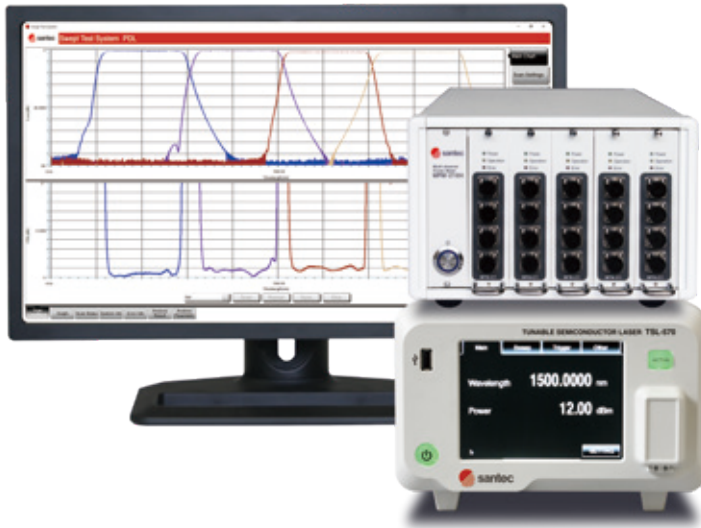


Swept Test System

High Speed Swept Test System



Product Overview

The Santec's Swept Test System has been developed to streamline photonic testing, providing a complete solution where high-speed analysis, high resolution and accuracy are key. Combining one of Santec's tunable lasers (TSL-770 or TSL-570) with a Santec's optical power meter (MPM-210H), a polarization control units (PCU-110) and custom software, the complete Swept Test System optimizes WDL and PDL measurement for use in both R&D and production environments. By combining multiple TSL units with an optical switch (OSU-110), it is possible to measure an ultra-wide tuning range from 1240 to 1680 nm.

Using real-time referencing, while simultaneously acquiring output power from the tunable laser and the transmitted optical power through the DUT, the system provides high accuracy in WDL and PDL analysis using the Muller Matrix Method. Over-sampling and rescaling algorithms are used to maximize testing throughput while maintaining measurement integrity. The Santec's MPM-210H power meter mainframe can be used in conjunction with the 4-channel current meter module, the MPM-213. The Swept Test System combined with the MPM-210H and MPM-213 is suitable for measuring the performance of fiber optics components using transceiver-like photodiodes (ROSA/Coherent receiver, etc.) or optical channel monitors.

Features

- Real-time power referencing
 1. Accurate WDL / PDL characteristics measurement
 - High power repeatability $< \pm 0.02$ dB
 - High PDL repeatability ± 0.03 dB
 2. Automatic normalization of laser source power
- Rescaling algorithm utilizing the Swept Processing Unit (data acquisition unit)
 1. High wavelength resolution and accuracy
 2. Reduced measurement time
- Multichannel measurement is available
- Achieving ultra-wide tuning range from 1240 to 1680 nm with a full-band TSL



Applications

- Optical components and modules characterization
 - Tunable Filters, Interleavers, Fiber Bragg Gratings (FBGs), Couplers, Splitters, Isolators, Switches
 - WSS, Wavelength Blockers
 - DWDM Components
- Photonic material characterization
- Optical spectroscopy

Specifications (Swept Test System with single TSL-570)

Parameter	Unit	Specification			Notes
		Type A	Type C	Type P	
Wavelength Accuracy (typ.) (Absolute) *1	pm	±12	±2.5	±1.0	at 50 nm/s
		±15	±3.5	±1.5	at 100 nm/s
		±17	±4.5	±2.1	at 200 nm/s
Wavelength Accuracy (typ.) (Relative)	pm	±9	±2.2	±0.8	at 50 nm/s
		±12	±3.0	±1.3	at 100 nm/s
		±14	±4.0	±1.9	at 200 nm/s
Wavelength Repeatability *2	pm	±5	±1.2	±0.5	at 50 nm/s
		±6	±1.5	±0.8	at 100 nm/s
		±8	±2.0	±1.1	at 200 nm/s
Tunable laser		TSL-570 Type A, Type C and Type P			
Power meter module		MPM-211, 212		MPM-215	
Scan Speed	nm/s	1 to 200			
Dynamic Range for Insertion Loss at one scan (typ.)	dB	40		60	
Dynamic Range for Insertion Loss at two scan (typ.)	dB	75		-	
Dynamic Range for PDL (typ.)	dB	0 to 5			
Measurement Time for IL (typ.) *3	sec	3@100 nm/s, 1.8@200 nm/s			
Measurement Time for IL / PDL (typ.) *3	sec	12@100 nm/s, 6.8@200 nm/s			
Wavelength Resolution	pm	0.1			
IL Accuracy (typ.)	dB	±0.02		±0.02	0 to 30 dB Device IL
		±0.1		±0.02	30 to 40 dB Device IL
		±0.1		±0.05	40 to 60 dB Device IL
IL Repeatability (typ.) *2, *4	dB	±0.02			
IL Resolution	dB	0.001			
PDL Accuracy (typ.)	dB	±(0.02 + 3% of PDL)		±(0.02 + 3% of PDL)	0 to 20 dB Device IL
		±(0.15 + 3% of PDL)			20 to 40 dB Device IL
PDL Repeatability (typ.) *2, *4	dB	±0.03			
PDL Resolution	dB	0.01			
Communication	-	USB (USB 2.0 High Speed)			MPM-210H
		GP-IB (IEEE488.2), Ethernet			PCU-110 / MPM-210H
Operating Temperature	°C	15 to 35			
Operating Humidity	%	< 80			non-condensing

