APPLICATION BROCHURE

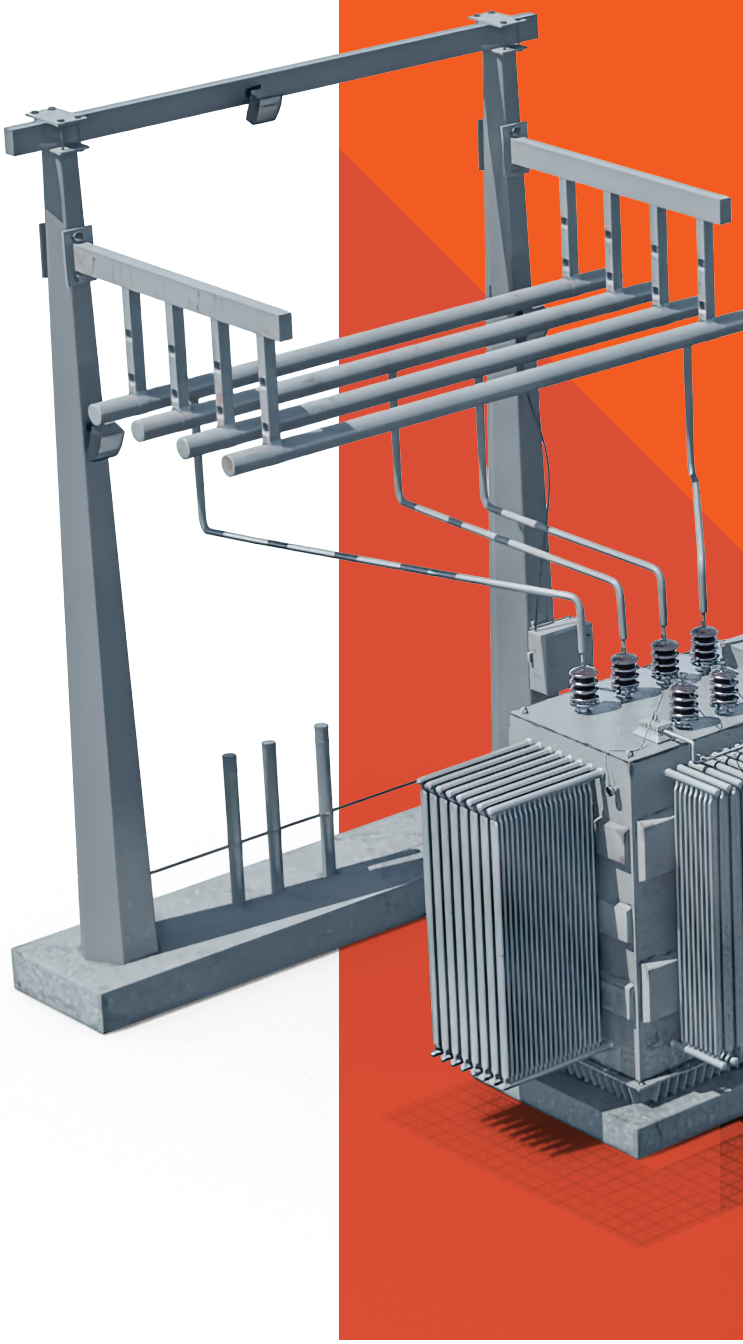
TRANSMISSION & DISTRIBUTION

Advanced Energy delivers innovative temperature and fault monitoring instruments for monitoring transmission and distribution assets.

TECHNOLOGY OVERVIEW

Innovative Instruments for Energy

Advanced Energy, delivers innovative temperature and fault monitoring instruments for monitoring transmission and distribution assets.



With decades of experience creating efficiencies through light-based measurement, Advanced Energy delivers innovative temperature and fault monitoring instruments for the Global Energy market. As the global demand for energy increases, energy generators and providers need asset monitoring to implement “smart” electric grids to allow for production of electricity in a more technologically advanced way.

To maintain a smart grid with aging equipment, energy professionals need to implement temperature and fault monitoring solutions to understand how their equipment is performing and detect developing failures. Our portfolio of bond meters and mega-ohmmeters are designed to withstand rugged outdoor environments and provided highly precise measurements. Our temperature solutions provide highly accurate data to help professionals realize condition-based maintenance with continuous and remote monitoring.

