AI TECHNOLOGY ENSURES SMART HEALTHCARE

Dahua Smart Healthcare Solution

TYPICAL SCENARIOS

Hospital

Scene Features

· Large and multi-functional areas such as inpatient area, outpatient hall, emergency center, medical room, parking lot, etc.
· Inpatient usually accommodates more than 300 beds
· Open park, big stranger traffic

Nursing Home

Scene Features

· Small, usually accommodates 50-150 beds
· Closed park, few visitors

KEY CHALLENGES

Patient Care

· Lack of nurse resources and the need for effective solution to help improve efficiency
· Lack of remote monitoring method in some special cases (e.g. epidemic ward)
· Difficult to find the incident such as falling down for elderly or disabled patient

Safety and Security

· Too much vehicle and foot traffic in and out of the hospital brings greater difficulty in security management
· Lack of quick and effective investigation methods after an incident
· Ensuring a safety environment for hospital/nursing home staff and patients

SOLUTION OVERVIEW

Inpatient Management

· Inpatient Access Control
· Video intercom to meet different requirements
· Falling down detection
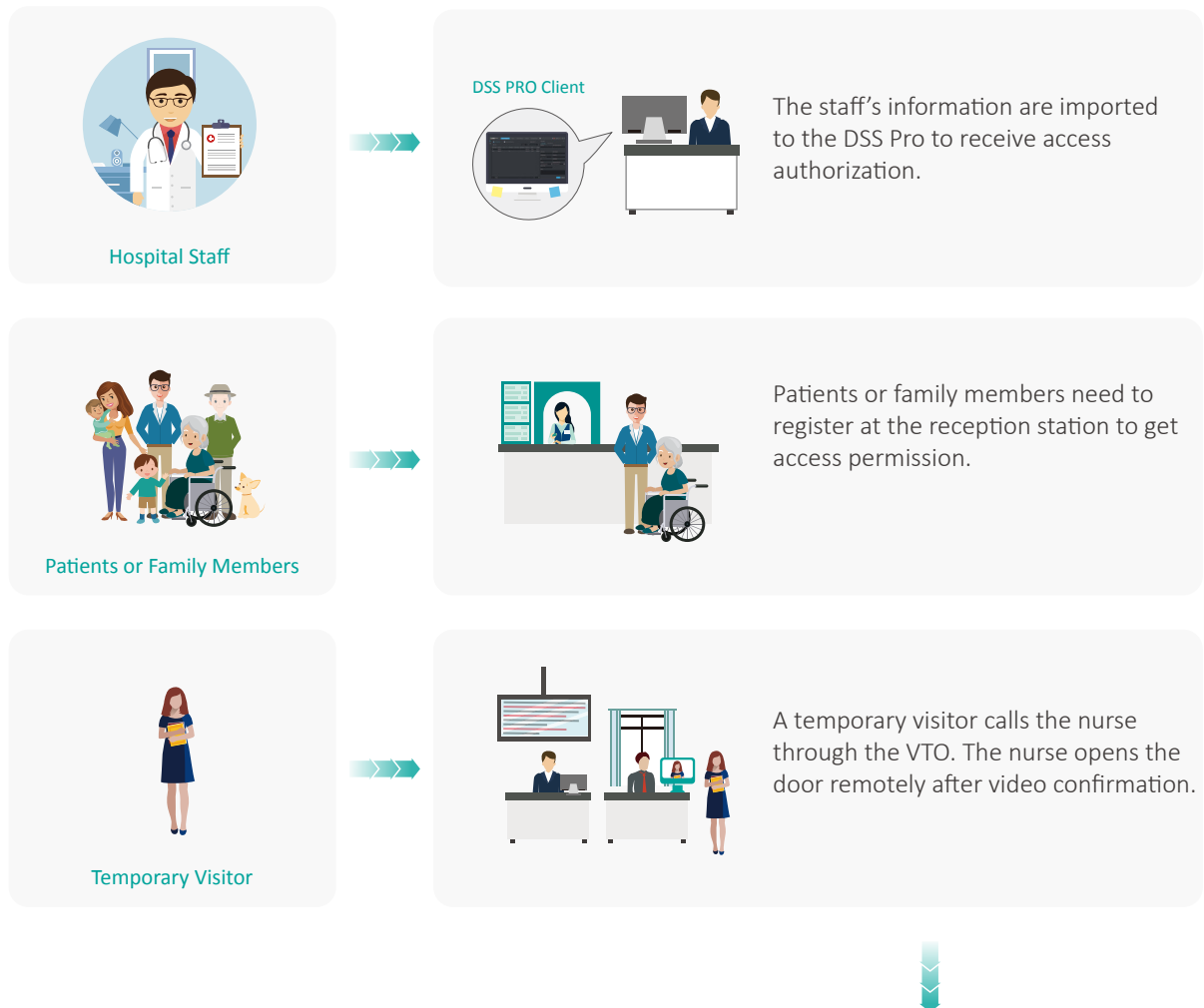· Privacy protection

