

Centurion® TK50 & WinCem® MultiView
High Performance Kiln Shell Scanning System



Centurion® TK50

The TK50 builds on the tried and tested, rugged reliability and high performance of Centurion technology from Thermoteknix.

- Higher scan speed for high-speed kilns
- High definition for refractory detail
- High sensitivity to identify smaller temperature changes
- Wide dynamic range from light-up to shut-down
- 120° field of view
- Fibre optic communication
- Standard USB2 connectivity
- Flexible installation
- Proven and ultimate reliability
- Full in-built diagnostics
- Support for multiple scanners and spot pyrometers
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“More than just an image!”



Centurion TK50 incorporates the latest digital technologies with flexible configuration options.

Fibre optic signal transmission ensures reliable, error-free communications in harsh environments, even in thunderstorms. TK50 is reliable and accurate at wide ambient temperature ranges with a high performance thermo-electrically cooled Mercury Cadmium Telluride (MCT) single element detector for optimum sensitivity.

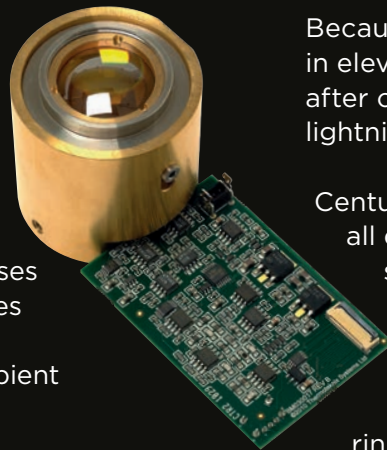
Within Centurion TK50, advanced control circuitry continuously monitors and optimises detector performance. This ensures maximum dynamic range and low NETD in continually changing ambient operating conditions.

Two internal calibrated blackbody temperature references are scanned on every revolution to ensure the highest system temperature measurement accuracy.

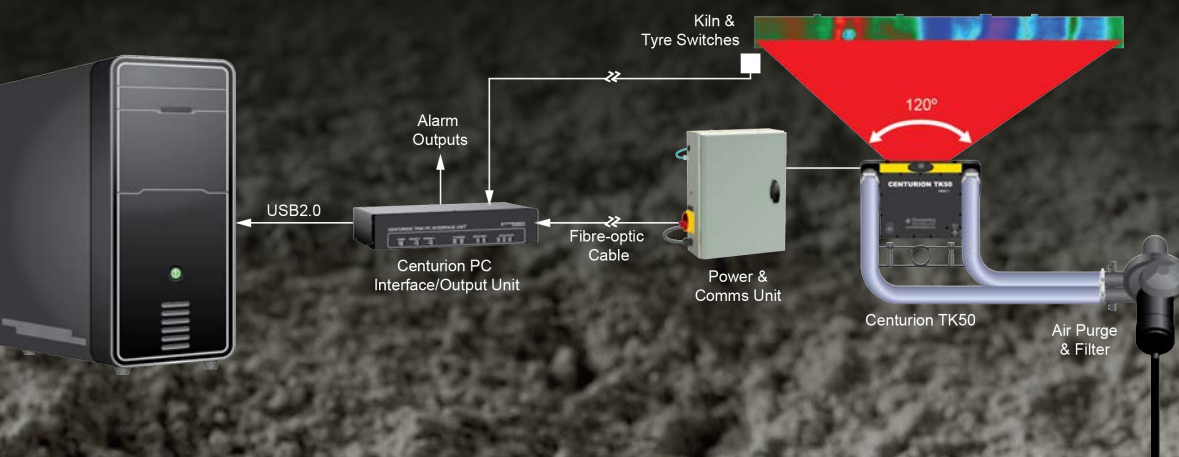
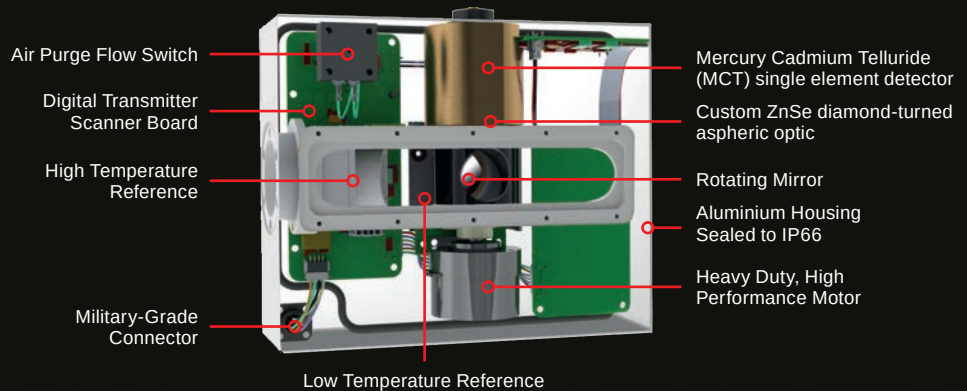
The modular design of Centurion TK50 improves long term system stability and allows rapid servicing minimising instrument down-time and cost. Centurion TK50 features a custom-designed ZnSe diamond turned aspheric optic for improved image clarity and depth of focus over a wide field of view.

