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.

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

**FEATURES**

| 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 FOIL, 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 |

**BENEFITS**

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.

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.

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.

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.

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.

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.

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.

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.
**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, 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 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 setup menu:

1: **Ratio** - Combined ratio signal from both detectors
   - R100: 550 to 1800 °C / 1022 to 3272 °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
   - 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
   - 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
   - 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 1800 °C / 1472 to 3272 °F
   - R100 Detector 2: 700 to 800 °C / 1292 to 1472 °F
   - R210 Detector 1: 800 to 1600 °C / 1472 to 2912 °F
   - R210 Detector 2: 700 to 1100 °C / 1292 to 2012 °F
   - R160 Detector 1: 700 to 1100 °C / 1292 to 2102 °F
   - R160 Detector 2: 400 to 700 °C / 752 to 1292 °F

6: **Signal processing**

All processing features are integrated into SPOT.

No need for any separate processor unit

**HIGH QUALITY OPTICS**

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

**INTEGRATED WEB SERVER**

Allows for remote adjustment and readings via any web browser

**REAR DISPLAY & CONTROLS**

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

**POWER OPTIONS**

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

**FIBER-OPTIC VARIANT**

Optic head and flexible fiber-optic

(Not available on 210 models)

**TYPICAL APPLICATIONS**

- **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.

  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)
### SPECIFICATIONS

<table>
<thead>
<tr>
<th><strong>M100</strong></th>
<th><strong>M100 F.O.</strong></th>
<th><strong>M160</strong></th>
<th><strong>M160 F.O.</strong></th>
<th><strong>M210</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measurement Range:</strong></td>
<td>500 - 1600 °C / 932 - 2912 °F</td>
<td>500 - 1600 °C / 932 - 2912 °F</td>
<td>250 - 1600 °C / 482 - 2912 °F</td>
<td>50 - 1100 °C / 122 - 2012 °F</td>
</tr>
<tr>
<td><strong>Field of View (90% of energy):</strong></td>
<td>200 °</td>
<td>100 °; 3 wavelengths of light guides available</td>
<td>200 °</td>
<td>100 °; 3 wavelengths of light guides available</td>
</tr>
<tr>
<td><strong>Detector Type:</strong></td>
<td>Single Wavelength 1.0 µm detector</td>
<td>Single Wavelength 1.6 µm detector</td>
<td>Single Wavelength 2.1 µm detector</td>
<td></td>
</tr>
<tr>
<td><strong>Display:</strong></td>
<td>Local display and remote capture:</td>
<td>Local display and remote capture:</td>
<td>Local display and remote capture:</td>
<td>Local display and remote capture:</td>
</tr>
<tr>
<td><strong>Settings:</strong></td>
<td>configurable locally using the pyrometer interface or remotely (using the Webserver or SPOTViewer). Emissivity, mode, current output range, alarm logic output thresholds, network settings, focus and LED, language and user name (focus and LED on standard body only)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sighting Image:</strong></td>
<td>Local display and remote capture:</td>
<td>Local display and remote capture:</td>
<td>Local display and remote capture:</td>
<td>Local display and remote capture:</td>
</tr>
<tr>
<td><strong>Focus Range:</strong></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><strong>LED Targeting:</strong></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><strong>Mounting:</strong></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><strong>Uncertainty:</strong></td>
<td>±0.25% K or 2 K**</td>
<td>±0.25% K or 2 K**</td>
<td>±0.25% K or 2 K**</td>
<td>±0.25% K or 2 K**</td>
</tr>
<tr>
<td><strong>Repeatability:</strong></td>
<td>&lt;1 °C</td>
<td>&lt;1 °C</td>
<td>&lt;1 °C</td>
<td>&lt;1 °C</td>
</tr>
<tr>
<td><strong>Resolution:</strong></td>
<td>0.1 °C</td>
<td>0.1 °C</td>
<td>0.1 °C</td>
<td>0.1 °C</td>
</tr>
<tr>
<td><strong>Noise:</strong></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><strong>Sealing:</strong></td>
<td>IP65</td>
<td>IP65</td>
<td>IP65</td>
<td>IP65</td>
</tr>
<tr>
<td><strong>Response Time:</strong></td>
<td>Adjustable 10 ms to 10 s</td>
<td>Adjustable 10 ms to 10 s</td>
<td>Adjustable 10 ms to 10 s</td>
<td>Adjustable 10 ms to 10 s</td>
</tr>
<tr>
<td><strong>Interfaces:</strong></td>
<td>0-20 mA DC or 4-20 mA DC, Digital CMD In and CMD Out, Ethernet (TCP/IP, Modbus TCP DHCP), http, TCP, UDP</td>
<td>0-20 mA DC or 4-20 mA DC, Digital CMD In and CMD Out, Ethernet (TCP/IP, Modbus TCP DHCP), http, TCP, UDP</td>
<td>0-20 mA DC or 4-20 mA DC, Digital CMD In and CMD Out, Ethernet (TCP/IP, Modbus TCP DHCP), http, TCP, UDP</td>
<td>0-20 mA DC or 4-20 mA DC, Digital CMD In and CMD Out, Ethernet (TCP/IP, Modbus TCP DHCP), http, TCP, UDP</td>
</tr>
<tr>
<td><strong>Power Req.:</strong></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><strong>Software:</strong></td>
<td>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).</td>
<td>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).</td>
<td>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).</td>
<td>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).</td>
</tr>
<tr>
<td><strong>Languages:</strong></td>
<td>Integrated multiple language selections: English, German, French, Italian, Spanish, Portuguese (Brazilian), Japanese, Chinese (simplified Mandarin), Korean, Russian, Polish</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ambient Temp. Range:</strong></td>
<td>5-60 °C specified, 0-70 °C operating before cooling required</td>
<td>5-60 °C specified, 0-70 °C operating before cooling required</td>
<td>5-60 °C specified, 0-70 °C operating before cooling required</td>
<td>5-60 °C specified, 0-70 °C operating before cooling required</td>
</tr>
<tr>
<td><strong>Power:</strong></td>
<td>24 V DC CMD In, Ethernet, TCP/IP, Modbus TCP DHCP, http, tcp, ICMP</td>
<td>0-20 mA DC, 4-20 mA DC, CMD Out relay, Ethernet (TCP/IP, Modbus TCP DHCP), http, tcp, ICMP</td>
<td>0-20 mA DC, 4-20 mA DC, CMD Out relay, Ethernet (TCP/IP, Modbus TCP DHCP), http, tcp, ICMP</td>
<td>0-20 mA DC, 4-20 mA DC, CMD Out relay, Ethernet (TCP/IP, Modbus TCP DHCP), http, tcp, ICMP</td>
</tr>
<tr>
<td><strong>Warranty:</strong></td>
<td>36 months</td>
<td>36 months</td>
<td>36 months</td>
<td>36 months</td>
</tr>
</tbody>
</table>

* Patent Pending **Measurements within specification over 5-95% of range
SPOTServer

Specifically developed to work seamlessly with the latest generation of industry leading single point pyrometers. SPOTServer’s simple installation means that the operator can quickly connect, configure and view data from any of AMETEK Land’s SPOT range of pyrometers.

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.