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Temperature Sensors

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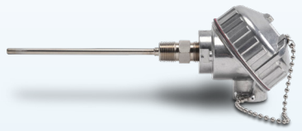
Temperature Sensors

Temperature measuring devices sense the temperature at a specific point or area and provide a signal for monitoring or control. Numerous applications rely on temperature control, including HVAC systems, heat-treating applications using ovens or furnaces, packaging devices like shrink wrap machines and glue applicators, plastic extrusion and injection molding machines, and more.

The most common temperature measuring devices are thermocouples, thermistors, and resistance temperature detectors (RTD). These devices provide outputs which can be connected directly to a temperature input on a controller or to an amplifier for longer distance transmission.

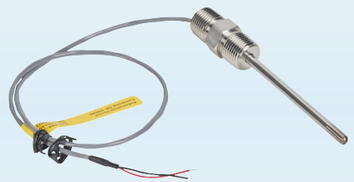
Thermocouple Sensing Elements/Probes

Thermocouples work based on the Seebeck effect, a phenomenon where a small voltage is produced across a junction of two dissimilar metals when exposed to a temperature gradient. The amount of voltage produced within the thermocouple is very small, usually millivolts, and is directly related to the difference in temperature across the junction. There are many types of thermocouples. The most common ones are J, K, and T, which designate a specific temperature range and wire color coding to identify them.



Thermistor Sensing Elements/Probes

Thermistors are sensitive, temperature-dependent resistors made from metal oxide semiconductors. A curve describes the nonlinear relationship between resistance and temperature. The specific combination of metal oxides determines their unique temperature-dependent resistance characteristics.



There are two types of thermistors:

- **Negative Temperature Coefficient (NTC):** This is the most common type. As the temperature increases, the resistance of the NTC thermistor decreases.
- **Positive Temperature Coefficient (PTC):** Their resistance increases with increasing temperature.



NTC thermistors excel in precise temperature measurement due to their rapid response time. Even minor temperature fluctuations produce a substantial resistance change, making them ideal for monitoring critical processes where real-time temperature control is essential.

Typical terminology expresses characteristics of the device, for example, an NTC 10k Thermistor Type 3 is a Negative Temperature Coefficient (NTC) thermistor with a nominal resistance of 10,000 ohms at 25 °C.

RTD Sensing Elements/Probes

RTDs have an internal resistance that changes linearly with temperature. They are typically made from a very fine wire wrapped around a ceramic or glass core, or are created using thin film technology. Since the resistance in the wire changes with temperature, the temperature can be determined by measuring the voltage drop across the resistance. RTDs come in a variety of types. The most common is the Pt100, which is made from platinum that has been calibrated to be 100 ohms at 0 °C. Platinum is an ideal metal for RTDs because of its stability, resistance to corrosion, and higher melting point. RTDs are great for applications up to around 600 °F.



For the latest prices, please check AutomationDirect.com.

Temperature Switches

Temperature switches offer simple temperature monitoring and control with easy setup via mechanical adjustment dials. An extremely durable housing and no moving parts make these switches very reliable. Switches contain both the sensing element and electronics to provide compatibility with typical control devices.



Temperature Transmitters

Temperature transmitters accept the signals from popular sensing elements and offer current outputs ideal for extending signals to controllers. Because temperature measurement signals are small and can be in the millivolt range, they are highly susceptible to attenuation and electrical interference when traveling through long wire runs. By converting the millivolt signal sent from a measurement probe into a less susceptible signal, temperature transmitters reduce the effects of electrical noise and prevent signal degradation for accurate readings over long transmission distances. Temperature transmitters are available for a variety of thermocouple and RTD types and provide several installation options.



Infrared Pyrometers

Infrared pyrometers determine the surface temperature of an object by measuring its emitted infrared radiation. These sensors can read the temperature of inaccessible or moving objects without difficulty. An essential feature of infrared temperature sensors is that they allow non-contact sensing, preventing contamination or exposure to hazardous materials.



Thermometers

Thermometer gauges provide accurate point-level temperature measurement using a bi-metallic sensing element. Dials with dual scales can provide instant readings in both Fahrenheit and Celsius. These devices offer visual indication only.



Thermowells

Thermowells provide a convenient method to insert or remove temperature probes without interrupting the process being measured. These drilled bar stock one-piece units (no welds) are typically made from 304 or 316 stainless steel.



Infrared Thermal Cameras

Infrared thermal cameras provide non-contact temperature measurement by detecting infrared energy emitted from objects and converting it into a visual thermal image. Unlike single-point infrared thermometers, thermal cameras measure temperatures across an entire field of view, allowing users to visualize heat distribution, identify temperature variations, and detect hot spots in real time.



For the latest prices, please check AutomationDirect.com.

Temperature Probe Styles

Adjustable Immersion Probes
Adjustable immersion probes are designed to be inserted directly into the medium being measured and are ideal for the plastics processing industry.



Attached Plug Probes
Probes with an attached plug allow for quick and easy plug-in connections.



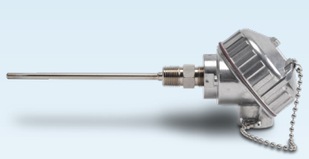
Bead Probes
Bead probes are miniature sensors adaptable to restricted space applications. They include a 6-foot cable pre-stripped for easy connection to the monitoring device.



