User Manual

Allen-Bradley

Stratix 6000 Ethernet Managed Switch

Catalog Numbers 1783-EMS08T, 1783-EMS04T

Allen-Bradley • Rockwell Software

Rockwell Automation

Important User Information

Solid-state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (publication SGI-1.1 available from your local Rockwell Automation sales office or online at http://www.rockwellautomation.com/literature/) describes some important differences between solid-state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid-state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

	**WARNING:** Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
	**ATTENTION:** Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence
	**SHOCK HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
	**BURN HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

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This manual contains new and updated information. Changes throughout this revision are marked by change bars, as shown to the right of this paragraph.

New and Updated Information

This table contains the changes made to this revision.

Topic	Page
IGMP Configuration	19
IGMP Report	37

Notes:

Appendix F

Work with RSLogix 5000 Software, Version 15 or Later

Appendix G

Download or Upload a Configuration

Appendix H

Available SFP Modules and Cables

Index

Notes:

What This Preface Contains

This preface includes introductory information for this manual.

Who Should Use This Manual

This manual is intended for users of the switch. We assume you are familiar with the procedures in the Stratix 6000 Ethernet Managed Switch Installation Instructions, publication 1783-IN004.

Common Techniques Used in This Manual

These conventions are used throughout this manual:

- Numbered lists provide sequential steps.
- Bulleted lists provide information, not sequential steps.
- Single quotes show exactly what you should type, for example, 'PASSWORD' denotes you should type the letters PASSWORD in upper case.

How To Use This Manual

Read and understand this manual before using the described products. Consult your Rockwell Automation representative if you have any questions or comments.

Terminology

Refer to this table for common terms used in this publication.

Table 1 - Terminology

This Term	Means
Auto-MDIX	Automatic Medium-dependent Interface Crossover. Allows the switch to detect the required cable type (straight-through or crossover) for copper Ethernet connections and configures the interfaces accordingly.
BOOTP	Commonly used with Allen-Bradley Ethernet products, the BOOTP protocol is used by a client machine to locate its IP address and network mask.
DHCP	Dynamic Host Configuration Protocol. Commonly used on office networks, scarce IP address space is efficiently used because IP addresses are "leased" to clients for a limited time. This lease concept facilitates the recycling of addresses, which is the heart of DHCP.
DNS	Domain Name Server. Translates domain names into IP addresses, for example, www.example.com can translate to 192.168.100.100.

Table 1 - Terminology

This Term	Means
Domain	A group of computers and devices on a network that are controlled as a unit with common rules and procedures.
TCP	Transmission Control Protocol. TCP enables two hosts to establish a connection and exchange streams of data. TCP guarantees delivery of data and also guarantees that packets are delivered in the same order in which they were sent.
UDP	User Datagram Protocol. This protocol offers a minimal transport service. UDP is used by applications that do not require the level of service of TCP or use communication services (for example, multicast or broadcast delivery) not available from TCP. An application program running over UDP must deal directly with end-to-end communication anomalies that a connection-oriented protocol would have handled - for example, retransmission for reliable delivery, packetization and reassembly, flow control, and congestion avoidance, when these are required. This is commonly seen with I/O type devices that send out information at an RPI rate.

Additional Resources

These documents contain additional information concerning related Rockwell Automation products.

Resource	Description
Stratix 6000 Ethernet Managed Switch Installation Instructions, publication 1783-IN004	Provides detailed specifications and information related to installation of the switch.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.ab.com	Provides declarations of conformity, certificates, and other certification details.
Internet Engineering Task Force website http://www.ietf.org	Provides access to documents such as the RFC (request for comment), public documents on networking topics and protocols, Internet standards documents, best current-practices information, and related informational documents.

You can view or download publications at http://www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Rockwell Automation distributor or sales representative.

Basic Configuration

What This Chapter Contains

This chapter covers how to use the Home web page options. It also includes information about how to set an IP address and security, work with Miscellaneous options, and understand status indicators.

Access the Home Page

To access the Home page, perform this procedure.

IMPORTANT	Before connecting to the network, set the IP address of the switch as described in Set the IP Address.

1. Connect the switch to your computer's LAN card. This connection is required before you can access the Home page.

   For information about how to establish this connection, see the Stratix 6000 Ethernet Managed Switch Installation Instructions, publication 1783-IN004.
2. Open your web browser once the connection is established.
3. In the address bar of your web browser, type your switch's IP address, for example, http://192.168.1.1 (192.168.1.1 is the default IP address).
4. From the user name and password dialog box, keep the user name empty and type the password of 'PASSWORD'.

   If the web browser does not open, verify:
   - the IP address of the switch; 192.168.1.1 is the default.
   - your connection setup, referring to the Stratix 6000 Ethernet Managed Switch Installation Instructions, publication 1783-IN004 for further guidance, if needed.
   - the switch has power (green power status indicator is on).
   - the cable is connected (you see a green or yellow status indicator lit on the Ethernet port).
   - a proxy server is not preventing you from accessing the switch.

You see the Home page. The table shows what is included in the page.

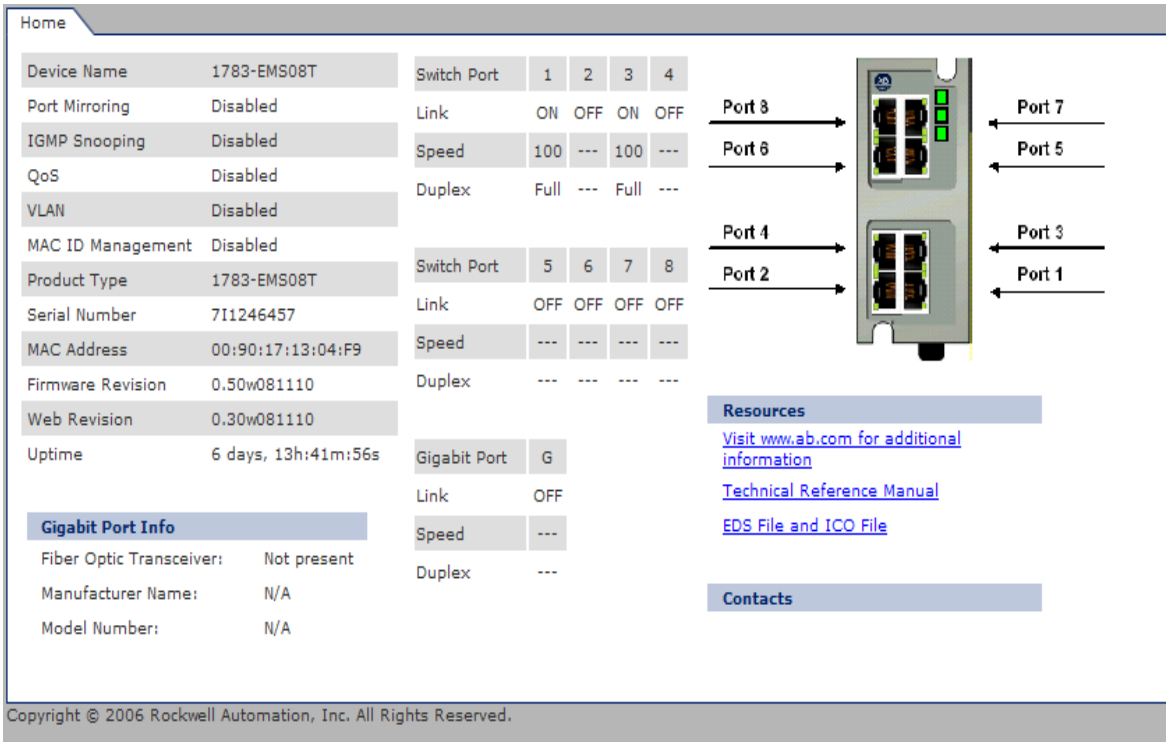


Table 2 - Items on the Home Page

Value	Description
Device Name	You provide this entry. Identifies the switch (see page 17 for instructions on changing the switch's name).
Port Mirroring	Allows traffic on one port to be copied and sent (mirrored) to another port so that an Ethernet protocol analyzer can capture it. For more on port mirroring, see page 42.
IGMP Snooping	Filtering mechanism for multicast traffic should be used when I/O is running on the Ethernet network. For more on IGMP snooping, see page 17.
QoS	When enabled, the switch can prioritize packet delivery to a certain port or MAC address.
VLAN	VLAN (virtual LAN) is used to eliminate traffic caused by multicast and broadcast Ethernet traffic. With this feature, you can partition the switch ports into different private domains.
MAC ID Management	Determines if a MAC ID is authorized on the network by checking the allowed MAC Ids and notifies the controller when an unauthorized node appears on the network.
Product Type	Shows the part number of the switch.
Serial Number	Unique to every switch.
Firmware Revision	Check our website to make sure you are up to date. This file updates product firmware. The Web interface must be updated separately.
Web Revision	Check our website to make sure you are up to date. This file updates your Web interface. For related information, see Appendix A.
Uptime	This setting indicates the switch's running time. This timer is reset when the switch is powered up.
Link	Possible values are ON and OFF. ON is if a device is connected to the port and has power. ON corresponds to the Link State Status indicator on the switch port being either solid or flashing green.
Speed	Possible values are 10 or 100, signifying a 10 Mbps or 100 Mbps connection. This corresponds to the Data Rate status indicator on the switch port being off (10 Mbps) or solid amber (100 Mbps).

Table 2 - Items on the Home Page

Value	Description
Duplex	Possible values are Full and Half.
Gigabit Port	This is offered as an option to the 1783-EMS08T switch and requires a pluggable SFP MSA-compliant transceiver that you must purchase separately. A fiber optic transceiver can be used to connect to a fiber optic network. Information about the transceiver used and the connection speed are found on the Home page.
Resources	Provides links to our website and this manual (you have to be connected to the Internet to reach our website). The manual link in this section does not require an Internet connection because it is embedded in the product. For convenience, we have also embedded the EDS file for this device under the EDS file link in this section. Download and install it with the EDS hardware installation tool (one of the RSLinx tools).
Contacts	Fill in contact information by Basic Configuration and Miscellaneous. This lets you enter a name or phone number and email address of the appropriate contact person.
Switch Port	Shows the numbering of the switch ports.

Access Basic Configuration Options

From the Home page, click the Basic Configuration folder to expand the menu bar in the left pane to show these options, as explained in this chapter:

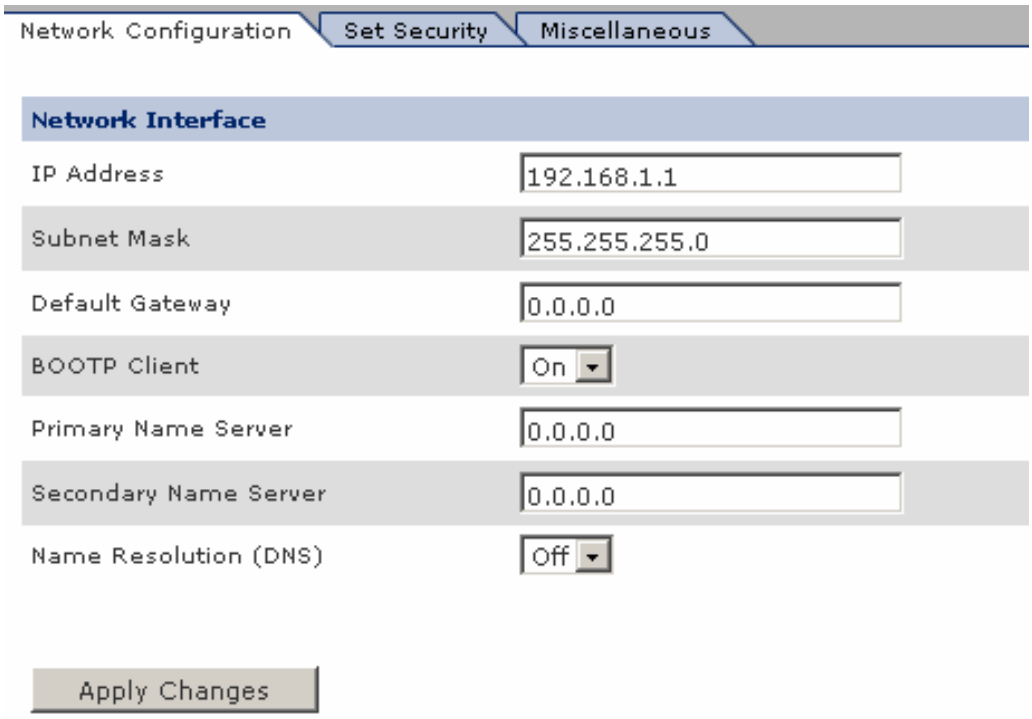
- Network Configuration
- Set Security
- Miscellaneous

Set the IP Address

You normally need to change your IP address to install the switch into your Ethernet network. To change the IP address, use this procedure.

1. Find an available IP address on your subnet.
2. Connect the switch to your computer's LAN card.

   For additional information, refer to the Stratix 6000 Ethernet Managed Switch Installation Instructions, publication 1783-IN004.
3. Click the Basic Configuration folder.
4. Click Network Configuration.



5. Type your new IP address.
6. Change the subnet mask and default gateway, if needed.
7. Turn BOOTP Client off to prevent dynamic IP address assignment.

   If using hostnames on the network, Name Resolution must be turned on and the DNS server addresses must be configured (usually required if using the email function).
8. Click Apply Changes to change the IP and subnet.

IMPORTANT	The switch does not load the new IP and subnet address until power is cycled.

9. Cycle power.

   Once the IP and subnet are changed, you must cycle power to load the new address.

   Power can be cycled remotely through the management interface by clicking the Diagnostics folder and Controller Restart. This restarts the 1783-EMS switch and does not restart the controller; all communication through the switch is interrupted.

Set the IP Address with BOOTP

The 1783-EMS switch ships with the BOOTP client enabled by default. To assign an address, use this procedure.

1. Put the switch on a network with a BOOTP server.
2. Cycle power to the switch.

   The 1783-EMS switch attempts to obtain an IP address several times from the server before timing out and defaulting to the factory preset address of 192.168.1.1.

IMPORTANT	The MAC address of the switch is on the Home page.

IMPORTANT	192.168.1.1 could interfere with another device on the network.

Set the Security

We recommend changing the administrator and read-only password before you place the switch in service.

The administrator password is used for the management interface (HTTP session), Telnet, and the FTP interface (used to upgrade the firmware). The user name is verified for the FTP session only. The user name for the HTTP session is not checked (therefore can be anything). The read-only password is used for read-only access to the management interface (HTTP session). Change your administrative or read-only user name and password as follows.

1. Click the Basic Configuration folder.

2. Click Set Security.

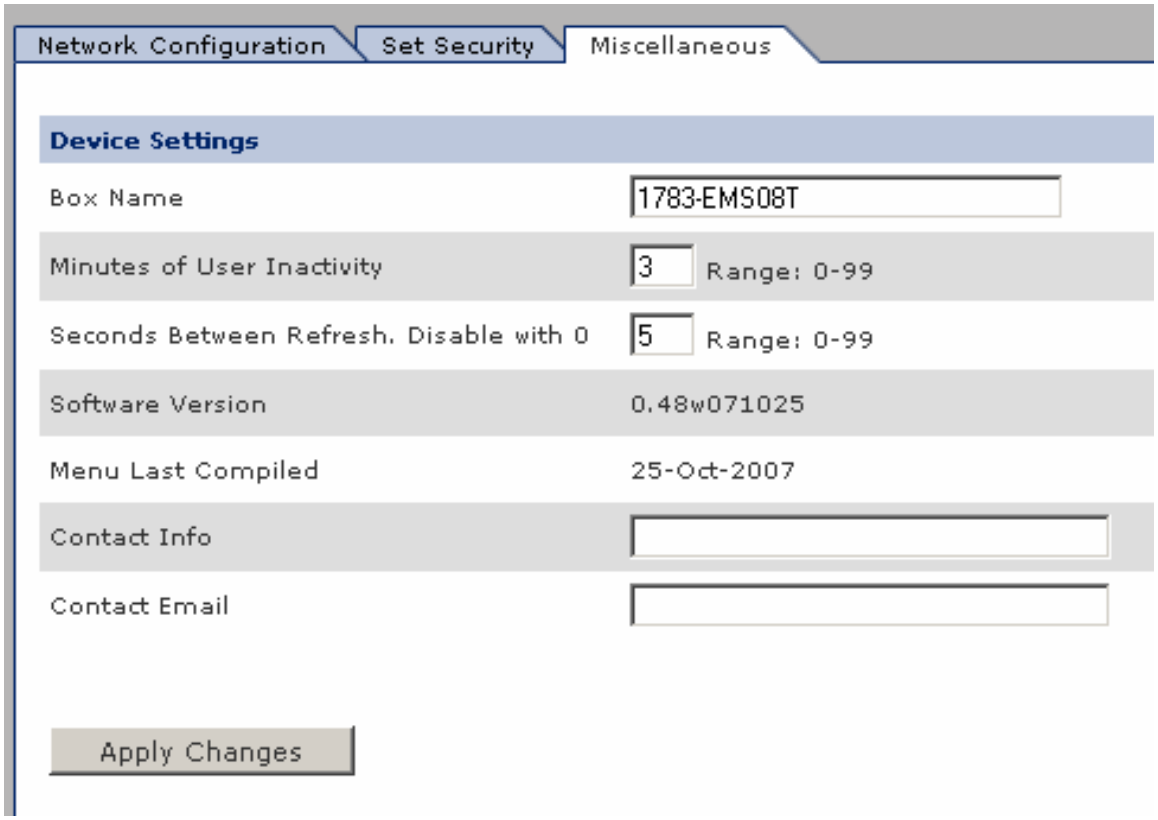
3. Change the user name and password (see Appendix B for recommendations).
4. Click Apply Changes.
5. Cycle power to the switch to load the new user name and password.