Safety and Security

· AI accelerates investigations
· Active alarm and quick response
· Vehicle security
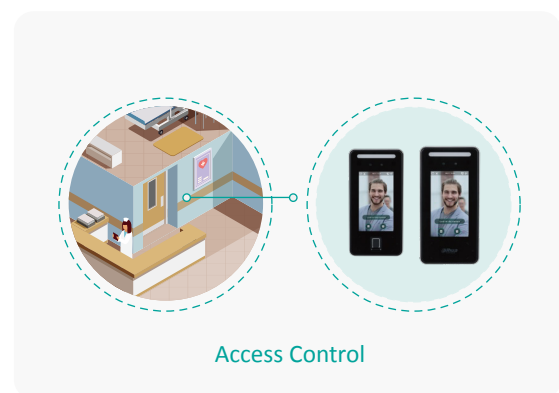· Basic surveillance
· Management center

SOLUTION DESIGN

• Inpatient Care | Access Control

Hospital Staff

DSS PRO Client

The staff's information are imported to the DSS Pro to receive access authorization.

Patients or Family Members

Patients or family members need to register at the reception station to get access permission.

Temporary Visitor

A temporary visitor calls the nurse through the VTO. The nurse opens the door remotely after video confirmation.
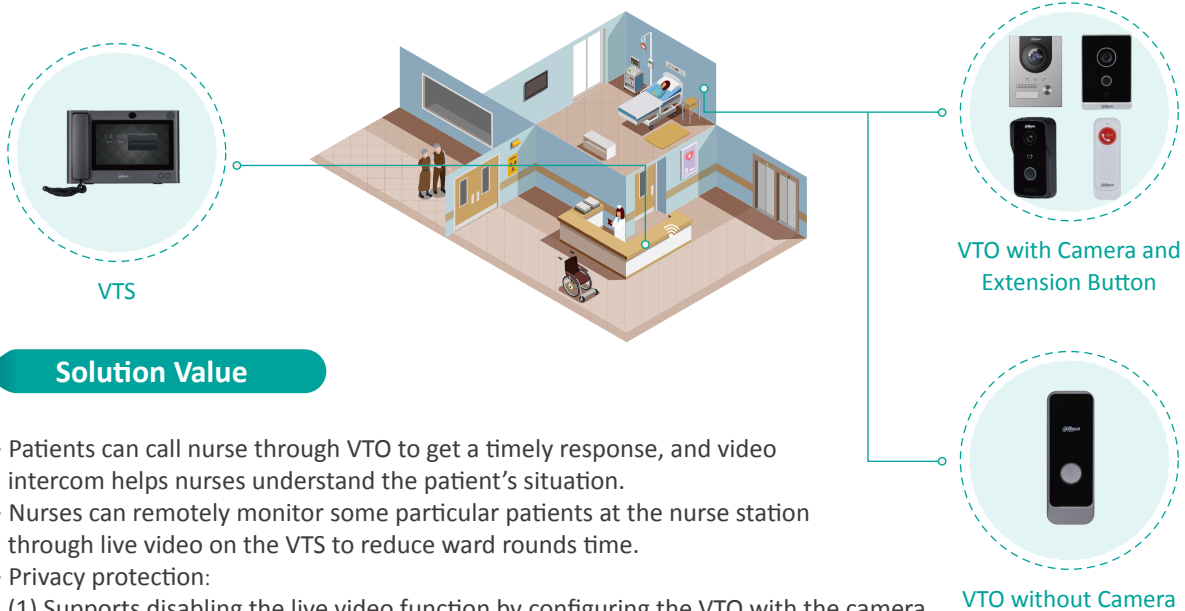
Solution Value

· Implements access control at the entrance of every floor in inpatient area to optimize people management.
· Supports several access modes to meet different requirements.
· Allows visitors to call the nurse station via video intercom. The nurse can open the door remotely after video verification.
· Supports disabling automatic access during certain periods such as midnight to reduce risks.

