MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Amikon cover with selected official Rockwell Automation pages

ALLEN-BRADLEY STRATIX 8300

1783-RMS10T

LAYER 3 MANAGED ETHERNET SWITCH

Selected official pages cover safety, parts, tools, mounting, grounding, power, alarms, copper-port connections and specifications.

Installation Instructions

Original Instructions

Stratix 8000 and 8300 Ethernet Managed Switches

Catalog Numbers 1783-MS06T, 1783-MS10T, 1783-RMS06T, 1783-RMS10T, 1783-MX08T, 1783-MX08F, 1783-MX04S, 1783-MX08S, 1783-MX04E, 1783-MX04T04E

Environment and Enclosure

ATTENTION: This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC 60664-1), at altitudes up to 2000 m (6562 ft) without derating.

This equipment is not intended for use in residential environments and may not provide adequate protection to radio communication services in such environments.

This equipment is supplied as open-type equipment for indoor use. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of 5VA or be approved for the application if nonmetallic. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain more information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

In addition to this publication, see the following:

- Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1, for additional installation requirements.
- NEMA Standard 250 and EN/IEC 60529, as applicable, for explanations of the degrees of protection provided by enclosures.

Class A Notice for Taiwan and other Traditional Chinese Markets

ATTENTION: This is a Class A Information Product. When used in a residential environment, it may cause radio frequency interference. Under such circumstances, the user may be requested to take appropriate countermeasures.

警告　這是甲類資訊產品，在居住環境中使用時，可能會造成射頻干擾，
在這種情況下，使用者會被要求採取某些適當的對策。

Prevent Electrostatic Discharge

ATTENTION: This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use.

ATTENTION: This product is grounded through the DIN rail to chassis ground. Use zinc-plated yellow-chromate steel DIN rail to assure proper grounding. The use of other DIN rail materials (for example, aluminum or plastic) that can corrode, oxidize, or are poor conductors, can result in improper or intermittent grounding. Secure DIN rail to mounting surface approximately every 200 mm (7.8 in.) and use end-anchors appropriately. Be sure to ground the DIN rail properly. Refer to Industrial Automation Wiring and Grounding Guidelines, Rockwell Automation publication 1770-4.1, for more information.

ATTENTION: Under certain conditions, viewing the optical port may expose the eye to hazard. When viewed under some conditions, the optical port may expose the eye beyond the maximum permissible exposure recommendations.

ATTENTION: This equipment is certified for use only within the surrounding air temperature range of -40…+60 °C (-40…+140 °F). The equipment must not be used outside of this range.

Electrical Safety Considerations

ATTENTION: Power to this equipment and all connected I/O must be supplied from a source compliant with the following:

- Class 2 approved to UL1310
- SELV source approved to EN/IEC60950-1, EN/IEC61010-2-201 or EN/IEC62368-1 (ES1)
- PELV source approved to EN/IEC60950-1, EN/IEC61010-2-201 or EN/IEC62368-1 (ES1)

WARNING: If you connect or disconnect the communications cable with power applied to this module or any device on the network, an electric arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

WARNING: If you connect or disconnect wiring while the field-side power is on, an electric arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

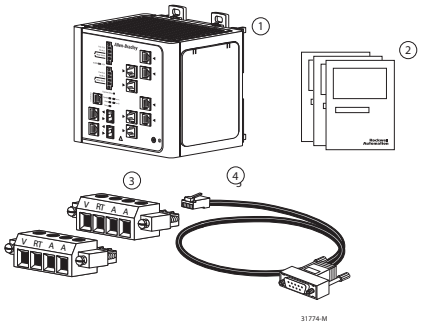
WARNING: When you insert or remove the CompactFlash while power is on, an electric arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

WARNING: When you insert or remove the small form-factor pluggable (SFP) optical transceiver while power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

WARNING: The USB port is intended for temporary local programming purposes only and not intended for permanent connection. If you connect or disconnect the USB cable with power applied to this module or any device on the USB network, an electric arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

Parts List

Verify that you have these items.



