



Optics Commands

This module describes the command line interface (CLI) commands for configuring Optics on the Cisco 8000 Series Routers.

Not all commands are supported on both coherent and non-coherent optical modules. Also, the supported keywords of a command vary based on the type of the optical module (coherent or non-coherent).

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.

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controller coherentDSP

To configure the coherent DSP controller, use the **controller coherentDSP** command in the Coherent DSP controller configuration mode.

```
controller coherentDSP R/S/I/P [ description description | perf-mon { enable | disable
} | pm { 30-sec | 15-min | 24-hour } { fec } { report | threshold } value | secondary-admin-state
{ maintenance | normal } loopback { internal | line }]
```

Syntax Description	<i>R/S/I/P</i>	Rack/Slot/Instance/Port of the coherent DSP controller.
	description <i>description</i>	Description of the coherent DSP controller.
	perf-mon { enable disable }	Enables or disables performance monitoring.
	pm { 30-sec 15-min 24-hour } { fec } { report threshold } <i>value</i>	Configures performance monitoring parameters for 30-second, 15-minute, or 24-hour intervals. The fec keyword configures FEC PM data in 30-second, 15-minute, or 24-hour intervals. The report keyword configures threshold crossing alerts (TCA) reporting status for the PM parameters. The threshold keyword configures threshold values for the PM parameters. The PM parameters that can be configured are: • Inst-Q-margin (Instantaneous Q margin) • Q threshold • Q-margin • ec-bits (error corrected bits) • post-FEC BER • pre-FEC BER • uc-words (uncorrected words)
	secondary-admin-state	Configures the administrative state of the controller. The states are maintenance or normal.
	loopback { internal line }	Configures the internal or line loopback mode on the controller.
	Command Default	None.
Command Modes	Coherent DSP controller configuration	

Command History	Release	Modification
	Release 7.3.1.5	This command was introduced.

Usage Guidelines Line loopback mode is supported only on Cisco 8000 series line cards and fixed-port routers based on Q100 and Q200 silicon.

Example

The following example shows how to enable line loopback configuration on coherent DSP controllers:

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

controller optics

To configure the optics controller, use the **controller optics** command in the optics controller configuration mode.

```
controller optics R/S/I/P [ DAC-Rate rate | [no] breakout muxponder-mode | cd-max
cd-max | cd-min cd-min | cd-low-threshold cd-low | cd-high-threshold cd-high |
dgd-high-threshold dgd-value | dwdm-carrier channel-grid | lbc-high-threshold lbc-value
| modulation modulation-type | osnr-low-threshold osnr-value description description |
fec fec-mode | sec-admin-state {maintenance | normal} | shutdown | transmit-power
transmit-power | [no] transceiver disable | perf-mon { enable | disable } | host {
auto-squelch } { disable } | pm { 30-sec | 15-min | 24-hour } { optics } { report |
threshold } pm-parameter value | loopback line | loopback internal | host loopback line | host
loopback internal | host fec-threshold { excess-degrade { raise | clear } threshold-value
| detected-degrade { raise | clear } threshold-value } | media fec-threshold {
excess-degrade { raise | clear } threshold-value | detected-degrade { raise | clear
} threshold-value } | media link-down prefec-degrade | speed 100g [ host-lanes
{ 4 | 2 } ] ]
[ appsel simple code id ]
```

Syntax Description

<i>R/S/I/P</i>	Rack/Slot/Instance/Port of the optics controller.
DAC-Rate <i>rate</i>	Sets the DAC (digital to analog conversion) sampling rate for this controller. The sampling rate options available are: • 1x1 • 1x1.25
breakout <i>muxponder mode</i>	Configures the muxponder mode for this controller. Muxponder mode options available are: • 4x100 • 3x100 • 2x100 • 2x200 • 1x100 • 8x100 The no form of this command switches the optics controller from the muxponder mode to the transponder mode.

cd-max <i>cd-max</i>	(Only for trunk optics controllers) Maximum chromatic dispersion. For QDD-400G-ZR-S optical module, the range is 0 to +2400. For QDD-400G-ZRP-S optical module: (Release 7.3.1) The range is 0 to +80000 ps/nm. (Release 7.3.2 onwards) The range is 0 to +160000 ps/nm.
cd-min <i>cd-min</i>	(Only for trunk optics controllers) Minimum chromatic dispersion. For QDD-400G-ZR-S optical module, the range is -2400 to 0. For QDD-400G-ZRP-S optical module: (Release 7.3.1) The range is -80000 to 0 ps/nm. (Release 7.3.2 onwards) The range is -160000 to 0 ps/nm.
cd-low-threshold <i>cd-low</i>	(Only for trunk optics controllers) Minimum acceptable chromatic dispersion value. The CD alarm is raised if the chromatic dispersion goes below this value. This is an alarm threshold parameter. For QDD-400G-ZR-S optical module, the range is -2400 to 0. For QDD-400G-ZRP-S optical module: (Release 7.3.1) The range is -80000 to 0 ps/nm. (Release 7.3.2 onwards) The range is 0 to +160000 ps/nm.
cd-high-threshold <i>cd-high</i>	(Only for trunk optics controllers) Maximum acceptable chromatic dispersion value. The CD alarm is raised if the chromatic dispersion exceeds this value. This is an alarm threshold parameter. For QDD-400G-ZR-S optical module, the range is 0 to +2400. For QDD-400G-ZRP-S optical module: (Release 7.3.1) The range is 0 to +80000 ps/nm. (Release 7.3.2 onwards) The range is -160000 to 0 ps/nm.
dgd-high-threshold <i>dgd-value</i>	(Only for trunk optics controllers) Configures the maximum acceptable Differential Group Delay (DGD) value. The DGD alarm is raised if DGD exceeds this value. This is an alarm threshold parameter. The range is 0 to 18000 (in the units of 0.01 ps).
dwdm-carrier <i>channel-grid</i>	Configures the DWDM carrier channel. Options are: • 100MHz-grid • 50GHz-grid
lbc-high-threshold <i>lbc-value</i>	Configures the high laser bias current threshold. This is an alarm threshold parameter. The range is 0 to 100%

modulation <i>modulation-type</i>	Configures the modulation type. Options are: • 16Qam • 8Qam • Qpsk Release 7.3.15 supports only 16QAM.
osnr-low-threshold <i>osnr-value</i>	(Only for trunk optics controllers) Configures the minimum acceptable Optical Signal-to-Noise ratio (OSNR) value. The OSNR alarm is raised if OSNR goes below this value. This is an alarm threshold parameter. The range is 0 to 4000 (in units of 0.01db).
description <i>description</i>	Description of the optics controller.
[no] transceiver disable	Enables or disables the transceiver module. The transceiver is enabled by default.
fec <i>fec-mode</i>	Configures Forward Error Correction (FEC) modes.
sec-admin-state	Configures the administrative state of the controller. The values are maintenance or normal.
shutdown	Disables the configuration of the controller.
host { auto-squelch } { disable }	Disable squelch for host.
pm { 30-sec 15-min 24-hour } { optics } { report threshold } <i>pm-parameter value</i>	Configures performance monitoring parameters for 30-second, 15-minute, and 24-hour intervals. The report keyword configures threshold crossing alerts (TCA) reporting status for the PM parameters. The threshold keyword configures threshold values for the PM parameters. The PM parameters that can be configured are: • cd (chromatic dispersion) • dgd (differential group delay) • low-freq-off (low signal frequency offset) • opr (optical power RX) • osnr (optical signal-to-noise ratio) • pcr (polarization change rate) • pdl (polarization dependent loss) • rx-sig (receiving signal power) • snr (signal-to-noise ratio) • sopmd (second order polarization mode dispersion)

