Hikvision Thermographic Cube Camera Introduction

What is Temperature Sensing?

With the progress of society and the development of industrial manufacturing, the measurement index of **temperature** is playing an increasingly important role. This is because **most industrial equipment has the characteristics of temperature increasing during working abnormally**.

Monitoring temperature not only can be used in some **traditional industries** (petrochemical industry, power energy industry, metallurgical industry) in **monitoring the working status of core equipment**, but also can be used in **high-end manufacturing**, such as automobile manufacturing, to do **production process control**.

By sensing the temperature, we could **locate the risk and solve the hidden dangers in time** to avoid further losses, this we called temperature sensing.

A generator destroyed due to temperature exception in working abnormally

Why we use thermal cameras in Temperature Sensing?

HIKVISION

Non-contact

Non-contact temperature measurement, **not affect the normal working** of monitor target.

Visualized

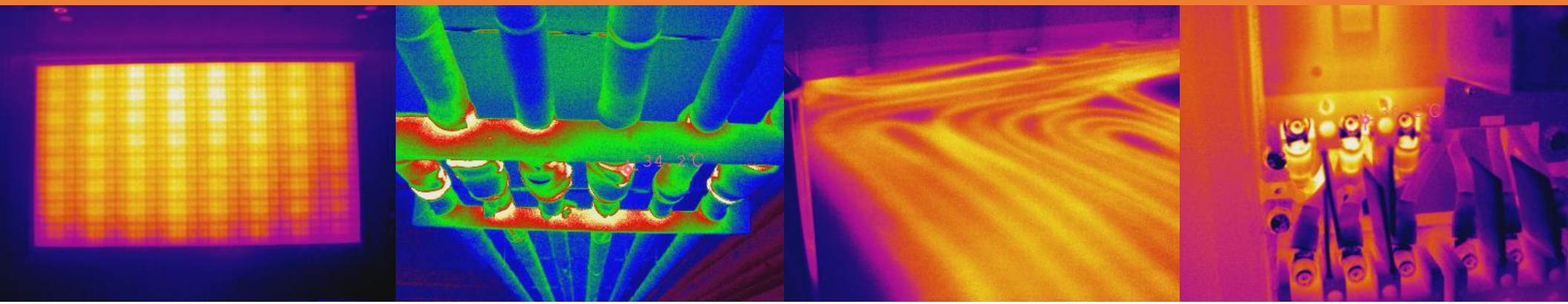
Visualized temperature measurement, help **double-checking problem** and improve problem solving efficiency

Multi-point

Multi-point temperature measurement, large field of view and **wide coverage, saving installation cost.**

Smart

Flexible measurement rules and high temperature/low temperature/temperature difference alarms, help in **more sensing methods**.

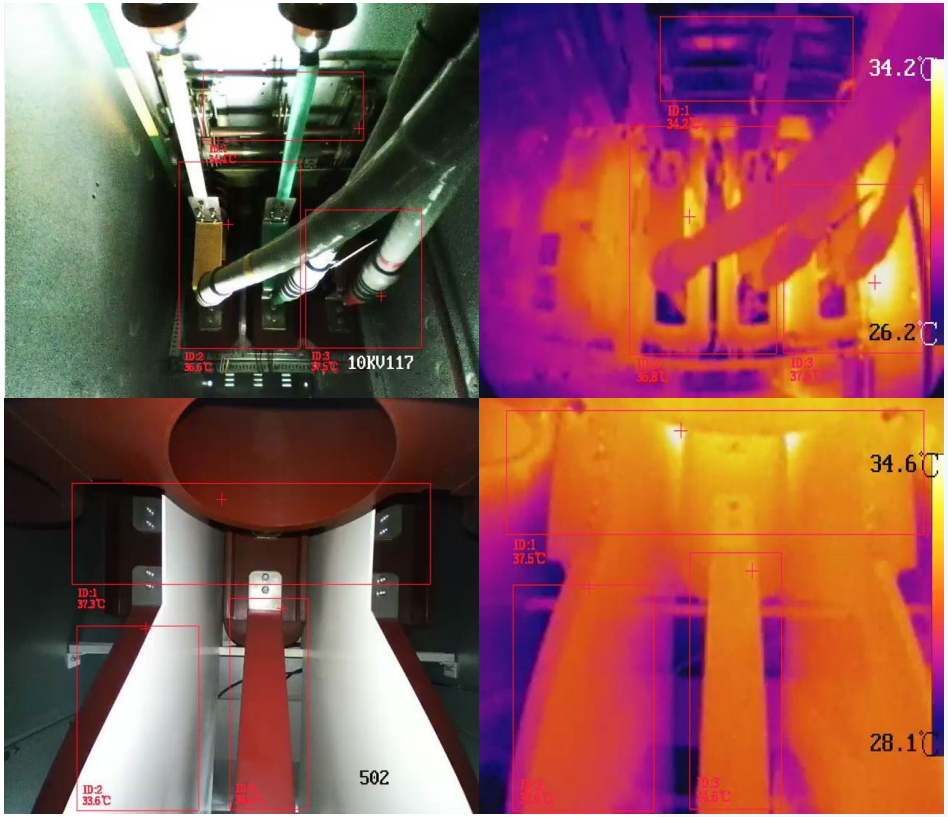


Product Overview – Thermographic Cube Camera

See Far, Go Further

- Thermal resolution : 160 × 120 （19200 Pixels）
- Optical resolution： 1920 × 1080 （2MP）
- Focal length: 2mm / 3mm
- FOV : 90° x 66.4° (2mm) / 50° x 37.2°(3mm)
- Temperature measurement range: -20℃ to 550℃
- Temperature measurement accuracy: ±2℃
- NETD: 40mk
- Rules： 10 points / 10 areas / 1 line
- ISAPI / SDK simple integration
- Shortest measurement disance: 10cm (2mm)/15cm(3mm)
- POE support
- IP 67

Electrical Industry – Distribution Cabinet



- **User :** Power provider / Industrial park maintenance agency / Building maintenance agency
- **Customer :** Electrical industry solution Integrator / Cabinet maintenance solution provider / Building maintenance service provider
- **Keywords :** Electrical cabinet monitor solution / Distribution cabinet maintenance solution

Why temperature sensing is required?

