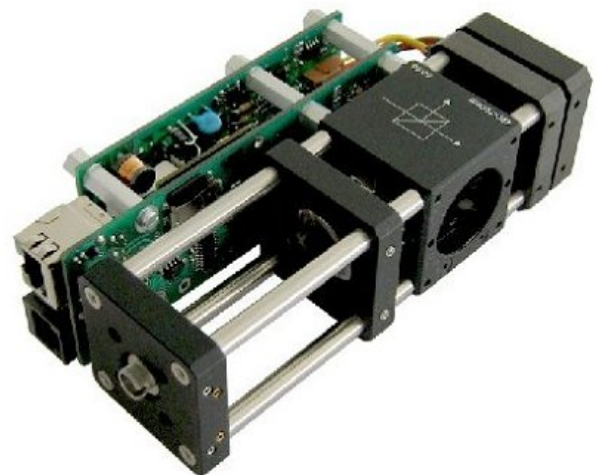# DTI2 OEM

compact digital phase-shifting interferometer

This compact and easy integrable digital phase-shifting interferometer is developed specially for creation of cost-effective optical quality control systems. It ideally suited for applications with limited space and power consumption. The interferometer can measure plane, spherical and some aspheric surfaces, contains innovative technical solutions, which allow increasing stability and accuracy of measurements. The interferometer can be named as "network interferometer". It connects direct to an Ethernet network, has no restrictions on cable length, and can be used from different workplaces. The free software contains a set of scripts for the interferogramm analysis and the graphic user interface for visualization of results. This software can be used as for laboratory measurements, as for embedding into automatic control systems.

Interferometer

The interferometer is build on the basis of high-quality optical and electronic components, has integrated high resolution digital image sensor synchronized with a phase-shifting element. The interferometer works with external coherent laser source, connected via fiber coupler. It makes possibility to select laser with desired wavelength and stability. For control and data transfer Fast Ethernet interface is used. Built-in HTTP server provides fast tunning and testing, is compatible with all popular Web browsers. Also the interferometer has RS485 interface. It allows connecting auxiliary devices (X-Y or rotation tables, attenuators, zoom-objectives, etc.) for expanding of functional capabilities and creating complete automatic system.

Features

Dimension without connectors 145x75x40
Power over Ethernet (PoE) technology (single supply 48V)
Typical power consumption 2.5W
FC/PC fiber coupler for external coherent laser source
Output aperture 5 mm
Can be adjusted for 400...700nm wavelength
Build-in phase calculation algorithm
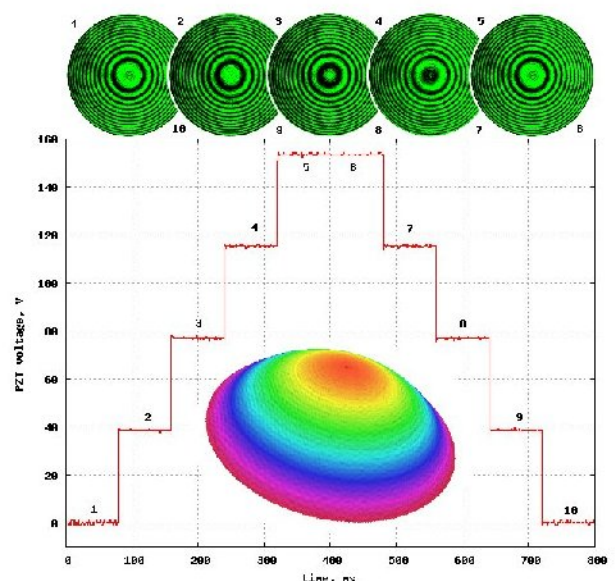Compatible with popular 30mm optical cage systems

Image sensor

Type: Gray-Scale CMOS image sensor
Pixel size: 5.2μm x 5.2μm (5mm image area)
Resolution: 1.3Mp, 1280x1024, 10bit
Programmable gain and exposition time
Pixel binning and skip modes
Digital zoom x1, x1.5, x2, x3, x4 @ resolution
512x512

Interfeces

1x 10/100Mb Fast Ethernet
1x RS485 (expansion serial interface)
OpenModbus protocol support

Libraries

Open-source, platform independent, socket
based library for control and image capture.
Can be used with most popular programming
languages (C, C#, Python, Matlab, etc.).

Interferogram analysis package

The interferogram analysis software uses
scripting programming language Python. It
extends Python with C control and
mathematical modules, provides fast data
acquisition and short OPD calculation time.
Scripts allow capture images from an
interferometer, recover a phase map,
calculate an optical path difference (surface
relief) and analyze it (Peak to Valley,
RMS, Zernike coefficients). Scripts are
very flexible can be easy adapted for the
specific features of a test object.

Graphic user interface

The graphic user interface for Windows
and Linux can be used together with
interferogram analysis package. GUI uses
icons for quick access to frequently used
functions, allows users to start
measurements and calculation scripts with
button click, visualize and save obtained
results. It can also be helpful for checking
or tuning interferometer before starting of
automatic processing.