SPOT

HIGH PRECISION PYROMETERS

A PRODUCT OF THE SYSTEM 5 FAMILY

50 to 3500 °C / 122 to 6332 °F

LAND

AMETEK®

QUALITY CUSTOMER SOLUTIONS

SPOT
HIGH PRECISION PYROMETERS

AMETEK LAND HAS BEEN MANUFACTURING PRECISION MEASURING EQUIPMENT SINCE 1947.

WE ARE SPECIALISTS IN NON-CONTACT TEMPERATURE MEASUREMENT AND COMBUSTION MONITORING WITH APPLICATIONS ACROSS DIVERSE INDUSTRIES SUCH AS STEEL AND GLASS MAKING, POWER GENERATION AND CEMENT MANUFACTURE.

As part of AMETEK Process & Analytical Instruments Division since 2006, our customers benefit from the worldwide AMETEK sales and service team.

The technologies utilized in SPOT make non-contact temperature measurement accurate, flexible and easy to use.

Combining Ethernet, Modbus TCP, Image streaming, Analog and Alarm Outputs within one device, SPOT makes all these conveniently available to the operator. Pyrometer readings and configuration settings are available on the rear display and remotely via a web browser or through SPOTViewer software. The standard body models use a focus assist flashing green patented* LED. The 100 and 160 models offer a fiber-optic variant which uses a red LED to confirm measurement spot size and location.

Flexible design with adapters provide simplified installation and easy replacement of older pyrometers. SPOT is designed to be interchangeable with existing fixed spot pyrometers.

Dedicated software extends the usability. AMETEK Land SPOTPro software is a valuable addition allowing you to configure, display and log data from up to 40 different SPOT pyrometers. To ensure security with multiple users, various levels of access are available. Data log frequency, file size, save and archive locations are all configurable. SPOTPro is the perfect choice for smaller operations where traditional process control systems may be absent.

SPOT IS AN INNOVATIVE STAND-ALONE PYROMETER DESIGNED WITH ADVANCED INTEGRATED PROCESSING CAPABILITIES.

* Patent Number GB2497609

FEATURES	BENEFITS
Single person installation at instrument location	Local display and settings; no need for a second control room person
Industry standard 4-20 mA linear temperature output	Also included: 0-20 mA, 4-20 mA, CMD Out relay, Ethernet (TCP-IP, Modbus TCP, DHCP, http, udp, ICMP)
Software	Web browser, SPOTViewer for single units FOC from the website, and SPOTPro provides remote display and data logging of multiple SPOT pyrometers
Password Access	Prevents unauthorized tampering
Modbus TCP	Widely used and popular industrial protocol over Ethernet
Durable Sapphire Protection Window	Resists scratches, solvents and easily cleaned with a soft cloth (standard body only)
Single Sensor Solution	Ideal for use with customer PLCs or DCS systems; no requirement for a separate processor. Easy to implement in small or large organizations
Choice of Measurement Location	The fiber-optic variant widens your location options with its small optic head. These are ideal for inaccessible locations, areas with high levels of RFI or high ambient temperature environments where water cooling may not be permitted

STEEL MILL

TYPICAL APPLICATION - BLAST FURNACE

SPOT
HIGH PRECISION PYROMETERS

SPECIFICATION & DESIGN

MONOCHROMATIC PYROMETERS

M100, M160 and M210 Standard Body

The M-Series pyrometers have a measurement range of 500 to 1800 °C / 932 to 3272 °F, 700 to 3500 °C / 1292 to 6332 °F, 250 to 1600 °C / 482 to 2912 °F and 50 to 1100 °C / 122 to 2012 °F. Proven, reliable electronics and a precision optical system combine to give a pyrometer which delivers accurate, repeatable temperature measurement.

FIBER-OPTIC VARIANTS

M100, M160, R100 and R160

The M and R Series fiber-optic versions measure at the same temperature range and wavelength. The use of flexible fiber-optics allows the optic head to be mounted in a hostile environment and the detector and electronics enclosure to be located in a less hostile environment, several meters away.