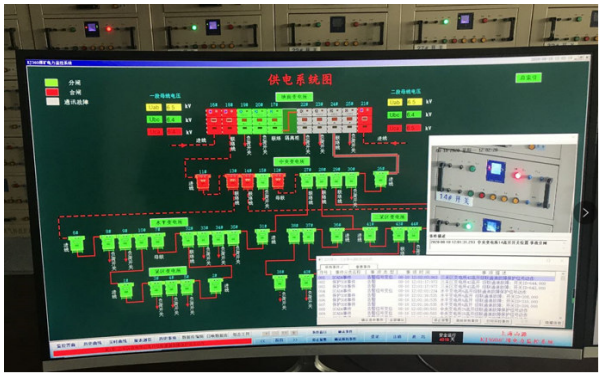
Abnormal working of power connector inside distribution cabinet may cause a regional outage, in severe cases it may cause a fire.

What are current solutions and disadvantages?

- **Manual inspection :** 1) Large workload, low efficiency 2) Usually once a month, not real time 3) Hard to statistical inspection data 4) Cost much if germanium window needed.
- **Contact temperature sensor** : 1) Only point temperature measurement and require large amounts 2) Easy to stain by ashes and turn to invalid, poor reliability 3) Not visualized solution and hard to double check

Electrical Industry – Distribution Cabinet

- Usually integrated with **customer's platform.** Customer controls whole system and **generate report.** Usually They need data rather than thermal image.

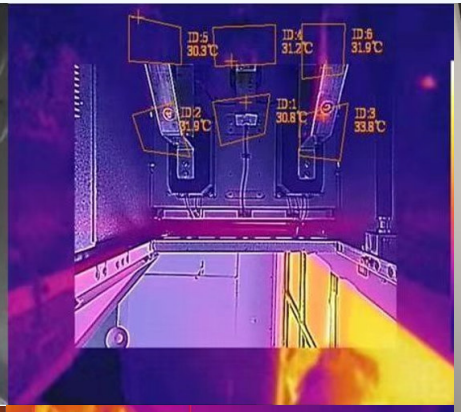


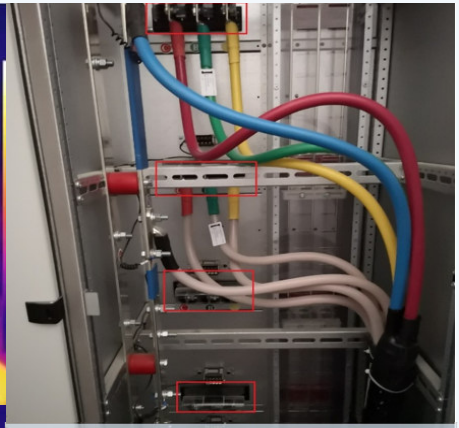
A electrical integrators' platform

See Far, Go Further

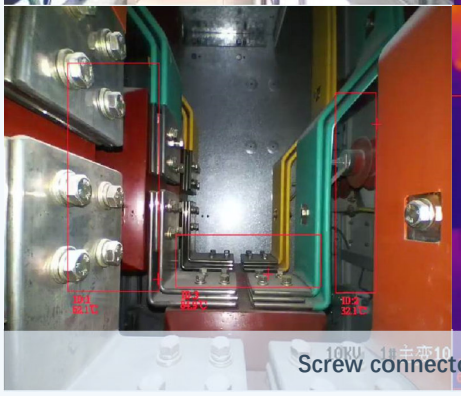
How to use thermal cameras?

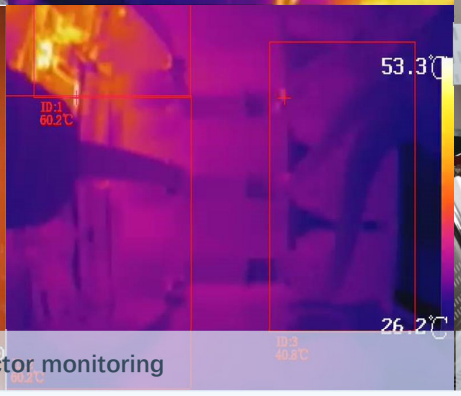
- Put the cube camera inside the 35KV / 10KV electrical cabinet and install it in the bottom, to monitor **cable cabinet power connector / screw connector / circuit breaker connector / transformer room / Feeder cabinets**



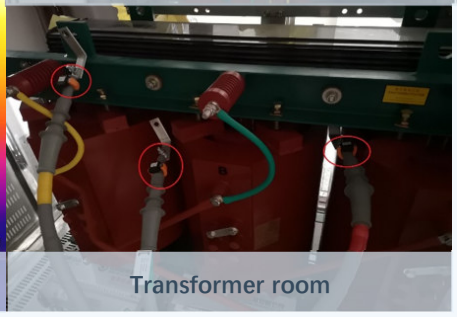


Feeder cabinets





Screw connector monitoring



Transformer room

Key Industry –
Datacenter Temperature sensing

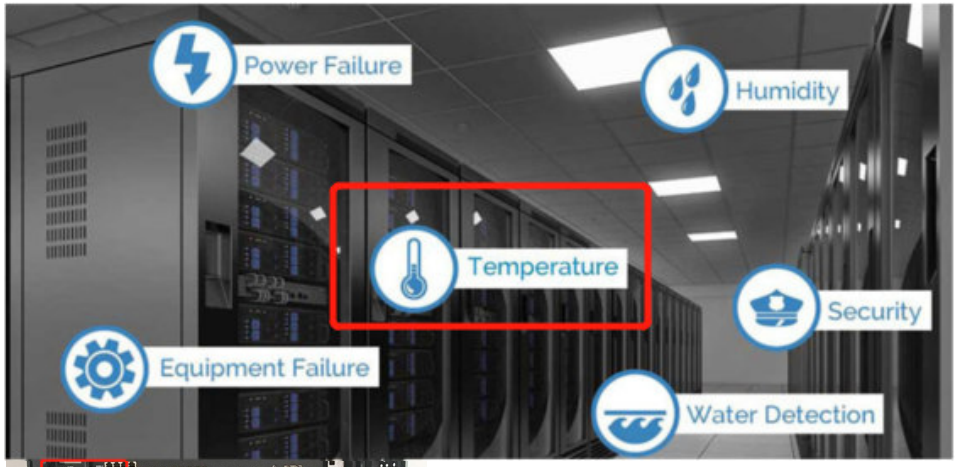
- **User :** Enterprise park. bank, hospital, datacenter building
- **Customer :** Datacenter solution provider; Server room solution integrator.
- **Keywords :** Datacenter monitoring; Dynamic server room monitoring ; Server monitor solution.

