August 2015

BENCHMARK

www.benchmarkmagazine.com

■ Graph

70

60

50

40

30

20

10

Statistics
Graph
Data

SETTINGS

0h 1h 2h 3h 4h 5h 6h 7h 8h 9h 10h 11h 12h 13h 14h 15h 16h 17

Date: Today

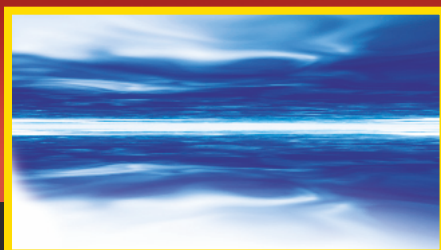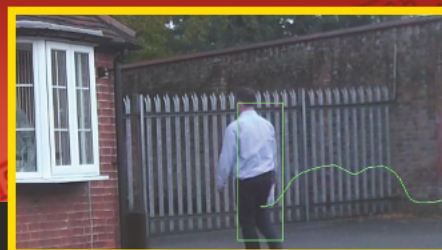Duration (precision): Day (hour)

In   Out
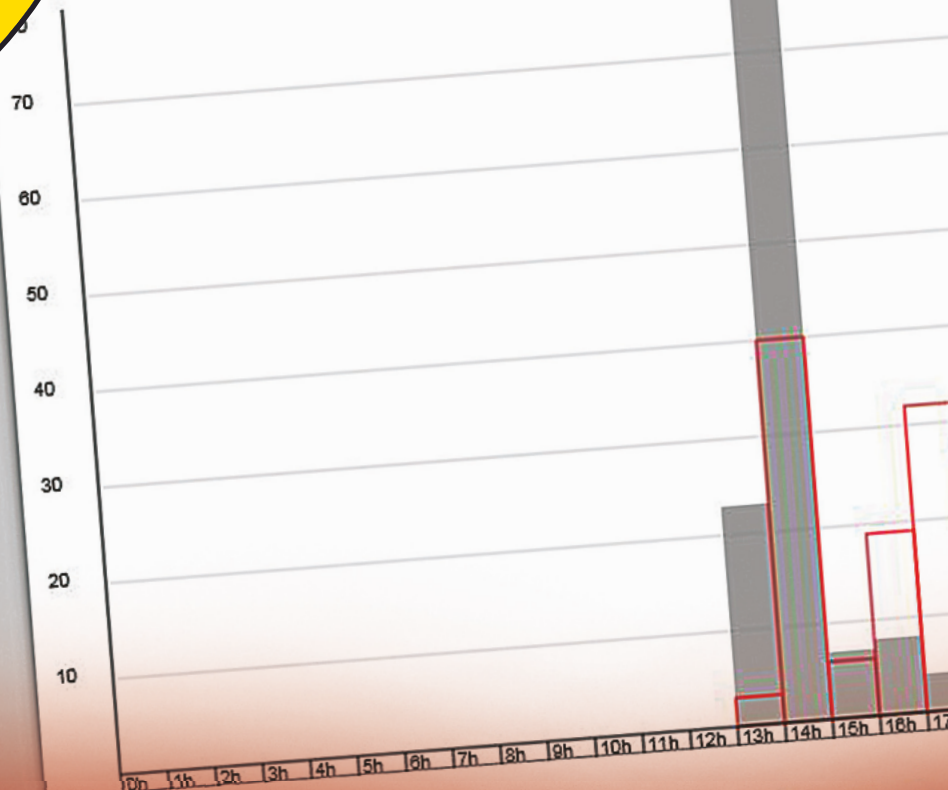
Counting on Value?

Benchmark looks at People Counting apps

Wireless: Higher Data Speeds?

Assesment: VMS Deployment

Group Test: People Counting Apps

As cameras are designed with increasing levels of processing power, so the use of onboard applications is expected to turn from a trickle to a deluge. The approach makes sense, allowing installers and integrators to 'customise' camera functionality dependent upon the needs of any given site. Business Intelligence applications can elevate a security system into a solution that assists with site management, thus adding value. Here Benchmark looks at the options for people counting.