Our unrivaled passion for excellence is why we have become one of the world‘s most trusted sensing solution providers. Beyond providing precision engineered instruments, our customers turn to us knowing our commitment to their success comes first. With expert application understanding and a growing portfolio of products, Advanced Energy can combine several technologies together into novel solutions for the most complex environments.

Our Solutions

Fiber Optic Temperature Measurements

Insulation Testing, Bond Testing, & Electrical Systems Checks

Thermal Imaging & Pyrometry for Power Substations

FIBER OPTIC TEMPERATURE MEASUREMENTS

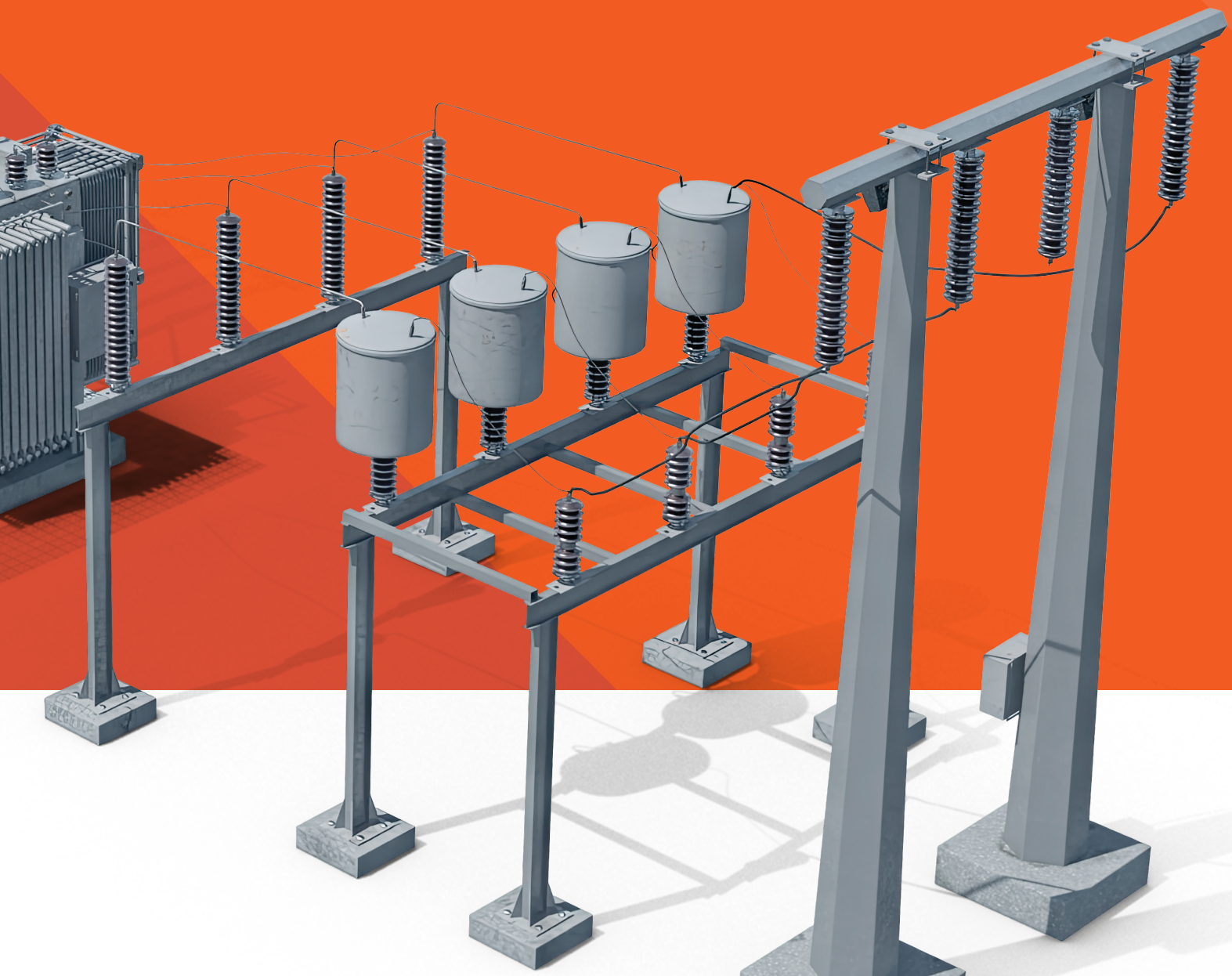
Pioneering the field of fiber optic winding temperature measurement, LUXTRON instruments are the premier control systems of direct, real-time hot spot monitoring for the power utility industry.

