Aruba 2930M Switches

Installation and Getting Started Guide

aruba

a Hewlett Packard
Enterprise company

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This document is intended for network administrators and support personnel.

> **NOTE:** The display and command line illustrated in this document are examples and might not exactly match your particular switch or environment.
>
> The switch and accessory drawings in this document are for illustration only, and may not exactly match your particular switch and accessory products.

Applicable products

JL319A Aruba 2930M 24G 1-slot Switch

JL320A Aruba 2930M 24G PoE+ 1-slot Switch

JL321A Aruba 2930M 48G 1-slot Switch

JL322A Aruba 2930M 48G PoE+ 1-slot Switch

JL323A Aruba 2930M 40G 8 HPE Smart Rate PoE+ 1-slot Switch

JL324A Aruba 2930M 24 HPE Smart Rate PoE + 1-slot Switch

R0M67A Aruba 2930M 40G 8 HPE Smart Rate PoE Class 6 1-slot Switch

R0M68A Aruba 2930M 24 HPE Smart Rate PoE Class 6 1-slot Switch

JL325A Aruba 2930 2-port Stacking Module

JL078A Aruba 3810M/2930M 1-Port QSFP+ 40GbE Module

JL081A Aruba 3810M/2930M 4 HPE Smart Rate 1G/ 2.5G/5G/10G PoE+ Module

JL083A Aruba 3810M/2930M 4-Port 100M/1G/10G SFP + MACsec Module

JL085A Aruba X371 12VDC 250W 100-240VAC Power Supply

JL086A Aruba X372 54VDC 680W 100-240VAC Power Supply

JL087A Aruba X372 54VDC 1050W 110-240VAC Power Supply

Related publications

- *Aruba 2930M Switches Installation and Getting Started Guide*

- *Aruba 2930M and 3810M Switch Power Supply Quick Setup Guide and Safety/Regulatory Information*

- HPE ArubaOS-Switch software manuals

- *HPE ArubaOS-Switch Power Over Ethernet (PoE/PoE+) Planning and Implementation Guide*

- *HPE ArubaOS-Switch Transceiver Guide*

To view and download these publications, visit **http://www.hpe.com/networking/ResourceFinder**.

Terminology

In instances where the text refers collectively to both PoE+ and PoE Class 6 in the 2930M switch family, *PoE* is used to refer to both.

Aruba 2930M multiport switches are store-and-forward devices offering low latency for high-speed networking. The 2930M switches also support a field-replaceable redundant power supply, Power over Ethernet (PoE) technologies, full network management capabilities, a stacking module slot, and a flexible uplink port slot.

When 2930M stacking modules are installed in the switches, any combination of up to ten 2930M switches can be stacked together through high-speed backplane cables to form a single extended virtual switch. See **Stacking information and topologies** and the *HPE ArubaOS-Switch Advanced Traffic Management Guide* for your switch OS version for more stacking information.

These switches are described in this manual:

Non-PoE switches	PoE switches
Aruba 2930M 24G 1-slot Switch (JL319A)	Aruba 2930M 24G PoE+ 1-slot Switch (JL320A)
Aruba 2930M 48G 1-slot Switch (JL321A)	Aruba 2930M 48G PoE+ 1-slot Switch (JL322A)
	Aruba 2930M 40G 8SR PoE+ 1-slot Switch (JL323A)
	Aruba 2930M 24SR PoE+ 1-slot Switch (JL324A)
	Aruba 2930M 40G 8 HPE Smart Rate PoE Class 6 1-slot Switch (R0M67A)
	Aruba 2930M 24 HPE Smart Rate PoE Class 6 1-slot Switch (R0M68A)

Accessories list:

Stacking module/cables	Power supply	Uplink port module
Aruba 2930 2-port Stacking Module (JL325A)	Aruba X371 12VDC 250W 100-240VAC Power Supply (JL085A)	Aruba 3810M/2930M 1-port QSFP + 40GbE Module (JL078A)
Aruba 2920/2930M 0.5m Stacking Cable (J9734A)	Aruba X372 54VDC 680W 100-240VAC Power Supply (JL086A)	Aruba 3810M/2930M 4 HPE Smart Rate 1G/2.5G/5G/10G PoE+ Module (JL081A)
Aruba 2920/2930M 1m Stacking Cable (J9735A)	Aruba X372 54VDC 1050W 110-240VAC Power Supply (JL087A)	Aruba 3810M/2930M 4-port 100M/1G/10G SFP+ MACsec Module (JL083A)
Aruba 2920/2930M 3m Stacking Cable (J9736A)		

This chapter describes these switches with the following information:

• Front of the switches:

   ◦ Network ports

   ◦ Management ports

   ◦ LEDs

   ◦ Buttons

- ◦ Out-of-Band Management (OOBM)
- ◦ SFP support

- Back of the switches:
  - ◦ Power supplies and power connectors
  - ◦ Uplink module slot
  - ◦ 2930M stacking module

- Switch features

Front of the switches

Figure 1: *Front of all the 2930M switches*
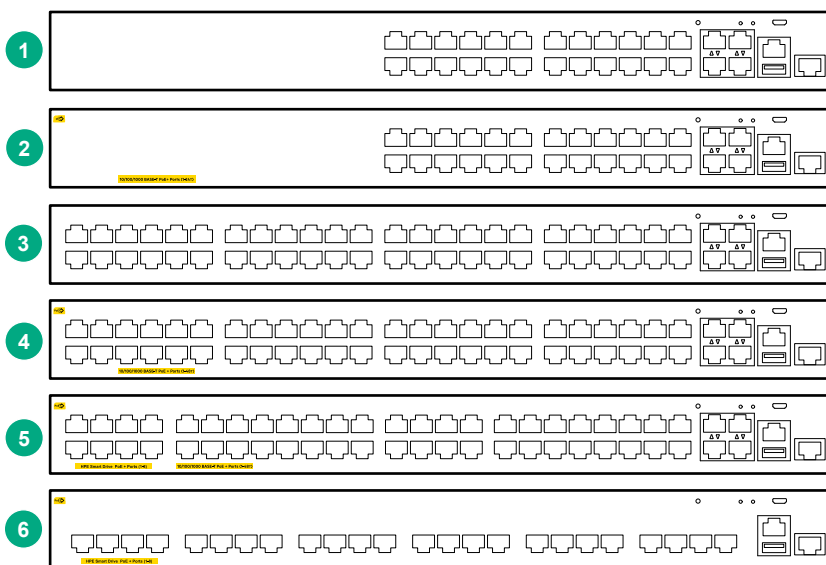
Table 1: *Front of all the 2930M switches: Label and description*

Label	Description
1	Aruba 2930M 24G 1-slot switch (JL319A)
2	Aruba 2930M 24G PoE+ 1-slot switch (JL320A)
3	Aruba 2930M 48G 1-slot switch (JL321A)
4	Aruba 2930M 48G PoE+ 1-slot switch (JL322A)

Table Continued

Label	Description
5	Aruba 2930M 40G 8SR PoE+ 1-slot Switch (JL323A)
	Aruba 2930M 40G 8 HPE Smart Rate PoE Class 6 1-slot Switch (R0M67A)
6	Aruba 2930M 24SR PoE+ 1-slot Switch (JL324A)
	Aruba 2930M 24 HPE Smart Rate PoE Class 6 1-slot Switch (R0M68A)

Figure 2: *Example of 2930M switch*
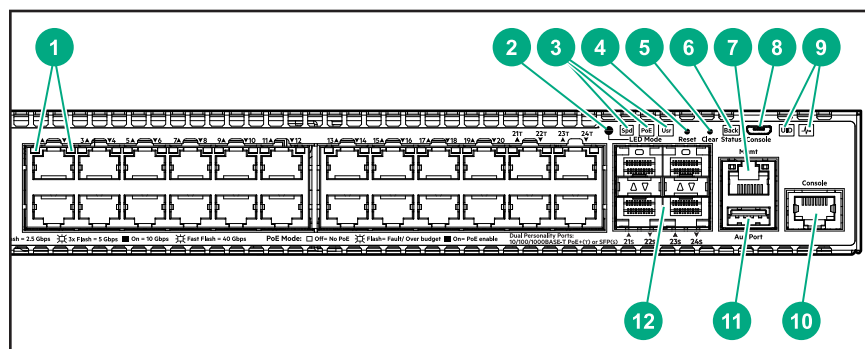
Table 2: *2930M switches: Labels and description*

Label	Description
1	Switch Port LEDs
2	LED Mode button
3	Speed, PoE[1], Usr LEDs
4, 5	Reset, Clear buttons
6	Back Module status LED
7	Out-of-Band Management port
8	Micro USB console
9	Unit Identification, Global Status LEDs
10	RJ serial console
11	USB/auxiliary port
12	Dual-personality SFP ports

[1] PoE Mode LED is present only on switch models that support PoE.

Network ports

Table 3: *Network ports*

10/100/1000 non-PoE RJ-45 ports	10/100/1000 PoE RJ-45 ports	Combo 10/100/1000 BaseT-100/1000 Gbps SFP ports	Combo 10/100/1000 BaseT PoE + 100/1000 Gbps SFP ports	SFP+ ports	Smart Rate PoE	40G	Stacking ports
Aruba 2930M 24G 1-slot switch (JL319A):							
20[1]	-	4	-	-	-	-	-
Aruba 2930M 24G PoE+ 1-slot switch (JL320A):							
-	20[1]	-	4	-	-	-	-
Aruba 2930M 48G 1-slot switch (JL321A):							
44[1]	-	4	-	-	-	-	-
Aruba 2930M 48G PoE+ 1-slot switch (JL322A):							
-	44[1]	-	4	-	-	-	-
Aruba 2930M 40G 8SR PoE+ 1-slot switch (JL323A):							
-	36	-	4	-	8 [3]	-	-
Aruba 2930M 40G 8 HPE Smart Rate PoE Class 6 1-slot switch (R0M67A)							
-	36	-	4	-	8 [3]	-	-
Aruba 2930M 24SR PoE+ 1-slot switch (JL324A):							
-	-	-	-	-	24[4]	-	-
Aruba 2930M 24 HPE Smart Rate PoE Class 6 1-slot switch (R0M68A)							
-	-	-	-	-	24[4]	-	-
Aruba 2930 2-port stacking module (JL325A):							
-	-	-	-	-	-	-	2
Aruba 3810M/2930M 1 Port QSFP+ 40GbE module (JL078A):							
-	-	-	-	-	-	1	-
Aruba 3810M/2930M 4 HPE Smart Rate 1G/2.5G/5G/10G PoE+ module (JL081A):							
-	-	-	-	-	4	-	-
Aruba 3810M/2930M 4 Port 100M/1G/10G SFP+ MACsec module (JL083A):							

Table Continued

10/100/1000 non-PoE RJ-45 ports	10/100/1000 PoE RJ-45 ports	Combo 10/100/1000 BaseT-100/1000 Gbps SFP ports	Combo 10/100/1000 BaseT PoE + 100/1000 Gbps SFP ports	SFP+ ports	Smart Rate PoE	40G	Stacking ports
-	-	-	-	4^2	-	-	-

Notes:

[1] All RJ-45 ports support "Auto-MDIX", which means you can use either straight-through or crossover twisted-pair cables to connect network devices to the switch.

[2] SFP+ ports support 100Mb (100-FX and 100-BX), 1G SFP and 10G SFP+ transceivers.

[3] JL323A and R0M67A Smart Rate ports are 1G/2.5G/5G/10G.

[4] JL324A and R0M68A Smart Rate ports are 1G/2.5G/5G (no 10G support).

[5] 10/100/1000Base-T PoE ports are able to support up to 60W of PoE.

These products also support optional network connectivity:

Table 4: *Optional network connectivity, speeds, and technologies*

Speed	Technology	Cabling	Uplink Module Connector	Transceiver Form-Factor and Connector[1]		
				SFP ("mini-GBIC") Connector	SFP+ Connector	QSFP+ Connector
100 Mbps	100-FX	Fiber (multimode)	-	LC	-	-
1 Gbps	1000-T	Copper (twisted-pair)	-	RJ-45	-	-
	1000-SX	Fiber (multimode)	-	LC	-	-
	1000-LX	Fiber (multimode or single mode)	-	LC	-	-
	1000-LH	Fiber (single mode)	-	LC	-	-
	1000-BX	Fiber (single mode)	-	LC	-	-
10 Gbps	10-Gig Direct Attach	Copper (twinaxial)	-	-	Not Applicable	-
	10-Gig SR	Fiber (multimode)	-	-	LC	-
	10-Gig LRM	Fiber (multimode)	-	-	LC	-

Table Continued

40 Gbps	10-Gig LR	Fiber (single mode)	-	-	LC	-
	10-Gig ER	Fiber (single mode)	-	-	-	-
40 Gbps	40-Gig Direct Attach 1/3/5 m	Copper (twinaxial)	-	-	-	Not Applicable
	40-Gig SR4	Fiber (multimode)	-	-	-	MPO
	40-Gig ESR4	Fiber (multimode)	-	-	-	MPO
	40-Gig LR4	Fiber (single mode)	-	-	LC	LC
Smart Rate 1/2.5/5/10 Gbps	Smart Rate	Copper (twisted pair)	RJ-45	-	-	-

[1] For supported transceivers, visit **http://www.hpe.com/networking/support .**

- In the first textbox, type **J4858** (for 100-Mb and Gigabit information), **J8436** (for 10-Gigabit information), or **JH231** (for 40–Gigabit information).

- Select any of the products that display in the dropdown list.

- Select **Support Center**. Then click on **Manuals**, followed by **View All** to and find the Transceiver Support Matrix.

For technical details of cabling and technologies, see **Cabling and technology information**.

Management ports

Console Ports

There are two serial console port options on the switch, an RJ-45 or Micro USB. These ports are used to connect a console to the switch either by using the RJ-45 serial cable optionally ordered with the switch, or a standard Micro USB cable (not supplied). The Micro USB connector has precedence for input. If both cables are plugged in, the console output is echoed to both the RJ-45 and the Micro-USB ports, but the input is only accepted from the Micro-USB port.

For more information on the console connection, see **Setting up a console connection** on page 59. The console can be a PC or workstation running a VT-100 terminal emulator, or a VT-100 terminal.

Auxiliary (Aux) port

An auxiliary port for processing a USB command file or downloading switch software code. This port uses a USB Type A connector, but does not comply with all USB protocols and standards.

NOTE: FAT32 USB format is required.

Switch and port LEDs on front of the switches

Figure 3: *Switch and port LEDs*
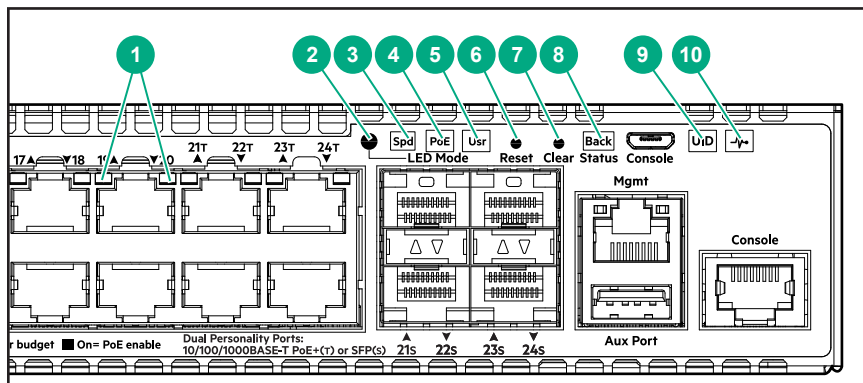
Table 5: *Switch and port LEDs: Labels and description*

Label	Description
1	Port LEDs
2	LED Mode button
3	Speed mode selected LED
4	PoE mode selected LED (only on Aruba 2930M models that support PoE operation)
5	Usr mode selected LED
6	Reset button
7	Clear button
8	Usr LED back status LED
9	UID (Unit Identification)
10	Global status LED

Table 6: *Front of switch status and mode LED behavior*

Switch LEDs	Function	State	Meaning
Global Status	Internal Power Status of the switch. Self-Test Status Switch/Port Fault Status	On Green	The Switch has passed self-test and is powered up normally.
		Slow Flash Green*	The switch self-test and initialization are in progress after the switch has been power cycled or reset. The switch is not operational until this LED stops blinking green.

Table Continued

Switch LEDs	Function	State	Meaning
		Slow Flash Orange*	A fault or self-test failure has occurred on the switch, one of the switch ports, or a module in the rear of the switch. The Status LED for the component with the fault will flash simultaneously.
		On Orange	If this LED is on orange for a prolonged time, the switch has encountered a fatal hardware failure, or has failed its self-test.
		Off	The unit is not receiving power.
UID (Unit Identification)	The Unit Identification LED is used to help you to identify a particular unit in a rack or collection of products.	On or Fast Flash**	The "chassislocate" command allows you to flash or turn on the LED for a specified number of minutes (1-1440). The default is 30 minutes.
		Off	LED will clear after the timeout period has expired.
Out-of-Band Management (OOBM) Port LED: Activity/ Link	Display Activity/Link and port status of OOBM	Half-Bright Green	The port is enabled and receiving a Link indication from the connected device. high-bandwidth
		On Green	The port is experiencing utilization.
		Activity Flicker Green	The percentage of time that the LED is full-bright is roughly proportional to the percentage of full bandwidth utilization of the port. Even just one packet will trigger a visible full-bright flicker. Half-Bright Green port Link indication remains on as Activity flickers from half-bright to full-bright.
		Slow Flash Orange	The port has failed its self-test. Flashes simultaneously with the Global Status LED flashing orange.
		Off	The port is disabled, not connected, or not receiving link.

Table Continued

Switch LEDs	Function	State	Meaning
Back Module Status	Status of modular components installed in the back of the unit.	On Green	Normal operation: All modular components installed in the back of the unit are functioning correctly.
		Slow Flash Orange*	One of the modules inserted from the back of the chassis (power supply or stacking module) has failed self-test or is experiencing a fault condition. Flashes simultaneously with the Global Status LED flashing orange.
		Off	No modular components installed in the back of the chassis.
Speed Mode Selected	Indicates when the Port LEDs are showing port speed information.	On	Speed Mode is selected. Port LEDs indicate port speed.
		Off	Speed mode not selected.
Power over Ethernet (PoE) Mode Selected***	Indicates when the Port LEDs are showing PoE status information.	On Green	PoE Mode is selected. Port LEDs show PoE information.
		On Orange	PoE Mode is selected and a port also has a PoE error. The Global Status LED and the LED corresponding to the port with the error will be flashing orange. The rest of the Port LEDs will display normal PoE status.
		Slow Flash Orange*	PoE Mode has NOT been selected and a port has a PoE error. LED will be flashing orange simultaneously with the Global Status LED and the LED corresponding to the port with the error. The rest of the Port LEDs will display normal PoE status.
		Off	PoE mode is not selected.
User Mode Selected	When stacking is enabled, the Port LEDs are displaying stack information and status. When stacking is disabled, this mode is reserved for future use.	On Green	User Mode is selected.
		Off	User mode not selected.

Table Continued

Aruba 2930M Switches

Switch LEDs	Function	State	Meaning
Save Power Mode Selected			This mode is indicated by ALL the switch indicator LEDs being off, except for the Global Status LED. This display occurs only if the switch has been configured with the `savepower led` command. See the *Management and Configuration Guide* for more information on that command.

* The slow flash behavior is an on/off cycle once every 1.6 seconds, approximately.

** The fast flash behavior is an on/off cycle once every 0.5 seconds, approximately.

*** Applies only to switches that support PoE.

Table 7: *Port LEDs and mode behavior*

Switch LEDs	Function	State/Mode	Meaning
Port LEDs	To display the information for the port as selected by the LED Mode select button. When transceivers and SFPs are installed, this LED is also used to indicate that the installation has occurred by turning on for two seconds then off.	Activity/Link	Shows port Activity and Link status. This operation is the DEFAULT. There is no dedicated mode LED indicating this mode. The Mode LED function returns to this selection 10 minutes after the last press of the LED Mode button.
		Speed	Shows port speed configuration.
		PoE	Shows PoE information.
		User	Shows user-selectable behavior.
Activity/Link Mode Selected	Port LEDs are displaying Link status and network activity information simultaneously. Activity/Link Mode is the default mode and is in effect unless another LED mode has been selected.	Half-Bright Green	The port is enabled and receiving a Link indication from the connected device.
		Activity Flicker Green	The percentage of time that the LED is full-bright is roughly proportional to the percentage of full bandwidth utilization of the port. Half-Bright Green port Link indication remains on as Activity flickers from half-bright to full-bright.

Table Continued

Switch LEDs	Function	State/Mode	Meaning
		Slow Flash Orange*	The corresponding port has failed its self-test. Flashes simultaneously with the Global Status LED flashing orange.
		Off	The Port is disabled, not connected, or not receiving link.
Speed Mode Selected	Port LEDs are displaying the connection speed at which each port is operating.	Fast Flash Green**	The port is operating at 40 Gbps.
		On Green	The port is operating at 10 Gbps.
		Triple Blink Green	The port is operating at 5 Gbps. (HPE Smart Rate ports only)
		Double Blink Green	The port is operating at 2.5 Gbps. (HPE Smart Rate ports only)
		Slow Flash Green*	The port is operating at 1 Gbps.
		Off	The port is not Linked, or is operating at 10 Mbps or 100 Mbps.
PoE Mode Selected	Port LEDs are displaying PoE information.	On Green	The port is providing PoE power.
		On Orange	PoE is disabled on the port.
		Fast Flash Orange**	The port is denied power or is detecting an external PD fault.
		Slow Flash Orange*	The port has an internal hardware failure. Flashes simultaneously with the Global Status LED flashing orange.
		Off	The port is not providing PoE power.
User Mode Selected	Mode currently active only in stacked configurations. Used to display the number of members in a stack and their status.	On Green	Stack Member exists in the stack and is operational.
		Slow Flash Green*	Indicates the Member # of the chassis.

Table Continued

Aruba 2930M Switches

Switch LEDs	Function	State/Mode	Meaning
	The status information is sticky and if a unit status changes while in USER mode, you must exit and re-enter USER mode to get the updated status.	Fast Flash Green**	Indicates the Member # of the Commander of the stack.
		On Orange	Stack Member is booting or has a fault that is preventing it from communicating.
		Slow Flash Orange*	Stack Member is in a known fault condition (for example, a PSU fault). The Global Status LED on all stack members will also Slow Flash Orange.
		Fast Flash Orange**	Stack Member is in an Alert condition (that is, Overtemp, PoE Over subscript, and so forth). The Global Status LEDs on all stack members will remain in normal operational.
		Off	Stack Member does not exist in the stack configuration.

* The slow flash behavior is an on/off cycle once every 1.6 seconds, approximately.

** The fast flash behavior is an on/off cycle once every 0.5 seconds, approximately.

*** Applies only to switches that support PoE.

Example of USER mode behavior

Assume that you have a 4-member stack, in a ring topology, with member numbers 1, 2, 3 and 5. Member 1 is the commander and member 3 is rebooting. In USER mode, the members will show the following on their port LEDs:

	Port 1 LED	Port 2 LED	Port 3 LED	Port 4 LED	Port 5 LED	Port 6-10 LEDs
Member 1	Fast Flash Green	On Green	On Orange	Off	On Green	Off
Member 2	Fast Flash Green	Slow Flash Green	On Orange	Off	On Green	Off
Member 3	Going through normal boot up sequencing					
Member 5	Fast Flash Green	On Green	On Orange	Off	Slow Flash Green	Off

Looking at any member, you can see that there are four members defined in the stack configuration, with member numbers 1, 2, 3, and 5 because these are the LEDs that are lit. The port 4 LED is off, indicating that this member number is not defined in the stack.

On all members, Port 1 LED is fast flashing, indicating that member 1 is the commander of the stack. Port 3 LED is on orange, indicating either that 3 is rebooting or not communicating because of an unknown fault.

