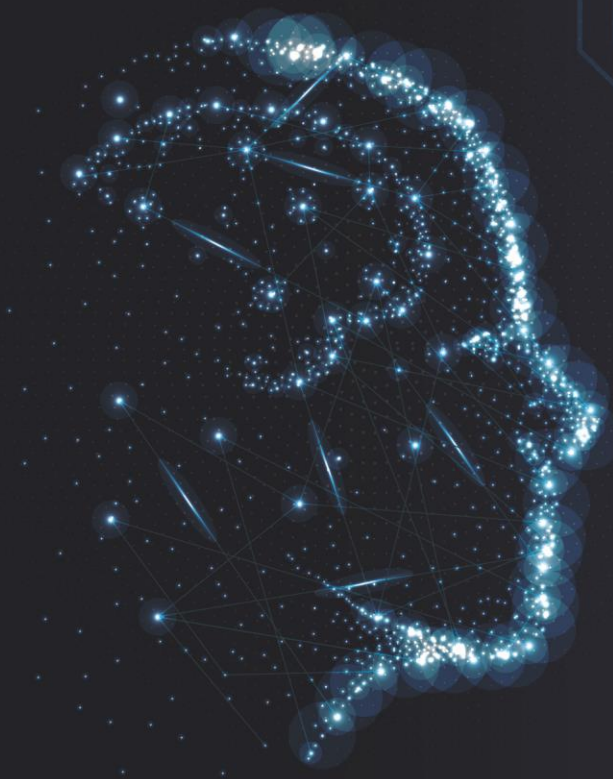


# AVLYTICS

*artificial intelligence for video surveillance*



The Most Cost Effective  
Artificial Intelligence for Surveillance Solutions

## **Product Portfolio**

Version 1.2

Welcome Guide

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# 1. Welcome to AVLYTICS

Thank you for choosing AVLYTICS as your AI security solution. AVLYTICS is an AI driven security solution developed by a proudly South African collaboration between Intertrade Security Distributors and our technology partner Cognitive Systems. The product specialises in offering Artificial Intelligence (AI) based solutions to the security industry both locally and abroad.

Below is a short overview of the AVLYTICS system architecture, how AME (Artificial Mind Engine) is applied to surveillance, the components you can expect to utilise when implementing an AVLYTICS solution, and how to go about purchasing, licensing and device setup.

## 1.1 What is AVLYTICS?

AVLYTICS is an Edge Based, third party artificial intelligence plug-in device, which analyses video streams from any CCTV product that offers an RTSP stream. AVLYTICS makes use of software known as AME (Artificial Mind Engine) which is a location aware cognitive computing program designed specifically for video streaming. The AVLYTICS hardware can be installed either locally on site, or remotely if required. The device is required to have a permanent network connection to the DVR / NVR providing the RTSP Stream. Throughout the AVLYTICS process, the RTSP video stream is monitored and analysed in order to detect certain criteria and classifications. AME makes intelligent decisions based on environments and behaviours and when the device is armed, it will provide notifications and alerts based on the required monitoring solutions.

It is important to note that whilst the AVLYTICS technology is primarily designed to provide notifications and alerts for accurate HUMAN DETECTION events, the solution is also designed to ensure that the required system health checks and test notifications are in place for system function monitoring. It is suggested that when choosing AVLYTICS as your AI CCTV solution, that the ALARM notifications, all HEALTH CHECK and OPERATIONAL alerts available are made use of, this ensures that your AVLYTICS device operates and functions optimally.

## 1.2 Using AVLYTICS

AVLYTICS may be used as an AI HUMAN DETECTION solution where a recognised Analogue HD or IP CCTV system is installed. The device can be monitored on-site with our AVLYTICS CLIENT / SERVER software and/or off-site in conjunction with an affiliated AMS (Alarm Monitoring Software) program.



Along with the above control room solutions for monitoring incoming ALARM ALERTS and the SYSTEM HEALTH STATUS of your AVLYTICS device, we also offer notifications of both the alerts to the TELEGRAM APP. This allows for easy access to alerts by mobile receipt of notifications. It must be noted that using the AVLYTICS devices to send notifications via the TELEGRAM APP only, is not seen as industry best practise and is therefore not suggested.

