



List of Commands

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controller optics

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

```

controller optics R/S/I/P [ baud-rate rate ] [ bits-per-symbol value ] [ cd-max cd-max
| cd-min cd-min | cd-low-threshold cd-low | cd-high-threshold cd-high |
dgd-high-threshold dgd-value | lbc-high-threshold lbc-value | osnr-low-threshold osnr-value
description description | rx-high-threshold rx-high | rx-low-threshold rx-low |
tx-high-threshold tx-high | tx-low-threshold tx-low | sec-admin-state { maintenance | normal
} | shutdown | transmit-power transmit-power | transmit-shutdown | perf-mon {
enable | disable } | pm { 30-sec | 15-min | 24-hour } | optics { report | threshold
{ cd | dgd | lbc | lbc-pc | opr | opr-dbm | opt | opt-dbm | osnr | pcr |
pdl | pn | sopmd | rx-sig-pow | rx-sig-pow-dbm } } ]

```

Syntax Description

| | |
|------------------------------|---|
| <i>R/S/I/P</i> | Rack/Slot/Instance/Port of the optics controller. |
| baud-rate <i>rate</i> | Sets baud-rate for this controller in GBd. |

| | |
|---|--|
| bits-per-symbol <i>value</i> | Sets bits-per-symbol for this controller. |
| cd-max <i>cd-max</i> | (Only for trunk optics controllers) Maximum chromatic dispersion. The range is -350000 to +350000 ps/nm. |
| cd-min <i>cd-min</i> | (Only for trunk optics controllers) Minimum chromatic dispersion. The range is -350000 to +350000 ps/nm. |
| cd-low-threshold <i>cd-low</i> | (Only for trunk optics controllers) Minimum acceptable chromatic dispersion. The CD alarm is raised if the chromatic dispersion goes below this value. The range is -350000 to +350000 ps/nm. |
| cd-high-threshold <i>cd-high</i> | (Only for trunk optics controllers) Maximum acceptable chromatic dispersion. The CD alarm is raised if the chromatic dispersion exceeds this value. The range is -350000 to +350000 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. The range is 0 to 18000 (in the units of 0.01 ps). |
| lbc-high-threshold <i>lbc-value</i> | Configures the high laser bias current threshold. The range is 0–100% |
| 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. The range is 0–4000 (in units of 0.01db). |
| description <i>description</i> | Description of the optics controller. |
| rx-high-threshold <i>rx-high</i> | Configures high receive power threshold. The range is -400 to 300 (in the units of 0.1 dBm). |
| rx-low-threshold <i>rx-low</i> | Configures low receive power threshold. The range is -400 to 300 (in the units of 0.1 dBm). |
| tx-high-threshold <i>tx-high</i> | Configures high transmit power threshold. The range is -400 to 300 dBm (in the units of 0.1 dBm). |
| tx-low-threshold <i>tx-low</i> | Configures low transmit power threshold. The range is -400 to 300 dBm (in the units of 0.1 dBm). |
| sec-admin-state | Configures the administrative state of the controller. The values are maintenance or normal. |
| shutdown | Disables the configuration of the controller. |

| | |
|--|--|
| pm | Configures performance monitoring parameters for 30 second, 15 minute, and 24 hour intervals. |
| transmit-power <i>transmit-power</i> | (Only for trunk optics controllers) Configures the transmit power. The range is -190 to 30 dBm (in the units of 0.1 dBm). |
| transmit-shutdown | Shuts down the transmit laser. |
| perf-mon { enable disable } | Enables or disables performance monitoring. |
| cd | Configures the chromatic dispersion threshold. |
| dgd | Configures the differential group delay threshold. |
| lbc | Configures the laser bias current threshold. |
| lbc-pc | Configures the laser bias current threshold in percentage. |
| opr | Configures the optical Rx power threshold in uW. |
| opr-dbm | Configures the optical Rx power threshold in dBm. The unit is 0.01 dBm. For example, if you want to configure 30.00 dBm, enter 3000. |
| opt | Configures the optical Tx power threshold in uW. |
| opt-dbm | Configures the optical Tx power threshold in dBm. The unit is 0.01 dBm. |
| osnr | Configures the OSNR threshold. |
| pcr | Configures the Polarization Change Rate (PCR) threshold. |
| pdl | Configures the Polarization Dependent Loss (PDL) threshold. |
| pn | Configures the Phase Noise (PN) threshold. |
| sopmd | Configures the Second Order Polarization Mode Dispersion (SOPMD) threshold. |
| rx-sig-pow | Configures the Rx signal power threshold in uW. |
| rx-sig-pow-dbm | Configures the Rx signal power threshold in dBm. The unit is 0.01 dBm. |

Command Default None

| Command History | Release | Modification |
|------------------------|----------------|------------------------------|
| | Release 6.5.1 | This command was introduced. |

Command Modes Optics controller configuration

Usage Guidelines

The configurations for chromatic dispersion (cd-max, cd-min, 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.

Example

The following example shows how to configure the optics controller and set the high power threshold at the transmit and receive side.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)#controller optics 0/0/1/1
RP/0/RP0/CPU0:ios(config-optics)#rx-high-threshold 200
RP/0/RP0/CPU0:ios(config-optics)#tx-high-threshold 300
```

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

```
RP/0/RP0/CPU0:ios#configure
RP/0/RP0/CPU0:ios(config)#controller optics 0/0/1/1
RP/0/RP0/CPU0:ios(config-optics)#cd-max 10000
RP/0/RP0/CPU0:ios(config-optics)#cd-min 2000
```

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

```
RP/0/RP0/CPU0:ios#configure
RP/0/RP0/CPU0:ios(config)#controller optics 0/0/1/1 pm 24-hour optics threshold osnr max
345
RP/0/RP0/CPU0:ios(config)#commit
```

controller ots

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

controller ots *R/S/I/P*

ampli-channel-power *value* | **ampli-channel-psd** *value* | **ampli-control-mode** {automatic | manual} | **ampli-gain** *value* | **ampli-gain-range** {extended | normal} | **ampli-gain-thr-deg-high** *value* | **ampli-gain-thr-deg-low** *value* | **ampli-tilt** *value* | **channel-power-max-delta** *value* | **osri** {on | off} | **pm** {15-min | 24-hour | 30-sec} **ots** {report {opr {max-tca enable | min-tca} | opt {max-tca enable | min-tca} }} | **threshold** {max | min} *value* | **rx-low-threshold** *value* | **rx-low-threshold-delta** *value* | **rx-low-threshold-psd** *value* | **rx-voa-attenuation** *value* | **safety-control-mode** {auto | disabled} | **sec-admin-state** {normal | maintenance} | **shutdown** | **tx-low-threshold** *value* | **tx-voa-attenuation** *value*

Syntax Description

| | |
|---|--|
| <i>R/S/I/P</i> | Rack/Slot/Instance/Port of the OTS controller. |
| ampli-channel-power <i>value</i> | Configures the amplifier per channel power set point. The valid range is -500 to 300. The default value is 0.0. |
| ampli-channel-psd | Configures the psd per channel. This is the power spectral density that the EDFA uses to calculate the amplifier gain. |
| ampli-control-mode | Configures the amplifier control mode. The valid mode is automatic or manual. |

| | |
|--------------------------------|--|
| ampli-gain | Configures the amplifier gain set point. The valid range is 0 to 500. The default value is 0.0. |
| ampli-gain-range | Configures the amplifier gain range. The valid mode is normal or extended. |
| ampli-gain-thr-deg-high | Configures high amplifier gain degrade threshold for gain alarm. The valid range is from 0 to 500. |
| ampli-gain-thr-deg-low | Configures low amplifier gain degrade threshold for gain alarm. The valid range is from 0 to 500. |
| ampli-tilt | Configures the amplifier tilt. The valid range is from -50 to 50. |
| channel-power-max-delta | Configures the maximum difference among all the measured channel powers. The valid range is from 0 to 200. . |
| osri | Configures the optical safety remote interlock. The valid mode is on or off. |
| pm | Configures the OTS performance monitoring parameters for 15-min, 24-hours, and 30-sec. report —Sets OTS/OPR TCA reporting status. <ul style="list-style-type: none"> • max-tca—Sets OPR maximum TCA reporting status. • min-tca—Sets OPR minimum TCA reporting status. threshold —Configures threshold on OTS parameters. <ul style="list-style-type: none"> • max—The maximum value is 6633. • min—The minimum value is -3000. |
| rx-low-threshold | Configures the transponder low receive power threshold. The valid range is from -500 to 300. |
| rx-low-threshold-delta | Configures the threshold hysteresis parameter of PSM revertive switch. Threshold hysteresis parameter is required to avoid transient or flipping power readings in the region near the threshold which is monitoring the primary rx port. Threshold hysteresis parameter, if set, works in combination with WTR timer. |
| rx-low-threshold-psd | Configures the psd threshold. |
| rx-voa-attenuation | Configures the RX Voa attenuation set point. The valid range is from 0 to 200. |
| safety-control-mode | Configures the safety control mode. The valid mode is auto or disabled. |
| sec-admin-state | Configures the secondary admin state of ots controller. The valid mode is normal or maintenance. |
| shutdown | Disables optics controller processing. |
| tx-low-threshold | Configures the transponder low transmit power threshold. The valid range is from -500 to 300. |

tx-voa-attenuation Configures the TX Voa attenuation set point. The valid range is from 0 to 200.

Command Default None

Command Modes OTS configuration

| Command History | Release | Modification |
|-----------------|---------------|---|
| | Release 6.2.1 | This command was introduced. |
| | Release 7.0.1 | rx-low-threshold-delta , rx-low-threshold-psd and ampli-channel-psd keywords were added. |

Example

The following is a sample in which the amplifier gain range is set to extended and amplifier gain set point is set to 29.0 dB.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# controller ots 0/3/0/0
RP/0/RP0/CPU0:ios(config-Ots)# ampli-gain-range extended
RP/0/RP0/CPU0:ios(config-Ots)# ampli-gain 290
RP/0/RP0/CPU0:ios(config-Ots)# commit
```

