



Cisco Analog Video Gateway Module Overview

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The Cisco IP Video Surveillance 16-Port Analog Video Gateway Network Module, referred to as the Cisco Analog Video Gateway module throughout this guide, converts analog camera signals into IP-accessible endpoints. The network module receives input from analog video cameras and converts analog signals to IP video streams for IP networks used in closed-circuit IP video surveillance (IPVS) systems (see [Figure 1](#)). These video streams can be displayed over a network or locally on analog monitors.

The Cisco Analog Video Gateway module fits into Cisco Integrated Services Routers (Cisco ISRs) that are optimized for the secure, wire-speed delivery of concurrent data, voice, video, and wireless services.

The Cisco Analog Video Gateway aggregates video streams for transport across the network. By transporting the video over your existing IP network, you no longer need to maintain a separate, duplicate system. Specific capabilities of the Cisco Analog Video Gateway include:

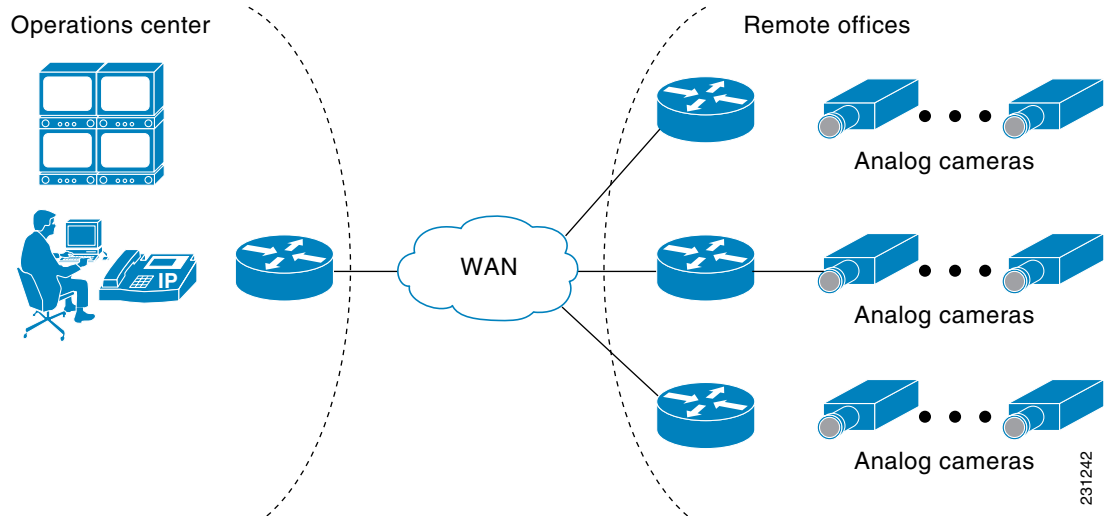
- High-density analog video encoding: Up to 16 ports in a single module
- Maximum-quality video resolution:
 - Common Intermediate Format (CIF) to 2CIF/4CIF
 - Frame rates up to 30 frames per second (fps) per port
- Remote camera control: Two independent RS-485 loops for serial pan-tilt-zoom (PTZ) control of traditional cameras
- Flexible codec selection: Motion JPEG (MJPEG), MPEG4, and H.264
- Integrated contact closure ports: Four input and four additional configurable inputs and outputs
- Embedded motion detection
- Hardware is based on a flexible digital-signal-processor (DSP) platform

This router-integrated, single-box solution is designed for video surveillance and other network services such as routing, security, and unified communications. It allows you to consolidate costly branch-office servers and deploy new applications centrally, while offering real-time access to physical security video and data.

Whenever possible, configuration and management of the Cisco Analog Video Gateway module should be configured using the Video Surveillance Operations Manager (VSOM) graphical user interface.

This guide supports features for version 1.2 and earlier versions of the Cisco Analog Video Gateway network module. To view the product feature history, see the [Release Notes for the Cisco Video Management and Storage System](#), which lists feature support for Cisco Analog Video Gateway versions.

