



White paper

Ocularis 5 Device Drivers

Prepared by:

Dan Berg, Sales Engineering Manager,
On-Net Surveillance Systems, Inc.

Date: February 1, 2019 v 5.7/R13

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 5-8. 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 most 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 5-8 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 5.7 release (which includes the R13 Recorder), Smart Drivers are available for: ALLNET, Arecont Vision, Axis, Bosch, Canon, Convision, Dahua, Eclipse, FLIR, Grundig, Hanwha (Samsung), Hikvision, Interlogix, Northern, Panasonic, Sony, THK Security, Vanderbilt, Vivotek 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 need to be manually 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. 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 Smart Driver	Arecont Vision Smart Driver	Axis Smart Driver	Bosch Smart Driver	Canon Smart Driver	Convison Smart Driver	
Protocol	Native Protocol	Native Protocol	Native VaPIX Version 3	Native RCP+	Onvif Profile-S	Native	
Camera Generation/Series	ALL-Cam23xx Series	Any MJPEG/H.264 Generation camera (except Contera)	A/D/F/M/P/Q Series (H.264/H.265 Generation)	CPP4, CPP5, CPP6, CPP7 Platform	H.264 Generation: VB-H/VB-M/VB-S	CC-7xxx Series Camera	
Firmware Versions	V5.3.0 or higher	Not Specified	5.x, 6.x, 7.x, 8.x, 1.x (A series)	6.30 or higher	Not specified	V5.3.5 or higher	
Authentication	User account	admin	admin	root	service	root	admin
	Basic/Digest	✓/✓	✓ / x	✓/✓	✓/✓	✓/✓	✓/✓
Video Streams	MJPEG	3	8	3	1	1	3
	H.264	3	8	3	2	2	3
	H.265	x	x	3	2	x	3
	Concurrent	3	8	6	3	2	3
H.264 Streaming Profiles	Baseline	✓	✓	✓	✓	✓	✓
	Main	✓	x	✓	x	x	✓
	High	✓	x	✓	x	x	✓
Transmission Modes (MJPEG/H.264/H.265)	UDP ¹⁾	✓/✓	x / ✓	x / ✓	✓/✓	✓/✓	✓/✓
	TCP ²⁾	✓/✓	x / ✓	x / ✓	✓/✓	✓/✓	✓/✓
	HTTP ³⁾	x / x	x / x	x / ✓	✓/✓	x / x	x / x
	Multicast ⁴⁾	x / x	x / ✓	x / ✓	✓/✓	x / x	x / x
MJPEG via HTTP_Serverpush	x	✓	✓	x	x	x	
Image Rotation	0°/180°	✓	✓	✓	✓	✓	✓
	90°/270°	x	✓	✓	✓	x	✓
Audio-In (listen)	✓	✓	✓	✓	✓	✓	
Audio-Out (speak)	✓	x	✓	✓	x	✓	
Multi Channel Support	✓	✓	✓	✓	x	x	
Read Device Capabilities	✓	✓	✓	✓	✓	✓	
Set Streaming Parameters	✓	✓	✓	✓	✓	✓	
PTZ Control	Continuous	✓	x	✓	✓	✓	✓
	ClickToCenter	✓	x	✓	✓	x	✓
	area Zoom	✓	x	✓	✓	x	✓
Event Triggers ⁵⁾	✓	✓	✓	✓	✓	✓	
HTTPS	✓	x	✓	✓	✓	✓	
Digital Inputs	✓	✓	✓	✓	✓ ⁶⁾	✓	
Digital Outputs	✓	✓	✓	✓	✓	✓	
Edge Storage	x	x	✓	✓	x	x	
General Information / Restrictions	90°/270° image rotation can be activated via web browser manually.	Event Triggers: Motion Detection only	ACAP event triggers supported incl. VMD3 & VMD4.		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.		

¹⁾ RTP_Over_UDP_Unicast | ²⁾ RTP_Over_RTSP_Over_TCP | ³⁾ RTP_Over_RTSP_Over_HTTP_unicast | ⁴⁾ RTP_Over_UDP_Multicast |
⁵⁾ A List of supported event triggers is queried from the device (incl. analytics triggers) | ⁶⁾ You can configure only one individual event trigger

For list of features supported by each specific camera model, visit the OnSSI Supported Devices List.