transmit-power <i>transmit-power</i>	(Only for trunk optics controllers) Configures the transmit power. The range is -190 to 50 dBm (in the units of 0.1 dBm).
perf-mon { enable disable }	Enables or disables performance monitoring.
loopback line	Configures line loopback on the optical module.
loopback internal	Configures internal loopback on the optical module.
host loopback line	Configures host line loopback on the optical module.
host loopback internal	Configures host internal loopback on the optical module.
host fec-threshold excess-degrade raise threshold-value	Configures the raise threshold value for FEC excessive degrade (FED) alarm on the host-side of the optical module. Range is 1 to 2046000000000000000.
media fec-threshold excess-degrade raise threshold-value	Configures the raise threshold value for FED alarm on the media-side of the optical module. Range is 1 to 2046000000000000000.
host fec-threshold excess-degrade clear threshold-value	Configures the clear threshold value for FED alarm on the host-side of the optical module. Range is 1 to 2046000000000000000.
media fec-threshold excess-degrade clear threshold-value	Configures the clear threshold value for FED alarm on the media-side of the optical module. Range is 1 to 2046000000000000000.
host fec-threshold detected-degrade raise threshold-value	Configures the raise threshold value for FEC detected-degrade (FDD) alarm on the host-side of the optical module. Range is 1 to 2046000000000000000.
media fec-threshold detected-degrade raise threshold-value	Configures the raise threshold value for FDD alarm on the media-side of the optical module. Range is 1 to 2046000000000000000.
host fec-threshold detected-degrade clear threshold-value	Configures the clear threshold value for FDD alarm on the host-side of the optical module. Range is 1 to 2046000000000000000.
media fec-threshold detected-degrade clear threshold-value	Configures the clear threshold value for FDD alarm on the media-side of the optical module. Range is 1 to 2046000000000000000.
media link-down prefec-degrade	Enables link-down and prefec degrade mode when the BER counter crosses the threshold value.

appsel simple code <id>	Enables application selection Code on a module, where <i>id</i> specifies the application id.
speed 100g host-lanes { 4 2 }	Configures the port speed as 100G for the controller with specified optional host-lanes configuration.

Command Default

Table 1: Default Traffic Configuration Values for supported Optical Modules

	QDD-400G-ZR-S	QDD-400G-ZRP-S	DP04QSDD-HE0	DP04QSDD-ER1	DP01QSDD-ZF1
Client Speed	400G (400GAUI-8)	400G (400GAUI-8)	400G GAUI8	400G GAUI-8	100G GAUI2
Trunk Speed	400G	400G	400G	400G	100G
Frequency	193.10THz	193.10THz	193.10THz	193.10THz	193.10THz
FEC	cFEC	oFEC	oFEC	oFEC	oFEC
Modulation	16QAM	16QAM	16QAM	16QAM	QPSK
DAC-Rate	1x1	1x1.25	1x1.25	1x1	1x1.25
Chromatic Dispersion (CD)	+/-2400	+/-26000	+/-26000	+/-2400	+/-2400
Transmitted (Tx) Power	-10.00 dBm	-10.00 dBm	+1dBm	-9dBm	-5dBm

For FDD and FED alarms, the default **raise** and **clear threshold value** for both media and host side of the optics controller is as follows:

Table 2: Default Raise and Clear Threshold Value for FDD and FED Alarms

Threshold	FDD	FED
Raise	9,00E-05	2,40E-04
Clear	9,00E-06	2,40E-05

Command History

Release	Modification
Release 7.3.1.5	This command was introduced.
Release 7.11.1	The loopback line , loopback internal , host loopback line , and host loopback internal keywords were introduced.
Release 7.11.1	The host auto-squelch disable keyword was introduced.

Release	Modification
Release 24.1.1	The following keywords were introduced: • host fec-threshold excess-degrade raise • media fec-threshold excess-degrade raise • host fec-threshold excess-degrade clear • media fec-threshold excess-degrade clear • host fec-threshold detected-degrade raise • media fec-threshold detected-degrade raise • host fec-threshold detected-degrade clear • media fec-threshold detected-degrade clear
Release 24.1.1	Extended Support for DP04QSDD-HE0 optical module.
Release 25.2.1	A new muxponder mode, 2x200 , was added as an option to the breakout keyword.
Release 25.2.1	A new keyword, appsel simple code <id>, was added as an option.
Release 25.3.1	A new keyword, speed 100g [host-lanes { 4 2 }] , was added as an option.
Release 24.3.1	• The media link-down prefec-degrade keyword was introduced. • Added support for DP04QSDD-ER1 and DP01QSDD-ZF1 optical modules.
Release 25.3.1	A new muxponder mode 8x100 was added as an option to the breakout keyword.

Command Modes

Optics controller configuration

Usage Guidelines

The configurations for chromatic dispersion , cd-low-threshold, and cd-high-threshold) must be performed only after the **hw-module** configuration. These configurations must be removed before the **no hw-module** configuration. Default values are set to optimize the power consumption by Cisco 400G Digital Coherent QSFP-DD optical modules.

For FDD and FED alarms, the **raise threshold value** must always be greater than the **clear threshold value**. Also, the **raise** or **clear threshold value** of FED alarm must always be greater than the **raise or clear threshold value** of the FDD alarm. While the router configuration permits a range of 1 to 18446744073709551615, the router only supports a range of 1 to 2046000000000000000.

