

# SMART ENERGY SMART SECURITY TOTAL SOLUTION FOR OIL & GAS

-Safe  
-Smart  
-Reliable



#### Industry-grade Design

- Explosion-proof
- Anti-corrosion
- IP68



#### Fire Detection & Alarm

- Temperature measurement
- Above-threshold alarm



#### Equipment Failure Detection

- Thermal imaging
- Facility overheating
- Oil & Gas leakage



#### Vandalism Prevention

- Intelligent video analysis
- LPR & Blacklist alarm
- Access control



#### Operation Efficiency

- Integrated platform
- Multi-system linkage



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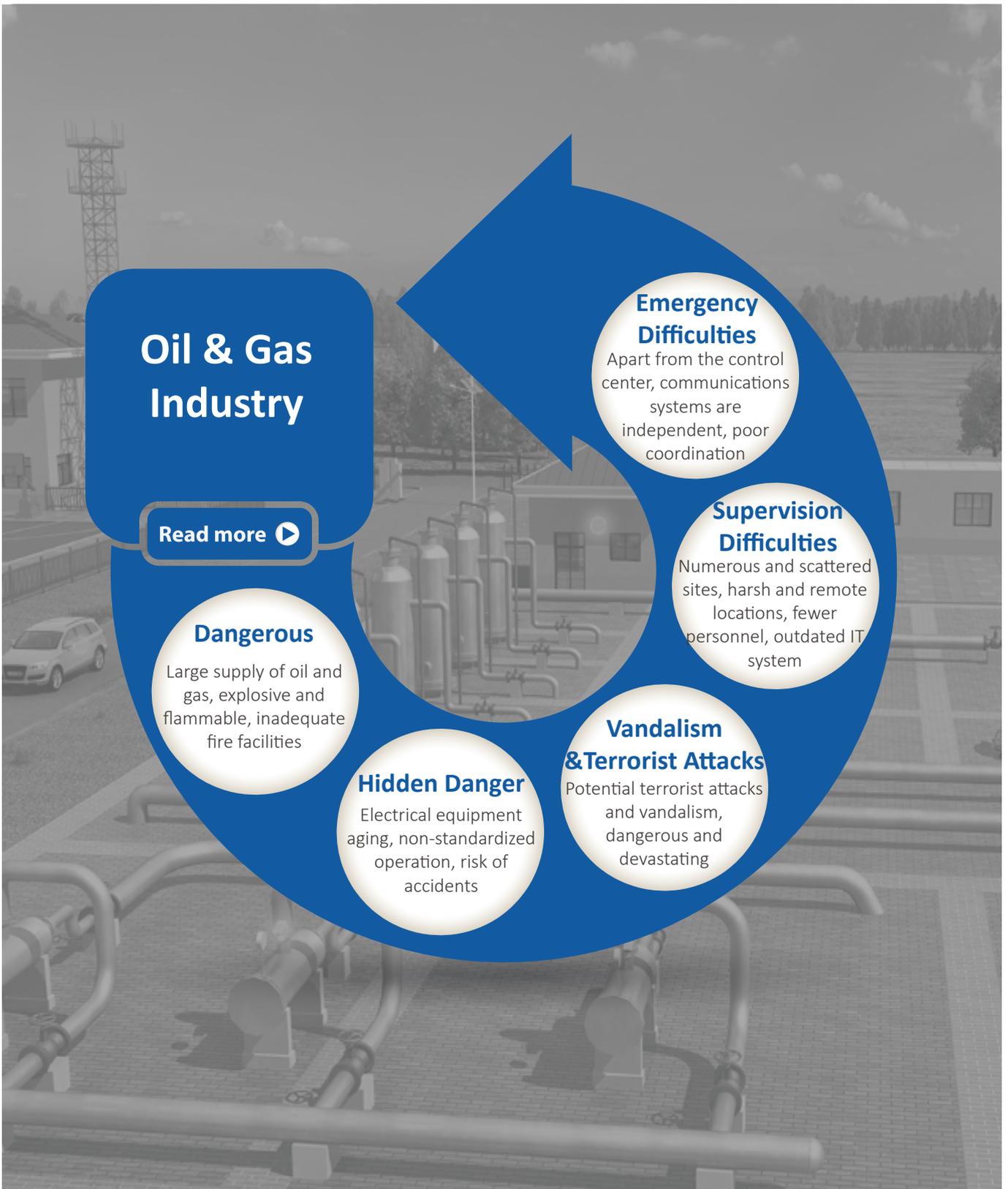
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## INDUSTRY BACKGROUND

- The energy industry is the pillar of the economy. Economic development is increasingly dependent on the energy industry and the demand for energy is growing.
- Oil and natural gas are important energy resources. The business process is complicated and includes exploration, drilling and oilfield construction, resource transportation, refinement, storage, and sales. Furthermore, fuels are flammable and explosive, creating a challenge to ensure the security of the entire process.
- Therefore, there is an urgent need to build a comprehensive security system to enhance the energy industry in all aspects of standardized management, monitoring, early warning, and accident investigation, so as to prevent accidents. At the same time, there is high demand to build infrastructure which provides timely and accurate information to rescue workers, improving the efficiency of rescue work and minimizing loss.
- Dahua provides a professional one-stop solution for different applications required by the energy industry in building a complete visual security system to ensure the security and stable operation of the entire business flow.



# INDUSTRY CHALLENGES



## OVERCOMING CHALLENGES

1

FIRST

### How to reduce the possibility of fire and prevent loss in the Oil & Gas industry?

- Industrial explosion-proof materials minimize the possibility of explosion.
- Thermal imaging for temperature measurement and timely alarm to reduce the loss caused by fire.

