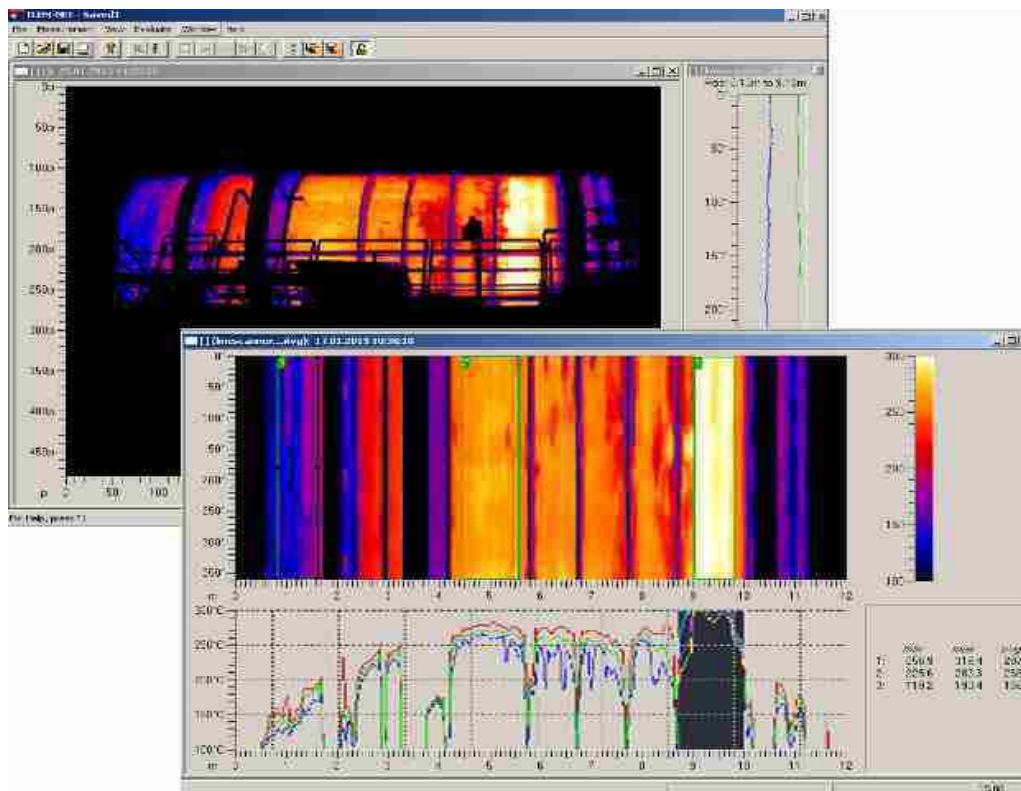


“TMCx-2D”

Temperature Measuring 2D-Cameras

Series of advanced Thermal-Imagers with up to 120° HFOV & embedded Visual-Camera Option



The Product

GESOTEC TMCx-2D camera models combine classical infrared line-scanner functionality with thermal and visual TCP/IP-camera surveillance. Taking a rotary kiln as an example, this technology allows users to see the “classical thermal image” of a complete kiln shell rotation plus the whole scene as “multispectral real-time TV”. With this new kind of leading edge instrumentation for combined thermal & visual process monitoring many industrial applications can largely be improved.

Advantages:

- Real-time thermal and visual video for reliable detection of “hot spots” and/or obstacles.
- Exchangeable infrared optics and optical filters provide best measurement results for any particular application.
- Flexible horizontal angle of view between $30^{\circ} \leq \text{HFOV} \leq 120^{\circ}$.
- Suitable optical filters for different applications.
- Free selectable “scan-lines” within the 2D image.
- Easy setup through the TCP/IP Ethernet webserver.
- Live video stream to any network client.
- Intelligent video image processing capabilities for most demanding plant surveillance applications.



