

Monitoring and Control Solutions

TT330 Series Brochure

DC Power

USB-Configured

Slim Design



Space-Saving 4-Wire Isolated Transmitters

Answers @ Acromag

*Experience counts:
especially when
selecting an I/O
partner. And with
60+ years of I/O
experience, Acromag
can help you improve
reliability, increase
productivity and
reduce your costs.*



ISO9001
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Process Instruments, Signal Conditioners, and Distributed I/O



Acromag: The I/O Leader

Acromag is a customer-driven manufacturer focused on developing embedded I/O products that provide the best long term value in the industry. Compare and you'll find that Acromag products offer an unmatched balance of price, performance, and features.

60+ Years of I/O Experience

Acromag has more than 60 years of measurement and control experience. Since 1957, we have delivered nearly a million units to thousands of customers around the globe for manufacturing, power, environmental, transportation, and military applications.

Quality with a 2-Year Warranty

We take every measure to guarantee you dependable operation and products that perform at or beyond the specifications. State-of-the-art manufacturing and military-grade components add an extra degree of ruggedness. Acromag is also certified for ISO9000/AS9100 quality control management procedures.

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Online Ordering

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Fast Delivery from Stock

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We are happy to accommodate your special requirements and offer the following services:

- Custom product development
- Custom calibration
- Source inspections, quality audits
- Special shipping, documentation
- Protective humiseal coating
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Certification and Approvals

Many Acromag products carry globally recognized agency approvals and safety certifications.

- | | |
|-----------|---------------------------|
| • CE | • Ethernet/IP conformance |
| • UL, cUL | • Modbus conformance |
| • Atex | • HART conformance |
| • CSA | • IECEx |

Transmitters: TT330 Series



TT330 Series Thin 4-Wire Isolated Transmitters



Introduction

The TT330 series features space-saving thin transmitters and isolators that combine flexibility with rugged housing to withstand harsh industrial environments. Advanced signal processing capabilities, variable range input, and convenient USB programming make these instruments versatile for many applications.

Input

Various sensor signals (by model)

Output

- Universal current/voltage:
±10V, ±5V, 0-10V, 0-5V,
±20mA, 0-20mA and 4-20mA

Power

- 12-32V DC isolated power

Key Features and Benefits

- Space saving 17.5mm housing
- Easy setup via USB with Windows® configuration software
- Better than 0.1% accuracy
- Supports unipolar and bipolar input ranges up to ±20mA or ±500mV DC
- 1500V AC isolation
- Normal/reverse acting output
- Wide operation temperature of -40 to 80°C
- Shock and vibration resistant
- CE Compliant. UL/cUL Class 1 Div 2 Zone 2 approvals. ATEX / IECEx Zone 2.

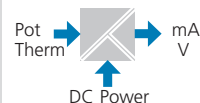
TT333 Thermocouple, Millivolt Input



- Input**
- Type J,K,T,R,S,E,B,N thermocouple
 - ±100mV

[See data sheet](#)

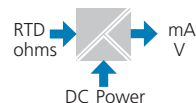
TT334 Potentiometer/ Thermistor Input



- Input**
- 100-100K ohms from potentiometer/slidewire
 - 2K - 30K thermistor
 - Custom 100 - 1M ohms

[See data sheet](#)

TT335 RTD Isolated Input



- Input**
- 100, 200, 500, or 1000 ohm Pt RTD; 120 ohm Ni RTD; 10 ohm Cu RTD
 - 0-450 ohms linear resistance

[See data sheet](#)

TT336 Current, Millivolt Input



- Input**
- 0-20mA, 4-20mA DC
 - ±1mA, ±20mA DC
 - 0-500mV DC
 - ±500mV DC
 - 0-11.17mA

[See data sheet](#)

TT337 Low-Voltage Input



- Input**
- ±1V DC
 - ±5V DC
 - ±10V DC

[See data sheet](#)

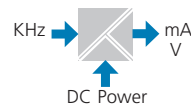
TT338 High-Voltage Input



- Input**
- ±15V DC
 - ±75V DC
 - ±150V DC

[See data sheet](#)

TT339 Frequency, Pulse Input



- Input**
- 0 - 100KHz
 - Up to 12V rms amplitude
 - Unipolar or bipolar signals

[See data sheet](#)

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Transmitters: TT330 Series

Key Features

Unipolar and bipolar input

A single unit supports both unipolar and bipolar input ranges up to $\pm 20\text{mA}$ or $\pm 500\text{mV}$ DC.

Space Saving

A strikingly thin enclosure, at only 17.5mm wide, to easily achieve high-density DIN-rail mounting.

Simple Configuration

Digital setup and calibration with straightforward Windows (Vista and newer) software via USB.



Bus or Local Power

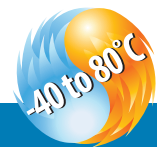
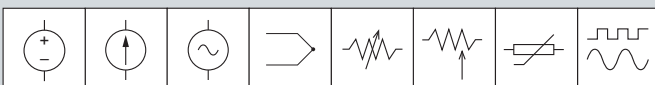
Can be powered through the unit terminals or via the DIN rail bus connector when mating to a plug-in terminal block.

Rugged Design

Wide ambient temperature operation, shock and vibration-resistant, as well as CE and UL/cUL Class 1, Division 2, Zone 2 approved and ATEX and IECEx certified.



Input Options



Transmitters: TT330 Series



General Operation and Performance Specifications

The following specifications are common to all TT330 Series transmitter modules.

■ USB Interface	
USB Connector	USB Mini-B type socket, 5-pin
USB Data Rate	12Mbps. USB v1.1 and 2.0 compatible

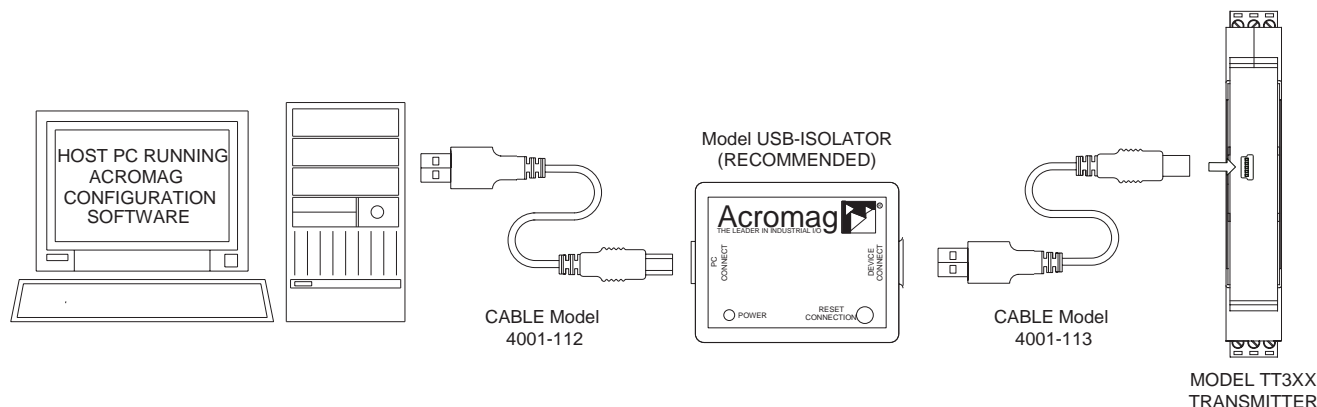
■ Output	
Output Range	±10V, ±5V, 0-10V, 0-5V, ±20mA, 0-20mA, 4-20mA
Accuracy	±0.05% of span typical

■ 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 DC SELV (Safety Extra Low Voltage); 24mA max.
Isolation	1500V AC peak. 250V AC (354V DC) continuous isolation between input and output circuits.
Shock and Vibration Immunity	Vibration: 4g, per IEC 60068-2-6 Shock: 25g, per IEC 60068-2-27
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
Approvals	CE compliant. UL/cUL listing. Designed for Class I; Division 2; Groups ABCD; Zone 2. ATEX / IECEx Zone 2.