Access Control

• Inpatient Care | Video Intercom

VTS

VTO with Camera and Extension Button

VTO without Camera

Solution Value

· Patients can call nurse through VTO to get a timely response, and video intercom helps nurses understand the patient's situation.
· Nurses can remotely monitor some particular patients at the nurse station through live video on the VTS to reduce ward rounds time.
· Privacy protection:
(1) Supports disabling the live video function by configuring the VTO with the camera.
(2) Supports VTO without camera.

• Inpatient Care | Fall Detection

Solution Value

· Some patients such as elderly or disabled person has the special care to monitor their falling down accident which may induce serious damage. Our stereo analysis technology can help to detect the falling down behavior.
· Once detect falling down with AI technology, alarm will be pushed to VTS in the nurse station with audio and message until nurse response.
· Considering the patient's privacy protection, the solution can provide different mosaic technologies such as human body or screen mosaic. In addition, the original video recording is also saved with admin authorization in case of an investigation.

Falling Down Detection

Human Body Mosaic

Screen Mosaic

• Safety and Security | Fast Investigation

20+ Attributes

Face: 6

Human: 8

Non-motor Vehicle: 6

Motor Vehicle: 7

Human Face

· Gender
· Age
· Glasses
· Mouth Mask
· Expression
· Beard

Human Body

· Gender
· Top Color
· Top Type
· Bottom Color
· Bottom Type
· Hat
· Bag
· Umbrella

Non-motor Vehicle

· Vehicle Type
· Vehicle Color
· Cycling Number
· Top Color
· Top Type
· Hat

Vehicle

· Plate No.
· Plate Color
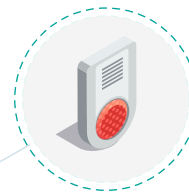· Car Color
· Car Type
· Calling
· Seatbelt
· Smoking

Solution Value

· AI technology helps classify all objects, including persons, motor vehicles, and non-motor vehicles.
· Allows tracking of the target if needed.
· Provides Big Data for further analysis.

• Safety and Security | Alarm

Intruder Alert

Panic Button

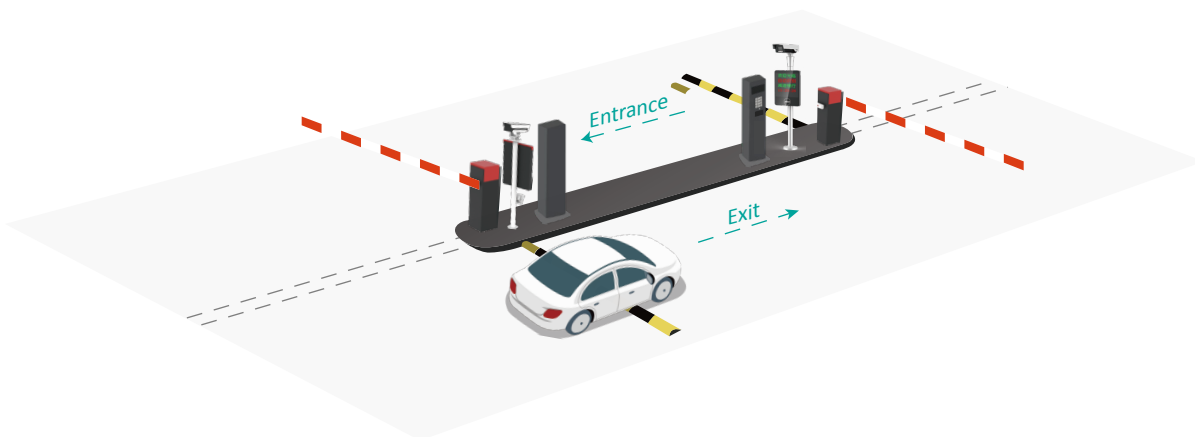Emergency Call

Solution Value

· Intergrates AI sensor, panic buttons, platform and mobile terminal to set up an entire emergency management system, allowing the security personnel to respond in time and reduce safety risks.
· Equipped with perimeter protection technology to detect intruders inside the hospital/nursing home.
· Install panic buttons with camera or emergency call in some areas such as nurse station, reception desk, etc. to get timely support.

