# TT508/TT518 Programmable Temperature Transmitter

## Overview

This transmitter amplifies a signal from a RTD or linear resistance, and it turns the signal into a current which increases from 4 to 20 milliamperes as the temperature or input signal increases. This industry-standard 4-20mA signal travels thousands of feet over a pair of wires, ignoring electrical interference and bringing the temperature, accurately, into your computer or controller. Drawing power directly from the signal line, only 2 wires are needed for power and signal.

• RTD or Ohm input

• Accurate, Stable 4–20mA Output

• PC and field-programmable

• FM Approved Intrinsically Safe

## Converts multiple inputs

Temperature measurement can be done with one of several RTD's: 100 Ω, 1000 Ω platinum, 100 Ω Nickel and 1000 Ω Nickel.

Because amplification and conversion of the input signal is performed within a few feet of the sensor, electrical interference in noisy environments is eliminated. The transmitter can be mounted at the field location in a standard DIN form B head or on a DIN rail inside a local box.

## Applications

• Single temperature measurement

## Configuration

The TT508/TT518 is delivered configured to the customer's specifications, including the transmitter's measurement range and RTD type.

## PC Programming

The TT508/TT518 transmitter can be configured via a standard PC using a programming kit. It can be configured before installation or while installed in the process - even in hazardous areas. Communication is 2-way, so set-up and serial/tag numbers can be retrieved from the transmitter.

## Specifications

**Ambient temperature range:** -40°C to +85°C

**Supply voltage:** 8 -30 VDC

**Warm-up time:** 5 min.

**Communication interface:** PC Interface/Loop Link

**Signal/noise ratio:** Min. 60 dB

**Response time (programmable):** 0.33 sec. to 60 sec.

**Update time:** 135 msec.

**Calibration temperature:** 20 to 28°C

**Effect of supply voltage change:** < 0.005% of span/ VDC

**EMC-Immunity influence:** < ±0.5% of span

**Vibration:** IEC 600 68-2-6 Test FC

**Lloyd's specification no. 1:** 4 g / 2 - 100 Hz

**Max. wire size:** AWG14 (1.5 mm$^2$)

**Air humidity:** 0 - 95% RH

**Dimensions:** ⌀1.73 x 0.84 in (⌀44 x 20.2mm)

**Tightness (enclosure/terminal):** IP 68 / IP00

**Weight:** 50g

# TT508/TT518 Programmable Temperature Transmitter

## Inputs (common specifications)

**Max. offset:** 50% of selected max. value

**Cable resistance per wire (max.):** 10Ω

**Sensor current:** >0.2mA, <0.4mA

**Effect of sensor cable resistance:**
    (3-wire): < 0.002 Ω/Ω

**Input:**

| Type | Minimum Value | Maximum Value | Minimum Span |
|------|---------------|---------------|--------------|
| PD (Pt100) | -200°C | +850°C | 25°C |
| PF (Pt1000) | -200°C | +850°C | 25°C |
| Linear Res. | 0 Ω | 10000 Ω | 30 Ω |

**Basic accuracy:**
    PD/PF (Pt100/1000): <±0.3°C
    Linear Resistance: <±0.2Ω

**Temperature coefficient:**
    PD/PF (Pt100/1000): <±0.01°C/°C
    Linear Resistance: <±20mΩ/°C

**Current output:**
    Signal range: 4 - 20 mA
    Min. signal range: 16 mA
    Load resistance : < (Vsup. – 8) / 0.023 [Ω]
    Load stability: ± 0.01% of span / 100 Ω

**Sensor error detection:**
    Programmable: 3.5 - 23 mA, or no action
    Namur NE43 Downscale/Upscale: 3.5 mA/ 23 mA

**Approvals:**
    EMC: EN 61326-1
    ATEX.: KEMA 03ATEX1535
    FM: 2D5A7
    CSA: 1125003
    GOST R: Yes
    GOST Ex: Yes
    DNV Marine: Stand. F. Certification No. 2.4

## Input

The input type is selected to be one of these types:

• RTD (2 or 3-wire): PT100, PT1000

## Output

The 4-20 mA output follows the TT518 input configuration, reflecting the temperature and/or resistance. The unit is protected against polarity reversal. The output signal action can be reversed with respect to the input signal. Sensor and/or cable errors can be programmed to cause the output to go to a fixed value.

## Specification and order options:

| | |
|---|---|
| TT518 | Model Number:<br>TT518 Approvals, fits .236" Probe Max<br>TT508 No Approvals, fits .250" Probe Max |
| PD | Sensor Type:<br>PD = 100 Ω Platinum RTD (0.00385)<br>PF = 1000 Ω Platinum RTD (0.00385) |
| (-25/200) | Ranging:<br>Specify temperature range in either °C or °F.<br>For example, -25° to +200°C = 4 to 20 mA. |
| C | Display Units:<br>C = Celsius<br>F = Fahrenheit |
| 1 | Calibration:<br>1 = Nominal<br>2 = Matched to sensor ±0.75% of span<br>For other calibration options, contact Mod-Tronic |
| Z | Sensor Leads: (3 Lead Recommended)<br>Y = 2-lead RTD (Supplied with jumper wire to connect terminals 3 and 4)<br>Z = 3-lead RTD |
| TT518PD(-25/200)C1Z : Sample part number | |

*Note: TT508 does not carry any external approvals, but does allow a .250" probe to pass through its center hole*

# TT509/TT519 Programmable Temperature Transmitter

## Overview

This transmitter amplifies a signal from a thermocouple, and it turns the signal into a current which increases from 4 to 20 milliamperes as the temperature or input signal increases. This industry-standard 4-20mA signal travels thousands of feet over a pair of wires, ignoring electrical interference and bringing the temperature, accurately, into your computer or controller. Drawing power directly from the signal line, only 2 wires are needed for power and signal.