   The administrative password applies to Telnet, FTP, and the web browser interface.

IMPORTANT	The 1783-EMS switch does not load the new settings until power is cycled.

Work with the Miscellaneous Settings

The table gives information about the Miscellaneous entries you see when you click the Basic Configuration folder and then Miscellaneous.

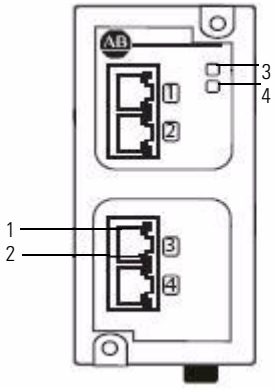


Setting	Description
Box Name	Lets you give your 1783-EMS switch a name that describes its location or connected devices. This feature is useful when multiple 1783-EMS switches are installed. The switch reports this name on the Home page. To change this setting, complete this procedure. 1. Click Basic Configuration. 2. Click Miscellaneous. 3. Type the new name in the text box and click Apply Changes. The new name does not show in the Home page until you click Refresh on the browser.
User Inactivity	Lets you change the length of time the management interface (HTTP session) remains open while inactive. Choose from 0…99 min. Select 0 = Feature Disabled for the interface to remain open until it is closed. The default is 3 min.
Status Refresh	Controls the refresh rate of the management interface. Choose 0…99 seconds. Select 0 = Feature Disabled for no refresh. The default value is 5 seconds.
Contact Info, Contact Email	Use to identify the responsible service personnel.

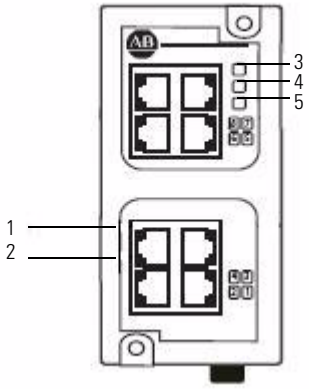
Work with the Status Indicators

The figures and table show the status indicators.

1783-EMS04T



1783-EMS08T



Item	Indicator	State	Description
1	Link state(1)	Solid green	Ethernet link exists.
		Flashing green	Valid link is present and transmitting data.
2	Data rate(1)	Solid amber	100 Mbit link is present.
		Off	10 Mbit link is present.
3	PWR	Solid green	Power to the switch is present.
4	STA	Flashing green	This hearbeat indicator normally flashes at a slow rate. It flashes at a faster rate when the switch is being upgraded or set back to factory default settings by using the button on the back of the switch.
5	UPL	Solid green	Fiber transceiver present.
		Flashing green	Flashing indicates data is being transmitted over the gigabit link on the the 1783-EMS08T switch that has a gigabit fiber transceiver on the bottom of the switch.

(1) Appears on all copper Ethernet ports.

Network Services Setup

What This Chapter Contains

This chapter covers information related to network services setup to include the following:

- Internet Group Management Protocol (IGMP) configuration
- Dynamic Host Configuration Protocol (DHCP) configuration

IGMP Configuration

Read this section for information about the IGMP snooping feature included in the 1783-EMS switch.

IGMP snooping sorts multicasting devices into groups. This limits the multicast packets received by hosts that do not need the information, making the network more efficient and deterministic.

Option	Description
Broadcast 	Without IGMP snooping, an I/O module acts like a broadcasting device and all devices on the subnet are flooded with I/O traffic.
Multicast 	IGMP snooping filters the I/O traffic from devices that are not in the intended multicast group.
Unicast 	A message instruction from one controller to another would be an example of unicast; it contains one source and one destination address.

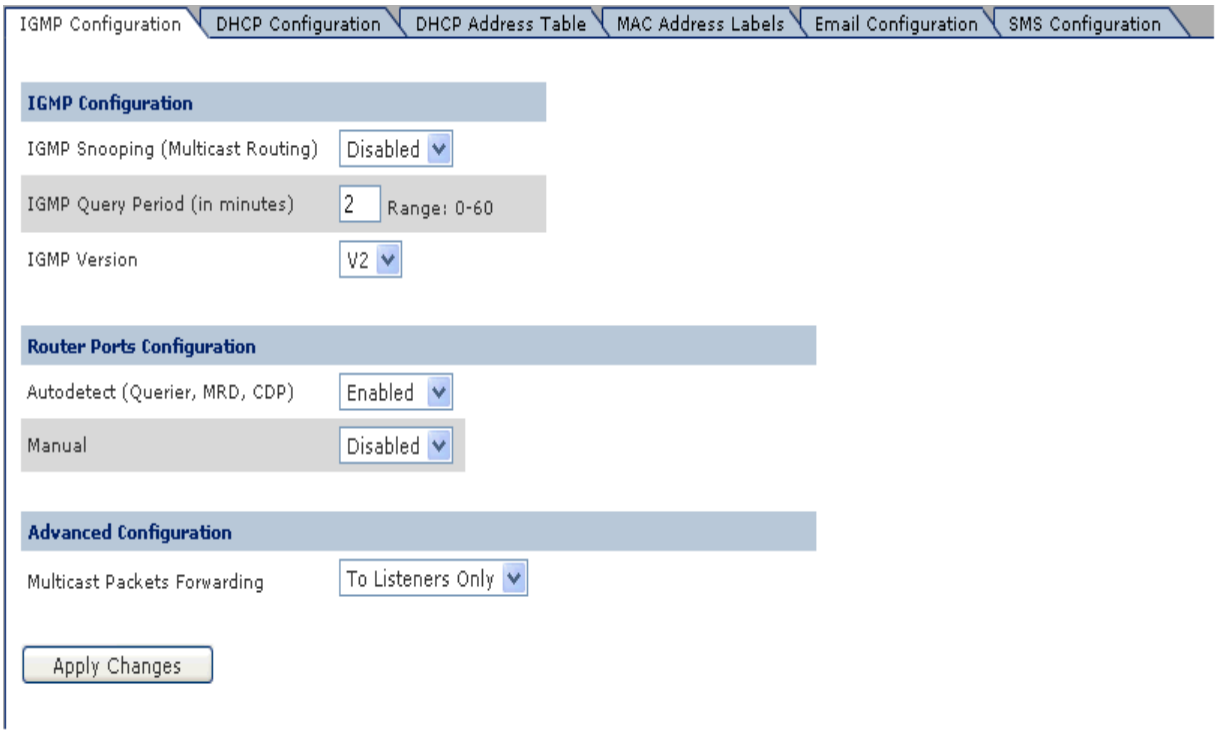
When and How to Use IGMP

Use IGMP when I/O is running on your network. IGMP helps to isolate this UDP traffic to ports that need to receive it. When it is not used, other devices may be slowed down by the continuous flow of UDP packets.

Use these steps to work with the IGMP Configuration page.

1. Click Network Services Setup and IGMP Configuration.

   The IGMP Configuration page appears with the defaults as shown in the figure.



2. From the IGMP Configuration page, complete the entries, and click Apply Changes.
   - IGMP Configuration
   - Configure IGMP by selecting Enabled for IGMP Snooping and setting the query period and version.

     The switch implements the IGMP Querier function.

     When Enabled is selected, the switch enables both the IGMP querier function and IGMP snooping. If there are multiple switches with the querier enabled, the switches will determine which is the querier based on the IGMP protocol definition.

     The query period determines how often your network is queried for group information. The hosts on your network respond with their group information.
   - To see your multicast groups, see the IGMP report by clicking Diagnostics.
   - The 1783-EMS switch supports IGMP V1 and IGMP V2.

V2 is the default when IGMP snooping is enabled, and is the recommended setting. Per the IGMP definition, hosts and routers implementing differing IGMP versions will interoperate correctly on the network.

- Router Ports Configuration
  - When a multicast router (including IGMP querier) is connected to a switch port, all multicast packets and IGMP reports are forwarded on that port. This behavior is important to ensure proper functioning of IGMP snooping.
  - Autodetect lets the Stratix 6000 switch automatically determine the querier and routers that are connected to the switch.
  - Manual mode lets the user make the selections.
  - Use the Manual mode to select the ports on the Stratix 6000 switch that are connected to routers.

    When the Manual mode is disabled, the switch determines the ports connected to routers automatically.

- Advanced Configuration
  - Use the Multicast Packets Forwarding to select where to forward multicast packets.
  - Packets can be forwarded to Listeners Only, Listeners and Uplink Port or Listeners and all Snoopers, depending on your security requirements. The defauls setting is To Listeners and Uplink Ports.
  - Use the uplink port to either have the Statix 6000 switch automatically determine the uplink port or to select the uplink port manually.

IGMP Product Support

Rockwell Automation products support IGMP, version 2.

When using RSLogix 5000 software for configuration of your switch:

- settings of the IGMP page in the profile overwrite settings made on the HTML management interface.
- if you are scanning the 1783-EMS switch with Logix software, use the IGMP page in the Add-on Profile to configure IGMP to avoid confusion. See Appendix F for more information.

DHCP Configuration

The 1783-EMS switch can function as a DHCP/BOOTP server.

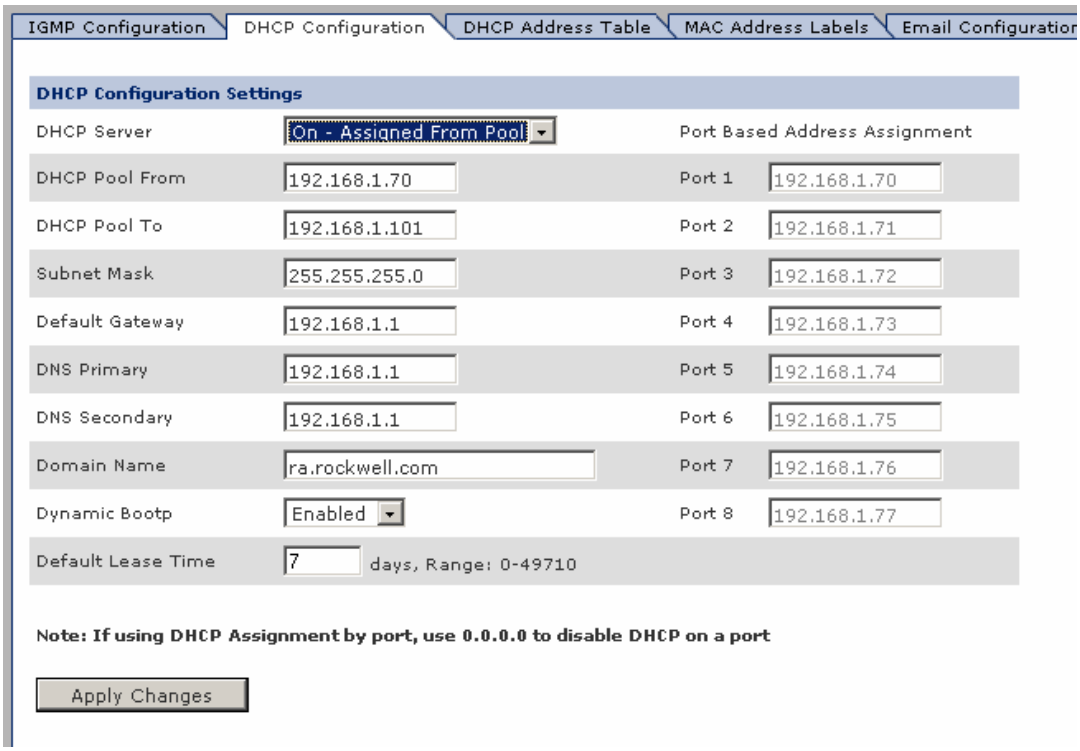
IMPORTANT	Do not confuse this with the BOOTP/DHCP client, which lets the 1783-EMS switch receive an address from a DHCP/BOOTP server.

Dynamic IP Address Assignment by IP Address Pool

IMPORTANT	Keep this feature shut off if this device is on a larger IT-controlled network. Company networks typically have DHCP servers in place to service the computers on the network with IP addresses. This device can conflict with the existing DHCP servers on the network and prevent them from handing out addresses.

The 1783-EMS switch has the ability to serve IP addresses to 32 nodes. Set up the 1783-EMS switch as follows.

1. Establish a connection with the 1783-EMS switch.
2. Click Network Services Setup and DHCP Configuration.



3. Enable the DHCP server by clicking ON - Assigned from Pool; this is off by default.
4. Enter your subnet and gateway addresses for the network.

5. Enter or type in the primary and secondary DNS servers.
6. Enter the domain name, if appropriate.
7. Use DHCP Pool From and DHCP Pool To to assign a range of addresses.

   The switch assigns an address out of this range.
8. Enable Dynamic BOOTP to answer BOOTP requests.
9. Pick a value for Default Lease Time for DHCP requests; the default value is 7 days.
10. Click Apply Changes and cycle power for the changes to take effect.

Dynamic IP Address Assignment by Port

The 1783-EMS switch has the ability to serve IP addresses based on the port where the device is connected. When used properly, this feature provides for easy replacement of Ethernet equipment on the factory floor. Set up the 1783-EMS switch as follows.

1. Establish a connection with the 1783-EMS switch.
2. Click Network Services Setup and DHCP Configuration.
3. Enable the DHCP Server by selecting ON – Assigned by Port; this is off by default.
4. Enter your subnet and gateway addresses for the network.
5. Enter the primary and secondary DNS servers; the domain name fills out if the 1783-EMS switch resides on a domain.
6. Assign the IP address to the port you want Dynamic IP Address Assigned by port.
7. Click Apply Changes and cycle power for the changes to take effect.

IMPORTANT	If multiple devices are connected to a port (with an uplink to another switch) the IP address is sent to the first device to request it from the port. If a field is set to an address of 0.0.0.0 a DHCP request on the port is ignored.

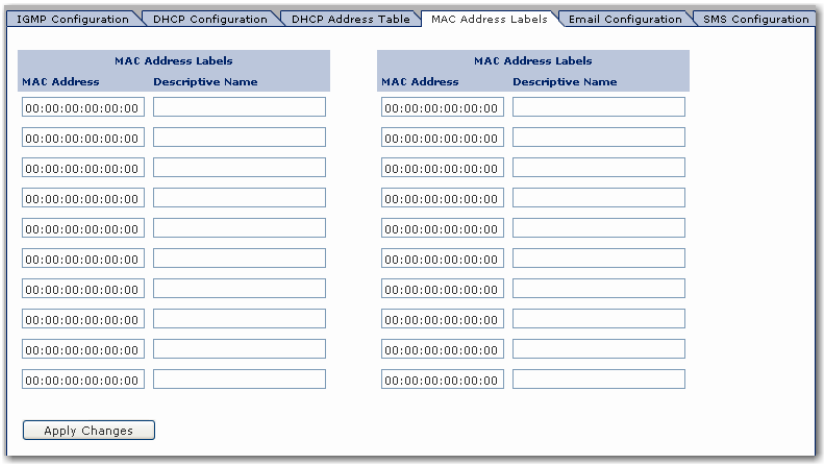
IMPORTANT	Most applications with controllers do not require changes to the DNS, domain name, and lease time fields. If these functions do not apply to your network, leave these fields at their default value.

