Dahua TECHNOLOGY

4K Penta-brid HDCVI DVR
4-Channel Mini 1U Digital Video Recorder with Analytics+

- 4K at 7 fps Recording Resolution on All HDCVI Channels
- Available with a 2 TB, 4 TB, 6 TB, or 8 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
- 4 + 4 IP Camera Channels, each channel up to 8MP
- Maximum 64 Mbps Incoming Bandwidth
- Perimeter Protection and Smart Motion Detection (SMD)[1]
- Long-distance Video Transmission
- Five-year Warranty*

Perimeter Protection	SMD	AI Coding	H.265	4K HDMI	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.

System Overview

The X81B Series HDCVI DVR offers 4K recording on each HDCVI channel and a host of advanced features and functions. The X81B 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, plus the DVR delivers 4K resolution on each HDCVI or IP channel.

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
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.

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.

4K Resolution
The HDCVI DVR records 4K resolution on each HDCVI and IP channel. 4K is a revolutionary breakthrough in image processing technology. 4K delivers four times the resolution of standard HDTV 1080p cameras and offers superior picture quality and image details. 4K resolution improves the clarity of a magnified scene to view or record crisp forensic video from large areas.

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.

*Warranty applies to products sold through an authorized Dahua Dealer.

Technical Specification

System

Main Processor	Embedded Processor
Operating System	Embedded LINUX

Analytics+ Perimeter Protection[2,3]

Performance	• Human and Vehicle object classification • Decreased false alarms from leaves, lights, animals • Configure function on a single channel • 10 Tripwire/Intrusion rules
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[2,3]

Performance	• Detect motion based on object classification (human or vehicle) • Decreased false alarms from leaves, lights, animals • Configure functions on four(4) 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	Four (4) Channels, BNC
HDCVI	8MP, 6MP, 5MP, 4MP, 1080p, 720p
AHD	8MP, 5MP, 4MP, 3MP, 1080p, 720p
TVI	8MP, 5MP, 4MP, 3MP, 1080p, 720p
CVBS	NTSC
IP Camera Input	4+4 Channels, each channel up to 8 MP
Audio	Input: Four (4) 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		8 MP, 6 MP, 5 MP, 4K-N, 4 MP, 3 MP, 4 M-N, 1080p, 720p, 960H, D1, CIF
Record Rate	Main Stream	8MP at 7 fps; 6MP at 10 fps, 5MP at 12 fps, 4 K-N, 4MP or 3MP at 15 fps, 4 M-N, 1080p, 720p, 960H, D1, or CIF at 30 fps
	Sub Stream	960H, D1, or CIF at 12 fps
Max. Incoming Bandwidth		64 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 to 30 s, Post-record: 10 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

Display

Interface		One (1) HDMI (3840 x 2160) One (1) VGA (1920 x 1080)
Spot Output		HDMI or VGA, configurable, 1920 x 1080 max resolution
Native Output Resolution	HDMI	3840 x 2160, 2560 x 1440, 1920 x 1080, 1280 x 1024, 1280 x 720
	VGA	1920 x 1080, 1280 x 1024, 1280 x 720
Maximum Playback Decoding		Four (4) Channels of 4K at 7 fps Four (4) Channels of 6 MP at 10 fps Four (4) Channels of 5 MP at 12 fps Four (4) Channels of 4 M-N, 1080p, 720p, 960H at 30 fps One (1) Channelsof 4K at 30 fps
Multi-screen Display		IP extension mode disabled: 1/4 IP extension mode enabled: 1/4/8/9
Fisheye Dewarp		Supported via Web Interface
On-screen Display		Camera Title, Time, Video Loss, Camera Lock, Motion Detection, Recording

Network

Interface	One (1) RJ45 (100 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)
Max. 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	Eight (8) Channels
Relay Output	Three (3) Channels

Playback and Backup

Playback	1/4
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	Two (2) USB 2.0 Ports
RS485	One (1) Port for PTZ Control

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1. The Analytics+ functions operate only on HDCVI channels, the functions are not available on IP channels.
2. The Analytics+ functions are disabled when the additional IP channels are active.
3. The DVR is capable of processing two (2) channels of Perimeter Protection or four (4) channels of SMD at one time.

