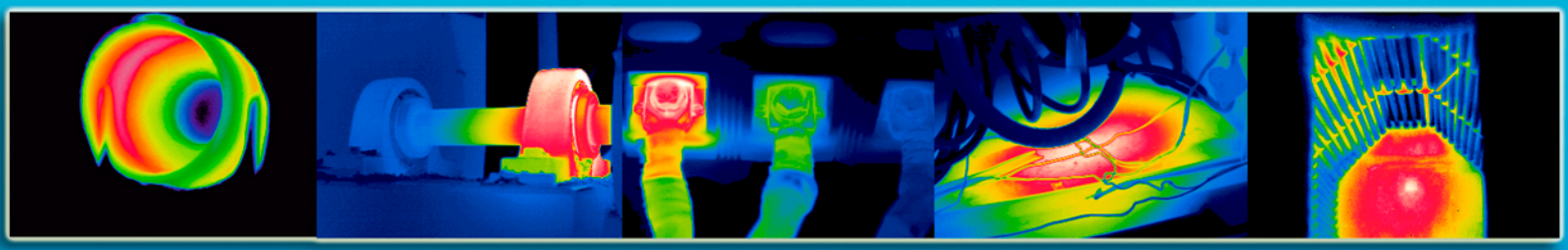
MIKRON® INFRARED

2005 Thermal Imaging Product Portfolio

Infrared Technology for Non-Contact Temperature Measurement



MikroScan 7200V

MikroScan 7515

MikroScan 7400

MikroScan 7600 PRO

MikroScan 7302/7304

MikroLine 2128/2256

MikroLine 2250

Pyrovision 7900/9103

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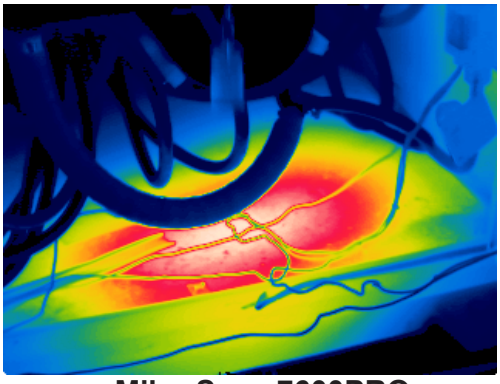
THE INFRARED PROS

Call 1-888-506-3900 or
Visit www.mikroninfrared.com

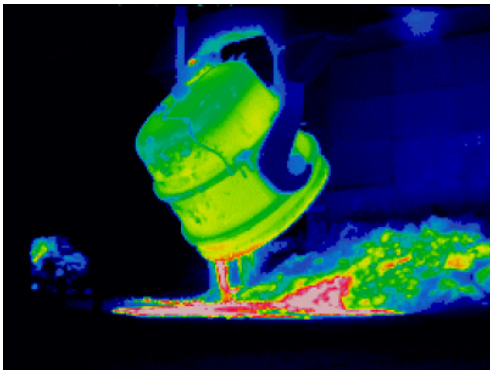
Sample Images

MIKRON INFRARED

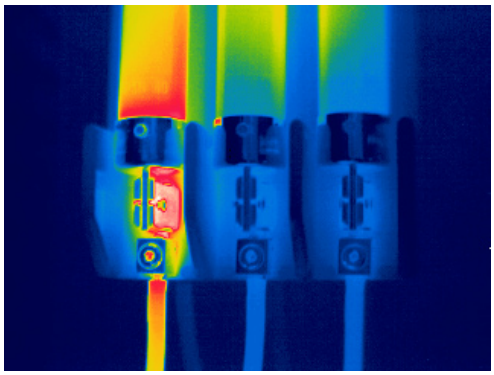
For More Information Call:
1-888-506-3900



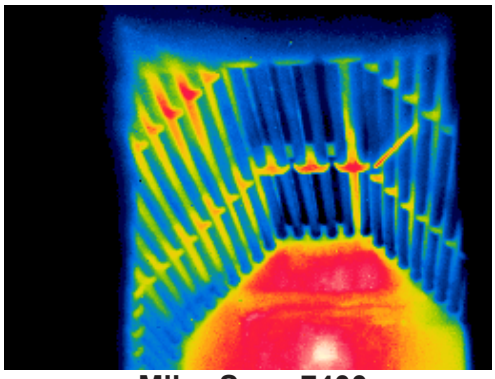
MikroScan 7600PRO



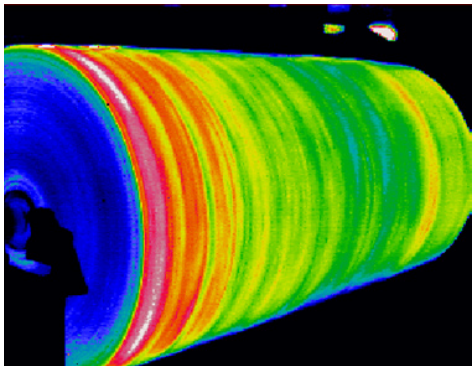
MikroScan 7200V



MikroScan 7515



MikroScan 7400



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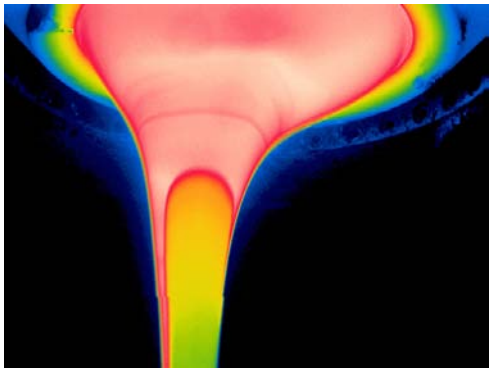
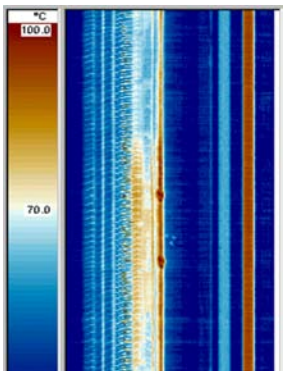
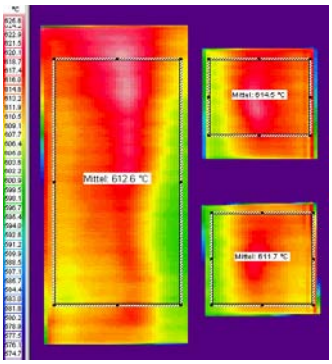


Pyrovision 9103/9104



MikroLine 2250



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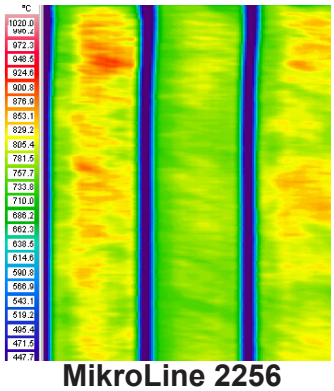


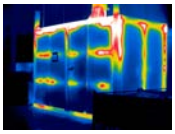
MikroLine 2256

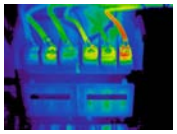
Mikron Infrared, Inc., Thermal Imaging Division, 1101 Elevation Street, Suite 3, Hancock, MI 49930 ● Email: jon@mikroninfrared.com ● Internet: www.mikroninfrared.com

MikroScan 7600PRO

World's Finest, Fully Radiometric Hand-Held Thermal Imager with Built-in Visible Light Camera

Easy to use, superior performance infrared camera with high-quality flip-out LCD display and on-board digital visual and voice recording for demanding PPM applications





Key Features

- Newly developed high performance 320x240 UFPA detector
- Exceptional performance with a resolution of 0.06°C (at 30°C 60Hz)
- Temperature Range -40°C to 2000°C
- Focusing Range of 30cm to infinity
- Weighs 3.5 with batteries and LCD
- Real-time image recording (1664 images at 60Hz)
- On-board digital visual and voice recording
- Multi-spot temperature measurement with emissivity settings
- Automatic level, gain and focus
- IEEE 1394 (Firewire®)

Mikron has once again raised the bar on thermal imaging with the introduction of the MikroScan 7600 PRO. This high resolution and high performance, hand-held IR camera offers capabilities that far exceed any IR camera on the market today. The MikroScan 7600 PRO is an extremely lightweight, fully-radiometric camera with a built-in visual imaging capabilities. With its newly developed high-performance UFPA detector and built-in visual camera, linking thermal and visual images for easy data storage, analysis and post processing has never been more efficient.

The MikroScan 7600 PRO is ergonomically designed for comfortable one-handed point-and-shoot operation using simple joystick operation, an intuitive menu system, five direct access buttons, viewfinder and high-quality flip out LCD display. It includes on-board digital voice recording and has the ability to simultaneously record high-definition 14-bit thermal images with digital visual images.

It is battery operated, comes standard with extensive onboard image processing software, and has the ability to store images and data to a standard compact flash memory card. Images can also be viewed in real-time via the video output or through a built-in IEEE 1394 (Firewire®) interface. Completely self-contained in a dust proof and splash proof case, the MikroScan 7600 PRO not only meets IP54 specifications, but it also offers a shock rating of 30G (IEC60068-2-27) and a vibration rating of 3G (IEC60068-2-6), making it the perfect imager for the even the most extreme of environments.

Mikron has been an innovative leader in the field of infrared non-contact temperature measurement since 1969. Mikron offers Value Imageering to help customers solve their most challenging application problems. Value Imageering is a turnkey package, consisting of complete engineering, design, and installation services to meet the most severe and difficult thermal imaging system requirements. Today, the company provides industrial customers and R&D laboratories with accurate instrumentation ranging from convenient portable cameras to complete thermal imaging systems.

Technical Data

MikroScan 7600 PRO		
Performance	Temperature Range:	Range 1: -40°C to 120°C Range 2: 0°C to 500°C Range 3: 200°C to 2000°C (Optional)
	Measurement Accuracy:	±2% or 2°C of reading
	Field of View:	21.7°(H) x 16.4°(V)
	Focus Range:	30 cm to infinity
	Instantaneous FOV / Spatial Resolution:	1.2 mrad
	Image Update Rate:	60 frames per second
	Resolution:	0.06°C (at 30°C 60Hz) or 0.03°C (at 30°C Σ12)
	Detector:	320 x 240 Uncooled Focal Plane Array Microbolometer
	Spectral Band:	8.0 to 14.0 µm
Display Functions	B&W/Color Image:	Several palettes available
	Isothermal Band Display:	Max. 4 bands
	Multi-image display:	Replay 12 thermal images
	Multi-Sense Display:	Provided
	Line Profile:	X, Y line profile (waveform display)
Presentation	A/D Resolution	14 bit
	Annotation:	Text and voice annotation (30 sec. per image)
	Movie Recording:	Real-time memory (1664 images @ 60Hz)
	Image Processing Functions:	Variable level/sense; Multi-point temperature display (10 pts); Multi-point emissivity display (10 pts); ΔT Display; Max/Min (peak hold) temperature display; Alarm (full screen or specified box); 2x and 4x digital zoom (Run/Freeze); Box setting (max 5 boxes)
	Display:	Viewfinder and 3.5 inch LCD monitor
	Video Output:	NTSC/PAL composite video signal, S-Video
	Image Zoom:	2:1, 4:1 (with spatial filtering)
Visual Camera	Pixels:	0.41 Mega pixels
	Effective Image Pixels:	752 (H) x 480 (V) pixels
	Field of View:	30.1° (H) x 22.7°(V)
	Sensitivity:	1 lux
	Focusing distance:	30 cm to infinity
	Auto Exposure:	Provided
	Video Signal:	NTSC
Measurement	Measuring Functions:	Run/Freeze
	S/N improvement:	Σ2, Σ8, Σ16, and spatial filter ON/OFF
	Alarm:	Screen display and alarm sound (ON/OFF)
	Interval Measurement:	Recording on memory card: 2 to 3600 sec. interval; trigger function
	Emissivity Correction:	0.10 to 1.00 (at 0.01 steps)
	Environmental Temperature Correction:	Provided (including interval NUC)
	Background Compensation:	Provided
	User Setup:	Pre-registration of user setup (max. 10 setups)
	Auto Functions:	Full automatic (level, sense, focus); level trace, auto gain control
Interface	Communication:	RS-232/C
	Storage Device:	Compact Flash Memory Card (stores Thermal Image in .SIT or .BMP file format and Visible image in .SIT or .JPEG file format)
	Video Signal Output:	NTSC/PAL composite video signal, S-video
	Remote Control Operation:	IEEE1394 (Firewire®) Interface
Environmental	Operating Temperature:	-15°C to 50°C 90% Relative Humidity or less (not condensed)
	Storage Temperature:	-40°C to 70°C 90% Relative Humidity or less (not condensed)
	Environmental Protection:	IP 54 (IEC60529)
	Shock:	30G (IEC60068-2-27)
	Vibration:	3G (IEC60068-2-6)
Electrical	Power Supply:	AC adaptor: 100V to 240V, DC 7.2V (nominal)
	Power Consumption:	Approx. 6W (typical)
	Battery Operation:	Approx. 2 hours 30 minutes
Physical Characteristics:	Camera Dimensions:	4.3" x 4.5" x 7.4" (excluding projection)
	Camera Weight:	2.9 lb (excluding battery and LCD) 3.5 lb. (including battery and LCD)

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Thermal Imaging Division

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MIKRON INFRARED

MikroScan 7600PRO Rev 032905

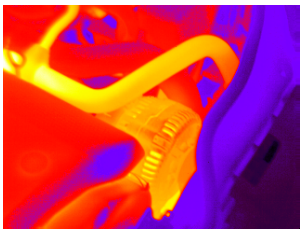
MikroScan 7515

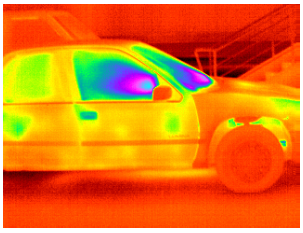
Low-Cost, Fully Radiometric, Hand-Held Thermal Imaging Camera

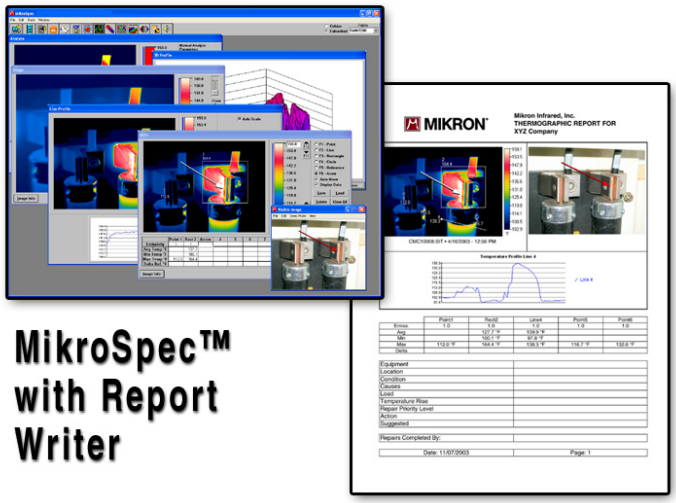
High-resolution, affordable and easy to use infrared camera complete with MikroView™ Thermal Imaging Software

The MikroScan 7515 is an extremely lightweight, high-performance handheld IR camera offering capabilities normally found in models costing much more. This fully-radiometric camera is ergonomically designed for comfortable one-handed point-and-shoot operation using an intuitive keypad located on the top of the viewfinder. Completely self-contained in a splash-proof metal case, it is battery operated, uses advanced uncooled UFPA microbolometer technology, and stores images and data to compact flash memory cards.

In addition to its on-board image processing capabilities, the MikroScan 7515 is fully compatible with Mikron's MikroSpec™ Thermal Imaging Software package which provides fully-comprehensive, post image analysis and report generation features.

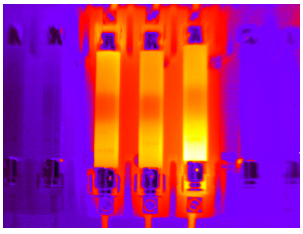

Mechanical Inspection


Surveillance



MikroSpec™ with Report Writer


High Voltage Contact


Connector at Fuse

Mikron has been an innovative leader in the field of infrared non-contact temperature measurement since 1969. The company provides industrial customers and R&D laboratories with accurate instrumentation ranging from convenient portable units to complete thermal imaging systems. The company also offers experience in many different thermal applications, specialized software, and custom camera configurations. Mikron offers Value Imageering to help customers solve their most challenging application problems. Value Imageering is a turnkey package, consisting of complete engineering, design, and installation services to meet the most severe and difficult thermal imaging system requirements.

