

TT330 Series Thin Transmitters

DIN-Rail Mount

USB-Configured

Slim design



Distribué par GMI-Databox

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Space-Saving 4-Wire
Isolated Transmitters

Answers @ Acromag

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ISO9001
AS9100



Process Instruments, Signal Conditioners, and Distributed I/O



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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

For your convenience, Acromag provides full product documentation and pricing information on our website. You can obtain quotes or even place your order directly on our website.

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- Custom calibration
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- Special shipping, documentation
- Protective humiseal coating
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- CE
- Ethernet/IP conformance
- UL, cUL
- Modbus conformance
- Atex
- HART conformance
- CSA

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Transmitters: TT330 Series



TT330 Series Thin 4-Wire 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: $\pm 10V$, $\pm 5V$, $0-10V$, $0-5V$, $\pm 20mA$, $0-20mA$ and $4-20mA$

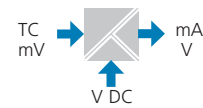
Power

- $12-32V$ DC local/bus 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 $\pm 20mA$ or $\pm 500mV$ DC
- 1500V AC isolation
- Normal/reverse acting output
- Wide operation temperature of -40 to $80^{\circ}C$
- Shock and vibration resistant
- Designed for use in hazardous locations
UL/cUL Class 1 Division 2 Zone 2

TT333 Thermocouple, Millivolt Input

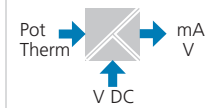


Input

- Type J,K,T,R,S,E,B,N thermocouple
- $\pm 100mV$

[See data sheet](#)

TT334 Potentiometer/ Thermistor Input

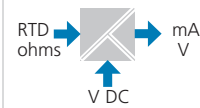


Input

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

[See data sheet](#)

TT335 RTD Isolated Input

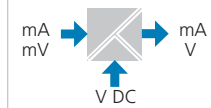


Input

- 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
- $\pm 1mA$, $\pm 20mA$ DC
- 0-500mV DC
- $\pm 500mV$ DC
- 0-11.17mA

[See data sheet](#)

TT337 Low-Voltage Input

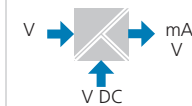


Input

- $\pm 1V$ DC
- $\pm 5V$ DC
- $\pm 10V$ DC

[See data sheet](#)

TT338 High-Voltage Input

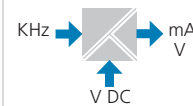


Input

- $\pm 15V$ DC
- $\pm 75V$ DC
- $\pm 150V$ DC

[See data sheet](#)

TT339 Frequency, Pulse Input



Input

- 0 - 100Khz
- Up to 12V rms amplitude
- Unipolar or bipolar signals

[See data sheet](#)



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 (XP, Vista, 7, 8) software via USB.

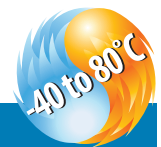


Bus or Local Power

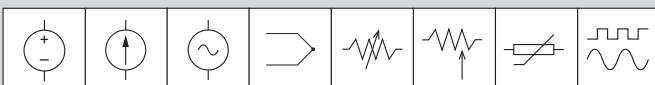
Can be powered through the unit terminals or via the DIN rail bus connector when mating to a plug-in terminal block.

Rugged Design

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



Input Options



Transmitters: TT330 Series



General Operation and Performance Specifications

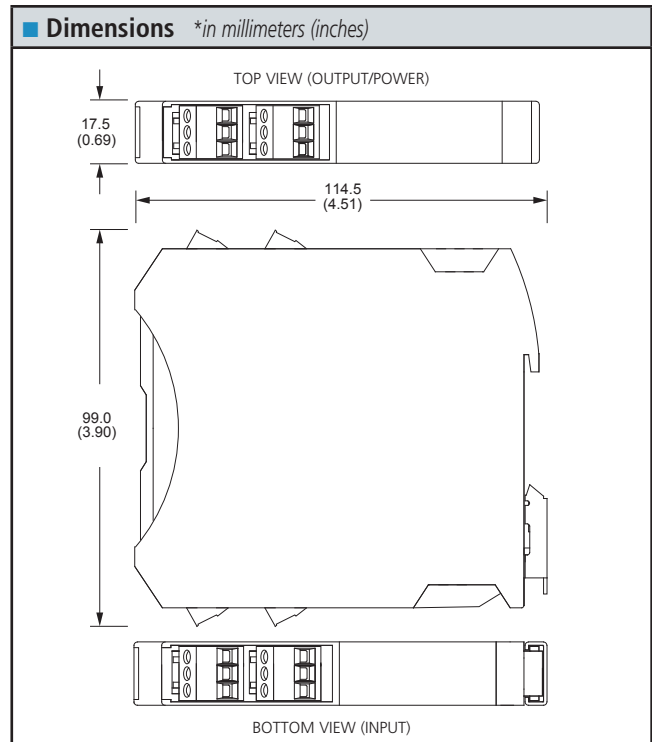
The following specifications are common to all TT330 Series transmitter modules.