The following is a sample in which the safety control mode of the booster amplifier is set to disabled.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# controller ots 0/3/0/1
RP/0/RP0/CPU0:ios(config-Ots)# safety-control-mode disabled
RP/0/RP0/CPU0:ios(config-Ots)# commit
```

controller ots-och

To configure the OTS-CSH controller, use the **controller ots-och** command in the OTS configuration mode.

controller ots-och *R/S/I/P*

ampli-channel-power *value* | **ampli-control-mode** {automatic | manual} | **ampli-gain** *value* | **ampli-gain-range** {extended | normal} | **ampli-gain-thr-deg-high** *value* | **ampli-gain-thr-deg-low** *value* | **ampli-tilt** *value* | **channel-power-max-delta** *value* | **osri** {on | off} | **pm** {15-min | 24-hour | 30-sec} **ots** {report {opr {max-tca enable | min-tca} | opt {max-tca enable | min-tca}} | **threshold** {max | min} *value*} | **rx-low-threshold** *value* | **rx-voa-attenuation** *value* | **safety-control-mode** {auto | disabled} | **sec-admin-state** {normal | maintenance} | **shutdown** | **tx-low-threshold** *value* | **tx-voa-attenuation** *value*

Syntax Description *R/S/I/P* Rack/Slot/Instance/Port of the OTS-CSH controller.

ampli-channel-power *value* Configures the amplifier per channel power set point. The valid range is -500 to 300. The default value is 0.0.

| | |
|--------------------------------|--|
| ampli-control-mode | Configures the amplifier control mode. The valid mode is automatic or manual. |
| ampli-gain | Configures the amplifier gain set point. The valid range is 0 to 500. The default value is 0.0. |
| ampli-gain-range | Configures the amplifier gain range. The valid mode is normal or extended. |
| ampli-gain-thr-deg-high | Configures high amplifier gain degrade threshold for gain alarm. The valid range is from 0 to 500. |
| ampli-gain-thr-deg-low | Configures low amplifier gain degrade threshold for gain alarm. The valid range is from 0 to 500. |
| ampli-tilt | Configures the amplifier tilt. The valid range is from -50 to 50. |
| channel-power-max-delta | Configures the maximum difference among all the measured channel powers. The valid range is from 0 to 200. . |
| osri | Configures the optical safety remote interlock. The valid mode is on or off. |
| pm | Configures the OTS performance monitoring parameters for 15-min, 24-hours, and 30-sec. report —Sets OTS/OPR TCA reporting status. <ul style="list-style-type: none"> • max-tca—Sets OPR maximum TCA reporting status. • min-tca—Sets OPR minimum TCA reporting status. threshold —Configures threshold on OTS parameters. <ul style="list-style-type: none"> • max—The maximum value is 6633. • min—The minimum value is -3000. |
| rx-low-threshold | Configures the transponder low receive power threshold. The valid range is from -500 to 300. |
| rx-voa-attenuation | Configures the RX Voa attenuation set point. The valid range is from 0 to 200. |
| safety-control-mode | Configures the safety control mode. The valid mode is auto or disabled. |
| sec-admin-state | Configures the secondary admin state of ots controller. The valid mode is normal or maintenance. |
| shutdown | Disables optics controller processing. |
| tx-low-threshold | Configures the transponder low transmit power threshold. The valid range is from -500 to 300. |
| tx-voa-attenuation | Configures the TX Voa attenuation set point. The valid range is from 0 to 200. |

Command Default None

Command Modes OTS configuration

| Command History | Release | Modification |
|-----------------|---------------|------------------------------|
| | Release 6.2.1 | This command was introduced. |

Example

The following is a sample in which the RX low power threshold and TX low power threshold for the OTS OCH controller is set to -30 dB and -35dB.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# controller ots-och 0/1/0/0
RP/0/RP0/CPU0:ios(config-Ots)# rx-low-threshold -30
RP/0/RP0/CPU0:ios(config-Ots)# tx-low-threshold -35
RP/0/RP0/CPU0:ios(config-Ots)# commit
```

fault-profile

Use the **fault-profile** command in the global configuration mode, to create a new fault profile with one or more alarms and user-defined severity.

```
fault-profile name fault-identifier subsystem XR fault-type { HW_GFP | HW_ETHERNET | HW_SDH_CONTROLLER | HW_SONET | HW_OPTICS | HW_G709 | HW_CPRI | HW_OTS } fault-tag fault-name sas severity-level nsas severity-level
```

| Syntax Description | | |
|---|--|---|
| fault-profile <i>name</i> | Name of the fault profile. | |
| fault-identifier subsystem XR | Supports the IOS XR sub-system. | |
| fault-type | The component the fault profile is applicable to. The available options are: | <ul style="list-style-type: none"> • HW_GFP • HW_ETHERNET • HW_SDH_CONTROLLER • HW_SONET • HW_OPTICS • HW_G709 • HW_CPRI • HW_OTS |
| fault-tag <i>fault-name</i> | The faults that are included as part of the newly created fault profile. | |

| | |
|---|---|
| sas severity-level nsas severity-level | <p>Sets the severity level for:</p> <ul style="list-style-type: none"> • sas (service affecting; impacts traffic) • nsas (non-service affecting; does not impact traffic) <p>The available options are:</p> <ul style="list-style-type: none"> • Critical • Major • Minor • Non-faulted • Non-reported |
|---|---|

| | |
|------------------------|--------------------------------|
| Command Default | No default behavior or values. |
|------------------------|--------------------------------|

| | |
|----------------------|----------------------|
| Command Modes | Global Configuration |
|----------------------|----------------------|

| | |
|------------------------|------------------------------|
| Command History | Release Modification |
| | This command was introduced. |

Example

The following example shows how to use the **fault profile** command.

```
RP/0/RP0/CPU0:ios#configure terminal
RP/0/RP0/CPU0:ios(config)#fault-profile FpSystem fault-identifier subsystem XR
fault-type HW_OTS fault-tag OTS_SWITCH_TO_PROTECT sas NONFAULTED nsas NONFAULTED
RP/0/RP0/CPU0:ios(config)#commit
```

fault-profile-apply

Use the **fault-profile apply** command in the global configuration mode, to apply a fault profile at the port level or node level.

fault-profile *name* **apply** *rack0 slot location port port-id*

| | |
|---------------------------|---|
| Syntax Description | fault-profile <i>name</i> Name of the fault profile. |
| | rack 0 slot location port port-id Applies the fault profile at the port level or node level. |

| | |
|------------------------|--------------------------------|
| Command Default | No default behavior or values. |
|------------------------|--------------------------------|

| | |
|----------------------|----------------------|
| Command Modes | Global Configuration |
|----------------------|----------------------|

Command History**Release Modification**

This command was introduced.

Example

The following sample creates a fault profile and applies at port or slot level.

The following sample creates a fault profile and applies at node level.

```
RP/0/RP0/CPU0:ios#configure terminal
RP/0/RP0/CPU0:ios(config)#fault-profile FpNode fault-identifier subsystem XR
fault-type HW_OTS fault-tag OTS_RX_LOS_P sas CRITICAL nsas CRITICAL
RP/0/RP0/CPU0:ios(config)#commit
RP/0/RP0/CPU0:ios(config)#fault-profile FpNode apply rack 0 slot ALL
RP/0/RP0/CPU0:ios(config)#commit
RP/0/RP0/CPU0:ios(config)#exit
```

hw-module

To provision the Optical Amplifier Module, Protection Switching Module (PSM), or Optical Time Domain Reflectometer (OTDR) module, use the **hw-module location** command in IOS XR configuration mode.

```
hw-module location { location WORD } slot slotnumber { ampli { auto-threshold } { flex-mode
flex-spectrum channel-id channel-id | channel-width channel-width } { grid-mode | { 100GHz |
50GHz | 75GHz | GRIDLESS } } { | flex-channel-id channel-id | chan-central-freq frequency |
chan-width width | } | span-loss | node-type { iLA | TERM } | udc-vlan VLANID } | psm { revertive
wtr wtr-value } { primary-path path } section-protection { lockout-from { PROTECTED |
WORKING } | manual-switch-to { PROTECTED | WORKING } } }
hw-module location location slot slot-number otdr port port-number direction direction { ml-enabled
| { 1 | 0 } } { scan | { expert | auto | abort } } | { mode-auto | mode-expert } }
```

Syntax Description

| | |
|--|---|
| <i>location</i> | Specifies the location of the hardware module. The location is 0/RP0/CPU0. |
| <i>WORD</i> | Specifies the name of the hardware module. |
| slot <i>slotnumber</i> | Specifies the slot number. The range is from 1 to 3. |
| ampli | Configures the optical amplifier module . |
| auto-threshold | Enables automated ots-och thresholds on EDFA. |
| flex-mode | Enables the flex mode. In R7.1.1, the channel width can be set between 50GHz to 800GHz in multiples of 25GHz. |
| grid-mode { 100GHz 50GHz 75GHz GRIDLESS } | Specifies the optical spectrum on the interfaces of the amplifier module. The valid values are 100GHz, 50GHz, 75GHz and GRIDLESS. |

| | |
|--|--|
| flex-channel-id <i>channel-id</i> | Defines the channel identifier. The range is 1 to 96. |
| chan-central-freq <i>frequency</i> | Defines the central frequency of the channel. The range is 191350 to 196100 in multiples of 125. |
| chan-width <i>width</i> | Defines the width of the channel. The range is 500 (50.0 GHz) to 8000 (800.0 GHz) in multiples of 12.5 GHz. |
| span-loss | Enables automatic span loss calculation. |
| node-type { iLA TERM } | Specifies the type of the node in which the amplifier is set to work. The valid values are iLA and TERM. |
| udc-vlan <i>VLANID</i> | Specifies the VLAN associated to the selected slot and its UDC port. <i>VLANID</i> —The valid range is from 2 to 4080. |
| psm | Configures the protection switching module. |
| revertive wtr | Configures PSM revertive switch. WTR (Wait To Restore Time) is the time delay (in seconds) introduced after LOS alarm on the primary path is cleared. When WTR timer elapses, traffic moves to the primary path. |
| primary-path | Configures the primary path of PSM. The primary path is set to WORKING by default. The user can change this path from WORKING to PROTECTED but cannot delete it. |
| lockout-from { PROTECTED WORKING } | Switches the active path on the selected port. The valid range is PROTECTED and WORKING. |
| section-protection | Enables section protection. |
| otdr port <i>port-number</i> direction <i>direction</i> scan { expert auto abort } { mode-auto mode-expert } | Configures OTDR in specific ports and directions in automatic and expert modes. |
| ml-enabled 1 | Enable ML (Machine Learning) on the OTDR card. By default, ML is disabled. |

Command Default No hardware module is configured.

Command Modes Cisco IOS XR Configuration

| Command History | Release | Modification |
|------------------------|----------------|------------------------------------|
| | Release 6.2.1 | This command was introduced. |
| | Release 6.3.1 | iLA keyword was introduced. |

| Release | Modification |
|---------------|---|
| Release 6.5.1 | otdr keyword was introduced. span-loss keyword was introduced. |
| Release 7.0.1 | revertive wtr , flex-mode and primary-path keywords were introduced. |
| Release 7.1.1 | auto-threshold keyword was introduced for EDFA. |
| Release 7.3.1 | <ul style="list-style-type: none"> • ml-enabled keyword was introduced to enable ML on the OTDR card. • 75GHz grid mode was introduced. • flex-channel-id, chan-central-freq, and chan-width keywords were added to configure flex channels on the Amplifier module. |

Usage Guidelines

You can use **no hw-module location** command to remove all the hardware module configurations.

Example

The following is a sample in which the amplifier module is inserted in slot 3 and udc-vlan is set to 4000.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# hw-module location 0/RP0/CPU0 slot 3 ampli grid-mode 100GHz
RP/0/RP0/CPU0:ios(config)# hw-module location 0/RP0/CPU0 slot 3 ampli udc-vlan 4000
```

The following is a sample in which the PSM module is inserted in slot 2.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# hw-module location 0/RP0/CPU0 slot 2 psm manual-switch-to working
RP/0/RP0/CPU0:ios(config)# hw-module location 0/RP0/CPU0 slot 2 psm lockout-from working
```

The following is a sample in which the amplifier module is configured in ILA automatic mode.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# hw-module location 0/RP0/CPU0 slot 3 ampli grid-mode 50GHz
node-type iLA
```

The following is a sample of configuring the WTR parameter of PSM revertive switch in which the PSM module is inserted in slot 2 and primary path is set to working.