■ 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.
Shipping Weight	0.22 kg (0.5 pounds) packed

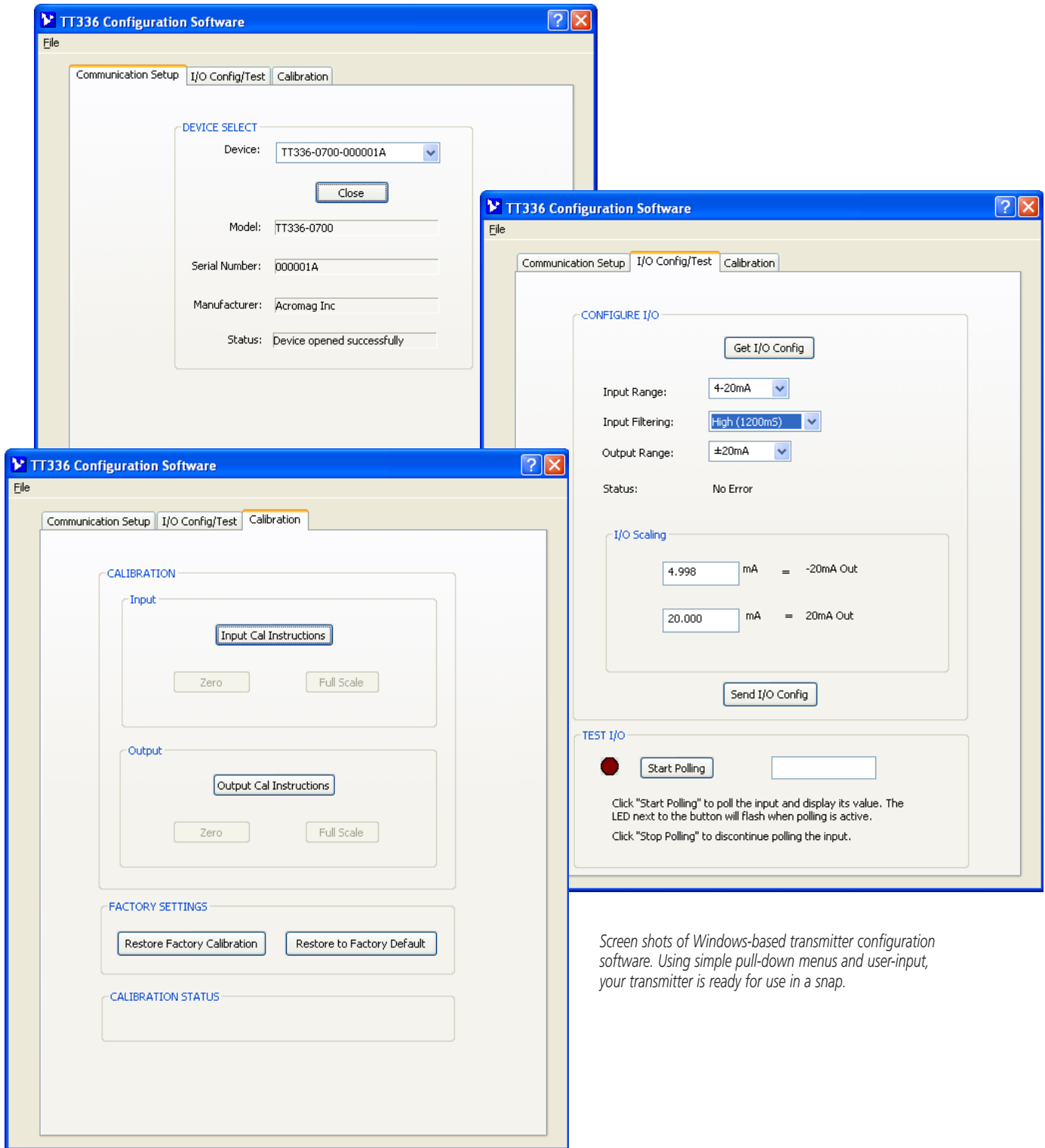
■ Dimensions *in millimeters (inches)	
<p>TOP VIEW (OUTPUT/POWER)</p> <p>114.5 (4.51)</p> <p>17.5 (0.69)</p> <p>99.0 (3.90)</p> <p>BOTTOM VIEW (INPUT)</p>	

TT Series USB Transmitter Connections



Transmitters: TT330 Series

Module Configuration



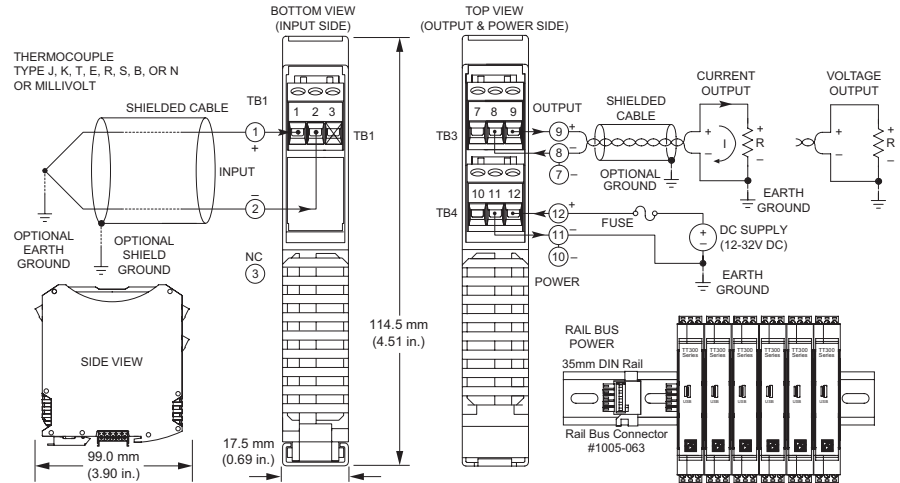
Screen shots of Windows-based transmitter configuration software. Using simple pull-down menus and user-input, your transmitter is ready for use in a snap.

Transmitters: TT330 Series

TT333 Thermocouple/millivolt input four-wire transmitter



**USB
Configured**



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.

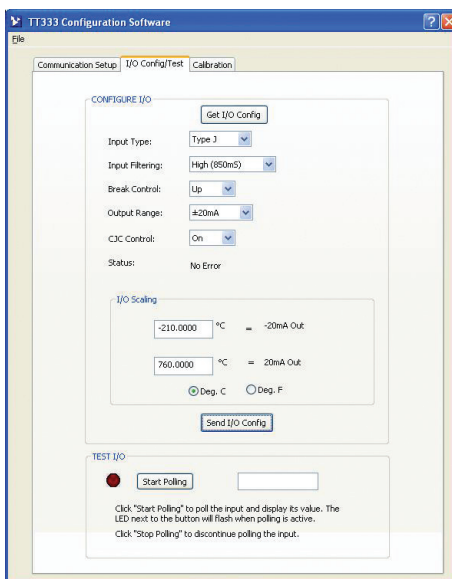
High-voltage isolation separates the input from the output circuit. Isolation protects from surges, reduces noise, and eliminates ground loop errors.

