



## Configuring Controllers

This chapter describes the Optics Controller for the 36-port QSFP56-DD 400 GbE and 48-port QSFP28 100 GbE Line Cards. This chapter also describes the procedures used to configure the controllers.



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**Note** When two MACsec enabled Cisco 8000 Series Routers with Coherent Line Cards are connected, there is no compatibility between Coherent Line Cards of IOS XR Release.

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Following controller configuration options are supported on the router:

- breakout - Configure breakout mode ('breakout 4x10' only.)
- clear - Clear the uncommitted configuration.
- commit - Commit the configuration changes to running.
- do - Run an exec command.
- end - Exit from configure mode.
- exit - Exit from this submode.
- ext-description - Set ext-description for this controller.
- no - Negate a command or set its defaults.
- pwd - Commands used to reach current submode.
- root - Exit to the global configuration mode.
- show - Show contents of configuration.
- [How to Configure Controllers, on page 1](#)

## How to Configure Controllers

This section contains the following procedures:

## Configuring Optics Controller

Configuring optics controller of breakout 4x10:

```
RP/0/RP0/CPU0:uut#configure
Fri Oct 11 16:22:31.222 UTC
RP/0/RP0/CPU0:uut(config)#controller optics 0/1/0/28
RP/0/RP0/CPU0:uut(config-Optics)#breakout 4x10
RP/0/RP0/CPU0:uut(config-Optics)#commit
Fri Oct 11 16:23:26.868 UTC
RP/0/RP0/CPU0:uut(config-Optics)#end
RP/0/RP0/CPU0:uut#
RP/0/RP0/CPU0:uut#show running-config controller optics 0/1/0/28
Fri Oct 11 16:23:41.273 UTC
controller Optics0/1/0/28
breakout 4x10
!
```

## Configuring Line Loopback on Grey Optics

Grey optics, which implies no color, is an optical transceiver that uses only one or two wavelengths of light to transmit and receive data. Grey optics are reasonably priced and ideal for short-distance transmission.

From IOS XR Release 7.5.4 onwards, it is possible to enable line loopback functionality on grey optics. Line loopback is the routing of traffic or data or signals received on an optical module back to their source. The source can be another router within the same network. When the traffic is received back at the source, you can utilize the received traffic to troubleshoot physical connection issues or network issues, such as traffic loss or a faulty optics. Line loopback is also known as media side input loopback.

Consider a scenario where there are two routers in a network, Router-A and Router-B. Router-A has a port and this port is connected to an optical module, OM-A. Similarly, Router-B is connected to another optical module OM-B. OM-A and OM-B are connected via a cable. In this setup, Router-A is the host side and OM-A is the media side. The traffic travels from Router B via OM-B to OM-A. If you have line loopback enabled on OM-A, the traffic that is received at OM-A (media side), is routed or looped back to Router B via OM-B.

You can now utilize the traffic received at Router-B to troubleshoot if there was any data loss. Or, if there is no traffic or signal received at Router-B, it could indicate that OM-A has physical connection issues or has malfunctioned.

### Guidelines and Limitations

- Line loopback mode is supported only on Cisco 8000 Series routers, and Q100 and Q200-based line cards.
- Host side line loopback isn't supported.

### Configure Line Loopback

To enable line loopback on the grey optics, use the **controller optics r/s/i/p loopback line** command.

This example shows how to enable line loopback configuration on grey optics:

```
Router#conf
Router(config)#controller optics 0/4/0/4
Router(config-CoDSP)#loopback line
Router(config-CoDSP)#secondary-admin-state maintenance
Router(config-CoDSP)#commit
```

### Running Configuration

This example shows the running configuration on grey optics:

```
Router#show run controller optics 0/4/0/4
Mon Jan 23 17:07:29.034 UTC
controller Optics0/4/0/4
  loopback line
  sec-admin-state maintenance
!

Router#
```

### Verification

This example shows how to verify the line loopback configuration on grey optics:

```
Router#show controller optics 0/4/0/4 information loopback
Fri Jan 20 17:18:05.541 UTC

Supported Loopback Types :
=====
[1.] Media Line
[2.] Host Line

Unsupported Loopback Types :
=====
[1.] Media Internal
[2.] Host Internal
Media Configured Loopback : Media Loopback Line
Media Applied Loopback   : Media Loopback Line

Router#
```

## Configuring Low Power Mode on Grey Optics

### Overview

Starting Release 7.5.4, Cisco IOS XR supports low power mode feature on the controller optics that allows you to configure ports used for grey optics in a low power mode. Use the **controller optics R/S/I/P shutdown** command to configure the low power mode. To disable the low power mode, use the **no** form of this command.