```
configure
hw-module location 0/RP0/CPU0 slot 2 psm
revertive wtr 120
primary-path WORKING
commit
end
```

The following is a sample for enabling autothreshold on an EDFA equipped in slot 1.

```
RP/0/RP0/CPU0:ios#configure terminal
RP/0/RP0/CPU0:ios(config)#hw-module location 0/RP0/CPU0 slot 1 ampli auto-threshold
```

```
RP/0/RP0/CPU0:ios(config)#commit
RP/0/RP0/CPU0:ios(config)#end
```

The following command configures the channel width as 800GHz. This means that the channels are spaced on eight slices at 100GHz each.

```
RP/0/RP0/CPU0:ios#configure terminal
RP/0/RP0/CPU0:ios(config)#hw-module location 0/RP0/CPU0 slot 1 ampli flex-mode flex-spectrum
channel-id 10 channel-width 8000
RP/0/RP0/CPU0:ios(config)#commit
RP/0/RP0/CPU0:ios(config)#end
```

The following is a sample for enabling ML on the OTDR card on slot 1, port 1, and direction tx:

```
RP/0/RP0/CPU0(config)#hw-module location 0/RP0/CPU0 slot 1 otdr port 1 direction tx ml-enabled
1
RP/0/RP0/CPU0(config)#commit
```

The following is a sample in which the amplifier module is configured in flex spectrum.

```
RP/0/RP0/CPU0:ios#configure terminal
RP/0/RP0/CPU0:ios(config)#hw-module location 0/RP0/CPU0 slot 2 ampli grid-mode gridless
RP/0/RP0/CPU0:ios(config)#hw-module location 0/RP0/CPU0 slot 2 ampli flex-channel-id 5
chan-central-freq 1931750 chan-width 6500
RP/0/RP0/CPU0(config)#commit
RP/0/RP0/CPU0(config)#end
```

hw-module slot

To start the calculation of rxlow-threshold for an EDFA inserted in slot 1, use the **hw-module slot** command in IOS XR configuration mode.

```
hw-module slot { slot number } { ampli-auto-rxlow-threshold { threshold-offset } { offset } }
```

| Syntax Description | slot <i>slotnumber</i> | Specifies the slot number. The range is from 1 to 3. |
|--------------------|---------------------------------------|---|
| | ampli-auto-rxlow-threshold | Triggers the auto-threshold calculation. |
| | threshold-offset <i>offset</i> | <i>Offset</i> is a value to be chosen in the range <0-800> (in tenth of dBm). |

Command Modes EXEC

| Command History | Release | Modification |
|-----------------|---------------|---|
| | Release 7.1.1 | ampli-auto-rxlow-threshold and threshold-offset keywords were introduced. |

Example

The following is a sample to start the calculation of rx-low-threshold for an EDFA equipped in slot 1 and offset is 4 DB.

```
RP/0/RP0/CPU0:ios#hw-module slot 1 ampli-auto-rxlow-threshold threshold-offset 40
```

router-id

To specify an IPv4 address to act as the router ID, use the **router-id** command in MPLS LDP configuration mode.

router-id *ip-address*

| | |
|---------------------------|--|
| Syntax Description | <i>ip-address</i> IP address in A.B.C.D format |
|---------------------------|--|

| | |
|------------------------|---|
| Command Default | LDP uses router ID as determined by global router ID agent, IP Address Repository Manager (IP ARM). |
|------------------------|---|

| | |
|----------------------|------------------------|
| Command Modes | MPLS LDP configuration |
|----------------------|------------------------|

| | | |
|------------------------|----------------|------------------------------|
| Command History | Release | Modification |
| | Release 6.3.2 | This command was introduced. |

Example

The following example shows how to specify an IP address as the router ID:

```
RP/0/RP0/CPU0:ios(config-ldp)# router-id 10.0.0.1
```

router ospf

To enable Open Shortest Path First (OSPF) for a specific area interface, use the **router ospf** command in IOS XR Configuration mode.

router ospf *process-id* [**area** { *area-id* | *ip-address* }] **interface** *type* *R/S/I/P*

| | |
|---------------------------|---|
| Syntax Description | <i>process-id</i> Internally used identification parameter for an OSPF routing process. It is locally assigned and can be any positive integer. A unique value is assigned for each OSPF routing process. |
| area | (Optional) Enters the OSPF area configuration submode. |
| <i>area-id</i> | Specifies the OSPF area ID as a decimal value. |
| <i>ip-address</i> | Specifies the OSPF area ID as an IP address in A.B.C.D format. |
| interface | (Optional) Enters the OSPF interface configuration submode. |
| <i>type</i> | Interface type. |

R/S/I/P Rack/Slot/Instance/Port

Command Default No default behavior or values

Command Modes IOS XR Configuration Mode

| Command History | Release | Modification |
|-----------------|---------------|------------------------------|
| | Release 6.3.2 | This command was introduced. |

Example

The following example shows how to enable OSPF.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# router ospf 109
RP/0/RP0/CPU0:ios(config-ospf)#
```

show alarms

To display alarms in brief, detail or xml format, use the **show alarms** command in XR EXEC mode or Administration EXEC mode.

show alarms brief [**card** [**location** *location* | *WORD* | **xml**] | **xml**]

show alarms detail [**card** [**location** *location* | *WORD* | **xml**] | **xml**] **system** [**active** | **clients** | **history** | **stats** | **suppressed** | **xml**]

show alarms xml

| Syntax Description | | |
|---------------------------------|--|---|
| brief | | Displays alarms in brief. |
| card | | Displays card scope alarms related data. |
| location <i>location</i> | | Specifies the target location in the <i>rack/slot</i> notation. |
| <i>WORD</i> | | Specifies the name of the card. |
| xml | | Displays the output in xml format. |
| detail | | Displays alarms in detail. |
| system | | Displays the system scope alarms related data. |
| active | | Displays the active alarms. |
| clients | | Displays the clients associated with the service. |
| history | | Displays the alarm history. |

| | |
|-------------------|----------------------------------|
| stats | Displays the service statistics. |
| suppressed | Displays the suppressed alarms. |

Command Default None

Command Modes EXEC
Administration EXEC

Command History

| Release | Modification |
|---------------|------------------------------|
| Release 6.2.1 | This command was introduced. |

Example

The following example shows the output of the **show alarms** command.

```
sysadmin-vm:0_RP0# show alarms
```

```
RP/0/RP0/CPU0:ios#show alarms
Mon Apr 17 07:32:33.474 CEST
```

```
-----
Active Alarms (Brief) for 0/RP0
-----
```

| Location | Severity | Group | Set Time | Description |
|-------------------------------|------------|------------|---------------------|---------------------------|
| 0/2 to Protect Path | NotAlarmed | Controller | 04/17/2017 07:31:09 | CES0ts0/2/0/1 - Switched |
| 0/3 OFF for Safety Reasons | NotAlarmed | Controller | 04/17/2017 07:31:10 | CES0ts0/3/0/0 - Amplifier |
| 0/3 Continuity | Critical | Controller | 04/17/2017 07:31:10 | CES0ts0/3/0/1 - Loss Of |
| 0/3 OFF for Safety Reasons | NotAlarmed | Controller | 04/17/2017 07:31:10 | CES0ts0/3/0/1 - Amplifier |
| 0/3 Signal - Payload | Critical | Controller | 04/17/2017 07:31:10 | CES0ts0/3/0/3 - Loss of |
| 0/1 OFF for Safety Reasons | NotAlarmed | Controller | 04/17/2017 07:31:10 | CES0ts0/1/0/0 - Amplifier |
| 0/1 Continuity | Critical | Controller | 04/17/2017 07:31:10 | CES0ts0/1/0/1 - Loss Of |
| 0/1 OFF for Safety Reasons | NotAlarmed | Controller | 04/17/2017 07:31:10 | CES0ts0/1/0/1 - Amplifier |
| 0/1 Signal - Payload | Critical | Controller | 04/17/2017 07:31:10 | CES0ts0/1/0/3 - Loss of |


```

0/2          Critical    Controller    04/17/2017 07:31:10 CES0ts0/2/0/1 - Loss of
Signal - Payload

0/2          Critical    Controller    04/17/2017 07:31:10 CES0ts0/2/0/2 - Loss of
Signal - Payload

```

```

-----
History Alarms (Brief) for 0/RP0
-----

```

| Location | Severity | Group | Set Time | Description |
|----------|------------|------------|--------------------------|---|
| 0/1 | Critical | Controller | 04/17/2017 04:32:11 | CES0ts0/1/0/2 - Loss of Signal - Payload |
| | | | 04/17/2017 04:32:11 CEST | |
| 0/1 | Critical | Controller | 04/17/2017 04:32:38 | CES0ts0/1/0/2 - Loss of Signal - Payload |
| | | | 04/17/2017 04:32:38 CEST | |
| 0/3 | NotAlarmed | Controller | 04/17/2017 04:32:41 | CES0ts0/3/0/1 - Amplifier in power reduction for safety reasons |
| | | | 04/17/2017 04:32:49 CEST | |
| 0/1 | NotAlarmed | Controller | 04/17/2017 04:32:43 | CES0ts0/1/0/1 - Amplifier in power reduction for safety reasons |
| | | | 04/17/2017 04:32:51 CEST | |
| 0/1 | Critical | Controller | 04/17/2017 04:33:04 | CES0ts0/1/0/2 - Loss of Signal - Payload |
| | | | 04/17/2017 04:33:04 CEST | |
| 0/1 | Critical | Controller | 04/17/2017 04:33:30 | CES0ts0/1/0/2 - Loss of Signal - Payload |
| | | | 04/17/2017 04:33:30 CEST | |
| 0/1 | Critical | Controller | 04/17/2017 04:33:56 | CES0ts0/1/0/2 - Loss of Signal - Payload |
| | | | 04/17/2017 04:33:56 CEST | |
| 0/1 | Critical | Controller | 04/17/2017 04:34:25 | CES0ts0/1/0/2 - Loss of Signal - Payload |
| | | | 04/17/2017 04:34:25 CEST | |
| 0/3 | NotAlarmed | Controller | 04/17/2017 04:34:29 | CES0ts0/3/0/1 - Amplifier in power reduction for safety reasons |
| | | | 04/17/2017 04:34:37 CEST | |
| 0/1 | NotAlarmed | Controller | 04/17/2017 04:34:31 | CES0ts0/1/0/1 - Amplifier in power reduction for safety reasons |
| | | | 04/17/2017 04:34:39 CEST | |
| 0/1 | Critical | Controller | 04/17/2017 04:34:51 | CES0ts0/1/0/2 - Loss of Signal - Payload |
| | | | 04/17/2017 04:34:51 CEST | |
| 0/1 | Critical | Controller | 04/17/2017 04:35:17 | CES0ts0/1/0/2 - Loss of Signal - Payload |
| | | | 04/17/2017 04:35:17 CEST | |
| 0/1 | Critical | Controller | 04/17/2017 04:35:44 | CES0ts0/1/0/2 - Loss of Signal - Payload |

