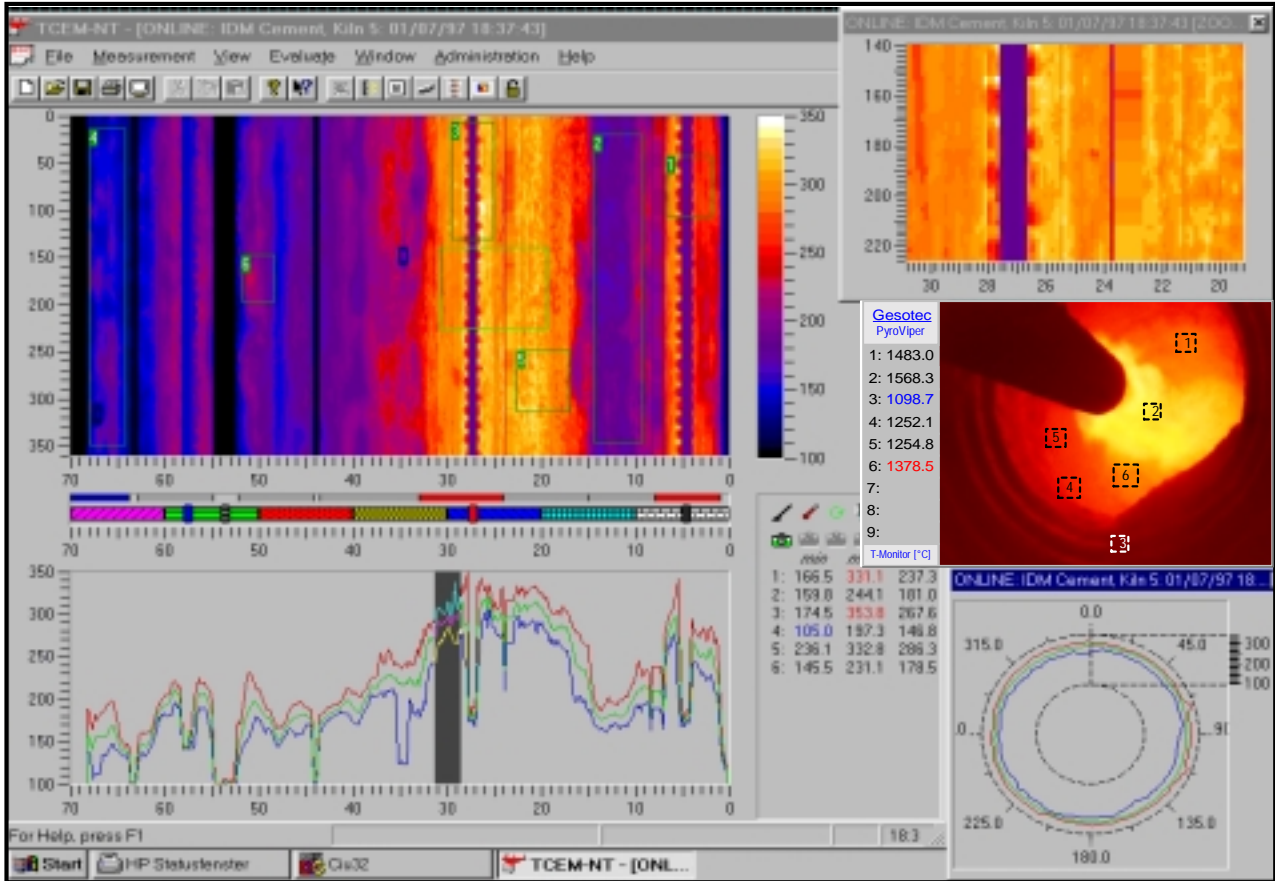


MILLENNIUM - TMCx

High Performance Infrared Linescanners



The Product

Gesotec's Millennium-TMCx series of high performance infrared linescanners define a new industrial standard for mechanical-scanning electro-optical high speed pyrometers. With the unique modular design for easy maintenance and customizing the Millennium scanners incorporate state of the art components for non-contact infrared linescanning, allowing both, high speed and high resolution continuous process monitoring. Eight standard versions of the TMCx- linescanners are available, with a variety of temperature ranges, thermal- and spatial resolutions, and with spectral filtering adapted to the specific application. The modular design of the TMCx sensors allows Gesotec to customize every unit individually at very reasonable cost to the users technical- and commercial advantage.

Application Example: Rotary cement kilns

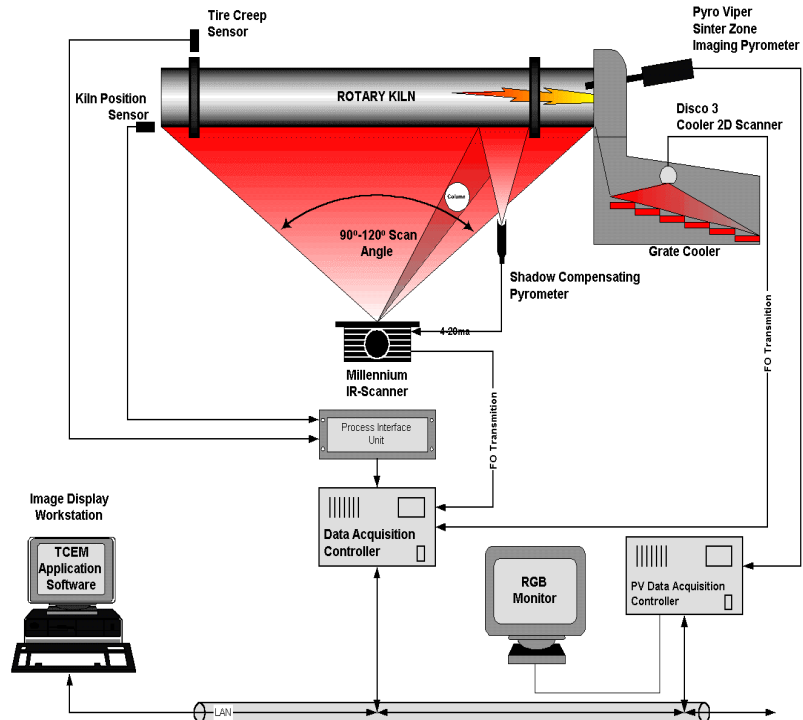
In the cement industry infrared linescanners have become a standard temperature measuring tool for checking kiln shell conditions, not only for the emergency hot spot detection and preventative maintenance, but also for optimized energy- and refractory lining management... (see system layout on page 2).