79%
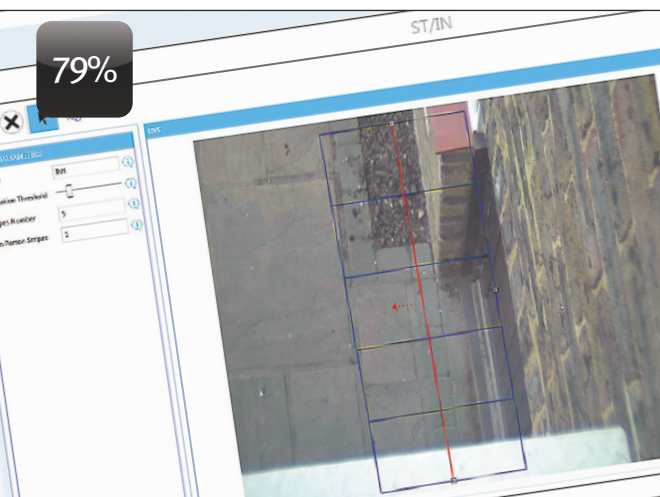
AI-Tech: AI-People

AI-People is a dedicated people counting application from Italian company AI-Tech, which is a spin-off business from the University of Salerno. The application can deliver bi-directional counting, and can also be used to measure occupancy. It does this via sensing of motion through 'virtual coils'.

AI-People is available for the Samsung Techwin Open Platform, the Axis Camera Application Platform and Hikvision's App-ready cameras, as well as Linux servers. Our test made use of the former.

The application is supplied made up of three software elements. AI-People includes the on-device application (in the case of the Samsung App a .cap file). There is also the AI-Config program which is used for configuration (this can be used with all of the applications available from AI-Tech). Finally, AI-Dash delivers the interface for counting and data reporting. The two latter elements also require a range of additional software.

AI-People makes use of cameras mounted above the counting point, so we cannot recommend using the camera running the App for other surveillance purposes. The mounting height is not specified, but should be sufficient to allow correct counting at the expected traffic speeds.

78%
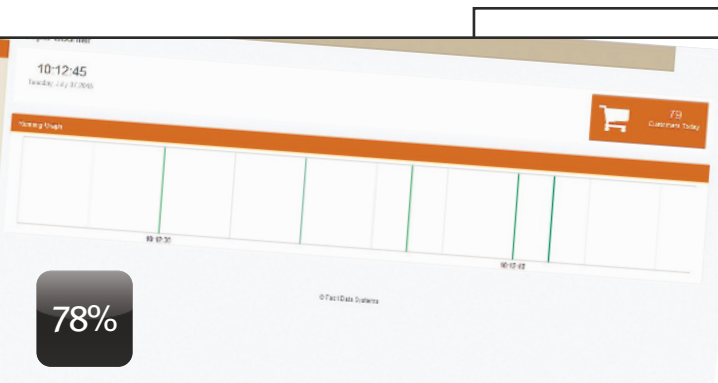
Facit Data Systems: People Counter

People Counter is a dedicated people counting application from Facit Data Systems. The application counts traffic and footfall by the use of regions of interest, and applies directional discriminations to counting by detecting persons moving from one detection region to another in the same ROI.

People Counter is available as an App for the Samsung Techwin WiseNet III Open Platform or as a boxed server-based solution. The Benchmark test made use of the edge application.

The application is supplied as a single .cap file along with a PDF instruction manual, much of which is dedicated to setting up the WiseNet III device.

Facit Data Systems uses a more traditional camera placement, allowing for a perspective view of the counting area. This enables the camera running the People Counter App to be utilised for some limited surveillance if appropriate. The mounting height is 3-4 metres and the camera must be 2.5-3.5 metres from the counting area.

FoxStream: FoxCounter

FoxCounter is a dedicated people counting application from French company FoxStream Intelligence Video. The application can be used for bi-directional counting, and therefore can also be used to measure occupancy of an area as well as to track traffic trends.

FoxCounter is available for the Samsung Techwin Open Platform and the Axis Camera Application Platform. Our test made use of the former. The application is supplied as an 'all-in-one' .cap file, along with a simple PDF instruction manual.

FoxStream does not recommend using the camera running the App for other surveillance purposes, and mounting needs to be above the counting area, at a height of between 2.5 and 6 metres.