Example

The following example shows how to configure the optics controller and set the ranges for chromatic dispersion:

```

Router#configure
Router(config)#controller optics 0/0/1/1
Router(config-optics)#cd-max 2000
Router(config-optics)#cd-min -2000
Router(config)#commit

```

The following is a sample in which the performance monitoring parameters of optics controller are configured in 24-hour intervals:

```

Router#configure
Router(config)#controller optics 0/0/1/1
Router(config-optics)#perf-mon enable
Router(config-optics)#pm 24-hour optics threshold osnr max 345
Router(config)#commit

```

The following is a sample in which line loopback is configured on the optical module :

```

Router#configure
Router(config)#controller optics 0/0/0/9
Router(config-Optics)#sec-admin-state maintenance
Router(config-Optics)#loopback line
Loopback is a traffic-affecting operation
Router(config-Optics)#commit
Router(config)#end

```

This example shows how to configure FDD clear and raise alarm threshold on the host side of the optics controller:

```

Router#config
Router(config)#controller optics 0/0/0/10
Router(config-Optics)#host fec-threshold detected-degrade clear 12000
Router(config-Optics)#host fec-threshold detected-degrade raise 22000
Router(config-Optics)#commit
Router(config-Optics)#end

```

This example shows how to enable Media Link-down PreFEC Degrade support on the media side of the optics controller:

This example shows how to enable Media Link-down PreFEC Degrade support on the media side of the optics controller:

```

Router#config
Router(config)#controller optics 0/0/0/10
Router(config-Optics)#media link-down prefec-degrade
Router(config-Optics)#commit
Router(config-Optics)#end

```

This example shows how to configure 2x200G DAC with 2x200G breakout:

```

Router#config
Router(config)#controller optics 0/0/1/1
Router(config-Optics)#breakout 2x200
Router(config-Optics)#commit

```

This example shows how to configure AppSel code on an optical module

```

Router(config)# controller optics 0/0/0/0
appsel simple code 4
!
!

```

interface CEM (PLE)

To specify or create a CEM interface and enter interface configuration mode, use the **interface CEM** command in XR Config mode.

```
interface CEM interface-path-id { l2transport | service-policy [ input | output ] policy-map-name
| cem [ class-attach | clock | dummy pattern pattern-id | endpoint | idle pattern pattern-id | payload
bytes [ de jitter microseconds | best-match ] ] }
```

```
no interface CEM interface-path-id { l2transport | service-policy [ input | output ] policy-map-name
| cem [ class-attach | clock | dummy pattern pattern-id | endpoint | idle pattern pattern-id | payload
bytes [ de jitter microseconds | best-match ] ] }
```

Syntax Description	CEM	Specifies or creates a CEM interface.
	l2transport	Specifies Layer 2 transport for the CEM interface.
	service-policy [input output] <i>policy-map-name</i>	Enables a service policy on the CEM interface
	<i>interface-path-id</i>	Physical interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
	class-attach	Specifies to attach a CEM class to the interface.
	clock	Specifies clocks on this CEM interface
	dummy	Specifies dummy frame parameters.
	endpoint	Specifies endpoint parameters.
	idle	Specifies idle frame parameters.
	<i>pattern</i>	Specifies bit pattern for idle frames.
	payload	Specifies payload size of CEM frames.
	bytes	Specifies payload size in bytes. The value range is from 32 to 1472.
	de jitter	Specifies de jitter buffer length of CEM frames.
	<i>microseconds</i>	Specifies de jitter buffer length. The value is from 1 to 500000 microseconds.
	best-match	Specifies payload to best suitable value for given de jitter buffer length.
	endpoint	Specifies endpoint parameters.

Command Default	None
------------------------	------

Command Modes	XR Config mode
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Command History	Release	Modification
	Release 7.11.1	This command was introduced.

Usage Guidelines To specify a physical interface, the notation for the *interface-path-id* is *rack/slot/instance/port*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:

- *rack*: Chassis number of the rack.
- *slot*: Physical slot number of the line card.
- *instance*: Instance number. Always 0.
- *port*: Physical port number of the CEM interface. The supported port is 0 or 1.

The *interface-path-id* is *rack/slot/instance/port*. The slash between values is required as part of the notation.

This example shows how to enter interface configuration mode for a CEM interface:

```
RP/0/RP0/CPU0:ios(config)#interface CEM0/0/0/0
RP/0/RP0/CPU0:ios(config-if)#l2transport
RP/0/RP0/CPU0:ios(config-if-l2)#service-policy input pm-ingress-cem
RP/0/RP0/CPU0:ios(config-if-l2)#commit
```

show controllers coherentdsp

To display the status and configuration information about the interfaces configured as coherent DSP controllers on a specific node, use the **show controllers coherentDSP** command in XR EXEC mode.

show controller coherentDSP *R/S/I/P* [**pm** { **current** | **history** } { **30-sec** | **15-min** | **24-hour** } { **fec** }]

Syntax Description

<i>R/S/I/P</i>	Rack/Slot/Instance/Port of the coherent DSP controller.
pm	Displays performance monitoring parameters for the controller.
current	Displays the current performance monitoring data in 30-second, 15-minute, and 24-hour intervals.
history	Displays the historical performance monitoring data in 30-second, 15-minute, and 24-hour intervals.
fec	The fec keyword displays FEC PM data in 30-second, 15-minute, or 24-hour intervals.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.3.1.5	This command was introduced.

Usage Guidelines

The following table lists the details of the following host PM parameters:

- **Host-Intf-{n}-FEC-BER**
- **Host-Intf-{n}-FEC-FERC**

The following table lists the details of the host PM parameters:

PM Parameter	Mode Type	Number of Host Interfaces	Description
Host-Intf-{n}-FEC-BER	Transponder	1	$n=0$ For example, Host-Intf-0-FEC-BER
	Muxponder	4	$n = 0, 1, 2, \text{ and } 3$. For example: • Host-Intf-0-FEC-BER • Host-Intf-1-FEC-BER • Host-Intf-2-FEC-BER • Host-Intf-3-FEC-BER

PM Parameter	Mode Type	Number of Host Interfaces	Description
Host-Intf-{n}-FEC-FERC	Transponder	1	$n=0$ For example, Host-Intf-0-FEC-FERC
	Muxponder	4	$n = 0, 1, 2, \text{ and } 3$ For example: • Host-Intf-0-FEC-FERC • Host-Intf-1-FEC-FERC • Host-Intf-2-FEC-FERC • Host-Intf-3-FEC-FERC

Example

The following is a sample to view the status and configuration information about the coherent DSP controller.

```
Router#show controllers coherentDSP 0/0/0/13
```

```
Thu May 27 06:56:37.505 UTC
```

```

Port                               : CoherentDSP 0/0/0/13
Controller State                   : Up
Inherited Secondary State          : Normal
Configured Secondary State         : Normal
Derived State                      : In Service
Loopback mode                     : None
BER Thresholds                    : SF = 1.0E-5   SD = 1.0E-7
Performance Monitoring             : Enable
Bandwidth                         : 400.0Gb/s

```

Alarm Information:

```

LOS = 32           LOF = 0 LOM = 0
OOF = 0 OOM = 0 AIS = 0
IAE = 0 BIAE = 0    SF_BER = 0
SD_BER = 0         BDI = 0 TIM = 0
FECMISMATCH = 0 FEC-UNC = 0 FLEXP_GIDM = 0
FLEXP-MM = 0 FLEXP-LOM = 0 FLEXP-RDI = 0
FLEXP-LOF = 43
Detected Alarms                     : None

```

Bit Error Rate Information

```

PREFEC BER                     : 8.5E-04
POSTFEC BER                    : 0.0E+00
Q-Factor                       : 9.90 dB