The use of the fiber-optic variant permits measuring of targets that are inaccessible, in areas with high RFI or in high ambient temperature environments where water cooling may not be permissible.

ADVANCED PYROMETERS

The SPOT R100, R160 and R210 offer different operating modes selectable from the set-up menu

1: Ratio - Combined ratio signal from both detectors
R100: 550 to 1800 °C / 1022 to 3272 °F
700 to 3500 °C / 1292 to 6332 °F
R160: 550 to 1600 °C / 1022 to 2912 °F
R210: 125 to 1100 °C / 257 to 2012 °F

2: Mono 1 - Signal from detector 1 only
R100: 550 to 1800 °C / 1022 to 3272 °F
700 to 3500 °C / 1292 to 6332 °F
R160: 550 to 1600 °C / 1022 to 2912 °F
R210: 125 to 1100 °C / 257 to 2012 °F

3: Mono 2 - Signal from detector 2 only
R100: 400 to 1800 °C / 752 to 3272 °F
700 to 3500 °C / 1292 to 6332 °F
R160: 250 to 1600 °C / 482 to 2912 °F
R210: 125 to 1100 °C / 257 to 2012 °F

4: Multi - Extended range with low temperature monochromatic and high temperature ratio signal
R100: 400 to 1800 °C / 752 to 3272 °F
700 to 3500 °C / 1292 to 6332 °F
R160: 250 to 1600 °C / 482 to 2912 °F
R210: 125 to 1100 °C / 257 to 2012 °F

5: Duo - Uses detector 2 at low temperatures, detector 1 at high temperatures and both in between

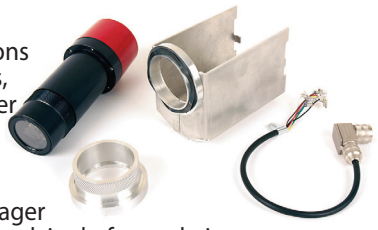
R100 Detector 1: 800 to 3500 °C / 1472 to 6332 °F
R100 Transition : 700 to 800 °C / 1292 to 1472 °F
R100 Detector 2: 400 to 700 °C / 752 to 1292 °F
R160 Detector 1: 800 to 1600 °C / 1472 to 2912 °F
R160 Transition : 700 to 800 °C / 1292 to 1472 °F
R160 Detector 2: 250 to 700 °C / 482 to 1292 °F
R210 Detector 1: 300 to 1100 °C / 572 to 2012 °F
R210 Transition : 200 to 300 °C / 392 to 572 °F
R210 Detector 2: 125 to 200 °C / 257 to 392 °F

MOUNTINGS AND ACCESSORIES

SPOT MENUS

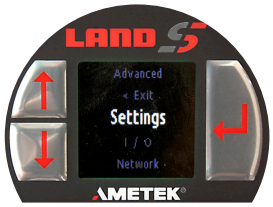
AMETEK LAND OFFERS A RANGE OF MOUNTINGS AND ACCESSORIES FOR SPOT PYROMETERS

SPOT is designed to be interchangeable with existing fixed spot pyrometers. To view the full range of mountings and accessories available, see our SPOT Mountings and Accessories Brochure.

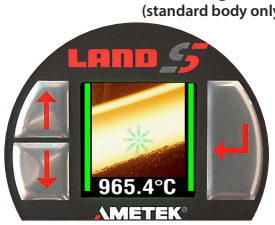


For specific recommendations on the choice of mountings, brackets, cables, or any other accessories, that may suit your specific industry or installation, please contact an AMETEK Land sales manager or representative for further advice before ordering.

Local user interface



Local image view (standard body only)



Flexibility of design enables the SPOT R100, R160 or R210 to adapt to multiple temperature measurement scenarios.

Change your materials or process parameters and continue to use the same instrument. Updating from an older sensor to SPOT form factor is flexible and easy. Utilize existing mountings and accessories for simple integration and installation.

