

# Cisco 3850 Series Switch Configuration Guide



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## Purpose

This document outlines the commands used to configure a **Cisco Catalyst 3850 series network switch\*** to function with the Igor<sup>®</sup> PoE lighting control system and includes additional commands useful for reporting and troubleshooting.

**\*ATTENTION:** The maximum PoE power available from a Cisco Catalyst 3850 series switch is 1800 watts. For the 48-port version of these switches, this means that only 30 ports (1800W / 60W) can be used at the maximum power rating of 60W/port; or if all 48 ports are used, then they will be limited to 37.5W each (1800W / 48). The 24-port version will have enough PoE power to supply 60W on all ports.

## Initial Configuration and Setup

### Connection

Refer to the appropriate Cisco documentation for information on connecting to the switch to access the command-line interface (CLI).

### Log In

Once you're connected to the Cisco switch and have a terminal prompt, enter the following commands to log in:

```
<switch-password (if prompted)>  
enable  
<config-password>
```

### Configure IP Address and Default Gateway

Determine the IP address, subnet mask, and default gateway values to which you want to configure the network switch; and then type the following commands in the console with those values:

```
Switch# configure terminal  
Switch(config)# interface vlan 1  
Switch(config-if)# ip address <ip-address> <subnet-mask>  
Switch(config-if)# exit  
Switch(config)# ip default-gateway <default-gateway>  
Switch(config)# end
```

## Enable Spanning Tree PortFast on a Range of Ports

The following commands will enable the Spanning-Tree PortFast feature on a range of ports. This feature should be enabled for any ports used for Igor nodes as it significantly reduces the delay time between when an Igor node is connected to a port and when the switch allows network communication from the node to the Igor Gateway:

```
Switch# configure terminal
Switch(config)# interface range Gi1/0/<starting port#>-<end port#>
Switch(config-if-range)# spanning-tree portfast
Switch(config-if-range)# end
```

## Disable Spanning Tree PortFast on Specific Ports

These commands should be executed on any switch ports that will be connected to other switches, hubs or routers. To disable the PortFast feature on a specific switch port, enter the following commands:

```
Switch# configure terminal
Switch(config)# int Gi1/0/<port#>
Switch(config-if)# no spanning-tree portfast
Switch(config-if)# end
```

## Disable IGMP Snooping

This step is required to allow multicast traffic between the Igor Nodes and Gateway. To disable IGMP snooping on the switch, enter the following commands:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping
Switch(config)# end
```

**Important:** If multicast traffic isn't allowed on your network, an alternative solution is to configure the network DHCP server to pass the Igor Gateway server IP address in DHCP Option 229. Contact Igor for more details.

## Enable LLDP

To enable LLDP, enter the following commands:

```
Switch# configure terminal
Switch(config)# lldp run
Switch(config)# end
```

## Enable Perpetual PoE and Fast PoE on all Igor Node Ports

The following commands will enable the Perpetual PoE and Fast PoE features on a range of ports. Perpetual PoE provides uninterrupted power to connected PD devices even when the switch is still booting. Fast Poe remembers the last power drawn from a particular port and switches on PoE power within 15 to 20 seconds after AC power is plugged-in without waiting for IOS to boot up. The combination of these two features means that the nodes will power on faster and turn on the lighting quicker, even before data communication has been granted:

```
Switch# configure terminal
Switch(config)# interface range Gi1/0/<starting port#>-<end port#>
Switch(config-if-range)# power inline port poe-ha
Switch(config-if-range)# end
```

## Enable Telnet (Optional)

This is an optional step to enable telnet on the Cisco switch. Determine the value you want to use for the telnet password, and then enter the following commands:

```
Switch# configure terminal
Switch(config)# line vty 0 15
Switch(config-line)# password <telnet-password>
Switch(config-line)# end
```

## Enable Jumbo Frames (Optional)

This is an optional step to increase the allowed MTU packet size. This setting is important to use in an Igor lighting network with multiple network switches interconnected via trunk ports to ensure no communication packets are dropped between the nodes and the Gateway. To configure this setting, enter the following commands:

```
Switch# configure terminal
Switch(config)# system mtu 9000
Switch(config-line)# end
```

Verify the setting change by entering the following command:

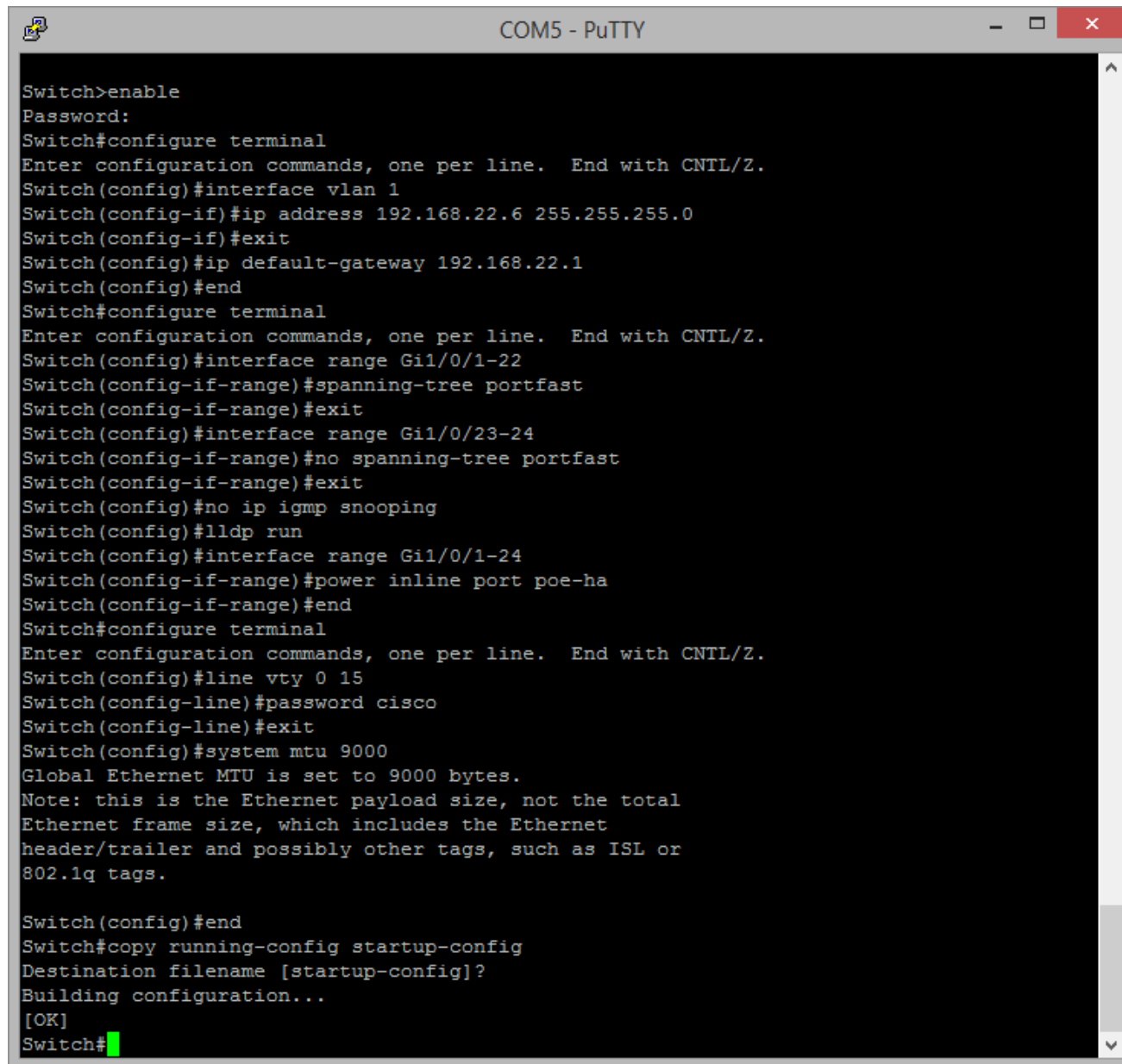
```
Switch# show system mtu
```

## Save Configuration

From the switch prompt, execute the following commands. (See screen example below.)