Recorded counts can be saved and exported as a .csv file, or displayed as a graph. The App delivers a degree of customisation with regard to how the count data is viewed.
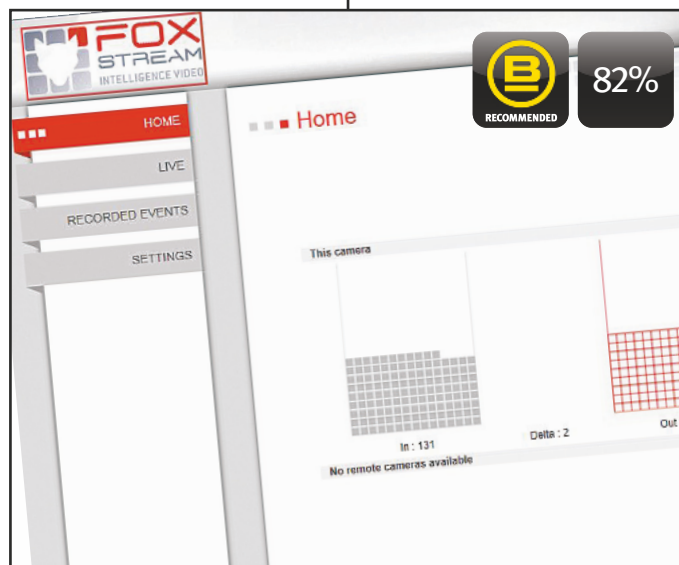
Visual Tools: AX-PeCo

AX-PeCo is a dedicated people counting application from Spanish company Visual Tools. The application can deliver bi-directional counting, and can also be used to measure occupancy of an area or location.

AX-PeCo is only available for the Axis Camera Application Platform, with different plug-ins for the various chipsets. Currently Apps are available for ARTPEC-4, ARTPEC-3 and AMBARELLA chipsets. The is not currently an App for the ARTPEC-5 chipset, although we ran the ARTPEC-4 version on a 5 camera without any issues.

AX-PeCo makes use of cameras mounted above the counting point, so it will not be possible to use the camera running the App for other surveillance purposes. The mounting height can be varied, and a simple configuration tool allows the installer or integrator to set the person size criteria using a simple slider.

Data captured by the App is displayed in simple tabular format. However, this can also be viewed in different ways using the company's PeCo-Graph tool, which is free-of-charge. This does deliver a higher level of data interrogation, but does require a fair degree of historical counting data for its functionality to be properly appreciated.
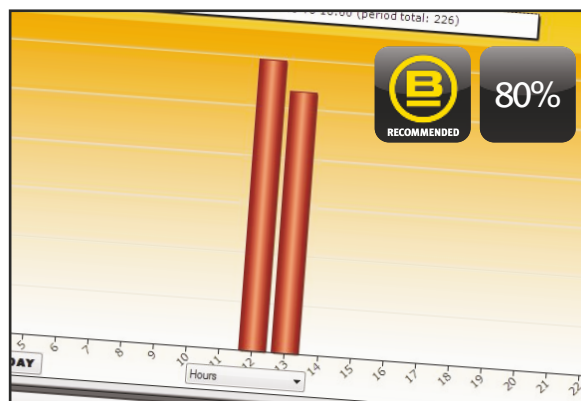
TESTED IN THE NEXT ISSUE OF BENCHMARK

3Y Teknoloji: PCount

PCount is a dedicated people counting application from 3Y Teknoloji. The application can deliver bi-directional counting, and can also be used to measure occupancy.

PCount is available for the Axis Camera Application Platform, and cameras are mounted above the counting area. Mounting height is 2.5-10 metres, and minimum illumination is 80 lux.

AllGoSystems: AllGoVision

AllGoVision is an embedded analytics package which delivers people counting functionality. It also delivers a range of video analytics.

The App is compatible with the Axis Camera Application Platform and ISD cameras. To run the App, the user will also require a number of other software programs to be deployed on a server, as well as a secondary App on the camera.

IntuVision: Line Crossing

IntuVision offers a wide range of edge analytics. In order to achieve people counting, you need to deploy a line crossing App on the edge device, and then deploy a server-based version of IntuVision VA, which implements the counting.

The App is compatible with the Axis Camera Application Platform, as well as Cisco and Samsung Techwin cameras.

