



Configuration Note for Catalyst 2960 Switch Power over Ethernet Ports

January 30, 2008

This configuration note describes the Power over Ethernet (PoE) feature for the Catalyst 2960 WS-C2960-24PC-L and WS-C2960-24LT-L switches. These switches require Cisco IOS Release 12.2(44)SE or later. For information about other features in this software release, see these documents:

- Release Notes for Cisco IOS Release 12.2(44)SE at this URL:
http://www.cisco.com/en/US/products/hw/switches/ps5023/prod_release_note09186a008092511f.html
- Catalyst 2960 Software Configuration Guide for Cisco IOS Release 12.2(44)SE at this URL:
http://www.cisco.com/en/US/products/ps6406/products_configuration_guide_book09186a00808d4f49.html
- Catalyst 2960 Command Reference for Cisco IOS Release 12.2(44)SE at this URL:
http://www.cisco.com/en/US/products/ps6406/products_command_reference_book09186a00808d4f4b.html

For information about the Catalyst 2960 PoE ports, see these sections:

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- [Power over Ethernet Ports](#)
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- [PoE Commands](#)
- [Obtaining Documentation, Obtaining Support, and Security Guidelines](#)



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Power over Ethernet Features

These are the Power over Ethernet features:

- Ability to provide power to connected Cisco prestandard and IEEE 802.3af-compliant powered devices from Power over Ethernet (PoE)-capable ports if the switch detects that there is no power on the circuit.
- Support for Cisco Discovery Protocol (CDP) with power consumption. The powered device notifies the switch of the amount of power that it is consuming.
- Support for Cisco intelligent power management. The powered device and the switch negotiate through power-negotiation CDP messages for an agreed power-consumption level. The negotiation allows a high-power Cisco powered device to operate at its highest power mode.
- Automatic detection and power budgeting; the switch maintains a power budget, monitors and tracks requests for power, and grants power only when it is available.

Known Limitations

These are known limitations for PoE on the Catalyst 2960 switches.

Device Manager Limitations

These limitations apply when using the Device Manager with the Catalyst 2960 switches:

- The Port Settings/Port Status dialog shows *NA* in the PoE column.
- After you disable a port from the Port Settings dialog or the command-line interface (CLI), you cannot enable it again.
- In Dashboard, the PoE Utilization meter is not active.
- In Health, the PoE Utilization graph does not appear.

IP Telephony Limitations

These are the IP telephony limitations:

- Some access point devices are incorrectly discovered as IEEE 802.3af Class 1 devices. These access points should be discovered as Cisco pre-standard devices. The **show power inline** user EXEC command shows the access point as an IEEE Class 1 device. The workaround is to power the access point by using an AC wall adaptor. (CSCin69533)
- After you change the access VLAN on a port that has IEEE 802.1x enabled, the IP phone address is removed. Because learning is restricted on IEEE 802.1x-capable ports, it takes approximately 30 seconds before the address is relearned. No workaround is necessary. (CSCea85312)
- The switch uses the IEEE classification to learn the maximum power consumption of a powered device before powering it. The switch grants power only when the maximum wattage configured on the port is less than or equal to the IEEE class maximum. This ensures that the switch power budget is not oversubscribed. There is no such mechanism in Cisco prestandard powered devices.

The workaround for networks with pre-standard powered devices is to leave the maximum wattage set at the default value (15.4 W). You can also configure the maximum wattage for the port for no less than the value the powered device reports as the power consumption through CDP messages. For networks with IEEE Class 0, 3, or 4 devices, do not configure the maximum wattage for the port at less than the default 15.4 W (15,400 milliwatts). (CSCee80668)

- The Cisco 7905 IP Phone is error-disabled when the phone is connected to wall power.

The workaround is to enable PoE and to configure the switch to recover from the PoE error-disabled state. (CSCsf32300)

Power over Ethernet Ports

Catalyst 2960 PoE-capable switch ports automatically supply power to these connected devices if the switch senses that there is no power on the circuit:

- Cisco prestandard powered devices (such as Cisco IP Phones and Cisco Aironet access points)
- IEEE 802.3af-compliant powered devices

The Catalyst 2960-24PC provides 24 10/100 PoE ports that can supply up to 15.4 W of power each, up to a maximum switch power output of 370 W. The Catalyst 2960 -24LT provides 24 10/100 ports, 8 of which are PoE ports that can supply up to 15.4 W of power each.

