

z-Snapper 3D camera

Instant 3D shape recording



The use of three-dimensional surface contour data instead of a two-dimensional intensity picture offers significant advantages for both machine vision solutions and life science applications. Frequently, the desired information can be detected much better from the object height than from its brightness. In the past, task specific illumination and evaluation techniques were necessary to solve such kind of testing problems; they may cause considerable development costs. The z-Snapper is closing this gap; it provides immediately full-field 3D surface data at a recording time that compares with a standard CCD camera. The high density of data points per measurement reveals even small object features with high reliability.

The z-Snapper sensing principle is based upon the well-known fringe projection methodology combined with sophisticated phase measuring algorithms. A sequence of patterns is projected and recorded by a precisely synchronized camera. Optimized algorithms are provided for the fast and reliable evaluation of the intensity patterns; the user benefits from the powerful application programming interface (API).

The z-Snapper line of products takes advantage of the novel opportunities of the DMD Discovery™ digital micromirror device of Texas Instruments. ViALUX developed the ALP high-speed controller for DMD Discovery™, a key component to make use of the unique DMD properties in optical metrology. Based upon DMD projection, the short recording time of 40 ms is one of the outstanding z-Snapper properties enabling not only hand-held operation or fast in-line applications but also the recording of living objects. The recording of 3D videos is also supported as a special operating mode with up to 40 fps VGA. There are two basic z-Snapper configurations: *compact* and *vario*.

z-Snapper *vario* consists in two items, projector and camera, that can be mounted independently thus simplifying system integration. It provides high flexibility in both field of view and triangulation angle.

z-Snapper *compact* comes as a single plug & play unit enabling high mobility. An additional novelty is the LED based DMD projector. The replacement of commonly used UHP arc lamps by a solid state light source eliminates a number of restrictions. At first, the device is self-contained (no fibre-bundle input) and does not need a cooling fan so that the housing is completely closed and dust protected. Secondly, in contrast to the arc lamp based systems, the z-Snapper can be tilted and is operating in any desired position. And finally, the LED does not require high voltage so that the whole system may be battery powered.



z-Snapper *compact*

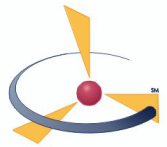


z-Snapper *vario*

The ALP controller interfaces via USB2.0 and the digital camera plugs into an IEEE1394b (FireWire) port so that the z-Snapper connects to standard laptop computers yielding a high degree of mobility together with the battery option.

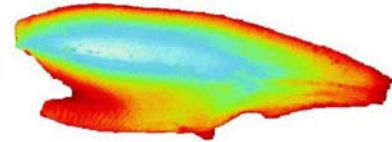
Two software packages are supplied with the device, the z-Snapper program for instant use and the SDK, a C++ DLL for integrating the device into a customer's application.





Examples

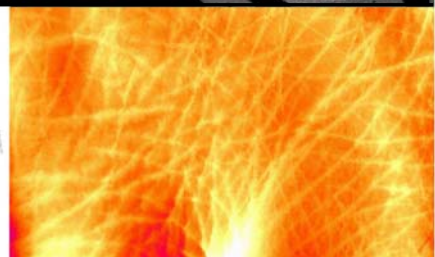
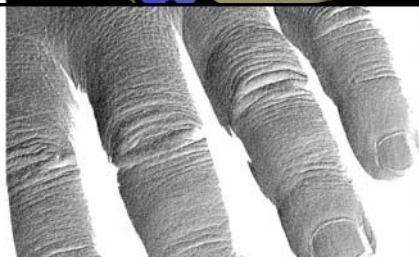
In-line shape control



Robotics



Living objects



Specifications

z-Snapper	compact	vario
Measurement		
Data field	full: 640x480 pixel or binning: 320x240 pixel	
Field of view	350 mm	180 – 1200 mm
Height resolution*	20-50 µm	10-200 µm
Recording time**	full: 40-200 ms or binning: 25-120 ms	
Interface		
Projection	USB2.0	
Camera	IEEE1394b (FireWire)	
Power	max 17W@12-30V	
General		
Dimensions	230x130x115 [mm]	200x130x115*** [mm]
Packaging	compact aluminium housing	projector and camera separated
Weight	2300 g	1600 g
Requirements	PC or laptop, Windows® XP/Pro, 1Gbyte RAM	

- * depends upon surface properties
- ** depends upon accuracy level
- *** projector unit