1: THROUGH-THE-LENS INTEGRATED CAMERA
Easy target alignment and verification in low and high brightness environments (standard body only); 512x288 pixel live image at 30fps (via webserver), 112x100 (rear display)

2: PATENTED* PULSED HIGH BRIGHTNESS LED SIGHTING
Indicates both target size and location using an easily visible pattern; no laser safety requirements; Fiber-optic variant uses a red LED circle with manual focus

3: SIGNAL PROCESSING
All processing features are integrated into SPOT. No need for any separate processor unit

4: HIGH QUALITY OPTICS
Features a durable sapphire protection window and ensures precise targeting and quality measurements (not available on fiber optic variant)

5: INTEGRATED WEB SERVER
Allows for remote adjustment and readings via any web browser; firmware updates through the webserver

6: REAR DISPLAY & CONTROLS
Target viewing, temperature reading and set-up through simple menu driven choices; no need for separate software

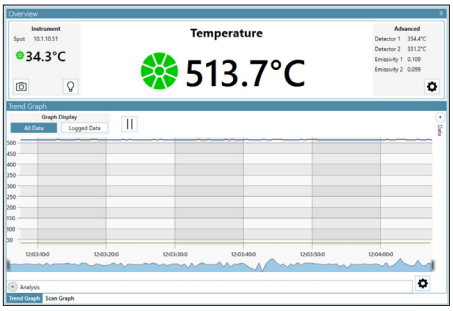
7: POWER OPTIONS
Power over Ethernet or 24 to 30 V DC at the instrument

8: FIBER-OPTIC VARIANT
Optic head and flexible fiber-optic (Not available on 210 models)

9: ADVANCED I/O FUNCTIONALITY
IOX enhanced electronic input/output functionality

SPOTVIEWER

SPOTViewer is a PC-based utility that enables you to connect, configure, and view data from a SPOT pyrometer and scan graphs with an Actuator.
Specifically developed to work seamlessly with the latest generation of industry leading single point pyrometers.



TYPICAL APPLICATIONS

Standard	Fiber-optic
Heat Treatment	Heat Treatment
Hot Rolling Mill	Polysilicon
Cement	Forging
Iron and Steel	Steel
Metal Forging	Induction Heating
Carburizing	Silicon Carbide
Plasma Nitriding	
Continuous Galvanizing Lines	

