TEKTROL

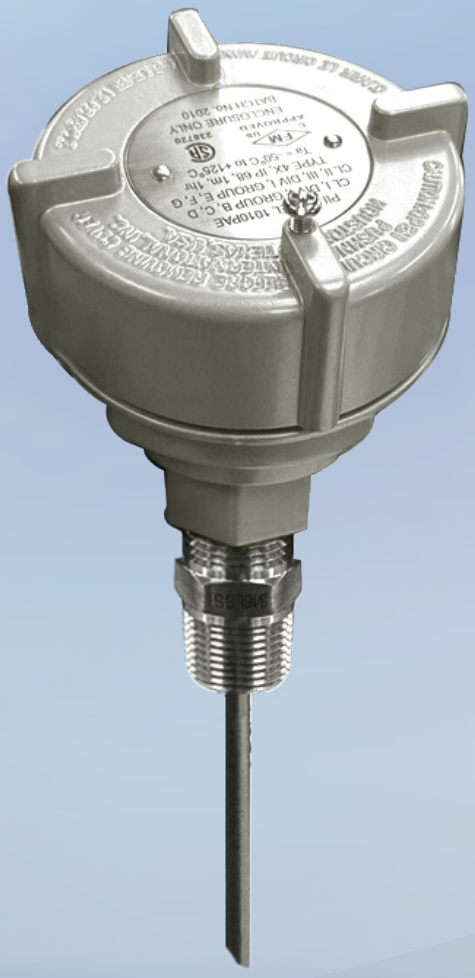
Technology Solutions

TEK-TEMP 2100B

Temperature Transmitter

Instruction Manual

Document Number: IM- 2100B



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NOTICE
Read this manual before working with the product. For personal and system safety, and for optimum product performance, make sure you thoroughly understand the contents before installing, using, or maintaining this product.

For technical assistance, contact
Customer Support
796 Tek-Drive
Crystal Lake, IL 60014
USA
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1 Safety Instructions

1.1 Intended Use

Tek-Temp 2100B is a general-purpose temperature transmitter that can be used in a variety of applications.

1.2 Certifications

ATEX, IECEx, FM, CSA, DNV Inmetro, CE

1.3 Safety Instructions from the Manufacturer

1.3.1 Disclaimer

The manufacturer is not liable for damages resulting from misuse. The warranty applies only to product documentation and the Terms of Sale.

1.3.2 Product Liability and Warranty

Operator is responsible for correct application. Incorrect use voids warranty.

1.3.3 Information Concerning the Documentation

Always read this manual and applicable safety standards before use.

1.4 Safety Precautions

- Read all instructions before installation or commissioning.
- Retain this guide for future reference
- Contact the manufacturer about unresolved issues.

Warnings and symbols Used

The following safety symbol marks are used in this operating instruction manual and instrument.

WARNING

Risk of injury or equipment damage.

CAUTION

Potential for malfunction or minor injury.

NOTE

Important info affecting performance.

1.5 Packaging, Transportation and Storage

- Check for shipping damage on delivery.
- Unpack only at the installation site. Avoid shock, rain, or impact.
- Keep plugs/seals intact until wiring. Use original packaging if storing.

1.5.1 Storage Conditions

- **Ambient Temperature**
  - -40°F to 185°F (-40°C to 85°C)
- **Verify device model and voltage from nameplate**

1.5.2 Nameplate

2 Product Description

2.1 Introduction

The Tek-Temp 2100B Temperature Transmitter is a precision-engineered device designed to improve temperature measurement accuracy, reliability, and system integration in industrial environments. It is built to convert a variety of sensor inputs into a stable 4–20 mA analog output, with optional HART® communication for enhanced diagnostics and remote configuration.

With universal input compatibility—including RTDs, thermocouples, millivolt, and resistance-based sensors—the 2100B provides flexibility across a broad range of process conditions. Its compact and rugged construction, combined with certifications for hazardous area use, makes it suitable for both standard and safety-instrumented installations.

