



Oil & Gas Production



Storage Areas



Waste Bunkers



Traffic Tunnels

IRMonitor

Fire Prevention with Thermal Imaging Systems

- Detection of Fire Hazards before Fire Outbreaks occur
- Early Detection of Critical Temperature Rises
- Comprehensive Monitoring of Large Areas
- Reliable 24/7 Monitoring Solution
- Self-Checking System Management
- Modular System Architecture for Tailor-Made Solutions

PIEPER



Fire Prevention

The IRMonitor System serves as a key solution for fire prevention and early fire detection, providing the highest level of safety in fire-hazard areas. Based on latest thermal imaging technologies and featuring fully automated monitoring procedures, any potential risks of a fire-breakout are detected at a very early stage. IRMonitor keeps an eye on critical temperature developments even in large-scale plants or warehouses with a 100% coverage.

Reliable fire prevention

Fire hazards are a common problem in many different branches like processing industries or storage areas and warehouses. Conventional fire detectors like smoke sensors or optical sensors release an alarm, when a fire breakout already occurred. However, this may be too late to avoid high economical impacts, environmental hazard or even threats to the personell.

In contrast to standard detectors, IRMonitor provides a reliable solution for fire prevention. With thermal cameras the surveillance area is continuously scanned. Any detection of suspicious temperatures will raise an alarm, allowing to take counter-measures before a fire breaks out.

How does it work

An IRMonitor system includes a variable number of thermal cameras, optionally combined with video IP-cameras. Depending on the application, the cameras are installed in fixed positions or mounted on pan/tilt heads. During operation the cameras continuously scan the surveillance area and transmit the temperature images to a central computer with a dedicated software, that controls the whole system and analyzes the images. Based on advanced algorithms high temperatures as well as any suspicious temperature increase with time are reliably detected long before it comes to a fire outbreak. If an alarm is released, the operator gets all relevant information, allowing him to initialize immediate counter measures: The position of the detected alarm condition is indicated in a ground plan of the surveillance area. In addition, the live image of the alarming thermal camera, the temperature value and optionally the live image of the IP-camera are displayed on the screen.

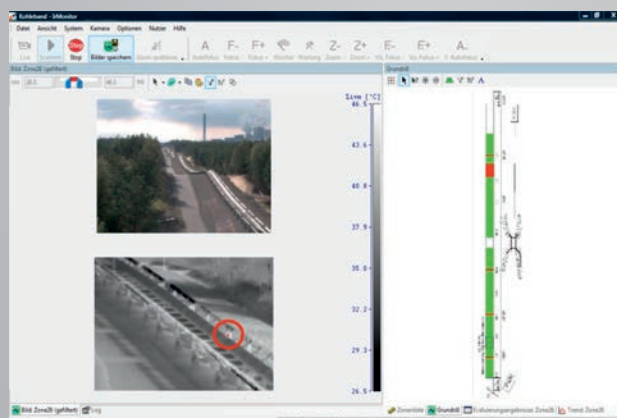
Tailor-made system design, compliant with newest standards and regulations

With its completely modular hardware and software, IRMonitor offers the highest flexibility to set up system solutions that optimally fulfill any requirements with respect to technical aspects, safety and cost effectiveness. For installations in hazardous areas, certified explosion-proof versions of camera stations and peripheral components are available.

All IRMonitor components are designed in accordance with the VdS directive 3189. IRMonitor is also compliant with the regulations of the 17. BImSchV. And of course the system has a built-in self-checking for all functions and components.