• Thermocouple or Voltage Input

• Accurate, Stable 4–20mA Output

• PC and field-programmable

• Galvanically Isolated

## Converts multiple inputs

Temperature measurement can be done with multiple thermo-couple types, which boast high operating temperature ranges.

Because amplification and conversion of the input signal is performed within a few feet of the sensor, electrical interfer-ence in noisy environments is eliminated. The transmitter can be mounted at the field location in a standard DIN form B head or on a DIN rail inside a local box.

## Applications

• Single temperature measurement

## Configuration

The TT509/TT519 is delivered configured to the customer's specifications, including the transmitter's measurement range and thermocouple type.

## PC programming

The TT509/TT519 transmitter can be configured via a standard PC using a programming kit. It can be configured before instal-lation or while installed in the process - even in hazardous areas. Communication is 2-way, so set-up and serial/tag num-bers can be retrieved from the transmitter.

## Specifications

**Ambient temperature range:** -40°C to +85°C

**Supply voltage:** 7.2 -30 VDC

**Warm-up time:** 5 min.

**Communication interface:** PC Interface/Loop Link

**Signal/noise ratio:** Min. 60 dB

**Response time (programmable):** 1 sec. to 60 sec.

**Update time:** 440 msec.

**Calibration temperature:** 20 to 28°C

**Effect of supply voltage change:** < 0.005% of span/ VDC

**EMC-Immunity influence:** < ±0.5% of span

**Electrical Isolation, test/operation:** 1.5kVAC/50VAC

**Vibration:** IEC 600 68-2-6 Test FC

**Lloyd's specification no. 1:** 4 g / 2 - 100 Hz

**Max. wire size:** AWG14 (1.5 mm$^2$)

**Air humidity:** 0 - 95% RH

**Dimensions:** $\varnothing$1.73 x 0.84 in ($\varnothing$44 x 20.2mm)

**Tightness (enclosure/terminal):** IP 68 / IP00

**Weight:** 50g

▼ = *STANDARD OPTIONS*
*Specifications subject to change*

# TT509/TT519 Programmable Temperature Transmitter

## Inputs (common specifications)

**Max. offset:** 50% of selected max. value

**Input:**

| Type | Minimum Value | Maximum Value | Minimum Span |
|------|---------------|---------------|--------------|
| E | -100°C | +1000°C | 50°C |
| J | -100°C | +1200°C | 50°C |
| K | -180°C | +1372°C | 50°C |
| T | -200°C | +400°C | 50°C |
| B | +400°C | +1820°C | 100°C |
| N | -180°C | +1300°C | 50°C |
| R | -50°C | +1760°C | 100°C |
| S | -50°C | +1760°C | 100°C |

**Basic accuracy:**

> TC type E, J, K, L, N, T: <±1°C
> TC type B, R, S: <±2°C
> Voltage: ¶±10uV

**Temperature coefficient:**

> TC type E, J, K, T: <±0.05°C/°C
> TC type B, N, R, S: <±0.2°C/°C
> Voltage: <±1uV/°C
> Cold Junction Compensation: <±1°C

**Current output:**

> Signal range: 4 - 20 mA
> Min. signal range: 16 mA
> Load resistance : < (Vsup. – 7.2) / 0.023 [Ω]
> Load stability: ± 0.01% of span / 100 Ω

**Sensor error detection:**

> Programmable: 3.5 - 23 mA, or no action
> Namur NE43 Downscale/Upscale: 3.5 mA/ 23 mA

**Approvals:**

> EMC: EN 61326-1
> ATEX.: KEMA 06ATEX0062
> GOST R: Yes
> GOST Ex: Yes
> DNV Marine: Stand. F. Certification No. 2.4

## Input

The input type is selected to be one of these types:

• Type E, J, K, T, B, N, R, S Thermocouple

• Voltage Input

## Output

The 4-20 mA output follows the TT519 input configuration, reflecting the temperature. The unit is protected against polarity reversal. The output signal action can be reversed with respect to the input signal. Sensor and/or cable errors can be programmed to cause the output to go to a fixed value.

## Specification and order options:

| TT519 | Model Number: TT519 Approvals, fits .236" Probe Max TT509 No Approvals, fits .250" Probe Max |
|-------|-----------------------------------------------------|
| K | Sensor Type: E=Type E Thermocouple J=Type J Thermocouple K=Type K Thermocouple T=Type T Thermocouple B=Type B Thermocouple N=Type N Thermocouple R=Type R Thermocouple S=Type S Thermocouple V = Voltage Input |
| (-25/200) | Ranging: Specify temperature range in either °C or °F. For example, -25° to +200°C = 4 to 20 mA. |
| C | Display Units: C = Celsius F = Fahrenheit MV = Millivolts |
| 1 | Calibration: 1 = Nominal |
| Y | Sensor Leads: Y = 2-lead |
| TT519K(-25/200)C1Y: Sample part number | |

*Note: TT509 does not carry any external approvals, but does allow a .250‴ probe to pass through its center hole*

▼ = *STANDARD OPTIONS*
*Specifications subject to change*

# Programmable Transmitters

## Overview

Models TT520 and TT530 are programmable transmitters designed for process control and other applications. Both transmitters use a 4-20mA current loop output and are PC programmable to accept a signal from a thermocouple, a Resistance Temperature Detector (RTD), or a millivolt signal. Model TT520 can be mounted at the field location in a standard DIN form B head or on a DIN rail inside a local box (with an AC807 Minco DIN rail adapter), whereas model TT530 can be mounted vertically or horizontally on a DIN rail.

