

# Storage Tank Safety Monitoring

## 1 Application Background

Storage tanks are important facilities for petrochemical enterprises, which store liquid and gaseous raw materials, products and intermediate products. Most of the petrochemical products are Class A and B (classified by the fire hazard of flammable gases) hazardous materials, which are flammable, explosive, volatile, easy to generate static electricity, easy to expand by heat, toxic, etc. Once an accident occurs, it will cause huge damage to people and property.

Based on the heat status distribution of the device, the infrared thermal imaging technology can diagnose whether the device is in good operating status or not, realizing no downtime, no contact, long-distance, fast and intuitive imaging of the heat status of the device. Whether the heat distribution of the storage tank in the operating condition is normal or not is an important feature to determine the status of the device is good or not, so infrared imaging technology can be used to diagnose the status of the device and its hidden defects by analyzing the thermal image of storage tanks.

## 2 Unique Advantages of Thermal Cameras



Non-contact temperature measurement is achieved. The temperature of storage tanks is monitored in real time. 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



The temperature information is visualized. The temperature is visualized through the screen, and the temperature of any area displayed on the screen can be viewed. It meets the needs of large-area detection



Support setting alarm thresholds and enable various forms of alarm warning; trigger alarms when the temperature reaches set range; prompt personnel with specific fault location and status information to facilitate timely troubleshooting



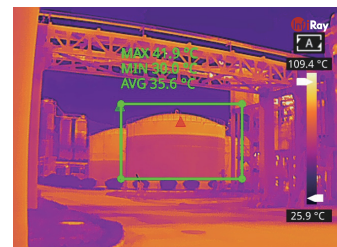
It provides a secondary development kit (SDK) to support the linkage and development of the customer's automation device, realizing the automatic alarm and fire disposal for the fault situation in the plant.

## 3 Applications of Thermal Cameras in Storage Tank Safety Monitoring

### ▪ Detecting the liquid position in the storage tank

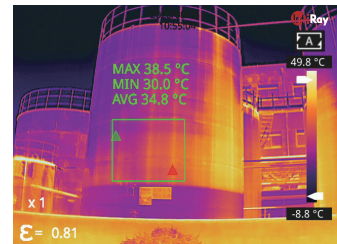
The storage tank is equipped with a level meter to control the level in the tank. Once the level meter fails, it will lead to empty and full tanks, which will suddenly interrupt production or cause storage tank overflow accidents, resulting in huge losses.

The thermal camera can directly detect the liquid level inside the tank, helping device maintenance personnel to detect faulty level meters in time or avoid potential dangers by conducting in-depth detection of tanks with obvious deviations in storage capacity.



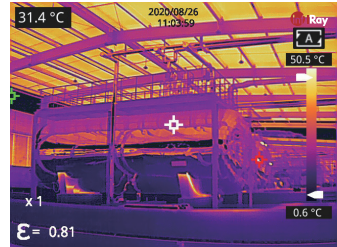
### ▪ Detecting the temperature distribution of storage tank

By analyzing the infrared thermal image of the storage tank with a thermal camera, the thermal temperature distribution on the surface of the tank can be observed. The temperature distribution is usually uniform in an intact tank. If the tank is damaged, the temperature point will be too cold or too hot in the infrared thermal image, which is convenient for maintenance personnel to detect the tank in time according to the location of the abnormal point.



▪ **Detecting sediment in storage tanks**

The sedimentation phenomenon may occur for many materials or products in storage tanks. If only a level meter is used, the occurrence or the amount of sedimentation is undetectable, thus causing measurement deviations of the liquid in the tank. The use of the thermal camera enables the amount and location of sediment to be detected and assists maintenance personnel in dealing with the sediment timely.