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°C)
- CE compliant. UL/cUL Class I Div 2, ATEX/IECEx Zone 2 approvals



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

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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: 4g, per IEC 60068-2-6

Shock: 25g, per IEC 60068-2-27

Approvals

CE compliant. UL/cUL listed Class I Division 2 Groups
ABCD. ATEX / IECEx 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)

TT BUS-KIT

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

ISO9001
AS9100



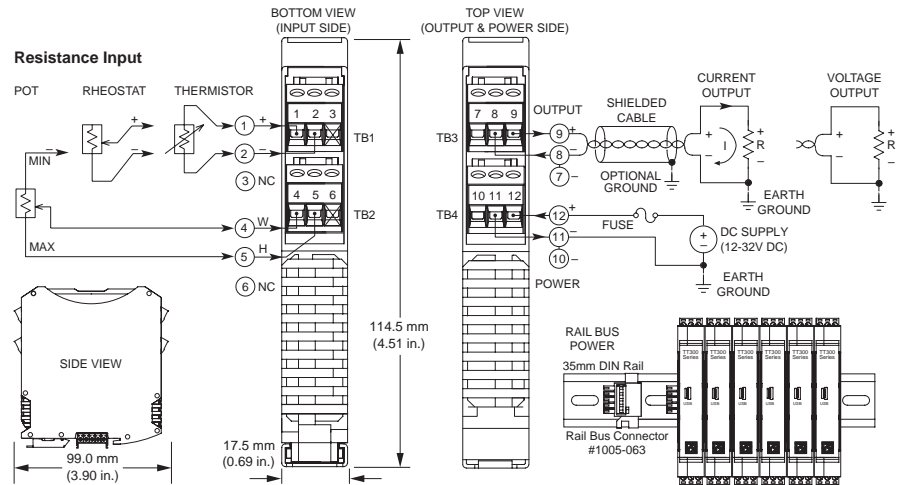
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Transmitters: TT330 Series

TT334 Potentiometer / thermistor input four-wire transmitter



**USB
Configured**



Pot/slidewire, thermistor input ♦ Universal current/voltage output ♦ 12-32V DC local/bus power

Description

The TT334 model is a space-saving four-wire transmitter that isolates and converts a resistive 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.

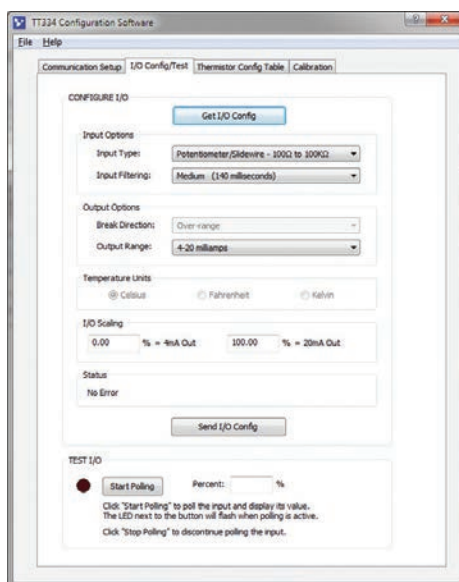
High-voltage isolation separates the input from the output circuit. Isolation protects from surges, reduces noise, and eliminates ground loop errors.

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
- Interfaces 100-100kΩ potentiometer/slidewire and 100-1MΩ NTC thermistor/rheostat inputs
- Customizable thermistor linearization table with preset curves for popular resistances
- Universal output connections support ranges up to ± 21 mA or ± 10.5 V DC without rewiring
- Pluggable terminals for convenient wiring
- High accuracy, linearity, stability, and reliability
- User-selectable filtering (none, low, med., high)
- Fast response (as low as 21ms)
- Supports normal or reverse-acting output
- Selectable upscale or downscale operation for sensor faults and lead-break detection
- Bus power, local power, or both for redundant power supplies
- 1500V isolation, 3-way (power, input, output)
- Shock (25g) and vibration (4g) resistant
- Wide ambient operation (-40 to 80°C)
- CE compliant. UL/cUL Class I Div 2, ATEX/IECEx Zone 2 approvals



TT330 Series Transmitter Configuration Software is downloadable (FREE) from 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

TT334 Model software allows you to configure transmitters offline, save the file, and download into units later, at your convenience.

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Transmitters: TT330 Series

TT334 Potentiometer / thermistor 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

Pot/slidewire, 0% to 100% input, 4-20mA output, downscale break detect, medium filter.

Input Configuration

Two- or three-wire sensor input connections.

User-configurable thermistor linearization table has preset curves for resistances below at 25°C.

Programs in °C, °F, °K, or ohmic integer values only.

Input Ranges

Input Type	Input Range	Accuracy
Potentiometer	0 to 100% (100 to 100KΩ)	< ±0.01% of span
Rheostat	100 to 1MΩ	< ±0.5% of input
Thermistor 2252Ω	-40 to 100°C (-40 to 212°F)	< ±0.05°C (±0.09°F)
Thermistor 2752Ω	-40 to 100°C	< ±0.05°C (±0.09°F)
Thermistor 2795Ω	-40 to 100°C	< ±0.05°C (±0.09°F)
Thermistor 3kΩ	-40 to 100°C	< ±0.05°C (±0.09°F)
Thermistor 5kΩ	-40 to 100°C	< ±0.05°C (±0.09°F)
Thermistor 10kΩ	-40 to 100°C	< ±0.05°C (±0.09°F)
Thermistor 30kΩ	-40 to 100°C	< ±0.05°C (±0.09°F)
Custom thermistor	100 to 1MΩ	< ±0.5% of input

Input Scaling Adjust

Zero: 0 to 95% of range, typical.

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

Lead Break (Sensor Burnout) Detection

Configurable for either upscale or downscale on thermistor or rheostat inputs. Downscale only on potentiometer/slidewire inputs.

Excitation Voltage

Thermistor/rheostat: 1.25V DC, typical.

Potentiometer: 0.3V DC, limited to 3.35mA, typical.

■ Output

Output Range

Range	Over-Range	Resolution
±10V	±10.5V	1 part in 62558
±5V	±5.25V	1 part in 31278
0 to 10V	-0.5527 to +10.5V	1 part in 59293
0 to 5V	-0.27634 to +5.25V	1 part in 60414
±20mA	±21mA	1 part in 62400
0 to 20mA	-1.1054 to 21mA	1 part in 58732
4 to 20mA	-1.1054 to 21mA	1 part in 46984

Output Accuracy

Better than ±0.05% of span, typical (±0.1% max.) for nominal input spans. Includes the effects of repeatability, terminal point conformity, and linearization, but does not include sensor error.

Output Load

Voltage output: 1K ohms minimum.

Current output: 0-525 ohms.

Output Response Time (for step input change)

No filter: 21ms. Medium filter: 150ms.

Low filter: 40ms. High filter: 1200ms.

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), 1.3W max.

Isolation

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

Shock and Vibration Immunity

Vibration: 4g, per IEC 60068-2-6

Shock: 25g, per IEC 60068-2-27

Approvals

CE compliant. UL/cUL listed Class I Division 2 Groups ABCD. ATEX / IECEx 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

TT334-0700

Four-wire transmitter, potentiometer/thermistor 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)

TT BUS-KIT

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

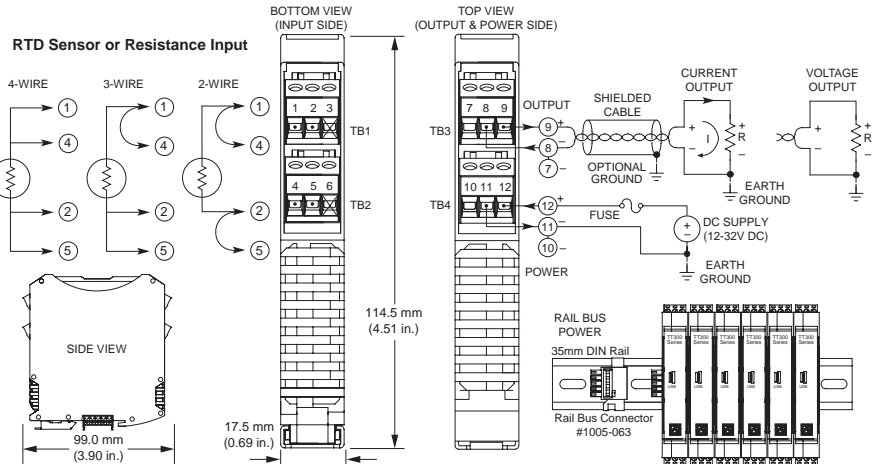
ISO9001
AS9100



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Transmitters: TT330 Series

TT335 Isolated RTD/resistance input four-wire transmitter



RTD (Pt, Ni, Cu) or 0-450 ohm input ♦ Universal current/voltage output ♦ 12-32V DC local/bus power

Description

The TT335 model is a space-saving four-wire transmitter that isolates and converts an RTD 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.

