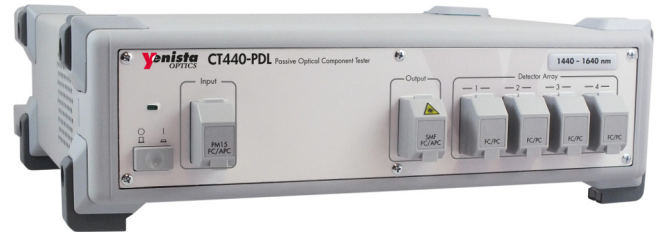


CT440-PDL

Optical Component Tester

PRELIMINARY

Yenista's CT440-PDL is a compact instrument for fast and accurate IL & PDL spectral characterization of passive optical components (Mux/Demux, filters, splitters, Photonics Integrated Circuits...) and modules (ROADM, WSS). Two models are available: one for the O-band (1260–1360 nm) and the other for the SCL-band (1440–1640 nm).



Fast IL & PDL Measurement

The CT440-PDL is a unique combination of high speed electronics, polarization control and optical interferometry that allows spectral characterization of both Insertion Loss (IL) and Polarization Dependent Loss (PDL based on Mueller matrix method) using successive polarization-controlled sweeps. Up to four device outputs can be simultaneously measured with high dynamic range and fast data retrieval, ideal for in-situ optical alignment and analysis.

IL & PDL Measurement Time

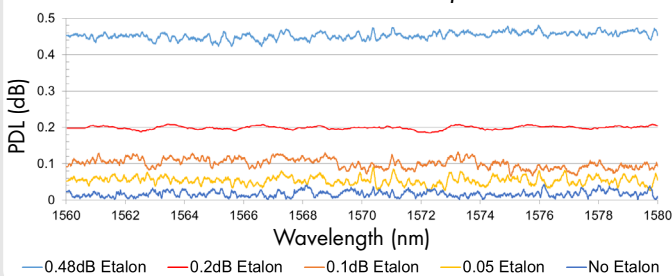
Sweep Span	Sweep Rate 4-States Method	Sweep Rate 6-States Method
5 nm	8.6 s	12.8 s
40 nm	11 s	16.8 s
100 nm	16.3 s	24 s
200 nm	24 s	36 s

Measurement span centered at 1550nm, sampling resolution of 5 pm, laser speed 100 nm/s.

Reliable IL & PDL Measurement

Wavelength sweeping systems need to perform fast acquisition of both power and wavelength. The quality of the tunable lasers sources is therefore a key factor: mode hops, sweeping velocity, power flatness, wavelength accuracy are phenomena that need to be controlled in order to make reliable measurements. The CT440-PDL can operate with most common tunable laser sources (TLS) available on the market. It allows for all these features to provide accurate IL & PDL measurements in a single box when interfaced with the TLS and a PC.

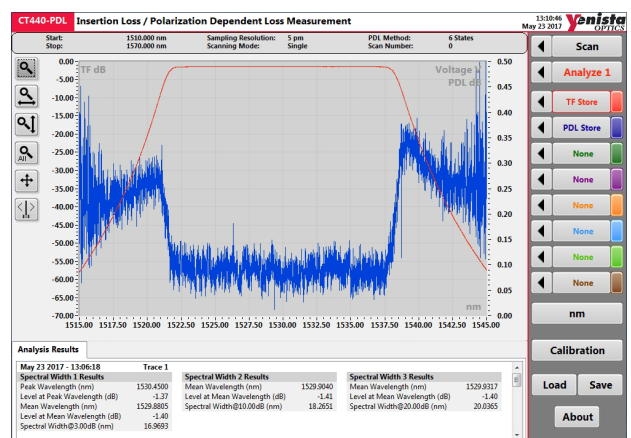
4 PDL Etalons Measured at 10 pm resolution