```

```
Q-Margin                        : 2.70dB
```

```
OTU TTI Received
```

The following is a sample to view the current performance monitoring parameters of the coherent DSP controller in 30 second intervals.

```
Router#show controllers coherentDSP 0/0/0/13 pm current 30-sec fec
g709 FEC in the current interval [07:03:00 - 07:03:29 Thu May 27 2021]
```

```
FEC current bucket type : Valid
```

```
EC-BITS : 11885430510 Threshold : 83203400000 TCA(enable) :
```

```
YES
```

```
UC-WORDS : 0 Threshold : 5 TCA(enable) :
```

```
YES
```

Threshold	TCA		MIN	AVG	MAX	Threshold	TCA
						(min)	(enable)
(max)	(enable)						
PreFEC BER		:	8.4E-04	8.6E-04	8.7E-04	0E-15	NO
0E-15	NO						
PostFEC BER		:	0E-15	0E-15	0E-15	0E-15	NO
0E-15	NO						
Q[dB]		:	9.90	9.90	9.90	0.00	NO
0.00	NO						
Q_Margin[dB]		:	2.70	2.70	2.70	0.00	NO
0.00	NO						

```
Last clearing of "show controllers OTU" counters never
```

show controllers optics

To display status and configuration information about the interfaces configured as optics controller on a specific node, use the **show controllers optics** command in XR EXEC mode.

```
show controllers optics R/S/I/P [ pm { current | history } { 30-sec | 15-in | 24-hour }
optics lane-number | observable-info | information [loopback| all| counters] | fec-thresholds ]
appsel { advertised | detailed | active }
```

Syntax Description		
	<i>R/S/I/P</i>	Rack/Slot/Instance/Port of the optics controller.
	pm	Displays performance monitoring parameters for the controller.
	current	Displays the current performance monitoring data in 30 second, 15 minute, and 24 hour intervals.
	history	Displays the historical performance monitoring data in 30 second, 15 minute, and 24 hour intervals.
	optics	Displays the PM data for optics controller.
	<i>lane-number</i>	Displays the performance monitoring data for the applicable lanes in the optical module. The lane number is always 1.
	observable-info	Displays the following details for an optical transceiver (gray optics or non-coherent optics): • Effective Signal to Noise Ratio (eSNR) • Pulse Amplitude Modulation with Four Levels (PAM4) Level Transition Parameter (LTP) • Pre-Forward Error Correction (FEC) and Post-FEC Bit Error Rate (BER) • Frame Error Count (FERC) • Laser age • Thermoelectric Cooler (TEC) current • Laser frequency • Laser temperature Note Not all optical modules support the observable-info keyword. Also, the parameters that are displayed depend on what the optical module supports, that is, not all optical modules display the same parameters. For additional information on VDM (Versatile Diagnostics Monitoring), see the Common Management Interface Specification.
	information loopback	Displays the loopback types that the optical transceiver supports.
	information all	Displays all the details related to the optical transceiver.

information counters	Displays counter details related to the optical transceiver.
fec-thresholds	Displays the FEC detected degrade (FDD) and FEC excessive degrade (FED) threshold values of the host and media side of the optical transceiver.
appsel advertised	Displays application advertised or supported by the module in a tabular format. It also displays if the host supports the host-id advertised by the module in each application.
appsel detailed	Displays full details of an application including host-id , media-id , host-lane and media-lane counts , host-lane and media-lane assignment options.
appsel active	Displays the details of currently the active applications on the module.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 7.3.1.5	This command was introduced.
	Release 7.5.5/Release 7.11.1	The observable-info and information loopback keywords were introduced.
	Release 24.1.1	The fec-thresholds keyword was introduced. The display of information counters and information counters keywords was enhanced.
	Release 25.2.1	The appsel { advertised detailed active } options were introduced.

Usage Guidelines The supported keywords in the show controllers optics command vary based on the type of the optical module (coherent or non-coherent). Not all keywords are supported on coherent and non-coherent optical modules.

Example

```
Router#show controllers optics 0/0/0/7
Controller State: Up
Transport Admin State: In Service
Laser State: On
LED State: Green
FEC State: FEC ENABLED
Optics Status
  Optics Type: QSFPDD 400G ZR
  DWDM carrier Info: C BAND, MSA ITU Channel=61, Frequency=193.10THz,
  Wavelength=1552.524nm
  Alarm Status:
  -----
  Detected Alarms: None
  LOS/LOL/Fault Status:
  Alarm Statistics:
  -----
  HIGH-RX-PWR = 0          LOW-RX-PWR = 0
  HIGH-TX-PWR = 0          LOW-TX-PWR = 0
  HIGH-LBC = 0             HIGH-DGD = 0
  OOR-CD = 0               OSNR = 55
  WVL-OOL = 0              MEA = 0
```

```

IMPROPER-REM = 0
TX-POWER-PROV-MISMATCH = 0
Laser Bias Current = 0.0
Actual TX Power = -8.16 dBm
RX Power = -7.85 dBm
RX Signal Power = -7.55 dBm
Frequency Offset = 5 MHz
Performance Monitoring: Enable
THRESHOLD VALUES
-----
Parameter                High Alarm  Low Alarm  High Warning  Low Warning
-----
Rx Power Threshold(dBm)   1.9        -28.2      0.0           -25.0
Tx Power Threshold(dBm)   0.0        -15.0      -2.0          -16.0
LBC Threshold(mA)         0.00       0.00       0.00          0.00
Temp. Threshold(celsius)  80.00      -5.00      75.00         15.00
Voltage Threshold(volt)   3.46       3.13       3.43          3.16
LBC High Threshold = 98 %
Configured Tx Power = -6.00 dBm
Configured CD High Threshold = 80000 ps/nm
Configured CD lower Threshold = -80000 ps/nm
Configured OSNR lower Threshold = 9.00 dB
Configured DGD Higher Threshold = 80.00 ps
Baud Rate = 59.8437500000 GBd
Modulation Type: 16QAM
Chromatic Dispersion 2 ps/nm
Configured CD-MIN -2400 ps/nm CD-MAX 2400 ps/nm
Second Order Polarization Mode Dispersion = 87.00 ps^2
Optical Signal to Noise Ratio = 36.30 dB
Polarization Dependent Loss = 0.40 dB
Polarization Change Rate = 0.00 rad/s
Differential Group Delay = 2.00 ps
Temperature = 51.00 Celsius
Voltage = 3.36 V
Transceiver Vendor Details
Form Factor                : QSFP-DD
Optics type                : QSFPDD 400G ZR
Name                      : CISCO-ACACIA
OUI Number                 : 7c.b2.5c
Part Number                : DP04QSDD-E20-19E
Rev Number                 : 10
Serial Number              : ACA2449003P
PID                       : QDD-400G-ZR-S
VID                       : ES03
Firmware Version           : 61.12
Date Code(yy/mm/dd)       : 20/12/03

```

The following is a sample to view the current performance monitoring parameters of the optics controller in 30 second intervals.

```

Router#show controllers optics 0/0/0/7 pm current 30-sec optics 1
Thu May 27 07:11:33.466 UTC
Optics in the current interval [07:11:30 - 07:11:33 Thu May 27 2021]
Optics current bucket type : Valid