* All specifications are quoted after 1 hour warm-up period and executing a zero calibration.

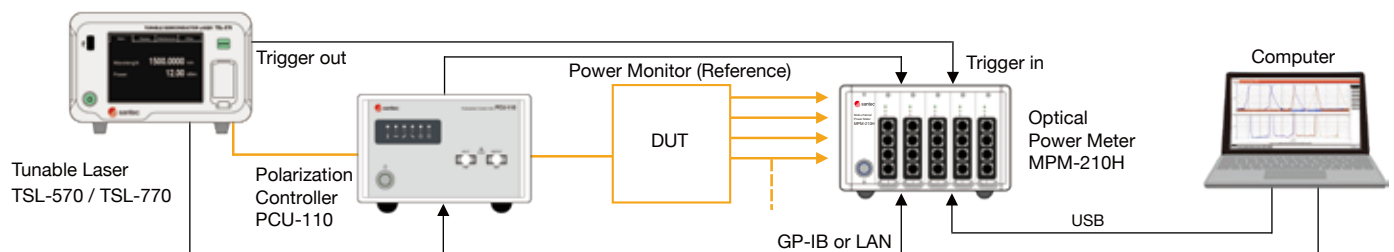
*1: Temperature within 25±5 °C, *2: Temperature within 25±1 °C

*3: The measurement condition is within wavelength resolution 5 pm, wavelength range 100 nm, one scan for 1 channel.

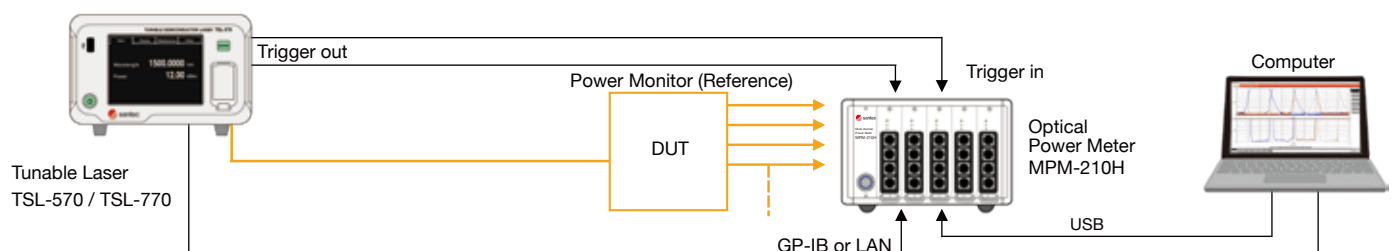
*4: Does not include influence of connector.

Typical configuration

IL / PDL measurement setup with the polarization controller PCU-110 and the power meter MPM-210H



IL measurement setup with the power meter MPM-210H



Specification (Swept Test System with Full-band TSL)

