100-1000000 when the "Unit" is "kbps" or "fps", and it is restricted to 1-3300 when the "Unit" is "Mbps" or "kfps".	500
Unit	
Specify the unit of measure for the policer rate as kbps, Mbps, fps or kfps . The default value is "kbps".	kbps
Flow Control	
This field displays whether the flow control is enabled for the port: • **Checked**: The flow control is enabled. If the port buffers become full, the switch sends pause packets. • **Unchecked**: The flow control is disabled. If the port buffers become full, the switch does not send pause packets.	Unchecked

3.7.6 Queue Policing

It must be enabled the Queue number first, and then you could configure this feature.

Port	Queue 0			Queue 1	Queue 2	Queue 3	Queue 4	Queue 5	Queue 6	Queue 7
	E	Rate	Unit	Enable	Enable	Enable	Enable	Enable	Enable	Enable
*	☑	500	<>	☐	☐	☐	☐	☐	☐	☐
1	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
2	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
3	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
4	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
5	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
6	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
7	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
8	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
9	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
10	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
11	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
12	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
13	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
14	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
15	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
16	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
17	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
18	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
19	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
20	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
21	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
22	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
23	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
24	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
25	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
26	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
27	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐
28	☑	500	kbps	☐	☐	☐	☐	☐	☐	☐

Description	Factory default
Port	
The interface number	*interface number*
Queue_0-7	
The Queue policer number.	*Queue number*
Enable	
Specify whether the Queue policer is enabled or not.	Unchecked
E	
Specify whether the interface is participates in the specific Queue policer or not.	kbps
Rate	
Specify the rate of the QoS ingress port policer. This value is restricted to 100-1000000 when the "Unit" is "kbps" or "fps", and it is restricted to 1-3300 when the "Unit" is "Mbps" or "kfps".	500
Unit	
Specify the unit of measure for the policer rate as kbps, Mbps, fps or kfps . The default value is "kbps".	kbps

3.7.7 Port Scheduler

This feature allows you to configure the Scheduler and Shapers for the specific port.

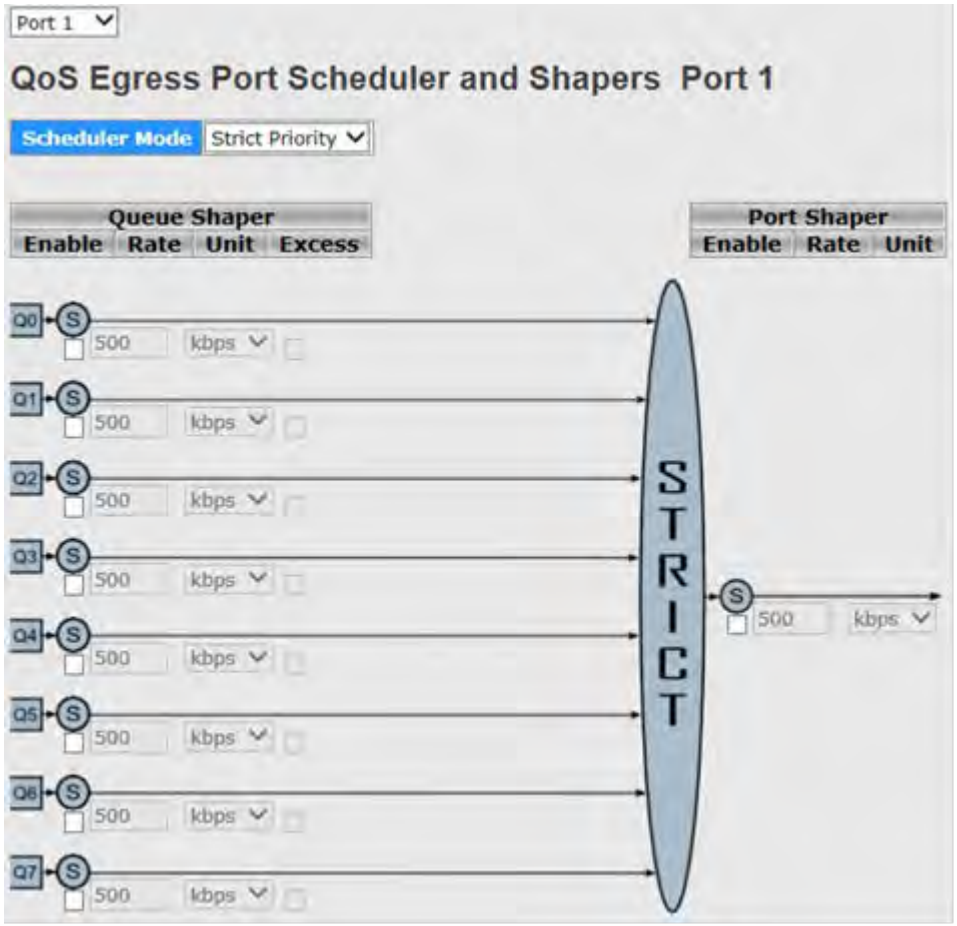
Port	Mode	Weight					
		Q0	Q1	Q2	Q3	Q4	Q5
1	Strict Priority	-	-	-	-	-	-
2	Strict Priority	-	-	-	-	-	-
3	Strict Priority	-	-	-	-	-	-
4	Strict Priority	-	-	-	-	-	-
5	Strict Priority	-	-	-	-	-	-
6	Strict Priority	-	-	-	-	-	-
7	Strict Priority	-	-	-	-	-	-
8	Strict Priority	-	-	-	-	-	-
9	Strict Priority	-	-	-	-	-	-
10	Strict Priority	-	-	-	-	-	-
11	Strict Priority	-	-	-	-	-	-
12	Strict Priority	-	-	-	-	-	-
13	Strict Priority	-	-	-	-	-	-
14	Strict Priority	-	-	-	-	-	-
15	Strict Priority	-	-	-	-	-	-
16	Strict Priority	-	-	-	-	-	-
17	Strict Priority	-	-	-	-	-	-
18	Strict Priority	-	-	-	-	-	-
19	Strict Priority	-	-	-	-	-	-
20	Strict Priority	-	-	-	-	-	-
21	Strict Priority	-	-	-	-	-	-
22	Strict Priority	-	-	-	-	-	-
23	Strict Priority	-	-	-	-	-	-
24	Strict Priority	-	-	-	-	-	-
25	Strict Priority	-	-	-	-	-	-
26	Strict Priority	-	-	-	-	-	-
27	Strict Priority	-	-	-	-	-	-
28	Strict Priority	-	-	-	-	-	-

Item	Description
Port	The interface number.
Mode	The field displays the scheduler mode for this port.

If you click on the port number, it will display the information of the specific port scheduler and shapers.

And you could also configure the scheduler mode here.

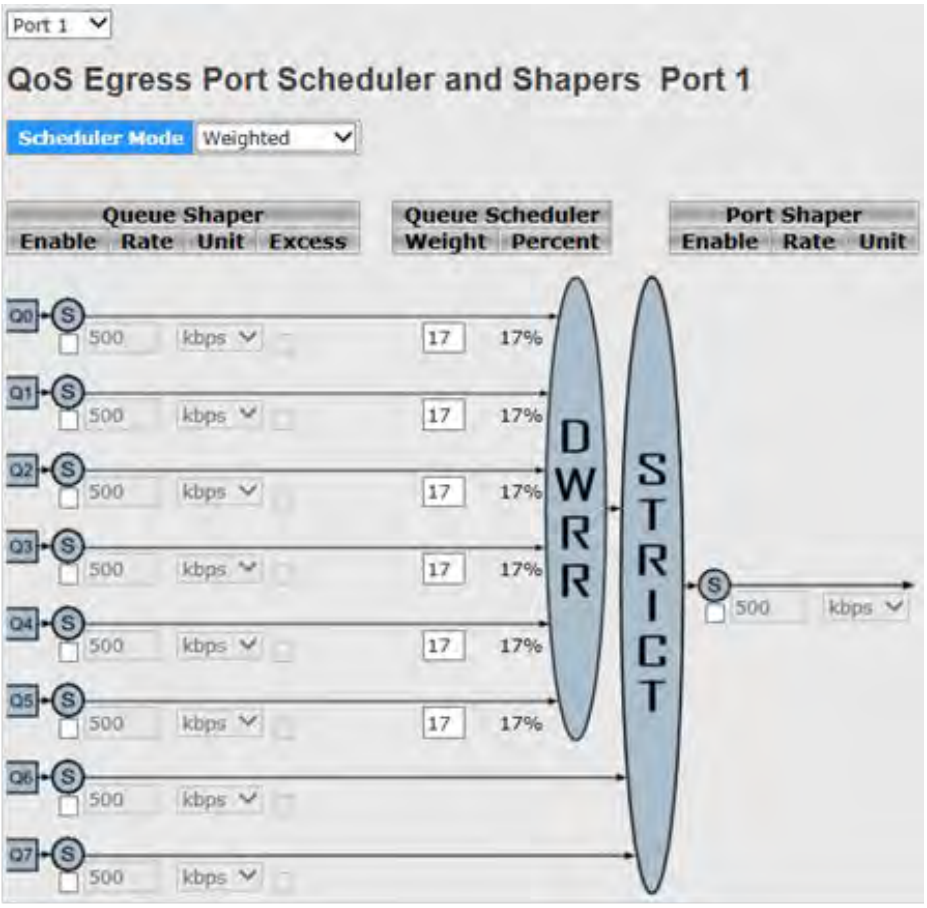
- **Scheduler Mode: Strict Priority**



Description	Factory default
Scheduler Mode	
Specify whether the scheduler mode is "Strict Priority" or "Weighted" on this switch port.	Strict Priority
QueueShaper_Enable	
Controls whether the queue shaper is enabled for this queue on this switch port.	Unchecked
QueueShaper_Rate	
Specify the rate of the queue shaper. This value is restricted to 100-1000000 when the "Unit" is "kbps" or "fps", and it is restricted to 1-3300 when the "Unit" is "Mbps" or "kfps".	500
QueueShaper_Unit	
Specify the unit of measure for the queue shaper rate as kbps, Mbps, fps or kfps.	kbps
QueueShaper_Excess	
Specify whether the queue is allowed to use excess bandwidth.	Unchecked
Port Shaper_Enable	
Controls whether the port shaper is enabled or not.	Unchecked
Port Shaper_Rate	
Specify the rate of the port shaper. This value is restricted to 100-1000000 when the "Unit" is "kbps" or "fps", and it is restricted to 1-3300 when the "Unit" is	500

Description	Factory default
"Mbps" or "kfps".	
Port shaper _Unit	
Specify the unit of measure for the port shaper rate as kbps, Mbps, fps or kfps.	kbps

- **Scheduler Mode: Weighted**



Description	Factory default
Scheduler Mode	
Specify whether the scheduler mode is "Strict Priority" or "Weighted" on this switch port.	Strict Priority
QueueShaper_Enable	
Controls whether the queue shaper is enabled for this queue on this switch port.	Unchecked
QueueShaper_Rate	
Specify the rate of the queue shaper. This value is restricted to 100-1000000 when the "Unit" is "kbps" or "fps", and it is restricted to 1-3300 when the "Unit" is "Mbps" or "kfps".	500
QueueShaper_Unit	
Specify the unit of measure for the queue shaper rate as kbps, Mbps, fps or kfps.	kbps
QueueShaper_Excess	
Specify whether the queue is allowed to use excess bandwidth.	Unchecked

Description	Factory default
QueueScheduler_Weight	
Specify the weight for this queue. This value is restricted to 1-100. This parameter is only shown if "Scheduler Mode" is set to "Weighted".	17
QueueScheduler_Percent	
This field dispaythe weight in percent for this queue. This parameter is only shown if "Scheduler Mode" is set to "Weighted".	fixed
Port Shaper_Enable	
Specify whether the port shaper is enabled or not.	Unchecked
Port Shaper_Rate	
Specify the rate of the port shaper. This value is restricted to 100-1000000 when the "Unit" is "kbps" or "fps", and it is restricted to 1-3300 when the "Unit" is "Mbps" or "kfps".	500
Port shaper _Unit	
Specify the unit of measure for the port shaper rate as kbps, Mbps, fps or kfps. The default value is "kbps".	kbps

3.7.8 Port Shaping

Port	Shapers								
	Q0	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Port
1	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
2	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
3	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
4	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
5	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
6	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
7	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
8	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
9	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
10	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
11	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
12	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
13	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
14	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
15	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
16	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
17	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
18	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
19	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
20	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
21	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
22	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
23	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
24	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
25	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
26	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
27	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
28	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled

Item	Description
Port	The interface number. You could click the port number to configure the shapers.
Shapers	The field displays the "disabled" or actual queue shaper rate.

3.7.9 DSCP-Based QoS

Description	Factory default
DSCP	
The DSCP number and the maximum value is 64.	interface number
Trust	
Specify whether a specific DSCP value is trusted or not. • **Checked**: The trust mode is enabled. • **Unchecked**: The trust mode is disabled.	Unchecked
QoS Class	
Specify the QoS Class.The values are from 0 to 7	0
DPL	
Specify the Drop Percedence Level is 0 or 1.	0

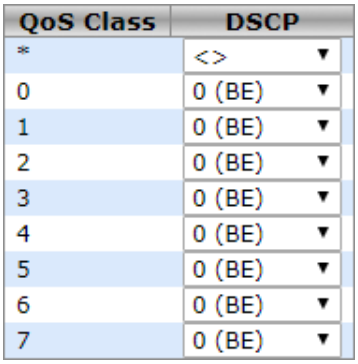
3.7.10 DSCP Translation

Description	Factory default
DSCP	
The DSCP number and the maximum values are 64.	interface number

Description	Factory default
Ingress_Translate	
DSCP at Ingress side can be translated to any of (0-63) DSCP values.	interface number
Ingress_Classify	
Specify whether the classification is enabled or not. • **Checked**: The classification is enabled. • **Unchecked**: The classification is disabled.	Unchecked
Egress_Remap	
Select the DSCP value from select menu to which you want to remap. DSCP value ranges from 0 to 63.	interface number

3.7.11 DSCP Classification

This page allows you to configure the mapping of QoS class and Drop Precedence Level to DSCP value.



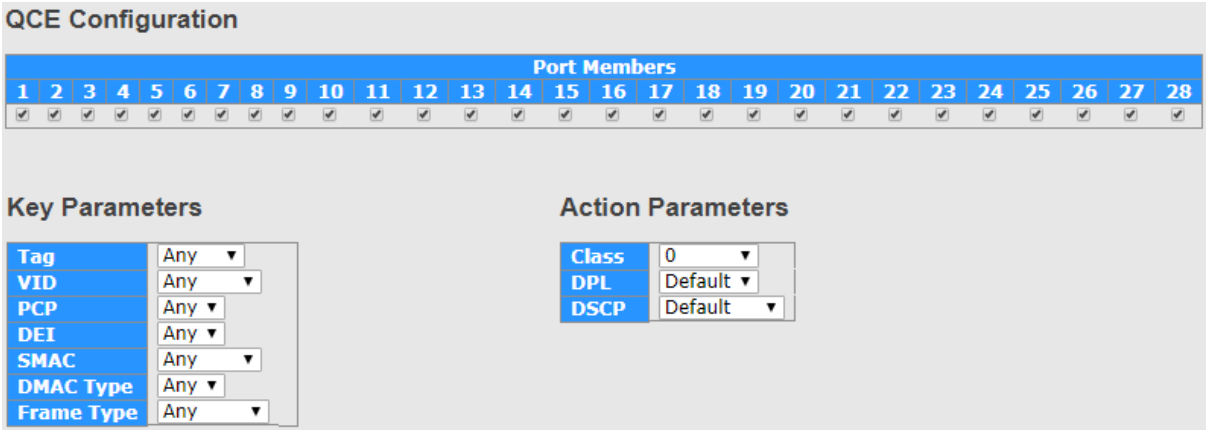
Description	Factory default
QoS Class	
The QoS class number.	class number
DPL	
Actual Drop Precedence Level.	fixed
DSCP	
Select the classified DSCP value (0-63).	0 (BE)

3.7.12 QoS Control List

This feature allows you edit or insert a single QoS Control Entry at a time. A QCE consists of several parameters. These parameters vary according to the frame type that you select.

- **QoS Control List**

You can click the icon to add a QCE, and it will display in the QoS Control List.



- **QCE Configuration**

Description	Factory default
Port Members	
Select the port to add in the QCL entry. **Checked**: The port is including in the QCL entry. **Unchecked**: The port is not including in the QCL entry.	Checked

- **Key Parameters**

Description	Factory default
Tag	
Specify the Tag mode: 'Any', 'Untag' or 'Tag'.	Any
VID	
Specify the Valid value of VLAN ID in the range 1-4095 or 'Any'; Or you can enter either a specific value or a range of VIDs.	Any
PCP	
Specify the Priority Code Point range.Valid value PCP are specific (0, 1, 2, 3, 4, 5, 6, 7) or in a range (0-1, 2-3, 4-5, 6-7, 0-3, 4-7) or 'Any'.	Any
DEI	
Specify the Drop Eligible Indicator mode. The valid value of DEI can be any of values between 0, 1 or 'Any'.	Any
SMAC	
Source MAC address: 24 MS bits (OUI) or 'Any'.	Any
DMAC Type	
Specify the Destination MAC type. • **UC**: In unicast format • **MC**: In multicast format. • **BC**: In broadcast format • **Any**: In any format.	Any
Frame Type	
Specify the frame type as below: • **Any**: Allow all types of frames. • **Ethernet**: Ethernet Type Valid ethernet type can have a value within 0x600-0xFFFF or 'Any' but excluding 0x800(IPv4) and 0x86DD(IPv6) • **LLC**: Include SSAP address, DSAP address and Control Valid.	Any

Description	Factory default
• **SNAP** • **IPv4** • **IPv6**	

- **Action Parameters**

Description	Factory default
Class	
Specify the QoS class range from 0 to 7.	0
DPL	
Specify the DPL and the range can be 0 to 3 or Default.	Default
DSCP	
Specify the DSCP value.	Default

3.7.13 QoS Statistics

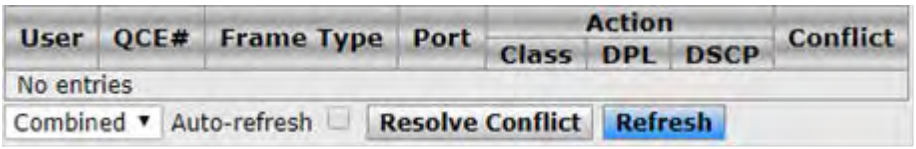
Port	Q0		Q1		Q2		Q3		Q4		Q5		Q6		Q7	
	Rx	Tx	Rx	Tx	Rx	Tx	Rx	Tx	Rx	Tx	Rx	Tx	Rx	Tx	Rx	Tx
1	883454	0	0	0	0	0	0	0	0	0	0	0	0	0	0	664560
2	21234846	15711822	0	0	0	0	0	0	0	0	0	0	0	0	0	61811
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	15916962	21195205	0	0	0	0	0	0	0	0	0	0	0	0	0	161082
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	45479	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34872
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	1586790	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1257433
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

You can click on the Port number to check the details.

Item	Description
Port	The interface number.
Queue number	There are 8 QoS queues per port. Q0 is the lowest priority queue.
Rx	The number of received packets per queue.
Tx	The number of transmittd packets per queue.

3.7.14 QCL Status

This page shows the QCL status by different QCL users. Each row describes the QCE that is defined. It is a conflict if a specific QCE is not applied to the hardware due to hardware limitations. The maximum number of QCEs is 256 on each switch.



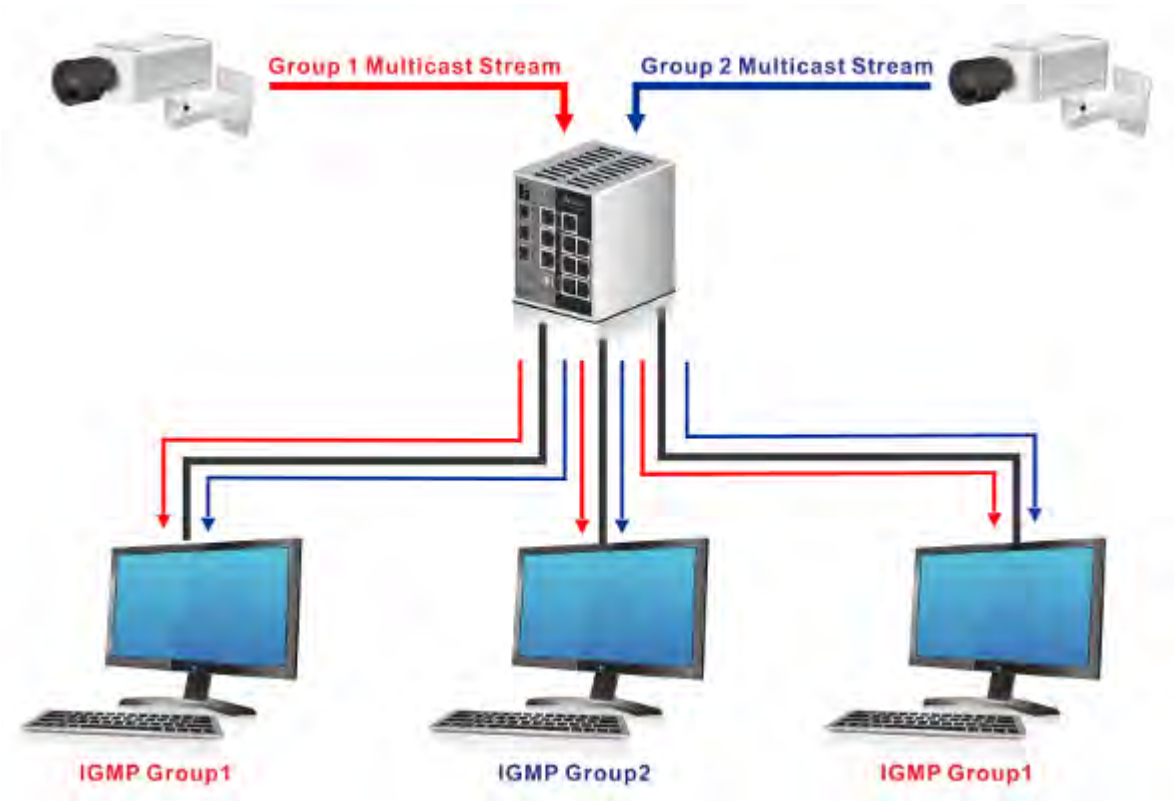
Item	Description
User	The QCL user name.
QCE#	The index of QCE
Frame Type	The type of frame type.
Port	The port list of the QCE entry.
Action	The classification action taken on ingress frame if parameters configured are matched with the frame's content. • **Class**: Classified QoS class; if a frame matches the QCE it will be put in the queue. • **DPL**: Drop Precedence Level; if a frame matches the QCE then DP level will set to value displayed under DPL column. • **DSCP**: If a frame matches the QCE then DSCP will be classified with the value displayed under DSCP column.
Conflict	Displays Conflict status of QCL entries. As H/W resources are shared by multiple applications. It may happen that resources required to add a QCE may not be available, in that case it shows conflict status as 'Yes', otherwise it is always 'No'. Please note that conflict can be resolved by releasing the H/W resources required to add QCL entry on pressing 'Resolve Conflict' button.

3.8 Multicast

Multicast IP traffic is traffic that is assigned to a host group. Host groups are identified by class D IP addresses, which range from 224.0.0.0 to 239.255.255.255. A multicast IP packet is only sent by one host to multiple hosts. Only those hosts that belong to a specific multicast group will receive the multicast. The Internet Group Management Protocol (IGMP) snooping enables the switch to forward multicast traffic intelligently to only the interface that requests the multicast traffic. So the network resource is not wasted too much.

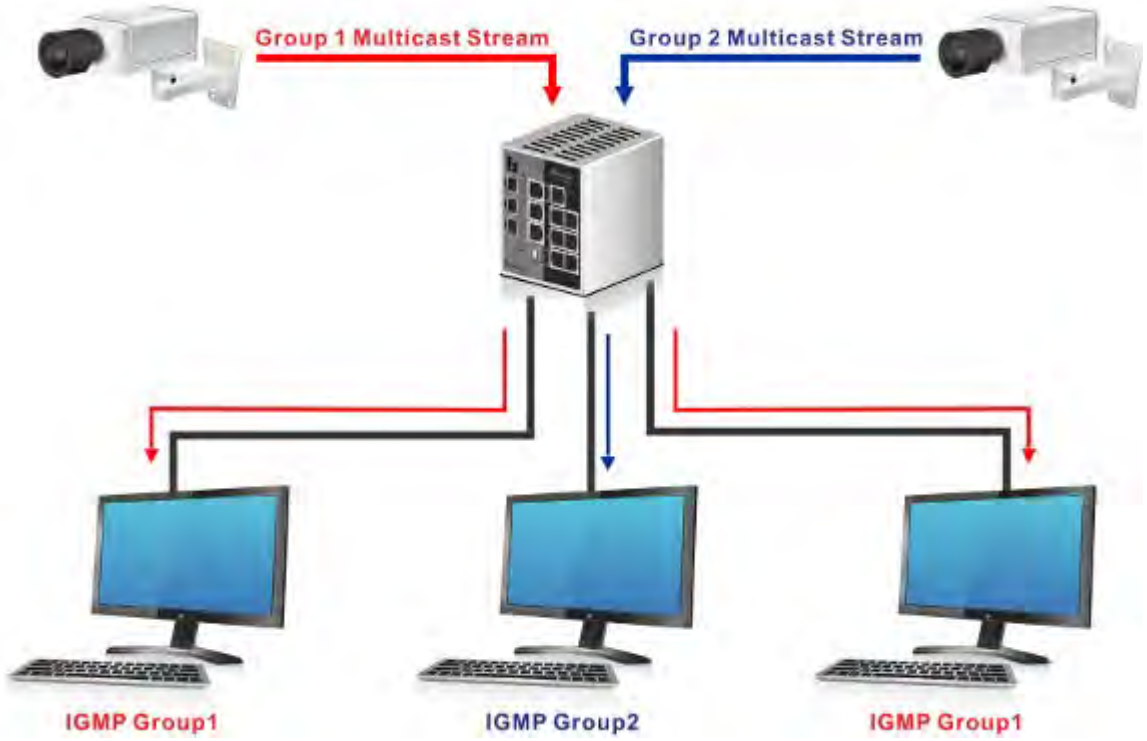
If there is a network without the multicast filtering, and a host needs to send data to many hosts, then it needs to produce several copies in the network. It wastes too much network bandwidth. If there is a network with the multicast filtering, then it reduces the load of resources (ex. a server) and makes the network bandwidth efficient. The figures below show the difference between the network without Multicast Filtering and the network with Multicast Filtering.

- **Network without Multicast Filtering:**



(All hosts receive the multicast traffic.)

- **Network with Multicast Filtering:**



(Only the host which belongs to the group can receive the traffic.)

IGMP Snooping manages multicast traffic by making use of switches, routers, and hosts that support IGMP. Enabling IGMP Snooping allows the ports to detect the IGMP queries, report packets, and manage multicast traffic through the switch. IGMP has three fundamental types of messages, as shown below:

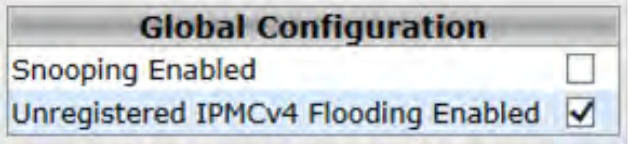
Item	Description
Query	A message is sent from the querier (an IGMP router or a switch) which asks for a response from each host that belongs to the multicast group.
Report	A message is sent by a host to the querier to indicate that the host wants to be or is a member of a given group indicated in the report message.
Leave Group	A message is sent by a host to the querier to indicate that the host has quit as a member of a specific multicast group.

