

security

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Design of the times

on test:

**Videotec's Ulisse
positioning unit**



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The bench test [1]

Design of the

What our experts say...

FOR THE MOST PART VIDEO SECURITY AND surveillance products are utilitarian in nature, designed more for dependability and ruggedness than good looks. It would have been interesting, therefore, to be a fly on the wall at the first product meeting when the outline specs for the Ulisse pan tilt camera (UPT to its friends) were first discussed.

It's not difficult to imagine someone suggesting that it should have a robotic, almost human form. It surely can't be a just coincidence that it is shaped like an armless – but not headless – torso. At some point during that meeting someone may have raised the question of serviceability. The response appears to have been that sending installers up ladders and gantries in all weathers is cruel therefore the UPT will be built to outlast whatever structure it is attached to and once in place should not require further attention.

An equally plausible explanation for the distinctive lines and the impressive build quality may just be that the UPT is a collaboration between the design conscious Italians and technology-centred Japanese, but whatever its origins there's no denying it has a real presence, which is clearly an advantage in a camera that is designed to see, and be seen.

Camera features

Starting at the top with the camera, it's a high-performance day/night model with an integrated 26x optical zoom lens. Behind that there's a 1/4-inch Sony ExView HAD CCD sensor with 440k pixels giving a claimed low light sensitivity of 1 lux.

Key camera features include a digital zoom giving a magnification of up to 312x, it has a range of automatic and manual exposure, there's backlight compensation, and up to 24 'dynamic' privacy masks can be programmed (colour or greyscale and up to 8 masks can be displayed at any one time).

A range of on-screen information can be superimposed on the image, including pan/tilt position, position and area titles, time, date and so on. Moving down to the pan/tilt head the first and the most obvious point to make is that it is big and heavy, a pole-bending 14kg to be precise. Clearly a UPT installation will require a lot of planning and preparation, it is most definitely not a quick up and down the ladder sort of job...

Much of the bulk is due to a pair of very large and powerful stepper motors, and with a load rating of 20kg it's hard to imagine it ever being stressed by environmental conditions. Suffice it to say there's not much that can stop it moving where the operator wants it to go.

It's capable of continuous 306 degree panning

at speeds of between 0.1 to 100 degrees/second. The vertical tilt moves through +90 to -40 degrees from the vertical at between 0.1 and 40 deg/sec. The unit can store up to 250 positions and these can be used for auto panning and to set up a sequence of preset patrols and patterns.

Manual tracking accuracy is to within 0.05 degrees under manual control and 0.02 degrees when moving between preset positions. There is also provision for eight alarm inputs which can be programmed for a range of responses including patrol, scan, autopan and move to preset position.

Position control and camera configuration is handled by a RS485 twisted pair or RS422 connection, the latter suitable for 'cascade' control of several UPT units. In addition it has an RS232 serial interface for direct PC control, using the software version of the Videotec DCT controller. The UPT is compatible with a range of commonly used telemetry control protocols including Videotec's own (Macro) plus Pelco D and Sensormatic. The camera housing is very substantially built from tough, heavy-gauge ABS plastic. Thick rubber seals around the edge of the camera case and all other removable panels suggest that it is very well protected against the elements. The top of the camera swings open to reveal the compact Sony camera module with its integrated lens and its associated power supply PCB. Between them they only take up around 25 per cent of the available space, which leaves plenty of room for optional components like a screen wiper mechanism. A small heating element is mounted directly in front of the camera just in front of the lens.

An imposing sight

A single arm connects the camera to the body of the unit; the camera cables pass through this and into the body of the unit keeping everything neat and tidy. The two side panels can be removed to access the mechanism and electronics and it's an imposing sight! The right side is occupied by the tilt drive mechanism. This consists of a two-stage reduction gearing using toothed belts and pulleys.

You'll get some idea of the scale of the drive train from size of the belts, the largest of which is almost 3/4-inch or nearly 2cm wide. It wouldn't look out of place spinning the camshaft on a small family hatchback...

On the left side there's only enough room for a single printed circuit board – this handles motor control and telemetry. The pan drive mechanism is another twin-belt affair and the bottom of the case is dominated by a large pulley and the second of the two drive motors. All of the mechanical parts and the PCB are bolted to a very substantial

looking cast alloy chassis. The outer casing, like the camera housing, is made from thick ABS plastic mouldings.

The final part of the case is the base module, which is responsible for mounting the unit and carrying the power, video and telemetry feeds. It is designed for quick fixing and it separates from the body of the drive mechanism by unscrewing four bolts; a 'floating' multi-way connector ensures that the two parts mate together easily – a definite bonus when installing or replacing a UPT head at altitude or in a precarious location.