In order to offer AVLYTICS as an AI HUMAN DETECTION solution a service provider must have suitable and reliable access to the internet along with suitable hardware in place to run and operate the required software.

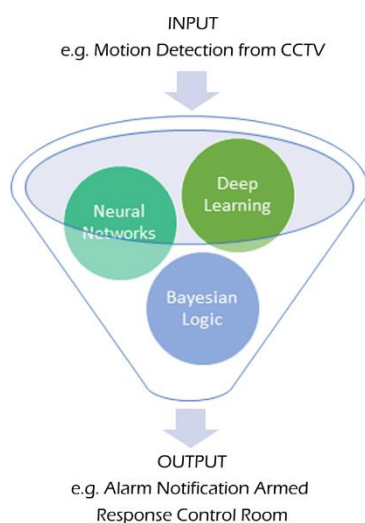
#### IMPORTANT NOTE:

Security providers wanting to add AVLYTICS to their list of security solutions would need to register on <http://AVLYTICS.online> . Registering here as an AVLYTICS provider will require the AVLYTICS CLIENT and AVLYTICS SERVER programs in order to monitor and manage the sites linked to the registered account.

These programs are supplied at NO EXTRA CHARGE and are available when contacting [aisupport@intertradesecurity.co.za](mailto:aisupport@intertradesecurity.co.za) .

The required hardware specifications needed to operate your AVLYTICS CLIENT and SERVER platforms are available on request.

## 2. AME Applied to Surveillance



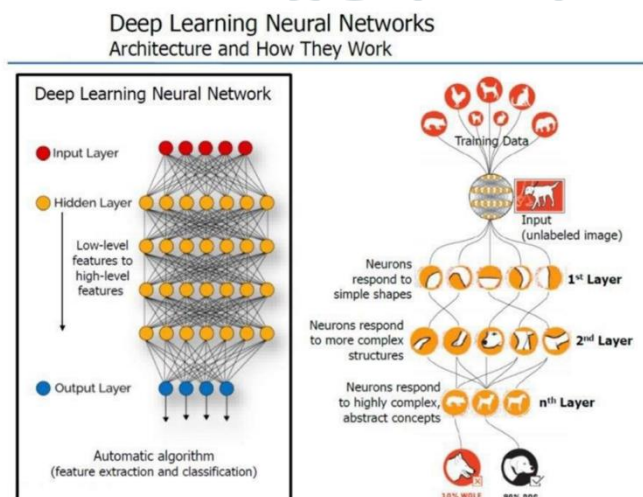
Intertrade Security Distributors, experts in the security and surveillance industry, has partnered with AI Software Developers to merge Artificial Intelligence with Surveillance.

The Artificial Mind Engine, referred to as SeeingAME, is a location aware cognitive computing program designed specifically for RTSP video streaming and forms part of your AVLYTICS package.

AME works on a Dual Tiered Object Classification System to provide you with the most affordable and adaptable AI solution for surveillance.

### Tier 1: Object Classifier

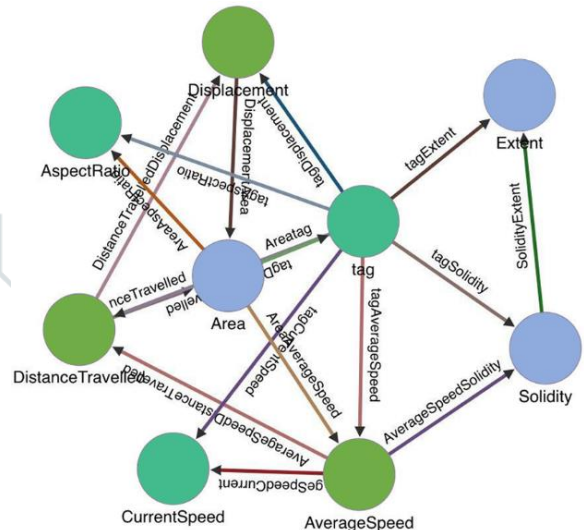
This is also referred to as “Deep Learning” in the diagram on the right, and refers to the breaking down of images into a number of features (shapes, textures and colours), to be analysed and identified in accordance with the training the device has received.





The Neural Network analyses the history of the movement of the blob (or object). The blob's history is visible in each of the images sent through as an alarm (see left) in the form of a yellow line and these characteristic patterns of movement assist in identifying the nature of the object.