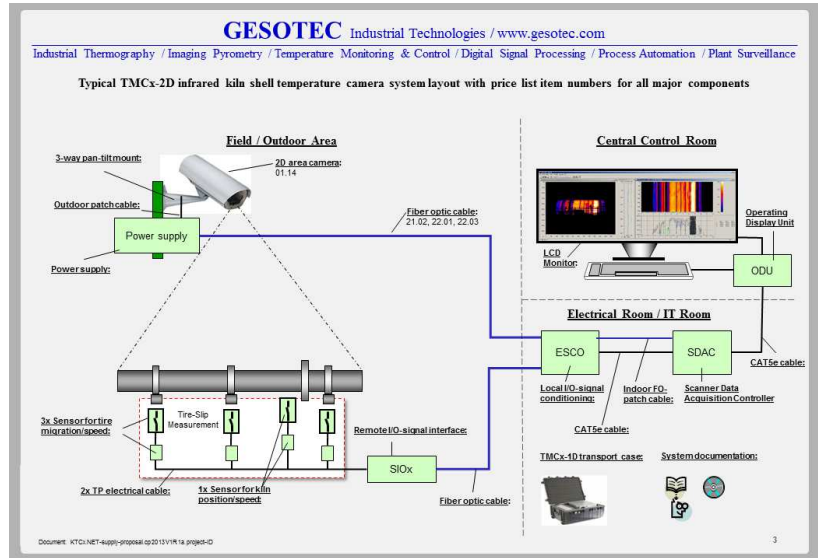
Applications:					
Rotary Kilns:	Glass Production:	Fire Monitor (Security):	Plastics + Paper:	Electrolysis:	Steel + Aluminum:
Cement + Lime Waste	Float Glass Windshields	Tire Stocking Waste Stocking	Foil Extrusion Packing	Aluminum Copper	Hot rolling Mills Induction Heating

PRINCIPLE OF OPERATION

TMCx-2D cameras contain rugged uncooled micro-bolometer type focal plane arrays (FPA's) as thermal imaging sensors. Various models are available with QVGA or VGA resolution and a spectral sensitivity in the long-wave infrared region from 8µm to 12µm ("LWIR") and/or in the mid-wave infrared region from 3µm to 5µm ("MWIR"). All TMCx-2D cameras have a rugged BBAR coated germanium optics with a standard or customized horizontal field of view (HFOV) between 30° and 120°.

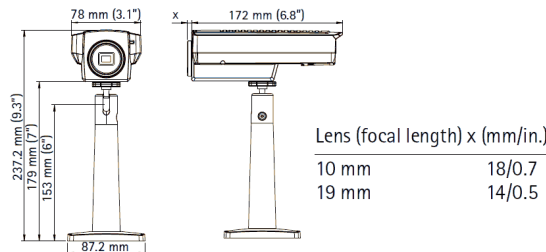
A precision laboratory instrument calibration incl. certificate for at least eight traceable blackbody reference temperatures ensures reliable measurement results within any suitable temperature range of interest. Image and scan line refresh rates of the unit are adjustable from 1Hz to 30Hz. The standard RJ45 Ethernet signal interface with TCP/IP protocol and the embedded web server for remote instrument setup & control guarantee easy installation & operation.

TMCx-2D cameras provide multiple, individually configurable video streams in H.264 and Motion-JPEG standards including video compression, which reduces Ethernet bandwidth usage and also needs for high storage capacity. TMCx-2D cameras are available with an IP66 rated professional environmental protective housing, ready for outdoor installations. In this case, a heated solid entrance window and a special sheet metal roof provide secure protection against most ambient condition changes, such as rain, snow, sun-heat, etc. within the effective ambient operating temperature range -40°C to +60°C. Installation is made easy and cost effective with Power over Ethernet (IEEE 802.3af). More details are available on request.