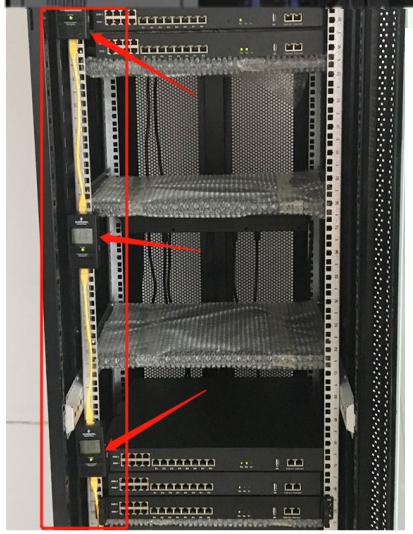
Why temperature sensing is required?

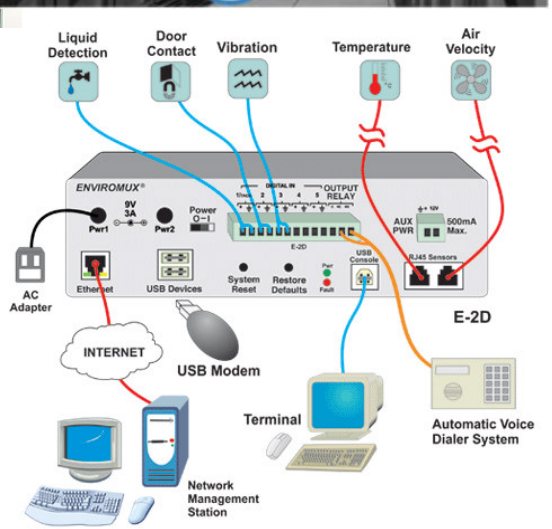
- **External temperature sensing of cabinet:** Generally speaking, Cabinets are required not to be fully filled by server equipment, however, engineering companies always have irregular installations. **If there is a problem with the equipment installation or the cabinet is too full, the cabinet will have heat dissipation problems** and the temperature will rise. At this time, the temperature exception can be a basis of detection.
- **Temperature sensing inside cabinet:** The server inside the cabinet might block the view of thermal cameras, therefore, thermal cameras could be used as a supplement to monitor key locations specifically.

What are current solutions and disadvantages?

Currently the monitor of all servers are all doing by **contact sensor**, which is **not visualized and hard to double check**. Thermal cameras could cover this pain point perfectly







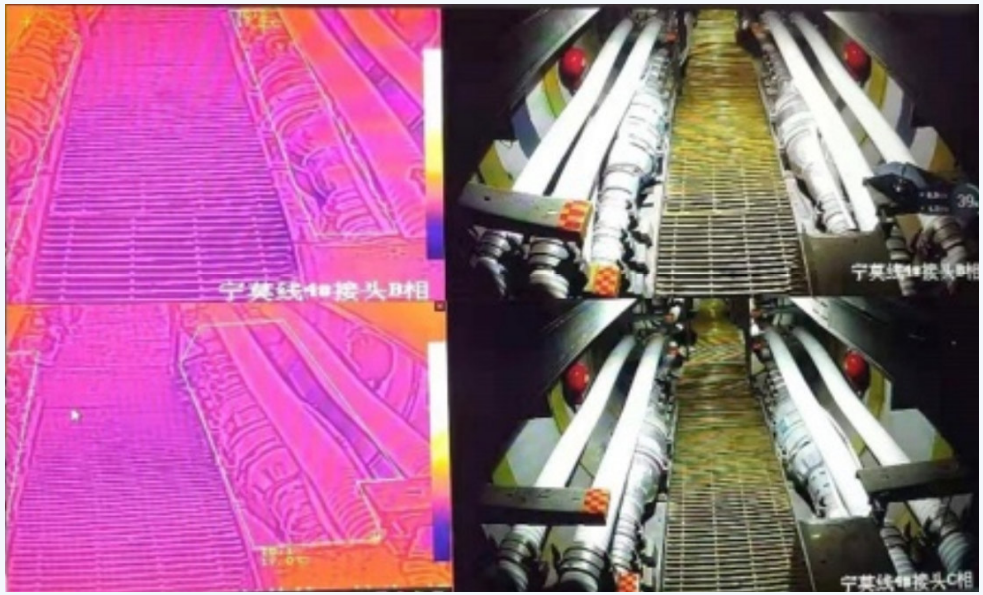
Datacenter / Server room monitoring is a mature industry with quantities customers, they always provide full solution not only temperature but also humidity / security / fire detection and so on. These facilities are integrated in a specific server.

Electrical Industry –
Electrical Cable Tunnel Sensing

- **User :** Power provider / Power Transmission Company
- **Customer :** Cable tunnel monitoring solution provider
- **Keywords :** Cable tunnel system / Cable tunnel monitor solution

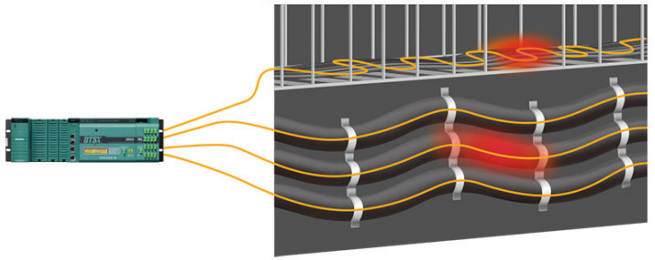
Why temperature sensing is required?

In electrical cable tunnel condition, the aging of tunnel cable may lead to **shortcut even fire risk**. Also it is hard to get into real place when issue happens, so **a video solution** is strongly required.

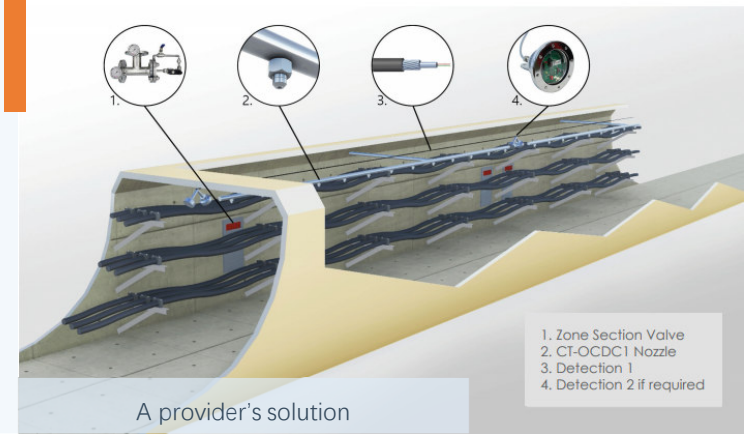


What are current solutions and disadvantages?

