Test the Best!

Low-light cameras

In cooperation with Seetec, GIT SECURITY tests current and new video cameras under standardised conditions in the test laboratory of the SeeTec Hardware Competence Center. The Hardware Competence Center was set up because the data and performance specifications of network cameras as stated by manufacturers are often measured under different conditions and are not always reliable in practice. The results provided a sound basis for planning IP video projects and help to avoid unpleasant surprises. For the testing procedure, video sequences are produced under defined lighting scenarios and are then evaluated. Here, movements in the picture as well as night and backlight situations are taken into consideration.

Performance

Performance assessment when used with 1,000 Lux
Under good lighting conditions, the camera produces an extremely high-contrast and clear image, although some tonal shades are lost. Colours appear on the cold side, with somewhat reduced saturation. The acute sharpness is striking; contours are emphasised and lines reproduced very precisely. The motion sharpness is close to perfect; there is no evidence of smearing or Moiré effects. No image noise is detected.

Performance assessment when used with less than 1,000 Lux
With decreasing light intensity, colours tend to appear warmer; the contrast decreases somewhat overall, which results in a rather more natural overall impression. Under 30 lux, the image becomes somewhat darker overall. The camera, which has been optimised for back light conditions, cannot fully compensate for the reduction in lighting. However, the scenery continues to be clearly visible. An effective reduction in image noise is noted. However, this results in the formation of artifacts and reduced sharpness under low light conditions. Even at two lux, hardly any smearing can be detected with moving objects. At 0.5 lux, the image rendition still occurs in colour.

Performance assessment in backlight situations
The recovery time is extremely short; after ca. one second, the camera produces a stable image in which the back light source clearly overexposes. As is to be expected from a camera that has been optimised for this purpose, the scenery background is reproduced very light all over – details are even visible in the border area of the test image.

Performance assessment in use: Bandwidth measurement
The camera was tested using high profile, H.264. From 1000 lux to 0.5 lux, the camera bandwidth required remained relatively constant at ca. 5 MB/s. In an extremely low light field and when confronted with back light conditions, the recovery performance results in short load peaks of more than 20 MB/s. Overall, the average bandwidth required is 5.64 MB/s.

Conclusion

The network camera with WDR and very high contrast range, which has been specially optimised for back light situations, produces unsurprisingly good results, particularly in difficult lighting and back light conditions. Of particular note is the fine image definition, even with moving objects. The maximum definition of the PoE camera with streaming is 1280 x 960 pixels – it can provide multiple MJPEG and H.264 video streams simultaneously.

In Focus: Axis Q1604

Axis Q16 Network Camera Series comprises of indoor and outdoor-ready fixed cameras that deliver outstanding image quality in demanding video surveillance conditions, such as poor light or highly variable lighting. Equipped with Axis' Lightfinder and WDR technology, the Q1604 is designed to enable clear identification of both people and objects, even in highly variable lighting conditions. The camera's Wide Dynamic Range with dynamic capture works by acquiring several images with different exposure times to handle complex scenes such as when light comes through a window creating both dark and bright zones. The camera delivers progressive scan image quality at 1MP or HDTV 720p in compliance with the SMPTE standard in resolution. It can generate multiple, individually configurable H.264 and Motion JPEG video streams simultaneously and allows easy installation with remote back focus.

CAMERA TEST

Technical data for the camera test

Manufacturer	Axis
Model	Q1604
Firmware version	5.40.3.1
Distance to test chart	0,7 m
Lens used	Tamron MP 2.8-8 mm IR1:1.2 1/3 CCTV CS
* Focal length set	6 mm
*Compression method	H.264
*Resolution	1280 x 720
*Compression	50 %
I-Frame-interval	1 second
Max. stream bandwidth	unlimited
Measured frame rate	30 fps
Average bandwidth	5.64 Mbit/s

*The camera was integrated into the test system with the "default" settings. The settings were modified according to the test criteria listed above.

Assesment with differing illumination conditions

Criteria	Lux values	1000 Lux	100 Lux	10 Lux	0,5 Lux	0 Lux + *BL1
Colours	2	1.5	2	2.5	b/w
Contrast	2.5	2	2.5	2.5	2.5
Focus	2	2	2.5	2.5	3
Motion sharpness	1.5	1.5	1.5	2	2
Image noise	1.5	1.5	2	2	2
Recovery from backlight	–	–	–	–	1
Performance against backlight	–	–	–	–	2.5

Assessment was performed according to the rating system of 1 (very good) to 6 (unsatisfactory). By setting various parameters on the camera interface itself, it is possible to obtain an improved image quality. *BL= Backlight