INSULATION TESTING, BOND TESTING, & ELECTRICAL SYSTEMS CHECKS

AE TEGAM bond meters and mega-ohmmeters offer unmatched performance and convenience. With a rugged, compact design, these instruments offer precise measurements for a variety of field applications.

AUTOMATED & REMOTE THERMAL IMAGING

Advanced Energy offers an automated, remote thermal imaging system for continuous early fault detection in substations and industrial sites. ThermalSpection 724 is the first system to allow remote monitoring of temperatures in real time via image data obtained from one or more cameras and sent to a monitoring and diagnostics center.



WINDING HOT SPOT MONITORING

Fluoroptic Thermometry Fiber Optic Temperature Sensing System

Effective fiber optic hot spot monitor and controller for power transformers

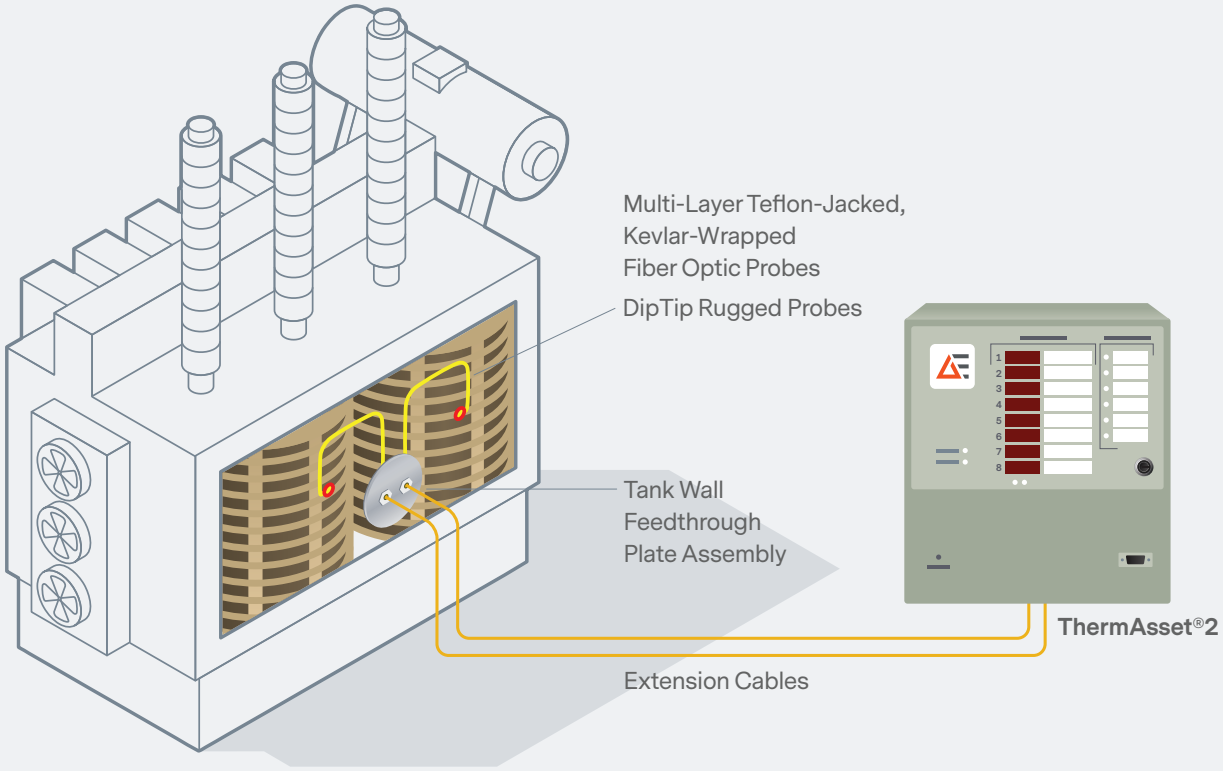
The Luxtron® ThermAsset®2 controller is designed to measure transformer winding hot spots in real time and activate control of the cooling system. This allows for optimum operation of the transformer at safe load capacity during overload conditions. The ThermAsset2 controller offers many of the reliable and proven features considered the standard for fiber optic temperature measurement of transformer windings in the power utility industry. The same-patented Fluoroptic® thermometer (FOT) technology is employed using a lifetime LED light source to activate the sensors. The ThermAsset2 utilizes Luxtron ruggedized probes, the toughest in the industry, which require no calibration over the lifetime of the transformer.

