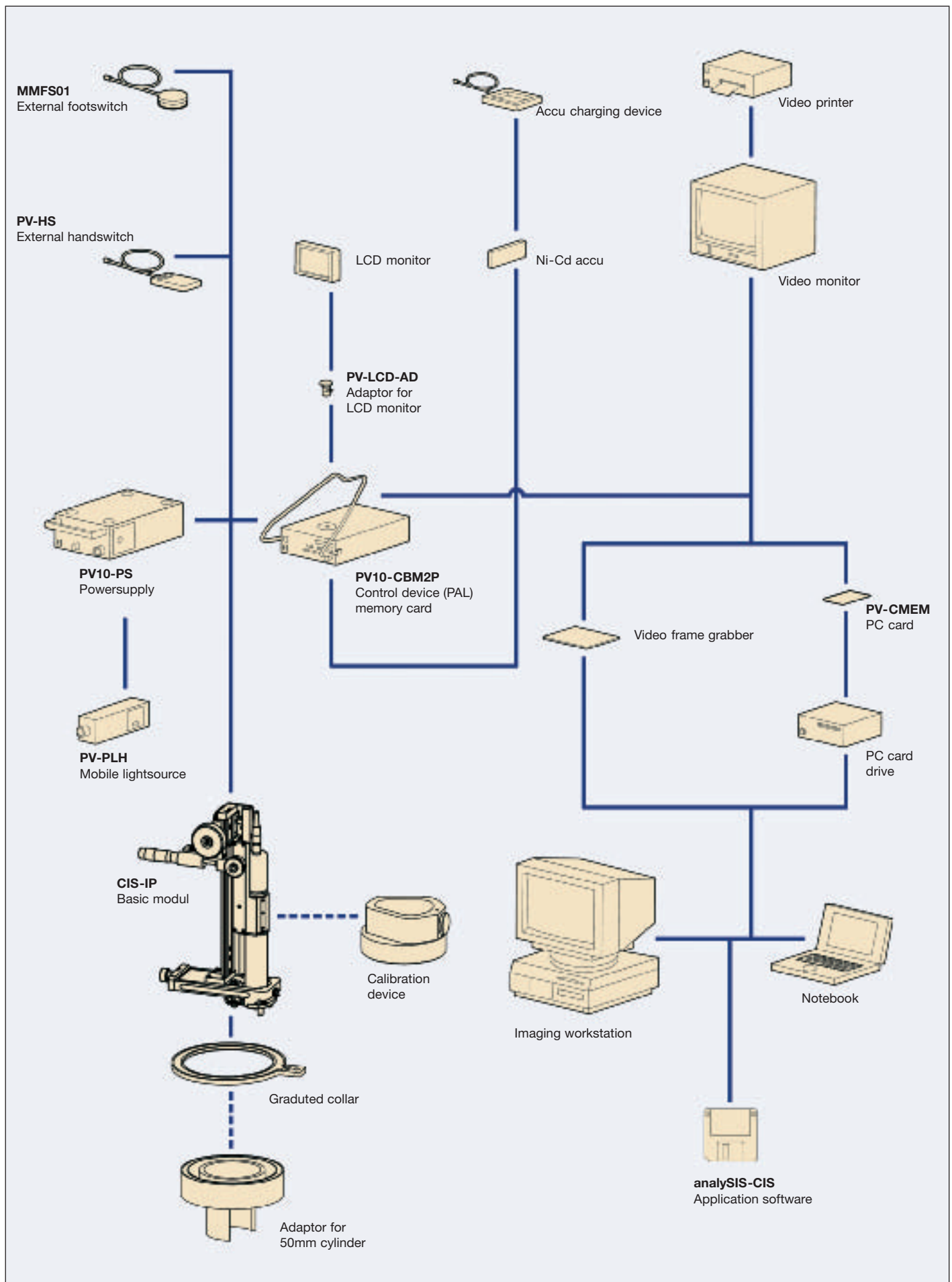


# CIS Systemchart



# System specifications: model CIS-IP

mechanical system	self-centering bearing system for cylinders of diameters between 67 and 120 mm, continuously adjustable. (Pat. Pending)	<ul style="list-style-type: none"> <li>● via special adapter device to be mounted to cylinder of 50 mm diam.</li> <li>● self centering graduated collar, corresponding with diameter of the cylinder (a reference point for reading the angle of rotation can be determined by the user)</li> </ul>	
	fine focus (micrometer screw) with digital display and reset button. (mech. working distance: 7.5 mm)		
	lowering device (traverse path 157 mm at diam. 67 to 120 mm, 75 mm at diam. 60 mm)	<ul style="list-style-type: none"> <li>● graduation beginning with 0 at upper edge of cylinder</li> </ul>	
optical system	vario-optic system with 8 optical elements	<ul style="list-style-type: none"> <li>● zoom system, magnification 54 to 280 times (displayed on 17" display device)</li> <li>● continuously adjustable zoom with snap-fit position at 120 times</li> <li>● direction of observation is perpendicular to zoom axis</li> </ul>	
		continuously adjustable aperture-stop system with 3 snap-fit positions	<ul style="list-style-type: none"> <li>● maximum open aperture (gives minimum depth of focus), used for surface profile measurement</li> <li>● medium aperture (optimised depth of focus/contrast- ratio)</li> <li>● maximum closed aperture (enhanced depth of focus)</li> </ul>
