



# Creative process

Bosch's 15-bit Dinion has been the industry's pre-eminent analogue surveillance camera for the past 5 years and with 32 times more processing power the company's new 20-bit Dinion 2X is a worthy successor.



**T**HERE are a couple of good reasons to take notice of the new Bosch Dinion 2X. The first is that with Dinion 2X, Bosch is acknowledging how important to its revenues analogue cameras will continue to be in the medium term. The second reason is that the new Dinion 2X is a superb surveillance camera.

So - what are the specifications of Bosch's latest release? Run your eye over this camera's spec sheet and what's immediately apparent is that the Dinion 2X has an enormous amount of processing power - 32x more processing power than the original 15-bit Dinion. The other interesting thing about the new Dinion 2X is that the camera offers 540 lines horizontal resolution, same as the 15-bit Dinion. This is an issue we're going to come back to but clearly Bosch has decided to focus its effort on processing and not on resolution.

Other standout features of the camera include a CCD sensor manufactured to Bosch's own design to enhance wide dynamic range and a dynamic processing engine with Smart BLC. There's also day/night mode, privacy masking, default shutter, lens wizard, Bilinx comms with cameras installed anywhere along a cable run, 6 programmable operating modes and video motion detection.

Dynamic range is excellent at 120dB and there's a sharpness enhancement selection capability and onboard cable compensation for cable runs of 1000 metres without external amplifiers. That last is a really valuable feature. Typical of Bosch, too, is an onboard test pattern generator that ensures installers can make sure installations are put together properly, with all hardware functioning as it should. Having a test pattern generator onboard the camera is pretty neat and it works extremely well. You can check colour bars to 100 per cent, 11-step greyscale, Sawtooth 2H, Checker Board, Cross Hatch and UV plane.

I got a first look at the Dinion 2X at Bosch's Huntingwood HQ where a couple of untweaked cameras, the new 20-bit Dinion 2X and the current 15-bit Dinion camera were set up and linked to the same standard CRT monitor. As well as having the ability to adjust light levels in the room the way the test bench was arranged allowed the introduction of some nasty backlight by opening doors and blinds.

In terms of housings, the unit comes as a



Flexidome or a full bodied camera and the camera we were playing with was the full bodied unit. It was immediately apparent that the new camera is a big step forward. There's increased clarity in all parts of a scene – it's significant. The increased clarity is such that there's significantly greater visible detail. With Dinion 2X, the small details really spring to life.

We tormented the camera by varying the inside and outside light while seeking a useable view in both parts of the scene and the 2X easily out-performed the 15-bit Dinion which was doing a good job in its own right.

Next, we tested the 2 cameras with inside light very low and outside light very bright with a subject standing in the gloom. This is a very difficult shot to get right but the Dinion 2X managed it nicely. There is distinctly more detail – right down to tie stripes, shirt creases and facial lines. Given the challenge of the situation, performance is exemplary.

According to Bosch's Sean Borg, the new camera is significantly better than the old one.

"The Dinion 2X is a great improvement which is a big call considering the capability of the existing Dinion technology," Borg says.

"The new Dinion 2X processor is 32x more powerful in terms of processing than its predecessor and that makes a massive difference to this camera's imaging capability.

"The key to Dinion 2X is image quality – not resolution," he explains. "It doesn't matter how high the resolution is if the camera is not designed to handle the conditions. Resolution is not the be-all and end-all – what's important is being able to see and identify. There is no point having high resolution if your camera can't use it."

Borg's position makes perfect sense when you are sitting in front of the camera views, challenging the camera with silly amounts of backlight and

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adjusting the light levels in the foreground. There is far greater clarity in the scene and a noticeable increase in sharpness.

All that extra processing power gives this unit the ability to handle situations other cameras battle with, including the management of dual exposure.

"The Dinion 2X has a 10-millisecond and a .06-millisecond exposure," says Borg. "The 10 millisecond exposure is the long exposure that gets the dark areas lit up nicely while the shorter exposure allows the camera to pick up what's outside – ideal when there's extreme backlight.

"And because of this camera's additional processing power we can use our wide dynamic function as well as our dual exposure at the same time, which is a really big deal in surveillance applications.

"When you break it down what we are doing is taking a long exposure in 16-bit step sizes and a short exposure in 4-bit step sizes with each image being interlaced after capture," he explains. "The result of the extra processing is that you can see more in harsh lighting conditions."

What Borg says is true. Dual exposures create a major challenge for cameras, particularly in scenes where there are still and moving parts.

"When you're giving extra exposure time to defeat backlight it's important that this does not introduce problems like blurring in moving parts of the scene," Borg says. "With the Dinion 2X we get a nice still shot that handles backlight and movement."