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

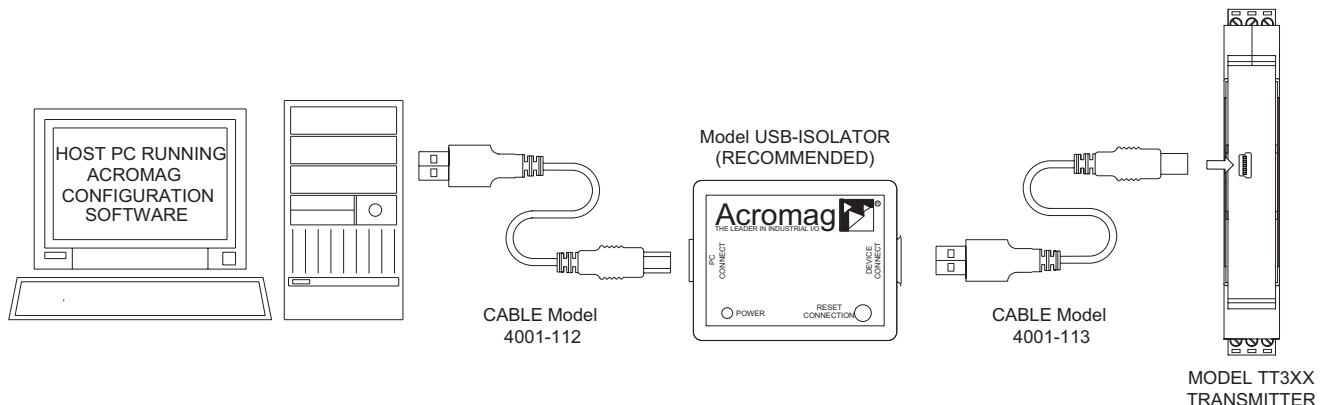
■ Output	
Output Range	±10V, ±5V, 0-10V, 0-5V, ±20mA, 0-20mA, 4-20mA
Accuracy	±0.05% of span typical

■ 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 60068-2-64. 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.

