

# XU2HI (Rev 1) Temperature Head Mount Isolated Transmitter

USB Programmable Isolated Temperature Head Mount 4~20mA Output Loop Powered Transmitter

## Features.

- Programmable via USB (requires the **XU-USB** programming key).
- No power supply or calibration required during programming.
- Input types:
  - RTD Pt100 and Pt1000.
  - Thermocouple B, E, J, K, N, R, S, T.
- Output is Linear with Temperature.
- Input to Output Isolation of 3750Vac.
- High Accuracy 0.1%.
- Reverse Polarity Protected.
- Case Temperature range -20°C to +85°C.
- Head Mount.
- Easy to Install.
- Low Cost.



## Ordering Information.

- XU2HI** Head Mount Transmitter Isolated; Standard = RTD Pt100, 0~100°C Input; Upscale; 4~20mA Output (Loop Powered).
- XU-Spring-Kit** For vibration areas or where wide ambient temperatures exist on the probe head.
- XU-USB** USB Programming Key  
Download free software via the link from: [www.intech.co.nz/product/xu2hi/](http://www.intech.co.nz/product/xu2hi/)

**Note:** The table below shows the USB programmable input types etc. for the XU2HI: The XU2HI can be pre-programmed before dispatch or is easily programmed using the **XU-USB** programming key and the free XU programming software.

ITEM	CODE		DESCRIPTION
SERIES	<b>XU2HI-</b>		Head Mount Transmitter Isolated
Type of Input	<b>Pt100-</b>		RTD Pt100 DIN (Options JIS & CN10)
	<b>Pt1000-</b>		RTD Pt1000 DIN (Options JIS & CN10)
	<b>Tc</b> <input type="checkbox"/> -		Thermocouple Type; <b>B, E, J, K, N, R, S, T</b>
Measuring Range		-	State Measuring Range
Output Action on Sensor Fail		<b>US</b>	Upscale
		<b>DS</b>	Downscale

## Ordering Examples:

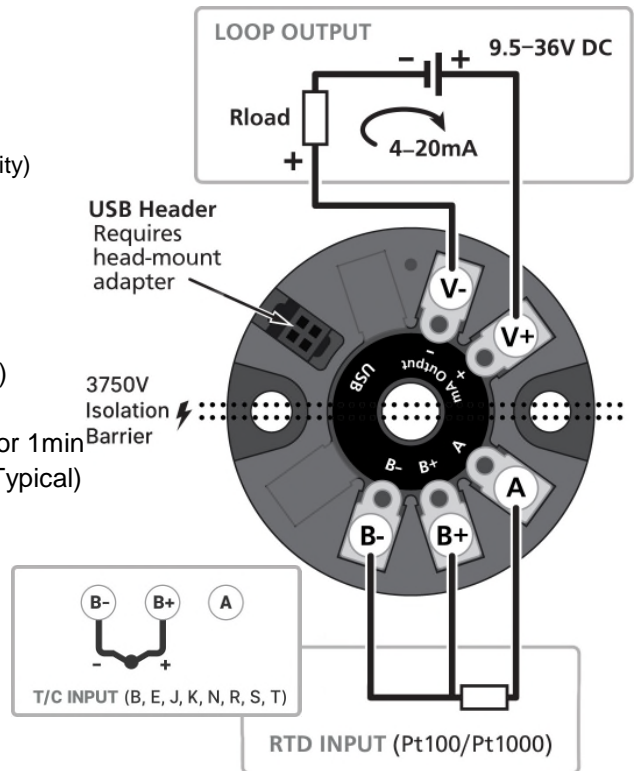
- 1/ XU2HI - Pt100 - 0~100C - DS XU2HI; RTD Pt100 DIN 0~100°C Input; Downscale; 4~20mA Output.
- 2/ XU2HI - Tc K - 0~1200C - US XU2HI; Thermocouple Type K 0~1200°C Input; Upscale; 4~20mA Output.

**Product Liability.** This information describes our products. It does not constitute guaranteed properties and is not intended to affirm the suitability of a product for a particular application. Due to ongoing research and development, designs, specifications, and documentation are subject to change without notification. Regrettably, omissions and exceptions cannot be completely ruled out. No liability will be accepted for errors, omissions or amendments to this specification. Technical data are always specified by their average values and are based on Standard Calibration Units at 25C, unless otherwise specified. Each product is subject to the 'Conditions of Sale'.

