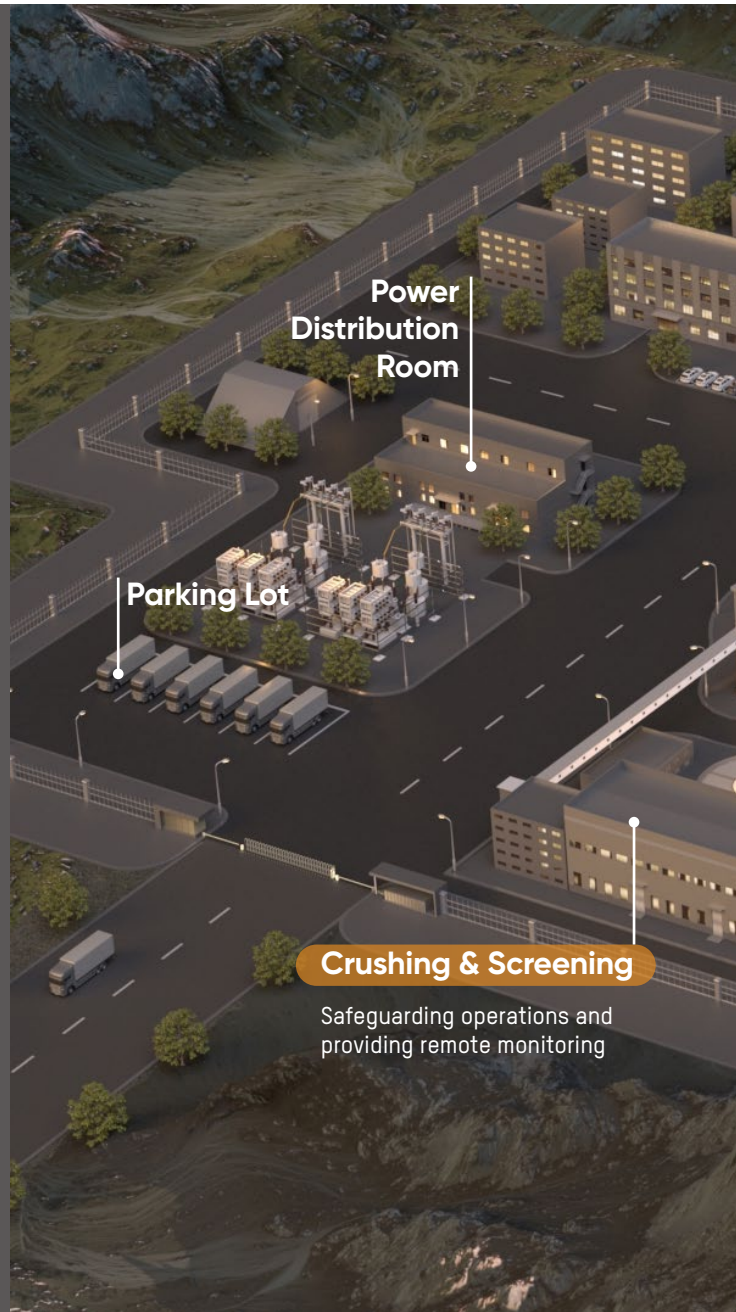# Hikvision
Mining Industry Solution

Safeguarding employees and operations
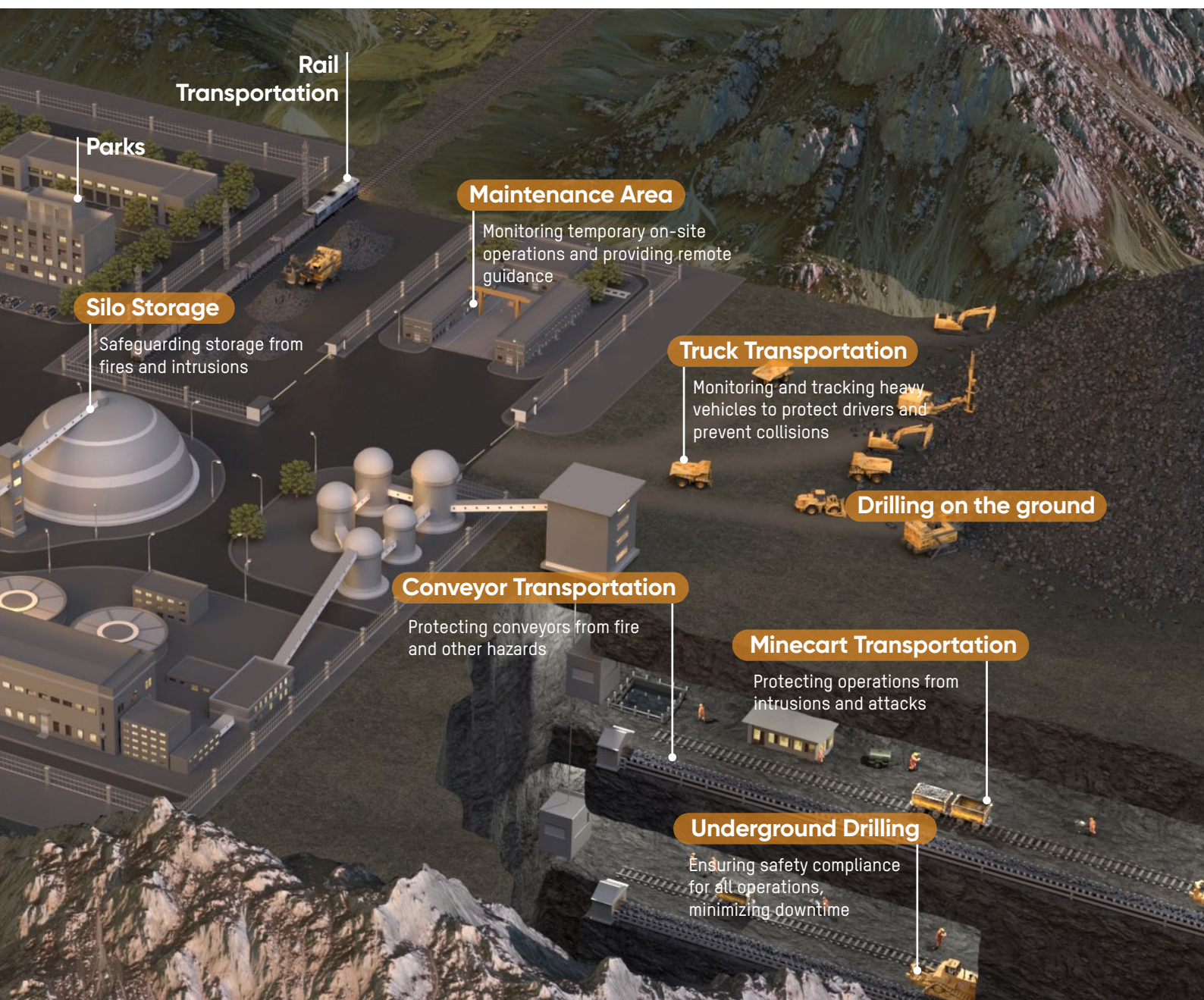with boosted productivity

HIKVISION®

Solution Overview

Whether underground or on the surface, priority number one in mining is workforce safety. Slips, trips, and falls in high-risk environments can mean serious consequences. Physical loss or damage to assets causes costly downtime, posing tremendous concerns for mining companies. Furthermore, the industry requires digital technologies – automation, improved manufacturing processes, and production optimizations – to promote operational efficiency and standardize the work process.

Integrated Systems Improve Safety for Employees, Operations and Facilities

Power Distribution Room

Parking Lot

Crushing & Screening

Safeguarding operations and providing remote monitoring

Taking these concerns into account, Hikvision's Mining Industry Solution protects employees, operations, and assets with high efficiency. Hikvision's solution harnesses the power of AI technology and top-tier products to help ensure workforce and facility safety, fluid operations, and improved productivity in general.

Continue reading to find out how our solution can safeguard your employees and critical operations with higher efficiency.

