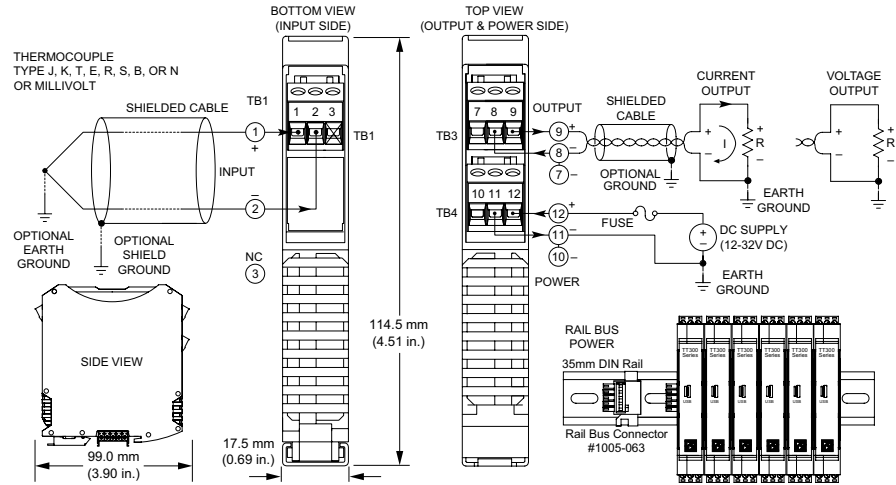


Transmitters: TT330 Series

TT333 Thermocouple/millivolt input four-wire transmitter



Universal thermocouple/millivolt input ♦ Universal current/voltage output ♦ 12-32V DC local/bus power

Description

The TT333 model is a space-saving four-wire transmitter that isolates and converts a millivolt or thermocouple sensor input to a proportional control signal. DC current and voltage output are both supported on a single model. An optional DIN rail bus can deliver primary or redundant power to multiple units without wiring.

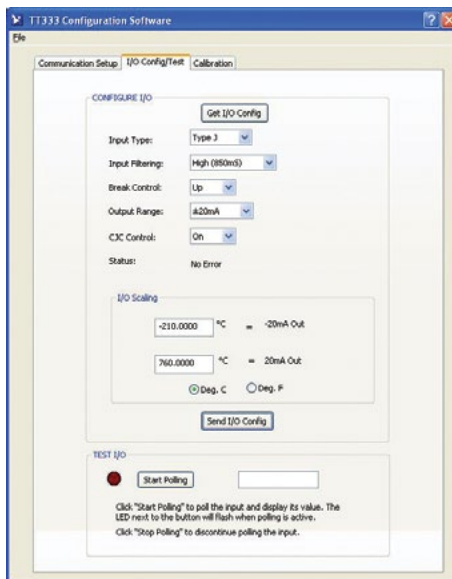
High-voltage isolation separates the input from the output circuit. Isolation protects from surges, reduces noise, and eliminates ground loop errors.

Setup and calibration are fast and easy with a convenient USB connection to your PC and Acromag's Windows configuration software.

Advanced signal processing capabilities, variable range input, and convenient USB programming make this instrument a very versatile temperature measurement device. These transmitters can withstand harsh industrial environments and operate reliably across a wide temperature range with very low drift. They feature RFI, EMI, ESD, EFT, and surge protection plus low radiated emissions.

Key Features & Benefits

- Easy setup and digital calibration via USB with Windows configuration software
- Universal thermocouple or millivolt input (TC Type J, K, T, R, S, E, B, N or $\pm 100\text{mV}$)
- Universal output connections support ranges up to $\pm 21\text{mA}$ or $\pm 10.5\text{V DC}$ without rewiring
- Space-saving 17.5mm (0.7 inch) unit with pluggable terminals for convenient wiring
- High accuracy, linearity, stability, and reliability
- User-selectable filtering (none, low, med., high)
- Adjustable response times (15ms to 850ms)
- Supports reverse-acting (inverse) output
- Selectable upscale or downscale operation for sensor faults and lead-break detection
- Bus power, local power, or both
- Redundant power ready (rail/local)
- 1500V isolation, 3-way (power, input, output)
- Shock (50g) and vibration (5g) resistant
- Wide ambient operation (-40 to 80°C)
- CE compliant. UL/cUL Class 1 Div 2 Zone 2 approvals



TT330 Series Transmitter Configuration Software is downloadable (FREE) from www.acromag.com.

Windows® XP, Vista, 7, and 8

TT333 Model software allows you to configure transmitters offline, save the file, and download into units later, at your convenience.



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Performance Specifications

IMPORTANT: To prevent damage or errors from grounded PCs and surges, Acromag strongly recommends use of their USB-ISOLATOR when configuring a TT330 Series transmitter.

■ USB Interface

USB Connector

Type: USB Mini-B type socket, 5-pin.
Data rate: 12Mbps. USB v1.1 and 2.0 compatible.
Maximum cable length: 5.0 meters.

USB Transient Protection

Transient voltage suppression on power and data lines.

Driver

Not required. Uses Windows HID drivers.

■ Input

Default Configuration/Calibration

Input: TC J, -210 to 760°C, med. filter, break: up
Output: 4 to 20mA.