Technical Data

MikroScan 7515		
Performance	Temperature Range:	-40°C to 500°C
	Measurement Accuracy:	±2% or 2°C of reading
	Field of View:	29°(H) x 22°(V)
	Focus Range:	30 cm to infinity
	Instantaneous FOV:	1.58 mrad
	Detector:	320 x 240 Uncooled Focal Plane Array (Microbolometer)
	Spectral Band:	8.0 to 14.0 µm
	Image Update Rate:	30 Frames/sec or 60 Frames/sec
	Sensitivity / NETD:	0.06°C @ 30°C (Normal)
	Temperature Level Setup:	-40°C to 120°C
	Sensitivity Setup:	0.2°C to 20°C /DIV
	Emissivity Setting:	Auto Based on Operator Input
	Emissivity Correction:	0.10 to 1.00 (0.01 step) [Only Temp & Emiss Display)
	Ambient Correction:	Provided (Including interval NUC)
	Ambient Compensation:	Inputs for Distance, Atmospheric Temperature, and Relative Humidity
	Background Compensation:	Provided
	Measurement Function:	Run/Freeze S/N Improvement Σ2 (Fast) Σ8 (Normal)
	Response Calibration:	Provided
	Lens Assembly Correction:	Provided
	Image Zoom:	2:1, 4:1 (with spatial filtering)
Presentation	A/D Resolution:	14 bit
	Display Color:	Color/Monochrome, Pos/Neg (16, 32, 64, 128, 256 Grades) 4 Palettes Available
	ISO Band Display:	1-4 Lines (ISO Temp Band Width, Display Position Change)
	Auto Function:	Full Auto (Focus, Level, Sens) Level Auto, Sens Auto, Focus Auto (Manually Available)
	Auto Gain Control (AGC):	Provided
	Level Trace:	Auto Center Level Control
	Image Processing Function:	Level Change During Freeze, Sens Change During Freeze, Point Temperature Display (1 Point Available) Point Emissivity Correction (1 Point Setting), Digital Zoom x2 and x4, Spatial Filter (Run & Freeze)
	Viewfinder:	Standard (Color LCD optional)
	Data Display:	Range, Measurement Mode, Point Temp, Time, and Error Message
	Software:	MikroView™ Thermal Imaging Software
Interface	Communication:	RS-232C
	Video Output:	NTSC/PAL, Composite Video, S-Video
	Data Memory:	16 MB Compact Flash Memory Card
Environmental	Operating Temperature:	-15°C to 50°C
	Storage Temperature:	-40°C to 70°C
	Enclosure:	IP 54 IEC60536-2
	Shock Resilience:	30G IEC60068-2-29
	Vibration Resilience:	3G IEC60068-2-6
Electrical	Power Supply:	95-250V AC 47-63 Hz
	Power Requirements:	7.2V DC 6W (Typical) Approx. 12W(Max when Stabilized)
	Battery Operation:	110 mins (Li-ion Battery)
Physical Characteristics:	Camera Dimensions:	3.8" x 4.3" x 6.7"
	Camera Weight:	3.3 lb. (Without Battery)
MikroScan 7515 Optional	Lenses:	Telephoto 2.0, Wide-angle, Close Focus, SpyGlass
	LCD Panel 5.6" diagonal measurement:	Complete with belt battery pack
	LCD Panel:	With full remote control capabilities

Mikron reserves the right to change specifications to reflect the latest changes in technology and improvements at any time without notice. These changes will be reflected in subsequent editions of our literature when warranted.

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MIKRON INFRARED

MikroScan 7515 Rev 032905

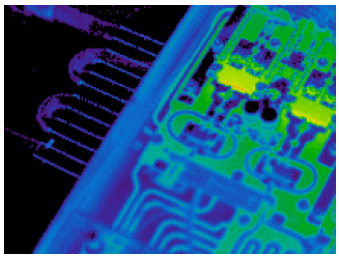
MikroScan 7200V

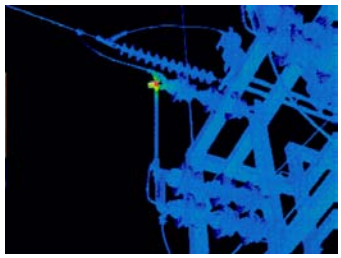
Fully Radiometric, Hand-Held Thermal Imager with Built-in Visible Light Camera

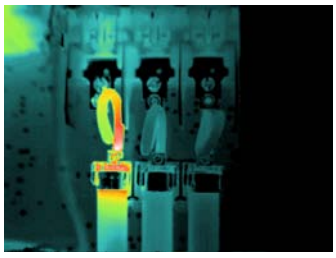
Easy to use, fully-radiometric infrared camera with on-board digital visual and voice recording capabilities for demanding PPM applications

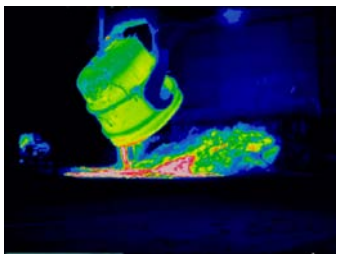
The MikroScan 7200V represents another milestone in innovative infrared thermometry. This fully-radiometric camera is ergonomically designed for comfortable one-handed point-and-shoot operation, includes on-board digital voice recording, and can simultaneously record high-definition 14-bit thermal images with digital visual images. The MikroScan 7200V is completely self-contained in a splash-proof metal case, is battery operated, and stores images and data to PCMCIA cards. Images can also be viewed in real-time via the video output or through an optional built-in IEEE 1394 (Firewire®) interface.

The MikroScan 7200V comes standard with extensive onboard image processing software. It also can be remotely controlled from a PC using optional software developed by Mikron, which provides additional analysis and reporting capabilities.


Electronic Component Uniformity


High Voltage Contact


Connector at Fuse


Refractory Degradation

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Technical Data

MikroScan 7200V		
Performance	Temperature Range:	Range 1: -40°C to 120°C Range 2: 0°C to 500°C Range 3: 200°C to 2000°C (Optional)
	Measurement Accuracy:	±2% or 2°C of reading
	Field of View:	29°(H) x 22°(V)
	Focus Range:	30 cm to infinity
	Instantaneous FOV / Spatial Resolution:	1.58 mrad
	Image Update Rate:	30 Hz/60Hz (selectable)
	Sensitivity / NETD:	0.06°C @ 30°C
	Detector:	320 x 240 UFPA VOX Microbolometer
	Spectral Band:	8.0 to 14.0 µm
	Atmospheric Transmission Correction:	Input correction by outside temp., humidity, and measuring distance
	Emissivity Setting:	Auto based on operator input
	Alarm:	Upper or Lower
	Image Freeze:	Provided
Presentation	File Format:	14 bit
	Digital Visual Recording:	On-board
	Digital Voice Recording:	On-board
	B&W/Color Image:	Several palettes available
	Auto Gain Control (AGC):	Automatic level, gain, focus
	Viewfinder:	Standard (Color LCD optional)
	Video Output:	NTSC/PAL, S-Video
	Image Zoom:	2:1, 4:1 (with spatial filtering)
Measurement	NUC:	Flag correction by specifying the interval time. (Manual/Auto selectable. Interval time setting available at auto)
	ΔT Display:	Display temperature difference between point A and B
	Region of Interest Setting:	Display Max/Min temperature in an operator-defined box
	Peak Temperature Hold:	Keep Max/Min temperature during recording cycle
	Isotherm:	Variable Bandwidth, Multi-Color for Regions available
	Temperature Span:	Automatic
	Temperature Range Setting:	Auto and Manual
	Multi-Spot Temperature Measurement:	10 pt. max. with EMISS setting
Interface	Communication:	RS-232/C (computer control available)
	Memory Card:	Provided PCMCIA 16mb
	Remote Control Operation:	GPIB, RS-232C, or LCD Remote Panel IEEE1394 (Firewire®) Interface (optional)
Environmental	Operating Temperature:	-15°C to 50°C (90% Relative Humidity)
	Storage Temperature:	-40°C to 70°C (90% Relative Humidity)
	Enclosure / Protection:	IP 54 IEC 529 Housing
Electrical	Power Supply:	95-250V AC 47-63 Hz
	Power Requirements:	7.2V DC 6W
	Battery Operation:	110 mins (Li-ion Battery)
Physical Characteristics:	Camera Dimensions:	3.8" x 4.3" x 6.7"
	Camera Weight:	4.0 lb. (without battery)
	Enclosure / Protection:	IP 54 IEC 529 Housing
MikroScan 7200V Optional	Temperature Range 3:	200°C to 2000°C
	Onboard Real-time Memory Recording:	Operator selectable image capture rate
	Lenses:	Telephoto 2.0, Wide-angle, Close Focus
	LCD Panel:	With full remote control capabilities
	LCD Panel 5.6" diagonal measurement:	Complete with belt battery pack
	Real-time Image Capturing:	IEEE1394 (Firewire®) Interface MikroSpec R/T software

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FireWire is a trademark of Apple Computer, Inc., registered in the U.S. and other countries.

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MIKRON INFRARED

MikroScan 7200V Rev 032905

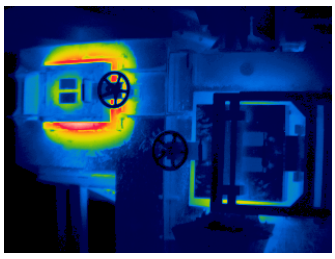
MikroScan 7400

Fully Radiometric, Multi Purpose, Hand-Held Thermal Imager with Built-in Visible Light Camera

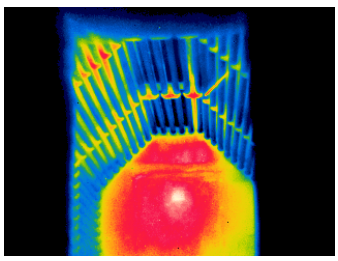
Unique and easy to use infrared camera with on-board digital visual and voice recording capabilities plus specialized filtering for seeing through flames

The MikroScan 7400 represents another milestone in innovative infrared thermometry. This fully-radiometric camera with its high-temperature functionality makes it the perfect tool for PPM inspections and radiometric inspections of internal furnace/boilers.

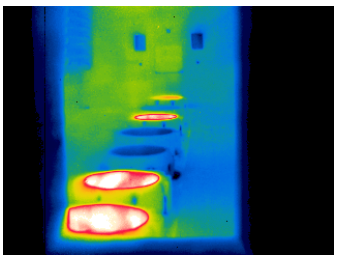
The MikroScan 7400 is ergonomically designed for comfortable one-handed point-and-shoot operation, includes on-board digital voice recording, and can simultaneously record high-definition 14-bit thermal images with digital visual images. The MikroScan 7400 is completely self-contained in a splash-proof metal case, is battery operated, and stores images and data to PCMCIA cards. Images can also be viewed in real-time via the video output or through an optional built-in IEEE 1394 (Firewire®) interface.



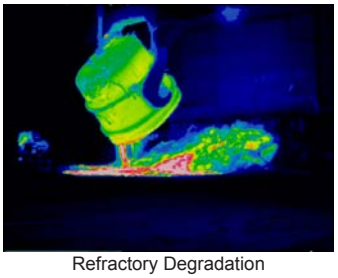
Furnace Door Seals



Inside Furnace



Inside Boiler



Refractory Degradation

The MikroScan 7400 also includes a high temperature range, specialized infrared filtering capabilities, radiation shield, and protective window assembly, which allows the imager to be used to measure temperature of tube walls inside a furnace without the interference from combustion flames.

The MikroScan 7400 comes standard with extensive onboard image processing software. It also can be remotely controlled from a PC using optional software developed by Mikron, which provides additional analysis and reporting capabilities.

MikroScan 7400 with Radiation Shield

Mikron has been an innovative leader in the field of infrared non-contact temperature measurement since 1969. Mikron offers Value Imageering to help customers solve their most challenging application problems. Value Imageering is a turnkey package, consisting of complete engineering, design, and installation services to meet the most severe and difficult thermal imaging system requirements. Today, the company provides industrial customers and R&D laboratories with accurate instrumentation ranging from convenient portable cameras to complete thermal imaging systems.

Technical Data

MikroScan 7400		
Performance	Temperature Range:	Range 1: -40°C to 120°C Range 2: 0°C to 500°C Range 3: 400°C to 1600°C (with Flame Filter)
	Measurement Accuracy:	±2% or 2°C of reading
	Field of View:	29°(H) x 22°(V)
	Focus Range:	30 cm to infinity
	Instantaneous FOV / Spatial Resolution:	1.58 mrad
	Image Update Rate:	30 Hz/60Hz (selectable)
	Sensitivity / NETD:	0.06°C @ 30°C
	Detector:	320 x 240 UFPA VOX Microbolometer
	Spectral Band:	8.0 to 14.0 µm
	Atmospheric Transmission Correction:	Input correction by outside temperature, humidity, and measuring distance
	Emissivity Setting:	Auto based on operator input
	Alarm:	Upper or Lower
	Image Freeze:	Provided
Presentation	File Format:	14 bit
	Digital Visual Recording:	On-board
	Digital Voice Recording:	On-board
	B&W/Color Image:	Several palettes available
	Auto Gain Control (AGC):	Automatic level, gain, focus
	Viewfinder:	Standard (Color LCD optional)
	Video Output:	NTSC/PAL, S-Video
	Image Zoom:	2:1, 4:1 (with spatial filtering)
Measurement	NUC:	Flag correction by specifying the interval time. (Manual/Auto selectable. Interval time setting available at auto)
	ΔT Display:	Display temperature difference between point A and B
	Region of Interest Setting:	Display Max/Min temperature in an operator-defined box
	Peak Temperature Hold:	Keep Max/Min temperature during recording cycle
	Isotherm:	Variable Bandwidth, Multi-Color for Regions available
	Temperature Span:	Automatic
	Temperature Range Setting:	Auto and Manual
	Multi-Spot Temperature Measurement:	10 pt. max. with EMISS setting
Interface	Communication:	RS-232/C (computer control available)
	Memory Card:	Provided PCMCIA 16mb
	Remote Control Operation:	GPIB, RS-232C, or LCD Remote Panel IEEE1394 (Firewire®) Interface (optional)
Environmental	Operating Temperature:	-15°C to 50°C (90% Relative Humidity)
	Storage Temperature:	-40°C to 70°C (90% Relative Humidity)
	Enclosure / Protection:	IP 54 IEC60536-2
	Shock Resilience:	30G IEC60068-2-29
	Vibration Resilience:	3G IEC60068-2-6
Electrical	Power Supply:	95-250V AC 47-63 Hz
	Power Requirements:	7.2V DC 6W
	Battery Operation:	110 mins (Li-ion Battery)
Physical Characteristics:	Camera Dimensions:	3.8" x 4.3" x 6.7"
	Camera Weight:	4.0 lb. (without battery)
	Enclosure / Protection:	IP 54 IEC 529 Housing
MikroScan 7400 Optional	Onboard Real-time Memory Recording:	Operator selectable image capture rate
	Lenses:	Telephoto 2.0, Wide-angle, Close Focus, SpyGlass* (*patent pending)
	LCD Panel:	With full remote control capabilities
	LCD Panel 5.6" diagonal measurement:	Complete with belt battery pack
	Real-time Image Capturing:	IEEE1394 (Firewire®) Interface MikroSpec R/T software

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MIKRON INFRARED

MikroScan 7400 Rev 032905

SpyGlass™ Lens and ViewPorts

MIKRON INFRARED

An effective, safe, patented and UL-approved method for inspecting the interior of electrical cabinets without resorting to opening cabinet doors or shutting down electrical circuits.

Requirements and Solution:

Hotspots in electrical cabinets can be quickly pinpointed while circuits are energized and under load, using Mikron's SpyGlass™ Lens and economical ViewPorts.

Raising the safety and convenience standard for thermal inspections, the SpyGlass Lens and ViewPort encourage frequent examinations of electrical switchgear because – with cabinet doors closed – no downtime is required to de-energize circuits for safety reasons.

Characteristics of the solution:

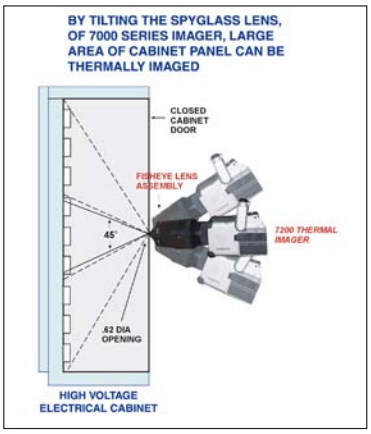
- Permits thermal inspection of electrical switch gear without opening the enclosure and disconnecting circuits.
- Views entire scene through a 5/8" (16mm) diameter hole in the cabinet.
- Offers 53°H x 40°V (66° Diagonal) Field of View.
- Provides minimum focus range of 4″.
- Large depth of field reduces the need to re-focus for different cabinet depths.
- Provides Temperature Measurement accuracy: ±3°C
- Attaches to Mikron's MIDAS camera and any MIKRON MikroScan® 7000 Series cameras, making them multi-purpose imagers.
- Allows immediate field installation without having to return the camera to MIKRON for specialized calibration.
- SpyGlass lens and ViewPorts are patented under US Patent No. 6,798,587 B2

SpyGlass™ Lens

The SpyGlass fisheye lens, with its wide field of view (53° horizontal by 40° vertical, or 66° diagonal), allows easy scanning of the interior of the electrical cabinet through the Viewport, providing a temperature measurement accuracy of ±3°C.

The SpyGlass lens attaches to Mikron's MIDAS thermal imaging camera or any Mikron 7000 Series imager, allowing the lightweight, high performance infrared camera to view entire electrical panels from just inches away.

With a minimum focus range of 4″(10 cm) and large depth of field, the SpyGlass lens reduces the need to re-focus for different electrical cabinet depths.



Technical Data

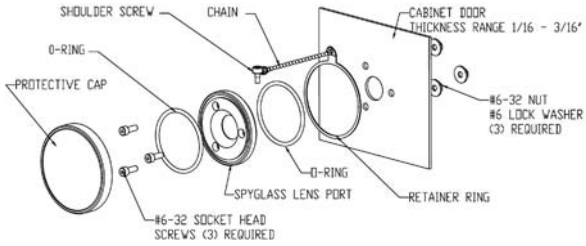
SpyGlass™ ViewPorts

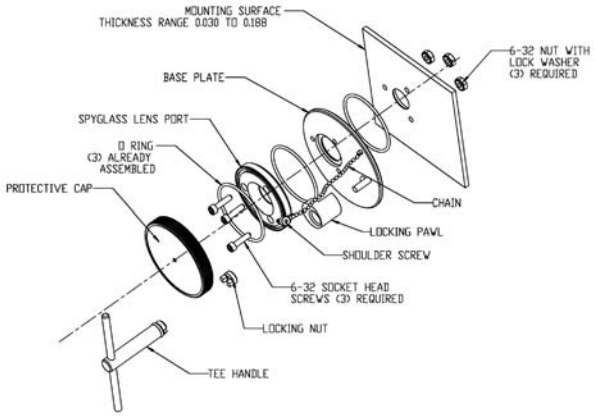
The unique design of the Viewport uses only a 0.62″ aperture, maintaining the integrity and safety rating of the cabinet, without the need for a metal screen barrier which can skew thermal readings, or break and compromise safety. The Viewport is unaffected by moisture, dirt, UV and corrosive environments – it never needs cleaning or replacement glass. When used with the plastic-tipped SpyGlass™ lens, there is no "path to ground" through the camera, enhancing operator safety.

