

# 1080p H.265 Penta-brid HDCVI DVR

## 4+2/8+4/16+8-Channel Mini 1U HDCVI Digital Video Recorder



- Embedded Processor
- Smart H.265+ and Smart H.264+ Dual Codec
- Dual-stream Recording
- 1080p at 15 fps Maximum Recording Resolution
- 4, 8, or 16 HDCVI, AHD, TVI, CVBS Channels
- 4 + 2, 8 + 4, or 16 + 8 IP Channels, up to 6 MP per Channel
- Maximum 24/48/96 Mbps Incoming Bandwidth
- Built-in Smart Search
- Intelligent Video System
- One (1) SATA HDD Port, up to 10 TB per Hard Disk Drive
- Five-year Warranty\*



### System Overview

The X51A Series HDCVI DVR offers 1080p recording on each HDCVI channel and a host of advanced features and functions. The X51A takes advantage of HDCVI technology for easy integration into existing video surveillance systems while leveraging existing networks, cabling, and cameras. Penta-brid access technology seamlessly records video from HDCVI, AHD, TVI, CVBS, and IP sources simultaneously.

The X51A utilizes the Smart H.265+ Codec to significantly improve encoding efficiency and to reduce bandwidth and storage costs. This recorder is the ideal solution for actively monitoring and recording video feeds in a wide range of applications including public venues, retail stores, transportation hubs and access ways, personal property and homes, and educational institutions.

#### Camera Connections

Record and monitor video from analog/HDCVI camera inputs and IP camera inputs simultaneously. The X51A series supports a maximum of 24 channels, with up to 16 channels of HDCVI/AHD/TVI/CVBS inputs and up to an additional 8 channels of IP inputs. The flexibility of the HDCVI DVR allows all 24 channels to record input from IP cameras, or from a combination of input from analog and IP sources (not to exceed the maximum number of analog cameras allowed per recorder).

#### Flexible Recording

The HDCVI DVR offers a variety of configurable recording options and schedule that saves HDD space and active monitoring time. The recorder monitors incoming video and can be programmed to record if motion is detected or if an alarm is triggered. The recorder can also be programmed to record on a schedule or at different intervals. The recording options and schedules can be set for each individual camera or copied to all cameras.

### Functions

#### Smart H.265+

Smart H.265+ is the optimized implementation of the H.265 codec that uses a scene-adaptive encoding strategy, dynamic GOP, dynamic ROI, flexible multi-frame reference structure and intelligent noise reduction to deliver high-quality video without straining the network. Smart H.265+ technology reduces bit rate and storage requirements by up to 90% when compared to the H.264 video compression standard.

#### HDCVI/AHD/TVI/CVBS Auto-detect

The HDCVI DVR automatically recognizes the incoming signals of each attached camera without any setup, making installation easy and operation convenient.

#### Intelligent Video System (IVS)

With built-in IVS analytics on up to eight (8) channels, the HDCVI DVR delivers intelligent functions to monitor a scene for Tripwire violations, intrusion detection, and abandoned or missing objects. A device with IVS quickly and accurately responds to monitoring events in a specific area.

#### Face Detection

The HDCVI DVR offers Face Detection of the first analog channel. This technology detects and captures a snapshot of a human face in a defined area within a scene.

#### Smart Fan Design

The HDCVI DVR automatically turns on or turns off the fan according to the CPU temperature. This function reduces fan noise and helps to conserve electricity.

#### Smart Search

Smart Search allows an operator to specify a region in the playback video to search for a motion detection event, saving time and manpower.

### Technical Specification

#### System

Main Processor	Embedded Processor
Operating System	Embedded LINUX

#### Interface

	X51A1E	X51A2E	X51A3E
Analog Camera Input	Four (4) Channels, BNC	Eight (8) Channels, BNC	16 Channels, BNC
Preview Ability <sup>1</sup>	Channel 1: • 5 M-N at 20 fps or • 4 M-N, 1080p, 720p at 30 fps Other Channels: • 4 M-N, 1080p, 720p at 30 fps	Channels 1 and 2: • 5 M-N at 20 fps or • 4 M-N, 1080p, 720p at 30 fps Other Channels: • 4 M-N, 1080p, 720p at 30 fps	
HDCVI	5 MP, 4 MP, 1080p at 30 fps, 720p at 60 fps, 720p at 30 fps		
AHD	5 MP, 4 MP, 1080p at 30 fps, 720p at 30 fps		
TVI	5 MP, 4 MP, 1080p at 30 fps, 720p at 30 fps		
CVBS	NTSC		
IP Camera Input	4 + 2	8 + 4	16 + 8
Audio			
Input	Four (4) Channels, RCA	Eight (8) Channels, RCA	16 Channels (use DB25 Audio Dongle)
Output	One (1) Channel, RCA		
Two-way Talk	Reuse Audio In/Out, RCA		

