



# DIN Rail Mounted Universal Temperature Transmitters - Programmable

## Features - Programmable Models



**XTD2-0-UNV-S**



**XTD2-0-UNV-P**

- Sensor Types:
  - Thermocouple Types J, K, T, E, N, R, S, U, B, C, D, L, A
  - RTD Types Pt100, Pt200, Pt500, Pt1000, Pt50, Ni100, Ni120, Cu50, Cu100 (2, 3 or 4-wire)
  - Linear Resistance 10 to 400 Ohms, 10 to 2000 Ohms (2, 3 or 4-wire)
  - Millivolts -20 to 100 mV
- Measuring range configurable within the full range of the sensor type selected
- Selectable units of °F, °C, K, Ohm and mV
- Choose from internal, external, or user defined fixed value reference junction compensation for thermocouple inputs
- Wire resistance compensation for 2-wire RTDs
- Transmitter is powered by 11-36 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 on 35mm DIN rail in a control panel
- 2kVAC isolation between input and output
- Quick and easy configuration with Free ProSense Field Device Configurator software and XT-USB cable (purchased separately) – NO decade box, meters, or signal generators needed!



## DIN Rail Mounted Universal Temperature Transmitters - Programmable

| Part No.                   | Description   | Pcs/Pkg | Wt (lb) | Drawing Link        | Price    |
|----------------------------|---|---------|---------|---------------------|----------|
| <b><u>XTD2-0-UNV-S</u></b> | ProSense programmable temperature transmitter, isolated, RTD, thermocouple, millivolt or potentiometer input, deg F or deg C, current output, 11-36 VDC operating voltage, 35mm DIN rail mount, removable screw terminal plugs. | 1       | 0.20    | <a href="#">PDF</a> | \$136.00 |
| <b><u>XTD2-0-UNV-P</u></b> | ProSense programmable temperature transmitter, isolated, RTD, thermocouple, millivolt or potentiometer input, deg F or deg C, current output, 11-36 VDC operating voltage, 35mm DIN rail mount, removable push-in terminals.    | 1       | 0.40    | <a href="#">PDF</a> | \$136.00 |



Scan the QR Code above or click to view the XTD2 Series product insert.



# DIN Rail Mounted Universal Temperature Transmitters - Programmable

| DIN Rail Mounted Universal Temperature Transmitters - Programmable<br>General Specifications |  |  |                  |
|--|--|--|------------------|
|  | <i>Input Type</i>  | <i>Programmable Measuring Range Limits</i>   | <i>Min. Span</i> |
| <i>Inputs</i>  | Pt100 RTD<br>Pt200 RTD<br>Pt500 RTD<br>Pt1000 RTD<br>(to IEC 751)<br>a=0.003851) | -328 to 1562°F (-200 to 850°C)<br>-328 to 1562°F (-200 to 850°C)<br>-328 to 932°F (-200 to 500°C)<br>-328 to 482°F (-200 to 250°C) | 18°F (10°C)      |
|  | Pt100 RTD<br>(to JIS C1604)<br>(a=0.0039)  | -328 to 950°F (-200 to 510°C)  | 18°F (10°C)      |
|  | Ni100 RTD<br>Ni120 RTD<br>(to DIN 43760)<br>(a=0.006180)                         | -76 to 482°F (-60 to 250°C)  | 18°F (10°C)      |
|  | Ni100 RTD<br>Ni120 RTD<br>(to OIML, GOST)<br>(a=0.006170)                        | -76 to 356°F (-60 to 180°C)  | 18°F (10°C)      |
|  | Pt50 RTD<br>Pt100 RTD<br>(to GOST)<br>(a=0.00390)                                | -301 to 2012°F (-185 to 1100°C)<br>-328 to 1562°F (-200 to 850°C)  | 18°F (10°C)      |
|  | Pt100 (Callendar van Dusen)<br>Nickel polynomial<br>Copper polynomial            | The measuring range limits are specified by entering the limit values that depend on the coefficients A to C and R0.               | 18°F (10°C)      |
|  | Cu50 RTD<br>Cu100 RTD<br>(to OIML, GOST)<br>(a=0.004280)                         | -292 to 392°F (-180 to 200°C)  | 18°F (10°C)      |
|  | Cu50 RTD<br>(to OIML, GOST)<br>(a=0.004260)                                      | -58 to 392°F (-50 to 200°C)  | 18°F (10°C)      |