Electrical

Power Supply	12 VDC, 2 A
Power Consumption	< 7 W, without HDD

Construction

Dimensions	
HDCVI DVR	Mini 1U, 325.0 mm x 257.20 mm x 55.0 mm (12.80 in. x 10.12 in. x 2.17 in.)
Net Weight	1.20 kg (2.70 lb)
Gross Weight	1.90 kg (4.20 lb)
Installation	Desktop

Video Transmission Distance

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

Environmental

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

Third-party Support

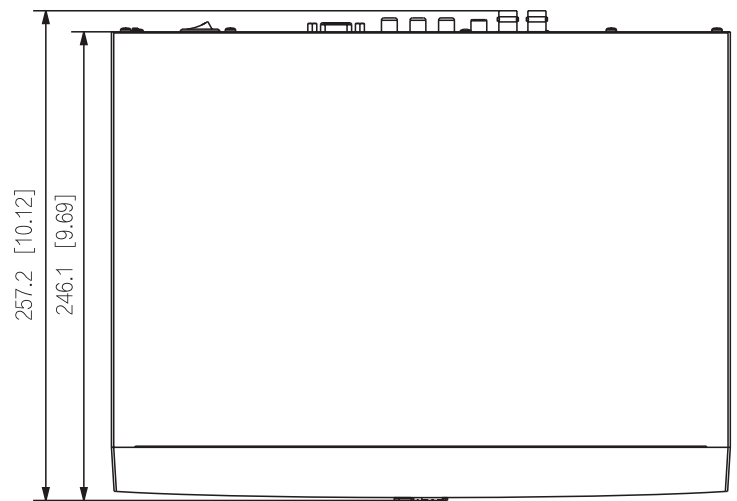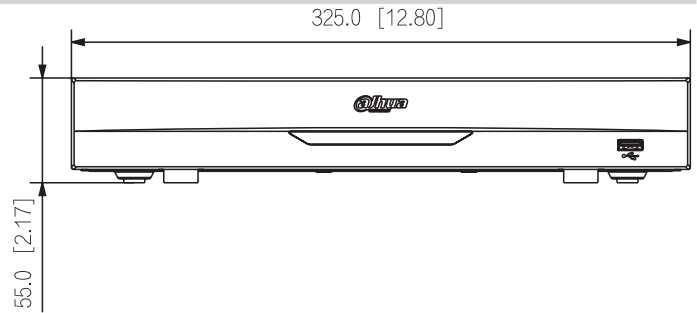| Third-party Support	Dahua, Arecont Vision, AXIS, Bosch, Brickcom, Canon, CP Plus, Dynacolor, Honeywell, Panasonic, Pelco, Samsung, Sanyo, Sony, Videotec, Vivotek, and others

Certifications

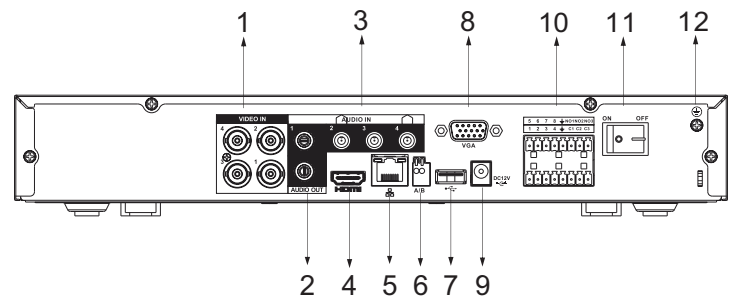| Safety	EN 60950-1 IEC 60950-1
Electromagnetic Compatibility (EMC)	CFR 47 FCC Part 15 Subpart B EN 61000-3-2 EN 61000-3-3 EN 55032 EN 50130 EN 55024

Ordering Information

Type	Part Number	Description
4K HDCVI DVR with Analytics+	X81B1E	4-Channel Penta-brid 4K Mini 1U Digital Video Recorder, No pre-installed HDD
	X81B1E2	4-Channel Penta-brid 4K Mini 1U, 2 TB Digital Video Recorder
	X81B1E4	4-Channel Penta-brid 4K Mini 1U, 4 TB Digital Video Recorder
	X81B1E6	4-Channel Penta-brid 4K Mini 1U, 6 TB Digital Video Recorder
	X81B1E8	4-Channel Penta-brid 4K Mini 1U, 8 TB Digital Video Recorder

Dimensions (mm/in.)

325.0 [12.80]

55.0 [2.17]

257.2 [10.12] 246.1 [9.69]

Rear Panel

1	Video Input (x4 BNC)	7	USB Port
2	Audio Output (x1 RCA)	8	VGA Output
3	Audio Input (x4 RCA)	9	Power Input
4	HDMI Output	10	Alarm Input (x16) Alarm Output (x3)
5	RJ45 Ethernet Port (100 Mbps)	11	Power Switch
6	RS485 Port	12	Ground