

CT440

OPTICAL COMPONENT TESTER



EXFO's CT440 is a compact tester for fast and accurate characterization of passive optical components (MUX/DEMUX, filters, splitters, etc.) and modules (ROADM, WSS). The unit covers the spectral range from 1240 to 1680 nm, so measurements can be made over the full telecom band.

KEY FEATURES

Fast transfer function measurement

Wavelength band: SMF type: 1240–1680 nm
PM13 type: 1260–1360 nm
PM15 type: 1440–1640 nm

Wavelength resolution: 1 to 250 pm

Wavelength accuracy: ± 5 pm

Dynamic range: 65 dB in a single sweep

Combines up to four tunable lasers (SMF type)

Four internal detectors, expandable with synchronization

FULL BAND SWEEP

The CT440 is a unique instrument that allows you to sweep continuously over several lasers (up to four) in order to achieve a fast, full-range measurement from 1240 to 1680 nm (in SMF version).

It achieves 1 pm resolution over the full band.

FAST INSERTION LOSS MEASUREMENT

The CT440 features a unique combination of high-speed electronics and optical interferometry. Up to four simultaneous measurements are now possible with ± 5 pm wavelength accuracy. This means the CT440 can be used during optical alignment in manufacturing, as well as for optical sensor analysis.

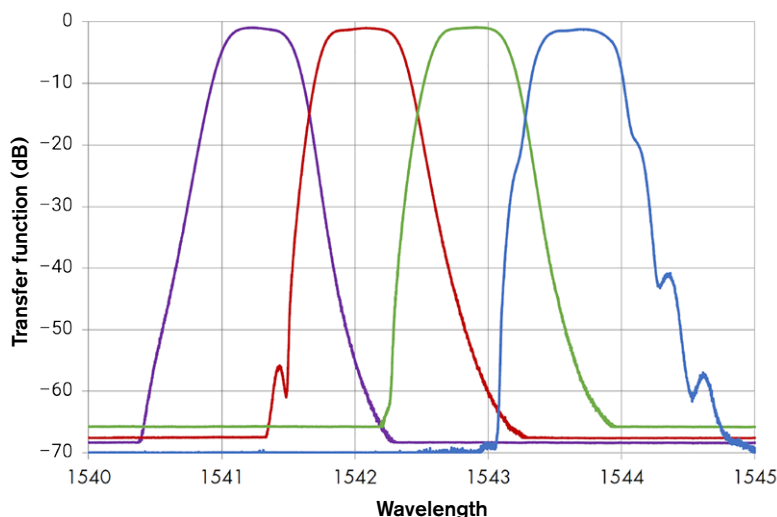


Figure 1. Four channel DWDM filter measurement in single sweep

ACCURATE IL MEASUREMENT

The CT440 integrates a monitoring photodetector to compensate for any power fluctuation coming from the laser source during the sweep. Sampling resolution can be chosen between 1 and 250 pm independently of the laser sweep speed. In addition to the unit's ± 5 pm wavelength accuracy, its built-in wavemeter relaxes TLS requirements to bring down system cost without affecting measurement performance. The CT440 provides all the features you need for accurate measurements in a single box when interfaced with a tunable laser source (TLS) and a PC.

