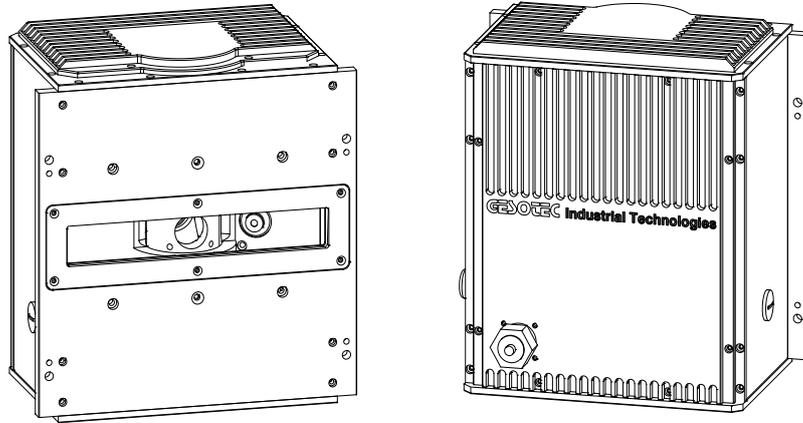


GESOTEC “TMCx-1D”

Temperature Measuring 1D-Cameras

(Series of “Infrared Line Scanners” with 120° FOV & embedded “IP-Camera”)



The Product

TMCx-1D instruments are state-of-the-art thermal profile cameras featuring a precision optical system including a special balanced rotating scan mirror design (deflection unit) for a distortion free 120° wide angle field of view (FOV). This distortion free measurement spot positioning with an accuracy of better 0.8mrad provides a high precision geometrical object scaling independent of the TMCx-1D cameras actual mounting distance/position. All TMCx-1D infrared line scanners offer real-time absolute temperature measurement by non-contact scanning of an infrared thermal line across the surface of an object of interest. This technique is especially suitable when monitoring the temperature distribution on large moving or rotating objects. A single TMCx-1D camera can provide instantaneous and continuous temperature measurement of the entire outer shell of up to 150m long rotary kilns.

Various TMCx-1D scanner models are available in different levels of geometrical resolution and thermal sensitivities. The instruments effective scanning field of view (FOV) can remotely be switched between the 120° GESOTEC standard and the FLIR/AGEMA compatible standards 90°/110°. Within the overall scanning speed range of 8Hz to 100Hz five standard sub-ranges are available. The high quality brush-less DC motor and the well-balanced scan mirror guarantee trouble free long term operation. All scanner versions are of robust construction for continuous operation under tough industrial - or even hostile - conditions.

The modular design of the TMCx sensors allows Gesotec to customize every unit individually at very reasonable cost to the user's technical- and commercial advantage. The new embedded wide-angle surveillance miniature IP-camera monitors the object of interest through the scanner entrance window. It features an integrated IP web server with GPL LAN video player for access & control from any Ethernet PC client. A calibrated “marker” in the live video player image indicates the actual position of the TMCx scan line on the object surface providing permanent supervision of proper scanner mounting and alignment.

Furthermore, this color camera allows real-time monitoring of environmental conditions between the scanner and the object of interest. Practical advantages are the immediate recognition of problems such as obstacles (birds, persons, mechanical structures...), dust, moist, cracks, rain, fog, snow, etc...



