

# Produkt-Datenblatt

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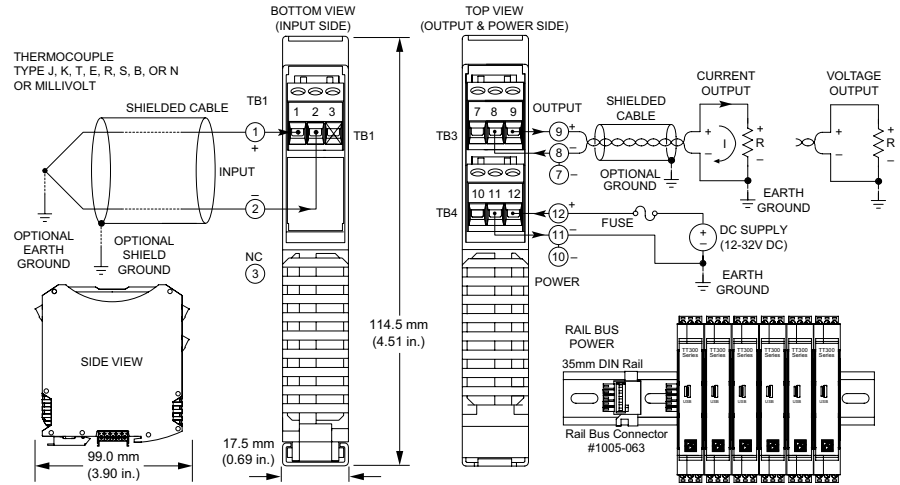
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# Transmitters: TT330 Series

## 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.

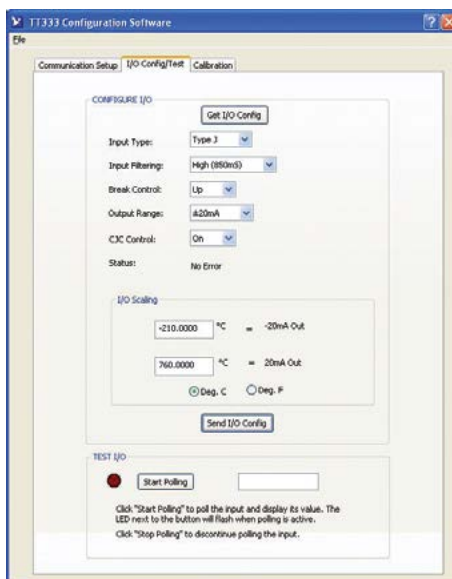
High-voltage isolation separates the input from the output circuit. Isolation protects from surges, reduces noise, and eliminates ground loop errors.

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 (25g) and vibration (4g) resistant
- Wide ambient operation ( $-40$  to  $80^\circ\text{C}$ )
- CE compliant. UL/cUL Class 1 Div 2 Zone 2 approvals. ATEX Certified.



TT330 Series Transmitter Configuration Software is downloadable (FREE) from [www.acromag.com](http://www.acromag.com).

Windows® XP, Vista, 7, and 8

The Agility™ Config Tool is downloadable (FREE) at the [Google Play Store](https://play.google.com/store/apps/details?id=com.acromag.agility) For Android Devices only

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



# Transmitters: TT330 Series

## TT333 Thermocouple/millivolt input four-wire transmitter

### 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. ATEX Certified.  
Designed for Class I; Division 2; Groups ABCD; Zone 2.  
Ⓜ II 3 G Ex nA IIC T4 Gc -40°C ≤ Ta ≤ +80°C

##### 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](http://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