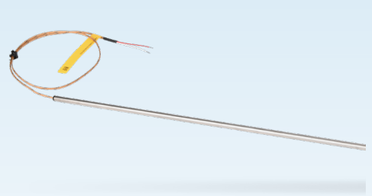
Bolt-On Ring Probes
Bolt-on ring probes feature a ring terminal or washer and are bolt or screw mounted for surface temperature measurements.



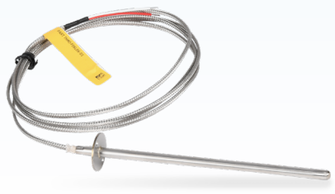
Connection Head Probes
Connection head probes combine the sensing element with a protective housing that encloses the wires and connections. Spring-loaded probes ensure tip contact in thermowells.



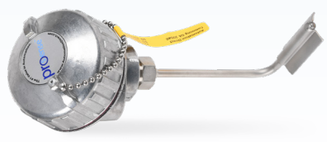
Cuttable Probes
Cuttable probes provide the utmost flexibility and can be trimmed to the required length of an application.



Flange Mount Probes
Flange mount probes are ideal for use with ovens, freezers, ducts, or any application where through-the-wall temperature sensing is required.



Heat Trace Probes
Heat trace probes measure the surface temperature of process pipes to detect freeze-up or to help maintain the viscosity level needed for proper flow of the medium inside.



Hex Nipple Probes
Hex nipple probes allow easy probe replacement and connection to a junction box. Spring-loaded probes ensure tip contact in thermowells.



Junction Box Probes
Junction box probes feature a sensing element attached to a galvanized box with knockouts for convenient connection to conduit and other electrical connectors. Spring-loaded probes ensure tip contact in thermowells.



Lead Wire Transition Probes
Probes with lead wire transitions are adaptable to a variety of applications and allow easy connection to extension wire.



M12 Probes
Probes with M12 electrical connection are adaptable to a variety of applications and allow easy connection to RTD extension wire.



Magnet Mount Probes
Magnetic-mount probes measure the surface temperature of ferrous materials and are affixed with a convenient and non-destructive magnetic attachment.



Melt Bolt Probes
Melt-bolt probes measure the melt temperature of plastic as it moves down the barrel of an extruder or injection molding machine.



Sanitary Connection Probes
Sanitary connection probes are designed for applications where corrosion and product contamination are factors and are used extensively in the food and beverage industry.



Spade Probes
Spade probes have a sensing element sandwiched between layers of polyimide tape. Their tip can be formed and secured to the outside of tubes, pipes, or nozzles.



Threaded Bolt Probes
Threaded bolt probes are typically used to measure the nozzle temperature of an injection molding machine without being in direct contact with the molten plastic. The small size of this sensor makes it ideal for general use, such as mounting in bearing housings, sealing bars, heat plates, and other space-limited applications.



Room Temperature Sensors
Wall-mount room temperature sensors are appropriate for indoor use in offices, warehouses, manufacturing plant floor space, and walk-in freezers.



Reliable process measurement for less -
Temperature Sensors, Switches, Transmitters, and Thermometers

Temperature Switches



Starting at
$116.00
(TSDA25N-AP-0284-H)

ProSense® TSDA25 Series Electronic

ProSense TSDA25 series compact temperature switches offer a simple setup using mechanical adjustment dials.

- -4 to 284°F (-20 to 140°C) or -13 to 284°F (-25 to 140°C) setpoint ranges
- Two DC switching outputs
- Extremely durable housing with 316 stainless steel wetted parts
- LEDs indicate power and function status

ASHCROFT® T4 Series Mechanical

Trust the shield.®

Ashcroft T4 series mechanical temperature switches offer precision, reliability, and high-current switching capability for demanding industrial applications. Designed to withstand harsh environments, these switches resist water, dust, and corrosion, making them ideal for industrial, process, and outdoor installations. Featuring Ashcroft's renowned accuracy, field-adjustable setpoints, and durable, compact design, the T4 series delivers reliable and consistent performance.

- Wide -40° to 525°F (-40° to 274° C) setpoint range in one product family
- High-current (15A) SPDT switch contacts eliminate the need for external contactors or interposing relays
- Direct-mount models with 2.75 or 6 inch insertion lengths and remote-mount models with a 5 ft capillary tube and 3 inch insertion length provide installation flexibility
- Easy mechanical setpoint adjustment with locking screw for secure settings
- 1/2 inch male NPT process connection for easy installation into existing piping and equipment
- Rugged epoxy-coated aluminum housing with NEMA 4X/IP66 protection for demanding industrial environments



Starting at
$464.00
(T424TS027-40/60F)

Digital Temperature Switches/Transmitters



Starting at
$168.00
(ETS25N-30-1003)

ProSense® ETS Series

ProSense ETS series digital temperature sensors combine a precision RTD sensing element, measuring electronics, and process fitting in a stainless steel probe.

- Two solid-state switch outputs
- One output configurable as a scalable analog 4 to 20 mA signal (on select models)
- Wide measuring range of -58 to 302°F (-50 to 150°C)
- Easily configured with pushbuttons or free ProSense XT-SOFT
- 30, 50, 100, or 150mm probe lengths
- 1/4" or 1/2" male NPT threads for direct mounting or in thermowells
- Built-in digital display with two yellow status LEDs
- Housing rotates up to 310° and display flips for inverted installations
- IP65/IP66 ingress protection rating

For the latest prices, please check AutomationDirect.com.

