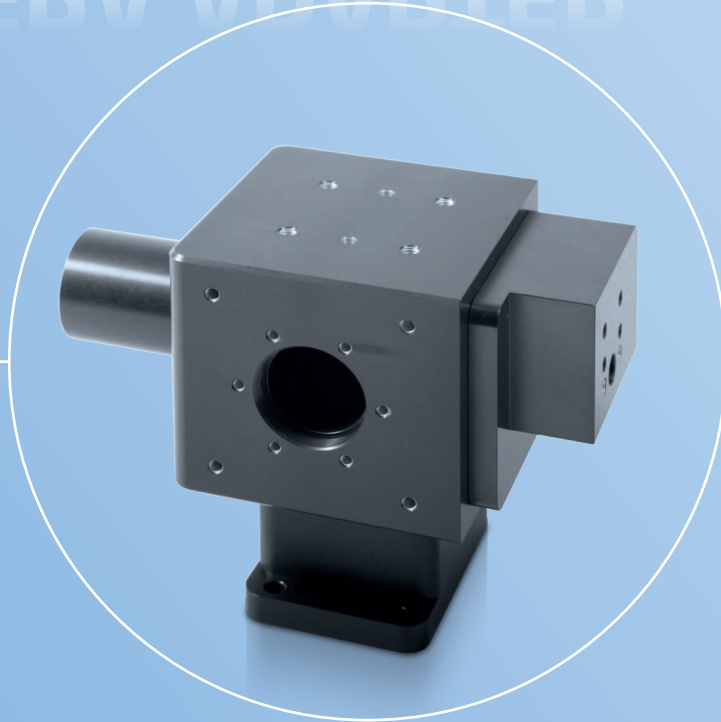


# CAMERA ADAPTER



The best connection for vision  
via scan head

- Functions with RAYLASE 2-axis deflection units
- Available for various wavelengths
- Camera lenses for different fields of view and observation wavelengths

RAYLASE camera adapter enables the connection of a CCD or CMOS camera for "on-axis" observation of workpieces via the deflection unit mirrors.

**Typical applications:**

- Workpiece control at high field resolution <10 microns
- Determination of workpiece position with automatic correction of the process data
- Process monitoring "online" or "offline"
- Downstream analysis of the process parameters with image processing

**FUNCTIONAL PRINCIPAL**

The camera adapter is mounted on a head-specific adapter plate in front of the beam entrance of the deflection unit. Inside the camera adapter is a dichroic element which deflects the laser beam 90 degrees to the mirrors. The light within a specified wavelength range which is coming through the mirror is almost completely transmitted. The transmitted light is received by an adjustable camera lens and is imaged on the respective camera chip.

Due to the deflection of the laser beam rather than transmission, focus shift is avoided at higher power levels. The rotationally symmetrical hole pattern of the camera adapter enables the possible coupling of the laser to be made in 4 different positions.

# CAMERA ADAPTER

For process monitoring applications

## CAMERA LENSES

There are camera lenses available for different resolutions and field sizes. The camera lenses are equipped with special filters that ensure a sharp and brilliant image of the field of view on the camera chip. The average wavelength of these filters are available in two versions for 640 nm and 850 nm. Camera lenses have a manual, lockable focus setting to adjust the sharpness of the image; the range is dependent on the F-theta objective. With another lockable adjustment the laser field and the camera field of view can be aligned.

At the outlet of the camera lenses is a C-mount adapter for mounting the appropriate cameras selected by the customer or from RAYLASE.

**Note:** For improved image quality cameras without infrared filters are recommended. This filtering is already done with less loss of light in the camera lens.

## ILLUMINATION UNITS

A wide range of illumination units available to match the respective observation wavelengths. RAYLASE is happy to provide you with the engineering of your process monitoring or with a solution for your image processing requirements.

### GENERAL SPECIFICATIONS

Maximum beam input diameter	30 mm
Camera connection type	C-Mount
Maximum chip size	2/3"
Weight without adapter plate	1,570 g
Weight adapter plate	500 g
Weight camera lens without camera	670 g
Ambient temperature	5°C to 35°C without condensation

A special "high-power camera adapter" is available for kilowatt lasers.

## TYPICAL CONFIGURATIONS

Several configurations are possible due to the field sizes, resolution of the flat field lens, the camera lens and the size of the camera chip. Typical configurations are shown in the following table:

Laser wavelength [nm] <sup>(1)</sup>	1,030 - 1,100	1,030 - 1,100	1,030 - 1,100	1,030 - 1,100	1,030 - 1,100	355 / 532	355 / 532
Camera lens type	002	003	003	003	003	002	003
Observation / Illumination wavelength (nm) <sup>(2)</sup>	640	640	640	640	640	640	640
Full width @ half maximum (nm)	13	13	13	13	13	13	13
Scan head aperture (mm)	10	10	15	20	30	10	10
Scan head mirror coating (nm)	1,064 + 640	1,064 + 640	1,064 + 640	1,064 + 640	1,064 + 640	355 (532) + 640	355 (532) + 640
Focal length F-theta objective (mm)	163	163	163	255	340	100	100
Processing field (mm)	110 x 110	110 x 110	110 x 110	160 x 160	215 x 215	55 x 55	55 x 55
Dichroic mirror laser wavelength (nm)	1,030 - 1,120	1,030 - 1,120	1,030 - 1,120	1,030 - 1,120	1,030 - 1,120	355 - 380 + 500 - 560	355 - 380 + 500 - 560
Dichroic mirror observation wavelength (nm)	450 - 650	450 - 650	450 - 650	450 - 650	450 - 650	> 630	> 630
Camera-chip (inch - Megapixel)	1/1.8" - 1.3MP	½" - 1.3MP	2/3" - 5MP	1/1.8" - 2MP	2/3" - 5MP	½" - 0.5MP	½" - 0.5MP
Field of view (mm)	approx. 3 x 2.3	approx. 9.7 x 7.3	approx. 14.0 x 10.7	approx. 17.7 x 13.5	approx. 29.3 x 22.3	approx. 1.7 x 1.3	approx. 6.0 x 4.5
Max. optical field resolution (µm)	approx. 5.5	approx. 7.6	approx. 5.7	approx. 10.9	approx. 12.0	approx. 2.2	approx. 7.7

The values for the observation fields and resolution are subject to tolerances and therefore approximate values.

(1) Configurations for diode lasers possible. (2) All configurations with observation / illumination wavelength 850 nm available.