SPOT
HIGH PRECISION PYROMETERS
A PRODUCT OF THE SYSTEM 5 FAMILY

50 to 1800 °C / 122 to 3272 °F

LAND
AMETEK®
PROCESS & ANALYTICAL INSTRUMENTS

QUALITY CUSTOMER SOLUTIONS
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 SPOTServer 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. SPOTServer is the perfect choice for smaller operations where traditional process control systems may be absent.

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

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 SPOTServer 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

* Patent Pending
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.

TYPICAL APPLICATIONS

1: THROUGH-THE-LENS INTEGRATED CAMERA
   Easy target alignment and verification in low and high brightness environments (standard body only)

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

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)

SPECIFICATION & DESIGN

MONOCROMATIC PYROMETERS

M100, M160 and M210 Standard Body

The M-Series pyrometers have a measurement range of 500 to 1800 °C / 932 to 3272 °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 measurements.

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

2: Mono 1 - Signal from detector 1 only

3: Mono 2 - Signal from detector 2 only

4: Multi - Extended range with low temperature monochromatic and high temperature ratio signal

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

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

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

8: Fiber-optic variant uses a red LED circle with an easily visible pattern; no laser safety requirements; EZSighting

Accessories

and accessories available, see our SPOT Mountings and Accessories Brochure.

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.

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.