Features

- Probes based on Fluoroptic technology which is immune to electromagnetic interference and high voltage
- Direct, real-time, and accurate measurement of transformer winding
- Probes require no calibration over the life time of the transformer
- Available with up to 8 channels
- Optional tank wall adapter plate with feedthroughs

Benefits

- Protect against overloading
- Activate cooling systems using actual winding hot spot temperatures
- Utilize drift-free, calibration-free industry-leading ruggedized probes
- Retain up to 300 days of data at 1-minute intervals on all channels
- Leverage alarm status indicators for up to six customer-specific relay functions



LUXTRON® THERMASSET®2 CONTROLLER

Fluoroptic® Probes

The measurement performance of LUXTRON probes exceeds common temperature sensors in environments with high voltage, radio frequency interference (RFI), electromagnetic interference (EMI) or corrosive and above boiling point liquids.

Tank Wall Plate Assembly

Advanced Energy provides welded tank wall feedthrough plate assemblies. Each tank wall plate features our proprietary welded feedthroughs on a stainless steel plate, with a carbon steel backing ring and Viton O-ring for maximum protection against leaks.

ELECTRICAL SYSTEM CHECKS

AE TEGAM 700 Series Handheld Bond Meters

Detection of loose bus bars, damaged shunts, failing fuses, faulty relays, and poor cable terminations

The AE TEGAM 700 series bond meters are designed for applications that demand high performance. Using 4-wire Kelvin sensing, these models deliver very accurate readings across the entire operating temperature range. The instruments are easy to set up and use, displaying measurements quickly and clearly with one-hand operation. Low-energy circuit design means extra-long battery life. Model 730A feature Bluetooth® LE connectivity for wireless datalogging to greatly reduce data recording errors. A free iOS/Android™ app allows seamless communication and integration with virtually any software.

Technical Specifications

- Bond Meter Accuracy: ± (0.2% reading + 0.02% range)
- Resolution: 1 µΩ
- Temperature Range: -10 to 55 °C / 14 to 131°F
- Reading Rate: 3 readings per second
- Wireless connectivity with Bluetooth LE (730A only)
- Free iOS/Android app (730A only)
- UL/CSA/ATEX/IECEx-compliant (720A only)
- Connector Type: M12
- Battery: 3AA (IEC LR6, ANSI 15) Alkaline
- 100-hour battery life
- Calibration: standard calibration, 17025 compliant calibration optional
- Assembled in the USA

710A Bond Meter

720A Intrinsically Safe Bond Meter

730A Wireless Datalogging Bond Meter

BOND TESTING WIND TURBINES

AE TEGAM Portable Bond Meter

Reliably measure resistance and verify connections

The R1L-BIR Bond Meter is a digital milli-ohmmeter and bond tester designed to measure resistances from 10 µΩ to 20 Ω. It is used in applications such as aerospace bond testing, metal bonding, switch, circuit breaker, circuit resistance and other contact and connection resistance tests as well as higher resistance measurements for circuit analysis and resistor testing up to 20 Ω. The instruments utilize the four-terminal, Kelvin technique to eliminate errors caused by the resistance of the leads.

This milli-ohmmeter and bond meter can measure resistance in the presence of reactive loads up to 2 mH or 100 µF.