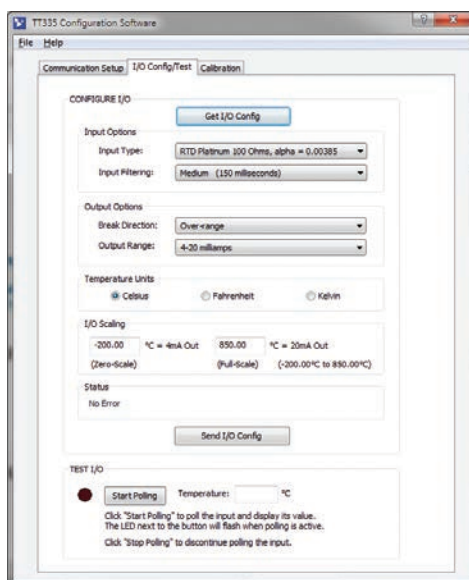
High-voltage isolation separates the input from the output circuit. Isolation protects from surges, reduces noise, and eliminates ground loop errors.

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
- Selectable RTD or linear resistance input type: Pt RTD (100Ω, 200Ω, 500Ω, or 1000Ω), Ni RTD (120Ω), Cu RTD (10Ω), or Resistance (0-450Ω)
- Universal output connections support ranges up to ±21mA or ±10.5V DC without rewiring
- Pluggable terminals for convenient wiring
- High accuracy, linearity, stability, and reliability
- User-selectable filtering (none, low, med., high)
- Fast response (as low as 32ms)
- Supports normal or reverse-acting output
- Selectable upscale or downscale operation for sensor faults and lead-break detection
- Bus power, local power, or both for redundant power supplies
- 1500V isolation, 3-way (power, input, output)
- Shock (25g) and vibration (4g) resistant
- Wide ambient operation (-40 to 80°C)
- CE compliant. UL/cUL Class I Div 2, ATEX / IECEx Zone 2 approvals



TT330 Series Transmitter Configuration Software is downloadable (FREE) from 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

TT335 Model software allows you to configure transmitters offline, save the file, and download into units later, at your convenience.

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Transmitters: TT330 Series

TT335 Isolated RTD/resistance 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

100Ω Pt RTD, $\alpha=0.00385$, -200 to 850°C input, 4-20mA output, upscale break detect, medium filter.

Input Configuration

Two-, three- or four-wire sensor input connections.
Programs in °C, °K, °F, or ohmic integer values only.

Input Ranges

Input Type	Input Range	Accuracy
Pt 100Ω	-200 to 850°C	±0.25°C
Pt 200Ω	-200 to 850°C	±0.30°C
Pt 500Ω	-200 to 850°C	±0.50°C
Pt 1000Ω	-200 to 850°C	±1.00°C
Ni 120Ω (Minco 7-120)	-80 to 320°C	±0.08°C
Cu 10Ω (Minco 16-9)	-200 to +270°C	±1.00°C
Linear Resistance	0 to 250Ω	±0.05Ω
Linear Resistance	0 to 450Ω	±0.10Ω
Linear Resistance	0 to 900Ω	±0.90Ω
Linear Resistance	0 to 2250Ω	±2.25Ω
Linear Resistance	0 to 4500Ω	±4.50Ω

Input Scaling Adjust

Zero: 0 to 95% of range, typical.
Full scale: 5 to 100% of full scale range, typical.

Lead Break (Sensor Burnout) Detection

Configurable for either upscale or downscale.

■ Output

Output Range

Range	Over-Range	Resolution
±10V	±10.5V	1 part in 62558
±5V	±5.25V	1 part in 31278
0 to 10V	-0.5527 to +10.5V	1 part in 59293
0 to 5V	-0.27634 to +5.25V	1 part in 60414
±20mA	±21mA	1 part in 62400
0 to 20mA	-1.1054 to 21mA	1 part in 58732
4 to 20mA	-1.1054 to 21mA	1 part in 46984

Output Accuracy

Better than ±0.05% of span, typical (±0.1% max.) for nominal input spans. Includes the effects of repeatability, terminal point conformity, and linearization, but does not include sensor error.

Output Load

Voltage output: 1K ohms minimum.
Current output: 0-525 ohms.

Output Response Time (for step input change)

No filter: 32ms
Low filter: 50ms
Medium filter: 160ms
High filter: 1210ms

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), 1.3W max.

Isolation

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

Shock and Vibration Immunity

Vibration: 4g, per IEC 60068-2-6
Shock: 25g, per IEC 60068-2-27

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

Approvals

CE compliant. UL/cUL listed Class I Division 2 Groups ABCD. ATEX / IECEx Zone 2.

■ 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

[TT335-0700](#)

Four-wire transmitter, isolated RTD/resistance 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)

[TT BUS-KIT](#)

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

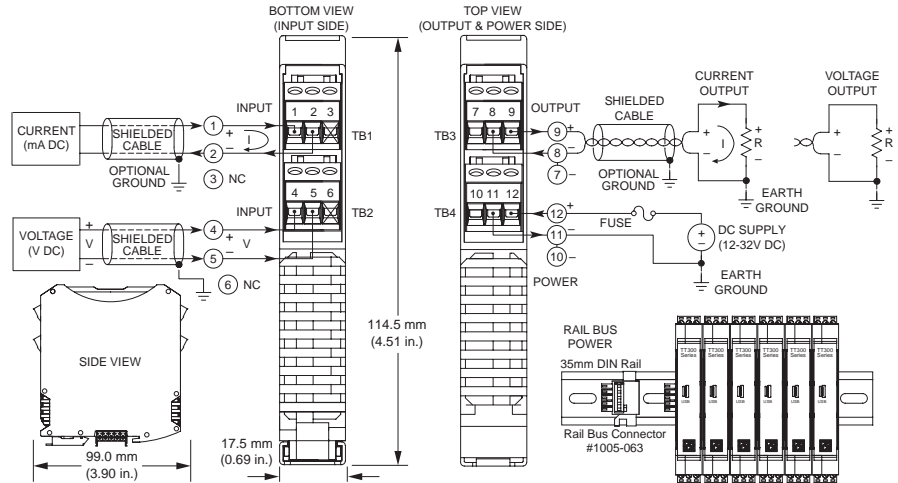
ISO9001
AS9100



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Transmitters: TT330 Series

TT336 Current/millivolt input four-wire transmitter



Multi-range $\pm 20\text{mA}$ or $\pm 500\text{mV}$ input ♦ Universal current/voltage output ♦ 12-32V DC local/bus power

Description

The TT336 model is a space-saving four-wire transmitter that isolates and converts a DC current or low voltage 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.

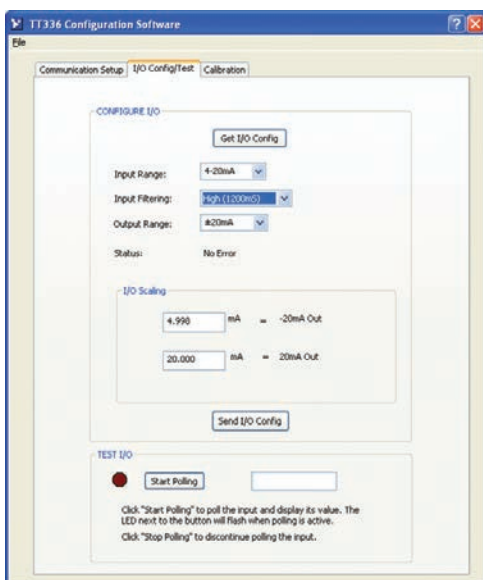
High-voltage isolation separates the input from the output circuit. Isolation protects from surges, reduces noise, and eliminates ground loop errors.