2.2 Measuring Principle

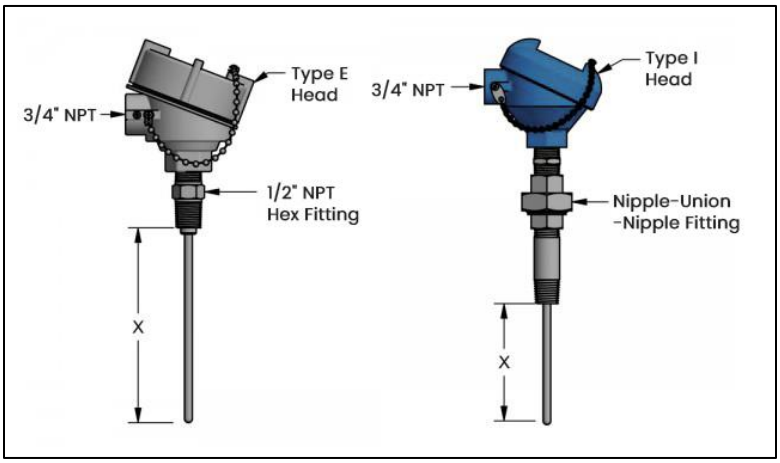
An RTD operates on the principle that the electrical resistance of a metal changes with temperature. The resistance of the sensing element increases as the temperature increases.

A Thermocouple operates on the principle that two dissimilar metals connected at two separate junctions will produce a voltage when one of the junction's temperatures is different than the other.

2.3 Specifications

Accuracy	Better than 0.1% of span
Sensor	**RTD:** Pt 100, Ni100, lin. R **TC:** B, E, J, K, L, N, R, S, T, U, W3, W5
Ambient Temperature	-40°F to 185°F (-40°C to 85°C)
Output	RTD, TC, 4-20mA, 4-20mA with HART
Process Connections	Threaded, Flanged, Tri-Clamp, Special
Update Time	Less than 0.5 seconds
Damping Time	32 seconds maximum. 5 seconds default amping
Material of Construction	Die-Cast Aluminium
Weight	0.5 KG (1.1 LBS)
Enclosure Rating	NEMAX IP66/68 rating
Approval	ATEX, IECEx, FM, CSA, DNV Inmetro, CE