show alarms

```

Signal - Payload
0/1          Critical      Controller  04/17/2017 04:35:44 CEST
Signal - Payload          04/17/2017 04:36:10 CESOts0/1/0/2 - Loss of

0/3          NotAlarmed   Controller  04/17/2017 04:36:10 CEST
in power reduction for safety reasons          04/17/2017 04:36:17 CESOts0/3/0/1 - Amplifier

0/1          NotAlarmed   Controller  04/17/2017 04:36:25 CEST
in power reduction for safety reasons          04/17/2017 04:36:19 CESOts0/1/0/1 - Amplifier

0/1          Critical      Controller  04/17/2017 04:36:27 CEST
Signal - Payload          04/17/2017 04:36:36 CESOts0/1/0/2 - Loss of

0/1          Critical      Controller  04/17/2017 04:36:36 CEST
Signal - Payload          04/17/2017 04:37:02 CESOts0/1/0/2 - Loss of

0/1          Critical      Controller  04/17/2017 04:37:02 CEST
Signal - Payload          04/17/2017 04:37:27 CESOts0/1/0/2 - Loss of

0/1          Critical      Controller  04/17/2017 04:37:27 CEST
Signal - Payload          04/17/2017 04:37:54 CESOts0/1/0/2 - Loss of

0/3          Critical      Controller  04/17/2017 04:37:54 CEST
Continuity                04/17/2017 04:31:01 CESOts0/3/0/1 - Loss Of

0/3          NotAlarmed   Controller  04/17/2017 04:38:06 CEST
OFF for Safety Reasons    04/17/2017 04:31:01 CESOts0/3/0/1 - Amplifier

0/2          NotAlarmed   Controller  04/17/2017 04:38:06 CEST
to Protect Path          04/17/2017 04:30:59 CESOts0/2/0/1 - Switched

04/17/2017 04:38:06 CEST

```

RP/0/RP0/CPU0:ios#show alarms detail system active

Mon Apr 17 07:35:49.634 CEST

Active Alarms

Description: Amplifier in power reduction for safety reasons

```

Location:          0/3
AID:               XR/(null)/139
Tag String:        FAM_FAULT_TAG_OTS_AUTO_POW_RED
Module Name:       Ots0/3/0/0
EID:               MODULE/TRC/1:PORT/OTS/0
Reporting Agent ID: 65587
Pending Sync:      false
Severity:          NotAlarmed
Status:            Set

```

```

Group:                Controller
Set Time:             04/17/2017 07:32:50 CEST
Clear Time:           -
Service Affecting:    NotServiceAffecting
Transport Direction:  Receive
Transport Source:     NearEnd
Threshold Value:      -
Current Value:        -
Bucket Type:          NotSpecified
Event Type:           Default
Interface:            Ots0/3/0/0
Alarm Name:           AUTO-POW-RED

```

```
-----
Description:          Loss Of Continuity

```

```

Location:             0/3
AID:                  XR/(null)/135
Tag String:           FAM_FAULT_TAG_OTTS_RX_LOC
Module Name:          Ots0/3/0/1
EID:                  MODULE/TRC/1:PORT/OTS/1
Reporting Agent ID:   65587
Pending Sync:         false
Severity:             Critical
Status:               Set
Group:                Controller
Set Time:             04/17/2017 07:35:11 CEST
Clear Time:           -
Service Affecting:    ServiceAffecting
Transport Direction:  Receive
Transport Source:     NearEnd
Threshold Value:      -
Current Value:        -
Bucket Type:          NotSpecified
Event Type:           Default
Interface:            Ots0/3/0/1
Alarm Name:           RX-LOC

```

```
-----
Description:          Amplifier OFF for Safety Reasons

```

```

Location:             0/3
AID:                  XR/(null)/138
Tag String:           FAM_FAULT_TAG_OTTS_AUTO_LASER_SHUT
Module Name:          Ots0/3/0/1
EID:                  MODULE/TRC/1:PORT/OTS/1
Reporting Agent ID:   65587
Pending Sync:         false
Severity:             NotAlarmed
Status:               Set
Group:                Controller
Set Time:             04/17/2017 07:35:11 CEST
Clear Time:           -
Service Affecting:    NotServiceAffecting
Transport Direction:  Receive
Transport Source:     NearEnd
Threshold Value:      -
Current Value:        -
Bucket Type:          NotSpecified
Event Type:           Default
Interface:            Ots0/3/0/1
Alarm Name:           AUTO-LASER-SHUT

```

show controllers

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

```
show controllers controllertype R/S/I/P [db | dwdm-carrrier-map | periodic {15-min period period
duration duration | 24-hour period period duration duration | 30-sec period period duration duration }
| pm | {current {15-min optics lane number } {24-hour optics lane number } {30-sec optics lane number }
{ flex-bin optics lane number bucket bucket number } | history {15-min optics lane number bucket
bucket number } {24-hour optics lane number } {30-sec optics lane number bucket bucket number } {
flex-bin optics lane number bucket bucket number } } | summary}]
```

| Syntax | Description |
|---------------------------------|---|
| <i>controllertype</i> | Type of the controller. The possible values are OTS, OTS-OCH, Coherent DSP, Fast Ethernet, FortyGigECtrlr, GigabitEthernet and so on. |
| <i>R/S/I/P/L</i> | Rack/Slot/Instance/Port/Lane number of the controller. |
| db | (Optional) Displays the optics parameters. |
| dwdm-carrrier-map | (Optional) Displays the ITU channel, frequency, and wavelength. |
| periodic | (Optional) Displays the performance monitoring data in 15 minute, 24 hour, and 30 seconds intervals. |
| period <i>period</i> | (Optional) Displays the performance monitoring data after the specified period. The range is from 1 to 60. |
| duration <i>duration</i> | (Optional) Displays the performance monitoring data for the specified number of times. The range is from 1 to 60. |
| pm | (Optional) Displays the optics performance monitoring parameters. |
| current | (Optional) Displays the current performance monitoring data in 10 seconds, 15 minute, 24 hour, and 30 seconds intervals. |
| history | (Optional) Displays the historical performance monitoring data in 10 seconds, 15 minute, 24 hour, and 30 seconds intervals. |
| optics | (Optional) Displays the performance monitoring data for optics controller. |
| <i>lanenumber</i> | (Optional) Lane number to display performance monitoring data. The valid value is 1. |
| bucket | (Optional) Displays the performance monitoring data for the specified bucket. |
| <i>bucketnumber</i> | (Optional) Lane number to display performance monitoring data. The valid range is 1 to 32 for 15 minute interval. The valid range is 1 to 30 for 30 seconds interval. |

summary (Optional) Displays brief information about optics controller.

Command Default The status and configuration information of all the interfaces is displayed.

Command Modes EXEC

| Command History | Release | Modification |
|-----------------|---------------|------------------------------------|
| | Release 6.2.1 | This command was introduced. |
| | Release 7.3.1 | flex-bin keyword was added. |

Examples

RP/0/RP0/CPU0:ios# **show controllers ots 0/3/0/1**

```
RP/0/RP0/CPU0:ios#show controllers ots 0/3/0/1
Wed Aug 23 09:08:27.962 UTC
```

```
Controller State: Up
```

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

```
Port Type: Line
```

```
Laser State: Off
```

```
Optics Status::
```

```
Alarm Status:
```

```
-----
```

```
Detected Alarms:
```

```
RX-LOC
```

```
Alarm Statistics:
```

```
-----
```

```
LOW-RX-PWR = 0
```

```
LOW-TX-PWR = 0
```

```
RX-LOS-P = 0
```

```
RX-LOC = 1
```

```
AMPLI-GAIN-DEG-LOW = 0
```

```
AMPLI-GAIN-DEG-HIGH = 0
```

```
AUTO-LASER-SHUT = 0
```

```
AUTO-POW-RED = 89
```

```
AUTO-AMPLI-CTRL-DISABLED = 0
```

```
AUTO-AMPLI-CFG-MISMATCH = 0
```

```
SWITCH-TO-PROTECT = 0
```

```
AUTO-AMPLI-CTRL-RUNNING = 0
```

```
Parameter Statistics:
```

```
-----
```

```
TX Power = -40.00 dBm
```

```
RX Power = -40.00 dBm
```

```
Ampli Gain = -1.00 dB
```

```
Ampli Tilt = 0.00
```

```
Total TX Power = -40.00 dBm
```

```
Total RX Power = -40.00 dBm
```

```
Configured Parameters:
-----
Rx Low Threshold = -25.0 dBm
Tx Low Threshold = -20.0 dBm
Ampli Gain = 1.00 dB
Ampli Tilt = 0.00
Ampli Channel power = 0.00 dBm
Channel Power Max Delta = 3.00 dBm
Ampli Control mode = Manual
Ampli Gain Range = Normal
Ampli Safety Control mode = auto
Osri = OFF
```

RP/0/RP0/CPU0:ios#

RP/0/RP0/CPU0:ios# show controllers ots 0/1/0/3 db

Wed Apr 12 08:34:37.869 CEST

Transport Admin State: In Service

Controller State: Up

RP/0/RP0/CPU0:ios# show controllers ots 0/1/0/1 pm history 24-hour optics 1

Wed Apr 12 07:49:58.268 CEST

Optics in interval 1 [00:00:00 - 24:00:00 Tue Apr 11 2017]

Optics history bucket type : Valid

| | MIN | AVG | MAX |
|----------|----------|--------|-------|
| LBC[%] | : 0.0 | 15.0 | 18.9 |
| OPT[dBm] | : -40.00 | 0.44 | 8.00 |
| OPR[dBm] | : -40.00 | -11.37 | -7.80 |

Last clearing of "show controllers OPTICS" counters never

RP/0/RP0/CPU0:ios# show controllers ots 0/1/0/1 periodic 15-min period 2 duration 2

Wed Apr 12 08:06:46.211 CEST

Iteration 1 of 2 for channel 1, Query At Timestamp: [08:06:48.495 Wed Apr 12 2017]

Optics in the current interval [08:00:00 - 08:06:48 Wed Apr 12 2017]

Optics current bucket type : Valid

| | MIN | AVG | MAX | Threshold (min) | TCA (enable) | Threshold (max) | TCA (enable) |
|----------|----------|--------|--------|--------------------|-----------------|--------------------|-----------------|
| LBC[%] | : 15.1 | 15.1 | 15.1 | 0.0 | NO | 0.0 | NO |
| OPT[dBm] | : 0.40 | 0.42 | 0.50 | -50.00 | NO | 10.00 | NO |
| OPR[dBm] | : -11.70 | -11.69 | -11.61 | -50.00 | NO | 10.00 | NO |

Last clearing of "show controllers OPTICS" counters never

Iteration 2 of 2 for channel 1, Query At Timestamp: [08:06:50.494 Wed Apr 12 2017]

