



- 1 3D sensor head.
- 2 3D point cloud of a technical object.
- 3 Detecting and measuring geometric objects in space with live 3D data analysis.

## INLINE 3D SENSOR FOR REAL-TIME APPLICATIONS

### Fraunhofer Institute for Applied Optics and Precision Engineering IOF

Albert-Einstein-Straße 7  
07745 Jena  
Germany

Director  
Prof. Dr. Andreas Tünnermann

Head of Business Unit Photonic Sensors and Measuring Systems  
Prof. Dr. Gunther Notni

Contact  
Dr. Peter Kühmstedt  
Phone +49 3641 807-230  
peter.kuehmstedt@iof.fraunhofer.de

[www.iof.fraunhofer.de](http://www.iof.fraunhofer.de)

### Measurement Principle

- Triangulation-based 3D measurement system with active illumination
- High-speed projection of aperiodic sinusoidal fringe patterns
- Synchronous image acquisition of two high-speed cameras and one color camera

### Exemplary Applications

- Real-time measurement for quality assurance
- Machine vision for industrial robots, e.g. pick and place applications
- Production and assembly monitoring on versatile objects
- Safety technology in industrial areas
- Detection of people's poses, gestures, or facial expressions for human-machine interaction
- Machine interior monitoring
- Interactive training systems

### Features

- Spatial measurement of moving objects
- Real-time computation of high-resolution 3D point clouds with color information
- Comparison with reference models (CAD)
- Further processing with established 3D analysis tools (e.g. HALCON & geomagic)
- Eye-safe due to incoherent projection

### System Parameters

- Sensor size: 300 x 190 x 100 mm<sup>3</sup>
- Measurement field: up to 1 x 1 m<sup>2</sup>
- Optical power: ~4.5 W
- Pattern projection rate: 360 Hz
- 3D frame rate: 36 Hz

### Our Offer

- Realization of custom-specific real-time 3D measurement systems
- Execution of various 3D measurement tasks