Parameter	Unit	Specification			Notes
		Type A	Type C	Type P	
Wavelength Accuracy (typ.) (Absolute) *1	pm	±12	±2.5	±1.0	at 50 nm/s
		±15	±3.5	±1.5	at 100 nm/s
		±17	±4.5	±2.1	at 200 nm/s
Wavelength Accuracy (typ.) (Relative)	pm	±9	±2.2	±0.8	at 50 nm/s
		±12	±3.0	±1.3	at 100 nm/s
		±14	±4.0	±1.9	at 200 nm/s
Wavelength Repeatability *2	pm	±5	±1.2	±0.5	at 50 nm/s
		±6	±1.5	±0.8	at 100 nm/s
		±8	±2.0	±1.1	at 200 nm/s
Tunable laser		TSL-570 Type A, Type C and Type P			
Power meter module		MPM-211, 212		MPM-215	
Scan Speed	nm/s	1 to 200			
Dynamic Range for Insertion Loss at one scan (typ.)	dB	40		65	
Dynamic Range for Insertion Loss at two scan (typ.)	dB	75		-	
Dynamic Range for PDL (typ.)	dB	0 to 5			
Measurement Time for IL (typ.) *3	sec	6.6@100 nm/s, 4.2@200 nm/s			
Measurement Time for IL / PDL (typ.) *3	sec	20.6@100 nm/s, 14.2@200 nm/s			
Wavelength Resolution	pm	1			
IL Accuracy (typ.)	dB	±0.04		±0.04	0 to 30 dB Device IL
		±0.2		±0.04	30 to 40 dB Device IL
		±0.2		±0.1	40 to 60 dB Device IL
IL Repeatability (typ.) *2, *4	dB	±0.04			
IL Resolution	dB	0.001			
PDL Accuracy (typ.)	dB	±(0.04 + 5% of PDL)		±(0.04 + 5% of PDL)	0 to 20 dB Device IL
		±(0.2 + 5% of PDL)			20 to 40 dB Device IL
PDL Repeatability (typ.) *2, *4	dB	±0.06			
PDL Resolution	dB	0.01			
Communication	-	USB (USB 2.0 High Speed)			MPM-210H
		GP-IB (IEEE488.2), Ethernet			TSL / PCU / OSU / MPM
Operating Temperature	°C	15 to 35			
Operating Humidity	%	< 80			non-condensing

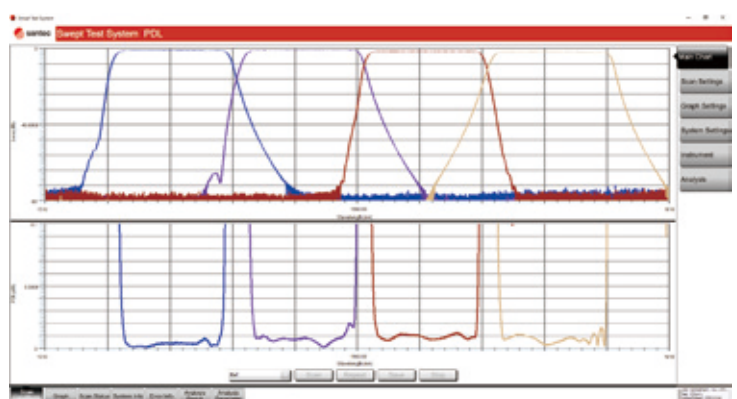
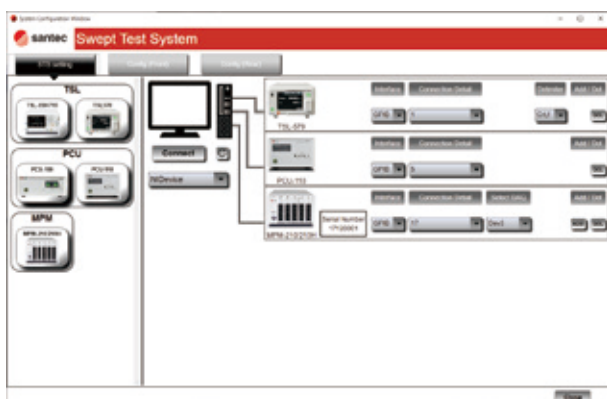
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*3: The measurement condition is within wavelength resolution 5 pm, wavelength range 100 nm, one scan for 1 channel.

*4: Does not include influence of connector.

Graphical user interface



Ordering Code

Optical Power Meter

Main frame **MPM-210H**

Module **MPM-211/212/213/215** Please refer to MPM-210H catalogue

Polarization Control Unit

PCU-100 - ☐ - ☐ - ☐ - ☐ - ☐
A B C D E

- Connector Polish (Output port): **SP**: SPC / **AP**: APC
- Connector Polish (Input port) : **AP**: APC (Angled PC)
- Connector Type: **F**: FC / **S**: SC
- Fiber: **P**: PMF
- Wavelength Range: **1**: O-band (1260 - 1360 nm) / **2**: CL-band (1480 - 1640 nm)

PMF Patch cord (Tunable Laser (TSL) <---> PCU-110)

Please select the ordering code for PMF patch cord if purchasing the PCU-110. Regarding the connector selection, select the same options for one port as the TSL code ("A" and "B") and the other port as the PCU-110 ("C" and "D"). Fiber length 1.0 m, Fiber jacket ϕ 2.0 mm.

PPC - ☐ - ☐ - ☐ - ☐
A B C D

- Connector 2 Polish: **AP**: APC (Angled PC)
- Connector 2 Type: **F**: FC / **S**: SC
- Connector 1 Polish: **SP**: SPC / **AP**: APC (Angled PC)
- Connector 1 Type: **F**: FC / **S**: SC



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