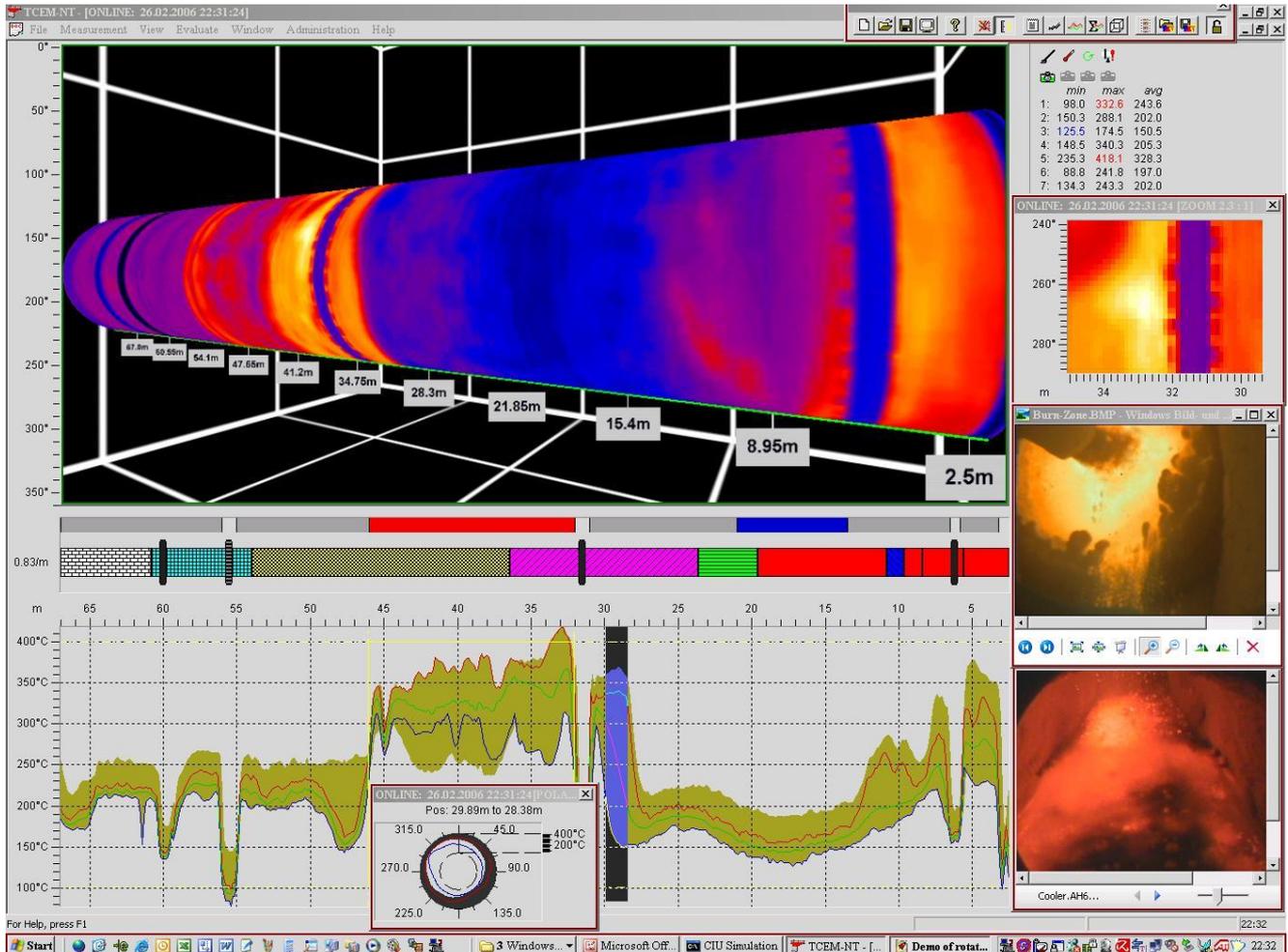
Application Example: View of built-in miniature IP-camera trough the scanner entrance window

Typical Applications

Rotary Kilns:	Glass Production:	Fire Monitor (Security):	Plastics + Paper:	Electrolysis:	Steel + Aluminum:
Cement + Lime Waste	Float Glass Windshields	Tire Stocking Waste Stocking	Foil Extrusion Packing	Aluminum Copper	Hot rolling Mills Induction Heating

Application Example: Rotary cement kiln

In the cement industry infrared line-scanners have become a standard temperature measuring tool for checking kiln shell conditions, not only for the emergency hot spot detection and preventative maintenance, but also for optimized energy- and refractory lining management.



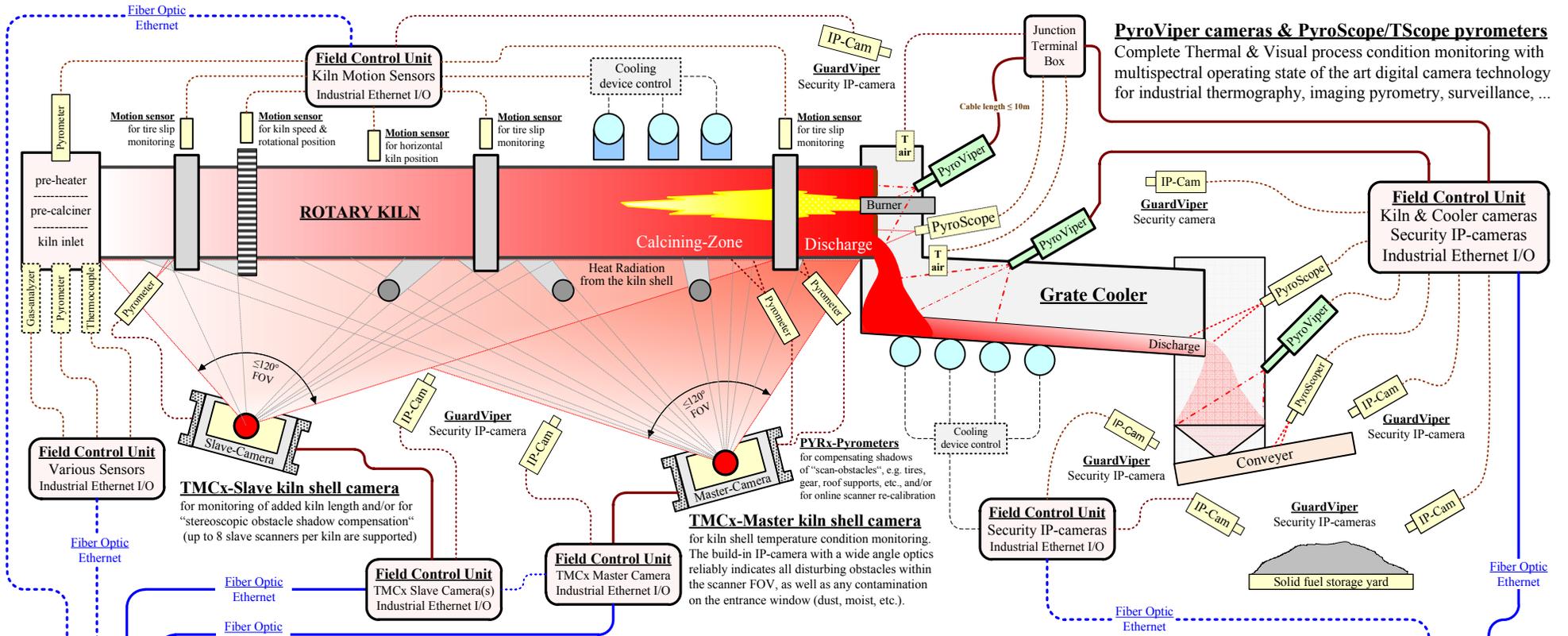
Application Example: Screenshot of GESOTEC application software for monitoring of a cement kiln with a TMCx-1D