2

SECOND

### How to detect equipment failure and track suspicious staff actions to reduce the risk of accidents?

- Thermal imaging system detects equipment failures.
- Intelligent analytics technology such as tripwire, intrusion, and auto-tracking finds suspicious behavior.

3

THIRD

### How to detect and prevent possible terrorist attacks and vandalism?

- Intelligent analytics technology such as tripwire, intrusion, and auto-tracking finds suspicious behavior.
- LPR system for vehicle management.
- Access control system for flexible and strict authority management.

4

FOURTH

### How to cope with different harsh environments and weather conditions?

- Explosion-proof with ATEX/IECEX certification.
- Anti-corrosion with NEMA 4X testing report.
- Water-proof, dust-proof and IP67/IP68.
- Resistant to extreme temperatures.

5

FIFTH

### How to monitor numerous and scattered sites?

- Deploy mobile equipment such as mobile terminals and drones.
- View real-time video and audio data from scattered sites.

6

SIXTH

### How to achieve rapid emergency command and response in the event of an emergency?

- Mobile equipment deployment to receive audio and video data of scattered sites in real-time.
- Integrated platform for complete supervision to achieve multi-system integration.

# OIL & GAS LAYOUT

Gas Station



Tanker



Pipeline



Refinery & Chemical



Oilfield

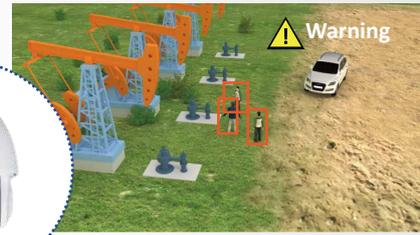
# APPLICATION AREA

## Oilfield

### • Oil Production Safety



Tripwire / Intrusion



Auto-tracking

- Important oilfield drilling equipment is secured.
- Cameras feature intelligent analytics functions such as tripwire detection, intrusion, and auto-tracking to ensure oilfield safety.
- Real-time alarms prevent illegal personnel and vehicle trespassing by sending an alert when triggered.



Vehicle management and control

- The license plate recognition system can effectively detect and record plate and vehicle information on the oilfield main roads and crossroads.
- The blacklist function prevents certain vehicles from illegally entering restricted oilfield areas, ensuring safety.
- License plate and vehicle information can be easily searched and viewed.



Wireless transmission  
Wind & Solar power supply system

- Oil production areas are often scattered and in harsh conditions. It is a challenge to ensure stable data transmission and power supply.
- Decentralized video and data can be transmitted to the monitoring center wirelessly with a 5.8G microwave system. It transmits data over up to 20km.
- Wind and solar power systems can effectively power site equipment in remote locations.

## Pipeline + Station

### • Long Distance Pipeline Safety



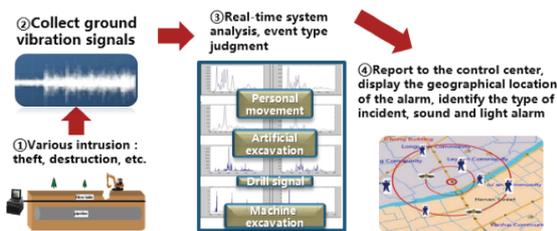
Pipeline remote video surveillance system

- Long-range PTZ cameras provide monitoring at distances of up to 1km, allowing for the detection of illegal mining, vandalism, and theft. Real-time alarms can be set and triggered to further ensure pipeline safety.



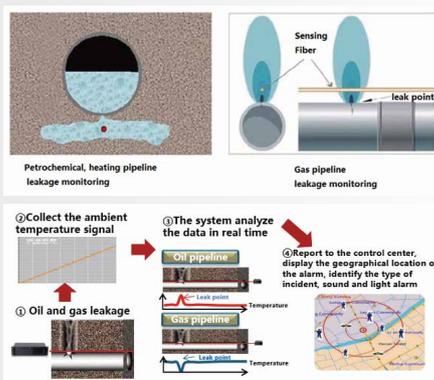
Pipeline inspection visualization

- Due to the extreme lengths of oil and gas pipelines, inspection work is a difficult challenge.
- Mobile emergency terminals and drones can effectively improve the efficiency of pipeline inspection work.



Pipeline Intrusion alarm system

- Detection distance: <50km
- Positioning accuracy: <50 m
- Intelligent intrusion identification, including illegal intrusion, theft, and vandalism.
- Audio linkage, video linkage, alarm linkage, real-time positioning and alarm.
- Long-range alarm and alarm broadcast to warn suspicious persons or animals.



Pipeline leakage alarm system

- Detection range: <50 km
- Positioning accuracy: 2m
- Temperature accuracy: 1 °C
- Rapid detection of oil & gas leakage, real-time positioning and alarm.
- Audio linkage, video linkage, and alarm linkage for timely informing area security personnel.

