

# GIGABIT MANAGED ETHERNET SWITCH 8 PoE+ PORTS USER MANUAL

Part #ESM308T000D



ESM308T000D

This handy switch is designed to pass both data and electrical power to a number of PoE-compatible devices via standard Cat5e or Cat6 network cables.

Easy-to-follow instructions in this user manual help make installation quick and simple, so you'll also soon be enjoying the benefits of these additional features:

- 10/100/1000 auto-sensing ports automatically detect optimal network speeds
- IEEE 802.3at/af-compliant RJ45 PoE/PoE+ output ports
- Power output up to 30 Watts per port\*
- Total power budget of 130 Watts
- Supports IEEE 802.3at and IEEE 802.3af-compliant PoE devices (wireless access points, VoIP phones, IP cameras)
- Supports IEEE 802.3at/af detection and short circuit, overload and high-voltage protection
- All RJ45 ports with Auto-MDIX (auto uplink) support
- Web-based configuration
- Provides detailed traffic and power use statistics
- Supports SNMP management
- Supports VLAN (tag-based and port-based)
- Provides IEEE 802.1x port-based security
- Supports link aggregation (trunking)
- Supports port mirroring
- Supports two types of QoS: 802.1p and DSCP
- Broadcast storm control with multicast packet rate settings
- Store and forward switching architecture
- Supports jumbo frames up to 9.6 kBytes
- Supports Rapid Spanning Tree/Spanning Tree protocol
- IEEE 802.3x flow control for full duplex
- Supports up to 8192 MAC address entries
- 176 kBytes buffer memory
- Desktop-size metal case

\* *Total PoE budget for this switch is 130 watts. Per-port average power distribution is 15 Watts; maximum per-port power usage cannot exceed 30 Watts.*

Some of the following screen images have been modified to fit the format of this user manual.

**NOTE:** For a quick install procedure, refer to the quick install guide enclosed with this product.

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# SAFETY & COMPLIANCE STATEMENTS

## FEDERAL COMMUNICATIONS COMMISSION (FCC) 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 when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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

## CE STATEMENT

This equipment complies with the requirements relating to electromagnetic compatibility, EN 55022 class A for ITE, the essential protection requirement of Council Directive 89/336/EEC on the approximation of the laws of the member states relating to electromagnetic compatibility.

## INSTALLATION TIPS

As with any electrical device, you should place the switch where it will not be subjected to extreme temperatures, humidity or electromagnetic interference:

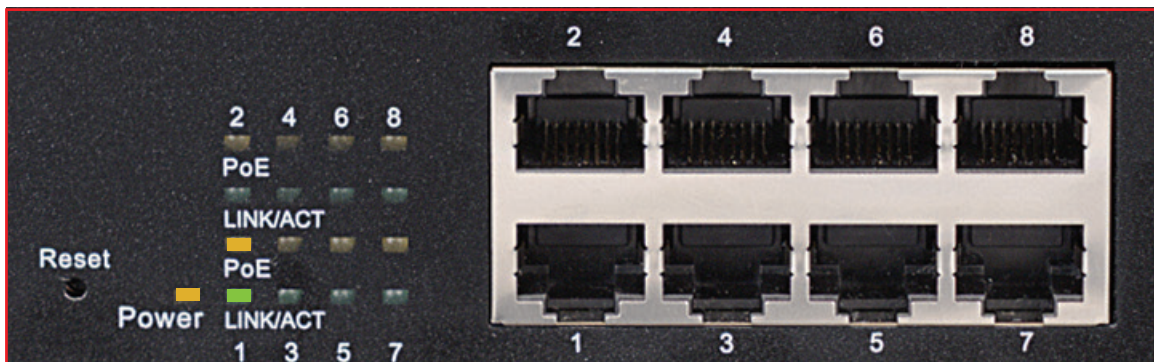
- Place the switch on a level surface with at least 25 mm (approx. 1") of clearance for ventilation;
- The ambient temperature should be between 32 and 104 degrees Fahrenheit (0 to 40 degrees Celsius).
- The relative humidity should be less than 90 percent, non-condensing.
- Surrounding electrical devices should not exceed the electromagnetic field (RFC) standards for IEC 801-3, Level 2 (3V/M) field strength.
- Make sure that the switch receives adequate ventilation. Do not block the fan exhaust port on the switch.
- The power outlet should be within 1.5 meters of the switch.
- Do not place objects on top of the unit.
- Always avoid dust and dirt.

# CONNECTIONS & INDICATORS

## LEDs

The LED indicators — Power, PoE, Link/Activity — make it easier to monitor the switch and its connections.

LED	Status	Operation
Power	On	Power on
	Off	Check the AC connection; turn the power on
PoE	On	Port is linked to a PSE/PoE device
	Off	No PSE/PoE device is linked
Link/Act	On	Valid port connection
	Blinking	Valid port connection; data transmitted/received
	Off	No link established



## Ports

All ports on the switch support Auto-MDI/MDI-X functionality, so crossover cables and uplink ports are not needed for connections to PCs, routers, hubs, other switches, etc. Cat5/5e/6 UTP/STP cables provide optimal performance; if a status LED doesn't indicate a link or activity, check the corresponding device for proper setup and operation. *NOTE:* The recessed Reset button can be pressed (using a pin or similar pointed object) to reset the switch if it isn't responding.

## Power

Use the included power cord to connect the device (next to the On/Off switch on the rear panel) to an AC outlet. Confirm that the power LED on the front panel is lit.