A powered device can receive redundant power when it is connected to a PoE switch port and to an AC power source. The powered device might be reset upon switching power sources.

Supported Protocols and Standards

The switch uses these protocols and standards to support PoE:

- CDP with power consumption—The powered device notifies the switch of the amount of power that it is consuming. The switch does not reply to the power-consumption messages. The switch can only supply power to or remove power from the PoE port.
- Cisco intelligent power management—The powered device and the switch negotiate through power-negotiation CDP messages for an agreed power-consumption level. The negotiation allows a high-power Cisco powered device that consumes more than 7 W to operate at its highest power mode. The powered device first boots up in low-power mode, consumes less than 7 W, and negotiates to obtain enough power to operate in high-power mode. The device changes to high-power mode only when it receives confirmation from the switch.

High-power devices can operate in low-power mode on switches that do not support power-negotiation CDP.

Cisco intelligent power management is backward-compatible with CDP with power consumption; the switch responds according to the CDP message that it receives. CDP is not supported on third-party powered devices; therefore, the switch uses the IEEE classification to determine the power usage of the device.

- IEEE 802.3af—The major features of this standard are powered-device discovery, power administration, disconnect detection, and optional powered-device power classification. For more information, see the standard.

Powered-Device Detection and Initial Power Allocation

The switch detects a Cisco prestandard or an IEEE-compliant powered device when the PoE-capable port is in the no-shutdown state, PoE is enabled (the default), and the connected device is not being powered by an AC adaptor.

After device detection, the switch determines the device power requirements based on its type:

- A Cisco prestandard powered device does not provide its power requirement when the switch detects it, so the switch allocates 15.4 W as the initial allocation for power budgeting.

The initial power allocation is the maximum amount of power that a powered device requires. The switch initially allocates this amount of power when it detects and powers the powered device. As the switch receives CDP messages from the powered device, and, as the powered device negotiates power levels with the switch through CDP power-negotiation messages, the initial power allocation might be adjusted.

- The switch classifies the detected IEEE device within a power consumption class. Based on the available power in the power budget, the switch determines if a port can be powered. [Table 1](#) lists these levels.

Table 1 IEEE Power Classifications

Class	Maximum Power Level Required from the Switch
0 (class status unknown)	15.4 W
1	4 W
2	7 W
3	15.4 W
4 (reserved for future use)	Treat as Class 0

The switch performs these power allocation tasks:

- Monitors and tracks requests for power and grants power only when it is available
- Tracks its power budget (the amount of power available on the switch for PoE)
- Performs power-accounting calculations when a port is granted or denied power to keep the power budget up to date

After power is applied to the port, the switch uses CDP to determine the *actual* power consumption requirement of the connected Cisco powered devices and adjusts the power budget accordingly. This does not apply to third-party PoE devices. The switch processes a request and either grants or denies power. If the request is granted, the switch updates the power budget. If the request is denied, the switch ensures that power to the port is turned off, generates a syslog message, and updates the LEDs. Powered devices can also negotiate with the switch for more power.

If the switch detects a fault caused by an undervoltage, overvoltage, overtemperature, oscillator-fault, or short-circuit condition, it turns off power to the port, generates a syslog message, and updates the power budget and the LEDs.

Power Management Modes

The switch supports these PoE modes:

- **auto**—The switch automatically detects if the connected device requires power. If the switch discovers a powered device connected to the port and if the switch has enough power, it grants power, updates the power budget, turns on power to the port on a first-come, first-served basis, and updates the LEDs. For LED information, see the hardware installation guide.

If the switch has enough power for all the powered devices, they all come up. If there is not enough available PoE, or if a device is disconnected and reconnected while other devices are waiting for power, it cannot be determined which devices are granted or are denied power.

If granting power would exceed the system power budget, the switch denies power, ensures that power to the port is turned off, generates a syslog message, and updates the LEDs. After power has been denied, the switch periodically monitors the power budget and continues to attempt to grant the request for power.

If a device being powered by the switch is then connected to an AC power source, the switch might continue to power the device. The switch might continue to report that it is still powering the device whether the device is being powered by the switch or receiving power from an AC power source.