To illustrate this point, Borg shows me a pair of images which compare the Dinion 2X to another leading camera. The shots are taken in the evening and include tall buildings at a distance, with side light, long shadows and in mid-scene, a bird flying by. The difference in the shots is readily apparent with the Dinion 2X doing a far better job of detail at a distance, light and colour rendition, general clarity and sharpness.

But the telling point though, is the bird. The Dinion 2X shows this clearly while the competitor's camera shows only a smudge.

"The Bosch camera has a default shutter speed operating at the same time as the smart BLC and this gives a perfect image when faced with challenges like this," says Borg.

"I don't think the technical challenges of dual shutter speeds are appreciated by the market. While we now have a fast shutter speed and a slow shutter speed – same as some of our competitors – the fact we've got a 20-bit processor means we are able to employ these capabilities without any artefacts being generated," Borg explains.

"We're also able to have that technology without this impacting on our wide dynamic range or our default shutter speed. Another strong feature is dynamic noise reduction – we sample the pictures to clear the dynamic noise like AGC out of the picture.



“This is doubly helpful because not only are images superior, it means AGC noise is not stored on valuable hard drive space – this is a major problem”.

### EASE OF INSTALLATION

Borg says he estimates the performance improvement makes the new camera at least 30 per cent sharper than the 15-bit Dinion. But he says there’s more to the story than meets the eye.

“With the 15-bit Dinion XF, I had to set up the back light compensation – that’s what you do with anybody’s camera. You have to set up the box and you have to set it up in the right size relative to the subject that is going to stand in front of it,” he explains.

“But I didn’t do any setup with the Dinion 2X – that image we are looking at is straight out of the box. This camera senses the bright spots and sorts out backlight all by itself as part of Dinion 2X’s smart backlight compensation.”

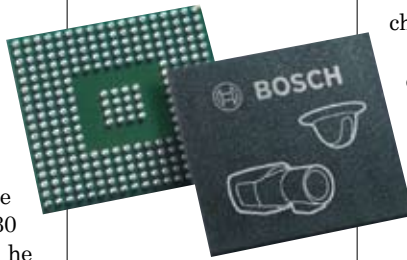
This means very simple installation and ease of installation is assisted further by the Dinion 2X’s simple menu system.

“We have a standard menu and an installation menu,” Borg says. “With the install menu we have 6 pre-program modes but you can install the camera straight out of the box if you like.

“There’s a 24-hour mode, a low light mode, a traffic mode for high speed, a smart BLC mode for extreme backlight like the front door of service stations or stores, and others.”

Borg says a feature he’s particularly happy with is the test pattern generator.

“With no effort during installation techs can use the onboard test pattern generator to make sure the commission process is perfect,” he says. “It’s all so easy. If you have not got 11 grey scales then there’s something wrong with the DVR, if the red is bleeding into the pink, there’s something wrong with the DVR, if you’re getting high frequency roll-off you’ll see the softer images on the



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checkerboard,” he says.

“The idea is to give the best quality image as quickly as possible to get techs through the job and off the site as quickly as possible,” Borg says. “There is a real nice feature called Peak White Inversion – if you’ve got some bright lights around the place you can press PWI and it will turn them light grey – it’s great.

“Our camera is one of the fastest to backfocus – most you have to pull the camera out of the housing to unlock the backfocus – screwdriver does not fit, apply ND filters and call it in.”

Borg says that with the Dinion 2X you access the auto wizard, unlock the backfocus with one finger which opens the iris completely and then you can backfocus the camera without pulling the camera out.

“Commissioning is much faster – installers don’t have to go to the camera – you can do it over the network or the coax,” he explains. “Backlight set-up costs are reduced – you don’t have to set up backlight – with other cameras it’s 2 people. With our old camera one could do it – but with the 2X it’s automatic.

“And many people forget to line-lock – it used to be important to stop vertical roll on switchers and it still needs to be done or you cannot ensure a set frame rate,” he says. “If one camera is ahead of another there will be a one cycle waiting period before the vertical integral pulse comes into line – the rate might be a couple of frames slow.”

According to Borg, with other cameras you have to line-lock with someone at the camera and someone at the DVR.

“With our 15-bit Dinion a single person could line-lock but the new Dinion 2X does line-lock automatically – all up I estimate you can save 60-70 per cent in time taken when installing the Dinion 2X – it’s that good.”

There’s a lot of value built into the new Dinion 2X – Bosch offers a 3-year warranty but the cameras have a 21-year mean time between failure. Then there are features like the cable compensation amplifier. Having this amp built in saves \$100 on hardware, discounting installation costs.

The new Dinion 2X is a strong contender in real world applications. It combines awesome new processing capability with practical features that streamline installation in ways no other analogue camera does. Best of all, despite the increased capabilities, the price of the new Dinion 2X remains the same as the 15-bit technology – that’s very appealing indeed. ▀▀▀