# DIN Rail Mounted Universal Temperature Transmitters - Programmable

| DIN Rail Mounted Universal Temperature Transmitters - Programmable General Specifications |  |  |                  |
|---|--|--|------------------|
|   | <i>Input Type</i>  | <i>Programmable Measuring Range Limits</i>   | <i>Min. Span</i> |
| <i>Inputs</i>   | RTDs:<br>• Connection type: 2-, 3-, or 4-wire connection<br>• Software compensation of cable resistance possible in the 2 wire system (0-30Ω)<br>• Sensor cable resistance max. 50Ω per cable in the 3 and 4 wire system<br>• Sensor current: ≤ 0.3mA  |  |                  |
|   | Resistance Ω   | 10 to 400 Ω<br>10 to 2000 Ω  | 10 Ω             |
|   | Thermocouples:<br>Type A<br>Type B<br>Type E<br>Type J<br>Type K<br>Type N<br>Type R<br>Type S<br>Type T<br>(to 60584, Part 1)   | 32 to 4532°F (0 to +2500°C)<br>104 to 3308°F (40 to +1820°C)<br>-482 to 1832°F (-250 to +1000°C)<br>-346 to 2192°F (-210 to +1200°C)<br>-454 to 2501°F (-270 to +1372°C)<br>-454 to 2372°F (-270 to +1300°C)<br>-58 to 3214°F (-50 to +1768°C)<br>-58 to 3214°F (-50 to +1768°C)<br>-328 to 752°F (-200 to +400°C) | 90°F (50°C)      |
|   | Thermocouples:<br>Type C<br>Type D<br>(to ASTM E988)   | 32 to 4199°F (0 to +2315°C)<br>32 to 4199°F (0 to +2315°C)   | 90°F (50°C)      |
|   | Thermocouples:<br>Type L<br>Type U<br>(to DIN 43710)   | -328 to 1652°F (-200 to +900°C)<br>-328 to 1112°F (-200 to +600°C)   | 90°F (50°C)      |
|   | Thermocouple:<br>Type L<br>(to GOST)   | -328 to 1472°F (-200 to +800°C)  | 90°F (50°C)      |
|   | Thermocouples:<br>• Internal cold junction (Pt100) or external programmable fixed value, -40 to 185°F (-40 to 85°C)<br>• Accuracy of cold junction: ± 1.8°F (1°C)<br>• Sensor current: 30nA<br>• Maximum sensor wire resistance 10kΩ<br>(If the sensor wire resistance is greater than 10 kΩ, an error message is output in accordance with NAMUR NE89.) |  |                  |
|   | Millivolt (mV)   | -20 to 100 mV  | 5 mV             |