- T/C, RTD, or mV input

- Accurate, Stable 4-20mA Output

- PC and field-programmable

- Galvanically isolated

- FM Approved Intrinsically Safe

- Single temperature measurement

TT520

TT530

## Specifications
## Common Specifications:

**Supply voltage:** 7.2 - 30 VDC

**Temperature coefficient:** $< \pm 0.01\%$ of span/ °C

**Effect of supply voltage change:** $< 0.005\%$ of span/ VDC

**Max. wire size:** AWG14 (1.5 mm²)

**Air humidity:** 0 - 95% RH

**Dimensions:**
TT520: Ø1.73 x 0.84 in (Ø44 x 20.2mm)

TT530: 4.29 x .93 x 4.09 in (109 x 23.5 x 104mm)

**AC205817 USB Loop Link Programmer:**
TT520 and TT530 transmitters are preconfigured for ease of use. The AC205817 USB Loop Link Programmer allows the user to reconfigure the transmitter using free, Windows-based software.

**Tightness (enclosure/terminal):**
TT520: IP 68 / IP00
TT530: IP50 / IP20

**Weight:**
TT520: 50 g
TT530: 145 g

## TC Input:

**Minimum measurement range:**
Type E, J, K, T: 50°C
Max. offset: 50% of selected max. value

**Basic accuracy:**
Type E, J, K, T: $\leq 1$°C
Cold junction compensation (CJC): $\leq 1.0$°C

**Temperature coefficient:**
Type E, J, K, T: $\leq \pm 0.05$ °C / °C$_{amb}$
Sensor error detection: yes

| RTD type | Minimum value | Maximum value | Minimum span. |
|---|---|---|---|
| PD (Pt100) | -200°C | +850°C | 25°C |
| PF (Pt1000) | -200°C | +850°C | 25°C |

**RTD-input:**
Basic accuracy PD/PF (Pt100/1000): $\leq \pm 0.2$°C
Temperature coefficient: $\leq \pm 0.01$°C / °C

**Current output:**
Signal range: 4 - 20 mA
Load resistance: $< (Vsup. - 7.2) / 0.023$ [$\Omega$]

**Intrinsic Safety data:** FM Approved Intrinsically Safe for Class 1, Div. 1, Groups A-D, Entity Approval

$V_{max}$: 30.0 VDC          $C_i$: 1 nF
$I_{max}$: 120 mADC          $L_i$: 10 $\mu$H
$P_{max}$: 0.84 W

Europe:   ATEX II 1 G

**Meets these European requirements:**
EMC 2004/108/EC: Standard EN 61326

▼ = *STANDARD OPTIONS*
*Specifications subject to change*
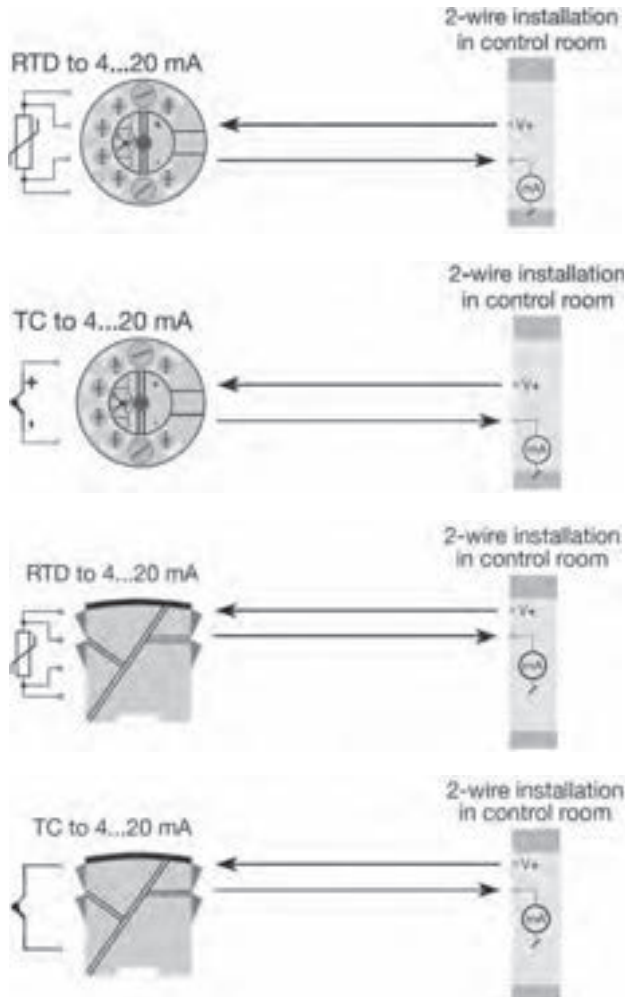
# Programmable Transmitters

## Specifications and order options

| TT520 | Model Number: |
|---|---|
| | TT520 Temperature Transmitter |
| | TT530 DIN Rail Temperature Transmitter |
| PD | Sensor Type: |
| | PD = 100Ω Platinum RTD (0.00385) |
| | PF = 1000Ω Platinum RTD (0.00385) |
| | E = Type E Thermocouple |
| | J = Type J Thermocouple |
| | K = Type K Thermocouple |
| | T = Type T Thermocouple |
| (-25/200) | Temperature Range: |
| | Specify temperature range in either °C or °F. |
| | For example, -25° to +200°C = 4 to 20 mA. |
| C | Temperature Units: |
| | C = Celsius |
| | F = Fahrenheit |
| 1 | Calibration: |
| | 1 = Nominal |
| | 2 = Matched to sensor ±0.75% span |
| | For other calibration options, contact Mod-Tronic |
| Y | Sensor Leads: |
| | Y = 2-lead RTD (or thermocouple) |
| | Z = 3-lead RTD |
| | X = 4-lead RTD |
| TT520PD(-25/200)C1Y = Sample part number | |