Optics in the current interval [08:00:00 - 08:06:50 Wed Apr 12 2017]

Optics current bucket type : Valid

| | MIN | AVG | MAX | Threshold (min) | TCA (enable) | Threshold (max) | TCA (enable) |
|----------|--------|------|------|--------------------|-----------------|--------------------|-----------------|
| LBC[%] | : 15.1 | 15.1 | 15.1 | 0.0 | NO | 0.0 | NO |
| OPT[dBm] | : 0.40 | 0.42 | 0.50 | -50.00 | NO | 10.00 | NO |

```
OPR[dBm] : -11.70 -11.69 -11.61 -50.00 NO 10.00 NO
```

Last clearing of "show controllers OPTICS" counters never

RP/0/RP0/CPU0:ios# show controllers ots 0/1/0/1 pm history 30-sec optics 1 bucket 1

Wed Apr 12 08:15:22.555 CEST

Optics in interval 1 [08:14:30 - 08:15:00 Wed Apr 12 2017]

Optics history bucket type : Valid

| | MIN | AVG | MAX |
|----------|----------|--------|--------|
| LBC[%] | : 15.1 | 15.1 | 15.1 |
| OPT[dBm] | : 0.50 | 0.50 | 0.50 |
| OPR[dBm] | : -11.70 | -11.61 | -11.61 |

Last clearing of "show controllers OPTICS" counters never

RP/0/RP0/CPU0:ios# show controllers ots 0/1/0/3 summary

Wed Apr 12 08:35:26.353 CEST

| Port | Type | Status | TX Power (dBm) | TX Total Power (dBm) | RX Power (dBm) | RX Total Power (dBm) |
|-----------------------------|-----------|-----------------------------|-------------------|-------------------------|-------------------|-------------------------|
| ----- | ---- | ----- | ----- | ----- | ----- | ----- |
| Ots0_1_0_3 | Com-Check | N/A | Unavailable | Unavailable | -8.30 | Unavailable |
| RX Voa Attenuation (dBm) | | TX Voa Attenuation (dBm) | | Ampli Gain | Ampli Tilt | |
| ----- | | ----- | | ----- | ----- | |
| Unavailable | | Unavailable | | Unavailable | Unavailable | |

The following sample shows the configured channel with its frequency and width.

RP/0/RP0/CPU0#show controllers ots-och 0/2/0/0/5 summary

Fri Oct 9 10:43:44.002 CEST

| Port | Type | Status | TX Power (dBm) | RX Power (dBm) |
|--------------------|--------------------|----------------------------|------------------------|-------------------|
| ----- | ----- | ----- | ----- | ----- |
| Ots-Och0_2_0_0_5 | Com | N/A | -8.60 | -8.90 |
| TX psd (nW/MHz) | RX psd (nW/MHz) | Central Frequency (GHz) | Channel Width (GHz) | |
| ----- | ----- | ----- | ----- | |
| 0.410 | 0.450 | 193175.0 | 650.0 | |

RP/0/RP0/CPU0#show controllers ots-och 0/2/0/0/5

Fri Oct 9 10:46:33.046 CEST

```
Controller State: Up
Transport Admin State: Maintenance
Port Type: Com
```

```
Laser State: Unknown
```

```
Optics Status::
```

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

```
Alarm Statistics:
-----
LOW-RX-PWR = 0
LOW-TX-PWR = 0
RX-LOS-P = 0
RX-LOC = 0
AMPLI-GAIN-DEG-LOW = 0
AMPLI-GAIN-DEG-HIGH = 0
AUTO-LASER-SHUT = 0
AUTO-POW-RED = 0
AUTO-AMPLI-CTRL-DISABLED = 0
AUTO-AMPLI-CFG-MISMATCH = 0
SWITCH-TO-PROTECT = 0
AUTO-AMPLI-CTRL-RUNNING = 0
```

```
Parameter Statistics:
-----
TX Power = -8.60 dBm
RX Power = -8.90 dBm
TX psd = 0.440 nW/MHz
RX psd = 0.450 nW/MHz
Channel Central Frequency = 193175.0 GHz
Channel Width = 650.0 GHz
```

```
Configured Parameters:
-----
Rx Low Threshold = -25.0 dBm
Tx Low Threshold = -25.0 dBm
```

show hw-module

To display the details of the Field Programmable Devices (FPDs), location, patchcord configuration, and slot, use the **show hw-module** in EXEC mode.

```
show hw-module { details | fpd [{ WORD | help-fpd }] | location { WORD | all fpd [{ WORD | help-fpd }] | help-loc | 0/0 | 0/1 | 0/2 | 0/3 | 0/FT0 | 0/FT1 | 0/FT2 | 0/FT3 | 0/RP0 } | patchcord { all | port optics R/S/I/P } | slot slotnumber { ampli-trail-view { all | bst | pre } | channel-trail-view active all } }
```

```
show hw-module slot slot-number otdr {status | scan}
```

Syntax Description

| | |
|----------------|--|
| details | Displays the hardware module information. |
| fpd | Displays information for all the Field Programmable Devices (FPD) installed. |
| <i>WORD</i> | (Optional) Displays information of the specified FPD. |

| | |
|--|--|
| help-fpd | (Optional) Displays the list of all FPDs installed. |
| location | Displays the information of the specified location of the FPD. |
| all | Displays all the FPDs location information. |
| help-loc | Displays the list of all available locations. |
| 0/0, 0/1, 0/2, 0/3, 0/FT0, 0/FT1, 0/FT2, 0/FT3, 0/RP0 | Displays the location of the FPD. |
| patchcord | Displays the hardware module patch-cord information. |
| all | Displays all the hardware module patch-cord information. |
| port optics <i>R/S/I/P</i> | Displays the configured patch-cord information for the specified optical port. <i>R/S/I/P</i> —Rack/Slot/Instance/Port/Lane number of the controller |
| slot <i>slotnumber</i> | Displays the slot information. <i>slotnumber</i> —Slot number of the hardware module. The valid range is 1 to 3. |
| ampli-trail-view | Defines the booster and pre trail information. |
| all | Displays booster and pre trail information. |
| bst | Displays booster trail information. |
| pre | Displays pre trail information. |
| channel-trail-view | Defines the channels trail information. |
| active | Displays active channels trail information. |
| all | Displays all channels trail information. |
| otdr { status scan } | status keyword: Displays a table with the status for all the OTDR ports and directions scan keyword: Displays the list of OTDR measurements |

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

| | |
|----------------------|------|
| Command Modes | EXEC |
|----------------------|------|

| Command History | Release | Modification |
|------------------------|----------------|-------------------------------------|
| | Release 6.2.1 | This command was introduced. |
| | Release 6.5.1 | otdr keyword was introduced. |

Example

RP/0/RP0/CPU0:ios# **show hw-module fpd**

Tue Sep 12 16:13:00.898 CEST

```

                                          FPD Versions
                                          =====
Location   Card type       HWver FPD device      ATR Status  Running Programd
-----
0/0        NCS1001-K9       0.1   Control_BKP        B   CURRENT      1.09
0/0        NCS1001-K9       0.1   Control_FPGA              CURRENT      1.09  1.09
0/1        NCS1K-EDFA       0.0   FW_EDFAv1          CURRENT      1.39  1.39
0/2        NCS1K-PSM        0.0   FW_PSMv1           CURRENT      1.38  1.38
0/3        NCS1K-EDFA       0.0   FW_EDFAv1          CURRENT      1.39  1.39
0/RP0     NCS1K-CNTLR2     0.1   BIOS_Backup        BS  CURRENT      13.60
0/RP0     NCS1K-CNTLR2     0.1   BIOS_Primary       S   CURRENT      13.60  13.60
0/RP0     NCS1K-CNTLR2     0.1   Daisy_Duke_BKP     BS  CURRENT      0.17
0/RP0     NCS1K-CNTLR2     0.1   Daisy_Duke_FPGA    S   CURRENT      0.17  0.17

```

RP/0/RP0/CPU0:ios# **show hw-module fpd help-fpd**

Thu Apr 13 08:24:15.770 CEST

```

Control_BKP
Control_FPGA
FW_EDFAv1
FW_PSMv2
FW_EDFAv1
BIOS_Backup
BIOS_Primary
Daisy_Duke_BKP
Daisy_Duke_FPGA

```

RP/0/RP0/CPU0:ios# **show hw-module fpd Control_BKP**

Thu Apr 13 08:25:15.360 CEST

```

                                          FPD Versions
                                          =====
Location   Card type       HWver FPD device      ATR Status  Running Programd
-----
0/0        NCS1001-K9       0.1   Control_BKP        B   CURRENT      1.09

```

RP/0/RP0/CPU0:ios# **show hw-module location 0/0 fpd help-fpd**

Thu Apr 13 08:30:12.529 CEST

```

Control_BKP
Control_FPGA

```

RP/0/RP0/CPU0:ios# **show hw-module location 0/0 fpd Control_FPGA**

Thu Apr 13 08:30:38.114 CEST

```

                                          FPD Versions
                                          =====
Location   Card type       HWver FPD device      ATR Status  Running Programd
-----
0/0        NCS1001-K9       0.1   Control_FPGA              CURRENT      1.09  1.09

```

RP/0/RP0/CPU0:ios# **show hw-module location all fpd help-fpd**

```
Thu Apr 13 08:33:50.794 CEST
Control_BKP
Control_FPGA
FW_EDFAv1
FW_PSMv2
FW_EDFAv1
BIOS_Backup
BIOS_Primary
Daisy_Duke_BKP
Daisy_Duke_FPGA
```

RP/0/RP0/CPU0:ios# show hw-module location all fpd

```
Tue Sep 12 16:13:00.898 CEST
```

| Location | Card type | HWver | FPD device | ATR | Status | FPD Versions | |
|----------|--------------|-------|-----------------|-----|---------|--------------|----------|
| | | | | | | Running | Programd |
| 0/0 | NCS1001-K9 | 0.1 | Control_BKP | B | CURRENT | | 1.09 |
| 0/0 | NCS1001-K9 | 0.1 | Control_FPGA | | CURRENT | 1.09 | 1.09 |
| 0/1 | NCS1K-EDFA | 0.0 | FW_EDFAv1 | | CURRENT | 1.39 | 1.39 |
| 0/2 | NCS1K-PSM | 0.0 | FW_PSMv1 | | CURRENT | 1.38 | 1.38 |
| 0/3 | NCS1K-EDFA | 0.0 | FW_EDFAv1 | | CURRENT | 1.39 | 1.39 |
| 0/RP0 | NCS1K-CNTLR2 | 0.1 | BIOS_Backup | BS | CURRENT | | 13.60 |
| 0/RP0 | NCS1K-CNTLR2 | 0.1 | BIOS_Primary | S | CURRENT | 13.60 | 13.60 |
| 0/RP0 | NCS1K-CNTLR2 | 0.1 | Daisy_Duke_BKP | BS | CURRENT | | 0.17 |
| 0/RP0 | NCS1K-CNTLR2 | 0.1 | Daisy_Duke_FPGA | S | CURRENT | 0.17 | 0.17 |

