INPROTEC IRT

Thermoteknix Systems Ltd

Centurion® TK50 & WinCem®

Infrared Kiln Shell Scanning System

Centurion® TK50

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Building on the tried and tested rugged reliability and high performance of the Thermoteknix Centurion technology, the TK50 scanner has been designed with a wide range of exciting new features:

- Higher scan speed for new faster, larger kilns
- Higher resolution for refractory detail
- High sensitivity to identify smaller temperature changes
- Wide dynamic range from light-up to shut-down
- 120º field of view
- Fibre optic communication
- Standard USB2 connectivity
- Fully compatible with existing Centurion systems
- Flexible installation
- Proven Reliability
- Full inbuilt diagnostics
- Support for multiple scanners and spot pyrometers

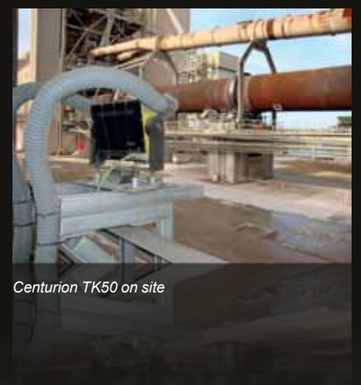
"Quality, Reliability, Performance — Proven"

Centurion TK50 incorporates the latest digital technologies with flexible configuration options which allow optimum and cost-efficient cabling throughout the plant using new or existing infrastructure.

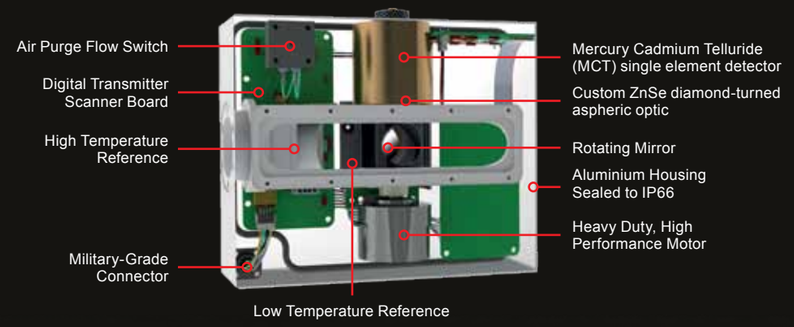
Fibre optic signal transmission ensures error-free communications in harsh environments. Centurion TK50 is designed to operate reliably and accurately at wide ambient temperature ranges with a high performance thermo-electrically cooled Mercury Cadmium Telluride (MCT) single element detector for optimum sensitivity, accuracy and ruggedness.

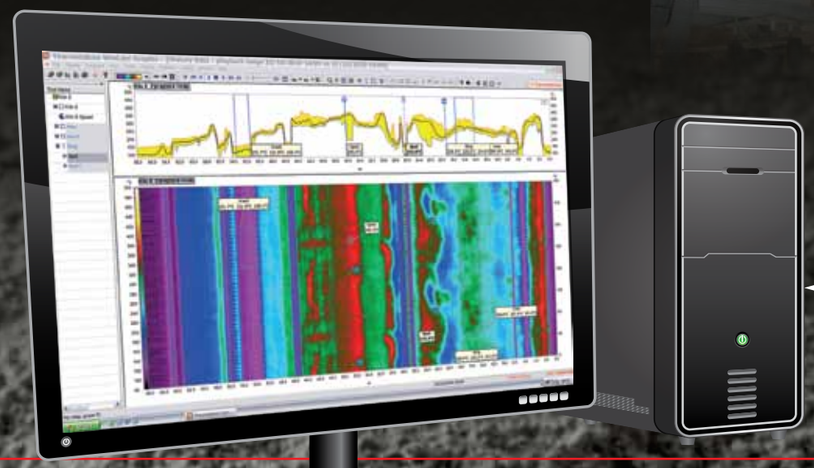
Within Centurion TK50, advanced control circuitry continuously monitors and optimises detector performance. This ensures maximum dynamic range and low NETD in continually changing ambient operating conditions. Two internal calibrated blackbody temperature references are scanned on every revolution to ensure the highest system temperature measurement accuracy. The new modular design of Centurion TK50 improves long term system accuracy, allows rapid servicing and component replacement, without the requirement for re-calibration minimising instrument down-time and cost. Centurion TK50 features a new custom designed ZnSe diamond turned aspheric optic for improved image sharpness, detail and depth of field over a wide field of view.