Figure 1 Analog Camera Signals Converted to IP Video Streams



Analog cameras are connected to video input ports of the network module over coaxial cable using DB-37 connector. Each Cisco Analog Video Gateway module has 16 ports, all of which can be configured as inputs. Ports 0 and 1 can be configured as inputs or outputs for connecting to analog monitors.

The video encoder converts the analog signal into a compressed video stream for transmission over the IP network and sends it to a network video recorder (NVR), which is typically located in the data center.

Security operations personnel can access and review archived surveillance video recorded at remote sites from terminals in their local facility. The NVR can reposition remote cameras by centering, focusing, and zooming them based on event triggers. Pan-tilt-zoom (PTZ) camera control is tunneled across the IP network using serial (RS-232/RS-485) interfaces.

Contact closure of eight input sensors and four output control elements allows the video surveillance system to report on events detected by the input sensors and allows the system to determine output control movements or feedback to the PTZ devices.

The primary means of configuring the Cisco Analog Video Gateway is by using the Cisco Video and Management Storage System (for details, see the [Cisco Video Management and Storage System CLI Administrator Guide](#)). The Cisco Analog Video Gateway can also be configured using either its command-line interface (CLI) or the XML-based application programming interface (API). For example, you can configure XML scripts and use the NVR to configure the module. See the [Cisco Analog Video Gateway XML API Guide](#) for information about using the XML API to configure the Cisco Analog Video Gateway. This guide describes how to use the CLI to configure the software options of the Cisco Analog Video Gateway module.

The Cisco Analog Video Gateway is one of four components that make up the Cisco IP Video Surveillance solution. Other components are the:

- Cisco integrated services routers (ISRs)
- Cisco Video Management and Storage System Network Module
- Cisco Video Surveillance Manager product line, consisting of the Cisco Video Surveillance Operations Manager Software and the Cisco Video Surveillance Media Server Software

System Application

The Cisco Analog Video Gateway software is a Linux-based application (see [Open Source License Notice](#)) that resides on a video network module that plugs into a host Cisco ISR running Cisco IOS software.

The Cisco Analog Video Gateway module is a video encoder engine with its own startup and run-time configurations and its own CLI, all of which are independent of the Cisco IOS configuration on the ISR. The Linux-based software of the network module does not have its own console on its front panel but uses the internal virtual console from the host router.

Launch and configure the module through the router by means of a configuration session on the module (see [“Configuring Host Router and Cisco Analog Video Gateway Module Interfaces”](#) section on page 7).

This arrangement—host router plus video network module (the latter is also sometimes called an *appliance* or *blade* or, with installed software, a *services* or *services engine*)—provides a router-integrated application platform for accelerating data-intensive applications.

Applications typically involve:

- Analog video gateway
- Application-oriented networking
- Contact centers and interactive-voice-response applications
- Content caching and delivery
- Data and video storage
- Network analysis
- Voice-mail and auto-attendant applications

Video Ports

Video port profiles are physical hardware profiles that you can configure by using either the CLI or the XML-based API. For example, you can configure XML scripts and use the NVR to configure the module. See the [Cisco Analog Video Gateway XML API Guide](#) for information about using the XML API to configure the Cisco Analog Video Gateway.

Physical port profile parameters can be modified but cannot be deleted. Two of the 16 video ports, port 0 and 1, can be configured as either input ports or output ports. The remaining ports can be configured only as input ports. Video monitors are connected to ports that are configured as output ports. To use the CLI to configure video ports for the Cisco Analog Video Gateway, see [Configuring Video Parameters](#).

Video Services

A video surveillance session is initiated by a remote end user using HTTP or RTSP session requests. Video profiles are software profiles, such as video codec or video stream profiles, that can be added, modified, or deleted. To configure video profiles on the Cisco Analog Video Gateway by using the CLI, see [“Configuring Video Parameters”](#) section on page 29.

