

Bosch LTC 0498 Dinion 2X Day/Night Camera

In these times of dramatic CCTV technology changes we will be testing two high performance analogue cameras. Following tests this month, and next month, we will carry out tests on several selected new technology, high performance IP cameras.

This month we will carry out basic objective tests on the Bosch LTC 0498 Dinion 2X Day/Night camera. It uses a 1/3-inch, wide dynamic range CCD sensor and incorporates advanced 20-bit digital signal processing for improved picture performance and the 2X-Dynamic technology extends the image dynamic range.

Our analogue CCTV camera tests will comply with the European Standard EN 61146-1 Video Cameras (PAL/SECAM/NTSC) – Methods of measurement – Part 1: Non-broadcast single-sensor cameras. This standard is also known as IEC 1146-1 and BS EN 61146-1 and is accepted world wide as the preferred method of testing single chip CCTV cameras and it is suitable and preferred for all current colour or monochrome single chip cameras.

The Camera
Valued features of the Bosch LTC 0498 Dinion 2X Day/Night camera include:

Detail in Extreme Lighting:

In some lighting conditions, the difference between the brightest and the darkest parts of a scene can be extreme. The Dinion 2X generates two images; one long exposure to resolve details in the scene's darkest areas, and one short exposure to resolve details in the scene's brightest areas. The Digital Signal Processor (DSP) combines these dual shutter images, from each exposure to produce the most suitable image.

20-bit Image Processing:

The digital signal processing optimally captures the detail in both bright highlights and deep shadows simultaneously. By combining

20-bit image processing the Dinion 2X maximizes the information visible in the picture even with strong backlighting.

Wide Dynamic Range:

The 2X-Dynamic and SmartBLC, using 2X-Dynamic technology, pixel-by-pixel analysis provides the user with detailed image information and SmartBLC is used to automatically compensate the image without the need for any set-up.

Lens Wizard:

The Dinion 2X camera auto detects the lens type (manual iris, DC iris, video iris) or it can set manually. The lens wizard can be used to back focus the lens with maximum iris opening so the lens will maintain focus through all lighting conditions over a 24 hour period.

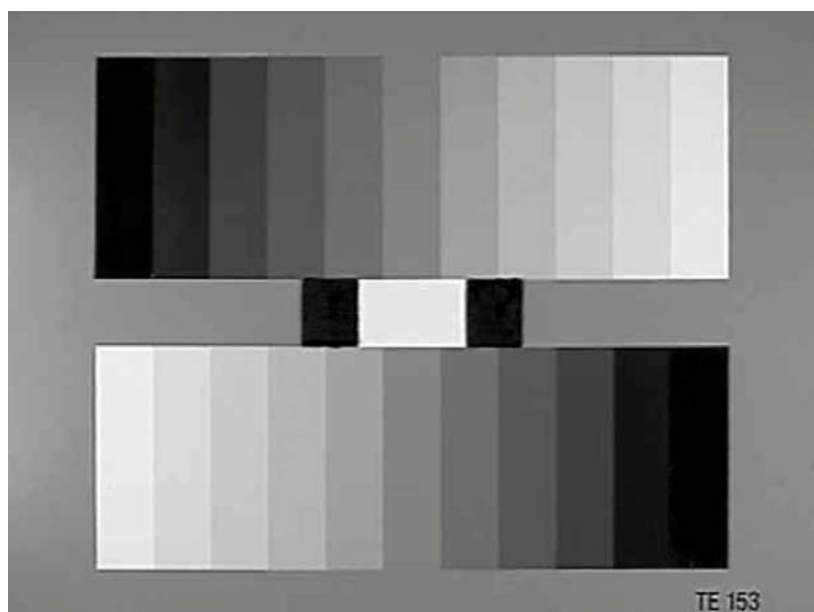
Cable Compensation:

The cameras include built in and menu controlled cable compensation which eliminates the need for an additional equalising amplifier on long coaxial cable runs. The cable compensation can be switched off, or set for various

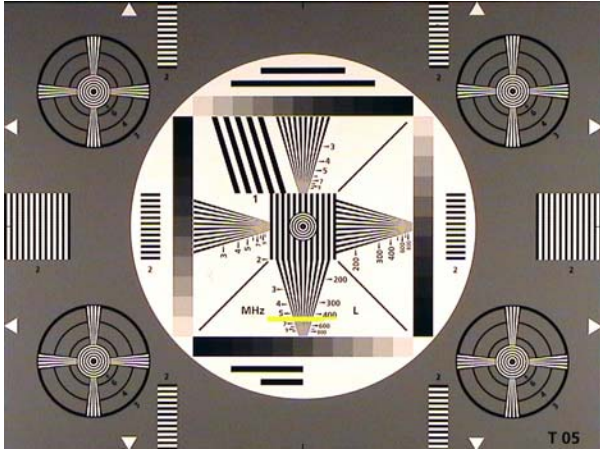
equalising levels and can be adjusted over a wide range.