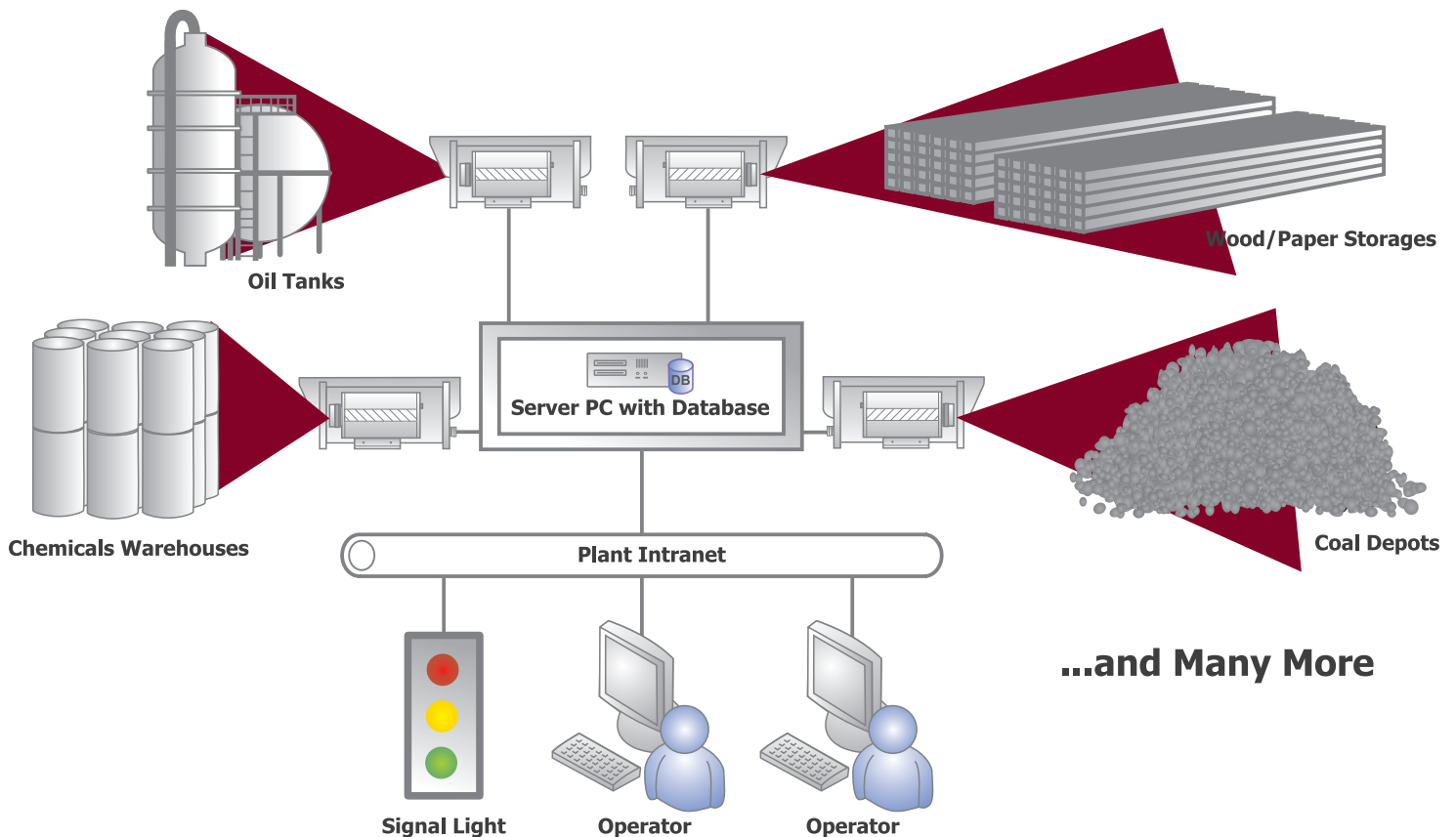
User-Interface: Overview of all Monitoring Zones



User-Interface: Display of an Alarm Zone with Video and Thermal Image and Location in the Ground Plan



System Setup



Typical System Setup:

- Infrared cameras with enclosure for outdoor use (optional with pan-tilt head for extension of the monitored area)
- Server-PC with database and web server
- Signaling device for indication of critical conditions
- Console for operation and visualization

Key Advantages of Thermographic Monitoring:

- Detection of fire hazards before a fire breaks out
- Reliable 24/7 monitoring of areas with a high risk of fire and explosions
- Comprehensive temperature monitoring of large areas with complex installations
- Automatic evaluation of thermal images and alarming for quickest possible danger prevention
- Maintenance-free operation
- Consultation and service for planning, installation and maintenance from a company with more than 15 years of experience in the field of thermal monitoring
- Recommended by leading insurers

Key Features of our Systems:

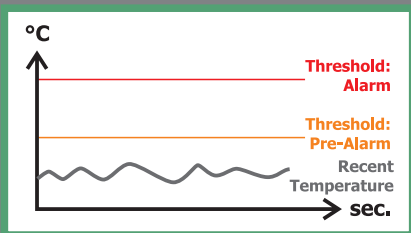
- Modular system architecture: Tailor-made system solutions even for complex monitoring tasks
- Fully automatic monitoring with continuous self-checking of all system components
- Various standard interfaces for easy integration and communication with existing control and fire alarm systems
- ATEX-certified housings for installation and operation of temperature measuring infrared cameras in Ex-zones 1, 2, 21 and 22
- Flexible data management and analysis with 100% traceability via database and web server

Fire Prevention - Temperature Trend Analysis



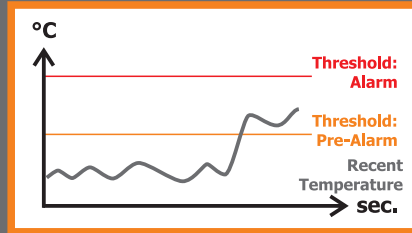
1.

