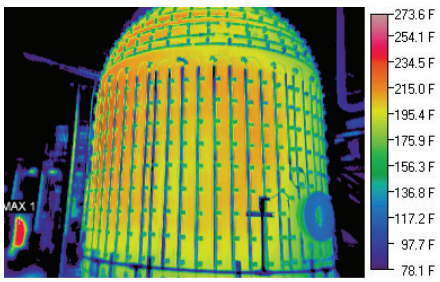
THERMALSPECTION CVM

Real-time thermal imaging solution for fault detection and monitoring for critical vessels such as gasifier skin temperature.

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. Advanced Energy'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 turn-key solution for monitoring critical vessels, such as gasifier skin temperature.

Gasifier without thermal imaging



Gasifier thermal imaging screenshot

PRODUCT HIGHLIGHTS

- 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

TECHNICAL DATA

MCL640 Infrared Camera Specifications	
Detector	640 x 480 uncooled focal plane array (microbolometer)
Temperature and Spectral Range	-40 to 120°C (-40 to 248°F) and 0 to 500°C (32 to 932°F)
	High temperature option available
Measurement Accuracy	±2% oR or 2°C
Field of View (H x V)	14° x 10°, 26° x 20°, 57° X 43°, 77° x 58°
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	
Lens Focal Length (H x L x W)	175 mm x 772 mm x 207 mm (6.89" x 30.39" x 8.15")
Weight	Approximately 11 kg (25 lb)

Interface and Electrical Specifications	
Communication	Gigabit Ethernet
Power Supply	Universal AC input standard (DC optional)

Environmental Specifications	
Operating Temperature	0 to 60°C (32 to 140°F)
	With optional heater: -40 to 60°C (-40 to 140°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)
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

Online Thermal Imaging 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.
Offline Analysis	Replay and analyze image sequence files that have been previously captured and saved to disk.

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 to 20 mA, 4 to 20 mA Universal I/O Module 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.

OVERVIEW

System Options

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

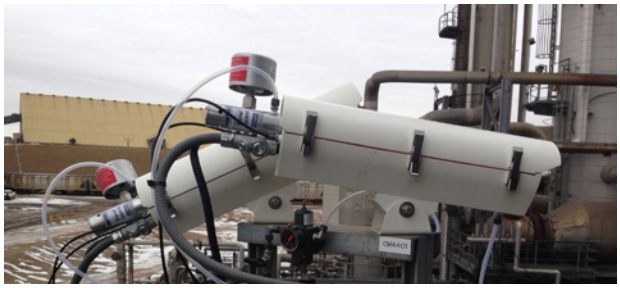
- Analog outputs
- Auxiliary pyrometer sensors integrated into the system to measure critical areas or tight locations that are obstructed from view (blind spots) to the thermal imaging camera
- Remote controlled pan and tilt mechanism for automated and remote aiming of the camera

Easy Integration Into the Plant's DCS

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

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.

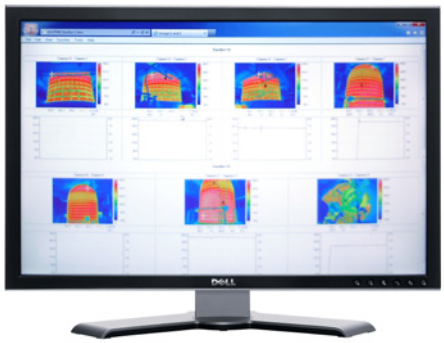


The ThermalSpection in its protective enclosure. Power, communication, and air connections are contained in a single hose.

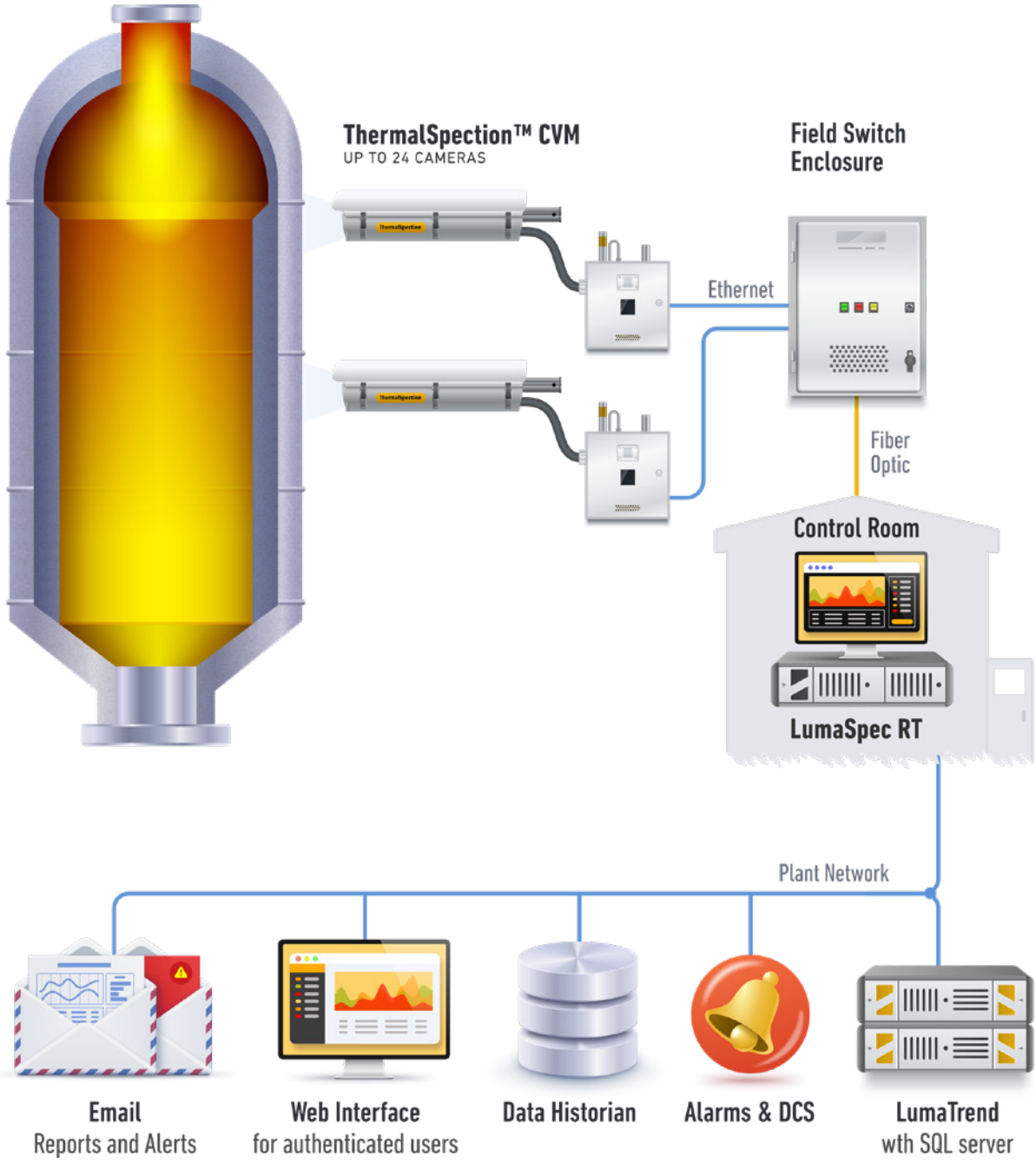
SOFTWARE WITH AUTOMATED ANALYSIS

Advanced Energy'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 (ROIs).

- 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



THERMALSPECTION CVM SYSTEM MONITORING A GASIFIER



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