# WEB-BASED BROWSER MANAGEMENT

You can set up and manage the switch remotely by connecting it to a computer with Ethernet cable and using the switch's Web-based browser management interface.

## Log In

The advanced management capabilities of the switch can be accessed using a standard Internet browser. To access the Web-based management interface:

1. Activate your Web browser and enter the IP address 192.168.1.1 in the address field.
2. When the Login screen displays, enter "admin" in the Password field, then click **Apply**. The message "Password Successfully Entered" displays to indicate the login is complete, and the main menu screen displays on the right side of the screen. Click on the links — grouped under Configuration, Monitoring and Maintenance — to access the various management functions.

The screenshot shows a web browser interface. At the top, it says "Please enter password to login". Below this is a "Password:" label followed by a text input field. Below the input field is an "Apply" button. To the right of the login form is a navigation menu with the following items: "Configuration" (bolded), "System", "Ports", and "VLANs".

## Configuration

The Configuration menu features the following subsections: System, Ports, VLAN, Aggregation, LACP, RSTP, IGMP Snooping, Mirroring, QoS (Quality of Service), PoE (Power over Ethernet) and Storm Control.

### System

This screen provides system configuration information and the current status of the device. Click **Apply** so any changes that are made will take effect.

**MAC Address:** Displays the unique hardware address assigned by manufacturer (default).

**S/W Version:** This is the software version of this device.

**H/W Version:** This is the hardware version of this device.

**Active IP Address:** Displays the current effective IP address of the device.

**Active Subnet Mask:** Displays the current effective subnet mask of the device.

**Active Gateway:** Displays the current effective gateway of the device.

**DHCP Server:** If the device uses the DHCP server to connect to the network, the system will display the IP address of the DHCP server. The default value is 0.0.0.0, indicating the DHCP is disabled.

**Lease Time Left:** Displays the real remaining lease time to the DHCP server.

**DHCP Enabled:** Either enabled (checked) or disabled (default). Specifies whether

System Configuration	
MAC Address	00-03-ce-09-3f-dc
S/W Version	V110915
H/W Version	1.0
Active IP Address	192.168.1.1
Active Subnet Mask	255.255.255.0
Active Gateway	192.168.1.254
DHCP Server	0.0.0.0
Lease Time Left	0 secs
DHCP Enabled	<input type="checkbox"/>
Fallback IP Address	192.168.1.1
Fallback Subnet Mask	255.255.255.0
Fallback Gateway	192.168.1.254
Management VLAN	1
Name	
Password	
Inactivity Timeout (secs)	0
SNMP enabled	<input checked="" type="checkbox"/>
SNMP Trap destination	0.0.0.0
SNMP Read Community	public
SNMP Write Community	private
SNMP Trap Community	public

the IP address is static or dynamically assigned via DHCP. “Enabled” is a special case of a dynamically assigned IP address. DHCP is widely used in LAN environments to dynamically assign IP addresses from a centralized server, which reduces the overhead of administrating IP addresses.

**Fallback IP Address:** XXX.XXX.XXX.XXX, where XXX ranges from 0 to 255.

Default: 192.168.1.1. Specifies the IP address of this device. An IP address is a 32-bit number that is notated by using four segments of numbers, each from 0 through 255, separated by periods. Only a unicast IP address is allowed, which ranges from 1.0.0.0 to 233.255.255.255.

**Fallback Subnet Mask:** XXX.XXX.XXX.XXX, where XXX ranges from 0 to 255.

Default: 255.255.255.0. Specifies the IP subnet mask of this device. An IP subnet mask is a 32-bit number that is notated by using four numbers from 0 through 255, separated by periods. Typically, subnet mask numbers use either 0 or 255 as values (e.g., 255.255.255.0), but other numbers can appear.

**Fallback Gateway:** XXX.XXX.XXX.XXX, where XXX ranges from 0 to 255.

Default: 0.0.0.0. Specifies the default gateway IP address. It is only required if you intend to manage the device from another LAN connected via an IP router. The gateway address must be on the same IP subnet as this device.

**NOTE:** After applying a new IP address, a new login page will automatically appear. Log in again to proceed to other configurations.

**Management VLAN:** The number ranges from 1 to 4094. Default: 1. Modify this parameter with care! It specifies the VLAN through which the switch can be managed. By default, the switch is programmed to use VLAN 1 for management and every port on the switch is programmed to use VLAN 1. If you modify a switch port to use a VLAN other than the management VLAN, devices on that port will not be able to manage the switch. If you change the management VLAN without having at least one port that supports the new management VLAN number, you will lose the ability to contact the management package. The switch will immediately stop responding to any pings, TFTP, Telnet and Web sessions from the old management VLAN. For this reason, it's suggested that modification of VLAN management information be made early in the switch-commissioning process, and via the console port.

**Name:** 16-character ASCII string. Default: admin. The system name can make it easier to identify the switches within your network provided that all switches are given a unique name.

**Password:** 16-character ASCII string. Default: admin. From here, you can modify the default management password.

**Inactivity Timeout (secs):** 0 or 60 to 10000. Default: 0. Specifies when the console will time out and display the login screen if there is no user activity. A value of zero disables timeouts for console users. For console users, the maximum timeout value is limited to 10,000 seconds.

**SNMP Enabled:** Either Enabled or Disabled (default). This parameter enables or disables SNMP access to the device. The device supports Simple Network Management Protocol Version 1 and Version 2 (SNMPv1 and SNMPv2), which provide access to devices over the network.