These patented viewports have received a UL approval number of NITW2.E228318 for use in the United States and a UL approval number of NITW8.E228318 for use in Canada. These UL approved viewports are designed for use with NEMA Type 1, 2, 3, 3R, 4, 5, 12, 12K, and 13 enclosures. They are available in three styles, with a list price starting under $50.

SpyGlass™ Standard ViewPort (Model 19015-1)

The SpyGlass Standard Viewport is UL-rated and approved for installation at the OEM level or as a retrofit in the field. Suitable for both low-and high-voltage applications from 480 volts and up, it can be installed in 20 minutes or less on cabinets indoors or outdoors, in either vertical or horizontal positions. The Standard ViewPort design contains two o-rings for the purposes of insuring that the addition of this assembly still maintains complete immunity to dust and water penetration to the inside of the cabinet.



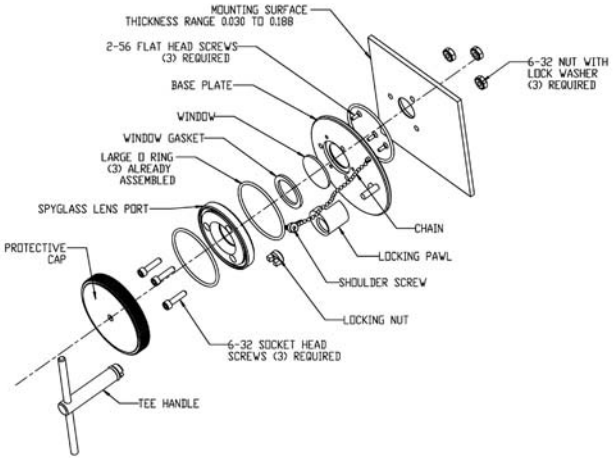


SpyGlass™ Lockable Viewport (Model 19015-4)

The Lockable Viewport is UL-rated and approved for installation at the OEM level or as a retrofit in the field. Suitable for both low-and high-voltage applications from 480 volts and up, it can be installed in 20 minutes or less on cabinets indoors or outdoors, in either vertical or horizontal positions. The Lockable ViewPort design contains three o-rings for the purposes of insuring that the addition of this assembly still maintains complete immunity to dust, water, and oil penetration to the inside of the cabinet. The keyed locking feature prevents unauthorized opening of the Viewport protective cover.

SpyGlass™ Lockable ViewPort with Window (Model 19015-3)

The Lockable Viewport with Window is UL-rated and approved for installation at the OEM level or as a retrofit in the field. Suitable for both low-and high-voltage applications from 480 volts and up, it can be installed in 20 minutes or less on cabinets indoors or outdoors, in either vertical or horizontal positions. The Lockable ViewPort with Window design includes an infrared window and contains three o-rings for the purposes of insuring that the addition of this assembly still maintains complete immunity to dust, water, and oil penetration to the inside of the cabinet. The keyed locking feature prevents unauthorized opening of the Viewport protective cover.



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MIKRON INFRARED

MikroScan 7302

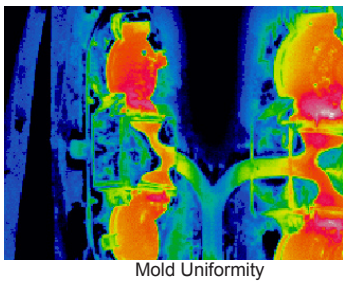
Fixed-Installation Thermal Imaging Camera for Industrial and Scientific Applications

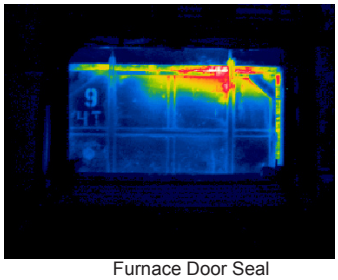
Affordable, high performance, infrared camera with digital image transfer and remote monitoring capabilities for demanding real-time imaging applications

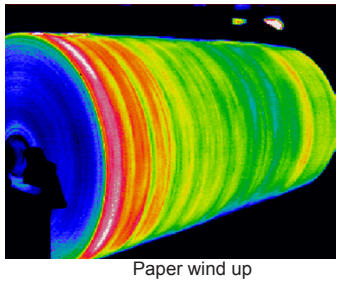
The MikroScan 7302 represents another milestone in innovative infrared thermometry. Designed with advanced maintenance-free electronics and Industrial Protective Packaging, the MikroScan 7302 offers unparalleled accuracy for demanding industrial and scientific applications. With an unmatched array of protective accessories, the MikroScan 7302 demonstrates Mikron's commitment to long-term trouble-free operation of these instruments. The MikroScan 7302 quickly measures temperature without contact in even the most adverse environments.

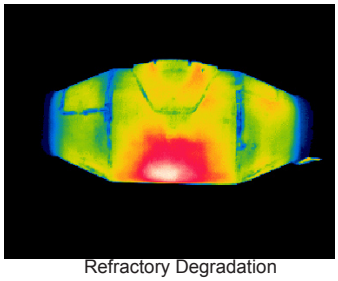
System Features

- *Affordable Price*
- *Real Time Digital Image Transfer via FireWire™ (IEEE1394)*
- *Remote Monitoring via Local Area Network [Optional]*
- *NEMA-4 housing [Optional]*
- *Maintenance Free operation*
- *Process Control Applications in Factory Production Environment*
- *Intrusion Detection and Surveillance*
- *Ambient temperatures to 100°C (212°F) with optional cooling*
- *High Accuracy ±2% or 2°C of reading*
- *Long Wavelength, Less Affected by Sunlight and Factory Lighting*
- *Camera Based on Proven MikroScan 7200*


Mold Uniformity


Furnace Door Seal


Paper wind up


Refractory Degradation

Mikron has been an innovative leader in the field of infrared non-contact temperature measurement since 1969. Mikron offers Value Imageering to help customers solve their most challenging application problems. Value Imageering is a turnkey package, consisting of complete engineering, design, and installation services to meet the most severe and difficult thermal imaging system requirements. Today, the company provides industrial customers and R&D laboratories with accurate instrumentation ranging from convenient portable cameras to complete thermal imaging systems.

Technical Data

MikroScan 7302		
Performance	Temperature Range:	Range 1: -40°C to 120°C Range 2: 0°C to 500°C Range 3: 200°C to 2000°C (Optional)
	Measurement Accuracy:	±2% or 2°C of reading
	Field of View:	29°(H) x 22°(V)
	Focus Range:	30 cm to infinity
	Instantaneous FOV:	1.58 mrad
	Detector:	320 x 240 Uncooled Focal Plane Array (Microbolometer)
	Spectral Band:	8.0 to 14.0 µm
	Image Update Rate:	30 Frames/sec or 60 Frames/sec (selectable)
	Sensitivity / NETD:	0.06°C @ 30°C
	Temperature Level Setup:	-40°C to 120°C
	Sensitivity Setup:	0.3°C to 20°C /DIV
	Emissivity Setting:	0.10 to 1.00 (0.01 step)
	Ambient Correction:	Provided (Including interval NUC)
	Ambient Compensation:	Inputs for Distance, Atmospheric Temperature, and Relative Humidity
	Background Compensation:	Provided
	Measurement Function:	Run/Freeze S/N Improvement Σ2 (Fast) Σ8 (Normal)
	Response Calibration:	Provided
	Lens Assembly Correction:	Provided
	Image Zoom:	2:1, 4:1 (with spatial filtering)
Presentation	A/D Resolution:	14 bit
	Display Color:	Color/Monochrome, Pos/Neg (16, 32, 64, 128, 256 Grades) 4 Palettes Available
	ISO Band Display:	1-4 Lines (ISO Temp Band Width, Display Position Change)
	Auto Function:	Full Auto (Focus, Level, Sens) Level Auto, Sens Auto, Focus Auto (Manually Available)
	Auto Gain Control (AGC):	Provided
	Level Trace:	Auto Level Trace
	Image Processing Function:	Level Change During Freeze, Sens Change During Freeze, Multi-Point Temperature Display (10 Points Available) Multi-Point Emissivity Correction (10 Points Setting), Delta T Display (displaying temperature difference between 2 points), Box setting (5 boxes max.) Max/Min temperature display, Max/Min peak hold, Alarm display, Digital Zoom x2 and x4, Spatial Filter
	Viewfinder:	Standard (Color LCD optional)
	Data Display:	Color Bar (Gray Scale), Display Temperature Range, Temperature Level, Temperature Sensitivity, Measuring Temperature Range, Emissivity, Measuring Mode, Multi-point Temperature, Time, Memo, and Error Message
Interface	Communication:	RS-232C, Ethernet (optional), IEEE1394
	Video Output:	NTSC/PAL, S-Video
Environmental	Operating Temperature:	-15°C to 50°C
	Storage Temperature:	-40°C to 70°C
	Shock Resilience:	30G (IEC60068-2-29/JIS C 0042)
	Vibration Resilience:	3G (IEC60068-2-6/JIS C 0040)
Electrical	Power Supply:	7.2V DC 6W (Nominal)
	Power Consumption:	Approx. 5W (Typical) Approx. 11W (Max when Stabilized)
Physical Characteristics:	Camera Dimensions:	3.7" x 4.2" x 6.5" (excluding projections)
	Camera Weight:	2.6 lb. (excluding protective housing)

Mikron reserves the right to change specifications to reflect the latest changes in technology and improvements at any time without notice. These changes will be reflected in subsequent editions of our literature when warranted.

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MIKRON INFRARED

MikroScan 7302 Rev 032905

FM Approvals

MikroScan 7304

High-Temperature, Fixed Installation Thermal Imaging Camera

MIKRON INFRARED

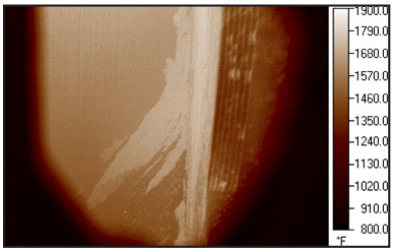
Affordable, high performance, infrared camera with digital image transfer and remote monitoring capabilities plus specialized filtering for seeing through flames.

The MikroScan 7304 represents another milestone in innovative infrared thermometry. Designed with advanced maintenance-free electronics, industrial protective packaging, and specialized flame filtering, the MikroScan 7304 offers unparalleled accuracy for demanding high-temperature applications such as radiometric inspections of internal furnace/boilers.

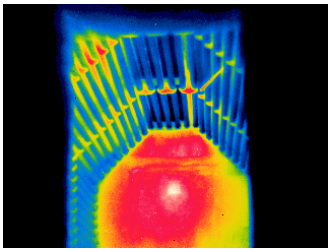
With an unmatched array of protective accessories, the MikroScan 7304 demonstrates Mikron's commitment to long-term trouble-free operation of these instruments. The MikroScan 7304 can quickly measure temperature of tube walls inside a furnace without the interference from combustion flames.

System Features

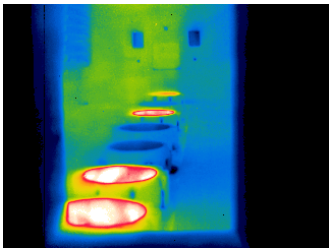
- Includes High-Temperature Range 400°C to 1600°C (with Flame Filter)
- Affordable Price
- Real Time Digital Image Transfer via FireWire™ (IEEE1394)
- Remote Monitoring via Local Area Network [Optional]
- NEMA-4 housing [Optional]
- Maintenance Free operation
- Process Control Applications in Factory Production Environment
- Ambient temperatures to 100°C (212°F) with optional cooling
- High Accuracy ±2% or 2°C of reading
- Long Wavelength, Less Affected by Sunlight and Factory Lighting
- Camera Based on Proven MikroScan 7302



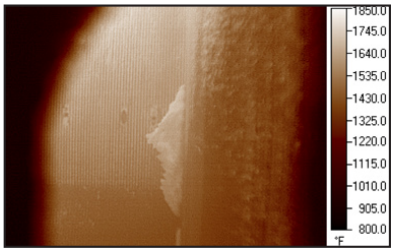
Inside Boiler



Inside Furnace



Inside Boiler



Inside Boiler

Introducing Mikron's THERMALSPECTION™

Implementing a systems approach for thermal process applications requires full knowledge of the customer's applications, available thermal imagers and thermal scanners, customer's existing controls platform, and software requirements, etc. We have a full staff of engineering and software specialists available for the design and development of comprehensive turn-key systems for all customer applications. Experience in many different thermal applications is the backbone of our designs and short-term turnaround for specialized software and custom camera configurations is our specialty.

Technical Data

MikroScan 7304		
Performance	Temperature Range:	Range 1: -40°C to 120°C Range 2: 0°C to 500°C Range 3: 200°C to 1600°C (with Flame Filter)
	Measurement Accuracy:	±2% or 2°C of reading
	Field of View:	29°(H) x 22°(V)
	Focus Range:	30 cm to infinity
	Instantaneous FOV:	1.58 mrad
	Detector:	320 x 240 Uncooled Focal Plane Array (Microbolometer)
	Spectral Band:	8.0 to 14.0 µm
	Image Update Rate:	30 Frames/sec or 60 Frames/sec (selectable)
	Sensitivity / NETD:	0.06°C @ 30°C
	Temperature Level Setup:	-40°C to 120°C
	Sensitivity Setup:	0.3°C to 20°C /DIV
	Emissivity Setting:	0.10 to 1.00 (0.01 step)
	Ambient Correction:	Provided (Including interval NUC)
	Ambient Compensation:	Inputs for Distance, Atmospheric Temperature, and Relative Humidity
	Background Compensation:	Provided
	Measurement Function:	Run/Freeze S/N Improvement Σ2 (Fast) Σ8 (Normal)
	Response Calibration:	Provided
	Lens Assembly Correction:	Provided
	Image Zoom:	2:1, 4:1 (with spatial filtering)
Presentation	A/D Resolution:	14 bit
	Display Color:	Color/Monochrome, Pos/Neg (16, 32, 64, 128, 256 Grades) 4 Palettes Available
	ISO Band Display:	1-4 Lines (ISO Temp Band Width, Display Position Change)
	Auto Function:	Full Auto (Focus, Level, Sens) Level Auto, Sens Auto, Focus Auto (Manually Available)
	Auto Gain Control (AGC):	Provided
	Level Trace:	Auto Level Trace
	Image Processing Function:	Level Change During Freeze, Sens Change During Freeze, Multi-Point Temperature Display (10 Points Available) Multi-Point Emissivity Correction (10 Points Setting), Delta T Display (displaying temperature difference between 2 points), Box setting (5 boxes max.) Max/Min temperature display, Max/Min peak hold, Alarm display, Digital Zoom x2 and x4, Spatial Filter
	Viewfinder:	Standard (Color LCD optional)
	Data Display:	Color Bar (Gray Scale), Display Temperature Range, Temperature Level, Temperature Sensitivity, Measuring Temperature Range, Emissivity, Measuring Mode, Multi-point Temperature, Time, Memo, and Error Message
Interface	Communication:	RS-232C, Ethernet (optional), IEEE1394
	Video Output:	NTSC/PAL, S-Video
Environmental	Operating Temperature:	-15°C to 50°C
	Storage Temperature:	-40°C to 70°C
	Shock Resilience:	30G (IEC60068-2-29/JIS C 0042)
	Vibration Resilience:	3G (IEC60068-2-6/JIS C 0040)
Electrical	Power Supply:	7.2V DC 6W (Nominal)
	Power Consumption:	Approx. 5W (Typical) Approx. 11W (Max when Stabilized)
Physical Characteristics:	Camera Dimensions:	3.7" x 4.2" x 6.5" (excluding projections)
	Camera Weight:	2.6 lb. (excluding protective housing)

Mikron reserves the right to change specifications to reflect the latest changes in technology and improvements at any time without notice. These changes will be reflected in subsequent editions of our literature when warranted.

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MIKRON INFRARED

MikroScan 7304 Rev 032905

FM Approvals ISO9001 Certified

ThermalSpection 724

Remote Thermal Monitoring System with Multiple Camera System Functionality

Multiple camera system functionality allows remote monitoring of temperatures in real time through image data obtained from one or more cameras to a single PC

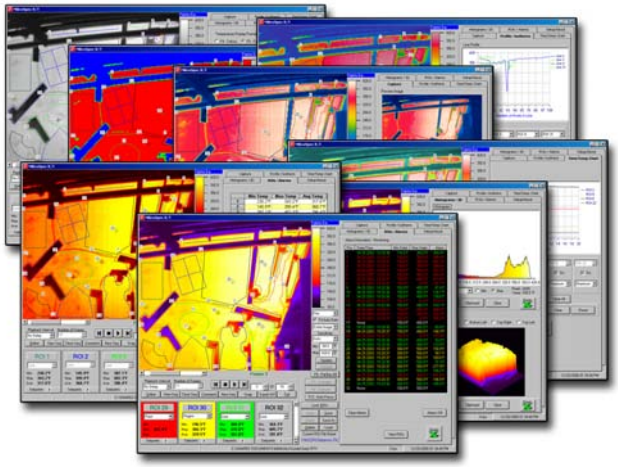
Mikron's ThermalSpection 724 Remote Thermal Monitoring System represents another milestone in innovative infrared thermometry. With its multiple camera system functionality, it is the first system to allow remote monitoring of temperatures in real time through image data obtained from one or more cameras to a single PC. Designed with advanced maintenance-free electronics and industrial protective packaging, the ThermalSpection 724 system offers unparalleled accuracy for demanding industrial and scientific applications while quickly measuring temperature without contact in even the most adverse environments. With an unmatched array of optional accessories, the ThermalSpection 724 system demonstrates Mikron's commitment to long-term trouble-free operation.