	camera system	1/3" CCD 470,000 pixel	
image display	integrated LCD-device, resp. display device of imaging workstation		
illumination system	cold-light device, integrated to control unit	<ul style="list-style-type: none"> <li>● fiber-optical light guide</li> <li>● multi angular illumination system, optimised to surface geometry</li> </ul>	
image analysis software from Soft Imaging System GmbH	analySIS-CIS Basic, OS: Windows 98/2000/XP	● calibration	
		● life-display	
		● grab image incl. scaling overlay	
		● image archive	
		● measuring documentation	
		● report automation	
		● direct measurement	
		● phase analysis (alloy, cast)	
		● multi-image-alignment	
		● extended focus imaging	
		● 3-D- surface profile	
		● image improvement	
		● dynamic data exchange incl. E-mail function	
	analySIS-CIS Extended (additional functionality)	<ul style="list-style-type: none"> <li>● automated image analysis</li> <li>● particle analysis (particle classification)</li> <li>● control of motorised system modules</li> <li>● chart-navigator for dynamic comparison of image standards</li> <li>● automatised measurement of honing</li> </ul>	
weight	mobile version incl. transport case	47 kg	
system modification	adaptations of Cylinder Inspection System to individual needs are possible. Please get in contact with CIS- development team.		

Specifications are subject to change without any obligation on the part of the manufacturer