**SNMP Trap Destination:** XXX.XXX.XXX.XXX, where XXX ranges from 0 to 255. Default: 0.0.0.0. This is the IP address of the user's SNMP management station if it is configured to receive traps and notifications.

**SNMP Read Community:** Any 20 characters. Default: public. This parameter identifies the MIB tree(s) to which this entry authorizes read access.



**SNMP Write Community:** Any 20 characters. Default: private. This parameter identifies the MIB tree(s) to which this entry authorizes write access.

**SNMP Trap Community:** Any 20 characters. Default: public. This parameter identifies the MIB tree(s) to which this entry authorizes access for notifications.

## Ports

The settings on these screens — including Mode and Flow Control — allow you to configure the functions of each port, in part so you can limit the number of devices using a switch port and protect against MAC flooding attacks. Select the port number and set its functions, then click **Apply** to save the new settings to the device.

**Port Configuration**

Enable Jumbo Frames

PERFECT\_REACH/Power Saving Mode: Full

Port	Link	Mode	Flow Control
1	Down	Auto Speed	<input type="checkbox"/>
2	100FDX	Auto Speed	<input type="checkbox"/>
3	Down	10 Half	<input type="checkbox"/>
4	100FDX	100 Half	<input type="checkbox"/>
5	Down	100 Full	<input type="checkbox"/>
6	Down	1000 Full	<input type="checkbox"/>
7	Down	Disabled	<input type="checkbox"/>
8	Down	Auto Speed	<input type="checkbox"/>

Drop frames after excessive collisions

**Enable Jumbo Frames:** Select/enable to adjust the size of jumbo frames. This switch provides more efficient throughput for large sequential data transfers by supporting jumbo frames on Gigabit Ethernet ports up to 9600 bytes. Compared to standard Ethernet frames that run only up to 1500 bytes, using jumbo frames significantly reduces the per-packet overhead required to process protocol encapsulation fields.

**Power Saving Mode:** When enabled, it adjusts the power provided to ports based on the length of the cable used to connect to other devices. Only sufficient power is used to maintain connection requirements.

**Link:** Displays the current link status of each port: **1000MFDX**, **100MFDX**, **100MHDX**, **10MFDX**, **10MHDX** or **Down**. The field lights green and shows the link speed if there is a valid connection on the port.

**Mode:** Options are **Auto Speed**, **10 Half**, **10 Full**, **100 Half**, **100 Full**, **1000 Full** and **Disabled**. Default: Auto Speed. Enabling auto-negotiation (Auto) results in speed and duplex being negotiated upon link detection; both end devices must be auto-negotiation compliant for the best possible results. 10Mbps and 100Mbps fiber optic media don't support auto-negotiation, so these media must be explicitly configured to either half or full duplex. Full duplex operation requires that both ends be configured as such; otherwise, severe frame loss will occur during heavy network traffic. Auto supports all speed and duplex modes. Disabling a port (for troubleshooting or to secure it from unauthorized connections, perhaps) will prevent all frames from being sent and received on that port. Also, when disabled, link integrity pulses aren't sent, so the link/activity LED will never be lit.

**Flow Control:** Either Enabled or Disabled (default). This is useful for preventing frame loss during times of severe network traffic. Examples of this include multiple source ports sending to a single destination port or a higher-speed port bursting to a lower-speed port. When the port is half duplex, it is accomplished using backpressure, in which the switch simulates collisions, causing the sending device to retry transmissions according to the Ethernet backoff algorithm. When the port is full duplex, it is accomplished using PAUSE frame, which causes the sending device to stop transmitting for a certain period of time.

**Drop frames after excessive collisions:** Either Enabled or Disabled (default). Enable to discard the frames after excessive collision.

## VLANs

A virtual LAN (VLAN) is a logical network grouping that limits the broadcast domain and allows you to isolate network traffic so only the members of the same VLAN will receive traffic from others in that same group. Traffic on one VLAN cannot pass to another except through an intranetwork router or Layer 3 switch. Basically, creating a VLAN from a switch is logically equivalent to reconnecting a group of network devices to another Layer 2 switch. However, all the network devices are still plugged into the same switch physically. A VLAN tag is the identification information that is present in frames in order to support VLAN operation.

### VLAN Port Segmentation

**VLAN ID:** Enter any number from 1 to 4094 (without leading zeroes); click **Add**.

**VLAN Configuration List:** This displays all the current VLAN groups created for

**Port Segmentation (VLAN) Configuration**

**Add a VLAN**

VLAN ID

**VLAN Configuration List**

12							
----	--	--	--	--	--	--	--

this system. Up to 16 VLAN groups can be defined. VLAN 1 is the untagged default VLAN.

**Modify:** Click to complete the current VLAN configuration.

**Delete:** Click to delete the current VLAN configuration.

**VLAN Setup**

The switch supports up to 16 VLANs based on the 802.1Q standard. From the VLAN Membership screen you can create and delete VLANs and change the VLAN port membership.

**VLAN Setup**

VLAN ID: 12

Port	Member	Port	Member
Port 1	<input checked="" type="checkbox"/>	Port 5	<input type="checkbox"/>
Port 2	<input checked="" type="checkbox"/>	Port 6	<input type="checkbox"/>
Port 3	<input type="checkbox"/>	Port 7	<input checked="" type="checkbox"/>
Port 4	<input type="checkbox"/>	Port 8	<input checked="" type="checkbox"/>

**VLAN Per Port Configuration**

This screen lets you change the VLAN parameters for individual ports or trunks. You can configure VLAN behavior for specific interfaces, including the accepted frame types and default VLAN identifier (PVID). Each row corresponds to one port or trunk. *NOTE:* Trunked ports can't be configured individually, so configure the trunk instead.

