



- 1 Schematic working principle.
- 2 Example prototype in adapted commercial camera housing.
- 3 Captured image of a five euro banknote. The inset shows two times magnified details.

COMPACT MICROOPTICAL IMAGING SYSTEM FOR DIGITAL CLOSE-UP IMAGING

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Ambition

Digital close-up imaging of extended object fields with high resolution using a compact optical system setup.

Characteristics

- optical setup using three double-sided microlensarray modules on a digital image sensor
- multichannel imaging with partial image stitching
- aspherical and achromatic lenslets
- unity magnification
- object-to-image distance 5.3 mm
- numerical aperture 0.1
- object field size 36 mm x 24 mm (scalable with image sensor size)
- resolution up to 4 μm

Application

- inspection of surfaces, print materials
- bio-/ medical imaging
- document analysis
- digitalization of photographic film material

Technology

- wafer-scale process on thin glass substrates
- master generation using lithography and resist reflow
- proportional transfer by dry etching (RIE, ICP) for aspherical lenslets
- double-sided, aligned UV-molding
- UV-structuring of absorbing polymer diaphragm arrays
- module assembly using alignment marks
- AR-coating of surfaces
- dicing with chip saw