RP/0/RP0/CPU0:ios# show hw-module location all fpd Control_BKP

```
Thu Apr 13 08:37:26.261 CEST
```

| Location | Card type | HWver | FPD device | ATR | Status | FPD Versions | |
|----------|------------|-------|-------------|-----|---------|--------------|----------|
| | | | | | | Running | Programd |
| 0/0 | NCS1001-K9 | 0.1 | Control_BKP | B | CURRENT | | 1.09 |

RP/0/RP0/CPU0:ios# show hw-module patchcord all

```
Thu Apr 13 08:38:53.553 CEST
```

```
Hw-module Patchcord Configuration
-----
No Hw-module Patchcord Configuration exists
```

RP/0/RP0/CPU0:ios# show hw-module patchcord port optics 0/3/0/4

```
Thu Apr 13 08:40:52.355 CEST
```

```
Hw-module Patchcord Configuration
-----
Given Port has not been used in any Patchcord Configuration
```

RP/0/RP0/CPU0:ios# show hw-module slot 1 ampli-trail-view all

```
Thu Apr 13 08:43:25.305 CEST
```

```
Ampli Trail View - BST and PRE Amplifiers
```

show hw-module

```

=====
Port: 0/COM                               Port: 1/LINE
-----
      Rx Power = -17.00 dBm                Rx Power = -50.00 dBm
      Rx Total Power = -17.00 dBm          Rx Total Power = -50.00 dBm
      Rx Low Threshold = -25.0 dBm         Rx Low Threshold = -25.0 dBm

Port: 1/LINE                               Port: 0/COM
-----
      Tx Power = -50.00 dBm                Tx Power = -50.00 dBm
      Tx Total Power = -50.00 dBm          Tx Total Power = -50.00 dBm
      Tx Low Threshold = -20.0 dBm         Tx Low Threshold = -20.0 dBm

      Bst Gain = 1.00 dB                   Pre Gain = -90.00 dB
      Bst Tilt = 2.00                      Pre Tilt = 0.00
Bst Channel Power = 3.00 dBm              Pre Channel Power = 3.00 dBm
Bst Control Mode = Auto                   Pre Control Mode = Auto
Bst Safety Mode = ALS Auto                Pre Safety Mode = ALS Auto
      Bst Osri = Off                       Pre Osri = Off
      Bst Gain Range = Normal               Pre Gain Range = Normal

```

RP/0/RP0/CPU0:ios# show hw-module slot 1 ampli-trail-view pre

Thu Apr 13 08:44:44.927 CEST

Ampli Trail View - PRE Amplifier

```

=====
Port: 1/LINE
-----
      Rx Power = -7.70 dBm
      Rx Total Power = -7.80 dBm
      Rx Low Threshold = -25.0 dBm

Port: 0/COM
-----
      Tx Power = -50.00 dBm
      Tx Total Power = -50.00 dBm
      Tx Low Threshold = -2.0 dBm

      Ampli Gain = 0.00 dB
      Ampli Tilt = 0.00
      Channel Power = 3.00 dBm
      Control Mode = Auto
      Safety Mode = ALS Auto
      Osri = Off
      Gain Range = Normal

```

RP/0/RP0/CPU0:ios# show hw-module slot 1 channel-trail-view active

Thu Apr 13 08:45:45.582 CEST

Channel Trail View - Active

```

=====
Och Name      Wavelength      Frequency      0/COM - BST - 1/LINE      1/LINE - PRE - 0/COM
              Rx Power        Tx Power        Rx Power        Tx Power
-----

```

RP/0/RP0/CPU0:ios# show hw-module location all fpd Control_BKP

```
RP/0/RP0/CPU0:ios#show hw-module slot 1 channel-trail-view all
Thu Apr 13 08:48:00.763 CEST
```

```
Channel Trail View - All
```

```
=====
1/LINE - PRE - 0/COM                                0/COM - BST - 1/LINE
Och Name      Wavelength      Frequency      Rx Power      Tx Power
Rx Power      Tx Power
-----
Ots-Och0_1_0_0_1      1528.77 nm      196.10 THz      -34.80 dBm      -50.00 dBm
-36.00 dBm      -5.50 dBm
Ots-Och0_1_0_0_2      1529.16 nm      196.05 THz      -35.80 dBm      -50.00 dBm
-38.20 dBm      -5.50 dBm
Ots-Och0_1_0_0_3      1529.55 nm      196.00 THz      -18.70 dBm      -50.00 dBm
-39.30 dBm      -5.40 dBm
Ots-Och0_1_0_0_4      1529.94 nm      195.95 THz      -36.50 dBm      -31.60 dBm
-33.80 dBm      -5.30 dBm
Ots-Och0_1_0_0_5      1530.33 nm      195.90 THz      -35.50 dBm      -50.00 dBm
-42.00 dBm      -5.50 dBm
Ots-Och0_1_0_0_6      1530.72 nm      195.85 THz      -46.40 dBm      -33.90 dBm
-44.10 dBm      -5.60 dBm
Ots-Och0_1_0_0_7      1531.12 nm      195.80 THz      -42.80 dBm      -35.90 dBm
-39.20 dBm      -5.60 dBm
Ots-Och0_1_0_0_8      1531.51 nm      195.75 THz      -39.50 dBm      -43.20 dBm
-44.80 dBm      -5.80 dBm
Ots-Och0_1_0_0_9      1531.90 nm      195.70 THz      -36.20 dBm      -50.00 dBm
-41.20 dBm      -5.80 dBm
Ots-Och0_1_0_0_10     1532.29 nm      195.65 THz      -42.00 dBm      -36.50 dBm
-46.40 dBm      -5.90 dBm
Ots-Och0_1_0_0_11     1532.68 nm      195.60 THz      -30.90 dBm      -33.60 dBm
-32.50 dBm      -6.10 dBm
Ots-Och0_1_0_0_12     1533.07 nm      195.55 THz      -46.00 dBm      -50.00 dBm
-41.00 dBm      -6.40 dBm
Ots-Och0_1_0_0_13     1533.46 nm      195.50 THz      -42.40 dBm      -50.00 dBm
-40.80 dBm      -6.50 dBm
Ots-Och0_1_0_0_14     1533.86 nm      195.45 THz      -42.80 dBm      -34.60 dBm
-37.00 dBm      -6.80 dBm
Ots-Och0_1_0_0_15     1534.25 nm      195.40 THz      -42.50 dBm      -33.60 dBm
-38.30 dBm      -7.00 dBm
Ots-Och0_1_0_0_16     1534.64 nm      195.35 THz      -39.90 dBm      -40.10 dBm
-40.30 dBm      -7.30 dBm
Ots-Och0_1_0_0_17     1535.04 nm      195.30 THz      -36.90 dBm      -50.00 dBm
-37.60 dBm      -7.60 dBm
Ots-Och0_1_0_0_18     1535.43 nm      195.25 THz      -34.00 dBm      -35.40 dBm
-34.80 dBm      -8.00 dBm
Ots-Och0_1_0_0_19     1535.82 nm      195.20 THz      -36.70 dBm      -50.00 dBm
-50.00 dBm      -8.30 dBm
Ots-Och0_1_0_0_20     1536.22 nm      195.15 THz      -39.80 dBm      -50.00 dBm
-41.80 dBm      -8.50 dBm
Ots-Och0_1_0_0_21     1536.61 nm      195.10 THz      -40.20 dBm      -50.00 dBm
-39.40 dBm      -8.60 dBm
Ots-Och0_1_0_0_22     1537.00 nm      195.05 THz      -36.70 dBm      -50.00 dBm
-43.00 dBm      -8.90 dBm
Ots-Och0_1_0_0_23     1537.40 nm      195.00 THz      -39.40 dBm      -50.00 dBm
-40.20 dBm      -9.00 dBm
Ots-Och0_1_0_0_24     1537.79 nm      194.95 THz      -44.40 dBm      -50.00 dBm
-39.10 dBm      -8.90 dBm
Ots-Och0_1_0_0_25     1538.19 nm      194.90 THz      -35.50 dBm      -30.40 dBm
-41.20 dBm      -9.10 dBm
Ots-Och0_1_0_0_26     1538.58 nm      194.85 THz      -39.80 dBm      -50.00 dBm
-41.60 dBm      -9.10 dBm
```

show hw-module

```

Ots-Och0_1_0_0_27      1538.98 nm      194.80 THz      -30.40 dBm      -31.10 dBm
-32.90 dBm      -9.20 dBm
Ots-Och0_1_0_0_28      1539.37 nm      194.75 THz      -40.00 dBm      -50.00 dBm
-38.60 dBm      -9.30 dBm
Ots-Och0_1_0_0_29      1539.77 nm      194.70 THz      -40.90 dBm      -33.50 dBm
-38.50 dBm      -9.30 dBm
Ots-Och0_1_0_0_30      1540.16 nm      194.65 THz      -36.20 dBm      -50.00 dBm
-36.30 dBm      -9.30 dBm
Ots-Och0_1_0_0_31      1540.56 nm      194.60 THz      -35.70 dBm      -50.00 dBm
-43.50 dBm      -9.50 dBm
Ots-Och0_1_0_0_32      1540.95 nm      194.55 THz      -48.70 dBm      -40.20 dBm
-50.00 dBm      -9.50 dBm
Ots-Och0_1_0_0_33      1541.35 nm      194.50 THz      -35.40 dBm      -50.00 dBm
-36.80 dBm      -9.40 dBm
Ots-Och0_1_0_0_34      1541.75 nm      194.45 THz      -34.50 dBm      -50.00 dBm
-38.10 dBm      -9.40 dBm
Ots-Och0_1_0_0_35      1542.14 nm      194.40 THz      -39.60 dBm      -38.00 dBm
-38.60 dBm      -9.50 dBm
Ots-Och0_1_0_0_36      1542.54 nm      194.35 THz      -42.50 dBm      -50.00 dBm
-35.10 dBm      -9.50 dBm
Ots-Och0_1_0_0_37      1542.94 nm      194.30 THz      -34.80 dBm      -39.40 dBm
-38.90 dBm      -9.70 dBm
Ots-Och0_1_0_0_38      1543.33 nm      194.25 THz      -40.10 dBm      -36.90 dBm
-41.60 dBm      -9.80 dBm
Ots-Och0_1_0_0_39      1543.73 nm      194.20 THz      -29.90 dBm      -29.20 dBm
-33.10 dBm      -9.60 dBm
Ots-Och0_1_0_0_40      1544.13 nm      194.15 THz      -36.50 dBm      -50.00 dBm
-34.80 dBm      -9.80 dBm
Ots-Och0_1_0_0_41      1544.53 nm      194.10 THz      -37.60 dBm      -35.50 dBm
-39.40 dBm      -9.90 dBm
Ots-Och0_1_0_0_42      1544.92 nm      194.05 THz      -37.10 dBm      -50.00 dBm
-40.70 dBm      -9.60 dBm
Ots-Och0_1_0_0_43      1545.32 nm      194.00 THz      -38.60 dBm      -50.00 dBm
-36.20 dBm      -9.80 dBm
Ots-Och0_1_0_0_44      1545.72 nm      193.95 THz      -32.40 dBm      -41.30 dBm
-41.80 dBm      -10.20 dBm
Ots-Och0_1_0_0_45      1546.12 nm      193.90 THz      -33.90 dBm      -32.50 dBm
-41.20 dBm      -10.00 dBm
Ots-Och0_1_0_0_46      1546.52 nm      193.85 THz      -38.00 dBm      -50.00 dBm
-50.00 dBm      -10.10 dBm
Ots-Och0_1_0_0_47      1546.92 nm      193.80 THz      -32.70 dBm      -29.80 dBm
-37.40 dBm      -10.20 dBm
Ots-Och0_1_0_0_48      1547.32 nm      193.75 THz      -40.20 dBm      -37.80 dBm
-38.70 dBm      -10.20 dBm
Ots-Och0_1_0_0_49      1547.71 nm      193.70 THz      -35.80 dBm      -32.00 dBm
-40.60 dBm      -10.40 dBm
Ots-Och0_1_0_0_50      1548.12 nm      193.65 THz      -35.70 dBm      -41.10 dBm
-37.80 dBm      -10.40 dBm
Ots-Och0_1_0_0_51      1548.52 nm      193.60 THz      -45.40 dBm      -45.10 dBm
-37.20 dBm      -10.40 dBm
Ots-Och0_1_0_0_52      1548.91 nm      193.55 THz      -47.10 dBm      -32.80 dBm
-39.10 dBm      -10.70 dBm
Ots-Och0_1_0_0_53      1549.32 nm      193.50 THz      -41.60 dBm      -50.00 dBm
-37.40 dBm      -10.60 dBm
Ots-Och0_1_0_0_54      1549.71 nm      193.45 THz      -34.60 dBm      -50.00 dBm
-34.10 dBm      -10.80 dBm
Ots-Och0_1_0_0_55      1550.12 nm      193.40 THz      -38.80 dBm      -50.00 dBm
-43.50 dBm      -10.50 dBm
Ots-Och0_1_0_0_56      1550.52 nm      193.35 THz      -29.40 dBm      -29.90 dBm
-31.30 dBm      -10.90 dBm
Ots-Och0_1_0_0_57      1550.92 nm      193.30 THz      -33.50 dBm      -50.00 dBm
-37.90 dBm      -11.00 dBm
Ots-Och0_1_0_0_58      1551.32 nm      193.25 THz      -38.20 dBm      -35.30 dBm
-37.30 dBm      -10.90 dBm