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 extensive opto-isolation in all elements of the system to minimise power surges during strikes. With a configurable field of view, custom aligned for every kiln, 2048 digital, unique patented linear measurements at 30Hz, Centurion TK50 scans every brick in every ring of the fastest, modern kilns, to ensure refractory integrity from light-up to shutdown. Coating and refractory performance are also continually checked throughout the campaign.



Centurion TK50 on site

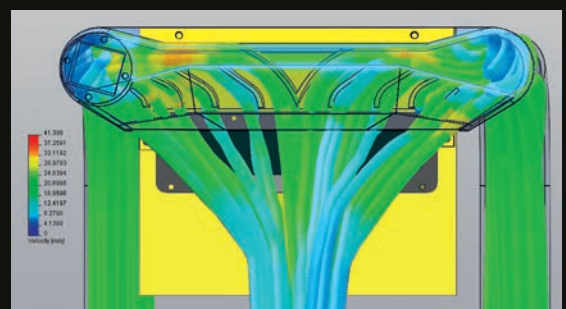


Centurion® TK50

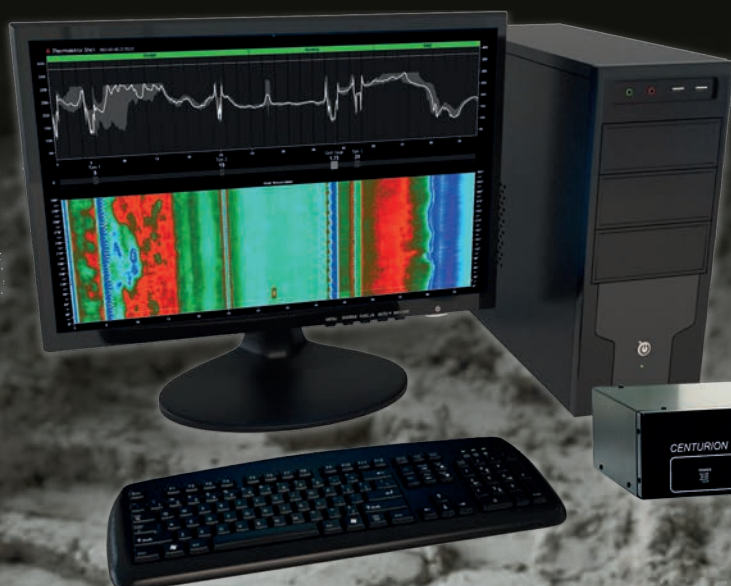
Intelligent design throughout

Great care has been taken to design each element of the 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 aircraft. 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.

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



Air purge designed with Computational Fluid Dynamics





Centurion TK50 works with powerful, market leading WinCem MultiView software. This kiln monitoring software represents the most exciting development in rotary kiln scanning information.