2.4 Dimensional Drawing



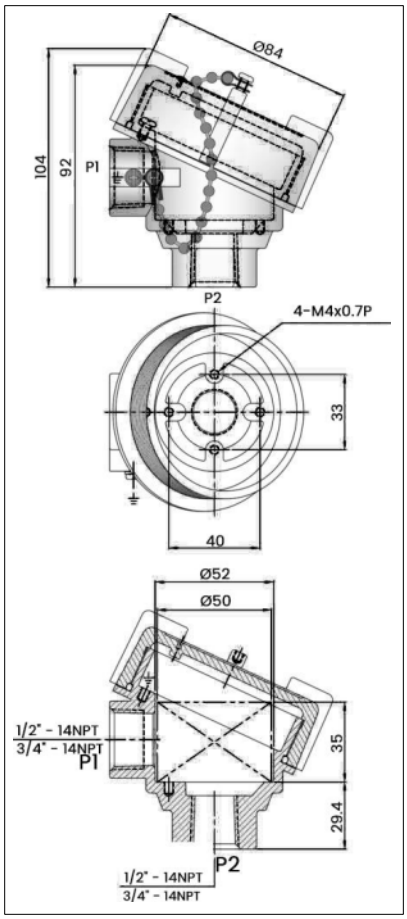


Fig 2. Dimensional Drawing

2.5 Model Chart

Example	Tek - Temp 2100B	01	A	R	01	N	01	2.5	FC	Tek-Temp 2100B-01-A-R-01-N-01-2.5-FC
Series	Tek-Temp 2100B									Temperature Transmitter
Housing		1 2								General Purpose (NEMA 4X) Explosion-Proof
Transmitter			A B C							None 4–20 mA 4–20 mA HART
Sensor				R J K T						RTD (Pt 100) J Type Thermocouple K Type Thermocouple T Type Thermocouple
Type					1 2 3					Welded Spring Loaded Nipple Union
Thermowell						N W				No Thermowell Thermowell
Process Connection							1 2 3 4 5 6 7 X			½" NPT ¼" NPT 1" NPT 1" 150# Flange (Thermowell only) 1" 200# Flange (Thermowell only) 1" 300# Flange (Thermowell only) 2" 300# Flange (Thermowell only) Custom
U-Length								2.5 04 06 09 12 XX		2.5" 4" 6" 9" 12" Custom
Options									FC TAG CC1	Factory Configuration (HART only) Stainless Steel Tag Custom Range (1 Line, HART only)

3 Installation

The Tek-Temp 2100B can be supplied either as a complete assembly with a sensor and thermowell, or as a stand-alone transmitter. When the unit is provided without a sensor or thermowell assembly, please refer to the installation guidelines below for proper integration with your existing sensor configuration.

- Attach the thermowell to the pipe or process container wall, then install and tighten the thermowell before applying process pressure.
- Assemble the transmitter to the sensor. Push the transmitter mounting screws through the sensor mounting plate and insert the snap rings (optional) into the transmitter mounting screw groove.
- Wire the sensor to the transmitter

- Insert the transmitter-sensor assembly into the connection head. Thread the transmitter mounting screw into the connection head mounting holes and assemble the extension to the connection head then insert the assembly into the thermowell
- Slip the shielded cable though the cable gland
- Attach a cable gland into the shielded cable
- Insert the shielded cable leads into the connection head through the cable entry then connect and tighten the cable gland.
- Connect the shielded power cable leads to the transmitter power terminals making sure to avoid contact with sensor leads and sensor connections.
- Install and tighten the connection head cover making sure the enclosure covers are fully engaged to meet explosion-proof requirements

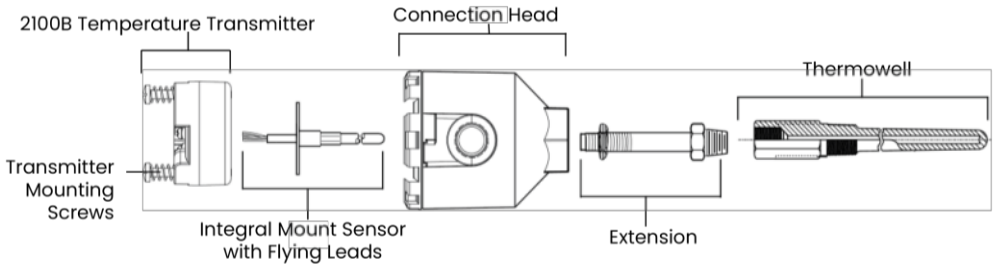


Fig 3. Installation Drawing

4 Wiring

4.1 General Wiring Guidelines

RTD and thermocouple assemblies (with or without a thermowell) are factory-wired before they are shipped.

For explosion proof assemblies:

- In North America, you need to install a conduit seal within 18 inches of the connection head.
- For ATEX or IECEx approved setups, the seal must be placed right at the connection head.

For setups that are not explosion-proof, you must use an intrinsically safe barrier. Always follow the wiring instructions given by the equipment supplier to connect the head to your input device.

Important for Hazardous Areas:
Before taking the device out of service in a hazardous location, make sure the area is safe and no longer classified as hazardous. Not doing this can cause serious injury or major damage.

4.2 Commissioning and Set Up

The transmitter housing composes of two parts. One side is electronics circuit, and other side is terminal block. The terminal block side is the transmitter's front side and is indicated as "Field Terminal" in transmitter's external housing. Open this side's housing cover; the terminal block in-housing is inside. Consider the terminal block polarity while connecting the transmitter's power supply.