Group Test: People Counting Apps
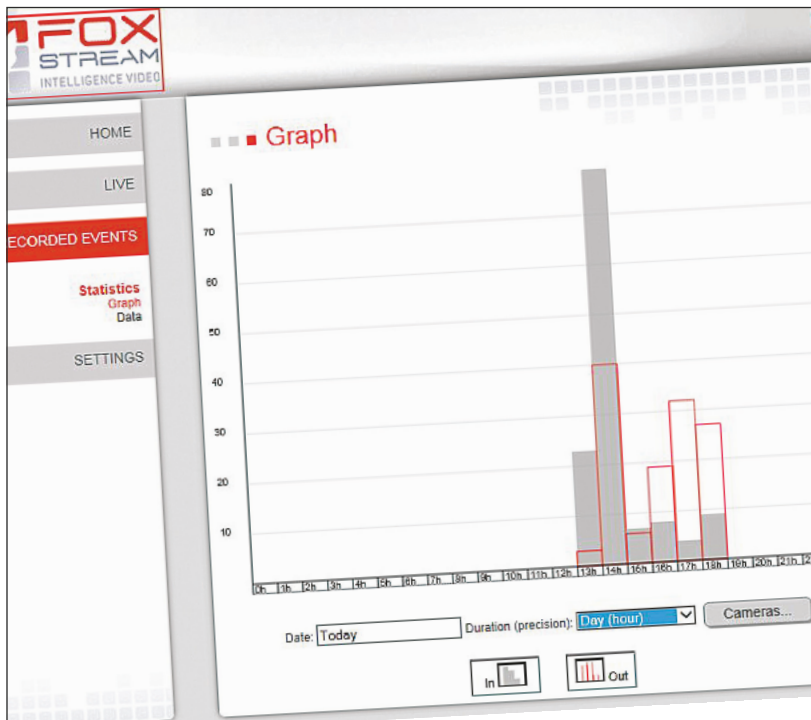
People counting offers a wide range of benefits to a number of end users. Whilst much emphasis is placed upon the retail sector, the applications for the technology are varied. These vary from tracking footfall in a defined area, through to assessing efficiency in businesses handling members of the public, down to managing occupancy in line with licensing and/or site policies. With regard to issues such as licensing and management of site conditions, compliance is a significant issue, and the implementation of people counting illustrates that this aspect of business management is being taken seriously.

Accuracy figures vary per system and are generally indicative of a worst-case scenario. With intelligent and careful installation, accuracy levels can be increased. For example, accuracy will be boosted if separate portals are used for access and egress, and if counting takes place at narrow pinch-points. If an attempt is made to count in a wide area where people are both entering and leaving – and inevitably meeting and loitering to chat – then you should expect the accuracy figures to fall.

Many will argue that a camera delivering people counting functionality can effectively 'double up' as a surveillance camera. For effective people counting, cameras are best mounted in accordance with the instructions from the supplier of the people counting application. This should eradicate issues associated with perspective, and enable more accurate definition of valid targets. As such, it is best to avoid using cameras for dual purpose surveillance.

Many suppliers of people counting systems will make marketing statements that include reference to how their software will work in a range of lighting levels. Whilst there will inevitably be some truth in these statements, best practice is to ensure that the location has sufficient lighting for the camera to process a clean, noise-free real-time image with as little degradation as possible.

The true power of people counting comes when the user needs to view the results. The ability to not only report the data that each people counting device has captured, but to also include relevant data from other devices, elevates some of the systems to a point where they deliver true benefits to the user. If they are to realise the potential of an investment, then the data delivered by the system must fit in with their expectations.

This Benchmark test looks at Applications which can be added to cameras, in a similar way to loading apps on a smartphone. The test will look at installation (issues which are not associated with the specific App will be reported but will not affect it's final rating), configuration, performance and reporting.

FoxStream: FoxCounter

The test version of FoxCounter was for the Samsung WiseNet III Open Platform cameras. It is supplied as a single .cap file, along with instructions. We had a slight issue, in that the Samsung camera was updated to the latest firmware via the UK site, but the App would not load. Following a few phone calls which did not resolve the issue, we found a later firmware upgrade on another site, and this solved the problem. It's not a FoxCounter issue, but anyone looking to use the App should ensure they have a Series 3 firmware upgrade!

The addition of the App is straightforward, and once it is activated you need to access its web page on the camera to generate a Product Code. This is then sent to the App provider to

generate a licence. The process is straightforward and took just over five minutes.

The camera will need to be mounted above the counting area, and alignment should ensure that entry and exit show movement in the vertical plane. Mounting height should be at least 2.5 metres, but not higher than 6 metres.

FoxStream claims that FoxCounter is a plug-and-play application, and the configuration screens are relatively simple.

Once mounted, the counting zone is established via the settings menu. This uses a drag-and-drop approach which is straightforward. One point to note is that the size of the zone can impact on performance. A larger zone may result in missed persons, whilst a smaller zone can create false counts. The instructions give advice, and the system can be tested with live views. There is an option to toggle the In/Out directions.

Other options include Count Sensitivity and Frequency. The latter creates the frequency of data saves (variable between 5 and 30 minutes) and the reference time. If the camera is powered off it will only retain data from the last save.