The Bayesian Logic Tier will be used to identify behaviour based on previously learnt information. In the diagram to the right, an example of the process of behaviour analysis is indicated through the complex structure of a neural network. The technology makes the classification decision based on the comparisons performed on various previously identified behaviours.



The use of AI Technology as a component of a CCTV security solution is becoming more prevalent and has achieved mainstream status as of 2020. The adoption of AI in security has seen its place in many applications, with SeeingAME engine and AVLYTICS as our monitoring solution. With this offering we are able to provide a cost effective open source plugin and monitoring facility.

When choosing an Artificial Intelligence solution for offsite monitoring there are two critical factors to consider:

Ensuring accurate and reliable detections take place.



Continual device and communication infrastructure monitoring.



## 3.1 Health Status Monitoring

The developers of AVLYTICS place the same importance on providing health checks and notifications as they do in developing the actual Human detection algorithms. This principal is key to offering a 24HR security solution that is essentially designed to save lives and protect property. When considering AVLYTICS as an AI solution, it is important to note that the following diagnostic health checks are available and should be used as standard practise.

### 3.1.1 Accuracy

To offer a reliable and accurate Human detection solution it is imperative to monitor and understand the device's accuracy metrics / measurements with regard to training per channel, per device, per class. It is recommended that a calibration walk test is done prior to site handover, and periodic walk tests and camera maintenance is scheduled and carried out as industry best practice.



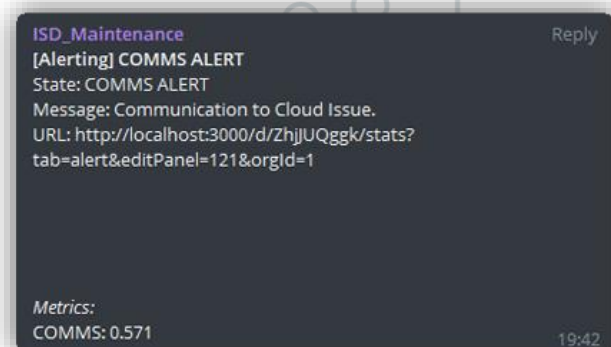
### 3.1.2 Status

The status of each device is communicated simultaneously to both Cloud Grafana and the Telegram Messenger App. In addition to the basic health status monitoring through Grafana and Telegram, AVLYTICS provides the ability to integrate these alerts directly into a number of third party Alarm Monitoring Software (AMS) packages. When integrating with AMS packages we are able to automate checking processes.

### 3.1.2 Timeouts

TCP/IP ( Transmission Control Protocol / Internet Protocol ) protocol requires good communication infrastructure. The ability to communicate alerts through to a control room is reliant on stable communication. AVLYTICS has the ability to notify the user / control room in the event of communication failure. A timeout notification can be received via TELEGRAM or GRAFANA notifying the service provider.

Two critical alerts that should be monitored at all times include Test and Offline signals. Test signals are monitored signals that that can be configured to send and receive at the required intervals. If the device fails to send a test message an alarm will be raised in the control room. Offline signals would indicate that the device is not communicating via TCP/IP.



**NB:** Whilst AVLYTICS is designed primarily to communicate via TCP/IP, it is regarded as industry best practise that an alternative / backup communications platform is also in place.

## 3.2 System Design and Architecture

The AVLYTICS system comprises of a central control unit monitoring various detection peripherals installed around a premises and affords the user the same stability and reliability as that of a conventional alarm system by harnessing the same design principals and methodology.

In Standard alarm systems, the design facilitates supervisory methods to monitor both the main control panel and the detectors within the solution. The system allows the security provider to monitor the state of all the relevant equipment on site, from the device itself to the cameras installed around the premises. As part of the standard offering, the system monitors and alerts on numerous maintenance features.

It is important to note that the following failures will negatively affect the ability of the device to make the required predictions and therefore, it is suggested that these fault statuses be monitored by the security provider.