Typical RTD Wiring – Industrial RTDs

- All RTDs are fully tested to ensure accuracy and function.
- Standard sheath material is 316 Stainless Steel (SS).
- Other materials and coatings are available if requested.
- RTDs use either thin film or wire-wound elements, with thin film being the default.
- Every RTD includes a heavy-duty spring for secure installation.

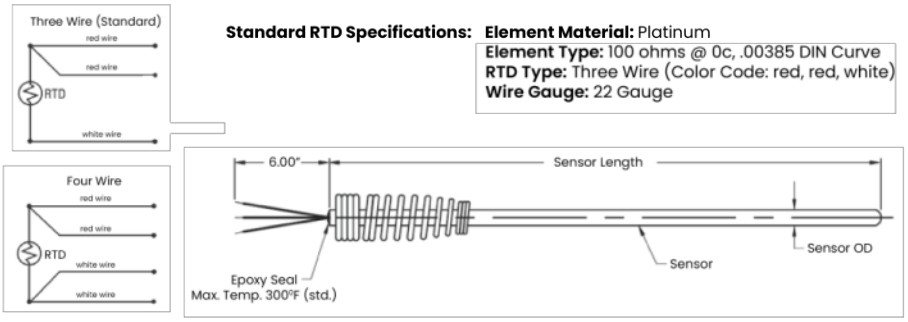


Fig 4. Commissioning and Set Up Drawing

Typical Thermocouple Wiring

- Industrial thermocouples are made using high-purity mineral oxide insulation with a metallic sheath.
- Standard sheath material is 316 Stainless Steel.
- Outer diameters are designed to fit wells or protection tubes.
- Each thermocouple includes a heavy-duty spring for proper contact and pressure.
- Wire gauge: 20 AWG solid, Teflon insulated conductors.

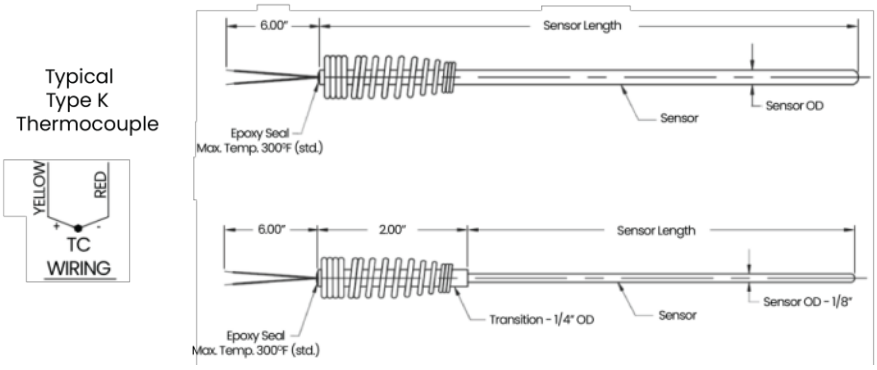


Fig 5. Typical Thermocouple Wiring

4.3 Sensor Connection

Your assembly may include a DIN head-mounted puck-style transmitter; this transmitter connects directly to the sensor leads and provides a 4–20 mA analog output, often with HART communication capability.

Wiring Guidelines:

- Connect sensor wires to clearly mark input terminals on the transmitter.
- Check polarity and ensure all terminal screws are securely tightened.
- Use proper wiring materials, such as 20 AWG Teflon-insulated wires for thermocouples.
- Always follow the wiring diagram or labeling on the transmitter.