## Stations

### • Key Areas And Core Facilities

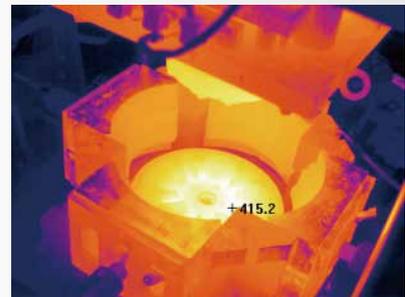
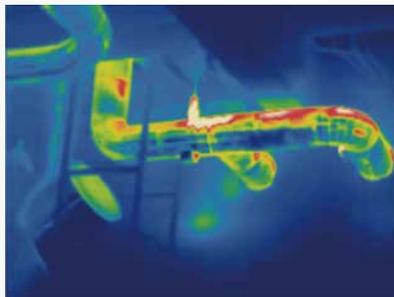
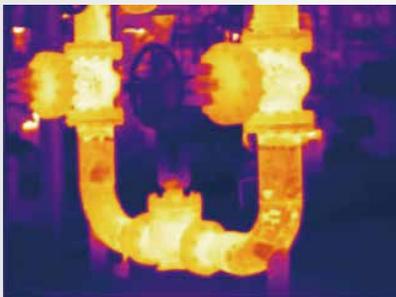
Many flammable and explosive substances are located in key station areas and core facilities. Explosion-proof cameras reduce the risk of explosions through the monitoring of facility operating status, staff operations, and vehicles.



Visual Monitoring with Explosion-proof Camera

### • Thermal Imaging

Thermal imaging system provides facility damage and overheating detection.



**Refinery + Chemical**



**Perimeter**



**Entrance & Exit**



**Indoor Office Area**

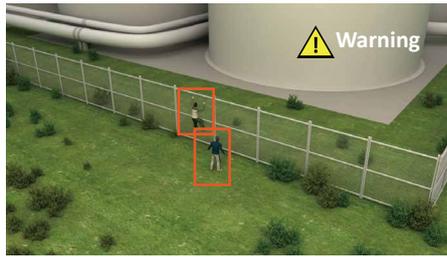
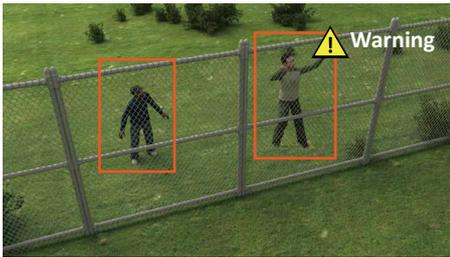


**Key Areas and Core Facilities**



**• Perimeter Intrusion Protection**

- Various sensors available: vibration fiber, pulse electronic fence, microwave, and infrared shooting.
- Timely detection of illegal intrusion of people and vehicles to ensure the safety of perimeter area.
- Video surveillance link provides on-site video monitoring and remote alarm warnings.



**• Vehicle Entrance & Exit Management**

- License plate recognition system.
- Whitelist, blacklist, and barrier control.
- Vehicle license plate and information are recorded for easy records search and analytics.



**• Key Areas And Core Facilities**

- Flammable and explosive substances are located in key areas and core facilities such as the refining unit, tank field, auxiliary device, pumping station, metering station, and warehouse.
- Explosion-proof cameras achieve effective visual monitoring under any conditions.



Visual monitoring with explosion-proof cameras



refining unit



tank field



auxiliary device



warehouse

In a refinery, numerous areas, such as laboratories, sewage treatment facilities, and chemical warehouses contain highly corrosive gases and chemicals. Anti-corrosion cameras ensure long-term, normal operation of the video surveillance system, keeping the refinery safe.



Anti-corrosion video surveillance system



laboratory Area



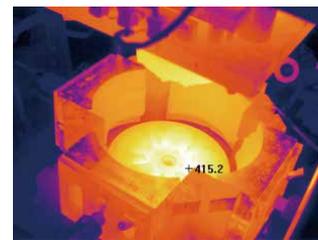
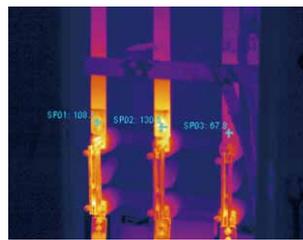
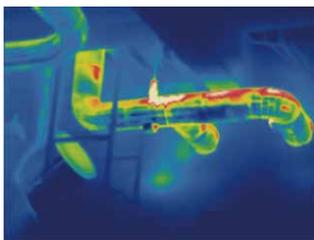
sewage treatment



warehouse

### • Thermal Imaging

The thermal imaging system provides facility damage and overheating detection.



### • Indoor Office Area

- At the entrance to the office area, the set of multi-lens cameras with 180 degree panoramic view can catch the details of people and cars.
- Indoors, fisheye cameras allow for wide-angle surveillance. An access control system can manage access and record staff attendance.
- An emergency alarm system can be configured to alert personnel of emergencies.



