



# Head Mounted Universal Temperature Transmitters - Programmable

## Features - Programmable Models



**XTH2-0-UNV-S**



**XTH2-0-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 10-36 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 in ProSense connection head probes or any DIN Form B sensor head, XTH2-ENC-F, XTH2-ENC-P, DN-CLIP-FM4-5
- 2 kVAC 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!



## Head Mounted Universal Temperature Transmitters - Programmable

Part No.	Description	Pcs/Pkg	Wt (lb)	Drawing Link	Price
<a href="#"><u>XTH2-0-UNV-S</u></a>	ProSense programmable temperature transmitter, isolated, RTD, thermocouple, millivolt or potentiometer input, deg F or deg C, current output, 10-36 VDC operating voltage, DIN Form B connection head mount, screw terminals.	1	0.20	<a href="#"><u>PDF</u></a>	\$110.00
<a href="#"><u>XTH2-0-UNV-P</u></a>	ProSense programmable temperature transmitter, isolated, RTD, thermocouple, millivolt or potentiometer input, deg F or deg C, current output, 10-36 VDC operating voltage, DIN Form B connection head mount, push-in terminals.	1	0.40	<a href="#"><u>PDF</u></a>	\$110.00



Scan the QR Code above or click to view the XTH2 Series product insert.



# Head Mounted Universal Temperature Transmitters - Programmable

Head Mounted Universal Temperature Transmitters - Programmable General Specifications			
	<i>Input Type</i>	<i>Programmable Measuring Range Limits</i>	<i>Min. Span</i>
<i>Inputs</i>	Pt100 RTD Pt200 RTD Pt500 RTD Pt1000 RTD (to IEC 751) a=0.003851	-328 to 1562°F (-200 to 850°C) -328 to 1562°F (-200 to 850°C) -328 to 932°F (-200 to 500°C) -328 to 482°F (-200 to 250°C)	18°F (10°C)
	Pt100 RTD (to JIS C1604) (a=0.0039)	-328 to 950°F (-200 to 510°C)	18°F (10°C)
	Ni100 RTD Ni120 RTD (to DIN 43760) (a=0.006180)	-76 to 482°F (-60 to 250°C)	18°F (10°C)
	Ni100 RTD Ni120 RTD (to OIML, GOST) (a=0.006170)	-76 to 356°F (-60 to 180°C)	18°F (10°C)
	Pt50 RTD Pt100 RTD (to GOST) (a=0.00390)	-301 to 2012°F (-185 to 1100°C) -328 to 1562°F (-200 to 850°C)	18°F (10°C)
	Pt100 (Callendar van Dusen) Nickel polynomial 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 Cu100 RTD (to OIML, GOST) (a=0.004280)	-292 to 392°F (-180 to 200°C)	18°F (10°C)
	Cu50 RTD (to OIML, GOST) (a=0.004260)	-58 to 392°F (-50 to 200°C)	18°F (10°C)



# Head Mounted Universal Temperature Transmitters - Programmable

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



# Head Mounted Universal Temperature Transmitters - Programmable

Head Mounted Universal Temperature Transmitters - Programmable 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 Over ranging / Standard / 20.5 mA 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>	(Vpowersupply- 10V) / 0.023 A e.g. (24V-10V) / 0.023A=608.7 $\Omega$
	<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>	10 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>	$\leq 0.1$ K / Year or $\pm 0.05\%$ / Year
<b>Installation</b>	<b>Orientation</b>	No restrictions
	<b>Location</b>	Connection head according to DIN 43 729 Form B
<b>Environmental</b>	<b>Ambient</b>	-40 to 185°F (-40 to 85°C)
	<b>Storage</b>	-58 to 212°F (-58 to 100°C)
	<b>Climate Class</b>	As per IEC 60 654-1, class C1
	<b>Ingress Protection</b>	IP00 with screw terminals, IP30 with push-in terminals/ IP66/68 when installed in NEMA Type 4x enclosure.
	<b>Shock and Vibration</b>	4g / 2 to 100 Hz (increased 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>Construction</b>	<b>Materials</b>	Housing: Polycarbonate (PC); Potting: QSIL 553
	<b>Terminals</b>	Cable up to max. 1.75 mm <sup>2</sup> (16 AWG), secure screws
	<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)
	<b>Measurement Range</b>	<b>Measurement Accuracy*</b>
<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 $\mu$ V

\* Maximum measured error for the specified measuring range.  
Note: For less common types see manual.