Temperature Transmitters with Integral Sensor



Starting at
$134.00
(XTP-160-N40140F)

ProSense® XTP Series

ProSense XTP series temperature transmitters conveniently combine a precision RTD and transmitter in a single stainless steel body. Available in three pre-configured measuring ranges, they are ready to use out-of-the-box or can be custom configured using the free XT-SOFT software.

- 30 to 360mm probe lengths
- In measuring ranges up to 300°F (148.9°C)
- 1/4" or 1/2" male NPT, 3-A approved sanitary CIP tri-clamp, or compression fitting process connections
- 4 to 20 mA output
- M12 quick-disconnect
- IP66/67 or IP69K protection rating with appropriately rated cable

Endress+Hauser TM311 iTHERM CompactLine Series

People for Process Automation

Endress+Hauser TM311 iTHERM CompactLine temperature transmitters integrate a precision RTD and transmitter within a single stainless steel housing. Pre-configured measuring ranges allow for immediate use, while IO-Link capability provides advanced access to temperature readings, configuration settings, diagnostics, and data logging.

- 30 to 150mm probe lengths
- 32 to 302°F (0 to 150°C) measuring range
- TipSens RTD delivers rapid response times
- 1/4" or 1/2" male NPT, or 3-A approved sanitary CIP tri-clamp process connections
- 4 to 20 mA output or IO-Link output
- M12 quick-disconnect
- IP69 protection rating with appropriately rated cable



IO-Link

Starting at
$253.00
(TM311-TLU6/0)

Temperature Transmitters



Starting at
$79.00
(TTD-20-N40160F-H)

ProSense® TTD-20 Series

ProSense TTD-20 series temperature transmitters mount directly to the M12 connection port of select RTDs.

- High accuracy 2- or 3-wire RTD transmitters
- M12 quick-disconnect for fast mounting and connection
- -40 to 160 °F or -40 to 300 °F temperature range options
- 4 to 20 mA output

Temperature Transmitters (cont.)

ProSense® XTD2 Series

ProSense XTD2 series temperature transmitters are compact, DIN rail–mounted signal conditioners that deliver accurate, isolated temperature signals for PLCs, meters, or controllers. Available in fixed-range and programmable models, they support a variety of input types and provide versatile solutions for a wide range of temperature sensing applications.

- Programmable models accept RTD, thermocouple, resistance, and mV inputs
- Fixed range models support PT100 RTDs and Type J, K, and T thermocouples
- 4 to 20 mA output
- NAMUR NE 43 compliant fault indication
- Screw or push-in terminal options
- ProSense Field Device Configurator software (free download) and XT-USB cable required for configuring universal transmitters



Starting at
$97.00
(XTD2-0100F-PT1)

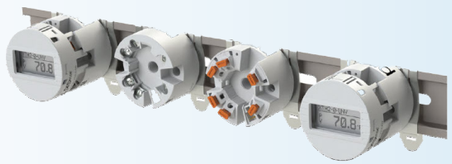
ProSense® XTH2 Series



ProSense XTH2 series head-mounted fixed range and programmable temperature transmitters are compact signal conditioners designed for direct installation in DIN Form B sensor heads. They convert various sensor inputs into precise temperature signals for PLCs, meters, or controllers. Optional accessories offer versatile mounting options to suit a wide range of applications.

- Programmable models accept RTD, thermocouple, resistance, and mV inputs
- Fixed range models support PT100 RTDs and Type J, K, and T thermocouples
- 4 to 20 mA output
- NAMUR NE 43 compliant fault indication
- Screw or push-in terminal options
- ProSense Field Device Configurator software (free download) and XT-USB cable required for configuring universal transmitters

Starting at
$99.00
(XTH2-0100F-PT1)



XTH2 units can be used with DN-CLIP-FM4 mounting clips (sold separately) as a low-cost DIN rail mounted temperature transmitter with or without a display

ProSense® Digital Display

The ProSense XTH2-UNV-DISP is a convenient, easy-to-use plug-on display accessory for the XTH2 head-mounted programmable temperature transmitters to get a digital readout of the transmitter scaled output.



Starting at
$87.00
(XTH2-UNV-DISP)

For the latest prices, please check AutomationDirect.com.



Starting at
$83.00
(XTH2-ENC-F)

ProSense® XTH2 Probe and Field Mount Housings

ProSense probe and field mount housings are designed to accommodate both the XTH2 transmitter and the digital display, and they include a window to view the reading from outside the housing.

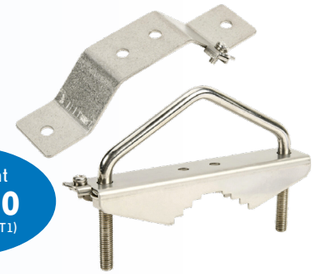
- Rugged aluminum construction
- Two 1/2" female NPT ports
- NEMA 4X, IP66/68 protection rating

ProSense® XTH2 Enclosure Mounting Brackets

Wall and pipe mounting brackets are available for use with the XTH2-ENC-F field mount aluminum housing.