```

	MIN Configured	AVG TCA	MAX	Operational Threshold(min)	Configured Threshold(min)	TCA (min)	Operational Threshold(max)
LBC[mA]	: 52	52	52	0.0	NA	NO	100.0
	NA	NO					
OPT[dBm]	: -8.17	-8.17	-8.17	-15.09	NA	NO	0.00
	NA	NO					
OPR[dBm]	: -7.80	-7.80	-7.80	-30.00	NA	NO	8.00
	NA	NO					

```

CD[ps/nm]      : 1          1          1          -2400          -2400          YES  2400
                  2400          YES
DGD[ps ]       : 2.00       2.00       2.00       0.00          NA          NO   80.00
                  NA          NO
SOPMD[ps^2]    : 53.00     53.00     53.00     0.00          NA          NO  2000.00
                  NA          NO
OSNR[dB]       : 36.30     36.30     36.30     9.00          55.00     NO   40.00
                  NA          NO
PDL[dB]        : 0.40      0.40      0.40      0.00          NA          NO   7.00
                  NA          NO
PCR[rad/s]     : 0.00      0.00      0.00      3.00          3.00          NO  2500000.00
                  3000000.00 YES
RX_SIG[dBm]    : -7.54     -7.54     -7.54     -30.00        NA          NO   1.00
                  NA          NO
FREQ_OFF[Mhz]  : 33        33        33        -3600         NA          NO  3600
                  NA          NO
SNR[dB]        : 17.90     17.90     17.90     7.00          NA          NO  100.00
                  NA          NO

```

Last clearing of "show controllers OPTICS" counters never

The following is an example to view the monitoring parameters using the **observable-info** keyword. Based on the requirement, the network administrators can use the displayed values of this command for monitoring and troubleshooting.

Router#show controllers optics 0/0/0/9 observable-info

Observable Information

[eSNR Media Input]

Unit: dB

Id	Value	LowThreshWarn	HighThresWarn	LowThreshAlarm
HighThreshAlarm	TCAWarn	TCAAlarm		
	Low High	Low High		
Lane0	21.30	0.00	0.00	0.00
0.00	n n	n n		
Lane1	22.05	0.00	0.00	0.00
0.00	n n	n n		
Lane2	22.62	0.00	0.00	0.00
0.00	n n	n n		
Lane3	22.05	0.00	0.00	0.00
0.00	n n	n n		

[PAM4 Level Transition Parameter Media Input]

Unit: dB

Id	Value	LowThreshWarn	HighThresWarn	LowThreshAlarm
HighThreshAlarm	TCAWarn	TCAAlarm		
	Low High	Low High		
Lane0	47.79	0.00	0.00	0.00
0.00	n n	n n		
Lane1	54.70	0.00	0.00	0.00
0.00	n n	n n		
Lane2	64.34	0.00	0.00	0.00
0.00	n n	n n		
Lane3	59.64	0.00	0.00	0.00
0.00	n n	n n		

[Pre-FEC BER Minimum Media Input]

Unit: n/a

Id	Value	LowThreshWarn	HighThresWarn	LowThreshAlarm
HighThreshAlarm	TCAWarn	TCAAlarm		

show controllers optics

```

Module      0.000E+00      Low High      Low High      0.000E+00      0.000E+00
0.000E+00      n      n      n      n

[Pre-FEC BER Minimum Host Input]
Unit: n/a
Id      Value      TCAWarn      LowThreshWarn      HighThresWarn      LowThreshAlarm
HighThreshAlarm

Module      0.000E+00      Low High      Low High      0.000E+00      0.000E+00
0.000E+00      n      n      n      n

[Pre-FEC BER Maximum Media Input]
Unit: n/a
Id      Value      TCAWarn      LowThreshWarn      HighThresWarn      LowThreshAlarm
HighThreshAlarm

Module      0.000E+00      Low High      Low High      0.000E+00      0.000E+00
0.000E+00      n      n      n      n

[Pre-FEC BER Maximum Host Input]
Unit: n/a
Id      Value      TCAWarn      LowThreshWarn      HighThresWarn      LowThreshAlarm
HighThreshAlarm

Module      0.000E+00      Low High      Low High      0.000E+00      0.000E+00
0.000E+00      n      n      n      n

[Pre-FEC BER Average Media Input]
Unit: n/a
Id      Value      TCAWarn      LowThreshWarn      HighThresWarn      LowThreshAlarm
HighThreshAlarm

Module      0.000E+00      Low High      Low High      0.000E+00      0.000E+00
0.000E+00      n      n      n      n

[Pre-FEC BER Average Host Input]
Unit: n/a
Id      Value      TCAWarn      LowThreshWarn      HighThresWarn      LowThreshAlarm
HighThreshAlarm

Module      0.000E+00      Low High      Low High      0.000E+00      0.000E+00
0.000E+00      n      n      n      n

[Pre-FEC BER Current Media Input]
Unit: n/a
Id      Value      TCAWarn      LowThreshWarn      HighThresWarn      LowThreshAlarm
HighThreshAlarm

Module      0.000E+00      Low High      Low High      0.000E+00      0.000E+00
0.000E+00      n      n      n      n

[Pre-FEC BER Current Host Input]
Unit: n/a
Id      Value      TCAWarn      LowThreshWarn      HighThresWarn      LowThreshAlarm
HighThreshAlarm

```

```

Module      0.000E+00      Low High      Low High      0.000E+00      0.000E+00
0.000E+00      n      n      n      n

[FERC Minimum Media Input]
Unit: n/a
Id      Value
HighThreshAlarm      TCAWarn      LowThreshWarn      HighThresWarn      LowThreshAlarm

Module      0.000E+00      Low High      Low High      0.000E+00      0.000E+00
0.000E+00      n      n      n      n

[FERC Minimum Host Input]
Unit: n/a
Id      Value
HighThreshAlarm      TCAWarn      LowThreshWarn      HighThresWarn      LowThreshAlarm

Module      0.000E+00      Low High      Low High      0.000E+00      0.000E+00
0.000E+00      n      n      n      n

[FERC Maximum Media Input]
Unit: n/a
Id      Value
HighThreshAlarm      TCAWarn      LowThreshWarn      HighThresWarn      LowThreshAlarm

Module      0.000E+00      Low High      Low High      0.000E+00      0.000E+00
0.000E+00      n      n      n      n

[FERC Maximum Host Input]
Unit: n/a
Id      Value
HighThreshAlarm      TCAWarn      LowThreshWarn      HighThresWarn      LowThreshAlarm

Module      0.000E+00      Low High      Low High      0.000E+00      0.000E+00
0.000E+00      n      n      n      n

[FERC Average Media Input]
Unit: n/a
Id      Value
HighThreshAlarm      TCAWarn      LowThreshWarn      HighThresWarn      LowThreshAlarm

Module      0.000E+00      Low High      Low High      0.000E+00      0.000E+00
0.000E+00      n      n      n      n

[FERC Average Host Input]
Unit: n/a
Id      Value
HighThreshAlarm      TCAWarn      LowThreshWarn      HighThresWarn      LowThreshAlarm

Module      0.000E+00      Low High      Low High      0.000E+00      0.000E+00
0.000E+00      n      n      n      n

[FERC Current Media Input]
Unit: n/a
Id      Value
HighThreshAlarm      TCAWarn      LowThreshWarn      HighThresWarn      LowThreshAlarm

Low High      Low High