## Dimensions in inches (mm)
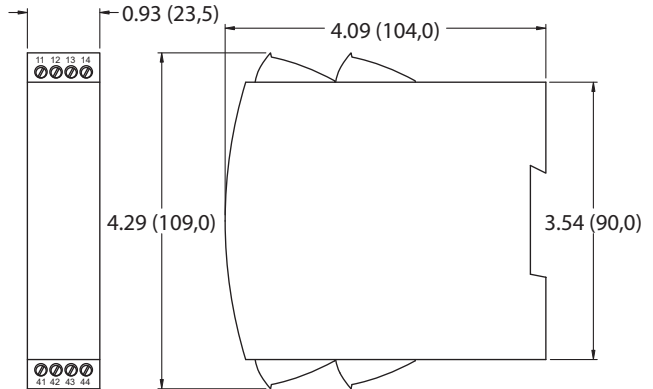


## Wiring Diagrams



## Dimensions in inches (mm)
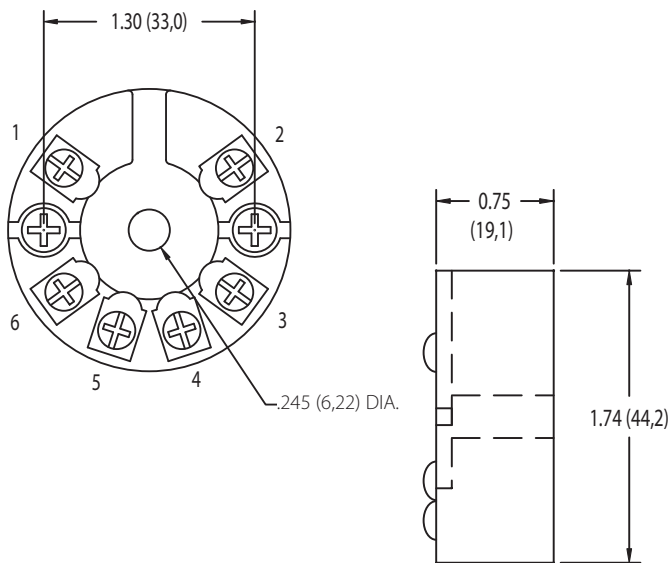


*Specifications subject to change*

# Programmable Transmitters w/ HART® Protocol



TT511/TT521

TT531

## Overview

Models TT511, TT521 and TT531 are programmable transmitters designed for process control and other applications. All three models use HART® communication protocol and are PC programmable to accept a signal from a thermocouple, a Resistance Temperature Detector (RTD), or a millivolt signal. Model TT511/TT521 transmitter can be mounted at the field location in a standard DIN form B head or on a DIN rail inside a local box (with an AC807 Minco DIN rail adapter). Model TT531 can be mounted vertically or horizontally on a DIN rail.

- T/C, RTD, or mV input
- HART® 7/5 Communication Protocol
- PC and field-programmable
- Galvanically isolated
- FM Approved Intrinsically Safe
- Single temperature measurement
- Difference temperature measurement
- Average temperature measurement

## HART® Communication

By way of 2-wire HART® communication between the process computer and the TT511, TT521 or TT531, the transmitter is programmable, readable, and controllable.

- Up to 63 transmitters can be controlled in a multidrop system. (Parallel connection of all transmitters on 2 wires).
- Set-up, configuration and control can be done from a central monitoring room.

When each transmitter is connected to a 2-wire cable, a standard 4-20 mA signal can be used at the same time as the HART® communication.

## Specifications

## Common Specifications:

**Supply voltage:** 8.0 - 30 VDC

*Specifications subject to change*

**Communication interface:** HART® 7/5 and PC interface

**Temperature coefficient:** $< \pm 0.005\%$ of span/ °C

**Effect of supply voltage change:** $< 0.005\%$ of span/ VDC

**Max. wire size:** AWG14 (1.5 mm$^2$)

**Air humidity:** 0 - 95% RH

**Dimensions:**
TT511/TT521: Ø1.73 x 0.84 in (Ø44 x 20.2mm)
TT531: 4.29 x .0.93 x 4.09 in (109 x 23.5 x 104mm)

**Tightness (enclosure/terminal):**
TT511/TT521: IP 68 / IP00      TT531: IP50 / IP20

**Weight:**
TT511/TT521: 50 g            TT531: 145 g

**AC205817 USB Loop Link Programmer:**
TT511/TT521 and TT531 transmitters are preconfigured for ease of use. The AC205817 USB Loop Link Programmer allows the user to reconfigure the transmitter using free, Windows-based software.

**TC Input:**

**Minimum measurement range:**
Type E, J, K, T : 50°C
Max. offset: 50% of selected max. value

**Basic accuracy:**
Type E, J, K, T : $<\pm0.5$°C
Cold junction compensation (CJC): $<\pm1.0$°C

**Temperature coefficient:**
Type E, J, K, T: $\pm 0.025$ °C / °C$_{amb}$
Sensor error detection: yes

**RTD-input:**

| RTD type | Minimum value | Maximum value | Minimum span. |
|----------|---------------|---------------|---------------|
| PD (Pt100) | -200°C | +850°C | 25°C |
| PF (Pt1000) | -200°C | +850°C | 25°C |

Basic accuracy PD/PF (Pt100/1000): $\leq\pm0.1$°C
Temperature coefficient: $\leq\pm0.005$°C / °C