DHCP Address Table

The DHCP Address Table is populated when the server is set to assign an IP address from a pool. This table details which IP address is assigned to a device (by MAC ID).

MAC Address Labels

This lets you associate a user-friendly label to a MAC ID within the 1783-EMS user interface. When a label is associated with a MAC ID it is reflected in the MAC ID table and the MAC ID management interface.



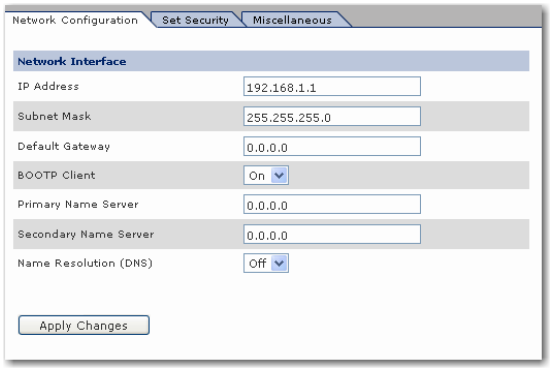
This feature eases troubleshooting a network. The labels are reflected in the MAC Address Report and the MAC ID Management Configuration page.

Email Configuration

The 1783-EMS switch includes an embedded email client that uses an email relay server or gateway message server to send email and text messages to a mail recipient, mobile telephone, or portable wireless device.

The network gateway address and DNS information must be entered. This setup is required once and is stored in 1783-EMS nonvolatile memory. See Set the IP Address for help setting up the network addresses.

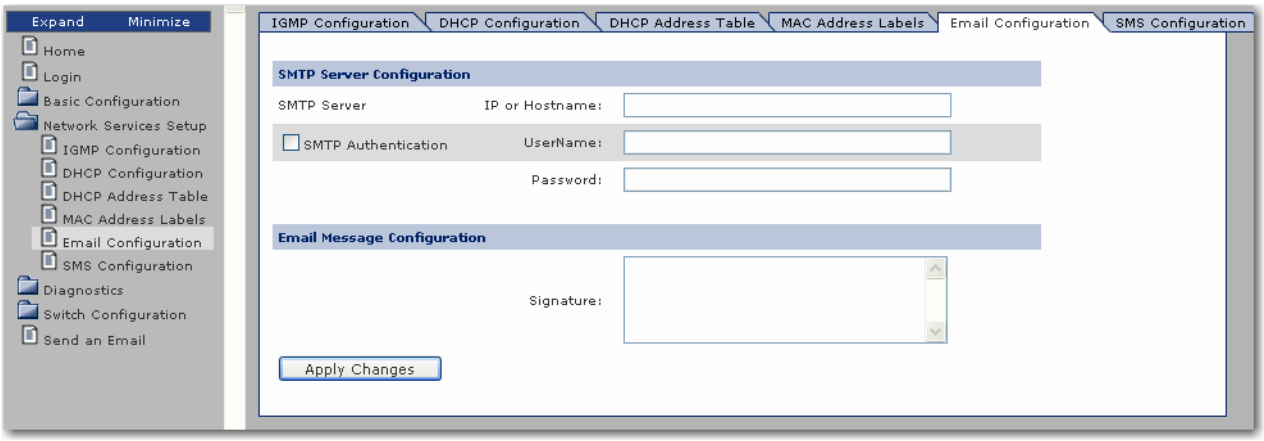
For help locating these IP addresses, see your network administrator.



IMPORTANT If you do not intend to use symbolic names, for example, smtp@yahoo.com, but rather only IP addresses to access your mail server, you can leave the DNS configuration empty.

To set the SMTP server parameters, use the Email Configuration page and this procedure.

1. Click Network Services Setup and Email Configuration.



2. Enter your SMTP server name or IP address in the field labeled IP or Hostname.
3. If authentication is used, as required by most ISPs, click the SMTP Authentication checkbox and enter your user name and password.

   Basic authentication, compatible with POP servers, is supported, and the name and password entered here are those associated with your outgoing email account.

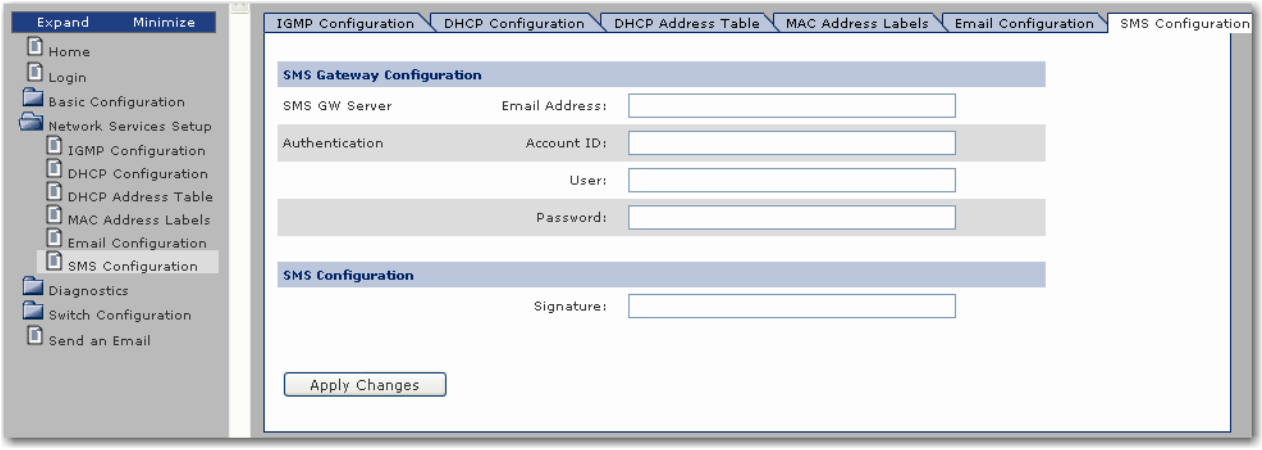
4. Test sending an email message from the Send an Email web page, making sure that the 1783-EMS switch is connected to a network that has access to your email server, which may require access to the Internet.

IMPORTANT	A status message providing the result of this operation is displayed at the bottom of the page. Detailed error descriptions let you identify a potential anomaly.

SMS Configuration

If you intend to use an SMS gateway service to send text messages to a mobile telephone or portable wireless device, use this procedure.

1. Click SMS Configuration and enter the email address of your SMS gateway provider in the SMS GW Server field.



2. Enter your account ID.
3. Enter your user name and password.

IMPORTANT	Most newer cell phones accept email directly. If your phone accepts email, you do not need to use an SMS gateway service to get text messages from the 1783-EMS switch. See your cell phone provider website to get the email address of your cell phone.

4. Test this setup by using the Send an Email page, making the To: field the phone number of the device to receive the message.

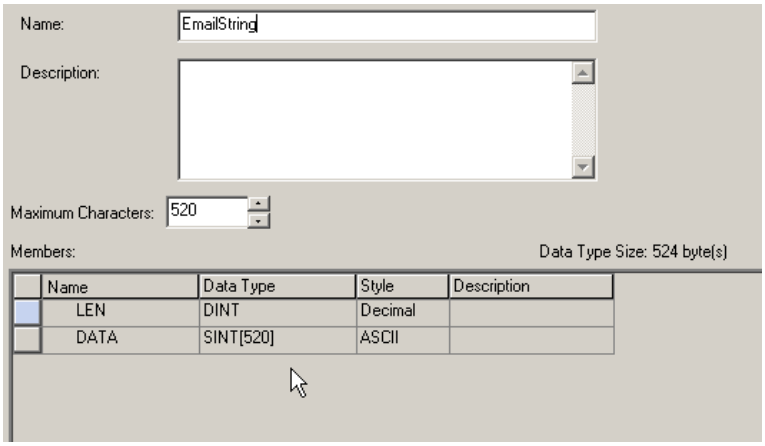
Send an Email via a Controller-initiated Message Instruction

A Logix controller can send a generic CIP message to the 1783-EMS switch instructing it to send an email message to an SMTP email server. This is useful to communicate controller data, network alerts, and application conditions to appropriate personnel. You need two controller-scoped string tags.

One tag contains the email text and the other contains the status of the email transmission (the result code). These tags contain as many as 520 characters. You must first create a user-defined STRING data type (the default STRING data type in RSLogix 5000 software is not large enough for most email text).

For example, create a STRING data type named EmailString. Next, create one controller-scoped tag of this new data type to contain the email text named EMS_EMAIL. Create a second controller-scoped tag of this new data type to contain the transmission status named EmailDstStr.

Both of these tags are of type EmailString.

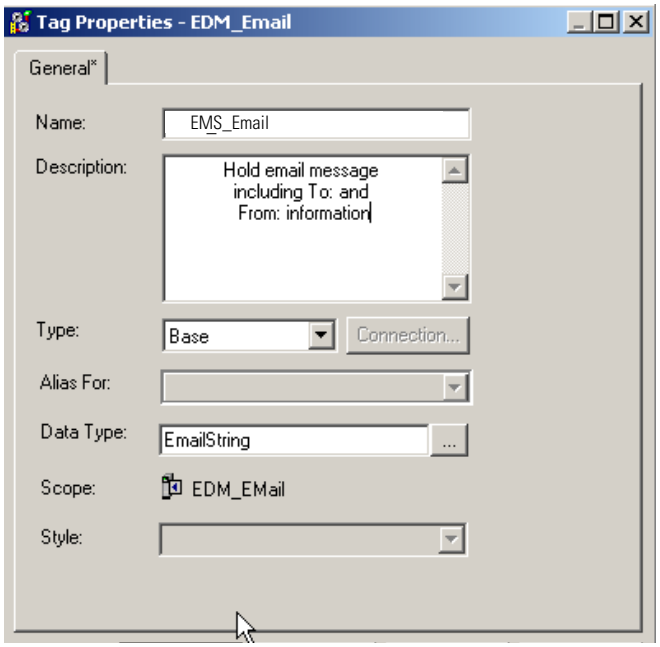


Use this procedure to send an email via a controller-initiated message instruction.

1. Open your RSLogix 5000 program and go to Data Types, Strings.
2. Create an EmailString type and note the initial LEN field.

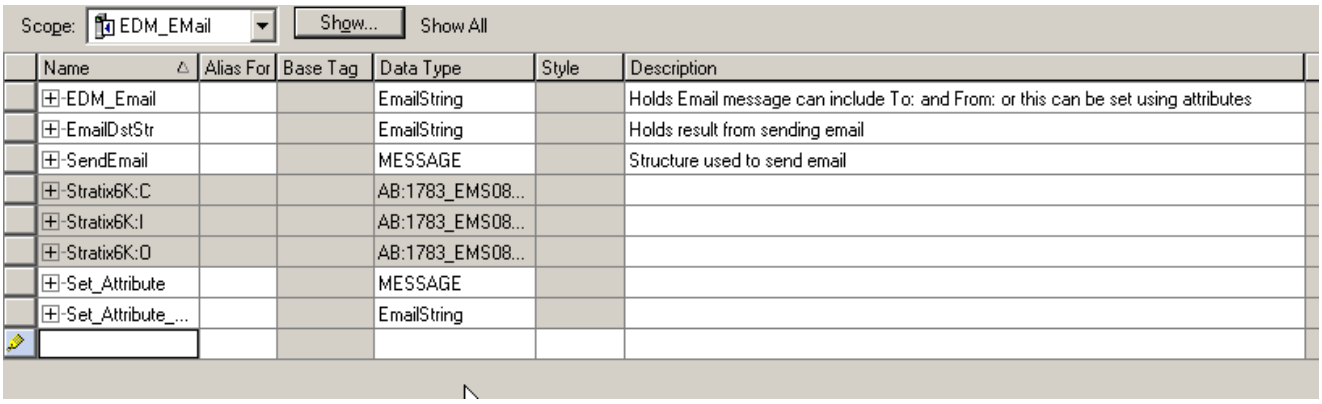
   When you edit this tag, its length is automatically inserted by the RSLogix editor.

When you send email with MSG instructions, the length of the LEN field must be added to the string length, as shown in the program example.



3. Open tags and click the Edit tab.
4. Insert EMS_EMAIL and EmailDstStr.

   Both tags are of the type EmailString. These tags can be created later when the MSG instruction is inserted. The text of the email does not have to be static. You can program a controller project to collect specific data to be sent in an email. For more information on using ladder logic to manipulate string data, see the Logix5000 Controllers Common Procedures Programming Manual, publication 1756-PM001.



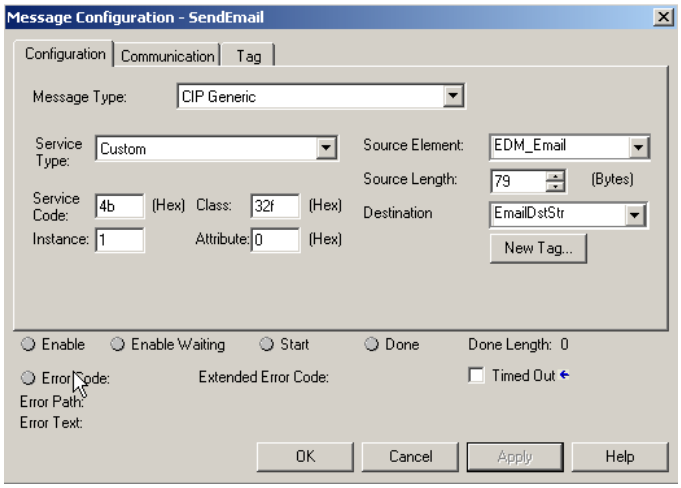
5. Create a tag of the type MESSAGE; our example uses a tag named SendEmail_EDM.

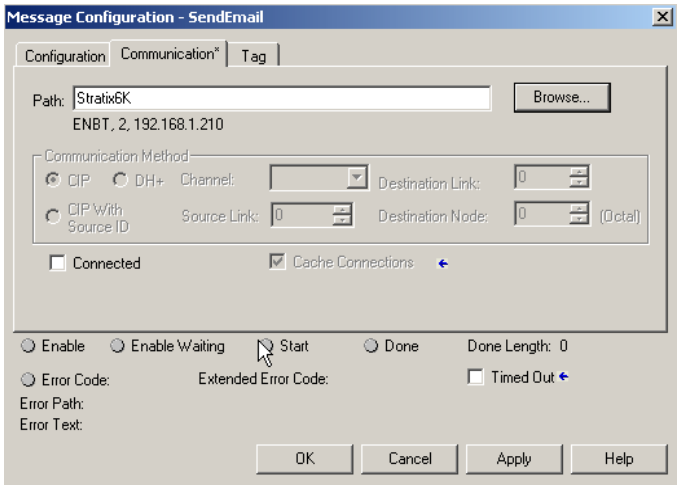
6. Set the message type to generic CIP, service code object class 32f, instance 1, attribute 0; note that the source length is the length of the string in the EMS_EMAIL tag + 4.

IMPORTANT Be sure to enter the correct communication path. Click the Communication tab and then Browse. Select the name associated with your 1783-EMS switch from the I/O tree and click Apply.

In this example, the name is Stratix6K. For more information on configuring the path of a MSG instruction, see the Logix Controllers General Instructions Reference Manual, publication 1756-RM003.

If an error occurs, you see the Error Code (Extended Error Code). The result code from the SMTP server is stored in the EmailDstStr tag. See page 33 for a table of status codes.



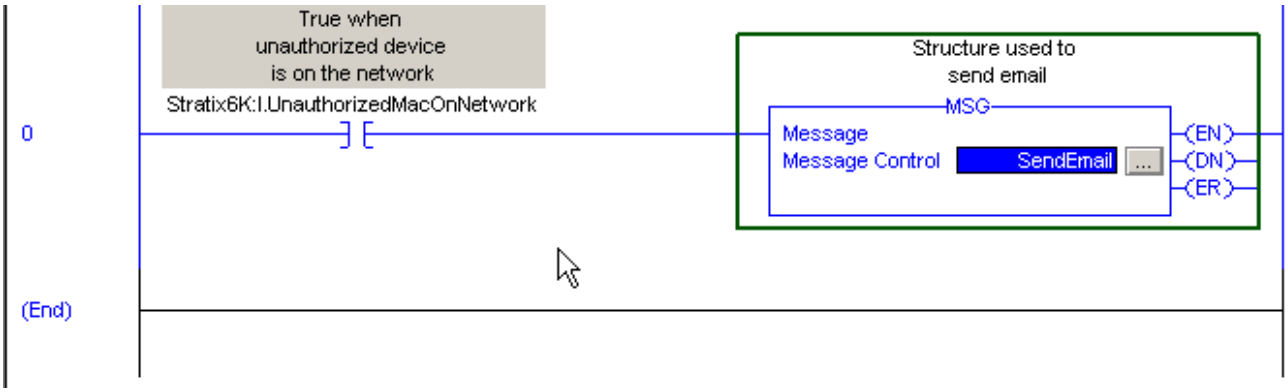


7. Open your routine window (for example, MainRoutine) and insert an MSG instruction.
8. Select the SendEmail MESSAGE tag.
9. Double-click the MSG block and choose source (EMS_EMAIL) and destination (EmailDstStr) tags.