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# OLYMPUS

THE VISIBLE DIFFERENCE

Industrial application microscopy

## CIS

Cylinder Inspection System

Innovative quality insurance  
in industrial production



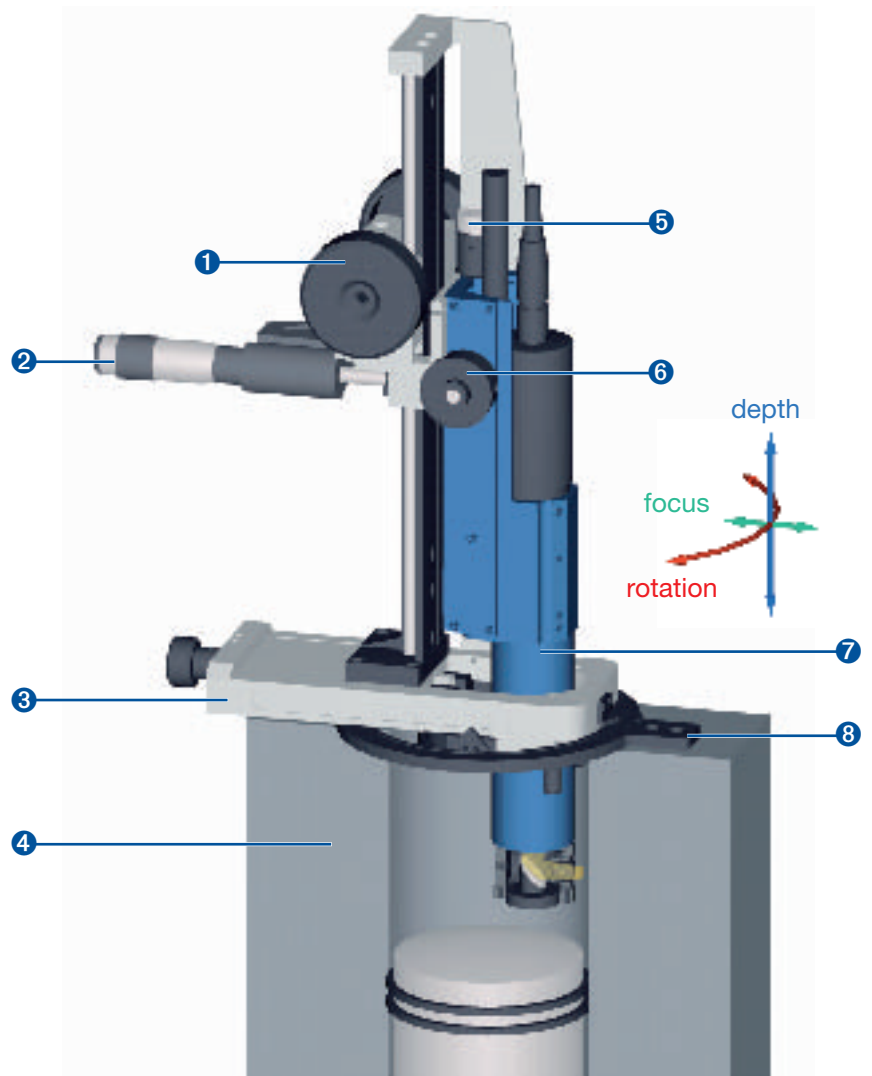
# Unusual point of view

Developing the cylinder inspection system (CIS) Olympus discovered a completely new field of application for microscope inspection in industrial production. Many processes of deformation and tooling solid materials demand highly qualified microscopic observation and inspection. Typically, the test samples are generated for destructive inspection, cutting the test item into suitable parts. The exposed surfaces optional prepared in a specific procedure are observed and analysed at high resolution and high magnification. General criteria for qualification of the observed surface are functional structures, defects or norm deviations.

For a special class of mechanical components Olympus created a microscope in unique wise adapted to the geometry and inspection demands of the test item: cylindrical hollow bodies of different kind and format can now be observed in microscopic inspection. The CIS is attached via mechanical adapters to the test item and enables the user to perform a complete microscopic observation of the cylindrical hollow body inner walls in a very flexible and convenient way.

The microscopic image is displayed on a system integrated LCD-device or on the monitor of the attached image analysis workstation.

Great importance was attached to the features mobility and flexibility of the system. So it was realised to adapt the Cylinder Inspection System to tasks of different character. Essential functions are optional to be motorised and allow incorporating the system into automated and software-controlled testing procedures. Our co-partner in development: Thalheim Spezial Optik customises the system to the individual requirement.



- ❶ Adjustment screw to drive down the device into the test item (optional motorised)
- ❷ Adjusting screw for focussing device
- ❸ Rotatable 3-point wheel bearing assembly (optional motorised)
- ❹ Cylindrical hollow body (e.g. cylinder block)
- ❺ Turn switch for selecting the depth of focus range
- ❻ Zoom device (optional motorised)
- ❼ Central video-optical module with 90°-optical system
- ❽ Graduated collar for readjustment of the rotation angle