Based on data of previous measurements IRMonitor continuously analyzes the temperature trend to check the safety conditions in the surveillance area.



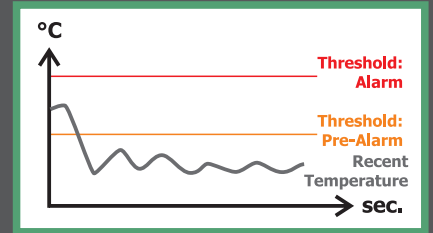
2.

A sudden increase in the temperature trend implies a potential fire hazard and will trigger a pre-alarm.



3.a

If the temperature drops below the pre-alarm value the warning status will disappear and turn to „O.K.“ again.

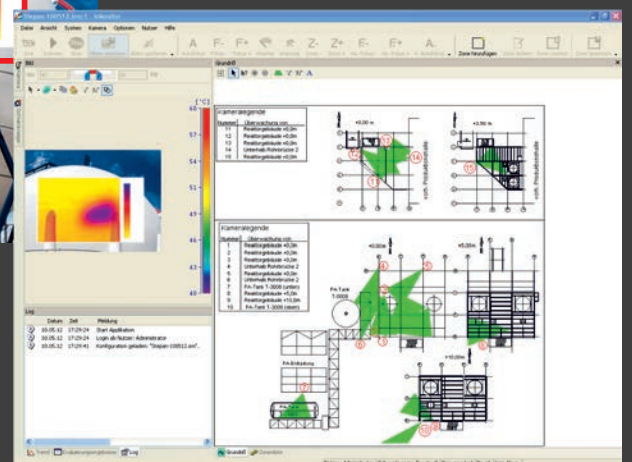
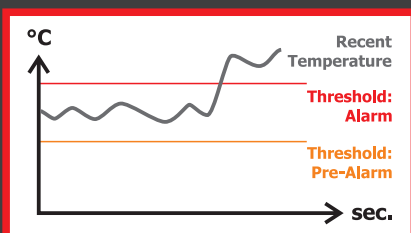


3.b

If the temperature will still raise and exceed the alarm threshold the software will trigger an alarm.

Via the system interface, the alarm can be directly transmitted to a fire-fighting system to automatically initiate counter-measures.

The position of the alarm zone will be highlighted in the map view of the surveillance area and the live image of the affected zone will be displayed in the main view of the user-interface.



User-Interface of the Software
 Right: Map View of the Surveillance Area
 Top-Left: Thermal Image
 Bottom-Left: System Messages

Application Examples

Chemical Plants / Oil & Gas Production

Reactors and installations in chemical industries as well as in oil and gas processing are usually operated at high temperatures and pressures. The processed materials are often highly-flammable, which causes substantial risks of explosions and fires. To keep the level of threat low, it is necessary to monitor these high-risk areas constantly and comprehensively. Thermal monitoring systems based on infrared imaging are an ideal and economical solution for these tasks. They continuously scan even large areas and complex installations with high resolution. By evaluating the temperature trends, even small abnormal temperature changes are detected, allowing to identify problems at a very early stage long before they become serious. For system installations in hazardous areas, explosion-proof camera-stations with and without pan/tilt heads are available.



Storage Depots and Warehouses

The storage of highly flammable goods like coal, paper, wood or pellets requires special attention to the prevention of fire hazards. Especially for large storage areas, our early fire detection systems based on infrared imaging provide you with an unsurpassed level of safety. No other technique enables temperature monitoring with a 100% coverage even of complex areas and installations. Moreover, even the smallest abnormal temperature rises are reliably detected long before it comes to a potential fire hazard. Based on our wide range of cameras and components, we offer tailor-made thermal monitoring systems to exactly meet the special requirements of your application.



Waste Bunkers

Self-ignition is a common problem in the storage of waste. Besides the economical impact there is always the risk of disastrous consequences like environmental pollution when it comes to a fire. This is why waste disposal companies have to comply with strict safety requirements. Infrared imaging systems are meanwhile widely used for the thermal monitoring of waste facilities. Besides a continuous monitoring with a 100% coverage, the temperature trending function of our systems detects even smallest abnormal temperature increases. This allows a reliable identification of smouldering fires hidden deep within the waste pile. With their ability to see even through dense smoke, our thermal cameras are also an effective tool for the coordination of the fire fighting.



