



 M3S+ Advanced Video Analytics

## **Smart and Safe City Based M3S+Video Analytics**

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## Introduction of M3S+ VA

This Data sheet gives the details of system requirements, salient features of HFCL M3S+ Analytics software product for actionable intelligence in security installations. Video analytics analyses the video stream and extracts useful information from images. The general applications of video analytics are Motion detection and tampering. The product provides excellent return on investment for a wide range of applications in different market domains covering following as under:

The HFCL video analytics used for different feature based on real date with continuous learning with increased accuracy. These are listed below

- **Schools:** - Video analytics are a perfect way for stadium security to keep track of attendance and occupancy by counting people at exit and entry points.
- **Transportation:** - Buses, trains, subways and other passenger transportation can be difficult to secure due to the sheer number of people who use the services each day.
- **Industrial:** - In factories, warehouse as and other industrial applications, video analytics can improve security by tracking items left behind.
- **Retail:** -Retail is one sector where video analytics lets the security department add extra value to the business. For example, analytics can help collect valuable non-security data.
- **Smart City Traffic Control:** - Vehicle/Pedestrian detection: It helps in differentiating between pedestrians & vehicles. This may prove helpful in pedestrian's safety. It's can give an approximate count of total number of vehicles & pedestrians on the rode its can also be used as an input for other smart city initiatives.

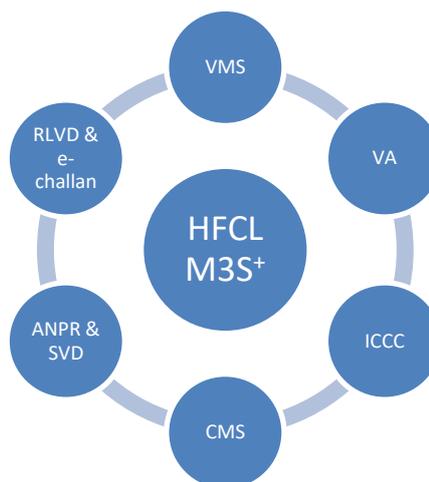
## M3S+ Architecture

HFCL M3S+ enables seamless integration of intelligent modules in the market. The rich and open interface allows any type of analytics solution to be integrated.

HFCL M3S+ VMS has an inbuilt video analytics solution for both the Analog and IP technologies for advance protection and monitoring. M3S+ platform aimed at many commercial and government domain CCTV applications.

There are wide ranges of solutions which come under the M3S+ Surveillance application are as under:

- ◆ Video Management System
- ◆ Video Analytics
- ◆ Central Monitoring System
- ◆ Automatic Number Plate Recognition'
- ◆ Red Light Violation and Speed Detection
- ◆ e-Challan etc.



## Introduction of M3S+ VA

HFCL video analytics platform enable seamless integration of analytics modules into the market leading M3S+ VMS. HFCL M3S+ VA technology adds sense to surveillance by automatically extracting meaningful actionable information from digital video based on a rich set of video analytics.

HFCL analytics solutions have been applied in diverse applications such as:

- Intelligent monitoring of vehicle.
- Crowd, infrastructure, People and objects Detection.
- For automatic detection and analytics of events of interest

Video Analytics is computerized video footage analysis that uses algorithms to differentiate between object types and identify certain behaviour or action in real time by providing alerts and insights to the users. HFCL M3S+ VA platform supports server based video analytics.

## SALIENT FEATURES OF M3S+ VA

HFCL VMS has inbuilt video analytics solution, providing a cost effective easy-to-implement solution targeted for advanced protection and monitoring. It is a general purpose analytics package aimed at intruder detection, flow analysis, counting, tampering detection, and many other commercial and government CCTV application.

- **Platform independent:** HFCL M3S+ VA has not been tuned for any particular make and model of camera and it simply works on the ONVIF.
- **Integrated with VMS :**
- **Robust in nature**
- **Quick and convenient**
- **Alert management**
- **Customization:** Developed in India, the solution is especially customised to meet challenging infrastructure and varying environmental conditions in India.

## BRIEF ON TYPES OF VIDEO ANALYTICS

HFCL video analytics software for security features is available in several forms from the CPU or server based analytics up-to the edge based analytics. Each version will be do the same things however the operator will search videos and alert the administrator for the actioner required.