If a powered device is removed, the switch automatically detects the disconnect and removes power from the port. You can connect a nonpowered device without damaging it.

You can specify the maximum wattage that is allowed on the port. If the IEEE-class maximum wattage of the powered device is greater than the configured maximum value, the switch does not provide power to the port. If the switch powers a powered device, but the powered device later requests through CDP messages more than the configured maximum value, the switch removes power to the port. The power that was allocated to the powered device is reclaimed into the global power budget. If you do not specify a wattage, the switch delivers the maximum value. Use the **auto** setting on any PoE port. The **auto** setting is the default.

- **static**—The switch pre-allocates power to the port (even when no powered device is connected) and guarantees that power will be available for the port. The switch allocates the port configured maximum wattage, and the amount is never adjusted through the IEEE class or by CDP messages from the powered device. Because power is pre-allocated, any powered device that uses less than or equal to the maximum wattage is guaranteed to be powered when it is connected to the static port. The port no longer participates in the first-come, first-served model.

However, if the powered-device IEEE class is greater than the maximum wattage, the switch does not supply power to it. If the switch learns through CDP messages that the powered device needs more than the maximum wattage, the powered device is shut down.

If you do not specify a wattage, the switch pre-allocates the maximum value. The switch powers the port only if it discovers a powered device. Use the **static** setting on a high-priority interface.

- **never**—The switch disables powered-device detection and never powers the PoE port even if an unpowered device is connected. Use this mode only when you want to make sure power is never applied to a PoE-capable port, making the port a data-only port.

For information on configuring a PoE port, see the [“Configuring a Power Management Mode on a PoE Port” section on page 6](#).

Configuring a Power Management Mode on a PoE Port

For most situations, the default configuration (auto mode) works well, providing plug-and-play operation. No further configuration is required. However, use the following procedure to give a PoE port higher priority, to make it data only, or to specify a maximum wattage to disallow high-power powered devices on a port.



Note

When you make PoE configuration changes, the port being configured drops power. Depending on the new configuration, the state of the other PoE ports, and the state of the power budget, the port might not be powered up again. For example, port 1 is in the auto and on state, and you configure it for static mode. The switch removes power from port 1, detects the powered device, and repowers the port. If port 1 is in the auto and on state and you configure it with a maximum wattage of 10 W, the switch removes power from the port and then redetects the powered device. The switch repowers the port only if the powered device is a Class 1, Class 2, or a Cisco-only powered device.

Beginning in privileged EXEC mode, follow these steps to configure a power management mode on a PoE-capable port:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	interface <i>interface-id</i>	Specify the physical port to be configured, and enter interface configuration mode.
Step 3	power inline { auto [max <i>max-wattage</i>] never static [max <i>max-wattage</i>] }	<p>Configure the PoE mode on the port. The keywords have these meanings:</p> <ul style="list-style-type: none"> • auto—Enable powered-device detection. If enough power is available, automatically allocate power to the PoE port after device detection. This is the default setting. • (Optional) max <i>max-wattage</i>—Limit the power allowed on the port. The range is 4000 to 15400 milliwatts. If no value is specified, the maximum is allowed (15400 milliwatts). • never—Disable device detection, and disable power to the port. <p>Note If a port has a Cisco powered device connected to it, do not use the power inline never command to configure the port. A false link-up can occur, placing the port into an error-disabled state.</p> <ul style="list-style-type: none"> • static—Enable powered-device detection. Pre-allocate (reserve) power for a port before the switch discovers the powered device. The switch reserves power for this port even when no device is connected and guarantees that power will be provided upon device detection. <p>The switch allocates power to a port configured in static mode before it allocates power to a port configured in auto mode.</p>
Step 4	end	Return to privileged EXEC mode.
Step 5	show power inline [<i>interface-id</i>]	Display PoE status for a switch or for the specified interface.
Step 6	copy running-config startup-config	(Optional) Save your entries in the configuration file.

For information about the output of the **show power inline** user EXEC command, see the [“show power inline” section on page 18](#). For more information about PoE-related commands, see the [“Troubleshooting Power over Ethernet Switch Ports” section on page 9](#).