Setup and operation

The first job is to connect the telemetry, video and power cables. These are handled by a set of spring terminals. In the case of the power supply this can be high or low voltage AC (24 volts or 115 to 230 volts). The video output options are coaxial or twisted pair and there is a separate connector for the RS232 PC programming interface. Cables pass through three watertight grommets on the underside of the detachable base and once they have been connected it can be bolted back into place. Our UPT review unit was connected to a Videotec DCT controller (see *Security Installer* August 2004) using a simple RS485 hook-up. In order for the two devices to communicate with one another it is necessary to configure Baud rate, comms protocol and the device Address.

All of this is accomplished by removing a small panel on the base unit, which reveals three miniature DIP switches, the RS232 PC connector and a fourth DIP switch for setting RS232 termination. This part of the setup should be relatively straightforward, however the rather dense instructions could have been a lot more helpful regarding some aspects of the setup, especially when it comes to connecting Videotec devices. It took rather longer than we had hoped to get our sample working and this was initially due to a problem with the ribbon cable connecting the camera module to the PCB inside the main body. Somehow or another it had come adrift from its guide plate, snagged and torn three conductor lines. The cable was repaired and vision restored but we then ran into trouble setting up the telemetry. This was partly of our own making, for not remembering that Videotec calls its protocol 'Macro', but once the fug cleared and after ploughing through the manual for the tenth time, plus some wise words from Videotec support, it eventually came together.

System configuration is split between the controller – in our case the DCT with its clever LCD touch screen – and a set of on-screen displays. Items on the OSD are selected and changed by

times



Factspanel

| | |
|---------------------------------|---|
| Equipment | Ulisse positioning unit |
| Product group | High spec PT unit |
| Application | External property protection |
| Manufacturer | Videotec S.p.A. |
| Address | Via Friuli, 6 1-36015 Schio (VI) Italy |
| Telephone | Italy: 0039 0445 697411 UK: 02392 477621 |
| Fax | Italy: 0039 0445 697414 UK: 02392 477621 |
| Email | sales@videotec.com |
| Available from | Videcon PLC, DVS Ltd, Envisage, CCTV Center |
| CE Mark awarded | Yes |
| Mono or colour | Colour/mono with Sony module |
| Lens | Sony module 26x zoom |
| F no | F1.6 to F3.8 |
| Horizontal angle of view | 55deg (wide end) to 2.3deg (tele end) |
| Minimum distance | 320mm (wide end) 1500mm (tele end) |
| Pick-up device | ExView HAD CCD |
| Pixel array | 440,000 pixels |
| Preset view positions | 250 presets |
| Weather resistance | IP66 |
| Housing material | Aluminium and polycarbonate |
| Power supply voltage | 230vAC or 24vAC |
| Max current consumption | 120W with wiper and heater |
| Warranty | 3 years |

Videotec's Ulisse pan tilt head and camera offers both style and substance

PHOTOGRAPHY: TOM DOBBIE

* Reader Service No 100 (or go to www.security-installer.co.uk/enquiries and key in 100)

moving the joystick up and down and rotating the joystick zoom control right or left confirms a setting or steps back to the previous menu.

The 'Main Menu' has six options: Language, Display Setup, Motion Parameters, Camera Parameter, Load default configuration and Setup Info. Language choices are Italian, English French and German. The Display setup menu leads to six sub-menus, to enable or disable displays for Pan/Tilt position, Preset Title, Preset Position, Area Title and Tilt Limit Title, plus switches for video system (PAL/NTSC), video interlace and Area Parameters.

Motion Parameters cover setting Pan and Tilt speeds (joystick travel is divided into 7 individually variable speed graduations), setting Limits for the start and end of pan and tilt travel, configuring presets, Home position, Patrol and Autopan sequences, wiper/washer configuration and Alarm setup.

Camera Parameters include sub menus for the Zoom (speed and electronic zoom setting) and Focus, which cover speed, mode and 'sensitivity' (we're sure that should have been 'sensitivity', but we know what they mean, and it sounds better...). The next two items on this menu are AE control (manual, auto, iris priority, shutter priority and bright mode), and Infrared, which enables or disables the switching of the IR filter in front of the CCD image sensor when the camera switches from day to night mode.

Also on the Camera Parameter menu is Dynamic Masking and Masking 'Management' (it should of course be Management but again the alternative spelling sounds much more interesting...) and these two menus deal with sizing and positioning, masks using a 8 x 6 grid of squares, each of which can be blanked out or coloured. Mask zones can also be created and these blank out the whole screen for preset arcs of camera travel.

The last menu in this section goes under the name 'Various' and this has two switches for Backlight Compensat(ion) and image stabilisation. Curiously the manufacturer's web site also suggest that the camera has a range of

additional picture effects, including Negative, Mirror, E-Flip and Art, but there's no sign of these intriguing extras anywhere on the OSC. The last two main menu options are used to reset the camera to its factory defaults and display setup info, which include things like comms settings and software version.