### CAMERA TAMPERING

Camera moved/ obstructed



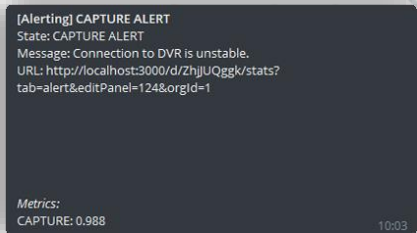
### STREAM FPS

Camera connection to AVLYTICS device



### DVR / NVR STATUS

CCTV Connection to AVLYTICS device



Apart from these key services in accuracy, online status and predictions listed above, AVLYTICS is able to report on a host of additional diagnostic alerts. When these alerts are communicated to a control room, the service provider and the end user are ensured that Human detection alerts, along with the wellbeing of the device is continually monitored to ensure optimal performance.

Other diagnostic and status notifications have key advantages such as: Armed Signal Alert: Allows the user or control room to monitor whether a site armed as expected. Maintenance: Pre-warning on site related issues. Keep Alive Heartbeat: To monitor constant uninterrupted communication.

The AVLYTICS range of devices provides an optional layer of a secondary / backup communication facility in the form of a hardwired relay module, which can be connected to a communications device of the security providers' choice. This so as to provide backup communications to the control room if the TCP/IP is not operational.



## 4. AVLYTICS Applications

AVLYTICS allows you as the security solutions provider, to offer your customer a detection and verification technology for a host of different applications and installations. With the design and development of AVLYTICS being centred around it's compatibility with both existing and new IP and ANALOGUE CCTV installations as well as integration with various CCTV manufacturers, we believe AVLYTICS to be an ideal solution in the following sectors and applications.

- Alarm monitoring and Verification
- Remote Guarding and E-patrols
- On Site Guarding
- Neighbourhood Watch Initiatives

### 4.1 Alarm Monitoring and Verification

#### Alarm Monitoring Applications

- Homes, Complexes & Estates (Perimeter Protection).
- Small & Medium Businesses.
- Farm Houses and Storage Facilities.
- High Security Applications (i.e. Banks).
- Warehouses and Storage Facilities.
- Retail Floor Space.



Ideally positioned to compliment the 24HR alarm monitoring and armed response sector of the security industry, AVLYTICS' ability to communicate alerts and diagnostic events through to two of South Africa's leading AMS products, your client's AVLYTICS device is able to link through to your ARMED RESPONSE control room in the same manner in which the clients alarm system would report. In this way the installed CCTV installation now becomes an intrusion detection and verification solution, complementing the existing detection solution and at the same time offering the security provider VERIFICATION of the alert within seconds of detection.

#### IMPORTANT NOTE:

Whilst alerts can be monitored via your 24HR control room, access to the alerts and images generated by AVLYTICS can also be given to the manager/supervisor/homeowner via the TELEGRAM Messenger APP in order to be viewed on Apple or Android devices, adding yet another additional security feature.

In terms of end user functionality and integrating your AVLYTICS device, one is also able to connect the AVLYTICS device to your customer's existing alarm system, so that ARMING/DISARMING can be carried out via the existing alarm control panel and along with the primary communications



platform of TCP-IP Internet, a zone output on the device can be connected to the existing control panel, providing secondary alert/communications.

## 4.2 Remote Guarding and E-patrols



The continued move towards the use of technology as the primary form of detection and property monitoring is seeing more and more security providers adopt the likes of AVLYTICS as part of their security solution. AVLYTICS is designed to encompass all the detection qualities that deliver both the accuracy levels required to provide HUMAN detection along with the ability to mitigate false alarms, at the same time deliver the diagnostic

feedback and remote control usability required to administer the security solution remotely from your control centre.

Fundamentally, the use of AVLYTICS in the remote guarding and e-patrol sector allows you to implement and deliver specific solutions that address the markets drive towards more cost effective solutions and at the same time mitigate any potential risk your guards may face on site.

Introducing an AVLYTIC device on site not only allows you to provide accurate HUMAN detection technology, but also to control the ARMING/DISARMING of the unit and receive important diagnostic feedback pertaining to operation of the cameras, network and recording hardware.

These are key indicators that allow you to know that the system is operational 24HRS a day and any change in the device's ability to operate fully is alerted at control room level.

The benefits of having an AVLYTICS detection technology installed on site only sending you key alarm events in telemetry and image form, allows your control centre to continue with day to day operation without the constant need to view a site remotely. So in terms of costs and scalability, because live linking to sites only gets done on the receipt of an alert, 24HR transmission and streaming is not required, also allowing more sites to be monitored by one controller.

