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complexity made simple.

APPLICATION NOTE

Transient testing in PXI

Contents

Coherent Solutions PowerPXIe-1401 optical power meter.

WHY DO TRANSIENT TESTING IN PXIE?

Until recently, measurements of power versus time were only available using expensive oscilloscopes and optical-to-electrical converters. These solutions required complex synchronisation and suffered from poor power accuracy and dynamic range in addition to requiring extra equipment.

With the TRACE capability of the optical power meters from Coherent Solutions, you can now capture accurate time domain power meter readings over the entire range of the power meter (>70dB).

This is industry-leading dynamic range time domain measurements. The TRACE capability allows you to capture small or large transient events such as EDFA add/drop gain transients or quickly characterize optical switches while simultaneously measuring switching time and switch isolation between channels.

MODULES THAT SUPPORT TRACE CAPABILITIES

VOAPXie-1xxx

PowerPXIe-14xx

PowerPXIe-15xx

O2EPXIe-1xxx

CONFIGURING TRACE CAPABILITIES IN PXI

The TRACing capability can be easily configured through the SCPI remote control interface.

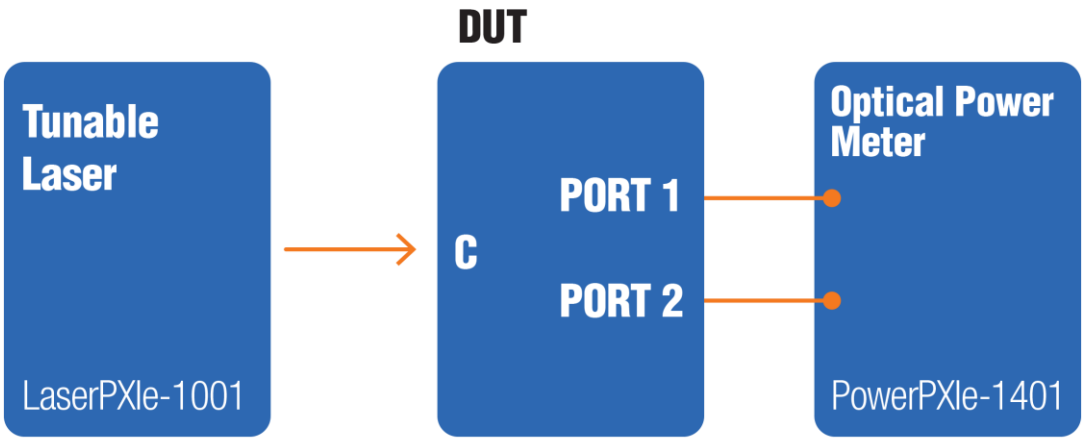
The module can be configured to wait for a software trigger or a hardware trigger. For more information on hardware triggering please see the Coherent Solutions application note - Hardware Triggering of Coherent Solutions' Optical PXIe Modules.

You can configure the length of the acquisition buffer and the sample rate of the acquisition units. All channels in the module will trigger and sample at the same time.

IMPORTANT NOTES

- Trace capabilities (# of points, triggering mode, sample rate) are module specific.
- All channels in a module will react to a trigger with same sample rate and number of points. You cannot configure different channels on the same module with different setups.

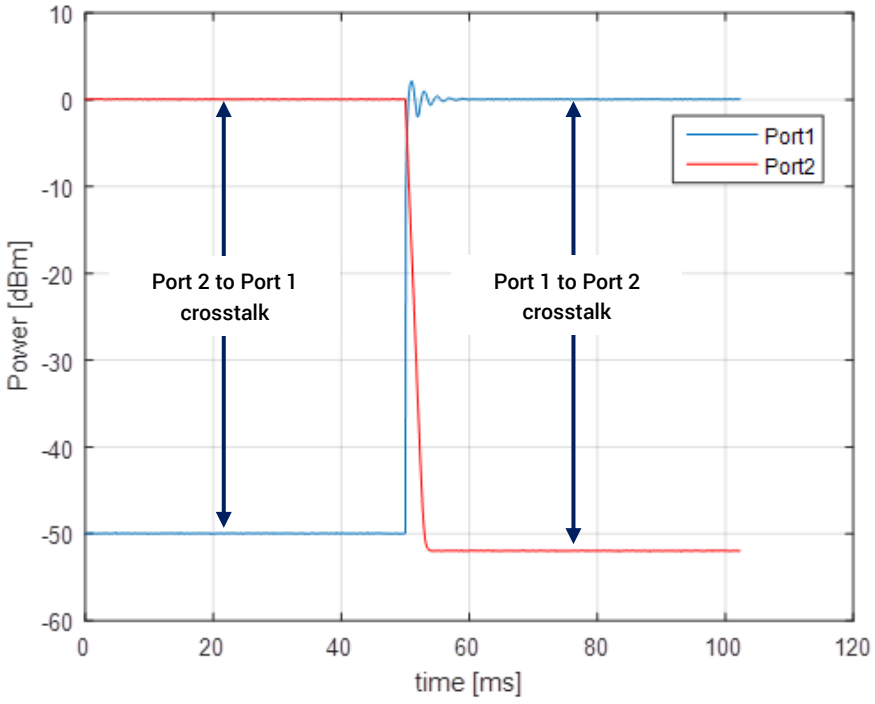
EXAMPLE: Optical switch characterisation, simultaneously measuring insertion loss, switching time and channel crosstalk



In this example, a 0 dBm optical input connected to the Common port is initially routed to Port 2. The switch then re-routes to Port 1 and the transition is traced as shown below.

The crosstalk from Port 2 to Port 1can be measured from the relative power differences to the left of the transition. The crosstalk from Port 1 to Port 2 can be measured from the relative power differences to the right of the transition.

Insertion loss measurement can be calculated as the difference between the measured power from the active port to the known input power.



1) Set PowerPXIe data capture sample size and rate

SENS3:TRACE:PTS 1024	# setup module in slot 3 to capture 1024 pts
SENS3:TRACE:RATE 10000	# setup sample rate to 10kS/s

2) Instruct switch to change positions

SENS3:TRACE:TRIG FORCE	#start the aquisition through the sw trigger
Loop on SENS3:TRACE:COMPLETE?	# check if the operation is complete on all channels
SENS3:TRACE?	# get 2 x 1000 power pts (data from all 2 channels)

OTHER RESOURCES

- Hardware Triggering of Coherent Solutions' PXIe Modules: http://www.ni.com/product-documentation/54579/en/

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