```
Switch# copy running-config startup-config  
[Enter]
```

**Important:** If the configuration changes are not saved, then the switch will return to the previous settings the next time it is rebooted.



```
COM5 - PuTTY  
Switch>enable  
Password:  
Switch#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Switch(config)#interface vlan 1  
Switch(config-if)#ip address 192.168.22.6 255.255.255.0  
Switch(config-if)#exit  
Switch(config)#ip default-gateway 192.168.22.1  
Switch(config)#end  
Switch#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Switch(config)#interface range Gi1/0/1-22  
Switch(config-if-range)#spanning-tree portfast  
Switch(config-if-range)#exit  
Switch(config)#interface range Gi1/0/23-24  
Switch(config-if-range)#no spanning-tree portfast  
Switch(config-if-range)#exit  
Switch(config)#no ip igmp snooping  
Switch(config)#lldp run  
Switch(config)#interface range Gi1/0/1-24  
Switch(config-if-range)#power inline port poe-ha  
Switch(config-if-range)#end  
Switch#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Switch(config)#line vty 0 15  
Switch(config-line)#password cisco  
Switch(config-line)#exit  
Switch(config)#system mtu 9000  
Global Ethernet MTU is set to 9000 bytes.  
Note: this is the Ethernet payload size, not the total  
Ethernet frame size, which includes the Ethernet  
header/trailer and possibly other tags, such as ISL or  
802.1q tags.  
Switch(config)#end  
Switch#copy running-config startup-config  
Destination filename [startup-config]?  
Building configuration...  
[OK]  
Switch#
```

## Common Commands

### Enable EXEC Commands

```
Switch> enable  
Password: <switch-password>  
Switch#
```

### View Switch Hardware and IOS Software Versions

```
Switch# show version
```

### View Status of All Switch Ports

```
Switch# show interface status
```

### View PoE Power Status of All Switch Ports

```
Switch# show power inline
```

### View Manually Set PoE Power Allocation for All Switch Ports

```
Switch# show power inline consumption
```

### View Detailed PoE Power Status of a Specific Port

```
Switch# show power inline gi1/0/<port#> detail
```

### View PoE Power Policing Status of All Switch Ports (Real-time Power Demand Limits)

```
Switch# show power inline police
```

### View Recent Messages from Switch Log (Including Errors)

```
Switch# show log
```



## Enable Console Log Messages

```
Switch# configure terminal
Switch(config)# logging console [severity-level]
    Severity-Level (Optional)
    0 - Emergencies
    1 - Alerts
    2 - Critical
    3 - Errors
    4 - Warnings
    5 - Notifications
    6 - Informational
    7 - Debugging (default)
```

## Set Console Privileged EXEC Timeout

```
Switch# configure terminal
Switch(config)# line console 0
Switch(config-line)# exec-timeout minutes [seconds]
Switch(config-line)# end
```

## Enable LLDP Globally on the Switch

```
Switch# configure terminal
Switch(config)# lldp run
```

## View Switch LLDP Statistics

```
Switch# show lldp
```

## View LLDP Neighbors

```
Switch# show lldp neighbors
```

## View Detailed LLDP Neighbor Information

```
Switch# show lldp neighbors detail
```

## Disable and Re-enable a Specific Port

(i.e., Cycle PoE Power on a Port)

```
Switch# configure terminal
Switch(config)# int gi1/0/<port#>
Switch(config-if)# shutdown
Switch(config-if)# no shutdown
Switch(config-if)# end
```

## Enable Portfast Globally to Allow DHCP Request Within Five (5) Seconds

```
Switch# configure terminal
Switch(config)# spanning-tree portfast default
Switch(config)# end
```

## Disable Portfast on Specific Ports Connected to Other Switches

```
Switch# configure terminal
Switch(config)# int gi1/0/<port#>
Switch(config-if)# spanning-tree portfast disable
Switch(config-if)# end
```

## Power Management Modes

### Default Mode-- Auto

Automatically allocates power to the PoE port after device detection. This is the default setting.