Budgeting Power for Devices Connected to a PoE Port

When Cisco powered devices are connected to PoE ports, the switch uses CDP to determine the *actual* power consumption of the devices, and the switch adjusts the power budget accordingly. This does not apply to IEEE third-party powered devices. For these devices, when the switch grants a power request, the switch adjusts the power budget according to the powered-device IEEE classification. If the powered device is a Class 0 (class status unknown) or a Class 3, the switch budgets 15,400 milliwatts for the device, regardless of the actual amount of power needed. If the powered device reports a higher class than its actual consumption or does not support power classification (defaults to Class 0), the switch can power fewer devices because it uses the IEEE class information to track the global power budget.

By using the **power inline consumption wattage** global configuration command, you can override the default power requirement specified by the IEEE classification. The difference between what is mandated by the IEEE classification and what is actually needed by the device is reclaimed into the global power budget for use by additional devices. You can then extend the switch power budget and use it more effectively.



Caution

You should carefully plan your switch power budget and make certain not to oversubscribe the power supply.



Note

When you manually configure the power budget, you must also consider the power loss over the cable between the switch and the powered device.

When you enter the **power inline consumption default wattage** or the **no power inline consumption default** global configuration command, or the **power inline consumption wattage** or the **no power inline consumption** interface configuration command, this caution message appears:

```
%CAUTION: Interface interface-id: Misconfiguring the 'power inline consumption/allocation' command may cause damage to the switch and void your warranty. Take precaution not to oversubscribe the power supply. Refer to documentation.
```

For more information about the IEEE power classifications, see the [“Power over Ethernet Ports” section on page 3](#).

Beginning in privileged EXEC mode, follow these steps to configure the amount of power budgeted to powered devices connected to any of the PoE ports:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	no cdp run	(Optional) Disable CDP.
Step 3	power inline consumption default <i>wattage</i>	Configure the power consumption of powered devices connected to any of the PoE ports. The range is 4000 to 15400 milliwatts. The default is 15400 milliwatts.
Step 4	end	Return to privileged EXEC mode.
Step 5	show power inline consumption	Display the power consumption status.
Step 6	copy running-config startup-config	(Optional) Save your entries in the configuration file.

To return to the default setting, use the **no power inline consumption default** global configuration command.

Beginning in privileged EXEC mode, follow these steps to configure the amount of power budgeted to a powered device connected to a specific PoE port:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	no cdp run	(Optional) Disable CDP.
Step 3	interface <i>interface-id</i>	Specify the physical port to be configured, and enter interface configuration mode.
Step 4	power inline consumption <i>wattage</i>	Configure the power consumption of the powered device connected to this PoE ports. The range is 4000 to 15400 milliwatts. The default is 15400 milliwatts.
Step 5	end	Return to privileged EXEC mode.
Step 6	show power inline consumption	Display the power consumption status.
Step 7	copy running-config startup-config	(Optional) Save your entries in the configuration file.

To return to the default setting, use the **no power inline consumption** interface configuration command.

For information about the output of the **show power inline consumption** privileged EXEC command, see the [“power inline consumption” section on page 14](#).

Troubleshooting Power over Ethernet Switch Ports

These sections describe how to troubleshoot PoE ports.

Disabled Port Caused by Power Loss

If a powered device (such as a Cisco IP Phone 7910) that is connected to a PoE switch port and is powered by an AC power source loses power from the AC power source, the device might enter an error-disabled state. To recover from an error-disabled state, enter the **shutdown** interface configuration command, and then enter the **no shutdown** interface command. You can also configure automatic recovery on the switch to recover from the error-disabled state. Use these commands to monitor the PoE port status:

- **show controllers power inline** privileged EXEC command
- **show power inline** privileged EXEC command
- **debug ilpower** privileged EXEC command

Disabled Port Caused by False Link Up

If a Cisco powered device is connected to a port and you configure the port by using the **power inline never** interface configuration command, a false link up can occur, placing the port into an error-disabled state. To take the port out of the error-disabled state, enter the **shutdown** and the **no shutdown** interface configuration commands.

You should not connect a Cisco powered device to a port that has been configured with the **power inline never** command.

