LENEL
A UTC Fire & Security Company
OpenAccess ALLIANCE PROGRAM

Camera Integration Guide

PERPETUAL INNOVATION

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Table of Contents

1 OpenVideo Process

The OpenVideo Tool Kit process allows video product manufacturers to integrate their IP camera or video server (encoder) product into Lenel OnGuard through the application of the Lenel OpenVideo Tool Kit. Depending on each manufacturer's engineering resources and time, OpenVideo Process has a high potential for a speedy integration of video product into Lenel OnGuard.

1.1 Process Overview

1. The 3rd party organization must first be partner in the OAAP program. Please visit our website at www.lenel.com for more information. (Or, for a direct link to the OAAP site, go to http://lenel.com/utcfs/Templates/Pages/Template-54/0,8063,pageId%3D2800%26siteId%3D464,00.html.

2. Submit a Video Product Specification to Lenel at oaap@lenel.com to request authorization to integrate into OnGuard Video Manager.

3. Lenel authorizes OpenVideo integration and sets up a design integration meeting between Lenel and 3rd party manufacturer to determine integration strategy

4. OpenVideo Tool Kit is provided to you (manufacturer).

5. Manufacturer completes the integration.

6. Manufacturer requests Video Product Certification though Lenel OAAP department (oaap@lenel.com) (Two no-cost product samples are required for this evaluation.) These samples will be kept indefinitely by Lenel and used to complete Quality Assurance Certification and for upstream troubleshooting, re-certification of new firmware or customer calls to Lenel Technical Support.

7. QA Certification is completed by Lenel and a public announcement is authored and sent to all Lenel VARs (Value Added Resellers). (Quality certification must be completed to Lenel standards before the video product is announced to Lenel VARs.)

8. XML (required software/firmware) is provided to the Lenel Marketing Communications Web Master for posting to the Lenel web site.

1.2 Initial Qualification

All video products must meet a set of minimum standards for acceptance by Lenel Product Management and OAAP program Director. (See: Technical Requirements.)

1.3 Cost for Engineering Support

Lenel reserves the right to charge the camera manufacturer or requesting implementation party for some or all implementation support cost related to OpenVideo involving type two or type three cameras (see Technical Requirements) or for other circumstances that Lenel deems as extended engineering support.

Lenel engineering support is limited to 4 hours per certification (up to 5 cameras per certification). These hours are tracked by our engineering support team. If more support hours are needed to complete the integration, please contact the OAAP program director.

1.4 Quality Assurance Certification

Some notes about certification:

- Camera manufacture is to provide Lenel with two (2) samples of each model of camera to be certified. QA certification is by model, not by underlying camera firmware.
- If samples are not provided, certification will not be scheduled.
- Arranging for new firmware certification is the responsibility of the video product manufacturer.
- Re-certification of the same camera for new firmware is a chargeable at a rate of $200 per model of camera or video server, per Lenel OnGuard version.
- Contact OAAP program director to schedule a time for initial certification or re-certification. Max of five (5) cameras to one OnGuard version per certification. This is due to the nature of the certification. Each test consumes about five (5) business days to test the cameras. Up to five (5) cameras can be supported in this fashion. Additional testing of cameras or OnGuard versions will require more testing time and will need to be scheduled with the program director.
- If during the certification process, a problem is encountered with the XML, the certifying manufacturer may attempt an immediate fix. If the fix requires time, a new appointment will need to be arranged through the OAAP program director and some cost may be associated for the lost QA time.
- Quality Assurance schedules are managed by the QA department and are subject to change with Lenel Development schedules.

1.5 Technical Support

1. Before product implementation begins, Lenel requires the contact information for the manufacturer technical support engineer. Send the name, email address and phone number of the manufacturer technical support engineer to product management. This individual will be asked to respond quickly to technical questions from Lenel Quality Assurance or Lenel Technical Support (TSG).
2. Technical Support is ultimately the responsibility of the certifying manufacturer. However, in an effort to support the Lenel VAR, the first line of Technical Support may, at the discretion of Lenel, be provided by Lenel TSG.
3. The manufacturer should be prepared to respond and assist Lenel TSG within a maximum twelve business hours from the time the question was sent to the manufacturer technical contact. Responses may either be by telephone or email to Lenel Technical Support.
4. To allow for mutual support of the integrated video product, Lenel needs each video product manufacturer to notify Lenel when new firmware versions are implemented in their video products or if new technical problems are encountered. Lenel commits to notifying video product vendor of technical issues discovered by Lenel QA or TSG.
5. Once a camera has been certified by Lenel, the camera manufacture must confirm to Lenel's release support structure. This is identified as a three (3) year period from date of