3.8.1 IGMP Snooping

On this page, you can enable or disable IGMP Snooping. And it displays the VLAN which enables the IGMP Snooping function.

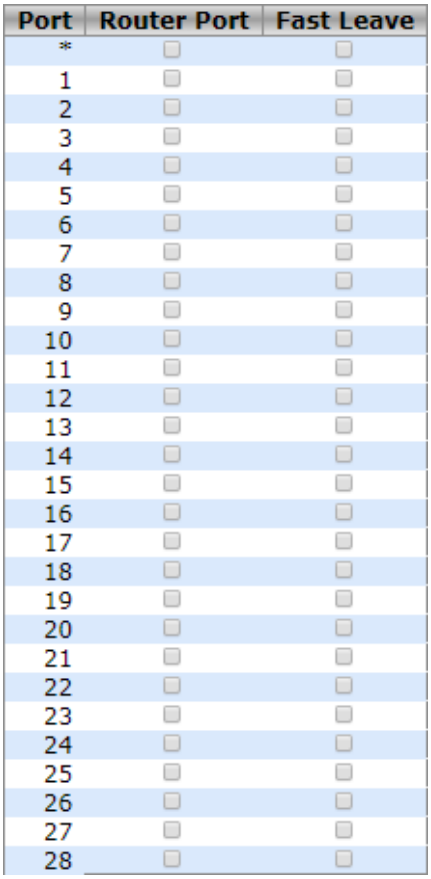
3.8.1.1 Basic Configuration

- **Global Configuration**



Description	Factory default
Snooping Enabled	
Specify the status of IGMP Snooping: • **Unchecked:** The IGMP Snooping is disabled. The IGMP setting still can be configured, but the settings do not take effect after you have applied them. • **Checked:** The IGMP Snooping is enabled. The switch snoop all the IGMP packets it receives to determine which segments should receive the packets directed to the group address.	Unchecked
Unregistered IPMCv4 Flooding Enabled	
Specify the status of unregistered IPMC traffic flooding: • **Unchecked:** The unregistered IPMC traffic flooding is disabled. • **Checked:** The unregistered IPMC traffic flooding is enabled.	Checked

- **Port Related Configuration**

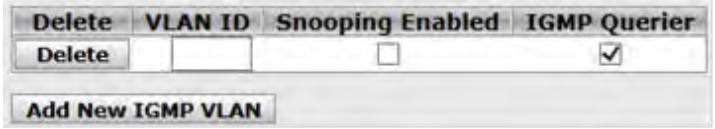


Port	Router Port	Fast Leave
*	☐	☐
1	☐	☐
2	☐	☐
3	☐	☐
4	☐	☐
5	☐	☐
6	☐	☐
7	☐	☐
8	☐	☐
9	☐	☐
10	☐	☐
11	☐	☐
12	☐	☐
13	☐	☐
14	☐	☐
15	☐	☐
16	☐	☐
17	☐	☐
18	☐	☐
19	☐	☐
20	☐	☐
21	☐	☐
22	☐	☐
23	☐	☐
24	☐	☐
25	☐	☐
26	☐	☐
27	☐	☐
28	☐	☐

Description	Factory default
Port	
The port number.	*port number*
Router Port	
Specify which ports act as router ports. A router port is a port on the Ethernet switch that leads towards the Layer 3 multicast device or IGMP querier. If an aggregation member port is selected as a router port, the whole aggregation will act as a router port. • **Unchecked:** The port doesn't act as router port. • **Checked:** The port act as router port.	Unchecked
Fast Leave	
Specify the status of the port. • **Unchecked:** The port is disabled. • **Checked:** The port is enabled.	Unchecked

3.8.1.2 VLAN Configuration

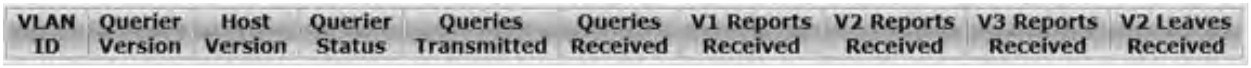
You can use "Add new IGMP VLAN" to create a new IGMP VLAN entry.



Description	Factory default
VLAN ID	
Enter a VLAN ID for which you want to create an IGMP snooping configuration.	None
Snooping Enabled	
Specify the status of per-VLAN IGMP Snooping. Up to 32 VLANs can be selected for IGMP Snooping. • **Unchecked:** The status is disabled. • **Checked:** The status is enabled.	Unchecked
IGMP Querier	
Specify the status of IGMP Querier in the VLAN. • **Unchecked:** The status is disabled. • **Checked:** The status is enabled.	Checked

3.8.1.3 Status

- **Statistics**



Item	Description
VLAN ID	The VLAN ID of the entry.
Querier Version	Working Querier Version currently.
Host Version	Working Host Version currently.
Querier Status	Show the Querier status is "ACTIVE" or "IDLE".
Querier Receive	The number of Transmitted Querier.
V1 Reports Receive	The number of Received V1 Reports.
V2 Reports Receive	The number of Received V2 Reports.
V3 Reports Receive	The number of Received V3 Reports.
V2 Leave Receive	The number of Received V2 Leave.

- **Router Port**

Port	Status
1	-
2	-
3	-
4	-
5	-
6	-
7	-
8	-
9	-
10	-
11	-
12	-
13	-
14	-
15	-
16	-
17	-
18	-
19	-
20	-
21	-
22	-
23	-
24	-
25	-
26	-
27	-
28	-

Item	Description
Port	The port number.
Status	Indicate whether specific port is a router port or not.

3.8.1.4 Group Information

Entries in the IGMP Group Table are shown on this page. The IGMP Group Table is sorted first by VLAN ID, and then by group.

VLAN ID	Groups	Port Members																									
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
No more entries																													

Item	Description
VLAN ID	VLAN ID of the group.
Groups	Group address of the group displayed.
Port Members	Ports under this group.

3.9 Security

This group allows you to configure a MAC address, an IP address or the Port authentication to reach the security purpose.

3.9.1 Remote Control Security

Remote Control Security allows you limit the remote access of management interface. When enabled, the request of client which is not in the allow list will be rejected.

You can enable the mode first, and then click"Add new entry" to add a new role.

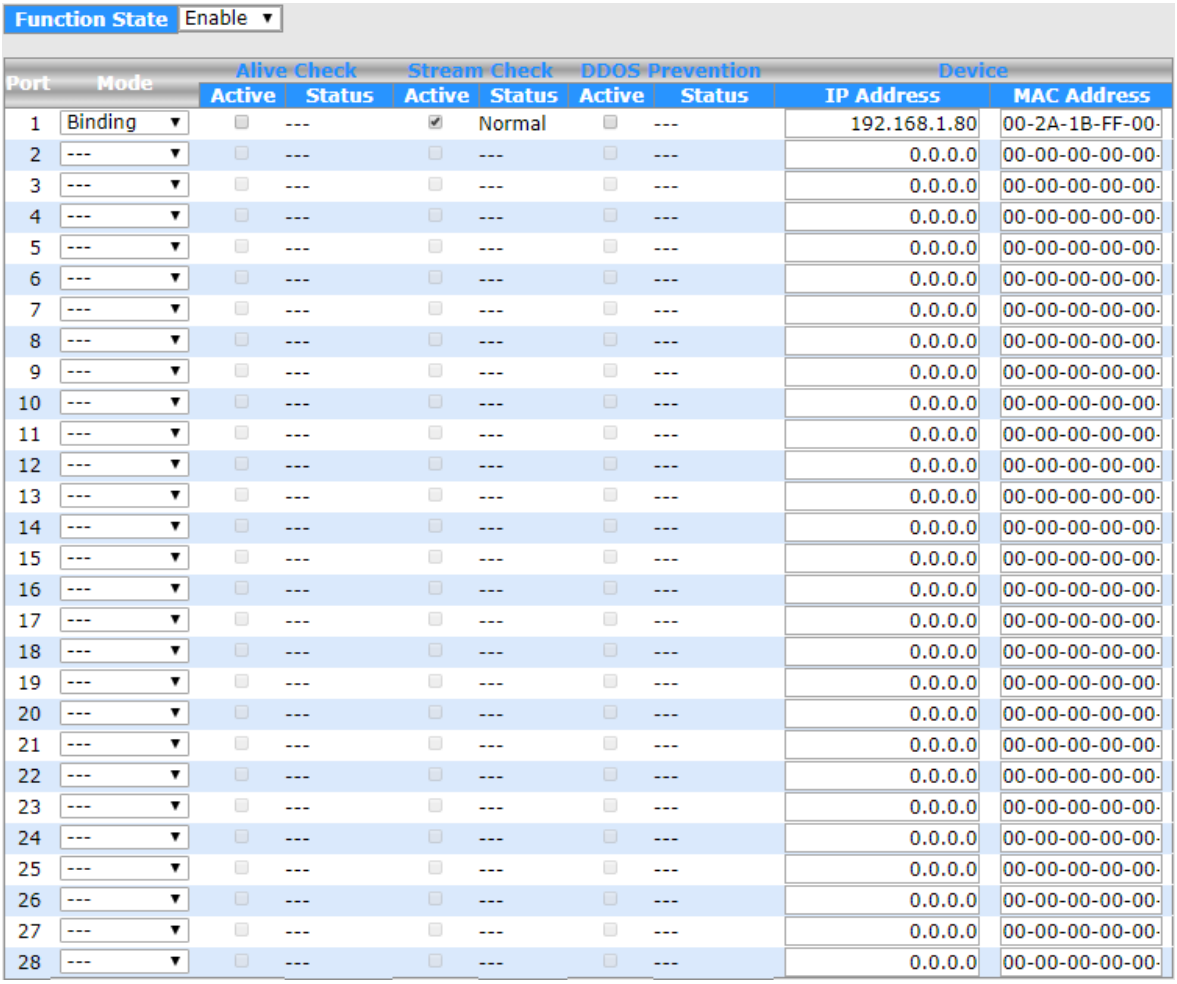
Description	Factory default
Port	
Port number of remote client.	Any
IP	
IP address of remote client. Keeps this field "0.0.0.0" means "Any IP".	Unchecked
Web	
Specify the status of web management interface • **Unchecked:** The status is disabled. • **Checked:** The status is enabled.	Unchecked
Telnet	
Specify the status of telnet management interface. • **Unchecked:** The status is disabled. • **Checked:** The status is enabled.	Unchecked
SNMP	
Specify the status of SNMP management interface. • **Unchecked:** The status is disabled. • **Checked:** The status is enabled.	Unchecked

3.9.2 Device Binding

This group provides Device Binding related configuration. Device Binding is a powerful monitor for devices and network security.

3.9.2.1 Configuration

The configuration will be activated after the Function State enabled.



Description	Factory default
Mode	
Specify the Device Binding operatin mode of the specific port. • **Scan:** Scan IP/MAC automatically, but no binding function. • **Binding**: Any IP/MAC doesn't match the entry will not be allowed to access the network • **Shutdown**: Shutdown the port (No Link)	None
Alive Check_Active	
Specify the status of Alive Check. • **Unchecked:** The status is disabled. • **Checked:** The status is enabled. **Note:** It only can specify when the Device Binding mode is “Binding” mode.	Unchecked
Alive Check_Status	
Display the Alive Check status. • **---**: Disable. • Got Reply: Got ping reply from device, that means the device is still alive. • Lost Reply: Lost ping reply from device, that means the device might have been hanged	---
Stream Check_Active	
Specify the status of Stream Check.	Unchecked

Description	Factory default
• **Unchecked:** The status is disabled. • **Checked:** The status is enabled. **Note:** It only can specify when the Device Binding mode is “Binding” mode.	
Alive Check_Status	
Display the Stream Check status. • **---**: Disable. • Normal: The stream is normal. • Low: The stream is getting low.	---
DDOS Prevention_Active	
Specify the status of DDOS Prevention. • **Unchecked:** The status is disabled. • **Checked:** The status is enabled. **Note:** It only can specify when the Device Binding mode is “Binding” mode.	Unchecked
DDOS Prevention _Status	
Display the DDOS Prevention status. • **---**: Disable. • Analysing: Analysing the packet throughput for initialization. • Running: Function ready. • Attacked: DDOS attack happened.	---
IP Address	
Specify the IP Address of device.	0.0.0.0
MAC Address	
Specify the MAC Address of device.	00:00:00:00:00:00

3.9.2.2 Advanced Configuration

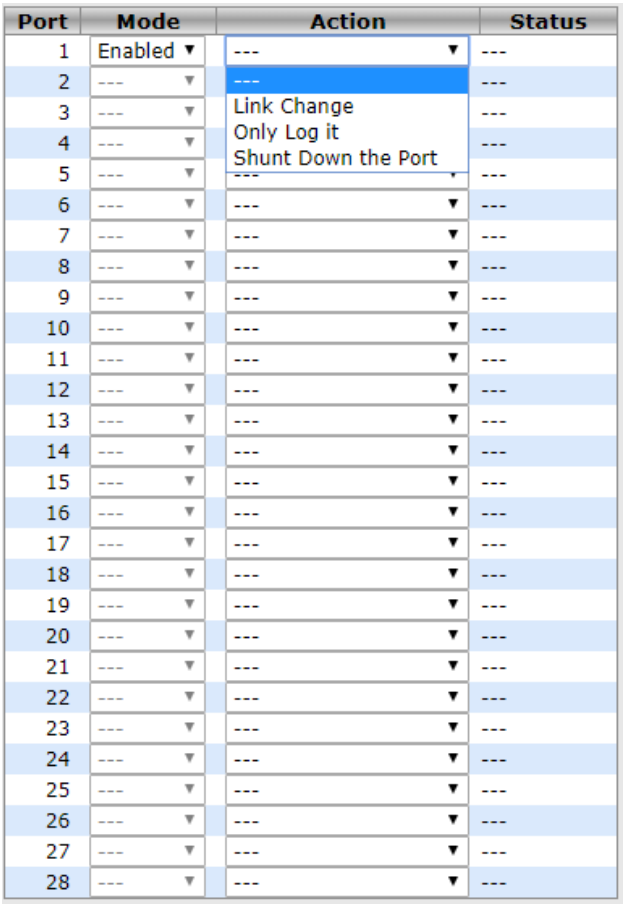
- **Alias IP Address**

Port	Alias IP Address
1	0.0.0.0
2	0.0.0.0
3	0.0.0.0
4	0.0.0.0
5	0.0.0.0
6	0.0.0.0
7	0.0.0.0
8	0.0.0.0
9	0.0.0.0
10	0.0.0.0
11	0.0.0.0
12	0.0.0.0
13	0.0.0.0
14	0.0.0.0
15	0.0.0.0
16	0.0.0.0
17	0.0.0.0
18	0.0.0.0
19	0.0.0.0
20	0.0.0.0
21	0.0.0.0
22	0.0.0.0
23	0.0.0.0
24	0.0.0.0
25	0.0.0.0
26	0.0.0.0
27	0.0.0.0
28	0.0.0.0

Description	Factory default
Port	
The interface number	*interface number*
Alias IP Address	
Specify Alias IP address. Keeps "0.0.0.0", if the device doesn't have alias IP address.	0.0.0.0

- **Alive Check**

The information will relate with the Device Binding Configuration.



Description	Factory default
Port	
The interface number	*interface number*
Mode	
This field displays the status of Alive Check in Device Binding Configuration.	Fixed
Action	
Specify the action of Alive check. • **Link Change**: Disable or enable the port. • **Only Log it**: Simply sends logs to the log server. • **Shut Down the Port**: Disable the port.	---
Status	
This field displays the Alive Check Status.	Fixed

- **DDOS Prevention**

The information will relate with the Device Binding Configuration.

Port	Mode	Sensibility	Packet Type	Socket Number		Filter	Action	Status
				Low	High			
1	Enabled	Normal	TCP	80	80	Destination	---	---
2	---	Normal	TCP	80	80	Destination	---	---
3	---	Normal	TCP	80	80	Destination	---	---
4	---	Normal	TCP	80	80	Destination	---	---
5	---	Normal	TCP	80	80	Destination	---	---
6	---	Normal	TCP	80	80	Destination	---	---
7	---	Normal	TCP	80	80	Destination	---	---
8	---	Normal	TCP	80	80	Destination	---	---
9	---	Normal	TCP	80	80	Destination	---	---
10	---	Normal	TCP	80	80	Destination	---	---
11	---	Normal	TCP	80	80	Destination	---	---
12	---	Normal	TCP	80	80	Destination	---	---
13	---	Normal	TCP	80	80	Destination	---	---
14	---	Normal	TCP	80	80	Destination	---	---
15	---	Normal	TCP	80	80	Destination	---	---
16	---	Normal	TCP	80	80	Destination	---	---
17	---	Normal	TCP	80	80	Destination	---	---
18	---	Normal	TCP	80	80	Destination	---	---
19	---	Normal	TCP	80	80	Destination	---	---
20	---	Normal	TCP	80	80	Destination	---	---
21	---	Normal	TCP	80	80	Destination	---	---
22	---	Normal	TCP	80	80	Destination	---	---
23	---	Normal	TCP	80	80	Destination	---	---
24	---	Normal	TCP	80	80	Destination	---	---
25	---	Normal	TCP	80	80	Destination	---	---
26	---	Normal	TCP	80	80	Destination	---	---
27	---	Normal	TCP	80	80	Destination	---	---
28	---	Normal	TCP	80	80	Destination	---	---

Description	Factory default
Port	
The interface number	*interface number*
Mode	
This field displays the status of Alive Check in Device Binding Configuration.	Fixed
Sensibility	
Specify the level of DDOS detection. • **Low**: Low sensibility. • **Normal**: Normal sensibility. • **Medium**: Medium sensibility. • **High**: High sensibility.	Normal
Packet Type	
Specify the packet of DDOS monitor. • **RX Total**: Total ingress packets. • **RX Unicast**: Unicast ingress packets. • **RX Multicast**: Multicast ingress packets • **RX Broadcast**: Broadcast ingress packets. • **TCP**: TCP ingress packets. • **UDP**: UDP ingress packets.	TCP

Description	Factory default
Socket Number	
If packet type is UDP or TCP, please specify the socket number here. The socket number could be a range, from low to high. If the socket number is only one, please fill the same number in low field and high field.	Low:80 High:80
Filter	
If packet type is UDP or TCP, please choose the socket direction (Destination/Source).	Destination
Action	
Specify the action when DDOS attack happened. • **---**: Do nothing. • **Blocking 1 minute**: To block the forwarding for 1 mintue, and log the event. • **Blocking 10 minute**: To block the forwarding for 10 mintues, and log the event. • **Blocking**: Just blocking, and log the event • **Shunt Down the Port**: Shut down the port(No Link), and log the event. • **Only Log it**: Just log the event. • **Reboot Device**: If switch supported, the device could be rebooted. And log the event.	---
Status	
This field displays the status of DDOS Prevention. • **---**: Disable. • **Analysing**: Analysing the packet throughput for initialization. • **Running**: Function ready. • **Attacked**: DDOS attack happened.	Fixed

- **Device Description**

Port	Device		
	Type	Location Address	Description
1	---		
2	---		
3	---		
4	---		
5	---		
6	---		
7	---		
8	---		
9	---		
10	---		
11	---		
12	---		
13	---		
14	---		
15	---		
16	---		
17	---		
18	---		
19	---		
20	---		
21	---		
22	---		
23	---		
24	---		
25	---		
26	---		
27	---		
28	---		

Description	Factory default
Port	
The interface number	*interface number*
Type	
Specify the type of device.	---
Location Address	
Entering the Location information of device, this information could be used for Google Mapping.	None
Description	
Entering the Device description.	None

- **Stream Check**

Port	Mode	Action	Status
1	Enabled	Log it	Normal
2	---	---	---
3	---	---	---
4	---	---	---
5	---	---	---
6	---	---	---
7	---	---	---
8	---	---	---
9	---	---	---
10	---	---	---
11	---	---	---
12	---	---	---
13	---	---	---
14	---	---	---
15	---	---	---
16	---	---	---
17	---	---	---
18	---	---	---
19	---	---	---
20	---	---	---
21	---	---	---
22	---	---	---
23	---	---	---
24	---	---	---
25	---	---	---
26	---	---	---
27	---	---	---
28	---	---	---

Description	Factory default
Port	
The interface number	*interface number*
Mode	
This field displays the status of Alive Check in Device Binding Configuration.	Fixed
Action	
Specify the action of Alive check. • **---**: Do nothing. • **Log it**: Just log the event.	---

Description	Factory default
Status	
This field displays the Stream Check status.	Fixed

3.9.3 ACL

Access control lists (ACLs) can make sure that only authorized devices have access to specific resources when any unauthorized devices which are blocked attempt to access network resources. ACLs provide security for the network, traffic flow control, and determine which types of traffic can be forwarded or blocked.

A Delta switch supports ACLs based on the MAC addresses of the source and destination devices (MAC ACLs).

3.9.3.1 Ports

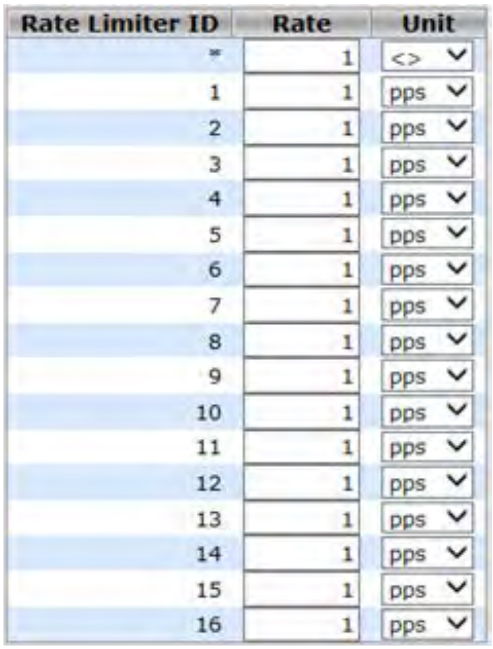
Port	Policy ID	Action	Rate Limiter ID	Port Redirect	Logging	Shutdown	State	Counter
*	0	<>	<>	<>	<>	<>	<>	*
1	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	892191
2	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	21236150
3	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
4	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
5	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
6	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
7	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
8	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
9	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	16041573
10	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
11	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
12	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
13	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
14	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
15	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
16	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
17	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
18	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	46062
19	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
20	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
21	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
22	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
23	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
24	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
25	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
26	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0
27	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	1596340
28	0	Permit	Disabled	Disabled	Disabled	Disabled	Enabled	0

- **Ports Configuration**

Description	Factory default
Port	
The interface number.	*interface number*
Policy ID	
Entering the policy to apply to this port. The allowed values are 1 through 8. The default value is 1.	0
Action	
Specify the forwarding rule as Permit or Deny.	Permit

Description	Factory default
Rate Limiter ID	
Specify which rate limiter to apply to this port. The values 1 through 15.	Disabled
Port Redirect	
Specify the port to redirect. The range is from Port1 to Port 28.	Disabled
Mirror	
Specify the destination port or the monitored interface.	Disabled
Logging	
Specify the logging operation of this port. • **Enabled**: Frames received on the port are stored in the System Log. • **Disabled:** Frames received on the port are not logged.	Disabled
Shutdown	
Specify the logging operation of this port. • **Enabled**: If a frame is received on the port, the port will be disabled. • **Disabled:** Port shut down is disabled.	Disabled

3.9.3.2 Rate Limit



Rate Limiter ID	Rate	Unit
*	1	<>
1	1	pps
2	1	pps
3	1	pps
4	1	pps
5	1	pps
6	1	pps
7	1	pps
8	1	pps
9	1	pps
10	1	pps
11	1	pps
12	1	pps
13	1	pps
14	1	pps
15	1	pps
16	1	pps

Description	Factory default
Rate Limiter ID	
The Rate Limiter ID number.	*ID number*
Rate	
The rate unit is packet per second (pps), configure the rate as 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1K, 2K, 4K, 8K, 16K, 32K, 64K, 128K, 256K, 512K, or 1024K.	1
Unit	
Specify the unit of measure for the rate limit as pps or kbps.	pps

3.9.3.3 Access Control List

This feature displays the Access Control List, and you can click the edit icon to configure the parameters to the specific ingress port.

Ingress Port	Policy / Bitmask	Frame Type	Action	Rate Limiter	Port Redirect	Mirror	Counter
2	Any	IPv4/TCP 80 HTTP	Permit	Disabled	Disabled	Disabled	0
3	Any	IPv4/TCP 80 HTTP	Permit	Disabled	Disabled	Disabled	13074
5	Any	IPv4/TCP 80 HTTP	Permit	Disabled	Disabled	Disabled	0
6	Any	IPv4/TCP 80 HTTP	Permit	Disabled	Disabled	Disabled	0
7	Any	IPv4/TCP 80 HTTP	Permit	Disabled	Disabled	Disabled	0
8	Any	IPv4/TCP 80 HTTP	Permit	Disabled	Disabled	Disabled	0
9	Any	IPv4/TCP 80 HTTP	Permit	Disabled	Disabled	Disabled	0
10	Any	IPv4/TCP 80 HTTP	Permit	Disabled	Disabled	Disabled	0
11	Any	IPv4/TCP 80 HTTP	Permit	Disabled	Disabled	Disabled	0
12	Any	IPv4/TCP 80 HTTP	Permit	Disabled	Disabled	Disabled	0

- **ACE Configuration**

An ACE consists of several parameters. These parameters vary according to the frame type that you select. First select the ingress port for the ACE, and then select the frame type. Different parameter options are displayed depending on the frame type that you selected. A frame that hits this ACE matches the configuration that is defined here.