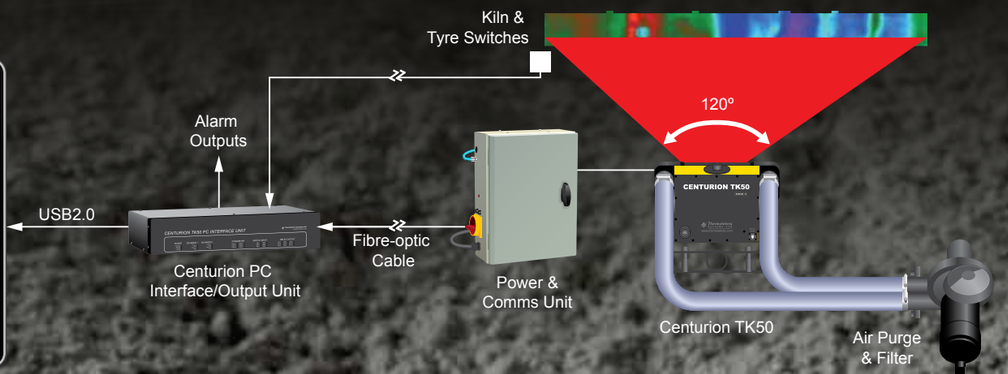
Because cement kiln shell scanners are situated in elevated exposed positions, running campaign after campaign, they can be vulnerable to lightning strikes. Centurion TK50 has been designed with extensive opto-isolation in all elements of the system to minimise power surges and strikes. With a configurable field of view, custom aligned for every kiln, 2048 digital, linear measurements at 30Hz, Centurion TK50 scans every brick in every ring of the fastest, newest kiln, to ensure kiln integrity from light-up to shutdown. Coating and refractory performance are also continually checked throughout the campaign with hot spot tracking and coating loss reports available.



Centurion TK50 on site



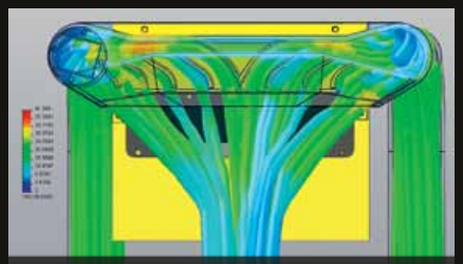




Centurion® TK50

Intelligent design throughout

Great care has been taken to design each element of the new Centurion TK50 for optimum performance. The air purge for the high transmission sapphire window was developed using Computational Fluid Dynamics (CFD) – a technique normally reserved for designing high performance cars and airplanes. The TK50's super-aerodynamic air purge has been designed to direct the flow of air efficiently and accurately over the scanner window to keep it dust free.



Air purge designed with Computational Fluid Dynamics

Centurion TK50's new 19" rack mount ruggedised PC interface unit supports up to two scanners, 8 pyrometer inputs, 8 tyre / kiln slip inputs and 12 alarm relay outputs. This unit in combination with the TK50 power and communications module provides much greater flexibility in how each plant decides to install the system.

WinCem® Graphic PROFESSIONAL

Centurion TK50 works with powerful award-winning market leading WinCem Graphic Professional. This kiln monitoring software represents the most exciting development in rotary kiln shell scanning information in years...

3D Coating / Brick thickness display

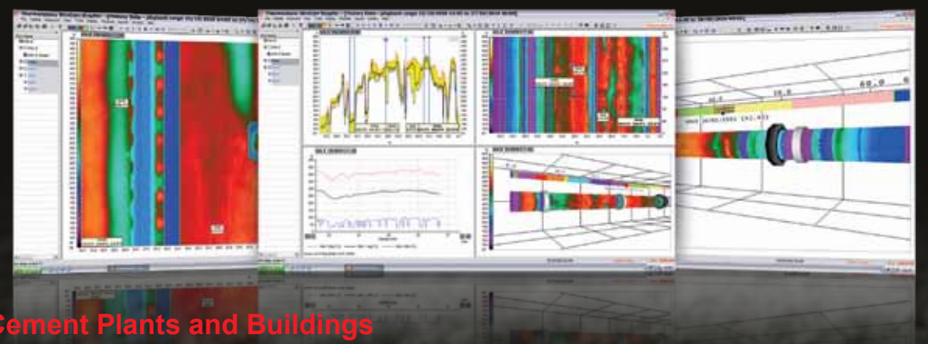
The unique WinCem® 3D software technology "peels away" the kiln in layers to show what you really need to see: shell and refractory temperatures, brick wear and coating thickness from any viewpoint or angle.