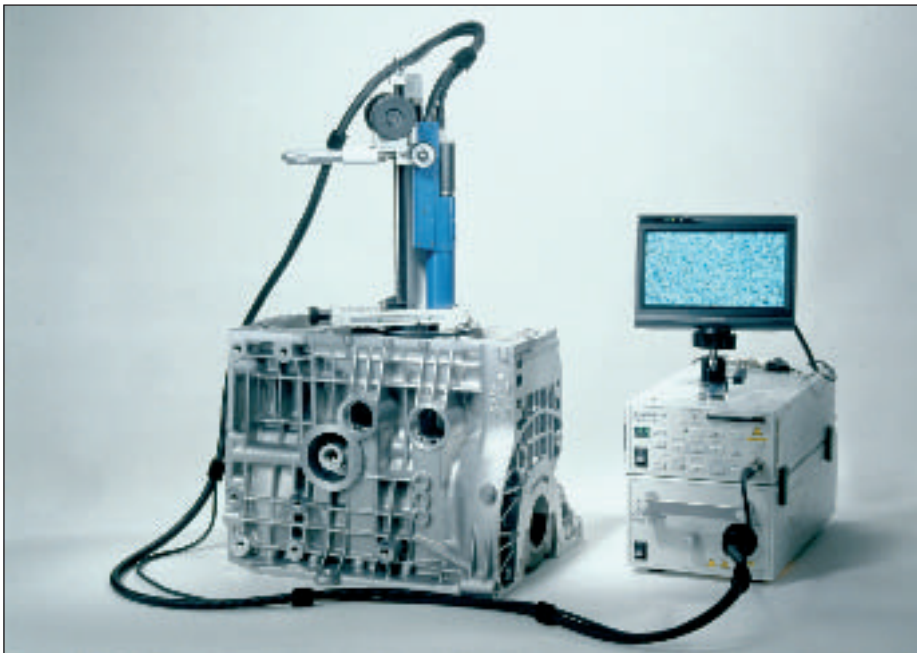
Its advantages make the Cylinder Inspection System a valuable inspection tool in product development and production line:

- Non-destructive inspection of cylindrical hollow-bodies.
- Due to its flexibility and portability the CIS is well suited for on-the-spot application in production and mounting facilities.
- The modular concept allows the CIS to be adapted to customised requirements.
- Simplified testing process, realised with a specific application software (Soft Imaging System, analySIS-CIS) with a multitude of image archiving and –measurement functions.

## To meet a challenge

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Motor production and other manufacturing processes of cylinder-shaped bodies with highly precise surfaces and sensible machining tolerances, demand strict compliance with defined dimensions. Exemplary applications for the Cylinder Inspection System are given with the inspection of working surface of cylinders in engines, hydraulic systems and brake systems and the load-bearing surfaces in large bearings.



Cylinder Inspection System (mobile version).

Optimised for flexible and mobile use on-the-spot. Mobile image archiving on PC-card (Flash-Memory Type). Incl. LCD-device, portable light source and accumulator module. Supplied with transport case (airfreight suited).



Cylinder Inspection System (stationary version).

Optimised for stationary use in the testing- or development lab. Image archiving and -analysis via integrated imaging workstation. Software modul analysis-CIS (Soft Imaging System). Incl. LCD-device. 110/220 V.

Typical requirements in microscopic control is the investigation of defects in the working surface of the cylinder after machining like drilling or grinding. Cavities and microscopic cracks become visible and can be analysed.

Procedures like grit blasting may leave residues of microscopic dimensions on the material surface, which can be easily identified by CIS.

Sizing the particles with integrated image-analysis tools of analySIS-CIS software gives detailed information about origin and relevance of the disturbance.