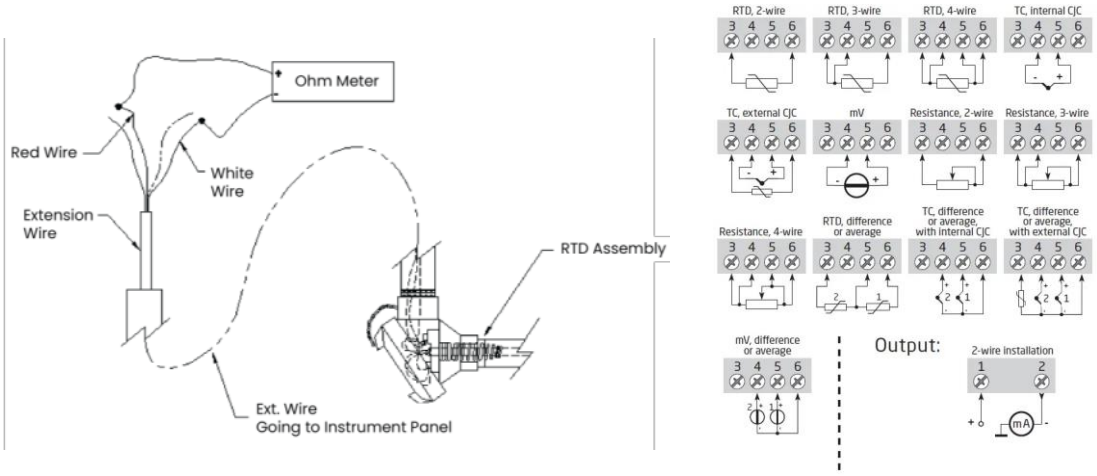


Fig 6. Sensor Connection

5 Operation

The Tek-Temp 2100B temperature transmitter operates by converting input signals from RTDs or thermocouples into a standard 4–20 mA output, with optional HART communication. It is designed for precision temperature measurement in industrial environments and is typically pre-configured at the factory when shipped.

5.1 Programming Options

The 2100B includes a head-mounted (hockey puck-style) transmitter, located inside the sensor assembly's terminal head. This transmitter is programmable through the following interfaces:

1. HART Modem + Preset

Connect the modem to your PC and follow on-screen instructions to configure sensor type, range, and output parameters.

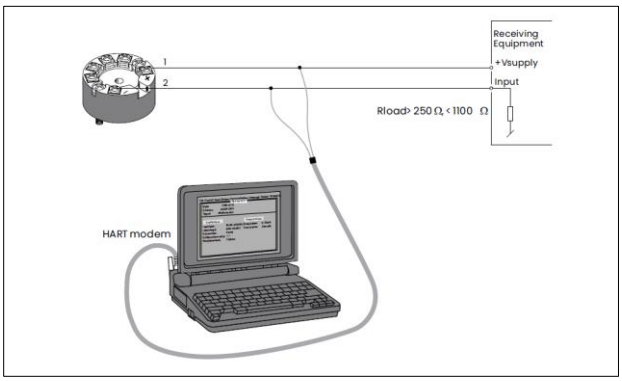


Fig 7. HART Modem

2. Loop Link + Preset PC Software

For local setup in non-hazardous areas only. Not suitable for use in Ex-rated zones.

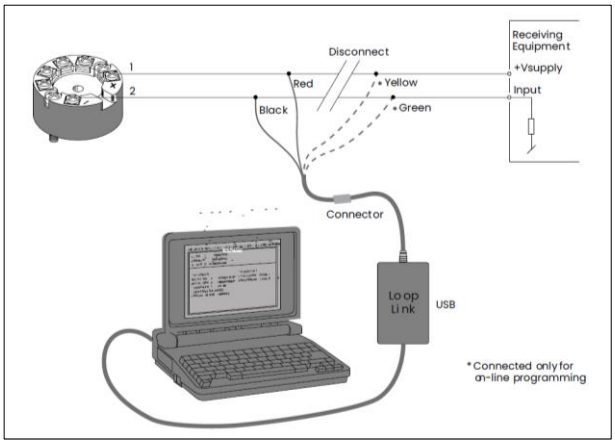


Fig 8. Loop Link

3. HART Handheld Communicator

Load the **Tektrol LIC A/S DDL driver** onto the communicator to access full configuration capabilities.

