1080p Penta-brid HDCVI DVR
16-Channel 1U Digital Video Recorder with Analytics+

- 5M-N/1080p Recording Resolution on All HDCVI Channels
- Available with a 4 TB, 6 TB, 8 TB, or 10 TB Pre-installed Hard Drive
- Dual-stream Video Recording
- AI Coding Technology for High-quality Human/Vehicle Video
- Auto-detection and Auto-configuration of Video Inputs
- 16 + 8 IP Camera Channels, each channel up to 6 MP
- Maximum 128 Mbps Incoming Bandwidth
- Perimeter Protection and Smart Motion Detection (SMD)
- Long-distance Video Transmission
- Five-year Warranty*

Perimeter Protection	SMD	AI Coding	H.265	Coax Audio	1200m Long Distance

WizSense

WizSense Series devices combine Dahua's powerful Analytics+ with an intuitive and easy to use interface. WizSense devices offer Smart Motion Detection and Perimeter Protection functions that focus on human and vehicular images and ignore irrelevant images to capture important video while reducing false alarms. WizSense Series devices provide powerful general security for small to medium size businesses at a sensible price.

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.

Long Distance Transmission
HDCVI technology guarantees real-time transmission over long distances without loss of video quality. HDCVI devices provide the same resolution as most IP network camera systems using existing RG-59, RG-6, or CAT 6 UTP cabling.

System Overview

The X51C Series HDCVI DVR offers 5M-N/1080p recording on each HDCVI channel and a host of advanced features and functions. The DVR takes advantage of HDCVI technology for easy integration into existing video security systems while leveraging existing networks, cabling, and cameras. Penta-brid access technology seamlessly records video from HDCVI, AHD, TVI, CVBS, and IP sources simultaneously.

Functions

Perimeter Protection
Dahua Analytics+ includes Tripwire and Intrusion functions that offer custom tripwires based on object type for automation in limited access areas. Perimeter Protection requires less pixels to detect an object to deliver improved accuracy and decreased false alarms due to lights, weather, trees, or animals.

Smart Motion Detection
The Smart Motion Detection, a component of Dahua's Analytics+ technology, improves alarm accuracy and decreases the number of false alarms. The advanced SMD algorithm analyzes a scene for human or vehicle motion, while filtering out other motion due to trees, leaves, animals, weather, and triggers an alarm when detected.

AI Coding
The AI Coding function puts recording emphasis on human or vehicular objects in the video scene. This technology, based on constant bit rate (CBR), dynamically allocates increased bit rate to the target object while reducing the bit rate allocated to background objects. AI Coding reduces bit rate and storage requirements by up to 50% when compared to the H.265 video compression standard.

Technical Specification

System

Main Processor	Embedded Processor
Operating System	Embedded LINUX

Analytics+ Perimeter Protection[1,2]

Performance	• Human and Vehicle object classification • Decreased false alarms from leaves, lights, animals • Configure function on two (2) analog channels • 10 Tripwire/Intrusion rules per channel
Live View	• Configure Rule and Object Inspection area • Display object classification, event types, trigger time, image snapshot, and object types • Export event playback 10 seconds prior to or after event
Playback	• Search by channel, time, event type, and target type • Search event playback 10 seconds prior to or after event • Snapshot capacity: 500,000

Analytics+ Smart Motion Detection[1,2]

Performance	• Detect motion based on object classification (human or vehicle) • Decreased false alarms from leaves, lights, animals • Configure functions on 16 analog channels
Preview	• Configure and inspect detection area
Playback	• Search by channel, time, event type, and target type • Search event playback 10 seconds prior to or after event

Interface

Analog Camera Input	16 Channels, BNC
HDCVI	5 MP, 4 MP, 1080p, 720p
AHD	5 MP, 4 MP, 1080p, 720p
TVI	5 MP, 4 MP, 1080p, 720p
CVBS	NTSC
IP Camera Input	16 + 8 Channels, each channel up to 6 MP (The recording rate is dependent on the maximum resolution and frame rate of the connected IP camera.)
Audio	Input: 16 Channels, RCA Output: One (1) Channel, RCA
Two-way Talk	Audio Input Channel 1 In/ Audio Output, RCA

Recording

Compression		AI Coding, Smart H.265+, H.265, Smart H.264+, H.264
Recording Resolution[3]		5 M-N, 4 M-N, 1080p, 1080N, 720p, 960H, D1, CIF (The recording rate is dependent on the maximum resolution and frame rate of the connected IP camera.)
Record Rate	Main Stream	5 M-N at 10 fps 4 M-N or 1080p at 15 fps 1080N, 720p, 960H, D1, or CIF at 30 fps
	Sub Stream	960H at 15 fps D1 or CIF at 30 fps
Max. Incoming Bandwidth		128 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		G.711a, G.711Mu, PCM
Audio Sample Rate		8 KHz, 16 bits per Channel
Audio Bit Rate		64 Kbps per Channel

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1. The recorder is capable of two (2) simultaneous Perimeter Protection channels, 16 SMD channels, or one (1) Perimeter Protection channel and eight (8) SMD channels. Perimeter Protection and SMD cannot be used on the same channel.
2. Analytics+ functions on all HDCVI channels are disabled if an IP camera is enabled on channel 17 through 24.
3. 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.

