

Remotely Managed Internet Cameras Deliver Low-Cost IP Surveillance Monitoring and Automation

White Paper
June, 2008

Abstract

Internet Protocol cameras (IP cameras) enable anyone with access credentials and a standard browser to remotely monitor, control and record video from any location with Internet or private network connectivity. The latest equipment features user-friendly interfaces for remote monitoring, event triggers and configuration on the fly. Alert notifications or alarm triggers, for example can be set up in just a few clicks, with snapshots or video clips sent directly to cell phones, email, FTP or Web pages. The newest equipment offers excellent video quality, which can be adjusted for bandwidth and evidence requirements. The management and monitoring features are easier than ever to set up.

This white paper describes the benefits of remote IP camera monitoring, the various ways remote events can be monitored, and D-Link IP camera equipment designed specifically for remote management.

IP Camera Background

Unlike traditional analog closed circuit television systems that transport analog signals back to a centralized video recording device, IP surveillance systems digitize and compress video at each camera. The cameras send simple digital signals across the IP network. From end-to-end, IP surveillance is a decentralized data encoding system that sends binary data across a shared, standards-based IP network – the same one used for email, Web pages, file transfers, and other data network applications. The resulting media can be watched, stored, or acted upon like any other piece of data. That's important, because video usage and applications in business, at home, and across the World Wide Web are booming.

As unique and creative video solutions are developed, the characteristics of IP video (portability, flexibility, and scalability) will only become more of an advantage. By portable, we mean that IP video can be delivered anywhere there's a network connection (local, private or Internet). By flexible, we're describing both the software capabilities and the physical characteristics of IP cameras. With wireless features, weather-proof housings, and Power over Ethernet (PoE), most modern IP cameras can be placed anywhere (then picked right up and placed somewhere entirely different without re-configuration). By scalable, we're talking about the general scalability of IP, where storage, processing and bandwidth are easily expanded with open standards.

Benefits

Remote Access and Management

Remote access is one of the key benefits of IP surveillance systems. With IP cameras and the right networking equipment, you can view, manage, and record video locally and remotely using standard Internet browsers like Internet Explorer, Firefox, and Safari.

IP camera-generated images (including video) can be viewed on a wide range of devices, including:

- Web browsers
- Cell/mobile phones
- Handheld devices
- Laptop computers
- Desktop computers
- Mobile terminals in security and police cars

Multiple authorized clients can directly access and manipulate any camera installation from any location in the world. D-Link's IP camera management software – which comes free with each camera – supports up to 32 cameras. In addition, most IP cameras allow users to change frame rates, resolution, and timed record cycles remotely.

Management and monitoring software solutions sold with digital IP systems include automated snapshot, event, alarm and motion detection features. D-Link provides the management and surveillance software free with its IP cameras, unlike some other vendors.

Full Access via Mobile/Cell Phone

Mobile phones and smart phone devices that use 3GPP systems can easily view and manage IP cameras. Users can have video clips and snapshots sent directly to their phones as MMS messages, for example. Or, users with Internet data plans on their phones can log in to common mobile phone browsers. They can also receive alerts via email on their phones.

Mobile accessibility is the perfect solution for business users and family members that are on the road and want anytime/anywhere access to their assets, premises and family members. Use the cameras to monitor property, check up on infants, keep in touch with relatives, view secure areas or record specific movement incidents, like moving cars, shift changes, scheduled activities and more. The possibilities are endless, and IP video feeds can be monitored from any device that supports open IP standards for messaging and streaming.

Event Driven Intelligence

One of the most compelling reasons to use IP cameras is automation. Built-in software and 3rd party applications make IP camera images and feeds infinitely automate-able. As a result, any camera event can provide intelligence that is customized to specific situations and custom user delivery preferences.

By contrast, a typical digital video recorder (DVR) surveillance system is only as smart as the person monitoring it at the moment it is being watched. With an IP-based system, you gain efficiency, reduce costs, eliminate errors, and add this automated intelligence layer. Typical IP camera and management software settings handle motion detection, event triggers, alert automation, and more. For example, certain cameras might only send data to the recording servers when a specific threshold of motion is detected. Sensitivity settings can be adjusted so insignificant movements will not trigger a recording. This saves recording space and human analysis time by keeping only what is relevant to the particular security situation at hand.

