2MP HDCVI Security System

Four (4) 2MP HDCVI IR Eyeball Cameras with One (1) 1080p Penta-brid HDCVI DVR with Analytics+

2MP HDCVI Cameras

- 2MP (1920 x 1080) at 30 fps Maximum Resolution
- 2.8 mm Fixed Lens
- Maximum IR Length 30 m (98 ft), Smart IR
- IP67 Environmental Protection

HDCVI DVR

- Embedded Processor
- Four (4) Channel Penta-brid Recorder
- 4 +2 IP Camera Channels, each channel up to 6 MP
- 1080p at 15 fps Recording Resolution on All HDCVI Channels
- AI Coding Technology for High-quality Human/Vehicle Video
- Automatically Detects HDCVI, AHD, TVI, and CVBS Inputs
- Perimeter Protection and Smart Motion Detection (SMD)
- Maximum 32 Mbps Incoming Bandwidth

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 surveillance for small to medium size businesses at a sensible price.

System Overview

The Dahua HDCVI Security System provides all the components to quickly install, configure, and employ a complete video surveillance solution. The HDCVI cameras offer the clarity of high definition video, and the HDCVI DVR offers built-in motion detection algorithms, alarm triggers, and customized recording modes. The cameras and the HDCVI DVR supports multiple video outputs making the kit compatible with many existing systems. The kit features Dahua's HDCVI technology that leverages an existing coaxial infrastructure, saving time and costs from running networking and power cables.

Functions

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.

Simplicity

HDCVI technology seamlessly integrates traditional analog surveillance systems with upgraded, high-quality HD video, making it the best choice to protect security investments. The plug and play approach enables full HD video surveillance without the hassles of configuring a network.

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+

The HDCVI DVR uses Smart H.265+ video compression to reduce bit rate and storage requirements by up to 70% when compared to standard H.265 video compression. 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.

Multi-format Support

The camera and HDCVI DVR supports multiple video formats including, HDCVI, CVBS, AHD, and TVI. The camera can switch between these four formats via the OSD menu or the switch located on the video output cable making the camera compatible with not only HDCVI DVRs but also most existing HD/SD DVRs. The HDCVI DVR automatically recognizes the incoming signals of each attached camera without any setup, making installation easy and operation convenient.

Environmental

With a temperature range of −40° C to +60° C (−40° F to +140° F), the cameras are designed for extreme temperature environments. The cameras, subjected to rigorous dust and water immersion tests, are certified to the IP67 rating making them suitable for demanding outdoor applications.

The HDCVI DVR features an operating temperature of −10° C to +55° C (+14° F to +131° F).

Technical Specification

A21BJ02 2MP HDCVI IR Eyeball Camera

Camera

Image Sensor	1/2.7-in. CMOS
Effective Pixels	1920 (H) x 1280 (V), 2MP
Scanning System	Progressive
Electronic Shutter Speed	NTSC: 1/30 s–1/100,000 s
Minimum Illumination	Color: 0.02 Lux at F2.0 (30 IRE) 0 Lux with IR on
S/N Ratio	More than 65 dB
IR Distance	30 m (98.4 ft)
IR On/Off Control	Auto, Manual
IR LEDs	One (1) IR Light

Lens

Lens Type	Fixed Lens / Fixed Iris
Mount Type	M12
Focal Length	2.8 mm
Maximum Aperture	F2.0
Angle of View	2.8 mm: H: 102° V: 54° D: 120°
Close Focus Distance	0.5 m (1.6 ft)

DORI[1] Distance

Detect (8 ppf)	Observe (19 ppf)	Recognize (38 ppf)	Identify (76 ppf)
37 m (121 ft)	15 m (49 ft)	8 m (26 ft)	4 m (13 ft)

Installation Angle

Range	Pan: 0° to 360° Tilt: 0° to 78° Rotation: 0° to 360°

Video

Resolution	1080p (1920 × 1080); 720p (1280 × 720); 960H (960 × 480)
Frame Rate	CVI: 1080p at 30 fps; 720p at 30 fps AHD: 1080p at 30 fps; 720p at 30 fps TVI: 1080p at 30 fps; 720p at 30 fps CVBS: 960H at 30 fps
Video Output	One (1) BNC Output, HDCVI, AHD, TVI, CVBS switchable
Video Transmission[2]	RG-59/U Coax: 720p: 800 m (2624.67 ft) / 1080p: 500 m (1640.42 ft) RG-6/U Coax: 720p: 1200 m (3937.01 ft) / 1080p: 800 m (2624.67 ft) CAT 6 UTP (balun required): 720p: 450 m (1476.38 ft) / 1080p: 300 m (984.25 ft)
Day/Night	Auto (ICR), Manual
OSD Menu	Multi-language
BLC Mode	BLC, HLC, DWDR
WDR	Digital WDR
Gain Control	Auto, Manual
Noise Reduction	2D NR
White Balance	Auto, Manual
Smart IR	Auto, Manual
Mirror	Off, On
Privacy Masking	Off, On (8 Area, Rectangle)