Port	VLAN aware Enabled	Ingress Filtering Enabled	Packet Type	Pvid
Port 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/> All <input type="radio"/> Tagged Only	12
Port 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/> All <input type="radio"/> Tagged Only	None 12
Port 3	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/> All <input type="radio"/> Tagged Only	None
Port 4	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/> All <input type="radio"/> Tagged Only	None
Port 5	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/> All <input type="radio"/> Tagged Only	None
Port 6	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/> All <input type="radio"/> Tagged Only	None
Port 7	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/> All <input type="radio"/> Tagged Only	None
Port 8	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/> All <input type="radio"/> Tagged Only	None

Apply Cancel

**Port:** The number of the port or the ID of a trunk.

**VLAN Aware Enabled:** When enabled (default is Disabled), the VLAN-aware ports are able to use VLAN tagged frames to determine the destination VLAN of a frame. VLAN-aware ports will strip the VLAN tag from received frames and insert the tag in transmitted frames (except for the PVID). VLAN-*unaware* ports will *not* strip the tag from received frames or insert the tag in transmitted frames.

**Ingress Filtering Enabled:** When enabled (default is Disabled), incoming frames for VLANs which do not include this ingress port in their member set will be discarded.

**Packet Type:** This sets the interface to accept all frame types: select **All** to include tagged or untagged frames; select **Tagged Only** to limit acceptance only to tagged frames. (Default: All.) When set to All, the port can accept incoming tagged and untagged packets. Any received packets that are untagged are assigned to the default VLAN. Any tagged packets will be dropped unless the port is a member of the VLAN identified by the VLAN tag in the packet. When set to Tagged Only, the port will drop untagged packets and only receive tagged packets. Tagged packets will be dropped unless the port is a member of the VLAN identified by the VLAN tag in the packet. Switches should be connected to each other with the Packet Type set to Tagged Only.

**PVID:** The PVID (Port VLAN ID) is associated with untagged, ingress packets. It's assigned to untagged frames received on the specified interface. The PVID has no effect on ports that have Packet Type set to Tagged Only. (Default PVID: 1.) It is not possible to remove a port from VLAN 1 unless its PVID has been changed to something other than 1. Outgoing packets are tagged unless the packet's VLAN ID is the same as the PVID. When the PVID is set to None (recommended as the standard configuration option in Tagged Only mode), all outgoing packets are tagged.

## Aggregation

This screen lets you create port trunks so multiple links can be bundled to act as a single physical link for increased throughput, providing load balancing and redundancy of links in a switched inter-network. Actually, the link doesn't have an inherent total bandwidth equal to the sum of its component physical links. Traffic in a trunk is distributed across an individual link in a deterministic method called a hash algorithm, which automatically applies load balancing to the ports. A port failure within the trunk group causes the network traffic to be directed to the remaining ports. Load balancing is maintained whenever a link in a trunk is lost or returned to service.

**Aggregation/Trunking Configuration**

Group\Port	1	2	3	4	5	6	7	8
Normal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Group 1	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Group 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Group 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Group 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Aggregation / Trunking Configuration

To assign a port to a trunk, click the required trunk number, then click **Apply**.

## LACP

The IEEE 802.3ad Link Aggregation Control Protocol (LACP) increases bandwidth by automatically aggregating several physical links together as a logical trunk and

**LACP Port Configuration**

Port	Protocol Enabled	Key Value
1	<input type="checkbox"/>	auto
2	<input type="checkbox"/>	auto
3	<input type="checkbox"/>	auto
4	<input type="checkbox"/>	auto
5	<input type="checkbox"/>	auto
6	<input type="checkbox"/>	auto
7	<input type="checkbox"/>	auto
8	<input type="checkbox"/>	auto

providing load balancing and fault tolerance for uplink connections.

### **LACP Port Configuration**

**Port:** Indicates the port number to be configured.

**Protocol Enabled:** Enables LACP on the associated port.

**Key Value:** Configures a port's LACP administration key. The port administrative key must be set to the same value for ports that belong to the same link aggregation group (LAG). If this administrative key is not set when an LAG is formed (i.e., it has the null value of 0), this key will automatically be set to the same value as that used by the LAG.

### **RSTP**

The IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) provides a loop-free network and redundant links to the core network with rapid convergence to ensure faster recovery from failed links, enhancing overall network stability and reliability.

### **RSTP System Configuration**

**System Priority:** Options range from **0** to **61440**. Default: 32768. This parameter configures the spanning tree priority globally for this switch. The device with the highest priority becomes the STP root device. However, if all devices have the same priority, the device with the lowest MAC address will then become the root device.

System Priority	32768 ▾
Hello Time	2
Max Age	20
Forward Delay	15
Force version	Normal ▾

**Hello Time:** Enter a value from 1 to 10. Default: 2. This is the interval (in seconds) at which the root device transmits a configuration message (BPDU frame).

**Max Age:** Enter a value from 6 to 40. Default: 20. This is the maximum time (in seconds) a device can wait without receiving a configuration message before attempting to reconfigure. It also equals the maximum lifetime of a BPDU frame.