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
- Single unit supports unipolar and bipolar input ranges up to $\pm 20\text{mA}$ or $\pm 500\text{mV}$ DC
- Compatible with 0-20A AC sensor input
- 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 (10ms to 1200ms)
- Supports reverse-acting (inverse) output
- Bus power, local power, or both
- Redundant power ready (rail/local)
- 1500V input isolation, 3-way (power, input, output)
- Shock (25g) and vibration (4g) resistant
- Mounts on Type T DIN-rail
- Wide ambient operation (-40 to 80°C)
- CE compliant. UL/cUL Class I Div 2, ATEX / IECEx Zone 2 approvals



TT330 Series Transmitter Configuration Software is downloadable (FREE) from 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

TT336 Model software allows you to configure transmitters offline, save the file, and download into units later, at your convenience.

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Transmitters: TT330 Series

TT336 Current/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

USB Mini-B type socket, 5-pin.

USB Data Rate

12Mbps. USB v1.1 and 2.0 compatible.

USB Transient Protection

Transient voltage suppression on power and data lines.

USB Cable Length

5.0 meters maximum.

Driver

Not required. Uses built-in Human Interface Device (HID) USB drivers of the Windows operating system.

■ Input

Default Configuration/Calibration

Input: 4 to 20mA, medium filter.

Output: 4 to 20mA.

Input Ranges and Accuracy

Range	Accuracy
±500mV	±0.05% of span
0 to 500mV	±0.05% of span
±20mA	±0.05% of span
0 to 20mA	±0.05% of span
4 to 20mA	±0.05% of span
0 to 11.17mA (for AC sensor)	±0.05% of span
±1mA	±0.05% of span

Error includes the effects of repeatability, terminal point conformity, and linearization.

Ambient Temperature Effect

Better than ±80ppm/°C (±0.008%/°C)

Zero Scaling Adjust

0 to 95% of range, typical

Full Scale Adjust

5 to 100% of full scale range, typical.

Input Over-Voltage Protection

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

Input Resolution

Bipolar input: 1 part in 50000 (±25000)
Unipolar input: 1 part in 25000

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:
>4dB (no filter), >80dB (high filter)
Common mode @ 60Hz:
>90dB (no filter), >120dB (high filter)

■ Output

Output Range

Range	Over-Range	Resolution
±10V	±10.5V	1 part in 62415
±5V	±5V	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 59596
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)		
	TB1 (±20mA)	TB2 (±500mV)
No filter	10 milliseconds	15 milliseconds
Low filter	34 milliseconds	45 milliseconds
Medium filter	136 milliseconds	120 milliseconds
High filter	1168 milliseconds	1072 milliseconds

Output Ripple

Less than ±0.1% of output span.

Output Ambient Temperature Drift

Better than ±80ppm/°C (±0.008%/°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: 4g, per IEC 60068-2-6
Shock: 25g, per IEC 60068-2-27

Approvals

CE compliant. UL/cUL listed Class I Division 2 Groups ABCD. ATEX / IECEx Zone 2 approvals.

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

TT336-0700

Four-wire transmitter, current/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).

TT BUS-KIT

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

5020-350

AC current sensor (toroidal transformer); converts 0-20A AC to 0-11.17mA DC.

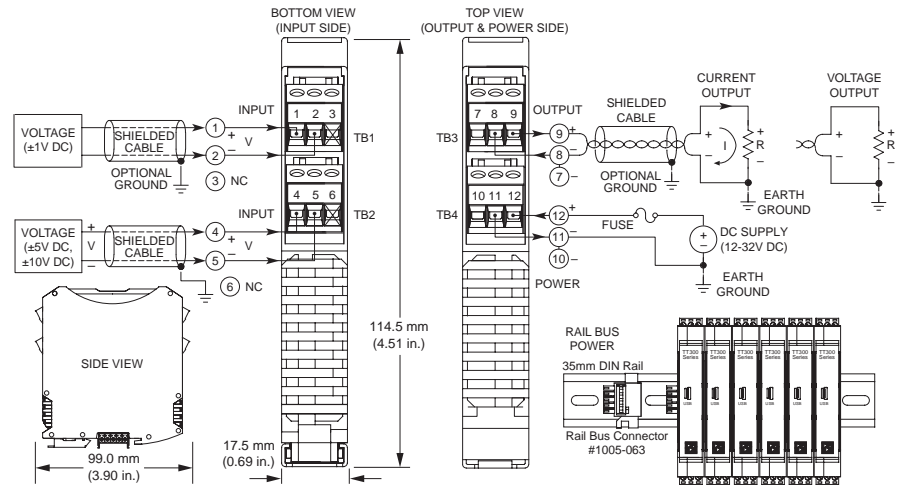
ISO9001
AS9100



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Transmitters: TT330 Series

TT337 Process voltage input four-wire transmitter



Multi-range $\pm 1V$, $\pm 5V$, or $\pm 10V$ input ◆ Universal current/voltage output ◆ 12-32V DC local/bus power

Description

The TT337 model is a space-saving four-wire transmitter that isolates and converts a process level DC voltage 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.

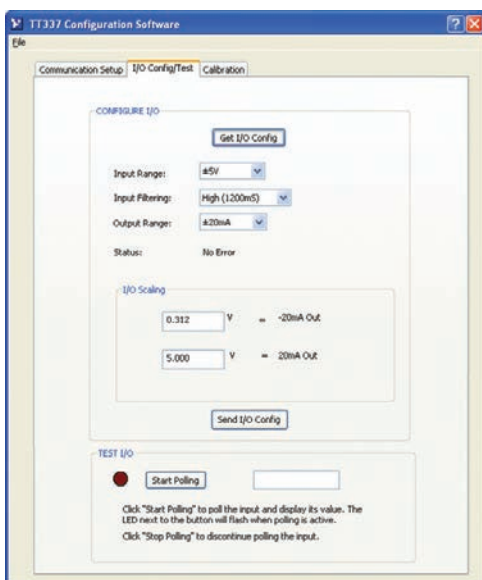
High-voltage isolation separates the input from the output circuit. Isolation protects from surges, reduces noise, and eliminates ground loop errors.

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
- Single unit supports $\pm 1V$, $\pm 5V$, and $\pm 10V$ DC input ranges
- Universal output connections support ranges up to $\pm 21mA$ or $\pm 10.5V$ 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 (12ms to 1200ms)
- Supports reverse-acting (inverse) output
- Bus power, local power, or both
- Redundant ready power
- 1500V input isolation
- Shock (25g) and vibration (4g) resistant
- Mounts on Type T DIN-rail
- Wide ambient operation (-40 to $80^{\circ}C$)
- CE compliant. UL/cUL Class I Div 2, ATEX / IECEx Zone 2 approvals



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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

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Transmitters: TT330 Series

TT337 Process voltage 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

USB Mini-B type socket, 5-pin

USB Data Rate

12Mbps. USB v1.1 and 2.0 compatible

USB Transient Protection

Transient voltage suppression on power and data lines.

USB Cable Length

5.0 meters maximum

Driver

Not required. Uses built-in Human Interface Device (HID) USB drivers of the Windows operating system.

■ Input

Default Configuration/Calibration

Input: $\pm 10V$, medium filter

Output: 4 to 20mA

Input Ranges and Accuracy

Range	Accuracy
$\pm 1V$ DC	$\pm 0.05\%$ of span
$\pm 5V$ DC	$\pm 0.05\%$ of span
$\pm 10V$ DC	$\pm 0.05\%$ of span

Error includes the effects of repeatability, terminal point conformity, and linearization.