When looking at member 1, only Port 1 LED is fast flashing green. This behavior indicates that this unit is member 1 and is the commander.

When looking at member 2, the port 2 LED is slow flashing green, indicating that unit is member number 2. Likewise on member 5, the port 5 LED is slow flashing green, indicating that unit is member 5.

Member 3 will be going through the normal boot LED boot up sequence. When it has completed booting and joined the stack, if you exit and re-enter USER mode, the members show the following on their port LEDs:

	Port 1 LED	Port 2 LED	Port 3 LED	Port 4 LED	Port 5 LED	Port 6-10 LEDs
Member 1	Fast Flash Green	On Green	On Green	Off	On Green	Off
Member 2	Fast Flash Green	Slow Flash Green	On Green	Off	On Green	Off
Member 3	Fast Flash Green	On Green	Slow Flash Green	Off	On Green	Off
Member 5	Fast Flash Green	On Green	On Green	Off	Slow Flash Green	Off

LED mode select button and indicator LEDs

The state of the mode LEDs is controlled by the LED Mode select button. The current view mode is indicated by the mode LEDs next to the button. To step from one view mode to the next, press the button.

> **NOTE:** Stacking Notes
>
> • For 2930M switches that are in a stack, the LED Mode select button on every switch in the stack controls the LED mode for all the switches in the stack. Using the LED Mode select button on one switch in the stack changes the LED mode for the entire stack.
>
> • If there is a combination of PoE switches and non-PoE switches in the stack, when any LED Mode select buttons is pressed to put the stack into PoE mode, the non-PoE switches indicate no PoE support by not illuminating any of the mode indicator LEDs or any of the port LEDs.
>
> • If any of the switches in the stack are configured with the Save Power LED feature, the default LED mode for the whole stack becomes the Save Power display. (This condition means all LED mode indicator LEDs are off). However, only the stack members on which that feature is configured display the other characteristics of that feature (all LEDs off except for the power LED).

Reset and Clear buttons

The Reset and Clear buttons are recessed from the front panel (to protect them from being pushed accidentally) and are accessible through small holes on the top of the front panel. Use pointed objects, such as unbent paper clips, to push them.

The buttons are used singly or in combination, as follows:

To accomplish this:	Do this:	This will happen:
Soft reset (Standalone switch)	Press and release the Reset button	The switch operating system is cleared gracefully (such as data transfer completion, temporary error conditions are cleared), then reboots and runs self-tests.
Hard reset (Standalone switch)	Press and hold the Reset button for more than 5 seconds (until all LEDs turn on), then release.	The switch reboots, similar to a power cycle. A hard reset is used, for example, when the switch CPU is in an unknown state or not responding.
Soft reset (Stacked switch)	Press and release the Reset button	Same as a standalone switch, except: • If action happened on the commander, the standby switch will become commander. • If action happened on the standby, a new standby will be elected.
Hard reset (Stacked switch)	Press and hold the Reset button for more than 5 seconds (until all LEDs turn on), then release.	Same as a standalone switch, except: • If action happened on the commander, the standby switch will become commander. • If action happened on the standby, a new standby will be elected.
Delete console and management access passwords	Press Clear button for more than 5 seconds, but within 15 seconds (in btw 5 - 15 seconds)	Clears all passwords. Will flash Global Status Green LED, after 5 seconds has expired to indicate passwords have cleared.
Turn off UID LED	Press Clear button and release within 5 seconds (in btw 0.5 - 5 seconds)	Clears the UID LED.

Table Continued

To accomplish this:	Do this:	This will happen:
Restore the factory default configuration	1. Press Clear and Reset simultaneously. 2. While continuing to press Clear, release Reset. 3. When the Global Status LED begins to fast flash orange (after approximately 5 seconds), release Clear.	The switch removes all configuration changes, restores the factory default configuration, and runs self test.

> **NOTE:** These buttons are provided for your convenience. If you are concerned with switch security, make sure that the switch is installed in a secure location, such as a locked wiring closet. You can also disable these buttons by using the `front-panel-security` command. See the *2930M Management and Configuration Guide* for a description of that command.

Out-of-band management (OOBM) port

This RJ-45 port is used to connect a dedicated management network to the switch. To use it, connect an RJ-45 network cable to the management port to manage the switch through Telnet from a remote PC or a UNIX workstation.

To use this port, the switch must have an IP address. IP settings can be configured through a console port connection or automatically from a DHCP/Bootp server.

A networked out-of-band connection through the management port allows you to manage data network switches from a physically and logically separate management network.

For more information, see the Network Out-of-Band Management (OOBM) appendix in the *Management and Configuration Guide* at **https://www.hpe.com/networking/support**.

Back of the switches

The back of all 2930M switches is the same.

Figure 4: *Back of the 2930M switches*
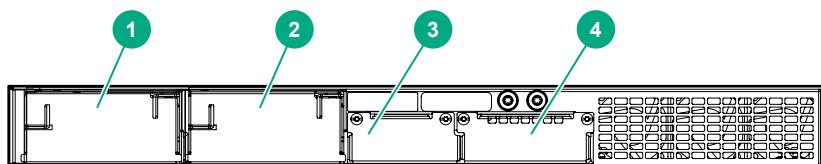
Table 8: *Back of the 2930M switches: Label and description*

Label	Description
1	AC power connector / power supply slot 1
2	AC power connector / power supply slot 2
3	Stacking module slot
4	Uplink module slot

Power supplies

The following power supplies can be installed in the 2930M switches:

- **Aruba X371 12VDC 250W 100-240VAC Power Supply (JL085A)**: A 250 watt power supply for the non-PoE switches. This power supply does not provide any PoE power. It is keyed so that it will not fit into the power supply slots of 2930M PoE switches.

- **Aruba X372 54VDC 680W 100-240VAC Power Supply (JL086A)**: A 680 watt power supply for 2930M PoE supported switches. This power supply offers up to 370 watts of PoE+ power. It is keyed so that it does not fit into the power supply slots of non-PoE 2930M switches.

- **Aruba X372 54VDC 1050W 110-240VAC Power Supply (JL087A)**: A 1,050 watt power supply for 2930M PoE supported switches. This power supply offers up to 740 watts of PoE power. It is keyed so that it does not fit into the power supply slots of non-PoE 2930M switches.

For initial power supply installation, see the *Aruba 3810M/2930M Switch Power Supply Quick Setup Guide and Safety/Regulatory Information* that was shipped with the power supply units.

For more power supply information, see **(Optional) Installing a second power supply**.

Power connector

The 2930M switches do not have a power switch. They will power on when either one or both power supplies are connected to an active AC power source.

Stacking module slot

Each of the 2930M switches has one module slot that can accept the following:

- 2930M Stacking Module (JL325A)

- 2920/2930M 0.5m Stacking Cable (J9734A)

- 2920/2930M 1.0m Stacking Cable (J9735A)

- 2920/2930M 3.0m Stacking Cable (J9736A)

These components provide high-speed connectivity to other 2930M switches. Only the 2930M switches support this module.

Uplink port slot and module support

The 2930M family of switches features a module slot that allows the user to customize the uplink ports on the switch. The slot support 40Gbps of maximum bandwidth and is available in three possible options: four Smart Rate, four SFP+, or one QSFP+.

NOTE: Unsupported modules are mechanically prevented from installing into unsupported slots.

Table 9: *Switch module/support matrix*

Switch model	Module support		
	JL078A 1QSFP+	JL081A Smart Rate 1G/ 2.5G/5G/10G PoE	JL083A 4SFP+
JL319A Aruba 2930M 24G 1-slot switch	Yes	Yes, but no PoE	Yes
JL320A Aruba 2930M 24G PoE+ 1-slot switch	Yes	Yes	Yes
JL321A Aruba 2930M 48G 1-slot switch	Yes	Yes, but no PoE	Yes
JL322A Aruba 2930M 48G PoE+ 1-slot switch	Yes	Yes	Yes
JL323A Aruba 2930M 40G 8SR PoE+ 1-slot Switch	Yes	Yes	Yes
JL324A Aruba 2930M 24 SR PoE + 1-slot Switch	Yes	Yes	Yes
R0M67A Aruba 2930M 40G 8 HPE Smart Rate PoE Class 6 1-slot Switch	Yes	Yes	Yes
R0M68A Aruba 2930M 24 HPE Smart Rate PoE Class 6 1-slot Switch	Yes	Yes	Yes

LEDs on the back of the switches

This section describes the LEDs on the back of the switch. When the back LED on the front of the unit is blinking a fault, the user can look at the back of the switch to find the corresponding blinking LED for the faulted module or power supply. If a user installs a second power supply and did not turn on the power (PSU module status = OFF), the back LED will blink orange.

Figure 5: *LEDs on the back of switches*
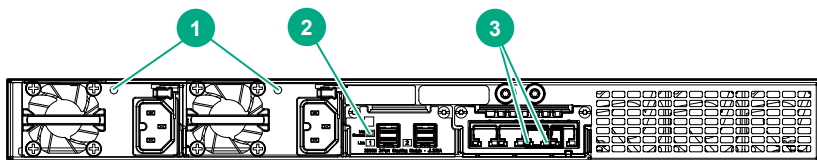
Table 10: *Back of the 2930M switches LED labels and description*

Label	Description
1	Power supply unit (PSU) status LED
2	Stacking module status LED
3	Uplink module status LED

Table 11: *LEDs on the back of the switch*

Switch LEDs	Function	State	Meaning
PSU module Status	Status of PSU: Looking at the back of the unit, PSU1 is on the left and PSU2 is on the right.	On Green	The power supply has valid AC input and valid DC outputs.
		Slow Flash Green	Either the power supply has an internal fault, or switch has a fault that is causing power supply to cycle on/off.
		Off	The power supply has an invalid AC input, or invalid DC outputs.
Uplink module status	Status of uplink module	On Green	Uplink module operating correctly.
		Slow Flash Orange*	Uplink module has experienced a fault. The Global Status LED should be flashing synchronously.
		Fast Flash Orange**	Uplink module or one or more of its ports is/are experiencing an alert condition. Alert conditions include that an unsupported cable has been installed in the module or that the uplink module has been installed while the switch was powered on (hot-swapped) and the switch needs to be rebooted to support the module.
		Off	No power
		No Present	No Module

2930M stacking module

The 2930M 2-port stacking module (JL325A) is a component you can add to an 2930M switch to provide high-speed stacking connections to other 2930M switches. See **Stacking information and topologies** and the *HPE*

ArubaOS-Switch Advanced Traffic Management Guide for your switch OS version for more information about stacking configuration and operation.

Figure 6: *Front of 2930M 2-port stacking module*
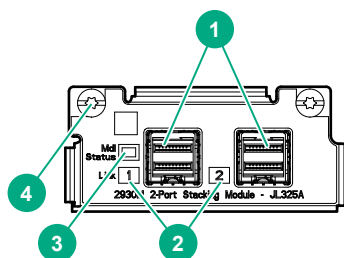
Table 12: *Front of 2930M 2-port stacking module: Label and description*

Label	Description
1	Stacking connectors
2	Link LEDs
3	Stacking module status LED
4	Module retaining screws

The 2930M 2-port stacking module JL325A has the following features:

• Two stacking connectors for connecting the 2930M switch to other 2930Ms in a stacked topology (ring only). Any of these available stacking cables can be used for these connections:

  ◦ Aruba 2920/2930M 0.5M Stacking Cable (J9734A)

  ◦ Aruba 2920/2930M 1.0m Stacking Cable (J9735A)

  ◦ Aruba 2920/2930M 1.0m Stacking Cable (J9735A)

• LEDs, described below.

Stacking module LEDs

The following LEDs are located on the 2930M stacking module itself and are only viewable from the rear of the switch.

Table 13: *Stacking module LEDs*

Name	Function	Mode	Description
Stacking Module Status	Status of Stacking module	On Green	Stacking module operating correctly.
		Slow Flash Orange	Stacking module has experienced a fault, or one or more of the module ports has experienced a fault. The 1.6 seconds cycle flash should be synchronized with the switch Global Status LED. The Global Status and Back LED should also be flashing.
		Fast Flash Orange	Stacking module or one or more of its ports is experiencing an alert condition. Alert conditions include that an unsupported cable has been installed in the module or that the stacking module has been installed while the switch was powered on (hot-swapped) and the switch needs to be rebooted to support the module. The BACK LED should be flashing and the Global Status LED should NOT be flashing.
		Off	No power
Stacking Link Status	The Link LED per stacking port indicates the port is enabled, connected and detects a signal from the attached device.	On Green	The port is enabled and receiving a link indication from the connected device.
		Slow Flash Orange	Port Failed POST or cable fault. Module Status LED on the stacking module and Global Status and Back LED on front of unit should also be synchronized and flashing orange.
		Off	No cable plugged in

2930M uplink modules

Figure 7: *Front of 2930M uplink modules*
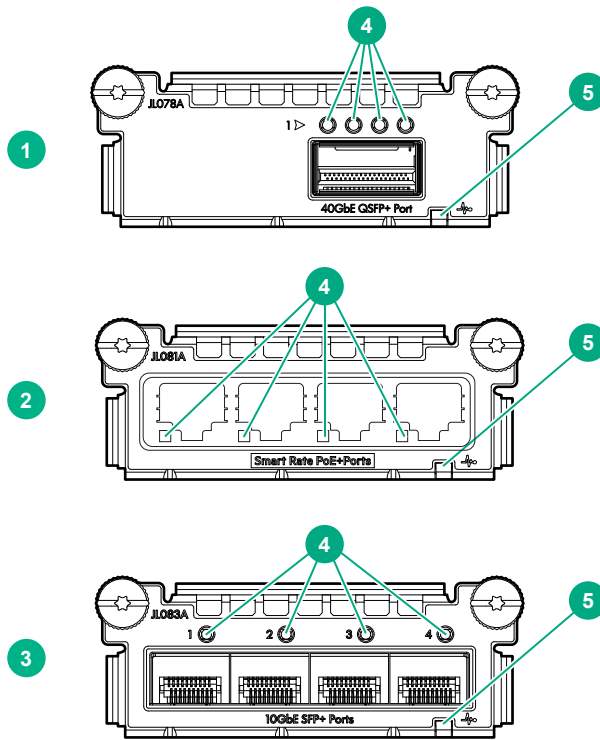
Table 14: *2930M uplink modules: Label and description*

Label	Description
1	Aruba 3810M/2930M 1-port QSFP+ 40GbE Module (JL078A)
2	Aruba 3810M/2930M 4 HPE Smart Rate 1G/2.5G/5G/10G PoE+ Module (JL081A)
3	Aruba 3810M/2930M 4-port 100M/1G/10G SFP+ MACsec Module (JL083A)
4	Port LEDs
5	Uplink module status LED

Uplink module LEDs

Each QSFP+ port has four green/orange bicolor LEDs to communicate port-level information. The four LEDs are located above each QSFP+ port as shown in the following illustration.
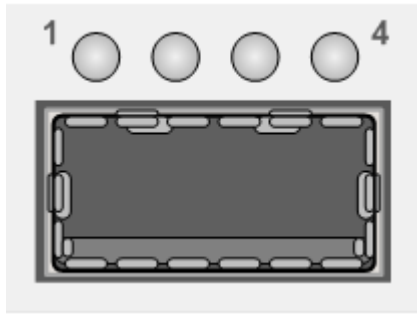
Table 15: *Uplink module LEDs*

		40GbE mode	4x10GbE mode
Power-on / reset		All four LEDs cycle through Green-Orange-Green-Off	
Self-test		During boot, all four LEDs will flicker green, then clear. During a failure, all four LEDs slow-blink orange synchronously with the Chassis Fault LED, Management Module Test, and module number LEDs.	
QSFP+ device ID and authentication		All four LEDs turn on green for ~two seconds when QSFP+ device passes ID and authentication. All four LEDs slow-blink orange when QSFP+ device fails identification (unsupported device). All four LEDs slow-blink orange synchronously with the Chassis Fault LED and Management Module Test and Module Number LEDs when QSFP+ device fails authentication.	
LED mode	Activity	All four LEDs flicker green synchronously to indicate traffic on the 40G link. Off = Linked but no traffic, no link, or device not installed.	Individual LEDs flicker green asynchronously to indicate traffic on each active 10G links. Off = Linked but no traffic, no link, or device not installed.
	Duplex	All four LEDs turn on green to indicate full-duplex. All four LEDs clear when there is no link or QSFP+ device is not installed.	
	Speed	QSFP+ device installed: • All four LEDs turn on green to indicate port configured for 40GbE mode and linked. • LEDs off to indicate that port is not linked. QSFP+ device not installed: All four LEDs on green indicates port configured for 40GbE mode.	QSFP+ device installed: • All four LEDs slow-blink green to indicate that port is configured for 4x10GbE mode and linked. • LEDs off to indicate that port is not linked. QSFP+ device not installed: All four LEDs slow-blink green to indicate that port is configured for 4x10GbE mode.

Table Continued

		40GbE mode	4x10GbE mode
	PoE	Off	
	User-defined	Reserved for future use.	
Port mismatch		All LEDs fast-blink orange.	

Switch features

The features of the 2930M switches include:

- Combinations of fixed 10/100/1000-T, HPE Smart Rate, and SFP/SFP+ ports, as described under **Network ports** on page 11.

- Selected switch models feature HPE Smart Rate ports and provide 1 Gbps, 2.5 Gbps, 5 Gbps, and 10 Gbps connectivity. See **Cabling specifications** on page 88 for more information.

- All switch models feature one uplink port module slot that allows configuration with either Smart Rate, 10G SFP+, or 40G QSFP+ ports, as described in **Uplink port slot and module support** on page 23.

- One module slot is provided in the back of the switches to support a stacking module to provide connectivity to other 2930M switches with stacking modules. See **Stacking information and topologies** on page 51 and the *HPE ArubaOS-Switch Advanced Traffic Management Guide* for your switch OS version for more information about stacking.

- Power over Ethernet (PoE) operation; enabled by default. The following switches power IP phones, wireless access points, indoor web cameras, and more.

Aruba 2930M switch	PoE per port	Standard[1]
24G PoE+ 1-slot switch (JL320A)	Up to 30W	802.af
48G PoE+ 1-slot switch (JL322A)		802.3at
40G 8SR PoE+ 1-slot Switch (JL323A		
24SR PoE+ 1-slot Switch (JL324A)		
40G 8 HPE Smart Rate PoE Class 6 1-slot Switch (R0M67A)	Up to 60W	802.3bt
24 HPE Smart Rate PoE Class 6 1-slot Switch (R0M68A)		802.3 af/at [2]

[1] These switches also support some prestandard PoE devices. For a list of these devices, see the FAQs (Frequently Asked Questions) for your switch model.

[2] 2-Pair Power Noncompliant Dual Sig up to class 4 with optional 4-pair power through test mode. Includes 2-Pair Power legacy 802.3 af/at with prestandard detect enabled.

For instructions on using the switch PoE features, see the *2930M Management and Configuration Guide* for your switch OS version at **http://www.hpe.com/networking/ResourceFinder**. (For more PoE information, see the *HPE Power over Ethernet (PoE) Planning and Implementation Guide*, available at the same URL.)

- The option to have one or two internal power supplies in the switch:

◦ A second power supply supports redundant system power and/or redundant/additional PoE power. If one of the internal power supplies fails, the second power supply immediately provides the power necessary to keep the switch running, including PoE power on an allocated basis.

◦ If maximum PoE power is used on the 48-port PoE switches, the second power supply is needed for PoE power. There is no PoE power redundancy, but system power is always maintained. On a power supply failure, the system drops the PoE power on ports based on user priority, to maintain system power. For more information on Power Supplies, see **Power supplies** on page 23.

◦ JL086A PSUs can support up to six ports at 60W. In terms of 802.3bt PoE power allocation, the second JL086A provides redundant power if PoE is configured for six ports at 60W. However, if PoE is configured for 12 ports at 60W, there is no power redundancy. This condition is because the moment one power supply fails, the PoE ports drop from 12 at 60W to 6 at 60W. However, if there is one power supply in the platform, the system power will still be maintained.

- Plug-and-play networking: All ports are enabled by default. Connect the network cables to active network devices and your switched network is operational.

- Auto MDI/MDI-X on all twisted-pair ports (10/100/1000 and 10GBase-T), meaning that all connections can be made using straight-through twisted-pair cables.

  Cross-over cables are not required, although they will also work. The pin operation of each port is automatically adjusted for the attached device. If the switch detects that another switch or hub is connected to the port, it configures the port as MDI. If the switch detects that an end node device is connected to the port, it configures the port as MDI-X . (See the appendixes for recommended or required cabling.)

- Automatically negotiated full-duplex operation for the 10/100/1000 RJ-45 ports when connected to other auto-negotiating devices. The SFP/SFP+ ports always operate at full duplex.

- Easy management of the switch through several available interfaces:

  ◦ **Console interface**: A full-featured, easy-to-use, VT-100 terminal interface for out-of-band or in-band switch management.

  ◦ **Web browser interface**: An easy-to-use built-in graphical interface that can be accessed from common web browsers.

  ◦ **Aruba AirWave**: A powerful and easy-to-use network operations system that manages wired and wireless infrastructures. For more information, visit **https://www.hpe.com/networking/imc** and select the link to Aruba AirWave.

  ◦ **Aruba Activate**: Cloud-based service that provides inventory control and facilitates Zero Touch Provisioning.

  ◦ **Aruba ClearPass Policy Manager**: Network policy management software for wired and wireless network devices that provide on-boarding and role-based control/security.

  ◦ **Aruba Central**: Network management software cloud platform. It offers IT organizations a simple, secure, and cost-effective way to manage and monitor Aruba switches and Aruba instant wireless APs.

  ◦ **IMC** (HPE Intelligent Management Center): An SNMP-based, graphical network management tool that you can use to manage your entire network. Free trials of IMC can be downloaded at **https://www.hpe.com/networking/imc**. (Scroll down to the IMC options.)

- Support for the Spanning Tree Protocol to eliminate network loops.

- Support for up to 2048 IEEE 802.1Q-compliant VLANs so you can divide the attached end nodes into logical groupings that fit your business needs.

- Support for many advanced features to enhance network performance: For a description, see the *Management and Configuration Guide* for your 2930M switch model at **https://www.hpe.com/networking/ResourceFinder**.

- Ability to update the switch software. To download product updates, go to either of the following:

  ◦ Hewlett Packard Enterprise Support Center Get connected with updates page: **https://www.hpe.com/support/e-updates**

  ◦ HPE Networking Software: **https://www.hpe.com/networking/software**

  To view and update your entitlements and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center at **https://www.hpe.com/support/AccessToSupportMaterials**.

- An auxiliary port (USB Type A connector) for processing a USB command file and updating switch software.

- Low-power operation:

  ◦ Ports on a switch or stack member may be set to operate at reduced power.

  ◦ Port status LEDs may be turned off.

  ◦ If the port is not connected (link partner is not detected), then RJ-45 ports will operate at reduced power.

- Switch Hibernation mode to allow the switch to power down for a period each day to save energy.

- IEEE 1588 end-to-end transparent mode support.

Aruba 2930M Switches

This chapter shows how to install the switch. The 2930M switches come with an accessory kit that includes the brackets for mounting the switch in a standard 19-inch telco rack or in an equipment cabinet. Also included are rubber feet that can be attached so the switch can be securely positioned on a horizontal surface. The brackets are designed to allow mounting the switch in a variety of locations and orientations. For other mounting options, contact your local Hewlett Packard Enterprise authorized network reseller or Hewlett Packard Enterprise representative.

Shipping the switch in a rack

If the switch is to be shipped in a rack, it can be mounted and shipped in a Hewlett Packard Enterprise Universal Rack.

- This method uses the HPE X410 Universal Rack Mounting Kit (J9583A).

- For more information and rack mount documentation, visit **http://www.hpe.com/networking/support** and enter **J9583A** for search information.