One benefit of the FoxCounter App is that you can set one enabled camera to handle the counting data from other FoxCounter equipped devices on the same system. This simplifies the creation of overview reports for a number of devices.

The Live view can be used to check operation, but if the Live window is refreshed the counts are reset. This only happens on the live display; the recorded data is retained. We had a slight anomaly, in that the data was not retained at first. We traced this to the fact that the date and time on the camera did not match that of the FoxCounter App. Once corrected it worked as expected.

Data is shown in the Live view as totals In and Out, with occupancy also shown in brackets. On the FoxCounter Home screen, In and Out figures are shown as granular icons, with an occupancy figure. In the Recorded Events menu, statistics can be shown as a graph (daily by 5 minute or hour increments; weekly by two hour or day increments; monthly by day increments). Alternatively, a data period can be inserted to show a figures-based report.

Accuracy is claimed to be 95 per cent, although by tweaking sensitivity and count area we achieved slightly better than that. Changes in ambient illumination didn't affect the count, showing that the application is stable.

The system is simple, but does what you'd expect from a people counting application.

AI-Tech: AI-People

The test version of AI-People was for the Samsung WiseNet III Open Platform cameras. It is supplied as a .cap file, along with instructions. As with the other WiseNet III applications, anyone looking to use the App should ensure they have a Series 3 firmware upgrade. We couldn't find the upgrade on the UK site but did find it on the international one!

The App for the camera is straightforward, and once uploaded and activated you need to install a configuration utility on the connecting server, along with a dashboard tool. Without these, the App cannot be set up or accessed. This process also involves installing the Dot Net framework and a media codec. Installers for both are provided.

Once these are loaded, the AI-Config program itself needs to be installed. Again, this is automated and once the process is complete the configuration can commence.

The initial task is to create a project and attach a device to it. Once this is done, the

EASE OF CONFIGURATION	
FOXSTREAM – FOXCOUNTER	82%
AI-TECH – AI-PEOPLE	76%
FACIT DATA – PEOPLE COUNTER	80%
VISUAL TOOLS – AX-PECO	82%

79
Customers Today

10:12:40
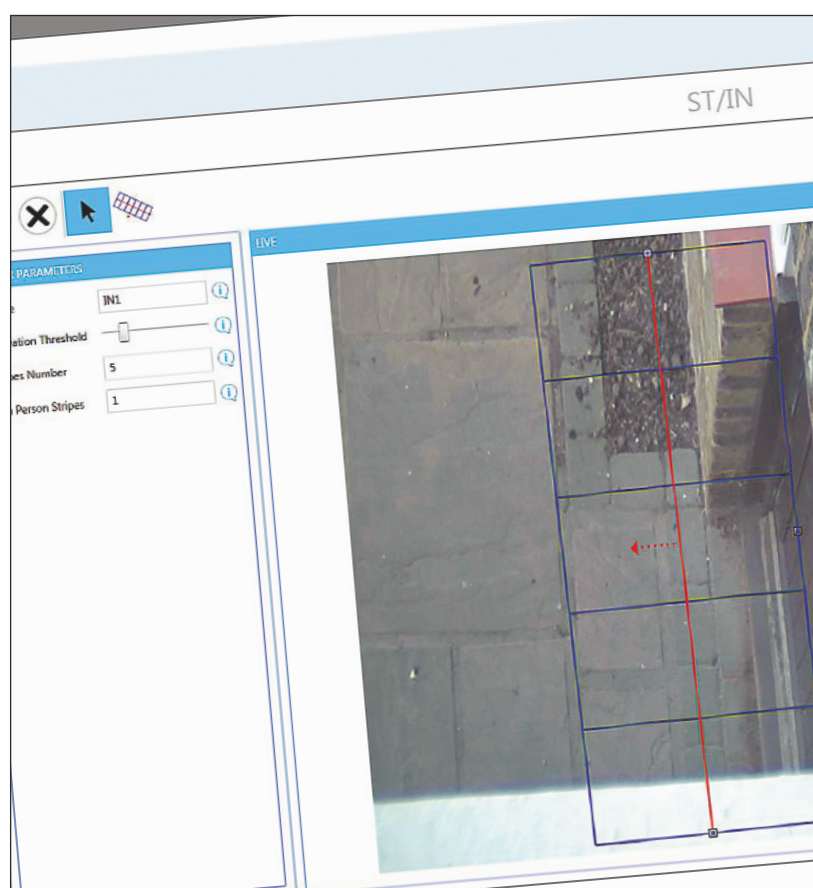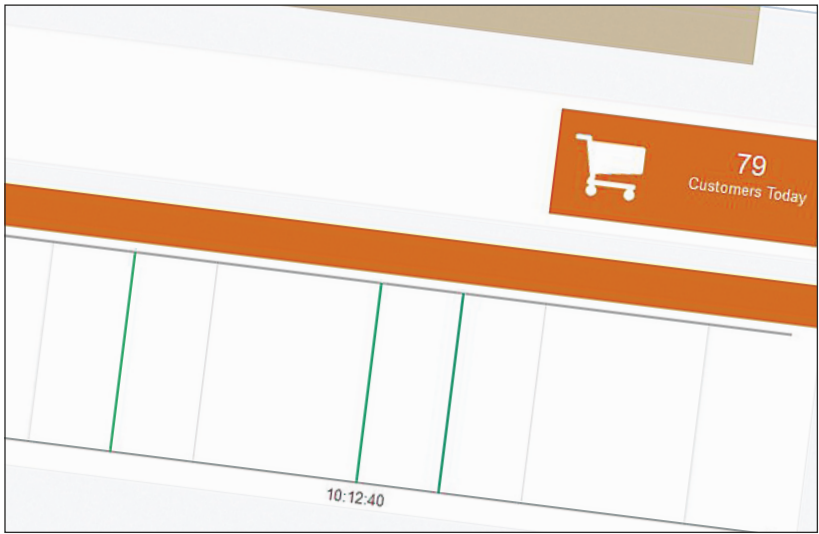
video stream needs to be identified. This can be a MJPEG or an RSTP stream; there is also an option to use a video file. Using the MJPEG stream wasn't stable so we opted for the RSTP option. The final step is to identify the application to be used as AI-Config works with a range of applications.