**Forward Delay:** Enter a value from 4 to 30. Default: 15. This is the maximum time (in seconds) the root device will wait before changing states (i.e., discarding to learning to forwarding).

**Force Version:** Select **Normal** (default) to support only RSTP, or **Compatible** to support both STP (802.1d) and RSTP.

## **RSTP Port Configuration**

**Port:** The port ID can't be changed. "Aggregations" refers to any configured trunk group.

**Protocol Enabled:** Click to enable (checked) or disable (default). When checked, you're enabling RSTP for this port as per the configuration in the RSTP Port Configuration menu.

Port	Protocol Enabled	Edge	Path Cost
Aggregations	<input type="checkbox"/>		
1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	auto
2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	auto
3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	auto
4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	auto
5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	auto
6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	auto
7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	auto
8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	auto

Apply Refresh

**Edge:** The default setting is enabled (checked); click to disable (unchecked). Edge ports don't participate in the Spanning Tree Protocol, but still send configuration messages, linking to an end station or another STP device.

**Path Cost:** This parameter is used by the STP to determine the best path between devices. Lower values should be assigned to ports attached to faster media; higher values for slower media. Set the RSTP pathcost on the port. Enter a value from 0 to 200000000 or keep the default setting (Auto).

## **IGMP Snooping**

Internet Group Management Protocol (IGMP) Snooping is the process of listening to IGMP network traffic. As implied by the name, IGMP Snooping is a feature that allows a Layer 2 switch to "listen in" on the IGMP conversation between hosts and routers by processing the Layer 3 IGMP packets sent in a multicast network. When enabled in a switch, IGMP Snooping analyzes all IGMP packets between hosts connected to the switch and multicast routers in the network. When a switch hears an IGMP report from a host for a given multicast group, the switch adds the host's port number to the multicast list for that group. And when the switch hears an IGMP "leave," it removes the host's port from the table entry. As a result, this feature prevents flooding of IP multicast traffic and limits bandwidth-intensive video traffic to subscribers only.

## IGMP Configuration

**IGMP Enabled:** When checked/selected, the switch will monitor network traffic to determine which hosts want to receive multicast traffic.

### IGMP Configuration

IGMP Enabled

Router Ports 1  2  3  4  5  6  7  8

Unregistered IPMC Flooding enabled

VLAN ID	IGMP Snooping Enabled	IGMP Querying Enabled
1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Apply Refresh

**Router Ports:** Select if the port is connecting to the IGMP administrative routers.

**Unregistered IPMC Flooding enabled:** Select this forwarding mode for unregistered (not-joined) IP multicast traffic. The traffic will flood when enabled (checked) and forward to router-ports only when disabled.

**IGMP Snooping Enabled:** When checked/selected, the port will monitor network traffic to determine which hosts want to receive the multicast traffic.

**IGMP Querying Enabled:** When checked/selected, the port can serve as the querier, responsible for asking hosts if they want to receive multicast traffic.

## Mirroring

Port Mirroring is used on a network switch to send a copy of network packets seen on one switch port (or an entire VLAN) to a network monitoring connection on

### Mirroring Configuration

Port	Mirror Source
1	<input type="checkbox"/>
2	<input type="checkbox"/>
3	<input type="checkbox"/>
4	<input type="checkbox"/>
5	<input type="checkbox"/>
6	<input type="checkbox"/>
7	<input type="checkbox"/>
8	<input type="checkbox"/>

Mirror Port

Apply Refresh



another switch port. This is commonly used for network appliances that require monitoring of network traffic, such as an intrusion-detection system.

### **Mirroring Configuration**

**Mirror Source:** The port that will duplicate, or “mirror,” the traffic on the source port.

Only incoming packets can be mirrored. Packets will be dropped when the available egress bandwidth is less than the ingress bandwidth.

**Mirror Port:** Select the ports that you want to mirror, then click **Apply**.

### **Quality of Service**

Quality of Service (QoS) enhances communication quality by giving precedence to certain classes of packets. This switch provides **QoS Disabled**, **802.1p** and **DSCP** modes.

### **QoS Configuration**

**Strict:** Services the egress queues in sequential order, transmitting all traffic in the higher-priority queues before servicing lower-priority queues.

**WRR:** Weighted Round-Robin shares bandwidth at the egress ports by using scheduling weights with default values of 1, 2, 4, 8 for queues 0 through 7, respectively. (This is the default selection.) *NOTE:* WRR can only be selected if Jumbo Frame mode is disabled on the Port Configuration screen.

The screenshot shows a web-based configuration window titled "QoS Configuration". It features two main sections. The first section, "Queue Mode", has two radio buttons: "Strict" (which is selected) and "WRR". Below these is a note: "Note : WRR is not supported in Jumbo Frame mode." The second section, "QoS Mode", contains a dropdown menu with three options: "QoS Disabled", "802.1p" (which is currently selected and highlighted in blue), and "DSCP". At the bottom of the window are two buttons: "APPLY" and "CANCEL".

### **QoS Mode: 802.1p**

Packets are prioritized using the 802.1p field in the VLAN tag. This field is three bits long, representing the values 0 - 7. When the QoS Mode is set to 802.1p, the 802.1p Configuration table appears, allowing you to map each of the eight 802.1p values to a local priority queue (low, normal, medium or high). The default settings are shown below.

**QoS Configuration**

Queue Mode:  Strict  WRR  
 Note : WRR is not supported in Jumbo Frame mode.