**Current output:**
Signal range: 4 - 20 mA
Load resistance: $<$ (Vsup. - 8) / 0.023 [Ω]

**Intrinsic Safety data:** FM Approved Intrinsically Safe for Class 1, Div. 1, Groups A-D, Entity Approval
$V_{max}$: 30.0 VDC                $C_i$: 1 nF
$I_{max}$: 120 mADC                $L_i$: 10 $\mu$H
$P_{max}$: 0.84 W
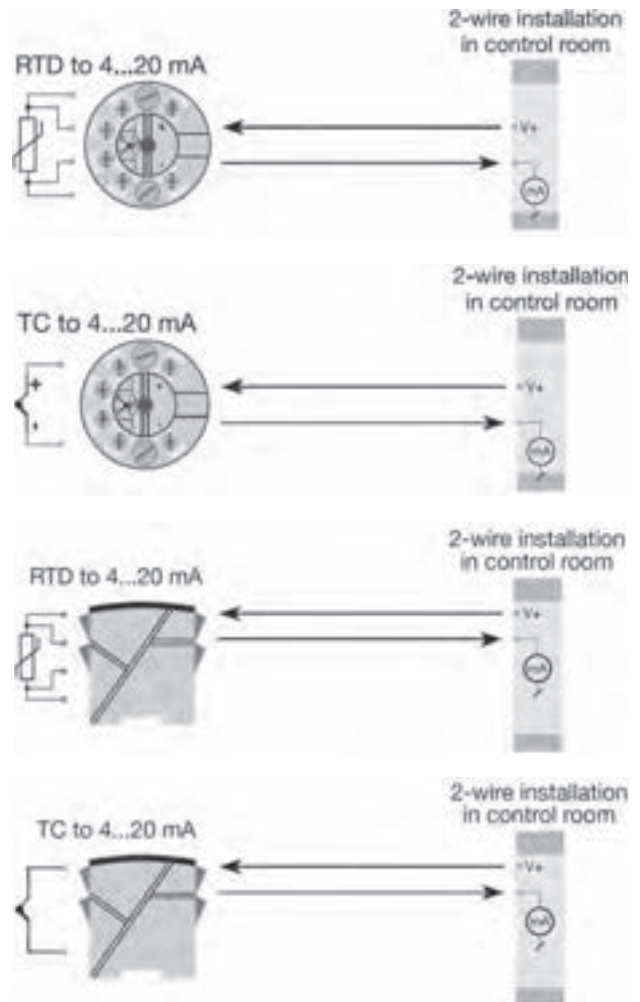Europe:   ATEX II 1 G

**Meets these European requirements:**
EMC 2004/108/EC: Standard EN 61326-1
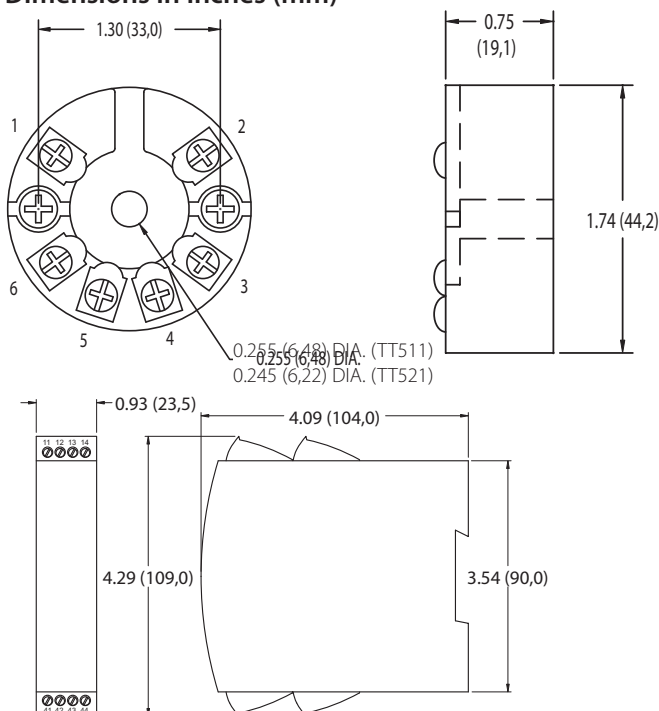
# Programmable Transmitters w/ HART® Protocol

## Specifications and order options

| TT521 | Model Number: |
|---|---|
| | TT511 No Approvals, Temperature Transmitter with HART® protocol, fits .250" Probe Max |
| | TT521 Temperature Transmitter with HART® Protocol, fits .236" Probe Max |
| | TT531 DIN Rail Temperature Transmitter with HART® Protocol |
| PD | Sensor Type: |
| | PD = 100Ω Platinum RTD (0.00385) |
| | PF  = 1000Ω Platinum RTD (0.00385) |
| | E  = Type E Thermocouple |
| | J  = Type J Thermocouple |
| | K  = Type K Thermocouple |
| | T  = Type T Thermocouple |
| (-25/200) | Temperature Range: |
| | Specify temperature range in either °C or °F. For example,  -25° to +200°C = 4 to 20 mA. |
| C | Temperature Units: |
| | C = Celsius |
| |  F = Fahrenheit |
| 1 | Calibration: |
| | 1 = Nominal |
| | 2 = Matched to sensor ±0.75% span |
| | For other calibration options, contact Minco |
| Y | Sensor Leads: |
| | Y = 2-lead RTD (or thermocouple) |
| | Z = 3-lead RTD |
| | X = 4-lead RTD |
| TT521PD(-25/200)C1Y = Sample part number | |

## Dimensions in inches (mm)



0.255 (6,48) DIA. (TT511)
0.245 (6,22) DIA. (TT521)