Brick thickness display

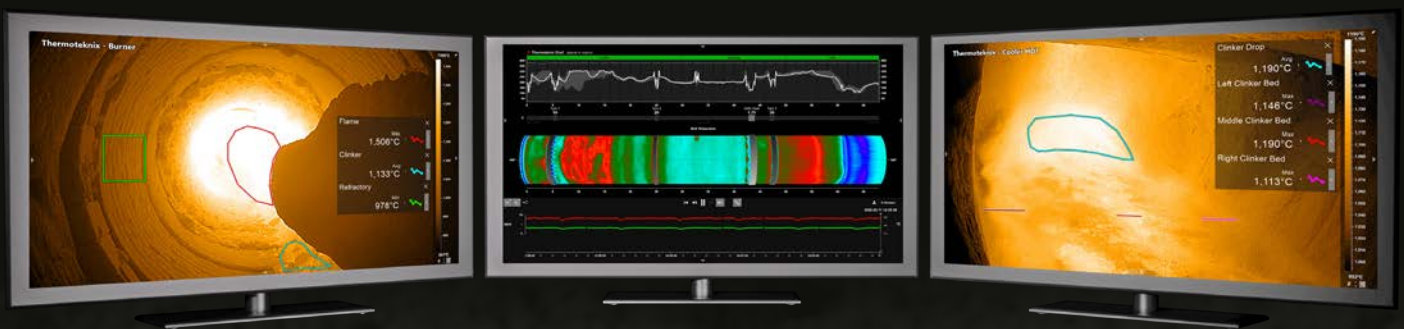
WinCem MultiView calculates both coating and brick thickness for the campaign, which enables planning of scheduled maintenance and bricking work during normal kiln operation.

Dynamic, multi-region trending

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

Timeline historical review

When operating modern high capacity kilns, faults in refractory condition or coating can develop over long periods of time. WinCem MultiView offers a unique "Timeline" interface which allows the user to simply "turn back time" and view display of kiln surface temperature or changes due to coating formation over time. The timeline combines the temperature trends, system and user alarms into one graphical display of system status.



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 MultiView 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. .

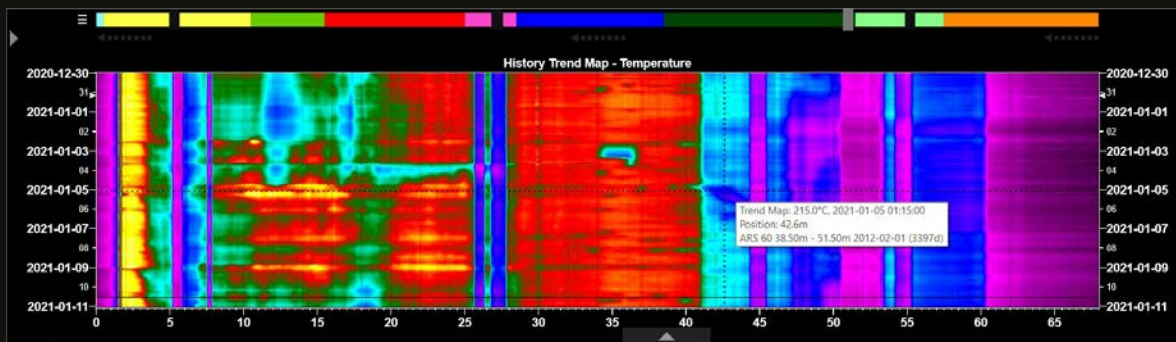
Centurion® TK50

New MultiView interface

In response to new demands for more data and ease of use, WinCem MultiView from Thermoteknix has an enhanced new user interface. Latest graphics technology matches the performance of 64-bit computer processors for stunningly vibrant and detailed thermal images of the kiln providing operators with a better user experience and ease of interpreting changes in kiln status.

Historical trend maps

WinCem MultiView has the ability to display historical kiln surface temperatures as a two dimensional (Time Vs Distance along the kiln) display, providing graphical insight to the kiln evolution over time.



Tyre slip

The Tyre Slip Monitoring (live ring migration) option integrates into the WinCem MultiView software to provide tyre slip information per rotation.