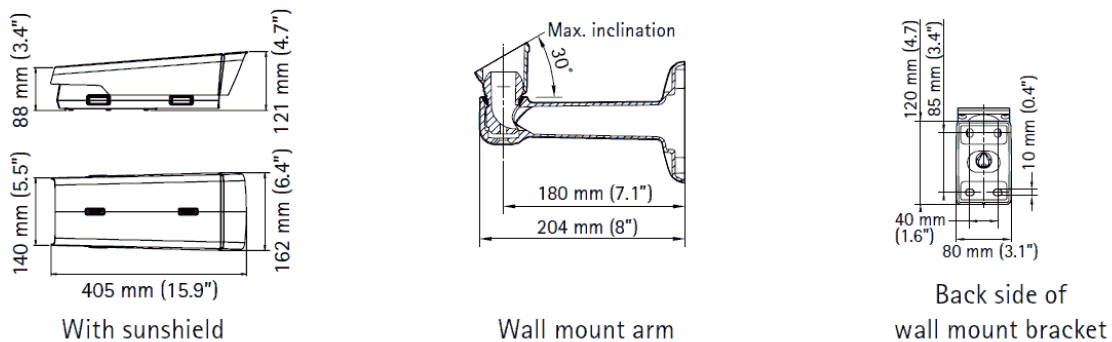


Typical dimensions and mounting options:

A) TMCx-2D thermal imager with basic ball-head mount for indoor installations



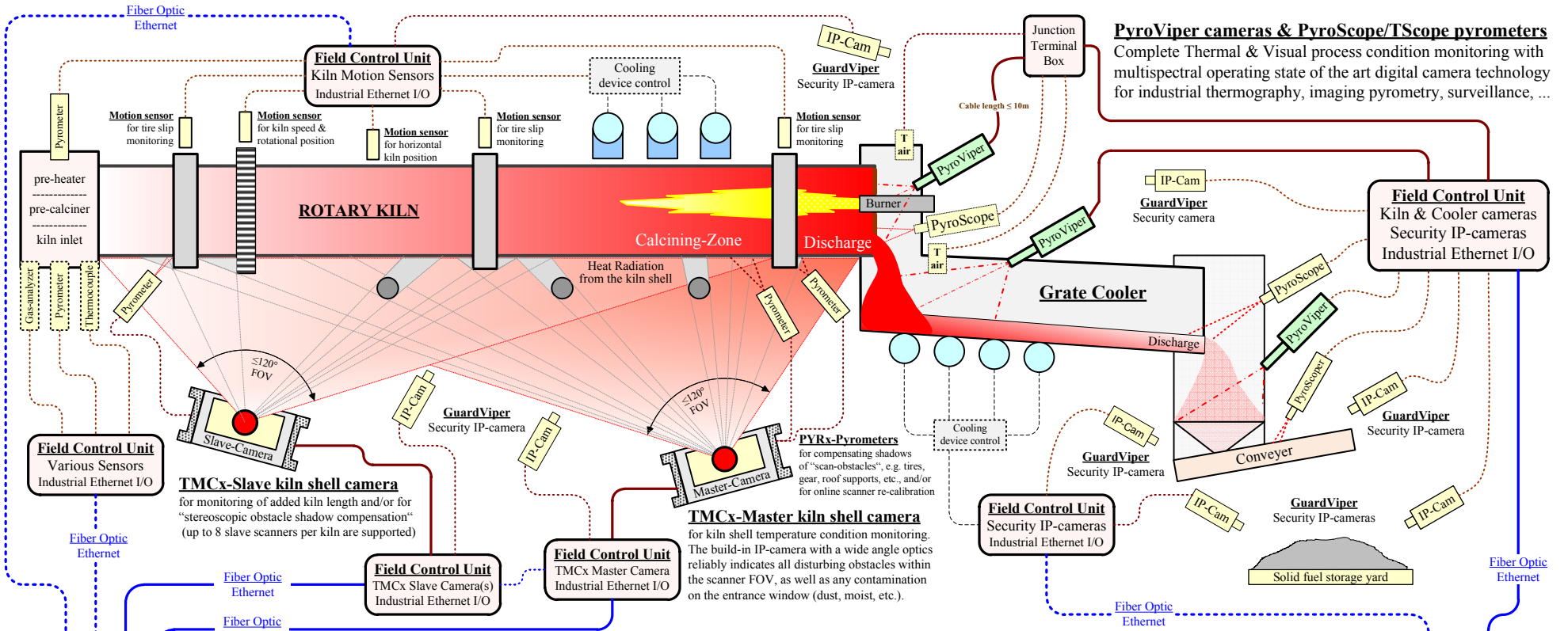
B) TMCx-2D thermal imager with IP66 housing and wall mount bracket for outdoor installations



