



Downstream Power Tilt

The Downstream Power tilt feature is used to correct cable loss in the head-end to produce a flat power spectrum for all channels in the controller port.

- [Hardware Compatibility Matrix for the Cisco cBR Series Routers, on page 1](#)
- [Information about Downstream Power Tilt, on page 3](#)
- [How to Configure the Downstream Power Tilt, on page 3](#)
- [Feature Information for Downstream Power Tilt, on page 5](#)

Hardware Compatibility Matrix for the Cisco cBR Series Routers



Note The hardware components that are introduced in a given Cisco IOS-XE Release are supported in all subsequent releases unless otherwise specified.

Table 1: Hardware Compatibility Matrix for the Cisco cBR Series Routers

Cisco CMTS Platform	Processor Engine	Interface Cards
Cisco cBR-8 Converged Broadband Router	<p>Cisco IOS-XE Release 16.5.1 and Later Releases</p> <p>Cisco cBR-8 Supervisor:</p> <ul style="list-style-type: none"> • PID—CBR-SUP-250G • PID—CBR-CCAP-SUP-160G 	<p>Cisco IOS-XE Release 16.5.1 and Later Releases</p> <p>Cisco cBR-8 CCAP Line Cards:</p> <ul style="list-style-type: none"> • PID—CBR-LC-8D30-16U30 • PID—CBR-LC-8D31-16U30 • PID—CBR-RF-PIC • PID—CBR-RF-PROT-PIC • PID—CBR-CCAP-LC-40G • PID—CBR-CCAP-LC-40G-R • PID—CBR-CCAP-LC-G2-R • PID—CBR-SUP-8X10G-PIC • PID—CBR-2X100G-PIC <p>Digital PICs:</p> <ul style="list-style-type: none"> • PID—CBR-DPIC-8X10G • PID—CBR-DPIC-2X100G <p>Cisco cBR-8 Downstream PHY Module:</p> <ul style="list-style-type: none"> • PID—CBR-D31-DS-MOD <p>Cisco cBR-8 Upstream PHY Modules:</p> <ul style="list-style-type: none"> • PID—CBR-D31-US-MOD



Note Do not use DPICs (8X10G and 2x100G) to forward IP traffic, as it may cause buffer exhaustion, leading to line card reload.

The only allowed traffic on a DPIC interface is DEPI, UEPI, and GCP traffic from the Cisco cBR-8 router to Remote PHY devices. Other traffic such as DHCP, SSH, and UTSC should flow via another router, since DPICs cannot be used for normal routing.

Information about Downstream Power Tilt

The downstream power tilt feature is used to correct cable loss in the head-end to produce a flat power spectrum for all channels on the controller port.



Note There may be noise floor degradation on the failover path (following linecard switchover) with this feature enabled.

Restrictions for Configuring Downstream Power Profile

The downstream power tilt feature and OFDM power profile feature are mutually exclusive. They cannot be configured at the same time.

How to Configure the Downstream Power Tilt

Configuring Downstream Power Tilt

Downstream power tilt applies to all the SCQAM or OFDM channels on the downstream. To configure downstream power tilt for a controller port, use the power-tilt configuration command under the downstream controller port.

```
enable
configure terminal
controller Integrated-Cable slot/subslot/port
max-ofdm-spectrum value
max-carrier value
base-channel-power value
power-tilt mode loss max-frequency freq-max
rf-chan start_id [end_id]
type value
rf-output value
power-adjust value
qam-profile id
docsis-channel-id id
ofdm channel-profile id start-frequency value width value [plc value]
```

Below is an example:

```
controller Integrated-Cable 3/0/0
max-ofdm-spectrum 192000000
max-carrier 32
base-channel-power 34
power-tilt linear 4.0 max-frequency 696000000
rf-chan 0 31
type DOCSIS
frequency 261000000
rf-output NORMAL
power-adjust -2.0
```

```

qam-profile 1
docsis-channel-id 1
rf-chan 158
power-adjust 0
docsis-channel-id 159
ofdm channel-profile 20 start-frequency 600000000 width 96000000 plc 645000000

```

In the above configuration steps, there is a command **power-tilt mode loss max-frequency freq-max**, where the *mode* represent a formula that calculates the loss of a coax cable at a frequency F, given the loss at *freq-max* is known. It provides two options to select:

- linear: $loss_F = loss_{freq-max} * (F / freq-max)$
- cable-loss-approx: $loss_F = loss_{freq-max} * SQRT((freq-max - F) / freq-max)$

loss is the measured cable loss at *freq-max*, specified in 1/10 dB.