Certifications

Safety	EN55032, EN55024, EN50130-4 UL60950-1+CAN/CSA C22.2 No.60950-1
Electromagnetic Compatability (EMC)	FCC CFR 47 FCC Part 15 Subpart B ANSI C63.4-2014

Electrical

Power Supply	12 VDC ±30%
Power Consumption	Maximum 2.9 W (12 VDC with IR on)

Environmental

Operating Temperature	−40° C to +60° C (−40° F to +140° F), Less than 90% RH
Storage Temperature	−40° C to +60° C (−40° F to +140° F), Less than 90% RH
Protection Grade	IP67

Construction

Casing	Aluminum
Camera Dimensions	φ94.0 mm × 85.7 mm (φ3.70 in. x 3.37 in.)
Net Weight	0.33 kg (0.73 lb)
Gross Weight	0.47 kg (1.04 lb)

Technical Specification

X51C1E2 1080p Penta-brid HDCVI DVR

System

Main Processor	Embedded Processor
Operating System	Embedded Linux

Analytics+ Perimeter Protection[3,4]

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[3,4]

Performance	• Detect motion based on object classification (human or vehicle) • Decreased false alarms from leaves, lights, animals • Configure functions on four (4) analog channels
Preview	• Configure and inspect detection area
Playback Information	• Search by channel, time, event type, and target type • Search event playback 10 seconds prior to or after event

Interface

Analog Camera Input	4 Channels, BNC
HDCVI	5MP, 4MP, 1080p, 720p
AHD	5MP, 4MP, 1080p, 720p
TVI	5MP, 4MP, 1080p, 720p
CVBS	NTSC
IP Camera Input	4 + 2 Channels, each channel up to 6 MP (The recording rate is dependent on the maximum resolution and frame rate of the connected IP camera.)

Technical Specification (Cont.)

X51C1E2 1080p Penta-brid HDCVI DVR

Audio	Input: Four (4) Channels, RCA Output: One (1) Channel, RCA

Recording

Compression	AI Coding, Smart H.265+, H.265, Smart H.264+, H.264
Recording Resolution[5]	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	D1 or CIF at 15 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 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

Display

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

Network

Interface	One (1) RJ-45 (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)
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	Eight (8) Channels
Relay Output	Three (3) Channels

Playback and Backup

Playback	1/4
Search Mode	Time/Date, Alarm, MD, 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 6 TB capacity per HDD (Ships with a pre-installed 2 TB HDD)

Auxiliary Interface

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

Electrical

Power Supply	12 VDC, 1.5 A
Power Consumption	< 4 W, without HDD

Construction

Dimensions	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	1.20 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), 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)	FCC CFR 47 Part 15 Subpart B. EN 61000-3-2, EN 61000-3-3, EN 55032, EN 50130, EN 55024

1. The DORI distance is a measure of the general proximity for a specific classification to help pinpoint the right camera for your needs. The DORI distance is calculated based on sensor specifications and lab test results according to EN 62676-4 , the standard that defines the criteria for the Detect, Observe, Recognize and Identify classifications.
2. Transmission distance results verified by real-scene testing in Dahua's test laboratory. Actual transmission distances may vary due to external influences, cable quality, and wiring structures.
3. The recorder is capable of two (2) simultaneous Perimeter Protection channels, four(4) SMD channels, or one (1) Perimeter Protection channel and two (2) SMD channels. Perimeter Protection and SMD cannot be used on the same channel.
4. SMD on all HDCVI channels is disabled if an IP camera is enabled on channels 5 and 6.
5. 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.

Ordering Information

Type	Part Number	Description
2MP HDCVI Kit	C542E42B	• A21BJ02 2MP HDCVI IR Eyeball Camera (x4) • X51C1E2 1080p Penta-brid HDCVI DVR (x1)
Accessories, optional	DH-PFA13A-E	Junction Box
	DH-PFB205W-E	Wall Mount Bracket
	PFA152-E	Pole Mount Bracket
	PFA106	Mount Adapter
	PFB220C	Ceiling Mount Bracket
	PFM800-E	Passive HDCVI Balun
	DH-PFM321D-US 12 VDC, 1 A	12V 1A Power Adapter
	DH-PFM904	Integrated Mount Tester