Key Features

- Fast IL & PDL measurement up to 100 nm/s
- Wavelength band:
 - O-band model: 1260–1360 nm
 - SCL-band model: 1440–1640 nm
- Wavelength resolution: 5 to 250 pm
- Wavelength accuracy: ± 5 pm
- PDL method: 4 or 6 states (4 or 6 sweeps)
- PDL accuracy: ± 0.05 dB + 4% PDL
- Dynamic range: 65 dB @ single sweep
- Trigger generated from TLS sweep

IL & PDL Measurement on a CWDM Filter



Specifications

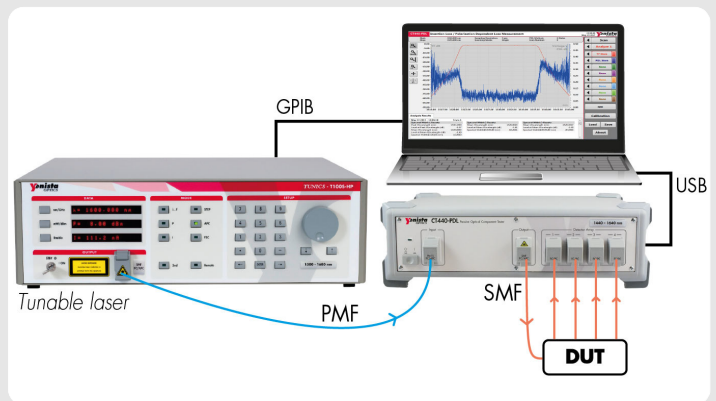
		O-band Model	SCL-band Model
Wavelength	Operating wavelength range	1260–1360 nm	1440–1640 nm
	Wavelength accuracy	Absolute ^{*1*2}	±5 pm
Relative		±5 pm	
Optical Ports (Front Panel)	TLS inputs & outputs	Number of input ports	1 (PM13)
		Number of output ports	1 (SMF)
		Connector type	FC/APC narrow key (PM: slow axis aligned to connector key)
	Detector array	PER on input port	≥18 dB (recommended)
		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 @ 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	0 to 10 dBm
		On detector ports	-60 dBm to 7 dBm
	Transfer function	Accuracy ^{*3}	±0.2 dB
		Sampling resolution	0.02 dB
		Dynamic range ^{*4}	65 dB typ.
	Polarization Dependent Loss	Accuracy ^{*5}	±0.05 dB + 4% PDL
		Measurement range ^{*6}	0 to 20 dB
Repeatability		±0.05 dB	
Sampling Characteristics	Resolution (1 pm and native res. accessible via DLL only)	5 to 250 pm	
	Native sampling resolution (accessible via DLL only)	$N \times 100 \pm 10$ MHz ($N=1$ to 250)	
	Compatible sweep speed of TLS	From 10 to 100 nm/s	
Data Handling	Interface with PC / Data exchange 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	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 / < 80% (non condensing)	
	Storage temperature range	-10 °C to +60 °C	
	Power supply	AC 100 to 240 V (50 to 60 Hz)	
	Dimensions (W x H x D), Weight	335 x 110 x 320 mm, 4 kg	

* 1: For a TLS sweep span > 5 nm at sampling resolution of 5 pm, excluding the acceleration and deceleration part of the TLS sweep.
 * 2: After wavelength referencing.
 * 3: For incident power on detectors > -30 dBm.
 Accuracy: +/- 0.5 dB for power between -30 dBm and -60 dBm.

* 4: If laser output power = 10 mW (dynamic range is proportional to laser output power).
 * 5: For incident power on detectors > -30 dBm and determined from a 6-states measurement at 5 pm resolution.
 * 6: Stable testing conditions, 6-states recommended for high PDL measurement.

Measurement Set-up

Tunable Laser Source (TLS)	
Remote Control	GPIB
Output Power	see CT440-PDL Specifications above
Sweep Speed	
Mode Hops	No mode hop is best but the instrument is able to detect and still operates with a few mode hops
PC	
Operating System	From Windows 7 to Windows 10
Interfaces	USB-A 2.0 port to CT440-PDL GPIB interface card to TLS



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