   In our example, we have GetAttributeValue and SetAttributeValue tags and GetAttribute/SetAttribute MESSAGE tags for individual attribute handling.

   Message sending is triggered by the trigger_send BOOL tag. The message is sent when you press Ctrl+T in the rung or set the tag value to 1.

   The figure shows an example of a program that sends an email when any unauthorized MAC is detected by the 1783-EMS switch.

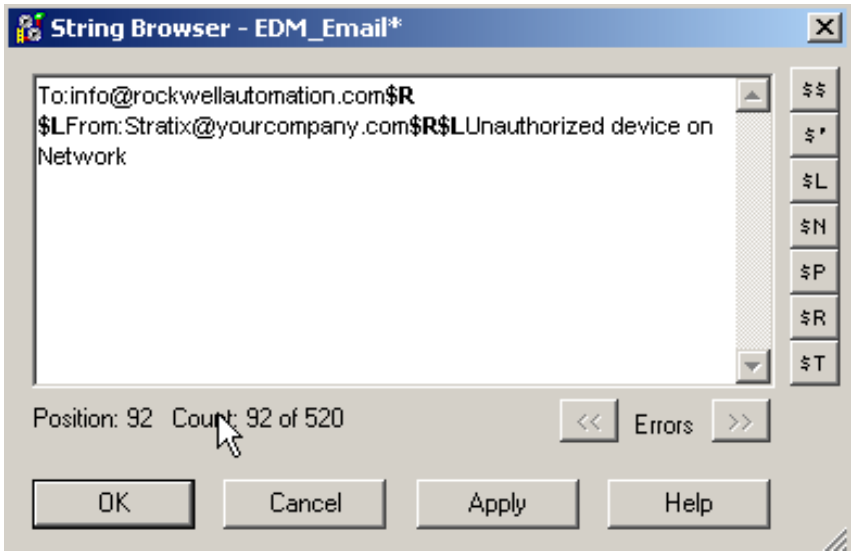


Enter the Text of the Email Message

Use the string browser to enter the text of the email. In the example, you enter the email text into the EWEB_EMAIL tag. To include To:, From:, and Subject: fields in the email, use <CR><LF> symbols to separate each of these fields. The To: and From fields are required; the Subject: field is optional. Use a second set of <CR><LF> symbols after the last one of these fields you enter.

EXAMPLE	To: email address of recipient rl
	From: email address of sender$r$l
	Subject: subject of message rlrl
	body of email message

The maximum length of an email message is 520 characters. An additional 4-byte string-length value is added to the tag. As a result, the maximum source length is 524 characters.



TIP <CR><LF> characters are coded as rl.

Send an SMS from the Controller

Text messages are sent in the same way as a normal email message. The only difference is the recipient in the To: field is a telephone number instead of an email address.

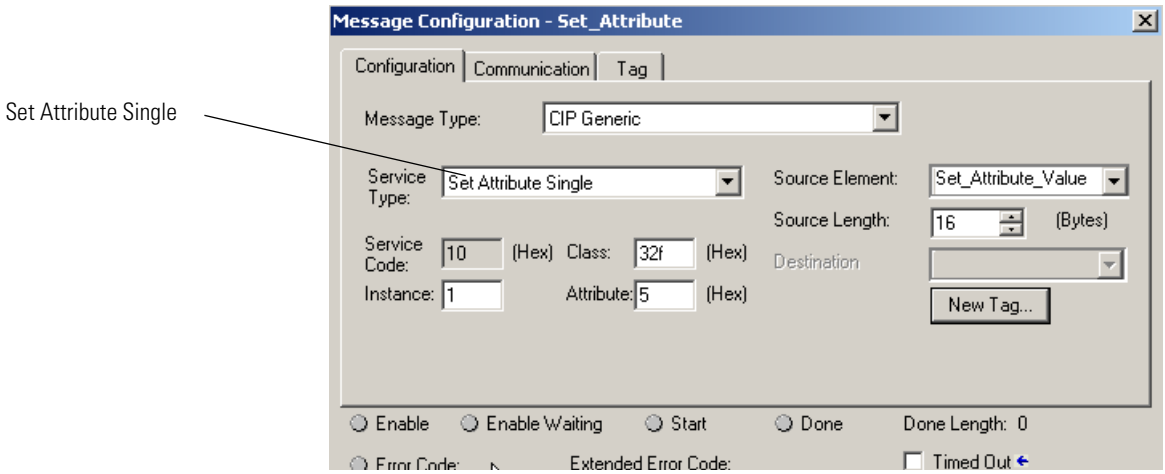
The email format for sending text messages by using a SMS gateway service is shown as follows:

- api_id:nnnnnnn$r$l
- user:xxxxx$r$l
- password:ppppp$r$l
- to:cell_phone#rl
- text:Simple text$r$l
- text:on all$r$l
- text:3 lines. rl
- text:Sms signature - 1234567890123456rl

Modify the SMTP Server Setup in a Controller Program

You can modify the SMTP server you use to send email by setting class 32f, attribute #5.

IMPORTANT Set Attribute Single uses service code 10.



Email and SMS Error Codes

Examine the destination element of the email MSG to see if the email was successfully delivered to the mail relay server.

This indicates that the mail relay server placed the email message in a queue for delivery. It does not mean the intended recipient successfully received the email message.

This table shows possible codes that could be in this destination element.

Table 3 - Error Codes

Error Code (hex)	Extended-error Code (hex)	Description
0x00	None	Delivery successful to the mail relay server.
0x02		Resource unavailable. The email object was unable to obtain memory resources to initiate the SMTP session.
0x08		Unsupported Service Request. Make sure the service code is 0x4B and the class is 0x32F.
0x11		Reply data too large. The Destination string must reserve space for the SMTP server reply message. The reply can be 470 bytes max.
0x13		Configuration data size too short. The Source Length is less than the Source Element string size plus the 4-byte length. The Source Length must equal the Source Element string size + 4.
0x15		Configuration data size too large. The Source Length is greater than the Source Element string size plus the 4-byte length. The Source Length must equal the Source Element string size + 4.
0x19		Data write failure. An error occurred when attempting to write the SMTP server address (attribute 4) to nonvolatile memory.
0xFF	0x0100	Error returned by email server; check the Destination string for reason. The email message was not queued for delivery.
	0x0101	SMTP mail server not configured. Attribute 5 was not set with a SMTP server address.
	0x0102	To: address not specified. Attribute 1 was not set with a To: address with no To: field header in the email body.
	0x0103	0x0103 From: address not specified. Attribute 2 was not set with a From: address **and** no From: field header in the email body.

Table 3 - Error Codes

Error Code (hex)	Extended-error Code (hex)	Description
0xFF	0x0104	Unable to connect to SMTP mail server set in Attribute 5. If the mail server address is a hostname, make sure that the device supports DNS and a Name Server is configured. If the hostname is not fully qualified, for example, mailhost and not mailhost.xx.yy.com, then the domain must be configured as xx.yy.com. Try ping <mail server address> to be sure the mail server is reachable from your network. Also try telnet <mail server address> 25 to attempt to initiate a SMTP session with the mail server via telnet over port 25. If you connect, enter 'QUIT'.
	0x0105	Communication error with SMTP mail server. An error occurred after the initial connection with the SMTP mail server. See the ASCII text following the error code for more details on the type of error.
	0x0106	SMTP mail server hostname DNS query did not complete. A previous send service request with a hostname as the SMTP mail server address did not yet complete. Note that a timeout for a DNS lookup with an invalid hostname can take up to 3 min. Long timeouts can also occur if a domain name or name server is not configured correctly.
	0x0107	No DNS entry.
	0x0108	DNS not configured.
	0x0109	GW not configured.
	0x0110	System fail (socket error).

Diagnostics

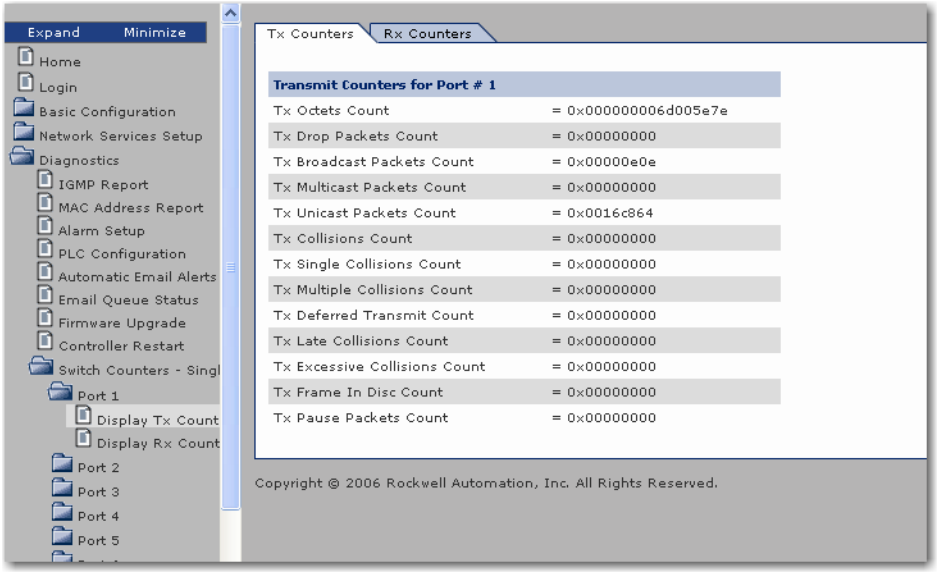
What This Chapter Contains

This chapter provides information about diagnostics to include the following:

- Display switch counters
- IGMP report
- MAC address report
- Alarm setup
- Controller restart
- PLC configuration
- Automatic email alerts
- Email queue status
- Firmware upgrade

Display Switch Counters

This option gives you various counts from the switch, as shown in the figure that shows a typical counter page.



Counters are displayed in hex, where an octet equals 8 bits. TX counters include the following:

- Tx Octet Count -Total of transmitted good octets from the selected port
- Tx Drop Pkts Count - Packet is not acknowledged by the receiving host
- Tx BroadcastPkts Count - Number of good packets sent with destination of everyone. Receivers are unspecified
- Tx MulticastPkts Count - Packets sent to members of multicast group. One terminal to many host
- Tx UnicastPkts Count - In contrast with multicast, consist of one terminal transmitting to one host
- Tx Collisions Count - Two terminals transmit packets at the same time causing them to collide. Collision Count should be very low. Collisions could indicate a faulty device on the network
- Tx SingleCollision Count - Packet collides with one other terminal's transmitted packet
- Tx MultipleCollision Count - Packet collides with more than one terminal's transmitted packets
- Tx DeferredTransmit Count - Number of packets delayed because the network is busy (the higher the number the less deterministic your network)
- Tx LateCollision Count - Collision is detected later than the 512 bits into the packet transmittion
- Tx ExcessiveCollision Count - Packets not transmitted because the packet experienced 16 failed attempts
- Tx FrameInDisc Count - Network device is not acting in compliance with a flow control request
- Tx PausePkts Count - Pause frames sent by this port

RX counters include the following:

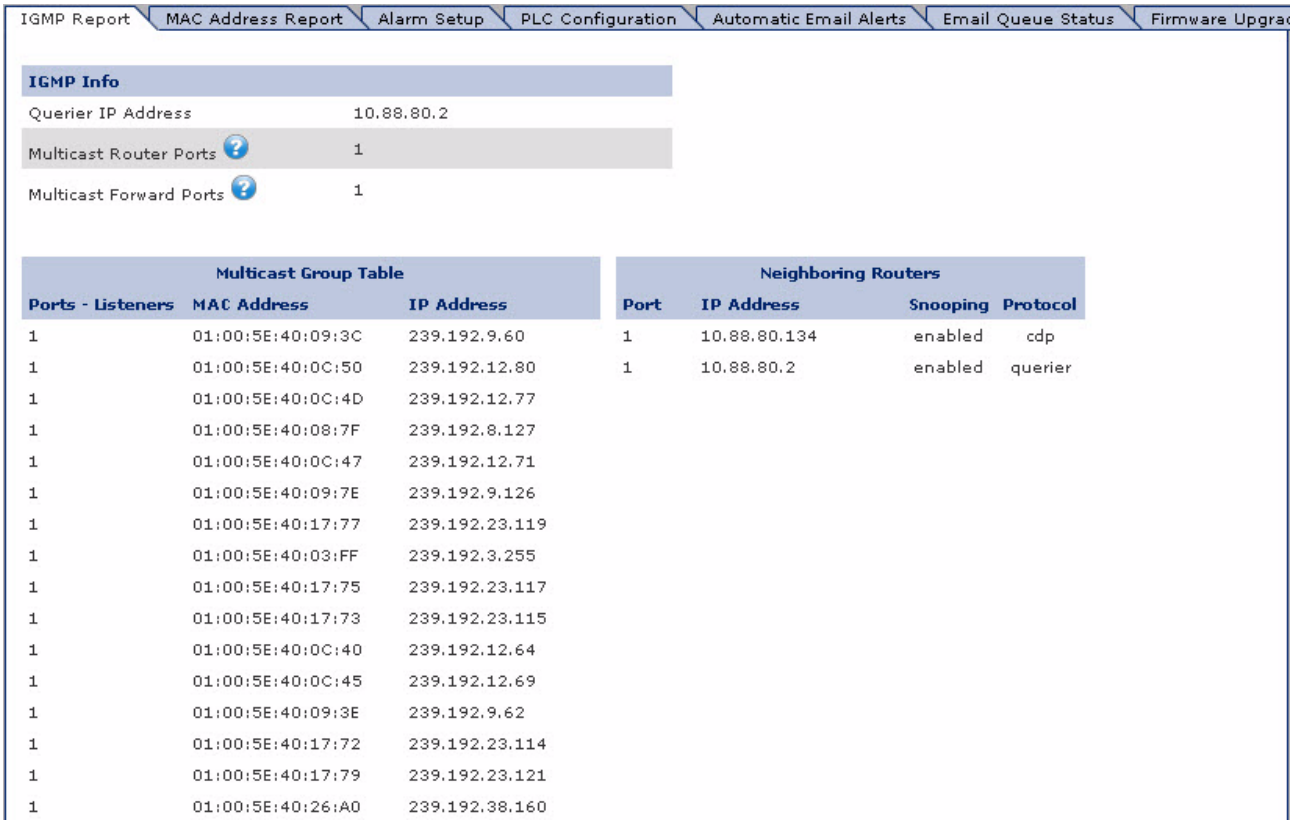
- Rx Octets - Total good octets received on selected port
- Rx Undersize Pkts - Good packets that are under 64 octets long
- Rx Pause Pkts - Pause packets received by this port
- Pkts64 Octets - Data packets = 512 bits
- Pkts65to127 Octets - Data packets = 520...1016 bits
- Pkts128to255 Octet - Data packets = 1024...2040 bits
- Pkts256to511 Octet - Data packets = 2048...4088 bits
- Pkts512to1023 Octet - Data packets = 4096...8184 bits
- Pkts1024to1522 Octet - Data packets = 8192...12,176 bits
- RxOversize Pkts - Packets over 12,176 bits or 1523...1536 Octets
- RxJabbers Pkts - Packets longer than 1522 octets and have an error, usually caused by a faulty device
- RxAlignment Errors - Packets between 64 and 1522 octets and have an error

- RxFCS Errors - Packets received (between 645 and 1522 octets) with FCS (frame check sequence) not matching
- RXGoodPkts - Octets received with no errors
- RXDrop Pkts - Packets dropped due to lack of resources (bandwidth, input buffer)
- RxUnicast Pkts - Unicast packet received (only one receiving host)
- RxMulticast Pkts - Multicast packets received (many receiving hosts)
- RxBroadcast Pkts - Received by all hosts on the network
- RxSAChanges - Number of times the Source address of a good packet has changed value. A count greater than 1 indicates a repeater based network
- RxFragments - Packets received less than 64 octets
- RxExcessSizeDisc - Packets received greater than 1536 octets and discarded due to excessive length
- RxSymbolError - Invalid data symbol detected

IGMP Report

The IGMP protocol manages membership in IP multicast groups. Only hosts in that group receive the packet. The IGMP protocol prevents a multicast packet from behaving like a broadcast (transmitted to all network hosts).

