

# MagicBox HD: high definition video analytics server

## 1. Product overview

### 1.1 Introduction

MagicBox HD is a high performance, temperature hardened, ONVIF compliant, video analytics server for mission critical customers in Defense, Transportation and Energy Infrastructure.

MagicBox HD delivers accurate analytics metadata for IP or analogue video to ONVIF network video clients (NVC) such as video management system (VMS) or network video recorder (NVR). MagicBox HD also provides a local storage for video, audio and metadata.

MagicBox HD features SSD local storage, dual Gigabit Ethernet network connection, optional analogue video inputs, digital I/O interfaces, GPS, WI-FI and WI-MAX modules.



### 1.2 Embedded video analytics

MagicBox HD is video analytics machine enabling robust object detection in an outdoor environment, rule-driven event recognition and advanced tracking features such as multiple camera tracking, real-time map positing and PTZ camera targeting.

MagicBox is i-LIDS<sup>®</sup> approved primary detection system both for operational alert use and event recording in sterile zone monitoring applications. i-LIDS<sup>®</sup>, the Image library for intelligent detection systems, is the UK government's benchmark for video analytics systems.

MagicBox video analytics is optimized to run in the embedded system at the native resolution and frame rates to ensure maximum accuracy. This concept of embedded analytics ensures scalability and avoids bottlenecks in large networks.

### 1.3 Native ONVIF support

The video analytics server is based on ONVIF, the global standard for the interface of IP-based physical security products. The ONVIF specification ensures interoperability between MagicBox HD and video management systems (VMS), network video recorders (NVRs) and other third-party products.



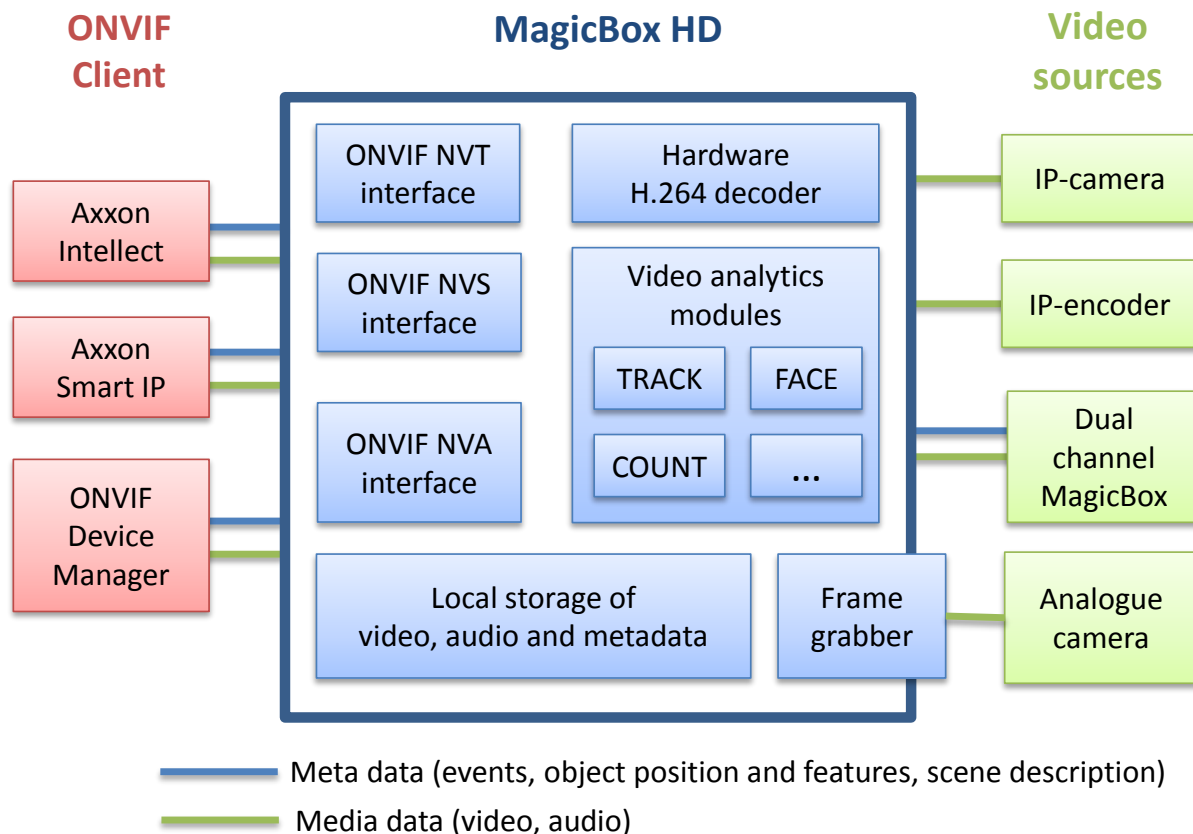
MagicBox HD implements interfaces of the following ONVIF device types: NVT (Network Video Transmitter), NVS (Network Video Storage), NVA (Network Video Analytics); and ONVIF services: Device IO, Media, Receiver, Video Analytics, Video Analytics Device, Recording Control, Recording Search, Replay Control, Remote Discovery and Action Trigger.