Each thermal imaging camera is mounted in a totally sealed environmental enclosure which contains an IR transparent window and offers continuous cooling from a UL-certified air cooling system. Positive pressure inside the enclosure prevents dirt or dust from entering, even in the harshest conditions. With an optional purge unit, the enclosure can also protect against explosion hazards in areas with possible exposure to volatile gases.

Each camera has an Internet IP address and password protection, offering control from any computer using wired or wireless Ethernet. When utilized with Mikron's MikroSpec™ R/T Thermal Data Acquisition and Analysis software, each camera is capable of monitoring up to 32 Regions of Interest and of being able to record up to 75 minutes of data in real time. Frames can also be captured at intervals rather than continuously, or they can be triggered by temperature alarms tied to individual Regions of Interest or by direct signal from the PC.

System Features/Benefits

- High Quality, Real Time Digital Image Transfer via Ethernet or IEEE1394 (Firewire)
- Remote Monitoring via (wired or wireless) Ethernet
- NEMA-4 housing
- Maintenance Free operation
- Control and Alarm Triggering Software with 32 Regions of Interest
- High Accuracy ±2% or 2°C of reading
- Long Wavelength, Less Affected by Sunlight
- Ambient temperatures to 100°C (212°F) with optional cooling
- IR Camera Based on Proven MikroScan 7302
- Remote Pan-And-Tilt capability (optional)
- Multiple Camera System functionality (optional)
- 8-Channel Input/Output Module (optional)



MikroSpec R/T Software

Technical Data

IR Camera–MikroScan 7302	Detector:	320 x 240 Uncooled Focal Plane Array (Microbolometer)
	Measurement Accuracy:	±2% or 2°C of reading
	Field of View:	29°(H) x 22°(V)
	Focus Range:	30 cm to infinity
	Instantaneous FOV:	1.58 mrad
	Spectral Band:	8.0 to 14.0 µm
	Image Update Rate:	30 Frames/sec or 60 Frames/sec (selectable)
	Sensitivity / NETD:	0.06°C @ 30°C
	A/D Resolution:	14 bit
Interfaces	Communication:	Ethernet, IEEE1394
	Video Output:	NTSC/PAL, S-Video
OnLine Thermal Image Processing Software	Presentation:	In run mode the system displays a live thermal image on the screen in 256 colors. Images can also be frozen.
	Remote Camera Control Functionality	Allows you to select the camera type, mode, range, temperature scale and lens. Also allows adjustments to be made for focusing, emissivity, ambient calibration, and percentage of transmission loss.
	Real-time Image Acquisition	Allows large amount of data to be capture at user-adjustable capture rate.
	Multiple Regions of Interest (ROIs)	Process and compute the minimum, maximum and average temperatures for up to 32 Regions of Interest (ROIs) defined in a variety of shapes.
	Multiple Color Palettes	Offer flexibility for optimal image clarity.
	Off-Line Analysis	Replay and analyze image sequence files that have been previous captured and saved to disk.
Housing	NEMA-4 Enclosure with Mounts	Includes IR Transparent Window, interface connections, power termination strip, vortex air cooler with thermostat control or optional solid state air conditioner or heater with thermostat control
Environmental	Operating Temperature:	-15°C to 50°C
	Storage Temperature:	-40°C to 70°C
	Shock Resilience:	30G (IEC60068-2-29/JIS C 0042)
	Vibration Resilience:	3G (IEC60068-2-6/JIS C 0040)
Electrical	Power Supply:	120 VAC 5 Amps Max Standard (10 Amps with Pan & Tilt)
Physical Characteristics	Dimensions:	8.5″ (H) x 29″ (L) x 10.625″ (OD) (excluding projections)
	Weight:	approximately 60 lb.

Mikron reserves the right to change specifications to reflect the latest changes in technology and improvements at any time without notice. These changes will be reflected in subsequent editions of our literature when warranted.

Optional Equipment

8-Channel Input/Out Modules

Relay Output (Alarms) Module	Offers 8 relay channels with each channel driving up to 240VAC at 3 Amps
Universal Input (Remote Triggering) Module	Offers 8 channels with each channel ranging from 5 VDC to 240 VAC
4-20 mA Output Module	Offers 8 channels allowing MikroSpec R/T software to send each Region of Interest temperature to a 4-20mA output.
4-20 mA Input Module	Offers 8 channels allowing the MikroSpec R/T software to store external signals with captured temperature data.

MikroSpec R/T Multiple IR Camera System Package

The MikroSpec R/T Multiple IR Camera System Package is a unique software add-on that allows data obtained from up to 14 cameras to be monitored simultaneously in real-time on a single computer.

Lenses

The MikroScan 7302 is supplied with a standard lens offering a 29°(H) x 22°(V) field of view. Optional Telephoto and Wide Angle lenses are also available at an additional cost.

Remote-Controlled Pan/Tilt Head

A remote-controlled pan-and-tilt head is available at an additional cost.

Mikron Infrared, Inc.
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MIKRON® INFRARED

TS724 Rev 032905

TS724 DualVision

Remote Thermal Monitoring System with Visual Image Functionality

Visual and infrared cameras combined with specialized software allows remote monitoring of critical applications in real-time

Mikron's DualVision 724 Remote Thermal Monitoring System represents another milestone in innovative infrared thermometry. The system is the first to combine visual and infrared cameras to produce optimized, blended images for simple quick analysis – all in a single intranet/internet-enabled package. Designed with advanced maintenance-free electronics and Industrial Protective Packaging, the DualVision 724 system offers unparalleled accuracy for demanding industrial and scientific applications while quickly measuring temperature without contact in even the most adverse environments. With an unmatched array of optional accessories, the DualVision 724 system demonstrates Mikron's commitment to long-term trouble-free operation.

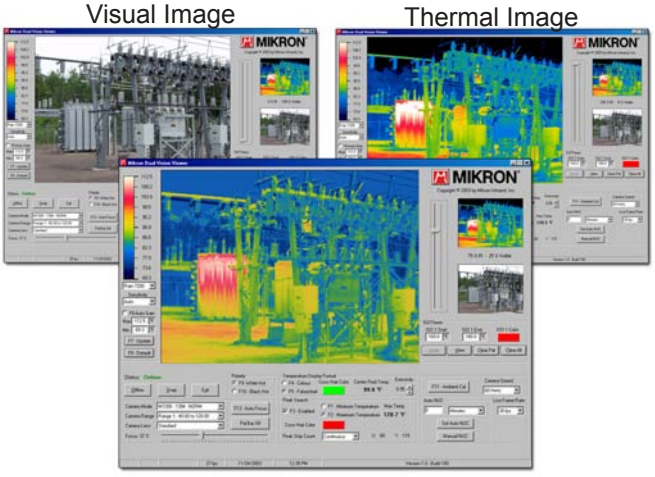
The DualVision 724 system consists of separate thermal imaging and video cameras in an environmentally sealed, temperature-controlled enclosure. Both cameras have Internet IP addresses and password protection, allowing control from any computer using wired or wireless Ethernet.

Mikron's DualVision software blends the visual and IR camera feeds into a single blended image with correct aspect ratio and spatial area. When utilized with Mikron's MikroSpec™ R/T Thermal Data Acquisition and Analysis software, the system is capable of recording up to 75 minutes of blended visual and IR video feeds in real-time. Frames can also be captured at intervals rather than continuously, or they can be triggered by a temperature alarm tied to a defined Region of Interest or by direct signal from the PC.

System Features/Benefits

- High Quality, Real Time Digital Image Transfer via Ethernet.
- Remote Monitoring via (wired or wireless) Ethernet
- NEMA-4 housing
- Maintenance Free operation
- Control and Alarm Triggering Software
- Infrared-Enhanced Visual Surveillance capabilities
- High Accuracy ±2% or 2°C of reading
- Long Wavelength, Less Affected by Sunlight
- Ambient temperatures to 100°C (212°F) with optional cooling
- IR Camera Based on Proven MikroScan 7302
- Remote Pan-And-Tilt capability (optional)
- Multiple Camera System functionality (optional)
- 8-Channel Input/Output Module (optional)

Visual Image | Thermal Image



Blended Image

Technical Data

IR Camera–MikroScan 7302	Detector:	320 x 240 Uncooled Focal Plane Array (Microbolometer)
	Measurement Accuracy:	±2% or 2°C of reading
	Field of View:	29°(H) x 22°(V)
	Focus Range:	30 cm to infinity
	Instantaneous FOV:	1.58 mrad
	Spectral Band:	8.0 to 14.0 µm
	Image Update Rate:	30 Frames/sec or 60 Frames/sec (selectable)
	Sensitivity / NETD:	0.06°C @ 30°C
	Interfaces:	Ethernet, IEEE1394, NTSC/PAL, S-Video
	A/D Resolution:	14 bit
Visual Camera	Sensor:	1/4″ Interline Transfer CCD
	Pixel Depth:	8 bit Digit B/W or 24 bit Digital Color
	Resolution:	640x480 or 320x240
	Shutter:	1/30s - 1/30,000s
	Sensitivity:	1-200,000 Lux
	Frame Rate:	Up to 30 Frames per Second
	Communication:	Ethernet
	External Video:	CCTV Video Inputs/Outputs
OnLine Visible/Thermal Image Processing Software	Presentation:	In run mode the system displays a live thermal image on the screen in 256 colors. Images can also be frozen.
	Remote Camera Control Functionality	Allows you to select the camera type, mode, range, temperature scale and lens. Also allows adjustments to be made for focusing, emissivity, ambient calibration, and percentage of transmission loss.
	Real-time Image and Data Acquisition	Allows large amount of data to be capture at user-adjustable capture rate.
	Multiple Regions of Interest (ROIs)	Process and compute the minimum, maximum and average temperatures for up to 32 Regions of Interest (ROIs) defined in a variety of shapes.
	Multiple Color Palettes	Offer flexibility for optimal image clarity.
	Off-Line Analysis	Replay and analyze image sequence files that have been previous captured and saved to disk.
	Image Blending	Blends the visual and IR camera feeds into a single DualVision image with correct aspect ratio and spatial area. Allows hot spots to be identified while viewing the scene as a visual image. The composite image can be adjusted to show any percentage of the IR and visual.
Housing	NEMA-4 Enclosure with Mounts	Includes IR Transparent Window, interface connections, power termination strip, vortex air cooler with thermostat control or optional solid state air conditioner or heater with thermostat control
Environmental	Operating Temperature:	-15°C to 50°C
	Storage Temperature:	-40°C to 70°C
	Shock Resilience:	30G (IEC60068-2-29/JIS C 0042)
	Vibration Resilience:	3G (IEC60068-2-6/JIS C 0040)
Electrical	Power Supply:	120 VAC 5 Amps Max Standard (10 Amps with Pan & Tilt)
Physical Characteristics	Dimensions:	8.5″ (H) x 29″ (L) x 10.625″ (OD) (excluding projections)
	Weight:	approximately 65 lb.

Mikron reserves the right to change specifications to reflect the latest changes in technology and improvements at any time without notice. These changes will be reflected in subsequent editions of our literature when warranted.

Optional Equipment

8-Channel Input/Out Modules

Relay Output (Alarms) Module	Offers 8 relay channels with each channel driving up to 240VAC at 3 Amps
Universal Input (Remote Triggering) Module	Offers 8 channels with each channel ranging from 5 VDC to 240 VAC
4-20 mA Output Module	Offers 8 channels allowing MikroSpec R/T software to send each Region of Interest temperature to a 4-20mA output.
4-20 mA Input Module	Offers 8 channels allowing the MikroSpec R/T software to store external signals with captured temperature data.

MikroSpec R/T Multiple IR Camera System Package

The MikroSpec R/T Multiple IR Camera System Package is a unique software add-on that allows data obtained from up to 14 cameras to be monitored simultaneously in real-time on a single computer.

Lenses

The MikroScan 7302 is supplied with a standard lens offering a 29°(H) x 22°(V) field of view. Optional Telephoto and Wide Angle lenses are also available at an additional cost.

Remote-Controlled Pan/Tilt Head

A remote-controlled pan-and-tilt head is available at an additional cost.

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MIKRON® INFRARED

TS724 DualVision Rev 032905

TS724 DualVision/Ultra

Remote Thermal Monitoring System with Visual Image Functionality and Ultrasonic Detection

Visual and infrared cameras combined with ultrasonic detection and specialized software allows remote monitoring of critical substation components in real-time

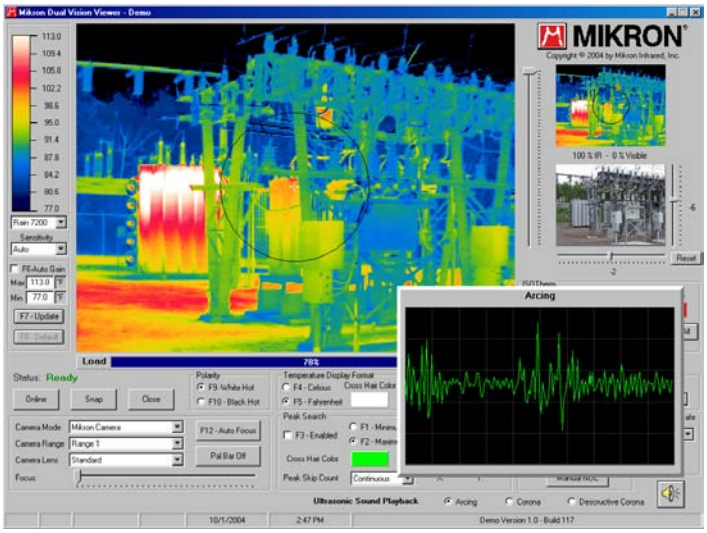
The DualVision/Ultra System represents another milestone in Mikron's innovative ThermalSpection 724 Remote Thermal Monitoring line of products. This system is the first to combine visual imagery with infrared and airborne ultrasound technologies to continuously monitor substations and electrical switchgear – all in a single intranet/internet-enabled package. With this system, visual surveillance enhanced with IR imaging makes it easy to spot intruders and monitor critical substation components 24/7, without supplementary lighting. With the addition of airborne ultrasound, certain conditions such as arcing, tracking, or corona can also be detected before they reach the critical stage. Designed with advanced maintenance-free electronics and industrial protective packaging, the DualVision/Ultra system offers unparalleled accuracy for demanding applications in even the most adverse environments. With an unmatched array of optional accessories, the DualVision/Ultra system demonstrates Mikron's commitment to long-term trouble-free operation.

System Features/Benefits

- High Quality, Real Time Digital Image Transfer via Ethernet
- Remote Monitoring via (wired or wireless) Ethernet
- NEMA-4 housing
- Maintenance Free operation
- Control and Alarm Triggering Software
- Infrared-Enhanced Visual Surveillance capabilities
- Arcing/tracking/corona detection with ultrasound
- High Accuracy ±2% or 2°C of reading
- Long Wavelength, Less Affected by Sunlight
- Ambient temperatures to 100°C (212°F) with optional cooling
- IR Camera Based on Proven MikroScan 7302
- Remote Pan-And-Tilt capability (optional)

The DualVision 724 system consists of separate thermal imaging and video cameras and an ultrasonic detection unit all housed in an environmentally sealed, temperature-controlled enclosure. These components have Internet IP addresses and password protection, allowing control from any computer using wired or wireless Ethernet.

Mikron's DualVision/Ultra software blends the visual and IR camera feeds into a single blended image with correct aspect ratio and spatial area. It also offers a spectral component which is useful in displaying electric emissions caused by arcing, tracking, or corona. When utilized with Mikron's MikroSpec™ R/T Thermal Data Acquisition and Analysis software, the system is capable of recording up to 75 minutes of blended visual and IR video feeds and ultrasonic data in real-time. Frames can also be captured at intervals rather than continuously, or they can be triggered by a temperature alarm tied to a defined Region of Interest or by direct signal from the PC.



Technical Data

IR Camera–MikroScan 7302	Detector:	320 x 240 Uncooled Focal Plane Array (Microbolometer)
	Measurement Accuracy:	±2% or 2°C of reading
	Field of View:	29°(H) x 22°(V)
	Focus Range:	30 cm to infinity
	Instantaneous FOV:	1.58 mrad
	Spectral Band:	8.0 to 14.0 µm
	Image Update Rate:	30 Frames/sec or 60 Frames/sec (selectable)
	Sensitivity / NETD:	0.06°C @ 30°C
	A/D Resolution:	14 bit
Visual Camera	Sensor:	1/4″ Interline Transfer CCD
	Pixel Depth:	8 bit Digit B/W or 24 bit Digital Color
	Resolution:	640x480 or 320x240
	Shutter:	1/30s - 1/30,000s
	Sensitivity:	1-200,000 Lux
	Frame Rate:	Up to 30 Frames per Second
	External Video:	CCTV Video Inputs/Outputs
Interfaces	Communication:	Ethernet
	Video Output:	NTSC/PAL, S-Video
OnLine Visible/Thermal Image Processing Software with Spectral Viewing	Presentation:	In run mode the system displays a live thermal image on the screen in 256 colors. Images can also be frozen.
	Remote Camera Control Functionality	Allows you to select the camera type, mode, range, temperature scale and lens. Also allows adjustments to be made for focusing, emissivity, ambient calibration, and percentage of transmission loss.
	Real-time Image and Data Acquisition	Allows large amount of data to be capture at user-adjustable capture rate.
	Multiple Regions of Interest (ROIs)	Process and compute the minimum, maximum and average temperatures for up to 32 Regions of Interest (ROIs) defined in a variety of shapes.
	Multiple Color Palettes	Offer flexibility for optimal image clarity.
	Off-Line Analysis	Replay and analyze image sequence files that have been previous captured and saved to disk.
	Image Blending	Blends the visual and IR camera feeds into a single DualVision image with correct aspect ratio and spatial area. Allows hot spots to be identified while viewing the scene as a visual image. The composite image can be adjusted to show any percentage of the IR and visual.
Housing	NEMA-4 Enclosure with Mounts	Includes IR Transparent Window, interface connections, power termination strip, vortex air cooler with thermostat control or optional solid state air conditioner or heater with thermostat control
Environmental	Operating Temperature:	-15°C to 50°C
	Storage Temperature:	-40°C to 70°C
	Shock Resilience:	30G (IEC60068-2-29/JIS C 0042)
	Vibration Resilience:	3G (IEC60068-2-6/JIS C 0040)
Electrical	Power Supply:	120 VAC 5 Amps Max Standard (10 Amps with Pan & Tilt)
Physical Characteristics	Dimensions:	8.5″ (H) x 29″ (L) x 10.625″ (OD) (excluding projections)
	Weight:	approximately 75 lb.

