# Temperature Transmitters - Head Mounted

## Features - Non-programmable Models

Sensor Types:
- Models for thermocouple Types J, K, or T
- Models for RTD Type Pt100 3-wire
- Select from a variety of pre-configured measuring ranges
- Internal cold junction compensation for thermocouple input models
- Transmitter is powered by 8-35 VDC and is reverse-polarity protected

Output is linearized 2-wire 4-20mA current loop
- Up scale signal for sensor lead break or short circuit detection (NAMUR NE 43 fault response)
- Mounts in ProSense connection head or any DIN Form B sensor head
- 2 kVAC isolation between input and output

### ProSense Head Mounted Temperature Transmitters

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Input Type</th>
<th>Fixed Measuring Range</th>
<th>Pcs/Pkg</th>
<th>Wt(lb)</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>XTH-N40140F-PT1</td>
<td>Pt100 RTD (to IEC 751)</td>
<td>-40 to 140°F (-40 to 60°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
</tr>
<tr>
<td>XTH-0100F-PT1</td>
<td>0 to 100°F (-17.8 to 37.8°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
<tr>
<td>XTH-0200F-PT1</td>
<td>0 to 200°F (-17.8 to 93.3°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
<tr>
<td>XTH-0300F-PT1</td>
<td>0 to 300°F (-17.8 to 148.9°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
<tr>
<td>XTH-0500F-PT1</td>
<td>0 to 500°F (-17.8 to 260°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
<tr>
<td>XTH-0100F-J</td>
<td>Type J thermocouple (to NIST Monograph 175, IEC584)</td>
<td>0 to 100°F (-17.8 to 37.8°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
</tr>
<tr>
<td>XTH-0200F-J</td>
<td>0 to 200°F (-17.8 to 93.3°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
<tr>
<td>XTH-0300F-J</td>
<td>0 to 300°F (-17.8 to 148.9°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
<tr>
<td>XTH-0500F-J</td>
<td>0 to 500°F (-17.8 to 260°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
<tr>
<td>XTH-0800F-J</td>
<td>0 to 800°F (-17.8 to 426.7°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
<tr>
<td>XTH-1000F-J</td>
<td>0 to 1000°F (-17.8 to 537.8°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
<tr>
<td>XTH-0100F-K</td>
<td>Type K thermocouple (to NIST Monograph 175, IEC584)</td>
<td>0 to 100°F (-17.8 to 37.8°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
</tr>
<tr>
<td>XTH-0200F-K</td>
<td>0 to 200°F (-17.8 to 93.3°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
<tr>
<td>XTH-0300F-K</td>
<td>0 to 300°F (-17.8 to 148.9°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
<tr>
<td>XTH-0500F-K</td>
<td>0 to 500°F (-17.8 to 260°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
<tr>
<td>XTH-0800F-K</td>
<td>0 to 800°F (-17.8 to 426.7°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
<tr>
<td>XTH-1000F-K</td>
<td>0 to 1000°F (-17.8 to 537.8°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
<tr>
<td>XTH-1500F-K</td>
<td>0 to 1500°F (-17.8 to 815.5°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
<tr>
<td>XTH-2000F-K</td>
<td>0 to 2000°F (-17.8 to 1093.3°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
<tr>
<td>XTH-N2000F-T</td>
<td>Type T thermocouple (to NIST Monograph 175, IEC584)</td>
<td>-200 to 0°F (-128.9 to -17.8°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
</tr>
<tr>
<td>XTH-N100100F-T</td>
<td>-100 to 100°F (-73.3 to 37.8°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
<tr>
<td>XTH-0200F-T</td>
<td>0 to 200°F (-17.8 to 93.3°C)</td>
<td>1</td>
<td>0.09</td>
<td>$72.00</td>
<td></td>
</tr>
</tbody>
</table>

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For the latest prices, please check AutomationDirect.com.
# Temperature Transmitters - Head Mounted

