



ThermalSpection™ CVM

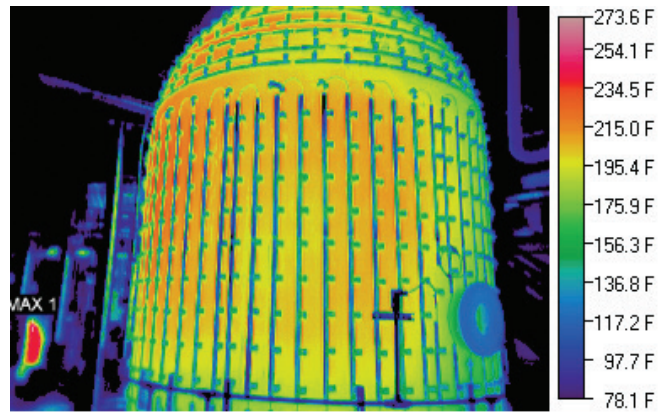
Real-Time Fault Detection and Monitoring for Critical Vessels

- Early fault detection reduces risk, emergencies, and unplanned outages
- Continuous, automated monitoring
- Integrates into existing plant control system and data historian archive
- Designed for hazardous area installations (ATEX and Class I, Div 2)
- Proven technology from the world leader, with installations in the US, Canada, Europe, and Asia