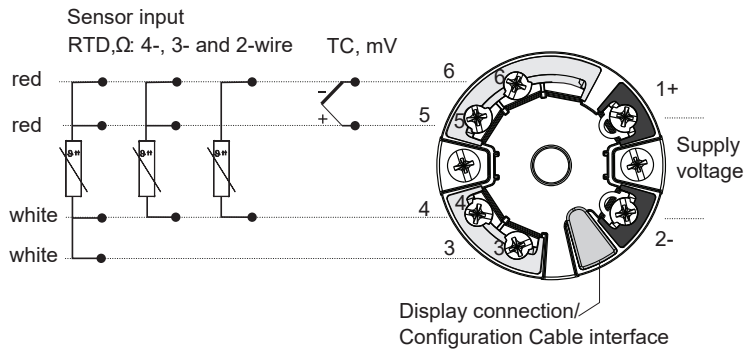
Table 2 - IEC Immunity			
<b>Discharge of Static Electricity</b>	IEC 61000-4-2	6 kV cont., 8 kV air	N/A
<b>Electromagnetic Fields</b>	IEC 61000-4-3	0.08 to 2.7 GHz	10 V/m
<b>Burst (Signal)</b>	IEC 61000-4-4	1 kV; 2 kV (B)**	N/A
<b>Transient Voltage</b>	IEC 61000-4-5	1 kV unsym.	N/A
<b>HF Coupling</b>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

\*\* self recovery



# Head Mounted Universal Temperature Transmitters - Programmable

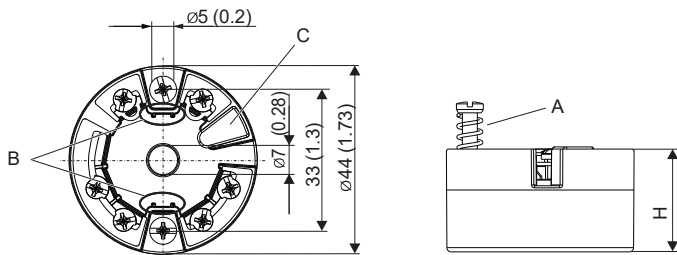
## Wiring



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

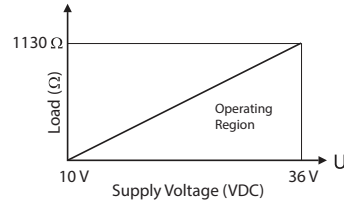
inches [mm]



Head transmitter version with screw terminals.  
Dimensions in mm (in)

- A Spring travel  $L \geq 5$  mm (not for US - M4 securing screws)
- B Mounting elements for attachable measured value display
- C Interface for contacting measured value display
- H The height of housing H varies depending on the terminal version:  
screw terminals = 24.1 mm (0.95 in)  
push-in terminals = 29.1 mm (1.15 in)

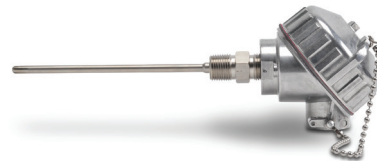
## Load Impedance



$$R_{Lmax} = (V_{powersupply} - 10V) / 0.023A \text{ (current output) e.g. } (24V - 10V) / 0.023A = 608.7 \Omega$$

## 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.



Pre-Assembled ProSense Connection Head Temperature Probe



XTH2 Series Transmitter



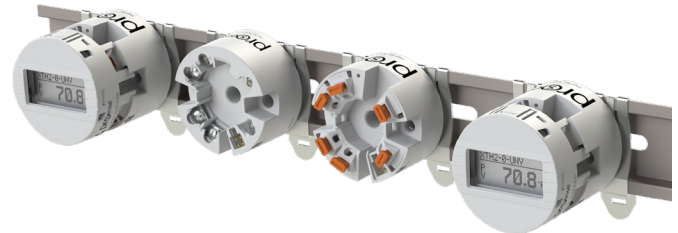
# Head Mounted Universal Temperature Transmitters - Programmable Accessories

The **XTH2-UNV-DISP** is a convenient, easy to use display accessory for the XTH2 temperature transmitters. Simply clip the display on the XTH2 transmitter to get a digital readout of the transmitter scaled output. Transmitter configuration parameters are automatically read by the XTH2-UNV-DISP, so no additional configuration is required. A DIP switch setting is available to rotate the display reading 180 degrees.

The **XTH2-ENC-F** is a rugged aluminum NEMA 4X, IP66/68 rated field mount housing for the XTH2 temperature transmitters. The housing is designed to accommodate both the XTH2 transmitter and the XTH2-UNV-DISP, and includes a window to view the display reading from outside the housing. Two 1/2" female NPT ports are available for wiring access. The XTH2-ENC-F can be wall mounted using the XTH2-ENC-BKT1 wall mount bracket or pipe mounted using the XTH2-ENC-BKT2 pipe mount bracket.

The **XTH2-ENC-P** is a rugged aluminum NEMA 4X, IP66/68 rated probe connection head housing for the XTH2 temperature transmitters. The housing is designed to accommodate both the XTH2 transmitter and the XTH2-UNV-DISP, and includes a window to view the display reading from outside the housing. One 1/2" female NPT port is available for a temperature probe and another 1/2" female NPT port for wiring access.

For a low cost DIN rail mounted temperature transmitter with or without a display, the DN-CLIP-FM4-5 DIN rail clip can be used with the XTH2 transmitter and XTH2-UNV-DISP. Use the mounting hardware provided with the XTH2 temperature transmitter to attach two DN-CLIP-FM4-5 clips to the XTH2 transmitter and secure the assembly to DIN rail in a panel as shown in the image below.