PoE Commands

These are the PoE commands:

- **logging event power-inline-status**
- **power inline**
- **power inline consumption**
- **show controllers power inline**
- **show power inline**
- **debug ilpower**
- **debug platform frontend-controller**

logging event power-inline-status

Use the **logging event power-inline-status** interface configuration command to enable the logging of Power over Ethernet (PoE) events. Use the **no** form of this command to disable the logging of PoE status events; however, the **no** form of this command does not disable PoE error events.

logging event power-inline-status

no logging event power-inline-status

Syntax Description

power-inline-status	Enable the logging of PoE messages.
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Defaults

Logging of PoE events is enabled.

Command Modes

Interface configuration

Command History

Release	Modification
12.2(44)SE	This command was introduced.

Usage Guidelines

The **power-inline-status** keyword is available only on PoE interfaces.

Examples

This example shows how to enable logging of PoE events on a port:

```
Switch(config-if)# interface fastethernet0/1  
Switch(config-if)# logging event power-inline-status  
Switch(config-if)#
```

Related Commands

Command	Description
power inline	Configures the power management mode for the specified PoE port or for all PoE ports.
show controllers power inline	Displays the values in the registers of the specified PoE controller.

power inline

Use the **power inline** interface configuration command to configure the power management mode on the Power over Ethernet (PoE) ports. Use the **no** form of this command to return to the default settings.

```
power inline {auto [max max-wattage] | never | static [max max-wattage]}
```

```
no power inline {auto | never | static}
```

Syntax Description

auto	Enable powered-device detection. If enough power is available, automatically allocate power to the PoE port after device detection.
max <i>max-wattage</i>	(Optional) Limit the power allowed on the port. The range is 4000 to 15400 milliwatts. If no value is specified, the maximum is allowed.
never	Disable device detection, and disable power to the port.
static	Enable powered-device detection. Pre-allocate (reserve) power for a port before the switch discovers the powered device.

Defaults

The default is **auto** (enabled).

The maximum wattage is 15400 milliwatts.

Command Modes

Interface configuration

Command History

Release	Modification
12.2(44)SE	This command was introduced.

Usage Guidelines

This command is supported only on PoE-capable ports. If you enter this command on a port that does not support PoE, this error message appears:

```
Switch(config)# interface gigabitethernet0/1
Switch(config-if)# power inline auto
                    ^
% Invalid input detected at '^' marker.
```

Use the **max** *max-wattage* option to disallow higher-power powered devices. With this configuration, when the powered device sends Cisco Discovery Protocol (CDP) messages requesting more power than the maximum wattage, the switch removes power from the port. If the powered-device IEEE class maximum is greater than the maximum wattage, the switch does not power the device. The power is reclaimed into the global power budget.



Note

The switch never powers any Class 0 or Class 3 device if the **power inline max** *max-wattage* command is configured for less than 15.4 W.

If the switch denies power to a powered device (the powered device requests more power through CDP messages or if the IEEE class maximum is greater than the maximum wattage), the PoE port is in a power-deny state. The switch generates a system message, and the Oper column in the **show power inline** user EXEC command output shows `power-deny`.

Use the **power inline static max** *max-wattage* command to give a port high priority. The switch allocates PoE to a port configured in static mode before allocating power to a port configured in auto mode. The switch reserves power for the static port when it is configured rather than upon device discovery. The switch reserves the power on a static port even when there is no connected device and whether or not the port is in a shutdown or in a no shutdown state. The switch allocates the configured maximum wattage to the port, and the amount is never adjusted through the IEEE class or by CDP messages from the powered device. Because power is pre-allocated, any powered device that uses less than or equal to the maximum wattage is guaranteed power when it is connected to a static port. However, if the powered device IEEE class is greater than the maximum wattage, the switch does not supply power to it. If the switch learns through CDP messages that the powered device needs more than the maximum wattage, the powered device is shut down.

If the switch cannot pre-allocate power when a port is in static mode (for example, because the entire power budget is already allocated to other auto or static ports), this message appears: `Command rejected: power inline static: pwr not available`. The port configuration remains unchanged.

When you configure a port by using the **power inline auto** or the **power inline static** interface configuration command, the port autonegotiates by using the configured speed and duplex settings. This is necessary to determine the power requirements of the connected device (whether or not it is a powered device). After the power requirements have been determined, the switch configures the interface by using the configured speed and duplex settings without resetting the interface.