The old idea of a video surveillance system is of a security guard sitting in a booth watching the security camera feed live, hoping to catch suspicious activity. This model relies on having a live person watching and reviewing all your video, however, which is not practical or efficient. Different security guards may have differing levels of focus or different ideas of suspicious activity.

Video analytics software is used to monitor video streams in near real-time. While monitoring the videos the software identifies attributes events or patterns of specific behaviour via video analytics of monitored environments. Video analytics software also generates automatic alerts and can facilitate forensic analysis of historical data to identify trends, patterns and incidents. The software enables its users to analyse, organize and share any insight gained from the data to make smarter, quicker decisions. It can promote enhanced coordination across and within agencies and organizations.

Video analytics come under two categories which are as under:

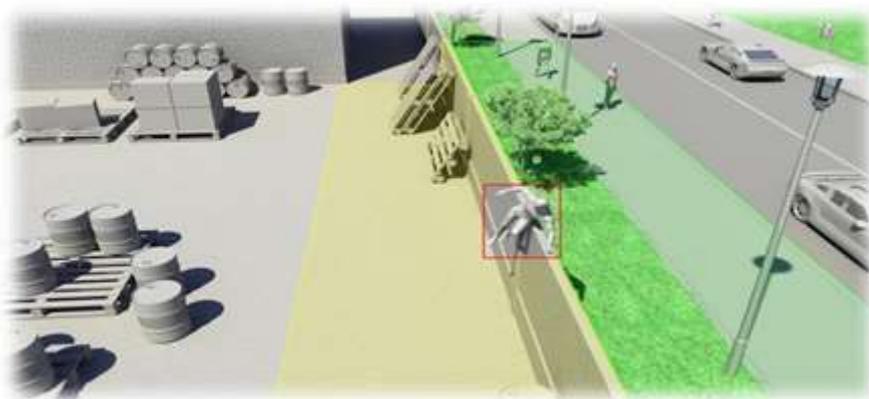
- ◆ Basic Analytics
- ◆ Advanced Analytics

Advanced AI based technology, analyses live video streams to quickly identify and examine potential issues, anomalies, or particular events of interest. Designed to help commercial and public organizations better leverage video to enhance infrastructure efficiency and safety. IVA automatically transforms raw video into enriched, searchable, structured data. IVA can help users to quickly highlight potential subjects and objects of interest, detect or track patterns, observe heat maps and anomalies in video footage, and deliver rapid reaction of subjects or objects.

Basic Video Analytics	Advanced AI Video Analytics
<ul style="list-style-type: none"> <li>• Motion Detection</li> </ul>	<ul style="list-style-type: none"> <li>• Fire detection &amp; identification</li> </ul>
<ul style="list-style-type: none"> <li>• Camera Tampering</li> </ul>	<ul style="list-style-type: none"> <li>• Wrong Direction Detection</li> </ul>
<ul style="list-style-type: none"> <li>• Intrusion Detection</li> </ul>	<ul style="list-style-type: none"> <li>• No Helmet Detection</li> </ul>
<ul style="list-style-type: none"> <li>• Tripwire</li> </ul>	<ul style="list-style-type: none"> <li>• Illegal Parking</li> </ul>
<ul style="list-style-type: none"> <li>• Zone Detection</li> </ul>	<ul style="list-style-type: none"> <li>• Crowd Detection</li> </ul>
<ul style="list-style-type: none"> <li>• Left/Taken Object</li> </ul>	<ul style="list-style-type: none"> <li>• Deep Learning based ANPR</li> </ul>
	<ul style="list-style-type: none"> <li>• Face Detection</li> </ul>
	<ul style="list-style-type: none"> <li>• Make &amp; Model recognition of vehicle</li> </ul>
	<ul style="list-style-type: none"> <li>• No Helmet detection</li> </ul>
	<ul style="list-style-type: none"> <li>• Person detection</li> </ul>
	<ul style="list-style-type: none"> <li>• Vehicle detection for Indian Category</li> </ul>

