

# Device Monitoring in Petrochemical Industry

## 1 Application Background

The petrochemical industry is the pillar industry in China. The petrochemical production process involves materials with high risks and is prone to fire and explosion. In addition, the petrochemical production technology is complex and prone to sudden disaster accidents. Therefore, fire prevention, explosion prevention, and temperature measurement in the petrochemical industry are the main prevention and control means in the petrochemical field to minimize accident losses.

The thermal camera can be used for 24-hour uninterrupted monitoring to timely warn of abnormal temperature points and onsite fire points and immediately alarm in case of abnormality. In addition to avoiding potential fires, the measurement settings can be reset and detection reports can be generated, which is convenient for the sorting, analysis, and mining of temperature measurement data, thereby helping the safe development of the petrochemical industry.

## 2 Unique Advantages of Thermal Cameras

**Remote and non-contact measurement and no need to change the target's structure**  
 Non-contact temperature measurement is achieved. The hottest spot on the screen or area is automatically captured to make problems directly visible and allow accurate problem locating. It helps ascertain the root causes of faults in a reliable and precise manner.

**Automatic temperature data collection and curve generation**  
 Read the measured temperature data in real time, and directly monitor the detection processes. When used together with client software, the cameras allow the temperature data collection from targets, making it easy for operators to intuitively analyze the temperature trends in the monitoring area.

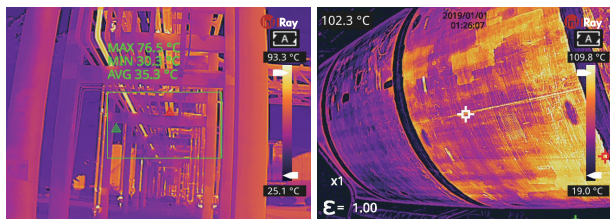
**Alarm function and messages of abnormality alarms**  
 Support setting the alarm threshold. When the temperature reaches the set range, the alarm will be triggered, notifying the staff to take corresponding measures promptly.

**Secondary development support for customers' unique advantages**  
 Provide the secondary development kit (SDK). Alarm messages can be pushed through the IO port, serial port, or other various methods to assist customers in the action linkage and development of automation devices.

## 3 Applications of Thermal Cameras in Device Monitoring in Petrochemical Industry

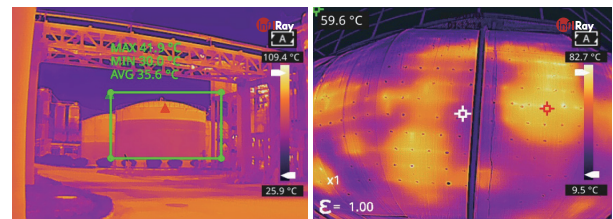
### ▪ Pipeline Monitoring

The oil transportation links involve oil and gas stations, pipelines, oil and gas storage tanks, etc. The pipelines used to transport oil and natural gas may have problems such as falling off of insulation layer, corrosion, scaling, and damage over time. With the thermal camera, abnormal temperature areas can be found and measures can be taken in time, preventing further escalation of problems.



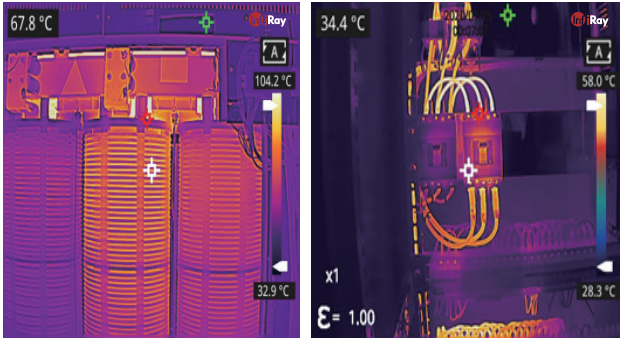
### ▪ Monitoring of Oil or Gas Storage Tank, Boiler Tube, and Other Devices

The thermal camera can be used to detect the liquid level of the oil storage tank, determine the fouling degree in the tank, identify the damage degree of the tank lining, and monitor the coking degree inside the boiler tube, thus assisting the device maintenance personnel to discover faults in time and providing references for maintenance.



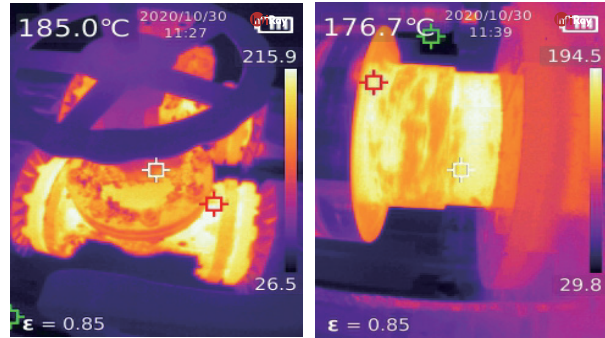
### ▪ Electrical Device Monitoring

The electrical devices and power distribution systems used in the petrochemical industry cover high-voltage contactors, fuse panels, main power circuit breaker panels, contactors, and all power distribution lines, motors, transformers, etc. The thermal camera can be used to monitor the operation status of electrical devices in real time to find faults in time and carry out preventive maintenance, thus effectively preventing electrical and fire hazards caused by thermal faults of electrical devices.