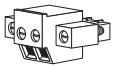
1 Stratix® 8000/8300 switch

2 Documentation

3 Power and alarm relay connectors (qty. 2)

4 Console cable

If you plan to install a PoE expansion module, verify that you have a PoE power connector.



At the end of its life, this equipment should be collected separately from any unsorted municipal waste.

Required Tools

Obtain these tools:

- Ratcheting torque screwdriver that exerts up to 1.69 N•m (15 in•lbs) of pressure
- #6 ring terminal lug for 5.3 mm^2 (10 AWG) wire, such as Thomas & Bett part number 10RC6 or equivalent
- Crimping tool, such as Thomas & Bett part number WT2000, ERG-2001, or equivalent
- 5.3 mm^2 (10 AWG) copper ground wire, such as Belden part number 9912 or equivalent
- Wire-stripping tool
- For panel-mounting without a DIN rail, M5 or #10-24 or #10-32 bolts or screws with 1.27 cm (0.5 in.) O.D. flat washers

For simplified cabling, the automatic medium-dependent interface crossover (auto-MDIX) feature is enabled by default on the switch. With auto-MDIX enabled, the switch detects the required cable type for copper Ethernet connections and configures the interfaces accordingly. You can use either a crossover or a straight-through cable for connections to a 10/100 or 10/100/1000 Ethernet switch port, regardless of the type of device on the other end of the connection.

Site Requirements

Observe these site requirements:

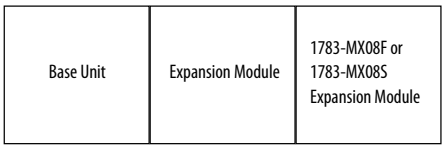
- Clearance to front and rear panels meets these conditions:
  - Front-panel status indicators can be easily read.
  - Access to ports is sufficient for unrestricted cabling.
  - Front-panel direct current (DC) power and relay connector is within reach of the connection to the DC power source.
- To prevent the switch from overheating, observe these minimum clearances:
  - Top and bottom: 105 mm (4.13 in.)
  - Left and right: 90 mm (3.54 in.)
  - Front: 65 mm (2.56 in.)
- Temperature surrounding the unit does not exceed 60 °C (140 °F).
- Cabling is away from sources of electrical noise, such as radios, power lines, and fluorescent lighting fixtures.

Attach Expansion Modules

IMPORTANT If you are adding expansion modules, attach the expansion modules to the switch before mounting the switch.

The switch can operate as a standalone device with two uplink ports and four or eight Fast Ethernet ports, or you can increase the number of Fast Ethernet ports by 8 or 16 by connecting expansion modules.

You can install as many as two expansion modules per base unit. However, only one of the two modules can be a 1783-MX08F or 1783-MX08S fiber expansion module. If you install a 1783-MX08F or 1783-MX08S fiber expansion module, the module must be in the right-most position.



Depending on the mix of switches and expansion modules, you can have as many 24 Fast Ethernet ports.

Mount the Switch

You can mount the switch on one of the following:

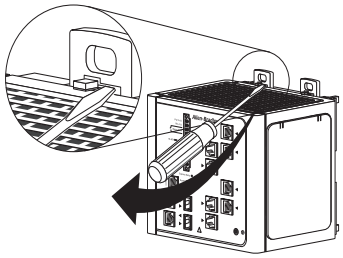
- DIN rail
- Wall or panel

IMPORTANT The switch must be mounted in an upright orientation, as shown in these instructions. Alternative mounting orientations are not supported.

Mount the Switch on a DIN Rail

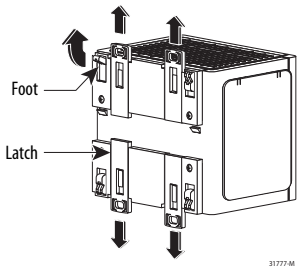
To mount the switch on a DIN rail, follow these steps.

1. Insert a sharp tool, such as a screwdriver, in the space next to the tab, push gently to release the catch, then turn the screwdriver to push the tab out.