■ 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

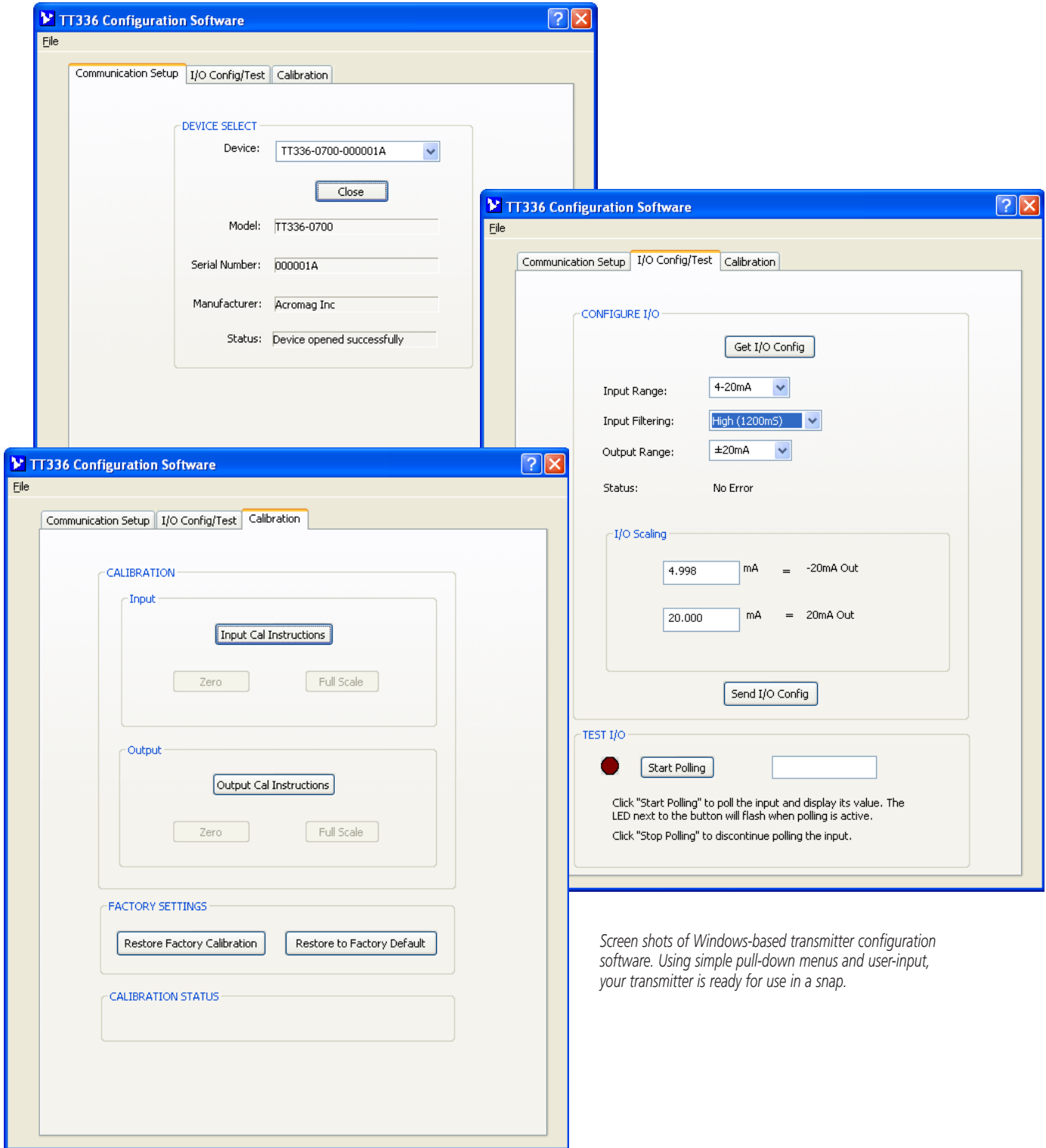


TT Series USB Transmitter Connections



Transmitters: TT330 Series

Module Configuration



TT336 Configuration Software

File

Communication Setup I/O Config/Test Calibration

DEVICE SELECT

Device: TT336-0700-000001A

Close

Model: TT336-0700

Serial Number: 000001A

Manufacturer: Acromag Inc

Status: Device opened successfully

TT336 Configuration Software

File

Communication Setup I/O Config/Test Calibration

CONFIGURE I/O

Get I/O Config

Input Range: 4-20mA

Input Filtering: High (1200mS)

Output Range: ±20mA

Status: No Error

I/O Scaling

4.998 mA = -20mA Out

20.000 mA = 20mA Out

Send I/O Config

TEST I/O

Start Polling

Click "Start Polling" to poll the input and display its value. The LED next to the button will flash when polling is active.

Click "Stop Polling" to discontinue polling the input.

TT336 Configuration Software

File

Communication Setup I/O Config/Test Calibration

CALIBRATION

Input

Input Cal Instructions

Zero Full Scale

Output

Output Cal Instructions

Zero Full Scale

FACTORY SETTINGS

Restore Factory Calibration Restore to Factory Default

CALIBRATION STATUS

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



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.

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

P55R-SB24

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

P55R-SD24

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

◆ USB Cables



Cables for both PC-to-USB isolator and USB isolator-to-transmitter connections.

Ordering Information

4001-112

USB Cable, Type A to Type B, 1 meter

4001-113

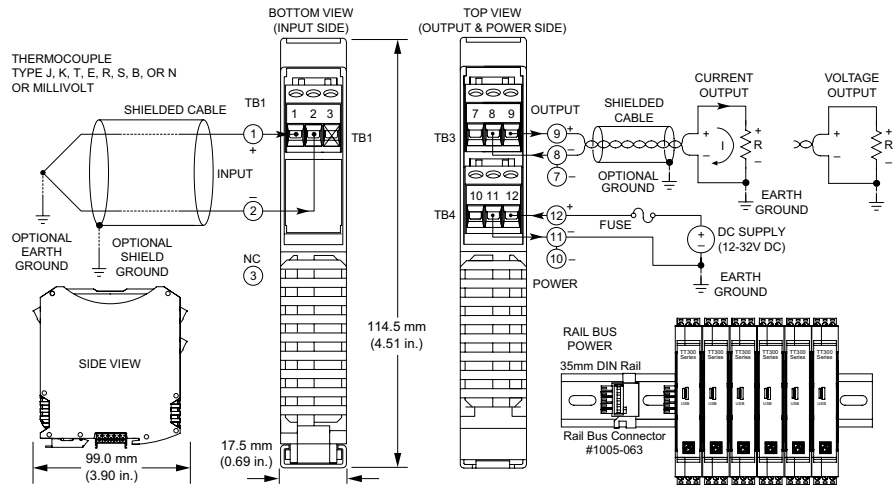
USB Cable, Type A to Mini-B, 1 meter

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.