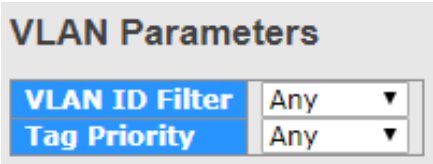
Description	Factory default
Ingress Port	
Specify the ingress port for which this ACE applies. • **All**: The ACE applies to any port. • **Port number**: The ACE applies to the specific port number.	None
Policy Filter	
Specify the policy filter.	Any
Frame Type	
Specify the frame type for this ACE. • **Any**: Any frame can match this ACE. • **Ethernet Type**: Only Ethernet Type frames can match this ACE. • **ARP**: Only ARP frames can match this ACE. • **IPv4**: Only IPv4 frames can match this ACE.	IPv4
Action	
Specify the action to take with a frame that hits this ACE. • **Permit**: The frame that hits this ACE is granted permission for the ACE operation. • **Deny**: The frame that hits this ACE is dropped.	Permit

Description	Factory default
Rate Limiter	
Specify the rate limiter in number of base units. The allowed range is 1 to 15. Disabled indicates that the rate limiter operation is disabled.	Disabled
Port Redirect	
Specify the port to redirect. The range is from Port1 to Port 12.	Disabled
Mirror	
Specify the destination port or the monitored interface.	Disabled
Logging	
Specify the logging operation of this port. • **Enabled**: Frames received on the port are stored in the System Log. • **Disabled:** Frames received on the port are not logged.	Disabled
Shutdown	
Specify the logging operation of this port. • **Enabled**: If a frame is received on the port, the port will be disabled. • **Disabled:** Port shut down is disabled.	Disabled
Counter	
Display the number of times the ACE was hit by a frame.	Fixed

- **MAC Parameters**

Description	Factory default
DMAC filter	
Specify the Destination MAC filter type. • **Any**: In any format. • **MC**: In multicast format. • **BC**: In broadcast format • **UC**: In unicast format	Any

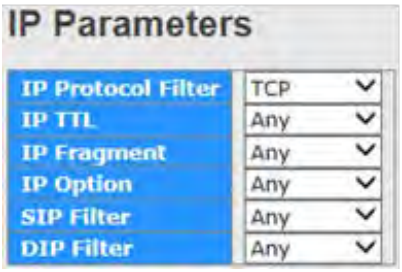
- **VLAN Parameters**



Description	Factory default
802.1Q Tagged	
Specify the 802.1Q status. • **Any**: In any format. • **Disabled**: Disabled the 802.1Q tagged function. • **Enabled**: Enabled the 802.1Q tagged function.	Any

Description	Factory default
VLAN ID Filter	
Specify the VLAN ID filter for this ACE. • **Any**: No VLAN ID filter is specified. (VLAN ID filter status is "don't-care".) • **Specific**: If you want to filter a specific VLAN ID with this ACE, choose this value. A field for entering a VLAN ID number appears.	Any
Tag Priority	
Specify the tag priority for this ACE. A frame that hits this ACE matches this tag priority. The allowed number range is 0 to 7. The value Any means that no tag priority is specified (tag priority is "don't-care".)	Any

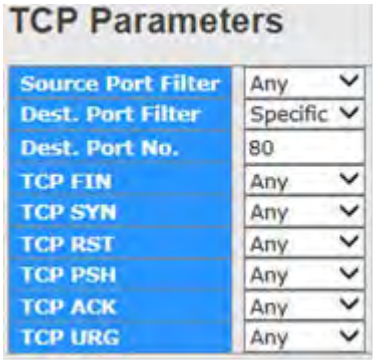
- **IP Parameters**



Description	Factory default
IP Protocol Filter	
Specify the IP protocol filter for this ACE. • **Any**: No IP protocol filter is specified ("don't-care"). • **Specific**: A field for entering an IP protocol filter appears • **ICMP**: Select ICMP to filter IPv4 ICMP protocol frames. • **UDP**: Select UDP to filter IPv4 UDP protocol frames. • **TCP**: Select TCP to filter IPv4 TCP protocol frames.	TCP
IP TTL	
Specify the Time-to-Live settings for this ACE. • **Any**: Any value is allowed ("don't-care"). • **Zero**: IPv4 frames with a Time-to-Live field greater than zero must not be able to match this entry. • **non-zero**: IPv4 frames with a Time-to-Live field greater than zero must be able to match this entry.	Any
IP Fragment	
Specify the fragment offset settings for this ACE. This involves the settings for the More Fragments (MF) bit and the Fragment Offset (FRAG OFFSET) field for an IPv4 frame. • **Any**: Any value is allowed ("don't-care"). • **Yes**: IPv4 frames where the MF bit is set or the FRAG OFFSET field is greater than zero must be able to match this entry. • **No**: IPv4 frames where the MF bit is set or the FRAG OFFSET field is greater than zero must not be able to match this entry.	Any
IP Option	
Specify the options flag setting for this ACE. • **Any**: Any value is allowed ("don't-care"). • **Yes**: IPv4 frames where the options flag is set must be able to match this entry.	Any

Description	Factory default
• **No**: IPv4 frames where the options flag is set must not be able to match this entry.	
SIP Filter	
Specify the source IP filter for this ACE. • **Any**: No source IP filter is specified. (Source IP filter is "don't-care".). • **Host**: Source IP filter is set to Host. Specify the source IP address in the SIP Address field that appears. • **Network**: Source IP filter is set to Network. Specify the source IP address and source IP mask in the SIP Address and SIP Mask fields that appear.	Any

- **TCP Parameters**



Description	Factory default
Source Port Filter	
Specify the TCP source filter for this ACE. • **Any**: No TCP/UDP source filter is specified (TCP source filter status is "don't-care"). • **Specific**: A field for entering a TCP source value. • **Range**: A field for entering a range of TCP source value.	Any
Dest.Port Filter	
Specify the TCP destination filter for this ACE. • **Any**: No TCP/UDP source filter is specified (TCP source filter status is "don't-care"). • **Specific**: A field for entering a TCP source value. • **Range**: A field for entering a range of TCP source value.	Specific
Dest. Port No.	
Enter a specific TCP/UDP destination value. The allowed range is 0 to 65535. A frame that hits this ACE matches this TCP destination value.	80
TCP FIN	
Specify the TCP "No more data from sender" (FIN) value for this ACE. • **Any**: Any value is allowed ("don't-care"). • **0**: TCP frames where the FIN field is set must not be able to match this entry. • **1**: TCP frames where the FIN field is set must be able to match this entry.	Any
TCP SYN	
Specify the TCP "Synchronize sequence numbers" (SYN) value for this ACE. • **Any**: Any value is allowed ("don't-care"). • **0**: TCP frames where the SYN field is set must not be able to match this entry.	Any

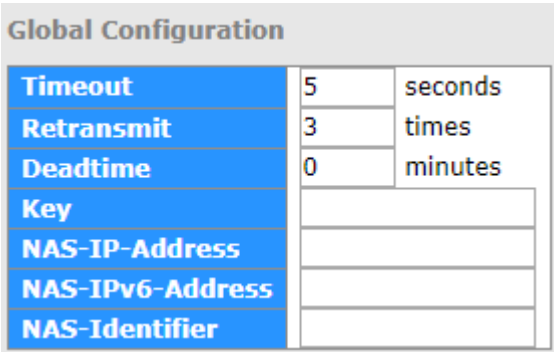
Description	Factory default
• **1**: TCP frames where the SYN field is set must be able to match this entry.	
TCP PSH	
Specify the TCP "Push Function" (PSH) value for this ACE. • **Any**: Any value is allowed ("don't-care"). • **0**: TCP frames where the PSH field is set must not be able to match this entry. • **1**: TCP frames where the PSH field is set must be able to match this entry.	Any
TCP ACK	
Specify the TCP Acknowledgment field significant" (ACK) value for this ACE. • **Any**: Any value is allowed ("don't-care"). • **0**: TCP frames where the ACK field is set must not be able to match this entry. • **1**: TCP frames where the ACK field is set must be able to match this entry.	Any
TCP URG	
Specify the TCP Urgent Pointer field significant" (URG) value for this ACE. • **Any**: Any value is allowed ("don't-care"). • **0**: TCP frames where the URG field is set must not be able to match this entry. • **1**: TCP frames where the URG field is set must be able to match this entry.	Any

3.9.4 AAA

An AAA server is an application that provides authentication, authorization, and accounting services for attempted access to a network. An AAA server can reside in a dedicated computer, an Ethernet switch, an access point or a network access server. The current standard by which devices or applications communicate with an AAA server is RADIUS (Remote Authentication Dial-In User Service). RADIUS is a protocol used between the switch and the authentication server. This page allows you to configure common settings for an authentication server.

3.9.4.1 AAA

- **Global Configuration**



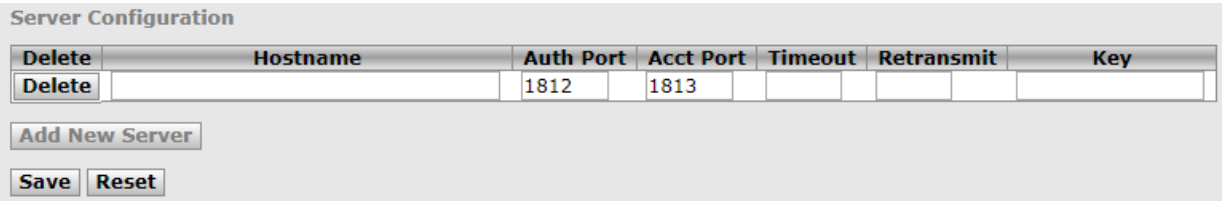
Description	Factory default
Timeout	
The timeout, which can be set to a number between 3 and 3600 seconds, is the maximum time to wait for a reply from a server. If the server does not reply within this time frame, we will consider it to be dead and continue with the next enabled server (if any).	5

Description	Factory default
RADIUS servers are using the UDP protocol, which is unreliable by design. In order to cope with lost frames, the timeout interval is divided into 3 subintervals of equal length. If a reply is not received within the subinterval, the request is transmitted again. This algorithm causes the RADIUS server to be queried up to 3 times before it is considered to be dead.	
Retransmit	
The number of times the switch tries to connect to a RADIUS server.	3
Dead Time	
The dead time, which can be set to a number between 0 and 3600 seconds, is the period during which the switch will not send new requests to a server that has failed to respond to a previous request. This will stop the switch from continually trying to contact a server that it has already determined as dead. Setting the dead time to a value greater than 0 (zero) will enable this feature, but only if more than one server has been configured.	0
NAS-IP-Address	
Indicates the identifying IP Address of the NAS which is requesting authentication of the user, and SHOULD be unique to the NAS within the scope of the RADIUS server.	None
NAS-ID	
Network Access Server identifier (NAS-ID) for the interface. The NAS-ID is sent to the RADIUS server by the controller (as a RADIUS client) using the authentication request, which is used to classify users to different groups. You can enter up to 32 alphanumeric characters.	None

When a user requests network connection, a RADIUS client which receives the request will perform an initial access negotiation with the user to obtain identity/password information. The client then passes the information to a RADIUS server as part of an authentication/authorization request.

The RADIUS server matches data from the authentication/authorization request with information in a trusted database. If a match is found and the user's credentials are correct, the RADIUS server sends an accept message to the client to grant access. If a match is not found or a problem is found with the user's credentials, the server returns a reject message to deny access. The NAD then establishes or terminates the user's connection. The NAD may then forward accounting information to the RADIUS server to document the transaction; the RADIUS server may store or forward this information as needed to support billing for the services provided.

- **Server Configuration**

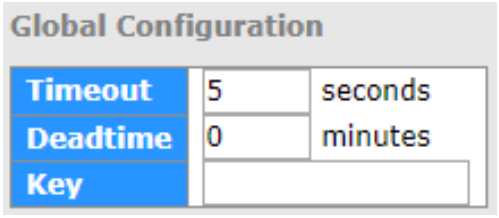


Description	Factory default
Delet	
Click to delete an entry from the table.	
Hostname	
Specifies the host name of the RADIUS server. The maximum supported length for the AAA RADIUS hostname is 40 characters.	None

Description	Factory default
Auth Port	
The authentication port which specifies the UDP port used to connect the RADIUS server for authentication. The default is 1812.	1812
Acct Port	
The UDP port to use on the RADIUS accounting server. If the port is set to 0 (zero), the default port (1813) is used on the RADIUS accounting server.	1813
Timeout	
The time to wait for the RADIUS server to respond.	None
Retransmit	
The number of times the switch tries to connect to a RADIUS server.	None
Key	
The shared secret between the switch and the RADIUS server.	None

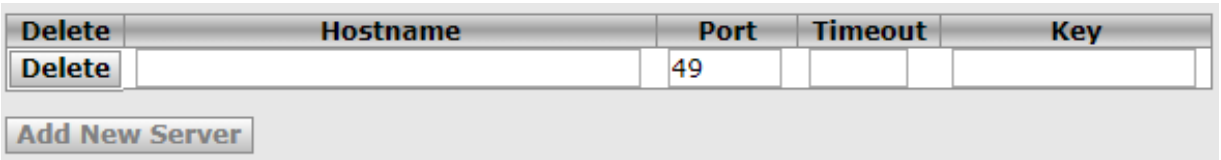
3.9.4.2 TACACS+

- **Global Configuration**



Description	Factory default
Timeout	
Timeout is the number of seconds, in the range 1 to 1000, to wait for a reply from a TACACS+ server before it is considered to be dead.	5
Deadtime	
Deadtime, which can be set to a number between 0 to 1440 minutes, is the period during which the switch will not send new requests to a server that has failed to respond to a previous request. This will stop the switch from continually trying to contact a server that it has already determined as dead. Setting the Deadtime to a value greater than 0 (zero) will enable this feature, but only if more than one server has been configured.	0
Key	
The secret key - up to 63 characters long - shared between the TACACS+ server and the switch.	None

- **Server Configuration**



Description	Factory default
Delet	
To delete a TACACS+ server entry, check this box. The entry will be deleted during the next Save.	
Hostname	
The IP address of the TACACS+ server.	None
Port	
The TCP port to use on the TACACS+ server for authentication.	49
Timeout	
This optional setting overrides the global timeout value. Leaving it blank will use the global timeout value.	None
Key	
This optional setting overrides the global key. Leaving it blank will use the global key.	None

3.9.4.3 RADIUS Overview

- **RADIUS Authentication / Accounting Server Configuration**

You can click the number to edit the parameter for AAA features.

#	IP Address	Status
1	0.0.0.0:1813	Disabled
2	0.0.0.0:1813	Disabled
3	0.0.0.0:1813	Disabled
4	0.0.0.0:1813	Disabled
5	0.0.0.0:1813	Disabled

Item	Description
#	The RADIUS server number. Click to navigate to detailed statistics for this server.
IP Address	The IP address and UDP port number (in <IP Address>:<UDP Port> notation) of this server.
Status	The current status of the server. • **Disabled**: The server is disabled. • **Not Ready**: The server is enabled, but IP communication is not up and running. • **Ready**: The server is enabled, IP communication is up and running. • **Dead**: Access attempts were made to this server, but it did not reply within the configured timeout. The server has temporarily been disabled, but will get re-enabled when the dead-time expires. The number of seconds left before this occurs is displayed in parentheses. This state is only reachable when more than one server is enabled.

3.9.4.4 RADIUS Details

- **RADIUS Authentication Statistics for Server.**

There are seven receive and four transmit counters.This section contains information about the state of the server and the latest round-trip time.

- **RADIUS Accounting Statistics for Server**

Receive Packets		Transmit Packets	
Responses	0	Requests	0
Malformed Responses	0	Retransmissions	0
Bad Authenticators	0	Pending Requests	0
Unknown Types	0	Timeouts	0
Packets Dropped	0		
Other Info			
IP Address			0.0.0.0:1813
State			Disabled
Round-Trip Time			0 ms

Item	Description
Receive Packets	RADIUS accounting server receive packet counter. There are five receive counters.
Transmit Packets	RADIUS accounting server transceiver packet counter. There are four transmit counters.
Other Info	This section contains information about the state of the server and the latest

3.9.5 NAS(802.1X)

A Delta switch can act as an authenticator in the 802.1X environment. You can either use an external authentication server, or implement the authentication server in the Delta switch by using a Local User Database.

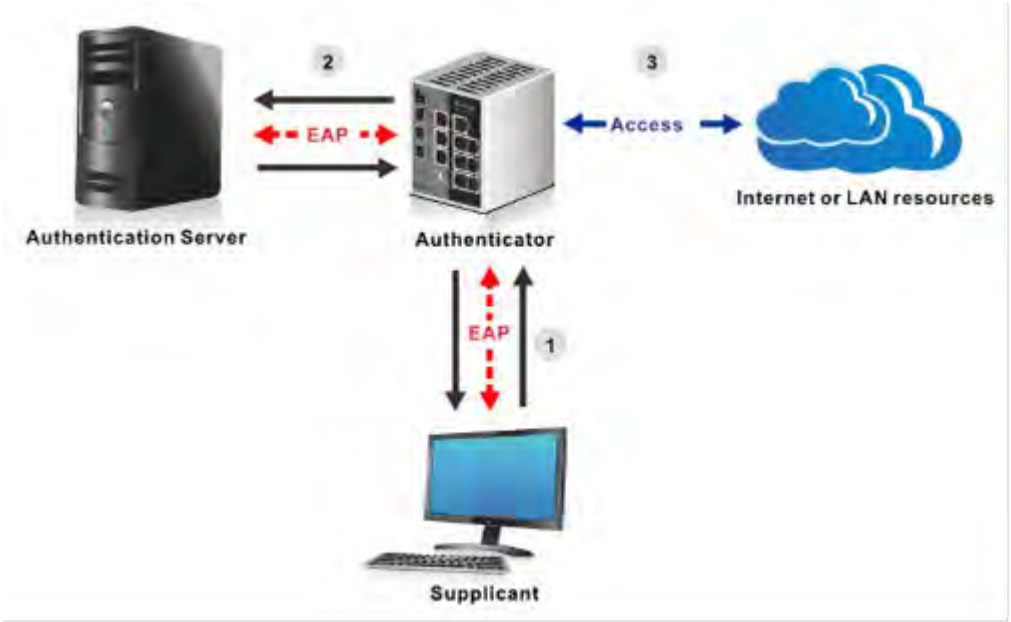
There are three components used to create a port-based authentication mechanism based on 802.1X:

Supplicant: The end of the station that requests the access to the LAN resource and switch services.

Authentication Server: The external server that performs the actual authentication of the supplicant, for example, a RADIUS server. It performs the authentication to indicate whether the user is authorized to access services.

Authenticator: It acts as a proxy between the supplicant and the authentication server. This kind of role is usually the edge switch or the wireless AP. It requests identity information from the supplicant, verifies the information with the authentication server, and relay a response to the supplicant.

The function theory is shown in the figure below.



3.9.5.1 Configuration

You can specify the status of System configuration and the port configuration

- **System Configuration**

Description	Factory default
Mode	
Specify the status of the system configuration. • **Unchecked**: Disable the status of system configuration. • **Checked**: Enable the status of system configuration.	Disabled
Reauthentication Enabled	
Specify the status of the Reauthentication. • **Unchecked**: Disable the status of Reauthentication. • **Checked**: Enable the status of Reauthentication.	Unchecked
Reauthentication Period	
Entering the period, in seconds, and this is only active if the Reauthentication Enabled checkbox is checked. Valid values are in the range 1 to 3600 seconds.	3600
EAPOL Timeout	
Entering the time for retansmission of Request Identity EAPOL frames, and values are in the range 1 to 65535 seconds.	30
Aging Period	
Entering the period for the Aging Period, and can be set to a number between 10 and 1000000 seconds.	300
Hold Time	
Entering the period for the Hold Time, and can be set to a number between 10 and 1000000 seconds.	10

- **Port Configuration**

Port	Admin State	Port State	Restart	
*	<>			
1	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
2	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
3	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
4	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
5	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
6	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
7	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
8	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
9	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
10	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
11	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
12	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
13	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
14	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
15	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
16	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
17	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
18	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
19	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
20	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
21	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
22	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
23	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
24	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
25	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
26	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
27	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize
28	Force Authorized	Globally Disabled	Reauthenticate	Reinitialize

Description	Factory default
Port	
The interface number.	*interface number*
Admin State	
Specify the status of the Admin State. • **Force Authorized:** Places the interface in the authorized state. The interface sends and receives normal traffic without the client port-based authentication. • **Force Unauthorized**: Places the interface in the unauthorized state. The switch can not provide authentication services for a client through the interface. • **Port-based 802.1X**: The maximum number of supplicants that can be attached to a port can be limited using the Port Security Limit Control functionality. • **MAC-based authentication**: The maximum number of clients that can be attached to a port can be limited using the Port Security Limit Control functionality.	Force Authorized
Port State	
Display the status of the port.	Fixed

Description	Factory default
• **Globally Disabled:** NAS is globally disabled. • **Link Down**: NAS is globally enabled, but there is no link on the port. • **Authorized**: The port is in Force Authorized or a single-supplicant mode and the supplicant is authorized. • **Unauthorized**: The port is in Force Unauthorized or a single-supplicant mode and the supplicant is not successfully authorized by the RADIUS server. • **X Auth/Y Unauth:** The port is in a multi-supplicant mode. Currently X clients are authorized and Y is unauthorized.	
Restart	
Specify what kind of the restart type. • **Reauthenticate:** Schedules a reauthentication whenever the quiet-period of the port runs out (EAPOL-based authentication). • **Reinitialize**: Forces a reinitialization of the clients on the port and thereby a reauthentication immediately. The clients will transfer to the unauthorized state while the reauthentication is in progress.	None

3.9.5.2 Switch

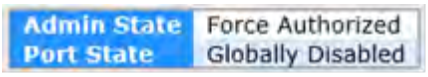
Port	Admin State	Port State	Last Source	Last ID
1	Force Authorized	Globally Disabled		
2	Force Authorized	Globally Disabled		
3	Force Authorized	Globally Disabled		
4	Force Authorized	Globally Disabled		
5	Force Authorized	Globally Disabled		
6	Force Authorized	Globally Disabled		
7	Force Authorized	Globally Disabled		
8	Force Authorized	Globally Disabled		
9	Force Authorized	Globally Disabled		
10	Force Authorized	Globally Disabled		
11	Force Authorized	Globally Disabled		
12	Force Authorized	Globally Disabled		
13	Force Authorized	Globally Disabled		
14	Force Authorized	Globally Disabled		
15	Force Authorized	Globally Disabled		
16	Force Authorized	Globally Disabled		
17	Force Authorized	Globally Disabled		
18	Force Authorized	Globally Disabled		
19	Force Authorized	Globally Disabled		
20	Force Authorized	Globally Disabled		
21	Force Authorized	Globally Disabled		
22	Force Authorized	Globally Disabled		
23	Force Authorized	Globally Disabled		
24	Force Authorized	Globally Disabled		
25	Force Authorized	Globally Disabled		
26	Force Authorized	Globally Disabled		
27	Force Authorized	Globally Disabled		
28	Force Authorized	Globally Disabled		

- **Switch Status**

Item	Description
Port	The switch port number. Click to navigate to detailed 802.1X statistics for this port.
Admin State	The port's current administrative state. Refer to NAS Admin State for a description of possible values.

Item	Description
Port State	The current state of the port. Refer to NAS Port State for a description of the individual states.
Last Source	The source MAC address carried in the most recently received EAPOL frame for EAPOL-based authentication, and the most recently received frame from a new client for MAC-based authentication.
Last ID	The user name (supplicant identity) carried in the most recently received Response Identity EAPOL frame for EAPOL-based authentication, and the source MAC address from the most recently received frame from a new client for MAC-based authentication.

3.9.5.3 Port



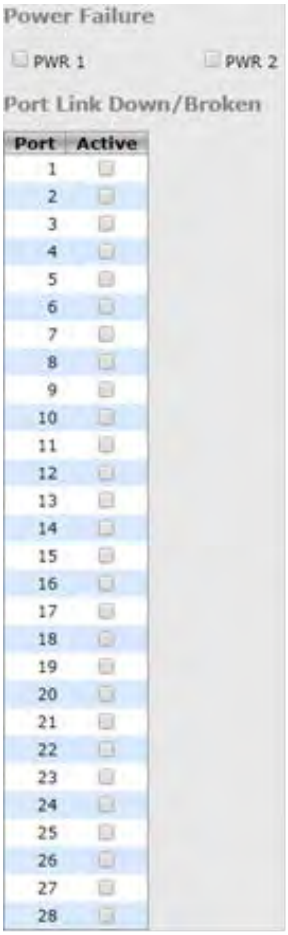
Item	Description
Admin State	The port's current administrative state. Refer to NAS Admin State for a description of possible values.
Port State	The current state of the port. Refer to NAS Port State for a description of the individual states.

3.10 Warning

Industrial Ethernet devices in an industrial environment are very important. These devices usually need to work for a long time and are usually located at the end of the system. So if the devices which connect to the industrial Ethernet switch need to be maintained, the switch must provide some messages for the maintainer. Even when the maintainers or the engineers do not stay in the control room, they still need to be informed of the status of the devices. A Delta switch provides different approaches that can warn engineers automatically. In this section, you can get the information about a relay alarm.

3.10.1 Fault Alarm

You can configure the power and the port active to notice related engineers.



Description	Factory default
Power Failure	
Specify the power event status: • **Unchecked:** Disable PWR 1 or PWR2 or both. • **Checked:** Enable PWR 1 or PWR2 or both.	Unchecked
Port Link Down/Broken_Port	
Specify the interface number.	*Port number*
Port Link Down/Broken_Active	
Specify the port link event status. • **Unchecked**: Disable the port link event alarm. • **Checked**: Enable the port link event alarm	Unchecked

3.10.2 System Warning

The System Warning function allows you to monitor the switch. When faults, errors, configuration changes or specified events happen, this function can generate messages, store the messages locally or forward the messages to one syslog server or more syslog servers. You can choose the severity level to filter the message according to your requirement.

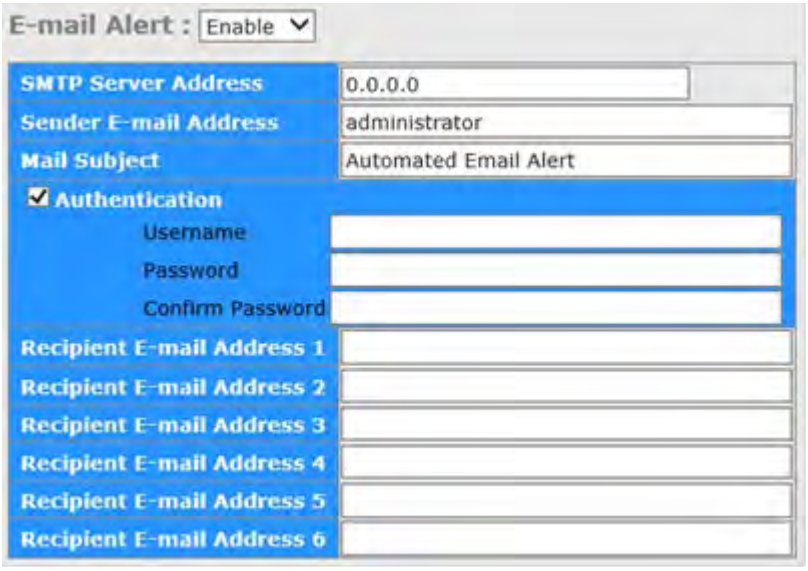
3.10.2.1 SYSLOG Setting

- **Fault Alarm**

Description	Factory default
Server Mode	
Specify the the server mode operation mode: • **Disable**: Disable server mode operation. • **Enabled**: Enable server mode operation.	Unchecked
Server Address	
Specify the Server IP address.	Port number

3.10.2.2 SMTP Setting

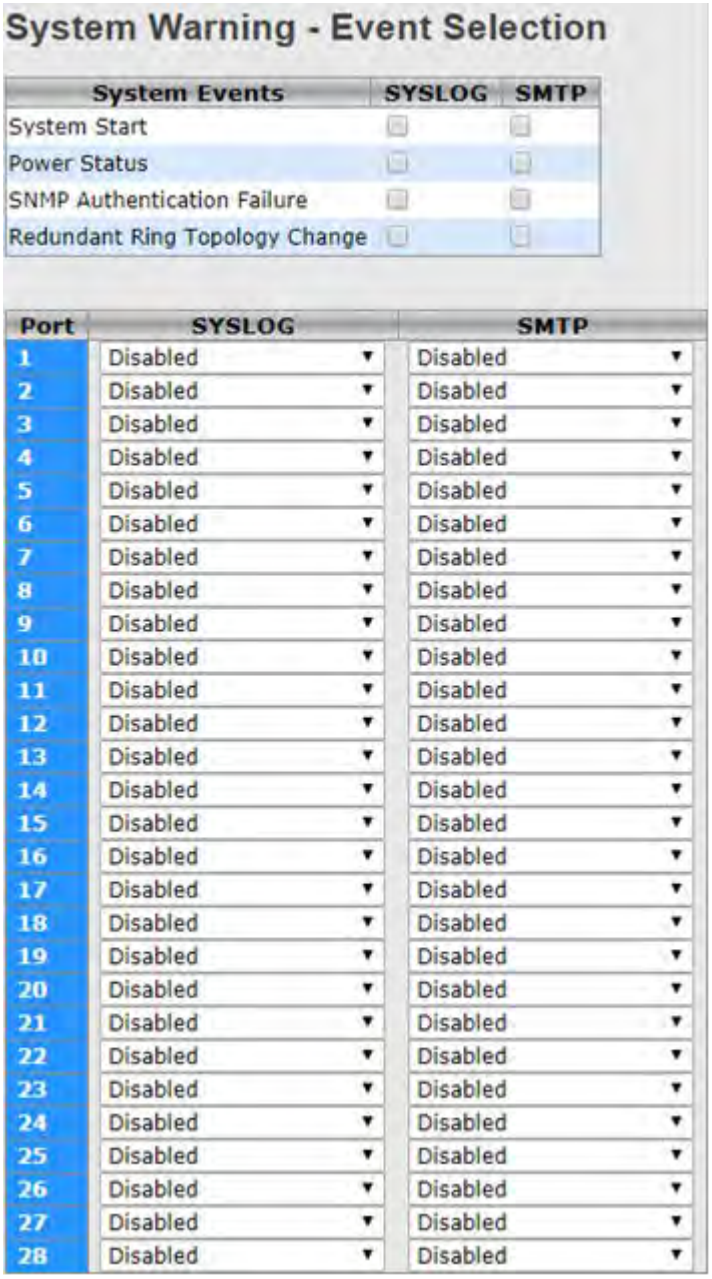
E-mail Server Configuration allows you to monitor the switch when you can not stay in front of the computer. For example, when the alarm event happens, you can use a smart phone to get an alarm event email anywhere. And then you can contact a related maintainer or engineer to check the device and solve the problem.