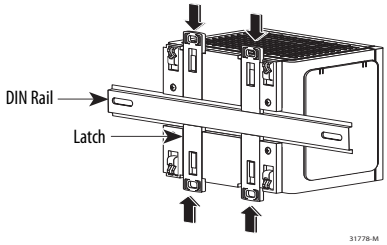


2. If you are using a heavy-duty 35 mm x 15 mm (1.38 in. x 0.59 in.) DIN rail, rotate all feet to the extended positions.

   Otherwise, if you are using 35 mm x 7.5 mm (1.38 in. x 0.30 in.) DIN rail, rotate the feet to the recessed positions.



3. Position the rear panel of the switch directly in front of the DIN rail, making sure that the DIN rail fits in the space between the two latches.



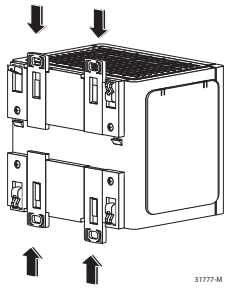
4. Push the DIN rail latches in after the switch is over the DIN rail to secure the switch to the rail.

Mount the Switch on a Wall or Panel

To mount the switch on a wall or a panel, you need M5 or #10-24 or #10-32 bolts or screws with 1.27 cm (0.5 in.) O.D. flat washers. This hardware is not provided with the switch.

To mount the switch to a wall or a panel, follow these steps.

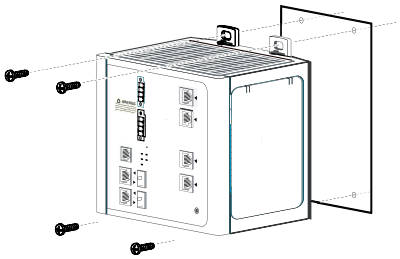
1. If the DIN rail latches are pushed out, push them in so they are fully locked in place.



2. Rotate all feet to their recessed positions so that the switch can mount flat on the wall or pane.

   If greater air circulation around the switch is required, rotate the feet to their extended positions before mounting the switch on the wall.

3. Position the rear panel of the switch against the wall or a panel in the desired location, as shown in this figure.



4. Place M5 or #10-24 or #10-32 bolts or screws with 1.27 cm (0.5 in.) O.D. flat washers through each DIN rail latch, and screw them into the wall.

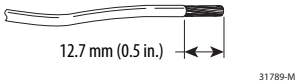
Ground the Switch

Follow these steps to connect the switch to a protective ground.

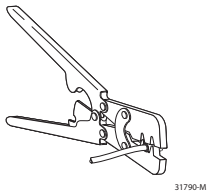
1. Use a screwdriver to remove the ground screw from the front panel of the switch.

   Store the ground screw for later use.

2. If your ground wire is insulated, use a wire stripping tool to strip the 5.3 mm^2 (10 AWG) ground wire to 12.7 mm (0.5 in.) ± 0.5 mm (0.02 in.).

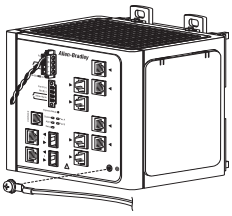


3. Insert the ground wire into the ring terminal lug.
4. Use a crimping tool to crimp the ring terminal to the wire.



5. Slide the ground screw through the ring terminal.

6. Insert the ground screw into the ground-screw opening on the front panel.



31791-M

7. Use a ratcheting torque screwdriver to tighten the ground screw and ring terminal lug to the switch front panel to 0.96 N•m (8.5 lb•in).
8. Attach the other end of the ground wire to a grounded bare-metal surface, such as a ground bus, or a grounded DIN rail.

Wire the Power Source for the Switch

Follow these steps to wire DC power to the switch.

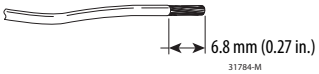
1. Locate the power and alarm relay connector and identify the positive and return DC power connections.

   The positive DC power connection is labeled V, and the negative DC power connection is the adjacent connection labeled RT. Connections labeled A are used for the alarm relay connectors.

31783-M

2. Measure a length of 0.82...0.52 mm^2 (18...20 AWG) copper wire long enough to connect to the DC power source.
3. Using an 18-gauge wire-stripping tool, strip each of the two wires to 6.3 mm (0.25 in.) ± 0.5 mm (0.02 in.).