the OnGuard release. For example, if Lenel OnGuard version X was released on Jan 1, 2008, Lenel TSG will continue to support OnGuard version X until Jan 1, 2011. Therefore, if a camera is certified with OnGuard version X, the camera manufacturer must be able to provide support until Jan 1, 2011. After end of support, video products may be used by end users at their own risk but Lenel will no longer support the product

1.6 End of Life or Removal from Active Listing

End of life and end of support from Lenel will follow the camera/video product manufacturer process and timelines.

1. Upon the announcement of End of Life (EOL) by the product manufacturer, a camera or video product shall be transferred to an end of life list which shall be posted on the Lenel web site but during the EOL period, Lenel Technical Support shall continue. Opportunities for re-certification no longer exist after end of life is announced by the camera/video product manufacturer.

Lenel reserves the right to remove for cause any video product from their OnGuard Video portfolio at any time.

1.7 After The Video Product Is Implemented

Lenel OAAP program director will notify the video products manufacturer of completed implementation as soon as the video product has passed QA certification. Manufacturers are welcome and encouraged to come to Lenel and be present during the certification.

1.8 VAR Notification

A VAR notification letter will be authored by Lenel Product Management and OAAP program director and disseminated to all Lenel VARs. The VAR notice will provide all necessary details to integrate the video product into OnGuard. Lenel product management will update the list of supported video products and provide that list to Lenel Marketing Communication for posting to the Lenel web site along with the required XML files that are needed for the VAR to use the new video product. Unsupported limits on any video product will be included into the VAR notification and Lenel release notes for OnGuard. The manufacturers will also be notified of any limitations at the time of release or before.

Please *telephone* the OAAP program director if you have process questions.

Note: Video product is a generic term to include cameras, joystick-controllers etc.

2 Technical Requirements

2.1 Minimum Standard Requirements for Camera Manufacturers

Camera manufacturers must comply with all Basic Integration Minimums in order to pass camera certification. Cameras that are sent for certification that do not meet the Basic Integration Minimums will fail OpenVideo-Capture: Standard certification.

2.2 Camera and Video Server (Encoder-Decoder) Complexity Levels

Definitions of product levels:

- Level I - The camera streams video and gets other features from OnGuard to the camera via HTTP or RTP /RTSP using a typical CGI get and put call. The camera can stream H.264 (base profile), MPEG4 (Advanced Simple profile Level 5 exclusively with I and P frames), or MJPEG via VLC player or Apple QuickTime.

- Level II - The camera does not stream video and or request other camera features via HTTP or RTP /RTSP using a typical CGI get and put call. The camera can stream H.264 (Base profile), MPEG4 (Advanced Simple profile Level 5 exclusively with I and P frames), or MJPEG via VLC player or Apple QuickTime but with a different or proprietary version of H.264, MPEG4, or MJPEG, and there is a need to develop custom drivers or to request a firmware change but the manufacturer must provide a complete SDK.

- Level III - The camera uses a proprietary protocol that falls outside of normal Lenel OnGuard capabilities and requires extensive engineering to implement. The camera does not use HTTP CGI calls; the camera may or may not stream video via RTP/RTSP using a typical CGI get and put call to stream video or acquire camera features. The camera may stream H.263 or an odd type of MPEG4 with modified headers, or display a proprietary H.264, MPEG4 or MJPEG. This type of camera may require a custom decoder in order to view video in OnGuard. The camera may use or may not be able to use TLC player or Apple QuickTime to stream video or audio. Other features may not be able to be implemented fully. The manufacturer SDK may be incomplete or poorly written or there may be a resistance or marked reluctance to provide all the information that we require to complete the certification. Lenel is required to do some level of reverse engineering to integrate the camera.

2.3 Manufacturer Responsibility

1. The manufacturers must complete the check list of functions that are implemented in OnGuard and are supported by the camera in order for Lenel to evaluate and implement for future releases.
2. OnGuard release notes will identify inconsistencies between the camera and OnGuard operation.
3. It is in the best interest of the manufacturer to implement as many camera features as possible to facilitate greater marketing opportunities.