Dynamic, multi-region trending

WinCem Graphic Professional temperature trending is an integral feature of the user interface. Users can select spot, line or area tools on the kiln shell, and trend temperatures from historical, live or combined historical and live data, to evaluate how a given situation developed and understand how to improve your kiln's performance.

"VCR" style historical playback

When operating modern high capacity kilns, faults in refractory condition or coating can develop over long periods of time. WinCem 3D offers a unique "VCR" style of interface which allows the user to simply "turn back time" and view a full screen dynamic display of kiln surface temperature or changes due to coating formation over time.



Dense Cement Plants and Buildings

For covered kilns where there are roof supports, pillars or obstacles in the line of sight between scanner and kiln, two or more Centurions can be connected to the WinCem software for elimination of shadows and obstructions. Pyrometers can also be incorporated into the system for small and awkward areas.

Worst Case temperature tracking

The WinCem history manager tracks the hottest temperatures occurring at every point on the kiln shell from light-up to shut-down. This data is kept in an industry standard SQL Server database on the WinCem or plant server computer for ease of access, integrity and availability for automatic security backup.

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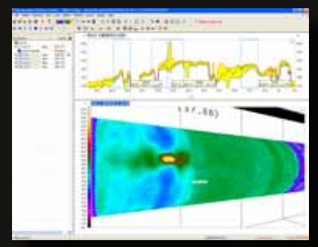
Client-Server Based Technology

Based on client-server technology, WinCem Graphic Professional provides unrivalled flexibility in the display of live and historical data from single or multiple kilns. Kiln data can be viewed both in the control room and remotely on any PC/monitor within your plant network. Remote viewers are able to set their own alarms, recall historical data and configure their PC screen to display particular areas of interest.

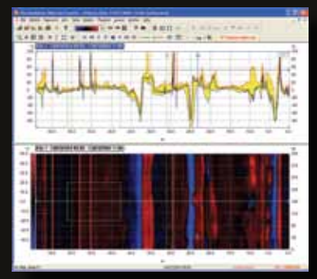


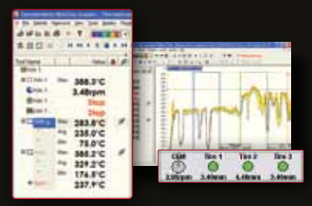
Alarms & Events

WinCem alarms and outputs can be set to automatically take various actions such as activating blowers to move and cool essential areas of the kiln. The Event Manager logs every activity during a campaign from light-up to shut-down and provides an invaluable detailed record of all changes made to the WinCem software.

Thermal Map Subtraction

The WinCem subtraction functions enable you to subtract the temperatures of the kiln shell from any history map from the current map, or any given reference map, such as the equilibrium light-up baseline temperatures. With full integration into the operator graphic controls, changes in temperatures can be displayed or graphed for on or off-line analysis.



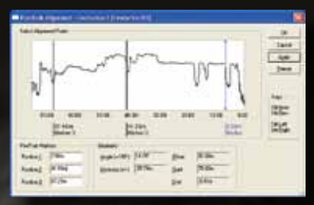


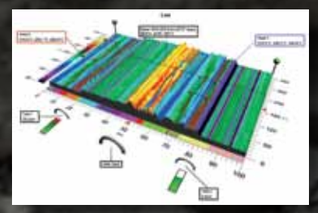
Tyre Slip & Tool Panel

The Tyre Slip Monitoring (live ring migration) accessory integrates into the WinCem software to provide tyre slip display per rotation. Tyre slip can be displayed graphically or digitally with individual alarms set for increasing or decreasing levels over pre-set limits. Integrate all the display and management of measurement tools, alarms and outputs in a single tool panel for ease of operator information.

Patented PosiTrak® Alignment Technology

Thermoteknix patented PosiTrak alignment technology allows key features of the kiln to be superimposed on the image and to maintain consistent, precise spot measurement at every point of the kiln and the values seamlessly merged with scanner data.





New dynamic 3D imaging feature

New 2D and 3D image display modes allow the operator to visualise kiln shell temperature and calculated refractory and coating thickness in a smooth transition; from familiar 2D map to 3D relief mode through to full dynamic 3D imaging. Rotate, split or section the kiln with mechanical features overlaid providing vital information for making decisions about the process.

Thermal Imaging throughout the plant

Thermoteknix Systems Ltd was founded over 25 years ago and supplies its tried and tested technology for monitoring the cement process from all angles:

WinBrix®

WinBrix® Refractory Expert Software

This specialist refractory management software monitors and tracks kiln refractory for best practice, optimum performance and cost per tonne of clinker production.