• Safety and Security | Vehicle Security

Solution Value

· Adopts ANPR and barrier gates for vehicle management at the entrance & exit gate with higher efficiency.
· Supports displaying of vehicle plate number, number of available parking spaces, welcome messages, and other information on the screen.
· Provides visual reports of vehicles entering the hospital or nursing home.

Entrance

Exit

· Dahua has a lot of PTZ products with different resolution, lens, and optical zoom capabilities that can be used to monitor outdoor parking lots.
· Auto tracking can automatically zoom and track the target according to the preset rules.
· Starlight+ technology offers best-in-class light sensitivity that can capture color details in low light environment (down to 0.005 lux), making it ideal for night monitoring.

Safety and Security | Basic Surveillance

Outpatient Hall

· One camera covers the whole scene and provides a 360° degree view
· Supports people counting and queue detection

Emergency

· Corner camera is easy to install
· Supports privacy masking
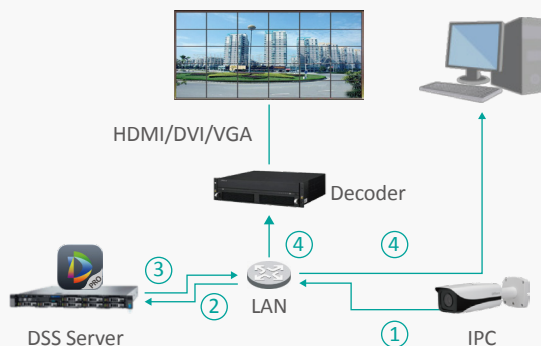· Can be customized to add an LED signal

Corridor

· One camera can cover two directions
· Supports perimeter protection and people counting
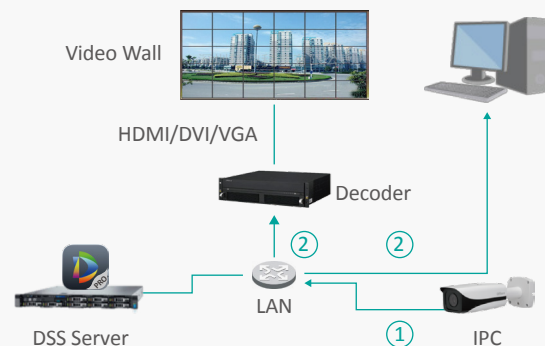
Safety and Security | Center Management

Pull Mode
Video Stream Sequence: 1 -> 2 -> 3 -> 4

HDMI/DVI/VGA   Decoder

④   ④

③

②   LAN   ①

DSS Server   IPC

Direct Mode
Video Stream Sequence: 1 -> 2

Video Wall

HDMI/DVI/VGA   Decoder

②   ②

LAN   ①

DSS Server   IPC

⚠ Not Supported: Auto Registration/P2P/ONVIF

Video Wall

Matrix

Keypad

Workstation

SOLUTION ARCHITECTURE

Management Center

Mobile Client

PC Client   WAN   DSS Pro   Storage   Video Wall

Inpatient Management

Safety & Security

• DSS Pro Highlight

Powerful & Scalable

· Up to 2,000 channels, 1,000 doors and 200TB storage capacity per server, maximizing the hardware performance.
· It can be easily expanded up to 20,000 channels and 2PB storage capacity through the distributed system.

High Availability

· Supports hot standby and N + M redundancy that enables the failover servers to serve as backup to primary recording and event servers.

-Software-

Customizable

· Allows integration of other systems and devices via API/SDK/ONVIF.
· Meets customer's personalized needs and assists them in formulating their market's competitive advantage.

DeepXplore

· It is an AI-based search feature enabling intelligent retrieval of humans and vehicles in time and space.
· The archive can uniformly manage case-related events, pictures, videos, and documents, and realize cross-event tracking.
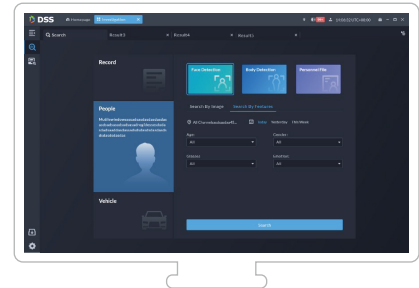
Monitoring Center

DSS PRO provides real-time monitoring applications that integrate devices, maps, events and other multi-dimensional tools.