The switch manages the task of forming a table of IGMP groups and hosts belonging to those groups. The table can be displayed by selecting Diagnostics and IGMP report.



IGMP Info

Querier IP Address	10.88.80.2
Multicast Router Ports	1
Multicast Forward Ports	1

Multicast Group Table

Ports - Listeners	MAC Address	IP Address
1	01:00:5E:40:09:3C	239.192.9.60
1	01:00:5E:40:0C:50	239.192.12.80
1	01:00:5E:40:0C:4D	239.192.12.77
1	01:00:5E:40:08:7F	239.192.8.127
1	01:00:5E:40:0C:47	239.192.12.71
1	01:00:5E:40:09:7E	239.192.9.126
1	01:00:5E:40:17:77	239.192.23.119
1	01:00:5E:40:03:FF	239.192.3.255
1	01:00:5E:40:17:75	239.192.23.117
1	01:00:5E:40:17:73	239.192.23.115
1	01:00:5E:40:0C:40	239.192.12.64
1	01:00:5E:40:0C:45	239.192.12.69
1	01:00:5E:40:09:3E	239.192.9.62
1	01:00:5E:40:17:72	239.192.23.114
1	01:00:5E:40:17:79	239.192.23.121
1	01:00:5E:40:26:A0	239.192.38.160

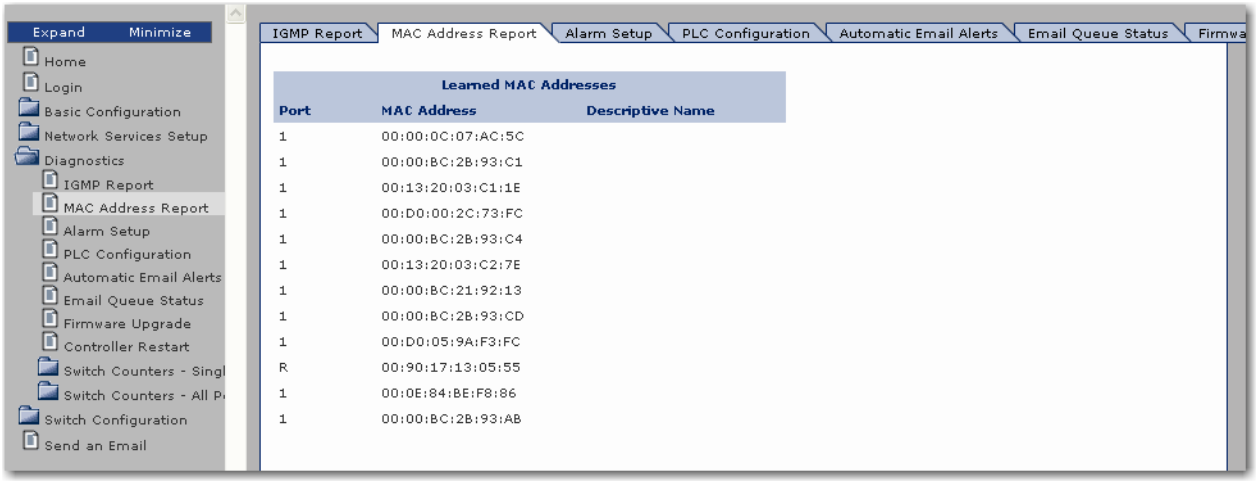
Neighboring Routers

Port	IP Address	Snooping	Protocol
1	10.88.80.134	enabled	cdp
1	10.88.80.2	enabled	querier

MAC Address Report

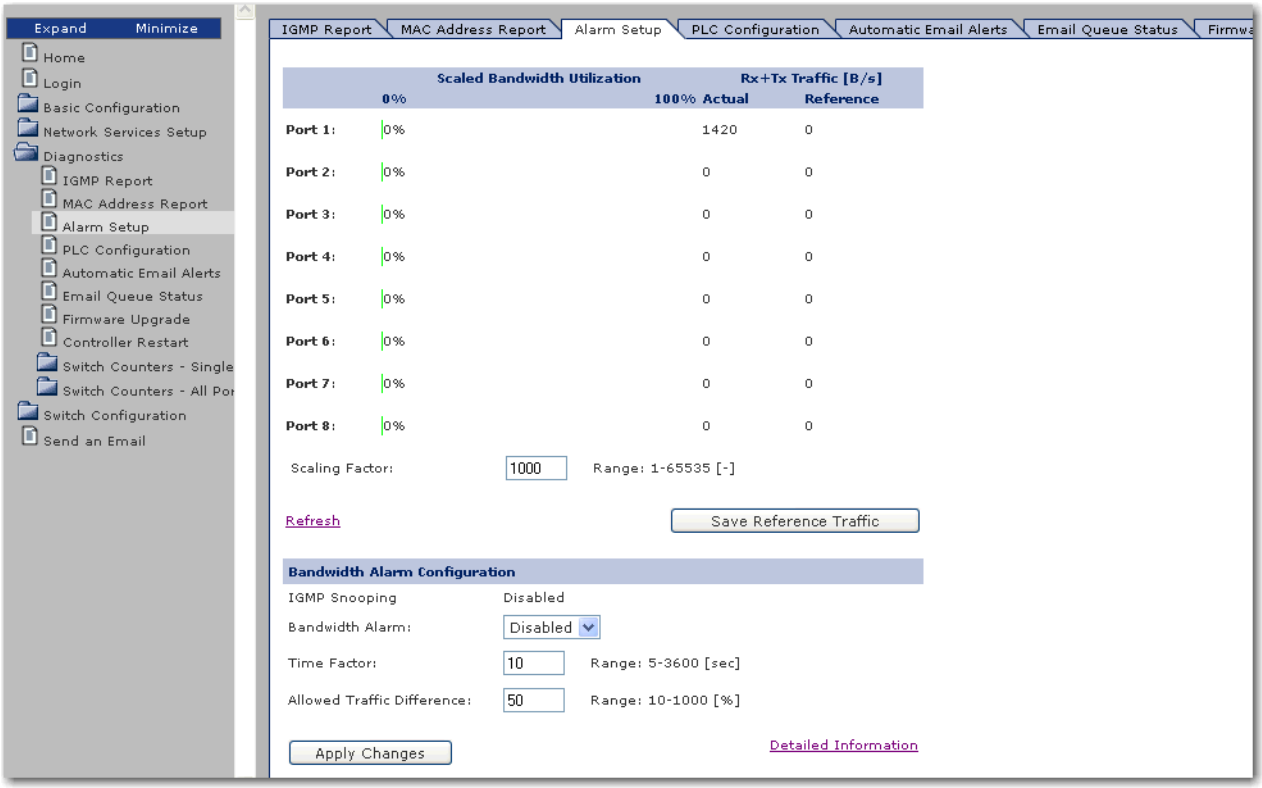
All Ethernet equipment has a MAC address (hardware address). These can be displayed by selecting Diagnostics and MAC Address Report. A pool of MAC addresses is assigned to each Ethernet product manufacturer.

For example, Allen-Bradley Ethernet equipment MAC addresses usually begin with 00:00:BC.



Alarm Setup

Alarm Setup is used to see the bandwidth on each port.



The bar turns red when the bandwidth is out of range. On this page, you see the following:

- Refresh - Used to refresh your screen with the latest information, the screen automatically refreshes at the rate configured under Basic Configuration and Refresh Rate.
- Save Traffic Reference - Used as a benchmark for the system network. Click this button when the network is running as it should in production. The 1783-EMS switch calculates the difference between the reference point and the current levels of traffic for each port. If it varies to an alarm state, it sends an input to the controller indicating the port number. See Appendix D for the complete I/O table for the 1783-EMS switch.
- Bandwidth Alarm - Disabled by default, when enabled calculates the difference between the reference point of the network and the current rate of traffic. If a variation exceeding the allowed traffic difference occurs, it sends an input to the controller indicating the port number where the bandwidth shortage is occurring.
- Scaling Factor - Most applications have such a small amount of traffic that the bandwidth is only a fraction of a percent. The scaling factor provides a more visual representation of the traffic on each port. See the detailed information link on the Alarm Setup page for more information on how the bandwidth is calculated.
- Time Factor - The length of time packets are counted to determine the bandwidth percentage for each port. See the detailed information link on the Alarm Setup page for more information on how the bandwidth is calculated.
- Allowed Traffic Difference - The percentage that the current traffic level can vary in either direction, from the stored reference value, before an input is sent to the controller.

Switch Restart

This selection restarts the 1783-EMS switch. It is useful when making configuration changes. The 1783-EMS switch must be restarted for some changes to take effect.

PLC Configuration

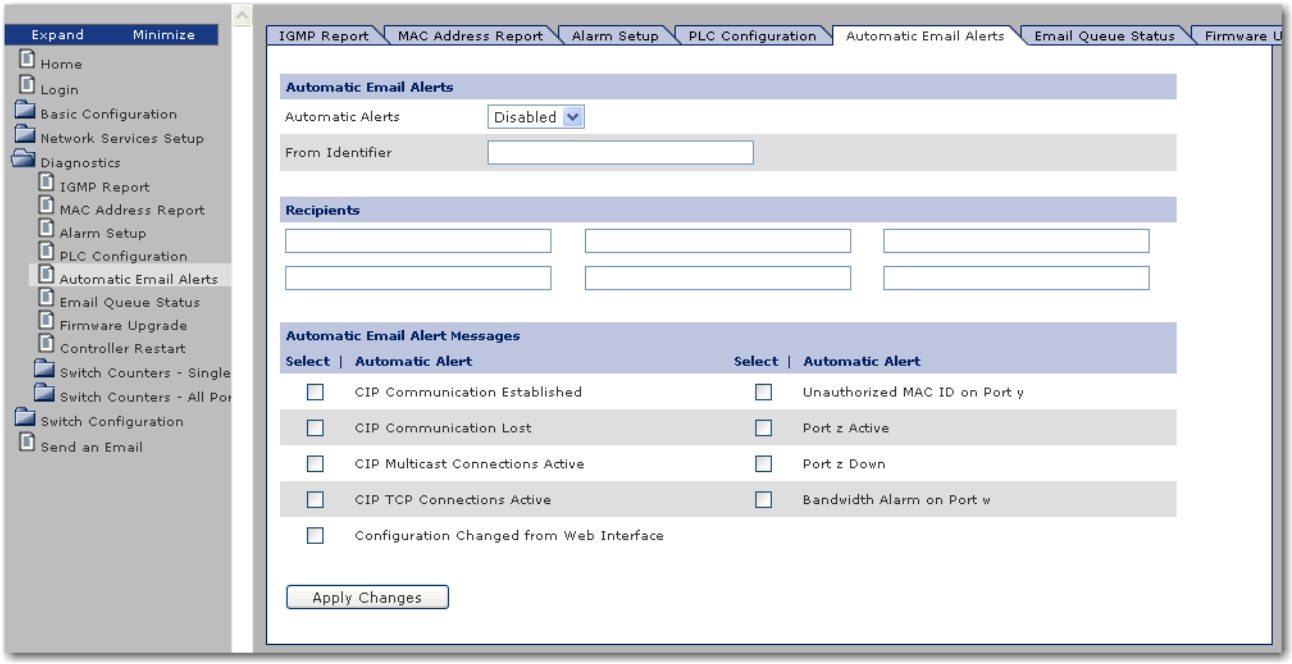
This is read-only information about the 1783-EMS switch, relating to the PLC connection to include EDS file name, multicast address used by the 1783-EMS switch, and status information on the 1783-EMS switch.

Automatic Email Alerts

The 1783-EMS switch can be configured to automatically send system alert messages via the email client to a recipient's email address, mobile telephone, or portable wireless device.

This can be useful in a critical control network to alert network personnel of an anomaly in the network as it occurs.

Events in the network like unauthorized MAC ID's, bandwidth utilization alarms, or port down can be communicated automatically to the responsible supervisor.



To enable this capability, use this procedure.

1. Click the Diagnostics tab and Automatic Alerts.

   The Alert page opens.

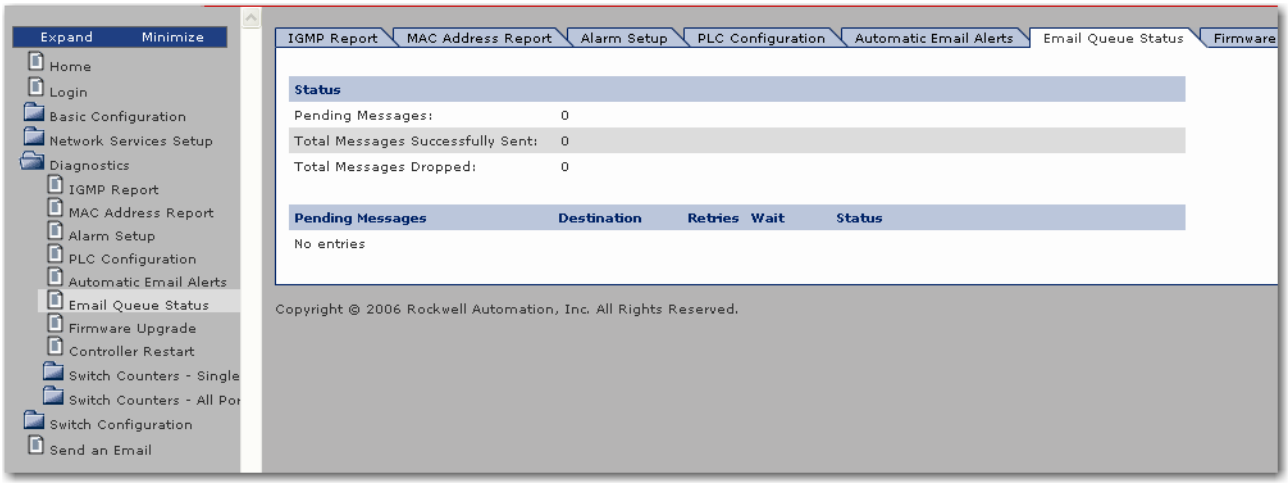
2. Enter up to six email addresses or mobile telephone numbers in the Recipients list.
3. Click Save Recipients.
4. Click which alerts you want to automatically trigger a message by clicking the check box next to the alert; you can select any number of automatic alerts from the list.
5. From the top of the page, click Automatic Alerts and from the bottom of the page, click Apply Changes.

   A dialog box shows the Automatic Alert Setup page.

Email Queue Status

This gives status on the email queue, including the following:

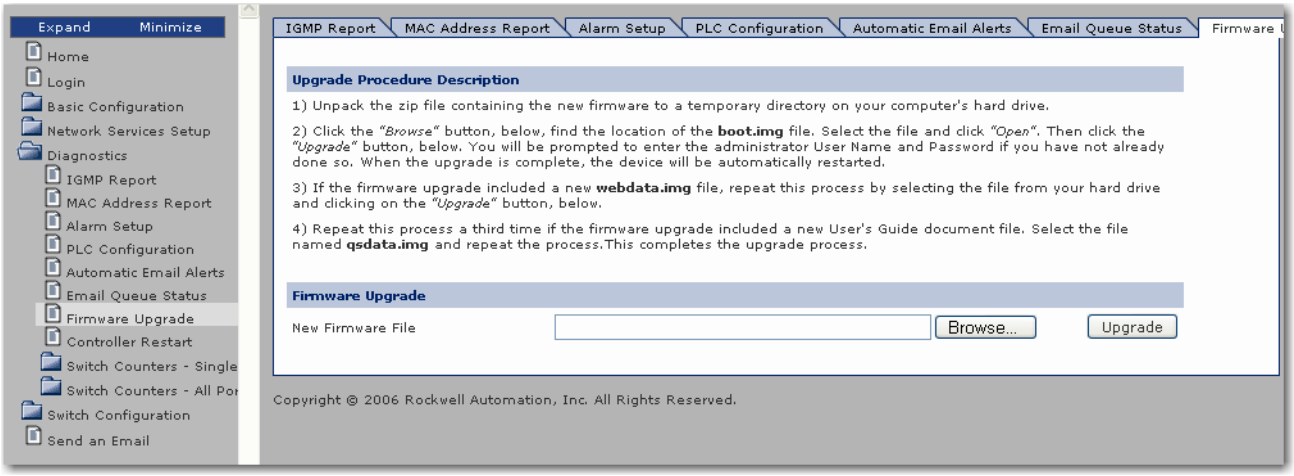
- Number of emails sent successfully
- Any dropped messages
- Pending messages



Upgrade Firmware

Upgrade firmware of the 1783-EMS switch by using:

- the configuration utility, as described in Appendix A.
- the Firmware Upgrade web page as shown in the figure.