- To order the J9583A rack mounting kit, contact your Aruba sales representative.

Included parts

The 2930M switches have the following components shipped with them:

- Documentation kit

- Accessory kit (5300-0103) containing:

  two mounting brackets

  eight 8-mm M4 screws to attach the mounting brackets to the switch

  four 5/8-inch number 12-24 screws to attach the switch to a rack

  four rubber feet

> **NOTE:** Console cables can be ordered separately, or as an accessory to your switch:
>
> Aruba X2C2 RJ45 to DB9 Console Cable (JL448A)
>
> A standard micro-USB (Aruba switches) or mini-USB (HPE FlexNetwork switches) cable can be used to console into the switch. Only data-capable USB cables can be used as console cables. USB charging-only cables will not work.

- Power cord, one of the following (included with power supply unit):

Aruba 2930M PoE Switches			
North America	8121-0973	Australia	8121-0857
North America high line	8121-0941	Brazil	8121-1265
South Africa/India	8121-1483	Europe/South Korea	8120-5336

Table Continued

Aruba 2930M PoE Switches			
Israel	8121-1009	China	8121-1034
United Kingdom/Hong Kong/ Singapore/Malaysia	8120-5334	Argentina	8121-1481
Switzerland	8120-5339	Chile	8120-8389
Danish	8120-5340	Thailand/Philippines	8121-0671
Japan high line	8120-5338 (JL086A, JL087A)	Taiwan 15A	8121-1511 (JL086A, JL087A)
Japan low line	8120-5342 (JL086A)	Taiwan 10A	8121-0967 (JL086A)

Aruba 2930M Non-PoE Switches			
Argentina	8120-6869	Japan	8120-4753
Australia/New Zealand	8121-0834	Switzerland	8120-6815
Brazil	8121-1069	South Africa	8120-6813
Chile	8120-6980	Taiwan	8121-0974
China	8120-8707	Philippines/Thailand	8121-0668
Continental Europe/South Korea	8120-6811	UK/Hong Kong/Singapore/ Malaysia	8120-6809
Denmark	8120-6814	US/Canada/Mexico	8121-0973
India	8121-0780	North America high line	8121-0941
Israel	8121-1035		

製品には、同梱された電源コードをお使い下さい。
同梱された電源コードは、他の製品では使用出来ません。

Installation precautions and guidelines

To avoid personal injury or product damage when installing your switch, read the following installation precautions and guidelines.

WARNING:

- Do not mount the switch on a wall or under a table or under another horizontal surface.

- Mount devices installed in a rack or cabinet as low as possible. Put the heaviest devices at the bottom and progressively lighter devices positioned higher.

- To prevent the rack or cabinet from becoming unstable and/or falling over, ensure that it is adequately secured.

Aruba 2930M Switches

CAUTION:

- If your installation requires a different power cord than the one supplied with the switch and power supply, be sure that the cord is adequately sized for the current switch requirements. In addition, be sure to use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country/region. The mark is your assurance that the power cord can be used safely with the switch and power supply.

- Do not ship any switch in a rack without checking for restrictions. Otherwise, you may void the switch warranty. See **Shipping the switch in a rack** on page 33.

- Ensure that the power source circuits are properly grounded. Then connect the switch to the power source by using the power cord supplied with the switch. For more information on power cords, see **Included parts** on page 33.

- When installing the switch, ensure that the AC outlet is near the switch. Make it easily accessible in case the switch must be powered off.

- Ensure that the power cord and network cables at the switch mounting location do not create a tripping hazard.

- Do not install the switch in an environment where the operating ambient temperature exceeds its specification. See the Operating temperature information under **Environmental** on page 83.

- Ensure that the switch does not overload the power circuits, wiring, and over-current protection. To determine the possibility of overloading the supply circuits, add the ampere ratings of all devices installed on the same circuit as the switch. Then compare the total with the rating limit for the circuit. The maximum ampere ratings are printed on the devices near the AC power connectors.

- Avoid blocking any ventilation openings on the sides, rear, or front of the switch.

- Ensure that the air flow around the switch is not restricted. Leave at least 3 inches (7.6 cm) for cooling. For the air flow direction, see **1. Prepare the installation site** on page 36.

CAUTION: If a power supply must be removed, and then reinstalled, wait at least 5 seconds before reinstallation. Otherwise, damage to the switch may occur.

The power supply needs this time to bleed off any retained power.

CAUTION: Install cover plates on any slot that is not in use.

Installation procedures

Summary

Procedure

1. **Prepare the installation site**. Ensure that the physical environment is properly prepared. This preparation includes having the correct network cabling ready to connect to the switch, and having an appropriate location for the switch.

   NOTE: To avoid personal injury or product damage, review the **Installation precautions and guidelines** on page 34 before beginning the installation.

2. **Install a power supply (sold separately) and/or an optional second power supply**. You may want to use a second power supply with the switch to provide redundant power or added PoE power.

3.   **(Optional) Install the stacking module**.

4.   **4. Verify that the switch boots correctly**. Plug the switch into a power source and observe that the LEDs on the front panel indicate correct switch operation. When self-test is complete, unplug the switch.

5.   **5. Disconnect power from the switch**.

6.   **(Optional) Installing the uplink port module**

7.   **Mount the switch**. The switch can be mounted in the 19-inch telco rack, in an equipment cabinet, or on a horizontal surface.

8.   **(Optional) Connect a Management Console**. For example, you may want to configure an IP address for one of these purposes:

   •   Configure an IP address so it can be managed with a web browser.

   •   Manage the switch from an SNMP network management station.

   •   Manage the switch through a Telnet session.

   To connect a PC to the console port on the switch, use an Aruba X2C2 RJ45 to DB9 Console Cable (JL448A, sold separately).

9.   **Connect the switch to a power source**. Plug the switch into a nearby main power source.

10.   **(Optional) Install the stacking cables**.

11.   **(Optional) Install or remove SFP transceivers (mini-GBICs)**. Depending on the switch model purchased and optional uplink module configuration, the switch can support SFP/SFP+ or QSFP+ transceivers. Depending on where the switch is mounted, it may be easier to install the transceivers first. All transceiver types can be installed or removed while the switch is powered on.

12.   **Connect the network cables**. Using the appropriate network cables, connect the network devices to the switch ports.

At this point, the switch is fully installed. The rest of this chapter provides more detailed information on these installation steps.

1. Prepare the installation site

Cabling Infrastructure: Ensure the cabling infrastructure meets the necessary network specifications. See **Cabling and technology information** for more information.

Installation Location: Before installing the switch, plan its location and orientation relative to other devices and equipment:

•   In the front or the back of the switch, leave at least 7.6 cm (3 inches) of space for the twisted-pair and fiber-optic cabling.

•   In the back of the switch, leave at least 3.8 cm (1 1/2 inches) of space for the power cord. If you are stacking the switches, you will need 20 to 23 cm (approximately 8 to 9 inches), depending on the lengths of the stacking cables being used.

•   On the sides of the switch, leave at least 7.6 cm (3 inches) for cooling, except if the switch is installed in an open EIA/TIA rack.

Figure 8: *Air flow direction of the 2930M switches*
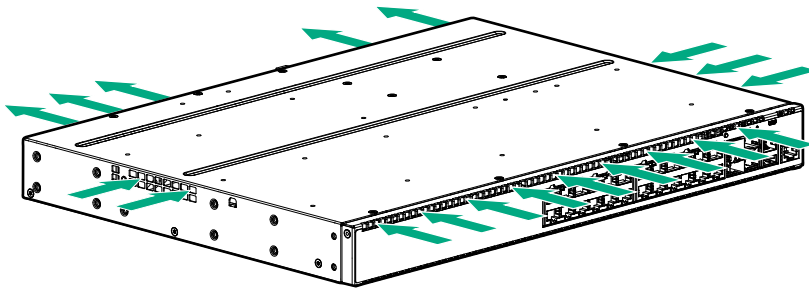
2. Install a power supply and an (optional) second power supply

Skip this step if a power supply (sold separately) is already installed and if you are not installing an optional second power supply.

Three types of power supplies can be installed:

- **Aruba 250W Power Supply** (JL085A, Aruba X371 250W 100-240VAC to 12VDC PS) is used with the non-PoE switches and is keyed so that it cannot be used in the PoE switches.

  The 250W power supply provides power to operate the switch. Installing a second power supply can provide power to the switch in case the initial power supply fails. If the power supplies are plugged into different AC power sources, redundant power can be supplied if there is loss of one of the AC power sources.

- **Aruba 680W PoE+ Power Supply** (JL086A, Aruba X372 680W 100-240VAC to 54VDC PS) used with the PoE switches and is keyed so that it cannot be used in the non-PoE switches.

- **Aruba 1050W PoE+ Power Supply**, (JL087A, Aruba X372 1050W 100-240VAC to 54VDC PS) is used with the PoE switches and is keyed so that it cannot be used in the non-PoE switches.

The 680W and 1050W power supplies provide two types of power to the PoE switches:

- The 680W and 1050W power supplies provide power to operate the switch. Installing a second power supply can provide power to the switch in case the initial power supply fails. If the power supplies are plugged into different AC power sources, redundant power can be supplied if there is loss of one of the AC power sources.

- The power supplies provide PoE power to the switch. If one of the power supplies fail, the second power supply will supply the needed PoE power to continue PoE operation. For the 48-port switches, the PoE power from the second power supply is additional power made available to the switch ports.

- It is important to understand the PoE power requirements of the switches. If the PoE power is not planned and implemented correctly, and an internal PoE power supply fails, the end devices connected to the switch ports may not receive power.

For power supply installation or replacement information, see the *Aruba 3810M/2930M Switch Power Supply Quick Setup Guide and Safety/Regulatory Information* at **https://www.hpe.com/networking/ResourceFinder**.

For further information regarding the power supply PoE capabilities, see the *HPE Power over Ethernet (PoE) Planning and Implementation Guide* on the Hewlett Packard Enterprise website at **http://www.hpe.com/networking/support**.

3. (Optional) Install the stacking module

📑 **NOTE:** The 2930M switch stacking module is not hot-swappable. The switch must be powered off before replacing the module.

If a 2930M switch is powered on for the first time without a stacking module installed, stacking is disabled in the switch running configuration. If you later install the stacking module, it will not be enabled until you either cycle the power to the switch or use the boot command to restart the switch. Otherwise, stacking is disabled even though the stacking module is installed. For information on the boot command, see the Basic Operation Guide for your switch model at **https://www.hpe.com/support/manuals**.

1. Disconnect the switch from all power sources.

2. Remove the stacking module cover plate. Store it in a secure location. Reuse it if the stacking module is removed from the switch in the future.
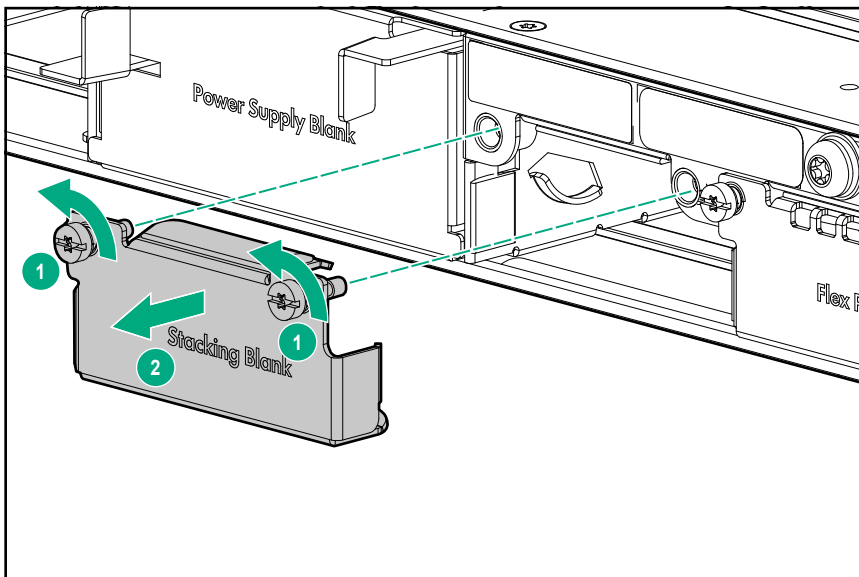
3. Install the stacking module.
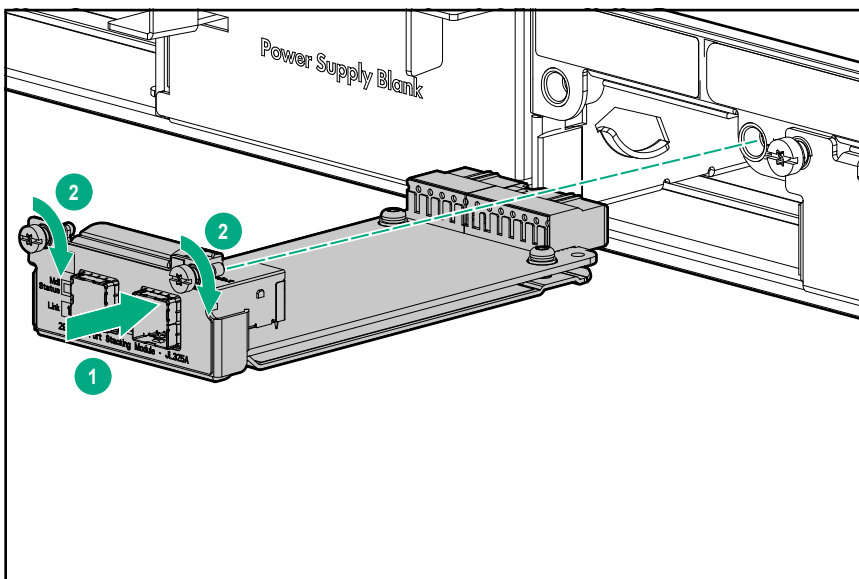
4. Verify that the switch boots correctly

NOTE: If a 2930M switch is powered on for the first time without a stacking module installed, stacking will be disabled and that will be saved in the switch running configuration. Subsequently, after a stacking module has been installed, stacking must be enabled through the console (CLI) command `stacking enable`.

Before installing the switch in its network location, plug it into a power source and verify that it boots correctly.

Procedure

1. Connect the power cord supplied with the switch to the power connector on the back of the switch. Then plug the power cord into a properly grounded electrical outlet.

    Figure 9: *Connecting the power cord*
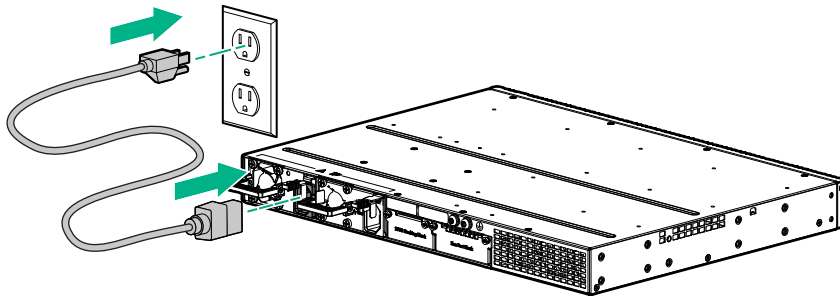
    NOTE: The 2930M switches do not have a power switch. They are powered on when the power cord is connected to the switch and to a power source. For safety, locate the power outlet near the switch installation.

    The switch automatically adjusts to any voltage between 100-240 (110–240 for JL087A power supply) and either 50 Hz or 60 Hz. No voltage range settings are required.

    If your installation requires a different power cord than the one supplied with the switch, be sure to use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country/region. The mark is your assurance that the power cord can be used safely with the switch.

2. Check the LEDs on the switch as shown in the following figure.

    Figure 10: *Example of an 2930M-48-port PoE switch*
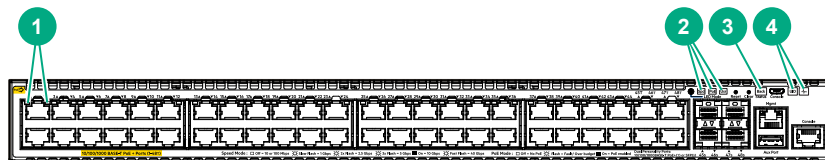
Label	Description
1	Switch Port LEDs
2	Mode LEDs
3	Back LED
4	Global Status and UID LEDs

When the switch is powered on, it performs its diagnostic self-test and initialization. This boot process, depending on switch model and configuration, takes approximately 1-2 minutes to complete.

General LED behavior:

During the switch boot:

- The Global Status, UID, other status, and mode LEDs, will initially turn green, and bicolor LEDs will change to orange, then back to green.

- The Global Status LED will start blinking green, indicating that the switch is going through its self-test and will continue to flash green until the switch is fully booted.

- The port LEDs will initially turn green, then turn orange, turn back to green, and then may blink on and off during phases of the boot.

When the switch boots successfully, the following LEDs display:

- Global Status and back LEDs will be solid green.

- Locator LED is off.

- Other status LEDs may be on or off depending on the switch configuration and the hardware installed.

- The port LEDs go into their normal operational mode:

  ◦ If the ports are connected to active network devices, the port LED may be on and behaves according to the LED mode selected. In the default LED mode (Activity/Link), the LED shows half-bright green to indicate link and be flickering full-bright green to show network traffic.

  ◦ If the ports are not connected to active network devices, the port LED will stay off.

If the LED display is different than what is described earlier in this section, the switch boot has not completed correctly. This is especially true if the Global Status LED continues to flash green for more than 120 seconds or flashes orange continually, See **Troubleshooting** on page 68 for diagnostic help.

(Optional) stacking module LED behavior

To verify that the module is installed correctly, observe the back and Global Status LEDs on front of the switch, and the Module Status LED on the module.

Figure 11: *Location of module status LEDs*
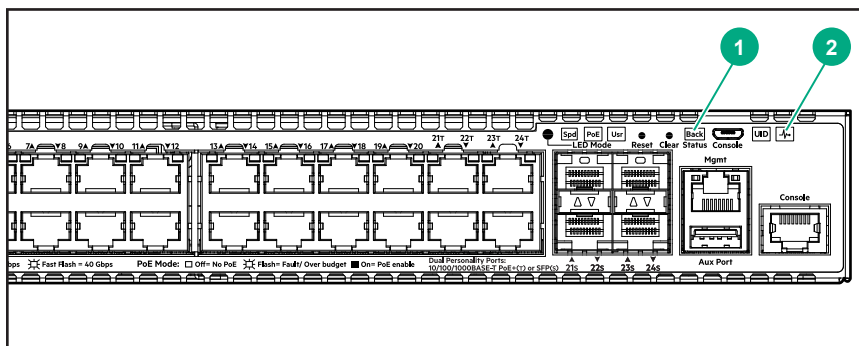
Table 16: *Location of module status LEDs: Label and description*

Label	Description
1	Back LED
2	Global Status LED

During the normal switch boot-up process, if the module is installed properly and the switch is powered on, the module undergoes a self-test. You can use the LEDs to determine that the module is installed properly and has passed the self-test. See the following table.

Table 17: *Stacking module LED behavior*

LED	Display for a properly installed module
Global Status and back LEDs on the front of the switch and Module Status LED on the stacking module	After boot-up sequencing, LEDs are on steady green.
Link (for each stacking port on the module)	The LED turns ON green if stacking cables are connected to the module and to a stacking module on another powered-on 2930M switch. This behavior indicates that the stacking port is enabled, connected, and detects a signal from the attached switch. If stacking cables on a given port are not connected between switches, the port LED is not lit. For more information, see **10. (Optional) Installing the stacking cables** on page 48.

5. Disconnect power from the switch

Disconnect the power cord from all of the switch power supplies and from the power sources.

6. (Optional) Install the uplink port module

NOTE: The 2930M uplink port module can be hot-swapped with another uplink port module of the same SKU (Stock Keeping Unit). However, it cannot be hot-swapped with another uplink port module having a different SKU. See **Replacing the uplink port module** on page 66.

Procedure

1. Unscrew the two retaining screws on the uplink port cover plate.

   Figure 12: *Remove the uplink port cover plate*
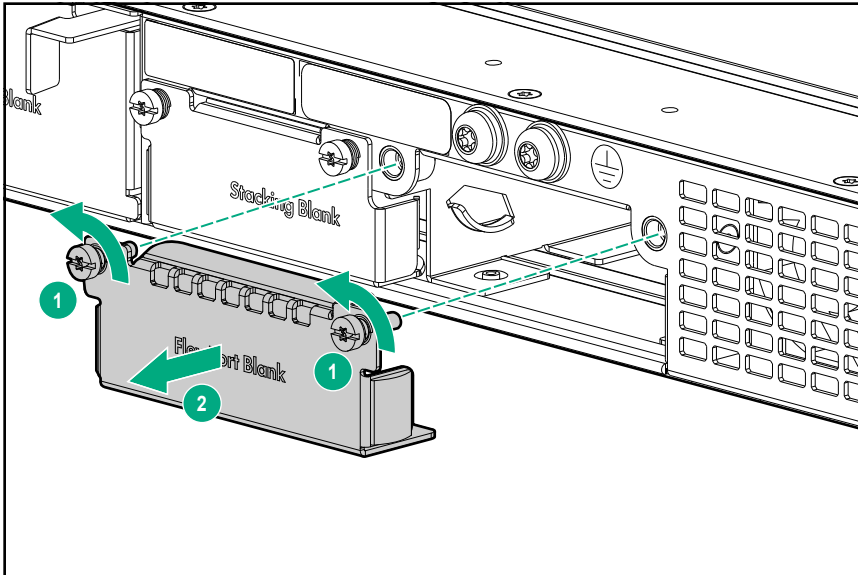
2. Remove the new uplink port module from its packaging, being careful not to touch any of the circuitries on the board.

3. Insert the uplink port module fully into the slot as shown following. The face plate of the module will be flush with the front face of the switch.

4. Engage the retaining screws and tighten them. Be sure not to over-tighten the screws.

Figure 13: *Install uplink port module*
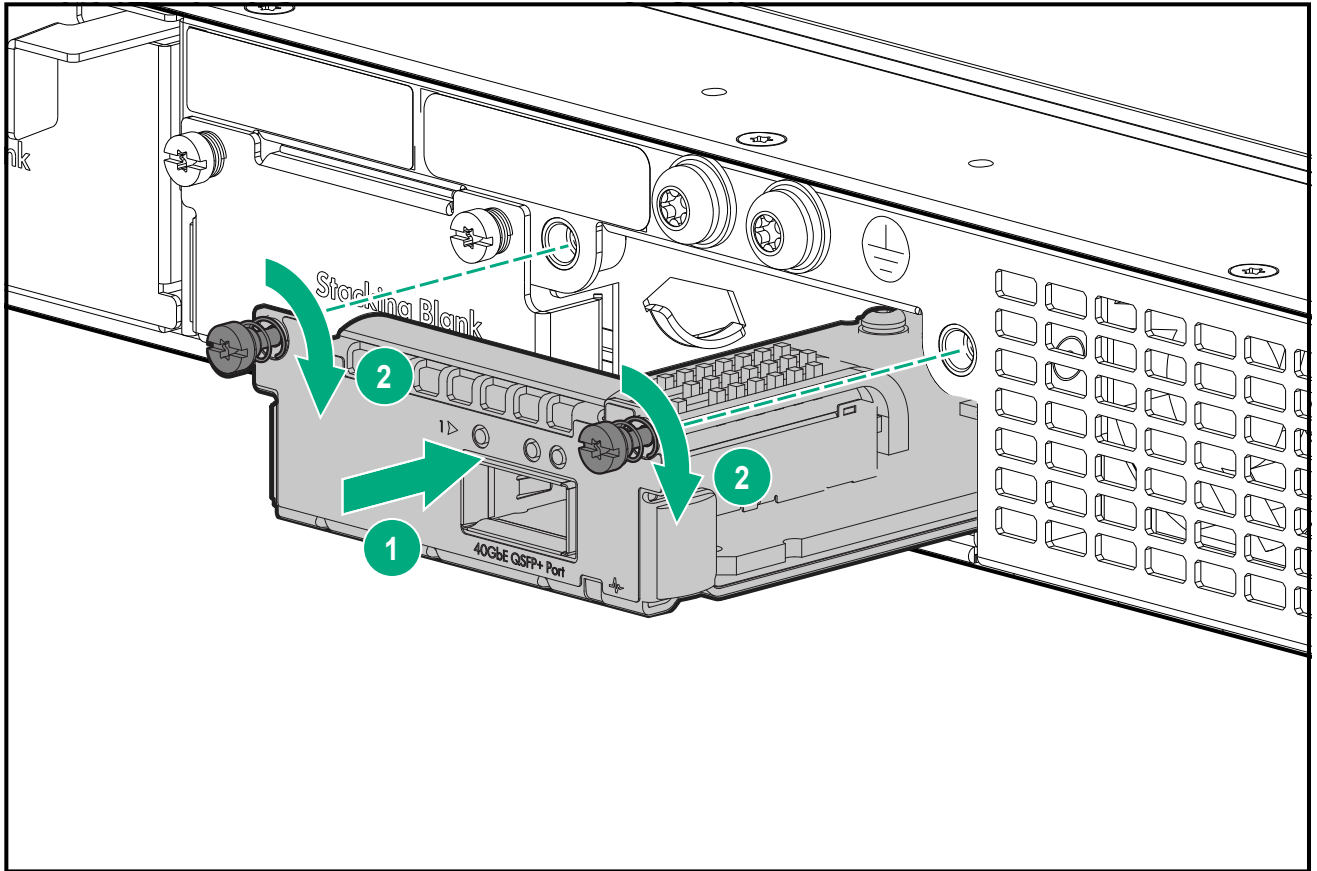
5. Power on the switch and make sure that the module passes its self-test. See **General LED behavior:** on page 40 for the module LED behavior that indicates correct installation.