Specifications are subject to change without prior notice.

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



PyroViper cameras & PyroScope/TScope pyrometers
 Complete Thermal & Visual process condition monitoring with multispectral operating state of the art digital camera technology for industrial thermography, imaging pyrometry, surveillance, ...

Field Control Unit
 Kiln & Cooler cameras
 Security IP-cameras
 Industrial Ethernet I/O

Field Control Unit
 Security IP-cameras
 Industrial Ethernet I/O

Field Control Unit
 Various Sensors
 Industrial Ethernet I/O

TMCx-Slave kiln shell camera
 for monitoring of added kiln length and/or for “stereoscopic obstacle shadow compensation” (up to 8 slave scanners per kiln are supported)

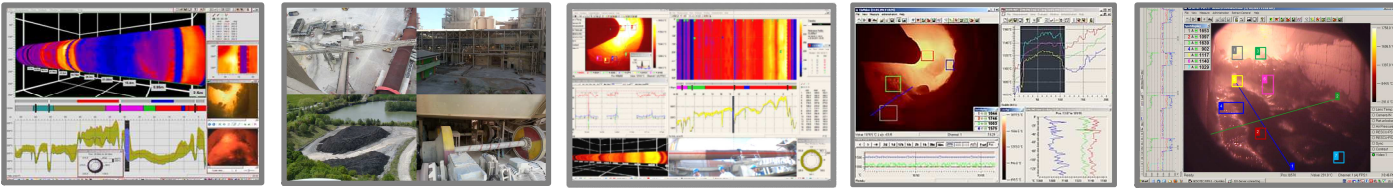
Field Control Unit
 TMCx Slave Camera(s)
 Industrial Ethernet I/O

Field Control Unit
 TMCx Master Camera
 Industrial Ethernet I/O

TMCx-Master kiln shell camera
 for kiln shell temperature condition monitoring. The built-in IP-camera with a wide angle optics reliably indicates all disturbing obstacles within the scanner FOV, as well as any contamination on the entrance window (dust, moist, etc.).

Field / Outdoor Area

Control Room / IT Room / Electrical Service Room



I/O-Interface Unit
 Signal conditioning & pre-processing

Kiln Shell Console
 SCADA Host & HMI/IS
 Signal/Data-Processor

Surveillance Console
 Security Video over IP
 Multi-screen Processor

Supervisor Console
 HMI/Integrated-System
 OPC data Client/Server

Burn-Zone Console
 SCADA Host & HMI/IS
 Signal/Data-Processor

Clinker Cooler Console
 SCADA Host & HMI/IS
 Signal/Data-Processor

I/O-Interface Unit
 Signal conditioning & pre-processing

—SCADA/Video Ethernet-LAN for thermal/visual pyro-Process Condition Monitoring & embedded Factory Surveillance / Advanced SCADA sub-system(s) in an industrial IoT-NETwork—

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	GESOTEC Industrial Technologies ©1982-2016 / www.gesotec.com
ah141128x: revised	KTCx.NET-SCADA system concept drawing, kiln & cooler layout 2014V1R3			
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	