## 4.3 On Site Guarding

Adding an AVLYTICS device to either an existing or new CCTV installation on site can further enhance and compliment the work of the on-site guards.

With the use of either AVLYTICS Client software within an on-site control room or alternatively the use of a handheld SMART device, your on-site guards would be able to receive alerts and

notifications pertaining to events like a perimeter breach or an entry into unauthorised areas, without having to spend valuable time viewing the on-site camera monitors.



This is especially evident on sites where only one guard is posted, or perhaps your client's budget only allows for a limited guarding compliment on a site that could require more. On such sites, adding AVLYTICS and its automated detection technology can further enhance a single guard's

performance in terms of detecting unwanted visitors within seconds, at the same time offer the guard the peace of mind knowing that the alert has been logged with the central control if a threat is significant or overpowering.

Apart from the benefits above, the functionality of AVLYTICS and the use of the TELEGRAM MESSENGER APP as one of its notifications platforms, allows for the on-site performance of the guarding compliment to be monitored visually by a shift supervisor or control room operator, as the images of periodic patrols can be viewed remotely for confirmation.

## 4.4 Neighbourhood Watch Initiatives



As more and more residential communities and security services providers see the benefits of introducing CCTV Technology in and around residential areas, AVLYTICS is well positioned to play its role in ensuring accurate vehicle and pedestrian traffic is monitored.

Whether via a 24HR control room or the TELEGRAM Messenger App, NHW (Neighbourhood Watch) role players are now able to

affordably and effectively role out CCTV solutions within a suburb that can make a significant difference in way a community monitors criminal activity. The distribution of alert notifications can be done within seconds from CCTV points installed in and around a suburb and because AVLYTICS can be used on both ANALOGUE and IP systems, designing and implementing solutions can prove to be very affordable.

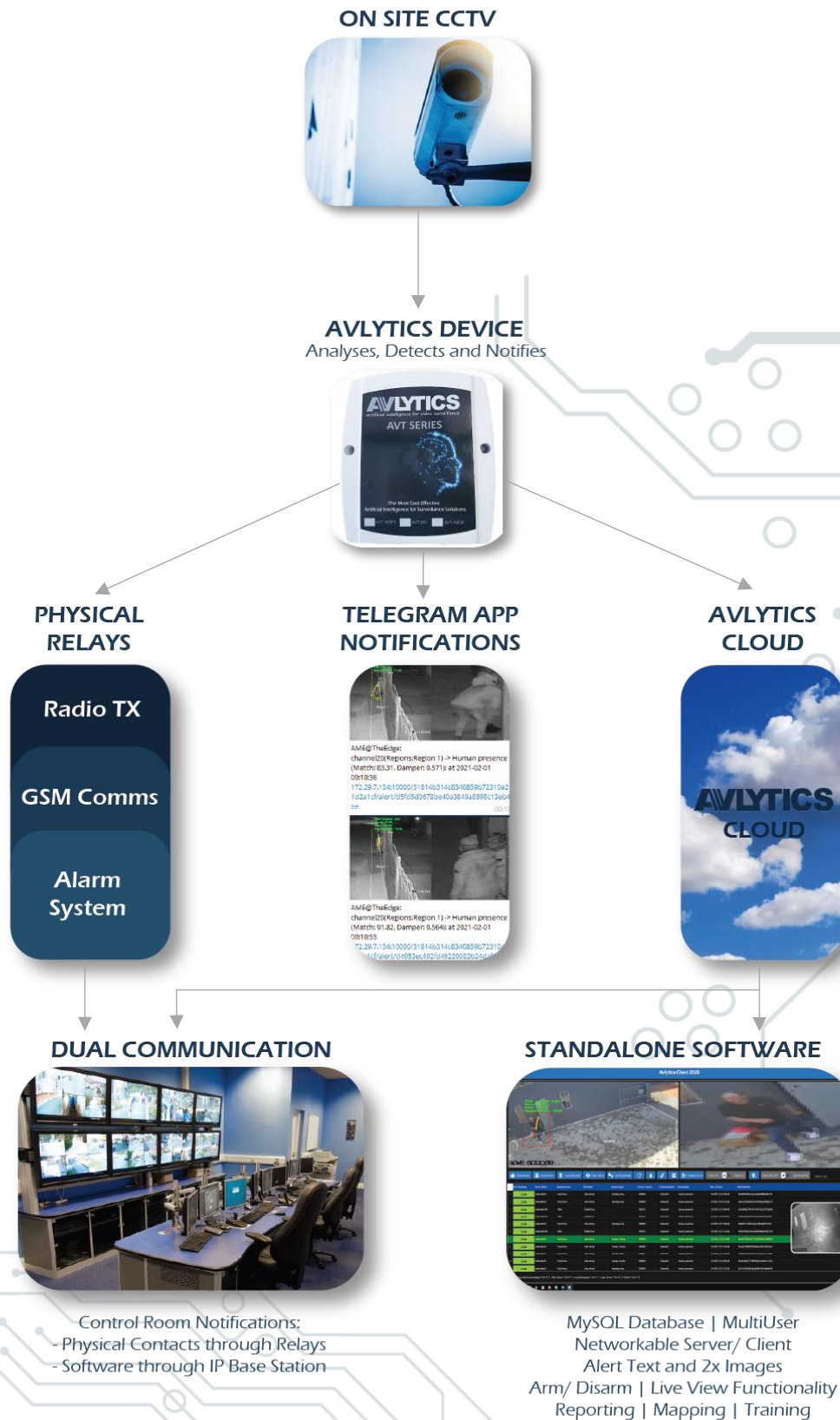
Once installed, that CCTV solution provides additional and cost effective “EYES” around the suburb, which on detection can be responded too immediately, which means NHW and security company patrols can be streamlined by reducing patrols and the associated costs.



