

# testDRIVE

analyzing the latest CCTV products



Test, text and photos by Vlado Damjanovski

In the January issue of CCTV focus I tested Practel's 3D video motion detector - Sensei. The 3D VMD is a very special method, as already explained in that test drive. I have been asked by many to "test drive" a "standard" VMD that analyses one camera image at a time, rather than having three-dimensional representation of the protected area.

For this reason, in this issue I decided to look into the ADPRO Axiom from Vision Systems. Thanks to the kindness of Carl Turner and Dan Trujic from ADPRO Vision Systems, I had a unit in our workshop for a few weeks and plenty of time to investigate and test it. I was pleased to have more time at hand, as we were in the middle of moving offices as

you can see next to the editorial column, and I needed every extra day I could get.

Axiom is the new product that superseded the renowned VMD-10, Adpro's outdoor video motion detection unit. I am sure many people will have at least seen or dealt with the VMD-10 in the past 6~10 years. It was known for its successful outdoor video motion analysis. Yes, it is a "standard" type of VMD (at least compared to Sensei), but don't get confused, the Axiom is far more intelligent than the video motion detections you can get in the multiplexers, or even in the more sophisticated digital video recorders. The outdoor VMD concept that ADPRO introduced about 16 years ago is challenged only by a few other brands that can be counted on

one hand. This refers primarily to the stability of operation and the precision of capturing genuine alarms with minimum false triggering (you can never say no false alarms in VMDs). This is especially tricky outdoor, with so many external factors - wind, clouds, birds, cats, etc. Despite all this, the Axiom is surprisingly smart and, in our testing, over 90% of the time was triggering correctly on people moving in the field of view. No matter how far they were from the camera, and no matter how they moved across the screen, crawling, walking, rolling along the ground or running.

Adpro people are very fair in their functional specification data sheet where they say "High probability of detection of intrusion under a wide range of environ-

mental conditions," and further in the text "Low probability of false alarms from small animals, clouds, snow, wind and rain." They never say 100% detection of intrusion, as nobody associated with the VMDs can say this. But if you are getting over 90% success rate, it deserves all the compliments.

The Axiom is a definite improvement on VMD-10, with greater software intelligence, although the external appearance and programming is very similar to what VMD-10 used to be.

The nice part about this testing was that ADPRO had cleverly provided me with a special "Video Footage Test" tape. This is a tape recorded with a variety of objects moving in front of the camera. I did test the VMD with our own camera and people moving in front of the unit, but the VHS tape provided 8 minutes of very special and tricky events, some of which we could not necessarily replicate: a person walking, running, crawling and rolling in the distance, a cat running in the field of view, birds flying in and out, flies buzzing in front of the lens, clouds throwing strong shadows over the viewed area, wind shaking the camera and plastic bags and newspapers blown by the wind. A nice

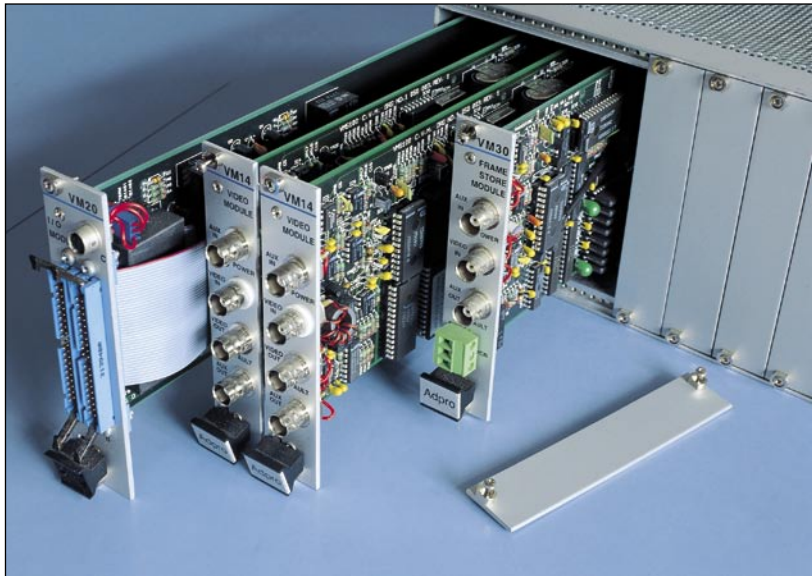
set of genuine and real situations. The Adpro guys have copied the 8-minute sequence many times, one after another filling up the whole tape. This provided me

even with parameters adjusted radically. More so, the play-back of a VHS tape is always noisy and not as clear as with a direct "live" signal. Even then, the Axiom was

performing better than I expected. In order to show you some of the objects detected I used my video capturing card on my computer, which was connected in series with the Axiom display monitor. The images showing little square-dot trails behind the object detected, with the text "Alarm capture" at the bottom of the screen, mean that

the movement was detected and Axiom triggered successfully. The images without any such indication mean the Axiom didn't see those objects as an alarm. In most cases this was what I would have liked to see.

