

# New Super Dynamic CCTV Camera Test

Panasonic design their CCTV cameras with performance and robustness in mind. A good example of this is the Panasonic Super Dynamic II (SDII) series cameras which were released in 2000 and are only just being superseded by the SDIII series cameras. Some CCTV camera manufacturers release new technologies much more often in an attempt to capture a slice of the market.

To see how well Panasonic has done we will carry out some basic objective tests on the Panasonic WV-CP484E SDIII 1/3" colour camera. The camera tests to be carried out will comply with the European Standard EN 61146-1 Video Cameras (PAL/SECAM/NTSC) – Methods of measurement

arity, sensitivity, resolution and next month we will look at the Panasonic CCD pixel by pixel back light compensation.

## The Cameras

Some of the interesting features of the new Panasonic SDIII camera series include:

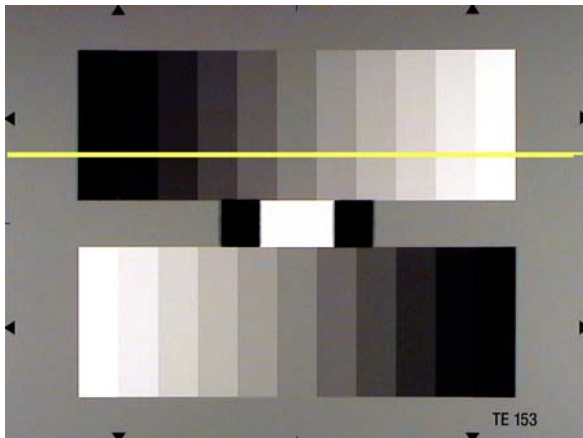
A pixel based 160x dynamic range correction which adjusts automatically to moment-by-moment changes in contrast, making it possible to view and identify subjects in all areas, including high level of back light.

A colour resolution of 540 TV lines and a monochrome resolution of 570 TV lines (typically).

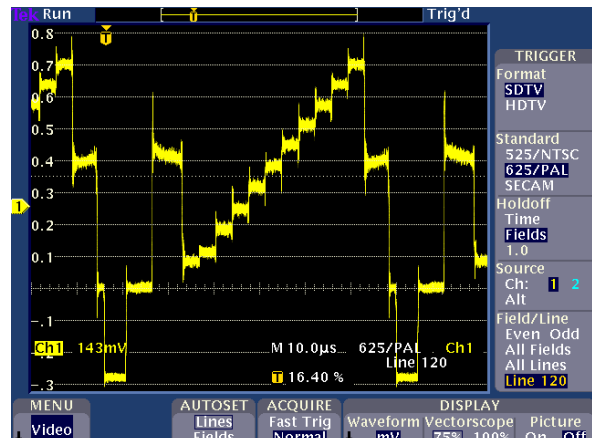
Auto Back Focus - One touch fo-

Scene Change Detection (Sabotage) Feature: Another unique feature to SDIII is the use of motion detection algorithms to determine whether a camera has been sabotaged. With this feature on, the camera will recognise a massive scene change (camera defocused, removal of lens, spray painted, forcibly moved etc) and raise an alarm either to the head end, or via the external alarm output can trigger alarms locally or alarm down the coax.

Low Pressure Sodium White Balance Setting: An often overlooked feature is the low pressure sodium white balance setting, optimised for 2000 degrees K colour temperature lighting. With this feature on, this allows better sur-



Greyscale test chart image showing measurement area in yellow.



Panasonic WV-CP484E SDIII 1/3" colour camera greyscale waveform image of test area and good linearity, but with slight black crushing.

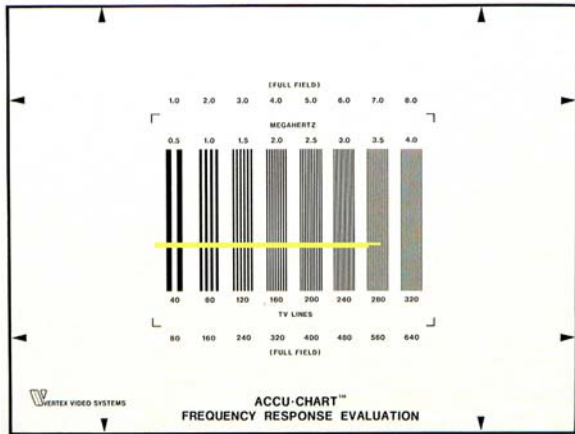
– Part 1: Non-broadcast single-sensor cameras. This standard is accepted world wide as the preferred method of testing single chip CCTV cameras and is suitable for all current colour or monochrome CCTV single chip cameras.