Event Center

DSS PRO offers alarm processing with panoramic application that integrates alarm, investigation, and other related processes.

DeepXplore

DSS PRO provides post-event videos and images that can be used as evidence for further investigation.

Mainatenance Center presents clear status of equipment

Overview

Visualized display of the platform's health status provides real-time status and fault monitoring for various resources, along with intelligent operation and maintenance applications for professional analysis.

Resource Status

The status of equipment, channels, services and faults are independently displayed.

Automatically Send Reports

Supports custom sending of report templates, including sending time, period, subject, data content, and recipients.

High standards ensure system security

Application Security

· Controls users' access based on their access permission
· Synchronously backups important system logs to the log server

Privacy Security

· Decentralizes and minimizes data
· Desensitizes private information
· Face mosaic technology

Network Security

· Utilizes RASP or WAF to prevent web attacks
· When system detects network attacks, users will receive notification by email, mobile phone, etc
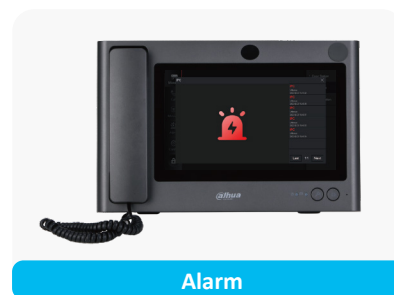· Supports CA certificate

Data Security

· Secures encryption on network transmission, storage, download, and export
· The storage duration of each video channel can be configured

VTS Client Highlight

Monitoring

Video Intercom

Alarm

· Client for nurse
· Supports DSS Pro and VTO as a SIP server to meet different project scales
· Supports live view of 4 streams @1080p at same time
· Supports 2 types of alarm: high-priority alarm with audio and message notification;
  and low-priority alarm with message
· Supports sending emails in case of a missed call (can be configured in the settings)

Transmission Highlights

Powerful PoE

Complies with the latest 802.3bt standard and supports up to 90W power supply via red ports.

Excellent Hardware

· Adapts to wide temperature range (-40°C-75°C)
· High lightning protection

Long Distance Transmission

Breaking the 100m limitation, the Dahua PoE switches can deliver a 250m transmission. Furthermore, Dahua's very own ePoE technology supports up to 800m transmission.

Smart Management

· PoE watchdog enables auto-reboot of faulty cameras.
· Intelligent PoE guarantees power supply for VIP ports.
· Green PoE schedules the operation to save energy.

Switch

Simple Cable-free Solution

· Allows connection from up to 5km distance without wiring.
· Auto pairing, less configuration.

Flexible Application

· Supports PtP, PtMP, and back-to-back, to meet different needs.
· Ideal for isolated locations.

Wireless Bridge

• Key Products

ASI6213J-MW/ASI6214J-MFW

FACT Access Control Terminal

• 4.3-inch LCD touch screen
• 6,000 face images
• 6,000 fingerprints (6214)
• 6,000 cards
• Wiegand in/out, RS485, TCP/IP
• WiFi
• P2P, NTP, DST

VTS5340B

Master Station

• 10-inch capacitive high resolution LCD
• Supports 4-ch 720P video
• SD card expansion enables local storage of videos and snapshots

VTO2111D-P-S2

Video Intercom

• High definition camera; WDR
• Supports two-way voice call;
  Supports calls between door stations
• Supports standard PoE power supply

VTO2201F-P

Video Intercom

• Anodized alumimum front panel
• CMOS low illumination 2MP HD colorful 140° camera
• Video intercom function
• IK07 & IP65
• Supports H.265
• Supports surface and flush mount
• PoE

VTO2211G-P

Video Intercom

• Thin lightweight design
• CMOS low illumination 2MP HD colorful 140° camera
• Video intercom function
• IK07 & IP65
• Supports H.265
• Supports surface and flush mount
• PoE

IPC-HDW8341X-BV-3D

3MP WizMind Dual-Lens
Network Camera

• 3MP, 1/2.8" CMOS image sensor, low illuminance, high image definition
• Outputs max. 3MP (2048 × 1536) @30 fps
• ROI, SMART H.264+/H.265+, flexible coding, applicable to various bandwidth and storage environments
• Stereo Analysis: fall detection, violence detection