When you configure a port by using the **power inline never** command, the port reverts to the configured speed and duplex settings.

If a port has a Cisco powered device connected to it, you should not use the **power inline never** command to configure the port. A false link-up can occur on the port, placing it into an error-disabled state.



Caution

In releases earlier than Cisco IOS Release 12.2(20)SE1, power was sometimes still applied to a PoE port even after a powered device was removed. This could cause damage to a nonpowered device when it was later connected to that port. Make sure that your switch is running Cisco IOS Release 12.2(20)SE1 or later.

Examples

This example shows how to enable detection of a powered device and to automatically power a PoE port:

```
Switch(config)# interface fastethernet0/2
Switch(config-if)# power inline auto
```

This example shows how to configure a PoE port to allow a Class 1 or a Class 2 powered device:

```
Switch(config)# interface fastethernet0/2
Switch(config-if)# power inline auto max 7000
```

This example shows how to disable powered-device detection and to not power a PoE port:

```
Switch(config)# interface fastethernet0/2
Switch(config-if)# power inline never
```

You can verify your settings by entering the **show power inline** user EXEC command.

Related Commands

Command	Description
logging event power-inline-status	Enables the logging of PoE events.
show controllers power inline	Displays the values in the registers of the specified PoE controller.
show power inline	Displays the PoE status for the specified PoE port or for all PoE ports.

power inline consumption

Use the **power inline consumption** global or interface configuration command to override the amount of power specified by the IEEE classification for the device by specifying the wattage used by each powered device. Use the **no** form of this command to return to the default power setting.

power inline consumption default *wattage*

no power inline consumption default



Note

The **default** keyword appears only in the global configuration command.

Syntax Description

<i>wattage</i>	Specify the power that the switch budgets for the port. The range is 4000 to 15400 milliwatts.
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Defaults

The default power on each Power over Ethernet (PoE) port is 15400 milliwatts.

Command Modes

Global configuration
Interface configuration

Command History

Release	Modification
12.2(44)SE	This command was introduced.

Usage Guidelines

When Cisco powered devices are connected to PoE ports, the switch uses Cisco Discovery Protocol (CDP) to determine the *actual* power consumption of the devices, and the switch adjusts the power budget accordingly. This does not apply to IEEE third-party powered devices. For these devices, when the switch grants a power request, the switch adjusts the power budget according to the powered-device IEEE classification. If the powered device is a Class 0 (class status unknown) or a Class 3, the switch budgets 15400 milliwatts for the device, regardless of the actual amount of power needed. If the powered device reports a higher class than its actual consumption or does not support power classification (defaults to Class 0), the switch can power fewer devices because it uses the IEEE class information to monitor the global power budget.

By using the **power inline consumption** *wattage* interface configuration command, you can override the default power requirement specified by the IEEE classification. The difference between what is mandated by the IEEE classification and what is actually needed by the device is reclaimed into the global power budget for use by additional devices. You can then extend the switch power budget and use it more effectively.



Caution

You should carefully plan your switch power budget and make certain not to oversubscribe the power supply.

When you enter the **power inline consumption default** *wattage* or the **no power inline consumption default** global configuration command, or the **power inline consumption** *wattage* or the **no power inline consumption** interface configuration command, this caution message appears.

%CAUTION: Interface *interface-id*: Misconfiguring the 'power inline consumption/allocation' command may cause damage to the switch and void your warranty. Take precaution not to oversubscribe the power supply. Refer to documentation.



Note

When you manually configure the power budget, you must also consider the power loss over the cable between the switch and the powered device.

For more information about the IEEE power classifications, see the “Configuring Interface Characteristics” chapter in the software configuration guide for this release.

This command is supported only on PoE-capable ports. If you enter this command on a switch or port that does not support PoE, an error message appears.

