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New best of breed

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Axis Q6032-E PTZ network dome

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Shaping the fu

What our experts say...

THE ONCE CLEAR DIVIDING LINE BETWEEN network or IP cameras and analogue models has been getting increasingly blurry and we are now rapidly approaching the point where it may disappear altogether. Axis, one of the pioneers and leading exponents of IP technology has produced some outstanding designs over the years and it has all come together in the Q6032-E network dome camera, one of those rare milestone products that has the potential to change minds and shape the future.

If you still need convincing then just consider the hardware, cabling and infrastructure involved even in a modest system comprising two or three PTZ dome cameras. You are probably visualising lots of grey boxes festooned with winking lights, displays, joysticks knobs and buttons plus a great deal of wiring.

Now picture the Q6032-E, and it's really not difficult because from the outside it looks pretty much like any other dome camera. There are plenty of differences, though, and they begin with the connection to the outside world. There's just one, a standard LAN or Ethernet cable, which carries power, video data, telemetry and everything else the camera needs to communicate with the hardware and the operator. There are no stacks of grey boxes at the other end either; in most cases the camera connects directly (or via a Power over Ethernet adaptor) to a standard network router.

This, basically, means that images from the camera, or cameras can be viewed, controlled and recorded on any PC connected to the network or remotely linked to it by the Internet, so it could be anywhere, ten feet away or on the other side of the world.

That's round one to the Q6032, but in the end what really matters is the live or recorded image on the operator's monitor screen. We also have to factor in how easy the camera and system is to control plus any extra facilities that enhance or contribute to the system's effectiveness. So without more ado let's see how it stacks up against the old school competition by highlighting some key features.

Axis Q6032 - the new best of breed ...

As usual we'll begin with the camera and it's not found wanting in any respect. It's a well-appointed day/night design based upon a 1/4-inch ExView HAD progressive scan CCD. This has 704 x 576 pixels and minimum illumination is claimed to be 0.5lux in colour mode and 0.008 lux in monochrome night mode. The lens is a 3.4 – 119mm autofocus type and, to save you doing the sums, that's an optical magnification of 35x, supplement by a 12x digital zoom, giving a whopping (though questionably useable) 420x maximum zoom.

Other facilities include motion sensing and auto tracking, a decent set of automatic and manual exposure and picture options (wide dynamic range, image stabilisation, manual shutter, variable compression, colour, brightness, contrast, sharpness, rotation, aspect ratio correction). There's text and image overlay, privacy mask, and image freeze on PTZ movement. Video is streamed using highly efficient H.264 compression or MJPEG at up to 25 fps, frame; multiple streams can be viewed and up to 3 simultaneous streams can be individually configured. There's an on-board 56Mb buffer for pre and post alarm events, it has an SD card slot for additional recording capacity and as well as direct network operation it can also upload video files and alarm info via FTP, HTTP and email notification

The PTZ section can store up to 100 preset positions. It pans and tilts at between 0.005 and 460 deg/sec, the camera tilts through 220 degrees giving it an extended view of 20 degrees above the horizon. Weatherproofing is to IP66 standard and it is designed to operate over a very wide range of temperatures, from -40 to 50 degrees centigrade.

It is encased inside an unremarkable weatherproof housing made from cast alloy. The dome, which is held in place by a thick abs collar, is a little taller than usual. The added height allows for the camera's extended tilt range. Inside, the camera module is mounted on a very substantial looking cast alloy sub-chassis that sits inside an abs pan.

The main pcb with the CPU running the unit's operating system plus ancillary functions such as power regulation and communications is mounted in the top of the housing. A second pcb is attached to one side of the camera platform; this also houses the reader/slot for an optional SD memory card. A pair of small stepper motors, operating through simple toothed belt-drive mechanisms are responsible for pan and tilt motion. Climatic control is courtesy of a cooling fan and heater module bolted to the side of the housing and there's a cut-off micro switch close to the rim, which switches the camera off when the dome is removed.

Build quality and the materials used are both of a very high standard and there is nothing to suggest that it will not function reliably for a long time in a wide range of conditions.