R1L-BIR Portable Bond Meter

Technical Specifications

- Rugged: MIL-PRF-28800F Class 3
- Portable: Long rechargeable battery life
- Ranges: 2 mΩ to 20 Ω
- Accuracy: ± 0.25% of reading
- Resolution: 1 µΩ
- Strong, rugged carry case
- Optional 125- or 250-ft Kelvin probes available
- 3-year warranty
- Assembled in the USA

AE TEGAM Mega-Ohmmeters

For measuring high resistances (insulation testing)

R1M-A
Portable Mega-Ohmmeter

The Model R1M-A from TEGAM is a portable Mega-ohmmeter designed to measure high values of resistance associated with the measurement of insulation resistance. It has six resistance ranges from 1 MΩ full scale to 200 GΩ full scale. Four test voltages of 50, 100, 250, and 500 volts DC are provided (50 V maximum to be used with resistances less than 1 MΩ).

The R1M-A is packaged in a rugged, weather tight case, designed to withstand the wear and tear of industrial and field applications, and has a gasket lid. An internal compartment is provided to store the line cord and a set test cables for this megohmmeter.

Technical Specifications

- Measures from 1 MΩ to 200 GΩ in 6 selectable ranges
- Measurement accuracy: ± 5%
- 50, 100, 250, 500 V test voltages
- Rugged weather-tight case
- 3-year warranty
- Assembled in the USA

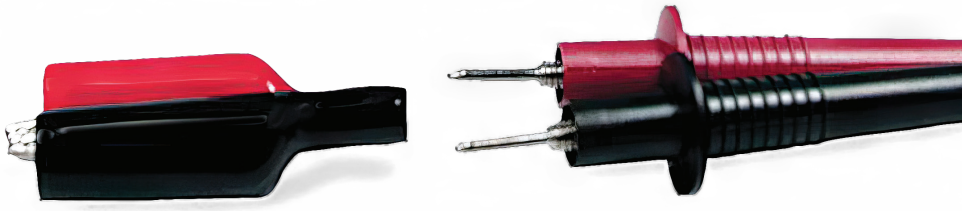
R1M-B
Handheld Mega-Ohmmeter

The Model R1M-B Handheld Voltmeter/ Mega-ohmmeter is designed to measure insulation resistance in “live” circuits, which may have voltage present. It can be connected to 600 V RMS AC or DC without damage, and its mode of operation is automatic. It has no fuse to replace. The R1M-B mega-ohmmeter will operate after a drop from a height of four feet to a concrete floor.

The R1M-B complies with MIL-PRF-28800, Type III, Class 3, Style E for rugged operational environments and field applications. These voltmeters/mega-ohmmeters perform under the extremes of heat, cold, humidity, shock, and vibration.

Technical Specifications

- Measures 1 MΩ to 200 MΩ
- 500 V test voltage
- Simple one-range operation
- Measures 3 V to 600 VAC RMS
- LED lit when voltage is present
- Rugged to military specifications
- 9 V battery operation
- 1-year warranty
- Assembled in the USA