```

| | | | | |
|-------------------|------------|------------|------------|------------|
| Ots-Och0_1_0_0_59 | 1551.72 nm | 193.20 THz | -30.70 dBm | -36.10 dBm |
| -37.10 dBm | -10.90 dBm | | | |
| Ots-Och0_1_0_0_60 | 1552.12 nm | 193.15 THz | -34.80 dBm | -50.00 dBm |
| -42.00 dBm | -11.10 dBm | | | |
| Ots-Och0_1_0_0_61 | 1552.52 nm | 193.10 THz | -38.00 dBm | -31.80 dBm |
| -35.30 dBm | -11.10 dBm | | | |
| Ots-Och0_1_0_0_62 | 1552.93 nm | 193.05 THz | -33.40 dBm | -30.90 dBm |
| -41.00 dBm | -11.00 dBm | | | |
| Ots-Och0_1_0_0_63 | 1553.33 nm | 193.00 THz | -34.20 dBm | -50.00 dBm |
| -50.00 dBm | -11.20 dBm | | | |
| Ots-Och0_1_0_0_64 | 1553.73 nm | 192.95 THz | -36.40 dBm | -43.50 dBm |
| -36.10 dBm | -11.30 dBm | | | |
| Ots-Och0_1_0_0_65 | 1554.13 nm | 192.90 THz | -41.20 dBm | -37.70 dBm |
| -50.00 dBm | -11.50 dBm | | | |
| Ots-Och0_1_0_0_66 | 1554.54 nm | 192.85 THz | -35.40 dBm | -30.00 dBm |
| -40.10 dBm | -11.30 dBm | | | |
| Ots-Och0_1_0_0_67 | 1554.94 nm | 192.80 THz | -38.70 dBm | -50.00 dBm |
| -37.40 dBm | -11.30 dBm | | | |
| Ots-Och0_1_0_0_68 | 1555.34 nm | 192.75 THz | -42.10 dBm | -50.00 dBm |
| -40.80 dBm | -11.30 dBm | | | |
| Ots-Och0_1_0_0_69 | 1555.75 nm | 192.70 THz | -34.20 dBm | -34.60 dBm |
| -36.20 dBm | -11.30 dBm | | | |
| Ots-Och0_1_0_0_70 | 1556.15 nm | 192.65 THz | -38.10 dBm | -31.60 dBm |
| -37.20 dBm | -11.40 dBm | | | |
| Ots-Och0_1_0_0_71 | 1556.56 nm | 192.60 THz | -43.50 dBm | -36.90 dBm |
| -50.00 dBm | -11.30 dBm | | | |
| Ots-Och0_1_0_0_72 | 1556.96 nm | 192.55 THz | -32.30 dBm | -50.00 dBm |
| -50.00 dBm | -12.00 dBm | | | |
| Ots-Och0_1_0_0_73 | 1557.36 nm | 192.50 THz | -39.50 dBm | -50.00 dBm |
| -37.00 dBm | -11.50 dBm | | | |
| Ots-Och0_1_0_0_74 | 1557.77 nm | 192.45 THz | -35.20 dBm | -50.00 dBm |
| -39.10 dBm | -11.80 dBm | | | |
| Ots-Och0_1_0_0_75 | 1558.17 nm | 192.40 THz | -32.50 dBm | -50.00 dBm |
| -41.00 dBm | -11.40 dBm | | | |
| Ots-Och0_1_0_0_76 | 1558.58 nm | 192.35 THz | -34.70 dBm | -50.00 dBm |
| -39.10 dBm | -11.70 dBm | | | |
| Ots-Och0_1_0_0_77 | 1558.98 nm | 192.30 THz | -37.90 dBm | -50.00 dBm |
| -41.20 dBm | -11.70 dBm | | | |
| Ots-Och0_1_0_0_78 | 1559.39 nm | 192.25 THz | -35.30 dBm | -50.00 dBm |
| -36.10 dBm | -11.90 dBm | | | |
| Ots-Och0_1_0_0_79 | 1559.79 nm | 192.20 THz | -35.70 dBm | -50.00 dBm |
| -50.00 dBm | -12.00 dBm | | | |
| Ots-Och0_1_0_0_80 | 1560.20 nm | 192.15 THz | -35.40 dBm | -50.00 dBm |
| -40.20 dBm | -12.00 dBm | | | |
| Ots-Och0_1_0_0_81 | 1560.61 nm | 192.10 THz | -32.40 dBm | -50.00 dBm |
| -37.80 dBm | -12.10 dBm | | | |
| Ots-Och0_1_0_0_82 | 1561.01 nm | 192.05 THz | -35.80 dBm | -38.10 dBm |
| -37.70 dBm | -12.10 dBm | | | |
| Ots-Och0_1_0_0_83 | 1561.42 nm | 192.00 THz | -33.10 dBm | -50.00 dBm |
| -32.70 dBm | -12.20 dBm | | | |
| Ots-Och0_1_0_0_84 | 1561.83 nm | 191.95 THz | -42.10 dBm | -33.90 dBm |
| -32.60 dBm | -11.90 dBm | | | |
| Ots-Och0_1_0_0_85 | 1562.23 nm | 191.90 THz | -28.90 dBm | -28.60 dBm |
| -30.30 dBm | -12.70 dBm | | | |
| Ots-Och0_1_0_0_86 | 1562.64 nm | 191.85 THz | -31.30 dBm | -50.00 dBm |
| -33.60 dBm | -12.60 dBm | | | |
| Ots-Och0_1_0_0_87 | 1563.05 nm | 191.80 THz | -34.70 dBm | -34.20 dBm |
| -32.70 dBm | -12.40 dBm | | | |
| Ots-Och0_1_0_0_88 | 1563.45 nm | 191.75 THz | -35.10 dBm | -34.20 dBm |
| -35.00 dBm | -13.00 dBm | | | |
| Ots-Och0_1_0_0_89 | 1563.86 nm | 191.70 THz | -33.00 dBm | -32.00 dBm |
| -42.10 dBm | -12.70 dBm | | | |
| Ots-Och0_1_0_0_90 | 1564.27 nm | 191.65 THz | -39.90 dBm | -50.00 dBm |
| -33.90 dBm | -13.20 dBm | | | |

```

Ots-Och0_1_0_0_91      1564.68 nm      191.60 THz      -34.90 dBm      -50.00 dBm
-35.70 dBm      -13.10 dBm
Ots-Och0_1_0_0_92      1565.09 nm      191.55 THz      -30.40 dBm      -32.00 dBm
-50.00 dBm      -13.30 dBm
Ots-Och0_1_0_0_93      1565.50 nm      191.50 THz      -38.00 dBm      -50.00 dBm
-50.00 dBm      -13.70 dBm
Ots-Och0_1_0_0_94      1565.90 nm      191.45 THz      -31.90 dBm      -36.00 dBm
-37.70 dBm      -12.90 dBm
Ots-Och0_1_0_0_95      1566.31 nm      191.40 THz      -35.40 dBm      -31.30 dBm
-35.70 dBm      -13.30 dBm
Ots-Och0_1_0_0_96      1566.72 nm      191.35 THz      -38.30 dBm      -50.00 dBm
-33.90 dBm      -13.90 dBm

```

show inventory

To retrieve and display the physical inventory information, use the **show inventory** command in EXEC or administration EXEC mode.

show inventory [{*WORD* | **all** | **details** | **location** {*WORD* | **all** | **0/0** | **0/1** | **0/2** | **0/3** | **0/FT0** | **0/FT1** | **0/FT2** | **0/FT3** | **0/RP0**} **details** | **raw** | {**details**} | **vendor-type**}]

Syntax Description

| | |
|--------------------|---|
| WORD | (Optional) Displays information of the partially qualified location specification. |
| all | (Optional) Displays inventory information for all the physical entities. |
| details | (Optional) Displays the detailed entity information. |
| location | (Optional) Displays inventory information for the specified location of the chassis. 0/0, 0/1, 0/2, 0/3, 0/FT0, 0/FT1, 0/FT2, 0/FT3, 0/RP0 —Fully qualified location specification. |
| raw | (Optional) Displays raw information about the chassis for diagnostic purposes. |
| vendor-type | (Optional) Displays vendor type inventory information about the chassis. |

Command Default

All hardware inventory information is displayed.