# DIN Rail Mounted Universal Temperature Transmitters - Programmable

| DIN Rail Mounted Universal Temperature Transmitters - Programmable<br>General Specifications Cont. |                                  |   |
|--|----------------------------------|---|
| <b>Output</b>  | <b>Output Signal</b>             | 4-20 mA, 20-4 mA programmable   |
|  | <b>Signal Transmission</b>       | Output linear to temperature  |
|  | <b>Fault Signal</b>              | Under ranging / Standard / 3.8 mA<br>Over ranging / Standard / 20.5 mA<br>Sensor failure; sensor short-circuit / To NAMUR NE43 / $\leq 3.6$ mA (low) or $\geq 21$ to 23 mA (high) |
|  | <b>Max. Load Impedance</b>       | $(V_{\text{powersupply}} - 11 \text{ V}) / 0.023 \text{ A}$ e.g. $(24\text{V}-11\text{V}) / 0.023\text{A}=565.22\Omega$   |
|  | <b>Galvanic Isolation</b>        | 2 kV AC (input/output)  |
|  | <b>Input Current Requirement</b> | $\leq 3.5$ mA   |
|  | <b>Current Limit</b>             | $\leq 23$ mA  |
|  | <b>Switch on Delay</b>           | $\leq 7$ seconds (during power up output current = 3.8 mA)  |
|  | <b>Response Time</b>             | 1 second  |
|  | <b>Digital Filter</b>            | 0 to 120 seconds (programmable)   |
|  | <b>Power Supply</b>              | 11 to 36 VDC, polarity protected  |
| <b>Accuracy</b>  | <b>Reference Conditions</b>      | Calibration temperature 77°F $\pm 5.4$ °F (25°C)  |
|  | <b>Maximum Measuring Error</b>   | See Table 1   |
|  | <b>Influence of Power Supply</b> | $\leq \pm 0.01\%/V$ deviation from 24 V   |
|  | <b>Load Influence</b>            | $\leq \pm 0.02\%/100 \Omega$  |
|  | <b>Long Term Stability</b>       | $\leq 0.1 \text{ K / Year}$ or $m 0.05\% / \text{Year}$   |
| <b>Installation</b>  | <b>Orientation</b>               | Mount vertically to ensure maximum accuracy   |
| <b>Environmental</b>   | <b>Ambient</b>                   | -40 to 185°F (-40 to 85°C)  |
|  | <b>Storage</b>                   | -58 to 212°F (-50 to 100°C)   |
|  | <b>Climate Class</b>             | As per IEC 60 654-1, class B2   |
|  | <b>Ingress Protection</b>        | IP20  |
|  | <b>Shock and Vibration</b>       | 0.7g / 2 to 100 Hz (general vibration stress) as per DNVGL-CG-0339 : 2015 and DIN EN 60068-2-27. Shock resistance as per KTA 3505 (section 5.8.4 Shock test)                      |
|  | <b>EMC Immunity</b>              | See Table 2   |
|  | <b>Moisture Condensation</b>     | Not Permitted   |
| <b>Construction</b>  | <b>Materials</b>                 | Housing: Polycarbonate (PC); Potting: Silgel612EH   |
|  | <b>Terminals</b>                 | Pluggable screw terminal, max. 2.5 mm <sup>2</sup> (14 AWG) solid, or strand with wire end sleeve, recommended torque 0.5-0.7Nm (4.5-6.2lb.in)                                    |
| <b>Human Interface</b>   | <b>Display</b>                   | Illuminated green power LED, Red status LED   |
| <b>Approvals</b>   |                                  | CE, CSA, RoHS   |

| Table 1 - Maximum Measuring Error                   |                     |                       |
|---|---------------------|-----------------------|
|   | Type                | Measurement Accuracy* |
| <b>Resistance Thermometer (RTD)</b>                 | Pt100               | 0.18°F (0.10°C)       |
|   | Pt1000              | 0.14°F (0.08°C)       |
| <b>Thermocouple TC</b>                              | K                   | 1.15°F (0.64°C)       |
|   | J                   | 0.98°F (0.54°C)       |
|   | T                   | 0.95°F (0.53°C)       |
|   | Measurement Range   | Measurement Accuracy* |
| <b>Resistance Transmitter (<math>\Omega</math>)</b> | 10 to 400 $\Omega$  | 120.7 m $\Omega$      |
|   | 10 to 2000 $\Omega$ | 623.4 m $\Omega$      |
| <b>Voltage Transmitters (mV)</b>                    | -20 to 100 mV       | 37.36 $\mu\text{V}$   |

\* Maximum measured error for the specified measuring range.

Note: For less common types see manual.

| Table 2 - IEC Immunity                 |               |                      |        |
|--|---------------|----------------------|--------|
| <b>Discharge of Static Electricity</b> | IEC 61000-4-2 | 6 kV cont., 8 kV air | N/A    |
| <b>Electromagnetic Fields</b>          | IEC 61000-4-3 | 0.08 to 2.7 GHz      | 10 V/m |
| <b>Burst (Signal)</b>                  | IEC 61000-4-4 | 1 kV (B)**           | N/A    |
| <b>Transient Voltage</b>               | IEC 61000-4-5 | 1 kV unsym.          | N/A    |
| <b>HF Coupling</b>                     | IEC 61000-4-6 | 0.15 to 80 MHz       | 10V    |

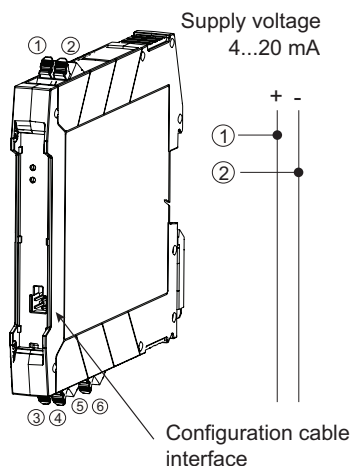
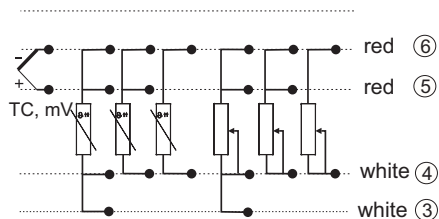
\*\* self recovery