Rail Transportation

Parks

Maintenance Area
Monitoring temporary on-site operations and providing remote guidance

Silo Storage
Safeguarding storage from fires and intrusions

Truck Transportation
Monitoring and tracking heavy vehicles to protect drivers and prevent collisions

Drilling on the ground

Conveyor Transportation
Protecting conveyors from fire and other hazards

Minecart Transportation
Protecting operations from intrusions and attacks

Underground Drilling
Ensuring safety compliance for all operations, minimizing downtime

Focusing on Personnel Safety and Risk Reduction

Hikvision's solution for the mining industry boosts health and safety for personnel with continuous monitoring of critical areas using AI-powered analytics. The solution can further identify, manage, and prevent potential risks. It also helps mining operators comply with safety regulations – ultimately saving lives.

AI-powered analytics for personnel protection

PPE compliance detection

Wearing PPE (personal protective equipment) elevates worker safety during the production and maintenance processes in hazardous environments.
With Hikvision's intelligent cameras and terminals, managers can remotely check employees' protective gear efficiently to maintain compliance and prevent injuries.

Hard Hats Protective Glasses Protective Masks

Safety Shoes Protective Clothing Safety Gloves

Violation detection

Safe Distance Detection

Violation detection inspects safety compliance and risks at the work site, providing safe distance detection, absence detection, and more, notifying supervisors when their employees step into dangerous or restricted areas, or when someone breaches local regulations.
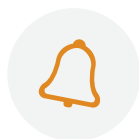
Dangerous activity detection
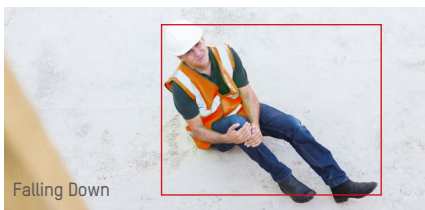
Falling Down

Dangerous activity detection identifies emergencies and hazardous events that can threaten worker safety, such as falling down, running, unauthorized gathering, and more, helping managers respond in a timely manner.

Real-Time Detection
Monitors and detects non-compliance of regulations or guidelines

Notifications & Alerts
Immediate notification of any type of safety violation

Safety Dashboards
An overview of the key metrics of safety compliance

Explosion-proof Cameras Deep Learning-equipped NVRs AI Open Platform

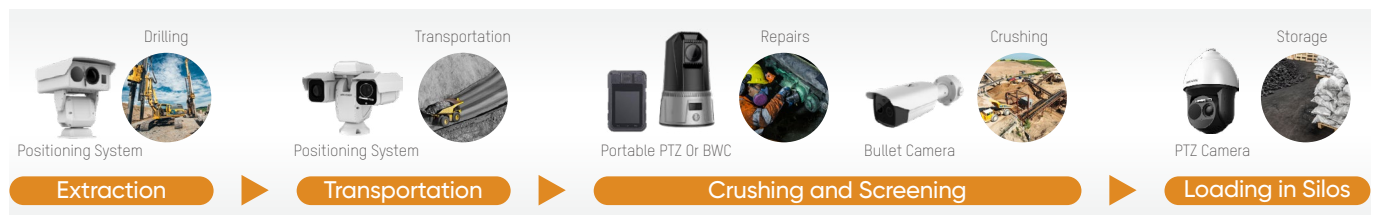# Ensuring Operational Efficiency and Productivity

Our solution adds visibility to mining operations and assists managers in predicting operational failures with intelligent video analysis. Incidents such as temperature anomalies and fire hazards can be detected and verified in the early stages, reducing losses and unnecessary downtime. A manager's duties get a boost when Hikvision makes their supervision smarter and more effective, decreasing labor costs and improving overall efficiency.