Traffic Tunnels

In tunnels for car traffic or trains a fire outbreak can cause disastrous consequences, because often such tunnels have only limited escape facilities. Moreover, the poor visibility conditions caused by smoke complicate the fire-fighting as well as the evacuation of personnel. To prevent such dangerous situations, potential fire risks like overheated brakes on vehicles need to be detected before they spark off a fire. Infrared cameras mean a reliable solution to detect these potential risks because they can continuously scan long and winding track sections for fire hazards. For immediate alarming, our monitoring systems feature several standard interfaces for a fast and direct communication with fire-fighting installations and fire alarm systems.



Fire Prevention - Configuration Examples

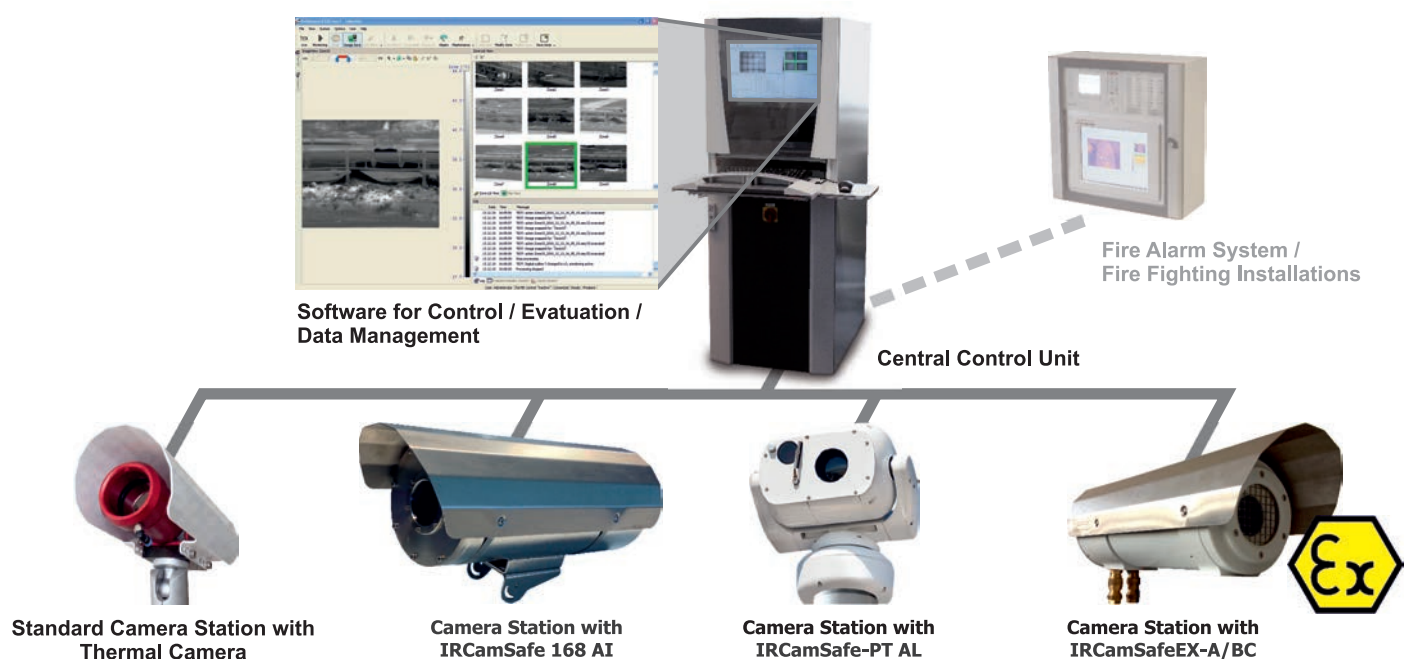
Thermal Cameras		
Type	IRSX-I Industrial Infrared Camera	
Temperature Measurement Range	-40°C to +550°C	
Temperature Measurement Accuracy	± 2°C or ± 2% of reading	
NETD	< 50 mK (@ 30°C, f/1.0)	
Image Pixels	336 x 256	640 x 512
	42° x 32° 35° x 27° 25° x 19° 17° x 13°	72 x 60° 62° x 52° 45° x 35° 32° x 26°
Motorized Zoom and Focus	(6° - 17,7°) x (4,7° - 14°)	
Frame Rate	9 Hz or 60 Hz	
Interface	Gigabit Ethernet	
Ambient Temperature Range	-40°C to +60°C	
Protection Class	IP67	

Interfaces
Web-Server
ODBC
Modbus-TCP
Digital I/O, 24V Input/Output, Potential-Free (Fieldbus Module)
Ethernet Link
OPC
SQL Database

