



White paper

Ocularis 5 Device Drivers

Prepared by:

Dan Berg, Sr. Sales Engineer, On-Net Surveillance Systems, Inc.

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OnSSI Support of IP Cameras and Encoders

Ocularis 5 uses several methods to support a large and growing number of camera and encoder models from most camera manufacturers. The Supported Devices list on the OnSSI website is updated continuously and offers a list of cameras and encoders that have been tested and certified to work with Ocularis 5. Additional information is provided on the website indicating tested firmware versions, which type of driver is used, and supported device features such as multi-streaming support, I/O and analytic functions.

To receive news and announcements about Ocularis camera drivers and other product news, please fill out the sign up form at <http://onssi.com/newsletter/>.

If you want to verify if a specific model that is not on our supported cameras list is supported, please contact us at (845) 732-7900, option 2.

Device License Requirements

Cameras and encoders are licensed in Ocularis by IP address. One device license is required per IP address used.

Examples:

- A multi-sensor or multi-stream camera that uses one IP address will only require a single device license – regardless of the number of video streams actually used.
- A 4 or 16 channel encoder using four IP addresses will require four licenses if all inputs are used.

Standalone input/output (I/O) modules and Axis audio-only devices do not require a license in Ocularis 5. However, Ocularis 5 PRO has a limitation of five I/O modules per server – Ocularis ENT and ULT do not have any limitations on the number of I/O modules used.

License requirements for supported devices are listed on the website.

Static Drivers

Many cameras and encoders are supported via static drivers specifically written to the device model. Many of these are flexible as they will work with a series of cameras that vary only in attributes such as camera type (box/minidome), mounting type, indoor vs. outdoor, lens type, etc. Camera specific drivers are available in the Ocularis Recorder via a drop down menu when adding the device. When using static drivers to add a camera to the Ocularis Recorder, it is not necessary that the camera be available on the network at the time of configuration.

Smart Drivers

Manufacturer-specific 'Smart Drivers' expand the range of model-specific static drivers. Instead of storing the device's information (codecs, resolutions, frame rates, etc.) statically, Ocularis queries the device for its capabilities using the manufacturers' proprietary protocol. Smart Drivers can be used with any camera or encoder model that meets the specifications in the table on pages 5-6. Configuring a device with a smart driver requires that the camera is available on the network at the time of configuration. Smart Drivers eliminate the need to wait for model-specific drivers or installation of driver packs and allow new cameras to be used immediately.

ONVIF Drivers

Generic ONVIF Drivers can be used for cameras that are not supported via static or smart drivers. The camera needs to support the vendor independent ONVIF standard.

The 'Generic ONVIF Driver (Simple)' can be used for basic compatibility as it doesn't set any parameters on the camera. It simply authorizes at the camera and performs RTSP streaming. PTZ control is supported using the 'Generic ONVIF Driver (Simple)' driver. (PTZ functionality must be manually activated in the camera properties window in the Ocularis Recorder.)

The 'Generic ONVIF Driver (Profile S Devices)' driver can be used for any camera which is ONVIF Profile-S compliant. In addition to the functionality of the 'Generic ONVIF Driver (Simple)' this driver also supports setting parameters and event triggers in the recorder software.

When using either ONVIF driver, the camera and server must be time synchronized in order to function properly.

Generic Video Driver (RTSP/Motion-JPEG)

The 'Generic Video Driver' is the simplest camera driver and is limited to video streaming using the Motion-JPEG or RTSP protocols only. However, incoming audio is now supported when using RTSP streaming. This driver requires entering the streaming URL manually in the configuration for the device. The streaming URL can be requested directly from each camera manufacturer or can often be discovered using a media player such as VLC. It is recommended to test the RTSP/Motion-JPEG compatibility with VLC Media Player first.

FAQ for vendor specific smart/generic drivers

- **Q:** What is the difference between a Smart Driver and a static driver?
A: For static drivers, information about each device is stored in Ocularis (codecs, resolutions, frame rates, digital I/Os, etc.). The Smart Driver uses the same protocol as the static driver, but queries the camera for its capabilities and offers it to the administrator.

- **Q:** Is my camera supported by a Smart Driver?
A: If your camera meets the requirements described in the table on pages 5-10 it can be used with the Smart Driver. The compatibility should be tested before productive use. OnSSI is continuously testing and certifying new camera models for the Smart and ONVIF drivers.