#### Recording

	X51A1E	X51A2E	X51A3E	
Compression	Smart H.265+, H.265, Smart H.264+, H.264			
Recording Resolution <sup>1</sup>	5 M-N (1296 x 1944), 4 M-N (1280 x 1440), 1080p, 1080N, 720p, 960H, D1, CIF			
Record Rate <sup>1</sup>	Main Stream	Channel 1: • 5 M-N at 10 fps Channels 2 to 4: • 4 M-N, 1080p at 15 fps • 1080N, 720p, 960H, D1, CIF at 30 fps	Channels 1 and 2: • 5 M-N at 10 fps Channels 3 to 8: • 4 M-N, 1080p at 15 fps • 1080N, 720p, 960H, D1, CIF at 30 fps	Channels 1 and 2: • 5 M-N at 10 fps Channels 3 to 16: • 4 M-N, 1080p at 15 fps • 1080N, 720p, 960H, D1, CIF at 30 fps
	Sub Stream	D1 or CIF at 15 fps		
Maximum Incoming Bandwidth	24 Mbps	48 Mbps	96 Mbps	
Bit Rate	32 Kbps to 6144 Kbps per Channel			
Record Mode	Manual, Schedule (Regular, Continuous), MD (Video Detection: Motion Detection, Video Loss, Tampering), Alarm, Stop			
Record Interval	1 to 60 minutes (default: 60 minutes), Pre-record: 1 s to 30 s, Post-record: 10 s to 300 s			
Audio Compression	AAC (first channel only), G.711A, G.711U, PCM			
Audio Sample Rate	8 KHz, 16 bits per Channel			
Audio Bit Rate	64 Kbps per Channel			

#### Display

	X51A1E	X51A2E	X51A3E
Interface	One (1) HDMI (3840 x 2160) One (1) VGA (1920 x 1080)		
Native Output Resolution	1920 x 1080, 1280 x 1024, 1280 x 720		
Maximum Decoding			
X51A1E	4 Channels of 1080p at 7 fps 4 Channels of 720p at 15 fps 4 Channels of 960H at 30 fps		
X51A2E	8 Channels of 4 M-N at 15 fps 8 Channels of 1080N at 30 fps 4 Channels of 4 M-N at 30 fps		
X51A3E	16 Channels of 4 M-N at 15 fps 16 Channels of 1080p at 15 fps 4 Channels of 4 M-N at 30 fps		
Multi-screen Display			
IP extension mode disabled	1/4	1/4/8/9	1/4/8/9/16
IP extension mode enabled	1/4/6	1/4/8/9/16	1/4/8/9/16/25
On-screen Display	Camera Title, Time, Video Loss, Camera Lock, Motion Detection, Recording		

#### Network

	X51A1E/X51A2E	X51A3E
Interface	One (1) RJ45 (100 Mbps) Port	One (1) RJ45 (1000 Mbps) Port
Network Function	HTTP, TCP/IP, IPv4/IPv6, UPnP, RTSP, UDP, SMTP, NTP, DHCP, DNS, IP Filter, PPPoE, DDNS, FTP, Alarm Server, P2P, IP Search (Supports Dahua IP cameras, DVRs, NVS)	
Maximum User Access	128 Users	
Mobile Operating System	IOS, Android	
Interoperability	ONVIF 16.12, CGI Conformant	

#### Video Detection and Alarm

	X51A1E/X51A2E	X51A3E
Alarms		
Trigger Events	Recording, PTZ, Tour, Video Push, Email, FTP, Snapshot, Buzzer and Screen Tips	
Video Detection	Motion Detection, MD Zones: 396 (22 x 18), Video Loss, Tampering and Diagnosis	
Alarms		
Input	Eight (8) Channels	16 Channels
Output	Three (3) Channels	Three (3) Channels

#### Playback and Backup

	X51A1E	X51A2E	X51A3E
Playback	1/4	1/4/9	1/4/9/16
Search Mode	Time/Date, Alarm, MD and Exact Search (accurate to 1 second)		
Playback Function	Play, Pause, Stop, Rewind, Fast Play, Slow Play, Next File, Previous File, Next Camera, Previous Camera, Full Screen, Repeat, Shuffle, Backup Selection, and Digital Zoom		
Backup Mode	USB Device/Network		

1. The M-N resolution refers to technology that allows a 1080p HDCVI DVR to accept a video signal from a 5 MP or a 4 MP camera by sampling every other pixel on a horizontal line from the camera. The resulting recording resolutions are: 5 M-N: 1296 x 1944; 4 M-N: 1280 x 1440.