With more and more use of CCTV technology as a proactive detection utility, we at AVLYTICS have concentrated on developing a solution that does not require continued off site streaming or analysis, but a solution that can detect offline and that communicates activations whilst in an armed state, offering BLACK SCREEN exception reporting to you, the solutions provider.

When it comes to the following applications AVLYTICS is designed to send alerts through to on-site or remote control rooms for further investigation and response and notifications.

## 5. Operational Overview





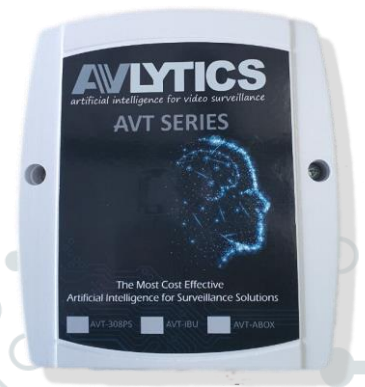
## 6. New Release – A BOX

A-Box is an affordable Video Verification Solution which is ideal for reducing armed response call out times to false alarms or isolated sites. It also empowers the armed response team with critical information of the event and threat.

**A\BOX**  
Video Verification

### Features:

- Live 16 Channel RTSP device
- Open Platform IP or Analogue
- Plug and Play Install
- URL Web Interface Link – Action on Event Receipt
- VPN Connection – Device Comes Pre-configured
- V2: On Board Relays – Internet Loss & Camera Loss Monitoring
- V2: Accessible Video Storage
- V2: Remote Relay Activation



A-Box uses an open platform URL video verification link to the customer's site via the AMS (Alarm Management Software) platform. On receipt of an alarm activation on the AMS stack, the controller is able to connect live to site via the AMS (2nd screen) via the URL link. On accessing the site via the control room AMS, cameras may be viewed live in both single, and quad view.

Because A-Box is an open platform solution, no specific cameras or DVRs are required. Any device with RTSP stream capability, is compatible with the A-Box. This would include most reputable DVR, NVR and IP camera brands.

The device makes use of a VPN link (pre-configured on the device) along with that of your control room for added security. You do not require a DNS account or Port Forwarding to bring the A-Box into your AMS.

On A-Box V1, the device will serve as simple, easy to install, live link from your AMS. In V2 limited recorded footage will be accessible for more in depth verification and pre-alarm information.

### Configuration:

No license fees or subscriptions are applicable when using the A-Box, the device is a once off purchase for the AMS user. Simply add your A-Box device to the network on site (same network as DVR/NVR/IP camera) via the hardwired network port, then link the A-Box to the desired DVR/NVR/IP camera's IP address with an authorised username and password. Configure the A-Box remotely, or via a PC locally via the devices' WIFI, and add the RTSP stream details of the cameras you wish to view via your AMS. Ideally a minimum of 2-3 MB internet upload speed on site, will allow for suitable off-site live viewing for single and quad view.