# pro<sup>ense</sup> Temperature Transmitters - DIN Rail Mounted

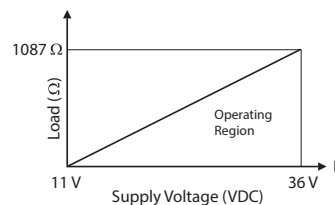
## Wiring

Sensor input

RTD, Ω: 4-, 3- and 2-wire



## Load Impedance



$$R_{L,max} = (V_{powersupply} - 11V) / 0.023A \text{ (current output)}$$

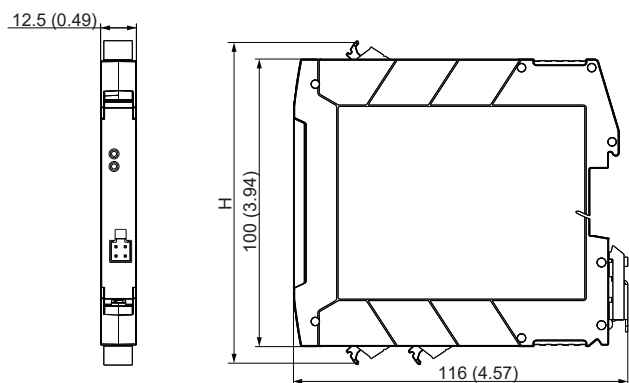
e.g.  $(24V - 11V) / 0.023A = 565.22 \Omega$

\* For convenient installation, wiring plugs are removable.

Note: In the event of a thermocouple (TC) measurement, a 2-wire Pt100 RTD can be connected to measure the reference junction temperature. This is connected to terminals 4 and 6.

## Dimensions

inches [mm]



The height of housing H varies depending on the terminal version: screw terminals = 114 mm (4.49 in), push-in terminals = 111.5 mm (4.39 in)

# proSense® Temperature Transmitter Configuration Software

Quick and easy configuration with Free XT-SOFT and ProSense Field Device Configurator 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 **XTD-0-UNV**, and XTP series temperature transmitters and ETS series digital temperature sensors.

ProSense Field Device Configurator is a utility program that allows users to easily configure, monitor, and retrieve diagnostic information from the ProSense XTH2 and XTD2 series temperature transmitters.

Download your free copy of **XT-SOFT** and ProSense Field Device Configurator at [www.AutomationDirect.com](http://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.

XT-SOFT System Requirements:

- Windows 10, 11
- 1 USB 2.0 Port
- 128 MB hard disk space



ProSense Field Device Configurator System Requirements:

- Windows 10, 11
- 1 USB 2.0 Port
- 25 MB hard disk space
- Microsoft .Net Framework ≥4.8
- PDF Reader

## XTP Series Configuration Parameters (Requires XT-SOFT):

- Measuring unit (°C/°F)
- Measuring range limits -50 to 150°C (-58 to 302°F)
- Fault condition reaction ( $\leq 3.6$  mA or  $\geq 21.0$  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



XTP Series

## XTH & XTD Configuration Parameters: (Requires XT-SOFT)

- Sensor Type:
  - Thermocouple Types J, K, T, E, N, R, S, U, B, C, D, L
  - 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 compensate for undesirable input fluctuations
- Zero point correction offset factor in °F or °C



XTH Series



XTD Series

# proense® Temperature Transmitter Configuration Software

## XTH2 & XTD2 Configuration Parameters (Requires Field Device Configurator):

- Sensor Type:
  - Thermocouple Types J, K, T, E, N, R, S, U, B, C, D, L
  - RTD Types Pt100, Pt500, Pt1000, Pt50, Ni100, Ni120, Ni500, Ni1000
  - Linear Resistance 10 to 400 Ohms, 10 to 2000 Ohms
  - Millivolts -20 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, °C, K, Ohm and mV
  - 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 compensate for undesirable input fluctuations
  - Zero point correction offset factor in °F or °C