Package Contents

Type	Material
HDCVI Cameras	Printed Manual Printed Regulatory Guide Plastic Wall Anchors with Screws (x3) Mounting Template
HDCVI DVR	Quick Network Guide Printed Manual Printed Regulatory Guide Mouse Adapter Power Adapter with Power Cord Ethernet Cable, RJ45 Alarm Cable Molex Units (x3) Screws (x4)

Accessories (Optional)

DH-PFA13A-E
Junction Box

DH-PFB205W-E
Wall Mount Bracket

PFA152-E
Pole Mount

PFA106
Mount Adapter
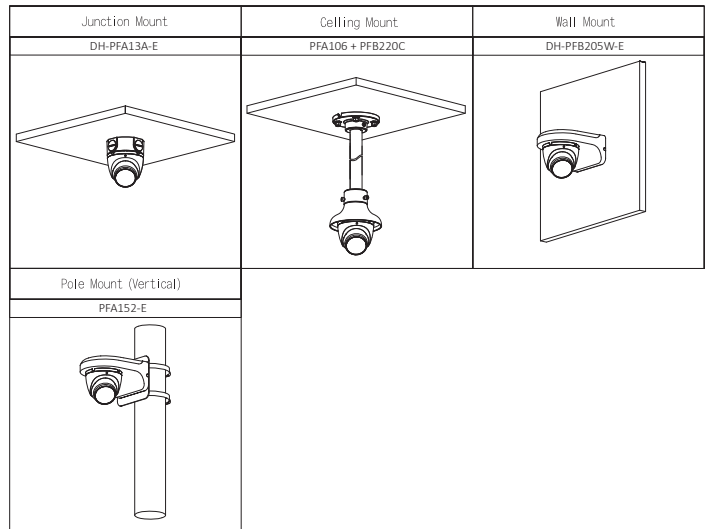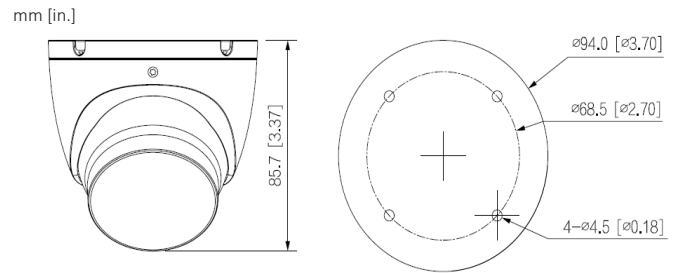
PFB220C
Ceiling Mount

PFM800-E
Passive HDCVI Balun

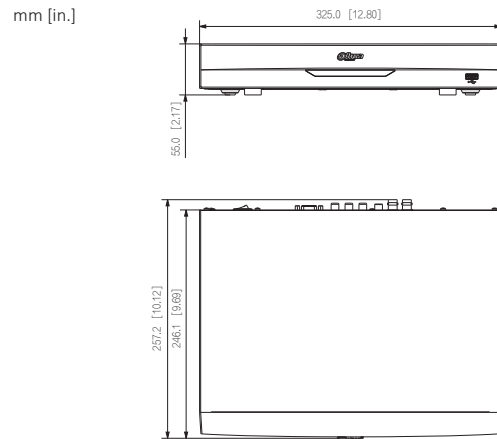DH-PFM321D-US
12 VDC, 1 A
Power Adapter

DH-PFM904
Integrated Mount Tester

Junction Mount	Ceiling Mount	Wall Mount
DH-PFA13A-E	PFA106 + PFB220C	DH-PFB205W-E

Pole Mount (Vertical)
PFA152-E

Dimensions - A21BJ02

mm [in.]

⌀94.0 [⌀3.70]
⌀68.5 [⌀2.70]
85.7 [3.37]
4−⌀4.5 [⌀0.18]

Dimensions - X51C1E2

mm [in.]

325.0 [12.80]
55.0 [2.17]
257.2 [10.12]
246.1 [9.69]

Rear Panel - X51C1E2
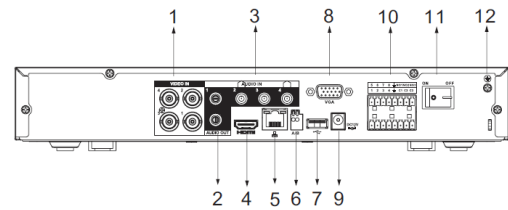
1	Video Input, x4 BNC	7	USB Port
2	Audio Output, x1 RCA	8	VGA Output
3	Audio Input, x4 RCA	9	Power Input
4	HDMI Output	10	Alarm I/O
5	RJ-45 Ethernet Port (100 Mbps)	11	Power Switch
6	RS485 Port	12	Ground