Description	Factory default
E-mail Alert	
Sepcify the status of email Alert	Disable
SMTP Server Address	
Enter the IP address of the mail server.	0.0.0.0
Sender E-mail Address	
Specify the email address of send the email alarm.	Administrator
Mail Object	
Specify the object of the email alarm.	None
Authentication	
Specify whether the mail server needs the authentication. If the box is selected, please enter the account name of the email.	None
Recipient E-mail Address	
Specify the email address for the email alarm. You can specify 1 to 6 email addresses.	None

3.10.2.3 Event Selecting

The Event Selecting page allows you to get an email message when the event you configured happened.



Description	Factory default
Switch Start	
Specify whether to send an alarm email or save logs when switch cold starts.	Unchecked
Power Status	
Specify whether to send an alarm email or save logs when there is a transition in power from Off to On or from On to Off.	Unchecked
SNMP Authentication Failure	
Specify whether to send an alarm email or save logs when there is a failure in SNMP Authentication.	Unchecked

Description	Factory default
Redundant Ring Topology Change	
Specify whether to send alarm email or save logs when the redundancy has changed.	Unchecked
Authentication Failure	
Specify whether to send an alarm email or save logs when there is authentication failure.	Checked
Port	
This field displays the interface number.	*interface number*
SYSLOG	
Specify whether to save logs when the port event happened. • **Disable**: Disabled to save logs. • **Link Up**: Specify whether to save logs when the Link is up. • **Link Down**: Specify whether to save logs when the Link is down. • **Link Up and down:** Specify whether to save logs when the Link is up or down.	Disabled
SMTP	
Specify whether to send an alarm email when the port event happened. • **Disable**: Disabled to send an alarm email. • **Link Up**: Specify whether to send an alarm email when the Link is up. • **Link Down**: Specify whether to send an alarm email when the Link is down. • **Link Up and down:** Specify whether to send an alarm email when the Link is up or down.	Disabled

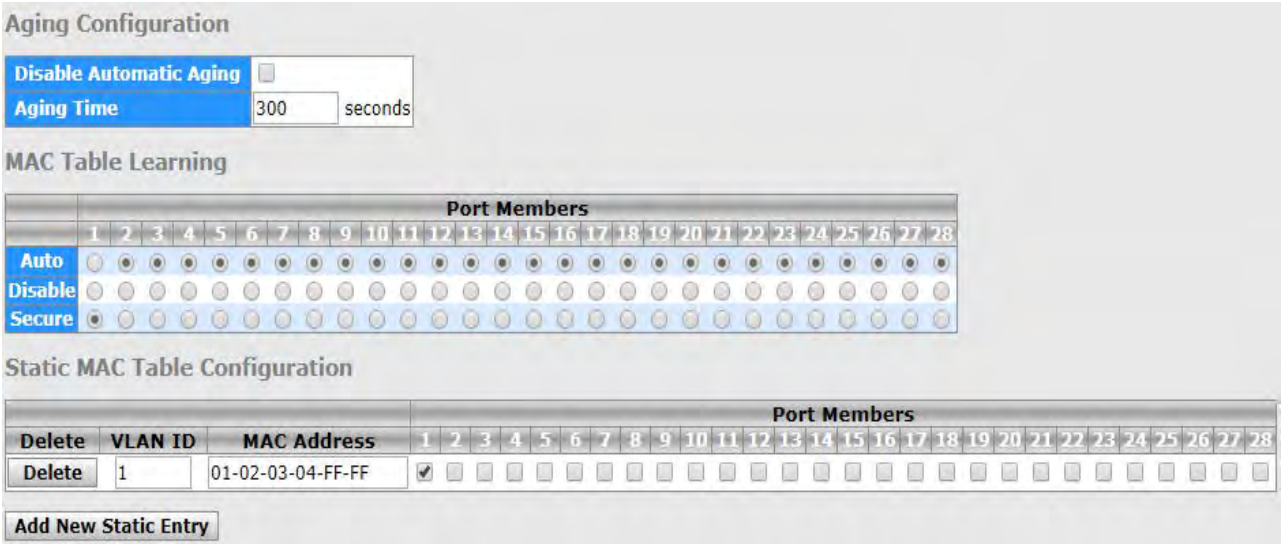
3.11 Monitor and Diag

You can monitor the status of the Delta switch in real time via the functions in this group.

3.11.1 MAC Table

The MAC address table displays the MAC address which is learned and manually added. There is a search function which can be used to display the information about the entry in the table.

3.11.1.1 MAC Address Table Configuration



- **Aging Configuration**

Description	Factory default
Disable Automatic Aging	
Specify whether the status of Disable Automatic Aging. • **Unchecked**: Disable the Disable Automatic Aging operation mode. • **Checked**: Enable the Disable Automatic Aging operation mode.	Unchecked
Aging Time	
Enter the period in seconds. If a learned MAC address has not been updated during the address aging time, then it will be removed from the address table automatically. Enter a period in the range of 10 to 1000000 seconds.	300

- **MAC Table Learning**

Description	Factory default
Port Members	
This field displays the port number.	*port number*
Auto	
Learning is done automatically as soon as a frame with unknown SMAC is received.	Checked
Disable	
No learning is done.	Unchecked
Secure	
Only static MAC entries are learned, all other frames are dropped. Make sure that the link used for managing the switch is added to the Static Mac Table before changing to secure learning mode, otherwise the management link is lost and can only be restored by using another non-secure port or by connecting to the switch via the serial interface.	Unchecked

- **Static MACTable Configuration**

Description	Factory default
Port Members	
Checkmarks indicate which ports are members of the entry. Check or uncheck as needed to modify the entry.	Unchecked
Delete	
Check to delete the entry. It will be deleted during the next save.	None
VLAN ID	
The VLAN ID for the entry.	Unchecked
MAC Address	
The MAC address for the entry.	Fixed
Add New Static Entry	
Adding a new entry to the static MAC table. Specify the VLAN ID, MAC address, and port members for the new entry. Click "Save".	None

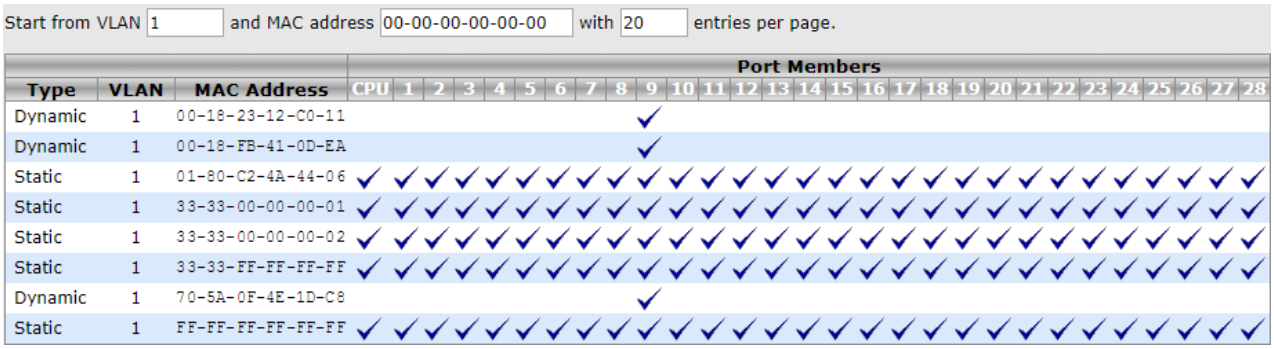
The static entries in the MAC table are shown in this table. The static MAC table can contain 64 entries.

The maximum of 64 entries is for the whole stack, and not per switch.

The MAC table is sorted first by VLAN ID and then by MAC address.

3.11.1.2 MAC Address Table

Each page shows up to 999 entries from the MAC table, default being 20, selected through the "entries per page" input field. When first visited, the web page will show the first 20 entries from the beginning of the MAC Table. The first displayed will be the one with the lowest VLAN ID and the lowest MAC address found in the MAC Table.



Item	Description
Type	The status of this entry:. • **Dynamic:** The MAC address was learned through incoming traffic and is being used. • **Static:** The MAC address was manually added and can not be relearned.
VLAN	The VLAN ID that is associated with the MAC address
MAC Address	The dynamically learned or manually added MAC address for which the switch has forwarded or filtered information, or both
Port Members	This field displays the interface which was learned or added manually. It also means the interface through which the MAC address can be reached.

3.11.2 Port Statistics

You can monitor the statistics of each interface of the Delta switch on this page.

Note:
Make sure that the port you want to monitor is connected to another device.

3.11.2.1 Traffic Overview

Port	Packets		Bytes		Errors		Drops		Filtered	
	Received	Transmitted	Received	Transmitted	Received	Transmitted	Received	Transmitted	Received	
1	892191	664560	181681201	274322539	0	0	8737	0	8737	Down
2	21236150	15773633	1655645755	1831222702	0	0	13813	0	1304	Down
3	0	0	0	0	0	0	0	0	0	Down
4	0	0	0	0	0	0	0	0	0	Down
5	0	0	0	0	0	0	0	0	0	Down
6	0	0	0	0	0	0	0	0	0	Down
7	0	0	0	0	0	0	0	0	0	Down
8	0	0	0	0	0	0	0	0	0	Down
9	16844621	22032493	2064003065	2040649018	13	0	47411	0	42717	1Gfdx
10	0	0	0	0	0	0	0	0	0	Down
11	0	0	0	0	0	0	0	0	0	Down
12	0	0	0	0	0	0	0	0	0	Down
13	0	0	0	0	0	0	0	0	0	Down
14	0	0	0	0	0	0	0	0	0	Down
15	0	0	0	0	0	0	0	0	0	Down
16	0	0	0	0	0	0	0	0	0	Down
17	0	0	0	0	0	0	0	0	0	Down
18	46062	34872	10047476	17169813	0	0	583	0	583	Down
19	0	0	0	0	0	0	0	0	0	Down
20	0	0	0	0	0	0	0	0	0	Down
21	0	0	0	0	0	0	0	0	0	Down
22	0	0	0	0	0	0	0	0	0	Down
23	0	0	0	0	0	0	0	0	0	Down
24	0	0	0	0	0	0	0	0	0	Down
25	0	0	0	0	0	0	0	0	0	Down
26	0	0	0	0	0	0	0	0	0	Down
27	1596340	1257433	348863075	563263740	0	0	9550	0	9550	Down
28	0	0	0	0	0	0	0	0	0	Down

Item	Description
Port	This field displays the port number.
Packets	The number of received and transmitted packets per port.
Bytes	The number of received and transmitted bytes per port.
Errors	The number of frames received in error and the number of incomplete transmissions per port.
Drops	The number of frames discarded due to ingress or egress congestion.
Filtered	The number of received frames filtered by the forwarding process.

3.11.2.2 Detail Stastistics

Port 1 ▼ Auto-refresh Refresh Clear

Receive Total	
Rx Packets	892191
Rx Octets	181681201
Rx Unicast	874113
Rx Multicast	12195
Rx Broadcast	5883
Rx Pause	0
Receive Size Counters	
Rx 64 Bytes	545795
Rx 65-127 Bytes	22303
Rx 128-255 Bytes	9501
Rx 256-511 Bytes	314487
Rx 512-1023 Bytes	105
Rx 1024-1526 Bytes	0
Rx 1527- Bytes	0
Receive Queue Counters	
Rx Q0	883454
Rx Q1	0
Rx Q2	0
Rx Q3	0
Rx Q4	0
Rx Q5	0
Rx Q6	0
Rx Q7	0
Receive Error Counters	
Rx Drops	8737
Rx CRC/Alignment	0
Rx Undersize	0
Rx Oversize	0
Rx Fragments	0
Rx Jabber	0
Rx Filtered	8737

Transmit Total	
Tx Packets	664560
Tx Octets	274322539
Tx Unicast	662187
Tx Multicast	2355
Tx Broadcast	18
Tx Pause	0
Transmit Size Counters	
Tx 64 Bytes	15431
Tx 65-127 Bytes	16028
Tx 128-255 Bytes	464428
Tx 256-511 Bytes	634
Tx 512-1023 Bytes	166771
Tx 1024-1526 Bytes	1268
Tx 1527- Bytes	0
Transmit Queue Counters	
Tx Q0	0
Tx Q1	0
Tx Q2	0
Tx Q3	0
Tx Q4	0
Tx Q5	0
Tx Q6	0
Tx Q7	664560
Transmit Error Counters	
Tx Drops	0
Tx Late/Exc. Coll.	0

- **Traffic Overview**

Item	Description
Rx and Tx Packets	The number of received and transmitted (good and bad) packets.
Rx and Tx Octets	The number of received and transmitted (good and bad) bytes. Includes FCS, but excludes framing bits.
Rx and Tx Unicast	The number of received and transmitted (good and bad) unicast packets.
Rx and Tx Multicast	The number of received and transmitted (good and bad) multicast packets.
Rx and Tx Broadcast	The number of received and transmitted (good and bad) broadcast packets.
Rx and Tx Pause	A count of the MAC Control frames received or transmitted on this port that have an opcode indicating a PAUSE operation.
Rx Drops	The number of frames dropped due to lack of receives buffers or egress congestion.
Rx CRC/Alignment	The number of frames received with CRC or alignment errors.
Rx Undersize	The number of short 1 frames received with valid CRC.
Rx Oversize	The number of long 2 frames received with valid CRC.
Rx Fragments	The number of short 1 frames received with invalid CRC.
Rx Jabber	The number of long 2 frames received with invalid CRC.
Rx Filtered	The number of received frames filtered by the forwarding process.
Tx Drops	The number of frames dropped due to output buffer congestion.
Tx Late / Exc.Coll.	The number of frames dropped due to excessive or late collisions.

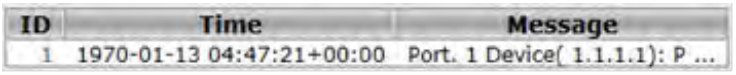
3.11.3 Port Monitoring

Port Monitoring is used for mirroring the network traffic of the source port by the analyzer.

Description	Factory default
Port to mirror	
Specify the port which is the mirror port.	Disabled
Port	
This field displays the port number.	*port number*
Mode	
Specify the direction in which the port mirroring occurs: • **Disabled:** Neither frames transmitted nor frames received are mirrored. • **Rx Only:** Only incoming traffic is mirrored. • **Tx Only:** Only outgoing traffic is mirrored. • **Enabled:** Both outgoing traffic and incoming traffic are mirrored.	Disabled

3.11.4 System Log Information

The System Log function allows you to monitor the switch. When faults, errors, configuration changes or specified events happen, this function can generate messages, store the messages locally or forward the messages to one syslog server or more syslog servers. You can choose the severity level to filter the message according to your requirement.

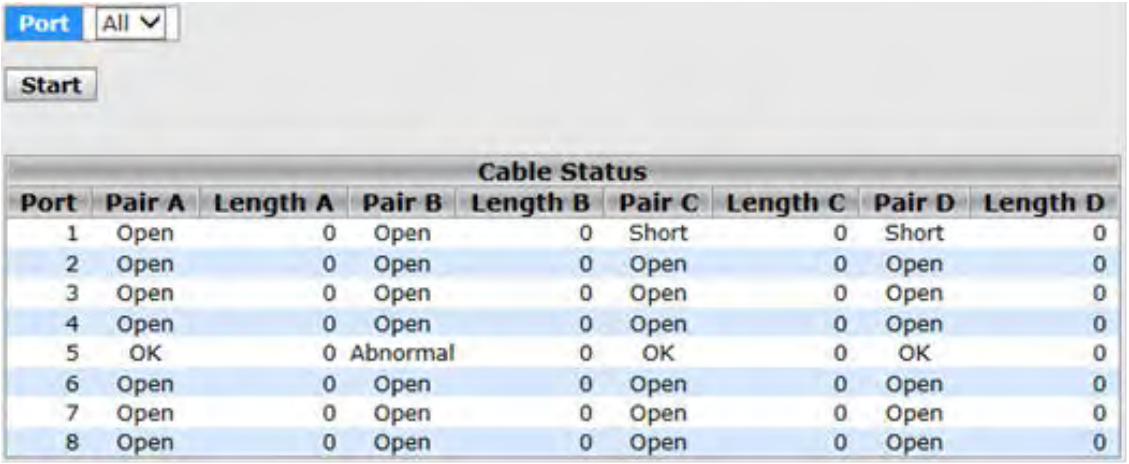


ID	Time	Message
1	1970-01-13 04:47:21+00:00	Port. 1 Device(1.1.1.1): P ...

Item	Description
ID	The ID (>= 1) of the system log entry.
Time	The time of the system log entry.
Message	The IP Address of this switch.

3.11.5 VeriPHY Cable Diagnostics

The Delta switch provides administrator the Cable Diagnostic function to detect whether the cable link status of the port is normal or not. The Cable status will show the cable link status of the port which you select.



Port	Pair A	Length A	Pair B	Length B	Pair C	Length C	Pair D	Length D
1	Open	0	Open	0	Short	0	Short	0
2	Open	0	Open	0	Open	0	Open	0
3	Open	0	Open	0	Open	0	Open	0
4	Open	0	Open	0	Open	0	Open	0
5	OK	0	Abnormal	0	OK	0	OK	0
6	Open	0	Open	0	Open	0	Open	0
7	Open	0	Open	0	Open	0	Open	0
8	Open	0	Open	0	Open	0	Open	0

Description	Factory default
Port	
The port where you are requesting VeriPHY Cable Diagnostics.	All

- **Cable Status**

Item	Description
Port	This field displays the port number.
Cable Status	This field displays the cable link status. • Port: Port number. • Pair: The status of the cable pair. • Length: The length (in meters) of the cable pair.

3.11.6 SFP Monitor

You can monitor the status of each SFP (small form-factor pluggable) port on this page.

Port No.	Temperature (°C)	Vcc (V)	TX Bias (mA)	TX Power (mW)	(dBm)	RX Power (mW)	(dBm)
9	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note:
Before you use the SFP DDM function, please make sure the SFP module you used are support SFP DDM function.

3.11.7 Ping

IP Address	0.0.0.0
Ping Length	56
Ping Count	5
Ping Interval	1

Description	Factory default
IP Address	
Specify the IP address that you want to ping. Enter an IPv4 address.	0.0.0.0
Ping Length	
Specify the size of the ping packet in bytes. Enter a payload size between 0 and 2080 bytes.	56
Ping Count	
Specify the number of echo requests to be sent. Enter a number between 1 and 10.	5
Ping Interval	
Specify the interval between ping packets in seconds. Enter a number between 1 and 100 seconds.	1

- **An unsuccessful ping is displayed in the way described below:**

PING server <ipv4 address>, 56 bytes of data.

recvfrom: Operation timed out

recvfrom: Operation timed out

recvfrom: Operation timed out

Sent<count> packets, received 0 OK, 0 bad

- **A successful ping is displayed in the way described below:**

PING server <ipv4 address>, 56 bytes of data.

64 bytes from <ipv4 address>: icmp_seq=0, time=10ms

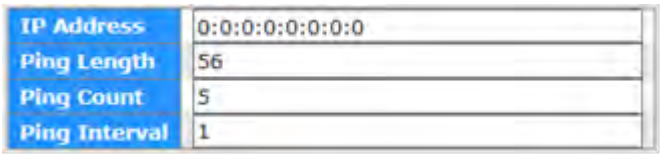
64 bytes from <ipv4 address>: icmp_seq=1, time=0ms

64 bytes from <ipv4 address>: icmp_seq=2, time=0ms

Sent 5<count> packets, received 5 OK, 0 bad

Note:
Make sure that the IP Address/Hostname you want to ping really exists and normally works in the same segment as the switch.

3.11.8 IPv6 Ping



Description	Factory default
IP Address	
Specify the IP address that you want to ping. Enter an IPv6 address or a host name.	0:0:0:0:0:0:0:0
Ping Length	
Specify the size of the ping packet in bytes. Enter a payload size between 0 and 2080 bytes.	56
Ping Count	
Specify the number of echo requests to be sent. Enter a number between 1 and 10.	5
Ping Interval	
Specify the interval between ping packets in seconds. Enter a number between 1 and 100 seconds.	1

- **An unsuccessful ping is displayed in the way described below:**

PING server <ipv6 address>, 56 bytes of data.

recvfrom: Operation timed out

recvfrom: Operation timed out

recvfrom: Operation timed out

Sent<count> packets, received 0 OK, 0 bad

- **A successful ping is displayed in the way described below:**

PING server <ipv6 address>, 56 bytes of data.

64 bytes from <ipv6 address>: icmp_seq=0, time=10ms

64 bytes from <ipv6 address>: icmp_seq=1, time=0ms

64 bytes from <ipv6 address>: icmp_seq=2, time=0ms

Sent 5<count> packets, received 5 OK, 0 bad

Note:
Make sure that the IP Address/Hostname you want to ping really exists and normally works in the same segment as the switch.

3.11.9 SFP Type

The page can show SFP Module EEPROM INFO.

Port	Vendor	PID	Version	Type
1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	-
7	-	-	-	-
8	-	-	-	-
9	DELTA	LCP-1250A4FDRJ	0008	1000BASE-SX LC multi-mode 550 m
10	-	-	-	-
11	-	-	-	-
12	-	-	-	-
13	-	-	-	-
14	-	-	-	-
15	-	-	-	-
16	-	-	-	-
17	-	-	-	-
18	-	-	-	-
19	-	-	-	-
20	-	-	-	-
21	-	-	-	-
22	-	-	-	-
23	-	-	-	-
24	-	-	-	-
25	-	-	-	-
26	-	-	-	-
27	-	-	-	-
28	-	-	-	-

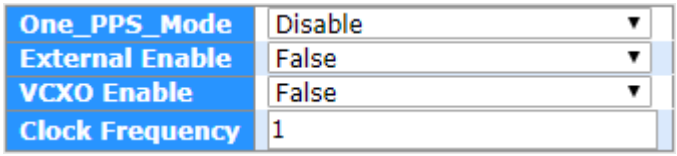
Description	Factory default
Port	
Show SFP Port, port number.	All
Vendor	
Show SFP module EEPROM Vendor info.	-
PID	
Show SFP module EEPROM PID info.	-
Version	
Show SFP module EEPROM Version info.	-
Type	
Show SFP module EEPROM TYPE info.	-

3.12 Synchronization

This page allows the user to configure and inspect the current PTP clock settings.

3.12.1 PTP

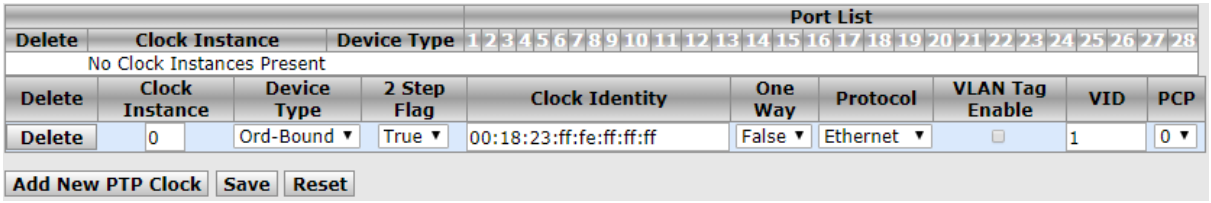
- **PTP External Clock Mode**



Description	Factory default
One_PPS_Mode	
Specify the status of One_PPS_Mode. • **Disable**: Disable the 1 pps clock in/out-put. • **Output**: Enable the 1 pps clock output. • **Input**: Enable the 1 pps clock input.	Disable
External Enable	
Specify the status of the External Clock output. • **False**: Disable the external clock output. • **True**: Enable the external clock output.	False
VCXO Enable	
Specify the status of the External VCXO rate adjustment. • **False**: Disable the VCXO rate adjustment • **True**: Enable the VCXO rate adjustment	False
Clock Frequency	
Entering the Clock Frequency.The possible range of values are 1 - 25000000 (1 - 25MHz)	1

- **PTP Clock Configuration**

You can click “Add New PTP Clock” to add a new PTP clock.

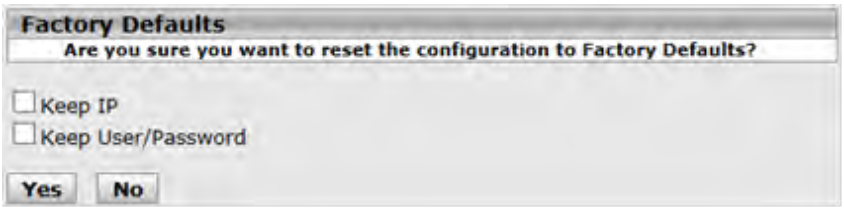


Description	Factory default
Delete	
Check this box and click on 'Save' to delete the clock instance.	Unchecked
Clock Instance	
Indicates the Instance of a particular Clock Instance [0.3]. Click on the Clock Instance number to edit the Clock details.	0
Device Type	
Specify whether the Device Type of the PTP Clock. • **Ord-Bound**: Clock's Device Type is Ordinary-Boundary Clock.	Ord-Bound

Description	Factory default
• **P2p Transp**: Clock's Device Type is Peer to Peer Transparent Clock. • **E2e Transp**: Clock's Device Type is End to End Transparent Clock. • **Master Only**: Clock's Device Type is Master Only. • **Slave Only**: Clock's Device Type is Slave Only.	
Port List	
Specify the port configured for this Clock Instance.	None
2 Step Flag	
Static member: defined by the system, true if two-step Sync events and Pdelay_Resp events are used.	True
Clock Identity	
It shows unique clock identifier.	00:18:23:ff:fe:ff:ff:ff
One Way	
Specify whether the mode is enabled or not.This parameter applies only to a slave.	False
Protocol	
Transport protocol used by the PTP protocol engine • **Ethernet**: PTP over Ethernet multicast. • **IP4Multi**: PTP over IPv4 multicast. • **IPv4Uni**: PTP over IPv4 unicast.	Ethernet
VLAN Tag Enable	
Specify the status of VLAN Tag. • **Unchecked**: Disable the VLAN Tag. • **Checked**: Enable VLAN Tag.	Unchecked
VID	
Specify the VLAN Identifier used for tagging the PTP frames.	1
PCP	
Specify the Priority Code Point value used for PTP frames.	0

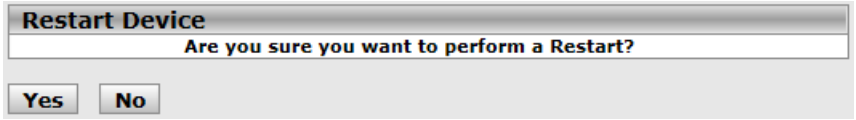
3.13 Factory Default

After you click the **Yes** button, the Delta Layer 3 switch will be reset to the factory default values. You can select to keep IP address or login information (username/password).



3.14 System Reboot

After you click the **Yes** button, GUI will not be available until the switch completes the boot cycle. After the switch is reset, you need to re-login again.