- 316L stainless steel construction
- Mounting hardware included

Starting at
$28.50
(XTH2-ENC-BKT1)



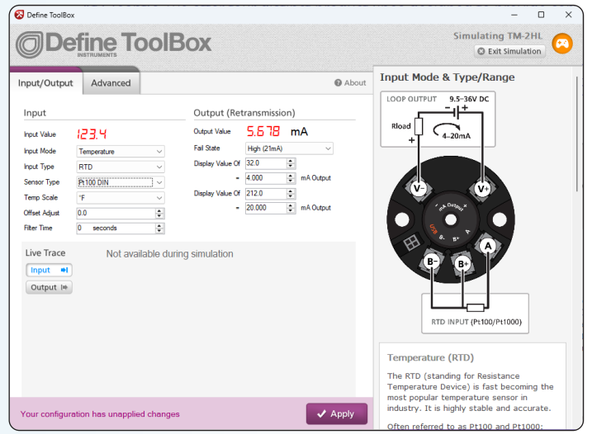


Starting at
$54.00
(DEFINE-TM-2HL)

Define INSTRUMENTS TM Series

Define Instruments TM series head-mount programmable temperature transmitters deliver reliable, high-accuracy performance in industrial applications. Designed for direct DIN Form B installation, these compact, loop-powered modules support multiple sensor types, provide fast, stable measurements, and are easily configured through a simple USB programming interface.

- Supports RTD (Pt100/Pt1000), NTC thermistor (including ProSense 10 K Type 3), and thermocouple inputs (DEFINE-TM-2HLI model)
- 2-wire 4–20 mA loop-powered output
- Fits standard DIN Form B connection heads, including ProSense models
- TM-2HLI provides 3750 VAC galvanic isolation for enhanced safety and noise rejection
- Configurable upscale or downscale output on sensor failure
- Accuracy up to ≤ 0.3 °C for RTD/NTC and ±1 -2 °C for thermocouples, with low ambient drift



Easy configuration using free Define ToolBox software (DEFINE-BRIDGE-KEY and DEFINE-BK-HM required)

IO-Link Compatible Temperature Transmitters

Endress+Hauser People for Process Automation TMT36 iTEMP Series

Endress+Hauser TMT36 iTEMP series head-mounted temperature transmitters enable fast commissioning and seamless integration with control systems via IO-Link. This advanced interface supports offline configuration, setup without process interruption, and simple plug-and-play replacement for minimal downtime. Comprehensive diagnostics ensure reliable performance and simplify maintenance.

- Supports Pt100 or Pt1000 RTD types
- DIN Form B sensor connection head mounting
- IO-Link enables access to process variable, configuration, diagnostic, and logging parameters
- Screw or push-in terminal options
- Compatible with Endress+Hauser TID10-1009/0 display



Priced at **$232.00** (TMT36-13A9/101)

HART Compatible Temperature Transmitters



Starting at **$692.00** (TMT72-4LR3/142)

Endress+Hauser People for Process Automation TMT72 iTEMP Series

Endress+Hauser TMT72 iTEMP series programmable temperature transmitters support critical applications across all industries. They provide exceptional reliability, accuracy, and long-term stability by converting signals from RTD, thermocouple (TC), resistance, and voltage inputs. Equipped with HART® communication, these transmitters integrate seamlessly into control and asset management systems. They can be configured and monitored via HART communication or wirelessly over Bluetooth using the free Endress+Hauser SmartBlue App.

- Available with DIN Form B sensor head or 35 mm DIN rail mounting options
- Measuring range configurable within the full range of the sensor type selected
- Linearized current output with optional HART® communication for enhanced diagnostics and device management
- Head mount units are compatible with the Endress+Hauser TID10-1009/0 display
- Adjustable filtering compensates for input fluctuations
- Screw or push-in terminal options

HART® COMMUNICATION PROTOCOL

Download the free Endress+Hauser SmartBlue Mobile App for phone or tablet:

Download on the App Store | GET IT ON Google Play

Endress+Hauser People for Process Automation Digital Display

The Endress+Hauser TID10-1009/0 is a convenient, easy-to-use plug-on display accessory for the TMT36 and TMT72 connection head transmitters to get a digital readout of the transmitter scaled output.



Priced at **$133.00** (TID10-1009/0)

(Transmitter not included)

For the latest prices, please check AutomationDirect.com.

Endress+Hauser People for Process Automation TMT142B iTEMP

The Endress+Hauser TMT142B iTEMP programmable temperature transmitter features a robust, compact housing and advanced measurement technology, making it ideal for demanding applications in harsh environments. This transmitter delivers exceptional accuracy and reliability, ensuring optimal performance in critical process control applications. The HART communication protocol enables seamless integration with control systems and enhances device diagnostics. Intelligent diagnostics improve process safety and efficiency by detecting issues early and preventing failures. The free SmartBlue App offers Bluetooth® connectivity to simplify device configuration and maintenance, even in hard-to-reach locations.