Storage

Internal HDD	One (1) SATA Ports, up to 10 TB capacity for each disk
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Auxiliary Interface

	X51A1E/X51A2E	X51A3E
USB	Two (2) USB 2.0 Ports	One (1) USB 2.0 Port One (1) USB 3.0 Port
RS485	One (1) Port for PTZ Control	

Electrical

Alarms	X51A1E/X51A2E	X51A3E
Power Supply	12 VDC, 2 A	
Power Consumption	< 10 W, without HDD	< 15 W, without HDD

Construction

	X51A1E	X51A2E	X51A3E
Dimensions	1U, 325.0 mm x 255.0 mm x 55.0 mm (12.80 in. x 10.04 in. x 2.17 in.)		
Net Weight, without HDD	1.10 kg (2.40 lb)	1.20 kg (2.60 lb)	1.3 kg (2.90 lb)
Gross Weight	1.80 kg (4.0 lb)	1.90 kg (4.20 lb)	2.20 kg (4.90 lb)
Installation	Desktop		

Environmental

Operating Temperature	-10° C to +55° C (+14° F to +131° F), 10% to 90% RH
Storage Temperature	-20° C to +70° C (-4° F to +158° F), 0% to 90% RH

Certifications

Safety	UL 60950-1
Electromagnetic Compatibility (EMC)	FCC Part 15 Subpart B ICES 003 Issue 6 EN 55032 EN 50130 EN 61000-3-2 EN 61000-3-3
Immunity	EN 55024 : 2010

Intelligence

The IVS features are operational only when the additional IP channel feature is not active. The HDCVI DVR supports only IVS or the additional IP channel inputs, both features cannot be in use simultaneously. IVS triggers an alarm and takes a defined action for the following events:

Premium Features

Channels 1 and 2: Support all Premium IVS Features  
Channels 3 through 8: Support Tripwire and Intrusion Premium IVS Features

Tripwire	A target crosses a user-defined line.
Intrusion	A target enters or exits a defined perimeter.
Abandoned/Missing Object	A target leaves an object in designated area, or a target removes an object from the same designated area.

Advanced Feature

Available on Analog Channel 1  
(feature not available if an IP camera is connected as Camera 1)

Face Detection	Detects and captures a snapshot of a human face in a defined area within a scene.
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Ordering Information

Type	Part Number	Description
4-channel HDCVI DVR	X51A1E	4 Analog/CVI Inputs, 4 + 2 IP Inputs, 8 Alarm Inputs, 3 Alarm Outputs
	X51A1E1	4 Analog/CVI Inputs, 4 + 2 IP Inputs, 1 TB HDD, 8 Alarm Inputs, 3 Alarm Outputs
	X51A1E2	4 Analog/CVI Inputs, 4 + 2 IP Inputs, 2 TB HDD, 8 Alarm Inputs, 3 Alarm Outputs
8-channel HDCVI DVR	X51A2E	8 Analog/CVI Inputs, 8 + 4 IP Inputs, 8 Alarm Inputs, 3 Alarm Outputs
	X51A2E1	8 Analog/CVI Inputs, 8 + 4 IP Inputs, 1 TB HDD, 8 Alarm Inputs, 3 Alarm Outputs
	X51A2E2	8 Analog/CVI Inputs, 8 + 4 IP Inputs, 2 TB HDD, 8 Alarm Inputs, 3 Alarm Outputs
16-channel HDCVI DVR	X51A3E	16 Analog/CVI Inputs, 16 + 8 IP Inputs, 16 Alarm Inputs, 3 Alarm Outputs
	X51A3E1	16 Analog/CVI Inputs, 16 + 8 IP Inputs, 1 TB HDD, 16 Alarm Inputs, 3 Alarm Outputs
	X51A3E2	16 Analog/CVI Inputs, 16 + 8 IP Inputs, 2 TB HDD, 16 Alarm Inputs, 3 Alarm Outputs