7. Mount the switch

After the switch passes self-test, it is ready to be mounted in a stable location. Supported mounting options for the Aruba 2930M switches include:

- Two-post rack mount
- Tabletop or desktop
- Four-post rack mount (Requires the optional J9583A HPE X410 Universal Rack Mounting Kit.)

> ⚠ **WARNING:** Do not mount the switch on a wall, under a table, or under another horizontal surface.

Mounting the switch in a two-post rack

Prerequisites
Before beginning here:

- Review the **Installation precautions and guidelines** on page 34.

- See **1. Prepare the installation site** on page 36.

- Prepare your network data cables (not included) for connecting the switch to the network.

Procedure

1. Attach the rack mount brackets to the switch by using a #1 Phillips (cross-head) screwdriver and the supplied eight 8-mm M4 screws.
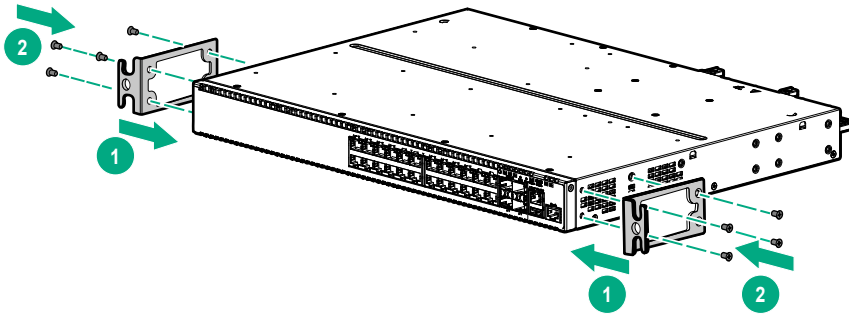
2. Use the four number 12-24 screws to secure the brackets to the rack.
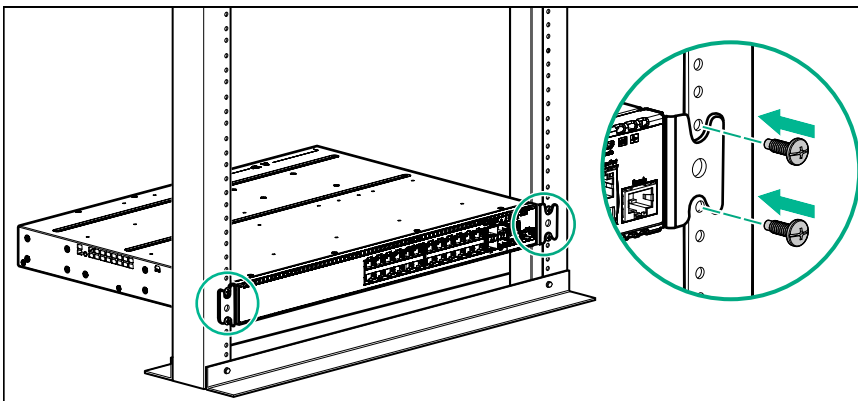
3. Go to **10. (Optional) Installing the stacking cables** on page 48.

Mounting a switch on a tabletop or desktop

Prerequisites

- Locate the four self-adhesive pads included in the switch accessory kit.

- Select a secure horizontal surface where the network cables and switch power cord will not create a tripping hazard.

Procedure

1. Attach the four self-adhesive pads to the bottom corners of the switch.
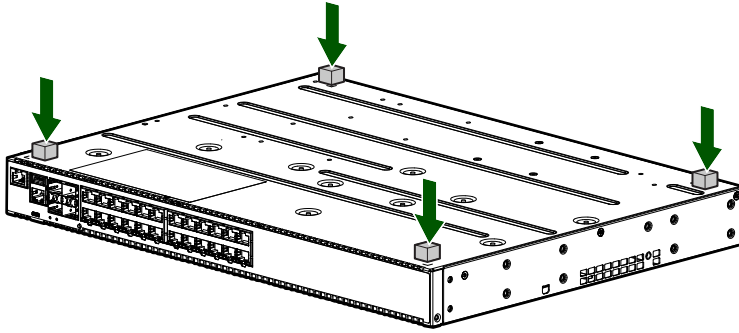
2. Position the switch with the top panel up on the selected horizontal surface.
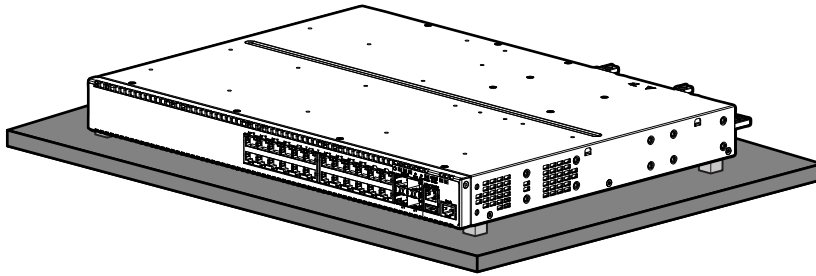
> (i) **IMPORTANT:** Ensure that the power cord and network cables at switch mounting location will not create a tripping hazard.

> (i) **IMPORTANT:** Avoid blocking any ventilation openings on the sides, rear, or front of the switch. For more information on proper ventilation spacing, see **Installation precautions and guidelines** on page 34.

3. Go to **10. (Optional) Installing the stacking cables** on page 48.

Mounting the switch in a four-post rack

The four-post rack mount for the 2930M switches requires the optional J9583A HPE X410 Universal Rack Mounting Kit. To use this kit to mount a 2930M switch, see the installation instructions provided with the kit. You can also download the installation instructions:

1. Enter J9583A in the Enter Search Information field.

2. Select a J9583A option.

3. Click Support Center.

4. Select the Documentation/Manuals document type.

5. Click the download icon.

6. Select the listed document option for the J9583A switch rail kit.

Prerequisites

•

• Review the **Installation precautions and guidelines** on page 34.

• See **1. Prepare the installation site** on page 36

8. (Optional) Connect a Management Console

The switch has a full-featured, easy-to-use console interface for performing switch management tasks including:

• Monitor switch and port status and observe network activity statistics.

• To optimize switch performance, enhance network traffic control, and improve network security, modify the switch configuration.

• Read the event log and access diagnostic tools to help in troubleshooting.

• Download new software to the switch.

• To control access to the switch from the console, web browser interface, and network management stations, add passwords.

You can access the console through these methods:

• **Out of band**:

Connect an Aruba X2C2 RJ45 to DB9 Console Cable (sold separately: JL448A) to the switch's RJ-45 Console Port and a workstation with terminal emulation software.

There is also the option of using a USB cable (not supplied) to connect the Micro USB Console Port on the switch to a PC. To use the USB Console Port, you must first download a USB driver to the PC. See the Note on page 33 for more information.

You cannot use both the RJ-45 Console Port and USB Console Port at the same time. When the USB Console Port is connected to a live PC, it has priority over the RJ-45 Console Port.

By default, the RJ-45 console port is active (accepts input). To activate the USB console port, connect it to a live PC. If the USB console session closes because of the inactivity timer, the RJ-45 console port becomes active again to allow remote access through a terminal server. To reactivate the USB console port, unplug it, then reconnect it to a live PC.

• **In-Band**:

Access the console using Telnet from a PC or UNIX station on the network, and a VT-100 terminal emulator. This method requires that you first configure the switch with an IP address and subnet mask by using either out-of-band console access or through DHCP/Bootp. For more information on IP addressing and on starting a Telnet session, see chapter 3, "Getting started with switch configuration" (page 38). The switches can simultaneously support one out-of-band console session through a Console Port and in-band Telnet console sessions.

Prerequisites

(Optional) The RJ-45 console cable (not included) or a micro-USB console cable (not included)

NOTE: JL448A, Aruba X2C2 RJ45 to DB9 Console Cable, can be ordered as an accessory to your switch.

Procedure

1. (Optional) Connect an RJ-45 to DB9 console cable to the Console port and to a VT-100 terminal (running suitable terminal emulation software). You can also connect a micro-USB console cable (not included) to a VT-100 terminal or to a PC (running suitable terminal emulation software).
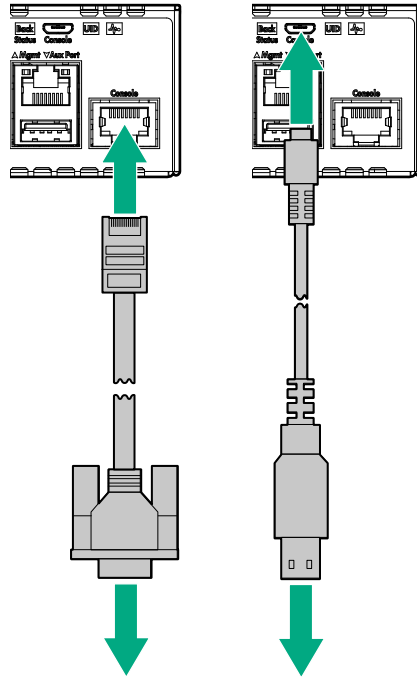
If cables are connected to both the Console port and the micro-USB port, input is accepted only from the Micro USB connector. (Echo output is accepted through both ports). See **Setting up a console connection** on page 59 and **Configuring the management console** on page 60.

2. (Optional) If you plan to manage the switch from a dedicated management network, connect an RJ-45 network cable from the management network to the **Mgmt** port.
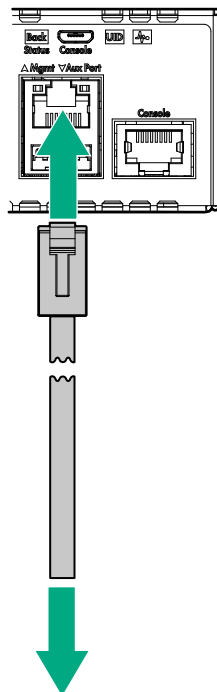
If cables are connected to both the **Mgmt** port and the micro-USB console port, input and output functions on both ports.

9. Connect the switch to a power source

NOTE:

- If you are stacking your 2930M switches, then the first switch to power-on is the switch that you want to be the stack Commander.

- The second switch to power-on is the one that you want to be the stack Standby.

- For the other switches in the stack, their member ID will be determined by the order in which they are booted.

For more information, see **Stacking information and topologies** on page 51.

Procedure

1. Plug the included power cord into the power connector on the switch and into a nearby AC power source.

2. Recheck the LEDs during self-test. For more information, see **General LED behavior:** on page 40.

10. (Optional) Installing the stacking cables

NOTE: Hot swapping the stacking cables is supported. You can install or remove a stacking cable with the switch powered on. (Hot-swapping stacking modules is *not* supported.)

1. Slide in the stacking cable connector until it clicks into place. to make sure that the cable connector is fully latched, pull on the connector itself (not the tab) .

Figure 14: *Installing a stacking cable*
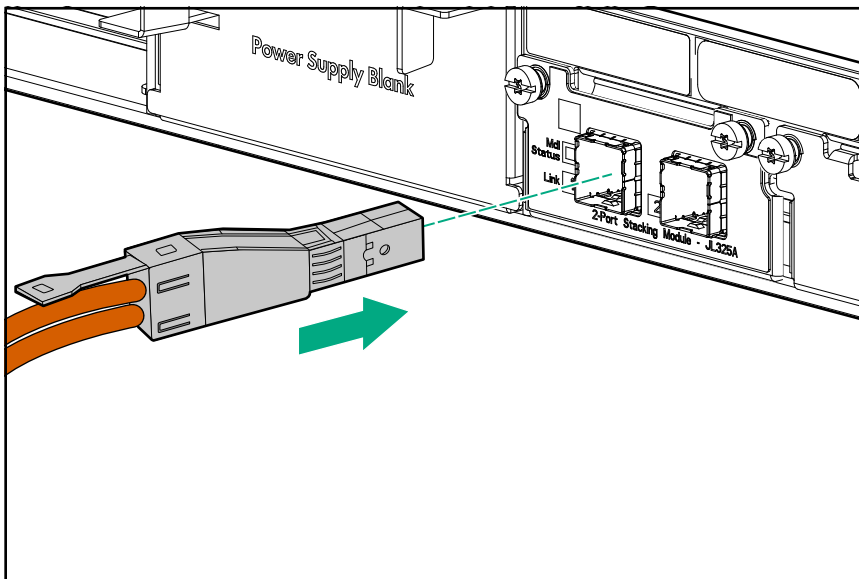
2. Connect the other end of the cable to a stacking module in another 2930M switch. For more connectivity information, see **Stacking information and topologies**.

To remove the stacking cable, pull the tab on the stacking cable connector straight out.

11. (Optional) Install transceivers

You can install or remove transceivers from the slots on the front of the switch without having to power off the switch.

(Optional) Insert up to four SFP transceivers in the fixed transceiver slots on the switch front panel.
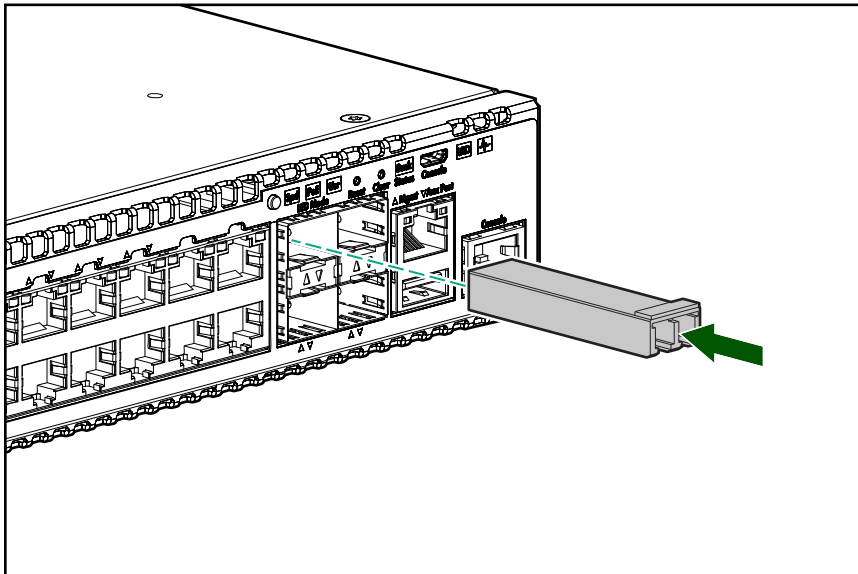
12. Connect network cables

Connect network cables from network devices or your patch panels to the fixed RJ-45 ports and to any installed transceivers.

- Connect network cables to the RJ-45 data ports and to any optional transceivers installed on the switch front panel.
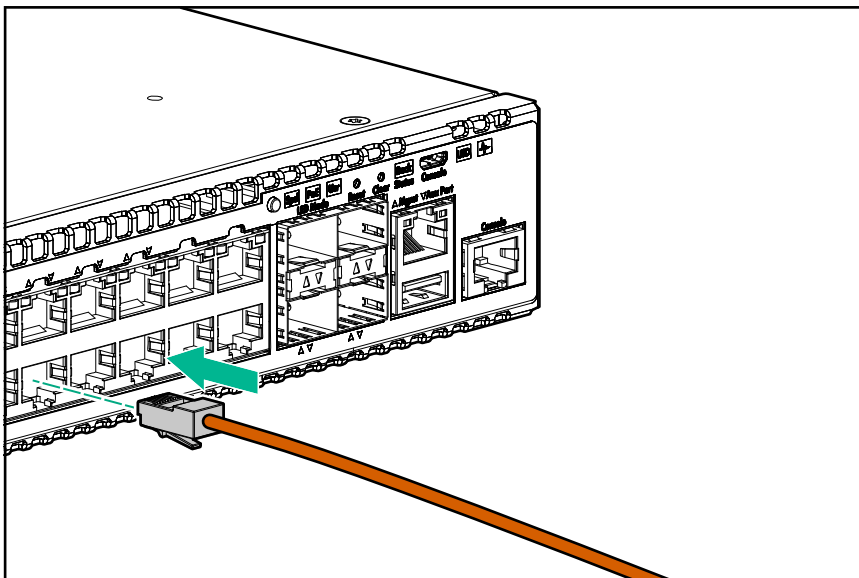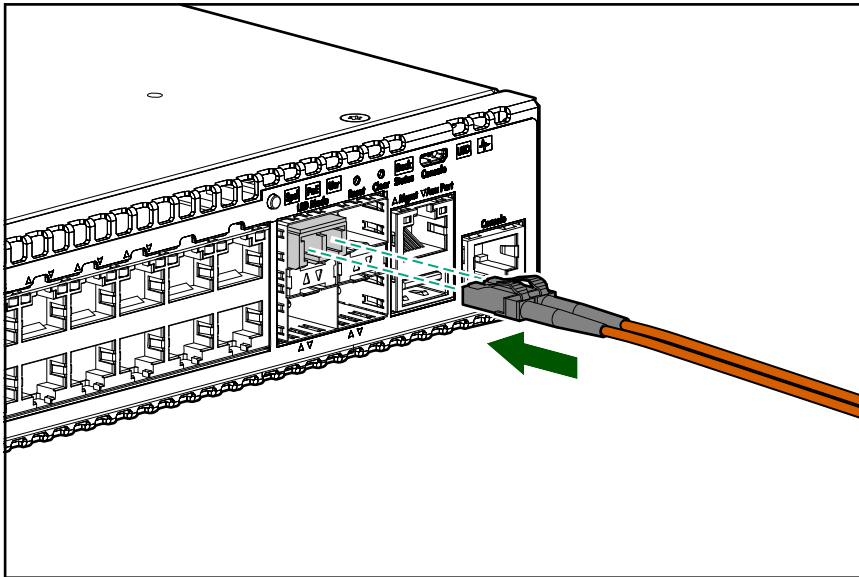
For more information, see **Cabling infrastructure**

SFP/SFP+/QSFP+ installation notes

(i) **IMPORTANT:** When selecting a fiber SFP/SFP+/QSFP+ device, make sure it can function at a maximum temperature that is not less than the recommended maximum operational temperature of the product. Use only an approved Laser Class 1 SFP/SFP+/QSFP+ transceiver.

(i) **IMPORTANT:** To ensure proper operation of your switch, use only the HPE Aruba SFP/SFP+/QSFP + transceivers supported by your switch.

Use only supported Aruba SFP/SFP+/QSFP+ transceivers

Non-Aruba SFP/SFP+/QSFP+ transceivers are not supported. Use of supported Aruba products ensures that your network maintains optimal performance and reliability. If you require additional transceivers, contact an Aruba sales representative or an authorized reseller. The following resources can help you to find transceiver support information for your switch model:

- See the *ArubaOS-Switch Transceiver Guide* at **http://www.hpe.com/networking/ResourceFinder**. (Select "Transceivers and Accessories" in the "Products" field.)

- See the supported transceivers information in the QuickSpecs for your switch model at **http://www.hpe.com/networking/products**, along with minimum software versions to support the listed transceivers:

  1. Select **Switches**.

  2. Select **Aruba Switches**.

  3. Select a switch model.

  4. Select **Product Details**

  5. Select an option under QuickSpecs.

Hot swapping SFP/SFP+/QSFP+ transceivers

Supported SFP/SFP+/QSFP+ transceivers that you can install in your Aruba switch can be "hot swapped"– removed and installed while the switch is receiving power. However, disconnect the network cables from the SFP/SFP+/QSFP+ transceivers before hot-swapping them.

When you replace a SFP/SFP+/QSFP+ transceiver with another transceiver of a different type, the switch may retain selected port-specific configuration settings that were configured for the replaced unit. Be sure to validate or reconfigure port settings as required.

SFP/SFP+/QSFP+ connections to devices with fixed speed/duplex configurations

When connecting a device to your switch port that contains a SFP/SFP+/QSFP+ transceiver, the speed and duplex settings of the switch port and the connected device must match. Otherwise, the device may not link properly—you may not get a link. For some older network devices, the default speed/duplex settings may be predefined such that they are set differently from the default configuration of your switch. (For example, 1000 Mbps/Full Duplex.) These setting differences may also apply to some older Hewlett Packard Enterprise devices. Because of these default speed/duplex considerations, make sure that devices connected to your SFP/SFP+/QSFP+ ports are properly configured. At a minimum, make sure the configurations match.

Stacking information and topologies

When 2930M stacking modules (JL325A) are installed in the switches, any combination of up to ten 2930M switches can be stacked together via high-speed backplane cables to form a single extended virtual switch.

The stacking cables and connections operate independently of any layer 2 or layer 3 network protocols and features, including spanning tree. When multiple switches are stacked, they behave as a single, virtual switch with additional network ports being supplied by the stack members.

> **NOTE:** If an 2930M switch is powered on for the first time without a stacking module installed, stacking will be disabled and that will be saved in the switch's running configuration. Subsequently, after a stacking module has been installed, stacking must be enabled through the console (CLI) command `stacking enable`.

To set up a stack of 2930M switches:

Procedure

1. Power off all switches that are going to be stacked.

2. Install stacking modules in the switches and connect the stacking cables to create your stacking topology.

3. Power on each switch, one at a time. The first switch that you should power on is the one that you want to be the Commander of the stack. The second one will become the stack Standby. For the other stack members, their member ID is determined by the sequence in which they are booted.

Chain topologies

Chain topologies are supported only as an intermediate topology resulting from a stack member or stacking cable connection failure event.

Ring topologies

Up to 10 switches can also be connected in closed ring topologies. Ring topologies afford some protection from a single failure because communication between the switches continues in a direction away from the failure.

Figure 15: *Typical ring topology*
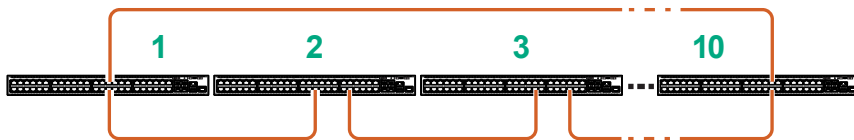
Figure 16: *Broken ring failure scenario*
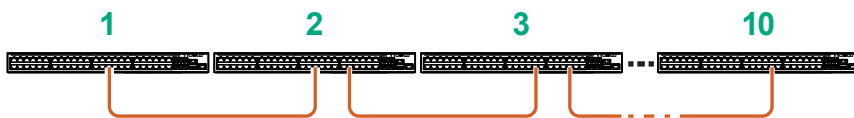
Mesh topologies

Mesh topologies are not supported for the 2930M.