One of the main reasons for such a successful rate of outdoor detection is the learning mode of the Axiom. Namely, the software was made with the capability to learn the scene. In order to make use of this, the Axiom needs to see a stable scene before a true detection operation is efficient. Every entering or exiting of the setup



*The Axiom uses Euro card format for its various modules*

with a chance to adjust the various settings of the VMD parameters and see what the outcome would be with the same scene repeating again in 8 minute gaps. I was surprised to see how consistent and correct the VMD capturing was



*The Axiom VMD Video Footage Test Tape was very helpful in our testing, and I recommend it to anybody involved in setting up the Axiom*

A nice



## Test Drive

mode automatically clears its "learning" memory and restarts the learning process. So in the case of using the tape, we had to be careful not to "misinform" the Axiom with fast forwarding or rewinding of the tape. That would not have been a real "live" scene.

A very important thing about the Axiom is that it is not a PC based, but rather a stand alone hardware platform. This assures trouble-free unattended operation in security important areas for a long time. It is built in a 19" standard rack cabinet with "DIN 4194, Euro-card" slots.

In a standard configuration, two slots are already populated with one VM-90 power supply module and two VM-20 input/output cards. Up to 10 slots can be populated with a single channel VM-14 processor card, which ADPRO calls "video intrusion detection modules." Cards with other functionality can be used in the same rack, such as the frame-store card VM-30 which remembers a few frames of the triggered intrusion and plays them back repeatedly so that the operators can quite clearly see the trace of the intrusion, and the VM-41 card which is Adpro's Fast Scan transmitter, which transmits the alarms and associated video to a remote mon-

itoring station. If you require more than 10 channels (cameras) to be analysed with the Axiom you can connect up to 14 racks, making a

movement in the background; cloud filtering; snow filtering, etc. With a bit of smart thinking at the design stage, a CCTV expert can design some very clever systems with Axiom.

Many times I have been asked, for example, if I can suggest a solution for a CCTV system where an alarm is triggered only when people, or vehicles, are coming onto a premises, and not when they are going out. With the target direction option, and the correct speed setting in the Axiom, this is easily achieved.

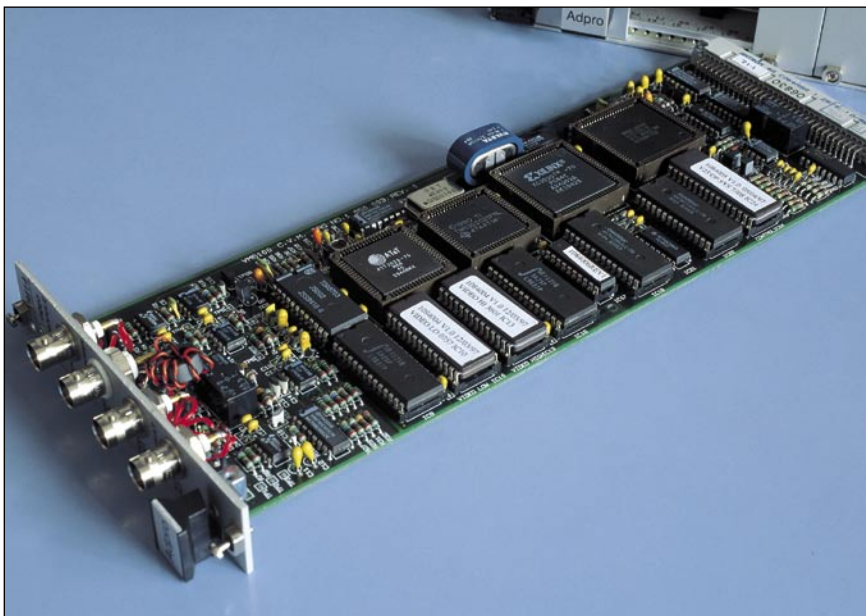
Another example would be a fenced area protected by a camera inside the area, looking towards the fence. If a road is in the background and cars are moving, one way or another, it would be very difficult to do the detection of an intruder without being affected by the cars' movement.