- Accepts thermocouple, RTD, resistance, and millivolt inputs
- Measuring range configurable within the full range of the sensor type selected
- Linearized current output with optional HART® communication for enhanced diagnostics and device management
- Adjustable filtering compensates for input fluctuations
- LCD displays measured values, bar graph, engineering units, and status information
- Die-cast aluminum housing with IP67 protection rating

Priced at **$1,545.00** (TMT142B-1E60/1W9)

HART® COMMUNICATION PROTOCOL

Typical Applications

- General process control in manufacturing plants
- HVAC system temperature monitoring
- Food and beverage processing lines
- Water and wastewater treatment facilities
- Pharmaceutical production environments
- Energy and utilities equipment monitoring
- Packaging machinery temperature control
- Industrial ovens and dryers

HART Protocol Information

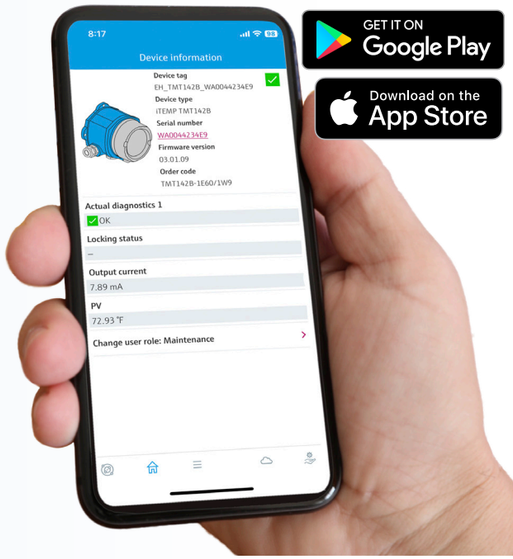
HART (Highway Addressable Remote Transducer) protocol is a communication standard used to enable digital data exchange over traditional analog 4 to 20 mA wiring. It allows smart field devices, like sensors and actuators, to send and receive additional information such as diagnostics, configuration, and status without disrupting the primary analog signal.

- Enables simultaneous analog and digital communication on the same wiring
- Provides enhanced device diagnostics and status monitoring
- Simplifies device configuration and calibration remotely
- Improves plant efficiency and reduces maintenance costs
- Supports interoperability across devices from different manufacturers

FREE SmartBlue Mobile App

The SmartBlue Mobile App allows configuration as well as comprehensive access to device data.

- Simple and fast navigation through device and diagnostic functions
- Configuration of display, outputs, and units
- Requesting diagnostics and status messages
- Available for Android and iOS
- Range up to 32 feet





ProSense Thermocouple, Thermistor, and RTD Sensors

Thermocouple, thermistor, and RTD sensors are pre-built stock items. Sensing elements include:

- Type J, K, or T thermocouples
- NTC 10k Type 3 thermistors
- 100 ohm platinum 3- or 4-wire RTDs with Class A accuracy

Probe styles include:

- Adjustable immersion probes
- Attached plug probes
- Bead probes
- Bolt-on ring probes
- Connection head probes
- Cuttable probes
- Flange mount probes
- Heat trace probes
- Hex nipple probes
- Junction box probes
- Lead wire transition probes
- M12 probes
- Magnet mount probes
- Melt bolt probes
- Sanitary connection probes
- Spade probes
- Threaded bolt probes
- Room Temperature Sensors

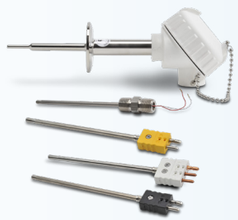
ProSense Thermowells

All thermowells are pre-built stock items. Models include:

- Thermowells for RTD probes with M12 cable connector
- Thermowells for spring-loaded thermocouple, thermistor, and RTD probes or thermometers
- TW series designed for use with ProSense thermocouples
- RTDTW series designed for use with ProSense RTD probes or ProSense thermometers
- Thermowells designed for sanitary clean-in-place (CIP) and 3-A approved. These thermowells allow the use of standard temperature sensors in hygienic applications

Accessories

- Compression mounting fittings for temperature probes
- Bayonet mounting adapter for temperature sensors
- Thermocouple, thermistor, and RTD connectors and panel jacks



ProSense Bi-Metal Thermometers

- Bi-metallic sensing element for reliable readings
- 3 and 5-inch dials
- Back or adjustable angle connection
- 304 stainless steel
- ±1% accuracy



Starting at **$42.00** (T30-N40160-25C)

For the latest prices, please check AutomationDirect.com.

Non-Contact Temperature Measurement

optris infrared sensing

optris Infrared Pyrometers

Infrared pyrometers determine the surface temperature of an object based on its emitted infrared radiation. These sensors read the temperature of inaccessible or moving objects without difficulty. An essential feature of infrared temperature sensors is that they allow non-contact sensing, preventing contamination or exposure to hazardous materials. Optris infrared temperature sensors are an excellent choice for applications that are moving, cannot be reached, are in areas that are too hot, or are near electrical interference.



Starting at **$125.00** (OPTCSLT15SFCB1)

optris CS LT Series Infrared Pyrometers

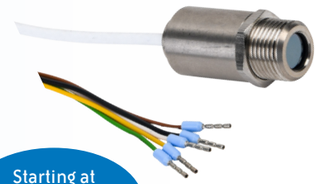
Optris CS LT series infrared pyrometers have a rugged stainless steel construction and are perfect for temperature measurement in small and narrow environments.

- -50°C to 1030°C (-58°F to 1886°F) measurement range
- Up to 80 °C ambient temperature without cooling
- 0 to 5 VDC, 0 to 10 VDC, Type K thermocouple, or alarm output
- 8-14 µm spectral response
- 15:1 optical resolution (26.7mm @ 400mm)
- 14 ms response time
- 5 to 30 VDC operating voltage
- IP63 protection rating

optris CSmicro LT Series Infrared Pyrometers

Optris CSmicro LT series infrared pyrometers feature a miniature stainless steel measuring head and are perfect for applications requiring installation in tight spaces.