Setup and operation

In the past year or two we have seen some dramatic improvements in network camera configuration. It can be a real chore and one of the main sources of problems for installers, and Axis has had its share of

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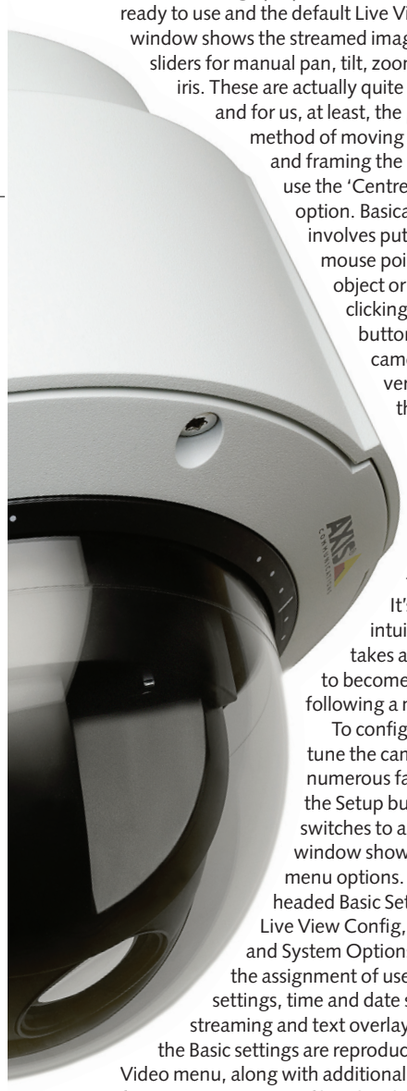
past horrors. The Q6032's setup on this model is reasonably civilised (or maybe we've just got better at it…) Even so, it still lags some way behind the leaders in this area. The first job is to assign the camera an IP address, using a utility on the supplied CD-ROM. It warns that it can take up to ten minutes to locate the camera and make the requested changes but on our test installations it took an average of 4.5 minutes. Following a reboot it should be possible to log onto the camera using Internet Explorer. It may well work with other browsers but we had no luck with Firefox or Google Chrome, both stumbling on the installation of Active X plug-ins needed to display the image and control panel.

After setting up a password it's more or less ready to use and the default Live View browser window shows the streamed image along with sliders for manual pan, tilt, zoom, focus and iris. These are actually quite hard to use and for us, at least, the preferred method of moving the camera and framing the shot was to use the 'Centre Mode' option. Basically this involves putting the mouse pointer on an object or subject, clicking the left mouse button and the camera moves very swiftly to the specified location. The zoom can then be controlled using the mouse thumbwheel. It's fast and intuitive, though it takes a little practice to become adept at following a moving target.



To configure and fine tune the camera's numerous facilities click the Setup button, which switches to a browser window showing a set of menu options. These are headed Basic Setup, Video, Live View Config, Dome, Events and System Options. Basic covers the assignment of users, network settings, time and date setup, video streaming and text overlay. Several of the Basic settings are reproduced on the Video menu, along with additional sub-menus for creating stream profiles, detailed camera settings (brightness, colour, white balance, WDR, exposure, autofocus etc), the option to upload a custom overlay image and privacy masks.

Live View Config, as the name implies lets the user or operator customise the browser page display by adding or removing buttons and adding clickable hyperlinks. The Dome menu deals with programming position presets, setting up a guard tour, enabling and configuring the auto tracking feature, setting 'exclude' areas and PTZ limits, setting OSDI (on screen direction indicator) zones, creating shortcut command buttons and configuring the PTZ control queue (to limit the number of users and set poll times).

In common with many other IP cameras, the sheer number of setup options can appear quite daunting, especially for users and installers accustomed to more modestly equipped analogue cameras. However, the menus are actually very easy to navigate and it's worth remembering that in most cases the camera will operate quite happily on auto systems and defaults. Furthermore, remote configuration makes it incredibly easy to dive in and tweak settings, without going near the camera.

Performance

With relatively few exceptions it's usually possible to spot a picture coming from an IP camera with one eye closed, at 20 feet but not this time. The usual giveaways are simply not there. The image is displayed at a normal frame rate, so there's no jerkiness on the MJPEG stream, and near negligible amounts in H.264 mode. Movement is fluid and there are few if any visible processing artifacts. MJPEG streams are very slightly crisper with better defined colours but it has to be said that the differences are very small, even on a full-screen display. The bottom line is that under ideal conditions, and on the highest quality and resolution settings, we suspect that most casual observers would be hard pressed to distinguish images coming from this camera, from pictures originating from a mid-range analogue camera.