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Optional Equipment

8-Channel Input/Out Modules

Relay Output (Alarms) Module	Offers 8 relay channels with each channel driving up to 240VAC at 3 Amps
Universal Input (Remote Triggering) Module	Offers 8 channels with each channel ranging from 5 VDC to 240 VAC
4-20 mA Output Module	Offers 8 channels allowing MikroSpec R/T software to send each Region of Interest temperature to a 4-20mA output.
4-20 mA Input Module	Offers 8 channels allowing the MikroSpec R/T software to store external signals with captured temperature data.

MikroSpec R/T Multiple IR Camera System Package

The MikroSpec R/T Multiple IR Camera System Package is a unique software add-on that allows data obtained from up to 14 cameras to be monitored simultaneously in real-time on a single computer.

Lenses

The MikroScan 7302 is supplied with a standard lens offering a 29°(H) x 22°(V) field of view. Optional Telephoto and Wide Angle lenses are also available at an additional cost.

Remote-Controlled Pan/Tilt Head

A remote-controlled pan-and-tilt head is available at an additional cost.

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MIKRON INFRARED

TS724 DualVision/Ultra Rev 032905

ThermalSpection 724HT

Remote Thermal Monitoring System for Demanding High-Temperature Applications

Provides high-temperature range, specialized flame filtering capabilities, and specialized software for monitoring high-temperature applications in real-time

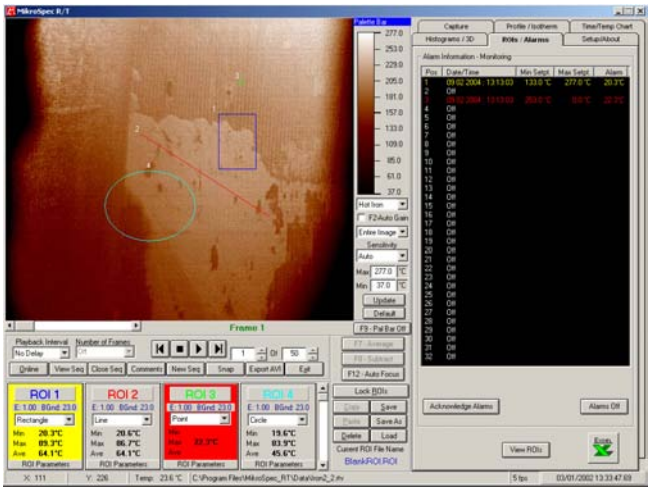
Mikron's ThermalSpection 724 HT Remote Thermal Monitoring System represents another milestone in innovative infrared thermometry. With its high-temperature range and specialized flame filtering capabilities, this is the first fixed-unit system that can remotely monitor high-temperature applications in real time. Designed with advanced maintenance-free electronics and industrial protective packaging, the ThermalSpection 724 HT system offers unparalleled accuracy for demanding high-temperature appli□
the most adverse environments. With an unmatched array of optional accessories, the ThermalSpection 724 HT system demonstrates Mikron's commitment to long-term trouble-free operation.

The ThermalSpection 724 HT thermal imaging camera is mounted in a totally sealed environmental enclosure which contains an IR transparent window and offers continuous cooling from a UL-certified air cooling system. Positive pressure inside the enclosure prevents dirt or dust from entering, even in the harshest conditions. With an optional purge unit, the enclosure can also protect against explosion hazards in areas with possible exposure to volatile gases.

The camera has an Internet IP address and can be controlled from any computer using wired or wireless Ethernet. When utilized with Mikron's MikroSpec™ R/T Thermal Data Acquisition and Analysis software, the camera is capable of monitoring up to 32 Regions of Interest and of being able to record up to 75 minutes of data in real time. Frames can also be captured at intervals rather than continuously, or they can be triggered by temperature alarms tied to individual Regions of Interest or by direct signal from the PC.

System Features/Benefits

- High Quality, Real Time Digital Image Transfer via Ethernet or IEEE1394 (Firewire)
- Remote Monitoring via (wired or wireless) Ethernet
- NEMA-4 housing
- Maintenance Free operation
- Control and Alarm Triggering Software with 32 Regions of Interest
- Includes High-Temperature Range 400°C to 1600°C (with Flame Filter)
- High Accuracy ±2% or 2°C of reading
- Long Wavelength, Less Affected by Sunlight
- Ambient temperatures to 100°C (212°F) with optional cooling
- IR Camera Based on Proven MikroScan 7304
- Remote Pan-And-Tilt capability (optional)
- Multiple Camera System functionality (optional)
- 8-Channel Input/Output Module (optional)



MikroSpec R/T Software

Technical Data

IR Camera–MikroScan 7304	Detector:	320 x 240 Uncooled Focal Plane Array (Microbolometer)
	Temperature Range:	Range 1: -40°C to 120°C Range 2: 0°C to 500°C Range 3: 400°C to 1600°C (with Flame Filter)
	Measurement Accuracy:	±2% or 2°C of reading
	Field of View:	29°(H) x 22°(V)
	Focus Range:	30 cm to infinity
	Instantaneous FOV:	1.58 mrad
	Spectral Band:	8.0 to 14.0 µm
	Image Update Rate:	30 Frames/sec or 60 Frames/sec (selectable)
	Sensitivity / NETD:	0.06°C @ 30°C
	A/D Resolution:	14 bit
Interfaces	Communication:	Ethernet, IEEE1394
	Video Output:	NTSC/PAL, S-Video
OnLine Thermal Image Processing Software	Presentation:	In run mode the system displays a live thermal image on the screen in 256 colors. Images can also be frozen.
	Remote Camera Control Functionality	Allows you to select the camera type, mode, range, temperature scale and lens. Also allows adjustments to be made for focusing, emissivity, ambient calibration, and percentage of transmission loss.
	Real-time Image Acquisition	Allows large amount of data to be capture at user-adjustable capture rate.
	Multiple Regions of Interest (ROIs)	Process and compute the minimum, maximum and average temperatures for up to 32 Regions of Interest (ROIs) defined in a variety of shapes.
	Multiple Color Palettes	Offer flexibility for optimal image clarity.
	Off-Line Analysis	Replay and analyze image sequence files that have been previous captured and saved to disk.
Housing	NEMA-4 Enclosure with Mounts	Includes IR Transparent Window, interface connections, power termination strip, vortex air cooler with thermostat control or optional solid state air conditioner or heater with thermostat control
Environmental	Operating Temperature:	-15°C to 50°C
	Storage Temperature:	-40°C to 70°C
	Shock Resilience:	30G (IEC60068-2-29/JIS C 0042)
	Vibration Resilience:	3G (IEC60068-2-6/JIS C 0040)
Electrical	Power Supply:	120 VAC 5 Amps Max Standard (10 Amps with Pan & Tilt)
Physical Characteristics	Dimensions:	8.5″ (H) x 29″ (L) x 10.625″ (OD) (excluding projections)
	Weight:	approximately 70 lb.

Mikron reserves the right to change specifications to reflect the latest changes in technology and improvements at any time without notice. These changes will be reflected in subsequent editions of our literature when warranted.

Optional Equipment

8-Channel Input/Out Modules

Relay Output (Alarms) Module	Offers 8 relay channels with each channel driving up to 240VAC at 3 Amps
Universal Input (Remote Triggering) Module	Offers 8 channels with each channel ranging from 5 VDC to 240 VAC
4-20 mA Output Module	Offers 8 channels allowing MikroSpec R/T software to send each Region of Interest temperature to a 4-20mA output.
4-20 mA Input Module	Offers 8 channels allowing the MikroSpec R/T software to store external signals with captured temperature data.

MikroSpec R/T Multiple IR Camera System Package

The MikroSpec R/T Multiple IR Camera System Package is a unique software add-on that allows data obtained from up to 14 cameras to be monitored simultaneously in real-time on a single computer.

Lenses

The MikroScan 7304 is supplied with a standard lens offering a 29°(H) x 22°(V) field of view. Optional Telephoto and Wide Angle lenses are also available at an additional cost.

Remote-Controlled Pan/Tilt Head

A remote-controlled pan-and-tilt head is available at an additional cost.

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MIKRON® INFRARED

TS724HT Rev 032905

M7900 PYROVISION®

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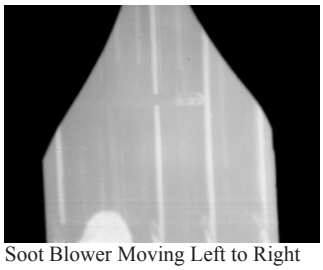
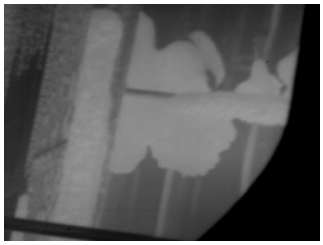
A Unique Ultra High Resolution Thermal Imager for High Temperature Industrial Processes and Research

For High Temperature Industrial process and Research for measuring temperature at 76,800 points 30 times a second

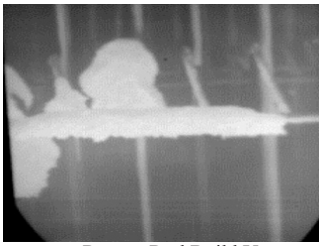
- Measures temperature at 76,800 points 30 times a second
- Minimally affected by emissivity
- Exceptionally high accuracy and resolution
- Advanced FPA technology
- Sees through glass or quartz view ports
- 8-channel isolated current outputs for automated process control
- Versatile image processing software



Soot Blower Moving Left to Right



Slag Build Up in Corner



Rapper Rod Build Up

The M7900 is a complete system, consisting of the imager, a range of available lenses, cables and mounting accessories, and MikroSpec R/T image processing software. The imager has a standard 50-mm lens and operates at a fast 30 frames per second. The images can be used by an operator for real-time process control or the data can be input to an automated system. More rugged than any comparable detector unit, the M7900 comes with a standard water-cooled protective jacket that allows it to operate in ambient temperatures up to 150°C. Measurement accuracy is ±0.5% of reading ±1°C .

Why the M7900?

When used for high temperature process applications, the conventional thermal imaging system is limited in its accuracy and general usefulness by several factors. Firstly, the spectral response of the system is normally limited to the mid-to-far infrared part of the usable spectrum, which will result in significant errors due to changes in process surface emissivity.

Secondly, for applications with enclosed processes such as vacuum induction melting, the M7900 can be viewed through existing viewport materials with no reduction on quality of images or on accuracy of temperature measuring. This way a costly program of changing the view port material is avoided.

The M7900 Series addresses these limitations and, in so doing, achieves a technological breakthrough in high temperature thermal imaging. This is how:

- The system is designed with a narrow band spectral response at the near infrared region which minimizes measurement errors due to variations in target emissivity. Windows and viewing port materials such as quartz, Pyrex, and sapphire cause minimal attenuation of infrared energy at this wavelength.
- When flame is present between the M7900 and the desired target, a specifically designed, custom infrared filter is used to avoid the emission of the hot combustion gases and to provide high quality images of the target and accurate temperature measurements.
- The Unique design of the focal plane array (FPA) detector unit produces a high resolution, bloom-free image of high temperature targets.
- Fast response, 30 frames per second, permits real-time imaging of dynamic processes.

8-Channel Analog Current Output (optional):

The Mikron MFP-1 is an analog output module for field installation with eight independent isolated 0-20mA or 4-20mA outputs. It can be used for process monitoring or as an input to a controller or PLC for controlling a variety of process devices, such as valves, actuators, pumps and heaters. Power for this module is provided by an internal loop supply of 24VDC. The MFP-1 module is installed on a universal terminal block base that supplies screw terminals for field I/O wiring. The terminal base also provides module power and terminal for connection to the M7900 image processor. The module can dip into a standard DIN rail or can be panel-mounted.

Software

The M7900 software can assign current outputs to point, line, rectangle or other shapes and temperatures which can be used for conventional process recording or controlling.

Technical Data

M7900 Series		
Detector Unit	Temperature Range: (Temperature display is field selectable in °F or °C)	Range Option 1: 300°C to 450°C Range Option 2: 440°C to 700°C Range Option 3: 660°C to 1150°C Range Option 4: 1100°C to 2500°C (consult Mikron for availability of additional temperature ranges)
	Measurement Accuracy:	±0.5% of reading ±1°C
	Temperature Resolution:	1°C or 1°F (1 sec avg.)
	Spectral Response:	Narrow band pass near infrared filter
	Detector Type:	Uncooled solid state FPA, with unique antiblooming characteristic, low pattern noise and superior stability
	Detector Spatial Resolution:	320 elements horizontal, 240 elements vertical
	Field of View:	16°(H) x 12°(V) with standard 50mm lens Other fields of view available using optional lenses
	Instantaneous FOV (50%):	0.87 mrad (H) x 0.87 mrad (V)
	Video Output:	Analog video RS 170 2:1 interlace (monochrome) Optional processor multiple display output RGB (color)
	Image Update Rate:	Up to 30 frame/second (Real-time)
	Focus Range:	1 meter to infinity with standard 50mm lens
	Mounting:	2 tapped ¼/20 holes
	Interconnecting Cables:	10 meters long with heavy duty MS type connector at detector unit side (up to 100 meters long, optional)
	Protective Cooling Jacket:	Cast aluminum jacket protects detector unit up to ambient of 150°C with water cooling
	Operating Ambient Temperature:	0°C to 50°C without cooling; 0°C to 150°C with water cooling
	Operating Humidity:	10 to 95% relative humidity, noncondensing
	Storage Environment:	-25°C to 85°C; up to 95% relative humidity, noncondensing
	Dimensions:	280mm(L) x 80mm(W) x 90mm(H) (11″ L x 3.2″ W x 3.6″ H)
	Weight:	4.0kg (9.0 lbs.)
Processor	Mounting:	Table top or optional 19″ rack mount
	Operating Environment:	0°C to 50°C; up to 95% relative humidity, noncondensing
	Storage Environment:	-25°C to 85°C; up to 95% relative humidity, noncondensing
	Image Pixel Resolution:	320 horizontal x 240 vertical
	Processor Output:	Ethernet
	Image Data Resolution:	8 bits
	Typical Temperature Kernel Resolution:	3 horizontal x 3 vertical
	Power Requirement:	90-240VAC 50/60Hz 100 watts
Monitor	Monitor Type:	Standard 17″ SVGA Interval time setting available at auto)
	Power Requirement:	90-240VAC 50/60Hz 400 watts
OnLine Thermal Image Processing Software	Presentation:	In run mode the system displays a live thermal image on the screen in 256 colors. Images can also be frozen.
	Cursor Temperatures:	Displays temperature at current cursor location along with x;y coordinates on high resolution screen.
	Object Data:	Object data are available for all objects described below. Data include the maximum, minimum and average temperatures of the pixels within the object. Other statistics such as standard deviation, and temperature distribution, as well as application-specific, proprietary or customized algorithms are also available as needed.
	Point Temperatures:	Displays numerious temperatures. Each point consists of a 3 x 3 pixel array or larger.
	Object shapes:	Displays the object data for regions within a rectangle, circle or ellipse. Also displays the object data for regions within an arbitrary shapes.
	Samples to Average:	Number of samples to average when computing object data. This is used to improve the signal-to-noise ratio.
	Object Emissivity:	Emissivity adjustment that applies to a specific object for each ROI
	Scene Transmission:	Transmission adjustment on an entire image to compensate for losses due to viewing ports or windows Other fields of view available using optional lenses
	Alarms (optional):	Low and high alarms may be set on any object to activate external devices via 5V TTL level output. Alarm conditions can be customized as needed
	Image Recording:	Images can be saved to disk either individually or in a high speed sequence.
	Edge Detection:	Detects and tracks 2 edges across user defined line superimposed over image.
	40-20mA Outputs (optional):	All object data may be used to drive industry standard current outputs for use with continuous conventional process recorders, PLC controllers, etc. Outputs are isolated and available in groups of 8 channels.

Optional Equipment

Accessories

A full range of cooling, purging and mounting accessories are available to protect the M7900 Series in harsh environments including an optional Air Purge assembly which allows the optics of the detector unit to be protected when airborne contaminants build up on the lens.

Analog Current Model MFP1

No. of Isolated Outputs	8 channel
Type of Current	4-20mA or 0-20 mA
Isolation Voltage	3000VRMS
Mounting	DIN rail mounting
Operating Ambient	-40° to 70°C
Power Input	90-240 VAC 50/60 Hz 100 Watts

Lenses

The M7900 is supplied with a 50mm lens as a standard option. Optional Close Focus, Wide Angle, Telephoto, and Fish Eye lenses are also available at an additional cost.

Optically Coated and Calibrated Lenses include:

- Wide Angle Lens (12.5mm) FL, FOV 60°H x 48°V
- Wide Angle Lens (25mm) FL, FOV 30°H x 24°V
- Telephoto (75mm) FL, FOV ratio 8°H x 6°V
- Distance microsopic lens with a resolution of 30 x 30um at 100mm distance

Fish eye with Stainless Steel Air Purged Jacket for viewing through refractory walls up to 75 cm (30″) thick and exposure to atmosphere of 1315°C (2400°F) temperature.