2.4 Required Basic Integration Minimums for Cameras and Video Servers (Encoders)

1. The camera must support the ability to be accessed and controlled via a Web Server (or Service) resident on the camera.
2. The camera must support at a minimum Basic Authentication and/or Digest Authentication.
3. The camera must provide methods to access MJPEG, MPEG4, H.264, (part or all) via a common streaming method (defined later).
4. The camera must provide the ability to stream video via the following methods:
    a. Streaming via HTTP GET request
    b. Streaming via RTP/RTSP
5. The camera must provide the ability to communicate through HTTP via either port 80 or another port configurable via the HTTP interface or the camera page.
6. The camera must provide the ability to obtain video via the push method (i.e. we are requesting for streaming and the camera continuously transmits video to the recorder until the connection is dropped stopped by the recorder). If the camera supports only the pull method (i.e. retrieval of an image a certain intervals) then the camera must support high frame rate on this method.
7. The video transmitted from the camera must work with the currently used Lenel decoders (currently MJPEG, MPEG4 Advanced Simple profile Level 5 exclusively with I and P frames, H.264 Base profile). **MPEG4 and H.264 are only available for RTP/RTSP camera integration.**

Camera or Video Server Features	Required- R Optional-0
Video _IP	R
Video_ Analog or Loop out/in (camera or server)	R-if supported in camera or encoder
G.711 Audio 1 way Y-N*	O but highly recommended
G.711 Audio 2 way Y-N*	O but highly recommended
FPS Maximum (number)	R- or maximum possible from the camera
FPS Variable (Y-N)	R-if supported in camera or encoder
FPS Adjustable Y-N)	R-if supported in camera or encoder
Relay Output (how many?)	O
Dry Contact Inputs (how many?)	O
Record in camera	O
Login and Password Security (Y-N)	R-if supported in camera or encoder
Serial Port / USB (How Many?)	O
Power over Ethernet	R if available O-if not available
Day Night Select (Y-N)	R-if supported in camera or encoder

PTZ Function	R on PTZ cameras and video servers
PTZ Presets	O-video server , R for PTZ
PTZ Tours	O-video server , R for PTZ
PTZ Scan	O-video server, R for PTZ
PTZ Pattern	R-if supported in camera or encoder
Digital Image Flip 180 degrees	R-if supported in camera or encoder
PTZ Privacy Mask	R-if supported in camera or encoder
MPEG 4	R-if supported in camera or encoder
H.264	R-if supported in camera or encoder
MJPEG	O unless MJPEG is the only compression then R.
Flickerless	R-if supported in camera or encoder
Auto Gain Control	R-if supported in camera or encoder
Camera Discovery	Preferred R (provide discovery tool)
Motion Detection	O
FTP Server	O
Password Change	R-if supported in camera or encoder
Time Stamp	O
FW revision	O- Highly Preferred
Resolution	R indicate that are available

* The G.711 mono, µ-law 64kbit/s protocol is supported. The audio should be streamed over a dedicated channel (one for each direction).

2.5 Required Minimum Video Quality Standards

Lenel VARs rely on Lenel for a high standard for video quality. Camera and video server partners already integrated into Lenel OnGuard are grandfathered as being acceptable. Companies seeking to become new partners must achieve the Minimum Video Quality Standard. The Quality Assurance Certification Team is the final judge. It is possible to pre-qualify a camera product by following the steps below.

1. For this standard and to identify acceptable resolution from known expert, Lenel used the RETMA Video Test Chart and followed the recommendations written in ***CCTV***

Vlado Damjanovski, 2nd Ed, (ISBN 13:978-0-7506-7800-1) Other acceptable test chart for the following is the IEEE-208 resolution test chart.

2. Use a varifocal lens (where applicable) and fixed lens if camera is not equipped to work with a varifocal lens. (Lenel uses a 2.8-12mm varifocal lens Computar PN : T4Z2813FCS)

3. Fixed or mini dome cameras should be positioned at a minimum distance from the test pattern of one linear foot or such that the entire test pattern fills the viewing screen when the lens focal point at focal mid-range. (Ensure that the camera is horizontally level and at a 90° [face-on vertically] to the test pattern.)