Notes:

Switch Management

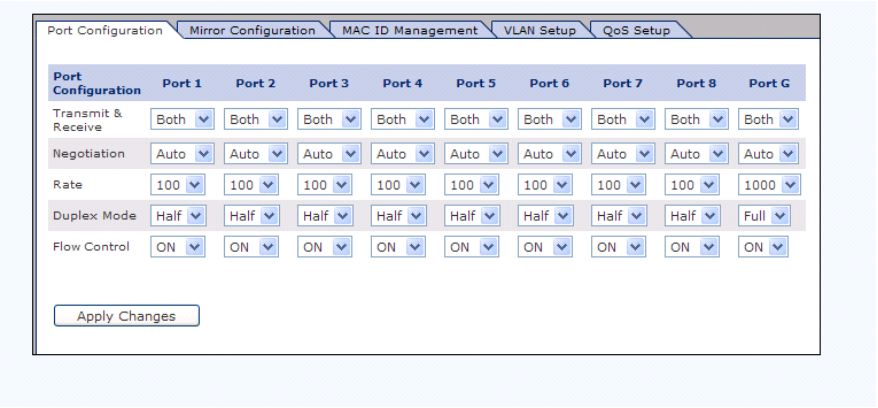
What This Chapter Contains

This chapter provides information about switch management and includes the following:

- Port configuration
- Mirror configuration
- MAC ID management
- VLAN setup
- QoS setup

Port Configuration

This device auto-negotiates most of its settings to ease the configuration process. These settings can be manually set by using this menu with these options as follows.



- Transmit and Receive - Default is Both. Choices are None, TX, RX, Both. Controls communication on the selected port.
- Negotiation - Default is Auto. Choices are None and Auto. Turn off auto-negotiation here if the port is to be manually configured.
- Rate - Auto-negotiates 10 or 100 mbit/s based on the connected device, must be manually selected if the negotiation parameter is changed to None.
- Duplex mode - Auto-negotiates half or full based on the connected device. Must be manually selected if the negotiation parameter is changed to None.
- Flow Control - Default is On. Prevents port buffers from over filling.

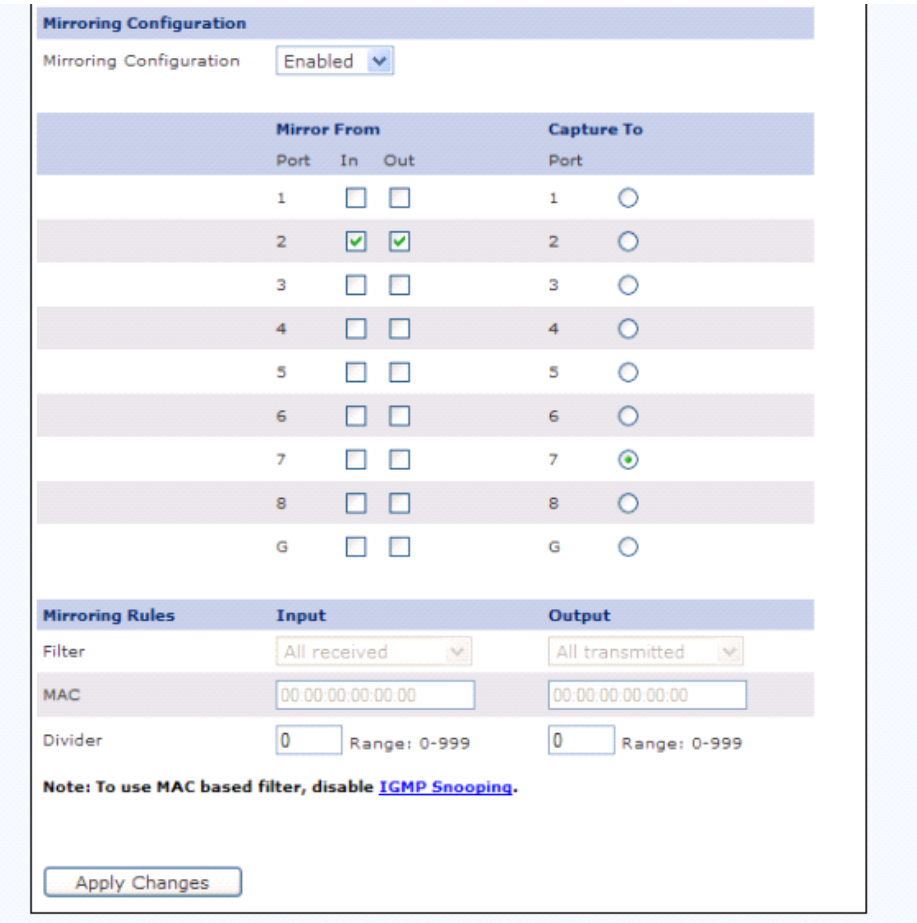
TIP Ports set for autonegotiation default to half duplex if the connected devices are not configured to autonegotiate.

TIP Turning off autonegotiation disables the auto-MDIX feature. In this case, crossover cables may be needed to establish communication to the connected device.

Mirror Configuration

This section configures the rules or filters for port mirroring. Filters can be configured to capture packets from certain devices (MAC addresses). You can also filter to capture packets with a certain destination address. To enable port mirror, follow this procedure.

1. Click Switch Configuration and Mirror Configuration to enable port mirroring.

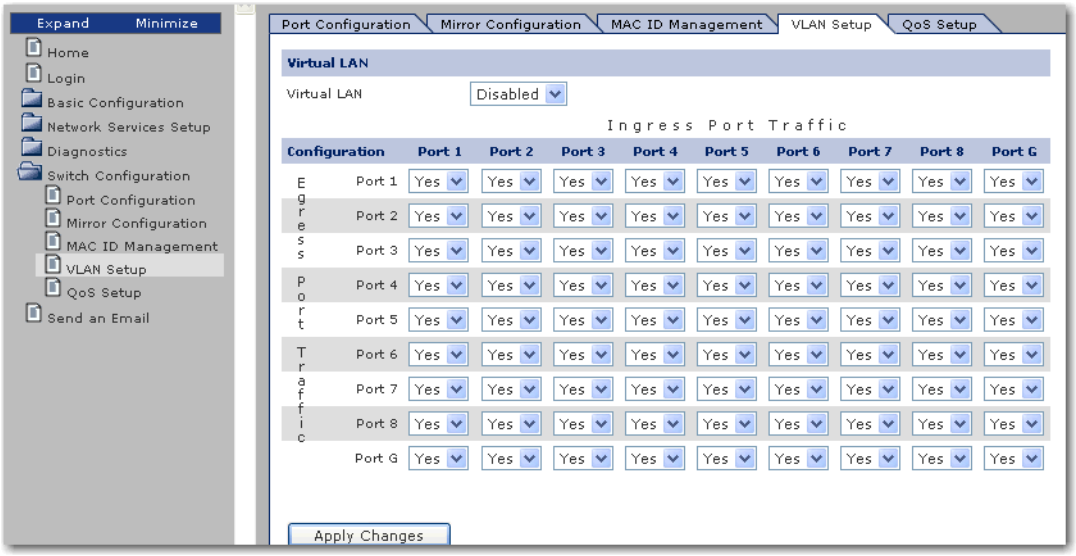


- Authorize MAC - Click to authorize the MAC ID that is typed in the box to the left of this button.
- Remove All - Click to remove all authorized MAC IDs from the authorized list.

- Remove Selected - Click to remove the selected MAC ID from the authorized list.
- Learned MAC Addresses - This table lists the MAC IDs detected on the network by the 1783-EMS switch. The port number and MAC ID are shown for each device detected on the network. This list is built automatically by the 1783-EMS switch.
- Authorized MAC Addresses - This list indicates which MAC IDs are allowed on the network. You must create this list. Whenever a new device comes online, this list is checked to determine if the device is authorized. If the device is not authorized, an input is sent the controller. (See Appendix D for the I/O table of the 1783-EMS switch.)

VLAN Setup

Used when network bandwidth becomes critical, VLAN is used to eliminate traffic caused by multicast and broadcast Ethernet traffic. With this feature, we can partition the switch ports into different private virtual networks.



For each received packet, the switch resolves the destination address and determines the appropriate port. The VLAN configuration is then checked to see if the destination address is configured to receive traffic from the source port.

For example, if a FLEX I/O module is connected to port 2 on the 1783-EMS08T switch, the I/O module is communicating with a ControlLogix module on port 3. We want the ControlLogix module on port 3 to receive traffic from the FLEX I/O module on port 2. VLAN can be used to prevent other devices on the network from receiving packets from the FLEX I/O module.

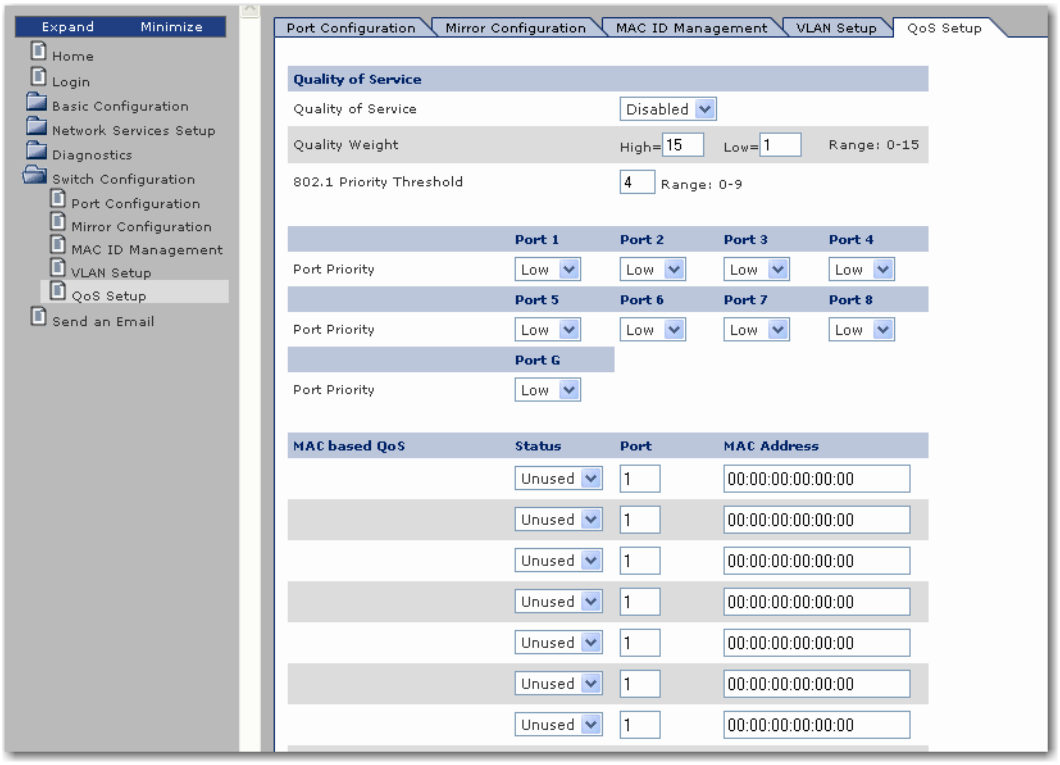
Our VLAN configuration would look as shown in the figure. The Egress port (source port 2) transmits to the Ingress port (destination port) 3.

QoS Setup

QoS (quality of service) provides for the classification of Ethernet traffic into high and low priority queues. High priority packets are forwarded to their destination address before a low priority packet.

WARNING: I/O devices do not support the QoS protocol.

Packets can be classified as high or low by MAC address, 802.1p priority tag, and/or port ID.



Note these options:

- Port-based Priority - When changed to High, the incoming traffic for that port is considered high priority.
- High/Low Quality Weight - Establishes algorithm for switching between high and low priority queues. The default value of 15/1 sends 15 packets of high priority traffic, then sends 1 packet of low priority traffic.
- MAC-based Priority - Incoming packets are cross referenced with the MAC based QoS list and put into the high priority queue if the destination address is on the list.
- 802.1p Priority - Each incoming packet is examined for a valid 802.1p priority tag. If present, the packet is put in the high priority queue if the priority tag exceeds the QoS Priority Threshold.

Notes:

Upgrade Firmware

What This Appendix Contains

This appendix provides information about how to upgrade 1783-EMS firmware.

WARNING: The 1783-EMS switch cycles power automatically at the end of the flash procedure.
Any switching activity is temporarily interrupted.

Upgrade with the HTML Management Interface

Use this procedure to upgrade the 1783-EMS switch by using the HTML management interface. The switch can be upgraded from its own HTML interface.

1. Click Diagnostics and Firmware to access this feature and display the dialog box.
2. Click Browse on this page and select the firmware (boot.img) file.
3. Click Upgrade.
4. Complete user name and password.

   By default the user name is 'uploader' (lower-case) and the password is 'PASSWORD' (all caps). Change the user name and password by selecting Basic Configuration and Set Security from the HTML interface of the 1783-EMS switch.
5. Check the firmware revision when the upgrade is complete to make sure the upgrade was successful.

   You can use the same process to upgrade the web browser (webdata.img) and the embedded manual (qsdata.img) files.

Notes:

User Name and Password Rules

What This Appendix Contains

This appendix provides information about user name and password characters and rules.

User Name and Password Characters

Use these characters for user name and password: 'A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'J', 'K', 'L', 'M','N', O', 'P', 'Q', 'R', 'S', 'T', 'U', 'V', 'W', 'X', 'Y', 'Z','a', 'b', 'c', 'd', 'e', 'f', 'g', 'h, 'i, 'j', 'k, 'l', 'm','n','o', 'p', 'q','r', 's, 't', 'u, 'v', 'w', 'x', 'y', 'z', '0', '1', '2', '3', '4', '5', '6', '7', '8', '9', '-', '.', ',' .

Other Rules

Follow these rules concerning the user name and password:

- User name: from 0...20 characters long, spaces count as a character
- Password: from 0...20 characters long, spaces count as a character

Notes:

Factory Reset

What This Appendix Contains

This appendix provides information about how to accomplish a factory reset, setting the 1783-EMS switch to the factory default settings. You have two levels of reset as described in this appendix. To complete the reset, you need a:

- small screwdriver.
- means to turn off the power to the switch.

Access the Reset Button

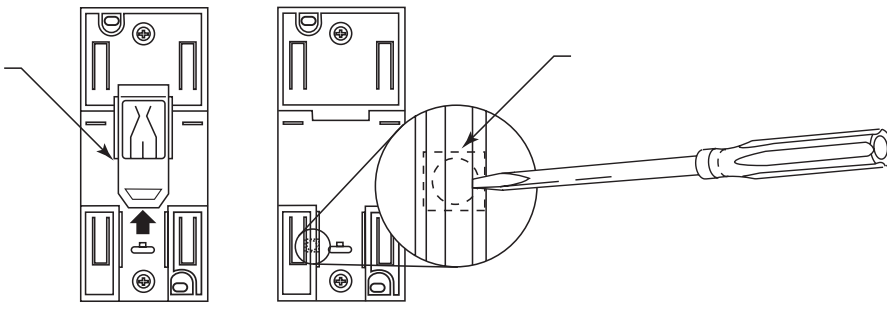
Complete the reset by using a small button located on the back of the switch.

To access the button, carefully remove the plastic DIN-rail clip by gently lifting the tab in the center with a screwdriver and sliding the clip upward.

The button is located inside the left slot, opened by the removal of the plastic DIN-rail clip.

The figure on the left shows the DIN rail clip that you remove to access the reset button. The figure on the right shows placement of the screwdriver on the reset button located inside the slot.

Figure 1 - Reset Button



Reset IP Address

To reset only the IP address, use this procedure.

1. With power applied, push the reset button with a small screwdriver.
2. Hold the button in for 30 seconds.
3. Cycle power to complete the IP reset.

   Your IP address defaults to 192.168.1.1.

Change Settings to Default

To change all settings back to default, use this procedure.

1. Remove power.
2. Push the reset button with a small screwdriver.
3. Apply power while continuing to hold the reset button.
4. Hold the button in for 30 seconds.
5. Cycle power to complete the reset.