## M3S+ AI BASED VIDEO ANALYTICS FEATURES

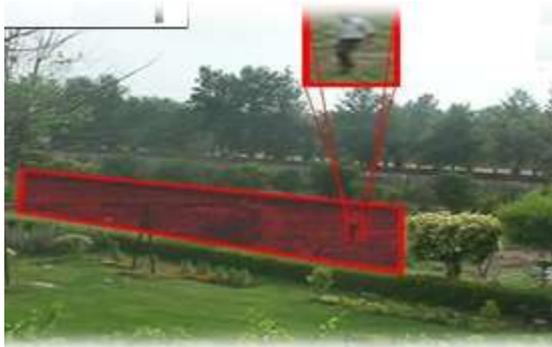
1. **Motion Detection:** - Motion detection in consequent images is nothing but the detection of the moving object in the scene. In video surveillance, motion detection refers to the capability of the surveillance system to detect motion and capture the events. Motion detection is usually a software-based monitoring algorithm which will signal the surveillance camera to begin capturing the event when it detects motion.



2. **Camera Tampering:** -The Tampering Alarm is an intelligent feature found on IP CCTV cameras. The camera tampering event will be generated whenever a camera is moved, partially covered, defocused etc. It strengthens the M3S+ VA solution by continuously monitoring the video feed from the camera.



3. **Intrusion Detection:** - Video based Intrusion detection (VID) is a way of defining activity in a scene by analysing image data. It allows you to set the activity threshold and sensitivity for indoor or outdoor depending on what you want to monitor to avoid false alarms. The algorithm analyses the video frames and outputs the location of moving targets within the frame



4. **Zone Detection:** - This is a method to detect and mark the target object removed from the monitoring scene and the unknown object left in the monitoring scene. The present method uses the timeliness background to extract the foreground object and to mask the part that was unwanted.



5. **Tripwire:** - Tripwire detection detects people or objects trespassing in restricted area. When a network camera detects moving objects in its view, the camera starts tracking each one of them. Once the object crosses an imaginary line in predefined direction, then the camera sends an alarm to the operators and highlights them with frame. Tripwire smart detection is ideal for a large warehouse, bank, and retail store and even found to be useful for the home if you have an entry point where you can draw a virtual line that shouldn't be crossed. It generates minimal false alarm rate and captures only the zoomed image of object causing the Line crossing and raises the alarm to the operator or to the assigned user.



6. **Left/Taken Object:** - The left object detector software uses a stereo camera and 3D-enhanced image processing in order to detect in real-time any suspicious objects that are added to or removed from an indoor area under observation. Set the alarm to notify security staff when an item has been removed from an area or left unattended designated of time



7. **Fire Detection & Identification:** - The proprietary Fire Detection is able to detect and identify a nearly unlimited number fire sources while avoiding false alarms from hot spots in the scene. When Fire Detection is implemented in the accuracies PTZ camera system, one camera could be used to monitor several Present locations and a limitless number of fire sources



8. **Wrong Direction:** - The wrong direction video analytics is the direction of the people moving across virtual fences or tripwire. If a person enters an area from the wrong way direction an alarm is generated in the control room nearby security persona can receive the alarm on a mobile devise via sms.



9. **No Helmet detection:** - The motor bike is becoming an increasingly utilized mode of transportation in India. Technology-related distracted motor bike and helmet use is behaviours that can impact bike safety. The proposed approach first detects bike riders from surveillance video using background subtraction and object segmentation. Then it determines whether bike-rider is using a helmet or not using visual features and binary classifier.



10. **Illegal Parking:** - With the massive, high quality, and pre-processed bike trajectories, detecting illegal parking events on a road segment is still a very hard problem. Most of the road accidents occur due to stopped vehicle or illegal parking. This analytics is capable of detecting a stopped vehicle and capable of taking the snapshot with number plate of vehicle. User can select any number of zones in the video with time duration for which vehicle is allowed to stop.



11. **Crowd Detection:** - Crowd Detection video analytics is the direction ins Instead of learning a set of collective motion patterns which are geared towards constraining the likely motions of individuals from a specific testing scene, we have demonstrated that there are several advantages to searching for similar behaviours amongst crowd motion patterns in other videos. Our experiments show that by leveraging a large database of previously observed crowd behaviour patterns we are able to accurately track individuals in a crowd exhibiting both typical and rare behaviours.