## 4 Recommended Models

**Infiray**

### 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

**Infiray**

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

It measures temperature for visible reading and analysis

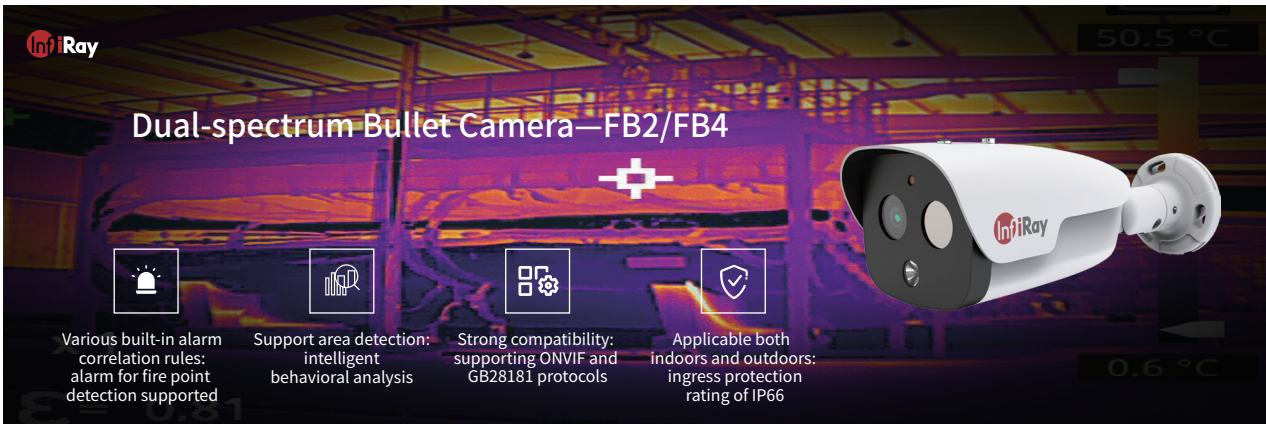
- Automatic focusing: more convenient field application
- PoE power supply: simplified cabling
- Comprehensive software functions: linkage with external alarm devices
- SDK for multiple platforms: supporting secondary development

**Infiray**

### Handheld thermal camera—M300G/600G

Quick detection and quick decision

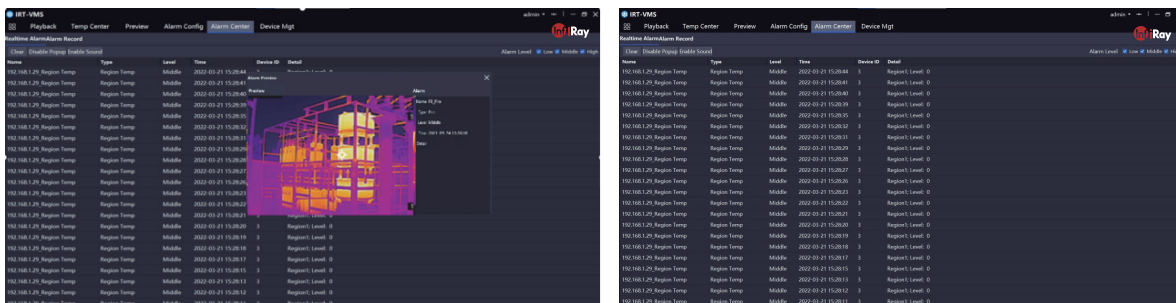
- Manual focus: assisting in distinguishing small targets
- Dual-spectrum fusion: easier to observe complex environments
- Intelligent high and low-temperature alarms: assisting in timely troubleshooting
- WIFI transmission: instant sharing of temperature data



## 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
- Temperature data curves and temperature reports can be automatically generated to effectively monitor temperature changes of conveyor belt
- Abnormal temperature alarm, support multi-level alarm configuration, real-time upload of alarm records



## 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:

- Try to choose a thermal camera with high thermal sensitivity
- Avoid direct sunlight in image taking, and take liquid level images in the shadow, so as to minimize sunlight interference and realize good effect
  - Pay attention to whether there are other heat sources around during shooting, especially for storage tanks 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
    - If normal temperature liquid is stored in the storage tank, the liquid liquid level shall be detected when the ambient temperature changes obviously (for example, an hour after the sun rises in the morning to 12 o'clock before the temperature rise is more obvious, and 1 to 2 hours after the sun sets in the afternoon, the cooling is more obvious)
    - 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