Video Profiles

Video stream profiles are created for every camera and are viewed through the stream ID created for every port. Video profiles can be created by using the CLI or the XML APIs.

The following are basic types of video profiles:

- [Video Codec Profiles](#)
- [Video Motion Detection Profiles](#)
- [Video Stream Profiles](#)

Video Codec Profiles

The video codec profile is a collection of characteristics for that codec. You can configure frame rate, codec type, resolution, bit rate, maximum bit rate, signal format, and groups of pictures (GOPs). Single or multiple video codec profiles can be created and associated with all the video ports. You can enable or disable deinterlacing, which is the process of converting interlaced video into a non-interlaced form, starting with Cisco Analog Video Gateway 1.1, and later versions.

The MJPEG, H.264, and MPEG4 codecs can use a variable bit-rate (VBR) algorithm, in which the desired bit rate can be controlled through the quality factor for MJPEG and the bit-rate can be maximized for MPEG4 and H.264. The H.264 and MPEG4 codecs can also use constant bit-rate (CBR) algorithms that allow the setting of a maximum bit-rate parameter.

Video Motion Detection Profiles

Cisco video servers support motion detection algorithms (MDAs) for all video codecs. Motion detection (using raw motion detection) for MJPEG is supported starting with Cisco Analog Video Gateway 1.1, and later versions. A motion detection region is created with x, y coordinates. Multiple regions can be created for motion detection.

Video Stream Profiles

A video stream profile is a collection of video characteristics that includes codec, detection, and port information.

Video streaming is controlled through the XMLAPI, in which the network video recorders attempt a TCP connection to the Cisco Analog Video Gateway module to establish video streaming.

Input streams from the camera to the Cisco Analog Video Gateway module are analog, and output streams from the network module to the IP network are packetized.

Contact Closure Ports

Each Cisco Analog Video Gateway module has eight contact-closure interfaces. The first four contact-closure interfaces can be configured as alarm inputs or relay outputs. The other interfaces can be configured only as inputs. The contact-closure inputs are used to detect contact trigger events and the outputs are used to control external devices.

You can configure and monitor these alarm interfaces by using the CLI or the XML API. See the [Cisco Analog Video Gateway XML API Guide](#) for information about using the XML API to configure the Cisco Analog Video Gateway. A contact-closure software module manages the alarm interfaces. To configure contact-closure ports on the Cisco Analog Video Gateway using the CLI, see [“Configuring Contact Closure Profiles” section on page 49](#).

Alarm Monitor Profiles

The Cisco Analog Video Gateway alarm software module serves as a central point for the control of alarms and relay interfaces in the video network module. The alarm software module sets the alarm interfaces to their predetermined states and monitors trigger events. When an alarm is detected, the alarm software module determines the source of the alarm, updates the system log file, and sends predefined HTTP messages to the controllers. The controllers act on these messages, based on the nature of the alarm. For example, a controller might adjust the camera, start video streaming, or trigger the external devices.

All four relay interface outputs in the video network module can be accessed by multiple users, but each interface can be operated by only one user at a time.

The alarm monitor senses alarm events on each alarm interface. When an event is triggered, it notifies the alarm application, which then passes the information to the configured monitor destination. To configure alarm profiles on the Cisco Analog Video Gateway using the CLI, see [Configuring Alarm Monitor Profiles](#).

RS-485 Ports for Camera Control

The Cisco Analog Video Gateway module only supports a half-duplex, two-wire RS-485 communication network, sometimes called a ring, which is used to connect PTZ cameras. The video network module consists of two RS-485 ports.

The RS-485 application is designed to work with external third-party vendor software in the NVR and supports only pass-through mode. You can configure and monitor these alarm interfaces using the CLI or GUI interfaces. See the [Cisco Analog Video Gateway XML API Guide](#) to configure the Cisco Analog Video Gateway using the XML API. To configure destination profiles on the Cisco Analog Video Gateway using the CLI, see “[Configuring Camera Controls](#)” section on page 61.