QoS Mode: 802.1p

Prioritize Traffic: Custom

802.1p Configuration

802.1p Value	Priority	802.1p Value	Priority	802.1p Value	Priority	802.1p Value	Priority
0	normal	1	low	2	low	3	normal
4	medium	5	medium	6	high	7	high

APPLY CANCEL

**QoS Configuration**

Queue Mode:  Strict  WRR  
 Note : WRR is not supported in Jumbo Frame mode.

QoS Mode: 802.1p

Prioritize Traffic: Custom

802.1p Configuration

802.1p Value	Priority	802.1p Value	Priority	802.1p Value	Priority	802.1p Value	Priority
0	medium	1	low	2	low	3	normal
4	medium	5	low	6	high	7	high

APPLY CANCEL

**QoS Mode: DSCP**

Packets are prioritized using the Differentiated Services Code Point (DSCP) value, a six-bit field that is contained within an IP (TCP or UDP) header. The six bits allow the DSCP field to take any value in the range 0 - 63. When QoS Mode is set to DSCP, the DSCP Configuration table is displayed, allowing you to map each of the DSCP values to a hardware output queue (low, normal, medium or high). The default settings map all DSCP values to the high-priority egress queue. The Prioritize Traffic drop-down list lets you quickly set the values in the DSCP Configuration table to a common priority queue. Select **Custom** to set each value individually.

**QoS Configuration**

Queue Mode:  Strict  WRR  
 Note : WRR is not supported in Jumbo Frame mode.

QoS Mode: DSCP

Prioritize Traffic: All High Priority

DSCP Configuration: All High Priority

DSCP Value(0..63)	Priority
	high
	low
	normal
	medium
	high
	high
	high
	high
	high
	high
All others	high

**DSCP Configuration**

DSCP Value(0..63)	Priority
	high
	low
	normal
	medium
	high
	high
	high
	high
	high
	high
All others	high

APPLY CANCEL

**PoE (Power over Ethernet)**

Power over Ethernet (PoE) is deployed in applications where supplying AC power would be inconvenient, expensive or infeasible. Web Smart features let you

**PoE (Power over Ethernet) Configuration**

Port	PoE Enabled	PD Class	Delivering Power [W]	Current [mA]	Voltage [V]	Power Budget [%] (total power = 130W)
1	<input checked="" type="checkbox"/>	--	0	0	0	0.5
2	<input checked="" type="checkbox"/>	3	0.711	13.908	51.115	
3	<input checked="" type="checkbox"/>	--	0	0	0	
4	<input checked="" type="checkbox"/>	--	0	0	0	
5	<input checked="" type="checkbox"/>	--	0	0	0	
6	<input checked="" type="checkbox"/>	--	0	0	0	
7	<input checked="" type="checkbox"/>	--	0	0	0	
8	<input checked="" type="checkbox"/>	--	0	0	0	

Apply Refresh

remotely control and centralized the power management simply by using a Cat5 cable to deliver both power and data.

### **PoE Configuration**

**PoE Enabled:** When enabled (checked), you can use the port to supply power to the attached — and thus, powered — device (PD), which in turn allows you to remotely access that device and monitor its status.

**PD Class:** This indicates the PD's classification (Class 0-4).

**Delivering Power (W):** This is the port's output power.

**Current (mA):** This is the port current.

**Voltage (V):** This is the port voltage.

**Power Budget (%):** This is the percentage of power usage.

### **Storm Control**

Broadcast storms can occur when a device on your network is malfunctioning or if application programs are not well designed or properly configured. If there is too much broadcast traffic on your network, performance can be severely degraded — even to the point where everything comes to a complete halt. You can protect your network from broadcast storms by setting a threshold for broadcast traffic for each port. Any broadcast packets exceeding the specified threshold will then be dropped.

The screenshot shows a web-based configuration page titled "Storm Control Configuration". It features a table with three rows: "Broadcast Rate", "Multicast Rate", and "Flooded unicast Rate". Each row has a corresponding input field. The "Broadcast Rate" field is currently set to "9910" and has a dropdown arrow. A dropdown menu is open, showing a list of values: 1982, 3964, 5946, 7928, 9910, 11892, 13874, 15856, 17838, 19820 (highlighted), 21802, 23874, 25766, 27748, 29730, 31712, and "No Limit". Below the table are two buttons: "Apply" and "Refresh".

Storm Control	
Number of frames per second	
Broadcast Rate	9910
Multicast Rate	
Flooded unicast Rate	

### **Storm Control Configuration**

There are three types of traffic that can be rate limited: Broadcast Rate, Multicast Rate and Flooded Unicast Rate. The Rate field (number of frames per second) is set by a single drop-down list since the same threshold is applied to every port on the switch. In other words — regardless of the flow-control settings — when the threshold is exceeded, packets are dropped.

## Monitoring

The Monitoring menu features the following subsections: Statistics Overview, Detailed Statistics, LACP Status, RSTP Status, IGMP Status, VeriPHY and Ping.

### Statistics Overview

This screen lets you monitor traffic from any source port to a target port for real-time analysis.

Port	Tx Bytes	Tx Frames	Rx Bytes	Rx Frames	Tx Errors	Rx Errors
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	2092	17	63016	251	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	45001	197	3355	26	0	0
8	0	0	0	0	0	0

### Detailed Statistics

This screen provides additional details for fine-tuning your configuration.