## Gas Station



Entrance & Exit



Refueling Area



Unloading Area



Business Station Area



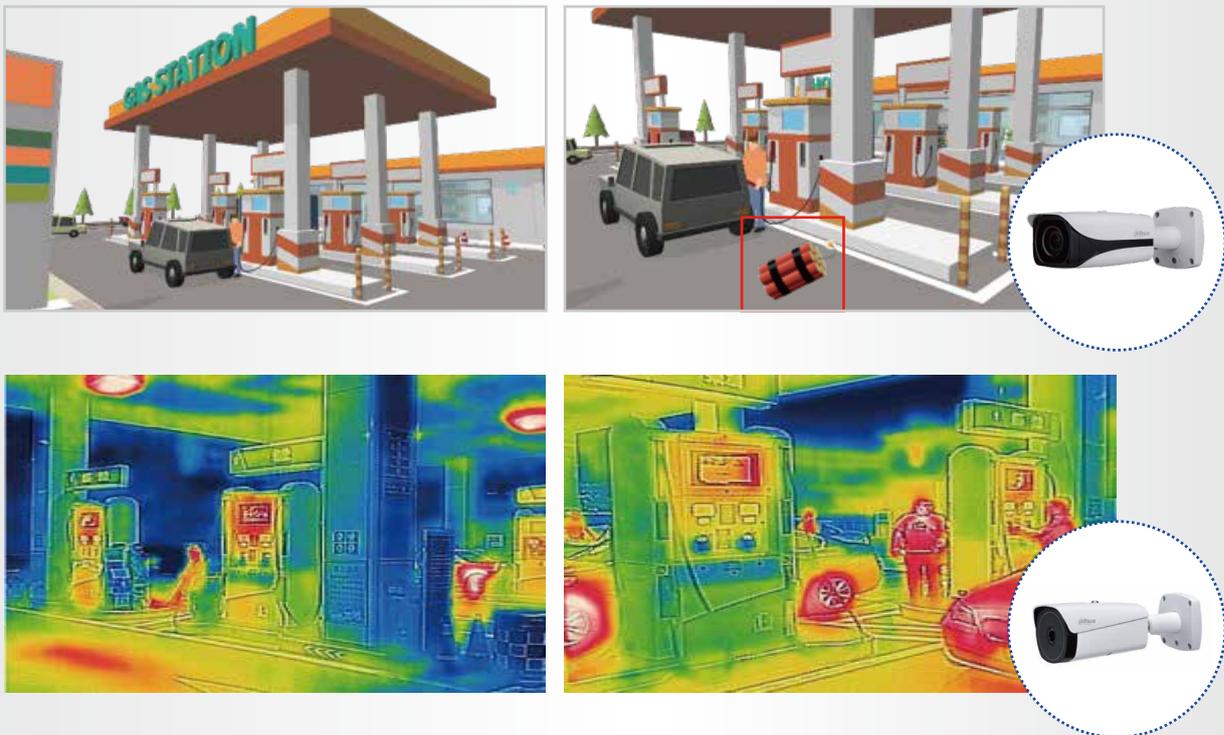
**Entrance & Exit Area**

- LRP system for automatic license plate capture and recognition.
- Blacklist function instantly triggers an alarm when illegal vehicles are detected.
- Traffic flow information analysis identifies peak periods, allowing manpower and oil transportation to be effectively managed.
- Instant detection of illegal oil hoarding and terrorist activity.



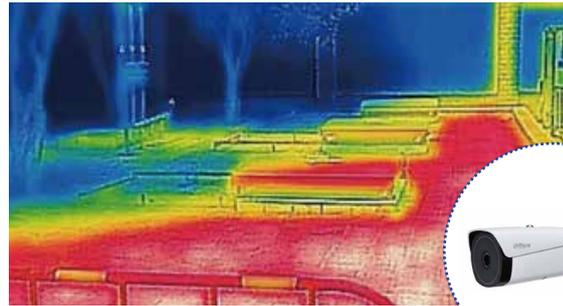
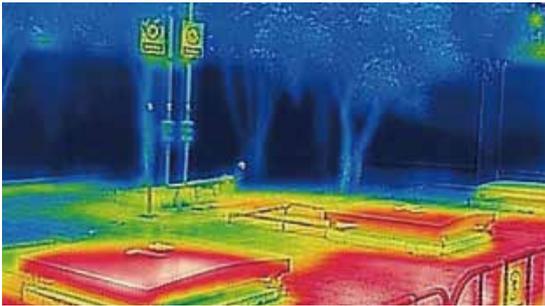
**Refueling Area**

- Intelligent analytics detect dangerous abandoned objects and keep the refueling area safe.
- Customer refueling behavior is recorded and analyzed in real-time to detect suspicious actions.
- Alarm information is instantly pushed to mobile clients and control centers when triggered.
- Thermal imaging detects overheating, damage, and leakage of refueling equipment.



**Unloading Area**

- Real-time recording of tanker unloading operation process, unloading port details, vehicle details and the complete view of unloading area.
- Intelligent analytics features such as tripwire and intrusion detection keep the unloading area safe by providing an early warning of illegal activity.
- Abandoned object detection discovers potentially dangerous objects before they can cause harm.
- Alarm information is instantly pushed to mobile clients and control centers when triggered.
- Thermal imaging detects overheating and damage of unloading equipment.



**Business Station Area**

- Record a live panoramic view of the business station area and cash register, as well as customer behavior.
- Point of Sale (POS) integration features associate video with POS information.
- The emergency alarm system triggers an alert in emergencies.
- Synchronized audio recording can provide valid evidence to settle disputes.
- Intelligent analytics features show a heat map and traffic flows throughout the business area.



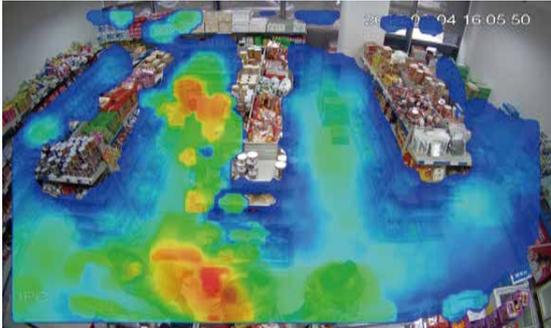
>> **Panoramic surveillance**

The 4K Ultra-Smart fisheye camera provides a 360 degree overview of the area in high definition.