Verifying Downstream Power Tilt Configuration

To display the downstream power tilt details, use the **show cable controller integrated-cable** command as given in the following example. This command will display the actual SCQAM and OFDM channel power levels as set by the DS Power Tilt command. For OFDM channels, the power level displayed represents the center frequency 6-MHz band power level.

```
Router# show controller Integrated-Cable 1/0/1 rf-chan 0-162
```

Chan	State	Admin	Frequency	Type	Annex	Mod	srate	Interleaver	dcid	power	output
0	UP	UP	261000000	DOCSIS	B	256	5361	I32-J4	1	29.9	NORMAL
1	UP	UP	267000000	DOCSIS	B	256	5361	I32-J4	2	30.0	NORMAL
2	UP	UP	273000000	DOCSIS	B	256	5361	I32-J4	3	30.0	NORMAL
3	UP	UP	279000000	DOCSIS	B	256	5361	I32-J4	4	30.0	NORMAL
4	UP	UP	285000000	DOCSIS	B	256	5361	I32-J4	5	30.1	NORMAL
5	UP	UP	291000000	DOCSIS	B	256	5361	I32-J4	6	30.1	NORMAL
6	UP	UP	297000000	DOCSIS	B	256	5361	I32-J4	7	30.2	NORMAL
7	UP	UP	303000000	DOCSIS	B	256	5361	I32-J4	8	30.2	NORMAL
8	UP	UP	309000000	DOCSIS	B	256	5361	I32-J4	9	30.2	NORMAL
9	UP	UP	315000000	DOCSIS	B	256	5361	I32-J4	10	30.3	NORMAL
10	UP	UP	321000000	DOCSIS	B	256	5361	I32-J4	11	30.3	NORMAL
11	UP	UP	327000000	DOCSIS	B	256	5361	I32-J4	12	30.3	NORMAL
12	UP	UP	333000000	DOCSIS	B	256	5361	I32-J4	13	30.4	NORMAL
13	UP	UP	339000000	DOCSIS	B	256	5361	I32-J4	14	30.4	NORMAL
14	UP	UP	345000000	DOCSIS	B	256	5361	I32-J4	15	30.4	NORMAL
15	UP	UP	351000000	DOCSIS	B	256	5361	I32-J4	16	30.5	NORMAL
16	UP	UP	357000000	DOCSIS	B	256	5361	I32-J4	17	30.5	NORMAL
17	UP	UP	363000000	DOCSIS	B	256	5361	I32-J4	18	30.5	NORMAL
18	UP	UP	369000000	DOCSIS	B	256	5361	I32-J4	19	30.6	NORMAL
19	UP	UP	375000000	DOCSIS	B	256	5361	I32-J4	20	30.6	NORMAL
20	UP	UP	381000000	DOCSIS	B	256	5361	I32-J4	21	30.6	NORMAL
21	UP	UP	387000000	DOCSIS	B	256	5361	I32-J4	22	30.7	NORMAL
22	UP	UP	393000000	DOCSIS	B	256	5361	I32-J4	23	30.7	NORMAL
23	UP	UP	399000000	DOCSIS	B	256	5361	I32-J4	24	30.7	NORMAL
24	UP	UP	405000000	DOCSIS	B	256	5361	I32-J4	25	30.8	NORMAL
25	UP	UP	411000000	DOCSIS	B	256	5361	I32-J4	26	30.8	NORMAL
26	UP	UP	417000000	DOCSIS	B	256	5361	I32-J4	27	30.8	NORMAL
27	UP	UP	423000000	DOCSIS	B	256	5361	I32-J4	28	30.9	NORMAL
28	UP	UP	429000000	DOCSIS	B	256	5361	I32-J4	29	30.9	NORMAL
29	UP	UP	435000000	DOCSIS	B	256	5361	I32-J4	30	30.9	NORMAL
30	UP	UP	441000000	DOCSIS	B	256	5361	I32-J4	31	30.9	NORMAL
31	UP	UP	447000000	DOCSIS	B	256	5361	I32-J4	32	31.0	NORMAL

```
Chan State Admin Mod-Type Start Width PLC Profile-ID dcid power output Frequency
```

158 UP UP OFDM 600000000 96000000 645000000 22

159 33.9

NORMAL

Feature Information for Downstream Power Tilt

Use Cisco Feature Navigator to find information about the platform support and software image support. Cisco Feature Navigator enables you to determine which software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to the <https://cfng.cisco.com/> link. An account on the Cisco.com page is not required.



Note The following table lists the software release in which a given feature is introduced. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Table 2: Feature Information for Downstream Power Tilt

Feature Name	Releases	Feature Information
Downstream Power Tilt	Cisco IOS XE Fuji 16.7.1	This feature was introduced on Cisco IOS XE Fuji 16.7.1 on the Cisco cBR Series Converged Broadband Routers.