The camera will need to be mounted above the counting area. Alignment is not critical as the Virtual Coils (the name that AI-Tech give to the sensing elements) can be freely rotated and placed. The procedure is relatively intuitive, and whilst it might feel a little clumsy at first having to use a server-based config tool, the reality is that the on-camera App is acting as a count tool for the AI-Dash program.

Once the configuration has been completed it must be sent to the camera, which will then reboot.

Somewhat frustratingly, you can't even check your configurations until you install the last element of the App: AI-Dash. This requires the installation of two Java applications plus Apache Tomcat, an open-source application manager.

In truth, the installation process could be simpler and cleaner. There's not a lot that will test any competent person, but given that many other suppliers offer a single installer that manages all elements and checks whether certain required programs are installed, you can see how AI-Tech could improve. Even when we'd finally installed all the elements, we found that the supplied passwords didn't work.

The manual is slightly out of date, and the delivery of our test App was delayed as

it needed to be translated into English. It could be better, and we've little doubt that it will be improved in time.

Once we'd obtained the correct details and finalised the installation, the operational functionality was pretty similar to other Apps, and it did feel as if we'd worked harder with AI-People than some of the other options. The App works as well as the others, and in reality it doesn't offer a whole lot more; certainly not enough to justify what was a clumsy and slightly fractured configuration.

If you are configuring a wide range of Apps on one device, then AI-Config makes a bit of sense. Using an Apache tool to run a dashboard isn't for everyone. In truth, this felt less like an on-board App and more like an additional software package, and if you're looking at that route then there are far superior options available.

Accuracy was decent, but a few false counts were generated by ambient lighting changes.

Facit Data Systems: People Counter

The test version of People Counter was for the Samsung WiseNet III Open Platform cameras. It is supplied as a single .cap file, along with a PDF file instruction manual. Interestingly, the first half of the manual refers to setting up the Samsung camera, including a tutorial of how to upgrade the camera to Series 3 firmware. As already mentioned, at the time of testing this firmware was not available on the UK Samsung site; we eventually found it on the international web site. We have informed the manufacturer so hopefully that will be resolved. Facit Data Systems can't be blamed for this, and indeed should be recognised for highlighting that a Series 3 firmware upgrade is required.

Installation of the People Counter App is straightforward, and once it is activated you can log in. Once past the authorisation, you are prompted to enter a licence code. The first few times we did this it was not accepted.

There is a note in the manual that People Counter is recommended to be used with either Google Chrome or Mozilla FireFox. In an industry that has pretty much standardised on IE (Microsoft Internet Explorer), there's every chance that some people will ignore that recommendation and forge ahead. However, the App would not accept the licence in IE.