Temperature transmitter, display, DIN rail, and DIN rail clips purchased separately.



**XTH2-ENC-F**



**XTH2-ENC-P**



**XTH2-UNV-DISP**



**XTH2-ENC-BKT1**



**XTH2-ENC-BKT2**

Note: Purchase XTH2-UNV-DISP separately

Head Mounted Universal Temperature Transmitters - Programmable Accessories					
Part No.	Description	Pcs/Pkg	Wt (lb)	Drawing Link	Price
<b>XTH2-UNV-DISP</b>	ProSense display, polycarbonate. For use with programmable temperature transmitter XTH2-0-UNV-S and XTH2-0-UNV-P.	1	0.10	<a href="#">PDF</a>	\$75.00
<b>XTH2-ENC-F</b>	ProSense field housing, (2) 1/2in female NPT, -40 to +212 degrees F (-40 to 100 degrees C), aluminum, NEMA 4X, IP66 IP68. For use with programmable temperature transmitter XTH2-0-UNV-S and XTH2-0-UNV-P.	1	1.65	<a href="#">PDF</a>	\$60.00
<b>XTH2-ENC-P</b>	ProSense connection head, 1/2in female NPT probe connection, 1/2in female NPT, -40 to +212 degrees F (-40 to 100 degrees C), aluminum, NEMA 4X, IP66 IP68. For use with programmable temperature transmitter XTH2-0-UNV-S and XTH2-0-UNV-P.	1	1.65	<a href="#">PDF</a>	\$60.00
<b>XTH2-ENC-BKT1</b>	ProSense wall mount bracket, 316L stainless steel. For use with field housing XTH2-ENC-F. Mounting hardware included.	1	0.22	<a href="#">PDF</a>	\$21.00
<b>XTH2-ENC-BKT2</b>	ProSense pipe mount bracket, 316L stainless steel. For use with field housing XTH2-ENC-F. Mounting hardware included.	1	0.60	<a href="#">PDF</a>	\$41.00

# 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



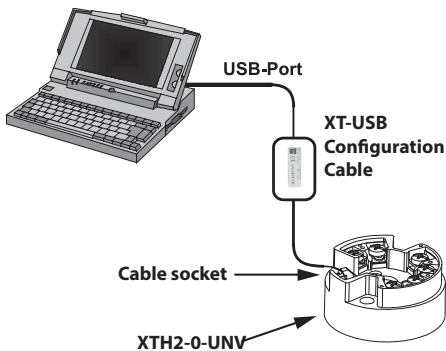
XT-M12

XT-SOFT

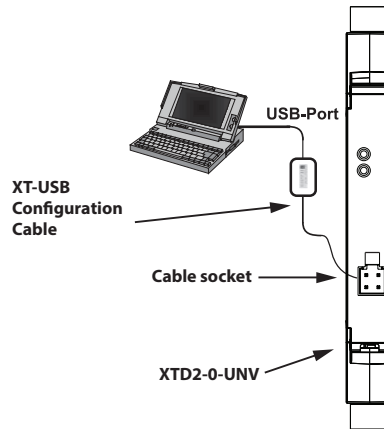
Part No.	Description	Pcs/Pkg	Wt(lb)	Price
<u>XT-SOFT</u>	ProSense configuration software, free download. For use with ProSense temperature transmitter XTP series, digital temperature sensor ETS series and models XTH-0-UNV, XTD-0-UNV.	1	N/A	Free Download
<u>Field Device Configurator</u>	ProSense configuration 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

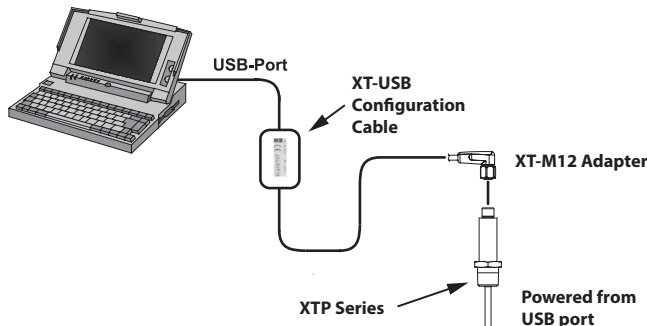
### XTH2-0-UNV Connection (Requires Field Device Configurator)



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

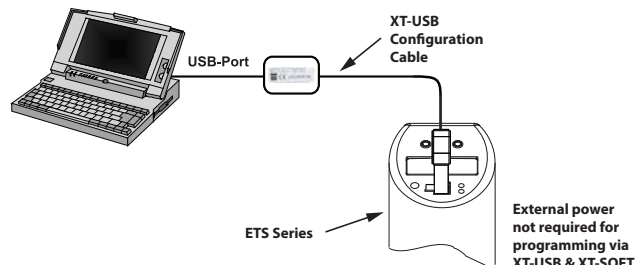


### XTP Series Connection (Requires XT-SOFT)



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.