Optical solutions for operational supervision

Monitoring processes in open areas

Protecting workers in expansive, open areas such as large pits can pose many challenges. Site managers must conduct continuous safety monitoring of the entire production process.
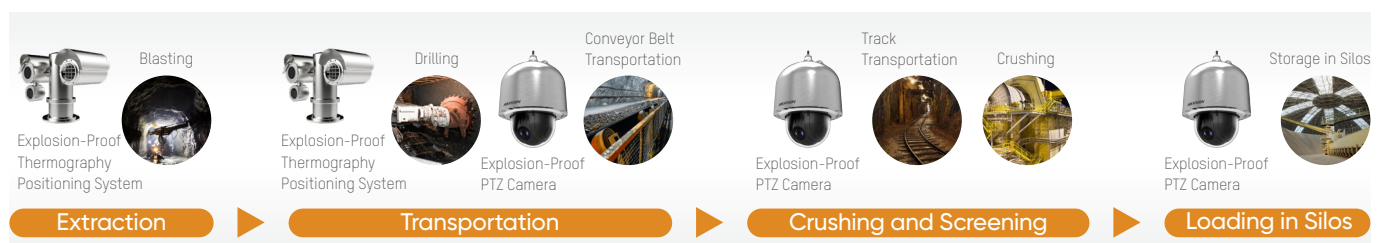Hikvision's Mining Solution helps users keep track of the entire operational process by using a control center connected to various optical cameras deployed at worksites, providing more efficient and secure remote management with 24/7 online protection.

Drilling — Positioning System | Transportation — Positioning System | Repairs — Portable PTZ Or BWC | Crushing — Bullet Camera | Storage — PTZ Camera

Extraction ▸ **Transportation** ▸ **Crushing and Screening** ▸ **Loading in Silos**
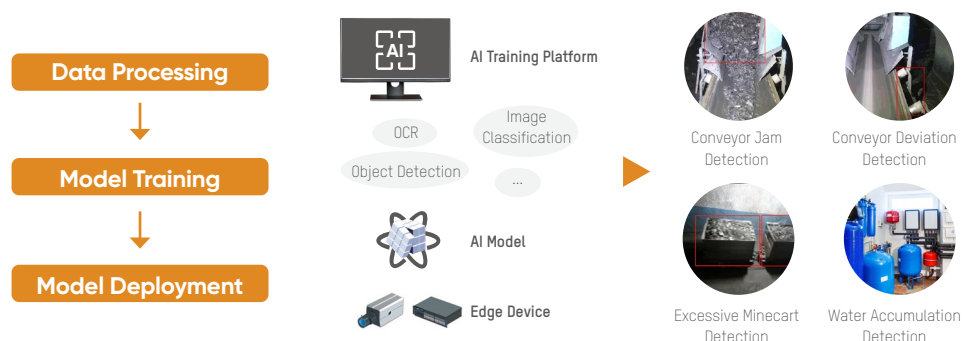
Processing monitoring in underground mines

Combustible substances – such as gas and chemical dust in drilling and blasting areas – elevate the risk of explosion and fire. What's more, mine fires and fire injuries remain serious hazards in equipment failures of mine tunnels or silos.
Our stainless steel explosion-proof cameras are designed for these extreme hazardous environments, providing stable and clear imaging to strengthen site-wide security and minimizing risk potentials.

Explosion-proof Cameras

Blasting — Explosion-Proof Thermography Positioning System | Drilling — Explosion-Proof Thermography Positioning System | Conveyor Belt Transportation — Explosion-Proof PTZ Camera | Track Transportation — Explosion-Proof PTZ Camera | Crushing | Storage in Silos — Explosion-Proof PTZ Camera

Extraction ▸ **Transportation** ▸ **Crushing and Screening** ▸ **Loading in Silos**

Asset status detection for underground mines

Our AI-powered image analytics support real-time alerts of abnormal status in mines via open AI platform. Integrated with on-site voice reminders and video, the analytics assist users intelligently, automatically identifying faults and intervening to greatly reduce downtime.