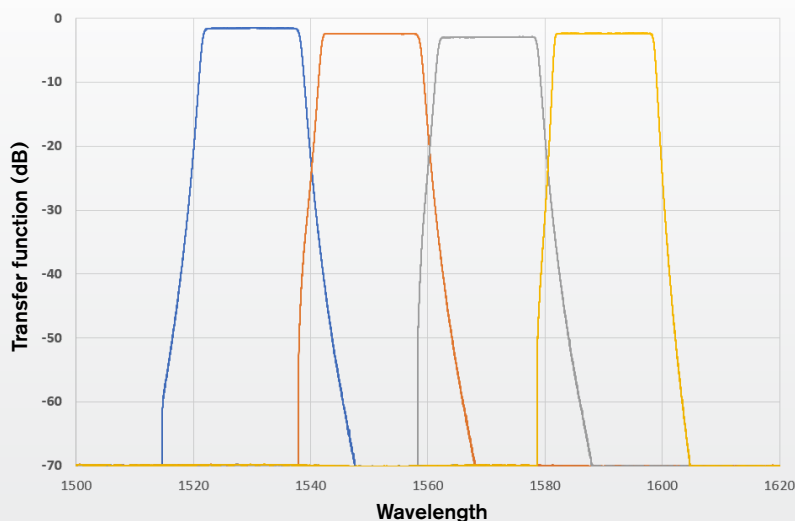


Figure 2. IL measurement on a CWDM filter

SPECIFICATIONS

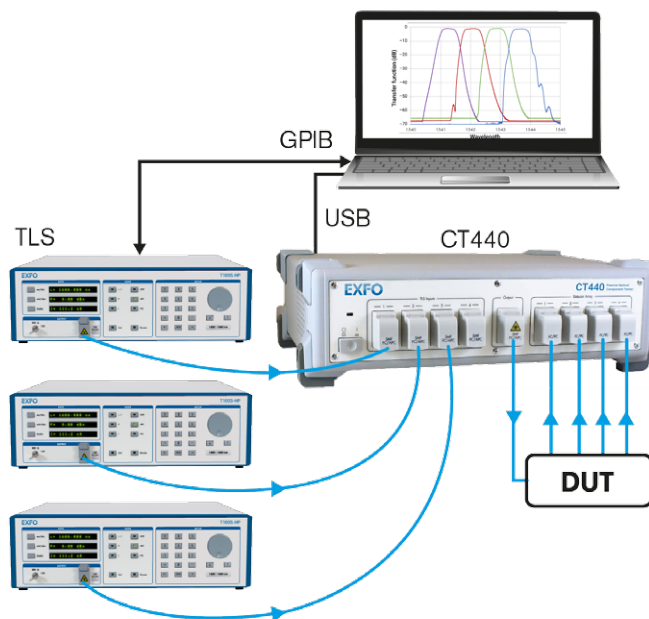
			SMF	PM13	PM15
Wavelength	Operating wavelength range (nm)		1240 to 1680	1260 to 1360	1440 to 1640
	Wavelength accuracy	Absolute ^{a, b}	±5 pm		
		Relative ^a	±1 pm		
Optical ports (front panel)	TLS inputs and outputs	Number of input ports	1 to 4	1	
		Number of output ports	1		
		Connector type	FC/APC narrow key	FC/APC narrow key (PM: slow axis aligned to connector key)	
		Polarization extinction ration (PER)	n/a	≥ 20 dB	
	Detector array	Number of detector ports	1 to 4		
		Connector type	FC/PC wide key		
Electrical ports (rear panel)	BNC A	Trigger out (5 V TTL)	Swept measurement external synchronization (pulse train generated at native sampling resolution)		
	BNC B	Trigger in (5 V TTL)	Triggered measurement without laser sweep control (measurement is taken when TTL level = high)		
	BNC C	Analog voltage in (0-5 V high impedance)	Voltage level sampling from an external device (sampling resolution of 1.3 mV)		
Optical power	Power range	On TLS input (dBm)	0 to 10		
		On detector ports (dBm)	–60 to 7		
	Transfer function	Accuracy (dB) ^{c, d}	±0.2		
		Sampling resolution (dB)	0.02		
		Dynamic range ^{d, e}	65 dB typ. for models with 1 or 2 TLS input ports 60 dB typ. for models with 3 or 4 TLS input ports		
Sampling characteristics	Resolution (pm)		1 to 250		
	Native sampling resolution		N x 100 ±10 MHz (N=1 to 250)		
	Compatible sweep speed of TLS (nm/s)		From 10 to 100		
Data handling	Interface with PC / Data rate		USB-B 2.0 / 4 MBaud		
	Maximum number of transfer function data points per TLS per detector as a function of number of activated detectors by software ^f		260,000 for 1 detector 219,500 for 2 detectors 164,400 for 3 detectors 131,100 for 4 detectors 110,500 for 5 detectors		
Environment	Operating temperature range / Relative humidity		15 °C to 30 °C (59 °F to 86 °F) / < 80 % (non condensing)		
	Storage temperature range		–10 °C to 60 °C (14 °F to 140 °F)		
	Power supply		AC 100 V to 240 V (50 Hz to 60 Hz)		
	Dimensions (W x H x D)		335 mm x 110 mm x 320 mm (13.2 in x 4.33 in x 12.6 in)		
	Weight		4 kg (8.8 lb)		

Notes

- a. For a TLS sweep > 5 nm at sampling resolution of 1 pm, excluding the acceleration and deceleration part of the TLS sweep
- b. After wavelength referencing
- c. For incident power on detectors > -30 dBm. Accuracy: ± 0.5 dB for power between -30 dBm and -60 dBm
- d. 1260 nm to 1640 nm
- e. If laser output power = 10 mW (dynamic range is proportional to laser output power)
- f. Selected frequency range of the laser divided by the native sampling resolution

MEASUREMENT SET-UP

Tunable laser source (TLS)		PC	
Remote control	GPIO	Operating system	From Windows XP to Windows 10
Output power	See CT440 specifications above	Interfaces	USB-B 2.0 port to CT440 and GPIO interface card to TLS
Sweep speed	See CT440 specifications above		
Mode hops	No mode hop is best but the instrument is able to detect and still operates with a few mode hops		



ORDERING INFORMATION

CT440-XX-XX-XX

Number of laser inputs

- 1 = 1 laser input
- 2 = 2 laser inputs ^a
- 3 = 3 laser inputs ^a
- 4 = 4 laser inputs ^a

Number of detectors

- 1 = 1 detector
- 2 = 2 detectors
- 3 = 3 detectors
- 4 = 4 detectors

Wavelength range and fiber type

- F = 1240 nm to 1680 nm, SMF28 singlemode fiber
- SCL = 1440 nm to 1640 nm, PM15 polarization maintaining fiber
- O = 1260 nm to 1360 nm, PM13 polarization maintaining fiber

Example: CT440-3-4-F

Note

a. only available for "F" wavelength range

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