

## ClearSpectrum™ CDE Chromatic Dispersion Emulator



The ClearSpectrum™ CDE is an ultra-compact chromatic dispersion emulator that uses TeraXion's fiber Bragg grating (FBG) technology to emulate the chromatic dispersion of hundreds or thousands of kilometers of fiber within the volume of a single half 1U 19-inch rack module. The modules have an ultra-low insertion loss and can be cascaded several times to emulate hundreds of thousands of picoseconds per nanometer of dispersion with no external power required.

TeraXion developed the ClearSpectrum™ CDE as a space-saving and cost effective solution for researchers who need to emulate the chromatic dispersion of hundreds or even thousands of kilometers of fiber. The ultra-low insertion loss also reduces the number of amplifiers required for long-haul emulation, trimming expenses while saving laboratory space.

### Top 5 Features

- **Low Insertion Loss:** the ClearSpectrum™ CDE significantly reduces the accumulated insertion loss caused by hundreds or thousands of kilometers of transport fiber, thus reducing the number of amplifiers needed when emulating very long fiber links.
- **Cost-effective:** the ClearSpectrum™ CDE eliminates the cost of purchasing and storing large fiber spools and reduces the number of amplifiers needed for long-haul transmission emulation.
- **Wide Bandwidth:** the CDE supports bandwidths as high as 350 GHz.
- **Massive Dispersion Levels:** dispersion emulation as high as 45,000 ps/nm per module. CDE modules can be cascaded to emulate submarine networks dispersion levels.
- **Ultra-compact:** the ClearSpectrum™ CDE is available as either half 1U 19-inch rack-mountable or benchtop modules.



## Single-channel Wide-bandwidth Chromatic Dispersion Emulator

Operation Bandwidth		> 350 GHz			
Channel Wavelength <sup>(1)</sup>		Any wavelength in the C-band or L-band			
Parameters	Outputs			A	Units
	A	A+B	A+B+C		
Dispersion Emulation Level	5 000	10 000	15 000	10 000	ps/nm
Dispersion Accuracy	≤ 2	≤ 2	≤ 2	≤ 2	%
Insertion Loss	≤ 4	≤ 7	≤ 10	≤ 7	dB

(1) Contact TeraXion for O-band

## Multi-channel Chromatic Dispersion Emulator

Multi-channel configurations can be designed in both C-band and L-band, upon requests.

Operation Bandwidth		> 50 GHz								
Channel Spacing		100 GHz								
Parameters	Outputs			Outputs			Outputs			Units
	A	A+B	A+B+C	A	A+B	A+B+C	A	A+B	A+B+C	
Dispersion Emulation Level	3 333	6 666	10 000	10 000	20 000	30 000	15 000	30 000	45 000	ps/nm
Dispersion Accuracy	≤ 3	≤ 3	≤ 3	≤ 3	≤ 2	≤ 2	≤ 3	≤ 2	≤ 2	%
Insertion Loss	≤ 5	≤ 9	≤ 12	≤ 12	≤ 24	≤ 36	≤ 16	≤ 32	≤ 48	dB

Operation Bandwidth		> 70 GHz		
Channel Spacing		200 GHz <sup>(1)</sup>		
Parameters	Outputs			Units
	A	A+B	A+B+C	
Dispersion Emulation Level	4 500	9 000	15 000	ps/nm
Dispersion Accuracy	≤ 3	≤ 3	≤ 3	%
Insertion Loss	≤ 7	≤ 12	≤ 20	dB

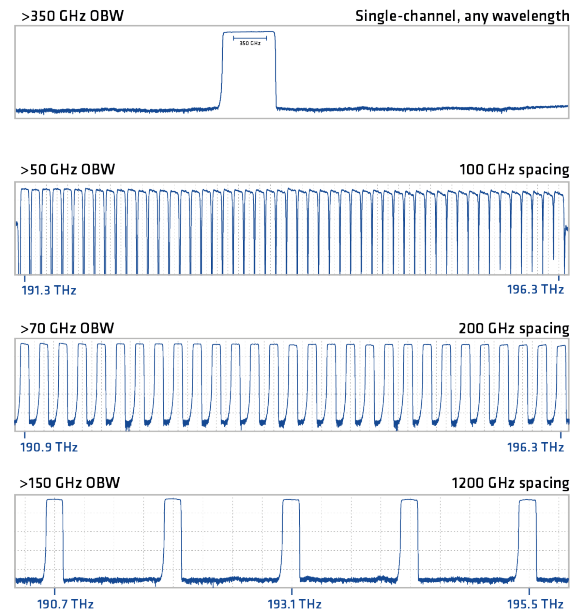
(1) Choice of odd or even channels on 100 GHz ITU grid