- Currently the contact sensor line and smoke detection is widely used in cable tunnel application.



The FIREKILL™ cable tunnel solution - overview



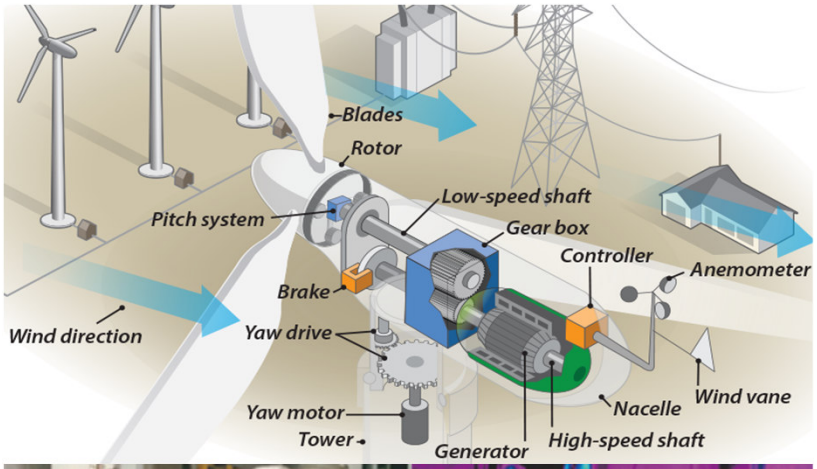
A provider's solution

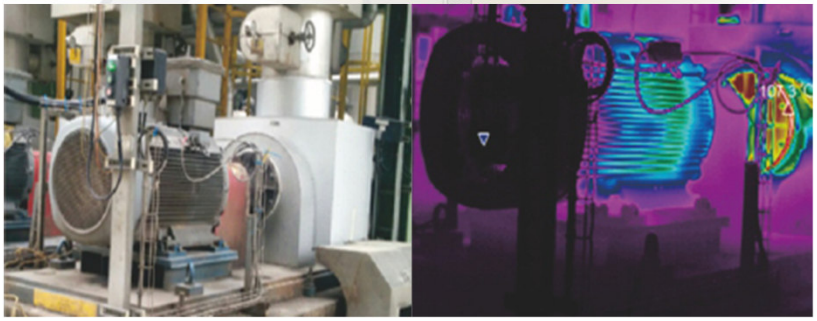
- Compared with thermal cameras, these sensor are **hard to deploy** and **not visualized to double check** the situation.

Energy Industry

– Wind turbine cabin temperature sensing

- **User :** Wind power provider / Wind power plant maintenance agency
- **Customer :** Wind power plant constructor
- **Keywords :** Wind power constructor / wind power solution

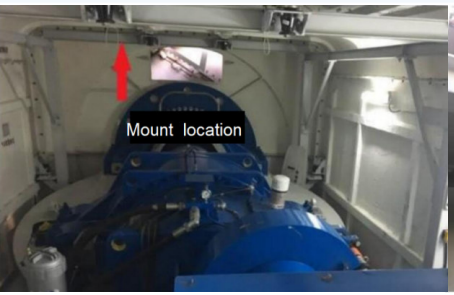


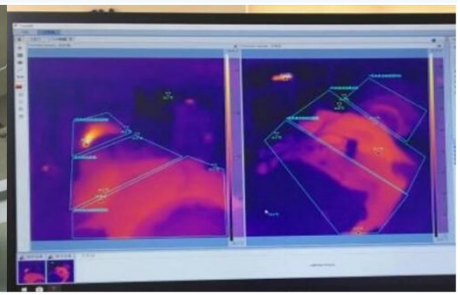


Why temperature sensing is required?

The working of wind turbines bring a huge amount of electricity. During the process both unit equipment and power transmission equipment will generate a large amount of heat and exhibit different temperatures.

When the equipment is about to fail or after a failure, the temperature of the equipment surface will change significantly. Core components like **transmission / electrical generator / converter** need to be monitored carefully





What are current solutions and disadvantages?

Currently the monitor of all machines are all doing by **contact sensor**, which is **not visualized and hard to double check**. Thermal cameras could cover this pain point perfectly

Petrochemical & Cement Industry –
Chemical waste Storage & Cement waste Plant Monitoring

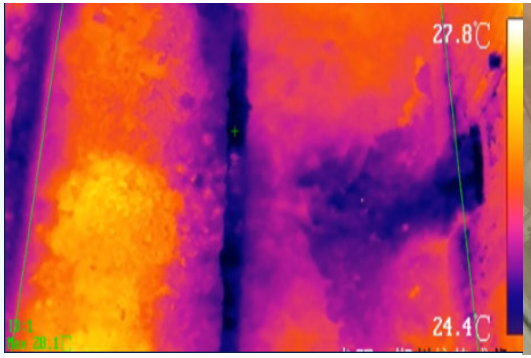
Why temperature sensing is required?

In petrochemical/chemical factory or cement factory there are always storage room, which are using to put chemical waste that waiting for incineration/destruction. **During storage process or destruction process , chemical reaction might occurred and put on fire.** In this case fire-prevention solution is needed.

What are current solutions and disadvantages?

Currently the monitoring method in these cases are **smoke detector or human inspection**, however these method **could not do pre-alarm**.
Thermal cameras could detect the temperature exception in sight and **send out real-time alarm before fire starts**, to prevent from property loss.

- **User :** Petrochemical plant / Cement plant (Business department rather than security department)
- **Customer :** Industrial system integrator / Solution provider
- **Keywords :** Petrochemical waste solution/ Cement waste solution



A cement factory's destruction plant use thermal camera to detect temperature exception

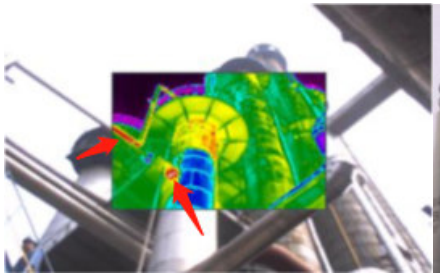
Various waste storage of chemical factory

Petrochemical Industry – Core Equipment Temperature Sensing

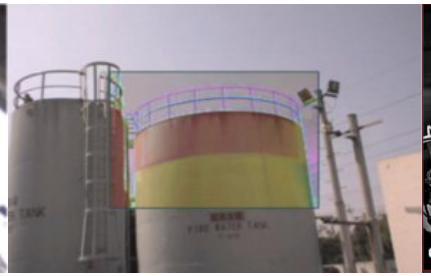
- **User :** Petrochemical plant (Business department rather than security department)
- **Customer :** Industrial system integrator / Solution provider
- **Keywords :** Petrochemical facility monitoring / Petrochemical temperature measurement

Why temperature sensing is required?