**Note** The **shutdown** option in the **controller optics R/S/I/P shutdown** command implies that the optical module will be set to the low power mode; there is no traffic transmission but you can still execute the **show controllers optics** command to view the optic details.

### Guidelines and Limitations

- Low power mode is supported only on the 400GbE ports on the Cisco 8000 Series routers, and Q100 and Q200-based line cards.

### Low Power Mode Configuration Example

The following example shows how to configure the low power mode on the optics controller:

```
Router#config
Router(config)#controller optics 0/4/0/4
Router(config-Optics)#shutdown
Router(config-Optics)#commit
Router(config-Optics)#exit
Router(config)#exit
```

## Running Configuration

This example shows the running configuration for the optics controller:

```
Router#show running-config controller optics 0/4/0/4
Mon Jan 23 17:07:29.034 UTC
controller Optics0/4/0/4
  shutdown
!
```

## Verification

This example shows how to verify the low power mode set on an optic:

```
Router#show controller optics 0/4/0/4
Tue Jan 24 00:14:28.531 UTC

Controller State: Administratively Down /* This indicates that the optics is in low power
mode */

Transport Admin State: Out Of Service /* This indicates that the optics is in low power
mode */

Laser State: Off /* This indicates that the optics is in low power mode */

LED State: Not Applicable

FEC State: FEC ENABLED

Optics Status

Optics Type: QSFPDD 400G FR4
Wavelength = 1301.00 nm

Alarm Status:
-----
Detected Alarms:
LOW-TX1-PWR LOW-TX2-PWR LOW-TX3-PWR LOW-TX4-PWR
LOW-TX1_LBC LOW-TX2_LBC LOW-TX3_LBC LOW-TX4_LBC

LOS/LOL/Fault Status:
Detected LOS/LOL/FAULT: RX-LOS RX-LOL TX-LOL

Performance Monitoring: Disable

THRESHOLD VALUES
-----

Parameter High Alarm Low Alarm High Warning Low Warning
-----
Rx Power Threshold(dBm) 6.4 -40.0 6.4 -40.0
Rx Power Threshold(mW) 4.3 0.0 4.3 0.0
Tx Power Threshold(dBm) 6.4 -4.3 6.4 -4.3
Tx Power Threshold(mW) 4.3 0.3 4.3 0.3
LBC Threshold(mA) 120.00 20.00 110.00 30.00
Temp. Threshold(celsius) 75.00 10.00 75.00 10.00
Voltage Threshold(volt) 3.56 3.03 3.56 3.03

Configured Tx Power = 0.00 dBm
Configured Tx Power(mW) = 1.00 mW
Configured CD High Threshold = 0 ps/nm
Configured CD lower Threshold = 0 ps/nm
Configured OSNR lower Threshold = 0.00 dB
```

Configured DGD Higher Threshold = 0.00 ps  
Polarization parameters not supported by optics

Lane Laser Bias TX Power RX Power Output Frequency

```
-----  
0 0.0 mA -40.00 dBm -40.00 dBm N/A  
1 0.0 mA -40.00 dBm -40.00 dBm N/A  
2 0.0 mA -40.00 dBm -40.00 dBm N/A  
3 0.0 mA -40.00 dBm -40.00 dBm N/A
```

Temperature = 28.78 Celsius  
Voltage = 3.31 V

Transceiver Vendor Details

Form Factor : QSFP-DD  
Optics type : QSFPDD 400G FR4  
Name : XYZ  
OUI Number : 44.7c.7f  
Part Number : T-DQ4CNT-NFB  
Rev Number : 50  
Serial Number : INLBYI552537  
PID : T-DQ4CNT-NFB  
VID : 50  
Firmware Version : Major.Minor.Build  
Active : 234.147.0  
Inactive : 0.0.0  
Date Code(yy/mm/dd) : 22/06/16