Display

Interface		One (1) HDMI (1920 x 1080) Port One (1) VGA (1920 x 1080) Port
Native Output Resolution	HDMI	1920 x 1080, 1280 x 1024, 1280 x 720
	VGA	1920 x 1080, 1280 x 1024, 1280 x 720
Maximum Playback Decoding		16 Channels of 5M-N at 10 fps 16 Channels of 4M-N at 15 fps 16 Channels of 1080N/720p at 30 fps Eight (8) Channels of 5M-N at 20 fps Eight (8) Channels of 4M-N at 30 fps Four (4) Channels of 5M-N at 30 fps One (1) Channel of 6 MP at 30 fps
Multi-screen Display		When IP extension mode not enabled: 1/4/8/9/16 When IP extension mode enabled: 1/4/8/9/16/25
On-screen Display		Camera Title, Time, Video Loss, Camera Lock, Motion Detection, Recording

Network

Interface	One (1) RJ-45 (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

Trigger Events	Recording, PTZ, Tour, Video Push, Email, FTP, Snapshot, Buzzer and Screen Tips
Video Detection	Motion Detection, MD Zones: 396 (22 × 18), Video Loss, Tampering, and Diagnosis
Alarm Input	16 Channels
Relay Output	Three (3) Channels

Playback and Backup

Playback	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

Storage

Internal HDD	One (1) SATA Port, up to 10 TB capacity

Auxiliary Interface

USB	One (1) USB 2.0 Port and One (1) USB 3.0 Port
RS485	One (1) Port for PTZ Control

Electrical

Power Supply	12 VDC, 2 A
Power Consumption	< 12 W, without HDD

Construction

Dimensions	
HDCVI DVR	Mini 1U, 325.0 mm x 257.10 mm x 55.0 mm (12.80 in. x 10.12 in. x 2.17 in.)
Net Weight	1.30 kg (2.90 lb)
Gross Weight	2.10 kg (4.60 lb)
Installation	Desktop

Video Transmission Distance

RG-59/U Coax	720p: 1080p: 4K/4MP:	800 m (2624.67 ft) 500 m (1640.42 ft) 500 m (1640.42 ft)
RG-6/U Coax	720p: 1080p: 4K/4MP:	1200 m (3937.01 ft) 800 m (2624.67 ft) 700 m (2296.59 ft)
CAT 6 UTP (balun required)	720p: 1080p: 4K/4MP:	450 m (1476.38 ft) 300 m (984.25 ft) 300 m (984.25 ft)

Environmental

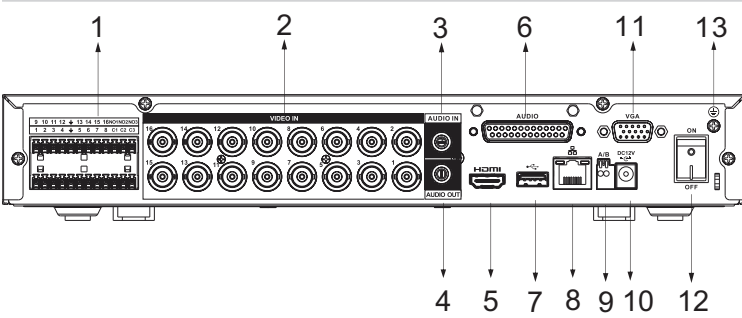| Operating Conditions	−10° C to +55° C (+14° F to +131° F), 0% to 90% RH
Storage Conditions	−20° C to +70° C (−4°F to +158° F), 0% to 90% RH

Third-party Support

Third-party Support	Dahua, Arecont Vision, AXIS, Bosch, Brickcom, Canon, CP Plus, Dynacolor, Honeywell, Panasonic, Pelco, Samsung, Sanyo, Sony, Videotec, Vivotek, and others

Certifications

Safety	EN 60950-1 IEC 60950-1
Electromagnetic Compatibility (EMC)	CFR 47 FCC Part 15 Subpart B EN 61000-3-2 EN 61000-3-3 EN 55032 EN 50130 EN 55024

Ordering Information

Type	Part Number	Description
1080p HDCVI DVR with Analytics+	X51C3E	16-Channel Penta-brid 1080p Mini 1U Digital Video Recorder, No pre-installed HDD
	X51C3E4	16-Channel Penta-brid 1080p Mini 1U, 4 TB Digital Video Recorder
	X51C3E6	16-Channel Penta-brid 1080p Mini 1U, 6 TB Digital Video Recorder
	X51C3E8	16-Channel Penta-brid 1080p Mini 1U, 8 TB Digital Video Recorder
	X51C3E10	16-Channel Penta-brid 1080p Mini 1U, 10 TB Digital Video Recorder

Dimensions

Rear Panel

1	Alarm I/O	8	RJ-45 Ethernet Port (1000 Mbps)
2	Video Input, x16 BNC	9	RS485
3	Microphone Input, RCA	10	Power Input
4	Audio Output, RCA	11	VGA Output
5	HDMI Output	12	Power Switch
6	Audio Input, DB-25	13	Ground
7	USB Port		

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