Tyre slip can be displayed graphically or digitally with individual alarms set for increasing or decreasing levels over pre-set limits.

Alarms and events

WinCem MultiView alarms and outputs can be set to automatically take various actions such as activating fans to 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 MultiView software.



2D and 3D coating dynamic 3D imaging feature

Interactive 2D and animated 3D thermal profile display choices allow the operator to easily interpret the kiln shell thermal data. Information about the refractory and shell temperature is immediately available at the cursor position anywhere on the thermal map. Profile, thermal map, tending, refractory thickness, coating thickness and alarms are all capabilities that WinCem Operators have come to rely on are still there, and much more.

Patented PosiTrack Alignment Technology

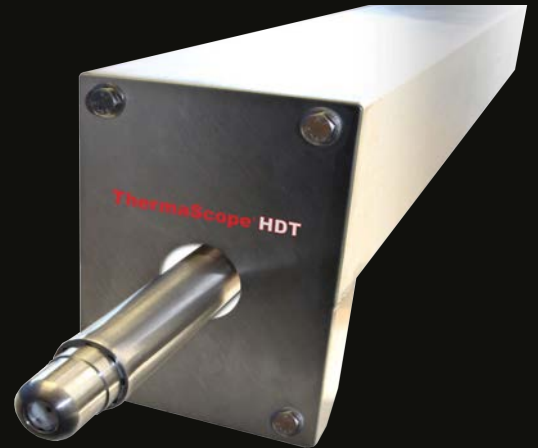
Thermoteknix Systems Ltd was founded nearly 40 years ago and continues to supply its industry-leading technology, for monitoring the cement process from all angles, to companies around the world.

Heat loss calculation

The WinCem MultiView software calculates the true energy cost over time is recorded and can be viewed in the timeline trend.

System expansion options

The MultiView system is capable of supporting up-to three ThermaScope Cameras and one Kiln shell scanning system in a Single Display interface. Flexible display options allow single monitor options with picture-in-picture technology or up to four discrete Monitors all controlled via a single User interface.



ThermaScope HD 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 optimised kiln burner control. With solid state technology, direct view optics and fibre optic signal transmission, ThermaScope offers reliability in the harshest environment and the fastest return-on-investment

ThermaScope expansion capabilities

For the first time, MultiView Enterprise software allows the combination of both internal burner cameras and external kiln shell temperature systems to be combined into a single time-line. This allows modern plant operators to gain a complete understanding of the correlation between all control changes.



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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 Operating System	✓
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MULTIVIEW SOFTWARE FEATURES

Real time Spot, Area & Regional Area measurement with Alarm outputs, 2D Image Map, Alarm Processing, Temperature Maps, Spot Area Processing, Worst Case History, Historical timeline, Simultaneous Line Display/Measurement on Live & Recalled Data, integral Temperature vs Time Trending, Multiple temperature & zone alarms with hardware outputs, Event Log Manager, Multiple User Configurations & monitor allocations, Profile/Envelope, Refractory Manager, Optional Tyre Slip Software & Alarms, On-line Diagnostics & Interfacing options, Operator/Supervisor protection, Remote viewers, OPC DA or UA server functions.

EXPANSION OPPORTUNITIES

Addition of ThermaSope Hardware to the WinCem computer allows combination of both internal and external kiln temperature monitoring.

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

STANDARD SYSTEM

- Air Purge
- Heavy Duty Blower Fan
- Centurion TK50 scanner
- Mounting Cradle Assembly
- Power & Communications Unit
- PC Interface Unit
- Kiln Synchronisation Switch
- Heavy Duty ABS Shipping Case
- Industrial-grade controller PC (inc. LCD screen, keyboard and mouse)

OPTIONAL ACCESSORIES

- Tyre Slip Software
- Remote I/O Module
- OPC Interfacing Software (OPC DA and OPC UA)
- Alignment Telescope
- Rack-mounted PC

COMMUNICATIONS

Multimode fibre optic cable kit - 50/125µm with ST terminations

WARRANTY

24 Months Standard