## Wiring Diagrams



RTD to 4...20 mA — 2-wire installation in control room

TC to 4...20 mA — 2-wire installation in control room

RTD to 4...20 mA — 2-wire installation in control room

TC to 4...20 mA — 2-wire installation in control room

## HART® Multidrop Wiring Diagram



TT511 / TT521 / TT531 Transmitters

Power supply

Rload>250Ω, <1100Ω

Max. 63 transmitters
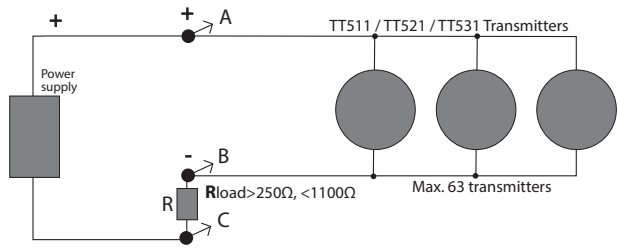
▼= STANDARD OPTIONS
*Specifications subject to change*

# Temptran™ Temperature Ranges

Below is a list of commonly selected Temptran temperature ranges. The endpoints of the temperature range correspond to the Temptran's 4 and 20 mA signals. Choose the smallest possible span for best accuracy. Be sure to check the temperature limits of the sensor you specify.

If you do not find the temperature range required by your application contact us. Custom ranges are also available for a small setup charge. Contact MOD-TRONIC Sales and Customer Service for more information.

## For more temperature ranges contact MOD-TRONIC

| | | | | | RTD Temptrans | | | Thermocouple Temptrans | |
| | Temperature Range | | | | TT111, TT115, TT211, TT829 | | TT246, TT220 | TT221 | TT205 |
| Range code | Zero °F | Span °F | Zero °C | Span °C | Platinum elements* | Other elements | Elements | T/C types | T/C types |
|---|---|---|---|---|---|---|---|---|---|
| MH | -328 | -148 | -200.0 | -100.0 | PA PB PD PE | | | | |
| HG | -325 | 100 | -198.3 | 37.8 | PA PB PD PE PF   PW | | | JT | |
| QS | -300 | 150 | -184.4 | 65.6 | | | PA PB PD PE | | |
| EZ | -148 | 32 | -100.0 | 0.0 | PA PB PD PE PF   PW | | PA PB PD PE | | |
| LN | -148 | 212 | -100.0 | 100.0 | PA PB PD PE | | | | |
| SA | -140 | 100 | -95.6 | 37.8 | | | PA PB PD PE | | |
| UL | -103 | 752 | -75.0 | 400.0 | | | | K | |
| M | -58 | 122 | -50.0 | 50.0 | PA PB PD PE PF   PW | | PA PB PD PE | | |
| EO | -58 | 212 | -50.0 | 100.0 | PA PB PD PE | NA | PA PB PD PE | T | ET |
| JD | -58 | 302 | -50.0 | 150.0 | PA PB PD PE | | PA PB PD PE | J | |
| MR | -58 | 500 | -50.0 | 260.0 | | | PA PB PD PE CA NA | | |
| SD | -50 | 100 | -45.6 | 37.8 | PA PB PD PE | | | | |
| MI | -50 | 150 | -45.6 | 65.6 | PA PB PD PE | | PA PB PD PE | T | |
| AI | -50 | 275 | -45.6 | 135.0 | PA PB PD PE PF   PW | FB FC FL NA | PA PB PD PE | | |
| MS | -50 | 650 | -45.6 | 343.3 | PA PB PD PE | | PA PB PD PE | | |
| AD | -40 | 120 | -40.0 | 48.9 | PA PB PD PE | FB FC | PA PB PD PE | | |
| AK | -40 | 140 | -40.0 | 60.0 | PA PB PD PE   PU | | PA PB PD PE | | |
| BE | -40 | 160 | -40.0 | 71.1 | PA PB PD PE | FB | PA PB PD PE | | |
| GH | -40 | 212 | -40.0 | 100.0 | PA PB PD PE | | PA PB PD PE | | |
| UE | -40 | 302 | -40.0 | 150.0 | PA PB PD PE | | PA PB PD PE | | |
| L | -30 | 120 | -34.4 | 48.9 | PA PB PD PE PF   PW | FB FC | | | |
| AS | -30 | 130 | -34.4 | 54.4 | PA PB PD PE PF   PW | FB | PA PB PD PE | | |
| R | -30 | 150 | -34.4 | 65.6 | PA PB PD PE | FB FC | PA PB PD PE | | |
| DN | -22 | 122 | -30.0 | 50.0 | PA PB PD PE | | PA PB PD PE | | |
| EE | -22 | 302 | -30.0 | 150.0 | PA PB PD PE | | PA PB PD PE | | |
| DO | -20 | 120 | -28.9 | 48.9 | PA PB PD PE PF   PW | ND | PA PB PD PE | | |
| EN | -20 | 140 | -28.9 | 60.0 | PA PB PD PE PF   PW | FB | PA PB PD PE | | |
| B | -20 | 180 | -28.9 | 82.2 | PA PB PD PE | FB FC   NA | PA PB PD PE CA | | |
| BP | -4 | 104 | -20.0 | 40.0 | PA PB PD PE | FC | PA PB PD PE | | |
| SH | -4 | 122 | -20.0 | 50.0 | PA PB PD PE | | | | |
| DB | -4 | 212 | -20.0 | 100.0 | PA PB PD PE | | PA PB PD PE | | |
| JZ | 0 | 65 | -17.8 | 18.3 | PA PB PD PE | | PA PB PD PE | | |
| S | 0 | 100 | -17.8 | 37.8 | PA PB PD PE PF PG PW | FB | PA PB PD PE PW | | |
| JH | 0 | 120 | -17.8 | 48.9 | PA PB PD PE PF   PW | FC | PA PB PD PE | | |
| HD | 0 | 130 | -17.8 | 54.4 | PA PB PD PE PF   PW | | PA PB PD PE | | |
| DV | 0 | 150 | -17.8 | 65.6 | PA PB PD PE | FB | PA PB PD PE | | |
| EI | 0 | 160 | -17.8 | 71.1 | PA PB PD PE | | | | |
| AC | 0 | 200 | -17.8 | 93.3 | PA PB PD PE PF   PW | FB    NA | PA PB PD PE CA | EJKT | T |
| EY | 0 | 250 | -17.8 | 121.1 | PA PB PD PE PF   PW | NA | PA PB PD PE | JK | JKT |
| AN | 0 | 300 | -17.8 | 148.9 | PA PB PD PE PF   PW | FB FC   NA | PA PB PD PE CA NA | EJKT | K |
| JA | 0 | 350 | -17.8 | 176.7 | PA PB PD PE | | PA PB PD PE | KJ | |
| DS | 0 | 400 | -17.8 | 204.4 | PA PB PD PE | NA | PA PB PD PE CA NA | JK | |
| AG | 0 | 500 | -17.8 | 260.0 | PA PB PD PE PF   PW | NA | PA PB PD PE CA | EJT | JKT |
| QN | 0 | 550 | -17.8 | 287.8 | PA PB PD PE | | PA PB PD PE | | |
| AB | 0 | 600 | -17.8 | 315.6 | PA PB PD PE PF   PW | NA | PA PB PD PE | EJK | J |
| AA | 0 | 800 | -17.8 | 426.7 | PA PB PD PE PF   PW | | PA PB PD PE | J | JK |
| BZ | 0 | 1000 | -17.8 | 537.8 | PA PB PD PE | | PA PB PD PE | JK | EJ |