12. **Illegal Encroachment:- Detection of Encroachment** is the **illegal** intrusion into a property with or without obstruction
13. **Deep learning based ANPR:** - Automatic Number Plates Recognize system is authorial product of HFCL. The system was built basing on automatic intelligent detection, motion analysis and recognition servers which send the information about recognized numbers of vehicles to the central server.



14. **Garbage Detection:-** Detection of heaps of unwanted garbage in specific areas.
15. **Face Detection:** - The M3S system recognizes faces are based on Principal Component Analysis (PCA) and the Fisher's Linear Discriminant Analysis (LDA). The PCA method on its own does not give good results in recognitions. This is primarily because the system is based on global statistics data, which does not efficiently differentiate faces of individuals that are captured in different lighting conditions and attitudes.

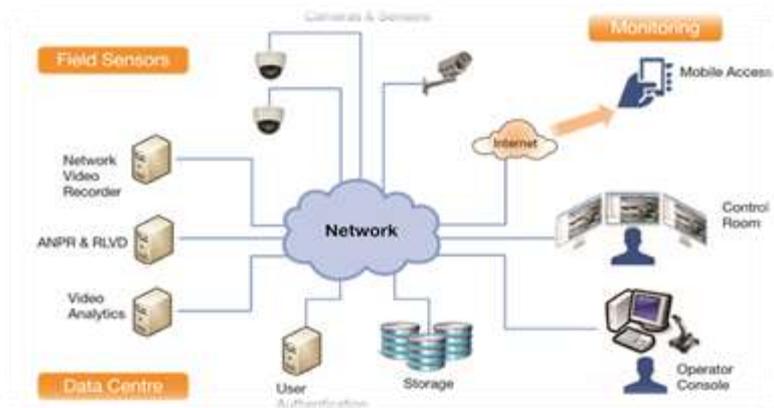


16. **Graffiti and Vandalism Detection:** - Detection of unwanted graffiti on walls. Detection of destruction caused by vandals in a specified area.

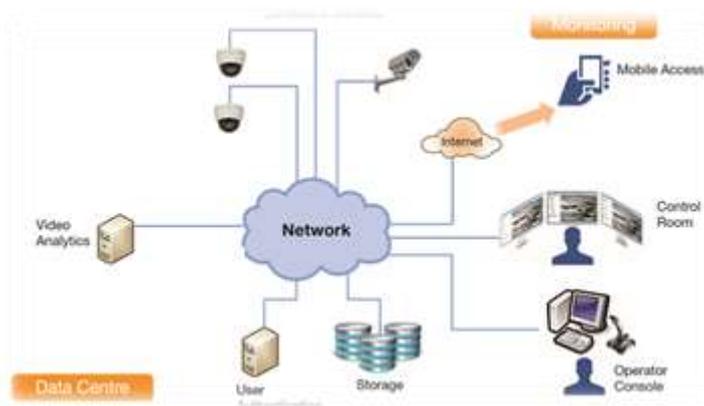
## INTEGRATION AND FLEXIBILITY

The HFCL M3S+ video analytics has been not been tuned for any particular make and model of camera and its simply works on the ONVIF.

**With VMS:** HFCL video analytics is integrates and integrates and works with various niche and third party systems to deliver a unified user experience, thanks to its flexible and open architecture design



**Without VMS:** - The HFCL video analytics can be work independent of VMS it's a stand-alone application it's taken the video store directly from the camera and send the alarm to control room the ones alarm management client software and work for view/ search/ reporting & analysis of alarms.



## M3S+ HIGHLIGHTS AND USPS

- ◆ Single Platform for solution of VMS, VA, Artificial Intelligence analytics.
- ◆ Easy licensing Policy- Single license for major overall application
- ◆ M3S+ has flexibility to use Rule based Analytics in different camera. It means if some analytics are ruled for one camera, we can use same analytics license for another camera after disabling first camera for analytics.
- ◆ Feature Rich Client Application & User GUI Unrivalled Scalability.
- ◆ Open platform architecture supports Access Control, PIDS systems, Intruder Alarms, Baggage handling systems and other integrations from a wide variety of 3rd party partners.
- ◆ Dedicated Team to support Indian Market and expanding.