**Warning:** These products are not designed for use in, and should not be used for patient connected applications.  
In any critical installation an independent fail-safe back-up system must always be implemented.

## XU2HI Common Specifications.

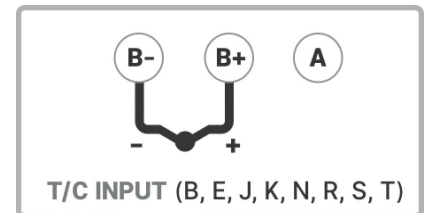
Output	2-wire 4~20mA (Loop Powered)
Power Supply	9.5~36Vdc
Supply Voltage Sensitivity	<±0.005%/V FSO
Output Load Resistance	700Ω at 24Vdc (50Ω/V above 9.5Vdc)
Maximum Output Current	Limited to <28mA (Emission and Immunity)
Emissions Compliance	EMC EN 61326
Immunity Compliance	EMC EN 61326
Safety Compliance	EMC EN 61010-1
Accurate to	<±0.03% FSO Typical
Ambient Drift	<±0.003%/°C FSO Typical
Noise Immunity	125dB CMRR Average (2.0kVdc Limit)
R.F. Immunity	<1% effect FSO Typical
Isolation Test Voltages	Between Input and Output: 3750Vac for 1min
Response Time	400msec Typical (10~90% 300msec Typical)
Sensor Fail	Low 3.8mA, High 21mA
Startup Time	3 seconds, 3.7mA output
Operating Temperature	-20~85°C
Storage Temperature	-20~100°C
Operating Humidity	5~85%RH MAX (Non-Condensing)
Mounting	Head Mount
Dimensions	H=44, W=44, D=23mm



## Thermocouple (T/C) Input Specifications.

Thermocouple Types	B, E, J, K, N, R, S, T
USB Programmable Zero	0~±99% of the Span
USB Programmable Span	Within Thermocouple Type limits
Input Impedance	1MΩ Minimum
T/C Lead Resistance	100Ω Maximum
Cold Junction Comp.	-20~90°C
Accuracy	E, J, K, N, T <±1°C B, R, S <±2°C
Temperature Drift	E, J, K, N, T <±0.05°C B, R, S <±0.2°C
CJC Error	<±1°C
Sensor Break Output Drive	Funct High Upscale Funct Low Downscale

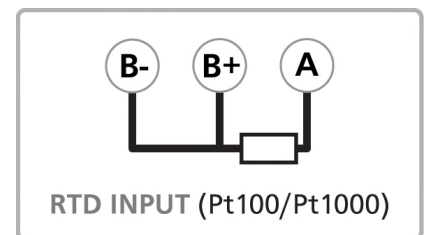
## Thermocouple (T/C) Input Wiring:



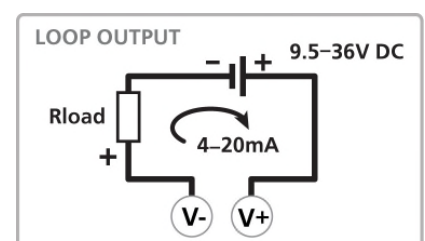
## RTD Input Specifications.

RTD Input	Pt100 or Pt1000 DIN 3-wire Type. (2-wire can be used with offset calibration)
Sensor Current	0.15mA Nominal
Lead Wire Resistance	Pt100: 10Ω/wire Maximum Pt1000: 5Ω/wire Maximum 0.02% FSO Offset Error per Ω of Lead Resistance
USB Programmable Zero	0~±99% of the Span
USB Programmable Span	-200~850°C
Sensor Break Output Drive	Funct High Upscale Funct Low Downscale
Linearity (Pt100)	0.02% FSO for Span Inputs ≤200°C 0.1% FSO for Span Inputs ≤850°C
Linearity (Pt1000)	0.02% FSO for Span Inputs ≤200°C 0.2% FSO for Span Inputs ≤520°C
Other Available RTD Types	JIS and CN10

## RTD Input Wiring:



## Output Wiring:



## **XU2HI Wiring, Installation and Maintenance.**

### **The XU2HI is to be Installed and Serviced by Service Personnel Only. No Operator / User Serviceable Parts.**

All power and signals must be de-energised before connecting any wiring.