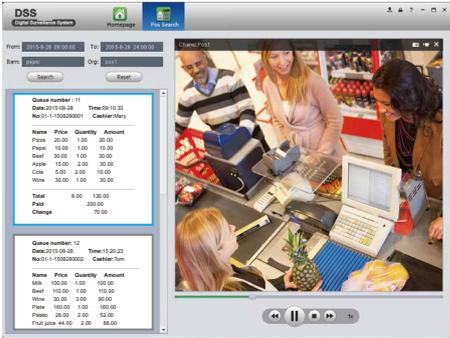
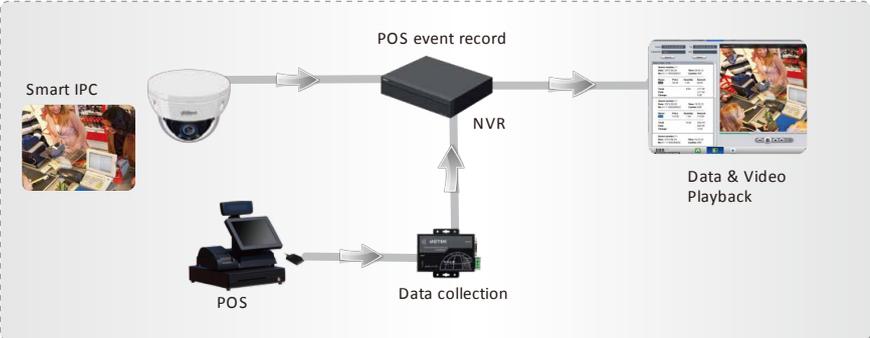
>> **Heat map**

Heat map features find the most active areas and create reports based on customer traffic. This provides valuable information for business and gas station management, allowing operators to enhance customer satisfaction and service.

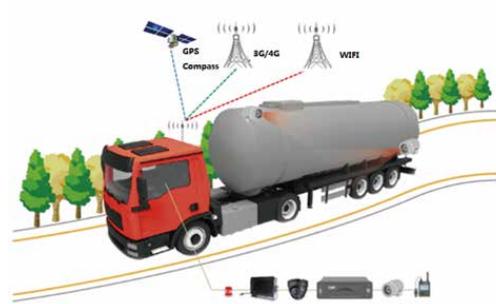


>> **POS information overlay**

- Video and POS information can be used as evidence when there is a dispute over goods and amounts.
- Video and POS information can be used as evidence when the gas station manager checks the amount of goods and sales.



## Tanker



- Real-time recording and positioning including vehicle travel area, travel path, speed, acceleration, deceleration, and steering.
- Radio and audio equipment allow for remote management and scheduling.
- Supports WiFi and 3G / 4G mobile networks with automatic switching.
- Supports automatic wake-up and offline functions.

## SOLUTION HIGHLIGHTS

### Industry-Grade Design



Cameras are designed in accordance with industrial standards with a variety of features such as explosion-proof, anti-corrosion, NEMA 4X certification, and IP68. It performs effectively in various harsh environments.

### Advanced Intelligent Application



tripwire



intrusion



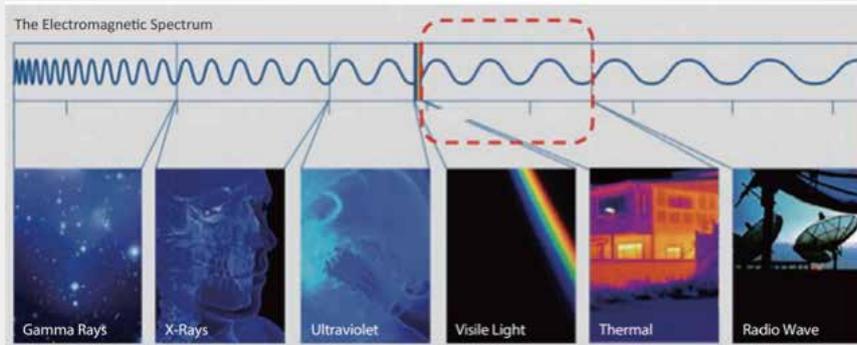
electric fence



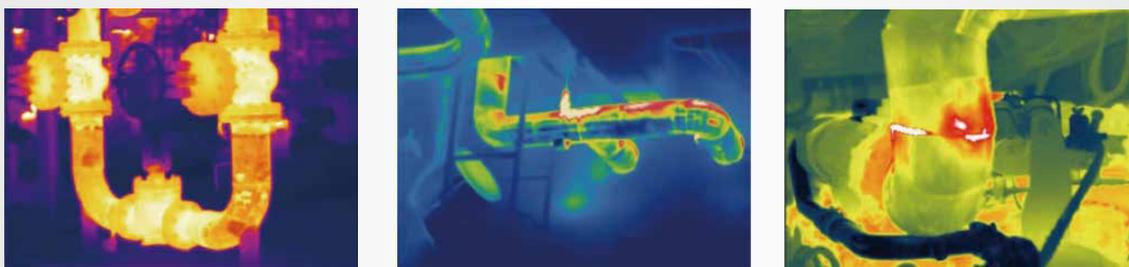
missing/abandoned

- Features smart-detection functions such as tripwire, intrusion, auto-tracking, missing or abandoned objects, and face detection.
- It can complement your artificial shortage, reduce labor costs, and increase security efficiency through 24/7 video analytics.