* Patent Number GB2497609

SPOT
HIGH PRECISION PYROMETERS

	R100	R100 F.O.	R160	R160 F.O.	R210
Measurement Range:	550 -1800 °C / 1022 - 3272 °F (ratio) 400 -1800 °C / 752 - 3272 °F (overall) 700 to 3500 °C / 1292 to 6332 °F (all modes)†	550 -1800 °C / 1022 - 3272 °F (ratio) 400 -1800 °C / 752 - 3272 °F (overall)	550 -1600 °C / 1022 - 2912 °F (ratio) 250 -1600 °C / 482 - 2912 °F (overall)	550 -1600 °C / 1022 - 2912 °F (ratio) 250 -1600 °C / 482 - 2912 °F (overall)	125 -1100 °C / 257-2012 °F
Field of View (90% of energy):	200:1	100:1; 3 lengths of light guides available	200:1	100:1; 3 lengths of light guides available	60:1
Detector Type:	Ratio Short Wavelength; Detector 1: 1.0 µm, Detector 2: 1.2 µm		Ratio Short Wavelength; Detector 1: 1.0 µm, Detector 2: 1.5 µm		Ratio Mid Wavelength; Detector 1: 2.1 µm, Detector 2: 2.4 µm
Display:	Local with video streaming	Local display	Local with video streaming	Local display	Local with video streaming
Settings:	Configure locally using the pyrometer interface or remotely (using the Webserver or SPOTViewer). Emissivity, mode, current output range, alarm logic output and thresholds, network settings, focus and LED, language and user name (focus and LED on standard body only)				
Sighting Image:	Local display and remote video streaming	Not available	Local display and remote video streaming	Not available	Local display and remote video streaming
Focus Range:	300 mm to infinity, locally or remotely adjusted	100 mm to 500 mm manually adjusted	300 mm to infinity, locally or remotely adjusted	100 mm to 500 mm manually adjusted	300 mm to infinity, locally or remotely adjusted
LED Targeting:	Patented* pulsed green LED focus pattern	Red circle LED	Patented* pulsed green LED focus pattern	Red circle LED	Patented* pulsed green LED focus pattern
Mounting:	Full range of mountings and accessories available - see Mountings and Accessories Brochure or visit our website				
Uncertainty:	Mono & Duo: ±0.25% K or 2 K** Ratio & Multi: ±0.5% K or 5 K**	Mono & Duo: ±0.25% K or 2 K** Ratio & Multi: ±0.5% K or 5 K**	Mono & Duo: ±0.25% K or 2 K** Ratio & Multi: ±0.5% K or 5 K**	Mono & Duo: ±0.25% K or 2 K** Ratio & Multi: ±0.5% K or 5 K**	Mono & Duo: ±0.25% K or 2 K** Ratio & Multi: ±0.5% K or 5 K**
Repeatability:	<1 °C				
Resolution:	0.1 °C				
Noise:	<0.5 °C RMS**				
Sealing:	IP65				
Response Time:	Adjustable 1 ms to 10 s				Adjustable 15 ms to 10 s
Interfaces:	x2 0/4 - 20 mA Output, 4 - 20 mA Input, Digital CMD In and CMD Out, Ethernet (TCP-IP, Modbus TCP, DHCP, http, udp, ICMP)				
Processing Functions:	Peak/Valley Picking, Averager, Modemaster, CMD in sampling, CMD out alarms				
Power Req.:	Power over Ethernet or 24 to 30 V DC at the instrument				
Software:	Live configuration and temperature display on any web browser. Optional SPOTViewer software with datalogging, live and historical data trending, plus remote image capture, control of multiple instruments (image capture not available on fiber-optic versions); SPOTPro Software available for use with multiple SPOT pyrometers				
Languages:	Integrated multiple language selections: English, German, French, Italian, Spanish, Portuguese (Brazilian), Japanese, Chinese (simplified Mandarin), Korean, Russian, Polish				
Ambient Temp. Range:	5-60 °C specified, 0-70 °C operating before cooling required	Optic head up to 200 °C / 392 °F before cooling required	5-60 °C specified, 0-70 °C operating before cooling required	Optic head up to 200 °C / 392 °F before cooling required	5-60 °C specified, 0-70 °C operating before cooling required
Inputs:	4 - 20 mA Input, 24 V DC CMD In, Ethernet, (TCP-IP, Modbus TCP, DHCP, http, udp, ICMP)				
Outputs:	2x 0/4 - 20 mA, CMD Out relay, Ethernet (TCP-IP, Modbus TCP, DHCP, http, udp, ICMP)				
Warranty:	36 months				