- Length 40cm (18.00″), diameter 38mm (1.5″)
- Length 60cm (24.00″), diameter 38mm (1.5″)
- Length 75cm 30.00″), diameter 38mm (1.5″)

Software

Off-line Image Processing and Report Writing Software MikroSpec 2.8.

Unconditional Warranty

Every M7900 Series Imager is covered for all defective material and workmanship for one full year after shipment.

Made in U.S.A.

The M7900 Series Imager is designed and built by Mikron, the leading innovator in technology of infrared thermometry. The Mikron manufacturing facility is located at 16 Thornton Road, Okland, New Jersey.

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For More Information Call:
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MIKRON® INFRARED

M7900 Rev 032905

FM Approvals ISO9001 Certified

M9103 PYROVISION®

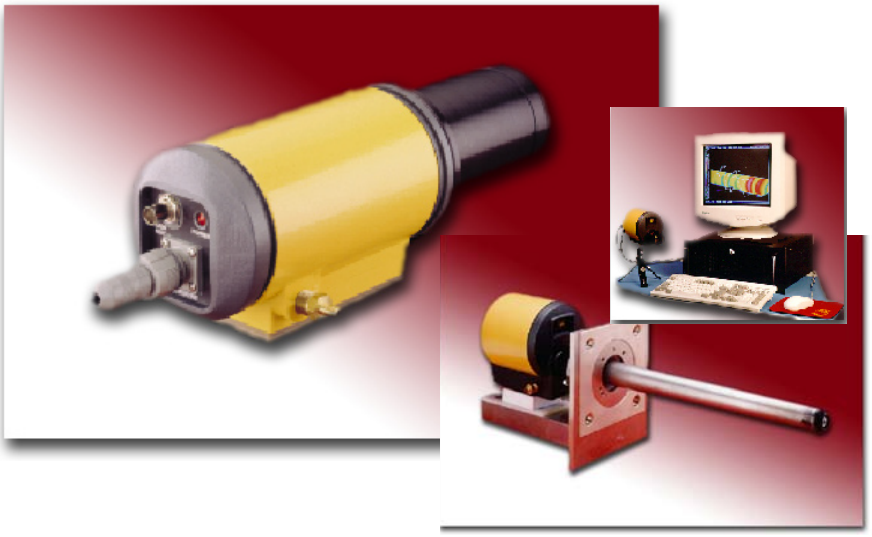
A Unique Ultra High Resolution Thermal Imager

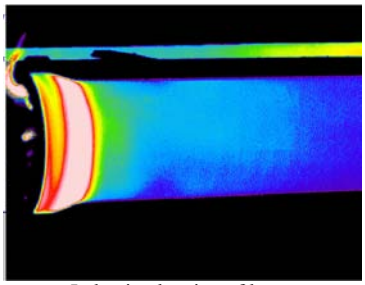
MIKRON® INFRARED

For High Temperature Industrial process and Research for temperature measurement between 600°C to 4000°C

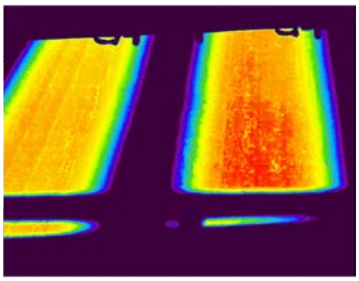
Features:

- Measures temperature at 300,000 points 30 times a second
- Minimally affected by emissivity
- Exceptionally high accuracy and resolution
- Advanced FPA technology
- Sees through glass or quartz view ports
- 8-channel isolated current outputs for automated process control
- Versatile image processing software

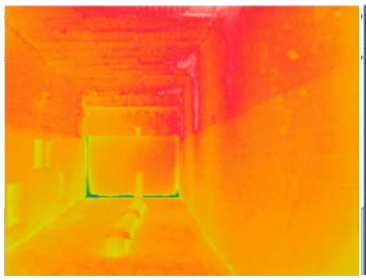




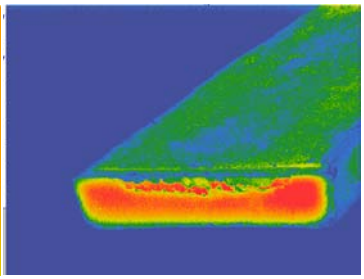
Induction heating of large diameter shaft



Rolling Mill applications



Interior of reheat furnace for uniformity check



Steel slab exiting reheat furnace

The M9103 is a complete system, consisting of the imager, a range of available lenses, cables and mounting accessories, and Pyrovision image processing software. The imager has a standard 50-mm lens and operates at a fast 30 frames per second. The images can be used by an operator for real-time process control or the data can be input to an automated system. More rugged than any comparable detector unit, the M9103 comes with a standard water-cooled protective jacket that allows it to operate in ambient temperatures up to 150°C. Measurement accuracy is ±1% of reading, ±1°C, or better.

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Introducing Mikron's THERMALSPECTION™

Implementing a systems approach for thermal process applications requires full knowledge of the customer's applications, available thermal imagers and thermal scanners, customer's existing controls platform, and software requirements, etc. We have a full staff of engineering and software specialists available for the design and development of comprehensive turn-key systems for all customer applications. Experience in many different thermal applications is the backbone of our designs and short-term turnaround for specialized software and custom camera configurations is our specialty.

Technical Data

Pyrovision M9103

Detector Unit	Temperature Range:	Many temperature ranges are available -- from 600C to 3000°C (Temperature display is field selectable in °F or °C)
	Measurement Accuracy:	±1% of reading ±1°C
	Temperature Resolution:	1°C or 1°F (1 sec avg.)
	Spectral Response:	Narrow band pass near infrared filter
	Detector Type:	Uncooled solid state FPA, with unique antiblooming characteristic, low pattern noise and superior stability
	Detector Spatial Resolution:	768 elements horizontal, 494 elements vertical
	Field of View:	7°(H) x 5.4°(V) with standard 50mm lens
	Instantaneous FOV (50%):	0.42 mrad (H) x 0.49 mrad (V)
	Video Output:	Analog video RS 170 2:1 interlace (monochrome)
		Optional processor multiple display output RGB (color)
	Image Update Rate:	Up to 30 frame/second (Real-time)
	Focus Range:	1meter to infinity with standard 50mm lens
	Mounting	2 tapped ¼/20 holes
	Interconnecting Cables:	Coax and control cables: 10 meters long with heavy duty MS type connector at detector unit side (up to 100 meters long, optional)
	Protective Cooling Jacket	Protects detector unit up to ambient of 150°C with water cooling
	Operating Ambient Temperature:	0°C to 50°C without cooling; 0°C to 150°C with water cooling
	Operating Humidity:	10 to 95% relative humidity, noncondensing
	Storage Environment:	-25°C to 85°C; up to 95% relative humidity, noncondensing
	Dimensions:	280mm(L) x 80mm(W) x 90mm(H) (11"L x 3.2"W x 3.6"H)
	Weight	3.0kg (6.6 lbs.)
Processor	Mounting:	Table top or optional 19" rack mount
	Operating Environment:	0°C to 50°C; up to 95% relative humidity, noncondensing
	Storage Environment:	25°C to 85°C; up to 95% relative humidity, noncondensing
	Image Pixel Resolution:	640 horizontal x 480 vertical (VGA)
	Image Data Resolution:	8 bits
	Typical Temperature Kernel Resolution:	214 horizontal x 160 vertical (3x3 pixel)
Monitor	Monitor Type:	Standard 17" VGA 0.28 dp style
	Power Requirement:	90-220VAC 50/60Hz 400 watts
Analog Current Model Module Model MFP1 (optional)	No. of Isolated Outputs:	8 channel
	Type of Current:	4-20mA
	Isolation Voltage:	3000VRMS
	Mounting:	DIN-Rail mounting
	Operating Ambient:	40°C to 70°C
	Power Input:	24VDC
OnLine Thermal Image Processing Software:	Presentation:	In run mode the system displays a live thermal image on the screen in 256 colors. Images can also be frozen.
	Cursor Temperatures:	Displays temperature at current cursor location along with x;y coordinates on high resolution screen.
	Object Data:	Object data are available for all objects described below. Data include the maximum, minimum and average temperatures of the pixels within the object. Other statistics such as standard deviation, and temperature distribution, as well as application-specific, proprietary or customized algorithms are available as needed.
	Point Temperatures:	Displays up to 10 point temperatures. Each point consists of a 1 x 1 pixel array or larger.
	Rectangles/Circles:	Displays the object data for regions within a rectangle, circle or ellipse.
	Other Shapes:	Displays the object data for regions within an arbitrary shape. Shapes can be defined as a polygon with any number of segments or can simply be drawn freehand.
	Samples to Average:	Number of samples to average when computing object data is used to improve the signal-to-noise ratio.
	Object Emissivity:	Emissivity adjustment that applies to a specific object for each ROI
	Scene Transmission:	Transmission adjustment on an entire image to compensate for losses due to viewing ports or windows.
	Alarms (optional):	Low and high alarms may be set on any object to activate external devices via 5V TTL level output. Alarm conditions can be customized as needed.
	Image Recording:	Images can be saved to disk either individually or in a high speed sequence.
	40-20mA Outputs (optional):	All object data may be used to drive industry standard current outputs for use with continuous conventional process recorders, PLC controllers, etc. Outputs are isolated and available in groups of 8 channels.

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MIKRON® INFRARED

M9103 Rev 032905

MikroLine 2128

MIKRON INFRARED

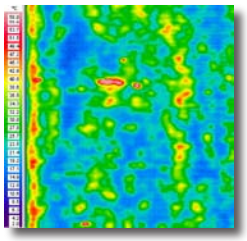
High Speed IR-line Camera for Fast Non-Contact Temperature Measurement of Production Processes

Unique high speed IR-Line camera with 128 data points per line and a measuring rate of 512 lines per second

Features:

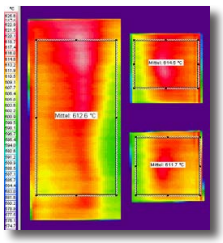
- Industrial housing IP65
- Air purge for lens
- Water-cooling
- Operation with or without PC
- Fiber-optic data transmission
- No opto-mechanical scanner
- 128 data points/line at 512 lines/second
- Uncooled infrared linear array
- 16 bit A/D conversion
- Large dynamic range
- Triggered measurement
- Alarm function
- Data recording
- Application specific hardware and software

M2128 and M2128S
for applications at 8 to 14 µm



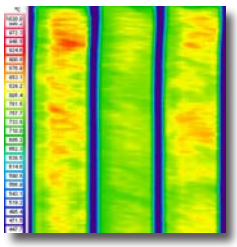
Hot-spot recognition in mineral wool production

M2128 G and M2128 GS
for applications at 4.8 to 5.2 µm



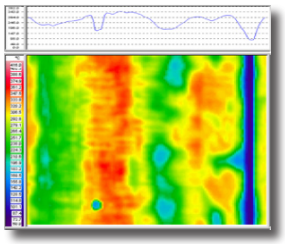
Images of glass panes after annealing process

M2128 H
for applications at 1.4 to 1.8 µm



Temperature control in the steel industry

M2128 M and M2128 MS
for applications at 3 to 5 µm



Jacket of a rotating kiln: color representation and line profile

High speed IR-line camera with 128 data points per line and a measuring rate of 512 lines per second — an industrial infrared camera for fast non-contact temperature measurement of production processes. Triggered inputs and alarm outputs allow the camera to be used as a threshold control alarm, even without being connected to a computer. An efficient online software running with Windows™ ensures the control of thresholds and processes. By recording data functions, quick temperature changes can be saved as a video.

Mikron has been an innovative leader in the field of infrared non-contact temperature measurement since 1969. Our staff of qualified engineers and trained sales consultants are completely dedicated to quality and to helping customers solve their most challenging application problems.

Introducing Mikron's ThermalSpection™

Implementing a systems approach for thermal process applications requires full knowledge of the customer's applications, available thermal imagers and thermal scanners, customer's existing controls platform, and software requirements, etc. We have a full staff of engineering and software specialists available for the design and development of comprehensive turn-key systems for all customer applications. Experience in many different thermal applications is the backbone of our designs and short-term turnaround for specialized software and custom camera configurations is our specialty.

Technical Data

SELECTION CHART 1

Model	MikroLine M2128	MikroLine M2128S	MikroLine M2128 G	MikroLine M2128 GS
Spectral range	8 to 14 µm	8 to 14 µm	4.8 to 5.2 µm	4.8 to 5.2 µm
Measurement range[1]	50 to 550°C or 450 to 1250°C	0 to 80°C or 50 to 350°C	450 to 1250°C	250 to 1250°C
Optics **Focal Length** **Field of View** **Measurement Distance** **Spatial resolution**	 18mm 40° x 0.3° 10 cm to infinity 6 mrad (50% modulation)	 18mm 40° x 0.3° 10 cm to infinity 6 mrad (50% modulation)	 13mm 60° x 0.5° 20 cm to infinity 9 mrad (50% modulation)	 13mm 60° x 0.5° 20 cm to infinity 9 mrad (50% modulation)
Measurement uncertainty[2]	2K (measured temperature < 100°C) or 1K + 1% of the measured value in °C	2K (measured temperature < 100°C) or 1K + 1% of the measured value in °C	1K + 1% of the measured value in °C	1K + 1% of the measured value in °C
Noise equivalent temperature difference[2]	<0.5 K	<0.2 K	<1 K	<1 K

SELECTION CHART 2

Model	MikroLine M2128 H	MikroLine M2128 M	MikroLine M2128 MS
Spectral range	1.4 to 1.8 µm	3 to 5 µm	3 to 5 µm
Measurement range[1]	600 to 1300°C	450 to 1250°C	200 to 800°C
Optics **Focal Length** **Field of View** **Measurement Distance** **Spatial resolution**	 12mm 60° x 0.5° 50 cm to infinity 9 mrad (50% modulation)	 13mm 60° x 0.5° 20 cm to infinity 9 mrad (50% modulation)	 13mm 60° x 0.5° 20 cm to infinity 9 mrad (50% modulation)
Measurement uncertainty[2]	1K + 1% of the measured value in °C	1K + 1% of the measured value in °C	1K + 1% of the measured value in °C
Noise equivalent temperature difference[2]	<1 K	<0.5 K	<0.5 K

GENERAL SPECIFICATIONS

Sensor	Uncooled pyroelectric linear array
Frame rate	Internal 512 Hz, selectable: 512 Hz, 256 Hz, 128 Hz, 64 Hz, 32 Hz …
Response time	Internal 16 ms, selectable: 2/measurement frequency
Interface[3]	RS232 wire (4 Hz max); RS422 wire (32 Hz max); RS232 fiber optic (32 Hz max); PCMCIA fiber optic (128 Hz max)
Digital inputs (trigger)	LED input (5V ≤ V_E ≤ 25V)
Digital outputs (alarm)	Optically coupled OC-outputs (1_C ≤ 50mA, V_E ≤ 25V); 4 I/O channels max
Connectors[3]	Round connector with thread interlocking (16 pins); Interlocking fiber optic connector (2 fibers); Water supply tubing (nominal width 4mm, 2 bar max); Compressed air tubing (nominal width 4mm, 2 bar max)
Weight	ca. 3.2 kg
Power Supply	11…36 V DC/10…20 VA
Housing	Protection degree IP65, optional with integrated water-cooling system, air purge, swivel base
Operating temperature **Camera** **System cable** **Fiber optic**	 0 to 50° (without water-cooling); -25° to 150°C (with water-cooling) -25 to 150°C 0 to 70°C
Storage conditions	-20 to 70°C, relative humidity: max. 95%
Software	PC control and display program IR_LINE for Windows™

[1] Other on request [2] Specification for 32 Hz measurement frequency, blackbody reference, ambient temperature 25°C [3] Dependent upon configuration

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MIKRON INFRARED

MikroLine 2128 Rev 032905

FM Approvals ISO9001 Certified

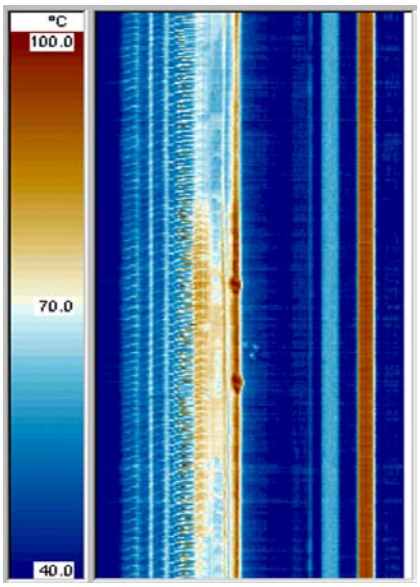
MikroLine 2250

High Speed IR-line Camera for Fast Non-Contact Temperature Measurement of Tires

Unique high speed IR-Line camera with 160 data points per line and a measuring rate of 18,000 lines per second

- Robust industrial housing
- Air purge for lens system
- No operating elements
- Fiber optic data-transfer

- Parallel measurement of 160 measuring points
- Measuring frequency 18,000 lines/sec.
- PbSe-160-element sensor
- Triggered data acquisition
- Threshold control
- Data recording function



360° Tire Image while Tire is traveling at 100 mph

High speed IR-line camera with 160 measuring points per line and a measuring rate of 18,000 lines per second — a special development for fast non-contact temperature measurement of tires. The triggered measurement allows an exact geometrical assignment of the single measuring points. An efficient online software under WIN NT™ permits the control of thresholds and processes. By recording functions, the quick temperature changes can be accumulated as a film.