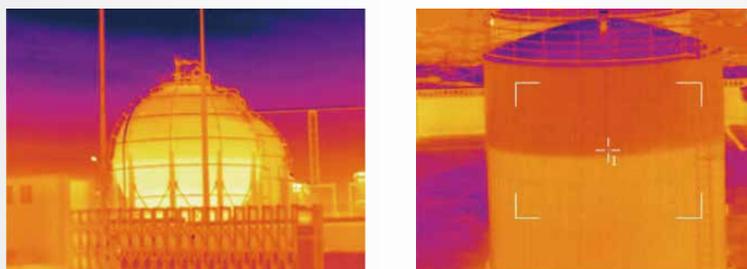
## Smart Thermal Imaging



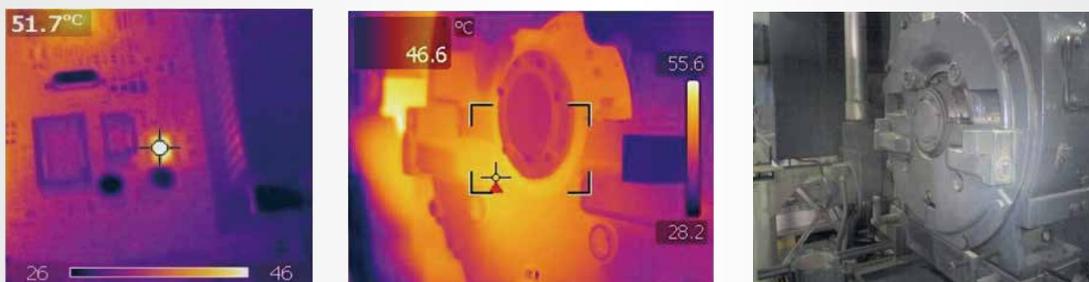
- Any object with a temperature above absolute zero (-273.15 °C) emits infrared radiation. Infrared radiation sits between the visible spectrum (0.4~0.75µm) and microwave spectrum (>15µm).
- Different amounts of infrared radiation are collected by the sensor and formed into a thermal image. Thermal images include temperature information and special algorithms can be used to calculate exact temperatures in the image.



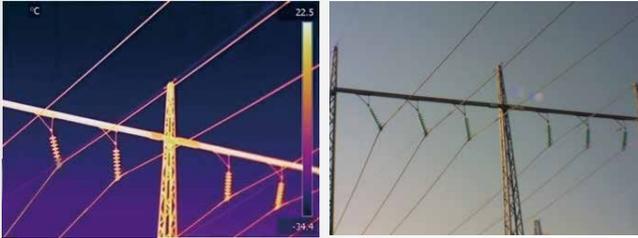
Pipeline leakage and damage detection.



Oil & Gas depot application, level detection and fault detection.



Power dissipation analytics, overheating detection.



Power system fault detection, temperature measurement

## Multi-Dimensional Deployment

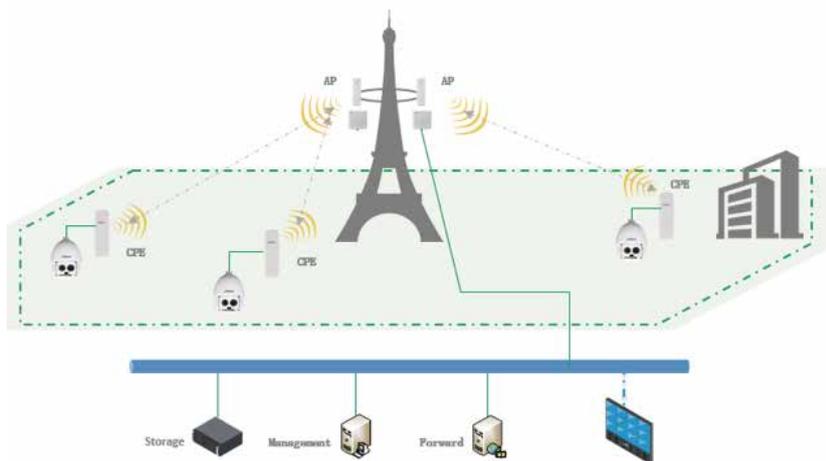
- Efficient inspection of oilfields, pipelines, and refineries is a significant challenge facing the energy industry.
- Mobile devices such as mobile handheld terminals, and drone systems support all-weather, all-dimension, and three-dimensional deployment to efficiently inspect energy equipment sites.



## Multi-Type Power Supply and Data Transmission



- Power supply and data transmission are often a severe challenge for some energy industry scenarios such as oilfields and pipelines.
- The use of wind & solar power supply systems and 5.8G wireless microwave transmission systems solve data and power problems while saving construction costs and reducing construction difficulties.



## Strict Authority Control



- There are various indoor office areas in the energy scenes such as pipeline stations, refineries, and oil depots.
- The Dahua Access Control System allows different staff members to have different permissions, ensuring the safety of indoor areas and providing attendance tracking functionality.

## High-Definition Visualization



- All aspects of the surveillance system, including acquisition, transmission, storage, display, and control, are all displayed and recorded in high definition.
- High definition monitoring ensures full coverage of the entire oil & gas business process.