Operation Bandwidth		> 150 GHz <sup>(1)</sup>		
Channel Spacing		1200 GHz; aligned on 75 GHz grid <sup>(2)</sup>		
Parameters	Outputs			Units
	A	A+B	A+B+C	
Dispersion Emulation Level	5 000	10 000	15 000	ps/nm
Dispersion Accuracy	≤ 3	≤ 2	≤ 2	%
Insertion Loss	≤ 11	≤ 22	≤ 33	dB

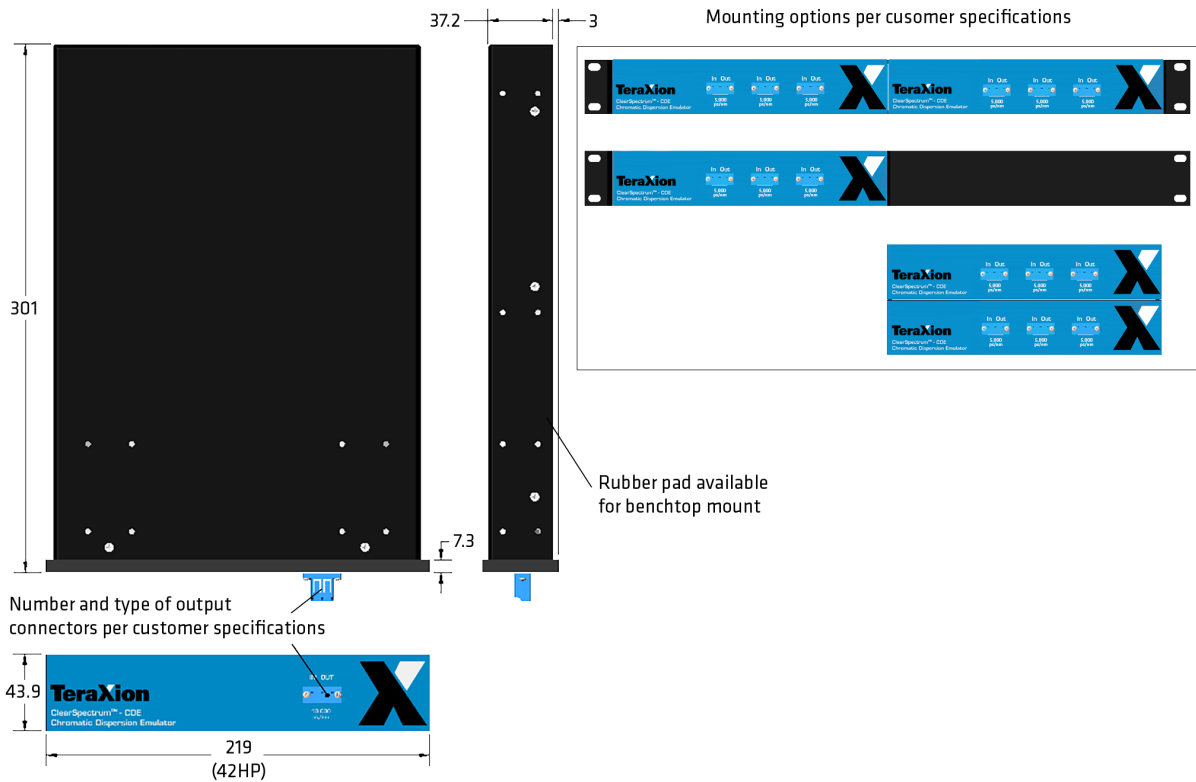
(1) Specification for C-band

(2) Contact TeraXion for specific center channel positioning

### Example of spectral profiles for various CDE configurations



## Module Dimensions



## Environmental and Mechanical Specifications

Parameters	Values	Units
Operating Temperature	10 to 40	°C
Storage Temperature	-40 to 85	°C
Output Connectors <sup>(1)</sup>	LC-UPC	
Module Dimension	1U for half 19-inch rack	
Mounting Options for Single Unit <sup>(2)</sup>	Benchtop or rack-mount brackets	
Mounting Options for Multiple Units <sup>(2)</sup>	Benchtop stacking brackets or side-by-side 1U rack-mount brackets	
RoHS Compliance	Yes	

(1) Other connectors available on request

(2) Mechanical drawing available on request

### Ordering information

For orders, questions, specific requirements or to learn more about TeraXion's products, contact us at [info@teraxion.com](mailto:info@teraxion.com)

# TeraXion

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