Ambient Temperature Effect

Better than $\pm 80\text{ppm}/^\circ\text{C}$ ($\pm 0.008\%/^\circ\text{C}$)

Zero Scaling Adjust

0 to 95% of range, typical

Full Scale Adjust

5 to 100% of full scale range, typical.

Input Over-Voltage Protection

Bipolar Transient Voltage Suppressors (TVS), 14V working and 18V clamp level typical.

Input Resolution

Bipolar input: 1 part in 50000 (± 25000)

Unipolar input: 1 part in 25000

Input Impedance

$\pm 1V$ input: 15M ohms

$\pm 5V$ input: $>1M$ ohms

$\pm 10V$ input: $>1M$ ohms

Input Filter

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

Noise Rejection

Normal mode @ 60Hz:

$>1\text{dB}$ (no filter), $>80\text{dB}$ (high filter)

Common mode @ 60Hz:

$>80\text{dB}$ (no filter), $>120\text{dB}$ (high filter)

■ Output

Output Range

Range	Over-Range	Resolution
$\pm 10V$	$\pm 10.5V$	1 part in 62415
$\pm 5V$	$\pm 5V$	1 part in 31208
0 to 10V	-0.5527 to $+10.5V$	1 part in 59293
0 to 5V	-0.27634 to $+5.25V$	1 part in 59293
$\pm 20mA$	$\pm 21mA$	1 part in 62415
0 to 20mA	-1.1054 to $21mA$	1 part in 59293
4 to 20mA	-1.1054 to $21mA$	1 part in 47434

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)		
	TB1 ($\pm 1V$)	TB2 ($\pm 5V$, $\pm 10V$)
No filter	12 milliseconds	78 milliseconds
Low filter	28 milliseconds	98 milliseconds
Medium filter	115 milliseconds	208 milliseconds
High filter	1116 milliseconds	1164 milliseconds

Output Ripple

Less than $\pm 0.1\%$ of output span.

Output Ambient Temperature Drift

Better than $\pm 80\text{ppm}/^\circ\text{C}$ ($\pm 0.0080\%/^\circ\text{C}$)

■ 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: 4g, per IEC 60068-2-6

Shock: 25g, per IEC 60068-2-27

Approvals

CE compliant. UL/cUL listed Class I Division 2 Groups

ABCD. ATEX / IECEx Zone 2 approvals.

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

TT337-0700

Four-wire transmitter, process voltage 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).

TT BUS-KIT

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

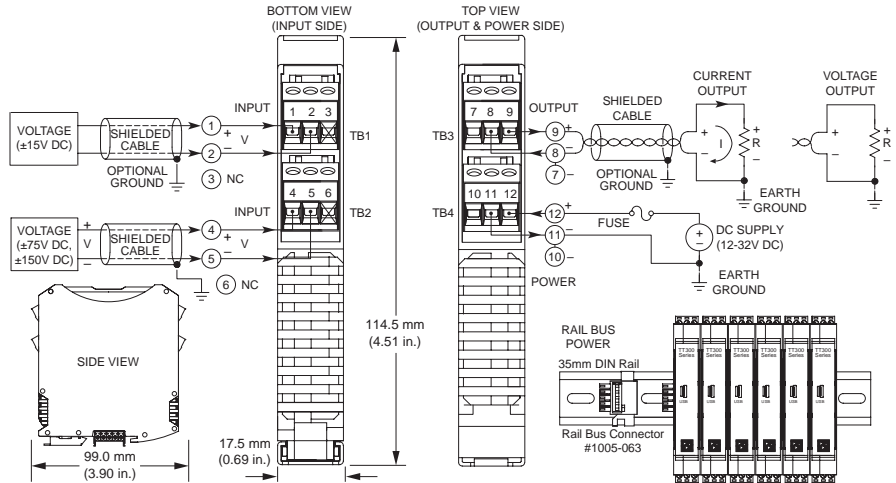
ISO9001
AS9100



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Transmitters: TT330 Series

TT338 High voltage input four-wire transmitter



Multi-range ± 15 , ± 75 , or ± 150 V input ♦ Universal current/voltage output ♦ 12-32V DC local/bus power

Description

The TT338 model is a space-saving four-wire transmitter that isolates and converts a high level DC voltage 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.

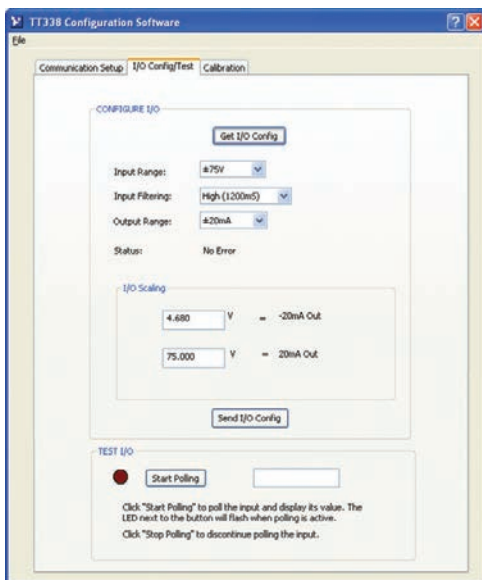
High-voltage isolation separates the input from the output circuit. Isolation protects from surges, reduces noise, and eliminates ground loop errors.

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
- Single unit supports ± 15 V, ± 75 V, and ± 150 V DC input ranges
- Universal output connections support ranges up to ± 21 mA or ± 10.5 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 (50ms to 1200ms)
- Supports reverse-acting (inverse) output
- Bus power, local power, or both
- Redundant ready power
- 1500V input isolation
- Shock (25g) and vibration (4g) resistant
- Mounts on Type T DIN-rail
- Wide ambient operation (-40 to 80°C)
- CE compliant. UL/cUL Class I Div 2, ATEX / IECEx Zone 2 approvals



TT330 Series Transmitter Configuration Software is downloadable (FREE) from 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

TT338 Model software allows you to configure transmitters offline, save the file, and download into units later, at your convenience.

Acromag 
THE LEADER IN INDUSTRIAL I/O

Tel 877-214-6267 ■ sales@acromag.com ■ www.acromag.com ■ 30765 Wixom Rd, Wixom, MI 48393 USA



Transmitters: TT330 Series

TT338 High voltage 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

USB Mini-B type socket, 5-pin

USB Data Rate

12Mbps. USB v1.1 and 2.0 compatible

USB Transient Protection

Transient voltage suppression on power and data lines.

USB Cable Length

5.0 meters maximum

Driver

Not required. Uses built-in Human Interface Device (HID) USB drivers of the Windows operating system.

■ Input

Default Configuration/Calibration

Input: $\pm 15V$, medium filter

Output: 4 to 20mA

Input Ranges and Accuracy

Range	Accuracy
$\pm 15V$ DC	$\pm 0.05\%$ of span
$\pm 75V$ DC	$\pm 0.05\%$ of span
$\pm 150V$ DC	$\pm 0.05\%$ of span

Error includes the effects of repeatability, terminal point conformity, and linearization.

Ambient Temperature Effect

Better than $\pm 80\text{ppm}/^\circ\text{C}$ ($\pm 0.008\%/^\circ\text{C}$)

Zero Scaling Adjust

0 to 95% of range, typical

Full Scale Adjust

5 to 100% of full scale range, typical

Input Over-Voltage Protection

Bipolar Transient Voltage Suppressors (TVS), 220V working typical.