The standard includes a large number of camera tests and it would take the whole magazine to show you test results and waveform images for each of the tests so we will limit the results to the most common tests discussed in the industry, in relation to CCTV cameras, such as greyscale line-

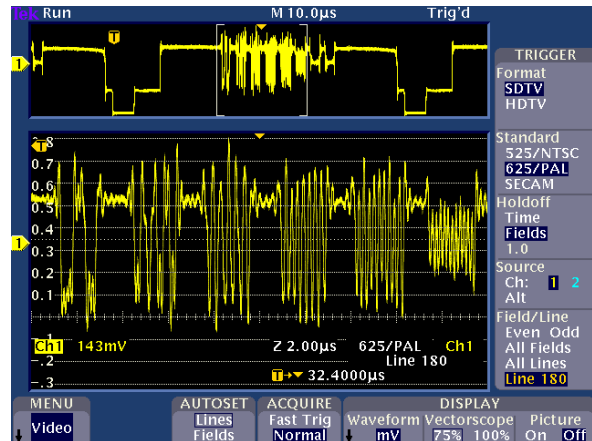
cus feature: Unique to SDIII WV-CP484, this feature enables the installer to simply press the menu button on the back of the camera once and the camera will shift the CCD block to achieve the optimum focus setting. Also, when the camera switches from colour to black and white mode, the IR cut filter is removed and the CCD block will shift again to retain the optimum focus. This allows for remote focus adjustments down the coax and also eliminates the requirement for technicians to back focus cameras on site or in varying lighting conditions.

veillance of images where low pressure sodium lighting is used, obviously common in street situations. Most other colour camera are particularly weak in this area.

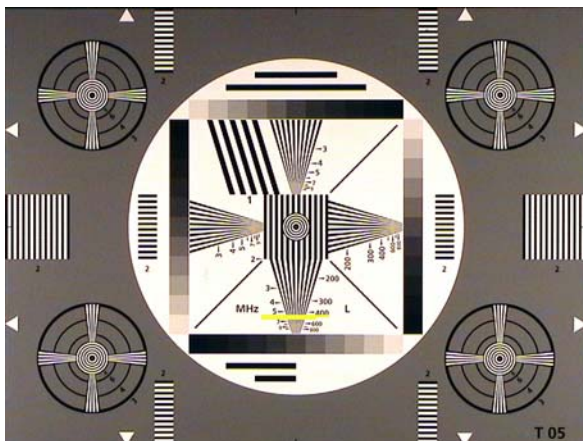
Pixel Loss Compensation: The SDIII series of cameras are equipped with a feature that allows the users to isolate dead pixels in the CCD block and not scan them. The image will simply take the colour of the pixel next to it, allowing the life span of the camera to be increased. This will remove 'dead' pixels in the image on the monitor.



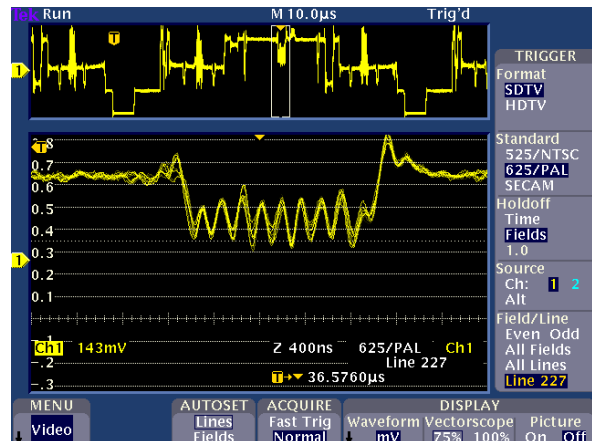
Frequency response evaluation test chart image showing measurement area.



Panasonic WV-CP484E SDIII 1/3" colour camera frequency response waveform image showing 1.0 MHz, 2.0 MHz, 3.0 MHz, 4.0 MHz, 5.0 MHz and 6.0 MHz. Note: 6.0 MHz is equal to 480 TV lines. This is a very good result at 6.0 MHz.



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



Panasonic WV-CP484E SDIII 1/3" colour camera resolution waveform showing good modulation depth at greater than 500 TV lines.

Privacy Zone and Horizontal Mirror features: The privacy zone allows for the user to set an area on the screen that becomes diffused to the monitor output. This is especially useful in cell applications as privacy concerns require that the camera can't be focused on certain private areas. With the privacy zone settings on, you can still see what's going on without capturing the detail thus retaining privacy. The horizontal flip feature creates an inverse of the image, useful if you have to focus the camera on a mirror in order to see around a corner etc.

An image stabiliser is used in the WV-CS954 SDIII 1/3" colour PTZ dome camera but is still only in a Beta phase on the fixed camera. It works by extracting motion vector and motion area coefficients from 4 sectors of the image. A slight electronic zoom is applied to the image and the software on the DSP then centres the

image based on the motion coefficients received from these 4 sectors.