3rd Party Application Integration

A wide variety of third party applications offer solutions for license plate recognition, people counting, Geographic Information Systems (GIS), and face recognition. Like the standard IP camera software, these solutions allow you to configure alerts and send video and snapshot messages to email and mobile phone clients. This includes notifications to handheld PDAs, cell phones, or other IP connected devices.

One-Way or Two-Way Audio

Since IP Surveillance systems are merely passing around information packets, any kind of additional data (sound, graphics, applications, event triggers, etc.) can accompany the data stream. Several D-Link IP cameras come equipped with built-in microphones and speaker jacks for two-way communication. Analog systems, on the other hand, can't handle single channel audio or two-way sound channels without added cabling and expense. Deploying audio with the video images becomes very simple in IP Surveillance applications.

Low Cost

D-Link offers several cameras with varying features priced from \$70 to \$700. These include stationary Web access cameras that feature motion triggering and scheduled recording options on the low end, and fully-featured Pan, Tilt, Zoom (PTZ) models that feature wireless connectivity, 2-way audio, extreme low light sensitivity, and smooth video recording. Storage (NAS, SAN and stand-alone disk drives) solutions are also inexpensive, so large files are no longer as prohibitive as they used to be. Computing equipment in general – like desktops, laptops, routers and mobile phones – is also reasonably priced when compared to proprietary digital and closed analog surveillance systems.

Case Studies

Arizona's Sanders Unified School District uses D-Link IP cameras to deter break-ins and vandalism at their schools. They no longer have to worry about the safety of their students and assets, and their cameras can be accessed from any Web browser, anywhere.

Reason Computer, Inc. installed D-Link IP cameras to protect aircraft in a Minneapolis airport hangar. They gather evidence for insurance claims and are able to set alerts for very specific on-camera events.

At Florida's Gulfarium Marine Park, animal trainers and veterinarians in remote locations study animal behavior, provide a diagnosis, or observe medical procedures via D-Link IP cameras.

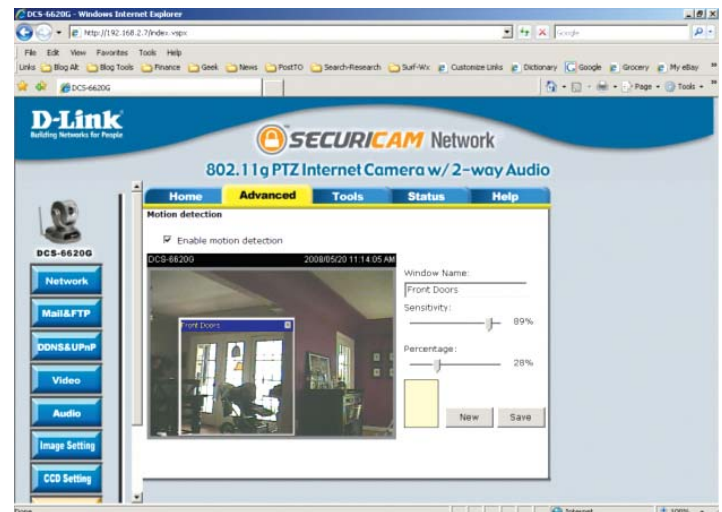
The 89 restaurant Souper Salad restaurant chain monitors stores from any remote location with D-Link equipment. They ruled out closed circuit television systems because they needed remote Internet monitoring capabilities.

How It Works

Setting up IP camera recording schedules, notification parameters, alerts, camera settings, and motion detection features is a simple, point-and-click process. The following screenshots show you the process in a web-based interface.