*\* Element codes (PA, PB, PD, PE, etc.) are defined in the Resistance/Temperature Tables on page 11-11*

*Specifications subject to change*

# Temptran™ Temperature Ranges

## For more temperature ranges contact MOD-TRONIC

| | Temperature Range | | | | RTD Temptrans | | | Thermocouple Temptrans | |
| | | | | | TT111, TT115, TT211, TT829 | | TT246, TT220 | TT221 | TT205 |
| Range code | Zero °F | Span °F | Zero °C | Span °C | Platinum elements* | Other elements | Elements | T/C types | T/C types |
|---|---|---|---|---|---|---|---|---|---|
| HU | 0 | 1300 | -17.8 | 704.4 | | | | K | |
| BY | 14 | 104 | -10.0 | 40.0 | PA PB PD PE | | PA PB PD PE | | |
| AJ | 14 | 122 | -10.0 | 50.0 | PA PB PD PE | | PA PB PD PE | | |
| AP | 20 | 70 | -6.7 | 21.1 | PA PB PD PE PF   PW | | PA PB PD PE | | |
| GV | 20 | 100 | -6.7 | 37.8 | PA PB PD PE PF   PW | | PA PB PD PE | | |
| A | 20 | 120 | -6.7 | 48.9 | PA PB PD PE PF   PW | FA FB FC   NA | PA PB PD PE PF | | |
| HE | 20 | 240 | -6.7 | 115.6 | PA PB PD PE | | | | |
| AF | 20 | 320 | -6.7 | 160.0 | PA PB PD PE | FA FB | | | |
| QE | 22 | 122 | -5.6 | 50.0 | PA PB PD PE | | | | |
| GW | 23 | 131 | -5.0 | 55.0 | PA PB PD PE | | | | |
| U | 30 | 80 | -1.1 | 26.7 | PA PB PD PE PF   PW | FB FC | PA PB PD PE | | |
| DA | 30 | 90 | -1.1 | 32.2 | PA PB PD PE PF   PW | FC | PA PB PD PE | | |
| DP | 30 | 100 | -1.1 | 37.8 | PA PB PD PE PF   PW | | | | |
| BI | 30 | 130 | -1.1 | 54.4 | PA PB PD PE PF   PW | | PA PB PD PE PF PW | | |
| DQ | 30 | 150 | -1.1 | 65.6 | PA PB PD PE | FB | PA PB PD PE | | |
| KK | 30 | 180 | -1.1 | 82.2 | PA PB PD PE | | | | |
| EV | 30 | 230 | -1.1 | 110.0 | PA PB PD PE | | PA PB PD PE | | |
| BN | 30 | 240 | -1.1 | 115.6 | PA PB PD PE PF   PW | FB | PA PB PD PE | | |
| BJ | 30 | 250 | -1.1 | 121.1 | PA PB PD PE PF   PW | NA | PA PB PD PE FA | | |
| GQ | 32 | 100 | 0.0 | 37.8 | PA PB PD PE PF   PW | | PA PB PD PE | | |
| EG | 32 | 104 | 0.0 | 40.0 | PA PB PD PE PF   PW | | PA PB PD PE | | |
| N | 32 | 122 | 0.0 | 50.0 | PA PB PD PE PF   PW | FB FC | PA PB PD PE | | |
| HL | 32 | 167 | 0.0 | 75.0 | PA PB PD PE | | PA PB PD PE | | |
| C | 32 | 212 | 0.0 | 100.0 | PA PB PD PE PF   PW | FB FC   NA | PA PB PD PE CA NA | JT | |
| QR | 32 | 257 | 0.0 | 125.0 | PA PB PD PE | | | | |
| DL | 32 | 280 | 0.0 | 137.8 | PA PB PD PE | | PA PB PD PE | | |
| J | 32 | 302 | 0.0 | 150.0 | PA PB PD PE PF PU PW | FC   NA | PA PB PD PE CA | J | J |
| K | 32 | 392 | 0.0 | 200.0 | PA PB PD PE   PU | NA | PA PB PD PE CA | JK | J |
| LX | 32 | 400 | 0.0 | 204.4 | PA PB PD PE | | | | |
| BW | 32 | 482 | 0.0 | 250.0 | PA PB PD PE | NA | PA PB PD PE | EJKT | J |
| LF | 32 | 572 | 0.0 | 300.0 | PA PB PD PE | | PA PB PD PE | JT | |
| JW | 32 | 932 | 0.0 | 500.0 | PA PB PD PE | | PA PB PD PE | JK | K |
| HA | 32 | 1112 | 0.0 | 600.0 | PA PB PD PE PF   PW | | | K | |
| GF | 32 | 1472 | 0.0 | 800.0 | PA PB PD PE | | PA PB PD PE | K | K |
| SG | 33.8 | 123.8 | 1.0 | 51.0 | PA PB PD PE | | | | |
| H | 40 | 90 | 4.4 | 32.2 | PA PB PD PE PF   PW | FB | PA PB PD PE | | |
| BU | 40 | 100 | 4.4 | 37.8 | PA PB PD PE PF   PW | | | | |
| QL | 40 | 120 | 4.4 | 48.9 | PF   PW | FC | | | |
| BK | 40 | 140 | 4.4 | 60.0 | PA PB PD PE PF   PW | FB | PA PB PD PE | | |
| KH | 40 | 240 | 4.4 | 115.6 | PA PB PD PE PF   PW | | PA PB PD PE | | |
| KP | 42 | 92 | 5.6 | 33.3 | PA PB PD PE | | | | |
| DU | 45 | 95 | 7.2 | 35.0 | PA PB PD PE | | PA PB PD PE | | |
| DX | 50 | 100 | 10.0 | 37.8 | PA PB PD PE PF   PW | | PA PB PD PE | | |
| AH | 50 | 110 | 10.0 | 43.3 | PA PB PD PE | FB | PA PB PD PE | | |
| ED | 50 | 120 | 10.0 | 48.9 | PA PB PD PE PF   PW | FB | | | |
| V | 50 | 150 | 10.0 | 65.6 | PA PB PD PE PF   PW | FA FB   NA | PA PB PD PE | | |
| AV | 50 | 230 | 10.0 | 110.0 | PA PB PD PE PF   PW | | PA PB PD PE | J | |
| BF | 50 | 250 | 10.0 | 121.1 | PA PB PD PE PF   PW | | PA PB PD PE PF PW | ET | |
| AO | 50 | 300 | 10.0 | 148.9 | PA PB PD PE | | PA PB PD PE CA FA | | |
| KF | 50 | 400 | 10.0 | 204.4 | PA PB PD PE | | PA PB PD PE | | |
| D | 70 | 220 | 21.1 | 104.4 | PA PB PD PE PF   PW | FB FC | PA PB PD PE | | |
| E | 100 | 500 | 37.8 | 260.0 | PA PB PD PE PF   PW | | PA PB PD PE | | |
| BH | 122 | 302 | 50.0 | 150.0 | PA PB PD PE | | PA PB PD PE | T | |
| BL | 200 | 500 | 93.3 | 260.0 | PA PB PD PE PF   PW | | | K | |