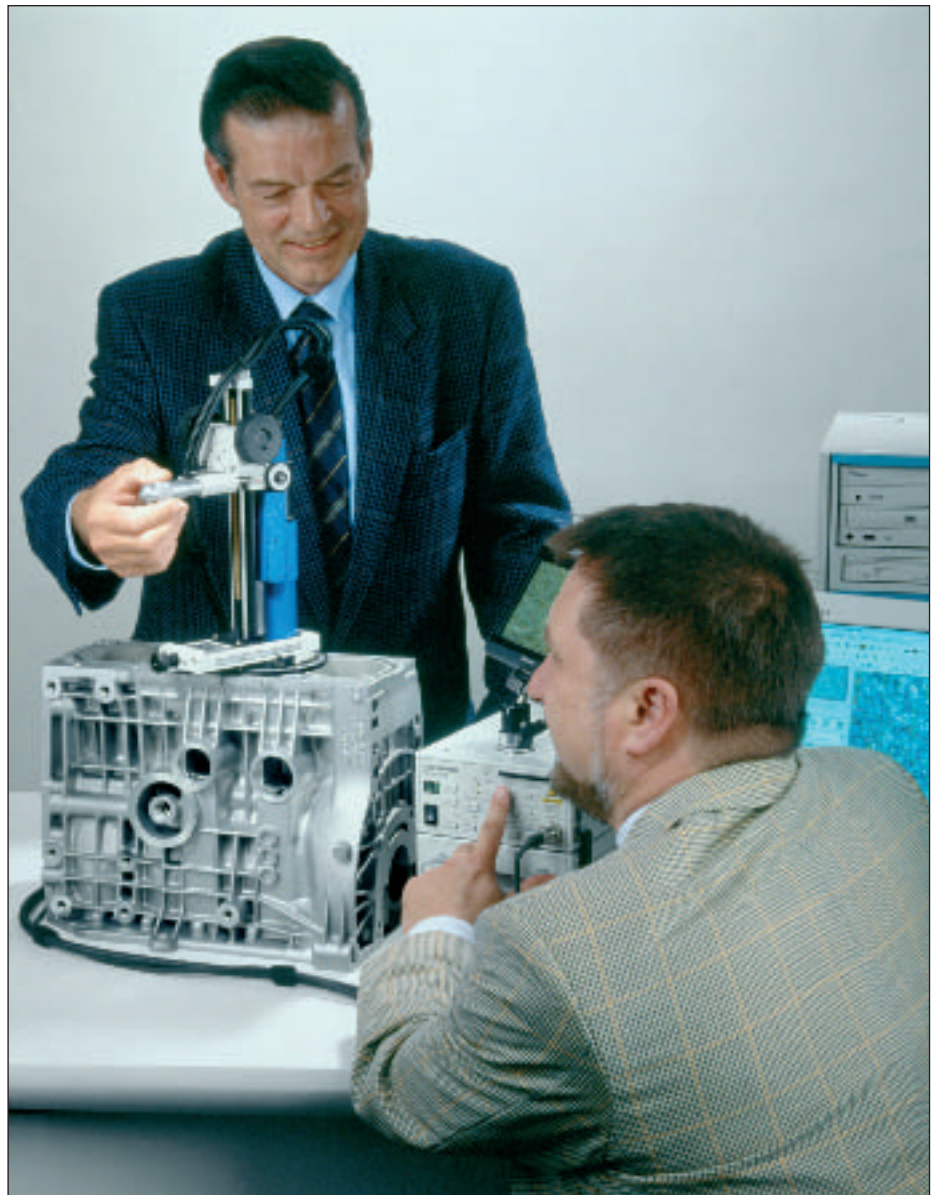
Increased significance is attached to the quality of specific tooling processes which affects the functionality of the material surface. So it is possible for example to automatically determine the honing-angle of the cylinder and control the measurement compared to a standard to qualify the process. A monitoring of the tool lifetime and process quality can easily be achieved.

Manufacturing companies with international production facilities and a decentralised quality-management demand on-the-spot opportunity to investigate the product quality with microscopic inspection methods.

There exists a mobile version beside the stationary version of CIS. The device is delivered in an air freight case. This assures a convenient handling of CIS. The edp components like PC and LC-display have been selected for high reliability and rigidity. Each set comes with accumulator and charging device, as well as adapters to international power-supply standards.

## Successful partners

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Successful application of CIS in motor-development (Volkswagen AG)

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The basis for realisation of the Cylinder Inspection System was a successful co-operation, focussed on the technical solution. In the context of a unique innovation in motor-production at the Volkswagen AG there was a development and establishment of special materials for generation of special hard-material coatings and their application on inner walls of cylinder bores. The control of the pre-processed material surface and the control of the plasma generated hard-material coating are of high importance for optimisation of involved process-parameters. The microscopic inspection discloses fundamental information about cleanness and character of the material surface, the homogeneity of the coating, and the efficiency of the honing tools. Significant value is attached to the non-destructive inspection of the cylinder bores, to the portability of the CIS and to a meaningful documentation of the microscopic images – which all together were the dominating requirements for functionality and design of the Cylinder Inspection System.