Input Resolution

Bipolar input: 1 part in 50000 (± 25000)

Unipolar input: 1 part in 25000

Input Impedance

Greater than 1M ohms

Input Filter

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

Noise Rejection

Normal mode @ 60Hz:

>15dB (no filter), >80dB (high filter)

Common mode @ 60Hz:

>70B (no filter), >120dB (high filter)

■ Output

Output Range

Range	Over-Range	Resolution
$\pm 10V$	$\pm 10.5V$	1 part in 62415
± 5	$\pm 5V$	1 part in 31208
0 to 10V	-0.5527 to +10.5V	1 part in 59293
0 to 5V	-0.27634 to +5.25V	1 part in 59293
$\pm 20mA$	$\pm 21mA$	1 part in 62415
0 to 20mA	-1.1054 to 21mA	1 part in 59293
4 to 20mA	-1.1054 to 21mA	1 part in 47434

Output Load

Voltage output: 1K ohms minimum

Current output: 0-525 ohms

Output Response Time (for step input change)

Time to reach 98% of final output value (typical)		
	TB1 ($\pm 15V$)	TB2 ($\pm 75V, \pm 150V$)
No filter	49 milliseconds	49 milliseconds
Low filter	69 milliseconds	68 milliseconds
Medium filter	175 milliseconds	152 milliseconds
High filter	1164 milliseconds	944 milliseconds

Output Ripple

Less than $\pm 0.1\%$ of output span

Output Ambient Temperature Drift

Better than $\pm 80\text{ppm}/^\circ\text{C}$ ($\pm 0.008\%/^\circ\text{C}$)

■ 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: 4g, per IEC 60068-2-6

Shock: 25g, per IEC 60068-2-27

Approvals

CE compliant. UL/CUL listed Class I Division 2 Groups

ABCD. ATEX / IECEx Zone 2 approvals.

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

TT338-0700

Four-wire transmitter, high voltage 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)

TT BUS-KIT

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

ISO9001
AS9100



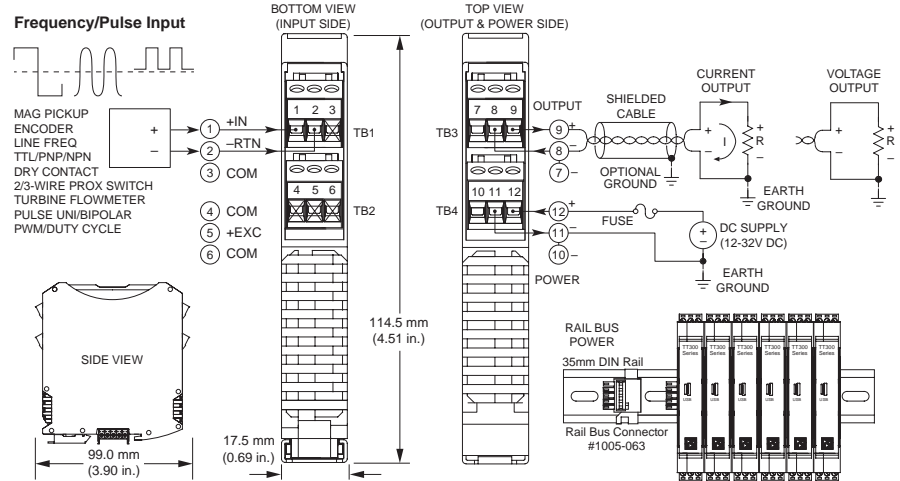
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Transmitters: TT330 Series

TT339 Frequency/pulse/PWM input four-wire transmitter



**USB
Configured**



Multi-range frequency/pulse input ♦ Universal current/voltage output ♦ 12-32V DC local/bus power

Description

The TT339 model is a space-saving four-wire transmitter that isolates and converts frequency, pulse, or pulse-width modulation (PWM) 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 frequency 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.

Amplifier applications include:

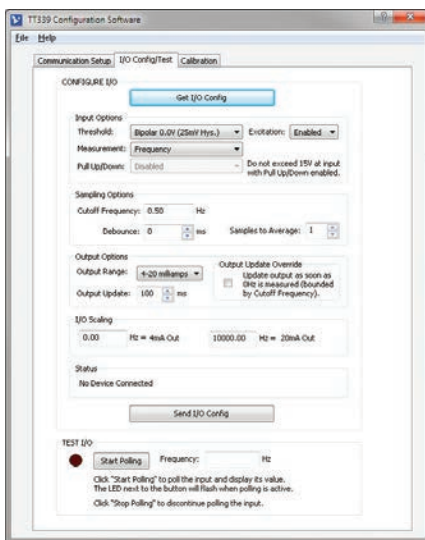
- Speed pickup
- Line frequency monitoring
- Turbine flowmeter interface
- PWM sensing/feedback circuits
- Shaft encoder interface

TT330 Series Transmitter Configuration Software is downloadable (FREE) from www.acromag.com.
Windows® XP, Vista, 7, 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

Key Features & Benefits

- Easy setup and digital calibration via USB with Windows configuration software
- Measures frequency or duty cycle and interfaces many input types up to 100KHz
- Accepts input amplitudes up to 120VRMS ($\pm 170V$ DC, unipolar or bipolar)
- Adjustable 0Hz cut-off, sample averaging, debounce, and output update time
- Universal output connections support ranges up to $\pm 21mA$ or $\pm 10.5V$ DC without rewiring
- Supports normal or reverse-acting output
- Fast response time and high accuracy
- Space-saving 17.5mm (0.7 inch) unit with pluggable terminals for convenient wiring
- Redundant power ready (rail/local)
- 1500V isolation, 3-way (power, input, output)
- Shock (25g) and vibration (4g) resistant
- Mounts on Type T DIN-rail
- Wide ambient operation (-40 to 80°C)
- CE compliant. UL/cUL Class I Div 2, ATEX / IECEx Zone 2 approvals



TT339 Model software allows you to configure transmitters offline, save the file, and download into units later, at your convenience.

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Transmitters: TT330 Series

TT339 Frequency/pulse/PWM 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

USB Mini-B type socket, 5-pin

USB Data Rate

12Mbps. USB v1.1 and 2.0 compatible

USB Transient Protection

Transient voltage suppression on power and data lines.

USB Cable Length

5.0 meters maximum

Driver

Not required. Uses built-in Human Interface Device (HID) USB drivers of the Windows operating system.

■ Input

Default Configuration/Calibration

±5.0V Square Wave; Input Threshold = Bipolar 0.0V; Hysteresis ±25mV; Pull Up/Down = Disabled; Excitation = Enabled; 0Hz Cutoff = 0.5Hz; Sample Average = 1; Output Range = 4-20mA; I/O Scaling = 0Hz to 10KHz, Normal Acting; Output Update = 100ms.

Frequency Input

Configurable for any range from 0Hz to 100KHz.

Accepts unipolar (non-zero crossing) or bipolar (zero crossing) input signals. 0.5Hz minimum span. 1µs minimum pulse width.

Duty Cycle Input

Carrier frequency range: Any range from 0 to 20KHz.

Duty cycle range: 1 to 99%, depending on freq. range.

Input Scaling Adjust

Zero: Adjustable over 0 to 99% of full-scale input.

Full scale: Adjustable over 0.5Hz to 100KHz.

Cut-off frequency: Adjustable over 0.01Hz to 100KHz.

Unipolar Signal Configuration:

Amplitude: 0 to 3V DC min., 0 to 170V DC max.

Thresholds: Configurable for 1.6V DC (±25mV hysteresis) or 5V DC (±83mV hysteresis), typical.

Bipolar Signal Configuration:

Amplitude: ±50 to ±200mV min. (depending on range and hysteresis), 120VRMS max. (±170V DC).

Thresholds: 0mV nominal (±25 or ±83mV hysteresis).

Input Pull-up/Pull-down (Internal)

Software-selectable 2.7KΩ input pull-up to +5V and a 1KΩ input pull-down to -FRN, or disabled. 15V DC maximum input when used.

Input Excitation Supply

+5V DC, current limited to +20mA typical.