There are plenty of arguments why Chrome of FireFox are preferable to IE, and we'd probably agree with most of them. However, because the surveillance sector has standardised on IE, it's unusual to see it has been totally ignored. There are far more cameras out there which are not compatible

with Chrome or FireFox, and bucking the trend simply inconveniences installers and integrators. One tester did question whether they found working with the Microsoft browser 'too challenging'.

The camera set-up for the Facit App makes use of a perspective view. The camera should be mounted at a height of 3-4 metres, and between 2.5 and 3.5 metres from the counting area. The camera needs to be centred on the counting area. This does impose certain limits on the usefulness of video captured by the camera for general surveillance purposes, and so installers and integrators should not expect the camera to be able to form part of a cohesive surveillance solution in all applications.

The configurations are carried out via the Settings menus. These include Camera Settings, Store Timings and License. Once you've activated and licensed the camera you can ignore the latter. Store Timings is simply a schedule for opening and closing times. Counting will only take place during the designated opening times.

The Camera Settings menu is where the actual counting configuration takes place. Using a camera view (this can either be a still image or video) an ROI (region of interest) needs to be established. This is made up of two trigger boxes: Region 1 and Region 2. These can be created by entering X,Y co-ordinates, or you can take the more sensible approach of drawing the box in place. Counting is established by a target moving from Region 1 to Region 2. The only consideration is that a target should fill a significant portion of each region.

There are three additional adjustments which can be used to optimise accuracy. These are detection sensitivity, lighting effect and background update. The first is self-explanatory, the second allows for lower lighting applications and the latter compensates for applications where there may be a high level of motion in the background of the viewed scene.

In the camera settings menu there is a scrolling real-time graph which shows detected counts. Each time a valid person is counted a green line shows. If you're testing the system you have to ensure you keep watching as the lines are only on screen for 20 seconds – the time it takes for the timeline to scroll across. This is okay for live testing during set-up.

However, what is a little odd is that the Today's Graph screen also uses the rolling timeline, along with a daily customer count. This isn't of great use to a user, and is
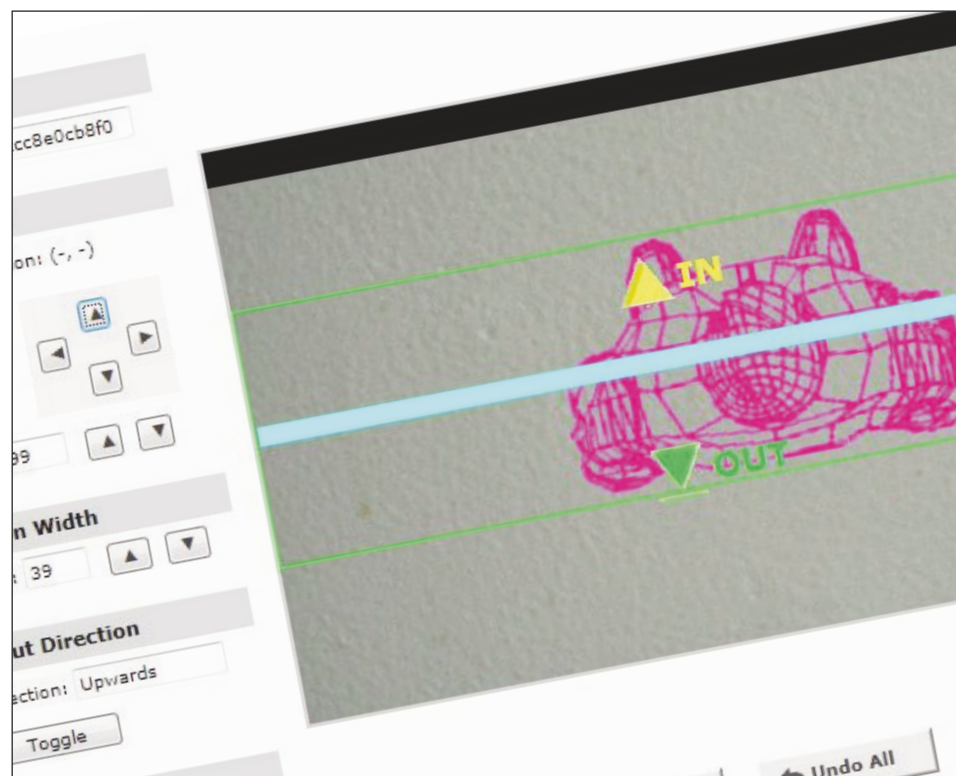
arguably a weakness in the reporting mechanism.