MEMO

4

Chapter 4 IEXplorer Utility Introduction

Table of Contents

Delta has many kinds of industrial products and network devices. If you have many Delta network products, the IEXplorer utility can help you search them via one interface. The IEXplorer utility can search for IES series products, DVP series products and some Delta products which have extension communication cards. It can help you know the IP address of a device, modify the configuration, and upgrade the firmware.

The IEXplorer utility supports the following models:

- DVS-108W02-2SFP
- DVS-109W02-1GE
- DVS-110W02-3SFP
- DVW-W02W2-E2 / DVW-W02W2-E2-CN / DVW-W02W2-E2-EU
- DVS-328R02-8SFP
- DVS-G512W01-4GF
- DVS-G928W01
- IFD9506
- IFD9507
- RTU-EN01
- DVPEN01-SL
- DVP12SE
- DVP-FEN01
- DVPSCM12-SL
- DVPSCM52-SL
- ASDA-M
- CMC-MOD01
- CMC-EIP01

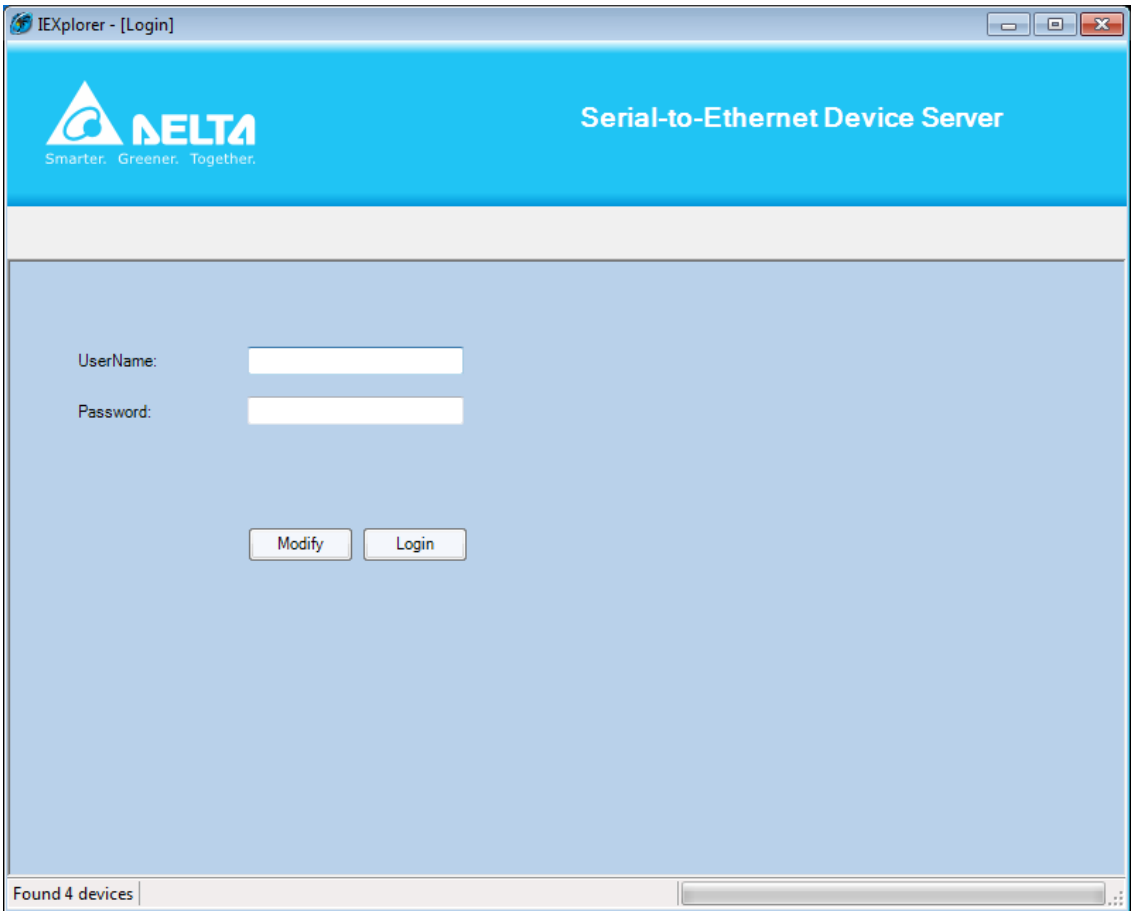
More models are coming soon.

Compatible OS: Windows XP SP2, Windows 7 (32/64 bits), Windows 8(64 bits)or Windows 10 (32/64 bits)

4.1 Starting the Configuration

After you finish the installation, you can find the IEXplorer icon on the desktop. Double-click the icon to run the program.

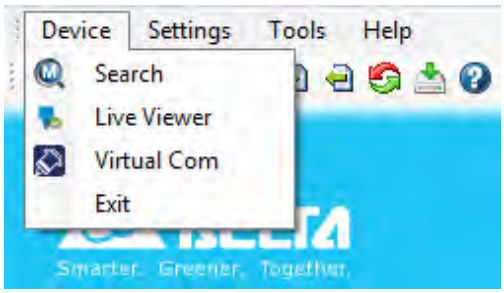
1. After double-clicking the icon, you can see the IEXplorer interface shown below:



2. Enter the username "**admin**" and the password is "**admin1234**", click Login button to start the configuration.
3. IEXPlorer also provides an admin user can be able to make modification of password. Passwords are 1–20 alphanumeric characters in length and are case sensitive. The password is displayed as asterisks (*).

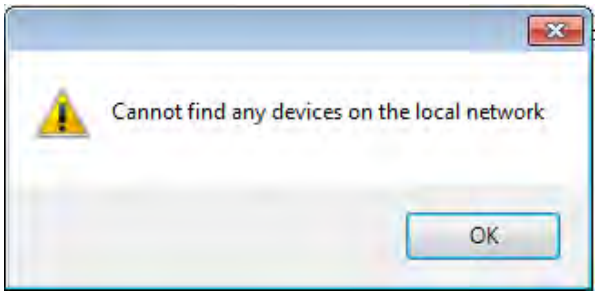
4.2 Device

There are four items on the **Devices** menu: Search, Live Viewer, Virtual COM and Exit.



4.2.1 Search

If the utility can not find any devices, the message box will pop up.



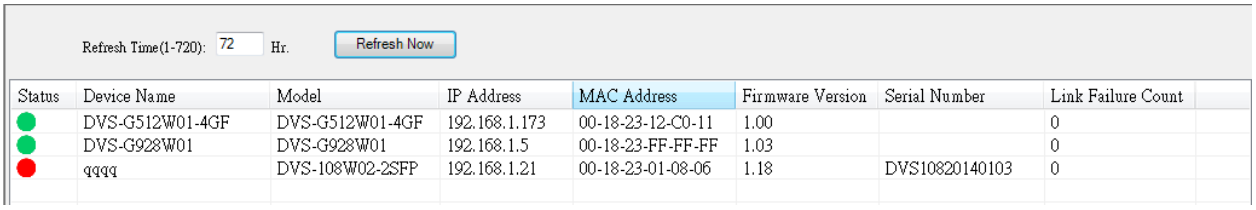
The automatic search function performs every 1 minute. If the device does not exist anymore, it will be moved from the list view.

You can specify the refresh interval from the device search window

4.2.2 Live Viewer

IEXplorer provides the user monitor the connectivity. The default refresh interval is 72 hours, and the range is 1 to 720 hours. The status of RED is meaning disconnection and the status of GREEN is meaning connection.

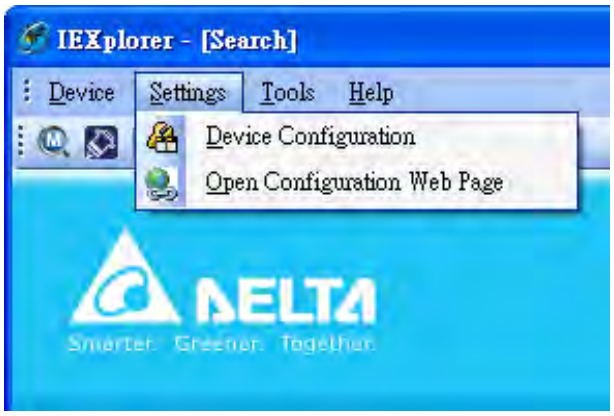
If the user needs to check current on-line status, please click the **Refresh Now** button.



Status	Device Name	Model	IP Address	MAC Address	Firmware Version	Serial Number	Link Failure Count
	DVS-G512W01-4GF	DVS-G512W01-4GF	192.168.1.173	00-18-23-12-C0-11	1.00		0
	DVS-G928W01	DVS-G928W01	192.168.1.5	00-18-23-FF-FF-FF	1.03		0
	qqqq	DVS-108W02-2SFP	192.168.1.21	00-18-23-01-08-06	1.18	DVS10820140103	0

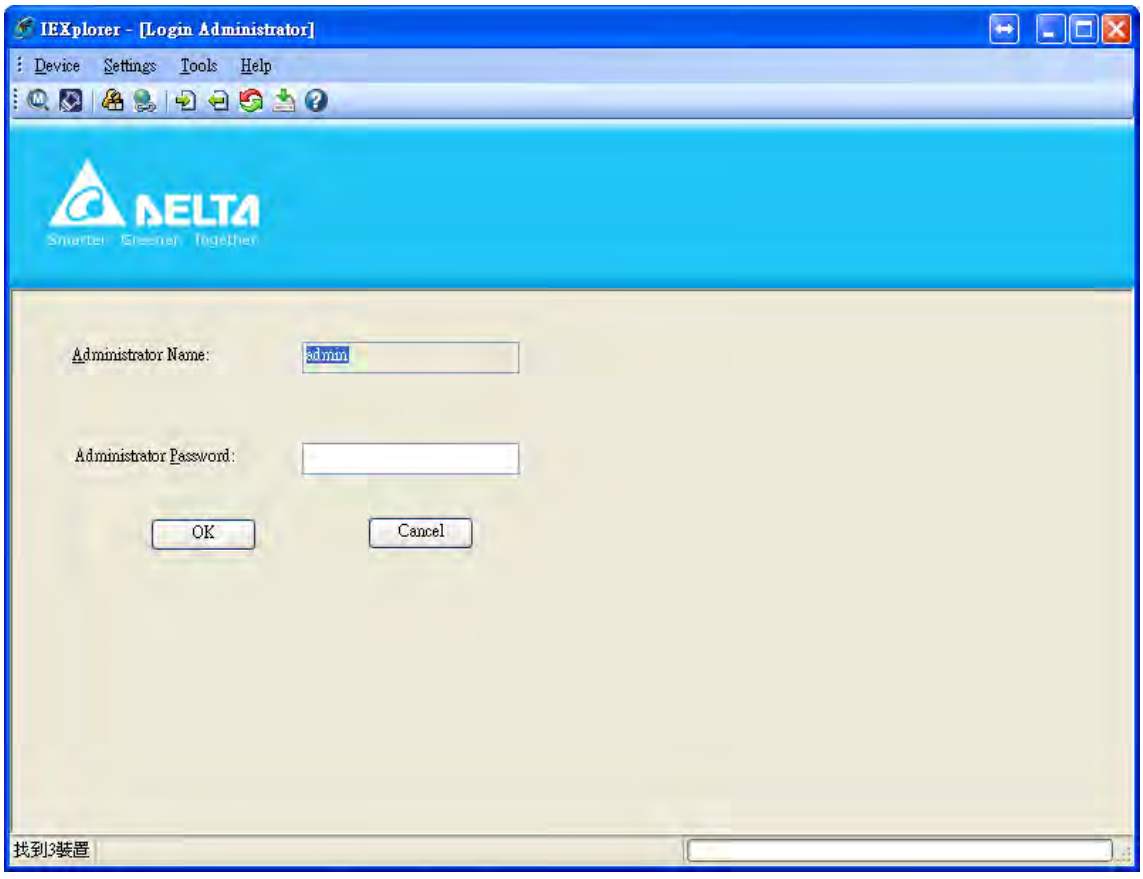
4.3 Settings

The IEXplorer utility provides two ways for users to configure the devices. You can configure the basic settings via **Device Configuration** or configure completely settings via **Open Configuration Web Page**. The **Settings** menu can be clicked only when you select DVS or DVW series products in the list view.

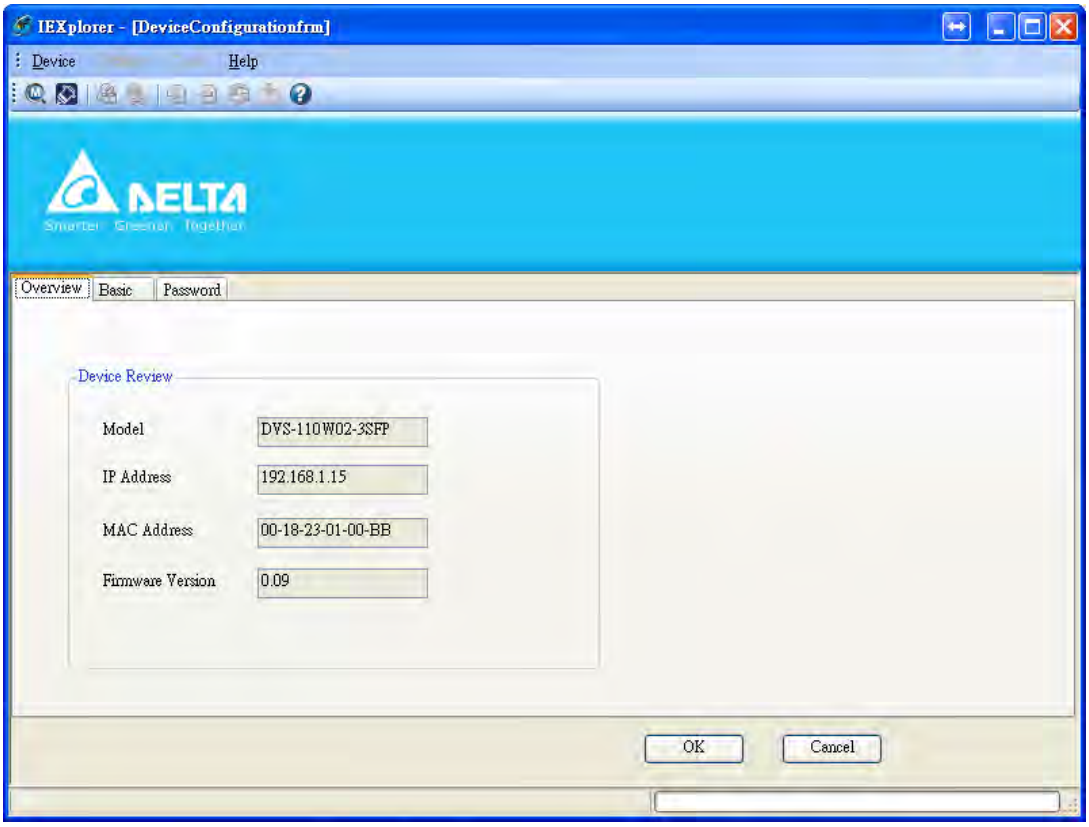


4.3.1 Device Configuration

The login ID and the password are the same as the web interface.



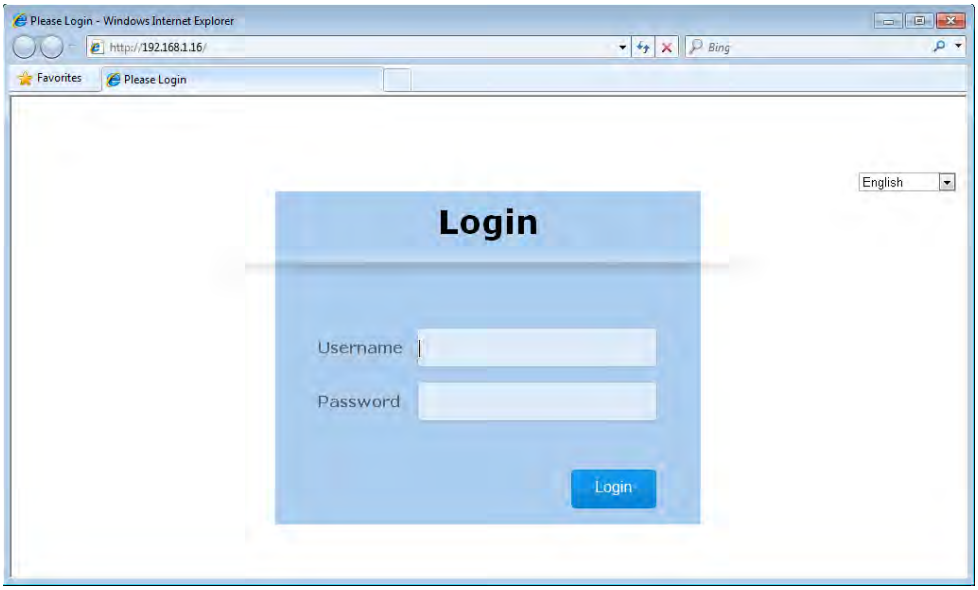
After the authentication progresses, the basic setting interface will display information, as shown below:



You can configure the device name and the IP information, modify the password, and reset the password to the factory default setting in this interface.

4.3.2 Configuration Web Page

If you click **Open Configuration Web Page**, the web interface will be displayed.



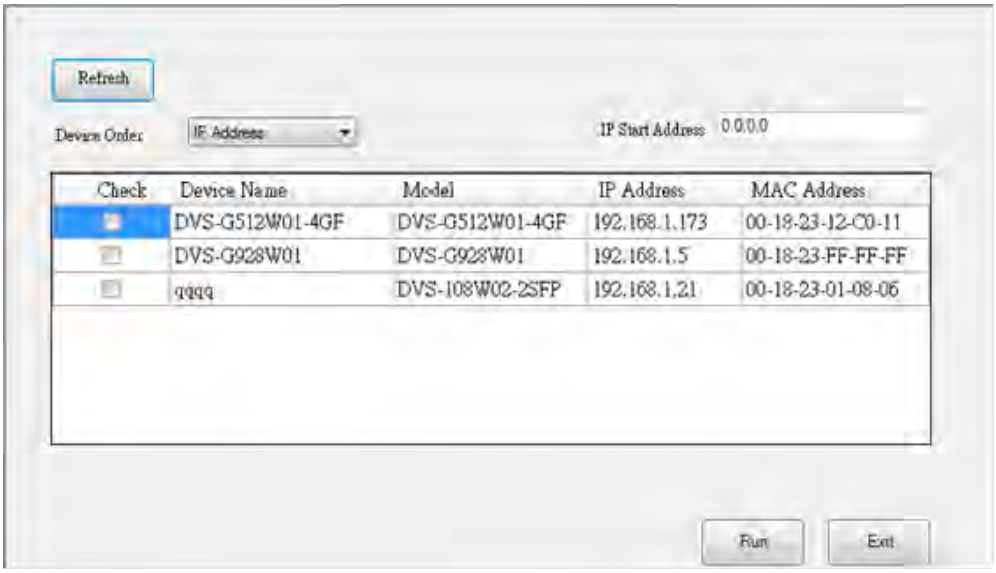
Note:
You can double-click the device in the list view to open the configuration web page. If the device which you select is not a DVS or DVW series device, the utility will start **DCISoft** for you to configure the device.

4.4 Tools

Please select the device before using the functions on the **Tools** menu.

4.4.1 IP Setting

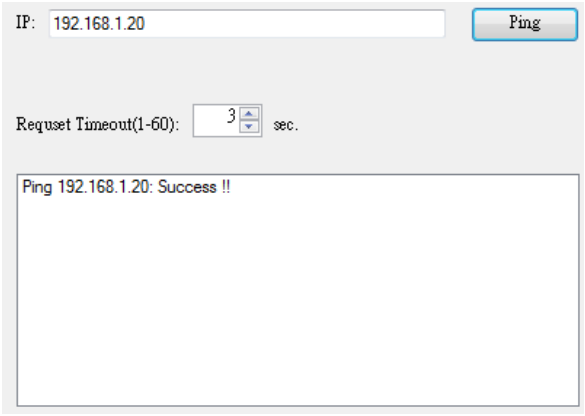
After IP Setting is clicked, it will display the device list and you can select one device to configure a static IP address, or entering the start IP address to configure multiple devices which you select from the device list.



Note:
If you need to keep the IP address, please remember to save the configuration from any managed interface.

4.4.2 Ping Test

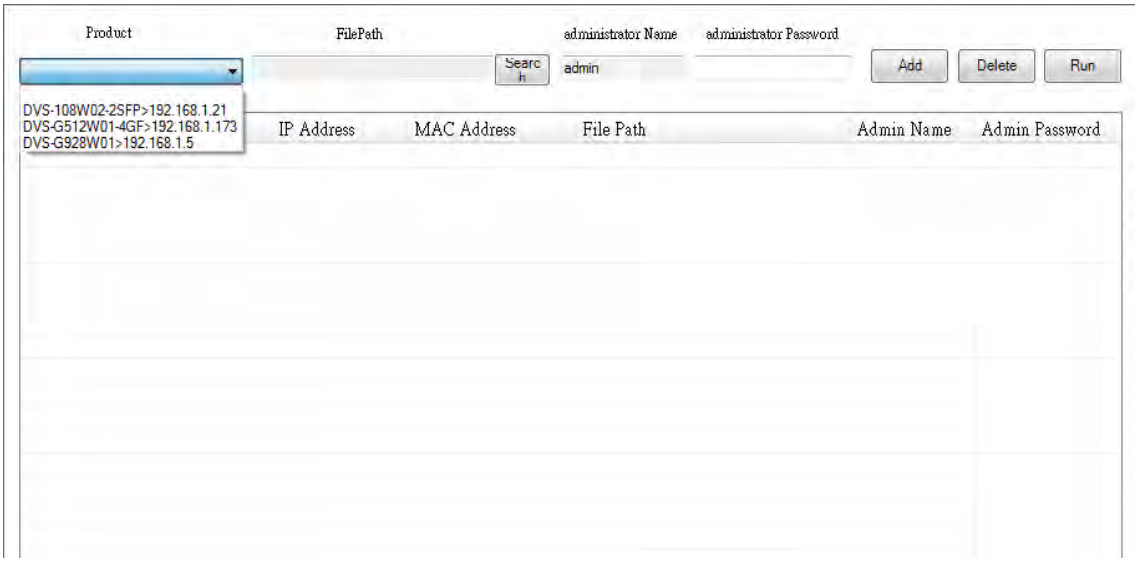
After Ping Test is clicked, you can specify the IP address that you want to ping.



4.4.3 Parameter Import

After **Parameter Import** is clicked, the drop-down list of Product will display the product list, and you can select one device to import the parameter file.

When you select the product and the path is specified, entering administrator name and password to starting import the parameter file.



Note:
1. Make sure the parameter file and the product you selected is matched.
2. The login ID and the password are the same as the web interface.

4.4.4 Parameter Export

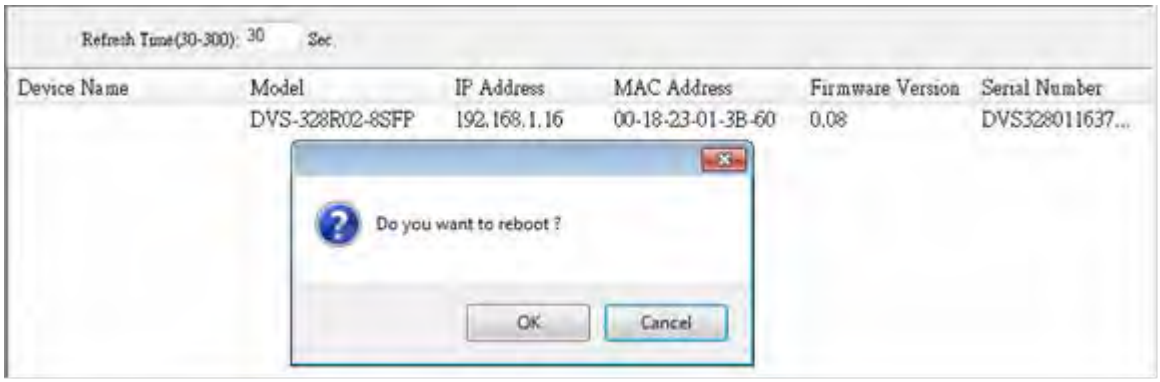
After **Parameter Export** is clicked, the drop-down list of Product will display the product list, and you can select one device to export the parameter file.

When you select the product and the path is specified, entering administrator name and password to starting export the parameter file.

Note:
The login ID and the password are the same as the web interface.

4.4.5 Device Reboot

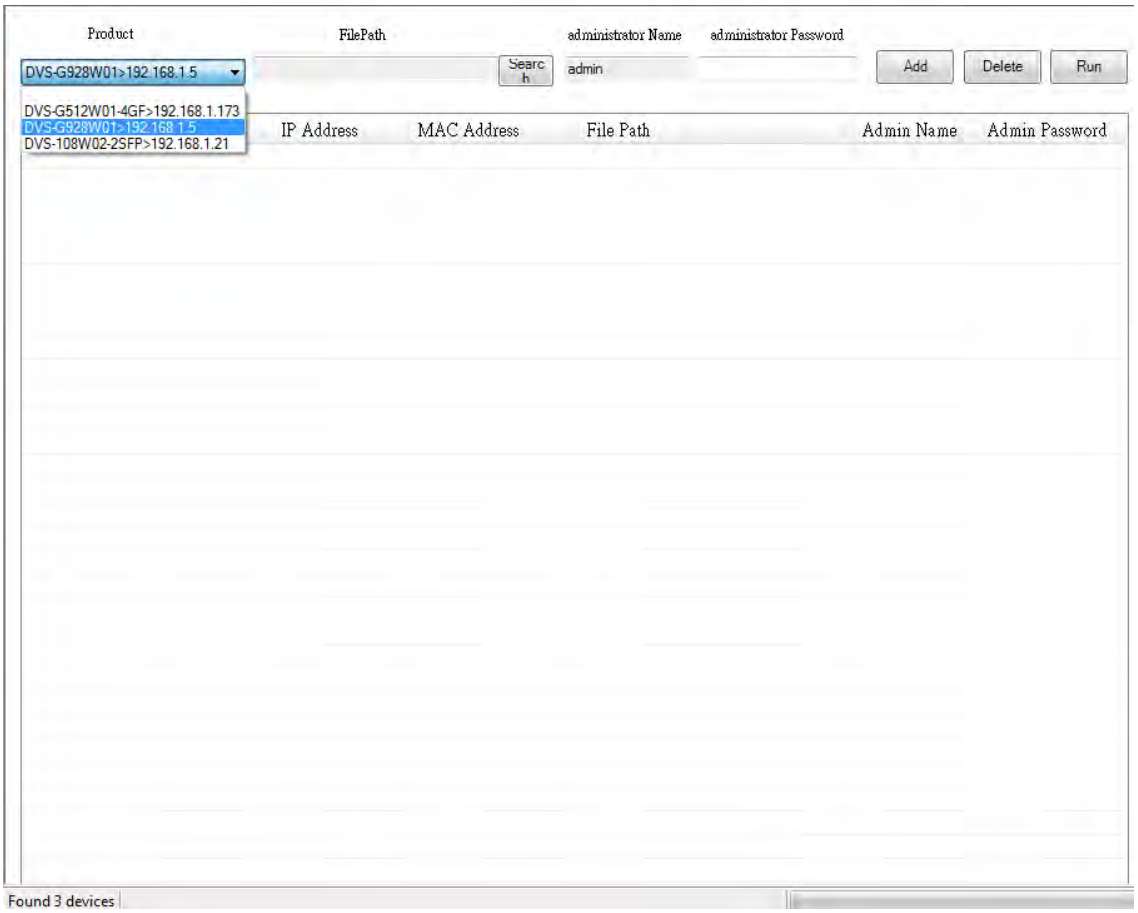
IEXplorer allows you to reboot the device via the utility.