# PRODUCT SHOWCASE

DH-EPC230U



- Material: 304 or 316L Stainless Steel
- 1080P Resolution, 30x optical zoom, IR Distance 100m
- H.265 & H.264 Triple-streams encoding
- IVS: Tripwire, Intrusion, Missing/Abandoned, Face Detection
- IP68, Working Temperature -40°C ~ 60°C
- Ex-Protection grade: EX II 2 G Ex db IIC T6 Gb, EX II 2 D Ex tb IIIC T80°C Db
- Ex-Proof certificate: ATEX, IECEx

DH-EPC230U-PTZ



- Material: 316L Stainless Steel
- 1080P Resolution, 30x optical zoom
- H.265 & H.264 Triple-streams encoding
- IVS: Tripwire, Intrusion, Missing/Abandoned, Face Detection
- IP67, Working Temperature -40°C ~ 60°C
- Explosion-proof

DH-EPC230U-PTZ-IR



- Material: 316L Stainless Steel
- 1080P Resolution, 30x optical zoom, IR Distance 100m
- H.265 & H.264 Triple-stream encoding
- IVS: Tripwire, Intrusion, Missing/Abandoned, Face Detection
- IP67, Working Temperature -40°C ~ 60°C
- Explosion-proof

SDZW2030U-N-SL



- Material: 316L Stainless Steel
- 2 MP, 30x optical zoom
- Max. IR Distance 100m
- Starlight, 120dB True WDR
- H.265 & H.264 Triple-stream encoding
- IVS: Tripwire, Intrusion, Missing/Abandoned, Face Detection
- IP68, IK10, NEMA 4X testing, AC24V/DC12V/PoE+

DH-SD60230U-HNI-SL



- Material: 316L Stainless Steel
- 2 MP, 30x optical zoom
- Starlight, 120dB True WDR
- H.265 & H.264 Triple-stream encoding
- IVS: Tripwire, Intrusion, Missing/Abandoned, Face Detection, Auto-tracking
- IP68, IK10, NEMA 4X testing, AC24V/PoE+
- Working Temperature: -40°C ~ 70°C

DH-IPC-HDBW8232E-Z-SL



- Material: 316L Stainless Steel
- 2 MP, 4x optical zoom
- Max. IR Distance 50m
- Starlight, 120dB True WDR
- H.265 & H.264 Triple-stream encoding
- IVS: Tripwire, Intrusion, Missing/Abandoned, Face Detection
- IP67, IK10, NEMA 4X testing, AC24V/DC12V/PoE+

## PRODUCT SHOWCASE

TPC-BF5600-T



- 640\*512 VOx uncooled thermal sensor technology
- Athermalized Lens, Focus-free
- Support temperature measurement-40°C ~+550°C
- Support ROI, Motion Detection, Color Palettes
- Tri-Mode for video output :IP/HDCVI/Analog
- IP66, PoE, -40°C~+60°C

TPC-PT8620-T



- 1/1.9" 2Megapixel progressive scan Exmor CMOS
- Max 60fps@720P and 30fps@1080P resolution
- Powerful 30x optical zoom
- 640\*512 VOx uncooled thermal sensor technology
- Athermalized Lens(thermal camera),Focus-free
- Support temperature measurement-40°C ~+550°C
- Support ROI, Motion Detection, Color Palettes
- IVS, IP66, -40°C~+70°C

TPC-SD8620-T



- Powerful 30x optical zoom
- 640\*512 VOx uncooled thermal sensor technology
- Athermalized Lens(thermal camera),Focus-free
- Support temperature measurement-40°C ~+550°C
- Support PIP(picture in picture)
- Support ROI, Motion Detection, Color Palettes
- IVS, IP66, -40°C~+70°C

IPC-PFW8800-A180



- Four 1/2.8" 2MP progressive scan Exmor R CMOS
- Smart Triple-stream supported
- Max 25fps@4096x1800
- Support not less than 180-degree panoramic view
- Intelligent Function
- Max. IR LEDs length 30m
- Support IP67, IK10

IPC-HDBW8231E-Z



- 1/2.8" 2Megapixel progressive scan CMOS
- H.265&H.264 triple-stream encoding
- 50/60fps@1080(1920x1080)
- Smart Detection supported
- 2.7mm ~12mm motorized lens
- Max. IR Length 50m
- IP67, IK10, DC12V/AC24V/PoE

IPC-EBW8630



- 1/1.8" 6Megapixel progressive scan CMOS
- Max 25/30fps@6.0M(3072x2048)
- Multiple de-warp Mode: Original ,Panoramic
- Max.IR LEDs Length 10m
- 1/1 Audio in/out(Built in Mic)
- Micro SD memory, IP67, IK10, PoE

## PRODUCT SHOWCASE

### ITC237-PU1B-L



- Embedded with LPR algorithm inside the camera.
- Support plate cutout, overview picture snapshot and video recording
- Embedded with whitelist database, barrier control
- Powerful 5-50mm manual lens and white light, ideal for long distance ANPR as far as 40m
- Working temperature -30°C~+60°C, IP66
- True WDR technology

### NVR608-32-4KS2



- Intel Processor
- Max 32 IP Camera Inputs
- Max 384Mbps Incoming Bandwidth
- Up to 12MP Resolution for Preview and Playback
- Supports RAID 0/1/5/6/10/50/60
- Smart Tracking and Intelligent Video

### DSS4004



- Support single input of 300Mbps, forwarding of 300Mbps, and storage of 100Mbps
- Max support 500-ch input / 200-device input for surveillance camera
- Max support 50-device input for LPR camera
- Hot stand-by mode, N+M redundancy
- Highly open, good compatibility

### MPT310



- H.264 dual-stream video compression
- Up to 25fps@1080P resolution recording
- Support "one-button" to start record, take photos, alarm and PTT
- 4.0 inch TFT LCD, support touch screen
- Wireless access Wi-Fi, 4G FDD-LTE (optional), WCDMA (optional)
- Support Global Positioning System (GPS)
- Support Bluetooth, fingerprint identification, license plate recognition
- Battery 4000mA/H

### ASA2212A



- Local standalone manages individual attendance
- Touch keyboard and LCD display
- Support 10,000 card users & 10,000 unlock records & 30,000 attendance records
- Support mifare card
- Support card, password, fingerprint and combination
- Watch dog function prevents device malfunction