Sample network topologies

This section shows a few sample network topologies in which the switch is implemented. For more topology information, visit the product website at **http://www.hpe.com/networking/support**.

The switch is designed to be used primarily as a desktop switch. End nodes, printers and other peripherals, and servers are directly connected, as shown in the following illustration. Notice that the end node devices are

connected to the switch by straight-through or crossover twisted-pair cables. Either cable type can be used because of the IEEE Auto MDI/MDI-X features on the switch.

Figure 17: *Example as a desktop switch implementing PoE*
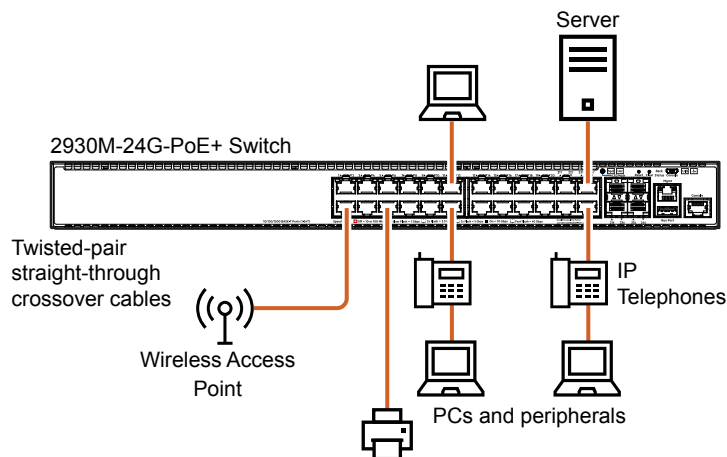
This illustration is an example of the switch being configured to supply PoE power to end devices such as IP telephones and wireless access points (WAPs).

As shown in this figure, the IP telephones can be connected in line, that is, between the switch and the end device, in this case a PC. The IP telephones in this illustration have two ports, one in and one out. Therefore the phone receives voice and power from the switch, and the PC can send and receive data through the phone to the switch.

The end node devices are connected to the switch by straight-through or crossover twisted-pair cables. Either cable type can be used because of the IEEE Auto MDI/MDI-X features on the switch.

Figure 18: *Example as a segment switch*
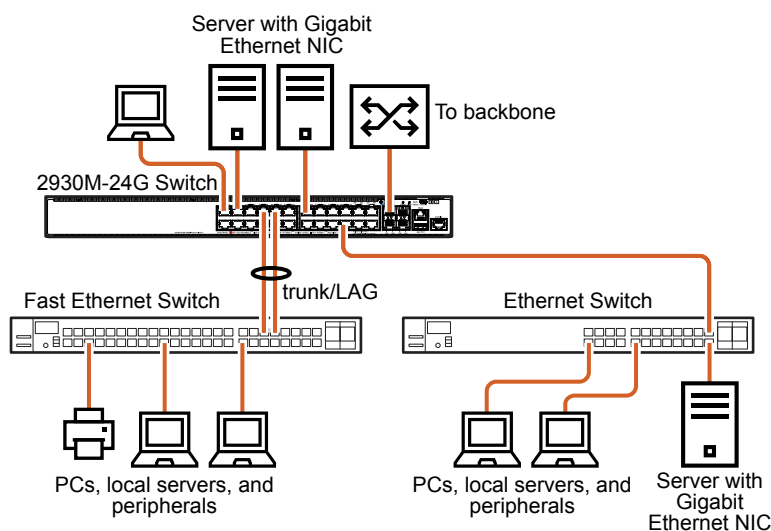
The switch also works well as a segment switch. That is, with its high performance, it can be used for interconnecting network segments. Simply connect the network hubs that form those segments to the switch or you can also connect other switches.

In the preceding illustration, two fast Ethernet hubs with PCs, printers, and local servers attached, are both connected to a switch. The devices attached to the two hubs can now communicate with each other through the switch. They can also all communicate with the server that is connected to a 1000Base-T port on the switch.

Because the switch has the IEEE Auto MDI/MDI-X features, the connections between the switch and the hubs, and between the switch and end nodes or servers, can be through category 5 straight-through or crossover twisted-pair cable.

If the connection is 10 Mbps only, then category 3 or 4 cable can also be used. In all cases, the device ports must be configured to auto negotiate the link characteristics for this feature to work.

The switch, in turn, can be connected to a network backbone through fiber-optic cabling connected to a Gigabit-SX, -LX, or -LH transceiver installed in the switch. Now, all the devices on these network segments can access other network resources that are connected elsewhere on the network backbone.

Figure 19: *Example as a segment switch implementing PoE*
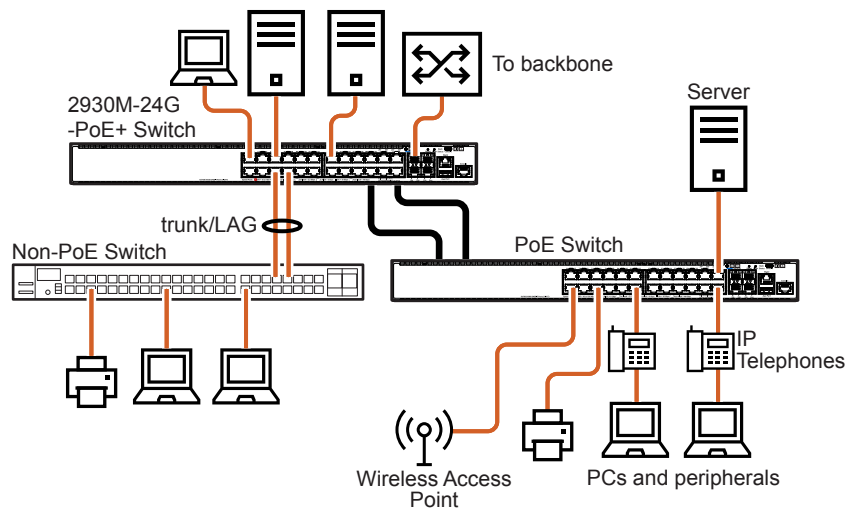
Figure 20: *Example of connecting to a backbone switch*
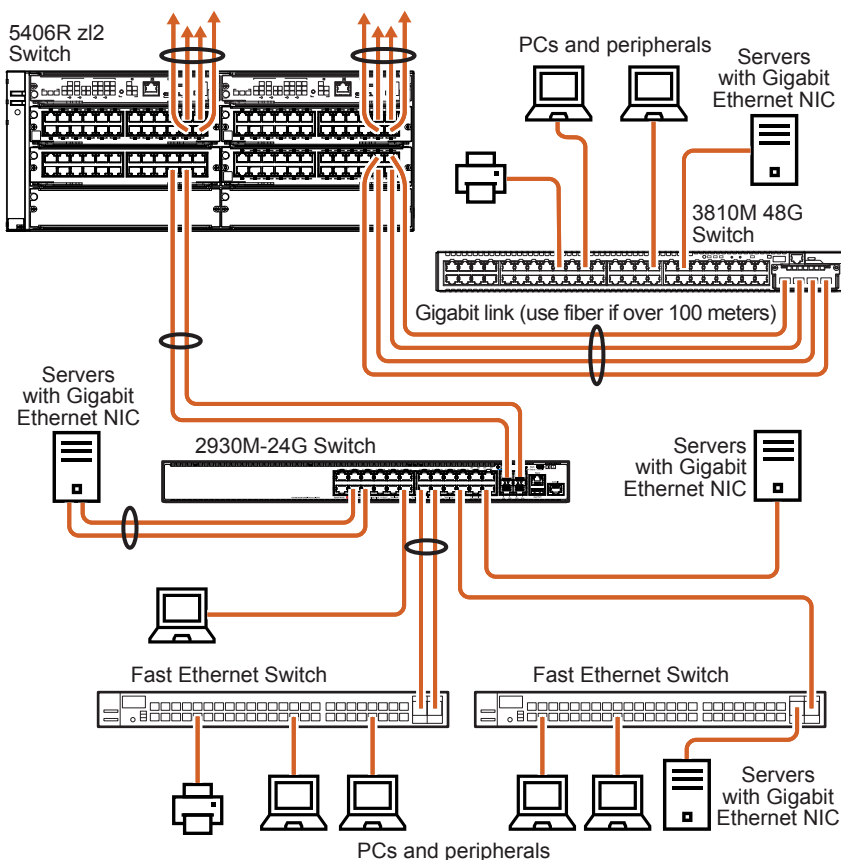
For example, you can use an Aruba 5406R zl switch to interconnect each of your smaller work group switches to form a larger network. All devices in this network can communicate with each other and also with the campus backbone. Depending on your bandwidth needs, the links between switches can run at 1G or 10G, and use

copper or fiber cabling with the appropriate SFP/SFP+ transceivers. Links can also be aggregated for additional bandwidth and redundancy.

This chapter is a guide for using the console Switch Setup screen to quickly assign an IP (Internet Protocol) address and subnet mask to the switch. You can also set a Manager password and, optionally, configure other basic features.

For more information on using the switch console, see the *Basic Operation Guide* and the *Management and Configuration Guide* for your switch model at **https://www.hpe.com/networking/ResourceFinder**.

For information on the HPE IMC (Intelligent Management Center), contact your HPE/Aruba representative.

Recommended minimal configuration

In the factory default configuration, the switch has no IP (Internet Protocol) address and subnet mask, and no passwords.

To manage the switch through a networked (in-band data port or out-of-band management port) connection, you must first configure the switch with an IP address and subnet mask compatible with your network.

Also, configure a manager password to control access privileges from the console and web browser interface. Other parameters in the Switch Setup screen can be left at their default settings or you can configure them with new values.

You can configure many other switch features through the switch console interface to:

- Optimize switch performance.

- Enhance control of network traffic.

- Improve network security.

- Enable stacking.

After you configure an IP address on the switch, you can manage these features more conveniently in any of the following ways:

- A remote Telnet session

- A web browser interface

- An SNMP network management station running a network management program, like HPE 3PAR Management Console.

For a list of switch features available with and without an IP address, see "How IP Addressing Affects Switch Operation" in the *Management and Configuration Guide* for your switch model. (Visit **http://www.hpe.com/networking/ResourceFinder**.)

For more information on IP addressing, see "IP Configuration" in the *Management and Configuration Guide* for your switch model.

NOTE: By default, the switch is configured to acquire an IP address configuration from a DHCP or BOOTP server. To use DHCP/BOOTP instead of the manual configuration method described in "Minimal Configuration Through the Console Port Connection", see "DHCP/BOOTP Operation" in the *Management and Configuration Guide* for your switch model.

Minimal configuration through the console port connection

The quickest and easiest way to minimally configure the switch for networked management and password protection is to use the direct (out-of-band) connection through the console port to start a console session and access the Switch Setup screen.

Procedure

1. Configure a Management Console as described in **Configuring the management console**.

2. Set up a console connection through the console port by following the procedure described in **Setting up a console connection** on page 59. The 2930M command-line prompt displays on the console screen, typically with the switch model number (for example, Aruba 2930M).

3. At the prompt, enter the `setup` command to display the Switch Setup screen. The following illustration shows the setup screen with the default settings.

Figure 21: *Example CLI switch setup screen*

```
Aruba-Stack-2930M                                    3-Feb-2017  13:56:05
==========================- TELNET - MANAGER MODE -==========================
                              Switch Setup

   System Name : Aruba-Stack-2930M
   System Contact :
   Manager Password : ××××××××××××××××
   Confirm Password : ××××××××××××××××
   Logon Default : CLI                      Time Zone [0] : 0
   Community Name : public
   Spanning Tree Enabled [No] : No          Default Gateway :
   Time Sync Method [TIMEP/SNTP] : TIMEP/SNTP
   TIMEP Mode [Disabled] : Disabled


   IP Config [Manual] : DHCP/Bootp

   IP Address  : 192.0.2.0.12
   Subnet Mask : 255.255.255.0
 Actions->   Cancel     Edit     Save     Help

 Enter System Name - up to 32 characters.
 Use arrow keys to change field selection, <Space> to toggle field choices,
 and <Enter> to go to Actions.
```

4. Use the **Tab** key to select the **Manager Password** field and enter a manager password.

5. Tab to the **IP Config (DHCP/Bootp)** field and use the spacebar to select the **Manual** option.

6. Tab to the **IP Address** field and enter the IP address that is compatible with your network.

7. Tab to the **Subnet Mask** field and enter the subnet mask for your network.

8. Press **Enter**, then **S** (for **Save**).

The following fields are displayed in the setup screen. For more information on these fields, see the *Management and Configuration Guide* for your switch model. (Visit the Hewlett Packard Enterprise website at **http:// www.hpe.com/networking/ResourceFinder**.)

Parameter	Default	
System Name	blank	Optional; up to 32 characters, including spaces
System Contact	blank	Optional; up to 48 characters, including spaces
Manager Password	blank	Recommended; up to 64 characters (no blank spaces)
Logon Default	CLI	The default setting selects the command-line interface for console access. The alternative is the menu interface.
Time Zone	0 (none)	Optional; 1440 to -1440. The number of minutes your location is to the West (-) or East (+) of GMT.
Community Name	public	Default setting recommended.
Spanning Tree Enabled	No	Default setting recommended unless STP is already running on your network or the switch will be used in complex network topologies.
Default Gateway	blank	Optional; If network traffic must reach off-subnet destinations, enter the IP address of the next-hop gateway node .
Time Sync Method	None	Optional; The protocol the switch uses to acquire a time signal. The options are NTP, SNTP, and TimeP.
TimeP Mode	Disabled	Optional; The method the switch uses to acquire the TimeP server address.
IP Config (DHCP/Bootp)	DHCP/Bootp	Set to Manual unless a DHCP/Bootp server is used on your network to configure IP addressing.
IP Address	xxx.xxx.xxx.xxx	Recommended; If you set IP Config to Manual, then enter an IP address compatible with your network.
Subnet Mask	xxx.xxx.xxx.xxx	

NOTE: The IP address and subnet mask assigned for the switch must be compatible with the IP addressing used in your network.

Setting up a console connection

To access the switch through a console port (out-of-band) connection, connect an RJ-45 or micro-USB console cable.
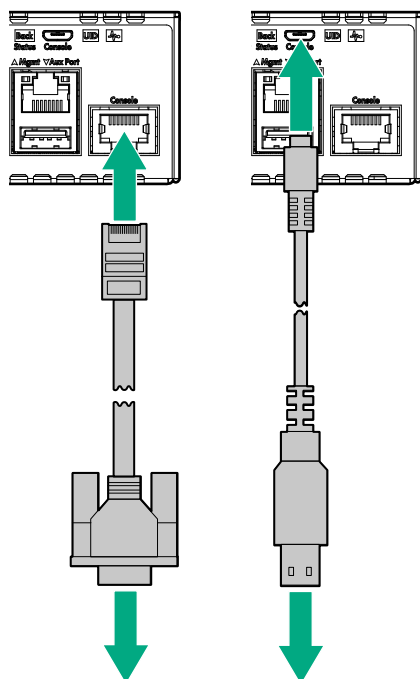
IMPORTANT: You must use the out-of-band console connection to minimally configure the switch with an IP address and subnet mask before you can use an in-band or out-of-band networked connection to manage the switch. For more information, see **Minimal configuration through the console port connection**.

Configuring the management console

To set up a console to manage the switch through the console port connection:

1. Configure the PC terminal emulator as a DEC VT-100 (ANSI) terminal or use a VT-100 terminal.

2. Configure the terminal with the following settings:

   • A baud rate from 1200 to 115200 (the switch senses the speed)

   • 8 data bits, 1 stop bit, no parity, and flow control set to Xon/Xoff

   • For the Windows Terminal program, disable (uncheck) the "Use Function, Arrow, and Ctrl Keys for Windows" option.

If you use a management console with different configuration settings, be sure to reconfigure the settings on both the terminal and the switch in the following order so that both configurations are compatible:

1. Reconfigure the switch and save the new settings.

2. Exit from the console session.

3. Reconfigure the terminal and save the new settings.

4. Begin a new console session.

Stacking configuration

Stacking is enabled by default if the stacking module is installed when the switch is powered up for the first time. If the stacking module is not installed when the switch is first powered up, stacking is disabled when the module is installed. In this case, the Back and Global Status LEDs and the stacking module status LED all show slow-flashing orange. To enable stacking when the LEDs show this behavior, execute the `stacking enable` command from the switch CLI.

Where to go from here: Network connections

After the switch is configured with a manager password, IP address, and subnet mask, you can manage the switch from a networked connection, such as:

- PC equipped with Telnet (see **Starting a Telnet session** on page 62).

- Web browser interface (see **Starting a web browser session** on page 62).

- SNMP-based network management station using a tool like HPE 3PAR Management Console.

For more information on these management interfaces and all the features that you can configure on the switch, see the *Management and Configuration Guide* and other switch software manuals at **http://www.hpe.com/networking/ResourceFinder**.

The following types of networked connections are supported on a 2930M Switch:

Out-of-band networked connection through the dedicated management port: To manage a 2930M switch through Telnet from a remote PC or UNIX workstation, connect an RJ-45 network cable to the management port . To use this port, the switch must have an IP address. IP settings can be configured through a console port connection (see **Minimal configuration through the console port connection** on page 58) or automatically from a DHCP/Bootp server.

A networked out-of-band connection through the management port allows you to manage data network switches from a physically and logically separated management network. For more information, refer to the "Network Out-of-Band Management (OOBM)" appendix in the *Management and Configuration Guide* for your switch model at **http://www.hpe.com/networking/ResourceFinder**.

In-band networked connection through a data port on the switch: Connect a PC or UNIX workstation with a VT-100 terminal emulator directly to a switch data port. Then access the switch through Telnet from the workstation.

To use Telnet, the switch must have an IP address. IP settings can be configured through a Console port connection (see **Minimal configuration through the console port connection** on page 58) or automatically from a DHCP/Bootp server.

For more information on in-band and out-of-band networked connections for switch management, see **Using the IP address for remote switch management** on page 61 and the *Management and Configuration Guide* for your switch at **http://www.hpe.com/networking/ResourceFinder**.

> **NOTE:** A 2930M switch can simultaneously support one out-of-band serial console session through the console port and up to six in-band Telnet/TCP (networked) sessions through the dedicated management port or data ports on the switch.

Using the IP address for remote switch management

The switch's IP address can be used to manage the switch from any PC on the same or on a different subnet as the switch. In a networked (in-band or out-of-band) connection, you can use a Telnet session or a standard web browser to manage the switch.

Starting a Telnet session

To access the switch through a Telnet session:

Procedure

1. Make sure the switch is configured with an IP address and that the switch is reachable from the PC that is running the Telnet session (for example, by using a `ping` command to the switch's IP address).

2. Start the Telnet program on a PC that is on the same subnet as the switch and connect to the switch's IP address.

3. You will see the copyright page and the message `Press any key to continue`. Press a key, and you will then see the switch console command (CLI) prompt (for example, `Aruba 2930M#`).
   Enter help or ? to see a list of commands that can be executed at the prompt. Entering any command followed by help provides more detailed context help information about the command. Entering any command followed by ? displays a list of options that are available at that point in the command entry.

Starting a web browser session

The Aruba 2930M switches can be managed through a graphical interface. You can access a 2930M switch from any PC or workstation on the network. Do so by running your web browser and entering the switch IP address as the URL. No additional software installation is required to make this interface available; it is included in the switch onboard software.

The following illustration shows a typical web browser interface screen.

Figure 22: *Web browser interface screen*
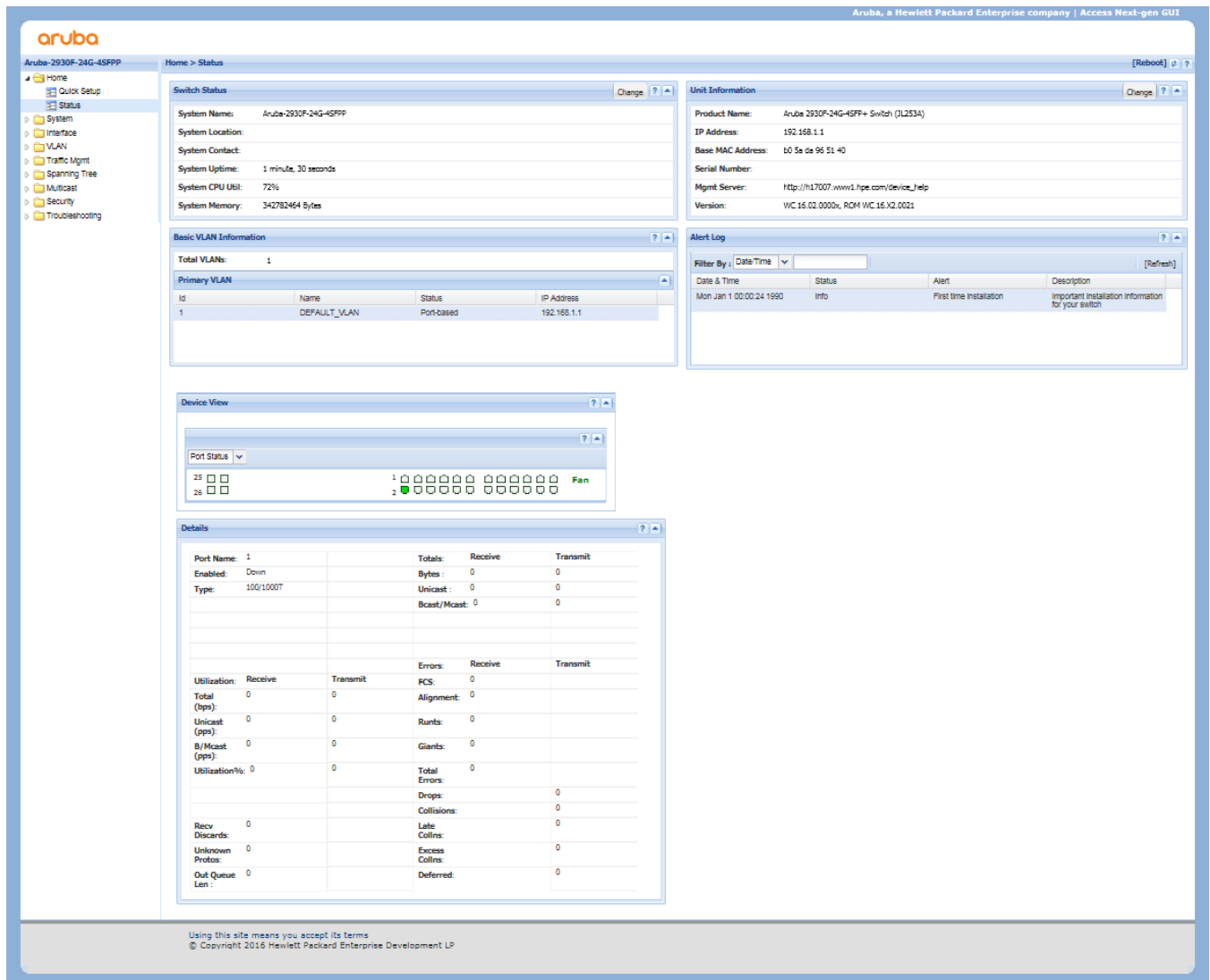
For more information on using the web browser interface, see the *Management and Configuration Guide* for your switch model at **https://www.hpe.com/networking/ResourceFinder**.

An extensive help system is also available for the web browser interface. To access the help system, the subnet on which the switch is installed must either have access to the Internet, or IMC or AirWave must be installed on a network management station that is on the subnet.

