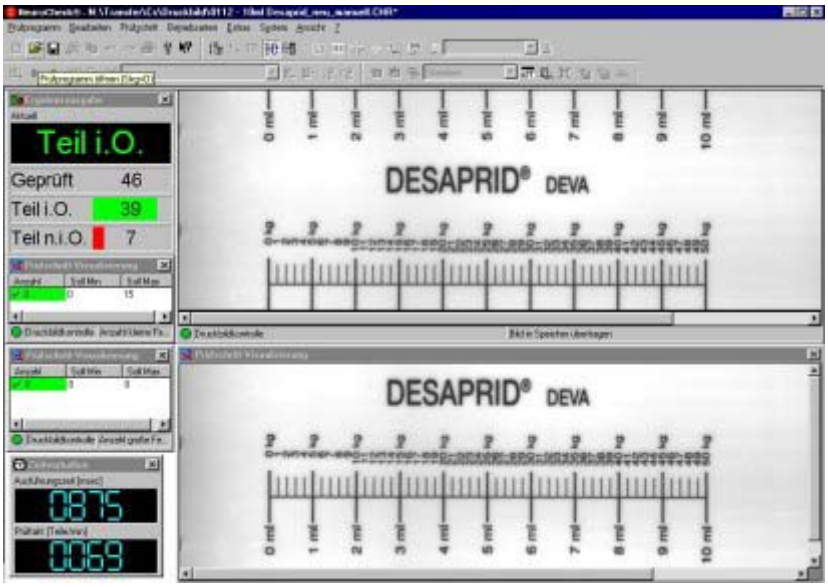
Dosage Plunger

This application was successfully implemented by our own application department using NeuroCheck is the print inspection on dosage plungers. The cycle time for evaluating the complete print was required to be less than 1.1 seconds.
To capture the print image, the cylindrical inspection parts which are marked with the type and the level scale are scanned by a high-speed line-scan camera. The part is presented at the inspection position on live rollers and turned by 396° (360° + 10%) within 0.3 seconds. The synchronization of the line-scan camera's capturing speed and the rotation of the inspection part is achieved using a shaft encoder fitted on the motor shaft of the transport roller.



Part scanned with line scan camera

Part with level scale

The starting position of the image capture is not defined. The first task of the image processing system is to match the constantly changing starting positions of the captured image with the stored target printing image. Using the built-in NeuroCheck function "Adjust line-scan image", the captured image is re-arranged and put back together according to the trained print image (see figure). Now the print image can be compared using another NeuroCheck standard function. For optimum evaluation speed, all printed characters are evaluated locally and then masked out. In a final step, the homogeneous background of the print is checked for color splashes and pollution. The area of the found disturbances serves as a measure for the evaluation of the inspection part.

The evaluation time for a print image is between 0.4 and 0.6 seconds depending on the complexity of the image. The total time for the inspection including image evaluation is 0.7 – 0.9 seconds. Because of the almost linear scalability of today's PC systems, evaluation time can be reduced even further with modern processors.

Another integrated functionality of the inspection line is the possibility for remote diagnosis using common remote maintenance software. Parameter changes and software updates can thus be performed cost effectively and quickly using a standard ISDN phone line.

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Technical Data	
Frame Grabber:	DS-SDIG, digital
Cameras:	Digital CCD line-scan camera, 2048 pixels
Illumination:	Cold light with fiber optic line light with focusing lens
Interfaces	Digital I/O Card DS-DIG 16/16
	Integrated remote maintenance using ISDN Modem

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