	M100	M100 F.O.	M160	M160 F.O.	M210
Measurement Range:	500 -1800 °C / 932 - 3272 °F	500 -1800 °C / 932 - 3272 °F	250 -1600 °C / 482 - 2912 °F	250 -1600 °C / 482 - 2912 °F	50 -1100 °C / 122-2012 °F
Field of View (90% of energy):	200:1	100:1; 3 lengths of light guides available	200:1	100:1; 3 lengths of light guides available	60:1
Detector Type:	Single Wavelength 1.0 µm detector		Single Wavelength 1.6 µm detector		Single Wavelength 2.3 µm detector
Display:	Local with video streaming	Local display	Local with video streaming	Local display	Local with video streaming
Settings:	Configure locally using the pyrometer interface or remotely (using the Webserver or SPOTViewer). Emissivity, mode, current output range, alarm logic output and thresholds, network settings, focus and LED, language and user name (focus and LED on standard body only)				
Sighting Image:	Local display and remote video streaming	Not available	Local display and remote video streaming	Not available	Local display and remote video streaming
Focus Range:	300 mm to infinity, locally or remotely adjusted	100 mm to 500 mm manually adjusted	300 mm to infinity, locally or remotely adjusted	100 mm to 500 mm manually adjusted	300 mm to infinity, locally or remotely adjusted
LED Targeting:	Patented* pulsed green LED focus pattern	Red circle LED	Patented* pulsed green LED focus pattern	Red circle LED	Patented* pulsed green LED focus pattern
Mounting:	Full range of mountings and accessories available - see Mountings and Accessories Brochure or visit our website				
Uncertainty:	±0.25% K or 2 K**	±0.25% K or 2 K**	±0.25% K or 2 K**	±0.25% K or 2 K**	±0.25% K or 2 K**
Repeatability:	<1 °C				
Resolution:	0.1 °C				
Noise:	<0.5 °C RMS**				
Sealing:	IP65				
Response Time:	Adjustable 1 ms to 10 s				Adjustable 10 ms to 10 s
Interfaces:	x2 0/4 - 20 mA Output, 4-20 mA Input, Digital CMD In and CMD Out, Ethernet (TCP-IP, Modbus TCP, DHCP, http, udp, ICMP)				
Processing Functions:	Peak/Valley Picking, Averager, Modemaster, CMD in sampling, CMD out alarms				
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Ambient Temp. Range:	5-60 °C specified, 0-70 °C operating before cooling required	Optic head up to 200 °C / 392 °F before cooling required	5-60 °C specified, 0-70 °C operating before cooling required	Optic head up to 200 °C / 392 °F before cooling required	5-60 °C specified, 0-70 °C operating before cooling required
Inputs:	4 - 20 mA Input, 24 V DC CMD In, Ethernet, (TCP-IP, Modbus TCP, DHCP, http, udp, ICMP)				
Outputs:	2x 0/4 - 20 mA, CMD Out relay, Ethernet (TCP-IP, Modbus TCP, DHCP, http, udp, ICMP)				
Warranty:	36 months				

* Patent Number GB2497609
**Measurements within specification over 5-95% of range
† Measurements within specification between 700 - 3000 °C / 1292 - 5432 °F

SPOT*PRO*

SPOTPro software package provides a single control point to configure, store and view data for up to 40 SPOT infrared pyrometers. Giving a complete overview of all the SPOT thermometers connected to your network, SPOTPro allows you to independently configure data logging for each pyrometer, by setting automatic triggers for data storage.

SPOTPro allows users to compare live and historical data to trend and diagnose process issues. Data can be logged to an SQLite database for easy configuration or an MS SQL Server database for enterprise-level data requirements. All data can be exported to CSV or XML for integration into other processes or further processing in applications such as MS Excel.

SPOTPro supports a flexible window layout with multiple monitor support – see all the data that is most important to you prominently on screen all at once.

CONTROL MULTIPLE SPOT PYROMETERS
Each pyrometer can be individually configured for a defined storage interval for target temperature, two detector temperatures, ambient temperature, and emissivity. This allows customised criteria to be set for data measurements during important events.

RICHER DATA ANALYSIS
With the facility to view up to 40 pyrometers, users can compare and contrast data from multiple devices on a single or multiple screens. Switching between live and historical data enables a comprehensive review and analysis of your measurements.

SIMPLE TO INSTALL AND RUN
Installation requires a single PC (exact requirements are dependent on the number of pyrometers).

AMECARE PERFORMANCE SERVICES

AMETEK Land's AMECare Performance Services ensure peak performance and maximum return on investment over the life of your equipment.

We will deliver this by:
- Proactively maintaining your equipment to maximize availability.
- Optimizing solutions to meet your unique applications.
- Enhancing user skills by providing access to product and application experts.

AMETEK Land's global service network provides unparalleled after-sales services to ensure you get the best performance and value from your AMETEK Land products. Our dedicated service centre teams and on-site engineers are trained to deliver the highest standard of commissioning, maintenance and after-sales support.

SEE OUR OTHER LITERATURE FOR SPOT FAMILY PYROMETERS:

SPOT MOUNTINGS & ACCESSORIES

SPOT ACTUATOR

DISCOVER HOW OUR BROAD RANGE OF NON-CONTACT TEMPERATURE MEASUREMENT AND COMBUSTION & EMISSIONS PRODUCTS OFFER A SOLUTION FOR YOUR PROCESS

WWW.AMETEK-LAND.COM