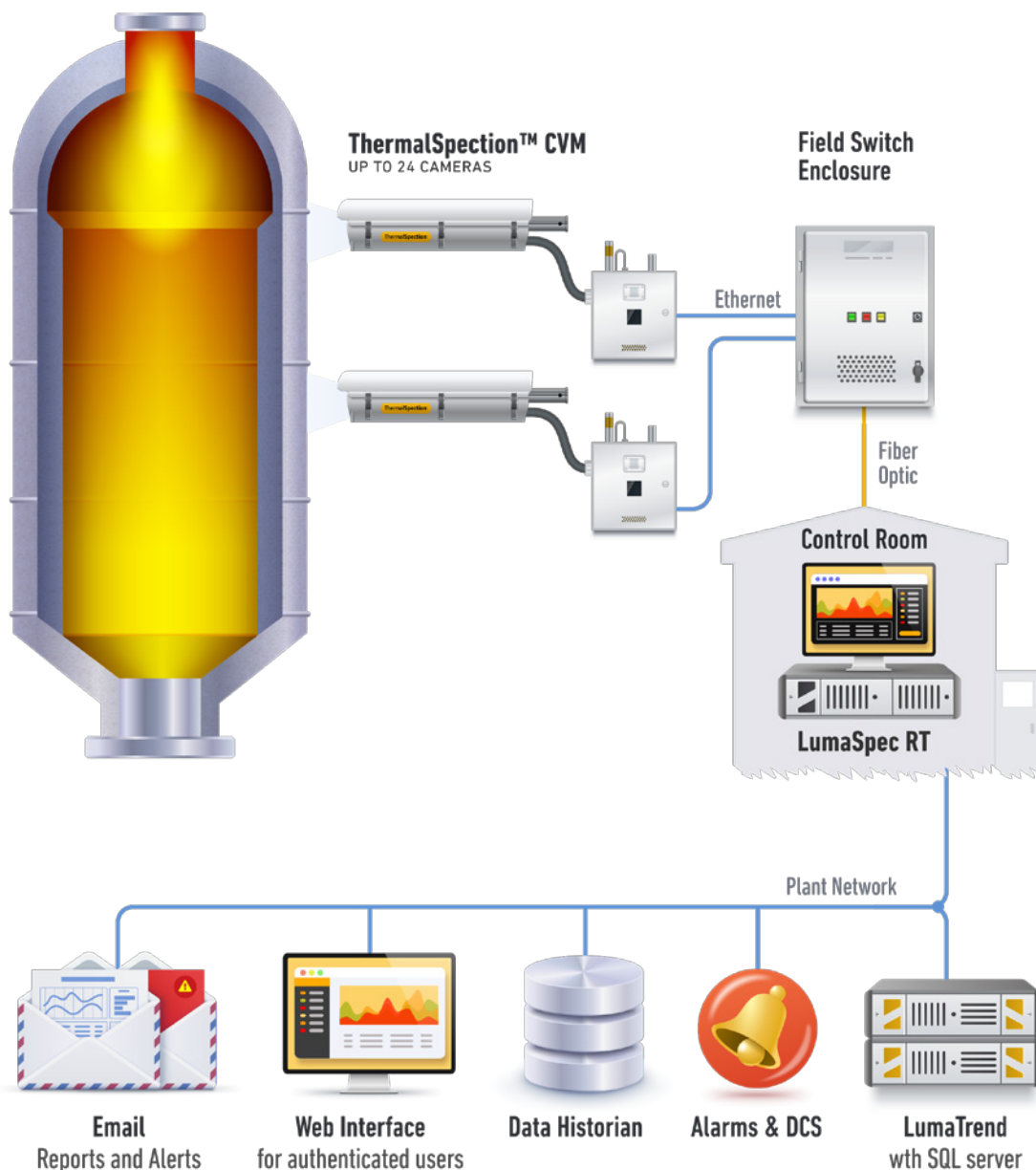
Real-Time, Non-Contact Fault Detection

Critical vessels in the chemicals, refining, and power industries operate at high temperature and pressure and are at risk of failure as joints and refractory degrade. The consequences of undetected failures can be very serious.

Conventional methods of real-time monitoring are unreliable and expensive to install and operate. LumaSense's ThermalSpection™ CVM infrared imaging system offers real-time, continuous fault and hot-spot monitoring, allowing plant operators to identify problems before they become emergencies. The system offers a turnkey solution for monitoring critical vessels, such as gasifier skin temperature.



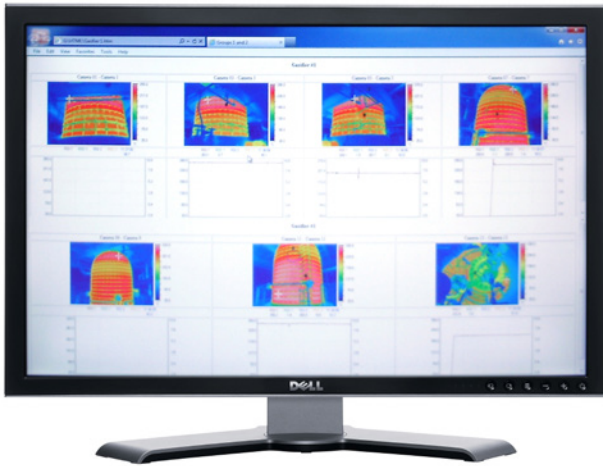
ThermalSpection System Monitoring a Gasifier



Easy to Use Software with Automated Analysis

LumaSense's LumaSpec™ software provides advanced features in a user-friendly interface. From a single computer, the software can send commands to and gather data from up to 24 cameras mounted in the field. Thermal data can be captured in snapshot frames at set intervals, or capture can be triggered by temperature alarms connected to user-defined Regions of Interest.

- Auto "Hot Spot" Tracking Feature
- HTML displays for broadcast on plant intranet
- Rate of change temperature charts
- Data Historian Archive
- Integrates with Plant's DCS
- OPC/Modbus interface supported
- Optional integration with third party PI database systems



Easy Integration into the Plant's DCS

The ThermalSpec system is fully digital and uses standard Ethernet LAN. This allows easy and cost-effective transfer of digital image data to control rooms. Additionally, our software has modules that support output via Modbus or OPC to the plant's DCS.