Data Processing → **Model Training** → **Model Deployment**

AI Training Platform — OCR, Image Classification, Object Detection, ...
AI Model
Edge Device

Conveyor Jam Detection | Conveyor Deviation Detection | Excessive Minecart Detection | Water Accumulation Detection

Remote anomaly detection with thermography

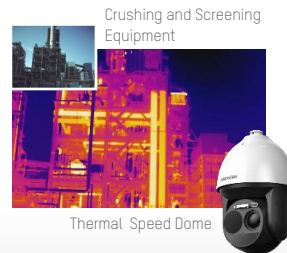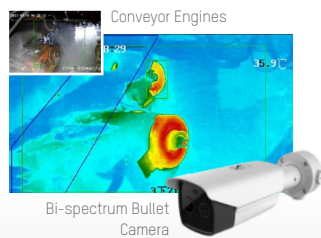## Industrial thermography for conveyor belts

Hikvision thermal cameras help capture temperature changes in the environment or equipment, rapidly detecting potential risks such as burning material or conveyor belts after long-distance transportation. When excessive temperatures are detected, our thermal cameras immediately trigger alarms on the central platform, equipping managers with critical information for the best response.
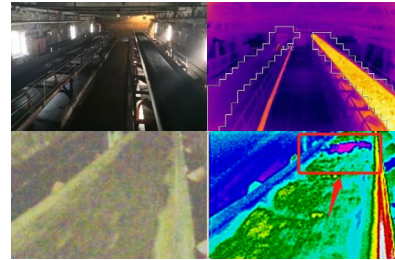
Bi-spectrum Bullet Camera

Industrial thermography for critical assets

Mining equipment is tremendously costly to repair or replace, so operators need to closely monitor high-value equipment. Our solution detects abnormal temperatures continuously around mining assets to catch potential failures early. This way, employees can take action before the equipment seizes or suffers damage, protecting workers at maximum efficiency and saving time and money.

Mining Drills

Bi-spectrum Explosion-proof Thermal PTZ

Conveyor Engines

Bi-spectrum Bullet Camera

Crushing and Screening Equipment

Thermal Speed Dome


Power Distribution Cabinet

Thermal cube camera

AR live interaction

Augmented reality in video imaging delivers an enhanced, panoramic view of every operational process in time without losing details. Mine operators can identify emergency issues quickly or review events remotely by bridging the physical and virtual worlds with 3D imaging.

32 MP 360-degree Panoramic & PTZ Cameras
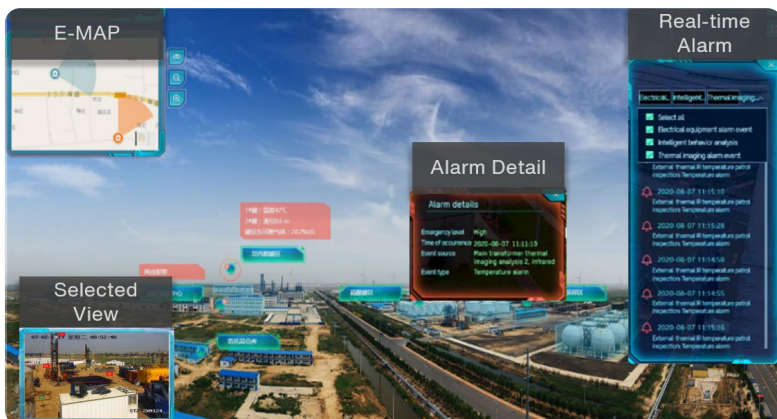
Enhanced awareness
From 2D GIS to 3D real images

Rapid understanding
One complete view of what's happening from cameras

Better information delivery
ANPR results, panic alarm, traffic data, and more

Transportation monitoring

The essential step of transporting minerals in the distribution process requires close monitoring. Drivers of transportation vehicles, such as large mining trucks and engineering vehicles, at dig sites often deal with blind spots which can cause collisions and injuries. Dangerous road conditions pose challenges as well.

