DopplerPXIe-1001

DopplerPXIe

Modular Photonic Doppler Velocimetry

SPEC SHEET

Photonic Doppler velocimetry (PDV) is a well accepted technique used to measure high-velocity events at speeds up to tens of km/s.

The DopplerPXIe module combines the key optical components for PDV measurements in a single PXIe slot to enable high-density multi-channel test setups.

coherent solutions

complexity made simple.

Features

Accurate control and measurement of target, probe and reference power

All of your optical power management in a single-slot PXIe module. This purpose built DopplerPXIe module streamlines your PDV test setup.

Generate reliable, repeatable measurements

Minimise the number of manual optical connections doppler module for reliable and repeatable measurements.

Easily build scalable, multi-channel systems

Combine with the LaserPXIe and O2EPXIe modules and fit up to 8-channels in a single 18-slot PXIe chassis.

Drastically reduce the footprint of your test setup

Replace the stack full of bulky individual optical test instruments with one small PXIe module and save valuable lab space.

Example 8-Channel PDV Setup

Figure 1 shows an example configuration of an 8-channel Doppler setup. It consists of four LaserPXIe-1002 laser sources (Target and Reference), and eight DopplerPXIe modules. The output of the DopplerPXIe module is sent to a four high channel and high bandwidth O2EPXIe-1101 where the probe and reference laser beat. The electrical beat signal is then digitized with an oscilloscope.

All of this functionality is incorporated into the open standard PXI platform. This provides the user with flexibility to create large multiplexed systems and upgrade the system over time with higher bandwidth detectors and digitizers.

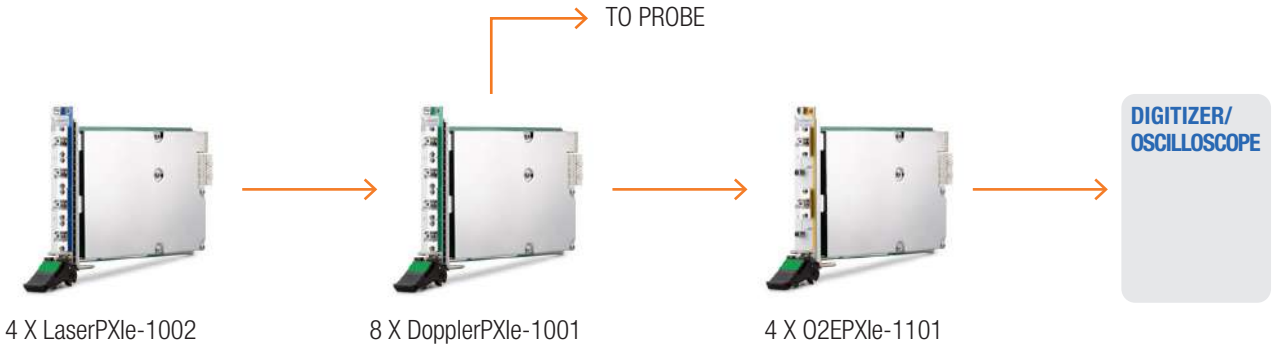

Figure 1: 8-channel PDV system in a single 18-slot chassis

Target Applications

- Study of material properties and impact response using shock physics.
- Replacement for Velocity Interferometer System for Any Reflector (VISAR) with an integrated fiber-based system.
- Measure velocities in dynamic experiments with high temporal precision.

DopplerPXIe Schematic

Figure 2 represents the configuration of the Doppler module (DopplerPXIe-1001-1-FA). It incorporates many of the key fiber optical components required to accurately condition the target and the reference laser and to mix the probe with the reference.

This is a single slot PXIe module, with the following connections:

