

### P5843 Camera and imaging

- ✓ CCD imaging chip
- ✓ Camera objective
- ✓ Objective magnification
- ✓ Iris and depth of sharpness
- ✓ NIR and night vision
- ✓ Computer control

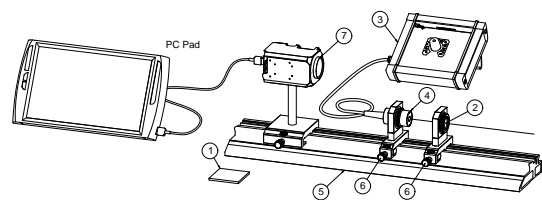


### Examples of investigation and measurement

#### General set-up

A high performance industrial CCD zoom camera (7) with computer interface is subject of a variety of investigations. The rapid development in the area of CCD sensors created a great variety of new possibilities. Most of them are introduced here and one get experienced in the manifold of parameters which needs to be set according to the requirements. The CCD camera used can be operated as day as well as night camera. In the latter case an IR filter is switched between the objective and the CCD chip enabling the sensitivity in the near infra red region (NIR).

The camera is fully controlled by a PC Pad, the video output is connected to the provided TFT monitor.



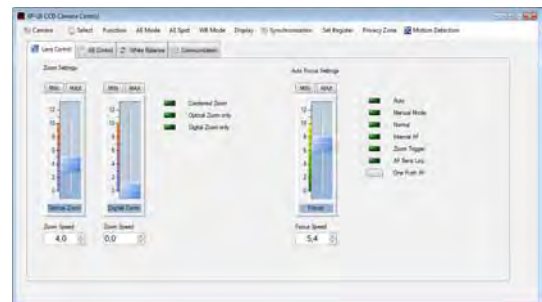
#### CCD Camera properties and control

The camera is internally controlled by digital signal processor (DSP) which also creates the image out of the pixel information of the CCD chip. By means of the common VISCA protocol commands are send and received via RS232 bus.

Beside the common controls like auto focus (AF), optical zoom, digital zoom, auto iris, shutter speed also the implemented motion detection and masking are controlled by the provided software.

Image flipping, black and white, negative distribution, white balance, back light compensation just to name a few special settings are accessible by the software.

Due to the possibility to control the iris, focus and zoom the optical relations of the depth of sharpness is impressively verified.

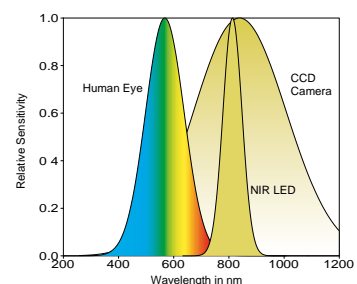


#### Active night vision

The figure shows the sensitivity of the human eye and a CCD camera. The maximum of the CCD camera peaks at 900 nm where the human eye is completely blind. Using an NIR light source like a laser or LED a complete dark night can be illuminated without be seen by humans or animals. This technology is termed as active night vision and plays an important role in surveillance tasks even in complete darkness.

To demonstrate this effect a NIR LED (4) controlled by the adaptive power supply (3) is provided. The divergent emission of the LED is collimated by a lense (2).

The camera is switched by the software into the NIR mode. A filter is removed electro-mechanically out of the front of the CCD chip allowing NIR radiation to access the chip.



#### P5843 Camera consisting of:

Item	Qty	Description
1	1	IR block filter
2	1	Plano convex lens f=60 mm, C25 mount
3	1	Adaptive power supply APS-05
4	1	LED NIR in C25 housing
5	1	Profile Rail MG-65, 300 mm
6	2	Mounting plate C25 with carrier 20 mm
7	2	CCD day and night camera module

Item	Qty	Description
8	1	CCD camera control software
Required Options:		
	1	Flat panel TV 20 inch
	1	PC Pad