Motion Detection Field

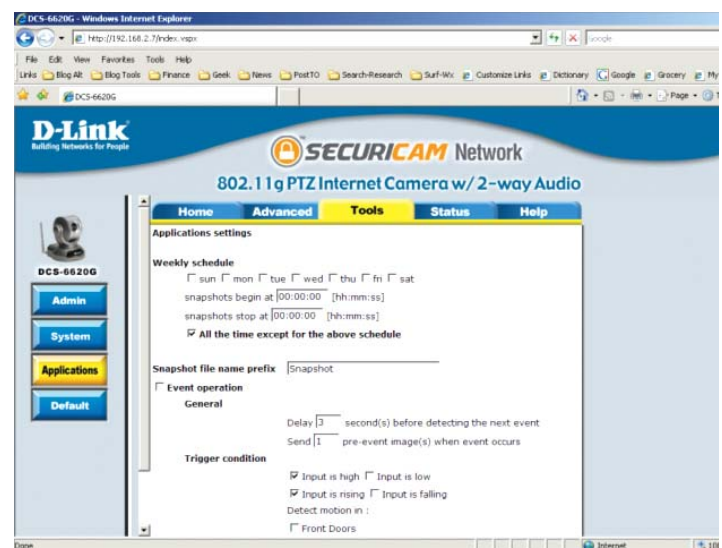
D-Link's Securicam software allows you to select specific regions in the frame to pinpoint motion detection that can be linked to alerts and recording options.



You can enable motion detection on the IP camera using standard Internet browsers like Internet Explorer, Firefox, and Safari.

Monitoring and Scheduling

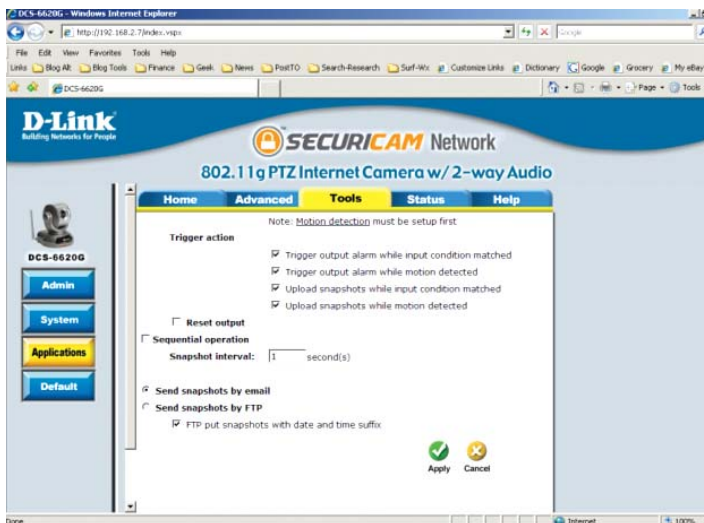
Scheduling options allow you to include and exclude dates and times, as well as set trigger conditions. Time stamping and record video to hard drive options are available.



Scheduling options are available using standard web browsers.

Alert Management and Messaging Delivery

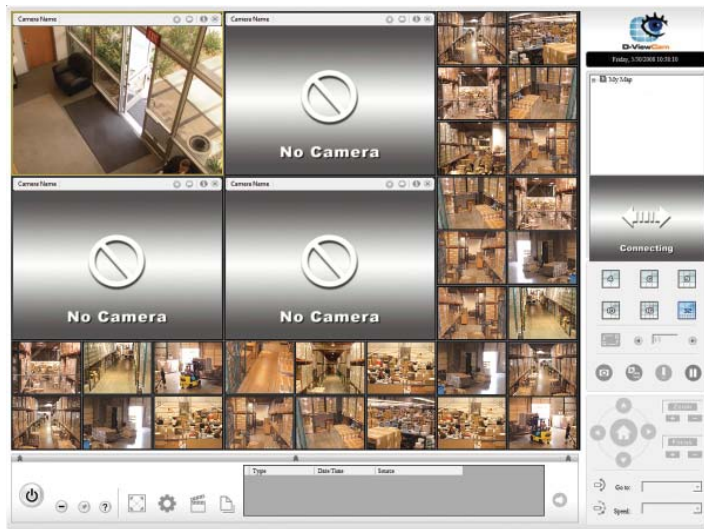
Real-time alerts can be set for specific conditions and motion detection events. Delivery via email or FTP is common.



Real-time alerts can be delivered via email or FTP.

Integrated Management

D-Link's free software, D-ViewCam™ offers integrated management for up to 32 separate cameras.