Such a rich feature set based on the well-established standard enables vendors and system integrators to quickly develop custom video analytics solutions in a distributed

multiple server environment. Unlike most video analytics products, MagicBox HD is natively based on ONVIF and use no other proprietary protocol for its advanced functionality.

### 1.4 Open source ONVIF Device Manager and ONVIF NVC Library

ONVIF Network Video Client (NVC) Library implements the protocol to manage video analytics devices such as MagicBox HD. Based on the library, ONVIF Device Manager is a Windows application providing the graphic user interface (GUI). Both the application and library are developed by Synesis and released to the public domain under GNU GPL. This free software is written in C# and F# are useful to implement GUI in third-party products.



### 1.5 Customization options

The MagicBox HD customization options include a custom product brand and user interface, custom event scripts and video analytics modules accessible through the open API.

## 2 Specifications

### 2.1 Embedded software

Max number of channels	16 4CIF/D1 channels or 8 HD 720p channels or 4 HD 1080p channels
Supported video sources	1. RTP/RTSP video stream (UDP, TCP, HTTP transport) from IP camera or IP encoder 2. Local file in AVI, MKV, MP4, MOV, TS, VOB containers (for testing and demonstration purposes)

	<p>3. Analogue video PAL/NTSC</p> <p>4. ONVIF NVT version 1.02 or above</p>
Data and control protocol	<p>ONVIF Core Specification 1.02 (NVT device type only)</p> <p>ONVIF Core Specification 2.2 (all device types)</p>
Implemented device interfaces	<p>NVT (Network Video Transmitter)</p> <p>NVS (Network Video Storage)</p> <p>NVA (Network Video Analytics)</p>
Implemented services	<p>Device IO</p> <p>Media</p> <p>Receiver</p> <p>Video Analytics</p> <p>Video Analytics Device</p> <p>Recording Control</p> <p>Recording Search</p> <p>Replay Control</p> <p>Remote Discovery</p> <p>Action Trigger</p>
Pre-installed software	<p>Embedded Linux</p> <p>MBS-CORE Video server core</p> <p>MBS-TRACK-16 Objection detection and tracking video analytics (VCA-SCT)</p>
Optional software	<p>MBS-STORE Local storage (NVR interface)</p> <p>MBS-SEARCH Event search (NVR interface)</p> <p>MBS-XTRACK-16 Multiple camera tracking analytics</p> <p>MBS-AUTOPTZ Automatic PTZ targeting module</p> <p>MBS-CUSTOM Customization module</p> <p>MBS-FACE Face detection and tracking</p> <p>MBS-MATCH Object classification and matching</p> <p>MBS-LPR License plate recognition</p> <p>MBS-COUNT People counting and queue detection</p>
Management software	<p>ONVIF Device Manager for Windows 7 / Vista / XP</p>
Firmware update	<p>Batch firmware update using ONVIF Device Manager or via ONVIF 2.x</p>

## 2.2 Hardware and operating environment

Network	<p>2 x 10/100/1000 Ethernet ports</p>
Power	<p>10-28V DC</p> <p>220V AC adapter included</p> <p>80W without heater</p> <p>180W with heater</p>
Hardware options	<p>Onboard HDD/SSD storage</p>

	GPS board WiFi board WiMax board PAL/NTSC video capture board with H.264 MP hardware compression (up to 16 channels) Digital I/O board (4 inputs, 4 outputs) RS485 interface board
Operating temperature range	- 40° ... +50° C
Storage temperature range	- 50° ... +70° C

## 2.3 ONVIF event specification

### 2.3.1 Device monitoring

Device/HardwareFailure/TemperatureCritical  
 Device/HardwareFailure/PowerSupplyFailure  
 Monitoring/BatteryCapacity  
 Monitoring/EnvironmentalConditions  
 Monitoring/CPUUsage  
 Monitoring/DSPUsage  
 Monitoring/MemoryUsage  
 Monitoring/NetworkUsage  
 Monitoring/NumberOfConnections  
 Device/OperationMode/UploadInitiated/Update  
 Device/ShutdownInitiated/Reboot  
 Device/OperationMode/UploadInitiated/Restore  
 Device/FactoryDefault  
 Device/NetworkInterfaceChanging  
 Device/NameChanged