- **Q:** Which manufacturers' cameras are supported via Smart Drivers?
A: In the current 5.3 release (which includes the R9 Recorder), Smart Drivers are available for: ALLNET, Arecont Vision, Axis, Bosch, Canon, FLIR, Hanwha (Samsung), Hikvision, Interlogix, Northern, Sony and W Box

- **Q:** How can I see that a camera was queried correctly?
A: Once you can see the correct model name and firmware version of the device in the configuration screen, the device is correctly queried and can be configured.

- **Q:** Once the capabilities of a camera are queried, will the information be updated?
A: The device will be queried again if the firmware version of the device was upgraded or you entered a different IP address in order to connect to a different device. You can also query again manually by clicking 'Query device'. This may be necessary if some functionality on the device has changed. For example, on some devices a digital input can be changed to a digital output.

- **Q:** Will firmware versions different from the specified ones work as well?
A: Firmware versions older than the specified ones may work with restrictions. There is no guarantee that firmware versions newer than the specified ones will work. Adjustments to the driver may be necessary. It is recommended to use the firmware versions specified in the table below.

- **Q:** Can I fully pre-configure an Ocularis system in the lab before installation on-site?
A: Yes, when using static drivers. When using Smart or ONVIF drivers, you should have a sample for each camera model used on-site for pre-configuration. If a device isn't reachable only limited configuration is possible.
 - Connect the cameras to the network
 - Create each camera type once using the Ocularis Recorder Manager
→ Ocularis reads the cameras capabilities (resolutions, frame rates, I/Os, etc...)
 - Copy each camera as many times as needed
 - Example: On-site the following cameras are used:
 - 5 x Axis Q6035 → You need one sample in the lab
 - 10x Axis P3367 → You need one sample in the lab
 - 20x Sony SNC-EM600 → You need one sample in the lab

	ALLNET	Arecont Vision	Axis	Bosch	Canon	FLIR
Ocularis Recorder Version	R8 or higher	R7 or higher	R5 or higher	R9 or higher	R6 or higher	R7 or higher
Protocol	Native ALLNET Protocol	Native Arecont Vision Protocol	VAPIX Version 3	Native RCP+	ONVIF Profile-S	Onvif Profile-S
Camera Generation/Series	ALL-Cam23xx Series	Any	A/F/M/P/Q Series (H.264 Generation)	CPP4, CPP5, CPP6, CPP7 Platform	H.264 Generation: VB-H/VB-M/VB-S	F-Series, PT-Series, FCSeries S/R
Firmware Versions	Not specified	Not specified	5.x, 6.x, 1.x (A Series)	6.30 or higher	Not specified	Not specified
Video Codecs (max.)	2x MJPEG 2x H.264 2x total	8x MJPEG 8x H.264 8x total	3x MJPEG 3x H.264 6x total	1x MJPEG 2x H.264 3x total	1x MJPEG 2x H.264 3x total	2x MJPEG 2x H.264 2x total
Audio Codecs (listen)	G.711	G.711	G.711, G.726	G.711	G.711	No
Audio-Out (speak)	No	No	Yes	No	No	No
H.264 Streaming Profiles	Baseline, Main, High	Baseline	Baseline, Main, High	Main	Baseline	Not specified
Multi channel support***	No	Yes	Yes	Yes	No	Yes
Read capabilities	Yes	Yes	Yes	Yes	Yes	Yes
Set Streaming Parameters	Yes	Yes	Yes	Yes	Yes	Yes
PTZ: continuous	Yes	No	Yes	Yes	Yes	Yes
PTZ: ClickToCenter	Yes	No	Yes	Yes	No	No
PTZ: Area Zoom	No	No	Yes	Yes	No	No
360 De-warping	n/a	Client-side	Client-side	Client-side	n/a	n/a
VMD Trigger	Yes	Yes	Yes	Yes	Yes	Yes
Analytics Trigger	Yes	No	No	Yes	No	No
Tampering Trigger	Yes	No	Yes	Yes	Yes	No
VideoLoss Trigger	No	No	Yes	Yes	No	No