## Features - Programmable Models

**Sensor Types:**
- RTD Types Pt100, Pi500, Pi1000, Ni1000, Ni5000, Ni10000, Cu50, Cu100 (2, 3 or 4-wire)
- Linear Resistance 10 to 400 Ohms, 10 to 2000 Ohms (2, 3 or 4-wire)
- Millivolts -10 to 100 mV
- Measuring range configurable within the full range of the sensor type selected
- Selectable units of °F or °C
- Choose from internal or external cold junction compensation for thermocouple inputs
- Wire resistance compensation for 2-wire RTDs
- Transmitter is powered by 8-35 VDC and is reverse-polarity protected
- Output is linearized 2-wire current loop and can be configured for 4-20mA or 20-4mA
- Selectable up scale or down scale signal for sensor lead break or short circuit detection (NAMUR NE 43 fault response)
- Adjustable digital filter time constant to compensate for undesirable input fluctuations
- Mounts in ProSense connection head probes or any DIN Form B sensor head
- 2 kVAC isolation between input and output
- Quick and easy configuration with Free XT-SOFT software and XT-USB cable (purchased separately) – NO decade box, meters, or signal generators needed!

## ProSense Head Mounted Temperature Transmitters

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Input Type</th>
<th>Programmable Measuring Range Limits</th>
<th>Min. Span</th>
<th>Pcs/Pkg</th>
<th>Wt(lb)</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>XTH-0-UNV</td>
<td>Pt100 RTD</td>
<td>-328 to 1562°F (-200 to 850°C)</td>
<td>18°F (10°C)</td>
<td>1</td>
<td>0.09</td>
<td>$92.00</td>
</tr>
<tr>
<td></td>
<td>Pt500 RTD</td>
<td>-328 to 482°F (-200 to 250°C)</td>
<td>18°F (10°C)</td>
<td>1</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pt100 RTD</td>
<td>-328 to 482°F (-200 to 250°C)</td>
<td>18°F (10°C)</td>
<td>1</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ni1000 RTD</td>
<td>-76 to 35°F (-60 to 180°C)</td>
<td>18°F (10°C)</td>
<td>1</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ni5000 RTD</td>
<td>-76 to 30°F (-60 to 150°C)</td>
<td>18°F (10°C)</td>
<td>1</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ni10000 RTD</td>
<td>-76 to 30°F (-60 to 150°C)</td>
<td>18°F (10°C)</td>
<td>1</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pt50 RTD</td>
<td>-328 to 2012°F (-200 to 1100°C)</td>
<td>18°F (10°C)</td>
<td>1</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pt100 RTD</td>
<td>-328 to 1562°F (-200 to 850°C)</td>
<td>18°F (10°C)</td>
<td>1</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ni50 RTD</td>
<td>-328 to 32°F (-200 to 200°C)</td>
<td>18°F (10°C)</td>
<td>1</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ni100 RTD</td>
<td>-328 to 32°F (-200 to 200°C)</td>
<td>18°F (10°C)</td>
<td>1</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cu50 RTD</td>
<td>-328 to 32°F (-200 to 200°C)</td>
<td>18°F (10°C)</td>
<td>1</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cu100 RTD</td>
<td>-328 to 32°F (-200 to 200°C)</td>
<td>18°F (10°C)</td>
<td>1</td>
<td>0.09</td>
<td></td>
</tr>
</tbody>
</table>

**RTDs:**
- Connection type: 2-, 3-, or 4-wire connection
- Software compensation of cable resistance possible in the 2 wire system (0-20 Ω)
- Sensor cable resistance max. 11 Ω per cable in the 3 and 4 wire system
- Sensor current: ≤0.6mA

**Thermocouples:**
- Type B
- Type E
- Type J
- Type K
- Type N
- Type R
- Type S
- Type T
- Type C
- Type D
- Type U
- Type L
- Type U (to DIN 43710)