4.4.6 Update Firmware

After **Update Firmware** is clicked, the drop-down list of Product will display the product list, and you can select one device to update the firmware.

When you select the product and the path is specified, entering administrator name and password to starting update firmware.

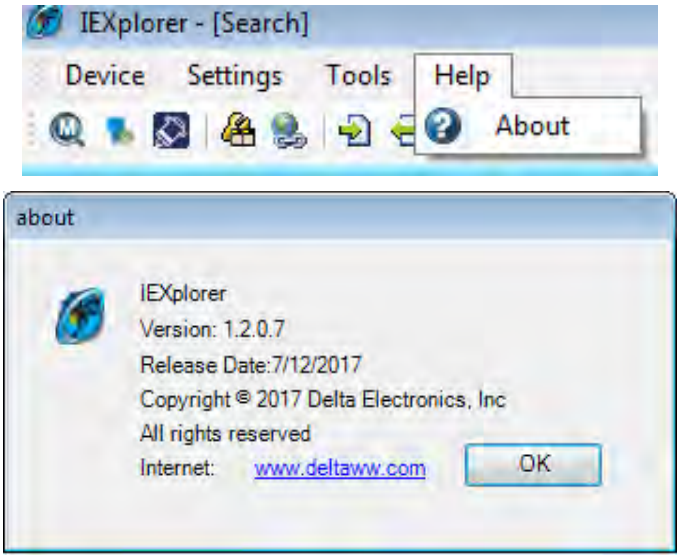


Note:

1. If it is update successfully, please wait for 3 minutes to login again.
2. The login ID and the password are the same as the web interface.

4.5 Help

After **About** on the **Help** menu is clicked, an information message window of IEXplorer will pop up.



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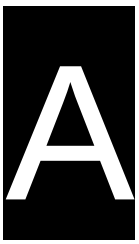


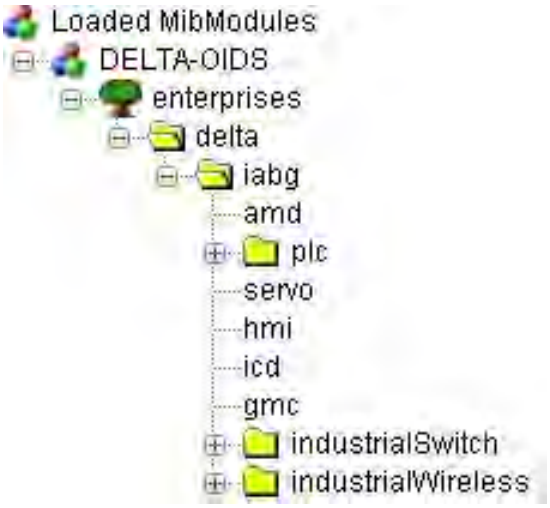
Appendix A Private MIB Group

Table of Contents

A.1 Private MIB Group

Delta switch not only supports standard MIBs, but also provides private MIBs. You can use the SNMP tool to configure or monitor the switch's configuration. The private MIBs are the same as standard MIBs. It is displayed like a web tree. It's easily to be understood and used, so you don't need to learn or find where the OIDs of the commands are.

A private MIB can be found in the product CD if you need to use it.



We also support standard MIB Groups. For example, Interfaces Group, IP Group, TCP Group, UDP Group, and SNMP Group.

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B

Appendix B MODBUS TCP Map

Table of Contents

B.1 MODBUS TCP Map

- Function code 0x04 only.

Address Offset	Data Type	Description
System Information		
0x0000	1 word	0x6574
0x0001	1 word	Unit ID (Ethernet = 1)
0x0002	1 word	The last code of the OID
0x0051	2 words	Firmware Version + Kernel Version
0x0010	16 string	Vendor Name = "Delta Electronics, Inc." Word 0 Hi byte = 'D' Word 0 Lo byte = 'e' Word 1 Hi byte = 'l' Word 1 Lo byte = 't' Word 2 Hi byte = 'a' Word 2 Lo byte = ' ' Word 3 Hi byte = 'E' Word 3 Lo byte = 'l' Word 4 Hi byte = 'e' Word 4 Lo byte = 'c' Word 5 Hi byte = 't' Word 5 Lo byte = 'r' Word 6 Hi byte = 'o' Word 6 Lo byte = 'n' Word 7 Hi byte = 'i' Word 7 Lo byte = 'c' Word 8 Hi byte = 's' Word 8 Lo byte = ', ' Word 9 Hi byte = ' ' Word 9 Lo byte = 'I' Word 10 Hi byte = 'n' Word 10 Lo byte = 'c' Word 11 Hi byte = '.' Word 11 Lo byte = '\0'
0x0030	16 string	Product Name = "DVS-G928W01" Word 0 Hi byte = 'D' Word 0 Lo byte = 'V' Word 1 Hi byte = 'S' Word 1 Lo byte = '-' Word 2 Hi byte = 'G' Word 2 Lo byte = '9' Word 3 Hi byte = '2' Word 3 Lo byte = '8' Word 4 Hi byte = 'W' Word 4 Lo byte = '0' Word 5 Hi byte = '1'
0x0055	3 words	Ethernet MAC Address Ex: MAC = 00:11:22:33:44:55

Address Offset	Data Type	Description
		Word 0 Hi byte = 0x00 Word 0 Lo byte = 0x11 Word 1 Hi byte = 0x22 Word 1 Lo byte = 0x33 Word 2 Hi byte = 0x44 Word 2 Lo byte = 0x55
Port Information		
0x1000 ~ 0x100N	1 word	Port 1 to N Status 0x0000: Link down 0x0001: Link up 0x0002: Disable
0x1100 ~ 0x110N	1 word	Port 1 to N Communication Format 0x0000: 10M,Half 0x0001: 10M,Full 0x0002: 100M,Half 0x0003: 100M,Fulll 0x0004: 1G,Half 0x0005: 1G,Full 0x0008: 10G,Half 0x0009: 10G,Full
0x1200 ~ 0x120N	1 word	Port 1 to N Flow Control 0x0000: OFF 0x0001: ON
0x1400 ~ 0x140N	16 string	Port 1 to N Description EX: 10/100/1000TX,RJ45 Word 0 Hi byte = '1' Word 0 Lo byte = '0' Word 1 Hi byte = '/' Word 1 Lo byte = '1' Word 2 Hi byte = '0' Word 2 Lo byte = '0' Word 3 Hi byte = '/' Word 3 Lo byte = '1' Word 4 Hi byte = '0' Word 4 Lo byte = '0' Word 5 Hi byte = '0' Word 5 Lo byte = 'T' Word 6 Hi byte = 'X' Word 6 Lo byte = ',' Word 7 Hi byte = 'R' Word 7 Lo byte = 'J' Word 8 Hi byte = '4' Word 8 Lo byte = '5' Word 9 Hi byte = '\0' Word 9 Lo byte = '\0'

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C

Appendix C EtherNet/IP

Table of Contents

C.1 DVS-108W02-2SFP

- **Identity Object (0x01)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
2	Get	Max Instance	UINT	Maximum instance number of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Vendor ID	UINT	799, Vendor ID of "Delta Electronics, Inc."
2	Get	Device Type	UINT	0x2C, "Managed Ethernet Switch Device".
3	Get	Product Code	UINT	Product code of device.
4	Get	Revision	STRUCT of:	Revision of the Identity Object
		Major	USINT	
		Minor	USINT	
5	Get	Status	WORD	0, Not used
6	Get	Serial Number	UDINT	Serial number of device
7	Get	Product Name	STRING	"DVS-108W02-2SFP", Product name of device.
Common Services				
Service Code	**Need in Implementation**		**Service name**	**Description of Service**
	Class	**Instance**		
0x01		V	Get_Attribute_All	Returns a predefined listing of this objects attributes.
0x05		V	Reset	Invokes the reset service for the device.
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.

- **Message Router Object (0x02)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
2	Get	Number Available	UINT	Maximum number of CIP connections supported
3	Get	Number Active	UINT	Number of CIP connections

				currently used by system components
Common Services				
Service Code	**Need in Implementation**		**Service name**	**Description of Service**
	Class	**Instance**		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.

- **Assembly Object (0x04)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
3	Get/Set	Data	ARRAY of BYTE	
4	Get	Size	UINT	
Instance				
Instance Number	**Size (bytes)**	**Name**	**Type**	**Description of attribute**
1	18	Power Source and Link Status	Inupt	Refer to Base Switch Object Attr ID 4 Byte 0: Power Source Status (Least Significant Byte) Byte 1: Power Source Status (Most Significant Byte) Refer to Base Switch Object Attr ID 8 Byte 2-5: Global Link Status DWORD 0 Byte 6-9: Global Link Status DWORD 1 Byte 10-13: Global Link Status DWORD 2 Byte 14-17: Global Link Status DWORD 3
2	16	Global Admin State	Input	Refer to Base Switch Object Attr ID 7 Byte 0-3: Global Admin Status DWORD 0 Byte 4-7: Global Admin Status DWORD 1 Byte 8-11: Global Admin Status DWORD 2 Byte 12-15: Global Admin Status DWORD 3
3	2	Contact Status	Input	Refer to Base Switch Object Attr ID 10

				Byte 0: Contact Status (Least Significant Byte) Byte 1: Contact Status (Most Significant Byte)
50	16	Port Admin State	Output	Refer to Base Switch Object Attr ID 7 Byte 0-3: Global Admin Status DWORD 0 Byte 4-7: Global Admin Status DWORD 1 Byte 8-11: Global Admin Status DWORD 2 Byte 12-15: Global Admin Status DWORD 3
64	75	Device Status	Input	Refer to I/O Assembly Connection 4 - Input

Common Services

Service Code	Need in Implementation		Service name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

I/O Assembly

Connection1

	Instance	Size(SINT)	Description
Input	1	18	Please refer to Assembly Object Attr ID 1.
Output	50	16	Please refer to Assembly Object Attr ID 50.
Configuration	64	0	

Connection2

	Instance	Size(SINT)	Description
Input	2	16	Please refer to Assembly Object Attr ID 2.
Output	50	16	Please refer to Assembly Object Attr ID 50.
Configuration	64	0	

Connection3

	Instance	Size(SINT)	Description
Input	3	2	Please refer to Assembly Object Attr ID 2.
Output	50	16	Please refer to Assembly Object Attr ID 50
configuration	64	0	

Connection4

	Instance	Size(SINT)	Description
Input	64	2	Please refer to Assembly Object Attr ID 3
Output	50	16	Please refer to Assembly Object Attr ID 50
configuration	80	0	

Direction	Name	Size(SINT)	Description
Input	Power Source Status	WORD	Refer to Base Switch Object Attr ID 4 Power Source Status (Least Significant Byte) Power Source Status (Most Significant Byte)
	Global Link Status	ARRAY OF DWORD	Refer to Base Switch Object Attr ID 8 Global Link Status DWORD 0 Global Link Status DWORD 1 Global Link Stauts DWORD 2 Global Link Status DWORD 3
	Global Admin State	ARRAY OF DWORD	Refer to Base Switch Object Attr ID 7 Global Admin Status DWORD 0 Global Admin Status DWORD 1 Global Admin Stauts DWORD 2 Global Admin Status DWORD 3
	Contact Status	WORD	Refer to Base Switch Object Attr ID 10
	AlarmStatus	ULINT	Refer to Delta IES Object Attr 11
	Bandwidth overload	ULINT	Refer to Delta IES Object Attr 12
	Loopback detection port status	ULINT	Refer to Delta IES Object Attr 13
	SFP Failure	ARRAY OF USINT	Refer to Delta IES Object Attr 14
	Redundancy Protocol	USINT	Refer to Delta IES Object Attr 15
	RSTP Root	USINT	Refer to Delta IES Object Attr 16
	Redundancy - RING Mode	USINT	Refer to Delta IES Object Attr 17
	Redundancy - Ring State	USINT	Refer to Delta IES Object Attr 18
	Redundancy - CHAIN State	USINT	Refer to Delta IES Object Attr 19
	Redundancy - COUPING Mode	USINT	Refer to Delta IES Object Attr 20
	Redundancy - COUPING State	USINT	Refer to Delta IES Object Attr 21
Output	Port Admin State	ARRAY OF USINT	Refer to Base Switch Object Attr ID 7 Global Admin Status DWORD 0 Global Admin Status DWORD 1 Global Admin Stauts DWORD 2 Global Admin Status DWORD 3

- **Connection Manager Object (0x06)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**

Common Services				
Service Code	**Need in Implementation**		**Service name**	**Description of Service**
	Class	**Instance**		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x4E		V	Forward_Close	Closes a connection
0x54		V	Forward_Open	Open a connection

- **Port Object (0xF4)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
2	Get	Max Instance	UINT	Maximum instance number.
3	Get	Num Instances	UINT	Number of port currently instantiated.
8	Get	Entry Port	UINT	Returns the port through which this request entered the device.
9	Get	Port Instance Info	ARRAY of STRUCT of	
		Port Type	UINT	Enumerates the type of port.
		Port Number	UINT	CIP port number associated with this port
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Port Type	UINT	Enumerates the type. (4=EthetNet/IP)
2	Get	Port Number	UINT	CIP port number associated with this port.
3	Get	Link Object	STRUCT of	
		Path Length	UINT	Number of 16 bit words in the following path.
		Link Path	Padded EPATH	Logical path segments that identify the object for this port.
4	Get	Port Name	SHORT_STRING	String which names the physical network port.
10	Get	Port Routing Capabilities	DWORD	Bit string that defines the routing capabilities of this port.
Common Services				
Service Code	**Need in Implementation**		**Service name**	**Description of Service**
	Class	**Instance**		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	

- **TCP/IP Interface Object (0xF5)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Status	DWORD	Interface status 0=The Interface Configuration attribute has not been configured. 1=The Interface Configuration attribute contains configuration obtained from BOOTP, DHCP or non-volatile storage.
2	Get	Configuration Capability	DWORD	Interface capability Bit 0: BOOTP Client 1 (TRUE) shall indicate the device is capable of obtaining its network configuration via BOOTP. Bit 1: DNS Client 1 (TRUE) shall indicate the device is capable of resolving host names by querying a DNS server. Bit 2: DHCP Client 1 (TRUE) shall indicate the device is capable of obtaining its network configuration via DHCP. Bit 3: DHCP-DNS Update Shall be 0 Bit 4: Configuration Settable 1 (TRUE) shall indicate the Interface Configuration attribute is settable.
3	Get/Set	Configuration Control	DWORD	Interface control flags Bit 0-3: Configuration Method 0=The device shall use statically-assigned IP configuration values. 1=The device shall obtain its interface configuration values via BOOTP. 2=The device shall obtain its interface configuration values via DHCP. 3-15=Reserved for future use. Bit 4: DNS Enable If 1 (TRUE), the device shall resolve host names by querying a DNS server.
4	Get	Physical Link Object	STRUCT of	Path to physical link object.

		Path size	UINT	Size of Path.
		Path	Padded EPATH	Logical segments identifying the physical link object.
5	Get/Set	Interface Configuration	STRUCT of	TCP/IP network interface configuration.
		IP Address	UDINT	The device's IP address.
		Network Mask	UDINT	The device's network mask
		Gateway Address	UDINT	Default gateway address
		Name Server	UDINT	Primary name server
		Name Server 2	UDINT	Secondary name server
		Domain Name	STRING	Default domain name Note: ASCII characters. Maximum length is 48 characters. Shall be padded to an even number of characters (pad not included in length).
6	Get/Set	Host Name	STRING	Host Name (Note: ASCII characters. Maximum length is 64 characters. Shall be padded to an even number of characters (pad not included in length).

Common Services

Service Code	Need in Implementation		Service name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

- **Ethernet Link Object (0xF6)**

Class Attributes

Attr ID	Access rule	Name	Data type	Description of attribute
1	Get	Revision	UINT	Revision of this object
2	Get	Max Instance	UINT	Maximum instance number of an object currently created in this class level of the device.
3	Get	Number of Instances	UINT	Number of object instances currently created at this class level of the device. (The value is mapping the number of ports in Switch device)

Instance Attributes

Attr ID	Access rule	Name	Data type	Description of attribute
1	Get	Interface Speed	UDINT	Interface speed currently in use Speed in Mbps (e.g., 0, 10, 100, 1000, etc.)

2	Get	Interface Flags	DWORD	Interface status flags
3	Get	Physical Address	ARRAY of 6 USINTs	MAC layer address
4	Get	Interface Counters	STRUCT of:	
		In Octets	UDINT	Octets received on the interface
		In Ucast Packets	UDINT	Unicast packets received on the interface
		In Nucast Packets	UDINT	Non-unicast packets received on the interface
		In Discards	UDINT	Inbound packets received on the interface but discarded
		In Errors	UDINT	Inbound packets that contain errors (does not include In Discards)
		In Unknown Protos	UDINT	Inbound packets with unknown protocol
		Out Octets	UDINT	Octets sent on the interface
		Out Ucast Packets	UDINT	Unicast packets sent on the interface
		Out Nucast Packets	UDINT	Non-unicast packets sent on the interface
		Out Discards	UDINT	Outbound packets discarded
		Out Errors	UDINT	Outbound packets that contain errors
5	Get	Media Counters	STRUCT of:	Media-specific counters
		Alignment Errors	UDINT	Frames received that are not an integral number of octets in length
		FCS Errors	UDINT	Frames received that do not pass the FCS check
		Single Collisions	UDINT	Successfully transmitted frames which experienced exactly one collision
		Multiple Collisions	UDINT	Successfully transmitted frames which experienced more than one collision
		SQE Test Errors	UDINT	Number of times SQE test error message is generated
		Deferred Transmissions	UDINT	Frames for which first transmission attempt is delayed because the medium is busy
		Late Collisions	UDINT	Number of times a collision is detected later than 512 bit-times into the transmission of a packet
		Excessive Collisions	UDINT	Frames for which transmission fails due to excessive collisions
		MAC Transmit Errors	UDINT	Frames for which transmission fails due to an internal MAC sublayer transmit error
		Carrier Sense	UDINT	Times that the carrier sense

		Errors		condition was lost or never asserted when attempting to transmit a frame
		Frame Too Long	UDINT	Frames received that exceed the maximum permitted frame size
		MAC Receive Errors	UDINT	Frames for which reception on an interface fails due to an internal MAC sublayer receive error
10	Get	Interface Label	SHORT_STRING	Human readable identification

Common Services

Service Code	Need in Implementation		Service name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.

- **Base Switch Object (0x51)**

Class Attributes

Attr ID	Access rule	Name	Data type	Description of attribute
1	Get	Revision	UINT	Revision of this object. The current value assigned to this values is 1

Instance Attributes

Attr ID	Access rule	Name	Data type	Description of attribute
1	Get	Device Up Time	UDINT	Time since device was powered up (s) (Note: the value is 32-bit)
2	Get	Total port count	UDINT	Number of physical ports
3	Get	System Firmware Version	SHORT_STRING	Human readable representation of System Firmware Version (Note: ASCII characters, max length is 32 bytes)
4	Get	Power Source	WORD	Status of switch power source Bit 0-1: Power Source 1 Bit 2-3: Power Source 2…. Bit 14-15: Power Source 8 00=Not Present (power source not present in switch) 01=Not Powered (power source present but not powered) 10=Faulted (power source present but faulted) 11=Powered and ok (power source present, powered and OK)
5	Get	Port Mask Size	UINT	Number of DWORDs in port array attributes (Minimum=4, supporting 128 ports)
7	Get / Set	Global Port Admin State	ARRAY OF DWORD	Port Admin Status (Note: Size of array=attribute 5)

				DWORD[0]: Port 0 - 31 admin status DWORD[1]: Port 32 - 63 admin status DWORD[2]: Port 64 - 95 admin status DWORD[3]: Port 96 - 127 admin status 0=Port (or Interface) Enabled 1=Port (or Interface) Disabled
8	Get	Global Port Link Status	ARRAY OF DWORD	Port Link Status (Note: Size of array=attribute 5) DWORD[0]: Port 0 - 31 link status DWORD[1]: Port 32 - 63 link status DWORD[2]: Port 64 - 95 link status DWORD[3]: Port 96 - 127 link status 0=Link inactive (Down) 1=Link Active (UP)
10	Get	Contact Status	WORD	Switch Contact Closure (DI) Bit 0-1: Switch Contact 1 (DI 1) Bit 2-3: Switch Contact 2 (DI 2) Other Reserved (should be 0) 00=Switch Contact not support/pressed 01=Switch Contact is OPEN (OFF) 10=Switch Contact is CLOSED (ON) 11=Reserved

Common Services

Service Code	Need in Implementation		Service name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

- **Delta IES Object (0x64)**

Class Attributes

Attr ID	Access rule	Name	Data type	Description of attribute
1	Get	Revision	UINT	Revision of this object

Instance Attributes

Attr ID	Access rule	Name	Data type	Description of attribute
1	Get/Set	Reboot Device	USINT	Reboot device Set 0x0001 to reboot device, and return to 0x0000 if reboot is completed.
2	Get/Set	Reset Device	USINT	Reset to default Set 0x0001 to reset configuration,

				and return to 0x0000 if reset is completed.
3	Get	Firmware Release Date	UDINT	Ex: 20120918, PM9:00 Word 0=0x1215, Word 1=0x0C09
4	Get	Relay Output Status	WORD	Relay Output Status Bit 0-1: Relay Output 1 status Bit 2-3: Relay Output 2 status Other Reserved (should be 0) 00=Digital output not support/pressed 01=Switch Contact is OPEN (OFF) 10=Switch Contact is CLOSED (ON) 11=Reserved
11	Get	Alarm Status	ULINT	Alarm Status (0 is ON, 1 is OFF) Bit 0: switch code start Bit 1: switch warm start Bit 2: power1 state on->off Bit 3: power1 state off->on Bit 4: power2 state on->off Bit 5: power2 state off->on Bit 6: DI1 state on->off Bit 7: DI1 state off->on Bit 8: DI2 state on->off Bit 9: DI2 state off->on Bit 10: authentication failure Bit 11: dot1d Bridge New Root Bit 12: dot1d Bridge Topology Changed Bit 13: LLDP Remote Tables Changed Bit 14: configuration changed Bit 15: firmware update Bit 16: IP changed Bit 17: password changed
12	Get	Bandwidth overload	ULINT	Bit 0: Port 0 state Bit 1: Port 1 state…. Bit 63: Port 63 state 0=OFF or not support 1=Bandwidth overload
13	Get	Loopback detection port status	ULINT	Bit 0: Port 0 state Bit 1: Port 1 state…. Bit 63: Port 63 state 0=OFF or not support 1=Loopback detected
15	Get	Redundancy Protocol	USINT	0x0000: None x0001: RSTP/STP
16	Get	RSTP Root	USINT	0x0000: Not Root 0x0001: Root
17	Get	Redundancy -	USINT	0x00: None (Disable)

		RING Mode		0x01: Master 0x02: Slave
18	Get	Redundancy - Ring State	USINT	RING function is disable: 0x00: None RING Mode is Master: 0x00: Discover 0x01: Monitor 0x02: Fault RING Mode is Slave: 0x00: Forwarding 0x01: Hold 0x02: Fault
19	Get	Redundancy - CHAIN State	USINT	0x00: None 0x01: The chain failure is happened.
20	Get	Redundancy - COUPING Mode	USINT	0x00: None (Disable) 0x01: Head 0x02: Tail
21	Get	Redundancy - COUPING State	USINT	COUPING mode is Head: 0x00: Monitor 0x01: Fault 0x02: Link-Up 0x03: Hold COUPING mode is Tail 0x00: Discover 0x01: Monitor 0x02: Fault

Common Services

Service Code	**Need in Implementation**		**Service name**	**Description of Service**
	Class	**Instance**		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

C.2 DVS-109W02-1GE

- **Identity Object (0x01)**

Class Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
1	Get	Revision	UINT	Revision of this object
2	Get	Max Instance	UINT	Maximum instance number of this object

Instance Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
1	Get	Vendor ID	UINT	799, Vendor ID of "Delta Electronics, Inc. "
2	Get	Device Type	UINT	0x2C, "Managed Ethernet Switch Device".
3	Get	Product Code	UINT	Product code of device.
4	Get	Revision	STRUCT of:	Revision of the Identity Object
		Major	USINT	
		Minor	USINT	
5	Get	Status	WORD	0, Not used
6	Get	Serial Number	UDINT	Serial number of device
7	Get	Product Name	STRING	"DVS-109W02-1GE", Product name of device.

Common Services				
Service Code	Need in Implementation		Service Name	Description of Service
	Class	Instance		
0x05		V	Reset	Invokes the reset service for the device.
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.

- **Message Router Object (0x02)**

Class Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
1	Get	Revision	UINT	Revision of this object

Instance Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
2	Get	Number Available	UINT	Maximum number of CIP connections supported
3	Get	Number Active	UINT	Number of CIP connections currently used by system components

Common Services

Service Code	Need in Implementation		Service Name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.

- **Assembly Object (0x04)**

Class Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
3	Get/Set	Data	ARRAY of BYTE	
4	Get	Size	UINT	
Instance				
Instance Number	Size (bytes)	Name	Type	Description of Attribute
1	18	Power Source and Link Status	Inupt	Refer to Base Switch Object Attr ID 4 Byte 0: Power Source Status (Least Significant Byte) Byte 1: Power Source Status (Most Significant Byte) Refer to Base Switch Object Attr ID 8 Byte 2-5: Global Link Status DWORD 0 Byte 6-9: Global Link Status DWORD 1 Byte 10-13: Global Link Stauts DWORD 2 Byte 14-17: Global Link Status DWORD 3
2	16	Global Admin State	Input	Refer to Base Switch Object Attr ID 7 Byte 0-3: Global Admin Status DWORD 0 Byte 4-7: Global Admin Status DWORD 1 Byte 8-11: Global Admin Stauts DWORD 2 Byte 12-15: Global Admin Status DWORD 3
3	2	Contact Status	Input	Refer to Base Switch Object Attr ID 10 Byte 0: Contact Status (Least Signifcant Byte)

				Byte 1: Contact Status (Most Signifcant Byte)
Instance Number	Size (bytes)	Name	Type	Description of Attribute
50	16	Port Admin State	Output	Refer to Base Switch Object Attr ID 7 Byte 0-3: Global Admin Status DWORD 0 Byte 4-7: Global Admin Status DWORD 1 Byte 8-11: Global Admin Stauts DWORD 2 Byte 12-15: Global Admin Status DWORD 3
64	75	Device Status	Input	Refer to I/O Assembly Connection 4 - Input

Common Services

Service Code	Need in Implementation		Service Name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

I/O Assembly

Connection1

	Instance	Size(SINT)	Description
Input	1	18	Please refer to Assembly Object Attr ID 1.
Output	50	16	Please refer to Assembly Object Attr ID 50.
Configuration	64	0	

Connection2

	Instance	Size(SINT)	Description
Input	2	16	Please refer to Assembly Object Attr ID 2.
Output	50	16	Please refer to Assembly Object Attr ID 50.
Configuration	64	0	

Connection3

	Instance	Size(SINT)	Description
Input	3	2	Please refer to Assembly Object Attr ID 2.
Output	50	16	Please refer to Assembly Object Attr ID 50
configuration	64	0	

Connection4

	Instance	Size(SINT)	Description
Input	64	2	Please refer to Assembly Object Attr ID 2.