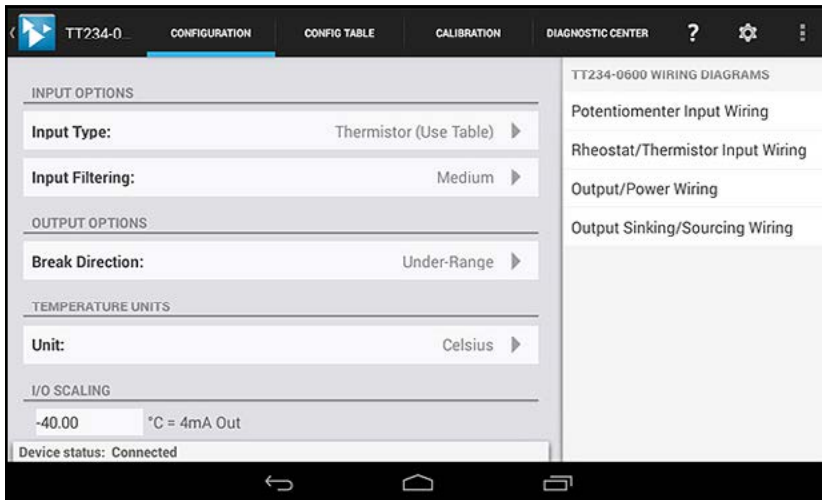
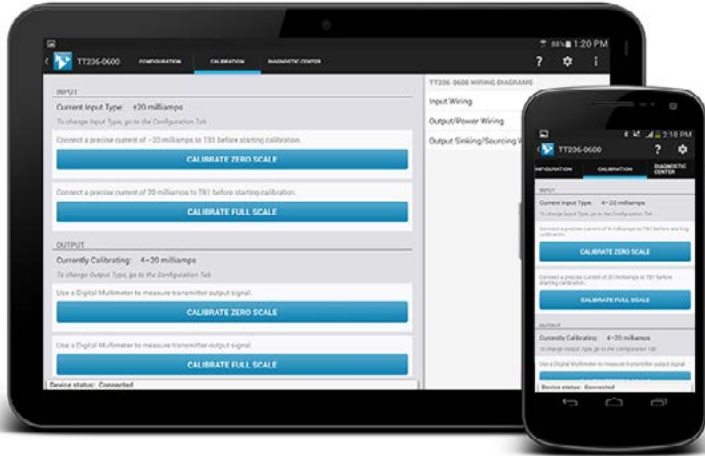
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# Transmitters: TT Series

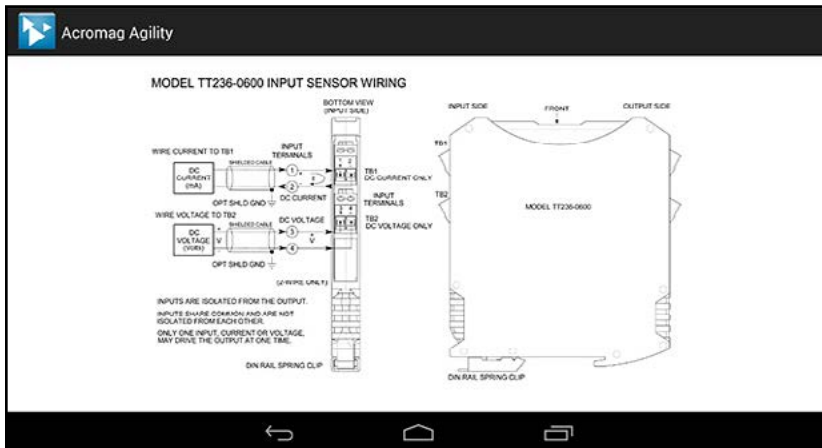
## Acromag Agility™ Config Tool Mobile Application

The Agility™ Config Tool is a mobile application that allows easy setup and configuration of Acromag TT Series transmitters via a tethered mobile device.

This free app is available for Android devices at the Google Play store at [Acromag Agility™ Config Tool](#).



With a couple of taps, quickly configure input, output, unit and scaling options.



Quick and easy access to the wiring diagram, even offline without internet access.

### Key Features & Benefits

- Connects to Acromag TT Series transmitters (except models TT231 and TT233)
- Requires the use of USB OTG Cable (Acromag part #: 5028-565) and USB A to Mini B Cable (Acromag part #: 4001-113)
- Configures and calibrates TT Series products via phone or tablet running Android 4.0 ICS (Ice Cream Sandwich) or later.
- View wiring diagrams, even without an internet connection
- Perform quick and easy field diagnostics and troubleshooting
- Ideal for field technicians



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