```

```

Module      0.000E+00      0.000E+00      0.000E+00      0.000E+00
0.000E+00      n      n      n      n

[FERC Current Host Input]
Unit: n/a
Id      Value      LowThreshWarn      HighThresWarn      LowThreshAlarm
HighThreshAlarm      TCAWarn      TCAAlarm

Module      0.000E+00      Low High      Low High      0.000E+00      0.000E+00
0.000E+00      n      n      n      n

```

The following is an example to view the loopback types supported by the optical transceiver using the **information loopback** keyword.

```
Router#show controllers optics 0/0/0/0 information loopback
```

```
Supported Loopback Types :
```

```
=====
```

```

[1.] Media Internal
[2.] Media Line
[3.] Host Line
[4.] Host Internal
[5.] Host Per Lane
[6.] Media Per Lane
[7.] Simultaneous Media Host

```

```
Unsupported Loopback Types :
```

```
=====
```

```

Media Configured Loopback : Media Loopback None
Media Applied Loopback    : Media Loopback None

```

```

Host Configured Loopback : Host Loopback None
Host Applied Loopback    : Host Loopback None

```

The following is an example to view the FDD and FED threshold values of the host and media side of the optical transceiver using the **fec-thresholds** keyword.

```
Router#show controllers optics 0/0/0/10 fec-thresholds
```

```
FEC Threshold Information
```

```

Media FEC excess degrade      : Raise      Clear
                               : 2.2222E-02      1.1111E-03
Media FEC detected degrade    : 4.4444E-02      3.3333E-03
Host FEC excess degrade       : 6.6667E-02      5.5556E-03
Host FEC detected degrade     : 8.8889E-02      7.7778E-03

```

The following is an example to view the module state and datapath state of the optical transceivers: using the **information counters** keyword:

```
Router#show controllers optics 0/0/0/8 information counters
```

```
Fri Feb 16 11:06:31.415 UTC
```

```
Module State : Ready
```

```
Datapath State [Client-0]: TX Turn On
```

```
Acquisition Counter:      INVALID
```

```
HOST SIDE ALARM COUNTERS
```

```
=====
```

```
Host-Intf-0-FDD-Alarm-Counter[          0]          Host-Intf-0-FED-Alarm-Counter[
0]
```

```
HOST SIDE FEC-BER FEC-FERC CURRENT VALUES
```

```
=====
```

```
Host-Intf-0-FEC-BER[0.00E+00]          Host-Intf-0-FEC-FERC[0.00E+00]
```

```
Supported Loopback Types :
```

```
=====
```

```
[1.] Media Internal
[2.] Media Line
[3.] Host Line
[4.] Host Internal
[5.] Host Per Lane
[6.] Media Per Lane
[7.] Simultaneous Media Host
```

```
Unsupported Loopback Types :
```

```
=====
```

```
Media Configured Loopback : Media Loopback None
Media Applied Loopback    : Media Loopback None
```

```
Host Configured Loopback : Host Loopback None
Host Applied Loopback    : Host Loopback None
```

```
FW Upgrade Capability Mode:
```

```
=====
```

```
Supports Both Warm & Cold boot
Supports Cold boot only
```

This is an example that displays the applications advertised by the module.

```
Router# #show controllers optics 0/0/0/10 appsel advertised
```

```
Sun Feb  2 20:00:04.884 UTC
```

	App-ID		Host-ID			Media-ID		Standard	
		Host	Power						
		Supported	Consumption (W)						
1		17	ETH 400GAUI-8 C2M (Annex		62	OIF 400ZR, DWDM, amplifi		OIF	
2		Yes		n/a		62	OIF 400ZR, DWDM, amplifi		OIF
		13	ETH 100GAUI-2 C2M (Annex						
3		Yes		n/a		70	OpenZR+ ZR400-OFEC-16QAM		OpenZR+
		17	ETH 400GAUI-8 C2M (Annex						
4		Yes		n/a		70	OpenZR+ ZR400-OFEC-16QAM		OpenZR+
		13	ETH 100GAUI-2 C2M (Annex						
5		Yes		n/a		199	0xC0-0xFE Vendor Specif		0xC0-0xFE
		17	ETH 400GAUI-8 C2M (Annex						
6		Yes		n/a		199	0xC0-0xFE Vendor Specif		0xC0-0xFE
		15	ETH 200GAUI-4 C2M (Annex						
7		Yes		n/a		199	0xC0-0xFE Vendor Specif		0xC0-0xFE
7		13	ETH 100GAUI-2 C2M (Annex		199	0xC0-0xFE Vendor Specif		0xC0-0xFE	

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8	Yes	n/a							
	17	ETH 400GAUI-8 C2M	(Annex	196	0xC0-0xFE	Vendor Specif	0xC0-0xFE		
9	Yes	n/a							
	15	ETH 200GAUI-4 C2M	(Annex	196	0xC0-0xFE	Vendor Specif	0xC0-0xFE		
10	Yes	n/a							
	13	ETH 100GAUI-2 C2M	(Annex	196	0xC0-0xFE	Vendor Specif	0xC0-0xFE		
11	Yes	n/a							
	17	ETH 400GAUI-8 C2M	(Annex	200	0xC0-0xFE	Vendor Specif	0xC0-0xFE		
12	Yes	n/a							
	15	ETH 200GAUI-4 C2M	(Annex	200	0xC0-0xFE	Vendor Specif	0xC0-0xFE		
13	Yes	n/a							
	13	ETH 100GAUI-2 C2M	(Annex	200	0xC0-0xFE	Vendor Specif	0xC0-0xFE		
14	Yes	n/a							
	17	ETH 400GAUI-8 C2M	(Annex	83	OTN-ITU-T FOIC4.8-DO (G.	OTN-ITU-T			
15	Yes	n/a							
	254	0xC0-0xFE Vendor Specif	254	0xC0-0xFE	Vendor Specif	0xC0-0xFE			
	Yes	n/a							

This is an example that displays the applications detailed by the module.