D-ViewCam uses IP technology to provide comprehensive management functions, such as system controls, live video feeds, and archived recordings.

Area No.	Area Name	Description
1	Main Display Area	Video monitoring area. Number of screens displayed is determined by split-screen configuration
2	System Board Area	System date and time display
3	Select Device and Map Area	Tree structure display that shows maps and devices
4	Preview Window Area	Display map or current video image if an active camera is selected from the tree structure
5	Split Screen Area	Selected number of screen displayed at the main display area
6	Manual Control Area	Snapshot, manual recording, two-way audio controls and freeze video display
7	PTZF Control Area	Selectable when a camera selected has pan, tilt, zoom and focus function
8	Program Control Area	Minimize the main window, exit D-ViewCam, auto-hide and help page
9	Setting and Search Area	Full screen, system configuration, search and playback videos, search and playback events
10	Event Action Log	Event log list

Descriptions of the ten areas that are included in the main user interface of D-ViewCam.

D-Link Solutions

IP Cameras

DCS-6620 10/100 Internet Camera, Pan/Tilt/Zoom, 10x Optical Zoom, Dual Codec, 0.05Lux

The D-Link DCS-6620 offers remote IP camera monitoring via a Web-based interface or through the included D-Link D-ViewCam software. The Web-based interface allows up to 10 simultaneous users to view the live feed from the camera. Using the feature-rich D-ViewCam software, monitor and manage up to 32 cameras, set recording schedules, configure motion detection settings, and change settings to multiple cameras.

IP Cameras

- Motorized Pan/Tilt/Zoom
- User-Selectable Compression Codec - MJPEG and MPEG-4
- 2-Way Audio Support
- Extreme Low Light Sensitivity
- Smooth Video Recording of Up to 30 FPS

DCS-5220 Wireless Pan/Tilt Internet Camera

With support for MPEG4 recording, the DCS-5220 is well suited for various recording scenarios. MPEG-4 video allows for smaller sized files for extended recording periods or for use in low bandwidth networks. Innovative software is included to enhance the monitoring and management of the DCS-5220. Using the feature-rich D-ViewCam software, monitor and manage up to 32 cameras simultaneously, set recording schedules, enable motion detection settings, and change settings to multiple cameras. The DCS-5220 allows you to schedule both recorded video and snapshots to be uploaded onto an FTP server and sent via e-mail.

The DCS-5220 features 3G mobile video support enabling you to view a live video feed from your camera on a compatible 3G mobile phone or PDA anywhere in your 3G coverage area. The 3G mobile video support expands the functionality of the DCS-5220, allowing you to monitor your remote location without requiring a computer. D-ViewCam software is also included to manage up to 32 cameras simultaneously from your computer, send automated e-mail alerts, and record video to your hard drive when motion is detected.

Features:

- View a Live Camera Feed from Your Compatible 3G Mobile Phone or PDA
- Expand Your Survey Area with Motorized Pan/Tilt and 4x Digital Zoom
- Advanced Video Motion Detection with E-mail Alerts

D-ViewCam Management Software for Large, Complex Surveillance Installations

D-Link's D-ViewCam software is an SNMP Network Management System for centrally managing critical network characteristics such as availability, responsiveness, resilience and security in a consistent way. This comprehensive, standards-based management tool is flexible, versatile, and accommodates a wide range of new D-Link and third-party devices, including wireless bridges and access points, multi-layer switches, remote routers, and multi-tenant broadband CO devices. D-ViewCam helps you manage device configurations, fault tolerance, performance, security and accounting services – all critical aspects of complex video surveillance installations.

The software's modular architecture allows users to install modules for a wide variety of devices. D-ViewCam's Module Wizard can be used to compile and store the MIB file into the database if the user does not possess the device module. D-ViewCam is also able to manage a network device through the MIB Browser. D-ViewCam supports many standard MIB utilities such as MIB II, 802.1D, 802.1p, 802.1Q, RMON group, OSPF, DVMRM, PIM, IPM, RIP1, and RIP2.

For more information about D-Link remote IP camera solutions, please visit our [Internet Camera Resources Site](http://www.dlink.com) located at www.dlink.com or call 1-800-326-1688.