- -50°C to 1030°C (-58°F to 1886°F) measurement range
- Up to 120°C ambient temperature without cooling
- 0 to 5 VDC, 0 to 10 VDC, 4 to 20 mA, alarm or pulse output
- 8-14 µm spectral response
- 15:1 optical resolution (26.7mm @ 400mm)
- 14 ms response time
- 5 to 30 VDC operating voltage
- IP65 (NEMA 4) protection rating



Starting at **$250.00** (OPTCSMALT15SF0505)



Starting at **$370.00** (OPTCSMALT22HSF0505)

optris CSmicro LTH Series Infrared Pyrometers

Optris CSmicro LTH series infrared pyrometers feature a miniaturized stainless steel measuring head and are an excellent option for space-limited applications. Their small size and temperature resistance make mechanical integration very cost-effective.

- -50°C to 1030°C (-58°F to 1886°F) measurement range
- Up to 180°C ambient temperature without cooling
- 0 to 5 VDC, 0 to 10 VDC, 4 to 20 mA, alarm or pulse output
- 8-14 µm spectral response
- 22:1 optical resolution (50mm @ 1100mm)
- 150 ms response time
- 5 to 30 VDC operating voltage
- IP65 (NEMA 4) protection rating



Starting at
$690.00
(OPTCSMA3MLSF0505)

optris infrared sensing CSmicro 3ML Series Infrared Pyrometers

Optris CSmicro 3ML series infrared pyrometers have a short measuring wavelength. With a spectral range of 2.3 µm, it is well-suited for measuring the temperature of metallic surfaces and even allows temperature measurement through glass.

- 50 to 350°C (122 to 662°F) measurement range
- Up to 85 °C ambient temperature without cooling
- 0 to 5 VDC, 0 to 10 VDC, or 4 to 20mA with alarm or pulse output
- 2.3 µm spectral response
- 22:1 optical resolution (50mm @ 1100mm)
- 8 ms response time (mA version: 20 ms)
- 5 to 30 VDC operating voltage
- Tough, stainless steel construction
- IP65 (NEMA 4) protection rating

optris infrared sensing CSmicro 3MH Series Infrared Pyrometers

Optris CSmicro 3MH series infrared pyrometers offer a broad temperature measuring range. Their short measuring wavelength makes them an optimum solution for temperature measurement of metallic surfaces. This series is also able to make temperature measurements through glass.

- 100 to 600°C (212 to 1112°F) measurement range
- Up to 85 °C ambient temperature without cooling
- 0 to 5 VDC, 0 to 10 VDC, or 4 to 20mA with alarm or pulse output
- 2.3 µm spectral response
- 33:1 optical resolution (48.5mm @ 1600mm)
- 8 ms response time (mA version: 20 ms)
- 5 to 30 VDC operating voltage
- Tough, stainless steel construction
- IP65 (NEMA 4) protection rating



Starting at
$525.00
(OPTCSMA3MHSF0505)



Starting at
$560.00
(OPTCSMA2MHSF0505)

optris infrared sensing CSmicro 2MH Series Infrared Pyrometers

Optris CSmicro 2MH series pyrometers have a wide temperature sensing range and a spectral range of 1.6 µm, making them the ideal IR pyrometers for temperature measurements of metals. Their small infrared measuring head is perfectly suited for installation in limited spaces and allows for a cost-effective installation.

- 385 to 1600°C (725 to 2912°F) measurement range
- Up to 125°C ambient temperature without cooling
- 0 to 5 VDC, 0 to 10 VDC, 4 to 20 mA with alarm or pulse output
- 1.6 µm spectral response
- 75:1 optical resolution (16mm@1200mm)
- 8 ms response time (mA version: 20 ms)
- 5 to 30 VDC operating voltage
- Tough, stainless steel construction
- IP65 (NEMA 4) protection rating

Accessories

- Close focus lens
- Swivel mounting bracket
- M12x1 mounting bolt
- Standard air purge collar
- Right angle mirror
- USB configuration cable



Starting at
$30.00
(ACCTMB)

For the latest prices, please check AutomationDirect.com.



Starting at
$700.00
(OPTCSLLTSF)

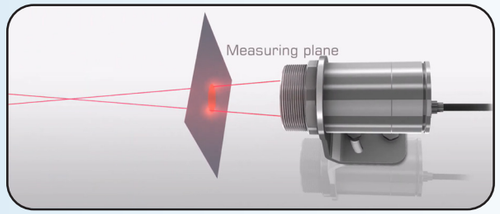
optris infrared sensing CSlaser Series Infrared Pyrometers

Optris CSlaser series infrared pyrometers feature an innovative double laser aiming system, a broad measurement range, and a rugged, stainless steel construction. With integrated electronics and fast response times, these performance sensors offer high accuracy and repeatability for applications where precise temperature measurement is critical.

- Up to 1600°C (2912°F) measurement range
- Up to 85 °C ambient temperature without cooling
- 4 to 20mA with alarm output
- 8-14 or 1.6 µm spectral response
- CSlaser LT: 50:1 optical resolution (24mm @ 1200mm)
- CSlaser 2ML: 150:1 optical resolution (7.3 mm @ 1100mm)
- CSlaser 2MH: 300:1 optical resolution (3.7 mm @ 1100mm)
- CSlaser LT: 150 ms response time
- CSlaser 2ML/2MH: 10 ms response time
- 5 to 30 VDC operating voltage
- M48x1.5mm threaded end mount
- IP65 (NEMA 4) protection rating

CSlaser Pyrometer Operation

Optris CSlaser pyrometers use dual lasers that intersect at the focal point where the spot size is the smallest, making it easy to aim the sensor without a spot size chart. These laser pyrometers offer optical resolutions up to 300:1, allowing long distances between the sensors and their target measuring points.