	ALLNET	Arecont Vision	Axis	Bosch	Canon	FLIR
Dynamic Event Triggers****	Yes	No	Yes	Yes	Yes (max 1)	Yes (max 1)
HTTPS	Yes	No	Yes	Yes	Yes	Not specified
Digital Inputs	Yes	Yes	Yes	Yes	Yes (max 1)	Yes (max 1)
Digital Outputs	Yes	Yes	Yes	Yes	Yes	Not specified
Quad View (encoders)	No	No	Yes	No	No	No
ULT Edge Storage**	No	No	Yes	Yes	No	No
General Information / Restrictions		Older firmware versions may also work but with functional restrictions	Hidden resolutions that aren't available on the web frontend are not supported. ACAP triggers supported.		Motion Detection and 2nd H.264 stream has to be configured manually on the camera before query. 'Check Time on Authentication' needs to be disabled on the device	Digital Outputs are virtual Outputs that can be mapped to actions on the device

Any supported feature depends on the capabilities of the device

* For some cameras it is possible to set streaming parameters via commands in the streaming URL

** Edge Storage is only supported in Ocularis 5 Ultimate

*** The number of channels will be added automatically

****List of supported event triggers are queried from the device dynamically (e.g. analytics triggers)

	Hanwha (Samsung)	Hikvision	Interlogix	Northern	Sony	W Box
Ocularis Recorder Version	R5 or higher	R4 or higher	R8 or higher	R8 or higher	R5 or higher	R8 or higher
Protocol	Native Sunapi 2.0	Native ISAPI 2.2 / CGI	Native Protocol	Native Protocol	Native	Native Protocol
Camera Generation / Series	WiseNet	Not Specified	Not Specified	NTH-IP3 Series	Generation 6, 7	Any IP Camera
Firmware Versions	Not specified. FW needs to support Sunapi 2.0	5.3.5 or higher	Not Specified	5.3.5 or higher	Gen 6: 2.x Gen 7: not specified	5.3.x or higher
Video Codecs (max.)	2x MJPEG 3x H.264/H.265 3x total	2x MJPEG 2x H.264/H.265 2x total	2x MJPEG 2x H.264 2x total	2x MJPEG 2x H.264 2x total	3x MJPEG 3x H.264 3x total	2x MJPEG 2x H.264 2x total
Audio Codecs (listen)	G.711, G.726	G.711	G.711	G.711	G.711	G.711
Audio-Out (speak)	No	No	No	No	No	No
H.264 Streaming Profiles	Not Specified	Baseline, Main, High	Baseline, Main, High	Baseline, Main, High	Baseline, Main, High	Baseline, Main, High
Multi channel support***	No	Yes	Yes	No	No	No
Read capabilities	Yes	Yes	Yes	Yes	Yes	Yes
Set Streaming Parameters	Yes	Yes	Yes	Yes	Yes	Yes
PTZ: continuous	Yes	Yes	Yes	Yes	Yes	Yes
PTZ: ClickToCenter	Yes	Yes	Yes	Yes	Yes	Yes
PTZ: Area Zoom	No	No	No	No	No	No
360 De-warping	Client-side	No		No	No	No
VMD Trigger	Yes	Yes	Yes	Yes	Yes	Yes
Analytics Trigger	Yes	Yes	Yes	Yes	Yes	Yes
Tampering Trigger	No	Yes	Yes	Yes	Yes	Yes
VideoLoss Trigger	No	No	No	No	No	No

	Hanwha (Samsung)	Hikvision	Interlogix	Northern	Sony	W Box
Dynamic Event Triggers****	Yes	Yes	Yes	Yes	Yes	Yes
HTTPS	Yes	Yes	Yes	Yes	Yes	Yes
Digital Inputs	Yes	Yes	Yes	Yes	Yes	Yes
Digital Outputs	Yes	Yes	Yes	Yes	Yes	Yes
Quad View (encoders)	No	No	No	No	No	No
ULT Edge Storage**	Yes	No	No	No	No	No
General Information / Restrictions	Multi channel encoders: Each channel has its own IP address so they are handled as single channel devices	If a device has different capabilities (resolutions, fps, etc.) per channel only the capabilities of channel #1 are offered. Please set streaming parameters for channels >1 on the device manually				

Any supported feature depends on the capabilities of the device

* For some cameras it is possible to set streaming parameters via commands in the streaming URL