• Key Products

VTO0301R-W
Voice Intercom

- Ultra slim design
- PC and ABS material
- Offers two-way voice call with indoor monitors
- Wi-Fi connection
- IP65 rated

NVR5-4KS2
Network Video Recorder

- 16/32/64-channel IP video access
- Smart H.265+/Smart H.264+/H.265/H.264/MJPEG; H.265 auto switch
- Max 320 Mbps incoming bandwidth
- Up to 24MP resolution for live view and playback
- 1-channel fisheye dewarping (AI by NVR)
- AI by Camera: perimeter protection; face detection and recognition; SMD Plus; video metadata; ANPR; people counting; stereo analysis; crowd distribution; heat map
- Support IPC UPnP, 16 PoE ports

HDBW5442E
4MP IR Vari-focal Dome
WizMind Network Camera

- 1/1.8" 4Megapixel progressive scan CMOS
- ROI, SMART H.264+/H.265+, flexible coding, applicable to various bandwidth and storage environments
- 8 mm-32 mm motorized lens
- Max. IR LEDs Length: 80 m
- Micro SD memory, IP67, IK10

EBW81242-AS-S2
12MP IR Fisheye WizMind
Network Camera

- 12MP 1/1.7" CMOS image sensor, low luminance, and high definition image
- Outputs max. 12M (4000 × 3000)@25 fps; supports 8M (3280 × 2480)@25/30 fps.
- Built-in IR LED, with a max. illumination distance of 10m
- Intelligent monitoring: Intrusion, tripwire, heat map, and people counting

IPC-HFW7442H-Z
4MP IR Bullet WizMind
Network Camera

- 4MP, 1/1.8" CMOS image sensor, low illuminance, high image definition
- Outputs max. 4MP (2688×1520) @50 fps/60 fps
- H.264/H.265 coding, high compression ratio
- Wide Dynamic, Day/Night, 3D NR, AWB, HLC, BLC
- ROI, SVC, SMART H.264+/H.265+, flexible coding, applicable to various bandwidth and storage environments
- Alarm: 3 in, 2 out; audio: 1 in, 1 out; RS-485; BNC; supports max. 256 G SD card
- 24V AC/12V DC/PoE power supply (the power ports vary depending on the power supply)

SDT5X405-4F-QA
4MP Starlight+ IR WizMind
Network Dual-PTZ Camera

- Dual PTZ system, dual vari-focal lens
- 1/1.8" 4Megapixel CMOS
- Powerful 5x optical zoom
- Starlight technology
- Max. 25/30 fps@4M
- Deep-learning-based auto tracking and perimeter protection
- Supports Hi-PoE
- H.265 Encoding
- IP67

• Key Products

HDBW5441F

2×4 MP Dual-Directional No-Splicing WizMind Network Camera

- 4 MP 1/2.7" CMOS image sensor, low luminance, and high definition image
- Outputs max. 4 MP (2560 × 1440)@25/30 fps
- Built-in IR LED, and the max. illumination distance is 30 m
- ROI, SMART H.264+/H.265+, AI H.264/H.265, flexible coding, applicable to various bandwidth and storage environments
- Rotation mode, WDR, 3D NR, HLC, BLC, digital watermark, applicable to various monitoring scenes

HCBW8442

12MP IR Fisheye WizMind Network Camera

- 1/1.8" 4Megapixel progressive scan CMOS
- H.265 & H.264 triple-stream encoding
- 25/30 fps@2688 × 1520
- WDR (140 dB), Day/Night (ICR), 3D DNR, AWB, AGC, BLC
- 2.5 mm fixed lens, distortion correction
- 1/1 Alarm in/out, 1/1 audio in/out
- Max. IR LEDs Length: 10 m
- IP67 and IK10+50J protection

S5600-48GT4XF

Aggregation Switch

- Rich 3-layer features
- High availability
- Excellent manageability
- Power saving design
- Comprehensive security control policies
- Supports Intelligent Resilient Framework
- Reliable hardware design with modular dual power supply
- High-density 10/100/1000 Base-T auto-sensing Ethernet ports and GE/10GE SFP + fiber ports on-board