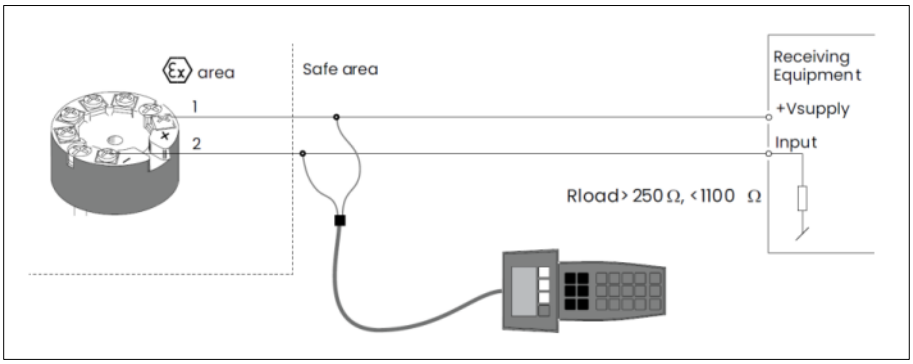


Fig 9. HART Communicator

5.2 Multidrop Configuration (Optional Mode)

For advanced HART network setups:

- Up to 15 transmitters can be connected in parallel on the same 2-wire loop.
- Each transmitter must have a unique polling address (1–15).
- Outputs are fixed at 4 mA in multidrop mode.
- Configure using a HART communicator or PC with HART software.
- Ensure loop current does not exceed 60 mA

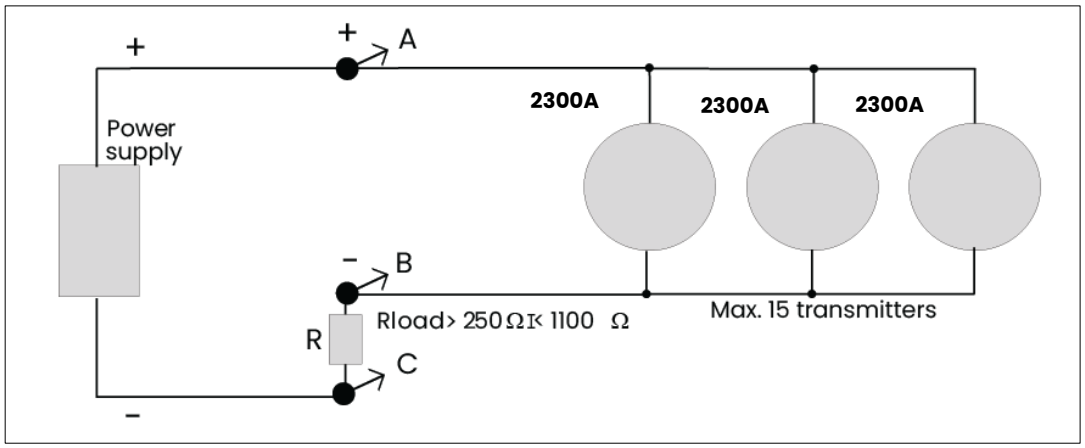


Fig 10. Connection of Transmitters in Multidrop Mode

6 Troubleshooting

Troubleshooting		
Resistance Reading	**Possible Problem**	**Corrective Action Follow-Up Check**
Infinite Resistance	Damaged Sensor Faulty Extension Wire Connection	Check sensor at RTD assembly head if possible and confirm reading
Between 0 and 1 Ohms	Short Circuit At Sensor Faulty Extension Wire (Shorted)	Disconnect extension wire at sensor head and test the sensor at the terminal block. If sensor checks out, problem is with extension wire, replace extension wire.

Fig 11. Troubleshooting

- Measure the resistance at the RTD sensor head by probing between the red and white wires.
- Ensure your power source delivers a voltage between 10 VDC and 42 VDC.
- Connect the power supply, a milliammeter, and a 100-ohm resistor in series with the input terminals of the transmitter.
- If the transmitter is configured for a 4–20 mA signal range and the starting point (zero) is set to 0°C, the output should read close to 4.00 mA on the milliammeter.

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