### The Tests

This series of tests shows the camera test chart with a yellow marker showing the actual position of measurement on the camera test chart in relation to the waveform image. This will assist those who are interested to know where the relevant test measurements are made.

These tests were carried out with the camera in its default (out of the box) settings, with one automatic exception where it set itself for a manual lens to suit our high performance Schneider test lens.

We found the greyscale linearity to be well within specification and more linear than most we have tested, but included slight black crush (which in many instances

actually helps the image quality).

The sensitivity according to EN 61146-1 standard for the Panasonic WV-CP484E SDIII 1/3" colour camera sensitivity to be 11.28 lux for full video and 6.64 lux for half video. This figure is in variance with the manufacturer's claim, but this is normal with most cameras because sensitivity test references are rarely quoted by manufacturer's these days.

The resolution was greater than 500 TV lines which is as specified by Panasonic. A pleasant surprise! The waveform image shows a depth of modulation of about 20% at 500 TV lines which is four times more than the 5% depth of modulation as specified in EN 61146-1.

It appears that Panasonic's commitment to performance and robustness will once again position Panasonic as one of the leading CCTV companies.

In the following section we will compare the CCD pixel by pixel back light compensation performance of the Panasonic WV-CP484E SDIII 1/3" colour camera in field tests with another Japanese new technology camera.

### Field Testing

In the last section we bench tested the Panasonic WV-CP484E SDIII 1/3" colour camera and it came up really well. This month we will field test the same camera for back light compensation tests against a well known good performing Japanese camera, which we will call brand Z. Brand Z is a well respected and well used new technology CCTV camera and its name has been hidden to protect the innocent and create some industry speculation.

Both cameras were set to their default settings and any variables within the default settings were set to mid positions. Therefore, both cameras will be tested on an equal footing and if they are as good as expected should perform in a similar manner. It's worth mentioning here that sometimes it is appropriate to test cameras under their optimum settings for the site conditions but not necessarily in comparative tests.

### The Tests

We have a standard backlight compensation test at a known site which is always carried out on a sunny day at about the same time. This test uses a window with a harbour view for back light and an individual of approximately the same size each time on an 8 mm lens. The tests are carried out with a transparent blind down which reduces the light level by

1.5 f-stops and with the blind up which is bright!

Because these tests include sky and other bright light sources both tests really sort out the wheat from the chaff. The Panasonic WV-CP484E SDIII 1/3" colour camera was found to be the best ever CCTV based camera with these tests to date. The WV-CP484E SDIII has a pixel based 160x dynamic range correction which makes it possible to view and identify subjects with high levels of back light.

Additional tests were carried out in an underground garage with average light level of 38 lux on the car. This is another standard test we find very helpful, the tests were carried out with no car lights, normal beam and high beam lights. The camera is paced in a typical position with a typical angle of view of an entrance or gate house with some ambient light around the area in view. To date the Panasonic WV-CP484E SDIII 1/3" colour camera was found to be the best performing CCD camera with these tests.

Unfortunately, the usually good performing Brand Z was left in the Panasonic WV-CP484E's dust, because it displayed soft images with significant noise at the low light levels compared to the Panasonic WV-CP484E and did not handle the bright car lights anywhere near as well as the Panasonic.

The Panasonic WV-CP484E did show some vertical pixel bleed on the car lights and it may be possible that the Pixim CMOS chips with quality DSP will give the WV-

CP484E a run on back light compensation, but the Pixim based cameras which we have seen and tested to date will have to greatly improve their poor static and random noise figures and sensitivity before they manage to cause any of the top quality CCD based CCTV cameras any real problems.

Acknowledgements:  
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**Please note:**  
*There is one more page of images on the following page.*



**Panasonic WV-CP484E SDIII 1/3" colour camera back light test with blind down. This is the best result yet for a CCD camera with this test.**



**Brand Z 1/3" colour camera back light test with blind down.**



**Panasonic WV-CP484E SDIII 1/3" colour camera back light test with blind up. Once again this is the best result yet for a CCD camera with this test.**



**Brand Z 1/3" colour camera back light test with blind up.**



**Panasonic WV-CP484E SDIII 1/3" colour camera in the underground garage taking the low light levels in its stride.**



**Brand Z 1/3" colour camera in the underground garage showing high random noise which is contributing to the soft image in this low light level image.**



**Panasonic WV-CP484E SDIII 1/3" colour camera in the underground garage with low light levels and normal beam headlights above and full beam headlights below.**



**Brand Z 1/3" colour camera in the underground garage with low light levels and normal beam headlights above and full beam headlights below.**