Input Filter Bandwidth

-3dB at 35KHz, typical

Input Impedance

37.2K ohms, typical

Noise Rejection

Normal mode @ 60Hz: Not applicable

Common mode @ 60Hz: 90dB

■ Output

Output Range

Range	Over-Range	Resolution
±10V	±10.5V	1 part in 62558
±5V	±5.25V	1 part in 31278
0 to 10V	-0.5527 to +10.5V	1 part in 59293
0 to 5V	-0.27634 to +5.25V	1 part in 60414
±20mA	±21mA	1 part in 62400
0 to 20mA	-1.1054 to +21mA	1 part in 58732
4 to 20mA	-1.1054 to +21mA	1 part in 46984

Output Load

Voltage output: 1000 ohms minimum

Current output: 525 ohms maximum

Output Update

Software configurable from 10 to 5000ms. Determines rate at which output signal updates, unless optionally overridden by the 0Hz cutoff setting.

Output Accuracy

Better than ±0.05% of span, typical (±0.1% max.) for nominal input spans. Includes the effects of repeatability, terminal point conformity, and linearization, but does not include sensor error.

Output Ripple

Less than ±0.1% of output span

Output Ambient Temperature Drift

Better than ±40ppm/°C (±0.0040%/°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: 4g, per IEC 60068-2-6

Shock: 25g, per IEC 60068-2-27

Approvals

CE compliant. UL/cUL listed Class I Division 2 Groups ABCD. ATEX / IECEx 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

TT339-0700

Transmitter, isolated frequency/pulse/PWM 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)

TT BUS-KIT

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

ISO9001
AS9100




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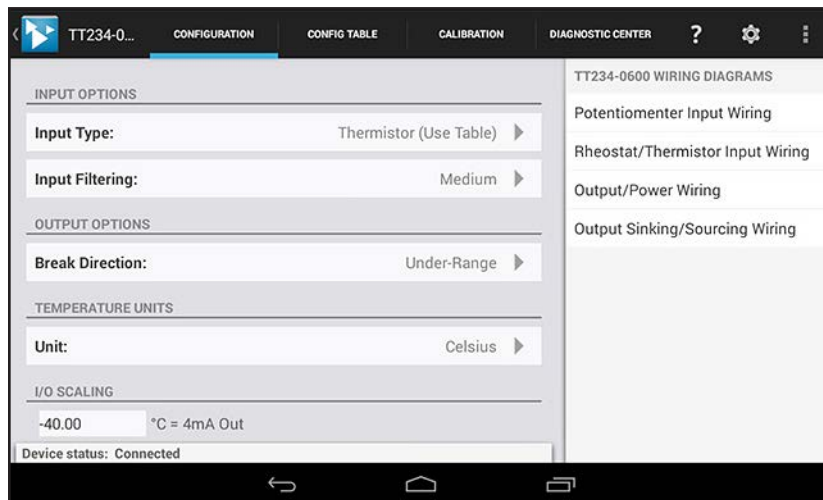
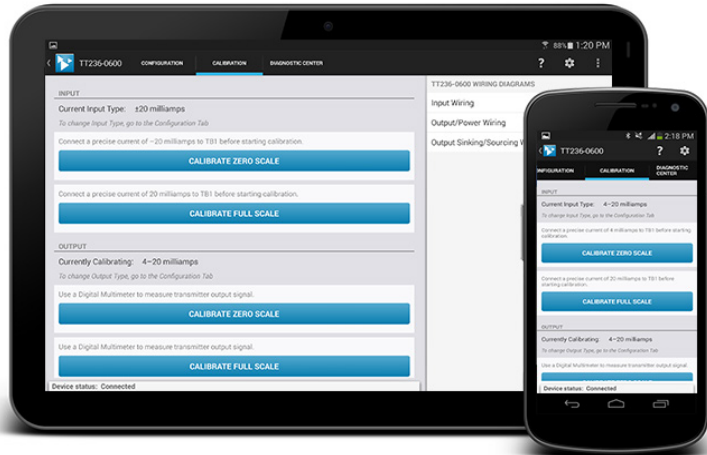
Transmitters: TT Series

Acromag Agility™ Config Tool Mobile Application

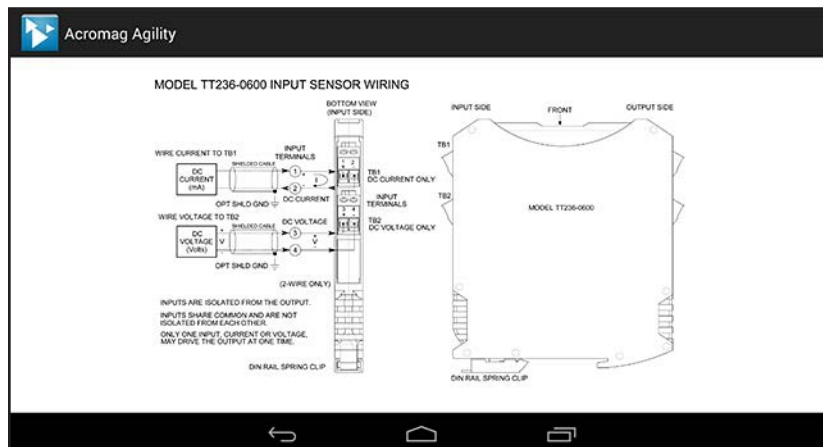
The Agility™ Config Tool is a mobile application that allows easy setup and configuration of Acromag TT Series transmitters via a tethered mobile device.

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

Demo the software, no need for a module. To enter demo mode simply tap the  icon in the upper left corner 8 times.



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)
- 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 4.3 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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Transmitters: TT330 Series



Accessories

◆ Configuration Software



TT330 Series Configuration

Simple to use, whether you need the full software interface package (includes USB isolator and cables) or just the configuration software itself. Acromag makes it easy to get started.

Acromag Agility™ Config Tool

Easy to download, configuration tool mobile app for free download at the [Google Play Store](#).

Ordering Information

[TTC-SIP](#)

Software Interface Package, includes: configuration software CD-ROM, USB-Isolator, and two USB cables (4001-112, 4001-113).

[TT330-Config/Cal](#)

Factory custom configuration/calibration service for all TT330 models.

[TT330-CONFIG](#)

Free download of TT330 Transmitter Configuration Software.

◆ Mounting Hardware



Din-Rail Mounting

For your convenience, Acromag offers several mounting accessories to simplify your system installation. Our 19" rack-mount kit provides a clean solution for mounting your I/O modules and a power supply. Or you can buy precut DIN rail strips for mounting on any flat surface.

Ordering Information

[20RM-16-DIN](#)

19" rack-mount kit with DIN rail.

[DIN RAIL 3.0](#)

[DIN RAIL 16.7](#)

DIN rail strip, Type T, 3 inches (75mm) or 16.7 inches (425mm)

◆ Power Supplies



Universal Slimline Power Supplies

Input Power Requirement

85 to 264V AC or 105 to 370V DC

Output

5V DC, 12V DC, or 24V DC

10W to 240W

Ordering Information

[PSSR-VB24](#)

Power supply, 15W, 0.65A at 24V DC

[PSSR-VD24](#)

Power supply, 60W, 2.5A at 24V DC

Visit www.acromag.com for additional models and more information.

◆ USB Isolator



USB-to-USB Isolator

This compact, industrial-grade isolator provides a high-voltage isolation barrier between a computer and a connected USB device; protecting equipment from electrical surges, transient voltage spikes, and ground loop currents.

Ordering Information

[USB-Isolator](#)

USB isolator, includes USB cable (Part # 4001-112) for isolator-to-PC connection

◆ Cables



Cables for PC-to-USB isolator, USB isolator-to-transmitter connections, and mobile device-to-USB isolator-to-transmitter connections.

Ordering Information

[4001-112](#)

USB Cable, Type A to Type B, 1 meter

[4001-113](#)

USB Cable, Type A to Mini-B, 1 meter

[5028-565](#)

USB Cable, USB OTG Cable, 6 inches