Router# show controllers optics 0/0/0/10 appsel detailed

Sun Feb 2 20:00:29.702 UTC

App-ID	Host-ID	Media-ID	Host Lane	Media Lane	Host Lane	Media
Lane	Host		Count	Count	Assign	Assign
	Supported					
1	17	62	8	1	1	1
	Yes					
2	13	62	2	1	85	1
	Yes					
3	17	70	8	1	1	1
	Yes					
4	13	70	2	1	85	1
	Yes					
5	17	199	8	1	1	1
	Yes					
6	15	199	4	1	17	1
	Yes					
7	13	199	2	1	85	1
	Yes					
8	17	196	8	1	1	1
	Yes					
9	15	196	4	1	17	1
	Yes					
10	13	196	2	1	85	1
	Yes					
11	17	200	8	1	1	1
	Yes					
12	15	200	4	1	17	1
	Yes					
13	13	200	2	1	85	1
	Yes					
14	17	83	8	1	1	1
	Yes					
15	254	254	8	1	255	1

| Yes |

This is an example that displays the active applications on a module.

```
Router# show controllers optics 0/0/0/10 appsel active
```

```
Sun Feb  2 20:00:47.776 UTC
Instance           : 1
App-ID             : 3
Host-ID            : 17   ETH 400GAUI-8 C2M (Annex
Media-ID           : 70   OpenZR+ ZR400-OFEC-16QAM
Host Lane Count    : 8
Media Lane Count   : 1
Host Lane Assign   : 0x1
Media Lane Assign  : 0x1
```

ampli-control-mode

To configure the mode of operation of the OLS pluggable to either gain control or power control mode, use the **ampli-control-mode** command in the controller ots configuration mode.

ampli-control-mode { **powermode** | **manual** }

Syntax Description	powermode	Configures the OLS pluggable to power control mode.
	manual	Configures the OLS pluggable to gain control mode.
Command Default	None.	
Command Modes	controller ots	
Command History	Release	Modification
	Release 24.1.1	This command was introduced.
Usage Guidelines	None.	
Task ID	Task ID	Operation
	dwdm	read, write

Example

The following example shows how to configure the gain control operational mode and the amplifier gain of the OLS pluggable :

```
Router#config
Router(config)#controller ots 0/0/2/1/0
Router(config-Ots)#ampli-control-mode manual
Router(config-Ots)#egress-ampli-gain +30
Router(config-Ots)#commit
Router(config-Ots)#exit
Router(config)#exit
```

controller ots (QDD OLS)

To configure the QDD OLS pluggable (ots controller), use the **controller ots** command in the global configuration mode.

controller ots *R/S/I/P/SuP*

Syntax Description	<i>R/S/I/P/SuP</i> Rack/Slot/Instance/Port/Sub-Port of the QDD OLS pluggable. <i>SuP</i> is the QDD pluggable subport which can be 0 or 1. Com port is represented as 0 and line port is represented as 1.	
Command Default	None.	
Command Modes	Global Configuration	
Command History	Release	Modification
	Release 24.1.1	This command was introduced.
Usage Guidelines	None.	
Task ID	Task ID	Operation
	dwdm	read, write
	sonet-sdh	read, write
	interface	read, write

Example

This example shows how to configure the ots controller and set the low- power threshold at the transmit and receive side.

```
Router#config
Router(config)#controller ots 0/0/2/1/0
Router(config-Ots)#rx-low-threshold -200
Router(config-Ots)#tx-low-threshold -200
Router(config-Ots)#commit
Router(config-Ots)#exit
Router(config)#exit
```

egress-ampli-force-apr

To enable or disable Force Automatic Power Reduction (APR) on the OLS pluggable, use the **egress-ampli-force-apr** command in the controller ots configuration mode.

egress-ampli-force-apr {on | off}

Syntax Description	on Enables Force APR on the OLS pluggable.
	off Disables Force APR on the OLS pluggable.

Command Default None.

Command Modes controller ots

Command History	Release	Modification
	Release 24.1.1	This command was introduced.

Usage Guidelines Automatic Power Reduction (APR) is an eye-safe output power level of the OLS pluggable when you restart the pluggable (amplifier).

If the OLS pluggable is in the APR state, then the default value for APR power is 8 dBm and APR timer is 9 seconds. When **Force APR** is configured or enabled, the OLS pluggable continues to remain in the APR state. If force APR is not configured or disabled, then the OLS pluggable remains in the Gain mode or Power mode, based on the **ampli-control-mode** user configuration.

Example

The following example shows how to enable Force APR on the OLS pluggable :

```
Router#config
Router(config)#controller ots 0/0/2/1/0
Router(config-Ots)#egress-ampli-force-apr on
Router(config-Ots)#commit
Router(config-Ots)#exit
Router(config)#exit
```

egress-ampli-gain

To configure the amplifier gain of the OLS pluggable, use the **egress-ampli-gain** command in the controller ots configuration mode.

egress-ampli-gain *gain-value*

Syntax Description	<i>gain-value</i> Sets the amplifier gain value. The range is <+30, +400> in units of 0.1dB. • For subport 0, the range is from +30 db to + 250 db • For subport 1, the range is from +70 db to +250 db					
Command Default	None.					
Command Modes	controller ots					
Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>Release 24.1.1</td><td>This command was introduced.</td></tr></table>		Release	Modification	Release 24.1.1	This command was introduced.
Release	Modification					
Release 24.1.1	This command was introduced.					
Usage Guidelines	None.					
Task ID	<table><tr><th>Task ID</th><th>Operation</th></tr><tr><td>dwdm</td><td>read, write</td></tr></table>		Task ID	Operation	dwdm	read, write
Task ID	Operation					
dwdm	read, write					

Example

The following example shows how to configure the gain control operational mode and the amplifier gain of the OLS pluggable :

```
Router#config
Router(config)#controller ots 0/0/2/1/0
Router(config-Ots)#ampli-control-mode manual
Router(config-Ots)#egress-ampli-gain +30
Router(config-Ots)#commit
Router(config-Ots)#exit
Router(config)#exit
```

egress-ampli-osri

To shutdown the amplifier (QDD OLS pluggable), use the **egress-ampli-osri** command in the controller ots configuration mode.

egress-ampli-osri { **off** | **on** }

Syntax Description

off Disables the Optical Safety Remote Interlock (OSRI) configuration.

on Enables the Optical Safety Remote Interlock (OSRI) configuration.

Command Default

None

Command Modes

controller ots

Command History

Release	Modification
Release 24.1.1	This command was introduced.

Usage Guidelines

The OSRI configuration is used during the maintenance of the pluggable, debugging scenarios, and when the OLS pluggable is not in use.

Task ID

Task ID	Operation
dwdm	read, write

Example

The following example shows how to configure the Optical Safety Remote Interlock (OSRI) on the OLS pluggable:

```
Router#config
Router(config)#controller ots 0/0/2/1/0
Router(config-Ots)#egress-ampli-osri on
Router(config-Ots)#commit
Router(config-Ots)#exit
Router(config)#exit
```

egress-ampli-power

To configure the amplifier output power of the OLS pluggable, use the **egress-ampli-power** command in the controller ots configuration mode.

egress-ampli-power *power-value*

Syntax Description	<i>power-value</i> Sets the amplifier power value. The range is <-30, +250> in units of 0.1dB. • For subport 0, the range is from 10 dB to 170 dB • For subport 1, the range is from 0 dB to 170 dB					
Command Default	None.					
Command Modes	controller ots					
Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>Release 24.1.1</td><td>This command was introduced.</td></tr></table>		Release	Modification	Release 24.1.1	This command was introduced.
Release	Modification					
Release 24.1.1	This command was introduced.					
Usage Guidelines	None.					
Task ID	<table><tr><th>Task ID</th><th>Operation</th></tr><tr><td>dwdm</td><td>read, write</td></tr></table>		Task ID	Operation	dwdm	read, write
Task ID	Operation					
dwdm	read, write					