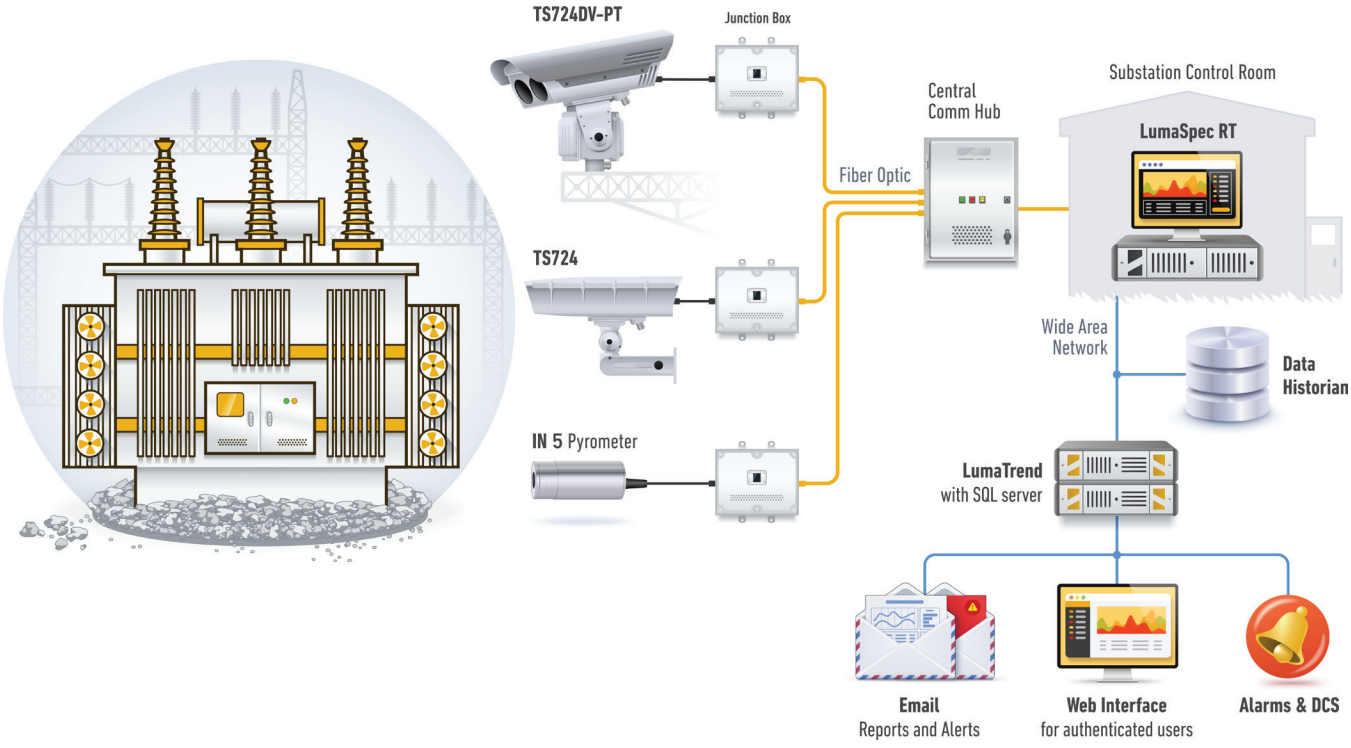


Thermal Imaging for Substation Assets

Automated, continuous thermal and visual imaging to identify thermal abnormalities within electrical substations and other process control systems.

The ThermalSpection 724 Remote Thermal Monitoring solution 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 via image data obtained from one or more cameras and sent to a single central controller.

Designed with advanced maintenance-free electronics and industrial protective packaging, the ThermalSpection 724 solution offers a high degree of accuracy for demanding industrial and electric utility settings, while quickly measuring temperature without contact in even the most adverse environments.



TS724DV-PT: Pan-Tilt Thermal Imager

Real-Time, Remote Monitoring/Control with Full Range Pan-and-Tilt Capability.

- High resolution infrared camera and strong telephoto lens accurately measures even small components at a distance
- Temperature measurement between -40°C and 500°C
- Alarm communication via OPC/Modbus or standard alarm feedback (Relay, 4-20 mA, 0-10 V, etc.)
- Multi-Spot temperature measurement with independent emissivity settings at each “tour” location

TS724: Fixed Mount Thermal Imager

Stationary Mount High Performance Infrared Camera in a Weatherized Enclsosure.

- High performance, cost-effective complete monitoring solution
- Precise targeting of small objects in a wider field of view
- Multiple wide viewing angles (12°, 25°, 42°, and 70°) allow for complete customization for different site layouts and applications
- IP66 enclosure designed for long-term use in all weather environments

IN 5: Pyrometer Temperature Sensor

2-wire pyrometer with fixed optics and analog output for measurements of non-metallic surfaces or painted, coated or anodized metals.

- Measure temperature of objects between -32°C and 900°C hidden from view of imagers
- Small stainless steel housing dimensions suitable for use in confined spaces
- Easy electrical and mechanical installation
- Ambient temperature up to 70°C without cooling

ABOUT ADVANCED ENERGY

Advanced Energy has devoted more than three decades to perfecting power for its global customers. We design and manufacture highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical.

With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

PRECISION | POWER | PERFORMANCE | TRUST

For international contact information,
visit advancedenergy.com

sales.support@aei.com
+1 970 221 0108

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