Output	50	16	Please refer to Assembly Object Attr ID 50
configuration	80	0	

Direction	Name	Size(SINT)	Description
Input	Power Source Status	WORD	Refer to Base Switch Object Attr ID 4 Power Source Status (Least Significant Byte) Power Source Status (Most Significant Byte)
	Global Link Status	ARRAY OF DWORD	Refer to Base Switch Object Attr ID 8 Global Link Status DWORD 0 Global Link Status DWORD 1 Global Link Stauts DWORD 2 Global Link Status DWORD 3
	Global Admin State	ARRAY OF DWORD	Refer to Base Switch Object Attr ID 7 Global Admin Status DWORD 0 Global Admin Status DWORD 1 Global Admin Stauts DWORD 2 Global Admin Status DWORD 3
	Contact Status	WORD	Refer to Base Switch Object Attr ID 10
	AlarmStatus	ULINT	Refer to Delta IES Object Attr 11
	Bandwidth overload	ULINT	Refer to Delta IES Object Attr 12
	Loopback detection port status	ULINT	Refer to Delta IES Object Attr 13
	SFP Failure	ARRAY OF USINT	Refer to Delta IES Object Attr 14
	Redundancy Protocol	USINT	Refer to Delta IES Object Attr 15
	RSTP Root	USINT	Refer to Delta IES Object Attr 16
	Redundancy - RING Mode	USINT	Refer to Delta IES Object Attr 17
	Redundancy - Ring State	USINT	Refer to Delta IES Object Attr 18
	Redundancy - CHAIN State	USINT	Refer to Delta IES Object Attr 19
	Redundancy - COUPING Mode	USINT	Refer to Delta IES Object Attr 20
	Redundancy - COUPING State	USINT	Refer to Delta IES Object Attr 21
Output	Port Admin State	ARRAY OF DWORD	Refer to Base Switch Object Attr ID 7 Global Admin Status DWORD 0 Global Admin Status DWORD 1 Global Admin Stauts DWORD 2 Global Admin Status DWORD 3

- **Connection Manager Object (0x06)**

Class Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
1	Get	Revision	UINT	Revision of this object

Instance Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
Common Services				
Service Code	Need in Implementation		Service Name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
Service Code	Need in Implementation		Service Name	Description of Service
	Class	Instance		
0x4E		V	Forward_Close	Closes a connection
0x54		V	Forward_Open	Open a connection

- **Port Object (0xF4)**

Class Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
1	Get	Revision	UINT	Revision of this object
2	Get	Max Instance	UINT	Maximum instance number.
3	Get	Num Instances	UINT	Number of port currently instantiated.
8	Get	Entry Port	UINT	Returns the port through which this request entered the device.
9	Get	Port Instance Info	ARRAY of STRUCT of	
		Port Type	UINT	Enumerateds the type of port.
		Port Number	UINT	CIP port number associated with this port
Instance Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
1	Get	Port Type	UINT	Enumerates the type. (4 = EthetNet/IP)
2	Get	Port Number	UINT	CIP port number associated with this port.
3	Get	Link Object	STRUCT of	
		Path Length	UINT	Number of 16 bit words in the following path.
		Link Path	Padded EPATH	Logical path segments that identify the object for this port.
4	Get	Port Name	SHORT_STRING	String which names the physical network port

7	Get	Node Address	Padded EPATH	Node number of this device on port.
Common Services				
Service Code	Need in Implementation		Service Name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.

- **TCP/IP Interface Object (0xF5)**

Class Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
1	Get	Status	DWORD	Interface status 0 = The Interface Configuration attribute has not been configured. 1 = The Interface Configuration attribute contains configuration obtained from BOOTP, DHCP or non-volatile storage.
2	Get	Configuration Capability	DWORD	Interface capability Bit 0: BOOTP Clinet 1 (TRUE) shall indicate the device is capable of obtaining its network configuration via BOOTP. Bit 1: DNS Client 1 (TRUE) shall indicate the device is capable of resolving host names by querying a DNS server. Bit 2: DHCP Client 1 (TRUE) shall indicate the device is capable of obtaining its network configuration via DHCP. Bit 3: DHCP-DNS Update Shall be 0 Bit 4: Configuration Settable 1 (TRUE) shall indicate the Interface Configuration attribute

				is settable.
3	Get/Set	Configuration Control	DWORD	Interface control flags Bit 0-3: Configuraiton Method 0 = The device shall use statically-assigned IP configuration values. 1 = The device shall obtain its interface configuration values via BOOTP. 2 = The device shall obtain its interface configuration values via DHCP. 3-15 = Reserved for future use. Bit 4: DNS Enable If 1 (TRUE), the device shall resolve host names by querying a DNS server.
4	Get	Physical Link Object	STRUCT of	Path to physical link object.
		Path size	UINT	Size of Path.
		Path	Padded EPATH	Logical segments identifying the physical link object.
5	Get/Set	Interface Configuration	STRUCT of	TCP/IP network interface configuration.
		IP Address	UDINT	The device's IP address.
		Network Mask	UDINT	The device's network mask
		Gateway Address	UDINT	Default gateway address
		Name Server	UDINT	Primary name server
		Namer Server 2	UDINT	Secondary name server
		Domain Name	STRING	Default domain name Note: ASCII characters. Maximum length is 48 characters. Shall be padded to an even number of characters (pad not included in length).
6	Get/Set	Host Name	STRING	Host Name (Note: ASCII characters. Maximum length is 64 characters. Shall be padded to an even number of

				characters (pad not included in length).
Common Services				
Service Code	Need in Implementation		Service Name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

- **Ethernet Link Object (0xF6)**

Class Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
1	Get	Revision	UINT	Revision of this object
2	Get	Max Instance	UINT	Maximum instance number of an object currently created in this class level of the device.
3	Get	Number of Instances	UINT	Number of object instances currently created at this class level of the device. (The value is mapping the number of ports in Switch device)
Instance Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
1	Get	Interface Speed	UDINT	Interface speed currently in use Speed in Mbps (e.g., 0, 10, 100, 1000, etc.)
2	Get	Interface Flags	DWORD	Interface status flags
3	Get	Physical Address	ARRAY of 6 USINTs	MAC layer address
4	Get	Interface Counters	STRUCT of:	
		In Octets	UDINT	Octets received on the interface
		In Ucast Packets	UDINT	Unicast packets received on the interface
		In Nucast Packets	UDINT	Non-unicast packets received on the interface
		In Discards	UDINT	Inbound packets received on the interface but discarded
		In Errors	UDINT	Inbound packets that contain errors (does not include In

				Discards)
		In Unknown Protos	UDINT	Inbound packets with unknown protocol
		Out Octets	UDINT	Octets sent on the interface
		Out Ucast Packets	UDINT	Unicast packets sent on the interface
		Out Nucast Packets	UDINT	Non-unicast packets sent on the interface
		Out Discards	UDINT	Outbound packets discarded
		Out Errors	UDINT	Outbound packets that contain errors
5	Get	Media Counters	STRUCT of:	Media-specific counters
		Alignmenet Errors	UDINT	Frames received that are not an integral number of octets in length
		FCS Errors	UDINT	Frames received that do not pass the FCS check
		Single Collisions	UDINT	Successfully transmitted frames which experienced exactly one collision
		Multiple Collisons	UDINT	Successfully transmitted frames which experienced more than one collision
		SQE Test Errors	UDINT	Number of times SQE test error message is generated
		Deferred Transmissions	UDINT	Frames for which first transmission attempt is delayed because the medium is busy
		Late Collisions	UDINT	Number of times a collision is detected later than 512 bit-times into the transmission of a packet
		Excessive Collisions	UDINT	Frames for which transmission fails due to excessive collisions
		MAC Transmit Errors	UDINT	Frames for which transmission fails due to an internal MAC sublayer transmit error
		Carrier Sense Errors	UDINT	Times that the carrier sense condition was lost or never asserted

				when attempting to transmit a frame
		Frame Too Long	UDINT	Frames received that exceed the maximum permitted frame size
		MAC Receive Errors	UDINT	Frames for which reception on an interface fails due to an internal MAC sublayer receive error
10	Get	Interface Label	SHORT_STRING	Human readable identification

Common Services				
Service Code	Need in Implementation		Service Name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.

- **Base Switch Object (0x51)**

Class Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
1	Get	Revision	UINT	Revision of this object. The current value assigned to this values is 1
Instance Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
1	Get	Device Up Time	UDINT	Time since device was powered up (s) (Note: the value is 32-bit)
2	Get	Total port count	UDINT	Number of physical ports
3	Get	System Firmware Version	SHORT_STRING	Human readable representation of System Firmware Version (Note: ASCII characters, max length is 32 bytes)
4	Get	Power Source	WORD	Status of switch power source Bit 0-1: Power Source 1 Bit 2-3: Power Source 2…. Bit 14-15: Power Source 8 00 = Not Present (power source not present in switch) 01 = Not Powered

				(power source present but not powered) 10 = Faulted (power source present but faulted) 11 = Powered and ok (power source present, powered and OK)
5	Get	Port Mask Size	UINT	Number of DWORDs in port array attributes (Minimum = 4, supporting 128 ports)
7	Get / Set	Global Port Admin State	ARRAY OF DWORD	Port Admin Status (Note: Size of array = attribute 5) DWORD[0]: Port 0 - 31 admin status DWORD[1]: Port 32 - 63 admin status DWORD[2]: Port 64 - 95 admin status DWORD[3]: Port 96 - 127 admin status 0 = Port (or Interface) Enabled 1 = Port (or Interface) Disabled
8	Get	Global Port Link Status	ARRAY OF DWORD	Port Link Status (Note: Size of array = attribute 5) DWORD[0]: Port 0 - 31 link status DWORD[1]: Port 32 - 63 link status DWORD[2]: Port 64 - 95 link status DWORD[3]: Port 96 - 127 link status 0 = Link inactive (Down) 1 = Link Active (UP)
10	Get	Constact Status	WORD	Switch Contact Closure (DI) Bit 0-1: Switch Contact 1 (DI 1) Bit 2-3: Switch Contact 2 (DI 2) Other Reserved (should be 0) 00 = Switch Contact not support/presed 01 = Switch Contact is OPEN (OFF) 10 = Switch Contact is CLOSED (ON)

				11 = Reserved
Common Services				
Service Code	Need in Implementation		Service Name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

- **Delta IES Object (0x64)**

Class Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
1	Get/Set	Reboot Device	USINT	Reboot device Set 0x0001 to reboot device, and return to 0x0000 if reboot is completed.
2	Get/Set	Reset Device	USINT	Reset to default Set 0x0001 to reset configuration, and return to 0x0000 if reset is completed.
3	Get	Firmware Release Date	UDINT	Ex: 20120918, PM9:00 Word 0 = 0x1215, Word 1 = 0x0C09
4	Get	Relay Output Status	WORD	Relay Output Status Bit 0-1: Relay Output 1 status Bit 2-3: Relay Output 2 status Other Reserved (should be 0) 00 = Digital output not support/preset 01 = Switch Contact is OPEN (OFF) 10 = Switch Contact is CLOSED (ON) 11 = Reserved
11	Get	AlarmStauts	ULINT	Alarm Status (0 is ON, 1 is OFF) Bit 0: switch code start Bit 1: switch warm start Bit 2: power1 state on->off Bit 3: power1 state off->on Bit 4: power2 state

				on->off Bit 5: power2 state off->on Bit 6: DI1 state on->off Bit 7: DI1 state off->on Bit 8: DI2 state on->off Bit 9: DI2 state off->on Bit 10: authentication failure Bit 11: dot1d Bridge New Root Bit 12: dot1d Bridge Topology Changed Bit 13: LLDP Remote Tables Changed Bit 14: configuration changed Bit 15: firmware update Bit 16: IP changed Bit 17: password changed
12	Get	Bandwidth overload	ULINT	Bit 0: Port 0 state Bit 1: Port 1 state…. Bit 63: Port 63 state 0 = OFF or not support 1 = Bandwidth overload
13	Get	Loopback detection port status	ULINT	Bit 0: Port 0 state Bit 1: Port 1 state…. Bit 63: Port 63 state 0 = OFF or not support 1 = Loopback detected
15	Get	Redundancy Protocol	USINT	0x0000: None 0x0001: RSTP/STP
16	Get	RSTP Root	USINT	0x0000: Not Root 0x0001: Root
17	Get	Redundancy - RING Mode	USINT	0x00: None (Disable) 0x01: Master 0x02: Slave
18	Get	Redundancy - Ring State	USINT	
19	Get	Redundancy - CHAIN State	USINT	0x00: None 0x01: The chain failure is happened.
20	Get	Redundancy - COUPING Mode	USINT	0x00: None (Disable) 0x01: Head 0x02: Tail
21	Get	Redundancy - COUPING State	USINT	COUPING mode is Head: 0x00: Monitor 0x01: Fault 0x02: Link-Up 0x03: Hold

				COUPING mode is Tail 0x00: Discover 0x01: Monitor 0x02: Fault
Common Services				
Service Code	Need in Implementation		Service Name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

C.3 DVS-110W02-3SFP

- **Identity Object (0x01)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
2	Get	Max Instance	UINT	Maximum instance number of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Vendor ID	UINT	799, Vendor ID of "Delta Electronics, Inc."
2	Get	Device Type	UINT	0x2C, "Managed Ethernet Switch Device".
3	Get	Product Code	UINT	Product code of device.
4	Get	Revision	STRUCT of:	Revision of the Identity Object
		Major	USINT	
		Minor	USINT	
5	Get	Status	WORD	0, Not used
6	Get	Serial Number	UDINT	Serial number of device
7	Get	Product Name	STRING	"DVS-110W02-3SFP", Product name of device.
Common Services				
Service Code	**Need in Implementation**		**Service name**	**Description of Service**
	Class	**Instance**		
0x01		V	Get_Attribute_All	Returns a predefined listing of this objects attributes.
0x05		V	Reset	Invokes the reset service for the device.
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.

- **Message Router Object (0x02)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
2	Get	Number Available	UINT	Maximum number of CIP connections supported
3	Get	Number Active	UINT	Number of CIP connections currently used by system components
Common Services				
Service Code	**Need in Implementation**		**Service name**	**Description of Service**
	Class	**Instance**		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.

- **Assembly Object (0x04)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
3	Get/Set	Data	ARRAY of BYTE	
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
4	Get	Size	UINT	
Instance				
Instance Number	**Size (bytes)**	**Name**	**Type**	**Description of attribute**
1	18	Power Source and Link Status	Inupt	Refer to Base Switch Object Attr ID 4 Byte 0: Power Source Status (Least Significant Byte) Byte 1: Power Source Status (Most Significant Byte) Refer to Base Switch Object Attr ID 8 Byte 2-5: Global Link Status DWORD 0 Byte 6-9: Global Link Status DWORD 1 Byte 10-13: Global Link Status

				DWORD 2 Byte 14-17: Global Link Status DWORD 3
2	16	Global Admin State	Input	Refer to Base Switch Object Attr ID 7 Byte 0-3: Global Admin Status DWORD 0 Byte 4-7: Global Admin Status DWORD 1 Byte 8-11: Global Admin Status DWORD 2 Byte 12-15: Global Admin Status DWORD 3
3	2	Contact Status	Input	Refer to Base Switch Object Attr ID 10 Byte 0: Contact Status (Least Significant Byte) Byte 1: Contact Status (Most Significant Byte)
50	16	Port Admin State	Output	Refer to Base Switch Object Attr ID 7 Byte 0-3: Global Admin Status DWORD 0 Byte 4-7: Global Admin Status DWORD 1 Byte 8-11: Global Admin Status DWORD 2 Byte 12-15: Global Admin Status DWORD 3
64	75	Device Status	Input	Refer to I/O Assembly Connection 4 - Input

Common Services

Service Code	Need in Implementation		Service name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

I/O Assembly

Connection1

	Instance	Size(SINT)	Description
Input	1	18	Please refer to Assembly Object Attr ID 1.
Output	50	16	Please refer to Assembly Object Attr ID 50.
Configuration	64	0	

Connection2

	Instance	Size(SINT)	Description
Input	2	16	Please refer to Assembly Object Attr ID 2.
Output	50	16	Please refer to Assembly Object Attr ID 50.

Configuration	64	0	
Connection3			
	Instance	**Size(SINT)**	**Description**
Input	3	2	Please refer to Assembly Object Attr ID 2.
Output	50	16	Please refer to Assembly Object Attr ID 50
configuration	64	0	
Connection4			
	Instance	**Size(SINT)**	**Description**
Input	64	2	Please refer to Assembly Object Attr ID 3
Output	50	16	Please refer to Assembly Object Attr ID 50
configuration	80	0	
Direction	**Name**	**Size(SINT)**	**Description**
Input	Power Source Status	WORD	Refer to Base Switch Object Attr ID 4 Power Source Status (Least Significant Byte) Power Source Status (Most Significant Byte)
	Global Link Status	ARRAY OF DWORD	Refer to Base Switch Object Attr ID 8 Global Link Status DWORD 0 Global Link Status DWORD 1 Global Link Stauts DWORD 2 Global Link Status DWORD 3
	Global Admin State	ARRAY OF DWORD	Refer to Base Switch Object Attr ID 7 Global Admin Status DWORD 0 Global Admin Status DWORD 1 Global Admin Stauts DWORD 2 Global Admin Status DWORD 3
	Contact Status	WORD	Refer to Base Switch Object Attr ID 10
	AlarmStatus	ULINT	Refer to Delta IES Object Attr 11
	Bandwidth overload	ULINT	Refer to Delta IES Object Attr 12
	Loopback detection port status	ULINT	Refer to Delta IES Object Attr 13
	SFP Failure	ARRAY OF USINT	Refer to Delta IES Object Attr 14
	Redundancy Protocol	USINT	Refer to Delta IES Object Attr 15
	RSTP Root	USINT	Refer to Delta IES Object Attr 16
	Redundancy - RING Mode	USINT	Refer to Delta IES Object Attr 17
Direction	**Name**	**Size(SINT)**	**Description**
Input	Redundancy - Ring State	USINT	Refer to Delta IES Object Attr 18
Input	Redundancy - CHAIN State	USINT	Refer to Delta IES Object Attr 19
	Redundancy - COUPING Mode	USINT	Refer to Delta IES Object Attr 20

	Redundancy - COUPING State	USINT	Refer to Delta IES Object Attr 21
Output	Port Admin State	ARRAY OF DWORD	Refer to Base Switch Object Attr ID 7 Global Admin Status DWORD 0 Global Admin Status DWORD 1 Global Admin Stauts DWORD 2 Global Admin Status DWORD 3

- **Connection Manager Object (0x06)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
Common Services				
Service Code	**Need in Implementation**		**Service name**	**Description of Service**
	Class	**Instance**		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x4E		V	Forward_Close	Closes a connection
0x54		V	Forward_Open	Open a connection

- **Port Object (0xF4)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
2	Get	Max Instance	UINT	Maximum instance number.
3	Get	Num Instances	UINT	Number of port currently instantiated.
8	Get	Entry Port	UINT	Returns the port through which this request entered the device.
9	Get	Port Instance Info	ARRAY of STRUCT of	
		Port Type	UINT	Enumerates the type of port.
		Port Number	UINT	CIP port number associated with this port
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Port Type	UINT	Enumerates the type. (4=EthetNet/IP)
2	Get	Port Number	UINT	CIP port number associated with this port.

3	Get	Link Object	STRUCT of	
		Path Length	UINT	Number of 16 bit words in the following path.
		Link Path	Padded EPATH	Logical path segments that identify the object for this port.
4	Get	Port Name	SHORT_STRING	String which names the physical network port
7	Get	Node Address	Padded EPATH	Node number of this device on port.

Common Services				
Service Code	**Need in Implementation**		**Service name**	**Description of Service**
	Class	**Instance**		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.

- **TCP/IP Interface Object (0xF5)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Status	DWORD	Interface status 0=The Interface Configuration attribute has not been configured. 1=The Interface Configuration attribute contains configuration obtained from BOOTP, DHCP or non-volatile storage.
2	Get	Configuration Capability	DWORD	Interface capability Bit 0: BOOTP Client 1 (TRUE) shall indicate the device is capable of obtaining its network configuration via BOOTP. Bit 1: DNS Client 1 (TRUE) shall indicate the device is capable of resolving host names by querying a DNS server. Bit 2: DHCP Client 1 (TRUE) shall indicate the device is capable of obtaining its network configuration via DHCP. Bit 3: DHCP-DNS Update Shall be 0 Bit 4: Configuration Settable 1 (TRUE) shall indicate the Interface Configuration attribute is settable.

3	Get/Set	Configuration Control	DWORD	Interface control flags Bit 0-3: Configuration Method 0=The device shall use statically-assigned IP configuration values. 1=The device shall obtain its interface configuration values via BOOTP. 2=The device shall obtain its interface configuration values via DHCP. 3-15=Reserved for future use. Bit 4: DNS Enable If 1 (TRUE), the device shall resolve host names by querying a DNS server.
4	Get	Physical Link Object	STRUCT of	Path to physical link object.
		Path size	UINT	Size of Path.
		Path	Padded EPATH	Logical segments identifying the physical link object.
5	Get/Set	Interface Configuration	STRUCT of	TCP/IP network interface configuration.
		IP Address	UDINT	The device's IP address.
		Network Mask	UDINT	The device's network mask
		Gateway Address	UDINT	Default gateway address
		Name Server	UDINT	Primary name server
		Name Server 2	UDINT	Secondary name server
		Domain Name	STRING	Default domain name Note: ASCII characters. Maximum length is 48 characters. Shall be padded to an even number of characters (pad not included in length).
6	Get/Set	Host Name	STRING	Host Name (Note: ASCII characters. Maximum length is 64 characters. Shall be padded to an even number of characters (pad not included in length).

Common Services

Service Code	Need in Implementation		Service name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

- **Ethernet Link Object (0xF6)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
2	Get	Max Instance	UINT	Maximum instance number of an object currently created in this class level of the device.
3	Get	Number of Instances	UINT	Number of object instances currently created at this class level of the device. (The value is mapping the number of ports in Switch device)
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Interface Speed	UDINT	Interface speed currently in use Speed in Mbps (e.g., 0, 10, 100, 1000, etc.)
2	Get	Interface Flags	DWORD	Interface status flags
3	Get	Physical Address	ARRAY of 6 USINTs	MAC layer address
4	Get	Interface Counters	STRUCT of:	
		In Octets	UDINT	Octets received on the interface
		In Ucast Packets	UDINT	Unicast packets received on the interface
		In Nucast Packets	UDINT	Non-unicast packets received on the interface
		In Discards	UDINT	Inbound packets received on the interface but discarded
		In Errors	UDINT	Inbound packets that contain errors (does not include In Discards)
		In Unknown Protos	UDINT	Inbound packets with unknown protocol
		Out Octets	UDINT	Octets sent on the interface
		Out Ucast Packets	UDINT	Unicast packets sent on the interface
		Out Nucast Packets	UDINT	Non-unicast packets sent on the interface
		Out Discards	UDINT	Outbound packets discarded
		Out Errors	UDINT	Outbound packets that contain errors
5	Get	Media Counters	STRUCT of:	Media-specific counters
		Alignment Errors	UDINT	Frames received that are not an integral number of octets in length
		FCS Errors	UDINT	Frames received that do not pass the FCS check

		Single Collisions	UDINT	Successfully transmitted frames which experienced exactly one collision
		Multiple Collisions	UDINT	Successfully transmitted frames which experienced more than one collision
		SQE Test Errors	UDINT	Number of times SQE test error message is generated
		Deferred Transmissions	UDINT	Frames for which first transmission attempt is delayed because the medium is busy
		Late Collisions	UDINT	Number of times a collision is detected later than 512 bit-times into the transmission of a packet
		Excessive Collisions	UDINT	Frames for which transmission fails due to excessive collisions
		MAC Transmit Errors	UDINT	Frames for which transmission fails due to an internal MAC sublayer transmit error
		Carrier Sense Errors	UDINT	Times that the carrier sense condition was lost or never asserted when attempting to transmit a frame
		Frame Too Long	UDINT	Frames received that exceed the maximum permitted frame size
		MAC Receive Errors	UDINT	Frames for which reception on an interface fails due to an internal MAC sublayer receive error
10	Get	Interface Label	SHORT_STRING	Human readable identification

Common Services

Service Code	Need in Implementation		Service name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.

- **Base Switch Object (0x51)**

Class Attributes

Attr ID	Access rule	Name	Data type	Description of attribute
1	Get	Revision	UINT	Revision of this object. The current value assigned to this values is 1

Instance Attributes

Attr ID	Access rule	Name	Data type	Description of attribute
1	Get	Device Up Time	UDINT	Time since device was powered up (s) (Note: the value is 32-bit)
2	Get	Total port count	UDINT	Number of physical ports
3	Get	System	SHORT_STRING	Human readable representation of

		Firmware Version		System Firmware Version (Note: ASCII characters, max length is 32 bytes)
4	Get	Power Source	WORD	Status of switch power source Bit 0-1: Power Source 1 Bit 2-3: Power Source 2…. Bit 14-15: Power Source 8 00=Not Present (power source not present in switch) 01=Not Powered (power source present but not powered) 10=Faulted (power source present but faulted) 11=Powered and ok (power source present, powered and OK)
5	Get	Port Mask Size	UINT	Number of DWORDs in port array attributes (Minimum=4, supporting 128 ports)
7	Get / Set	Global Port Admin State	ARRAY OF DWORD	Port Admin Status (Note: Size of array=attribute 5) DWORD[0]: Port 0 - 31 admin status DWORD[1]: Port 32 - 63 admin status DWORD[2]: Port 64 - 95 admin status DWORD[3]: Port 96 - 127 admin status 0=Port (or Interface) Enabled 1=Port (or Interface) Disabled
8	Get	Global Port Link Status	ARRAY OF DWORD	Port Link Status (Note: Size of array=attribute 5) DWORD[0]: Port 0 - 31 link status DWORD[1]: Port 32 - 63 link status DWORD[2]: Port 64 - 95 link status DWORD[3]: Port 96 - 127 link status 0=Link inactive (Down) 1=Link Active (UP)
10	Get	Contact Status	WORD	Switch Contact Closure (DI) Bit 0-1: Switch Contact 1 (DI 1) Bit 2-3: Switch Contact 2 (DI 2) Other Reserved (should be 0) 00=Switch Contact not support/pressed 01=Switch Contact is OPEN (OFF) 10=Switch Contact is CLOSED (ON) 11=Reserved
Common Services				
Service	**Need in Implementation**		**Service name**	**Description of Service**

Code	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

- **Delta IES Object (0x64)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get/Set	Reboot Device	USINT	Reboot device Set 0x0001 to reboot device, and return to 0x0000 if reboot is completed.
2	Get/Set	Reset Device	USINT	Reset to default Set 0x0001 to reset configuration, and return to 0x0000 if reset is completed.
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
3	Get	Firmware Release Date	UDINT	Ex: 20120918, PM9:00 Word 0=0x1215, Word 1=0x0C09
4	Get	Relay Output Status	WORD	Relay Output Status Bit 0-1: Relay Output 1 status Bit 2-3: Relay Output 2 status Other Reserved (should be 0) 00=Digital output not support/pressed 01=Switch Contact is OPEN (OFF) 10=Switch Contact is CLOSED (ON) 11=Reserved
11	Get	Alarm Status	ULINT	Alarm Status (0 is ON, 1 is OFF) Bit 0: switch code start Bit 1: switch warm start Bit 2: power1 state on->off Bit 3: power1 state off->on Bit 4: power2 state on->off Bit 5: power2 state off->on Bit 6: DI1 state on->off Bit 7: DI1 state off->on Bit 8: DI2 state on->off Bit 9: DI2 state off->on Bit 10: authentication failure Bit 11: dot1d Bridge New Root Bit 12: dot1d Bridge Topology

				Changed Bit 13: LLDP Remote Tables Changed Bit 14: configuration changed Bit 15: firmware update Bit 16: IP changed Bit 17: password changed
12	Get	Bandwidth overload	ULINT	Bit 0: Port 0 state Bit 1: Port 1 state…. Bit 63: Port 63 state 0=OFF or not support 1=Bandwidth overload
13	Get	Loopback detection port status	ULINT	Bit 0: Port 0 state Bit 1: Port 1 state…. Bit 63: Port 63 state 0=OFF or not support 1=Loopback detected
15	Get	Redundancy Protocol	USINT	0x0000: None x0001: RSTP/STP
16	Get	RSTP Root	USINT	0x0000: Not Root 0x0001: Root
17	Get	Redundancy - RING Mode	USINT	0x00: None (Disable) 0x01: Master 0x02: Slave
18	Get	Redundancy - Ring State	USINT	RING function is disable: 0x00: None RING Mode is Master: 0x00: Discover 0x01: Monitor 0x02: Fault RING Mode is Slave: 0x00: Forwarding 0x01: Hold 0x02: Fault
19	Get	Redundancy - CHAIN State	USINT	0x00: None 0x01: The chain failure is happened.
20	Get	Redundancy - COUPING Mode	USINT	0x00: None (Disable) 0x01: Head 0x02: Tail
21	Get	Redundancy - COUPING State	USINT	COUPING mode is Head: 0x00: Monitor 0x01: Fault 0x02: Link-Up 0x03: Hold COUPING mode is Tail 0x00: Discover 0x01: Monitor 0x02: Fault
Common Services				

Service Code	Need in Implementation		Service name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

C.4 DVS-328R02-8SFP

- **Identity Object (0x01)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
2	Get	Max Instance	UINT	Maximum instance number of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Vendor ID	UINT	799, Vendor ID of "Delta Electronics, Inc."
2	Get	Device Type	UINT	0x2C, "Managed Ethernet Switch Device".
3	Get	Product Code	UINT	Product code of device.
4	Get	Revision	STRUCT of:	Revision of the Identity Object
		Major	USINT	
		Minor	USINT	
5	Get	Status	WORD	0, Not used
6	Get	Serial Number	UDINT	Serial number of device
7	Get	Product Name	STRING	"DVS-328R02-8SFP", Product name of device.
Common Services				
Service Code	**Need in Implementation**		**Service name**	**Description of Service**
	Class	**Instance**		
0x01		V	Get_Attribute_All	Returns a predefined listing of this objects attributes.
0x05		V	Reset	Invokes the reset service for the device.
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.