- In petrochemical plant, temperature is a significant index. From thermal image , the user will be easy to check the working status of core facilities, such as **checking if there are leaking in pipeline, or check the liquid level of tank, or high-value compressor working temperature.**



A pipeline leaking is located by thermal image



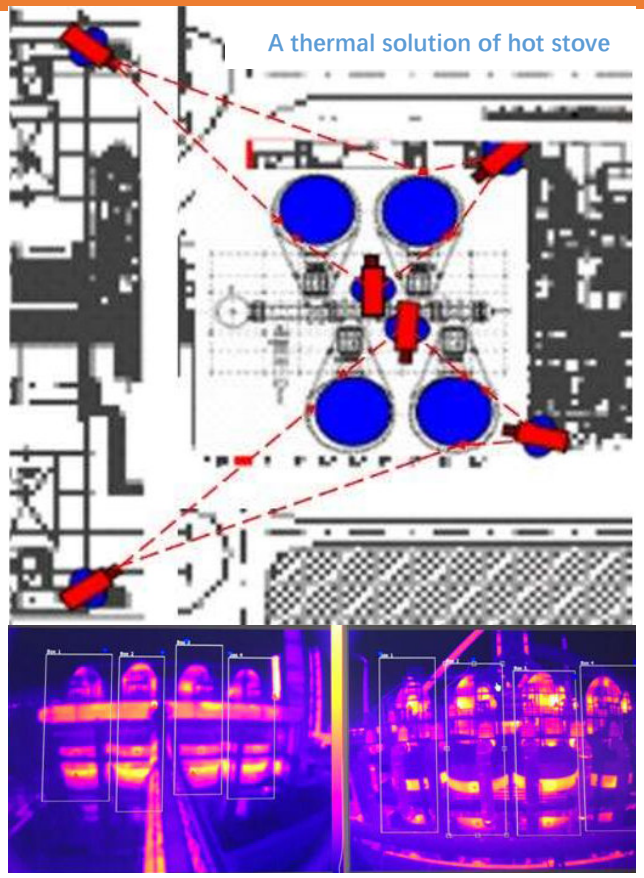
The liquid level is checked easily by thermal image

A high-value compressor is being monitored by thermal temperature sensing

Metallurgy Industry – Core Equipment Temperature Sensing

- **User :** Metallurgy plant (Business department rather than security department)
- **Customer :** Industrial system integrator / Solution provider

- **Keywords :** Metallurgy facility monitoring / Metallurgy temperature measurement / Safe metallurgy



Why temperature sensing is required?

- The temperature management of equipment in the metallurgy industry runs through the whole production process. It is of decisive significance for **reducing heat consumption, improving smelting quality, and extending equipment life.** Therefore, strengthening the analysis of the furnace temperature will help better improve the operation.
- **Hot stove :** Heat leakage of blast furnace pipes threatens production safety. It is necessary to **monitor the abnormal temperature of the lining of the blast furnace** (more than 150 degree) to determine the defect (maybe refractory bricks felled)
- **Torpedo hot metal mixer car : To monitor if there are abrasion of equipment outer**

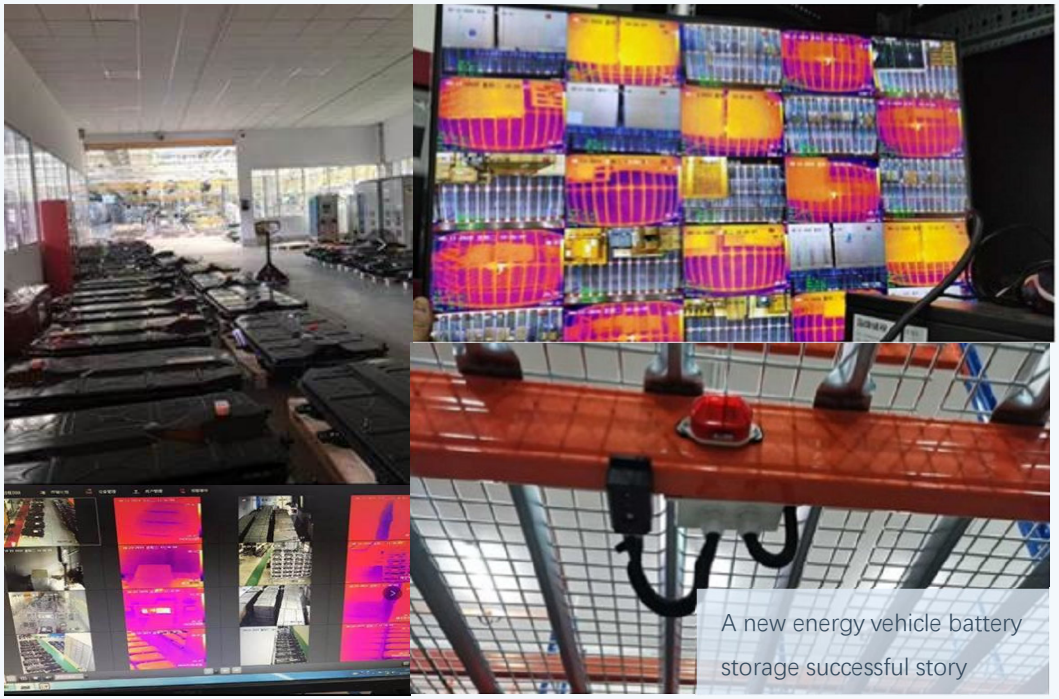
Manufacturing – New Energy Vehicle Battery Storage

Why temperature sensing is required?