Group-wide software can combine information from multiple kilns and plants, then compute optimum cost vs performance with availability charts and tables to enable optimised central planning.

VisIR®

ThermaScope® Kiln and Cooler Cameras

ThermaScope® cameras display and measure temperatures at every point in the field of view of the burning zone or cooler. Software provides the process engineer with advanced analysis tools for advanced kiln burner control.

With solid state technology, direct view optics and fibre optic signal transmission, ThermaScope offers reliability in the harshest environment and a fast return-on-investment.

ThermaScope®

Centurion® TK50 & WinCem®

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Infrared Kiln Shell Scanning System

PERFORMANCE

Scanning Rate	30Hz
Scanning Field of View	120°
Linear Samples per Scan	2048
Aperture	25mm
Focus	1m to Infinity
Temperature Range	60-700°C
Filter	Atmospheric
Spectral Range	3.3µm-4.2µm
Spatial Resolution:	
Spot Detection (50% modulation)	<1 mrad
Temperature Measurement (90% modulation)	<2 mrad
NETD at 100°C	<1.6°C
Thermal Sensitivity	± 1.6°C at 100°C
Accuracy	± 4°C at 100-250°C <1% at 250-700°C
Repeatability: Short term	<1°C
Long term	± 5°C (One calibration per year)
Scanline Stability	± 0.1°
Detector Type	Mercury Cadmium Telluride
Micro Blackbodies: Ref. 1	Internal Low Temp
Ref. 2	Internal High Temp (250°C)

SIGNAL PROCESSING

Digitisation	PosiTrak® Geometric Linearisation
Electronic Processing	22 bits per sample

PC INTERFACING SOFTWARE — PC/COMPUTER

Windows XP or later	✓

EMBEDDED SOFTWARE

Real time Spot, Area & Regional Area measurement with Alarm outputs, 2D Image Map, 3D Visualisation & Rotational View, 3D Relief Map, Alarm Processing, Temperature Maps, Spot Area Processing, Worst Case History, Historical Playback/VCR, Data/Image Subtraction, Simultaneous Line Display/Measurement on Live & Recalled Data, Temperature vs Time Trending with Trend on Alarm, Multiple temperature & zone alarms with hardware outputs, Event Log Manager, Multiple User Configurations & Layout Manager, Profile/Envelope, Optional Refractory Manager, Optional Tyre Slip Software & Alarms, On-line Diagnostics & Interfacing options, Operator/Supervisor protection, Client-Server data structure for multiple viewers & long term reliability & flexibility

TK50 & POWER UNIT ENVIRONMENTAL DETAILS

Operating Temperature Range (standard) -20°C to +50°C	BS EN 60068-2-1/2
Operating Temperature Range (optional) -40°C to +70°C	BS EN 60068-2-1/2
Enclosure Classification	IP66, BS EN 60529
Operating Ambient Relative Humidity (non condensing)	100% RH at + 40°C
Size (W x H x D) mm	200 x 180 x 70
Weight	3.5kg
Integral Power Supply	100-240VAC 50-60Hz
Power Consumption	24 Watts

TK50 SCANNER VIBRATION & SHOCK DETAILS

Vibration - Sine 2Hz - 9Hz, 7mm; 9Hz - 200Hz, 20m/s²	BS EN 60068-2-6
Random Vibration 5 to 10 Hz, +12dB/octave, 10 to 50Hz 0.04m²/s³, 50 to 100Hz -12dB/octave	ETSI EN 300019-2-3
Shock - Half sine 50gn pk	BS EN 60068-2-27

STANDARD SYSTEM

- Air Purge
- Heavy Duty Blower Fan
- Fan Filter Pack
- including Flow Indicator
- Mounting Cradle Assembly
- Power & Communications Unit
- PC Interface Unit
- Kiln Synchronisation Switch
- Heavy Duty ABS Shipping Case
- Desktop PC (with LCD screen, keyboard and mouse)

OPTIONAL ACCESSORIES

- Tyre Slip Software
- WinBrix Refractory Expert
- Remote I/O Module
- OPC Interfacing Software
- Client-Server Network Software
- Alignment Telescope
- Rack-mounted PC

COMMUNICATIONS

Multimode fibre optic cable kit - 62.5/125µm with ST terminations

WARRANTY

24 Months Standard

Web: www.thermoteknix.com

Per maggiori informazioni contattare:

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Thermoteknix Systems Ltd

THE QUEEN'S AWARDS FOR ENTERPRISE: INNOVATION

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