Command Modes

EXEC

Administration EXEC

Command History

| Release | Modification |
|---------------|--|
| Release 6.2.1 | This command was introduced. |
| Release 6.5.1 | The output was updated to include the passive modules connected through the USB ports. |

Example

RP/0/RP0/CPU0:ios# **show inventory**


```

Thu Apr 13 09:21:03.096 CEST
NAME: "0/0", DESCR: "Network Convergence System 1001 line system 3 slots"
PID: NCS1001-K9          , VID: V00, SN: CAT2015B010

NAME: "0/1", DESCR: "Network Convergence System 1000 amplifier module"
PID: NCS1K-EDFA        , VID: V01, SN: IIF2025003L

NAME: "0/2", DESCR: "Network Convergence System 1000 protection module"
PID: NCS1K-PSM         , VID: V01, SN: OPM20461001

NAME: "0/3", DESCR: "Network Convergence System 1000 amplifier module"
PID: NCS1K-EDFA        , VID: V01, SN: IIF2024001K

NAME: "0/RP0", DESCR: "Network Convergence System 1000 Controller"
PID: NCS1K-CNTRLR2     , VID: V01, SN: CAT2013B00P

NAME: "0/RP0-SFP-PORT", DESCR: "Unqualified SFP Pluggable Optics Module"
PID: ONS-SI-GE-LX      , VID: V01 , SN: FNS17350WZT

NAME: "Rack 0", DESCR: "Network Convergence System 1001 line system 3 slots"
PID: NCS1001-K9        , VID: V00, SN: CAT2015B010

NAME: "0/FT0", DESCR: "Network Convergence System 1001 Fan"
PID: NCS1K1-FAN        , VID: V01, SN: N/A

NAME: "0/FT1", DESCR: "Network Convergence System 1001 Fan"
PID: NCS1K1-FAN        , VID: V01, SN: N/A

NAME: "0/FT2", DESCR: "Network Convergence System 1001 Fan"
PID: NCS1K1-FAN        , VID: V01, SN: N/A

NAME: "0/FT3", DESCR: "Network Convergence System 1001 Fan"
PID: NCS1K1-FAN        , VID: V01, SN: N/A

NAME: "0/PM0", DESCR: "Network Convergence System 1000 2KW AC PSU"
PID: NCS1K-2KW-AC2     , VID: V00, SN: POG2004JT0L

NAME: "0/PM1", DESCR: "Network Convergence System 1000 2KW AC PSU"
PID: NCS1K-2KW-AC2     , VID: V00, SN: POG2015JT1G

NAME: "0/RP0-USB0", DESCR: "ONS Mux/Demux Patch Panel Even Extended"
PID: 15216-MD-48-EVENE , VID: V01 , SN: NSZ19510021

NAME: "0/RP0-USB1", DESCR: "OSC Combiner-Splitter Module"
PID: 15216-FLD-OSC=    , VID: V00 , SN: OPL17190305

NAME: "0/RP0-USB2", DESCR: "ONS Mux/Demux Patch Panel Odd Extended"
PID: 15216-MD-48-ODDE , VID: V01 , SN: NSZ19510003

NAME: "0/RP0-USB3", DESCR: "ONS Coupler and Splitter Pluggable"
PID: 15216-MD-48-CME   , VID: V01 , SN: NSZ20159002

```

RP0/RP0/CPU0:ios# show inventory details

```

Thu Apr 13 09:22:11.529 CEST
NAME: "0/0", DESCR: "Network Convergence System 1001 line system 3 slots"
PID: NCS1001-K9          , VID: V00, SN: CAT2015B010
MFG_NAME: CISCO SYSTEMS, INC, SNMP_IDX: 4097          , Type: Module
PN: N/A

NAME: "0/1", DESCR: "Network Convergence System 1000 amplifier module"
PID: NCS1K-EDFA        , VID: V01, SN: IIF2025003L
MFG_NAME: CISCO SYSTEMS, INC, SNMP_IDX: 8193          , Type: Module

```

show inventory

```

PN: N/A

NAME: "0/3", DESCR: "Network Convergence System 1000 amplifier module"
PID: NCS1K-EDFA , VID: V01, SN: IIF2024001K
MFG_NAME: CISCO SYSTEMS, INC, SNMP_IDX: 16385 , Type: Module
PN: N/A

NAME: "0/RP0", DESCR: "Network Convergence System 1000 Controller"
PID: NCS1K-CNTLR2 , VID: V01, SN: CAT2013B00P
MFG_NAME: CISCO SYSTEMS, INC, SNMP_IDX: 1 , Type: Module
PN: 800-45459-02

NAME: "0/RP0-SFP-PORT", DESCR: "Unqualified SFP Pluggable Optics Module"
PID: ONS-SI-GE-LX , VID: V01 , SN: FNS17350WZT
MFG_NAME: CISCO-FINISAR , SNMP_IDX: 532481 , Type: Module
PN: N/A

NAME: "Rack 0", DESCR: "Network Convergence System 1001 line system 3 slots"
PID: NCS1001-K9 , VID: V00, SN: CAT2015B010
MFG_NAME: CISCO SYSTEMS, INC, SNMP_IDX: 8384513 , Type: Rack
PN: 800-46433-01

NAME: "0/FT0", DESCR: "Network Convergence System 1001 Fan"
PID: NCS1K1-FAN , VID: V01, SN: N/A
MFG_NAME: CISCO SYSTEMS, INC, SNMP_IDX: 20481 , Type: Fantray
PN: N/A

NAME: "0/FT1", DESCR: "Network Convergence System 1001 Fan"
PID: NCS1K1-FAN , VID: V01, SN: N/A
MFG_NAME: CISCO SYSTEMS, INC, SNMP_IDX: 24577 , Type: Fantray
PN: N/A

NAME: "0/FT2", DESCR: "Network Convergence System 1001 Fan"
PID: NCS1K1-FAN , VID: V01, SN: N/A
MFG_NAME: CISCO SYSTEMS, INC, SNMP_IDX: 28673 , Type: Fantray
PN: N/A

NAME: "0/FT3", DESCR: "Network Convergence System 1001 Fan"
PID: NCS1K1-FAN , VID: V01, SN: N/A
MFG_NAME: CISCO SYSTEMS, INC, SNMP_IDX: 32769 , Type: Fantray
PN: N/A

NAME: "0/PM0", DESCR: "Network Convergence System 1000 2KW AC PSU"
PID: NCS1K-2KW-AC2 , VID: V00, SN: POG2004JT0L
MFG_NAME: CISCO SYSTEMS, INC, SNMP_IDX: 36865 , Type: Power Supply
PN: 341-100362-02

NAME: "0/PM1", DESCR: "Network Convergence System 1000 2KW AC PSU"
PID: NCS1K-2KW-AC2 , VID: V00, SN: POG2015JT1G
MFG_NAME: CISCO SYSTEMS, INC, SNMP_IDX: 40961 , Type: Power Supply
PN: 341-100362-02

```

RP/0/RP0/CPU0:ios# show inventory raw

```

Thu Apr 13 09:25:46.814 CEST
NAME: "Rack 0-Interconnect Board Slot", DESCR: "NCS1K1 Interconnect Board"
PID: N/A , VID: N/A, SN: N/A

NAME: "0/0", DESCR: "Network Convergence System 1001 line system 3 slots"
PID: NCS1001-K9 , VID: V00, SN: CAT2015B010

NAME: "0/0-Module Interconnect Board", DESCR: "Module Interconnect Board"
PID: N/A , VID: N/A, SN: N/A

```

```

NAME: "0/0-Power Sequencer 1", DESCR: "Sensor Module 1"
PID: N/A , VID: N/A, SN: N/A

NAME: "0/0-V12P0 IMON MOD1 CS", DESCR: "Current Sensor"
PID: N/A , VID: N/A, SN: N/A

NAME: "0/0-V12P0 IMON MOD2 CS", DESCR: "Current Sensor"
PID: N/A , VID: N/A, SN: N/A

NAME: "0/0-V12P0 IMON MOD3 CS", DESCR: "Current Sensor"
PID: N/A , VID: N/A, SN: N/A

NAME: "0/0-V1P2 IMON FPGA Core", DESCR: "Current Sensor"
PID: N/A , VID: N/A, SN: N/A

NAME: "0/0-V1P0 IMON PON Core", DESCR: "Current Sensor"
PID: N/A , VID: N/A, SN: N/A

NAME: "0/0-V0P9 IMON PEX Core", DESCR: "Current Sensor"
PID: N/A , VID: N/A, SN: N/A

NAME: "0/0-V3P3", DESCR: "Voltage Sensor"
PID: N/A , VID: N/A, SN: N/A

NAME: "0/0-V5P0 USB0-1", DESCR: "Voltage Sensor"
PID: N/A , VID: N/A, SN: N/A

NAME: "0/0-V5P0 USB2-3", DESCR: "Voltage Sensor"
PID: N/A , VID: N/A, SN: N/A

NAME: "0/0-V5P0 SATA", DESCR: "Voltage Sensor"
PID: N/A , VID: N/A, SN: N/A

NAME: "0/0-V1P8", DESCR: "Voltage Sensor"
PID: N/A , VID: N/A, SN: N/A

NAME: "0/0-V1P2 FPGA Core", DESCR: "Voltage Sensor"
PID: N/A , VID: N/A, SN: N/A

NAME: "0/0-V0P9 PEX Core", DESCR: "Voltage Sensor"
PID: N/A , VID: N/A, SN: N/A

```

show platform

To display information and status for each node in the system, use the **show platform** command in XR EXEC or administration EXEC mode.

```
show platform [{WORD | vm | 0/0 | 0/1 | 0/2 | 0/3 | 0/FT0 | 0/FT1 | 0/FT2 | 0/FT3 | 0/RP0 }]
```

| Syntax | Description |
|--|---|
| <i>WORD</i> | (Optional) Specifies the node type. |
| vm | (Optional) Displays the virtual machine information of node. |
| 0/0, 0/1, 0/2, 0/3, 0/FT0, 0/FT1, 0/FT2, 0/FT3, 0/RP0 | (Optional) Displays the platform detail of the specified node location. |

Command Default The status and information are displayed for all the nodes in the system.

Command Modes EXEC
Administration EXEC

| Command History | Release | Modification |
|-----------------|---------------|------------------------------|
| | Release 6.2.1 | This command was introduced. |

Example

The following example shows sample output from the **show platform** command.

RP/0/RP0/CPU0:ios#**show platform**

```
Mon Apr 17 07:37:38.014 CEST
Node          Type                               State          Config state
-----
0/0           NCS1001-K9                         OPERATIONAL    NSHUT
0/1           NCS1K-EDFA                          OPERATIONAL    NSHUT
0/2           NCS1K-PSM                           OPERATIONAL    NSHUT
0/3           NCS1K-EDFA                          OPERATIONAL    NSHUT
0/RP0/CPU0   NCS1K-CNTRLR2 (Active)             IOS XR RUN     NSHUT
0/FT0        NCS1K1-FAN                          OPERATIONAL    NSHUT
0/FT1        NCS1K1-FAN                          OPERATIONAL    NSHUT
0/FT2        NCS1K1-FAN                          OPERATIONAL    NSHUT
0/FT3        NCS1K1-FAN                          OPERATIONAL    NSHUT
```

RP/0/RP0/CPU0:ios# **show platform vm**

```
Mon Apr 17 07:38:54.025 CEST
Node name     Node type      Partner name   SW status      IP address
-----
0/RP0/CPU0   RP (ACTIVE)    NONE           FINAL Band     192.0.0.4
```