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Technical Data

High speed IR-line camera for temperature measurement of tires

MikroLine 2250	
Spectral range:	3 - 5 µm
Temperature range:	50°C - 180°C
Sensor:	PbSe-160-element sensor with CMOS-multiplexer
Opening angle:	30° x 0.13°
Measuring distance:	min. 10 cm to ∞
Spatial resolution:	3.3 mrad (50% modulation)
Temperature resolution:	0.5° K at 50°C
Temperature accuracy:	± 2K ± 2% from measurement (°C)
Line scan fequency:	2000 Hz up to 18 kHz
Response time:	approximately 1 second
Warm-up time:	< 30 min.
Interface:	Fiber Optic/PCI-PC-card
Camera housing:	protective housing IP-65
Operating temperature camera:	0°C - 40°C
Storage temperature:	-20°C - 70°C

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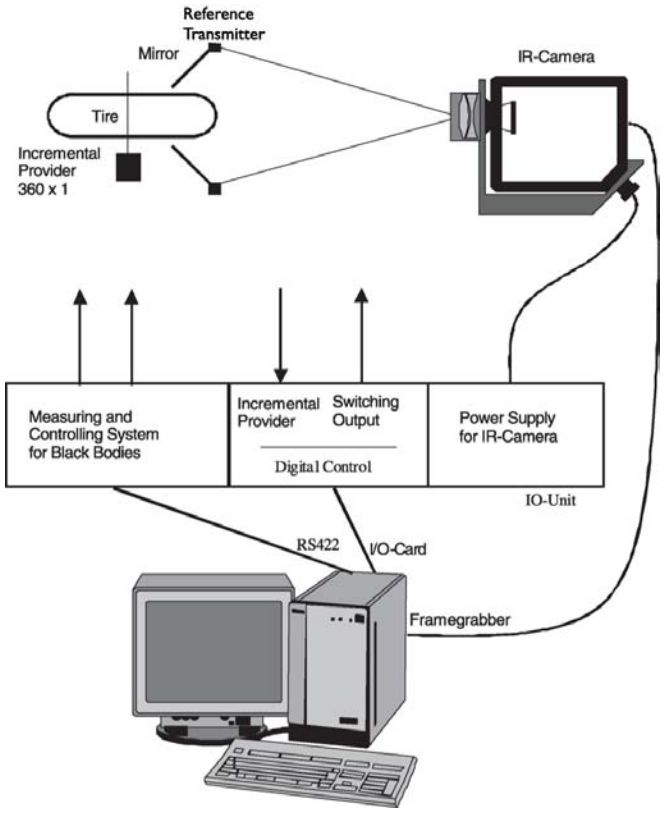
Standard accessories

- Controller (PC)
- Windows NT
- Fiber Optic/PCI-PC-Card
- Interface
- External trigger inputs
- Alarm output (open collector)
- Black Bodies for calibration
- 17” monitor, mouse, and keyboard
- Control device
- System cable 10 m



Standard-firmware

- Controlling/evaluation software in Visual C++ (Win NT)
- Camera control
- Trigger signal processing
- Temperature correction
- Accumulation of real time images (360 lines)
- Visualization software
- Presentation of color images
- Online threshold-control in tracks
- Recording function

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MIKRON INFRARED

MikroLine 2250 Rev 032905

MikroLine 2256

MIKRON INFRARED

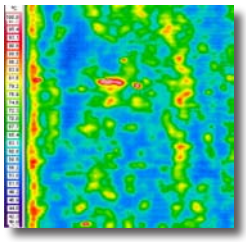
High Speed IR-line Camera for Fast Non-Contact Temperature Measurement of Production Processes

Unique high speed IR-Line camera with 256 data points per line and a measuring rate of 512 lines per second

Features:

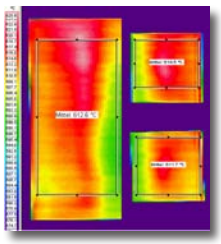
- Industrial housing IP65
- Air purge for lens
- Water-cooling
- Fiber-optic data transmission
- No opto-mechanical scanner
- 256 data points/line at 512 lines/second max.
- Uncooled infrared linear array
- Large dynamic range
- Triggered measurement
- Alarm function
- Data recording
- Application specific hardware and software

M2256
for applications at 8 to 14 µm



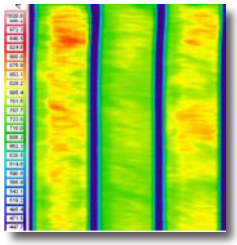
Hot-spot recognition in mineral wool production

M2256 G
for applications at 4.8 to 5.2 µm



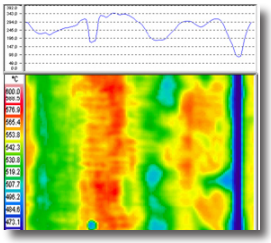
Images of glass panes after annealing process

M2256 H
for applications at 1.4 to 1.8 µm



Temperature control in the steel industry

M2256 M
for applications at 3 to 5 µm



Jacket of a rotating kiln: color representation and line profile

High speed IR-line camera with 256 data points per line and a maximum measuring rate of 512 lines per second — an industrial infrared camera for fast non-contact temperature measurement of production processes. An efficient online software running with Windows™ ensures the control of thresholds and processes. By recording data functions, quick temperature changes can be saved as a video.

Mikron has been an innovative leader in the field of infrared non-contact temperature measurement since 1969. Our staff of qualified engineers and trained sales consultants are completely dedicated to quality and to helping customers solve their most challenging application problems.

Introducing Mikron's ThermalSpection™

Implementing a systems approach for thermal process applications requires full knowledge of the customer's applications, available thermal imagers and thermal scanners, customer's existing controls platform, and software requirements, etc. We have a full staff of engineering and software specialists available for the design and development of comprehensive turn-key systems for all customer applications. Experience in many different thermal applications is the backbone of our designs and short-term turnaround for specialized software and custom camera configurations is our specialty.

Technical Data

SELECTION CHART

Model	MikroLine M2256	MikroLine M2256 G	MikroLine M2256 H	MikroLine M2256 M
Spectral range	8 to 14 µm	4.8 to 5.2 µm	1.4 to 1.8 µm	3 to 5 µm
Measurement range[1]	50 to 550°C or 450 to 1250°C	450 to 1250°C	600 to 1300°C	450 to 1250°C
Optics **Focal Length** **Field of View** **Measurement Distance** **Spatial resolution**	 18mm 40° x 0.3° 10 cm to infinity 3 mrad (50% modulation)	 13mm 60° x 0.5° 20 cm to infinity 4 mrad (50% modulation)	 12mm 60° x 0.5° 50 cm to infinity 4 mrad (50% modulation)	 13mm 60° x 0.5° 20 cm to infinity 4 mrad (50% modulation)
Measurement uncertainty[2]	2K (measured temperature < 100°C) or 1K + 1% of the measured value in °C	1K + 1% of the measured value in °C	1K + 1% of the measured value in °C	1K + 1% of the measured value in °C
Noise equivalent temperature difference[2]	<0.5 K	<1 K	<1 K	<0.5 K

GENERAL SPECIFICATIONS

Sensor	Uncooled pyroelectric linear array
Frame rate	Internal 512 Hz, selectable: 512 Hz, 256 Hz, 128 Hz, 64 Hz, 32 Hz …
Response time	Internal 4 ms, selectable: 2/measurement frequency
Interface	Fiber-optic/PCI-card
Digital inputs (trigger, 2 x)	Symmetrical (threshold 0.2 V difference) or unsymmetrical (threshold 2.5V)
Digital outputs (alarm, 2 x)	Optically coupled OC-outputs ($1_C \leq 150mA$, $V_E \leq 25V$)
Connectors[3]	Round connector with thread interlocking (16 pins) Interlocking fiber optic connector (2 fibers) Water supply tubing (nominal width 4mm, 2 bar max) Compressed air tubing (nominal width 4mm, 2 bar max)
Weight	ca. 3.2 kg
Power Supply	18…36 V DC/10…20 VA
Housing	Protection degree IP65, optional with integrated water-cooling system, air purge, swivel base
Operating temperature **Camera** **System cable** **Fiber optic**	 0 to 50° (without water-cooling); -25° to 150°C (with water-cooling) -25 to 150°C 0 to 70°C
Storage conditions	-20 to 70°C, relative humidity: max. 95%
Software	PC control and display program IR_LINE for Windows™

[1] Other on request
[2] Specification for 32 Hz measurement frequency, blackbody reference, ambient temperature 25°C
[3] Dependent upon configuration

Mikron reserves the right to change specifications to reflect the latest changes in technology and improvements at any time without notice. These changes will be reflected in subsequent editions of our literature when warranted.

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For More Information Call:
1-888-506-3900

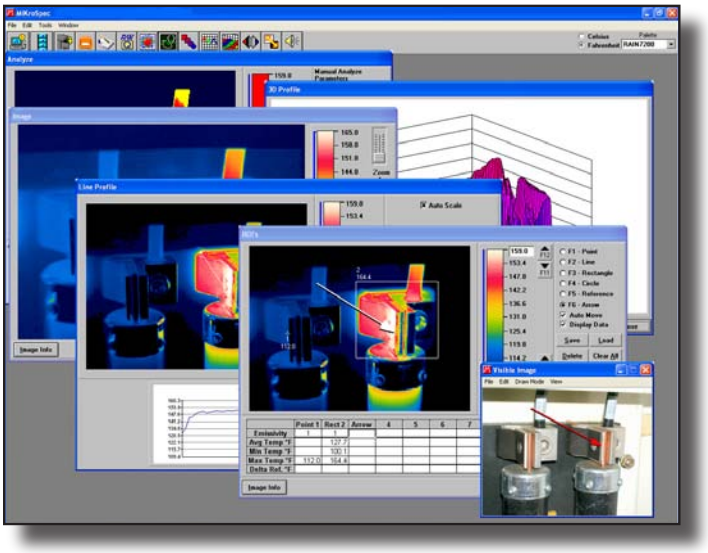
MIKRON INFRARED

MikroLine 2256 Rev 032905

MikroSpec™ 2.9

Thermal Image Processing and Report Writing Software

Thermal imaging software package that offers a combination of functionality, ease of use, and value that is unrivaled in the industry



System Requirements

Computer:

Pentium 75 MHz or higher processor
64 MB RAM
75 MB free on hard drive
VGA 16 bit (65,536 colors) or higher

Operating System:

Windows™ 98SE, XP, NT 4.0 with Service Pack 5 or higher, or 2000 with Service Pack 2 or higher

Features:

Advanced Image Analysis including image calibration, filtering, statistical analysis, and Regions of Interest definition, as well as scene emissivity and background correction.

OLE-2 Compliant Report Writer enables simple creation of professional quality reports using the integrated Mikron Report Writer software with your favorite Windows word processing and spreadsheet programs. It also has the ability to read and write Microsoft™ Word documents.

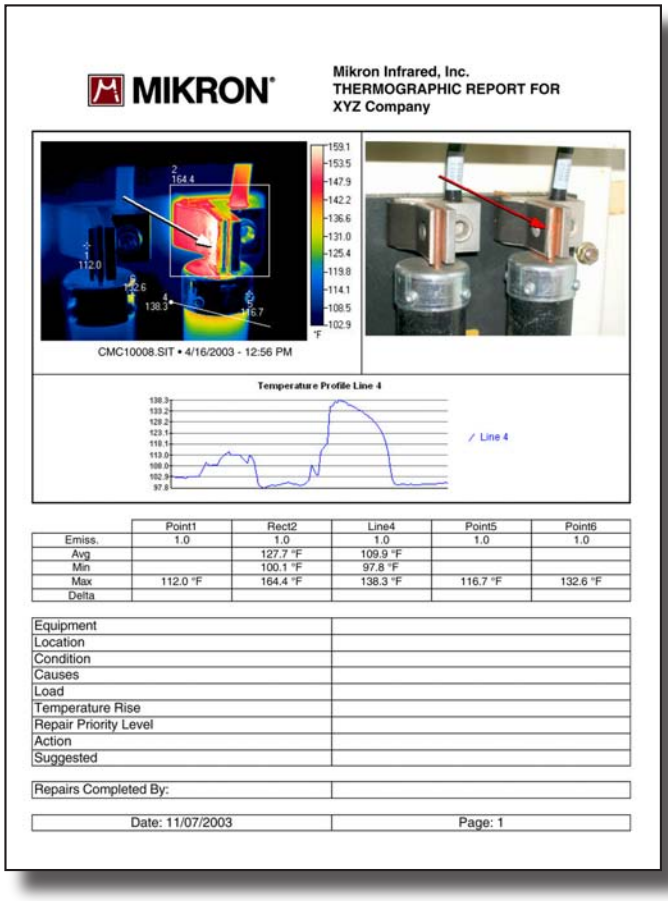
Industry-Leading Documentation and Support ensures easy start-up and continued access to technical assistance and support.

Free Updates for 12 Months provides you access to the latest advancements and improvements as soon as they are available — at no charge.

Windows™ Compatibility ensures flawless operation in Windows™ 98SE, XP, NT, or 2000.

Multiple Color Palettes offer flexibility for optimal image clarity.

Open Architecture assures flawless operation with virtually all Mikron infrared cameras.



MIKRON

Mikron Infrared, Inc.
THERMOGRAPHIC REPORT FOR
XYZ Company

CMC10008.SIT • 4/16/2003 - 12:56 PM

Temperature Profile Line 4

	Point1	Rect2	Line4	Point5	Point6
Emiss.	1.0	1.0	1.0	1.0	1.0
Avg		127.7 °F	109.9 °F		
Min		100.1 °F	97.8 °F		
Max	112.0 °F	164.4 °F	138.3 °F	116.7 °F	132.6 °F
Delta					

Equipment	
Location	
Condition	
Causes	
Load	
Temperature Rise	
Repair Priority Level	
Action	
Suggested	
Repairs Completed By:	

Date: 11/07/2003 Page: 1

MikroSpec™ 2.9 Features

Manage Images

Sound Playback

The sound playback feature allows you to listen to sound clips saved as part of the MikroScan 7200 image file.

Visible Light Images

The software allows you to view and save visible light images taken with the MikroScan 7200V.

Temperature Information

The software is able to use radiometric thermal image data, or you can manually define and imbed temperature information in an image. To manually define temperature information you must enter the values for two known temperature points on the image and allow the software to calculate the temperatures for the rest of the image based on these values.

Thumbnails

The view thumbnails feature displays thumbnails of all available thermal images in the specified directory. From the thumbnails window you can sort images by type, specify a color palette, load any of the images for detailed analysis, browse your entire file structure to access any image, or print the contents of the specified directory. An optional feature of the software also allows you to convert and save native .SIT images to a .IMG format.

Analyze Images

Analyze an Image

The image analyze feature allows you to define temperature ranges and colors to create a three channel static isotherm or a single channel dynamic isotherm. The analyzed image then provides you an easy-to-read graphic representation of discrete temperature ranges.

Regions of Interest

The regions of interest (ROIs) feature allows you to define a reference point on an image and up to nine additional regions for the software to monitor. For each region, the software automatically calculates the minimum temperature, the maximum temperature, the average temperature, and the difference between the maximum and the reference temperatures.

Filter

The filter feature allows you to view portions of an image that fall within a discrete user-defined temperature range. The software masks the temperatures above and below the range that you specify, and condenses the color palette to fit within the specified range.

Invert Polarity

The invert polarity feature reverses the current color palette of the thermal image to improve image clarity. For example, if you have a gray scale image that associates white with hot, the inverted image will associate black with hot.

Line Profile

The line profile feature generates a two-dimensional graph relating distance to temperature based on the location of a line on the thermal image. In addition to the 2-D graph, the software generates statistical data including minimum, maximum, and average temperatures along the line.

3-D Profile

The 3-D profile feature generates a three-dimensional temperature profile of the thermal image. The three axis of the graph represent horizontal distance, vertical distance, and temperature.

Generate Reports

Report Writer

The MikroSpec report writer is designed to provide you with a powerful yet simple and user-friendly means for creating professional-quality reports based on data collected by your MikroSpec software. You can either run the report writer as a stand-alone word processing program or simultaneously with your MikroSpec software.

The report writer functions like a standard Windows™ word processing program, and it is OLE-2 compliant. For added flexibility and optimal functionality, you can import from and link to your favorite Windows word processing or spreadsheet programs.

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MIKRON INFRARED

MikroSpec 2.9 Rev 032905

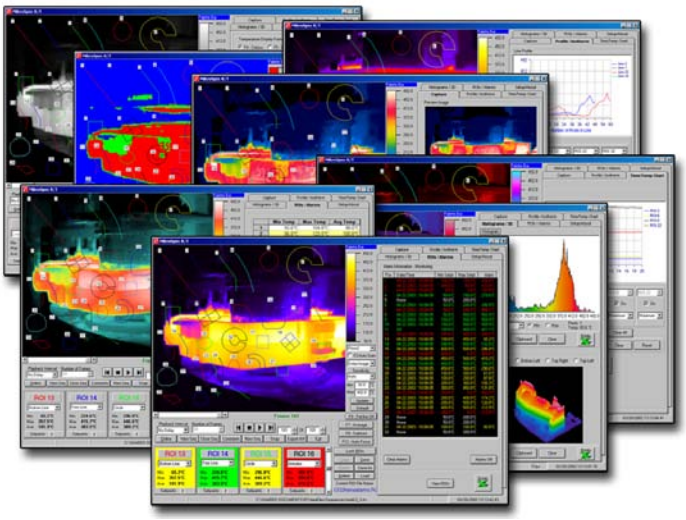
MikroSpec™ R/T

Real-Time Thermal Data Acquisition and Analysis Software

Windows-based thermal imaging software program that offers high-speed, real-time data acquisition and image analysis capabilities

By using one or more MIKRON Infrared cameras connected to the software, processes can be measured accurately to ensure production quality where individual images are insufficient. The software allows you to view thermal images in real-time as well as those that have been captured and stored to the computer's hard disk drive.

By creating up to 32 Regions of Interest (ROIs) in one of ten shapes, you can retrieve details as to the temperature range within the ROIs. Sophisticated graph tools allow you to create graphs of the real-time image temperature analysis, while the export to Excel™ feature allows you to analyze the real-time image temperature data in a numerical context.