Low light performance is very good indeed though we were a little surprised by the lack of controls for day/night switching, which on our sample seemed to occur quite late, when the colour image had become rather noisy.

PTZ operation is exceptionally smooth and fast, and once used to the controls, it is possible to achieve the kind of precision that you would expect to get from a joystick based control system. The auto-tracking feature worked really well. Most systems we've seen to date are really only of use in a very restricted range of circumstances. Provided the Q6032 doesn't have to contend with multiple large targets it does seem to be better than most of its rivals at latching on and staying with swiftly moving objects.

Factspanel

Equipment:	Axis Q6032-E PTZ network dome camera
Manufacturer:	Axis Communications (UK) Suite 6-7, Ladygrove Court, Hitchwood Lane, Preston, Nr Hitchin, Hertfordshire SG4 7SA Tel: +44 146 242 7910
Image sensor:	¼ inch ExView HAD progressive Scan CCD
Lens:	3.4-119mm, F1.4-4.2, autofocus, automatic day/night, horizontal angle of view: 1.7deg-55.8deg
Video compression:	H264 (MPEG-4 Part 10/AVC). Motion JPEG
Frame rate:	H264: Up to 30/25 (NTSC/PAL) fps in all resolutions Motion JPEG: Up to 30/25 (NTSC/PAL) fps in all resolutions
Intelligent video:	Video motion detection, auto tracking
Alarm triggers:	Intelligent video, PTZ position
Video buffer:	56 MB pre-and post-alarm
Casing:	IP rated metal casing (aluminium), acrylic (PMMA) clear dome cover pre mounted to casing, sunshield (polycarbonate)
Operating conditions:	Camera unit: -40degC to 50degC (Arctic Temperature Control enables camera start-up at temperatures as low as -40degC)
Weight:	3.5kg (7.7lb)

Overallassessment

Picture quality has long been the Achilles heel of IP camera technology; the list of limitations is a lengthy one and includes image size, slow frame rate, grain, fuzz, stutter and network lag, which can make it impossible to track movement and control the movement of a PTZ camera in real time. The Q6032 doesn't solve them all, and top of the line hard-wired analogue cameras still have an edge when it comes to some aspects of image quality. But, on the evidence of this camera, the differences are close to becoming insignificant. Unusually the image from this camera can bear enlargement to full screen size without serious degradation, and in most other areas it is on a par or very close to its analogue rivals.

It's unusual to get this far without one or two quibbles or concerns but the Q6032 really is a breath of fresh air. Until now, IP cameras and PTZ mounts have made uneasy bedfellows. Network dome cameras able to deliver high quality images and at the same time respond instantly to commands are rarer than hen's teeth but now there is at least one that in performance terms stands comparison with conventional dome systems. That combined with the simplicity of setup and operation means that the Q6032 is the new best of breed and deserves the very serious attention of both end users and installers.

Productassessment

Design and design features	★★★★
Circuitry and components	★★★★★
Ease of installation and wiring	★★★★★
Range and variety of functions	★★★★★
Accompanying instructions	★★★★
Technical advice and backup	★★★★
Value for money	★★★★

Grading Key: Outstanding ★★★★★ Very good ★★★★ Above average ★★★ Average ★★ Below average ★

What the manufacturer says ...

AXIS Q6032-E is an outdoor-ready PTZ dome network camera for cost-efficient and reliable installation in demanding surveillance applications. It is ideal for use at airports and seaports, as well as for city and perimeter surveillance.

The camera is powered through High Power over Ethernet. This simplifies installation since only one cable is needed.

Arctic Temperature Control allows the camera to not only function at -40degC (-40degF) but also power up at that temperature following a power failure. AXIS Q6032-E can operate in temperatures from -40degC to 50degC (-40degF to 122degF). It has an IP66-rated protection against dust and water.

AXIS Q6032-E has a fast and precise pan/tilt response. In addition, it can tilt 20deg above the horizon for a total tilt range of 220deg, enabling better views, especially over uneven terrain. It has 35x optical and 12x digital zoom. License plates can be read from a distance of 160 m (525 ft.) The camera has an auto-tracking functionality that can automatically detect and follow a moving object within the camera's field of view.