Applications:

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

The "opto-mechanical" deflection unit of all 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 360° rotation (complete scanline) its effective scan angle or field of view ("FOV") is max 120°. During the scanning the heat radiation of the object is continuously picked-up and transferred by the scan-mirror through a lens assembly to the TE-cooled infrared detector. The detector signal is digitized by a 12bit ADC at a sampling rate that results to 8192 points per complete 360° scanline independent of the actual scan speed. The resulting spot measurement information is intermediately stored into a 16 bit pixel buffer together with additional 4bit sensor status information and then 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 "DACx" located up to 2km away.



Application Example: Rotary Cement Kiln

Infrared Linescanner Specifications*

"Millennium-TMCx" Models	TMC5-HTP5*	TMC6-HTP6*	TMC7-HTP7*	TMC8-HTP8*
Temperature Measurement				
Standard Temperature Range	75° to 700°C (no Filter)	75° to 700°C (no Filter)	75° to 700°C (no Filter)	75° to 700°C (no Filter)
Measurement Accuracy	<±1% of reading or ±5°C	<±1% of reading or ±5°C	<±1% of reading or ±5°C	<±1% of reading or ±5°C
Repeatability (short term)	<±1°C	<±1°C	<±1°C	<±1°C
Repeatability (long term)	<±4°C	<±4°C	<±4°C	<±4°C
Thermal Sensitivity (NETD)	<1.5°C at 100°C	<1.5°C at 100°C	<1.5°C at 100°C	<1.5°C at 100°C
Field of View (FOV)	60°-120° adjustable	60°-120° adjustable	60°-120° adjustable	60°-120° adjustable
Focus Range	0.3m to Infinity	0.3m to Infinity	0.3m to Infinity	0.3m to Infinity
Optical Filter (optional)	adapted to application	adapted to application	adapted to application	adapted to application
Geometrical Resolution				
Spot-Detection (SRF @ 50%)	2.6 mrad (<1:380)	1.8 mrad (<1:550)	1.4 mrad (<1:710)	0.8 mrad (<1:1200)
Measurement (SRF @ 90%)	6.6 mrad (<1:150)	4.5 mrad (<1:220)	3.5 mrad (<1:285)	2.5 mrad (<1:400)
Deflection Unit (Scan-Mirror)				
Scanning Rate (Scan-Speed)	8 to 20Hz	8 (30) to 40 (60)Hz	8 (40) to 40 (80)Hz	8 (50) to 50 (100)Hz
Momentary Scanline Accuracy	<±0.6 mrad	<±0.6 mrad	<±0.6 mrad	<±0.6 mrad
Scanline Stability	<±1 mrad	<±1 mrad	<±0.8 mrad	<±0.6 mrad
Detector-Unit and Signal-I/O				
IR-Detector Type, TE-Cooler	PbSe (MCT), 2 stages	MCT, 2/3 stages	MCT, 2/3 stages	MCT, 2/3 stages
Spectral Range (no Filter)	2.2µm – 4.5 (5.6)µm	2.2µm – 5.6µm	2.2µm – 5.6µm	2.2µm – 5.6µm
A/D Conversion	12 bit (72db) 0.5Mhz	12 bit (72db) 1.0Mhz	12 bit (72db) 1.5Mhz	12 bit (72db) 2Mhz
Number of samples / 360° scan	8192	8192	8192	8192
External analog / digital input	2 / 4 channels	4 / 4channels	4+2aux. / 4 channels	4+2aux. / 4channels
Sensor status signals	4 bit + internal Temp.	4 bit + internal Temp.	4 bit + internal Temp.	4 bit + internal Temp.
Build-in digital PC-Data-Link				
Fiber optic data transmission via	2- or 4 fibers 50/125um	2- or 4 fibers 50/125um	2- or 4 fibers 50/125um	2- or 4 fibers 50/125um
Realtime transm. (Data+Clock)	16 bit at 4Mhz (10Mhz)	16 bit at 10Mhz (16Mhz)	16 bit at 10Mhz (16Mhz)	16 bit at 16Mhz (20Mhz)
Environment / Dimensions				
Ambient operating temperature	-20°C to 55°C	-20°C to 55°C	-20°C to 55°C	-20°C to 55°C
Classification	IP54/65	IP54/65	IP54/65	IP54/65
Size (W x H x D)mm / Weight	244x250x145 / 7.5kg	244x250x145 / 7.5kg	244x255x150 / 8kg	244x255x150 / 8kg
DC Power Requirements				
	+5V (2A) and ±15V (1A)	+5V (2A) and ±15V (1A)	+5V (2A) and ±15V (2A)	+5V (2A) and ±15V (2A)

* more details are available on request - specifications are subject to change without prior notice

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