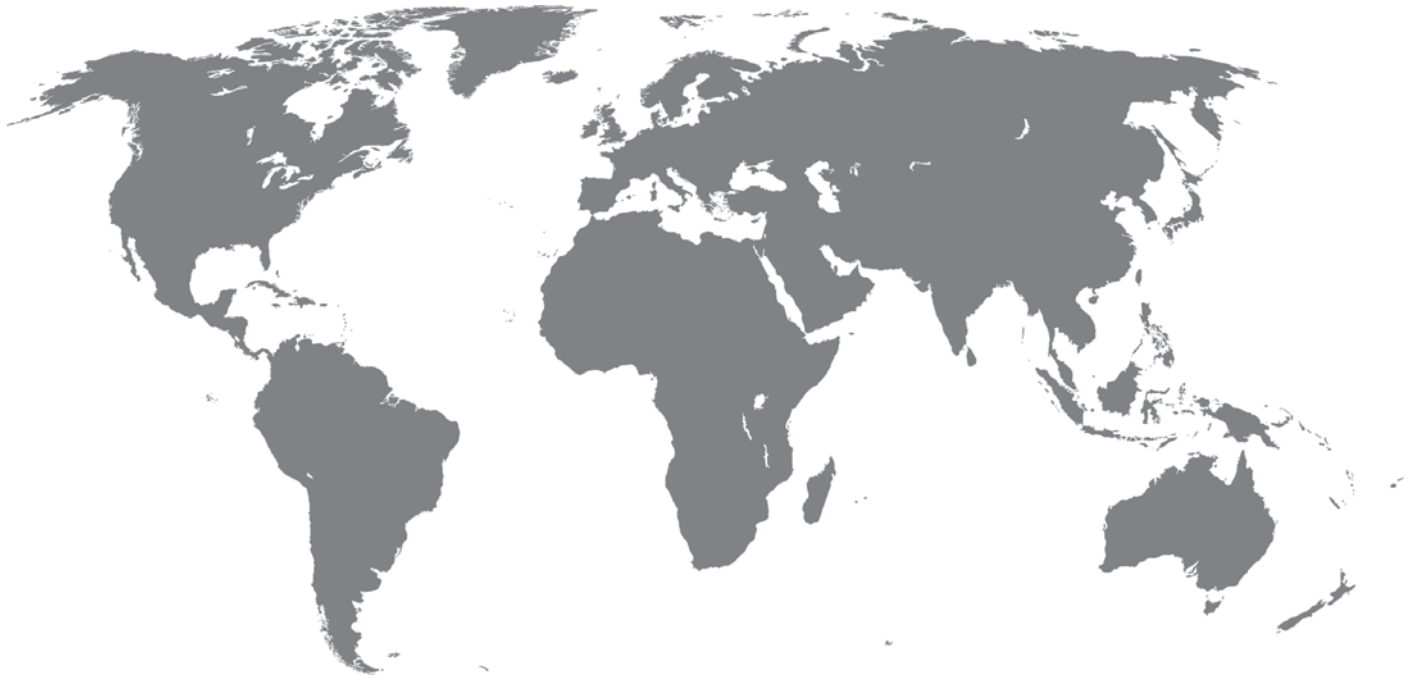
Data Link of Cameras and Computer
Gigabit Ethernet
Up to 90m with Industrial Ethernet Cable
Up to 500m with Multi-Mode Glass Fiber Cable
Up to several km with Single Mode Glass Fiber Cable

Thermal Camera Pan/Tilt Units	
IRCamSafe-PT AL	Compact and Rugged Pan/Tilt Unit for Continuous Rotation
IRCamSafe-PT AI	Pan/Tilt Unit with Stainless Steel Enclosure (IP67) for Heavy-Duty Requirements
IRCamSafe-PT EX	Pan/Tilt Unit with Stainless Steel Enclosure (IP67) and ATEX-Certification for the Ex-Zones 1, 2, 21 and 22

Thermal Camera Enclosures	
IRCamSafe 108 AL	Aluminium Enclosure (IP66) with Protective Window
IRCamSafe 168 AI	Stainless Steel Enclosure (IP67) with Protective Window and Integrated CTU-Board
IRCamSafe 168 AIW	Water-Cooled Stainless Steel Enclosure (IP67) with Protective Window
IRCamSafeEX-A/BC	Stainless Steel Enclosure (IP67) with Protective Window and Integrated CTU-Board for the Ex-Zones 1, 2, 21 and 22



PIEPER



PIEPER GMBH

Binnerheide 33
58239 Schwerte

T: +49 2304 4701-0
F: +49 2304 4701-77
info@pieper-video.de

www.pieper-video.de