Data Layout

What This Appendix Contains

This appendix provides information about the data layout for DINT input and output bits.

DINT Input

These tables show the data layout.

Bit	Bit
0	Unauthorized MAC ID on Network
1	Unauthorized MAC ID on Port 1
2	Unauthorized MAC ID on Port 2
3	Unauthorized MAC ID on Port 3
4	Unauthorized MAC ID on Port 4
5	Unauthorized MAC ID on Port 5
6	Unauthorized MAC ID on Port 6
7	Unauthorized MAC ID on Port 7
8	Unauthorized MAC ID on Port 8
9	Device Connected to Port 1(Link Active)
10	Device Connected to Port 2
11	Device Connected to Port 3
12	Device Connected to Port 4
13	Device Connected to Port 5
14	Device Connected to Port 6
15	device Connected to Port 7
16	Device Connected to Port 8
17	Bandwidth Alarm on Port 1
18	Bandwidth Alarm on Port 2
19	Bandwidth Alarm on Port 3
20	Bandwidth Alarm on Port 4
21	Bandwidth Alarm on Port 5
22	Bandwidth Alarm on Port 6
23	Bandwidth Alarm on Port 7
24	Bandwidth Alarm on Port 8
25	Port Shut Off by PLC
26	IGMP Status
27…31	Reserved

Word	Description
Word 1	Multicast Connections Active
Word 2	TCP Connections Active
Word 3	Bandwidth Used Port 1 (%)
Word 4	Bandwidth Used Port 2 (%)
Word 5	Bandwidth Used Port 3 (%)
Word 6	Bandwidth Used Port 4 (%)
Word 7	Bandwidth Used Port 5 (%)
Word 8	Bandwidth Used Port 6 (%)
Word 9	Bandwidth Used Port 7 (%)
Word 10	Bandwidth Used Port 8 (%)
Word 11	Bandwidth Scaling Factor

DINT Output

This table shows the data layout.

Bit	Bit
0	Shut down All Ports (disables all comms)
1	Shut down Port 1
2	Shut down Port 2
3	Shut down Port 3
4	Shut down Port 4
5	Shut down Port 5
6	Shut down Port 6
7	Shut down Port 7
8	Shut down Port 8
9…31	Reserved

Work with RSLogix 5000 Software, Version 13 or Earlier

What This Appendix Contains

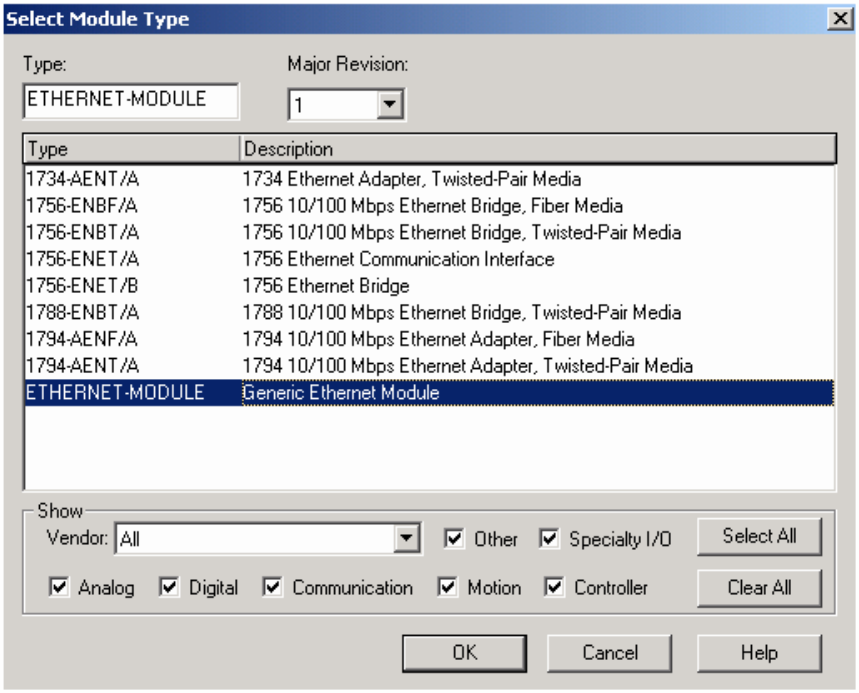
This appendix provides information about how to add the 1783-EMS switch to the RSLogix 5000 software, version 13 or earlier.

Add Modules

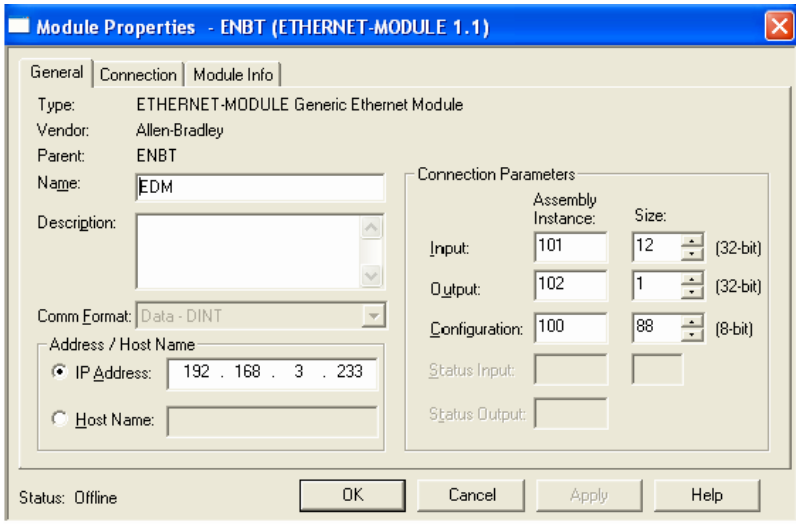
Use the module with the Logix platform only. Use these steps to add it to your RSLogix 5000 software, version 13 or earlier, by using the generic profile.

1. Right-click your Logix Ethernet card under the I/O configuration section of your program and choose New Module.

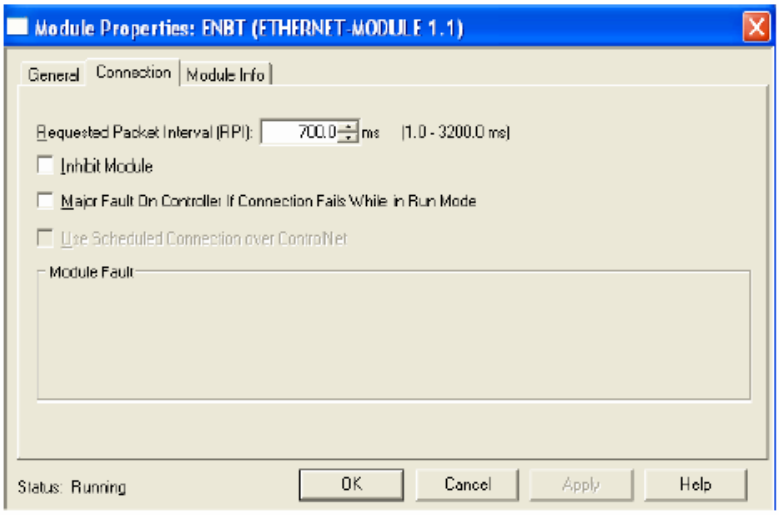
2. From the list, choose Generic Ethernet Module.



3. From the Module Properties dialog box, complete the following:
   a. Enter a name for the 1783-EMS switch.
   b. Enter the IP address of the 1783-EMS switch.
   c. Enter the Assembly instance and size for Input, Output, and Configuration, as shown in the figure.
   d. Click OK.



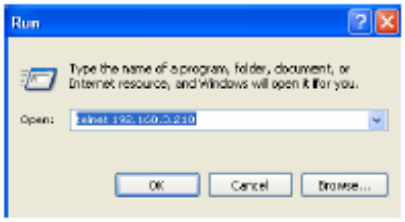
4. From the Module Properties dialog box, enter an RPI of 100...700 ms, (we recommend 700 ms), and click OK.



You see the 1783-EMS switch under your I/O configuration.

You can now use the 1783-EMS switch in your program. See Appendix D for the data layout.

5. Set up the 1783-EMS switch to ignore configuration tags in Logix software by using this procedure.



   a. Telnet into your 1783-EMS switch by clicking Start and Run and typing telnet followed by the IP address.
   b. Type the password ('PASSWORD' by default) to log on.
   c. Use keyboard arrows to scroll to Network Services Setup and press Enter.
   d. Scroll to CIP configuration and press Enter.
   e. Select NoCfg and press Enter.
   f. Press ESC twice to get back to the main menu.
   g. Scroll to Diagnostics and press enter.
   h. Highlight Controller Restart and press enter.

      This power cycles your 1783-EMS switch and all traffic going through the switch is interrupted.

Work with RSLogix 5000 Software, Version 15 or Later

What This Appendix Contains

This appendix provides information about how to add the 1783-EMS switch into a Logix application by using its Add-on Profile.

Use the Add-on Profile

To add the switch to your RSLogix 5000 software, version 15 or later, and to your application by using the Add-on Profile, follow this procedure.

1. Install the Add-on Profile onto the computer that you will use to program with RSLogix 5000 software..

IMPORTANT You must install the Add-on Profile for the switch before using the switch in the Logix programming environment.

2. Check the installation documentation included with the Add-on Profile to determine the necessary firmware revision for the 1783-EMS switch.
   - If you do not have the minimum revision of 1783-EMS firmware, upgrade your switch before proceeding, referring, if necessary, to Appendix A, which covers the upgrade procedure for the 1783-EMS switch.
   - To obtain the latest firmware, check the 1783-EMS website or contact Technical Support.

   a. Save the zip file on your hard disk drive and unzip the Add-on Profile archive.

   b. Run the batch file 'install' that is located in the root directory.

      The installation wizard for Add-on Profiles opens.

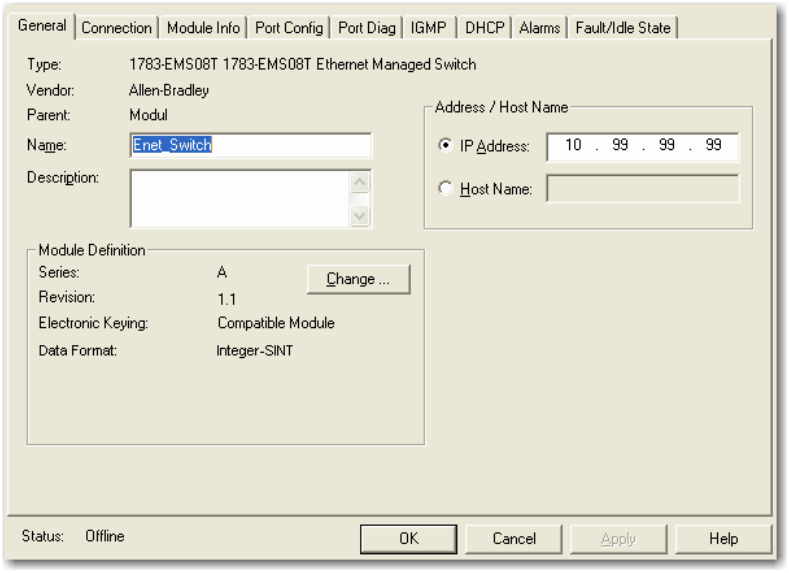
   c. Agree to the licensing terms and then click Next and Next again to install the Add-on Profile.

      Once the Add-on Profile is installed, it can be used in an RSLogix 5000 program, version 15 and later.

3. Add the 1783-EMS switch into your RSLogix program, following this procedure.
   a. Right-click your Logix Ethernet card under the I/O configuration section of your program and choose New Module.
   b. Click the Communications tab.
   c. Choose the 1783-EMS switch from the list.
   d. Give the switch a name in your program and enter its IP address.
   e. Click OK to add the switch to your program.

Work with the General Dialog Box

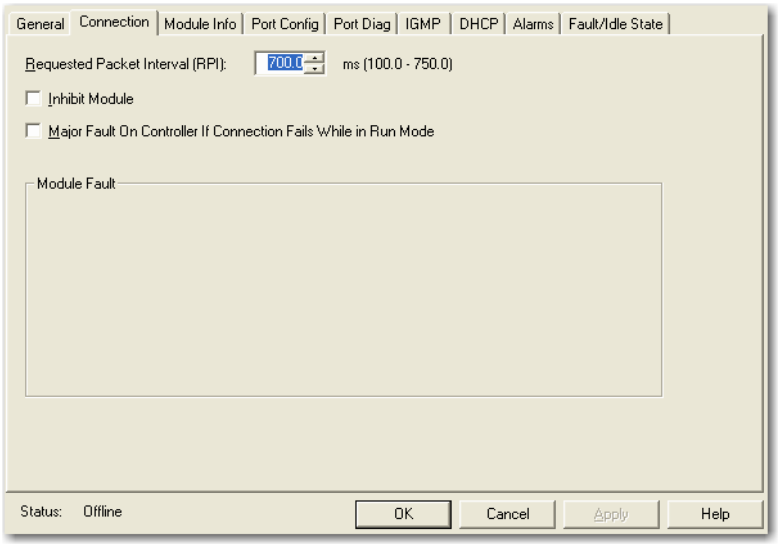
At the top of the dialog box, click the General tab. This General dialog box is available offline and includes the following entries.



- Name: Required field gives the module a descriptive name in your Logix program.
- Description: Optional field used for descriptive text.
- Module Definition: Leave at default.
- IP Address/Hostname: Required field must be populated with the IP address of the 1783-EMS switch; the RSLogix software cannot talk to the switch unless the 1783-EMS switch is set for the IP address in this field.

Work with the Connection Dialog Box

From the top of the dialog box, click the Connection tab. The Connection dialog box includes the following.

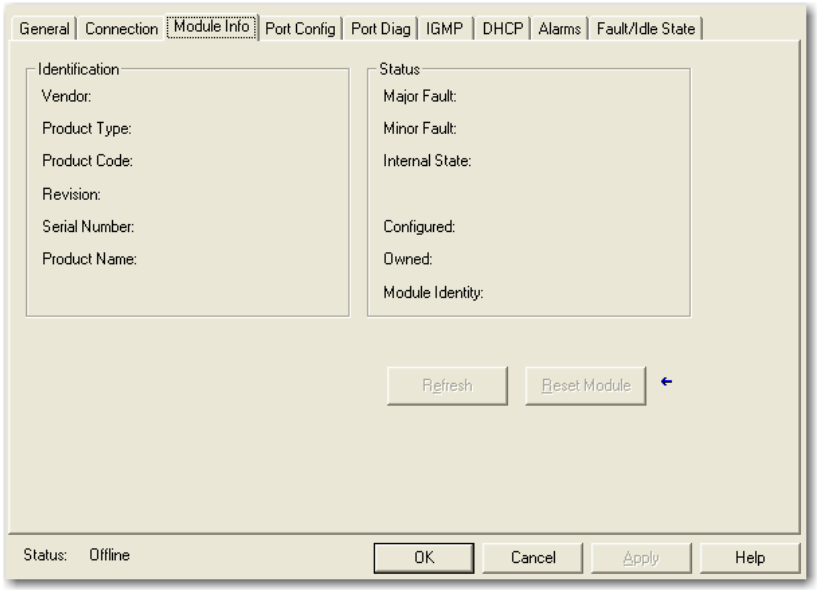


- Requested Packet Interval (RPI): Default value is 700 ms and supports RPI from 50...750 ms. Because this is a multicasting device and does not need a fast RPI to fulfill its purpose, we recommend a slow RPI to minimize network impact. Available online and offline.
- Inhibit Module: 1783-EMS switch is not scanned by the Logix controller when this is checked. Available online and offline.
- Major Fault On Controller If Connection Fails While in Run Mode: When checked, a communication failure with the 1783-EMS switch generates a major fault in the controller. When unchecked, a communication failure generates a minor fault. Available online and offline.

Work with the Module Info Dialog Box

From the top of the dialog box, click the Module Info tab. The Module Info dialog box displays identification and status of the 1783-EMS switch. The information displays while the controller is in Run mode only.