MOUNTINGS AND ACCESSORIES
## SPECIFICATIONS

<table>
<thead>
<tr>
<th>M1D0</th>
<th>M1D0 F.O.</th>
<th>M150</th>
<th>M150 F.O.</th>
<th>M21D</th>
</tr>
</thead>
<tbody>
<tr>
<td>### Measurement Range:</td>
<td>500-1800 °C / 932-3272 °F</td>
<td>500-1800 °C / 932-3272 °F</td>
<td>250-1600 °C / 482-2912 °F</td>
<td>50-1100 °C / 122-2012 °F</td>
</tr>
<tr>
<td>Field of View (90% of energy):</td>
<td>200:1</td>
<td>100:1: 3 lengths of light guides available</td>
<td>200:1</td>
<td>100:1: 3 lengths of light guides available</td>
</tr>
<tr>
<td>Detector Type:</td>
<td>Single Wavelength 1.0 µm detector</td>
<td>Single Wavelength 1.6 µm detector</td>
<td>Single Wavelength 2.3 µm detector</td>
<td></td>
</tr>
<tr>
<td>Display:</td>
<td>Local with image streaming</td>
<td>Local display</td>
<td>Local with image streaming</td>
<td>Local display</td>
</tr>
<tr>
<td><strong>Settings:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sighting Image:</td>
<td>Local display and remote capture</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
</tr>
<tr>
<td>Focus Range:</td>
<td>300 mm to infinity, locally or remotely adjusted</td>
<td>100 mm to 500 mm manually adjusted</td>
<td>100 mm to 500 mm manually adjusted</td>
<td>100 mm to 500 mm manually adjusted</td>
</tr>
<tr>
<td>LED Targeting:</td>
<td>Patented® pulsed green LED focus pattern</td>
<td>Red circle LED</td>
<td>Patented® pulsed green LED focus pattern</td>
<td>Red circle LED</td>
</tr>
<tr>
<td>Mounting:</td>
<td>Full range of mountings and accessories available - see Mountings and Accessories Brochure or visit our website</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repeatability:</td>
<td>&lt;1 °C</td>
<td>&lt;1 °C</td>
<td>&lt;1 °C</td>
<td>&lt;1 °C</td>
</tr>
<tr>
<td>Resolution:</td>
<td>0.1 °C</td>
<td>0.1 °C</td>
<td>0.1 °C</td>
<td>0.1 °C</td>
</tr>
<tr>
<td>Noise:</td>
<td>&lt;0.5 °C RMS**</td>
<td>&lt;0.5 °C RMS**</td>
<td>&lt;0.5 °C RMS**</td>
<td>&lt;0.5 °C RMS**</td>
</tr>
<tr>
<td>Sealing:</td>
<td>IP65</td>
<td>IP65</td>
<td>IP65</td>
<td>IP65</td>
</tr>
<tr>
<td>Interface:</td>
<td>0-20 mA DC or 4-20 mA DC, Digital CMD In and CMD Out, Ethernet (TCP/IP, Modbus TCP DHIC), HTTP, UDP, ICMP</td>
<td>0-20 mA DC or 4-20 mA DC, Digital CMD In and CMD Out, Ethernet (TCP/IP, Modbus TCP DHIC), HTTP, UDP, ICMP</td>
<td>0-20 mA DC or 4-20 mA DC, Digital CMD In and CMD Out, Ethernet (TCP/IP, Modbus TCP DHIC), HTTP, UDP, ICMP</td>
<td>0-20 mA DC or 4-20 mA DC, Digital CMD In and CMD Out, Ethernet (TCP/IP, Modbus TCP DHIC), HTTP, UDP, ICMP</td>
</tr>
<tr>
<td>Processing Functions:</td>
<td>Peak/Valley Picking, Average, Modemaster, CMD in sampling, CMD out alarms</td>
<td>Peak/Valley Picking, Average, Modemaster, CMD in sampling, CMD out alarms</td>
<td>Peak/Valley Picking, Average, Modemaster, CMD in sampling, CMD out alarms</td>
<td>Peak/Valley Picking, Average, Modemaster, CMD in sampling, CMD out alarms</td>
</tr>
<tr>
<td>Ambient Temp. Range:</td>
<td>S-60 °C specified, 0-70 °C operating before cooling required</td>
<td>Optic head up to 200 °C / 392 °F before cooling required</td>
<td>S-60 °C specified, 0-70 °C operating before cooling required</td>
<td>Optic head up to 200 °C / 392 °F before cooling required</td>
</tr>
<tr>
<td>Software:</td>
<td>Integrated multiple language selections: English, German, French, Italian, Spanish, Portuguese (Brazilian), Japanese, Chinese (simplified Mandarin), Korean, Russian, Polish</td>
<td>Integrated multiple language selections: English, German, French, Italian, Spanish, Portuguese (Brazilian), Japanese, Chinese (simplified Mandarin), Korean, Russian, Polish</td>
<td>Integrated multiple language selections: English, German, French, Italian, Spanish, Portuguese (Brazilian), Japanese, Chinese (simplified Mandarin), Korean, Russian, Polish</td>
<td>Integrated multiple language selections: English, German, French, Italian, Spanish, Portuguese (Brazilian), Japanese, Chinese (simplified Mandarin), Korean, Russian, Polish</td>
</tr>
<tr>
<td>Power Req.:</td>
<td>Power over Ethernet or 24 to 30 V DC at the instrument</td>
<td>Power over Ethernet or 24 to 30 V DC at the instrument</td>
<td>Power over Ethernet or 24 to 30 V DC at the instrument</td>
<td>Power over Ethernet or 24 to 30 V DC at the instrument</td>
</tr>
<tr>
<td>Inputs:</td>
<td>24 V DC CMD In, Ethernet, (TCP/IP, Modbus TCP DHIC), HTTP, UDP, ICMP</td>
<td>24 V DC CMD In, Ethernet, (TCP/IP, Modbus TCP DHIC), HTTP, UDP, ICMP</td>
<td>24 V DC CMD In, Ethernet, (TCP/IP, Modbus TCP DHIC), HTTP, UDP, ICMP</td>
<td>24 V DC CMD In, Ethernet, (TCP/IP, Modbus TCP DHIC), HTTP, UDP, ICMP</td>
</tr>
<tr>
<td>Outputs:</td>
<td>0-20 mA, 4-20 mA, CMD Out relay, Ethernet (TCP/IP, Modbus TCP DHIC), HTTP, UDP, ICMP</td>
<td>0-20 mA, 4-20 mA, CMD Out relay, Ethernet (TCP/IP, Modbus TCP DHIC), HTTP, UDP, ICMP</td>
<td>0-20 mA, 4-20 mA, CMD Out relay, Ethernet (TCP/IP, Modbus TCP DHIC), HTTP, UDP, ICMP</td>
<td>0-20 mA, 4-20 mA, CMD Out relay, Ethernet (TCP/IP, Modbus TCP DHIC), HTTP, UDP, ICMP</td>
</tr>
<tr>
<td>Warranty:</td>
<td>36 months</td>
<td>36 months</td>
<td>36 months</td>
<td>36 months</td>
</tr>
</tbody>
</table>