		Dahua Smart Driver	Eclipse Smart Driver	Flir Smart Driver	Grundig Smart Driver	Hanwha Techwin "Wisenet Smart Driver"	Hikvision Smart Driver
Protocol		Native	Onvif Profile-S	Onvif Profile-S	Native	Native Sunapi 2.0	Native ISAPI / CGI
Camera Generation/Series		Camera Generation Not Specified	Not Specified	F-Series, PT-Series, FC Series	Not Specified	WiseNet Devices	Not Specified
Firmware Versions		Not specified	Not specified	Not specified	V1.0.0 or higher	Not specified	5.3.5 or higher
Authentication	User account	admin	admin	admin	admin	admin	admin
	Basic/Digest	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓
Video Streams	MJPEG	3	3	2	2	2	3
	H.264	3	3	2	2	3	3
	H.265	3	3	x	x	3	3
	Concurrent	3	3	2	2	3	3
H.264 Streaming Profiles	Baseline	✓	✓	x	✓	✓	✓
	Main	✓	✓	x	✓	✓	✓
	High	✓	✓	x	✓	✓	✓
Transmission Modes (MJPEG/H.264/H.265)	UDP ¹⁾	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓
	TCP ²⁾	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓
	HTTP ³⁾	x / x	x / x	x / x	x / x	x / x	x / x
	Multicast ⁴⁾	✓ / ✓	✓ / ✓	x / x	x / x	x / x	x / x
MJPEG via HTTP_Serverpush		x	x	x	x	x	x
Image Rotation	0°/180°	✓	✓	✓	✓	✓	✓
	90°/270°	✓	✓	x	✓	✓	x
Audio-In (listen)		✓	✓	x	✓	✓	✓
Audio-Out (speak)		✓	x	x	✓	✓	✓
Multi Channel Support		x	✓	✓	x	✓	✓
Read Device Capabilities		✓	✓	✓	✓	✓	✓
Set Streaming Parameters		✓	✓	✓	✓	✓	✓
	Continuous	✓	✓	✓	✓	✓	✓
PTZ Control	ClickToCenter	✓	x	x	✓	✓	✓
	Area Zoom	✓	x	x	✓	✓	✓
Event Triggers ⁵⁾		✓	✓	✓	✓	✓	✓
HTTPS		✓	✓	✓	✓	✓	✓
Digital Inputs		✓	✓ ⁶⁾	✓ ⁶⁾	✓	✓	✓
Digital Outputs		✓	✓	✓	✓	✓	✓
Edge Storage		x	x	x	x	✓	x
General Information / Restrictions				Digital Outputs are virtual Outputs that can be mapped to actions on the device.	90°/270° image rotation can be activated via webbrowser manually.	Edge storage not supported for multi 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. 90°/270° image rotation can be activated via webbrowser manually.

¹⁾RTP_Over_UDP_Unicast | ²⁾RTP_Over_RTSP_Over_TCP | ³⁾RTP_Over_RTSP_Over_HTTP_unicast | ⁴⁾RTP_Over_UDP_Multicast |

⁵⁾A List of supported event triggers is queried from the device (incl. analytics triggers) | ⁶⁾You can configure only one individual event trigger |