Hikvision helps users solve these challenges with real-time vehicle tracking and monitoring based on automated, intelligent video driver assistance and activity detections.
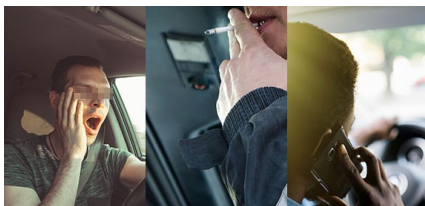
Real-time vehicle tracking & monitoring

Compared to traditional GPS positioning, Hikvision expands insight by adding video monitoring, intercom, and an emergency alarm system, which work together to track vehicle location and status for more efficient and effective event handling. Multi-dimensional driving data gets uploaded to the management platform so managers can stay on top of all activity.
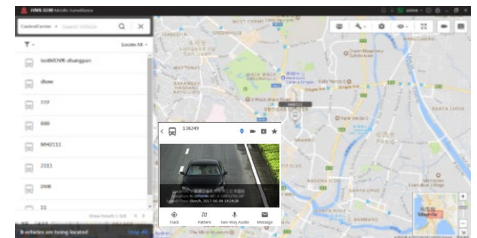
Driver assistance and detection

With the DBA, BSD, ADAS system, our solution provides intelligent driving analysis and detection, including fatigued driving, smoking and making a phone calls. The comprehensive driving assistance brings collision warning, deviation alarm, and blind spot detection, along with other functions to enhance safety and protect personnel.

Intelligent Driver Activity Analysis

Blind Spot Detection (BSD)

Intelligent Collision Warning

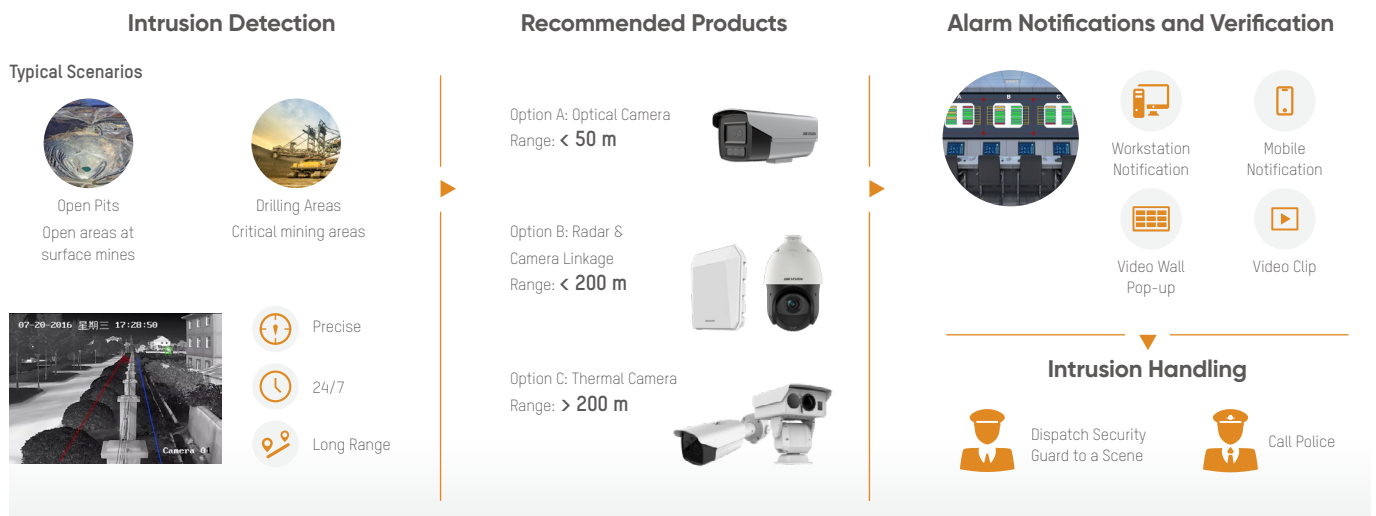| Interior Mobile Camera	Exterior Mobile Camera	Mobile Recorder	Intercom	LCD Monitor		DBA Camera	BSD Camera	ADAS Camera	Analysis server

Video Security System Products

ADAS Products

Providing Comprehensive Protection for Critical Infrastructure

Hikvision's solution builds the first line of perimeter protection for various high-value assets, preventing intrusions and safeguarding critical facilities from property damage or loss. Thanks to the clear and accurate remote imaging of our thermal and optical technologies and products, security management just got easier – even in low-light environments.