Example

The following example shows how to configure the power control operational mode and the amplifier output power of the OLS pluggable :

```
Router#config
Router(config)#controller ots 0/0/2/1/0
Router(config-Ots)#ampli-control-mode powermode
Router(config-Ots)#egress-ampli-power 30
Router(config-Ots)#commit
Router(config-Ots)#exit
Router(config)#exit
```

egress-ampli-safety-control-mode

To enable the safety control mode in the OLS pluggable, use the **egress-ampli-safety-control-mode** command in the controller ots configuration mode.

egress-ampli-safety-control-mode { **auto** | **disabled** }

Syntax Description	auto	Enables the safety control mode (automatic laser shutdown (ALS)) only on sub-port 1 of the OLS pluggable.
	disabled	Disables the safety control mode (automatic laser shutdown (ALS)) on sub-port 1 of the OLS pluggable.
Command Default	None	
Command Modes	controller ots	
Command History	Release	Modification
	Release 24.1.1	This command was introduced.
Usage Guidelines	You can enable safety control mode only on subport 1. With safety-control-mode set as auto and if LOS is detected on the line RX, the line TX normalizes the signal output power to 8 dBm and the ALS alarm is raised.	
Task ID	Task ID	Operation
	dwdm	read, write

Example

The following example shows how to enable the safety control mode on the OLS pluggable (on sub-port 1):

```
Router#config
Router(config)#controller ots 0/0/2/1/1
Router(config-Ots)#egress-ampli-safety-control-mode auto
Router(config-Ots)#commit
Router(config-Ots)#exit
Router(config)#exit
```

rx-low-threshold

To configure the low receive (RX) power threshold on the QDD OLS pluggable, use the **rx-low-threshold** command in the controller ots configuration mode.

rx-low-threshold *rx-low*

Syntax Description	<i>rx-low</i> Configures the low receive power threshold. The range is -400 to 400 (in the units of 0.1 dBm). • For subport 0, the range is from -300 dBm to 170 dBm • For subport 1, the range is from -300 dBm to 170 dBm	
Command Default	None.	
Command Modes	controller ots	
Command History	Release	Modification
	Release 24.1.1	This command was introduced.
Usage Guidelines	None.	
Task ID	Task ID	Operation
	dwdm	read, write

Example

This example shows how to configure the ots controller and set the low power threshold at the receiving side.

```
Router#config
Router(config)#controller ots 0/0/2/1/0
Router(config-Ots)#rx-low-threshold -200
Router(config-Ots)#commit
Router(config-Ots)#exit
Router(config)#exit
```

show controllers ots (QDD OLS)

To display the configuration details of the OLS pluggable, use the **show controllers ots** command in XR EXEC mode.

show controllers ots *R/S/I/P/SuP*

Syntax Description	<i>R/S/I/P/SuP</i> Rack/Slot/Instance/Port/Sub-Port of the QDD OLS pluggable. <i>SuP</i> is the QDD pluggable sub-port which can be 0 or 1. Com port is represented as 0 and line port is represented as 1.	
Command Default	None.	
Command Modes	XR EXEC	
Command History	Release	Modification
	Release 24.1.1	This command was introduced.
Usage Guidelines	None	
Task ID	Task ID	Operation
	interface	read

Example

The following example displays the configuration details of the OLS pluggable:

```
Router#show controllers ots 0/0/1/1/1
Wed Mar 29 06:59:00.016 UTC
```

```
Controller State: Up
```

```
Transport Admin State: In Service
```

```
LED State: Yellow
```

```
Alarm Status:
-----
Detected Alarms: None
```

```
Alarm Statistics:
-----
RX-LOS-P = 1
RX-LOC = 0
TX-POWER-FAIL-LOW = 0
INGRESS-AUTO-LASER-SHUT = 0
INGRESS-AUTO-POW-RED = 0
INGRESS-AMPLI-GAIN-LOW = 0
INGRESS-AMPLI-GAIN-HIGH = 0
```

```

EGRESS-AUTO-LASER-SHUT = 1
EGRESS-AUTO-POW-RED = 1
EGRESS-AMPLI-GAIN-LOW = 0
EGRESS-AMPLI-GAIN-HIGH = 0
HIGH-TX-BR-PWR = 0
HIGH-RX-BR-PWR = 0
SPAN-TOO-SHORT-TX = 0
SPAN-TOO-SHORT-RX = 0

Parameter Statistics:
-----
Total Tx Power = 7.52 dBm
Rx Signal Power = -26.77 dBm
Tx Signal Power = 7.23 dBm
Egress Ampli Gain = 20.8 dB
Egress Ampli Safety Control mode = auto
Egress Ampli OSRI = OFF

Configured Parameters:
-----
Egress Ampli Gain = 15.0 dB
Egress Ampli Power = 8.0 dBm
Egress Ampli Safety Control mode = auto
Egress Ampli OSRI = OFF
Ampli Control mode = Manual
Rx Low Threshold = -30.0 dBm
Tx Low Threshold = -5.0 dBm

Temperature = 35.09 Celsius
Voltage = 3.37 V

```

Optical Module Details

```

Optics type           : QDD DUAL EDFA
Name                  : CISCO-ACCELINK
OUI Number            : 00.00.00
Part Number           : EDFA-211917-QDD
Rev Number            : 21
Serial Number         : ACW2651Z003
PID                   : ONS-QDD-OLS
VID                   : VES1
Firmware Version      : 2.01
Date Code(yy/mm/dd)   : 22/12/28
Fiber Connector Type   : CS

```

tx-low-threshold

To configure the low transmit (TX) power threshold on the QDD OLS pluggable, use the **tx-low-threshold** command in the controller ots configuration mode.

tx-low-threshold *tx-low*

Syntax Description	<i>tx-low</i> Configures the low transmit power threshold. The range is -400 to 400 (in the units of 0.1 dBm). - For subport 0, the range is from -50 dBm to 190 dBm - For subport 1, the range is from -50 dBm to 190 dBm					
Command Default	None.					
Command Modes	controller ots					
Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>Release 24.1.1</td><td>This command was introduced.</td></tr></table>		Release	Modification	Release 24.1.1	This command was introduced.
Release	Modification					
Release 24.1.1	This command was introduced.					
Usage Guidelines	None.					
Task ID	<table><tr><th>Task ID</th><th>Operation</th></tr><tr><td>dwdm</td><td>read, write</td></tr></table>		Task ID	Operation	dwdm	read, write
Task ID	Operation					
dwdm	read, write					

Example

This example shows how to configure the ots controller and set the low power threshold at the transmit side.

```
Router#config
Router(config)#controller ots 0/0/2/1/0
Router(config-Ots)#tx-low-threshold -200
Router(config-Ots)#commit
Router(config-Ots)#exit
Router(config)#exit
```