	Interlogix Smart Driver	Northern Smart Driver	Panasonic Smart Driver	Sony		TKH Security Solutions Smart Driver	
				Generation 6/7	Generation X		
Protocol	Native Protocol	Native Protocol	Native CGI	Native	Native	Native	
Camera Generation/Series	Not Specified	NTH-IP3 Series	H.264, H.265 Generation Cameras	Generation 6, 7	Generation X	10xx/11xx Series	
Firmware Versions	Not Specified	5.3.5 or higher	Not Specified	Gen 6: 2.x - 3.x Gen7: 1.x	6.40 or higher	V1.0.0 or higher	
Authentication	User account	admin	admin	<administrative user>	admin	service	admin
	Basic/Digest	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓
Video Streams	MJPEG	3	3	1	2	1	3
	H.264	3	3	2	2	2	3
	H.265	3	x	2	x	2	3
	Concurrent	3	3	3	2	3	3
H.264 Streaming Profiles	Baseline	✓	✓	✓	✓	✓	✓
	Main	✓	✓	✓	✓	x	✓
	High	✓	✓	✓	✓	x	✓
Transmission Modes (MJPEG/H.264/H.265)	UDP ¹⁾	✓ / ✓	✓ / ✓	x / ✓	x / ✓	✓ / ✓	✓ / ✓
	TCP ²⁾	✓ / ✓	✓ / ✓	x / ✓	x / ✓	✓ / ✓	✓ / ✓
	HTTP ³⁾	x / x	x / x	x / x	x / x	✓ / ✓	x / x
	Multicast ⁴⁾	x / x	x / x	x / x	x / ✓	✓ / ✓	x / x
MJPEG via HTTP_Serverpush	x	x	✓	✓	x	x	
Image Rotation	0°/180°	✓	✓	✓	✓	✓	✓
	90°/270°	x	x	✓	x	✓	✓
Audio-In (listen)	✓	✓	✓	✓	✓	✓	
Audio-Out (speak)	✓	✓	x	✓	✓	✓	
Multi Channel Support	✓	x	✓	x	✓	x	
Read Device Capabilities	✓	✓	✓	✓	✓	✓	
Set Streaming Parameters	✓	✓	✓	✓	✓	✓	
PTZ Control	Continuous	✓	✓	✓	✓	✓	✓
	ClickToCenter	✓	✓	✓	✓	✓	✓
	Area Zoom	✓	✓	✓	✓	✓	✓
Event Triggers ⁵⁾	✓	✓	✓	✓	✓	✓	
HTTPS	✓	✓	✓	✓	✓	✓	
Digital Inputs	✓	✓	✓	✓	✓	✓	
Digital Outputs	✓	✓	✓	✓	✓	✓	
Edge Storage	✓	✓	✓	✓	✓	✓	
General Information / Restrictions	90°/270° image rotation can be activated via web browser manually.	90°/270° image rotation can be activated via web browser manually.	Event Triggers: On older firmware versions VMD only.	Multicast transmission mode only available for Gen. 7 devices		90°/270° image rotation can be activated via web browser manually.	

¹⁾RTP_Over_UDP_Unicast | ²⁾RTP_Over_RTSP_Over_TCP | ³⁾RTP_Over_RTSP_Over_HTTP_unicast | ⁴⁾RTP_Over_UDP_Multicast |
⁵⁾A List of supported event triggers is queried from the device (incl. analytics triggers) | ⁶⁾You can configure only one individual event trigger |

		Uniview Smart Driver	Vanderbilt Smart Driver	Vivotek Smart Driver	W Box Smart Driver
Protocol		Onvif Profile-S	Native	Native WebAPI	Native Protocol
Camera Generation/Series		Not Specified	Eventys Series	H.265, late H.264 Generation	Camera Generation Not Specified
Firmware Versions		Not specified	Not specified	Not specified	5.3.x or higher
Authentication	User account	admin	admin	root	admin
	Basic/Digest	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓
Video Streams	MJPEG	3	3	4	3
	H.264	3	3	4	3
	H.265	3	3	4	x
	Concurrent	3	3	4	3
H.264 Streaming Profiles	Baseline	✓	✓	✓	✓
	Main	✓	✓	✓	✓
	High	✓	✓	✓	✓
Transmission Modes (MJPEG/H.264/H.265)	UDP ¹⁾	✓ / ✓	✓ / ✓	x / ✓	✓ / ✓
	TCP ²⁾	✓ / ✓	✓ / ✓	x / ✓	✓ / ✓
	HTTP ³⁾	x / x	x / x	x / ✓	x / x
	Multicast ⁴⁾	✓ / ✓	x / x	x / x	x / x
MJPEG via HTTP_Serverpush		x	x	✓	x
Image Rotation	0°/180°	✓	✓	✓	✓
	90°/270°	✓	x	✓	x
Audio-In (listen)		✓	✓	✓	✓
Audio-Out (speak)		x	✓	✓	✓
Multi Channel Support		✓	✓	✓	x
Read Device Capabilities		✓	✓	✓	✓
Set Streaming Parameters		✓	✓	✓	✓
Continuous		✓	✓	✓	✓
PTZ Control	ClickToCenter	x	✓	✓	✓
	Area Zoom	x	✓	✓	✓
Event Triggers ⁵⁾		✓	✓	✓	✓
HTTPS		✓	✓	✓	✓
Digital Inputs		✓	✓	✓	✓
Digital Outputs		✓ ⁶⁾	✓	✓	✓
Edge Storage		✓	✓	✓	✓
General Information / Restrictions		90°/270° image rotation can be activated via web browser manually.	90°/270° image rotation can be activated via web browser manually.		90°/270° image rotation can be activated via web browser manually.