XTH2 Series



XTD2 Series

## ETS Series Configuration Parameters (Requires XT-SOFT):

- 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 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)



ETS Series

# proSense® Temperature Transmitter Configuration Software

proSense®  
XT-SOFT



XT-USB



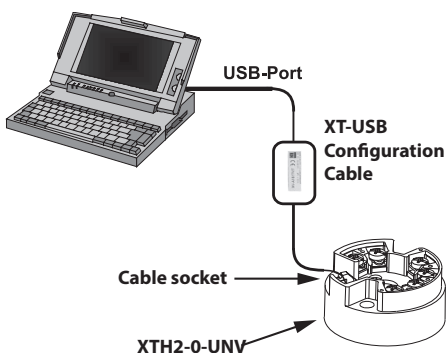
XT-M12

XT-SOFT

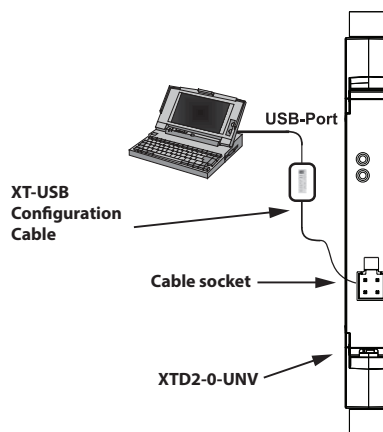
| Part No.                         | Description  | Pcs/Pkg | Wt(lb) | Price         |
|----------------------------------|--|---------|--------|---------------|
| <u>XT-SOFT</u>                   | ProSense configuration software, free download. For use with ProSense temperature transmitter XTP series, digital temperature sensor ETS series and models XTH-0-UNV, XTD-0-UNV.   | 1       | N/A    | Free Download |
| <u>Field Device Configurator</u> | ProSense configuration software, free download. For use with ProSense temperature transmitter series XTH2-0-UNV and XTD2-0-UNV.  | 1       | N/A    | Free Download |
| <u>XT-USB</u>                    | ProSense configuration cable, USB to keyed 4-pin male, 7.9 ft/2.4 m cable length. For use with XT-SOFT and Field Device Configurator software, ProSense temperature transmitter XTP series, digital temperature sensor ETS series and models XTH-0-UNV, XTD-0-UNV, XTH2-0-UNV, and XTD2-0-UNV. | 1       | 0.4    | \$110.00      |
| <u>XT-M12</u>                    | 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    | \$18.50       |

## Connection Examples

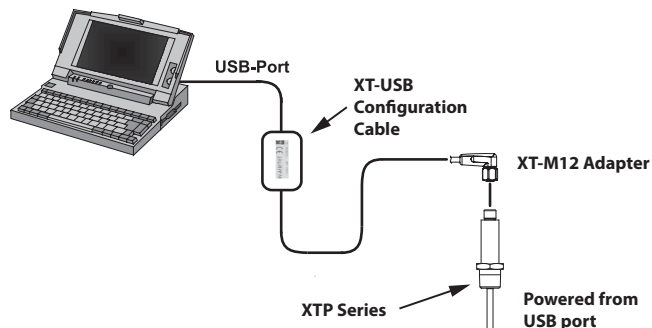
### XTH2-0-UNV Connection (Requires Field Device Configurator)



### XTD2-0-UNV Connection (Requires Field Device Configurator)

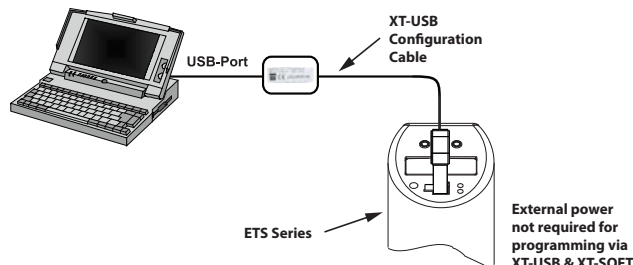


### XTP Series Connection (Requires XT-SOFT)



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

### ETS Series Connection (Requires XT-SOFT)



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



Scan the QR Code or click to view the help file for the XT-SOFT software.



Scan the QR Code or click to view the help file for the ProSense Field Device Configurator software.