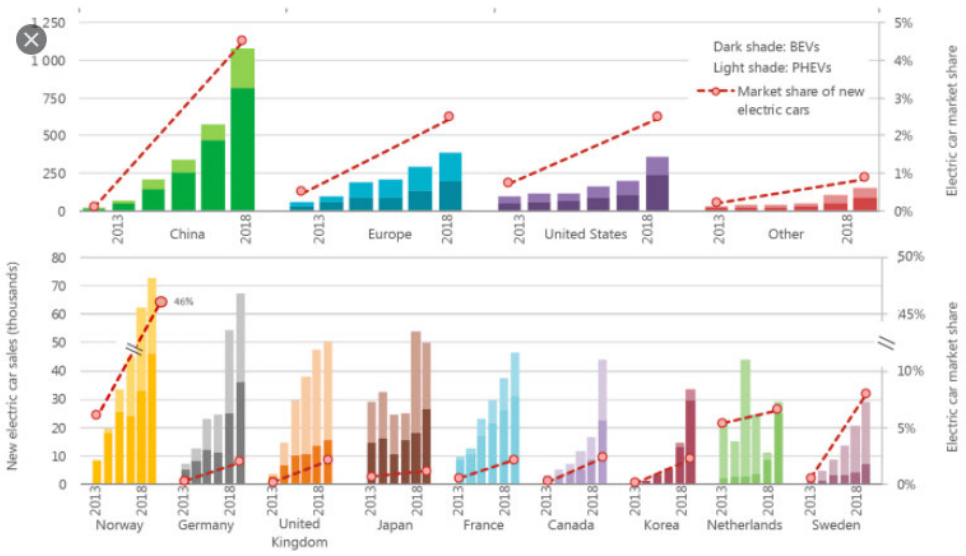
New energy vehicles are occupying more and more market shares recent years. The safety of battery storage and electrical charger is top priority.

Thermal cameras can be used to **monitor the temperature exception of the battery**, and to discover the hidden dangers in time, to avoid greater losses

- **User :** Vehicle battery provider / New energy vehicle factory
- **Customer :** Security integrator
- **Keywords :** Vehicle battery temperature measurement(fire protection)

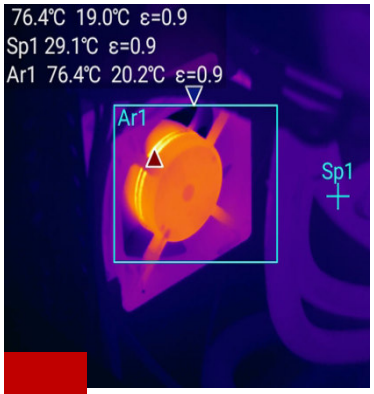


A new energy vehicle battery storage successful story



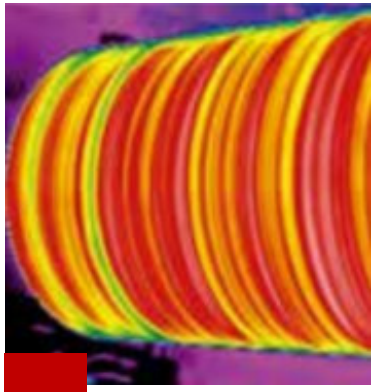
New energy vehicle market share 2013 to 2018

Manufacturing – Various Scenario in Manufacturing Sub-industry



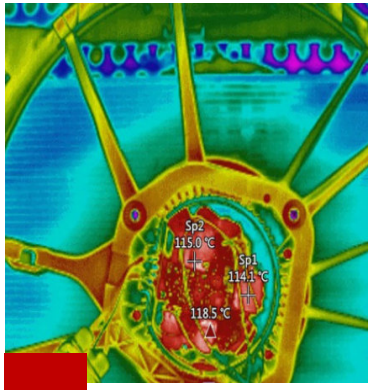
01 Cooling fan

Cooling fan affects cooling effect, noise, fuel, engine power consumption of the engineering machinery directly. Thermal cameras can detect temperature exception and **locate the risk**.



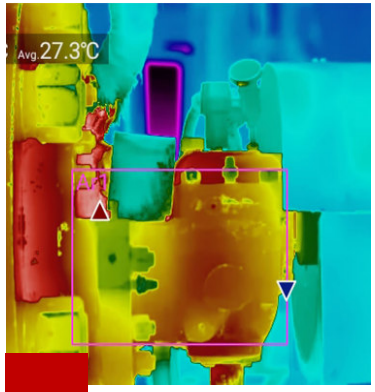
02 Paper

In papermaking industry , temperature is related to the thickness of the pulp distribution. Thermal camera could **check batch quality of the paper efficiently**.



03 Cooling system

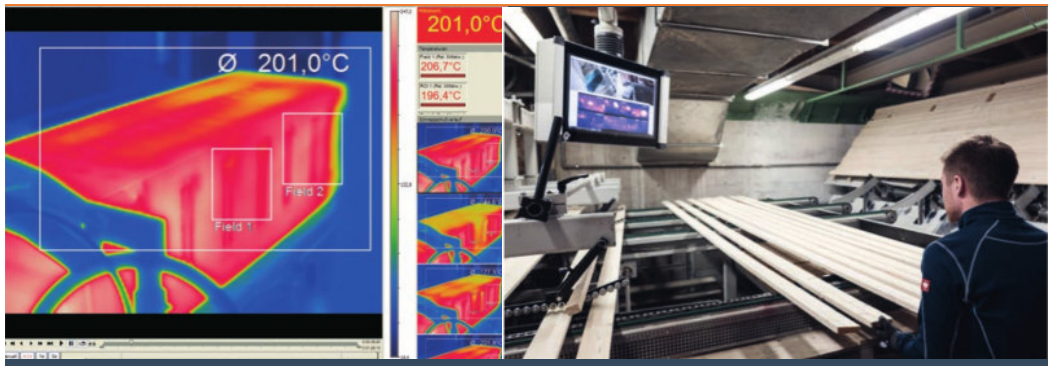
Cooling system are used to cool producing and power equipment. Thermal cameras could **monitor the working status and collect abnormal data, detect the exception**, provide a basis for further maintenance decisions.