System Options

The ThermalSpec system has several optional components, allowing you to customize a solution for your specific needs:

- Analog outputs
- Auxiliary pyrometer sensors integrated into the system to measure critical areas or tight locations that are obstructed from view (blind spots) to the thermal imaging camera
- Pan and Tilt mechanism for automated and remote aiming of the camera

Designed for Hazardous Environments

Each thermal imaging camera is mounted in a sealed housing that includes internal cooling and a positive pressure purge to prevent dirt or flammable gases from entering the enclosure. Each camera has an Internet IP address and password protection, allowing control from any computer in the network. All field hardware is protected by ATEX or Class I, Div 2 certified housings.



The ThermalSpec in its protective enclosure. Power, communication, and air connections are contained in a single hose.



ThermalSpec CVM in protective enclosure.

Proven in the Field

LumaSense has reference installations at major petrochemical sites worldwide, including North America, Europe, and Asia. LumaSense is the most experienced and trusted supplier to tier one engineering firms building today's most advanced and automated plants.

Service and Support

The mission of the LumaSense services organization is to deliver consistent world-class customer support so you can focus on your business. Our highly trained customer care agents, engineers, scientists, and PhDs are ready to help with:

- Technical and product support
- Order, shipment, repair, and parts
- Field Services including installation, and maintenance
- LumaServ™ extended warranty and maintenance agreements

Technical Data

MCL640 IR Camera

Detector	640 x 480 Uncooled Focal Plane Array (Microbolometer)
Temperature and Spectral Range	-40 to 120 °C and 0 to 500 °C; High Temperature Option Available
Measurement Accuracy	±2% of Reading or 2 °C
Field of View	14° (H) x 10° (V), 26° (H) x 20° (V), 57° (H) X 43° (V), 77° (H) x 58° (V)
Focus Range	Lens dependent. See website.
Pixel Pitch	17 µm
Image Update Rate	9 Hz or 50 Hz
Emissivity Correction	0.1 to 1.0
Transmittance	0.1 to 1.0
A/D Resolution	16 bit

Physical Characteristics

Dimensions	175mm (H) x 772mm (L) x 207mm (W)
Weight	Approximately 11 kg (25 lb)

Environmental

Operating Temperature	0 °C to 60 °C (-40 to 60 °C with optional heater)
Storage Temperature	-20 °C to 70 °C (-4 to 158 °F)

Compact Remote Input/Output Modules

Relay Output (Alarms) Module	6 channel digital input module with each channel ranging from 30 VDC to 120 VAC
Power Relay Module	6 channel digital input module with each channel ranging from 30 VDC to 250 VAC
0~20 mA, 4~20 mA Universal I/O Module	12 channel universal input/output module with 6 analog inputs, 2 analog outputs, 2 digital inputs, and 2 digital outputs. Allows LumaSpec RT software to send each ROI temperature to an output.

Interface

Communication	Gigabit Ethernet
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Online Thermal Image Processing Software

Presentation	In run mode, the screen displays a live thermal image in 256 colors. Images can also be frozen.
Remote Camera Control Functionality	Select the camera type, mode, range, temperature scale and lens. Also allows adjustments to be made for focusing, emissivity, ambient calibration, and percentage of transmission loss.
Real-time Image and Data Acquisition	Large amounts of data can be captured at a user-adjustable rate.
Multiple Regions of Interest (ROIs)	Process and compute the minimum, maximum, and average temperatures for up to 32 Regions of Interest defined in a variety of shapes.
Multiple Color Palettes	Flexibility for optimal image clarity.
Off-Line Analysis	Replay and analyze image sequence files that have been previously captured and saved to disk.

Electrical

Power Supply	Universal AC input standard (DC optional)
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Housing

ATEX and Class I, Div 2	Includes IR Transparent Window, interface connections, power termination strip, vortex air cooler with thermostat control or optional heater with thermostat control
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LumaSpec RT Multiple IR Camera System Package

The LumaSpec RT Multiple IR Camera System Package is a unique software add-on that allows data obtained from up to 24 cameras to be monitored simultaneously in real-time on a single computer.

Remote-Controlled Pan/Tilt Head

A remote-controlled pan-and-tilt head is available for non-hazardous area applications.

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Gas and Temperature Sensing Solutions