### ARC5408C-C



- 8 on-board zones
- 4 alarm out
- 8 alarm keypad
- 4CH @ 720P CVS/IPC
- 1/1ch audio in/out
- 2x3.5" HDD, local storage and playback, alarm and video review
- Support wireless remote arming/disarming
- TCP/IP, WCDMA, PSTN

## PRODUCT SHOWCASE

### UAV



- Thermal imaging and HD visible light cameras
- Triple-axis anti-shake technology
- Maximum flight altitude: 5KM
- Maximum control distance: 10KM
- Maximum flight speed: 25m / s
- Wind resistance: 7
- Smart battery: 22000mAh

### PFM880/ PFM881/ PFM886-10/ PFM886-20



- 0-20Km distance
- Max 867Mbps bandwidth
- Directional, omni-directional optional
- Supports automatic ranging between client and base station
- Equipment protection : 15KV ESD
- -40°C~+70°C working temperature

## SUCCESS STORIES



### Angot Oilfield, Afghanistan

- The Angot Oilfield was the first large-scale oilfield development project in Afghanistan.
- Dahua provided a complete video surveillance system for the Angot oilfield, including speed domes on the front-end, and DVR storage on the back-end.



### Shell & BP Gas Stations in The UK Ireland

- Shell and BP are multinational oil and gas companies with gas stations situated across the United Kingdom.
- Dahua was tasked with upgrading outdated analogue systems throughout Shell and BP gas stations. Dahua secured their gas stations with an IP system. A total of over 1600 cameras (3MP IP Camera) were used across 140 sites.

## SUCCESS STORIES



### Statoil ASA (Norway) Gas Station

- Statoil ASA is one of the world's largest oil companies in Northern Europe and in Norway with more than 25,000 employees. As one of the world's largest net oil sellers and a major supplier of natural gas to the continent, Statoil operates 2,000 gas stations in nine countries.
- Dahua provides a full range of video surveillance solutions, including a full set of HDCVI (HCVR+HAC 2MP Camera) products to ensure the daily operation of gas station security.



### China National Petroleum Corp. (CNPC) Gas Station

- PetroChina is one of the largest producers and sellers of petroleum products in China with a total of 20714 gas stations. In 2015, sales of refined oil in China reached 116.25 million tons of which retail volume of 80.54 million tons accounted for 69.3%.
- Since 2013, Dahua has built more than 3,000 gas station video surveillance systems(2MP IP Camera+5 series NVR+DSS) all over China.



### Sinopec Corp. Gas Station

- Sinopec oil sales market covers the whole of China with 30,121 gas stations. In 2015, the company's domestic refined oil sales reached 151 million tons, with an increase of 7.6%.
- From the beginning of 2014, Dahua undertook the construction of video surveillance systems(2MP IP Camera+5 series NVR+DSS) in many provinces including Jiangsu, Shanghai, Hunan, Hebei, Guangdong and Guizhou. The total number of gas stations exceeds 3000.



### China National Petroleum Corp. (CNPC) Daqing Oilfield

- Daqing Oilfield is a wholly-owned subsidiary of CNPC and the world's largest tertiary oil production base. Daqing Oilfield has more than 90,000 oil wells and 27 consecutive years of crude oil production reaching 50 million tons.
- Dahua helped Daqing Oilfield to construct and transform their security system. Dahua provided a full set of video surveillance and perimeter alarm system in which total sales exceeded 20 million RMB.

## SUCCESS STORIES



### Sinopec Corp. Sinopec Shengli Oilfield

- Shengli Oilfield is one of Sinopec's largest oilfields. There are 81 oilfields with an oil reserve of 5.408 billion tons. The annual production capacity is 27 million tons. The cumulative production of crude oil is 1.102 billion tons and the production of natural gas is 56.365 billion cubic meters.
- Dahua help Shenli Oilfield construct and transform their security system. Dahua provide a full set of video surveillance and perimeter alarm system equipment in which total sales exceeded 10 million RMB.



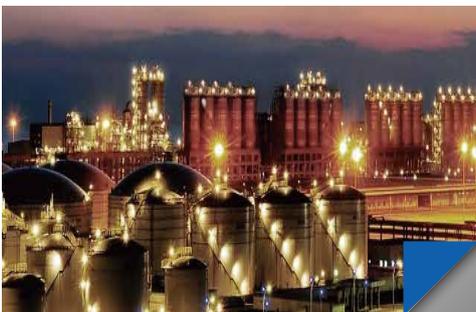
### China National Petroleum Corp. (CNPC) West - East Gas Transmission Pipeline

- "West-East" pipeline is the longest and largest caliber gas pipeline in China. The length of pipeline is 4200 km.
- From 2008- 2015, Dahua constructed the first-line, second-line, and third-line security systems, including video surveillance systems, industrial television systems and perimeter alarm systems.



### Sinopec Corp. Sinopec Qilu Petrochemical Company

- Qilu Petrochemical Company is a national super-large petrochemical enterprise directly under Sinopec Group. It is a large-scale oil refining, chemical and chemical fiber joint venture.
- Dahua provide a full set of industrial television and video surveillance system with a total amount of 15 million RMB and enhance the security level of chemical district.



### China National Petroleum Corp. (CNPC) Tankers

- The tanker security monitoring project made use of a three-level platform management and four-level application architecture.
- Dahua has built security systems for nearly 2,000 tankers. The systems include DVR, front-end and ancillary equipment. The network construction uses a 3G + WIFI combination.



## QUALITY BY DESIGN

\* Design and specifications are subject to change without notice.

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