Input Ranges and Accuracy

Input	Range	Accuracy
TC J	-210 to 760°C (-346 to 1400°F)	±0.5°C
TC K	-200 to 1372°C (-328 to 2502°F)	±0.5°C
TC T	-260 to 400°C (-436 to 752°F)	±0.5°C
TC R	-50 to 1768°C (-58 to 3214°F)	±1.0°C
TC S	-50 to 1768°C (-58 to 3214°F)	±1.0°C
TC E	-200 to 1000°C (-328 to 1832°F)	±0.5°C
TC B	260 to 1820°C (500 to 3308°F)	±1.0°C
TC N	-230 to 1300°C (-382 to 2372°F)	±1.0°C
mV	-100 to 100mV	±0.1mV

Error includes the effects of repeatability, terminal point conformity, and linearization (but not CJC error).

Thermocouple Reference

(Cold Junction Compensation)

±0.2°C typical, ±0.5°C maximum at 25°C.

Ambient Temperature Effect

Better than ±80ppm/°C (±0.008%/°C).

Scaling Adjust

Zero: 0 to 95% of range, typical.

Full scale: 5 to 100% of full scale range, typical.

Lead Break (Sensor Burnout) Detection

Upscale/downscale ±5% full scale range typical.

Input Over-Voltage Protection

Bipolar Transient Voltage Suppressors (TVS),
5.6V clamp level typical.

Input Resolution

Millivolt input: 0.0025% (1 part in 40,000)
Thermocouple input: 0.1°C.

Input Impedance

Current input: 24.9 ohms.
Voltage input: 15M ohms

Input Filter

Selectable digital filtering settings (none, low, medium, and high)

Noise Rejection

Normal mode @ 60Hz:
>0.5dB (no filter), >80dB (high filter)
Common mode @ 60Hz:
>100dB (no filter), >130dB (high filter)

■ Output

Output Range

Range	Over-Range	Resolution
±10V	±10.5V	1 part in 62415
±5V	±5.25V	1 part in 31208
0 to 10V	-0.5527 to +10.5V	1 part in 59240
0 to 5V	-0.27634 to +5.25V	1 part in 60262
±20mA	±21mA	1 part in 62259
0 to 20mA	-1.1054 to 21mA	1 part in 58596
4 to 20mA	-1.1054 to 21mA	1 part in 46877

Output Load

Voltage output: 1K ohms minimum.
Current output: 0-550 ohms.

Output Response Time (for step input change)

Time to reach 98% of final output value (typical)	
No filter	15 milliseconds
Low filter	40 milliseconds
Medium filter	120 milliseconds
High filter	850 milliseconds

Output Ripple

Less than ±0.1% of output span.

Output Ambient Temperature Drift

Better than ±80ppm/°C (±0.0080%/°C).

■ Environmental

Operating temperature

-40 to 80°C (-40° to 176°F).

Storage temperature

-40 to 85°C (-40 to 185°F).

Relative humidity

5 to 95% non-condensing.

Power Requirement

12-32V DC SELV (Safety Extra Low Voltage),
24mA max.

Isolation

1500V AC peak. 250V AC (354V DC) continuous
isolation between input, output, and power (3-way).

Shock and Vibration Immunity

Vibration: 5g, per IEC 60068-2-64.
Shock: 50g, per IEC 60068-2-27

Approvals

CE compliant. UL/cUL listing.
Designed for Class I; Division 2; Groups ABCD; Zone 2.

Electromagnetic Compatibility (EMC) Compliance

Radiated Emissions: BS EN 61000-6-4, CISPR 16.
RFI: BS EN 61000-6-2, IEC 61000-4-3.
Conducted RFI: BS EN 61000-6-2, IEC 61000-4-6.
ESD: BS EN 61000-6-2, IEC 61000-4-2.
EFT: BS EN 61000-6-2, IEC 61000-4-4.
Surge Immunity: BS EN 61000-6-2, IEC 61000-4-5.

■ Physical

General

General-purpose enclosure designed for mounting on
35mm "T-type" DIN rail.

Case Material

Self-extinguishing polyamide, UL94 V-0 rated, color
light gray. General-purpose NEMA Type 1 enclosure.

I/O Connectors

Removable plug-in terminal blocks rated for 12A/250V;
AWG #26-12, stranded or solid copper wire.

Dimensions

17.5 x 114.5 x 99.0 mm (0.7 x 4.51 x 3.90 inches).

Shipping Weight

0.22 kg (0.5 pounds) packed.

Ordering Information

Models

TT333-0700

Four-wire transmitter, thermocouple/millivolt input.

Services

TT330-Config/Cal

Factory custom configuration/calibration service.
Specify input type, input/output zero and full-scale
values, filtering, and sensor fault settings on order.

Software

TTC-SIP (recommend one kit per customer)

Software Interface Package for Acromag TT Series
transmitters. Includes configuration software CD-ROM
(5040-944), isolator (USB-ISOLATOR) and two USB
cables (4001-112, 4001-113).

Accessories

See www.acromag.com for more information.

USB-ISOLATOR

USB-to-USB isolator, includes USB cable (4001-112).

TTBUS-KIT

DIN rail bus power connector and left/right terminal
blocks. One kit supports multiple transmitters.

ISO9001
AS9100



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