Our tests showed that there is a degree of cable compensation even when the cable compensation is switched off. This can add overshoot and undershoot to the video signal with very short cable runs as can be seen on the waveform images. Our tests suggest Bosch have set the off position cable compensation to suit coaxial cable runs of about 100 metres, which is about average.

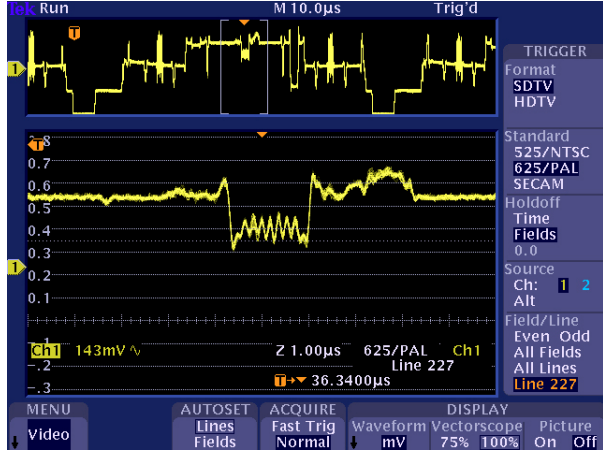
The overshoot and undershoot from this camera is very clean and does not detract from the viewed image but is very noticeable when the camera is connected via 1.5 metres of coaxial cable to sensitive test equipment. It is interesting to note that the European Standard EN 61146-1 Video Cameras (PAL/SECAM/NTSC) – Methods of measurement – Part 1: Non-broadcast single-sensor cameras state the following in a footnote for the overshoot and undershoot tests: "To improve the apparent sharpness of the visible picture, some cameras may produce an overshoot at the edge of a bar signal. Taking this into account, it should be noted that a smaller amplitude



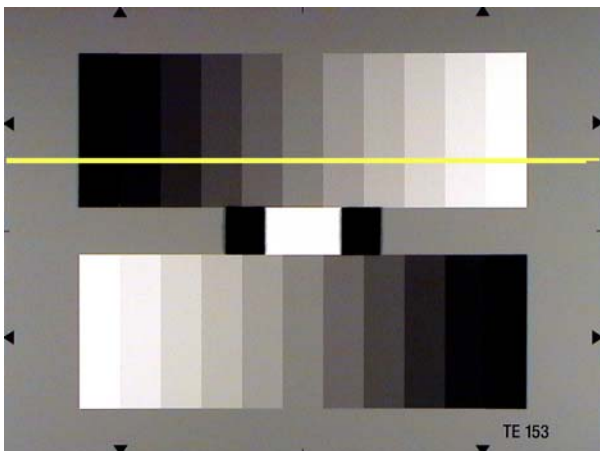
Bosch LTC 0498 Dinion 2X Day/Night camera greyscale image.



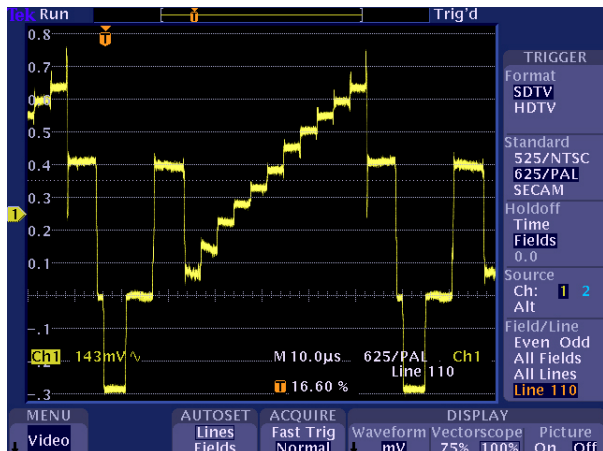
Universal camera test chart (RETMA) image showing area of resolution measurement.



Bosch LTC 0498 Dinion 2X Day/Night camera resolution waveform showing about 15% depth of modulation at 520 TV lines.



Greyscale test chart image showing measurement area in yellow.



Bosch LTC 0498 Dinion 2X Day/Night camera greyscale waveform image of test area and good linearity.

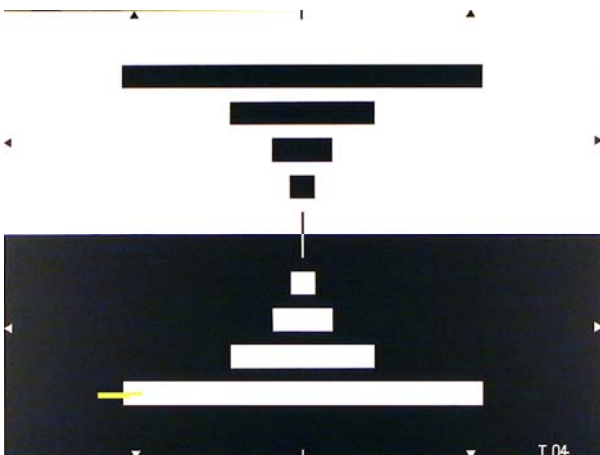
of overshoot and undershoot does not necessarily indicate better picture quality".