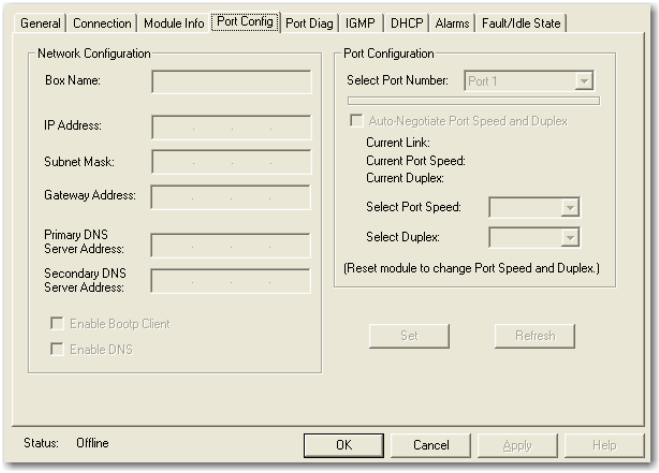
The Module Info dialog box includes the following.



- Refresh: Refreshes identification and status on this dialog box.
- Reset Module: Resets the 1783-EMS switch (communication to the module will be interrupted).

Work with the Port Configuration Dialog Box

The entries on the dialog box that you access by clicking Port Configuration include the following.

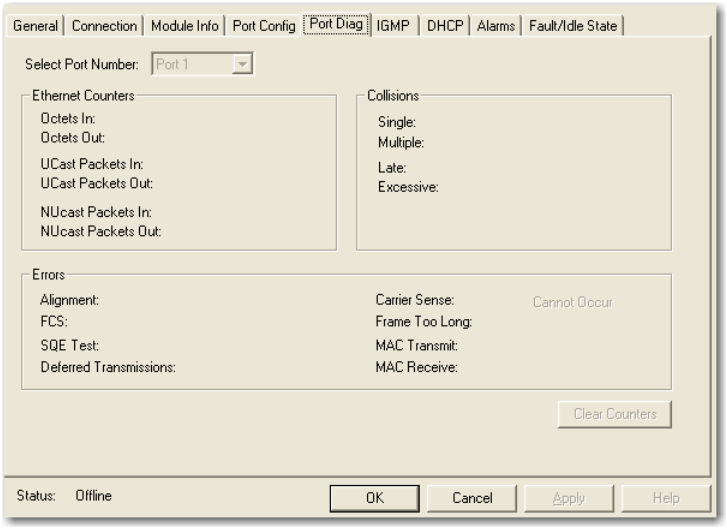


- Network Configuration: Use to configure network settings.
  - Box Name: Descriptive name for the switch.
  - IP Address: IP address of the 1783-EMS switch must match the IP address on the General dialog box.

  - Subnet Mask: The subnet mask is used to determine where the network number in an IP address ends and the node number in an IP address begins.
  - Gateway Address: Address of router on the network (if one exists, if not leave this at 0.0.0.0).
  - Enable BOOTP Client: Let the 1783-EMS IP address be assigned by a BOOTP server.
  - Enable DNS: If using hostnames on the network, DNS must be enabled in the 1783-EMS switch.
- Port Configuration: Use to configure port settings.
  - Select Port Number: Select the port to be configured.
  - Auto-negotiate port speed and duplex: Must be unchecked to manually override the port settings.
  - Current Link, Port speed, Duplex: Populated with settings from the selected port.
  - Select Port Speed: Active only when auto-negotiate is unchecked.
  - Select Duplex: Active only when auto-negotiate is unchecked.
  - Set: Must be clicked to load settings from this dialog box. Refresh: Reloads settings from the 1783-EMS switch.

Work with the Port Diagnostic Dialog Box

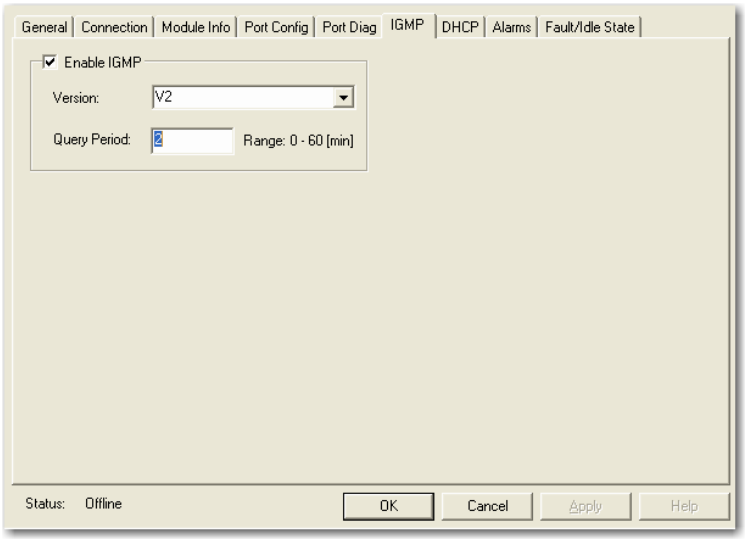
The entries on the dialog box that you access by clicking the Port Diagnostic tab from the top of the New Module dialog box include the following.



- Select Port Number: Select the port counters to be displayed.
- Clear Counters: Clears the counters.

Work with the IGMP Dialog Box

The entries on the dialog box that you access by clicking the IGMP tab from the top of the New Module dialog box include the following.

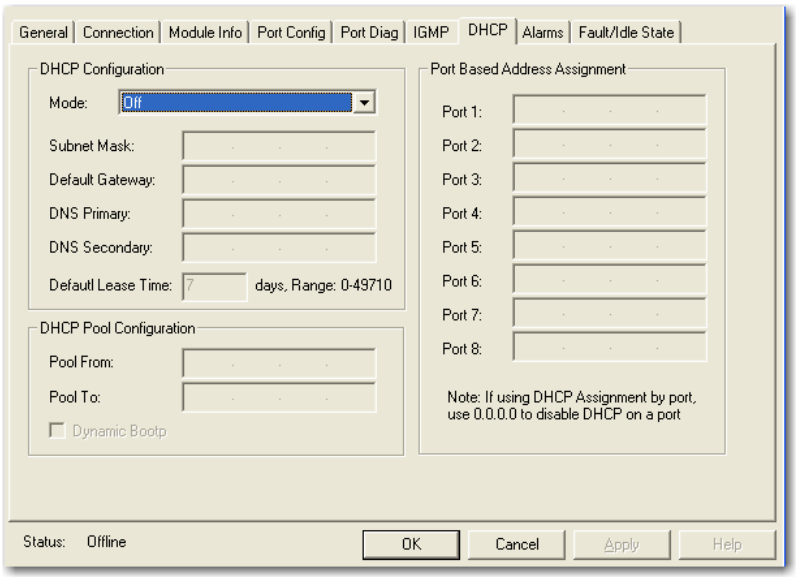


- Enable IGMP: Enables the IGMP feature in the 1783-EMS switch; see Chapter 2 of this manual for additional information.
- Version: Select from version 1 or version 2; see Chapter 2 of this manual for additional information.
- Query Period: Select the interval rate that the network is queried for IGMP information.

IMPORTANT Settings of the IGMP dialog box overwrite settings made on the HTML management interface. If you are scanning the 1783-EMS switch with Logix software, use this dialog box to configure IGMP to avoid confusion.

Work with the DHCP Dialog Box

The entries on the dialog box that you access by clicking the DHCP tab from the top of the New Module dialog box include the following.

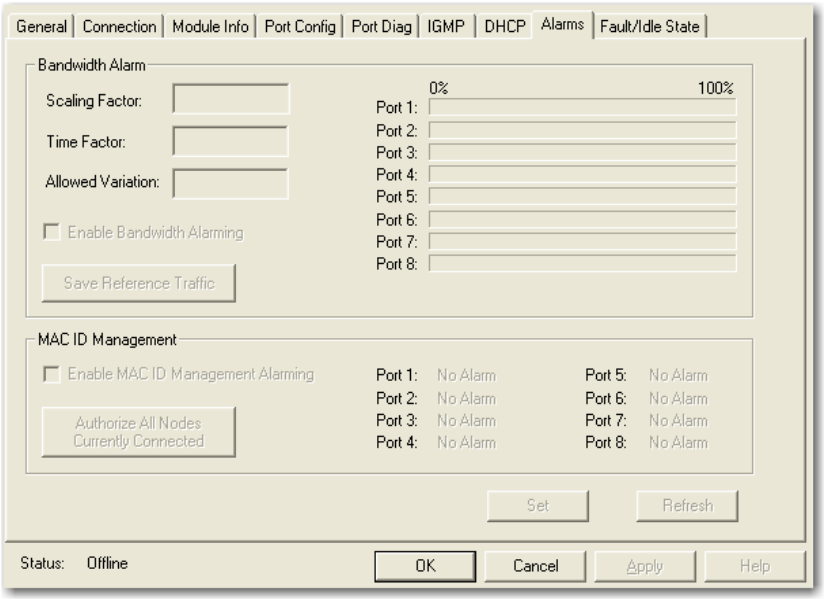


- Mode: Select from Assigned by Port, Assigned by Pool, Off.
- Subnet Mask: Subnet Mask given to all devices assigned IP addresses with the 1783-EMS switch.
- Default Gateway: Should be left blank if no gateway exists on the network.
- DNS Primary: Should be left blank if no DNS server is present on the network.
- DNS Secondary: Should be left blank if no DNS server is present on the network.
- Default Lease Time: 7 days by default.
- DHCP Pool Configuration: Used when Assigned by Pool mode is selected; assigns next available IP address from this range of addresses.
- Port Based IP assignment: Associates an IP address with a given port; any request coming over that port for an IP address is given the address associated with the port. Leaving the port blank instructs the 1783-EMS switch to ignore DHCP requests coming from that port.

IMPORTANT	Settings of the DHCP dialog box overwrite settings made on the HTML management interface. If you are scanning the 1783-EMS switch with Logix software, use this dialog box to configure IGMP to avoid confusion.

Work with the Alarms Dialog Box

The entries on the dialog box that you access by clicking the Alarms tab from the top of the New Module dialog box include the following.



- Bandwidth Alarm
  - Configuration of bandwidth alarming and displays a graph of current network traffic, the bars are red if the port is in alarm and green if it is not.
  - The bandwidth alarm requires a point of comparison; this must be set in the HTML interface.

IMPORTANT Unlike IGMP, this can be enabled from here or the HTML interface.

- MAC ID Management
  - Configuration of MAC ID management and display the alarm status on each port.

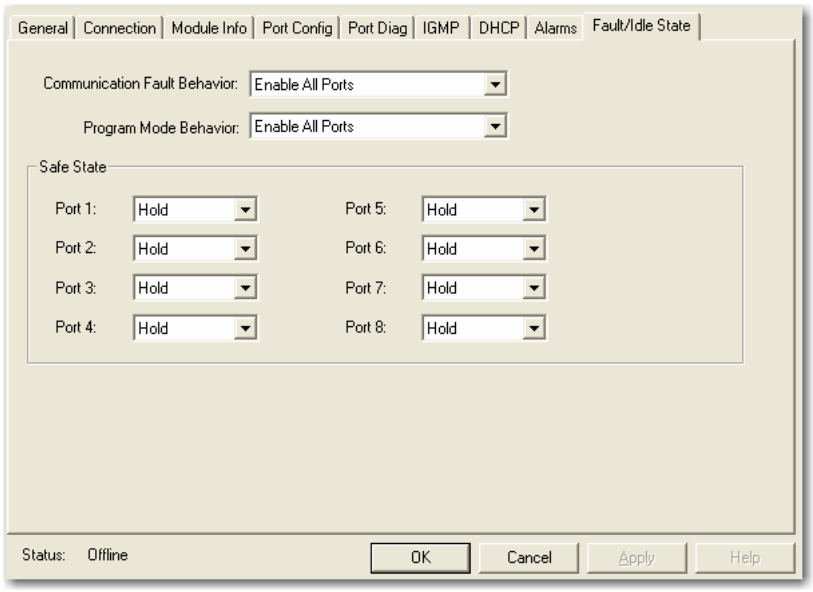
IMPORTANT Unlike IGMP, this can be enabled from here or the HTML interface.

  - Set button: Loads settings from this dialog box into the 1783-EMS switch.
  - Refresh button: Re-populates this dialog box with settings from the 1783-EMS switch.

Work with the Fault/Idle Action Dialog Box

This dialog box controls the port behavior when the 1783-EMS switch loses communication with the Logix controller or the Logix controller goes into Program mode. This feature can be used to disable ports while the Logix controller is in Run mode and enable them when the Logix controller is offline.

The entries on the dialog box that you access by clicking the Fault/Idle Action tab from the top of the New Module dialog box include the following.



- Communication Fault Behavior
  - Default value is Enable All Ports.
  - Enable all ports when the 1783-EMS switch loses communication with the controller. If the controller is disabling a port, it is enabled if communication with the controller is lost.
  - Hold last state when the 1783-EMS switch loses communication with the controller. If a port is disabled by the controller, it continues to be disabled when communication with the controller is lost. To re-enable all of the ports, the 1783-EMS switch requires a power cycle.
  - Apply safe state values to ports when communication with the controller is lost. Port status can be changed when communication to the controller is lost.

- Program Mode Behavior
  - Default value is Enable All Ports.
  - Enable all ports when the Logix controller is put in Program mode. If the Logix controller is disabling a port, it is enabled if the Logix controller is put in Program mode.
  - Hold last state when the Logix controller is put in Program mode. If a port is disabled by the controller, it continues to be disabled when the controller is put in Program mode. To re-enable all of the ports, the 1783-EMS switch requires a power cycle.
  - Apply safe state values to ports when the Logix controller is put in Program mode. Port status can be changed when the Logix controller is put in Program mode.

Download or Upload a Configuration

What This Appendix Contains

This appendix provides information about downloading and uploading switch configurations. The 1783-EMS switch can accept its configuration from a file stored on a personal computer.

This is useful if the same configuration must be used in multiple switches. This file can be retrieved from a switch and downloaded to another switch.

Upload Configuration

To upload configuration from the switch and save it on your computer, follow this procedure.

1. Open the DOS command prompt by clicking Start>Programs>Accessories>Command Prompt to see the Command Prompt window.
2. From the Command Prompt window, type 'FTP *xxx.xxx.xxx.xxx*' where *x* represents the switch's IP address and defaults are as follows:
   - Username is 'uploader'.
   - Password is 'PASSWORD'.
3. Type the following to store Switch_Config_file.img on your hard disk drive:

   'get c:\storage_location_on_my_PC\Switch_Config_file.img'

Download Configuration

To download a configuration from your computer to the switch, follow this procedure.

1. Open the DOS command prompt by clicking Start>Programs>Accessories>Command Prompt to see the Command Prompt window.
2. From the Command Prompt window, type 'FTP *xxx.xxx.xxx.xxx*' where *x* represents the IP address of the unit and defaults are as follows:
   - Username is 'uploader'.
   - Password is 'PASSWORD'.
3. Type the following to download the file into the switch:

   'put c:\storage_location_on_my_PC\Switch_Config_file.img config.img'

Available SFP Modules and Cables

What This Appendix Contains

This appendix provides information about the small form-factor pluggable (SFP) module and cabling used with the 1783-EMS08T switch.

TIP For detailed instructions on installing, removing, and connecting the SFP modules, see the documentation that shipped with the SFP module.

Available SFP Modules

Available SFP modules include the following:

- 1783-SFP1GSX - 1000BASE-SX multi-mode fiber transceiver
- 1783-SFP1GLX - 1000BASE-LX single-mode fiber transceiver

SFP Module Cable Specifications

The following table lists the cable specifications for the fiber-optic SFP module connections.

Each port must match the wave-length specifications on the other end of the cable. For reliable communication, the cable must not exceed the rated maximum cable length.

SFP Module Type	Cat. No.	Wave-length (mm)	Fiber Type	Core Size/ Cladding Size (micron)	Modal Band-width (MHz/ km)(1)	Cable Distance
1000BASE-SX	1783-SFP1GSX	850	MMF	62.5/125 62.5/125 50/125 50/125	160 200 400 500	220 m (722 ft) 275 m (902 ft) 500 m (1640 ft) 550 m (1804 ft)
1000BASE-LX/LH	1783-SFP1GLX	1310	SMF	G.652	-	10 km (32,810 ft)

(1) Modal bandwidth applies only to multimode fiber.

Notes:

Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products.
At http://www.rockwellautomation.com/support/, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration, and troubleshooting, we offer TechConnect support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/support/.

Installation Assistance

If you experience a problem within the first 24 hours of installation, review the information that is contained in this manual. You can contact Customer Support for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator at http://www.rockwellautomation.com/support/americas/phone_en.html, or contact your local Rockwell Automation representative.

New Product Satisfaction Return

Rockwell Automation tests all of its products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

United States	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication RA-DU002, available at http://www.rockwellautomation.com/literature/.

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