Examples

By using the global configuration command, this example shows how to configure the switch to budget 5000 milliwatts to each PoE port:

```
Switch(config)# power inline consumption default 5000
%CAUTION: Interface Gi0/1: Misconfiguring the 'power inline consumption/allocation'
command may cause damage to the switch and void your warranty. Take precaution not to
oversubscribe the power supply. Refer to documentation.
```

By using the interface configuration command, this example shows how to configure the switch to budget 12000 milliwatts to the powered device connected to a specific PoE port:

```
Switch(config)# interface gigabitethernet1/0/2
Switch(config-if)# power inline consumption 12000
%CAUTION: Interface Gi0/2: Misconfiguring the 'power inline consumption/allocation'
command may cause damage to the switch and void your warranty. Take precaution not to
oversubscribe the power supply. Refer to documentation.
```

You can verify your settings by entering the **show power inline consumption** privileged EXEC command.

Related Commands

Command	Description
power inline	Configures the power management mode on PoE ports.
show power inline	Displays the PoE status for the specified PoE port or for all PoE ports.

show controllers power inline

Use the **show controllers power inline** user EXEC command to display the values in the registers of the specified Power over Ethernet (PoE) controller.

```
show controllers power inline [instance] [ | {begin | exclude | include} expression]
```

Syntax Description

<i>instance</i>	(Optional) Power controller instance, where each instance corresponds to four ports. See the “Usage Guidelines” section for more information. If no instance is specified, information for all instances appear.
begin	(Optional) Display begins with the line that matches the <i>expression</i> .
exclude	(Optional) Display excludes lines that match the <i>expression</i> .
include	(Optional) Display includes lines that match the specified <i>expression</i> .
<i>expression</i>	Expression in the output to use as a reference point.

Command Modes

User EXEC

Command History

Release	Modification
12.2(44)SE	This command was introduced.

Usage Guidelines

For the Catalyst 2960-24PC switches, the *instance* range is 0 to 1. For instances other than 0 to 1, the switches provides no output.

Though visible on all switches, this command is valid only for PoE switches. It provides no information for switches that do not support PoE.

The output provides information that might be useful for Cisco technical support representatives troubleshooting the switch.

Expressions are case sensitive. For example, if you enter | **exclude output**, the lines that contain *output* do not appear, but the lines that contain *Output* appear.

Examples

This is an example of output from the **show controllers power inline** command on a Catalyst 2960-24PC switch:

```
Switch> show controllers power inline
Alchemy instance 0, address 0
Pending event flag      :N N N N N N N N N N N N
Current State          :00 05 10 51 61 11
Current Event          :00 01 00 10 40 00
Timers                 :00 C5 57 03 12 20 04 B2 05 06 07 07
Error State            :00 00 00 00 10 00
Error Code              :00 00 00 00 00 00 00 00 00 00 00 00
Power Status           :N Y N N Y N N N N N N N
Auto Config            :N Y Y N Y Y Y Y Y Y Y Y
Disconnect             :N N N N N N N N N N N N
Detection Status       :00 00 00 30 00 00
Current Class          :00 00 00 30 00 00
Tweetie debug          :00 00 00 00
POE Commands pending at sub:
  Command 0 on each port :00 00 00 00 00 00
  Command 1 on each port :00 00 00 00 00 00
  Command 2 on each port :00 00 00 00 00 00
  Command 3 on each port :00 00 00 00 00 00
```

Related Commands

Command	Description
logging event power-inline-status	Enables the logging of PoE events.
power inline	Configures the power management mode for the specified PoE port or for all PoE ports.
show power inline	Displays the PoE status for the specified PoE port or for all PoE ports.

show power inline

Use the **show power inline** user EXEC command to display the Power over Ethernet (PoE) status for the specified PoE port or for all PoE ports.

```
show power inline interface-id | consumption[ | {begin | exclude | include} expression]
```

Syntax Description		
<i>interface-id</i>	(Optional)	Display PoE-related power management information for the specified interface.
consumption default	(Optional)	Display the power allocated to devices connected to PoE ports.
begin	(Optional)	Display begins with the line that matches the <i>expression</i> .
exclude	(Optional)	Display excludes lines that match the <i>expression</i> .
include	(Optional)	Display includes lines that match the specified <i>expression</i> .
<i>expression</i>		Expression in the output to use as a reference point.

Command Modes User EXEC

Command History	Release	Modification
	12.2(44)SE	This command was introduced.

Usage Guidelines Expressions are case sensitive. For example, if you enter | **exclude output**, the lines that contain output do not appear, but the lines that contain Output appear.