Receive Total		Transmit Total	
Rx Packets	0	Tx Packets	0
Rx Octets	0	Tx Octets	0
Rx High Priority Packets	-	Tx High Priority Packets	-
Rx Low Priority Packets	-	Tx Low Priority Packets	-
Rx Broadcast	-	Tx Broadcast	-
Rx Multicast	-	Tx Multicast	-
Rx Broad- and Multicast	0	Tx Broad- and Multicast	0
Rx Error Packets	0	Tx Error Packets	0
Receive Size Counters		Transmit Size Counters	
Rx 64 Bytes	-	Tx 64 Bytes	-
Rx 65-127 Bytes	-	Tx 65-127 Bytes	-
Rx 128-255 Bytes	-	Tx 128-255 Bytes	-
Rx 256-511 Bytes	-	Tx 256-511 Bytes	-
Rx 512-1023 Bytes	-	Tx 512-1023 Bytes	-
Rx 1024+ Bytes	-	Tx 1024+ Bytes	-
Receive Error Counters		Transmit Error Counters	
Rx CRC/Alignment	-	Tx Collisions	-
Rx Undersize	-	Tx Drops	-
Rx Oversize	-	Tx Overflow	-
Rx Fragments	-		
Rx Jabber	-		
Rx Drops	-		

### LACP Status

These screens allow you to confirm the current settings and operation of individual ports as they relate to the Link Aggregation Control Protocol (LACP) configuration.

### LACP Aggregation Overview

This screen (below) simply gives you a quick look at group/port status.

**LACP Aggregation Overview**

Group/Port	1	2	3	4	5	6	7	8
Normal								

**Legend**

	Down	Port link down
	Blocked	Port Blocked by RSTP. Number is Partner port number if other switch has LACP enabled
	Learning	Port Learning by RSTP
	Forwarding	Port link up and forwarding frames
	Forwarding	Port link up and forwarding by RSTP. Number is Partner port number if other switch has LACP enabled

### LACP Port Status

**Protocol Active:** Shows if the port is a member of an active LACP group.

**LACP Port Status**

Port	Protocol Active	Partner Port Number	Operational Port Key
1	no		
2	no		
3	no		
4	no		
5	no		
6	no		
7	no		
8	no		

**Partner Port Number:** A list of the ports attached at the remote end of this LAG link member.

**Operational Port Key:** Current operational value of the key used by this LAG.

### **RSTP Status**

These screens allow you to confirm the current settings and operation of individual ports as they relate to the Rapid Spanning Tree Protocol (RSTP) configuration.

## **RSTP VLAN Bridge Overview**

**Hello Time:** Interval (in seconds) at which the root device transmits a configuration message.

**Max Age:** The maximum time (in seconds) a device can wait without receiving a configuration message before attempting to reconfigure. All device ports (except designated ports) should receive configuration messages at regular intervals. Any port that ages out STA information (provided in the last configuration message) becomes the designated port for the attached LAN. If it is a root port, a new root port is selected from among the device ports attached to the network.

VLAN Id	Bridge Id	Hello Time	Max Age	Fwd Delay	Topology	Root Id
12	32780:12-0e-c0-ee-30-e3	2	20	15	Steady	This switch is Root!

**Fwd Delay:** The maximum time (in seconds) the root device will wait before changing states (i.e., discarding to learning to forwarding). This delay is required because every device must receive information about topology changes before it starts to forward frames. In addition, each port needs time to listen for conflicting information that would make it return to a discarding state; otherwise, temporary data loops might result.

**Topology:** Indicates if Spanning Tree topology is steady or undergoing reconfiguration. (The time required for reconfiguration is extremely short, so no values other than “steady” state are likely to be seen in this field.)

**Root ID:** The priority and MAC address of the device in the Spanning Tree that this switch has accepted as the root device, and the port connected to the root device.

## **RSTP Port Status**

**Port/Group:** The number of a port or the ID of a static trunk.

**Path Cost:** The cost for a packet to travel from this port to the root in the current Spanning Tree configuration. The slower the media, the higher the cost.

**Edge Port:** Shows if this port is functioning as an edge port, either through manual selection (see the RSTP Port Configuration table) or auto-detection. *NOTE:* If

Port/Group	Vlan Id	Path Cost	Edge Port	P2p Port	Protocol	Port State
Port 1						Non-STP
Port 2						Non-STP
Port 3						Non-STP
Port 4						Non-STP
Port 5						Non-STP
Port 6						Non-STP
Port 7						Non-STP
Port 8						Non-STP

the switch detects another bridge connected to this port, the manual setting for Edge Port will be overridden and the port will instead function as a point-to-point (P2P) connection.

**P2P Port:** Shows if this port is functioning as a point-to-point connection to exactly one other bridge. The switch can automatically determine if the interface is attached to a point-to-point link or to shared media. If shared media is detected, the switch will assume that it is connected to two or more bridges.

**Protocol:** Shows the Spanning Tree Protocol functioning on this port, either RSTP or STP (that is, STP-compatible mode).

### IGMP Status

These screen shows the IGMP Snooping statistics for the whole switch.

**VLAN ID:** VLAN ID number.

**Querier:** Shows whether Querying is enabled.

**Queries transmitted:** Shows the number of transmitted Query packets.

**Queries received:** Shows the number of received Query packets.

IGMP Status							
VLAN ID	Querier	Queries transmitted	Queries received	v1 Reports	v2 Reports	v3 Reports	v2 Leaves
12	Active	1	0	0	0	0	0

Refresh

**v1 Reports:** Shows the number of received v1 Report packets.

**v2 Reports:** Shows the number of received v2 Report packets.

**v3 Reports:** Shows the number of received v2 Report packets.

**Leaves:** Shows the number of Leave packets received.

### VeriPHY

These screens allow you to perform cable diagnostics for all ports or just selected ports (using the drop-down menu) to identify any cable faults (shorts, opens, etc.).