4. Focus the lens and read the test pattern horizontal and vertical line pairs.

5. Assuming that the camera is set to its maximum resolution setting of 480 TVL (NTSC) or 576 (PAL) V (with consideration of the Kell factor of 0.7): A 480 TVL NTSC camera should be clearly resolved to the chart indication of 330 line pairs (NTSC). A 576 TVL PAL should be clearly resolved to the chart indication of 400 line pairs (PAL) before the test pattern line pairs converge. This is a minimum acceptable CCTV industry standard and the standard that will be upheld in the integration process.

6. Camera video must not reflect video flutter that is noticeable over a 1 minute period.

7. Video noise must be (subjectively reviewed) resolved to achieve video clarity and definition common to the Lenel ICT230S camera or the Axis 207.

8. Color representation must be true to the original (within one color shade difference from the original) when viewing the color pattern on a high resolution analog monitor.

2.6 Optional Supported Features for Cameras and Video Servers (Encoders)

OnGuard Video supports a wide variety of camera or video server features. The implementation of optional features is up to the camera manufacturer.

2.6.1 In Camera Storage

In Camera Storage is optional to pass OpenVideo-Capture: Standard certification. The camera may provide In Camera Storage capabilities. It is up to Lenel engineering to check and confirm whether this feature can be implemented or not.

2.6.2 Camera Time Stamp

A camera time stamp is optional to pass the OpenVideo-Capture: Standard certification. Each of the images streamed may support a method for OnGuard to retrieve the timestamp for the particular image.

Level III integrations: The time stamps from the camera should be synchronized with the client computer to prevent time drift from occurring.

2.6.3 Audio (Simplex or Duplex)

Audio is not a required feature to pass certification. However, if audio is implemented it must meet the following requirements to pass certification:

1. The camera must support a method for the recorder to retrieve audio (if audio is available) via an HTTP "GET" method or via RTP/RTSP. The streaming method must be separate from the video streaming (or if it merged with the video streaming, a method to obtain the audio separately must be supplied). This will be used for the two-way audio feature.
2. The camera must support at least G.711 64k audio protocol (mono). All other protocols would be considered for a later implementation.
3. The camera must support a method for the recorder to send audio (for two-way audio) (if audio is available) via an HTTP GET method or via RTP/RTSP.
4. The camera may support methods that will allow the NVR to control the volume and source type of the audio.

2.6.4 Dry Contacts

Dry Contacts are not a required feature to pass certification. However, if dry contacts are implemented it must meet the following requirements to pass certification.

1. The camera may support methods that will allow the recorder to retrieve input (dry contact) information from the camera. The following methods need to exist:
    a. Single IO Inputs Status, where the camera transmits a single report of the status of the input posts of the camera via an HTTP request.
    b. Open Connection IO Input Status (push) where the camera opens continuous connections, taken via an HTTP request and reports only changes in the status of the input ports.
    c. The camera may support IO Outputs commands (on/off if the camera supports output controls). In this mode, the camera controls the camera outputs via an HTTP request.

2.6.5 In Camera or Video Motion Detection

Motion Detection is not a required feature to pass certification. However, motion detection should be implemented if the camera supports it and if it is implemented it must meet the following requirement to pass certification.

- If the camera has Motion Detection algorithms, the camera must support Motion Detection continuous transmission (push). In this mode, the Camera transmits continuous motion detection information using a specific boundary separator, taken via an HTTP request. The various Windows of Motion (if any) should be clearly separated in the information transmitted and the levels of motion should be clearly marked.

2.6.6 Video Quality Adjustment Features

The Video Quality Adjustment options listed below are not a required feature to pass certification. However, if they are implemented, they must be controllable within OnGuard Video Manager via HTTP request to the camera Video Quality Adjustment feature.

1. Compression
2. Monochrome
3. Brightness
4. Contrast
5. Saturation
6. Sharpness
7. White Balance
8. Exposure
9. Hue

10. Gamma
11. Backlight Compensation

2.6.7 PTZ cameras

PTZ cameras must support the following three items to pass PTZ certification. PTZ cameras that do not offer PTZ control from within OnGuard will fail.

1. The camera must support a method to get and set the Relative PTZ values (If applicable function exists).
2. The camera must support a method to absolutely get and set the Absolute PTZ values (If applicable function exists).
3. The camera must support a method to get and set the Continuous PTZ values (If applicable function exists).

2.6.8 Smart Camera or Intelligent Camera or Video Server Features

Object Video or other IntelligentVideo features beyond camera or video server motion detection are unsupported through this program.