- ***Monitor processes in real-time***
- ***Eliminate or Reduce Downtime***
- ***Lower Production Costs***
- ***Save Time***
- ***Increase Quality***
- ***Reduce Safety Hazards***

Features

Remote Camera Control Functionality via FireWire™ or Ethernet Interface allows you to select the camera type, mode, range, temperature scale and lens. It also allows you to perform non-uniformity correction (NUC) as well as make adjustments for focusing, emissivity, ambient calibration, and percentage of transmission loss.

Real-time Image Acquisition allows you to capture large amounts of data at a user-adjustable capture rate of up to 30 frames per second via FireWire or one frame per second via Ethernet. Live images can be captured with full temperature data and stored to a sequence file. The maximum number of frames is dependent upon the amount of available memory in the computer. Individual snap shot images can also be stored to files with full temperature data for later analysis.

Multiple Regions of Interest (ROIs) allow you to process and compute the Minimum, Maximum and Average Temperatures for up to 32 Regions of Interest (ROIs). The ROIs can be resized and moved on the live image display. There are 10 different ROI shapes (Point, Line, Broken Line, Free Line, Circle, Annulus, Rectangle, Rotated Rectangle, Polygon, and Region). A custom formula ROI type is also available which allows temperatures to be computed using typical Excel™ formulas.

Each ROI has a minimum and a maximum alarm set point that can be configured to generate software and digital output alarms. These alarms can be recorded to a Text or Comma Separated log file for later review.

Multiple Color Palettes offer flexibility for optimal image clarity.

Off-line Analysis allows you to replay image sequence files that had been previously captured and saved to disk. Sequence files can be loaded into MikroSpec R/T and played back using all of the R/T tools.

Image Averaging and Subtraction *allows you to compare the current input image with a snapped or loaded reference image.*

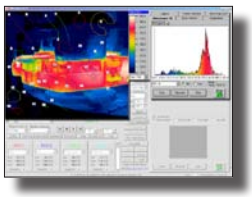
Windows™ Compatibility ensures flawless operation in Windows 2000 or Windows XP .

Industry-Leading Documentation and Support ensures easy start-up and continued access to technical assistance and support.

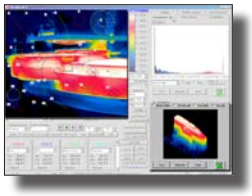
Free Updates for 12 Months provides you access to the latest advancements and improvements as soon as they are available — at no charge.

Technical Data

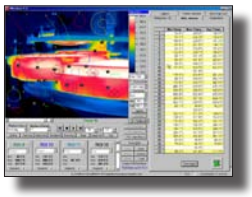
MikroSpec R/T Tools



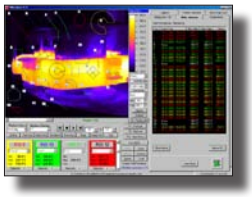
Histogram View graphically displays the temperature distribution of pixels in an image. This data can be exported to Excel™ for further analysis.



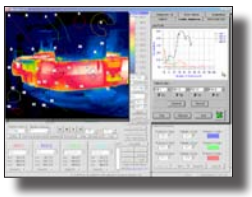
3D Display shows the temperature data on an image in the Z axis to provide a three-dimensional view of the image.



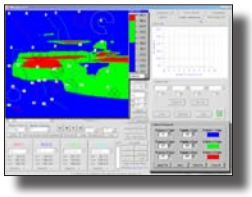
Regions of Interest (ROIs) Chart displays all 32 temperature values in a spreadsheet view. The ROI shape data can be exported to Excel™ to provide detailed pixel temperatures for each shape.



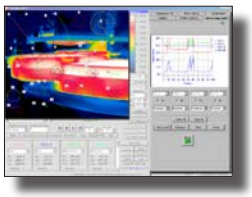
Alarms Chart displays all 32 Alarms on a single display. The display will show the set point for each ROI and will color code each channel when an alarm occurs. These alarms can be recorded to a Text or Comma Separated log file for later review.



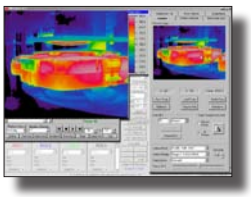
Line Profile Graph displays a two-dimensional line graph showing the temperature profile of up to four line, broken line, or free line ROIs. Each of the line profiles can be exported to Excel™ for further analysis.



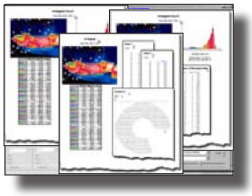
Isotherm Overlay provides a visual representation of the temperature breakdown on the image. MikroSpec R/T offers 3 Isotherm channels where temperature ranges can be set to display specific colors on the image display.



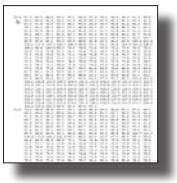
Time vs. Temperature Graph displays the minimum, maximum, or average temperature of up to four ROI channels on a two-dimensional graph. The graph data can be exported to Excel™ for further analysis.



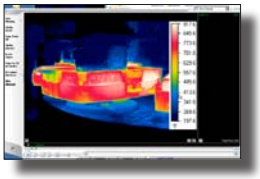
Captured Image allows a single image frame to be captured from the main image display and loaded into the preview image display where it can be viewed, copied, saved, and reloaded for further analysis.



Export to Excel™ allows data taken from the ROI Chart, the Line Profile graph, the Time vs. Temperature Graph, the Histogram and the 3D Display to be exported to Excel™ for further analysis.



Export to ASCII allows the entire pixel temperatures for each frame in a sequence to be exported as a tab delimited text file for analysis with statistical software packages.



.AVI Export allows sequence files to be exported to an AVI video file that can be viewed using any Windows™ media player software which supports the AVI format.

System Requirements

MikroSpec R/T is designed to operate on a Windows™ based computer with the following (minimum) components:

Computer

- Pentium 900 MHz or higher processor (2 GHz or higher recommended)
- 128 MB Ram (256 MB or higher recommended)
- VGA 16 bit (64K colors) or higher
- 100 MB Free Hard Disk Space

Operating System

- Microsoft Windows™ 2000 Professional Software (if using IEEE 1394 FireWire™ or Ethernet Interface)

  OR

- Microsoft Windows™ XP Professional Software (if using IEEE 1394 Firewire™ or Ethernet Interface)

Mikron Infrared, Inc.
Thermal Imaging Division

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For More Information Call:
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MIKRON INFRARED

MikroSpec R/T Rev 032905

MikroSpec R/T System With Optional I/O Module

MIKRON INFRARED

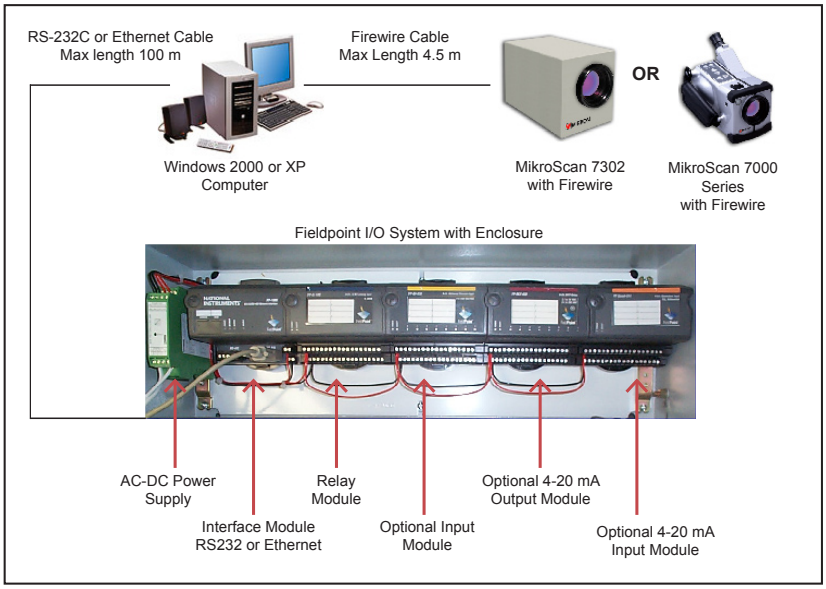
For More Information Call:
1-888-506-3900

Offers 8-channel input/output modules working with the MikroSpec R/T software to control alarms, remote triggering, and data capture

System Requirements

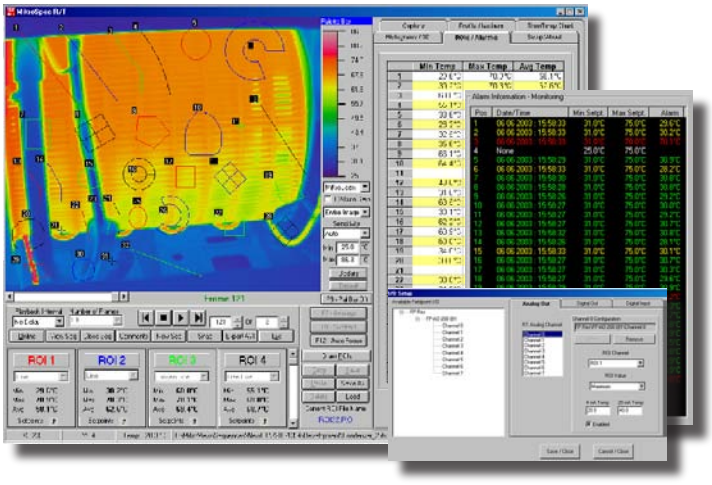
The dedicated process computer for the MikroSpec R/T System with the Optional I/O module has the following minimum specifications:

- Pentium 4 - 2.0 GHz or Higher PC
- 512 megabytes or higher of system memory
- 40 gigabyte hard disk with at least 10 gigabytes free
- CD ROM drive
- Microsoft Windows™ 2000 Professional or Microsoft Windows™ XP
- DirectX 8.1
- Keyboard and Mouse
- 17" monitor capable of 1024x768 resolution
- Video graphics board capable of displaying 1024 x 768 x 24 bit
- One Serial Port (RS232) or 100 baseT Ethernet for connection to Remote I/O
- OHCI Compliant IEEE 1394 (FireWire™) Host Controller



Remote I/O Specifications

- The power supply module uses AC input power and delivers all necessary power (24 VDC) to each of the I/O modules.
- The network interface module connects the process computer to the I/O modules. The module communicates to the computer via RS232 or Ethernet.



- The relay output module (Alarms) has 8 relay channels. Each channel can drive up to 240 VAC at 3 Amps.
- The optional universal input module (Remote Triggering) has 8 channels. Each channel can be from 5 VDC to 240 VAC. This input could turn off the alarms while the process equipment is in the camera's field of view. The input would then turn on the alarms when the equipment moves out of the field of view.
- The optional 4-20 mA output module has 8 channels. With the optional analog module, MikroSpec R/T can send each Region of Interest (ROI) temperature to a 4-20 mA output.
- The optional 4-20 mA Input module has 8 channels. With the optional analog module and the optional software module, MikroSpec R/T can store external signals with captured temperature data.

Mikron Infrared, Inc., Thermal Imaging Division, 1101 Elevation Street, Suite 3, Hancock, MI 49930 ● Email: jon@mikroninfrared.com ● Internet: www.mikroninfrared.com

FM Approvals

MikroSpec R/T Multiple Camera System

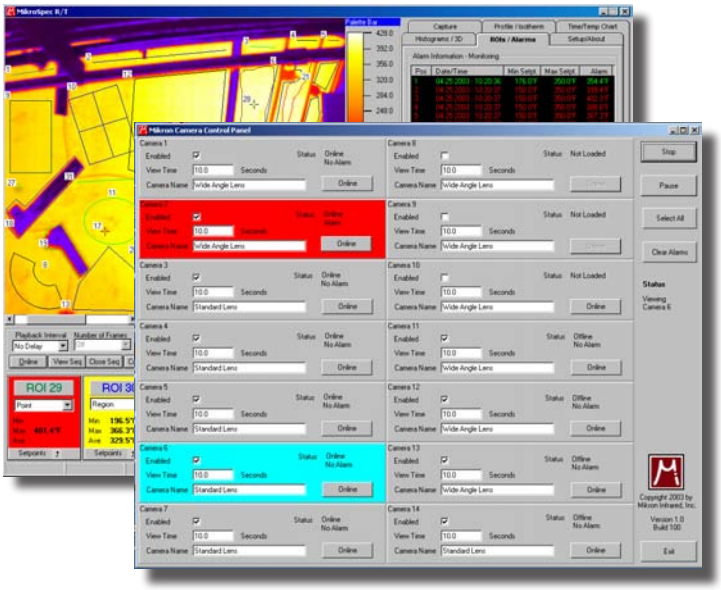
MIKRON INFRARED

For More Information Call:
1-888-506-3900

Unique thermal imaging software add-on that allows data obtained from multiple cameras to be monitored simultaneously in real-time on a single computer

System Description

The MikroSpec R/T Multiple IR Camera System was designed by Mikron Infrared, Inc. to assist in monitoring critical temperatures for safety and process control purposes. The system utilizes multiple Mikron MikroScan 7302 Ethernet-based Thermal Imaging cameras and custom software, which allows data to be monitored simultaneously in real-time on a single computer.



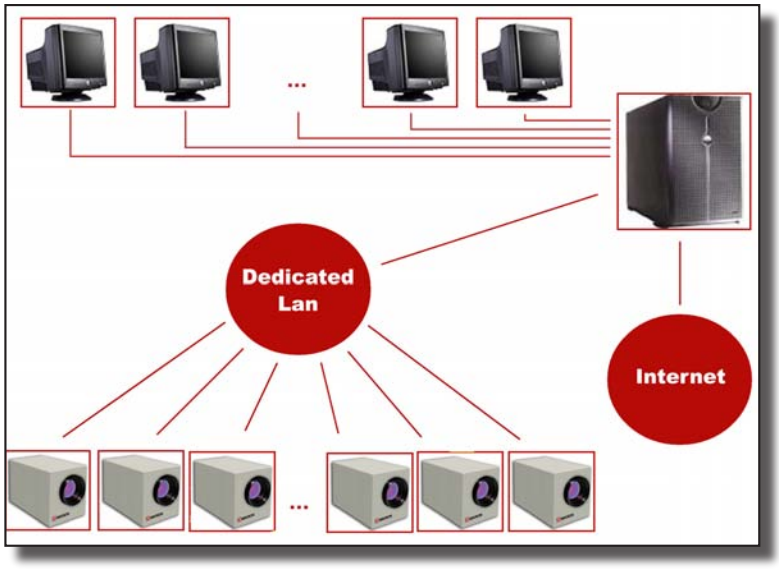
The system provides a high level of accuracy, reliability, and stability by utilizing customized Mikron Multi-Camera Controls and MikroSpec R/T software to monitor and analyze temperature and alarm data being received from all cameras.

The MikroSpec R/T software allows you to view the thermal images in real-time and also allows you to save the data for further analysis at a later time. By creating up to 32 Regions of Interest (ROIs) in one of ten shapes, you can retrieve details on temperature ranges and alarm conditions falling within the ROIs. While log files can be maintained on alarm conditions, MikroSpec R/T's sophisticated graph tools allow you to create and save graphs of the image temperature analysis. The software also provides an export to Excel feature which allows the image temperature data to be saved in a numerical context.

System Requirements

The dedicated process computer for the MikroSpec R/T Multiple IR Camera System has the following minimum specifications:

- Pentium 4 - 2.0 GHz or Higher PC
- 512 megabytes or higher of system memory
- 40 gigabyte hard disk with at least 10 gigabytes free
- CD ROM drive
- Microsoft Windows™ 2000 Professional or Microsoft Windows™ XP
- DirectX 8.1
- Keyboard and Mouse
- 17" monitor(s) capable of 1024x768 resolution
- Video graphics board capable of displaying 1024 x 768 x 24 bit
- One 100 baseT Ethernet for connection to cameras and Remote I/O



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MikroSpec™ Software

MikroSpec Software Series Feature Comparisons

MIKRON INFRARED

For More Information Call:
1-888-506-3900

FEATURES	*MikroView*	*MikroSpec™ 2.9*	*MikroSpec™ R/T*
Advanced Image Analysis			
3-D Profile		✔	✔
Histogram		✔	✔
Image Averaging and Subtraction			✔
Calibration of .BMP Images		✔	
Image Filtering		✔	
Invert Polarity	✔	✔	
Isotherms		✔	✔
Line Profile		✔	✔
Min, Max, Average Functions		✔	✔
Real-time Image Analysis			✔
Time vs. Temperature			✔
Zoom Image	✔	✔	✔
Alarms			
Alarm History Logging			✔
Alarm Monitoring			✔
Image Management			
Sound Playback	✔	✔	
Temperature Information	✔	✔	✔
Thumbnails	✔	✔	
Visible Light Images	✔	✔	
Image Processing			
Acquire and Save Image Sequences			✔
Acquire and Save Images			✔
Load and Save Images	✔	✔	✔
Export to .AVI			✔
Frame by Frame Playback and Analysis		✔	✔
Image Comments	✔	✔	✔
Image Capture			✔
Image Retouching and Enhancement		✔	✔
Multiple Color Palettes	✔	✔	✔
Real-time Image Acquisition			✔
Video Sequence Capture and Analysis			✔
Regions of Interest (ROIs)			
Multiple ROIs		Up to 10 ROI channels	Up to 32 ROI channels
ROI Definition		Up to 4 shapes	Up to 10 shapes
Remote Camera Control Functionality			✔
Report Functions			
Export to ASCII			✔
Export to Excel Feature		✔	✔
OLE-2 Compliant Report Writer		✔	
Windows™ Compatibility			
Windows™ 98	✔	✔	(Off-line functionality only)
Windows™ XP	✔	✔	✔
Windows™ NT	✔	✔	(Off-line functionality only)
Windows™ 2000	✔	✔	✔

Mikron reserves the right to change specifications to reflect the latest changes in technology and improvements at any time without notice. These changes will be reflected in subsequent editions of our literature when warranted.

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