¹⁾ RTP_Over_UDP_Unicast | ²⁾ RTP_Over_RTSP_Over_TCP | ³⁾ RTP_Over_RTSP_Over_HTTP_unicast | ⁴⁾ RTP_Over_UDP_Multicast | ⁵⁾ A List of supported event triggers is queried from the device (incl. analytics triggers) | ⁶⁾ You can configure only one individual event trigger

		ONVIF Profile-S Driver	ONVIF Simple Driver (Legacy)	Generic Video Driver (RTSP)	Generic Video Driver (Motion-JPEG)
Protocol		Onvif Profile-S	Onvif	RTSP	Motion-JPEG
Camera Generation/Series		Not Specified	Not Specified	Not Specified	Not Specified
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	Not Specified
Authentication	User account	"<administrative Onvif user>"	"<administrative Onvif user>"	<any>	<any>
	Basic/Digest	✓ / ✓	✓ / x	✓ / ✓	✓ / ✓
Video Streams	MJPEG	10	2	4	4
	H.264	10	2	4	x
	H.265	10	x	4	x
	Concurrent	10	2	4	4
H.264 Streaming Profiles	Baseline	✓	✓	✓	x
	Main	✓	✓	✓	x
	High	✓	✓	✓	x
Transmission Modes (MJPEG/H.264/H.265)	UDP ¹⁾	✓ / ✓	✓ / ✓	✓ / ✓	x / x
	TCP ²⁾	✓ / ✓	✓ / ✓	✓ / ✓	x / x
	HTTP ³⁾	✓ / ✓	x / x	✓ / ✓	x / x
	Multicast ⁴⁾	✓ / ✓	x / x	x / x	x / x
MJPEG via HTTP_Serverpush		x	x	x	✓
Image Rotation	0°/180°	✓	✓	✓	✓
	90°/270°	✓	x	x	x
Audio-In (listen)		✓	x	✓	x
Audio-Out (speak)		x	x	x	x
Multi Channel Support		✓	x	x	x
Read Device Capabilities		✓	x	x	x
Set Streaming Parameters		✓	x	x	x
Continuous		✓	✓	x	x
PTZ Control	ClickToCenter	x	x	x	x
	Area Zoom	x	x	x	x
Event Triggers ⁵⁾		✓	✓	x	x
HTTPS		✓	x	x	x
Digital Inputs		✓	x	x	x
Digital Outputs		✓ ⁶⁾	x	x	x
Edge Storage		x	x	x	x
General Information / Restrictions			Stream configuration has to be set directly on the camera. The stream from the camera cannot be chosen. It is assigned by camera internally. Please use the Onvif Profile-S Driver preferred	RTSP streaming URL has to be entered manually. Stream configuration (resolution, frame rate etc.) has to be set directly on the device. Some devices allow setting the streaming parameters in the streaming URL	Motion-JPEG URL has to be entered manually. Stream configuration (resolution, frame rate etc.) has to be set directly on the camera

¹⁾ RTP_Over_UDP_Unicast | ²⁾ RTP_Over_RTSP_Over_TCP | ³⁾ RTP_Over_RTSP_Over_HTTP_unicast | ⁴⁾ RTP_Over_UDP_Multicast | ⁵⁾ A List of supported event triggers is queried from the device (incl. analytics triggers) | ⁶⁾ You can configure only one individual event trigger

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. In this case, OnSSI recommends adding cameras by importing a camera list in csv format.
- 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.