## 7. Purchasing and Licencing

Register an account on <http://avlytics.online>

After registering you will gain access to the various interfaces, the account holder will be able to:

- Control of all registered devices.
- Access all admin related information at any time.
- Administer / add / delete devices and subscriptions from this portal.
- Access the device maintenance facility.
- View current device status: Online/Offline; Armed/ Disarmed.

### 7.1 Choosing your AVT Device

Choosing the correct AVT-device for your application will depend on the specifications (resolution) of the cameras to be used on site, and their combined MP (mega pixel) / resolution. The combined resolution total will determine which AVT device you require.

The AVT-range from the AVT-316PS up is rated at 1MP per channel i.e AVT-316PS = 16 x 1MP

It is important to note that the camera specifications (Resolution/Lens) will determine the range or distance you can accurately cover. Therefore, when planning a new site or retrofitting an existing site, please always consult the AVT-Series Specifications table (in **Section 9: Device Specifications** of this document) for guidelines when choosing your AVT-Device, and when deciding on the individual range/distance of detection for each channel.

#### IMPORTANT NOTE:

Exceeding the guidelines set out in the RESOLUTION/ LENS/ DISTANCE table (**Section 9: Device Specifications**) when setting up the area/region of detection, will result in inaccuracies of the detections and the resulting need for more site specific training.

Please note that the AVT-308PS is to be used with no more than 8 (CIF Resolution) channels. If you require INPUTS/ OUTPUTS for backup secondary communications, or local Input Arming or Zone Connection to the local alarm control panel, the AVT-IBU device must be used when installing an AVT-316 /AVT-332/AVT-364 or AVT-394.

The AVT-IBU interface module will allow for hardwired INPUTS /OUTPUTS to be linked to a backup communications device in the case of failure of internet connectivity on site.

Sites requiring 8 (CIF Resolution) or less AVLYTIC channels will be serviced by the AVT308-PS unit – which comes with the AVT-IBU unit built in. Sites requiring more than 8 (CIF Resolution) channels will be serviced by the AVT316-PS through to the AVT-364PS models, which are not supplied as standard with the AVT-IBU.

## 7.2 Licensing

The AVLYTICS services of Human and Vehicle detection are available as a channel per month subscription, or in the form of a pre-paid License Pack for your device.

The License Pack option are:

- A **24 month subscription** for the 16 Channel (AVT-1624LP) and 32 Channel (AVT-3224LP) at the **cost of 6 months**.
- A **36 month subscription** for the 8 Channel (AVT-836LP) at the **cost of 6 months**.

The license pack is renewable at the end of the license period and because it is not “*SITE*” locked, but linked to the ‘*i-number*’ on your database, the device and license can be moved between multiple sites and customers during this period. Only one license pack may be used per device.

All channels utilised on a device exceeding that of the license pack will be charged at the current per channel rate per month (at the time).

On purchasing a new device, the following services will be provisioned and initialised for that particular installation.

- Secure VPN for communication to SeeingAME HUB and a registered Username/Password
- Site will register in two Telegram Groups, for Alerts and Maintenance.

These Telegram groups will allow for the selective distribution of Site Notifications for both Alarm and HEALTH / Maintenance Alerts along with the ability to ARM/DISARM a device via the Telegram Maintenance group (see the Telegram Bot User Manual for full functionality). These groups will be managed by the AVLYTICS Account holder after registration.

- AVLYTICS Client and AVLYTICS Server software for control room use, either for remote control rooms or local on-site environments.
- Access to Grafana and AME Maintenance portal for site maintenance and diagnostics.

Once registered as above and a certificate number is issued – your site is ready for configuration, deployment and training.

Please note that it is industry best practise to ensure that your site is signed off at the point of commissioning, for your convenience a sign off form that may be used as guideline is available at [support@AVLYTICS.co.za](mailto:support@AVLYTICS.co.za)

## 8. AVLYTICS Device Setup

Once deployed, an AVLYTIC device is able to operate and carry out detections at the EDGE, configuration and programming of the device will require access to the SeeingAME HUB. This is done via a secure VPN connection and access is gained through the service providers registered USERNAME AND PASSWORD. Available once registered as service provider on <http://avlytics.online>.