Principle of Operation

The “opto-mechanical” deflection unit of TMCx-Sensors is designed to withstand a continuous high-speed operation up to 100Hz. The speed of this “scan-mirror” is digitally controlled. For every scan-line (360° mirror rotation) the effective scan-angle, or field of view (“FOV”), is max 120°. During the permanent scanning process the heat radiation of the object is continuously picked-up and momentarily transferred by the scan-mirror through a lens assembly to the TE-cooled infrared detector.

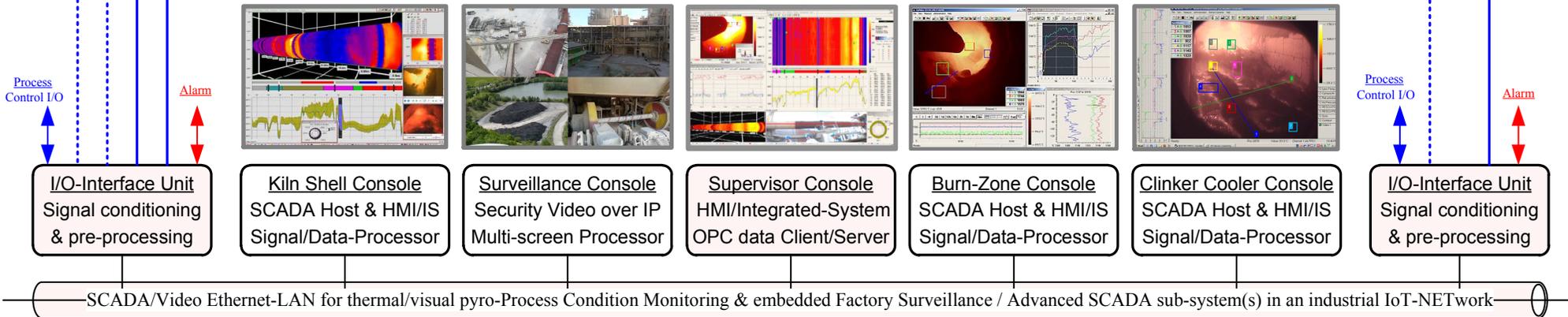
Independent of the actual scan speed the detector signal is digitized by a 12/14bit ADC at a sampling rate that always provides at least 8192 measurement points per complete 360° scan-line. The resulting spot measurement information is stored into a “pixel buffer” together with additional sensor status information. From here it is transmitted in real-time at a rate of up to 20MHz via GESOTEC’s integrated fiber-optic Data-Link “DaLi-Tx” to the data-acquisition-controller “SDAC” located up to 2km away near - or in - the CCR.

“PCMx-FaSu.NETx” system solutions for pyro-Process Condition Monitoring & embedded Factory Surveillance with advanced optronic instrumentation in an industrial IoT-NETwork



Field / Outdoor Area

Control Room / IT Room / Electrical Service Room



Data-link to the Field-, Control-, or Operations- Level of a Plant Automation System via industrial Ethernet communication

ah160927x: revised	PCMx-eFaS.NETx system concept 2016V2R1 incl. video surveillance console	Dwg-Title: PCMx-FaSu.NETx system solutions for pyro-Process Condition Monitoring & embedded Factory Surveillance	Project Code, Plant Name, Location	
ah141128x: revised	KTCx.NET-SCADA system concept drawing, kiln & cooler layout 2014V1R3		GESOTEC Industrial Technologies	
ah070917a: drawn/revised	KTCx.NET system concept drawing, kiln & cooler layout V2007R2	File-ID: PCMx-FaSu.NETx-system-solutions-2016V2R1(kiln-&cooler).ah160927x.vsd	Page #: 1	Project-Managers: Gesotec/Client
Initials/Date: Activity	Comments (All specifications are subject for changes without prior notice)	Dwg-ID: PCMx-FaSu.NETx-system-layout-2016V2R1	Pages: 1	©1982-2016 / www.gesotec.com