- Target input
- Reference input
- Probe port (input/output)
- Output port

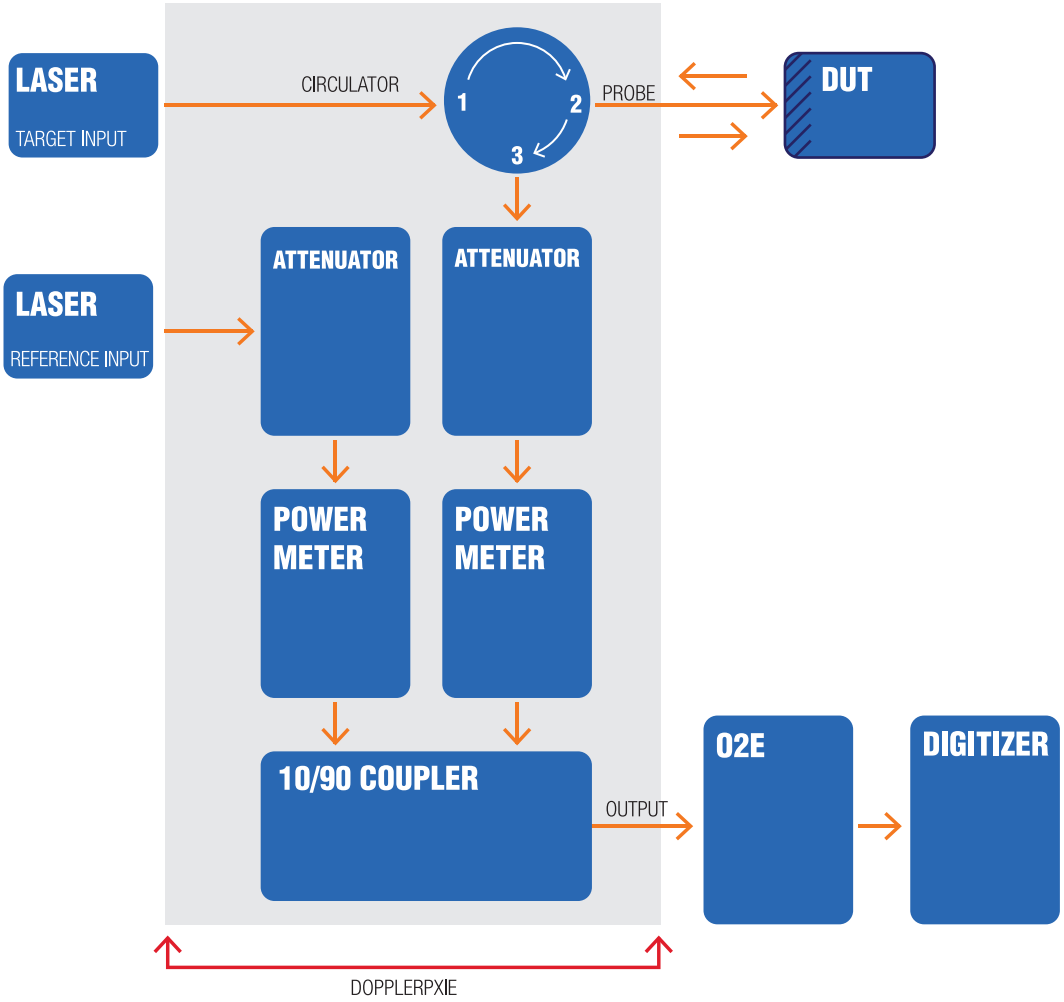

Figure 2: Doppler module (DopplerPXIe-1001)

DopplerPXIe Schematic

An alternative configuration of the Doppler module is also available. The DopplerPXIe-1002-FA (figure 3) places the target input attenuator and power meter before the circulator. With the power control before the probe, this reduces the optical power transmitted to the probe and the DUT which may be desirable in some circumstances.