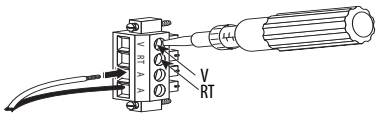
   Do not strip more than 6.8 mm (0.27 in.) of insulation from the wire. Stripping more than the recommended amount of wire can leave exposed wire from the connector after installation.



31784-M

4. Insert the exposed part of the positive wire into the connection labeled V and the exposed part of the return wire into the connection labeled RT.

   Make sure that you cannot see any wire lead. Only wire with insulation can extend from the connector.



31785-M

5. Use a ratcheting-torque screwdriver to torque the power and relay connector captive screws above the installed wire leads to 0.23 N•m (2.0 lb•in).
6. Connect the other end of the positive wire (the one connected to V) to the positive terminal on the DC power source, and connect the other end of the return wire (the one connected to RT) to the return terminal on the DC power source.

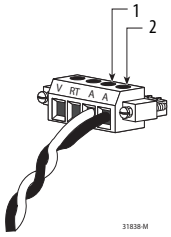
   You can use a second power source to provide redundant power. The alarm relays on the switch can be used to warn you if one of the power supplies fails. The switch operates properly with only one power source connected at either Pwr A or Pwr B.
7. If you are installing the switch and are using a second power source, repeat these with a second power and relay connector.

Wire External Alarms

The alarm relays on the switch are normally open. To connect an external alarm device to the relays, you must connect two relay contact wires to complete an electrical circuit. Because each external alarm device requires two connections to a relay, the switch supports a maximum of two external alarm devices.

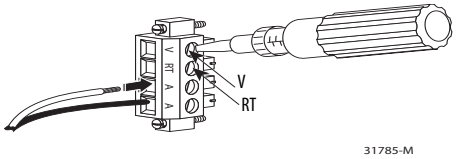
To wire alarms, follow these steps.

1. Measure two strands of twisted-pair wire (18...20 AWG) long enough to connect to the external alarm device.
2. Use a wire stripper to remove the casing from both ends of each wire to 6.3 mm (0.25 in.) ± 0.5 mm (0.02 in.).
3. Insert the exposed wires for the external alarm device into the two connections labeled A, as shown in the following figure.



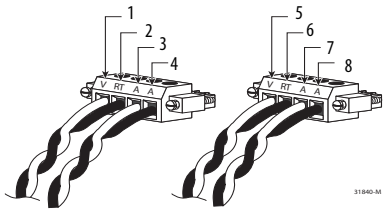
1	External device, relay wire A connection 1
2	External device, relay wire A connection 2

4. Use a screwdriver to torque the power and relay connector captive screw (above the installed wire leads) to 0.23 N•m (2.0 lb•in).



5. Repeat these steps to insert the input and output wires of an additional external alarm device into the second power and relay connector.

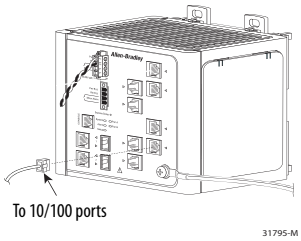
The following figure shows the completed wiring for two power supplies and two external alarm devices.



1	Power source A positive connection	5	Power source B positive connection
2	Power source A return connection	6	Power source B return connection
3	External device 1, relay wire major alarm connection	7	External device 2, relay wire minor alarm connection
4	External device 1, relay wire major alarm connection	8	External device 2, relay wire minor alarm connection

Connect to 10/100 Copper Ports

1. Insert a straight-through, twisted four-pair, Category 5e or better cable with an RJ45 connector into the port.



2. Insert the other cable end into an RJ45 connector on the other device.

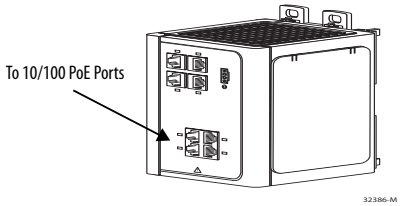
Connect to PoE Expansion Module Ports

Two expansion modules provide PoE capability:

- The 1783-MX04E PoE expansion module provides four PoE ports. You can configure as many as four ports in any combination of PoE and PoE+.
- The 1783-MX04T04E PoE expansion module provides four PoE ports and four non-PoE ports. You can configure as many as four ports in any combination of PoE and PoE+.