A more advanced report can be generated, with colour-coding to show levels of traffic, on an hour-by-hour basis for the previous week. There isn't any way to customise the data, which does make it a tool that is more aimed at immediate usage. Reports can be downloaded for future analysis.

Accuracy is claimed to be within 10 per cent of actual counts, and we'd say that is a fair reflection of reality in most conditions. However, if the count area is affected by changes in ambient lighting the App will generate a high level of false counts. As such, it might not be ideal for certain environments.

Visual Tools: AX-PeCo

AX-PeCo is a dedicated people counting application which is solely available for the Axis Camera Application Platform. It is supplied as a single .eap file, along with a PDF file instruction manual. Currently Apps are available for the ARTPEC-4, ARTPEC-3 and AMBARELLA chipsets. There isn't an App for ARTPEC-5 cameras, but we loaded the ARTPEC-4 version and it worked as expected. We had no issues, but would advise anyone thinking of doing the same to download a trial and give it a good workout on your chosen device!

The manual covers both the setting up and loading of the App on an Axis device, and the

configuration of the App itself. We did come across some materials which implied that a configuration tool was required to properly set-up the App, but the links for it were dead. However, the App itself contains the necessary access to the relevant settings.

Installation of the AX-PeCo App is very straightforward. It is simply a case of browsing to the .eap file via the camera's Application menu and uploading it.

The previous Axis Apps we've looked at needed to be running before they can be licensed. However, AX-PeCo can't be started until a valid licence has been added. A trial licence is available from the Axis web site.

Once licensed, the App will start, and the configuration can begin. The process is certainly very intuitive.

There are five menus: Live, Log, Configuration, Counting Schedule and Advanced.

The Configuration menu contains the set-up for the actual counting. Here you can set the count line, detection area and directional information. The latter allows the In and Out settings to be toggled. To ensure that the mounting height is compensated for, a graphical representation of a person is generated. This can then be scaled to allow the App to understand average size criteria.

The Counting Schedule allows start and end times to be set and applied to certain days of the week. There are five potential shift patterns that can be set. Once the configurations are complete, performance can be tested using the Live menu. This allows a test to be started and stopped, during which a live count is displayed.

The Advanced menu allows count logs to be deleted by date, and also includes the user and password settings for the PeCo-Graph application.

Finally, the Log menu hosts the all important captured data. Compared with some other people counting options, it is a bit dull if the truth be told. There is a table of In and Out reads for the day, defined by the hour, and

the same for the week, defined by day. There is also an option to download logs.

The Log page includes a link to download PeCo-Graph, which is a free utility that enables the log data to be viewed in different formats.

In order to use PeCo-Graph, the server must be running Microsoft .Net v4.0. The PeCo-Graph download page includes a link for this, and it must be installed first! If you're running a VMS then you'll probably already have this running.

PeCo-Graph isn't immediately as intuitive as the AX-PeCo App, but it will only take five minutes until you get used to it. It is preloaded with sample data, and we found that once we'd removed that it was easier to navigate.

In truth, PeCo-Graph does add to the ability to interrogate data, but it only starts to make sense if you have figures for a few months loaded!

The accuracy of the AX-PeCo is decent; our test showed it to be around 95 per cent in stable conditions, but this figure fell if the ambient lighting wasn't consistent. This does mean that in some applications it might not be consistent in terms of results.

Verdict

FoxCounter is a simple people counting plug-in, and it works well. It is quick to deploy, works very much as an App should, and adds functionality to the camera. Accuracy was good, and the simplicity of reporting doesn't detract from its appeal.

AI-People doesn't have the App feeling; it's clumsy to deploy, relies on additional programs and virtual servers, and doesn't add a whole lot more than the other Apps. If you want a server-based analytics solution, there are more robust and feature-heavy options.

Facit People Counter is a basic tool, and whilst it has some good points it also has a number of negatives. Accuracy was suspect in an environment where lighting was not stable, and the reporting – whilst looking quite funky – lacks basic customisation.

AX-PeCo is simple to configure, and delivers basic and generally reliable counts. The PeCo-Graph tool adds to what is otherwise very basic reporting, and accuracy can be slightly off in challenging conditions.

The Apps are designed to add functionality to cameras, and to an extent they do that. People counting has some valued applications in certain sectors, and whilst we would not recommend using any of these on cameras aligned for surveillance, they will work well as an addition to a system.