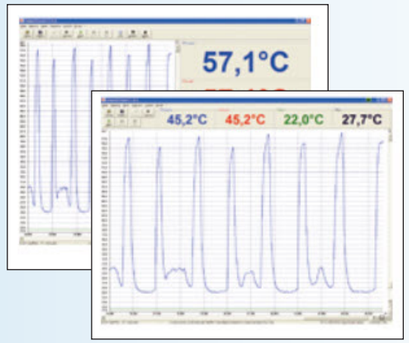




Optris Compact Connect Interface Software

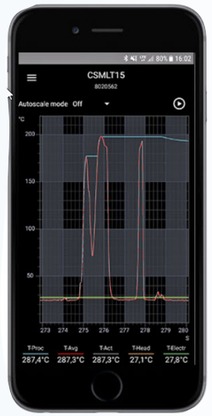
The free Windows-based Optris CompactConnect software features an intuitive user interface that displays temperature trends and automatically logs data for analysis and documentation. It requires the ACCSMIACC communication cable (sold separately).

The CompactConnect Windows software can be downloaded from Automationdirect.com



IRmobile Android App

The free Optris IRmobile Android App allows temperature monitoring on a smartphone or tablet. This app requires the ACCSMIACC communication cable (sold separately) and works on most Android devices running 5.0+ with a USB-C port supporting USB-OTG (On The Go).



- Configure emissivity, transmissivity, and other parameters
- Select units: Celsius or Fahrenheit
- Analog output scaling
- Alarm output setup
- Temperature time diagram with zoom function
- Integrated simulator

GET IT ON Google Play

Infrared Thermal Cameras

Infrared thermal cameras provide non-contact temperature measurement by detecting infrared energy emitted from objects and converting it into a visual thermal image. Unlike single-point infrared thermometers, thermal cameras measure temperatures across an entire field of view, allowing users to visualize heat distribution, identify temperature variations, and detect hot spots in real time.

optris infrared sensing

Xi 410 LT Series Infrared Thermal Cameras

Optris Xi 410 LT series infrared thermal cameras combine the functionality of a thermal camera and industrial infrared thermometer in a compact, fixed-mount design for continuous temperature monitoring. They provide flexible installation options and advanced communication capabilities for integration into automation systems. With features such as motorized focus, autonomous operation, and industrial communication interfaces, the Xi 410 LT series is ideal for process control, quality assurance, machine monitoring, and predictive maintenance applications.



Priced at
$3,675.00
(OPTXI41LTF20T090)

- 384 × 240 pixel FPA (Focal Plane Array) detector with an 8–14 µm spectral range provides high-resolution thermal images that reveal temperature distribution and hot spots across the entire field of view
- 60 mK thermal sensitivity enables detection of small temperature differences for identification of subtle heat variations and potential equipment issues
- ±2°C / ±2% accuracy provides precise, non-contact temperature measurement
- Stand-alone smart pyrometer mode with 1.5 Hz measurement rate, automatic hot spot/cold spot detection, and direct 0/4–20 mA analog output enables the Xi 410 LT to monitor critical temperature points without a PC
- Four fixed field-of-view lens options (18° × 12°, 29° × 18°, 53° × 31°, and 80° × 44°) provide flexibility for different target sizes and viewing distances, while motorized focus ensures clear thermal images
- Flexible power options include 5–30 VDC, Power over Ethernet (PoE), or USB
- IP67 (NEMA 4) rated enclosure supports reliable operation in wet, dusty, and vibration-prone environments

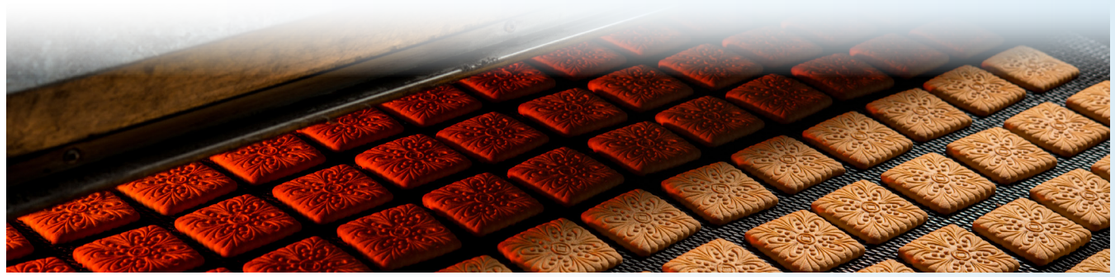
Applications

Monitor switchgear, transformer banks, and motor housings in autonomous mode, triggering relay alarms when hot spots exceed set thresholds, without requiring a connected PC.

Track temperature distribution across furnace and heat treatment workpieces or refractory surfaces in real time, providing temperature data directly to PLC or DCS systems for process control.

Monitor web or conveyor processes, such as moving film, sheet metal, and food products, for temperature uniformity using high-resolution thermal imaging and multi-area analysis to detect defects or uneven heating zones.