This chapter describes how to remove and install the following components:

- Power supply
- Stacking module
- Uplink port module

NOTE: The optional stacking module is not hot-swappable. Remove all power from the switch before removing the stacking module. See <u>Replacing the stacking module</u> on page 65 for more information.

An uplink module (JL078A, JL081A, and JL083A) is hot-swappable with another uplink module having the same SKU. In this case, put the installed uplink module in savepower mode, swap it, and then take it out of savepower. Uplink modules having different SKUs are not hot-swappable with each other. In the case of uplink modules having different SKUs, you must use the `flexible-module <MODULE-NUM> remove` put the uplink module in savepower mode, swap it, and then take it out of savepower.

CAUTION: The 2930M switches and their components are sensitive to static discharge. Use an antistatic wrist strap and observe all static precautions when replacing components.

CAUTION: If a power supply must be removed, and then reinstalled, wait at least 5 seconds before reinstallation. Otherwise, damage to the switch may occur. The power supply needs this time to bleed off any retained power.

Replacing the power supply

If a 2930M switch is configured with redundant power supplies, the switch will not suffer any loss of traffic or performance if one power supply fails. Replace the failed component as soon as possible. The PS (Power Supply) LED will flash simultaneously with the switch Fault LED indicating a power supply has failed.

To remove an AC power supply:

Procedure

1. Remove the AC power cable from the connector on the failed power supply.

2. Grasping the handle of the failed power supply, release the locking mechanism by squeezing the latch handle while removing the failed power supply.

Figure 23: *Replacing a failed power supply*
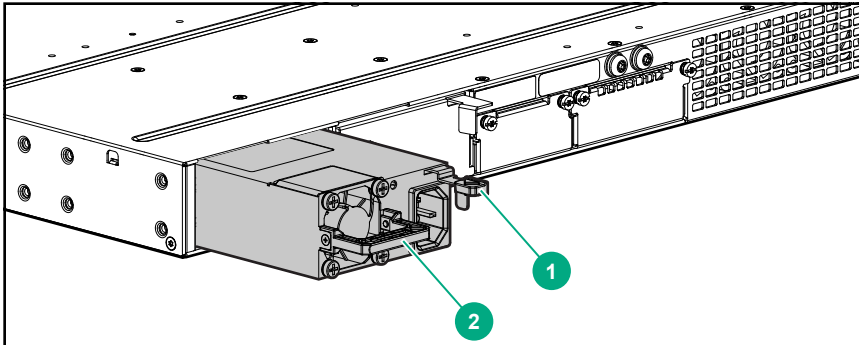
Table 18: *Replacing failed power supply: Label and description*

Label	Description
1	Lock mechanism
2	Handle

3. Insert the new power supply. Slide it in all the way in until the locking mechanism locks.

Replacing the stacking module

The 2930M stacking module is not hot-swappable. The switch must be powered off before replacing the module.

To replace a stacking module:

Procedure

1. Power off the switch for which the stacking module needs to be replaced.

2. Remove the new stacking module from its packaging, being careful to not touch any of the circuitry on the board.

3. Disconnect the stacking cables from the failed module. You do not need to disconnect the cables from the switches at the other ends of the cables.

4. Unscrew the two retaining screws on the module and pull the module straight out.

5. Insert the new stacking module fully into the slot as shown below. The face plate of the module will be flush with the back face of the switch.

Figure 24: *Replace stacking module.*
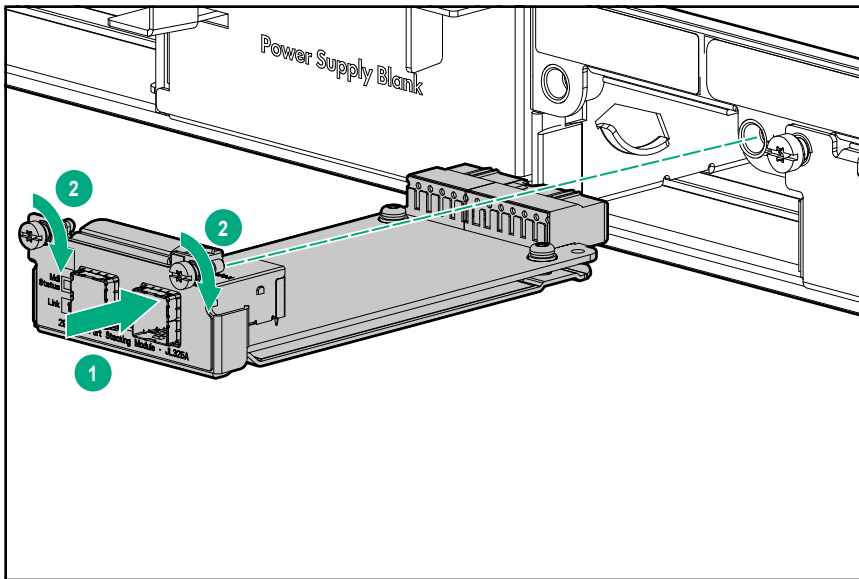
6. Engage the retaining screws and tighten them. Be sure to not over tighten the screws.

7. Reconnect the stacking cables.

8. Power on the switch and make sure the module passes its self test. See **LED behavior** for the module LED behavior that indicates correct installation.

Replacing the uplink port module

Hot-swapping uplink port modules:

- The switch *supports* hot-swapping an uplink port module for another uplink port module having the same SKU (Stock Keeping Unit).

- The switch *does not support* hot-swapping an uplink port module for another uplink port module having a different SKU.

To replace a 2930M uplink port module with another uplink port module having a different SKU, deactivate the module. Use the appropriate choice from the following two options:

- If replacing with the same SKU, power off the module with one of the following commands:
  - If stacking is enabled: `savepower flexible-module A member <ID>`
  - If stacking is disabled: `savepower flexible-module A`

- If replacing with a different SKU, remove the module with one of the following commands:
  - If stacking is enabled: `member <ID> flexible-module A remove`
  - If stacking is disabled: `flexible-module A remove`

To replace an uplink port module:

Procedure

1. Remove the new uplink port module from its packaging, being careful to not touch any of the circuitries on the board.

2. Disconnect the cables and any installed transceivers from the failed module. You do not need to disconnect the cables from the switches at the other ends of the cables.

3. Unscrew the two retaining screws on the module.

4. Pull on the two retaining screws toward you to disengage the module and pull out the module.

5. Insert the new uplink port module fully into the slot as shown in the following step. The face plate of the module will be flush with the front face of the switch.

6. Engage the retaining screws and tighten them. Be sure to not over-tighten the screws.

   Figure 25: *Replace uplink port module.*
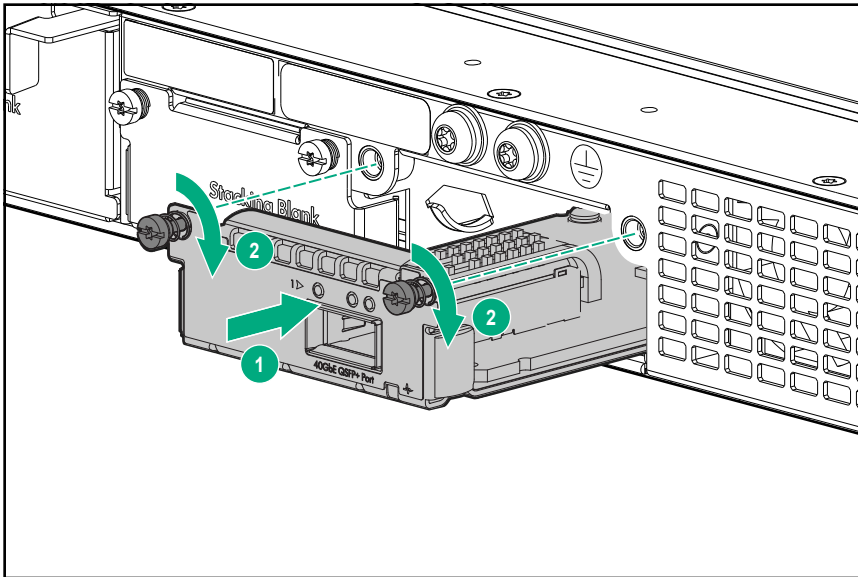
7. If replacing with the same SKU, power on the module with one of the following commands. If replacing with a different SKU, skip this step.

   a. If stacking is enabled: `no savepower flexible-module A member <ID>`

   b. If stacking is disabled: `no savepower flexible-module A`

8. Make sure that the module passes its self-test. See **General LED behavior:** on page 40 for the module LED behavior that indicates correct installation.

This chapter describes how to troubleshoot your switch, primarily from a hardware perspective. You can perform more in-depth troubleshooting on the switch using the software tools available with the switch. Included are the console interface and the built-in web browser interface. Other tools include AirWave and the Intelligent Management Center (IMC, which is the SNMP-based network management tool). For more information, see the "Troubleshooting" chapter in the *Management and Configuration Guide* for your switch, which is on the Hewlett Packard Enterprise website at **https://www.hpe.com/networking/ResourceFinder**.

This chapter describes the following:

- **Basic troubleshooting tips** on page 68

- **Diagnosing with the LEDs** on page 69

- **Proactive networking** on page 78

- **Hardware diagnostic tests** on page 79

- **Restoring the factory default configuration** on page 80

- **Downloading new switch software** on page 80

Basic troubleshooting tips

Most problems are caused by the following situations. Check for these items first when starting your troubleshooting:

- **Connecting to devices that have a fixed full-duplex configuration**: The RJ-45 ports are configured as "Auto". That is, when connecting to attached devices, the switch will operate in one of two ways to determine the link speed and the communication mode (half duplex or full duplex):

  ◦ If the connected device is also configured to Auto, the switch will automatically negotiate both link speed and communication mode.

  ◦ If the connected device has a fixed configuration, for example 100 Mbps, at half or full duplex, the switch will automatically sense the link speed, but will default to a communication mode of half duplex.

  Because the switch behaves in this way (in compliance with the IEEE 802.3 standard), if a device connected to the switch has a fixed configuration at full duplex, the device will not connect correctly to the switch. The result will be high error rates and very inefficient communications between the switch and the device.

  Make sure that all the devices connected to the switch are configured to auto negotiate, or are configured to speed and duplex settings matching those configured on the corresponding switch port.

- **Faulty or loose cables**: Look for loose or obviously faulty connections. If they appear to be OK, make sure the connections are snug. If that does not correct the problem, try a different cable.

- **Non-standard cables**: Non-standard and incorrectly-wired cables may cause network collisions and other network problems, and can seriously impair network performance. A category 5 or greater cable tester is a recommended tool for every 100Base-TX and 1000Base-T network installation.

- **Check the port configuration**: A port on your switch may not be operating as expected because it is administratively disabled in the configuration. It may also be placed into a "blocking" state by a protocol

operating on the port (dynamic VLANs), or LACP (dynamic trunking). For example, the normal operation of the spanning tree, GVRP, LACP, and other features may put the port in a blocking state.

Use the switch console to determine the port's configuration and verify that there is not an improper or undesired configuration of any of the switch features that may be affecting the port. For more information, see *Management and Configuration Guide* for your switch at **http://www.hpe.com/networking/support**.

Diagnosing with the LEDs

Table 19: *Switch LED error indicators*

| Global Status LED | Chassis status | | Mode/status | | | FP/IM | Port LED | Back side of chassis | | | See diag tip |
	AUX port	Back LED	Usr	PoE	Spd			PSU	Stacking module	Stacking port	
Off	*	Off	*	*	*	*	*	*	*	*	1
Solid Orange	*	Solid Green	*	*	*	*	*	*	*	*	2
Slow Flash Orange	*	Solid Green	*	*	*	Slow Flash Orange**	Slow Flash Orange**	Solid Green	Slow Flash Orange**	Slow Flash Orange**	3
Slow Flash Orange	*	Slow Flash Orange	*	*	*	*	*	*	*	*	4
Slow Flash Orange	*	Solid Green	*	*	*	*	Slow Flash Orange	*	*	*	5
Solid Green	*	Solid Green	*	*	*	*	Off	Solid Green	Solid Green	Solid Green	6
Solid Green	*	Solid Green	*	*	*	*	Half-Bright Solid Green	Solid Green	Solid Green	Solid Green	7
Slow Flash Orange	*	Slow Flash Orange	*	*	*	*	*	Flashing Green	*	*	8
Slow Flash Orange	*	Solid Green	*	*	*	*	*	Solid Green	*	*	9
Slow Flash Orange	*	*	*	Slow Flash Orange	*	*	Slow Flash Orange***	*	*	*	10
Slow Flash Orange	*	Slow Flash Orange	*	*	*	*	*	Solid Green***	*	*	11
1											

[1] * This LED is not important for the diagnosis.
**Provided the module is present.
***Mode select to PoE mode.

Diagnostic Tips

Tip	Problem	Solution
1	The switch is not plugged into an active AC power source, or the switch power supply may have failed. If the top is off, the switch will not power up.	**1.** Verify that the power cord is plugged into an active power source and to the switch. Make sure that these connections are snug. **2.** Try power cycling the switch by unplugging and plugging the power cord back in. **3.** If the Power LED is still not on, verify that the AC power source works by plugging another device into the outlet. Or try plugging the switch into a different outlet or try a different power cord. If the power source and power cord are OK and this condition persists, the switch power supply may have failed. Call your Hewlett Packard Enterprise authorized network reseller.
2	A switch hardware failure has occurred. All the LEDs will stay on indefinitely.	Try power cycling the switch. If the fault indication reoccurs, the switch may have failed. Call your Hewlett Packard Enterprise authorized network reseller.
3	The switch has experienced a software failure during self-test.	**1.** Try resetting the switch by pressing the Reset button on the front of the switch, or by power cycling the switch. **2.** If the fault indication reoccurs, attach a console to the switch (as indicated in chapter 2) and configure it to operate at 9600 baud. Then, reset the switch. Messages then appear on the console screen and in the console log to identify the error condition. You can view the console log at that point by selecting it from the console Main Menu. If necessary to resolve the problem, contact your Hewlett Packard Enterprise authorized network reseller.
4	One or more of the switch cooling fans may have failed.	Try disconnecting power from the switch and wait a few moments. Then reconnect the power to the switch and check the LEDs again. If the error indication reoccurs, one or more of the fans has failed. Call your Hewlett Packard Enterprise authorized network reseller.

Table Continued

Aruba 2930M Switches

Tip	Problem	Solution
5	The network port for which the LED is blinking has experienced a self-test or initialization failure.	Try power cycling the switch. If the fault indication reoccurs, the switch port may have failed. Call your Hewlett Packard Enterprise authorized network reseller. If the port is a pluggable SFP/SFP+ unit, verify it is a pluggable supported by the switch. An unsupported pluggable will be identified with this fault condition. Caution: Use only supported genuine Hewlett Packard Enterprise transceivers with your switch. To verify that the port has failed, try removing and reinstalling the SFP/SFP+. You can do that without having to power off the switch. If the port fault indication reoccurs, you will have to replace the SFP/SFP+ unit.

Table Continued

Tip	Problem	Solution
6	The network connection is not working properly.	Try the following procedures: • For the indicated port, verify both ends of the cabling, at the switch and the connected device, are connected properly. • Verify that the connected device and switch are both powered on and operating correctly. • Verify that you have used the correct cable type for the connection: ◦ For twisted-pair connections to the fixed 10/100 or 10/100/1000 ports, if the port is configured to "Auto" (auto negotiate), either straight-through or crossover cables can be used. This allowance is because of the switch's "Aruba Auto-MDIX" feature and the Auto MDI/MDI-X feature of the 10/100/1000-T port. **NOTE:** If the switch port configuration is changed to one of the fixed configuration options (for example, 100 Mbps/Full Duplex), then the port operates as MDI-X only and you must use the correct type of cable for the connection. In general, for connecting an end node (MDI port) to the switch, use straight-through cable; for connecting to MDI-X ports on hubs, other switches, and routers, use crossover cable. ◦ For fiber-optic connections, verify that the transmit port on the switch is connected to the receive port on the connected device, and the switch receive port is connected to the transmit port on the connected device. • For 1000Base-T connections, verify that the network cabling complies with the IEEE 802.3ab standard. Install the cable according to the ANSI/TIA/EIA-568-A-5 specifications. Ensure that cable testing complies with the stated limitations for Attenuation, Near-End Crosstalk, Far-End Crosstalk, Equal-Level Far-End Crosstalk (ELFEXT), Multiple Disturber ELFEXT, and Return Loss.

Table Continued

Aruba 2930M Switches

Tip	Problem	Solution
		The cable verification process must include all patch cables from any end devices, including the switch, to any patch panels in the cabling path.
		• Verify that the port has not been disabled through a switch configuration change.
		You can use the console interface, or, if you have configured an IP address on the switch, use the web browser interface, IMC, or AirWave network management software to determine the state of the port and re-enable the port if necessary.
		• Verify that the switch port configuration matches the configuration of the attached device. For example, if the switch port is configured as "Auto", the port on the attached device also MUST be configured as "Auto". Depending on the port type, twisted-pair or fiber-optic, if the configurations do not match, the results could be an unreliable connection, or no link at all.
		• If the other procedures do not resolve the problem, try using a different port or a different cable.
7	The port or remote link partner may be improperly configured, or the port may be in a "blocking" state by the normal operation of protocols, such as Spanning Tree, LACP, or GVRP features.	• Ensure that the device at the other end of the connection indicates a good link to the switch. If it does not, the problem may be with the cabling between the devices, the connectors on the cable, or the configuration of the device on the remote end of the cable. • Use the switch console to check the configuration on the port to confirm whether the port is administratively disabled or placed in a "blocking" state by the normal operation of one or more protocols. ◦ Check the Port Status using the show interfaces command to confirm whether the port is configured as "disabled". ◦ To confirm which protocols are operating on the port, review the switch configuration. Use the appropriate feature show commands to confirm whether the port is put into a "blocking" state. • For software troubleshooting tips, see the chapter "Troubleshooting" in the *Management and Configuration Guide* for your switch at **https://www.hpe.com/networking/support**.

Table Continued

Tip	Problem	Solution
8	A redundant power supply has experienced a fault.	At least one power supply must be operating properly. To make sure that the power supply is plugged in to an active power source, check the power supply. If the power supply is operating but the LEDs are still blinking, the power supply may have failed. Unplug the power supply, wait for 5 seconds for residual charge to dissipate, and then plug the power supply. If the fault light is still blinking, replace the power supply.
9	The switch has overheated.	Check to ensure that the fans are functioning correctly.
10	The port may have an internal hardware failure. The port may be denied PoE power. The port may be detecting an external PD fault.	Check the port for a hardware failure. Doing so may require a reboot of the switch. Check the port for correct PoE configuration and allocation. Also check the external PD for a fault.
11	A redundant power supply is not connected to an active AC power source.	(At least one power supply must be operating properly.) Connect the unplugged power supply to an AC power source, using a supported power cord for your country/region.

Table 20: *Stacked switch and stacking module LED error indicators*

Global Status LED	Chassis status Back LED	Mode/status Usr	Port LED	Back side of chassis Stacking module	Stacking port	See diag tip
Solid Green	Off	Solid Green	Off	Solid Green	Off	1
Slow Flash Orange	Slow Flash Orange	Solid Green	Slow Flash Green - Member Fast flash Green - Commander Slow Flash Orange - Member in other fragment	Slow Flash Orange	Off	2

Table Continued

Aruba 2930M Switches

| Global Status LED | Chassis status | Mode/status | Port LED | Back side of chassis | | See diag tip |
	Back LED	Usr		Stacking module	Stacking port	
Slow Flash Orange	Slow Flash Orange	Solid Green	Slow Flash Green - Member Fast flash Green - Commander Solid Green - Member with good stacking connection Slow Flash Orange - Member with poor stacking connection	Slow Flash Orange	Slow Flash Orange	3
Slow Flash Orange	Slow Flash Orange	Solid Green	Off	Slow Flash Orange	Off	4
Slow Flash Orange	Slow Flash Orange	Solid Green	Slow Flash Green - Member Fast Flash Green - Commander Slow Flash Orange - Member in other fragment	Slow Flash Orange, if the link is broken.	Slow Flash Orange, if the link is broken.	5 & 6
Solid Green	Off	Solid Green	Slow Flash Green - Member Fast Flash Green - Commander	Solid Green	Solid Green	7
Solid Green	Off	Solid Green	Slow Flash Green - Member Fast Flash Green - Commander	Solid Green	Solid Green	8

Table 21: *Diagnostic tips for stack errors*

Tip	Problem	Solution
1	Stacking is disabled on the switch.	1. Connect a console cable to the switch and establish a console session, as described in **(Optional) Connect a Management Console**. 2. From the CLI config context, enter the command `stacking enable`. 3. Recheck the switch LEDs: • Stacking Port LED back to Solid green. • Port LEDs in user mode are all in green color. **NOTE:** • Slow green flash LED represents stacking member ID. • Fast green flash LED represents commander member ID of that chassis. • Other solid green LEDs represent other stacking members.
2	The Stacking Module was installed in the switch while the switch was powered on. Hot install is not supported.	Reset or power cycle the switch to reboot it. After rebooting, the module will be correctly recognized and supported by the switch, and will be operational. When installing or removing the stacking module, the switch must be powered off.

3	One of these problems exists:
	• The stacking cable connected to the stacking port on which the Link LED is blinking orange is not connected at the far end.
	• A stacking link failure has occurred on a link that was functioning:
	  ◦ The switch at the other end of the stacking cable has been powered off.
	  ◦ The stacking feature is disabled on the switch at the other end of the stacking cable.
	  ◦ The stacking module or switch at the other end of the stacking link has failed.
	  ◦ The stacking cable is faulty.
		Make sure that the stacking cable is fully connected at both ends of the link.
		
		If an equipment failure has occurred, see the LEDs on the device at the other end of the connection.
		
		If this error occurred on an operational stack, it could result in changes to the stack configuration including election of a new stack commander, and possibly a new standby. See the Stack Management chapter in the *HPE ArubaOS-Switch Advanced Traffic Management Guide* for your switch OS version for more information.
		
		If necessary to resolve the problem, contact your Hewlett Packard Enterprise authorized network reseller.

Table Continued

Tip	Problem	Solution
4	The stacking module on this switch has experienced a failure. Stacking Module LED might be blinking orange slowly.	1. Try resetting the switch by pressing the Reset button on the front of the switch, or by power cycling the switch. 2. If the fault indication reoccurs, the stacking module may have to be replaced. This error could result in changes to the stack configuration including election of a new stack Commander, and possibly a new Standby. See the Stack Management chapter in the *HPE ArubaOS-Switch Advanced Traffic Management Guide* for your switch OS version for more information. If necessary to resolve the problem, contact your Hewlett Packard Enterprise authorized network reseller.
5	A stack link failure has occurred in a chain topology and multiple stack fragments have been created. Each fragment will elect a Commander, so there will be multiple switches with the Cmd LED on.	Repair the cause of the stack link failure and reconnect the switches in their original topology so that the switches can reform the original stack.
6	A stack link failure has occurred in a chain topology and multiple stack fragments have been created. One of the fragments has been made inactive according to the rules of the stack operation. All the network ports on the switches in the inactive fragment are disabled. As a result, all the port LEDs in other than user mode are off for those switches.	Repair the cause of the stack link failure so that the switches can reform the original stack.
7	You have tried to merge two stacks that have different Stack IDs – they were not previously part of the same stack. This arrangement is not allowed by the stack operation rules.	1. Select one of the stacks as the one to retain. 2. For the switches in the other stack, erase their stacking configuration by issuing the following config-level CLI command to each switch: `Aruba Switch(config)# stacking factory-reset`. This action erases the complete startup configuration for each switch, including the stacking configuration. 3. Add the switches to the stack as described in the Stack Management chapter in the *HPE ArubaOS-Switch Advanced Traffic Management Guide* for your switch OS version.
8	You have tried to add an 11th switch to a stack. A maximum of 10 switches can be stacked together.	Disconnect the 11th switch from the stack.