**Thermocouples:**
- Internal cold junction (Pt100) or external programmable fixed value, 32 to 176°F (0 to 80°C)
- Accuracy of cold junction: ± 1.8°F (1°C)
- Sensor current: 30mA

**Millivolts:**
- -10 to 100 mV
- 5 mV
# ProSense Head Mounted Temperature Transmitters General Specifications

### Output

- **Output Signal**: 4-20 mA
- **Output Signal (programmable)**: 4-20 mA, 20-4 mA
- **Signal Transmission**: Output linear to temperature
- **Fault Signal**:
  - Under ranging / Standard / 3.8 mA
  - Over ranging / Standard / 20.5 mA
  - Sensor break; sensor short circuit down scale / To NAMUR NE 43 / ±3.6 mA (only applicable to XTH-0-UNV)
  - Sensor break; sensor short circuit up scale / To NAMUR NE 43 / ±21.0 mA
- **Max. Load Impedance**: \( \left( \frac{\text{power supply} - 8 \text{V}}{0.025 \text{A}} \right) = 640 \Omega \)
- **Galvanic Isolation**: 2 kV AC (input/output)
- **Input Current Requirement**: ≤ 3.5 mA
- **Current Limit**: ≤ 25 mA
- **Switch on Delay**: 4 seconds (during power up output current = 3.8 mA)
- **Response Time**: 1 second
- **Digital Filter**: N/A
- **Power Supply**: 8 to 35 VDC, polarity protected
- **Allowable Ripple**: ≤ 5 V with power supply ≥ 13; Max. frequency = 1 kHz

### Accuracy

- **Reference Conditions**: Calibration temperature 73.4°F ± 9°F (23°C ± 5°C)
- **Maximum Measuring Error**: 0.36°F (0.2°C) or 0.08%
- **Influence of Power Supply**: ≤ ± 0.01%/V deviation from 24 V
- **Load Influence**: ≤ ± 0.02%/100 Ω
- **Long Term Stability**: ≤ 0.1 K / Year or ≤ 0.05% / Year

### Installation

- **Orientation**: No restrictions
- **Location**: Connection head according to DIN 43 729 Form B

### Environmental

- **Ambient**: -40 to 185°F (-40 to 85°C)
- **Storage**: -40 to 212°F (-40 to 100°C)
- **Climate Class**: As per IEC 60 654-1, class C
- **Ingress Protection**: IP00 / IP66 installed in appropriate housing
- **Shock and Vibration**: 4g / 2 to 150 Hz as per IEC 60 068-2-6
- **EMC Immunity**: See Table 2
- **Moisture Condensation**: Allowable

### Construction

- **Materials**: Housing: Polycarbonate; Potting: Polyurethane
- **Terminals**: Cable up to max. 1.75 mm² (16 AWG), secure screws

### Approvals

- **CE, UL recognized (UL 3111-1), File # E311366, RoHS**

## Table 1 - Maximum Measuring Error XTH-0-UNV

<table>
<thead>
<tr>
<th>Type</th>
<th>Measurement Accuracy*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resistance Thermometer (RTD)</strong></td>
<td></td>
</tr>
<tr>
<td>Pt100, Ni100</td>
<td>0.36°F (0.2°C) or 0.08%</td>
</tr>
<tr>
<td>Pt500, Ni500</td>
<td>0.9°F (0.5°C) or 0.20%</td>
</tr>
<tr>
<td>Pt1000, Ni1000</td>
<td>0.54°F (0.3°C) or 0.12%</td>
</tr>
<tr>
<td><strong>Thermocouple TC</strong></td>
<td></td>
</tr>
<tr>
<td>K, J, T, E, L, U, N, C, D, S, B, R</td>
<td>typ. 0.9°F (0.5°C) or 0.08%</td>
</tr>
<tr>
<td></td>
<td>typ. 1.8°F (1.0°C) or 0.08%</td>
</tr>
<tr>
<td></td>
<td>typ. 3.6°F (2.0°C) or 0.08%</td>
</tr>
<tr>
<td><strong>Measurement Range</strong></td>
<td>Measurement Accuracy*</td>
</tr>
<tr>
<td>Resistance Transmitter (Ω)</td>
<td></td>
</tr>
<tr>
<td>10 to 400Ω</td>
<td>± 0.1 Ω or 0.08%</td>
</tr>
<tr>
<td>10 to 2000Ω</td>
<td>± 1.5 Ω or 0.12%</td>
</tr>
<tr>
<td>Voltage Transmitters (mV)</td>
<td></td>
</tr>
<tr>
<td>-10 to 100 mV</td>
<td>± 20 µV or 0.08%</td>
</tr>
</tbody>
</table>