- **Message Router Object (0x02)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object

Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
2	Get	Number Available	UINT	Maximum number of CIP connections supported
3	Get	Number Active	UINT	Number of CIP connections currently used by system components
Common Services				
Service Code	**Need in Implementation**		**Service name**	**Description of Service**
	Class	**Instance**		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.

- **Assembly Object (0x04)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
3	Get/Set	Data	ARRAY of BYTE	
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
4	Get	Size	UINT	
Instance				
Instance Number	**Size (bytes)**	**Name**	**Type**	**Description of attribute**
1	18	Power Source and Link Status	Input	Refer to Base Switch Object Attr ID 4 Byte 0: Power Source Status (Least Significant Byte) Byte 1: Power Source Status (Most Significant Byte) Refer to Base Switch Object Attr ID 8 Byte 2-5: Global Link Status DWORD 0 Byte 6-9: Global Link Status DWORD 1 Byte 10-13: Global Link Status DWORD 2 Byte 14-17: Global Link Status DWORD 3
2	16	Global Admin State	Input	Refer to Base Switch Object Attr ID 7 Byte 0-3: Global Admin Status DWORD 0

				Byte 4-7: Global Admin Status DWORD 1 Byte 8-11: Global Admin Status DWORD 2 Byte 12-15: Global Admin Status DWORD 3
3	2	Contact Status	Input	Refer to Base Switch Object Attr ID 10 Byte 0: Contact Status (Least Significant Byte) Byte 1: Contact Status (Most Significant Byte)
50	16	Port Admin State	Output	Refer to Base Switch Object Attr ID 7 Byte 0-3: Global Admin Status DWORD 0 Byte 4-7: Global Admin Status DWORD 1 Byte 8-11: Global Admin Status DWORD 2 Byte 12-15: Global Admin Status DWORD 3
64	76	Device Status	Input	Refer to I/O Assembly Connection - Input

Common Services

Service Code	Need in Implementation		Service name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

I/O Assembly

Connection1

	Instance	Size(SINT)	Description
Input	1	18	Please refer to Assembly Object Attr ID 1.
Output	50	16	Please refer to Assembly Object Attr ID 50.
Configuration	64	0	

Connection2

	Instance	Size(SINT)	Description
Input	2	16	Please refer to Assembly Object Attr ID 2.
Output	50	16	Please refer to Assembly Object Attr ID 50.
Configuration	64	0	

Connection3

	Instance	Size(SINT)	Description
Input	3	2	Please refer to Assembly Object Attr ID 2.
Output	50	16	Please refer to Assembly Object Attr ID 50
configuration	64	0	

Connection4			
	Instance	**Size(SINT)**	**Description**
Input	64	76	Please refer to Assembly Object Attr ID 3
Output	50	16	Please refer to Assembly Object Attr ID 50
configuration	80	0	
Direction	**Name**	**Size(SINT)**	**Description**
Input	Power Source Status	WORD	Refer to Base Switch Object Attr ID 4 Power Source Status (Least Significant Byte) Power Source Status (Most Significant Byte)
	Global Link Status	ARRAY OF DWORD	Refer to Base Switch Object Attr ID 8 Global Link Status DWORD 0 Global Link Status DWORD 1 Global Link Stauts DWORD 2 Global Link Status DWORD 3
	Global Admin State	ARRAY OF DWORD	Refer to Base Switch Object Attr ID 7 Global Admin Status DWORD 0 Global Admin Status DWORD 1 Global Admin Stauts DWORD 2 Global Admin Status DWORD 3
	Contact Status	WORD	Refer to Base Switch Object Attr ID 10
	AlarmStatus	ULINT	Refer to Delta IES Object Attr 11
	Bandwidth overload	ULINT	Refer to Delta IES Object Attr 12
	Loopback detection port status	ULINT	Refer to Delta IES Object Attr 13
	SFP Failure	ARRAY OF USINT	Refer to Delta IES Object Attr 14
	Redundancy Protocol	USINT	Refer to Delta IES Object Attr 15
	RSTP Root	USINT	Refer to Delta IES Object Attr 16
	Redundancy - RING Mode	USINT	Refer to Delta IES Object Attr 17
	Redundancy - Ring State	USINT	Refer to Delta IES Object Attr 18
	Redundancy - CHAIN State	USINT	Refer to Delta IES Object Attr 19
	Redundancy - COUPING Mode	USINT	Refer to Delta IES Object Attr 20
	Redundancy - COUPING State	USINT	Refer to Delta IES Object Attr 21
Output	Port Admin State	ARRAY OF DWORD	Refer to Base Switch Object Attr ID 7 Global Admin Status DWORD 0 Global Admin Status DWORD 1 Global Admin Stauts DWORD 2 Global Admin Status DWORD 3

- **Connection Manager Object (0x06)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
Common Services				
Service Code	**Need in Implementation**		**Service name**	**Description of Service**
	Class	**Instance**		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x4E		V	Forward_Close	Closes a connection
0x54		V	Forward_Open	Open a connection

- **Port Object (0xF4)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
2	Get	Max Instance	UINT	Maximum instance number.
3	Get	Num Instances	UINT	Number of port currently instantiated.
8	Get	Entry Port	UINT	Returns the port through which this request entered the device.
9	Get	Port Instance Info	ARRAY of STRUCT of	
		Port Type	UINT	Enumerates the type of port.
		Port Number	UINT	CIP port number associated with this port
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Port Type	UINT	Enumerates the type. (4=EthetNet/IP)
2	Get	Port Number	UINT	CIP port number associated with this port.
3	Get	Link Object	STRUCT of	
		Path Length	UINT	Number of 16 bit words in the following path.
		Link Path	Padded EPATH	Logical path segments that identify the object for this port.
4	Get	Port Name	SHORT_STRING	String which names the physical network port

7	Get	Node Address	Padded EPATH	Node number of this device on port.
Common Services				
Service Code	**Need in Implementation**		**Service name**	**Description of Service**
	Class	**Instance**		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.

- **TCP/IP Interface Object (0xF5)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Status	DWORD	Interface status 0=The Interface Configuration attribute has not been configured. 1=The Interface Configuration attribute contains configuration obtained from BOOTP, DHCP or non-volatile storage.
2	Get	Configuration Capability	DWORD	Interface capability Bit 0: BOOTP Client 1 (TRUE) shall indicate the device is capable of obtaining its network configuration via BOOTP. Bit 1: DNS Client 1 (TRUE) shall indicate the device is capable of resolving host names by querying a DNS server. Bit 2: DHCP Client 1 (TRUE) shall indicate the device is capable of obtaining its network configuration via DHCP. Bit 3: DHCP-DNS Update Shall be 0 Bit 4: Configuration Settable 1 (TRUE) shall indicate the Interface Configuration attribute is settable.
3	Get/Set	Configuration Control	DWORD	Interface control flags Bit 0-3: Configuration Method 0=The device shall use statically-assigned IP configuration values. 1=The device shall obtain its interface configuration values via BOOTP. 2=The device shall obtain its

				interface configuration values via DHCP. 3-15=Reserved for future use. Bit 4: DNS Enable If 1 (TRUE), the device shall resolve host names by querying a DNS server.
4	Get	Physical Link Object	STRUCT of	Path to physical link object.
		Path size	UINT	Size of Path.
		Path	Padded EPATH	Logical segments identifying the physical link object.
5	Get/Set	Interface Configuration	STRUCT of	TCP/IP network interface configuration.
		IP Address	UDINT	The device's IP address.
		Network Mask	UDINT	The device's network mask
		Gateway Address	UDINT	Default gateway address
		Name Server	UDINT	Primary name server
		Name Server 2	UDINT	Secondary name server
		Domain Name	STRING	Default domain name Note: ASCII characters. Maximum length is 48 characters. Shall be padded to an even number of characters (pad not included in length).
6	Get/Set	Host Name	STRING	Host Name (Note: ASCII characters. Maximum length is 64 characters. Shall be padded to an even number of characters (pad not included in length).

Common Services				
Service Code	**Need in Implementation**		**Service name**	**Description of Service**
	Class	**Instance**		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

- **Ethernet Link Object (0xF6)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
2	Get	Max Instance	UINT	Maximum instance number of an object currently created in this class level of the device.
3	Get	Number of	UINT	Number of object instances

		Instances		currently created at this class level of the device. (The value is mapping the number of ports in Switch device)
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Interface Speed	UDINT	Interface speed currently in use Speed in Mbps (e.g., 0, 10, 100, 1000, etc.)
2	Get	Interface Flags	DWORD	Interface status flags
3	Get	Physical Address	ARRAY of 6 USINTs	MAC layer address
4	Get	Interface Counters	STRUCT of:	
		In Octets	UDINT	Octets received on the interface
		In Ucast Packets	UDINT	Unicast packets received on the interface
		In Nucast Packets	UDINT	Non-unicast packets received on the interface
		In Discards	UDINT	Inbound packets received on the interface but discarded
		In Errors	UDINT	Inbound packets that contain errors (does not include In Discards)
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
4	Get	In Unknown Protos	UDINT	Inbound packets with unknown protocol
		Out Octets	UDINT	Octets sent on the interface
		Out Ucast Packets	UDINT	Unicast packets sent on the interface
		Out Nucast Packets	UDINT	Non-unicast packets sent on the interface
		Out Discards	UDINT	Outbound packets discarded
		Out Errors	UDINT	Outbound packets that contain errors
5	Get	Media Counters	STRUCT of:	Media-specific counters
		Alignment Errors	UDINT	Frames received that are not an integral number of octets in length
		FCS Errors	UDINT	Frames received that do not pass the FCS check
		Single Collisions	UDINT	Successfully transmitted frames which experienced exactly one collision
		Multiple Collisions	UDINT	Successfully transmitted frames which experienced more than one collision
		SQE Test Errors	UDINT	Number of times SQE test error message is generated

		Deferred Transmissions	UDINT	Frames for which first transmission attempt is delayed because the medium is busy
		Late Collisions	UDINT	Number of times a collision is detected later than 512 bit-times into the transmission of a packet
		Excessive Collisions	UDINT	Frames for which transmission fails due to excessive collisions
		MAC Transmit Errors	UDINT	Frames for which transmission fails due to an internal MAC sublayer transmit error
		Carrier Sense Errors	UDINT	Times that the carrier sense condition was lost or never asserted when attempting to transmit a frame
		Frame Too Long	UDINT	Frames received that exceed the maximum permitted frame size
		MAC Receive Errors	UDINT	Frames for which reception on an interface fails due to an internal MAC sublayer receive error
10	Get	Interface Label	SHORT_STRING	Human readable identification

Common Services

Service Code	Need in Implementation		Service name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.

- **Base Switch Object (0x51)**

Class Attributes

Attr ID	Access rule	Name	Data type	Description of attribute
1	Get	Revision	UINT	Revision of this object. The current value assigned to this values is 1

Instance Attributes

Attr ID	Access rule	Name	Data type	Description of attribute
1	Get	Device Up Time	UDINT	Time since device was powered up (s) (Note: the value is 32-bit)
2	Get	Total port count	UDINT	Number of physical ports
3	Get	System Firmware Version	SHORT_STRING	Human readable representation of System Firmware Version (Note: ASCII characters, max length is 32 bytes)
4	Get	Power Source	WORD	Status of switch power source Bit 0-1: Power Source 1 Bit 2-3: Power Source 2…. Bit 14-15: Power Source 8 00=Not Present (power source not

				present in switch) 01=Not Powered (power source present but not powered) 10=Faulted (power source present but faulted) 11=Powered and ok (power source present, powered and OK)
5	Get	Port Mask Size	UINT	Number of DWORDs in port array attributes (Minimum=4, supporting 128 ports)
7	Get / Set	Global Port Admin State	ARRAY OF DWORD	Port Admin Status (Note: Size of array=attribute 5) DWORD[0]: Port 0 - 31 admin status DWORD[1]: Port 32 - 63 admin status DWORD[2]: Port 64 - 95 admin status DWORD[3]: Port 96 - 127 admin status 0=Port (or Interface) Enabled 1=Port (or Interface) Disabled
8	Get	Global Port Link Status	ARRAY OF DWORD	Port Link Status (Note: Size of array=attribute 5) DWORD[0]: Port 0 - 31 link status DWORD[1]: Port 32 - 63 link status DWORD[2]: Port 64 - 95 link status DWORD[3]: Port 96 - 127 link status 0=Link inactive (Down) 1=Link Active (UP)
10	Get	Contact Status	WORD	Switch Contact Closure (DI) Bit 0-1: Switch Contact 1 (DI 1) Bit 2-3: Switch Contact 2 (DI 2) Other Reserved (should be 0) 00=Switch Contact not support/pressed 01=Switch Contact is OPEN (OFF) 10=Switch Contact is CLOSED (ON) 11=Reserved

Common Services

Service Code	Need in Implementation		Service name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

- **Delta IES Object (0x64)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get/Set	Reboot Device	USINT	Reboot device Set 0x0001 to reboot device, and return to 0x0000 if reboot is completed.
2	Get/Set	Reset Device	USINT	Reset to default Set 0x0001 to reset configuration, and return to 0x0000 if reset is completed.
3	Get	Firmware Release Date	UDINT	Ex: 20120918, PM9:00 Word 0=0x1215, Word 1=0x0C09
4	Get	Relay Output Status	WORD	Relay Output Status Bit 0-1: Relay Output 1 status Bit 2-3: Relay Output 2 status Other Reserved (should be 0) 00=Digital output not support/pressed 01=Switch Contact is OPEN (OFF) 10=Switch Contact is CLOSED (ON) 11=Reserved
11	Get	Alarm Status	ULINT	Alarm Status (0 is ON, 1 is OFF) Bit 0: switch code start Bit 1: switch warm start Bit 2: power1 state on->off Bit 3: power1 state off->on Bit 4: power2 state on->off Bit 5: power2 state off->on Bit 6: DI1 state on->off Bit 7: DI1 state off->on Bit 8: DI2 state on->off Bit 9: DI2 state off->on Bit 10: authentication failure Bit 11: dot1d Bridge New Root Bit 12: dot1d Bridge Topology Changed Bit 13: LLDP Remote Tables Changed Bit 14: configuration changed Bit 15: firmware update Bit 16: IP changed Bit 17: password changed

12	Get	Bandwidth overload	ULINT	Bit 0: Port 0 state Bit 1: Port 1 state…. Bit 63: Port 63 state 0=OFF or not support 1=Bandwidth overload
13	Get	Loopback detection port status	ULINT	Bit 0: Port 0 state Bit 1: Port 1 state…. Bit 63: Port 63 state 0=OFF or not support 1=Loopback detected
15	Get	Redundancy Protocol	USINT	0x0000: None x0001: RSTP/STP
16	Get	RSTP Root	USINT	0x0000: Not Root 0x0001: Root
17	Get	Redundancy - RING Mode	USINT	0x00: None (Disable) 0x01: Master 0x02: Slave
18	Get	Redundancy - Ring State	USINT	RING function is disable: 0x00: None RING Mode is Master: 0x00: Discover 0x01: Monitor 0x02: Fault RING Mode is Slave: 0x00: Forwarding 0x01: Hold 0x02: Fault
19	Get	Redundancy - CHAIN State	USINT	0x00: None 0x01: The chain failure is happened.
20	Get	Redundancy - COUPING Mode	USINT	0x00: None (Disable) 0x01: Head 0x02: Tail
21	Get	Redundancy - COUPING State	USINT	COUPING mode is Head: 0x00: Monitor 0x01: Fault 0x02: Link-Up 0x03: Hold COUPING mode is Tail 0x00: Discover 0x01: Monitor 0x02: Fault

Common Services

Service Code	Need in Implementation		Service name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

C.5 DVS-G928W01

- **Identity Object (0x01)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
2	Get	Max Instance	UINT	Maximum instance number of an object currently created in this class level of the device
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Vendor ID	UINT	799, Vendor ID of "Delta Electronics, Inc."
2	Get	Device Type	UINT	0x2C, "Managed Ethernet Switch Device".
3	Get	Product Code	UINT	Product code of device.
4	Get	Revision	STRUCT of:	Revision of the Identity Object
		Major	USINT	
		Minor	USINT	
5	Get	Status	WORD	0, Not used
6	Get	Serial Number	UDINT	Serial number of device
7	Get	Product Name	STRING	"DVS-G928W01", Product name of device.
Common Services				
Service Code	**Need in Implementation**		**Service name**	**Description of Service**
	Class	**Instance**		
0x01		V	Get_Attribute_All	Returns a predefined listing of this objects attributes.
0x05		V	Reset	Invokes the reset service for the device.
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.

- **Assembly Object (0x04)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
3	Get/Set	Data	ARRAY of BYTE	The implicit messaging content
4	Get	Size	UINT	Number of bytes in Attr. 3

Common Services				
Service Code	**Need in Implementation**		**Service name**	**Description of Service**
	Class	**Instance**		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

I/O Assembly			
Direction	**I/O data**	**Size**	**Description**
Input	Port Link Status	ULINT (64)	Please refer to Assembly Object Attr ID 7.
Output	Port Enable	ULINT (64)	Please refer to Assembly Object Attr ID 6.

- **Port Object (0xF4)**

Class Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
1	Get	Revision	UINT	Revision of this object
2	Get	Max Instance	UINT	Maximum instance number.
3	Get	Num Instances	UINT	Number of port currently instantiated.
8	Get	Entry Port	UINT	Returns the port through which this request entered the device.
9	Get	Port Instance Info	ARRAY of STRUCT of	
		Port Type	UINT	Enumerateds the type of port.
		Port Number	UINT	CIP port number associated with this port
Instance Attributes				
Attr ID	Access Rule	Name	Data Type	Description of Attribute
1	Get	Port Type	UINT	Enumerates the type. (4 = EthetNet/IP)
2	Get	Port Number	UINT	CIP port number associated with this port.
3	Get	Link Object	STRUCT of	
		Path Length	UINT	Number of 16 bit words in the following path.
		Link Path	Padded EPATH	Logical path segments that identify the object for this port.
4	Get	Port Name	SHORT_STRING	String which names the physical network port
7	Get	Port Number and Node Address	Padded EPATH	Node number of this device on port.

10	Get	Port Routing Capabilities	DWORD	Bit string that defines the routing capabilities of this port
Common Services				
Service Code	Need in Implementation		Service Name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

- **TCP/IP Interface Object (0xF5)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Status	DWORD	Interface status 0=The Interface Configuration attribute has not been configured. 1=The Interface Configuration attribute contains configuration obtained from BOOTP, DHCP or non-volatile storage.
2	Get	Configuration Capability	DWORD	Interface capability Bit 0: BOOTP Client 1 (TRUE) shall indicate the device is capable of obtaining its network configuration via BOOTP. Bit 1: DNS Client 1 (TRUE) shall indicate the device is capable of resolving host names by querying a DNS server. Bit 2: DHCP Client 1 (TRUE) shall indicate the device is capable of obtaining its network configuration via DHCP. Bit 3: DHCP-DNS Update Shall be 0 Bit 4: Configuration Settable 1 (TRUE) shall indicate the Interface Configuration attribute is settable.
3	Get/Set	Configuration Control	DWORD	Interface control flags Bit 0-3: Configuration Method 0=The device shall use statically-assigned IP configuration values.

				1=The device shall obtain its interface configuration values via BOOTP. 2=The device shall obtain its interface configuration values via DHCP. 3-15=Reserved for future use. Bit 4: DNS Enable If 1 (TRUE), the device shall resolve host names by querying a DNS server.
4	Get	Physical Link Object	STRUCT of	Path to physical link object.
		Path size	UINT	Size of Path.
		Path	Padded EPATH	Logical segments identifying the physical link object.
5	Get/Set	Interface Configuration	STRUCT of	TCP/IP network interface configuration.
		IP Address	UDINT	The device's IP address.
		Network Mask	UDINT	The device's network mask
		Gateway Address	UDINT	Default gateway address
		Name Server	UDINT	Primary name server
		Name Server 2	UDINT	Secondary name server
		Domain Name	STRING	Default domain name Note: ASCII characters. Maximum length is 48 characters. Shall be padded to an even number of characters (pad not included in length).
6	Get/Set	Host Name	STRING	Host Name (Note: ASCII characters. Maximum length is 64 characters. Shall be padded to an even number of characters (pad not included in length).
13	Get/Set	Encapsulation Inactivity Timeout	UINT	Number of seconds of inactivity before TCP connection or DTLS session is closed.

Common Services

Service Code	Need in Implementation		Service name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.

- **Ethernet Link Object (0xF6)**

Class Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Revision	UINT	Revision of this object
2	Get	Max Instance	UINT	Maximum instance number of an object currently created in this class level of the device.
3	Get	Number of Instances	UINT	Number of object instances currently created at this class level of the device. (The value is mapping the number of ports in Switch device)
Instance Attributes				
Attr ID	**Access rule**	**Name**	**Data type**	**Description of attribute**
1	Get	Interface Speed	UDINT	Interface speed currently in use Speed in Mbps (e.g., 0, 10, 100, 1000, etc.)
2	Get	Interface Flags	DWORD	Interface status flags
3	Get	Physical Address	ARRAY of 6 USINTs	MAC layer address
4	Get	Interface Counters	STRUCT of:	
		In Octets	UDINT	Octets received on the interface
		In Ucast Packets	UDINT	Unicast packets received on the interface
		In Nucast Packets	UDINT	Non-unicast packets received on the interface
		In Discards	UDINT	Inbound packets received on the interface but discarded
		In Errors	UDINT	Inbound packets that contain errors (does not include In Discards)
		In Unknown Protos	UDINT	Inbound packets with unknown protocol
		Out Octets	UDINT	Octets sent on the interface
		Out Ucast Packets	UDINT	Unicast packets sent on the interface
		Out Nucast Packets	UDINT	Non-unicast packets sent on the interface
		Out Discards	UDINT	Outbound packets discarded
		Out Errors	UDINT	Outbound packets that contain errors
5	Get	Media Counters	STRUCT of:	Media-specific counters
		Alignment Errors	UDINT	Frames received that are not an integral number of octets in length
		FCS Errors	UDINT	Frames received that do not pass the FCS check

		Single Collisions	UDINT	Successfully transmitted frames which experienced exactly one collision
		Multiple Collisions	UDINT	Successfully transmitted frames which experienced more than one collision
		SQE Test Errors	UDINT	Number of times SQE test error message is generated
		Deferred Transmissions	UDINT	Frames for which first transmission attempt is delayed because the medium is busy
		Late Collisions	UDINT	Number of times a collision is detected later than 512 bit-times into the transmission of a packet
		Excessive Collisions	UDINT	Frames for which transmission fails due to excessive collisions
		MAC Transmit Errors	UDINT	Frames for which transmission fails due to an internal MAC sublayer transmit error
		Carrier Sense Errors	UDINT	Times that the carrier sense condition was lost or never asserted when attempting to transmit a frame
		Frame Too Long	UDINT	Frames received that exceed the maximum permitted frame size
		MAC Receive Errors	UDINT	Frames for which reception on an interface fails due to an internal MAC sublayer receive error
6	Get/Set	Interface Control	STRUCT of	Configuration for physical interface.
		Control Bits	WORD	Bit 0: Auto-Negotiate Value 0: Force Value 1: Auto-Nego Bit 1: Half/Full Duplex Value 0: half duplex Value 1: full duplex Bit 2 to 15: Reserved, all zero
		Forced Interface Speed	UINT	Speed at which the interface shall be forced to operate.
10	Get	Interface Label	SHORT_STRING	Human readable identification
11	Get	Interface Capability	STRUCT of	High Capacity Interface Counters.
		Capability Bits	DWORD	The total number of octets received on the interface.
		Speed/Duplex Options	STRUCT of	Unicast packets received on the interface.
			USINT	Multicast packets received on the interface.
			ARRAY of STRUCT of	Broadcast packets received on the interface.
			UINT	Octets sent on the interface.
			USINT	Unicast packets sent on the

				interface.
12	Get	HC Interface Counters	STRUCT of	High Capacity Interface Counters.
		HCInOctets	ULINT	The total number of octets received on the interface.
		HCInUcastPkts	ULINT	Unicast packets received on the interface.
		HCInMcastPkts	ULINT	Multicast packets received on the interface.
		HCInBcastPkts	ULINT	Broadcast packets received on the interface.
		HCOutOctets	ULINT	Octets sent on the interface.
		HCOutUcastPkts	ULINT	Unicast packets sent on the interface.
		HCOutMcastPkts	ULINT	Multicast packets sent on the interface.
		HCOutBcastPkts	ULINT	Broadcast packets sent on the interface.
13	Get	HC Media Counters	STRUCT of	High Capacity Media Counters.
		HCStatsAlignmentErrors	ULINT	Frames received that are not an integral number of octets in length and do not pass the FCS check.
		HCStatsFCSErrors	ULINT	Frames received that are an integral number of octets in length but do not pass the FCS check.
		HCStatsInternalMacTransmitErrors	ULINT	Frames for which transmission fails due to an internal MAC sublayer transmit error.
		HCStatsFrameTooLongs	ULINT	Frames received that exceed the maximum permitted frame size.
		HCStatsInternalMacReceiveErrors	ULINT	Frames for which reception on an interface fails due to an internal MAC sublayer receive error.
		HCStatsSymbolErrors	ULINT	Number of times there was an invalid data symbol on the media when a valid carrier was present.

Common Services

Service Code	Need in Implementation		Service name	Description of Service
	Class	Instance		
0x0E	V	V	Get_Attribute_Single	Returns the contents of the specified attribute.
0x10		V	Set_Attribute_Single	Modifies an attribute value.
0x4C		V	Get_and_Clear	Gets then clears the specified attribute. Supported by Attr 4, 5, 12, and 13.

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