The Tests

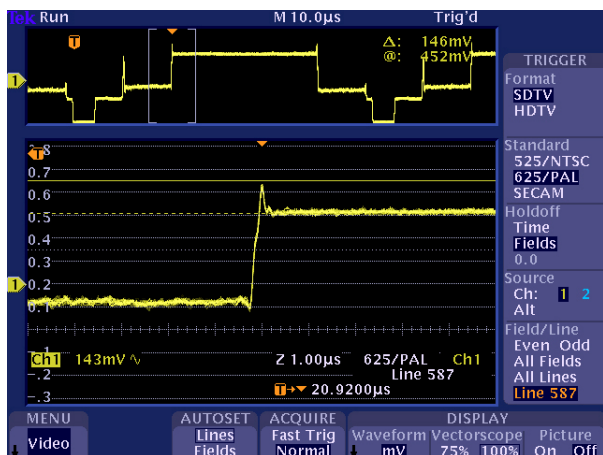
This series of tests shows the camera test chart with a yellow marker

showing the approximate position of measurement on the camera test chart in relation to the waveform image. This will assist those who are interested in the test chart position these test measurements are made.

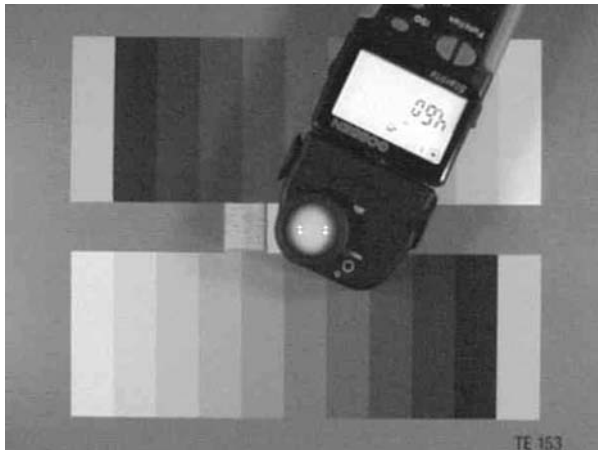
The tests were carried out on this camera with its default (out of the box) settings, except for the lens wizard, which was set for a manual lens to suit our high performance Schneider test lens.



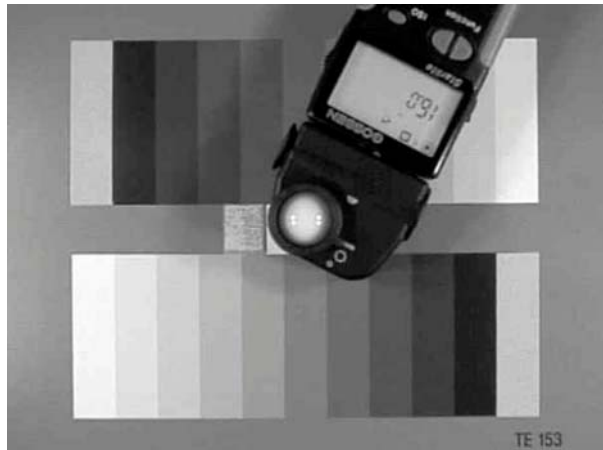
Bar Test Chart showing area of overshoot measurement.



Bosch LTC 0498 Dinion 2X Day/Night camera overshoot measurement waveform showing overshoot level.



Bosch LTC 0498 Dinion 2X Day/Night camera measured sensitivity at 4.6 lux.



Bosch LTC 0498 Dinion 2X Day/Night camera measured day to night changeover at 16.0 lux.

EN 61146-1 does not have provision for testing day/night cameras; therefore we developed a test which is based on EN 61146-1, but determined what is a useable image (without image smear due to the camera sampling speed) for a slow moving image at half screen height. With this test the sensitivity of the Bosch LTC 0498 Dinion 2X Day/Night camera was found to be 4.6 lux. This figure is in variance with the manufacturer's claim, but this is normal with most cameras because sensitivity test references and standards are rarely quoted by manufacturers these days. We also noted that the day to night change over happened at 16 lux according to the EN 61146-1 standard.

The resolution was 520 TV lines which is close to that specified by Bosch. The waveform image shows a depth of modulation of about 15% at 520 TV lines which is three times more than the 5% depth of modulation specified in EN 61146-1. (Note: The tested figure of 520 TVL against the Bosch specified 540 TVL was not found to be a problem).

We found the greyscale of this camera to be well within specification and more linear than many we have tested. We did note some black stretch which improved black detail.

We included an image and waveform of the overshoot mentioned above. This apparently complies with the EN 61146-1 standard and improves the apparent resolution to the eye viewing a CCTV monitor over a normal coaxial cable length.

In the next issue we will test an-

other top performing analogue camera and then, in the months following, test several selected new technology, high performance IP cameras.

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