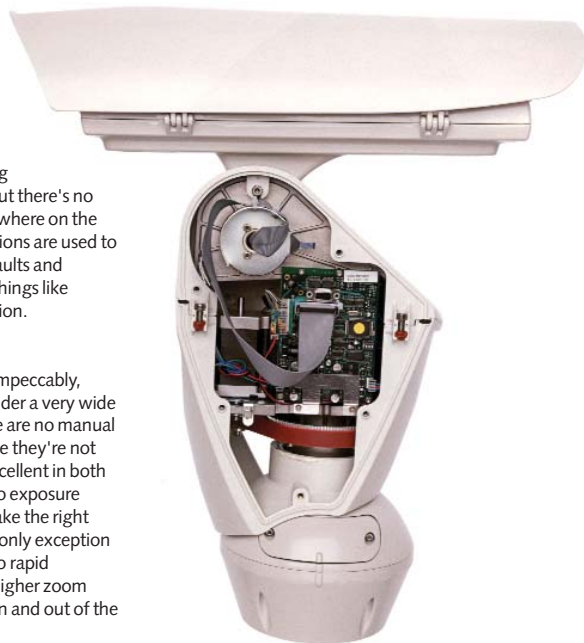
Performance

Sony's camera module performs impeccably, producing a crisp, bright image under a very wide range of lighting conditions. There are no manual white balance controls but for once they're not necessary as colour fidelity was excellent in both natural and artificial light. The auto exposure system could also be trusted to make the right decision nearly all of the time, the only exception being a slightly relaxed response to rapid changes, as can occur at night at higher zoom levels as vehicle headlights move in and out of the image area.

During our tests we noticed that some points during the camera's travel internal reflections could appear from the protective window. Depending on the angle of the camera and lighting source this can occur over as much as 45 degrees of travel, however in general use, in real world conditions, it's unlikely to cause too much of a problem.

The two mighty motors give the camera a really smooth ride with absolutely no overshoot or hesitancy, even at the highest pan and tilt speeds. It is superbly well balanced and the power of the motors is clear from the way it effortlessly swings the heavy camera assembly back and forth. We have no doubt that it will take the extra weight from options like the twin IR illuminators in its stride.

Pan/tilt speed changes are a little on the coarse side – compared with continuously variable 'proportional' control on some rival systems – but the slight jumpiness could probably be ironed out from the motion parameter menu. Nevertheless it is possible to make small, precise position adjustments even at high magnification as pan/tilt speed is linked to the zoom.



Productassessment

Design and design features ★★★★★

Circuitry and components ★★★★★

Ease of installation and wiring ★★★★★

Range and variety of functions ★★★★★

Technical advice and backup ★★★★★

Accompanying instructions ★★★

Value for money ★★★

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

What the manufacturer says...

Ulisse has been created combining the best technologies from traditional PTZ heads and high quality speed domes, integrating a high performance pan and tilt positioning unit with a quality camera housing and telemetry receiver. This has produced a device that has huge advantages over both speed dome and pan and tilt heads, with true high speed (100 deg per second pan, 40 deg per second tilt) continuous rotation and accuracy of 0.02 deg, and autopan, patrol and pattern sequences outperforming PTZ technology. Add the ability to look above the horizon, carry wipers and IR lighting (and anything else up to the 20kg limit) and your choice of camera and lens, means Ulisse offers basic requirements that speed domes can't.

Ulisse can be supplied as a stand alone unit, ready for the 'best in breed' camera and lens combination, or with an integrated day/night Sony block camera. The Sony block camera provides 26 times optical zoom and auto ICR capabilities with a 1/4" ExView HAD CCD for high sensitivity in low light environments. With the block camera option many top end features come as standard, including dynamic video masking. With options like incremental encoders absolute accuracy and real time feedback can be guaranteed. Available with two different housing options Ulisse fits most camera and lens combinations. The standard housing comes with a built-in wiper option, while the larger enclosure is available with an external wiper unit. It features integrated or external wiper options, an optional incremental encoder, max load 20kg, continuous rotation, autopan, preset, patrol and pattern, area and preset titling.

Overallassessment

The fusion between Italian styling and Japanese attention to detail has been very successful. It's not without a few little quirks but these can mostly be put down to the unfriendly instruction manuals.

Operationally the only very minor concerns are the possibility of internal reflections under some extreme lighting conditions and the torn connecting cable, which we have been assured the manufacturer is aware of and is being attended to.

When it comes to the nitty-gritty of pointing the camera and generating a video image we have no complaints, and even though the story behind the design of the UPT is probably nowhere as interesting as we have imagined, there is no denying that it is a remarkable piece of engineering.