* % is related to the adjusted measurement range. The value to be applied is the greater.

## Table 2 - IEC Immunity

<table>
<thead>
<tr>
<th>Discharge of Static Electricity</th>
<th>IEC 61000-4-2</th>
<th>6 kV cont., 8 kV air</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electromagnetic Fields</td>
<td>IEC 61000-4-3</td>
<td>80 to 1000 Hz</td>
<td>10 V/m</td>
</tr>
<tr>
<td>Burst (Signal)</td>
<td>IEC 61000-4-4</td>
<td>1 kV, 2 kV (B)**</td>
<td>N/A</td>
</tr>
<tr>
<td>Transient Voltage</td>
<td>IEC 61000-4-5</td>
<td>1 kV unсим., / 0.5 kV sym.</td>
<td>N/A</td>
</tr>
<tr>
<td>HF Coupling</td>
<td>IEC 61000-4-6</td>
<td>0.15 to 80 MHz</td>
<td>10V</td>
</tr>
</tbody>
</table>

** self recovery
Temperature Transmitters - Head Mounted

Wiring
XTH PT1 - RTD Input

XTH J, K & T - Thermocouple Input

Load Impedance

Application
ProSense head mounted transmitters can be easily added in the field to a ProSense connection head probe. Just order a pre-assembled ProSense connection head probe and replace the internal terminal block with an XTH series transmitter and included mounting hardware.
Temperature Transmitter Configuration Software

Quick and easy configuration with Free XT-SOFT software – NO decade box, meters, or signal generators needed!

Overview
XT-SOFT PC software is a utility program that allows users to easily configure ProSense XTH-0-UNV, XTD-0-UNV and XTP series temperature transmitters and ETS series digital temperature sensors. Download your free copy of XT-SOFT at www.AutomationDirect.com and connect your transmitter to the PC through an XT-USB configuration cable (purchased separately). An XT-M12 adapter is also required when connecting to an XTP series transmitter.

System Requirements:
- Windows XP (32 Bit)
- Windows Vista, Windows 7, Windows 8 (32 and 64 Bit)
- 1 USB 2.0 Port
- 128 MB hard disk space

XTP Series Configuration Parameters:
- Measuring unit (°C/F)
- Measuring range limits -50 to 150°C (-58 to 302°F)
- Fault condition reaction (≤ 3.6 mA or ≥ 21.0 mA)
- Output (4-20 mA or 20-4 mA)
- Filter (0 to 8s)
- Offset (-9.9 to +9.9 K)
- Measurement point identification/TAG
- Output simulation drives output to a fixed value

XTH & XTD Configuration Parameters:
- Sensor Type:
  - RTD Types Pt100, Pt500, Pt1000, Pt50, Ni100, Ni120, Ni500, Ni1000
  - Linear Resistance 10 to 400 Ohms, 10 to 2000 Ohms
  - Millivolts -10 to 100 mV
  - Wiring connection 2, 3, or 4-wire (RTD or Linear Resistance only)
  - Measuring range start and end points
  - Selectable units of °F or °C
  - Choose from internal or external cold junction compensation (TC only)
  - Wire resistance compensation (2-wire RTD or Linear Resistance only)
  - Output action of 4-20 mA or 20-4 mA
  - Selectable up scale or down scale signal for sensor lead break or short circuit detection (NAMUR NE43 fault response)
  - Adjustable digital filter time constant to compansate for undesirable input fluctuations
  - Zero point correction offset factor in °F or °C