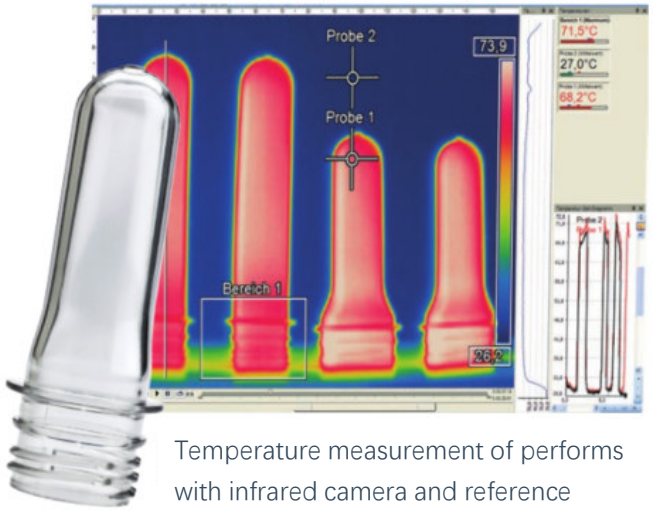
04 Bearing

Overheating of the bearings of the motor or water pump may case equipment failure directly, but most bearings are hard to detect due to their high-speed or positions. Thermal camera could help in **non-contact temperature measurement**.

Manufacturing – Various Manufacturing Sub-industry



- Software PIX connect for the observation of planer machines



Temperature measurement of performs with infrared camera and reference pyrometer in glass industry

- Detect the temperature exception of gas transportation pipeline, in solar battery manufacturing industry, to prevent explosion risks.

INSTALLATION METHOD

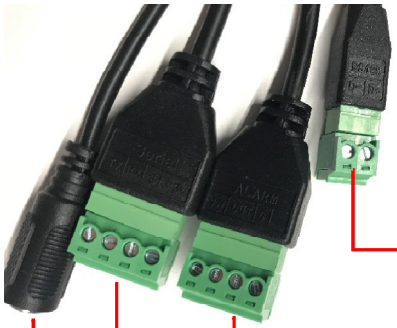
➢ Magnet Mount

➢ Wall / Roof mount

➢ Roof mount (Elastic)

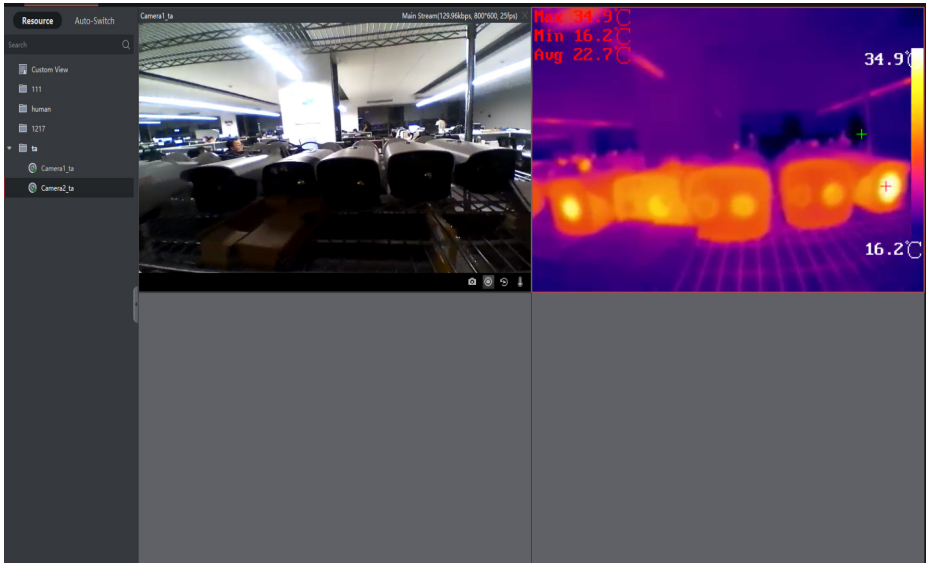
CABLING

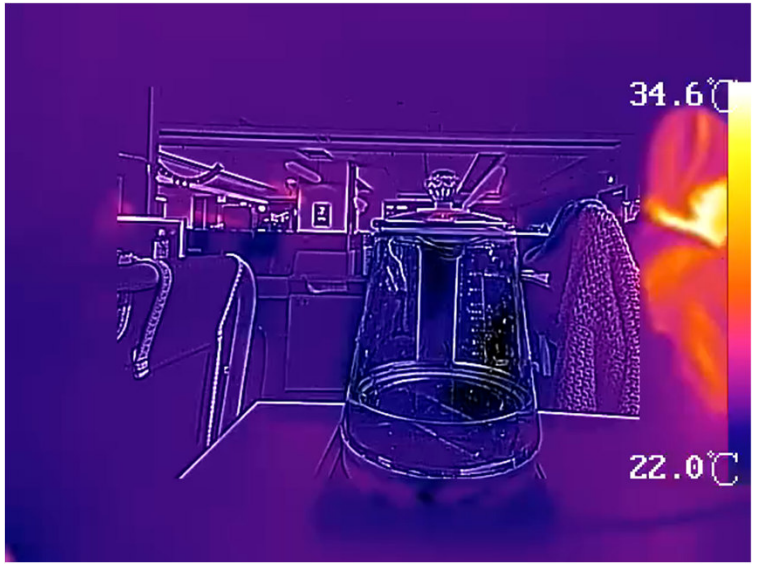
Black magnetic adapter and two M12 cables are shipped by default.



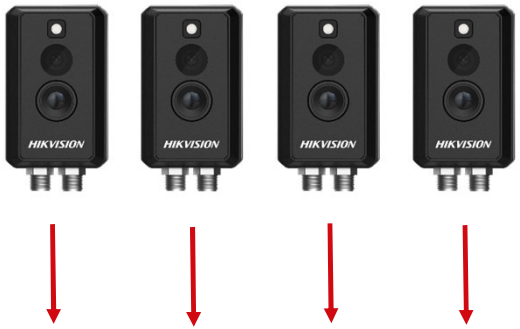
SELLING POINTS

- Small size & easy installation
- Wide Field of View, for monitoring narrow spaces
- Wide temperature measurement range & high temperature measurement accuracy
- Bi-spectrum image fusion, which shows more image details.
- Affordable price