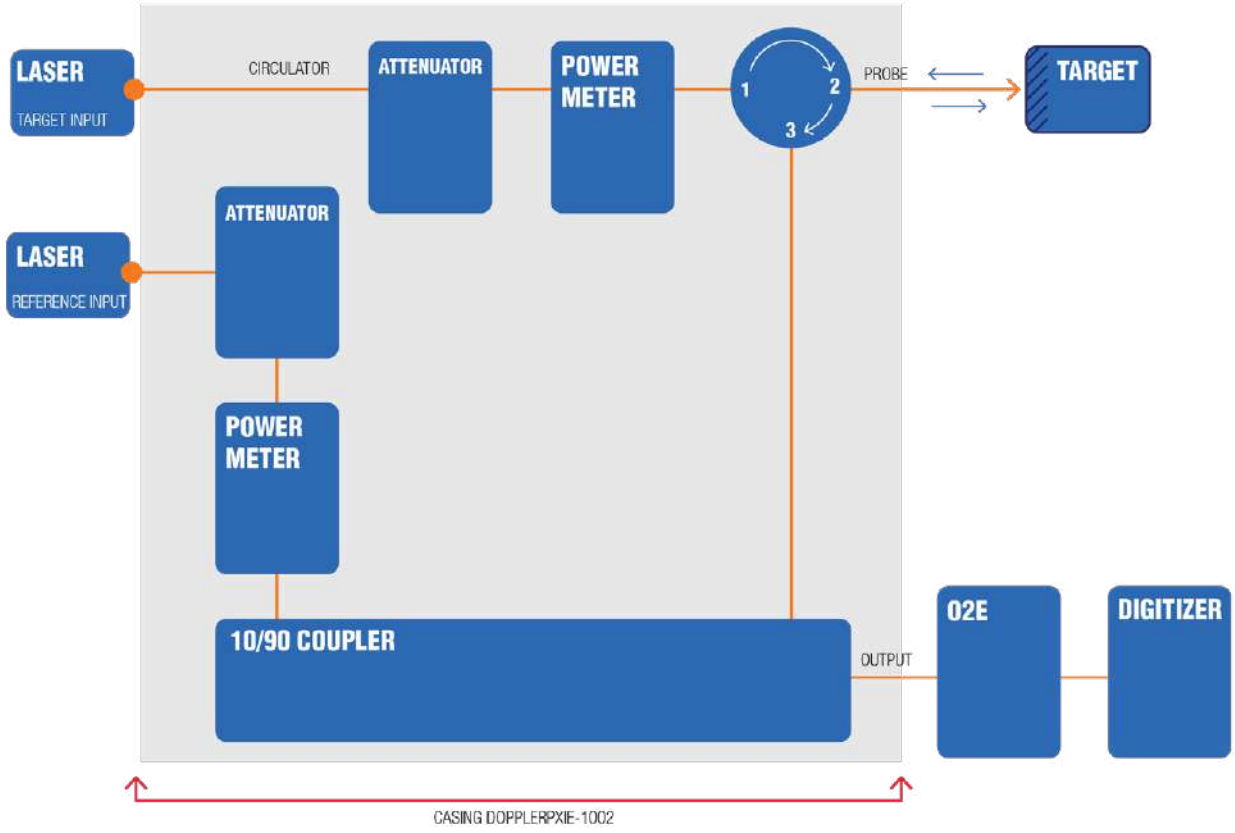

Figure 3: Doppler module (DopplerPXIe-1002)

The world-leader in PXI optical test & measurement

Our portfolio of PXI optical test modules is rapidly expanding to meet a wide range of customer requirements and applications.

Our experience designing and building advanced coherent optical communications instruments gives us the expertise to quickly and cost-effectively customize our products to meet your requirements. If you don't see what you need, contact us today at sales@coherent-solutions.com.

LaserPXIe
Versatile Laser Source

Versatile range of laser sources including fully-tunable C and/or L band or fixed wavelength.

PowerPXIe
Optical Power Meter

Large-area detector power meter available in various specifications. Options include external trigger input and analog output.

VOAPXIe
Variable Optical Attenuator

Operates in fixed attenuation or constant output power modes.

Integrated power meter for precise output power control.

OSAPXIe
Optical Spectrum Analyzer

Fast spectral test and measurement in a compact 2-slot module. O, C and L band options.

O2EPXIe
Optical-to-Electrical Converter

High bandwidth, broadband O-to-E converter. AC or DC coupling, various conversion gain and operating wavelength range.

SwitchPXIe
Automated Optical Switch

Proven reliability and fast switching time.

Various wavelength options including 850 nm, 980 nm, 1310 nm & 1550 nm.

PassivePXIe
Passive component integration

Integrate passive optical components of your choice in a single or dual slot module. WDM couplers, splitters, band-pass filters, PM beamsplitters, circulators and more.

DopplerPXIe
Photonic Doppler Velocimeter

Purpose-built module for Photonic Doppler Velocimetry.

A circulator, two VOAs and a passive coupler all built into one compact module.

TrayPXIe
Passive Component Organizer

Protect your passive fiber optic components to keep your workspace tidy & safe.

The perfect PXI chassis to suit your application

From a smaller 4-slot to the 18-slot rack mountable chassis, we can provide the perfect National Instruments PXIe chassis to suit your application.

Technical Specifications

General Specifications	1001	1002
Bus connection	PXIe	
Number of PXI slots	1	
Fiber type	SMF-28	
Optical connector type	FC/PC,SC/PC,FC/APC or SC/APC	
Operating temperature range	5 °C to 45 °C | 41 °F to 113 °F	
Storage temperature range	-40 °C to 70 °C | -40 °F to 158 °F	
Wavelength	1520 to 1650 nm	
Probe output	-50 to +20 dBm	
Reference output	-60 to +10 dBm	
Damage level	+23 dBm	
Insertion loss[3] target input to probe output	<3 dB	<5 dB
Insertion loss[3] probe input to output	<5 dB	<3 dB
Insertion loss[3] reference input to output	<14 dB	<14 dB
Wavelength dependent loss	<0.02 dB/nm	
Return loss[3]	> 45 dB	
Warm-up time	<20 minutes	

Attenuator	1001	1002
Calibration wavelength	1550 nm	
Attenuation range typical[5]	>46 dB	
Attenuation range guaranteed[5]	>40 dB	
Resolution	0.01 dB	
Attenuation speed	0.1 to 1000 dB/s	

Power Meter	1001	1002
Calibration wavelength	1550 nm	
Polarization dependent responsivity [2,3]	<0.2 dB	
Linearity[2,5]	± 0.1 dB	
Total uncertainty[2,3,5]	± 0.34 dB (Typical) ± 0.55 dB (Max)	
Averaging time	100 us to 10 s	
Resolution	0.01 dB	
Data logging	1 to 1024 per channel	

SPECS AS OF APRIL 2019

Notes
1 Specifications are valid at 23 °C ± 3 °C.
2 + 10dBm to -40dBm, 23 °C
3 Excluding connectors
5 At calibration wavelengths

Ordering Information

DopplerPXIe - XXXX - 1 - XX

Model number

1001 = Standard configuration

1002 = Probe and DUT power controlled configuration

Connector type

FC = FC/PC
FA = FC/APC
SC = SC/PC
SA = SC/APC

About Coherent Solutions

Coherent Solutions is the world-leader in PXI optical test and measurement. Our portfolio of PXI optical test modules is rapidly expanding to meet the needs of engineers and scientists around the globe. From enabling pioneering experiments to driving highly-efficient production testing, you'll find us working with customers to solve complex problems with simple and intuitive solutions.

To find out more, get in touch with us today.

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