#### **Mounting.**

\* Also refer to Connection Diagrams and Notes.

- (1) Mount in a water proof industrial connection head.
- (2) Do not subject to vibration or excess temperature or humidity variations.
- (3) Screws are supplied. Do not overtighten.
- (4) Avoid mounting near power control equipment.

#### **Analogue Signal Wiring.**

- (1) All signal cables should be good quality overall screened INSTRUMENTATION CABLE with the screen earthed at one end only.
- (2) Signal cables should be laid a minimum distance of 300mm from any power cables.
- (3) For 2 wire current loops, Austral Standard Cables B5102ES is recommended.
- (4) It is recommended that you do not ground analogue signals and use power supplies with ungrounded outputs.
- (5) Lightning arrestors should be used when there is a danger from this source.
- (6) Refer to diagrams for connection information. Observe polarity and the correct terminal connections for wiring correctly.

#### **Thermocouples.**

- (1) Avoid locating the Thermocouple where it will be in a direct flame.
- (2) Never insert a porcelain or refractory tube suddenly in a hot area. Pre-heat gradually while installing.
- (3) Locate it where the average temperature will be measured. It should be representative of the mass. If necessary use several Thermocouples to obtain the average temperature.
- (4) Immerse the Thermocouple far enough so that the measuring junction is entirely in the temperature to be measured: nine to ten times the diameter of the protection tube is recommended. Heat conducted away from the junction causes an error in reading.
- (5) If the Thermocouple is mounted horizontally and the temperature is above the softening point of the tube, a support should be provided to prevent the tube sagging. Otherwise install the tube vertically.
- (6) Keep the junction head and cold junction in the approximation of the ambient temperature. Especially in the Noble Metal Class.

#### **Thermocouple Extension Wire.**

- (1) Use the correct Thermocouple extension or compensation cable. I.e. Thermocouple type, insulation type, colour coding.
- (2) It is recommended to install extension or compensation cable in a grounded conduit by themselves, or use overall screened cable with the screen earthed at one end only. Never run electrical wires in the same conduit.
- (3) All wires that must be spliced should be soldered, or a proper Thermocouple termination block used.
- (4) Lightning arrestors should be used if there is a danger from this source.

#### **RTDs.**

- (1) Avoid locating the RTD where it will be in a direct flame.
- (2) Locate it where the average temperature will be measured. It should be representative of the mass.
- (3) Immerse the RTD far enough so that the measuring point is entirely in the temperature to be measured; nine to ten times the diameter of the protection tube is recommended. Heat that is conducted away from the measuring point causes an error in reading.

## **XU2HI Commissioning.**

- (1) **WARNING: Ensure that all programming is carried out BEFORE any wiring takes place!**
- (2) Check that the XU2HI has been set to the correct input ranges and all functions such as Upscale/Downscale. Observe polarity and the correct terminal connections for wiring correctly. Only use certified calibration equipment. Once the above conditions have been met, and the wiring checked, apply power to the XU2HI, and associated current loops, transducers, sensors and indicators etc. Allow a 5 minute warm-up period.

**RTD Inputs:** A small error can occur due to differences in cable resistance in the RTD legs, and errors in the RTD itself. (Usually less than 0.5°C).

## **XU2HI Maintenance.**

#### **RTD Inputs.**

- (1) Check RTD's in place. Do it regularly - at least once every six months.
- (2) Replace defective protection tubes - even if they look good they may not be air or gas tight.
- (3) Check cables entering the RTD sensor head.

#### **Thermocouple Inputs.**

- (1) Replace defective protection tubes - even if they look good they may not be air or gas tight.
- (2) Check extension and compensating cable circuits, especially cables entering the Thermocouple sensor head.
- (3) Do not use the same Chromel-Alumel (Type K) Thermocouple below 540°C if it was used above 860°C.
- (4) Repeat (2) of commissioning. Do it regularly - at least once a month.

**Intech**  
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