Table 22: *Uplink port LED error indicators*

Global Status LED	Mode/status			Uplink port status		
	Usr	SPD	PoE	Module status	Port status	See diag Tip
Slow Flash Orange	Off	Off	Off	Slow Flash Orange	Slow Flash Orange	1
Solid Green	Off	Off	Off	Solid Green	Slow Flash Orange	2
Slow Flash Orange	Off	Off	Off	Slow Flash Orange	Off	3
Slow Flash Orange	Off	Off	Off	Slow Flash Orange	Slow Flash Orange	4

Table 23: *Diagnostic tips for uplink port errors*

Tip	Problem	Solution
1	Newly inserted uplink port module does not match the previous uplink port module type.	Execute `flexible-module <A> remove`
2	Inserting an unsupported transceiver.	Check the transceiver against the switch peripheral support list.
3	Inserting an unsupported uplink port module.	Ensure that the uplink port module is genuine.
4	Uplink port module unable to boot up. Usually this behavior is a self-test error.	See **Replacing the uplink port module** on page 66.

Proactive networking

The 2930M switches have built-in management capabilities that proactively help you manage your network, they include:

- Finding and helping you fix the most common network error conditions (for example, faulty network cabling, and nonstandard network topologies).

- Informing you of the problem with clear, easy-to-understand messages.

- Recommending network configuration changes to enhance the performance of your network.

The following interfaces provide tests, indicators, and an event log that can be used to monitor the switch and its network connections:

- IMC, an SNMP-based network management tool that is included with your switch.

- A graphical web browser interface that you can use to manage your switch from a PC running a supported web browser, for example Microsoft Internet Explorer and Firefox.

- A full-featured easy-to-use console interface that you can access by connecting a standard terminal or PC running a terminal emulator to the switch console port using an Aruba X2C2 RJ45 to DB9 Console Cable (JL448A) (sold separately). The console command-line interface is also accessible through a Telnet or SSH connection.

For more information on using these software tools to diagnose and manage your switch, see the "Troubleshooting" chapter in the *Management and Configuration Guide* for your switch at **https://www.hpe.com/networking/ResourceFinder**.

Hardware diagnostic tests

Testing the switch by resetting it

If you believe the switch is not operating correctly, you can reset the switch to test its circuitry and operating code. To reset a switch, try any of the following:

- Unplug and plug in the power cord (power cycling).

- Press the Reset button on the front of the switch.

- Reboot the switch via the management console's `boot system` command.

Power cycling the switch and pressing the Reset button both cause the switch to perform its power-on self test, which almost always will resolve any temporary operational problems. These reset processes also cause any network traffic counters to be reset to zero, and cause the System Up Time timer to reset to zero.

Checking the switch LEDs

See **Diagnosing with the LEDs** on page 69 for information on interpreting the LED patterns and LED behaviors.

Checking console messages

Useful diagnostic messages may be displayed on the console screen when you reset a switch. Connect a PC running a VT-100 terminal emulator program or a standard VT-100 terminal to the switch console port. Configure the terminal to run at 9600 baud, and with the other terminal communication settings shown in **Configuring the management console** on page 60.

When you reset the switch, note the messages that are displayed. Additionally, you can check the switch event log, which can be accessed from the console using the `show log` command, or from the console main menu.

Testing twisted-pair cabling

Network cables that fail to provide a link or provide an unreliable link between the switch and the connected network device may not be compatible with the IEEE 802.3 Type 10Base-T, 100Base-TX, or 1000Base-T standards. The twisted-pair cables attached to the switch must be compatible with the appropriate standards. To verify your cable is compatible with these standards, use a qualified cable test device.

Testing switch-to-device network communications

The following communication tests can verify that the network is operating correctly between the switch and any connected device that can respond correctly to the communication test.

- Link Test: A physical layer test that sends IEEE 802.2 test packets to any device identified by its MAC address.

- Ping Test: A network layer test used on IP networks that sends test packets to any device identified by its IP address.

These tests can be performed through the switch console interface. Use a terminal connected directly to the switch or through a Telnet connection, or from the switch web browser interface. For more information, see the *Management and Configuration Guide* for your switch at **http://www.hpe.com/support/manuals**.

These tests can also be performed from an SNMP network management station running a program that can manage the switch. Examples include IMC or AirWave).

Testing end-to-end network communications

Both the switch and the cabling can be tested by running an end-to-end communications test. This is a test that sends known data from one network device to another through the switch. For example, if you have two PCs on the network that have LAN adapters between which you can run a link-level test or Ping test through the switch, you can use this test to verify that the entire communication path between the two PCs is functioning correctly. See your LAN adapter documentation for more information on running a link test or Ping test.

Restoring the factory default configuration

As part of your troubleshooting process on the switch, it may become necessary to return the switch configuration to the factory default settings. This process momentarily interrupts the switch operation, clears any passwords, clears the console event log, resets the network counters to zero, performs a complete self test, and reboots the switch into its factory default configuration, including deleting the IP address, if one is configured.

> **NOTE:** This process removes all switch configuration changes made from the factory default settings. This includes, for example, configuration of VLANs, spanning tree, trunks, and stacking. Returning the configuration of these features to their factory default settings (usually disabling them) may result in network connectivity issues.
>
> If the switch has a valid configuration, and you are restoring the factory default settings for a reason other than configuration problems, you should save the switch configuration prior to performing the factory default reset. After the reset and resolution of the original problem, you can restore the saved configuration to the switch. For information on saving and restoring the configuration, see the *Management and Configuration Guide* for your switch at **http://www.hpe.com/networking/support**.

You can restore the factory default configuration either on the switch console or on the switch itself.

To restore the factory default configuration using the console, execute the `erase startup-config` command from the console command prompt. For stacked switches, reset stacking configurations to factory defaults by executing the `stacking factory-reset` command.

To execute the factory default reset on the switch, perform these steps:

Procedure

1. Using pointed objects, simultaneously press both the Reset and Clear buttons on the front of the switch.

2. Continue to press the Clear button while releasing the Reset button.

3. When the Global Status LED begins to fast flash orange (after approximately 5 seconds), release the Clear button.

4. The switch will then complete its boot process and begin operating with its configuration restored to the factory default settings.

Downloading new switch software

Software updates can be downloaded to the switch through several methods. For more information, see **Accessing updates** on page 98.

Switch specifications

Physical

Product	Weight	Width	Depth	Height
Aruba 2930M 24G 1-slot switch (JL319A)	6.5 kg (14.28 lbs)	442.5 mm (17.4 in)	32.44 cm (12.77 in) 35.51 cm (13.98 in) [1]	43 mm (1.7 in)
Aruba 2930M 24G PoE+ with 1-slot switch (JL320A)	6.7 kg (14.7 lbs)			
Aruba 2930M 48G with 1-slot switch (JL321A)	6.7 kg (14.84 lbs)			
Aruba 2930M 48G PoE+ 1-slot switch (JL322A)	7.0 kg (15.4 lbs)			
Aruba 2930M 40G 8SR PoE+ 1-slot Switch (JL323A)	4.45 kg (9.81 lbs)			
Aruba 2930M 24SR PoE+ 1-slot Switch (JL324A)	4.50 kg (9.92 lbs)			
Aruba 2930M 40G 8 HPE Smart Rate PoE Class 6 1-slot Switch (R0M67A)	4.49 kg (9.90 lbs)			
Aruba 2930M 24 HPE Smart Rate PoE Class 6 1-slot Switch (R0M68A)	4.52 kg (9.96 lbs)			
[1] Includes power supply handles, which extend from the back of the switch chassis.				

Electrical

Electrical	Aruba 2930M PoE Switches (JL320A, JL322A, JL323A, JL324A, R0M67A, R0M68A)	Aruba 2930M Non-PoE Switches (JL319A, JL321A)
AC voltage: Maximum current: Frequency range:	Per JL086A power supply: 100V-240V 8A- 3.5A 50 -60 Hz The switch automatically adjusts to any voltage between 100-240 VAC, and either 50 Hz or 60 Hz.	Per JL085A power supply: 100 - 240 VAC 3A -1.2A 50 - 60 Hz
	Per JL087A power supply: 110V-240V 12A- 5A 50 -60 Hz	

Environmental

Uplink port module	
Operating temperature:	**JL319A**, **JL320A**, **JL321A**, **JL322A**, **JL323A**, **R0M67A** • 0°C to 55°C (32°F to 131°F) up to 5,000 ft. • 0°C to 50°C (32°F to 122°F) up to 10,000 ft. (Reduce 1°C for every 1,000 ft above 5,000 ft.) **NOTE:** If any of the following transceivers are installed in the switch, then the maximum operating temperature for an Aruba 2930M switch is 50°C (122°F): • J9150A HPE X132 10G SFP+ LC SR Transceiver • J9151A HPE X132 10G SFP+ LC LR Transceiver • J9152A HPE X132 10G SFP+ LC LRM Transceiver • J9153A HPE X132 10G SFP+ LC ER Transceiver • JH231A HPE X142 40G QSFP+ MPO SR4 Transceiver • JH232A HPE X142 40G QSFP+ LC LR4 SM Transceiver • JH233A HPE X142 40G QSFP+ MPO eSR4 Transceiver **NOTE:** JL324A and R0M68A have reduced maximum operating temperature restrictions: • 32°F to 113°F (0°C to 45°C) up to 5,000 ft. • 32°F to 104°F (0°C to 40°C) up to 10,000 ft. (Reduce 1 degree C for every 1,000 ft from 5,000 ft to 10,000 ft.)
Relative humidity:	15% to 95% at 40°C (104°F) noncondensing to 10,000 ft.
Nonoperating temperature:	-40°C to 70°C (-40°F to 158°F) up to 15,000 ft
Nonoperating relative humidity:	15% to 90% at 65°C (149°F) (noncondensing up to 15,000 ft.
Maximum operating altitude:	3.0 km (10,000 ft)
Nonoperating altitude:	4.6 km (15,000 ft)

Acoustics

Product[1]	Acoustics
Aruba 2930M 24G 1-slot switch (JL319A)	Sound Power (LWAd) 4.0 Bel Sound Pressure (LpAm) (Bystander) 22.8 dB
Aruba 2930M 24G PoE+ with 1-slot switch (JL320A)	Sound Power (LWAd) 4.1 Bel Sound Pressure (LpAm) (Bystander) 23.7 dB
Aruba 2930M 48G with 1-slot switch (JL321A)	Sound Power (LWAd) 4.6 Bel Sound Pressure (LpAm) (Bystander) 28.8 dB
Aruba 2930M 48G PoE+ 1-slot switch (JL322A)	Sound Power (LWAd) 4.6 Bel Sound Pressure (LpAm) (Bystander) 28.9 dB
Aruba 2930M 40G 8SR PoE+ 1-slot Switch (JL323A)	Sound Power (LWAd) 4.4 Bel Sound Pressure (LpAm) (Bystander) 26.0 dB
Aruba 2930M 24SR PoE+ 1-slot Switch (JL324A)	Sound Power (LWAd) 4.8 Bel Sound Pressure (LpAm) (Bystander) 31.2 dB
Aruba 2930M 40G 8 HPE Smart Rate PoE Class 6 1-slot Switch (R0M67A)	Sound Power (LWAd) 4.5 Bel Sound Pressure (LpAm) (Bystander) 27.1 dB
Aruba 2930M 24 HPE Smart Rate PoE Class 6 1-slot Switch (R0M68A)	Sound Power (LWAd) 4.9 Bel Sound Pressure (LpAm) (Bystander) 31.6 dB

[1] Acoustic levels based on the JL087A power supply.

Safety

Complies with:

- EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011+A2:2013
- EN62368-1, Ed. 2
- IEC60950-1:2005 Ed.2; Am 1:2009+A2:2013
- IEC62368-1, Ed. 2
- IEC60825:2007 (Applies to products with lasers)
- UL60950-1, CSA 22.2 No 60950-1
- EN60850-1:2007 / IEC 60825-1: 2007 Class1
- Class 1 Laser Products / Laser Klasse 1

Connectivity standards

Table 24: *Technology standards and safety compliance*

Technology	Compatible with these IEEE standards	Laser safety information		
		EN/IEC standard compliance	SFP ("mini-GBIC") Lasers	SFP+Lasers
10-T100-TX1000-T10GBASE-T	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX IEEE 802.3ab 1000BASE-T IEEE 802.3an 10GBASE-T			
2.5G and 5G Twisted-Pair Copper	HPE Smart Rate IEEE 802.3bz			
100-FX	IEEE 802.3u 100BASE-FX	EN/IEC 60825	Class 1 Laser Product Laser Klasse 1	
100-BX	IEEE 802.3ah 100BASE-BX10	EN/IEC 60825	Class 1 Laser Product Laser Klasse 1	
1000-SX	IEEE 802.3z 1000BASE-SX	EN/IEC 60825	Class 1 Laser Product Laser Klasse 1	
1000-LX	IEEE 802.3z 1000BASE-LX	EN/IEC 60825	Class 1 Laser Product Laser Klasse 1	
1000-LH	(not an IEEE standard)	EN/IEC 60825	Class 1 Laser Product Laser Klasse 1	
1000-BX	IEEE 802.3ah 1000BASE-BX10	EN/IEC 60825	Class 1 Laser Product Laser Klasse 1	
10-Gig Direct Attach	(not an IEEE standard)			

Table Continued

	Laser safety information			
Technology	Compatible with these IEEE standards	EN/IEC standard compliance	SFP ("mini-GBIC") Lasers	SFP+Lasers
10-Gig SR	IEEE 802.3ae 10GBASE-SR	EN/IEC 60825		Class 1 Laser Product Laser Klasse 1
10-Gig LRM	IEEE 802.3aq 10GBASE-LRM	EN/IEC 60825		Class 1 Laser Product Laser Klasse 1
10-Gig LR	IEEE 802.3ae 10GBASE-LR	EN/IEC 60825		Class 1 Laser Product Laser Klasse 1
10-Gig ER	IEEE 802.3ae 10GBASE-ER	EN/IEC 60825		Class 1 Laser Product Laser Klasse 1
40-Gig Direct Attach	(not an IEEE standard)			
40-Gig SR4	IEEE 802.3ba 40GBASE-SR4	EN/IEC 60825		Class 1 Laser Product Laser Klasse 1
40-Gig eSR4	IEEE 802.3ba 40GBASE-SR4	En/IC 60825		Class 1 Laser Product Laser Klasse 1
40-Gig LR4	IEEE 802.3ae 40GBASE-LR4	EN/IC 60825		Class 1 Laser Product Laser Klasse 1

Stacking module specifications

Physical

Product	Weight	Width	Depth	Height
JL325A	0.26 kg (0.58 lb)	148.59 mm (5.85 in)	92.71 mm (3.65 in)	40.39 mm (1.59 in)

Environmental

Stacking Module	
Operating temperature:	0°C to 55°C (32°F to 131°F)
Relative humidity:	15% to 95% at 40°C (104°F) noncondensing
Non-operating temperature:	-40°C to 70°C (-40°F to 158°F)
Non-operating relative humidity:	15% to 90% at 65°C (149°F)
Maximum operating altitude:	3.0 km (10,000 ft)
Non-operating altitude:	4.6 km (15,000 ft)

Uplink port specifications

Physical

Product	Weight	Width	Depth	Height
JL078A	0.15 kg (0.34 lb)	74.2 mm (2.92 in)	129.3 mm (5.09 in)	27.7 mm (1.09 in)
JL081A	0.17 kg (0.38 lb)	74.2 mm (2.92 in)	129.3 mm (5.09 in)	27.7 mm (1.09 in)
JL083A	0.17 kg (0.38 lb)	74.2 mm (2.92 in)	130.8 mm (5.15 in)	27.7 mm (1.09 in)

Environmental

Uplink port Module	
Operating temperature:	0°C to 55°C (32°F to 131°F)
Relative humidity:	15% to 95% at 40°C (104°F) noncondensing
Non-operating temperature:	-40°C to 70°C (-40°F to 158°F)
Non-operating relative humidity:	15% to 90% at 65°C (149°F)
Maximum operating altitude:	3.0 km (10,000 ft)
Non-operating altitude:	4.6 km (15,000 ft)

This section includes switch connector information and network cable information for cables that should be used with the Hewlett Packard Enterprise switches.

> **NOTE:** Incorrectly wired cabling is a common cause of problems for LAN communications. Hewlett Packard Enterprise recommends that you work with a qualified LAN cable installer for assistance with your cabling requirements.

Cabling specifications

Table 25: *Cabling specifications*

Twisted-pair copper	10 Mbps Operation	Category 3, 4 or 5, 100-ohm unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable, complying with IEEE 802.3 10BASE-T specifications.
	100 Mbps Operation	Category 5, 100-ohm UTP, or STP cable, complying with IEEE 802.3u 100BASE-TX specifications.
	1000 Mbps Operation	Category 5, 100-ohm 4-pair UTP or STP cable, complying with IEEE 802.3ab 1000BASE-T specifications —Category 5e or better is recommended.
	2.5 Gbps Operation	Category 5e, 100-ohm-4-pair UTP, or STP cable, complying with IEEE 802.ab 1000BASE-T specifications.
	5 Gbps Operation	Category 5e or better, 100-ohm-4-pair UTP or STP cable. Category 6 or better is recommended.
	10 Gbps Operation	Category 6 or 6A, 100-ohm 4-pair UTP cable, or Category 6A or 7, 100-ohm 4-pair STP cable, complying with IEEE 802.3an 10GBASE-T specifications.
Twinaxial copper	Direct attach cables	One-piece devices consisting of a cable with SFP+ connectors permanently attached to each end, complying with SFF 8431 SFP+ specifications.

Table Continued

Multimode fiber		62.5/125 µm or 50/125 µm (core/cladding) diameter, low metal content, graded index fiber-optic cables, complying with the ITU-T G. 651 and ISO/IEC 793-2 Type A1b or A1a standards respectively.[1]
Single mode fiber		9/125 µm (core/cladding) diameter, low metal content fiber-optic cables, complying with the ITU-T G.652 and ISO/IEC 793-2 Type B1 standards.

[1] A mode conditioning patch cord may be needed for some Gigabit-LX and 10-Gigabit LRM installations.

Note on 1000BASE-T cable requirements

The Category 5 networking cables that work for 100BASE-TX connections also work for 1000BASE-T, as long as all four-pairs are connected. But, for the most robust connections, use cabling that complies with the Category 5e specifications. This specification is described in Addendum 5 to the TIA-568-A standard (ANSI/TIA/EIA-568-A-5).

Because of the increased speed provided by 1000BASE-T (Gigabit-T), network cable quality is more important than for either 10BASE-T or 100BASE-TX. Cabling plants being used to carry 1000BASE-T networking must comply with the IEEE 802.3ab standards. In particular, the cabling must pass tests for Attenuation, Near-End Crosstalk (NEXT), and Far-End Crosstalk (FEXT). Additionally, unlike the cables for 100BASE-TX, the 1000BASE-T cables must pass tests for Equal-Level Far-End Crosstalk (ELFEXT) and Return Loss.

When testing your cabling, be sure to include the patch cables that connect the switch and other end devices to the patch panels on your site. The patch cables are frequently overlooked when testing cable and they must also comply with the cabling standards.

Note on HPE Smart Rate 2.5 Gb/s cable requirements

The 2.5 Gb/s Smart Rate operates on cable installations that are designed to support 1000BASE-T operation. The cabling installation must meet the 1000BASE-T link segment characteristics described in IEEE 802.3-2012. The installation must also meet the Category 5e or Class D limits described in the ANSI/TIA/EIA 568-C.2 and ISO/IEC 11801 standards, respectively.

Note on HPE Smart Rate 5Gb/s cable requirements

The 5 Gb/s Smart Rate operates on most Category 5e and Category 6 cable installations. Category 5e or Class D installations must meet the ANSI/TIA/EIA 568-C.2 or ISO/IEC 11801 transmission parameter limits extended to 200MHz. Category 6 or Class E installations must meet their respective transmission parameter limits as described in ANSI/TIA/EIA 568-C.2 or ISO/IEC 11801.

Also, to transmission performance, 5 Gb/s Smart Rate can be sensitive to alien noise. Such noise can come from either nearby cables or background noise from the environment. Therefore, cabling must additionally be tested for Alien Near-End Crosstalk (ANEXT) and Alien Equal-Level-Far-End Crosstalk (AELFEXT). Depending on the cabling installation, the magnitude of alien crosstalk may further limit the maximum supported cabling distance.

Hewlett Packard Enterprise recommends doing cable dressing carefully and in compliance with recommendations in the TIA TSB-155-A and ISO/IEC TR-24750.

Note on 10GBASE-T cable requirements

The Category 6 networking cables that work for 1000BASE-T connections may work for 10GBASE-T. The distance must be less than 55m, and the cable installation must be tested for compliance to IEEE requirements. But, for the most robust connections, use cabling that complies with the Category 6A or Category 7 specifications, as described in the TIA-568-C (ANSI/TIA-568-C.2) and ISO/IEC 11801 standards. 10GBASE-T is a sophisticated technology that relies upon high-quality cable installations. It is sensitive to Alien Near End Crosstalk (ANEXT). This can affect the cable due to other cables placed close to the data cables. Hewlett Packard Enterprise recommends doing cable dressing carefully and in compliance with recommendations in the TIA TSB-155A.

Like 1000BASE-T, 10GBASE-T requires testing of all the crosstalk and return loss parameters described preceding "Note on 1000BASE-T cable requirements", and also ANEXT.

In addition to ANEXT, 10GBASE-T is more sensitive to external electrical noise in the environment. Hewlett Packard Enterprise recommends keeping radio transmitters and other sources of high frequency continuous wave radio frequency away from LAN cables.

> **NOTE:** HPE Smart Rate speeds for the JL323A 2930M switch and the JL081A Aruba 3810M/2930M 4 Smart rate PoE+ Module are 1, 2.5, 5, 10GbE.

When testing your cabling, be sure to include the patch cables that connect the switch and other end devices to the patch panels on your site. The patch cables are frequently overlooked when testing cable and they must also comply with the cabling standards. For 10GBASE-T, Category 6 patch cables are sensitive to movement once link has been established, and could cause link to drop if moved. Therefore, Hewlett Packard Enterprise recommends using Category 6A patch cables. As an alternative, use cable management options to tie down (dress) the Category 6 patch cables so they cannot move.

For Conducted and Radiated Immunity in accordance with EN55024, the Aruba 2930M switches are limited to Performance Criteria A with shielded cables (CAT6/6A).