The PoE expansion modules each require a separate power supply. For power supply requirements based on your application, refer to page 13.

1. Insert a straight-through, twisted four-pair, Category 5e or better cable with an RJ45 connector into the port.

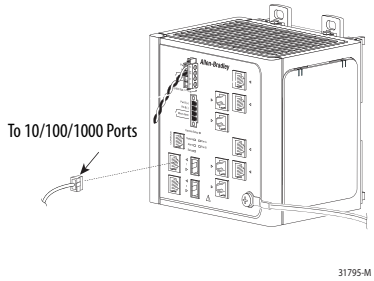


2. Insert the other cable end into an RJ45 connector on the other PoE powered device.

Connect to Dual-purpose Uplink Ports

The switches have two dual-purpose uplink ports. Each dual-purpose uplink port has a 10/100/1000 RJ45 connector for a copper interface and a slot for an SFP module. Only one port of the dual-purpose port can be active at a time. If an SFP module port is connected, the SFP module port has priority.

1. Insert a straight-through, twisted four-pair, Category 5e or better cable with an RJ45 connector into the port.



2. Insert the other cable end into an RJ45 connector on the other device.

Specifications

Stratix 8000 and 8300 Switches

Attribute	1783-MS06T, 1783-MS10T, 1783-RMS06T, 1783-RMS10T
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold) IEC 60068-2-2 (Test Bd, Operating Dry Heat) IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-40 °C < Ta < +60 °C (-40 °F < Ta < +140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Enclosure type rating	None (open-style)
Power input	2 A max, 18…60V DC, CL 2/SELV
Alarm relay	1A max, 30V DC max, CL 2/SELV
Isolation voltage	75 V (continuous), basic insulation type, power to ground, power to network channels, and power to alarm. No isolation between individual Ethernet ports No isolation between Console port and system
Wire size, Ethernet connections	RJ45 connector according to IEC 60603-7, 2 or 4 pair Category 5e minimum cable according to TIA 568-B.1 or Category 5 cable according to ISO/IEC 24702
Wire size, power and alarm connections	0.5… 0.8 mm^2 (20…18 AWG) solid or stranded copper wire rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation, max
Wire size, ground connection	3.3…5.3 mm^2 (12…10 AWG) solid or stranded copper wire rated at 75 °C (167 °F) or greater
Screw torque, power and alarm terminals	0.23 N•m (2.0 in•lb)
Screw torque, ground terminals	0.96 N•m (8.5 in•lb)
Pilot duty rating	Alarm not rated
North American temp code	T4
ATEX temp code	T4

Stratix 8000 and 8300 Expansion Modules

Attribute	1783-MX04E	1783-MX04T04E	1783-MX08T	1783-MX08F	1783-MX04S	1783-MX08S
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold) IEC 60068-2-2 (Test Bd, Operating Dry Heat) IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	-40 °C < Ta < +60 °C (-40 °F < Ta < +140 °F)					
Temperature, surrounding air, max	60 °C (140 °F)					
Enclosure type rating	None (open-style)					
Backplane power	3.3V DC @ 0.94 A	3.3V DC @ 1.08 A	3.3V DC, 1.7 A max	3.3V DC, 3.6A max	3.3V DC, 2.5 A max	3.3V DC, 4.0 A max
PoE power, max	48/54V DC, 2.5 A	48/54V DC, 2.4 A	—			
Isolation voltage	60V (continuous), basic insulation type, expansion backplane to network ports, expansion backplane to power ports, and power ports to network ports. No isolation between individual network ports.		75V (continuous), basic insulation type, expansion backplane to network channels. No isolation between individual Ethernet ports.	—		
Wire size, Ethernet connections	RJ45 connector according to IEC 60603-7, 2 or 4 pair Category 5e minimum cable according to TIA 568-B.1 or Category 5 cable according to ISO/IEC 24702					
Screw torque, PoE power	0.23 N•m (2.0 in•lb)		—			
North American temp code	T4					
ATEX temp code	T4					