```
Switch# configure terminal
Switch(config)# int gi1/0/<port#>
Switch(config-if)# power inline auto
Switch(config-if)# end
```

### Limit the Allocated Power Budget for Port Before Switch Discovers PD

```
Switch# configure terminal
Switch(config)# int gi1/0/<port#>
Switch(config-if)# power inline auto max <milliwatts>
Switch(config-if)# end
```

### Set Static Allocated Power Level for Port Before Switch Discovers PD

The switch reserves this amount of power for the port even when no device is connected:

```
Switch# configure terminal
Switch(config)# int gi1/0/<port#>
Switch(config-if)# power inline static max <milliwatts>
Switch(config-if)# end
```

### Force UPoE (60W) Power Availability from the Port via Four-Pair Mode

```
Switch# configure terminal
Switch(config)# int gi1/0/<port#>
Switch(config-if)# power inline four-pair forced
Switch(config-if)# shutdown
Switch(config-if)# no shutdown
Switch(config-if)# end
```

### Cancel Port Settings

To cancel specific port settings, reissue the command with a “no” preceding it.

**Example:**

```
Switch(config-if)# no power inline static max
```

## Cable Testing via Time-Domain Reflectometer (VDR)

To instruct the switch to run a TDR test on a specific interface, which helps determine if there's a fault in the cable and approximately how far away from the switch that fault exists, enter the following command:

```
Switch# test cable tdr int gi1/0/<port#>
```

Show the results:

```
Switch# show cable tdr int gi1/0/<port#>
```

## Configure Switched Port Analyzer (SPAN) Port Mirroring and Monitoring

To send a copy of the traffic from the source port to the destination port on the switch, enter the following command. SPAN mirrors receive or transmit (or both) traffic on one or more source ports to a destination port for analysis:

```
Switch# configure terminal
```

```
Switch(config)# no monitor session all
```

```
Switch(config)# monitor session 1 source int gi1/0/<port#>
```

```
Switch(config)# monitor session 1 destination int gi1/0/<port#>
```

## Cisco Command Short Forms

The Short Form commands below can be used in place of those listed in the commands above:

COMMAND	SHORT FORM
configure terminal	conf t
importance	imp
level	lev
name	n
show	sh
shutdown	shut
timeout	t

## Factory Reset of Network Switch

To perform a hard factory reset, which resets everything, including the VLANs, hold the **MODE** button for 10 seconds until the switch resets.

## Cisco References

1. *Cisco Catalyst 3850 Series Switches Data Sheet:*  
[http://www.cisco.com/c/en/us/products/collateral/switches/catalyst-3850-series-switches/data\\_sheet\\_c78-720918.html](http://www.cisco.com/c/en/us/products/collateral/switches/catalyst-3850-series-switches/data_sheet_c78-720918.html)
2. *Cisco IOS Command-Line Interface Basic Software Configuration:*  
[http://www.cisco.com/c/en/us/td/docs/routers/access/1800/1841/software/configuration/guide/sw/b\\_cli.html#wp1047439](http://www.cisco.com/c/en/us/td/docs/routers/access/1800/1841/software/configuration/guide/sw/b_cli.html#wp1047439)
3. *Troubleshooting Power over Ethernet (PoE):*  
[http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3750/software/troubleshooting/g\\_power\\_over\\_ethernet.html](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3750/software/troubleshooting/g_power_over_ethernet.html)
4. *Cisco PoE Power Calculator (PoE+ only, requires Cisco login):*  
<https://tools.cisco.com/cpc/launch.jsp>

END.