VeriPHY Cable Diagnostics		
Port	Port 5	
Mode	Full	
	<input type="button" value="Apply"/>	
	Full <b>Anomaly</b> Anomaly w/o X-pair	
Cable Status		
Pair	Length [m]	Status
A	0	Abnormal termination
B	0	Abnormal termination
C	0	Abnormal termination
D	0	Open



## Ping

This command sends ICMP echo request packets to another node on the network to determine if it can be reached. Possible results of the ping command:

- Normal response: The normal response occurs in 1-10 seconds, depending on network traffic.
- Destination does not respond: If the host does not respond, a “timeout” appears in 10 seconds.
- Destination unreachable: The gateway for this destination indicates that the destination is unreachable.
- Network or host unreachable: The gateway found no corresponding entry in the route table.

Press <Esc> to stop ping.

### Ping Parameters

Target IP address	192.168.0.1
Count	1
Time Out (in secs)	1

Apply

- 1
- 5
- 10
- 30

### Ping Results

Target IP address	192.168.0.1
Status	Test starting...
Received replies	0
Request timeouts	0
Average Response Time (in ms)	0

Refresh

**Target IP Address:** Enter the IP address of the network device you're pinging.

**Count:** Select the number of packets to send.

**Time Out:** Select the time period in which the device must respond to a ping.

## Maintenance

The Maintenance menu — featuring Restart, Factory Default, Software Upload, Configuration File Transfer and Logout subsections — presents the options and functions that help keep the switch operating at an optimal performance level.

## Reboot

Click **Yes** to restart the switch. The reset is complete when the Power LED stops blinking.



## Factory Default

This function is to force the switch back to the original factory settings. To reset the switch, select **Reset to Factory Defaults** from the drop-down list and click **Apply**. The LAN IP Address, Subnet Mask and Gateway IP Address will be reset to their factory settings.

## Software Upload

Select **Upgrade Firmware** from the Tools drop-down list, click **Browse** to select the firmware file, then click **Upload**.

## Configuration File Transfer

This allows you to save the switch's current configuration or restore a previously saved configuration back to the device. Configuration files can be saved to any location on the Web management station. Click **Browse** to find a configuration file, then click **Upload** to save it or **Download** to restore it.

## Logout

The administrator has write access for all parameters governing the onboard agent, so you should assign a new administrator password as soon as possible and store it in a safe place.

# SPECIFICATIONS

## Standards

- IEEE 802.1d (Spanning Tree Protocol)
- IEEE 802.1p (Traffic Prioritization)
- IEEE 802.1q (VLAN Tagging)
- IEEE 802.1w (Rapid Spanning Tree Protocol)
- IEEE 802.3ad (Link Aggregation)
- IEEE 802.3 (10Base-T Ethernet)
- IEEE 802.3ab (Twisted Pair Gigabit Ethernet)
- IEEE 802.3ad (Link Aggregation Control Protocol LACP)
- IEEE 802.3af (Power over Ethernet 802.3at Type 1)
- IEEE 802.3at (Power over Ethernet 802.3at Type 2)
- IEEE 802.3u (100Base-TX Fast Ethernet)
- IEEE 802.3x (flow control, for full duplex mode)

## General

- Media support:
  - 10Base-T Cat3, 4, 5 UTP/STP RJ45
  - 100Base-TX Cat5 UTP/STP RJ45
  - 1000Base-T Cat5e UTP/STP RJ45
- Packet filter/forwarding rate:
  - 1,488,000 pps (1000 Mbps)
  - 148,800 pps (100 Mbps)
  - 14,880 pps (10 Mbps)
- MAC address table: 8192 entries
- Backplane speed: 16 Gbps
- Switch architecture: store and forward
- Configuration Options:
  - Port link speed: 10 Mbps, 100 Mbps, 1000 Mbps or auto-negotiation
  - PoE on/off per port
  - Flow control on/off per port
  - VLAN
  - Port Mirroring

- Port Aggregation/LACP: 4 groups with up to 8 member ports per trunk
- Broadcast Storm configuration with broadcast rate, multicast rate and flooded unicast rate
- IGMP Snooping
- Quality of Service (QoS): 802.1p or DSCP
- Integrated VeriPHY cable diagnostics tool
- Integrated ICMP Ping client sends ping requests to other network nodes
- SNMPv1/v2c (Simple Network Management Protocol)
- LAN settings (IP address, DHCP, Gateway, etc.)
- Monitoring Options:
  - Traffic statistics
  - LACP status
  - RSTP status
  - IGMP status
- Certifications: FCC Class A, CE

## LEDs

- PoE, Power, Link/activity

## Power

- Input: 100 – 240 V AC, 50 – 60 Hz
- Power consumption: 130 Watts (max.)

## Environmental

- Metal housing
- Dimensions: 266 (w) x 160 (l) x 44 (h) mm (10.5 x 6.3 x 1.7 in.)
- Weight: 1.6 kg (3.5 lbs.)
- Operating temperature: 0 – 45°C (32 – 113°F)
- Operating humidity: 10 – 90% RH, non-condensing
- Storage temperature: -20 – 90°C (-4 – 194°F)



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