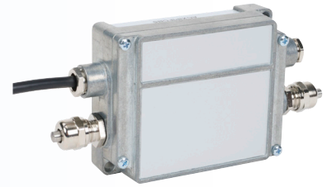
Provide continuous thermal surveillance for fire detection and prevention in bulk material storage, battery rooms, and waste processing facilities by identifying early-stage heat buildup before ignition.



For the latest prices, please check AutomationDirect.com.

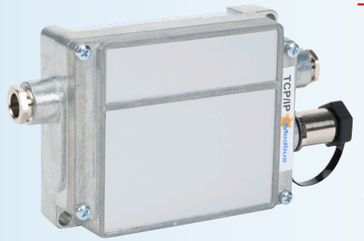
optris infrared sensing Discrete/Analog Process Interface Module

The Optris discrete/analog process interface module provides analog, digital, and relay I/O for direct connection to PLCs, DCS systems, and other industrial equipment for process monitoring, alarms, and automation applications. An integrated fail-safe relay continuously monitors system status and activates an alarm when a fault condition is detected.



Priced at
$415.00
(ACXIPIFCB5)

- Three analog and three relay alarm outputs provide flexible signal options for transmitting temperature data and alarm conditions
- Two analog inputs and one discrete input support connection to external control signals and process devices
- Up to three modules can be cascaded with a single camera for additional I/O capacity
- IP65 (NEMA 4) rated enclosure provides protection against dust and water ingress for reliable operation in industrial environments



Priced at
$440.00
(ACXICSVIENMBTCPK)

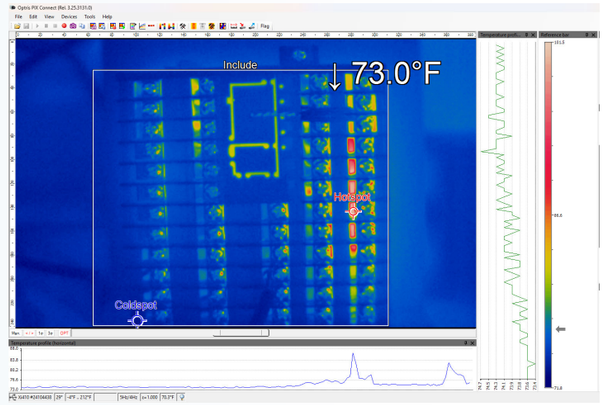
optris infrared sensing Modbus TCP Communications Module

The Optris Modbus TCP communications module enables the Xi 410 LT thermal camera to integrate seamlessly with PLCs, HMIs, SCADA systems, and other Modbus TCP-compatible devices over standard industrial Ethernet. By providing direct access to temperature measurement data, the module simplifies system integration and supports real-time monitoring and process control.

- RJ45 Ethernet communication with an IP67-rated 4-pin M12 D-coded connector provides a rugged network connection suited for industrial environments
- Fixed Modbus register mapping simplifies PLC, HMI, and SCADA configuration
- Includes the network interface board, software and documentation USB drive, M12 connector, and RJ45 extension cable for convenient installation
- Industrial-grade construction designed for continuous operation alongside Xi 410 LT systems

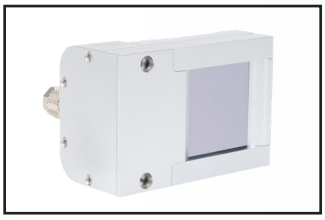
optris infrared sensing PIX Connect Software

Optris PIX Connect is free software that provides camera configuration, thermal image display, radiometric analysis, and data recording. It displays thermal images with temperature data from every pixel, supports measurement areas, temperature analysis, and trend monitoring. It configures emissivity, ambient temperature compensation, temperature range selection, and motorized focus while supporting multiple cameras from a single interface. A built-in web server provides remote access to thermal images and temperature data.



- Live thermal imaging with customizable color palettes, temperature scaling, and display modes for desktop, touch, and tablet viewing
- Flexible measurement areas with independent temperature readings for quickly identifying hot spots, cold spots, and temperature variations
- Temperature trend diagrams and histograms simplify monitoring of changes and distribution across the thermal image
- Radiometric video and snapshot recording preserves complete temperature data for playback, analysis, and documentation
- Multi-camera support and autonomous operation simplify deployment of Xi 410 LT systems without a connected PC after configuration

Infrared Thermal Camera Accessories



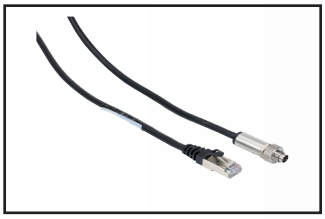
Air purge assembly keeps the lens free of airborne contaminants (ACXIAPL)



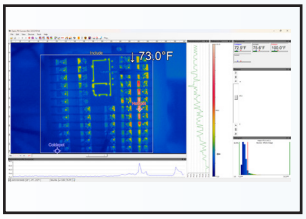
2-Axis mounting bracket provides flexible pan and tilt positioning (ACIAPLAB)



Emissivity labels provide a known emissivity reference for reflective or low-emissivity surfaces (ACLSED)



4-pin M9 quick-disconnect to RJ45 shielded industrial ethernet cables(ACXIETCB5, ACXIETCB10, and ACXIETCB20)



Optris PIX Connect configuration and monitoring software (free download only)