Perimeter protection at multiple sites

Our solution helps safeguard critical infrastructure, from perimeters to critical zones, with a series of optical cameras and radar and thermal devices. It can stop potential intruders in real time, alerting personnel of their presence when approaching restricted areas or attempting to breach a perimeter.

Intrusion Detection

Typical Scenarios

Open Pits
Open areas at surface mines

Drilling Areas
Critical mining areas

Precise

24/7

Long Range

Recommended Products

Option A: Optical Camera
Range: **< 50 m**

Option B: Radar & Camera Linkage
Range: **< 200 m**

Option C: Thermal Camera
Range: **> 200 m**

Alarm Notifications and Verification

Workstation Notification

Mobile Notification

Video Wall Pop-up

Video Clip

Intrusion Handling

Dispatch Security Guard to a Scene

Call Police

Temporary deployment for short-term operations requiring a temporary increase in monitoring points

Construction Sites

Drilling Areas

Long-term deployment for scenarios where electricity and internet are not readily available

Repairing Rooms

Stockyards

Solar-powered security camera kit

Users can enjoy timely monitoring 24/7 even with complex geographical and environmental conditions by using our Solar-powered Security Camera Kit. This kit effectively eases routine inspections at remote areas, minimizing human and hardware costs. Security staff can receive intelligent alerts in a timely manner when an abnormal event occurs. It requires no wiring for power or data transmission and can be installed virtually anywhere where there is a 3G/4G signal.

Fire prevention

Fire prevention is one of the core concerns of the mining industry. Spontaneous combustion, the accumulation of flammable materials, or smoking in unsafe areas can cause fires resulting in damage to surrounding assets as well as huge property losses. Our solution helps detect abnormally high temperatures and smoke before the worst happens.

Thermal Channel:
Fire source detection

The Thermal Channel works by comparing the difference between the target temperature and the environmental temperature. If the difference exceeds the threshold, an alarm will be generated.

Bi-spectrum Thermal PTZ Camera

Optical Channel:
Smoke detection

Optical lenses in the positioning system deliver smoke detection as a supplement to thermal fire source detection, which helps to locate suspicious targets earlier.

Bi-spectrum Thermal Positioning System

Vehicle management

Entrance & exit control

Hikvision offers flexible and efficient entrance & exit control for the mining industry, with varied access control levels for vehicles entering the park.

Vehicle type		Entrance	Exit
Private Car	Registered Vehicles	**Automatic access** ANPR Camera + I/O Relay Terminal + Barrier	**Automatic exit** ANPR Camera + I/O Relay Terminal + Barrier
	Visiting Vehicles	**Remote access granting** ANPR Camera + I/O Relay Terminal + **Video Intercom** +Barrier	
Truck	Registered Vehicles	**Automatic access** ANPR Camera + I/O Relay Terminal + Barrier	**Manual checking** Check the truck and open barrier manually
	Visiting Vehicles	**Remote access granting** Check the truck and open barrier manually	

Barrier   ANPR Camera   I/O Relay Terminal   Video Intercom   Control Client

On-site vehicle regulations management

Our vehicle checkpoints can be deployed on arterial roads in refinery and chemical plants to detect and send alarms upon detection of violations. Violations include speeding, illegal parking, and others, reducing potential risks while improving operations. All alarms and notification will be sent to security guards for further handling.

Visualizing Data for Better Insights

Hikvision's Solution for the Mining Industry features an all-inclusive dashboard to present perceived data in an intuitive, visualized way. The dashboard equips operations teams with a bird's eye view and multidimensional analytics, displaying on-going site operations and real-time inspection status with detailed information and data indexing. All of this comes together to inform and elevate decision-making.

Hikvision Mining Industry Solution
Safeguarding employees and operations
with boosted productivity

Hikvision Europe
Dirk Storklaan 3
2132 PX Hoofddorp
The Netherlands
T +31 23 5542770
info.eu@hikvision.com

f @HikvisionEurope   @HikvisionEurope   in @HikvisionEurope

HIKVISION
www.hikvision.com