Examples This is an example of output from the **show power inline** command. In the display, port 2 is configured as static; power has been pre-allocated to this port, but no powered device is connected. Port 6 is a static port in the power-deny state because its maximum wattage is configured for 10 W. The connected powered device has a reported class maximum wattage for a Class 0 or Class 3 device.

```
Switch> show power inline
Available:370.0(w) Used:80.6(w) Remaining:289.4(w)

Interface Admin Oper      Power   Device           Class Max
          (Watts)
-----
Fa0/1    auto   on       6.3     IP Phone 7910    n/a   15.4
Fa0/2    static off     15.4    n/a
Fa0/3    auto   on       6.3     IP Phone 7910    n/a   15.4
Fa0/4    auto   on       6.3     IP Phone 7960     2    15.4
Fa0/5    static on      15.4    IP Phone 7960     2    15.4
Fa0/6    static power-deny 10.0    n/a          n/a   10.0
Fa0/7    auto   on       6.3     IP Phone 7910    n/a   15.4
<output truncated>
```

This is an example of output from the **show power inline** command on a port:

```
Switch> show power inline fastethernet0/1
Interface Admin Oper      Power Device      Class Max
              (Watts)
-----
Fa2/0/1      auto  on        6.3   IP Phone 7910   n/a  15.4
```

Table 0-2 *show power inline interface Field Descriptions*

Field	Description
Admin	Administration mode: auto, off, static
Oper	Operating mode: <ul style="list-style-type: none"> on—the powered device is detected, and power is applied. off—no PoE is applied. faulty—device detection or a powered device is in a faulty state. power-deny—a powered device is detected, but no PoE is available, or the maximum wattage exceeds the detected powered-device maximum.
Power	The supplied PoE in watts.
Device	The device type detected: n/a, unknown, Cisco powered-device, IEEE powered-device, <i>name from CDP</i> .
Class	The IEEE classification: n/a, Class 0–4.
Available	The total amount of PoE in the system.
Used	The amount of PoE allocated to ports.
Remaining	The amount of PoE not allocated to ports in the system. (Available – Used = Remaining).

Related Commands

Command	Description
logging event power-inline-status	Enables the logging of PoE events.
power inline	Configures the power management mode for the specified PoE port or for all PoE ports.
show controllers power inline	Displays the values in the registers of the specified PoE controller.

debug ilpower

Use the **debug ilpower** privileged EXEC command to enable debugging of the power controller and Power over Ethernet (PoE) system. Use the **no** form of this command to disable debugging.

```
debug ilpower { cdp | controller | event | ha | port | powerman | registries }
```

```
no debug ilpower { cdp | controller | event | ha | port | powerman | registries }
```

Syntax Description

cdp	Display PoE Cisco Discovery Protocol (CDP) debug messages.
controller	Display PoE controller debug messages.
event	Display PoE event debug messages.
ha	Display PoE high-availability messages.
port	Display PoE port manager debug messages.
powerman	Display PoE power management debug messages.
registries	Display PoE registries debug messages.

Defaults

Debugging is disabled.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(44)SE	This command was introduced.

Usage Guidelines

This command is supported only on PoE-capable switches.

This command provides information that might be useful for Cisco technical support representatives troubleshooting the switch.

Related Commands

Command	Description
show controllers power inline	Displays the values in the registers of the specified PoE controller.
show power inline	Displays the power status for the specified PoE port or for all PoE ports.

debug platform frontend-controller

Use the **debug platform frontend-controller** privileged EXEC command to enable debugging of front-end controller activity. Use the **no** form of this command to disable debugging.

```
debug platform frontend-controller {all | image | led | manager | poe | register | thermal}
```

```
no debug platform frontend-controller {all | image | led | manager | poe | register | thermal}
```

Syntax Description

all	Display all the debug messages for front-end controller.
image	Display Image Manager debug messages.
led	Display LED debug messages.
manager	Display front-end-controller manager debug messages.
poe	Display Power over Ethernet (PoE) debug messages.
register	Display Register Access debug messages.
thermal	Display thermal debug messages.

Defaults

Debugging is disabled.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(44)SE	This command was introduced.

Usage Guidelines

The **undebg platform frontend-controller** command is the same as the **no debug platform frontend-controller** command.

This command provides information that might be useful for Cisco technical support representatives troubleshooting the switch.

Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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