* Patented** Measurements within specification over 5-95% of range

---

**Measurement Range:**
- R10D: 550-1800 °C (90% of energy) or 400-1800 °C / 752-3272 °F (overall)
- R10D F.O.: 550-1800 °C (90% of energy) or 400-1800 °C / 752-3272 °F (overall)
- R15D: 125-1100 °C / 257-212 °F

**Field of View (90% of energy):**
- 200:1
- 100:1, 3 lengths of light guides available
- 60:1

**Detector Type:**
- Ratio Short Wavelength; Detector 1: 0.0 µm, Detector 2: 1.2 µm
- Ratio Short Wavelength; Detector 1: 1.0 µm, Detector 2: 1.5 µm
- Ratio Half-Wavelength; Detector 1: 2.1 µm, Detector 2: 2.4 µm

**Display:**
- Local with image streaming
- Local display
- Local with image streaming
- Local display
- Local with image 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 capture
- Local display and remote capture
- Not available
- Not available
- Not available

**Focus Range:**
- 300 mm to infinity, locally or remotely adjusted
- 100 mm to 500 mm manually adjusted
- Not available
- Not available
- Not available

**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
- <1 °C
- <1 °C
- <1 °C
- <1 °C

**Resolution:**
- 0.1 °C
- 0.1 °C
- 0.1 °C
- 0.1 °C
- 0.1 °C

**Noise:**
- <0.5 °C RMS**
- <0.5 °C RMS**
- <0.5 °C RMS**
- <0.5 °C RMS**
- <0.5 °C RMS**

**Sealing:**
- IP65
- IP65
- IP65
- IP65
- IP65

**Response Time:**
- Adjustable 1 ms to 10 s
- Adjustable 15 ms to 10 s
- Adjustable 15 ms to 10 s
- Adjustable 15 ms to 10 s
- Adjustable 15 ms to 10 s

**Power Req.:**
- Power over Ethernet or 24 to 30 V DC at the instrument

**Software:**
- Integrated multiple language selections: English, German, French, Italian, Spanish, Portuguese (Brazilian), Japanese, Chinese (simplified Mandarin), Korean, Russian, Polish

**Languages:**
- Integrated multiple language selections: English, German, French, Italian, Spanish, Portuguese (Brazilian), Japanese, Chinese (simplified Mandarin), Korean, Russian, Polish

**Ambient Temp. Range:**
- S-60 °C specified, 0-70 °C operating before cooling required
- S-60 °C specified, 0-70 °C operating before cooling required
- S-60 °C specified, 0-70 °C operating before cooling required
- S-60 °C specified, 0-70 °C operating before cooling required
- S-60 °C specified, 0-70 °C operating before cooling required

**Inputs:**
- 24 V DC CMD In, Ethernet, (TCP/IP, Modbus TCP DHIC), HTTP, UDP, ICMP

**Outputs:**
- 0-20 mA, 4-20 mA, CMD Out relay, Ethernet (TCP/IP, Modbus TCP DHIC), HTTP, UDP, ICMP

**Warranty:**
- 36 months

---

**SPOT HIGH PRECISION PYROMETERS**

**WWW.AMETEK-LAND.COM | LAND.ENVYRI@AMETEK.COM**
The AMETEK Land SPOTServer software builds on the features of the SPOT Viewer to provide storage and analysis of data from multiple SPOT pyrometers.

A flexible user interface is provided that allows the user to simultaneously display and analyze the data from up to 40 pyrometers. The user can access the SPOT integrated camera image when applicable.

Each pyrometer can be configured independently with the freedom to define the storage interval for each of the following:

1. TARGET TEMPERATURE
2. DETECTOR 1 TEMPERATURE
3. DETECTOR 2 TEMPERATURE*
4. AMBIENT TEMPERATURE
5. EMISSIVITY / OBSCURATION*

Storage triggers allow the user to define custom criteria to capture important events and manage how and when to store data. Data can be stored to either Microsoft SQL, XML text file or .csv file.

Microsoft SQL provides a database archive that supports complex data queries and the possibility of plant data integration and reporting.

*Available on the R100, R100F.O., R160, R160 F.O. and R210 models only.

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.

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