SeeingAME is where an AVLYTICS Account holder will add, configure and deploy devices before fine tuning and customising the site requirements through AVLYTIC CLIENT. AVLYTIC Server will provide the conduit as the communications portal to AVLYTIC CLIENT for all incoming alerts and notifications.

When it comes to the deployment of new sites, it is required that a day and night CALIBRATION TEST is done of each channel. This will require a walkthrough of the desired area of detection and the training and fine tuning of the channels in order to receive accurate HUMAN DETECTIONS going forward.

The configuration process will require the ACCOUNT HOLDER to setup

- Rules and Area of detection (Important to note camera/lens/lighting can determine the accuracy and range of consistent detections – please ensure these guidelines are followed).
- Advanced configuration for each channel will allow for region specific fine tuning and enhanced accuracy.
- Alert Notifications and destination path – Onsite AVLYTICS, Remote AVLYTICS and/or AMS.
- Telemetry communications and Hardware failure reporting (for CCTV Hardware on site).

Once setup and commissioned, the AVLYTICS Client software will serve as the control room platform from which the controller will receive ALERTS and STATUS conditions from both AVLYTICS SERVER and all SITES in order.

- Receive and process incoming alarm alerts.
- Carry out basic alert reports.
- Carry out incident searches.
- Train incoming images per site.
- Carry out video verification via LIVE site connections.
- Respond to reported site maintenance or technical issues.

### IMPORTANT NOTE:

The AVLYTICS Client provides the controller with basic alert management functionality, it is suggested that for the best results, one integrates with a recognised AMS. A recognised AMS solution will allow for comprehensive cross checks and reminders along with providing the control room staff with case related reporting options.

## 9. Device Specifications

| BENCHMARK SPECIFICATIONS     |           | NUMBER OF CHANNELS PER RESOLUTION  |     |           |     |     |
|------------------------------|-----------|--|-----|-----------|-----|-----|
| RESOLUTION                   | CAPACITY  | 4MP  | 2MP | 1MP       | VGA | CIF |
| AVT-308PS                    | 1MP       | *  | *   | *         | 2   | 8   |
| AVT-316PS                    | 16MP      | 4  | 8   | <b>16</b> | 48  | 80  |
| AVT-332PS                    | 32MP      | 7  | 15  | <b>32</b> | 100 | 130 |
| AVT-364PS                    | 64MP      | 14   | 25  | <b>64</b> | 150 | 250 |
| AVT394PS                     | 94MP      | 23   | 50  | <b>94</b> | 200 | 350 |
| RESOLUTION / LENS / ACCURACY |           | RESOLUTION INDEX AND CAPACITY CALCULATOR   |     |           |     |     |
| CIF – 3.6mm                  | 20 meters | <p>When making use of the resolutions outside of the 1 MP specification, you are able to use multiple resolutions (CIF/ VGA/ 2MP and 4MP) on one AVT device. This excludes the AVT-308PS, which is limited to VGA/ CIF resolution).</p> <p>To do this, take the total MP capacity of your AVT-Device and divide it by the total number of channels / resolution you wish to utilise.</p> <p>By adding the number of CIF (1/8 MP), VGA (1/4 MP) and the MP of the cameras on the site, you are able to calculate the correct settings for your limitation, to not exceed the MP capacity of the device.</p> |     |           |     |     |
| VGA – 4mm                    | 30 meters |  |     |           |     |     |
| 1MP – 6mm                    | 40 meters |  |     |           |     |     |
| 2MP – 6mm                    | 60 meters |  |     |           |     |     |
| 4MP – 8mm                    | 80 meters |  |     |           |     |     |

### IMPORTANT NOTE:

The indication that the device can analyse 80 – 350 CIF and 100 – 200 VGA channels for various models, is purely on the device's CPU processing ability. Other factors contribute to the device's ability to process the streams, namely RAM, SWAP SPACE, and DISK size and performance. These factors, along with the CPU capacity limits the number of channels per device. Staying in the 1MP range indicated above will ensure that all channels have sufficient resources to process the streams.

End of Document

# Thank you