

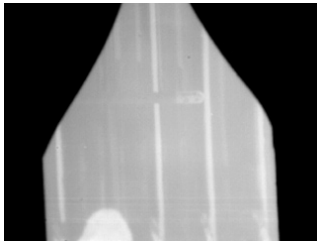
M7900 PYROVISION®



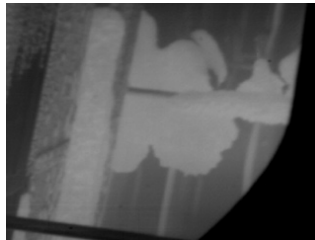
A Unique Ultra High Resolution Thermal Imager for High Temperature Industrial Processes and Research

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

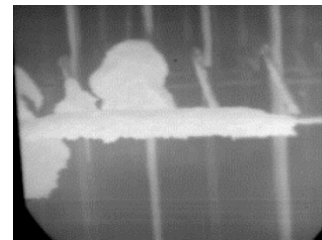
- Measures temperature at 76,800 points 30 times a second
- Minimally affected by emissivity
- Exceptionally high accuracy and resolution
- Advanced FPA technology
- Sees through glass or quartz view ports
- 8-channel isolated current outputs for automated process control
- Versatile image processing 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 $\pm 0.5\%$ of reading $\pm 1^\circ\text{C}$.

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 qual-

ity 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
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 numerous 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 microscopic 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.

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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