** Edge Storage is only supported in Ocularis 5 Ultimate

*** The number of channels will be added automatically

****List of supported event triggers are queried from the device dynamically (e.g. analytics triggers)

	ONVIF (Profile S devices)	ONVIF (Simple)	Generic Video (RTSP)	Generic Video (Motion-JPEG)
Ocularis Recorder Version	R2 or higher	R2 or higher	R2 or higher	R2 or higher
Protocol	Onvif Profile-S	Onvif	RTSP	Motion-JPEG
Camera Generation/Series	Not Specified	Not Specified	Not Specified	n/a
Firmware Versions	FW needs to meet Core Specification 2.2.1 and Profile S	FW needs to meet Core Specification 2.2.1	Not Specified	n/a
Video Codecs (max.)	10x MJPEG 10x H.264 10x total	2x MJPEG 2x H.264 2x total	4x MJPEG 4x H.264/H.265 4x total	4x MJPEG 4x total
Audio Codecs (listen)	G.711, G.726	Not Available	G.711, G.726	Not Available
H.264 Streaming Profiles	No	No	No	n/a
Multi channel support***	Baseline, Extended, Main, High	Not Specified	Not Specified	No
Read capabilities	Yes	No	No	No
Set Streaming Parameters	Yes	No	No	No*
PTZ: continuous	Yes	No	No*	No
PTZ: ClickToCenter	Yes	Yes	No	No
PTZ: Area Zoom	No	No	No	No
360 De-warping	Client-side	Client-side	Client-side	n/a
VMD Trigger	Yes (max 1)	No	No	No
Analytics Trigger	Yes (max 1)	No	No	No
Tampering Trigger	No	No	No	No
VideoLoss Trigger	No	No	No	No
Dynamic Event Triggers****	Yes (max 1)	No	No	No
HTTPS	Yes (max 1)	No	No	No
Digital Inputs	Yes (max 1)	No	No	No
Digital Outputs	Yes	No	No	No

	ONVIF (Profile S devices)	ONVIF (Simple)	Generic Video (RTSP)	Generic Video (Motion-JPEG)
Quad View (encoders)	No	No	No	No
ULT Edge Storage**	No	No	No	No
General Information / Restrictions	Instead of the motion detection trigger you can select different trigger types if supported by the camera (max 1).	Stream configuration has to be set directly on the camera. The stream from the camera cannot be chosen. It is assigned camera internally.	RTSP streaming URL has to be entered manually. Stream configuration (resolution, frame rate etc.) has to be set directly on the camera.	Motion-JPEG URL has to be entered manually. Stream configuration (resolution, frame rate etc.) has to be set directly on the camera.

How to use vendor-specific Smart Drivers

- Connect camera to the network
- Create new camera in configuration mode and select the Smart Driver of the manufacturer
- Ocularis queries the capabilities from the device and offers it for configuration. Until the capabilities are read you can only use the RTSP stream from the camera
- Once you see the model name and firmware version, the camera is ready for configuration
- If you use a PTZ camera, activate PTZ manually in the configuration

Known issues for vendor-specific Smart Drivers

- In certain cases the number of channels for multi-channel devices will not be read correctly. Workaround: delete device, add again.
- The Device Finder wizard for adding cameras does not fully support Smart Drivers.
- When adding a camera using a Smart Driver, it may take up to several minutes. Example: If a camera offers multiple capture modes it takes some time to set and query each capture mode one by one.
- If you add a multi-channel device, the number of channels will be added automatically. If you change the IP address to a device which has a lower number of channels the number of channels cannot be reduced. Workaround: delete device, add again.
- For each device that offers different video parameters (especially resolutions) for different video sources, only the parameters of source #1 can be used for any source (encoder quad view or virtual cameras of fisheye camera models may be affected).
- Converting static camera drivers into Smart Drivers may lead to loss of some information.
- For multi-streaming, the same stream from the camera can be selected twice for different streams in Ocularis. **Please make sure you use each stream only once.** Example: HikVision: Use 'H.264 Stream 1 (H.264)' for the first stream and use 'H.264 Stream 2 (H.264)' for the second stream or vice versa
- PTZ cameras added with a Smart Driver do not automatically allow for manual control of pan, tilt and zoom functions. The option for Control Camera must first be set to Yes in the Camera/General menu section, then manual control and other PTZ functions such as Camera Positions are available.
- PTZ cameras added with a Smart Driver do not show a PTZ camera icon in Ocularis Recorder Manager.