Technology distance specifications

Table 26: *Technology distance specifications*

Technology	Supported cable type	Multimode fibermodal bandwidth	Supported distances
100-FX	multimode fiber	any	up to 2,000 meters
1000-T	twisted-pair copper	N/A	up to 100 meters
2.5Gb/s HPE Smart Rate	twisted-pair copper	N/A	up to 100 meters
5Gb/s HPE Smart Rate	twisted-pair copper	N/A	Cat 5e - up to 100 meters[1] Cat 6 - up to 100 meters[2] Cat 6A - up to 100 meters
10GBASE-T	twisted-pair copper	N/A	Cat 6 unshielded - up to 55 meters[3] Cat 6 shielded - up to 100 meters[3] Cat 6A unshielded - up to 100 meters Cat 6A shielded - up to 100 meters Cat 7 shielded - up to 100 meters
1000-SX	multimode fiber	160 MHz*km 200 MHz*km 400 MHz*km 500 MHz*km	2 - 220 meters 2 - 275 meters 2 - 500 meters 2 - 550 meters

Table Continued

Aruba 2930M Switches

Technology	Supported cable type	Multimode fibermodal bandwidth	Supported distances
1000-LX	multimode fiber	400 MHz*km	2 - 550 meters
	single mode fiber	500 MHz*km	2 - 550 meters
		N/A	2 - 10,000 meters
1000-LH	single mode fiber	N/A	10 - 70,000 meters[4]
1000-BX	single mode fiber	N/A	0.5 - 10,000 meters
10-Gig Direct Attach	twinaxial copper	N/A	(various lengths offered)
10-Gig SR	multimode fiber	160 MHz*km	2 - 26 meters
		200 MHz*km	2 - 33 meters
		400 MHz*km	2 - 66 meters
		500 MHz*km	2 - 82 meters
		2000 MHz*km	2 - 300 meters
10-Gig LRM	multimode fiber	400 MHz*km	0.5 - 100 meters
		500 MHz*km	0.5 - 220 meters
10-Gig LR	single mode fiber	N/A	2 - 10,000 meters
10-Gig ER	single mode fiber	N/A	2 - 40,000 meters
40-Gig SR4	single mode fiber	2000 MHz*km	2 - 100 meters
		4700 MHz*km	2 - 150 meters
40-Gig ESR4	multimode fiber	2000 MHz*km	2 - 300 meters
		4700 MHz*km	2 - 400 meters
40-Gig LR4	single mode fiber	N/A	2 - 10,000 meters

[1] Cat 5e cabling requires testing to 200 MHz operation and additionally for ANEXT and AELFEXT. The maximum supported distances may be reduced depending on alien crosstalk levels. The support for untested cable installations is best-effort.

[2] Cat 6 cabling requires testing for ANEXT and AELFEXT. The maximum supported distances may be reduced depending on alien crosstalk levels.

[3] Cat 6 cabling requires TIA TSB-155A testing for 500 MHz operation and ANEXT.

[4] For distances less than 20km, a 10dB attenuator must be used. For distances between 20km and 40km, a 5dB attenuator must be used. Attenuators can be purchased from most cable vendors.

Mode conditioning patch cord

The following information applies to installations in which multimode fiber-optic cables are connected to a Gigabit-LX port or a 10-Gigabit LRM port. Multimode cable has a design characteristic called "Differential Mode Delay", which requires the transmission signals be "conditioned" to compensate for the cable design and thus prevent resulting transmission errors.

Under certain circumstances, depending on the cable used and the lengths of the cable runs, an external Mode Conditioning Patch Cord may need to be installed between the Gigait-LX or 10-Gigabit LRM transmitting device and the multimode network cable to provide the transmission conditioning. If you experience a high number of transmission errors on those ports, usually CRC or FCS errors, you may need to install one of these patch cords between the fiber-optic port in your switch and your multimode fiber-optic network cabling, at both ends of the network link.

The patch cord consists of a short length of single mode fiber cable coupled to graded-index multimode fiber cable on the transmit side, and only multimode cable on the receive side. The section of single mode fiber is connected in such a way that it minimizes the effects of the differential mode delay in the multimode cable.

> **NOTE:** Most of the time, if you are using good quality graded-index multimode fiber cable that adheres to the standards listed in **Cabling specifications**, there should not be a need to use mode conditioning patch cords in your network. This is especially true if the fiber runs in your network are relatively short.
>
> For 10-Gigabit LRM using OM3 cable (50 μm multimode @ 1500/500 MHz*km), a mode conditioning patch cord is not required. Other multimode cables may require mode conditioning patch cords to achieve the LRM maximum distances.

Installing the patch cord

As shown in the illustration below, connect the patch cord to the Hewlett Packard Enterprise transceiver with the section of single mode fiber plugged in to the Tx (transmit) port. Then, connect the other end of the patch cord to your network cabling patch panel, or directly to the network multimode fiber.

If you connect the patch cord directly to the network cabling, you may need to install a female-to-female adapter to allow the cables to be connected together.

Figure 26: *Connecting a mode conditioning patch cord for Gigabit-LX*

Aruba 2930M Switches
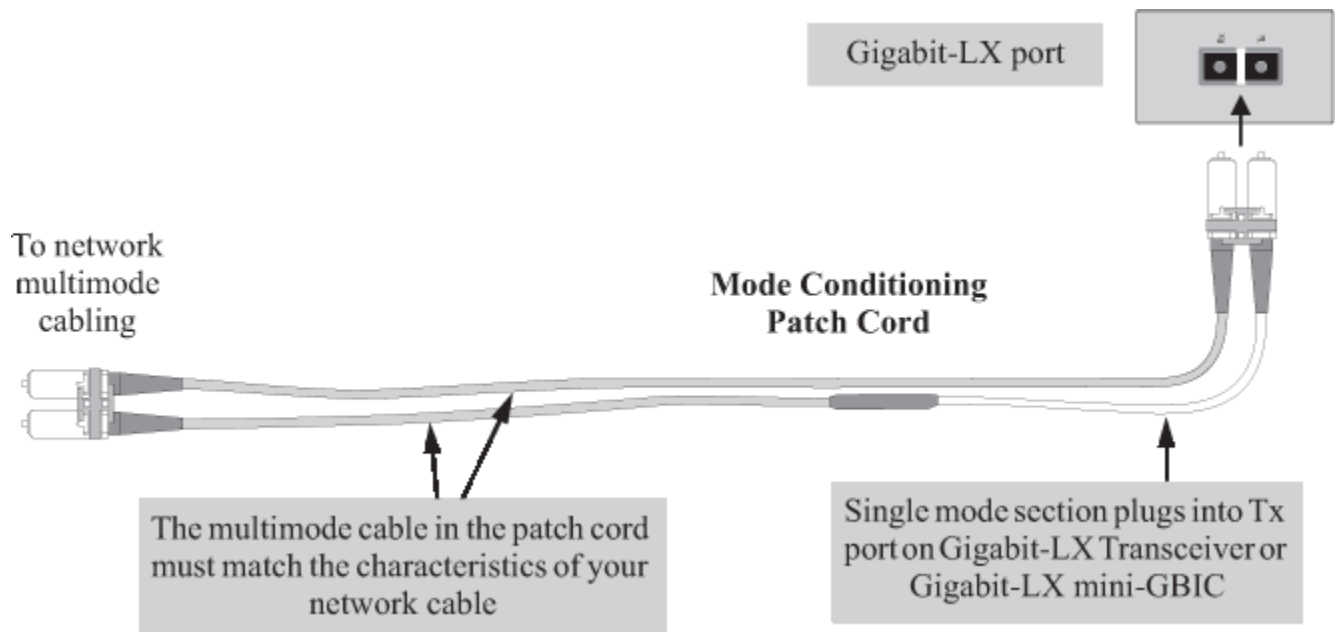
Be sure to purchase a patch cord that has appropriate connectors on each end, and has multimode fibers that match the characteristics of the multimode fiber in your network. Most important, the core diameter of the multimode patch cord must match the core diameter of the multimode cable infrastructure (either 50 or 62.5 microns).

Twisted-pair cable/connector pin-outs

Auto-MDIX feature:

The 10/100/1000-T ports support the IEEE 802.3ab standard, which includes the "Auto MDI/MDI-X" feature. In the default configuration, "Auto", the ports on the Switch 2930M all automatically detect the type of port on the connected device and operate as either an MDI or MDI-X port, whichever is appropriate. So for any connection, a straight-through twisted-pair cable can be used. You no longer have to use crossover cables, although crossover cables can also be used for any of the connections.

If you connect a 2930M switch twisted-pair port to another switch or hub, which typically have MDI-X ports, the 2930M port automatically operates as an MDI port. If you connect it to an end node, such as a server or PC, which typically have MDI ports, the 2930M switch port operates as an MDI-X port. In all cases, you can use standard straight-through cables or crossover cables.

If you use a correctly-wired crossover cable, though, the switch will still be able to automatically detect the MDI/MDI-X operation and link correctly to the connected device.
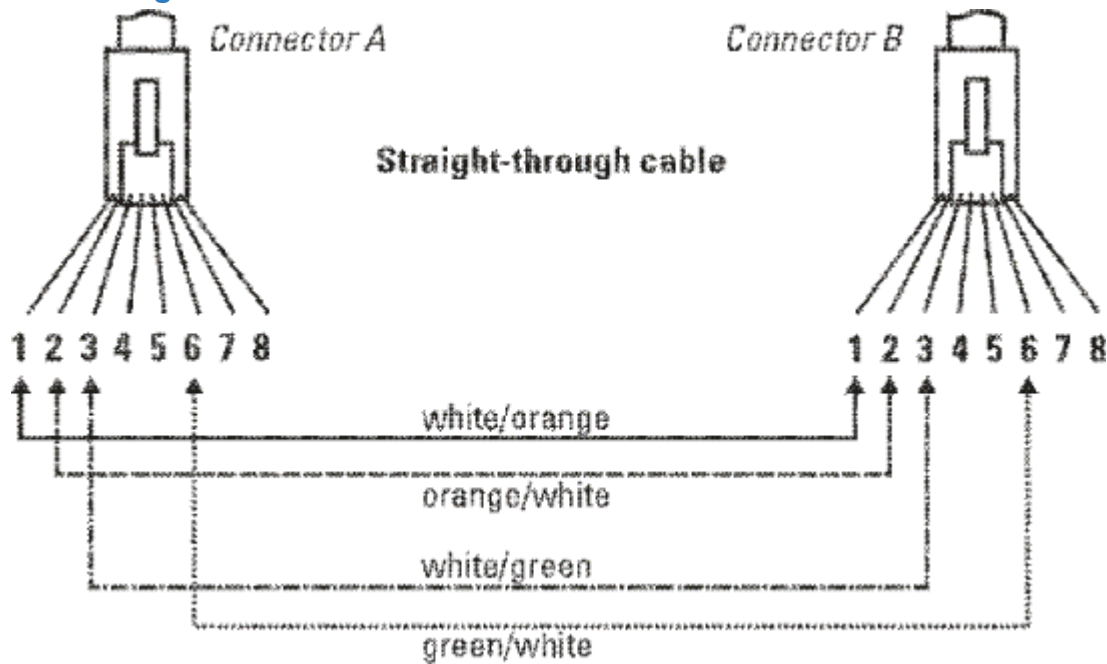
Other wiring rules:

- All twisted-pair wires used for 10 Mbps, and 100 Mbps operation must be twisted through the entire length of the cable. The wiring sequence must conform to EIA/TIA 568-B (not USOC). See "Pin Assignments" later in this appendix for a listing of the signals used on each pin.

- For 1000Base-T connections, all four pairs of wires in the cable must be available for data transmission.

- For 10 Mbps connections to the ports, you can use Category 3, 4, or 5 unshielded twisted-pair cable, as supported by the IEEE 802.3 Type 10Base-T standard.

- For 100 Mbps connections to the ports, use 100-ohm Category 5 UTP or STP cable only, as supported by the IEEE 802.3u Type 100Base-TX standard.

- For 1000 Mbps connections, 100-ohm Category 5e or better cabling is recommended.

Straight-through twisted-pair cable for 10 Mbps or 100 Mbps network connections

Because of the Aruba Auto-MDIX operation of the 10/100 ports on the switch, for all network connections, to PCs, servers or other end nodes, or to hubs or other switches, you can use straight-through cables.

If any of these ports are given a fixed configuration, for example 100 Mbps/Full Duplex, the ports operate as MDI-X ports, and straight-through cables must be then used for connections to PC NICs and other MDI ports.

Cable diagram

Connector A   Connector B

Straight-through cable

1 2 3 4 5 6 7 8   1 2 3 4 5 6 7 8

white/orange

orange/white

white/green

green/white

NOTE: Pins 1 and 2 on connector "A" must be wired as a twisted pair to pins 1 and 2 on connector "B".

Pins 3 and 6 on connector "A" must be wired as a twisted pair to pins 3 and 6 on connector "B".

Pins 4, 5, 7, and 8 are not used in this application, although they may be wired in the cable.

Pin assignments

Switch end (MDI-X)				Computer, transceiver, or other end	
Signal	Pins			Pins	Signal
receive +	1			1	transmit +
receive -	2			2	transmit -
transmit +	3			3	receive +
transmit -	6			6	receive -

Crossover twisted-pair cable for 10 Mbps or 100 Mbps network connection

The Auto-MDIX operation of the 10/100 ports on the switch also allows you to use crossover cables for all network connections, to PCs, servers or other end nodes, or to hubs or other switches.

If any of these ports are given a fixed configuration, for example 100 Mbps/Full Duplex, the ports operate as MDI-X ports, and crossover cables must be then used for connections to hubs or switches or other MDI-X network devices.

Cable diagram

Connector A   Connector B

Straight-through cable

1 2 3 4 5 6 7 8   1 2 3 4 5 6 7 8

white/orange

orange/white

white/green

green/white

> **NOTE:** Pins 1 and 2 on connector "A" must be wired as a twisted pair to pins 1 and 2 on connector "B".
>
> Pins 3 and 6 on connector "A" must be wired as a twisted pair to pins 3 and 6 on connector "B".
>
> Pins 4, 5, 7, and 8 are not used in this application, although they may be wired in the cable.
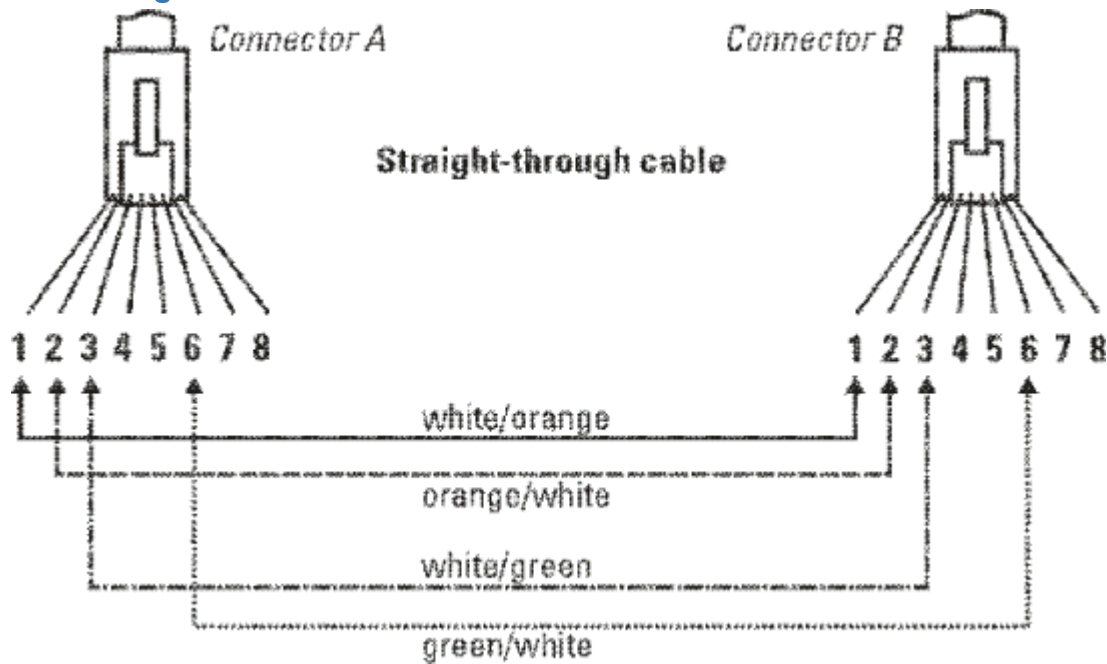
Pin assignments

Switch end (MDI-X)		Hub or switch port, or other MDI-X port end	
Signal	Pins	Pins	Signal
receive +	1	6	transmit -
receive -	2	3	transmit +
transmit +	3	2	receive -
transmit -	6	1	receive +

Straight-through twisted-pair cable for 1000 Mbps network connections

1000Base-T connections require that all four pairs or wires be connected.

Cable diagram
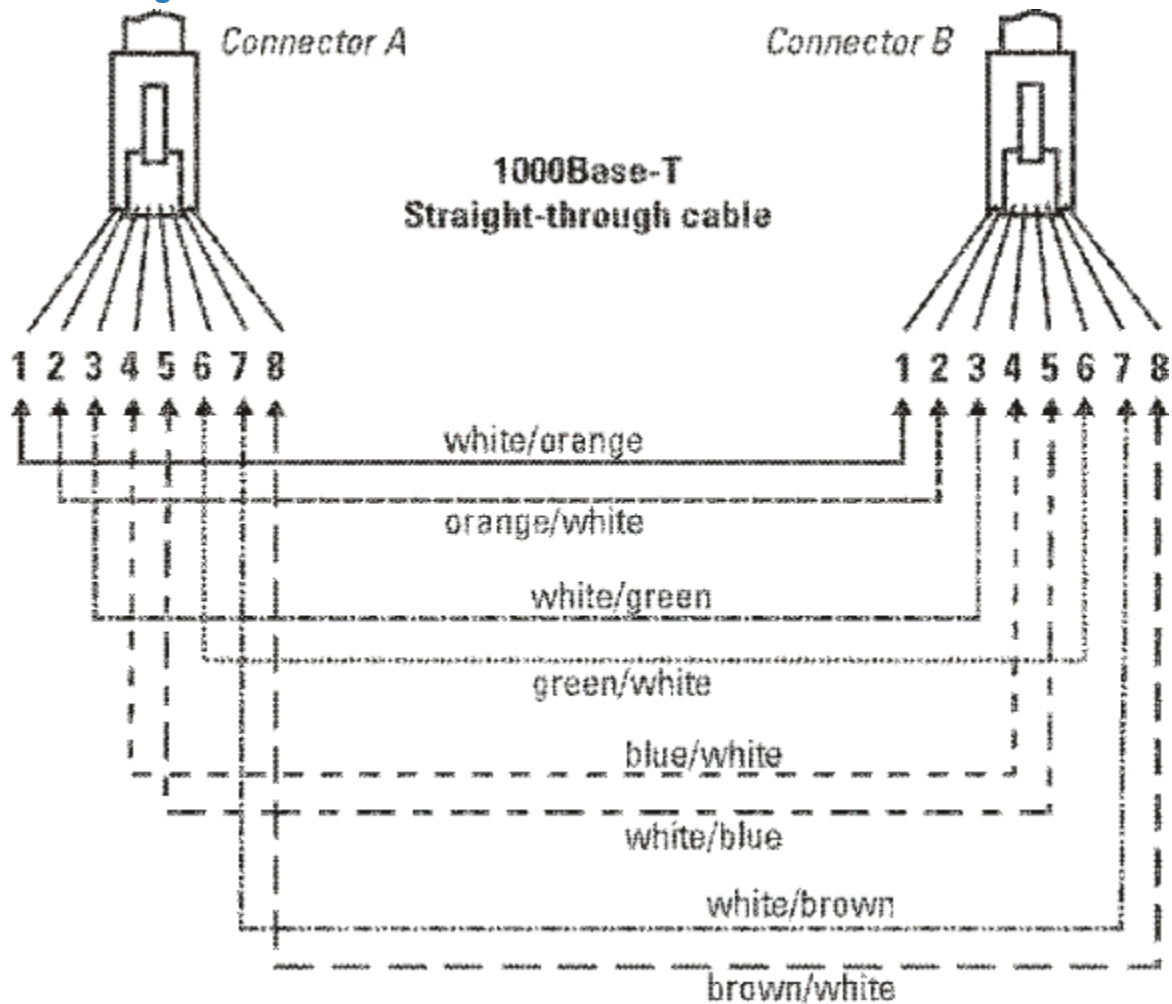
Connector A   **Connector B**

1000Base-T
Straight-through cable

1 2 3 4 5 6 7 8   1 2 3 4 5 6 7 8

white/orange

orange/white

white/green

green/white

blue/white

white/blue

white/brown

brown/white

NOTE: Pins 1 and 2 on connector "A" must be wired as a twisted pair to pins 1 and 2 on connector "B".

Pins 3 and 6 on connector "A" must be wired as a twisted pair to pins 3 and 6 on connector "B".

Pins 4 and 5 on connector "A" must be wired as a twisted pair to pins 4 and 5 on connector "B".

Pins 7 and 8 on connector "A" must be wired as a twisted pair to pins 7 and 8 on connector "B".

Pin assignments

For 1000Base-T operation, all four pairs of wires are used for both transmit and receive.

Networking Websites

Hewlett Packard Enterprise Networking Information Library

www.hpe.com/networking/resourcefinder

Hewlett Packard Enterprise Networking Software

www.hpe.com/networking/software

Hewlett Packard Enterprise Networking website

www.hpe.com/info/networking

Hewlett Packard Enterprise My Networking website

www.hpe.com/networking/support

Hewlett Packard Enterprise My Networking Portal

www.hpe.com/networking/mynetworking

Hewlett Packard Enterprise Networking Warranty

www.hpe.com/networking/warranty

General websites

Hewlett Packard Enterprise Information Library

www.hpe.com/info/EIL

For additional websites, see **Support and other resources**.

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:

    http://www.hpe.com/info/assistance

- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:

    http://www.hpe.com/support/hpesc

Information to collect

- Technical support registration number (if applicable)

- Product name, model or version, and serial number

- Operating system name and version

- Firmware version

- Error messages

- Product-specific reports and logs

- Add-on products or components

- Third-party products or components

Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.

- To download product updates:

    Hewlett Packard Enterprise Support Center
    >   **www.hpe.com/support/hpesc**

    Hewlett Packard Enterprise Support Center: Software downloads
    >   **www.hpe.com/support/downloads**

    Software Depot
    >   **www.hpe.com/support/softwaredepot**

- To subscribe to eNewsletters and alerts:

    www.hpe.com/support/e-updates

- To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to Support Materials** page:

    www.hpe.com/support/AccessToSupportMaterials

> ⓘ **IMPORTANT:** Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HPE Passport set up with relevant entitlements.

Customer self repair

Hewlett Packard Enterprise customer self repair (CSR) programs allow you to repair your product. If a CSR part needs to be replaced, it will be shipped directly to you so that you can install it at your convenience. Some parts do not qualify for CSR. Your Hewlett Packard Enterprise authorized service provider will determine whether a repair can be accomplished by CSR.

For more information about CSR, contact your local service provider or go to the CSR website:

http://www.hpe.com/support/selfrepair

Remote support

Remote support is available with supported devices as part of your warranty or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which will initiate a fast and accurate resolution based on your product's service level. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

If your product includes additional remote support details, use search to locate that information.

Remote support and Proactive Care information
HPE Get Connected
   www.hpe.com/services/getconnected
HPE Proactive Care services
   www.hpe.com/services/proactivecare
HPE Proactive Care service: Supported products list
   www.hpe.com/services/proactivecaresupportedproducts
HPE Proactive Care advanced service: Supported products list
   www.hpe.com/services/proactivecareadvancedsupportedproducts

Proactive Care customer information
Proactive Care central
   www.hpe.com/services/proactivecarecentral
Proactive Care service activation
   www.hpe.com/services/proactivecarecentralgetstarted

Warranty information

To view the warranty information for your product, see the links provided below:

HPE ProLiant and IA-32 Servers and Options
   www.hpe.com/support/ProLiantServers-Warranties
HPE Enterprise and Cloudline Servers
   www.hpe.com/support/EnterpriseServers-Warranties
HPE Storage Products
   www.hpe.com/support/Storage-Warranties
HPE Networking Products
   www.hpe.com/support/Networking-Warranties

Regulatory information

To view the regulatory information for your product, view the *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products*, available at the Hewlett Packard Enterprise Support Center:

www.hpe.com/support/Safety-Compliance-EnterpriseProducts

Additional regulatory information

Hewlett Packard Enterprise is committed to providing our customers with information about the chemical substances in our products as needed to comply with legal requirements such as REACH (Regulation EC No 1907/2006 of the European Parliament and the Council). A chemical information report for this product can be found at:

www.hpe.com/info/reach

For Hewlett Packard Enterprise product environmental and safety information and compliance data, including RoHS and REACH, see:

www.hpe.com/info/ecodata

For Hewlett Packard Enterprise environmental information, including company programs, product recycling, and energy efficiency, see:

www.hpe.com/info/environment

Documentation feedback

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