### ▪ Valve Body Monitoring

The thermal camera can be used to monitor pressure reducing valves, butterfly valves, check valves, exhaust valves, etc. to avoid valve failures to prevent gas leakage and oil leakage, which can cause immeasurable losses to production.



## 4 Recommended Models

### Online fixed focus temperature measuring thermal camera —AT31F/61F

It measures temperature for visible reading and analysis

A variety of focal length lenses available: meet the measurement requirements of different scenes

I/O alarm output: linkage with external alarm devices

Rich back-end interfaces: easy to integrate into various monitoring systems

SDK for multiple platforms: supporting secondary development

### Online auto-focus temperature measurement thermal camera—AT31/61

It measures temperature for visible reading and analysis

Automatic focusing: more convenient field application

PoE power supply: simplified cabling

Comprehensive software functions: linkage with external alarm devices

SDK for multiple platforms: supporting secondary development

**Online Dual-Spectrum Thermal Camera—AT20**  
High cost-effective temperature video sensing terminal thermal camera

- Small and compact structure: easy to install
- Dual-spectrum fusion: facilitate checking actual situation on site
- PoE power supply: reduce faults and ensure power safety
- SDK: facilitate secondary development

**Handheld thermal camera—M300G/600G**  
Check clearly, solve quickly

- Manual focus: assisting in distinguishing small targets
- Dual-spectrum fusion: easier to observe complex environments
- Intelligent high and low-temperature alarms: assisting in timely troubleshooting
- WiFi transmission: instant sharing of temperature data

**Dual-spectrum Bullet Camera—FB2/FB4**

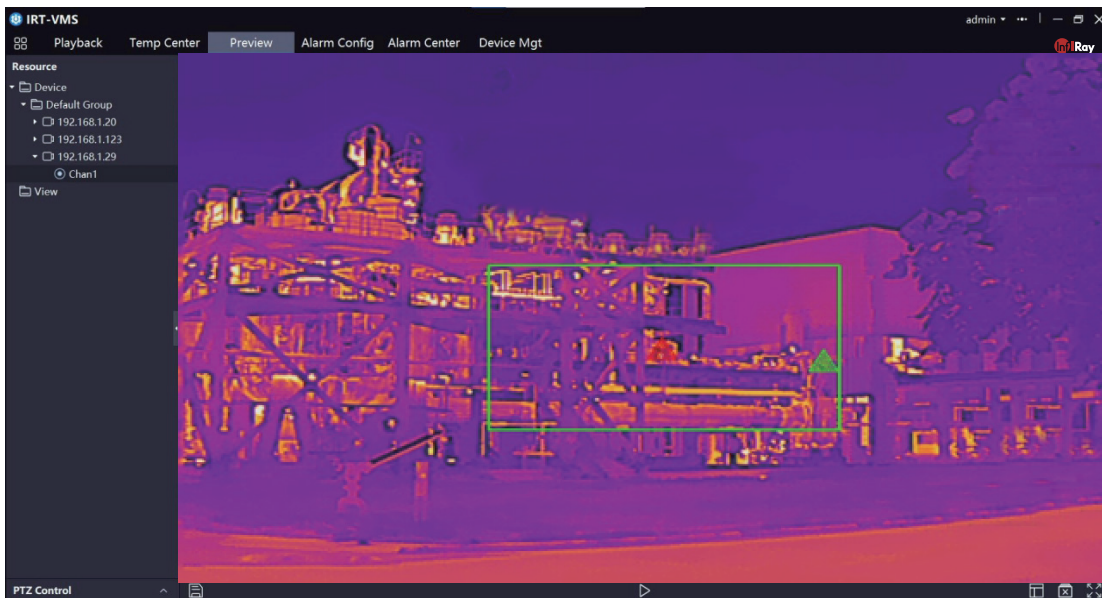
- Various built-in alarm correlation rules: alarm for fire point detection supported
- Support area detection: intelligent behavioral analysis
- Strong compatibility: supporting ONVIF and GB28181 protocols
- Applicable both indoors and outdoors: ingress protection rating of IP66



## 5 System Software

It is recommended to use with IRay's professional temperature measurement and monitoring system:

- Support the connection of multiple devices to the software platform by networking so that these devices can be displayed on the platform. Support the video preview of up to 64 real-time images
- Support palette selection and configuration of measurement tools, which can be flexibly and easily applied to provide a simple way for temperature data collection at the backend
- Automatically generate temperature data curves and temperature reports for effective monitoring of temperature changes in the area
- Abnormal temperature alarms. Support multi-level alarm configuration



## 6 How to Take an Infrared Thermal Image of Premium Quality?

Please refer to the following suggestions for using a thermal camera to take an infrared thermal image of premium quality:

- For scenes requiring a small temperature difference, select a thermal camera with high thermal sensitivity
- Select products or levels of proper measurement ranges for different scenes and temperatures
- Pay attention to whether there are other heat sources around during shooting, especially for pipelines with bright surfaces, because their shells are more likely to reflect the surrounding heat sources and cause interference to the detection. Therefore, please change the shooting angle if there are heat sources around
- Use automatic measurement first, and then enable the temperature width stretch function. Manually set the temperature width to the minimum and include the previously measured temperature range to enrich the image details