SOLUTION



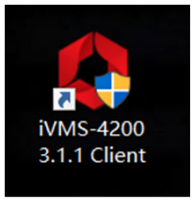
Switch

I series NVR

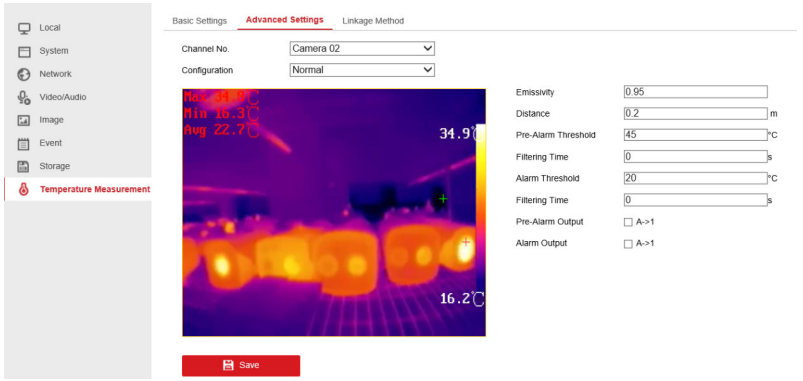
Display & Alarm

iVMS-4200

EXAMPLE

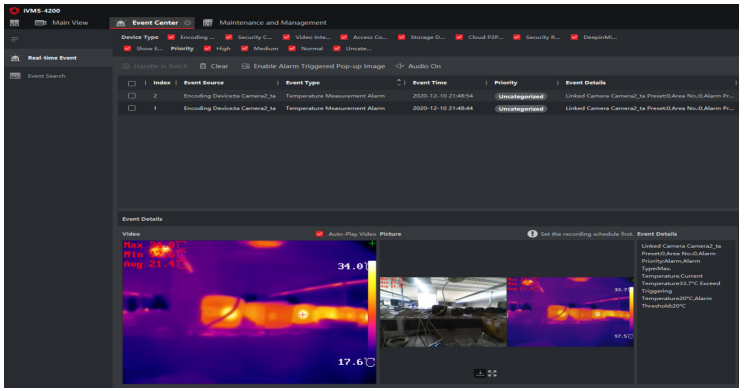


Platform



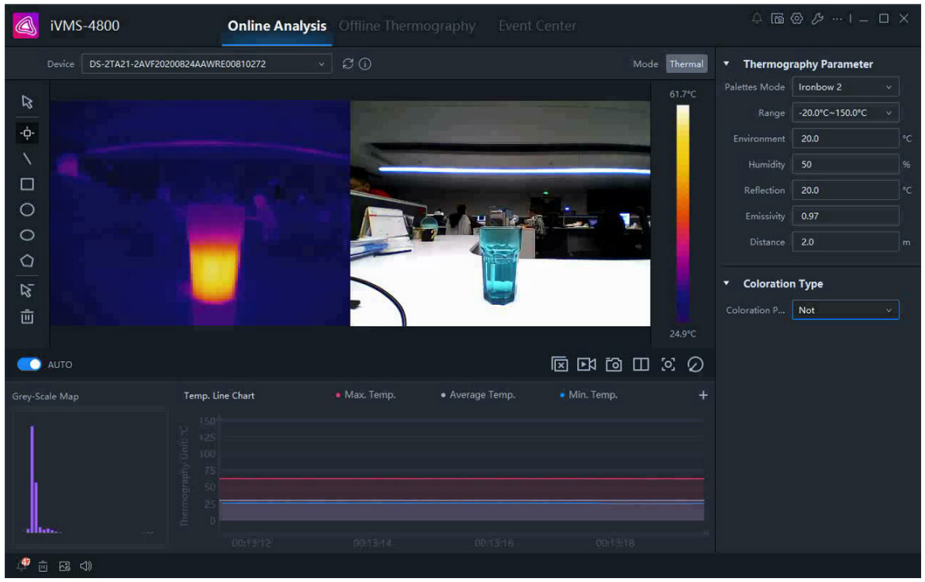
Configuration

Live View

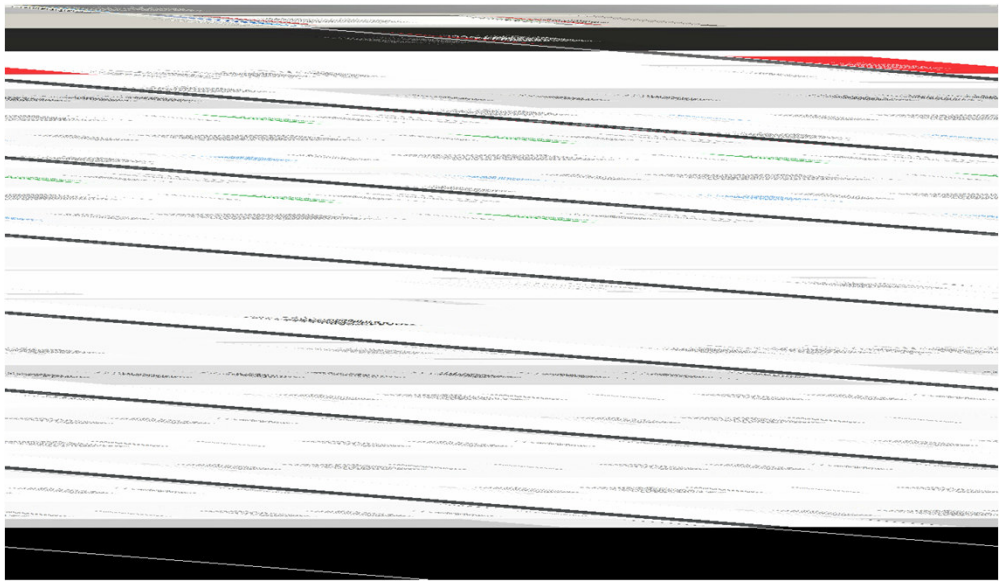


Alarm Report

Other Platforms



Data analysis of IVMS4800



Data analyze & visualize function of Hik-Central

COMPETITIVE ANALYZE

Contrast Item	HIK 3017T	FLIR AX8
Image		
Thermal Resolution	160 × 120	80 × 60
Temperature Range	-20° C to 550° C	–10° C to +150° C (14° F to 302° F)
Accuracy	Max (±2 ° C, ±2%)	±2° C (±3.6° F) or ±2% of reading (+10 to +100° C at +10 to +35° C ambient)
FOV	90° × 66.4° /50° × 37.2°	48° × 37°
Thermal Lens	1.8mm /3.1mm	Unknown
NETD	< 40mK	100 mK
Frame Rate	25Hz	Unknown
Measurement Rules	10 points, 10 boxes, 1 area	6 boxes with max./min./average
IFOV	5.48 mrad	Unknown
Optical Camera	Max:1600 × 1200	640 × 480
Ingress Protection	IP67	IP67
Platform	ivms4200,It can also connect to other surveillance cameras and devices for a wide range of applications worldwide.	Professional for temperature measurement, but not for other surveillance devices.

THANKS!