PFWB5-30ac

5GHz AC867 15dBi Outdoor Wireless CPE

- Integrated 5 GHz (2x2) MIMO radio
- Frequency 5.150- 5.850 GHz (FCC 5.150- 5.250 and 5.725-5.850 GHz)
- High performance and stability
- IP-66 standards rated enclosure
- Improved noise immunity
- TDMA ensures reliable communication
- Powerful OS
- Dual firmware
- Built-in tools including Site Survey, Link Test, Antenna Alignment, Spectrum Analyzer, and Ping & Trace help in configuration and debugging
- Recommended for 0-3km PTP/PTMP wireless connection (as a station in PTMP link)

• Key Products

MPT220
Mobile Portable Terminal

- Android 9.0.
- 8-core 1.8 GHz High-Performance CPU
- 2.0" touch screen
- Supports 1080p@30 fps recording, with image resolution of up to 34MP (7808 × 4400)
- H.265/H.264 high compression coding
- Supports 2G/3G/4G Cellular network, WiFi, Bluetooth, NFC, GPS/GLONALL positioning
- 16GB internal storage; supports external TF card storage which can be expanded up to 256 GB
- One-click recording of video/audio/alarm/PTT

VTA2302A
Emergency Call Terminal

- 1/2.7" 2MP CMOS high definition, low illumination
- Anodized aluminum panel
- Auto illumination and night vision
- One-button alarm, SOS emergency calling
- Voice broadcast
- PoE+
- IP65, IK08

ITC215-PW6M-(IR)LZF-O
Access ANPR

- Embraces deep learning algorithm for accurate recognition of vehicle model, vehicle logo, vehicle series, vehicle color, vehicles without license plate, and more
- Various signal, data and communication interfaces; supports connecting to extra devices, such as barrier
- Built-in LED illuminator for simplified installation
- Motorized vari-focal lens, easy for installation and commissioning
- Integrated design with low power consumption, and IP67 protection grade

SD49825XB-HNR
8MP 25x Starlight IR WizSense
Network PTZ Camera

- 1/2.8" 8Megapixel STARVIS™ CMOS
- Powerful 25x optical zoom
- Starlight technology
- IR distance up to 100 m
- Perimeter protection
- Face detection
- IP66

SUCCESS CASES

- ## UK R Hospital

👁 Project Background

UK R Hospital provides a full range of district general hospital service. The hospital has around 700 beds, operating theatre complex, outpatient suites, and education facilities. The hospital wants to update their CCTV system and emergency management.

✈ Project Highlights

· Emergency Response with MPT
Established an emergency response process with MPT, AI, external alarm and platform, which helped security teams build a system to handle emergencies as quickly as possible.

· Ethernet Transmission
Dahua provided all the Ethernet transmission for the whole project including PoE switches, aggregation switches and core switches with highly cost-effective solution.

• C Medical Center

👁 Project Background

C Medical Center is a modern medical and organizational complex that caters to the total care of an individual. Due to the spike of Covid-19 cases in the Philippines, particularly in Quezon City, the hospital needs to open more beds and convert a certain portion of their property into an intensive Covid-19 ward. The end user requires the latest video intercom and surveillance technology in order to be able to properly monitor their patients on site or, if needed, remotely.

✈ Project Highlights

· Video Intercom Solution
Installed multiple units of VTO (outdoor stations) near the patient's bed to act as an emergency call system which can be used by nurses to monitor their patients at the same time. The nurses can also call the patient if needed.

· Monitoring Station
Use one platform to manage all VTO and CCTV devices (third party included) of the hospital. VTS client is for nurses to take care of patients and DSS Pro client is for security guards to ensure the safety of the hospital.

• Singapore Nursing Homes

👁 Project Background

The client is an international joint service organization with business covering more than 131 regions. They have two pain points that they want to solve: first, accidents (e.g. fall) amongst the elderly residents are hard to detect, making it difficult to respond in time; second, the elderly residents may wander and get lost around the vicinity.

✈ Project Highlights

· Elderly Fall Detection
Real-time detection of fall accidents and sending of push notifications, allowing nurses to respond in time.

· Prevent Elderly Getting Lost
Deployed access control at the entrance and AI cameras in the key points of the building to prevent the elderly residents from going out without permission, and to investigate in case of an event using AI technology.

ENABLING A SAFER SOCIETY AND SMARTER LIVING

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