### 2.3.2 Digital inputs (dry contacts) and outputs (relays)

Device/DigitalInput  
 Device/Trigger/Relay  
 Device/SerialInput

### 2.3.3 Tampering events

Based on 10773r04ONVIF\_WG-ENH-BasicSetOfEvents\_supplemented.doc  
 VideoSource/SignalLoss  
 VideoSource/SignalTooNoisy  
 VideoSource/SignalTooDark  
 VideoSource/SignalTooBright  
 VideoSource/SignalTooBlurry  
 VideoSource/CameraRedirected  
 VideoSource/CameraObstructed  
 VideoSource/GlobalSceneChange

### 2.3.4 Object detector, tracker and feature estimator

VideoSource/Motion with the following Data:

- objectid – object id
- point – object center position

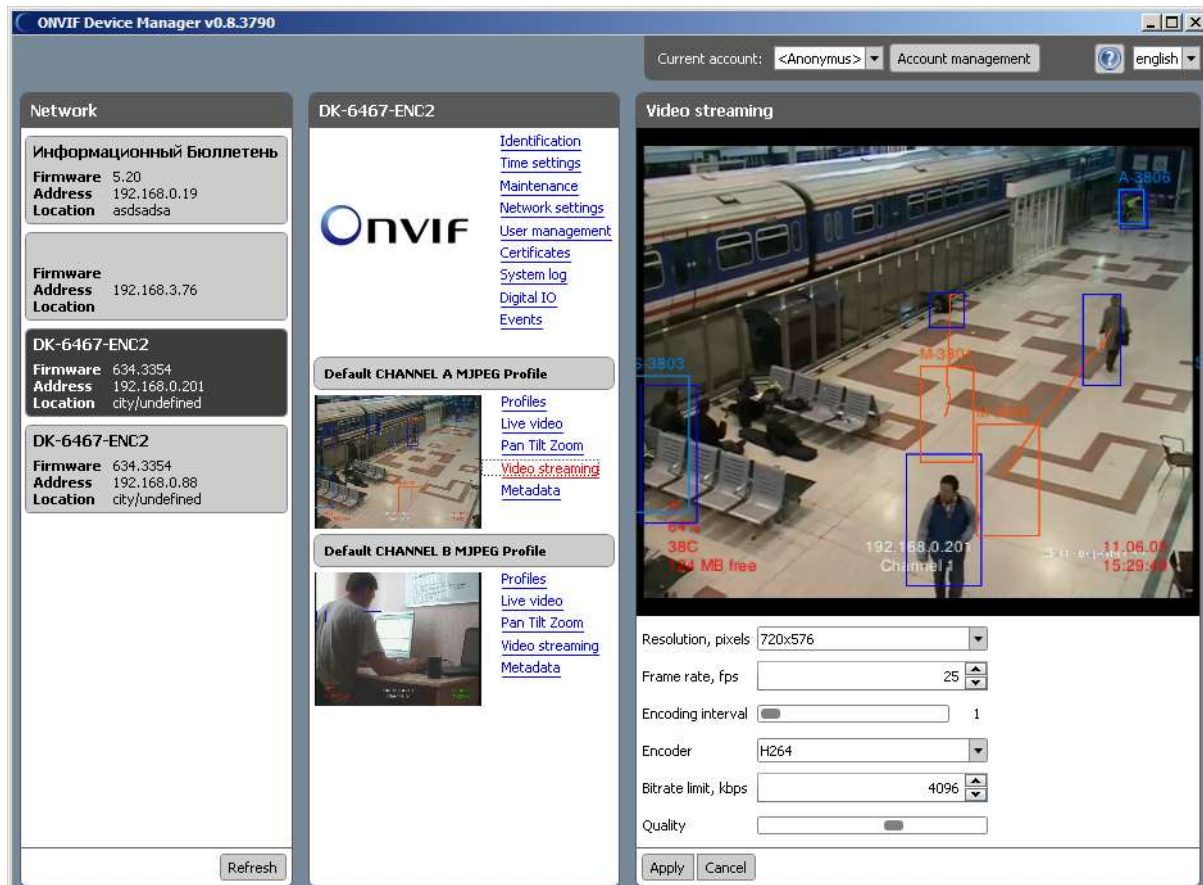
confidence – detector accuracy  
zoneid – zone id

### 2.3.5 Rule-based video analytics events

- VideoSource/MotionAlarm
- VideoSource/StopAlarm
- VideoSource/SpeedAlarm
- VideoSource/TripwareAlarm
- VideoSource/AbandonedItemAlarm
- VideoSource/MeetingAlarm

## 2.4 Management software

Application name	ONVIF Device Manager
Operating environment	.NET 4.0/Mono
Installers	Windows XP SP3 / Vista / 7
Source code	C#, F#, C++ <a href="https://sourceforge.net/projects/onvifdm/">https://sourceforge.net/projects/onvifdm/</a>



ONVIF Device Manager User Interface