*Element codes (PA, PB, PD, PE, etc.) are defined in the Resistance/Temperature Tables on page 11-11*

*Specifications subject to change*

# Temptran™ Calibration & Accessories

## Special high-accuracy calibration

Standard transmitters can be calibrated to the nominal resistance values of the RTD at the zero and span points. Total system error includes the tolerance of both the transmitter and the RTD sensor. If you order Minco Temptrans calibrated to the actual resistance of the RTD (traceable to NIST), this effectively eliminates the sensor tolerance from the system accuracy specifications.

Temptrans match calibrated to a sensor are always ordered as assemblies. Common examples are shown in Section 1.

## Free NIST traceability

With each matched sensor/transmitter set, Minco sends you calibration data traceable to the National Institute of Standards & Technology. This helps your process comply with ISO 9001 and other quality standards.

## Recalibration

Minco prints RTD resistance values right on the Temptran label to simplify recalibration. You simply connect a resistance decade box or "RTD simulator" in place of the RTD, dial in the correct values, and adjust zero and span.

Because Minco platinum RTDs are extremely stable in typical installations (0.1°C or better), you can trust the printed values for many years.



RTD resistances are printed on Temptran labels for easy recalibration of zero and span. A standard Temptran shows nominal values.



A specially calibrated Temptran shows actual resistance of the serialized, connected RTD.
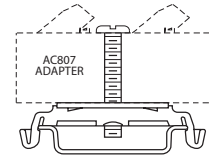
## Temptran Accessories

### DIN rail mounting
For easy installation in instrument cabinets. Adapters fit all Temptran models. Specify length when ordering rails.

| Model | Description |
|---|---|
| AC805 | DIN EN50022 Rail |
| AC807 | Adapter for EN50022 |



Temptrans mounted to DIN rail



AC807 adapter for EN50022

### Dual mounting kits

The AC103528 mounting kit fits connection head models CH105, CH107, CH328, CH330, CH342, CH343, CH357, CH358, CH405 and CH407. It holds two miniature Temptrans in a single head for use with dual RTDs.

Use AC103133 for connection head models CH104, CH106 and CH306, and CH356. CH106, CH306 and CH356 also require AC103625 connection head modification.



AC103528
mounting kit

AC103133
mounting kit