ETS Series Configuration Parameters:
- Basic Settings:
  - Measuring unit (°C/F/K)
  - Offset: Configure zero point ±18°F (±10°C/K)
  - Display: Measured value display
    - Measured value display rotated 180°
    - Set switch point display
    - Set switch point display rotated 180°
    - Display off
    - Display off rotated 180°
  - Damping: display value, output signal: 0 (no damping) to 40s (in increments of 1 second)
  - DESINA - PIN assignment of the M12 connector is in accordance with the guidelines of DESINA

Settings for Switch Output:
- Switching characteristic - Window/NC contact
  - Hysteresis/NC contact
  - Window/NO contact
  - Hysteresis/NO contact
  - Analog output (if applicable)

  - Switch point value: -57.1 to 302°F (-49.5 to 150°C) in increments of 0.18°F (0.1°C)
  - Switch-back point value: -58 to 300°F (-50 to 149°C) in increments of 0.18°F (0.1°C)
  - Switch point delay: 0 to 99s in increments of 0.1s
  - Switch-back point delay: 0 to 99s in increments of 0.1s

Settings for Analog Output (if applicable):
  - Value for 4mA: -58 to 266°F (-50 to 130°C) Lower range value in increments of 0.18°F (0.1°C)
  - Value for 20mA: -22 to 302°F (-30 to 150°C) Upper range value in increments of 0.18°F (0.1°C)
  - Error current - Current value in event of error:
    - Minimum = ≤ 3.6 mA
    - Maximum = ≥ 21.0 mA
    - HOLD = last value

Settings for Service Functions:
- Locking code - Enter the locking code for enabling the device.
- Change locking code - Freely selectable code 1 to 9999.
  - 0 = no locking
- Simulation output 1 or 2 - OFF: No simulation
  - OPEN: Switch output open
  - CLOSE: Switch output closed
  - Simulation values for analog output in mA
    - (3.5 / 4.0 / 8.0 / 12.0 / 16.0 / 20.0 / 21.7)
Connection Examples

**XTH-0-UNV Connection**

- **XT-SOFT** PC configuration software

**XTD-0-UNV Connection**

- **XT-SOFT** PC configuration software

**XTP Series Connection**

- **XT-M12** adapter, keyed 4-pin female to 4-pin M12. For use with ProSense temperature transmitter XTP series and XT-USB cable.

**ETS Series Connection**

- **XT-M12** adapter, keyed 4-pin female to 4-pin M12. For use with ProSense temperature transmitter XTP series and XT-USB cable.

**Part No.** | **Description** | **Pcs/Pkg** | **Wt(lb)** | **Price**
--- | --- | --- | --- | ---
**XT-SOFT** | ProSense configuration software, CD or free download. For use with ProSense temperature transmitter XTP series, digital temperature sensor ETS series and models XTH-0-UNV, XTD-0-UNV. | 1 | 0.1 | $9.25
**XT-USB** | ProSense configuration cable, USB to keyed 4-pin male, 7.9 ft/2.4 m cable length. For use with XT-SOFT configuration software, ProSense temperature transmitter XTP series, digital temperature sensor ETS series and models XTH-0-UNV, XTD-0-UNV. | 1 | 0.4 | $92.00
**XT-M12** | ProSense adapter, keyed 4-pin female to 4-pin M12. For use with ProSense temperature transmitter XTP series and XT-USB cable. | 1 | 0.1 | $15.50

Note: XT-SOFT version 1.27.13.0 or later required for use with the XTP series transmitters.

Note: XT-SOFT version 1.27.15.0 or later required for use with the ETS Series.