With the Axiom you can easily set the direction, target size and maximum target speed of the "expected" intrusion (a person runs slower than cars in a traffic situation), and thus ignore the traffic in the background and still successfully detect the intruder.

It is very obvious that for a successful and reliable movement detection the video signals must be all properly terminated and within the expected limits,



*Rear view of the Axiom*



*The video motion detection processing card of the Axiom the VM-14*



*Even a fast moving cloud did not trigger the Axiom VMD*



*A man walking was detected*



*The bird didn't trigger the Axiom*



*A person crawling at slow speed was detected by the Axiom*

i.e. 1Vpp. The Axiom has a setup mode where the signal levels can be checked without the need for an oscilloscope. A handy feature for easy setup and commissioning of a system.

The programming of the Axiom can be done with the small and standard ADPRO hand-held programmer, which I have used in our testing, but a more convenient and more powerful one would be the VM-86 keyboard, which also offers some extra features. For example, instead of only two operation modes, selectable with the hand held programmer, up to four can be selected with VM-86.

A system designed with Axiom could elegantly integrate in one 19" rack not only the VMD cards, but also the very useful frame store, which captures and replays frames in loop so that if a guard, or an operator, has missed the moment of intrusion - the frame store does the trick. It replays the detected intrusion over and over again, until cleared. Even better, such a site can be somewhere remote, and the Axiom can send



*Various Menu setup options in the Axiom*

the intrusion alarm and images automatically via the Fast Scan transmitter unit VM-41. Needless to say, with the I/O modules, various external alarms can be brought into the system, or devices, such as doors or gates, opened or locked automatically upon VMD detection.

Perhaps one thing that I would object to, and would like to see changed, is the old-fashioned hand-held programmer. I know the alternative VM-86 is there, and I know that the hand-held programmer works, but it is a bit slow, especially if you have to enter names on many channels and if you happen to make errors while spelling or re-naming channels. However, once the Axiom is programmed to the satisfaction of the user, the programmer can be removed. There is a Quick set-up facility whereby the user can easily program to a reasonable set of detection parameters in minutes, these are: field of view in foreground, field of view at horizon, detection sensitivity and environment activity. I am told that in most cases no further adjustment is required.

Another thing that could be pretty difficult to a new user is the setting parameters in the advanced setup. Of course, the advanced setup is for advanced and trained programmers, but perhaps a set of illustrated examples with various parameters would be helpful when configuring the system

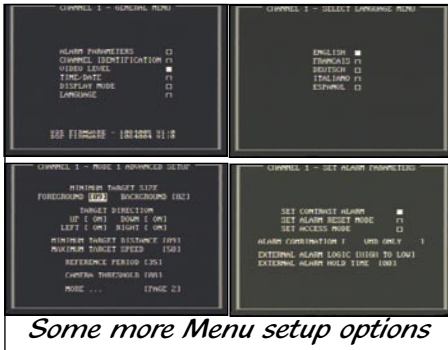


*The cat didn't trigger any alarm*



*A plastic bag blown by the wind didn't trigger an alarm*





Some more Menu setup options

the coming months the company will be providing a means of programming Axiom via a Graphical User Interface on a PC. The performance could be affected by very wrong and illogical settings. But then, there is always "Factory default" selection which will put you back to a very well balanced VMD setup.

Another "wish-list" idea: Although the Axiom performs its primary function - the video motion detection - pretty successfully, it would be nice to see in the future software update a video non-motion option available also. Namely, some other VMD devices can detect a disappearance of an object from a marked area. This could be a valuable car, or luggage parcel in the airport. People walking in front of such a "protected" object should not trigger the alarm, but only when the parcel or object is removed. I am sure that for the software guys at

Adpro this function would be easy to implement.

All in all, the Axiom is a very reliable and solidly designed movement device, or better to use ADPRO's terminology, intrusion detection device. For outdoor motion detection you probably wouldn't have a much better choice than ADPRO. Such a decision would gain much more weight if you know that Adpro has been around for over 16 years now, and it has been one of the pioneers in VMD technology. They have an impressive list of reference sites such as: Australian Customs Waterfront, British Telecom - worldwide, Prince's Palace - Saudi Arabia (220 km of perimeter protection), many, many prisons and numerous embassies world-wide, just to mention a few.

for the first time and choosing the best setting. And, to speed things up, instead of using the tedious hand-held programmer when entering changes, it would be nice to see a PC with a comms port connected to the "programmer" port on the Axiom uploading various parameters at an instant.

I want the readers to understand that the above are only my own "wish list" remarks, and the performance of the Axiom is not affected by the way changes are entered. The ADPRO marketing people have assured me that in

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