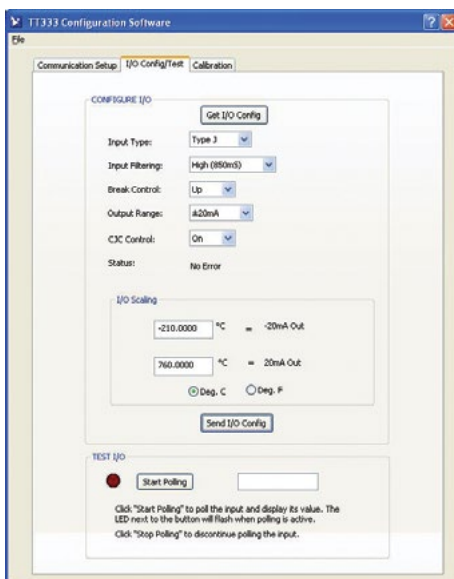
High-voltage isolation separates the input from the output circuit. Isolation protects from surges, reduces noise, and eliminates ground loop errors.

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 (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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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.
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

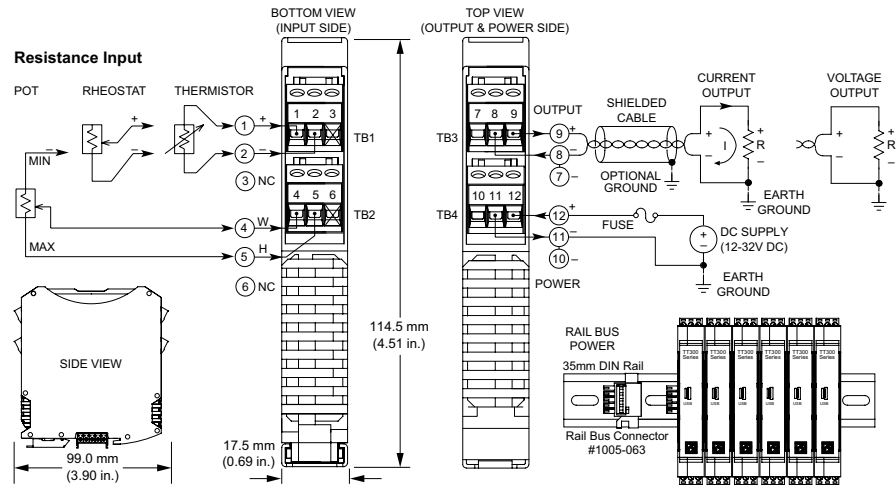
DIN rail bus power connector and left/right terminal
blocks. One kit supports multiple transmitters.



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Transmitters: TT330 Series

TT334 Potentiometer / thermistor input four-wire transmitter



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.

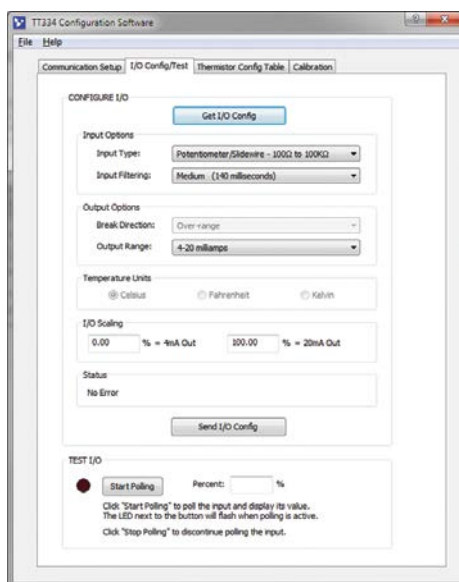
High-voltage isolation separates the input from the output circuit. Isolation protects from surges, reduces noise, and eliminates ground loop errors.

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 ±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 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 and 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

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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 60068-2-64.

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

Approvals

CE compliant. UL/cUL Class I Div. 2 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).

TTBUS-KIT

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

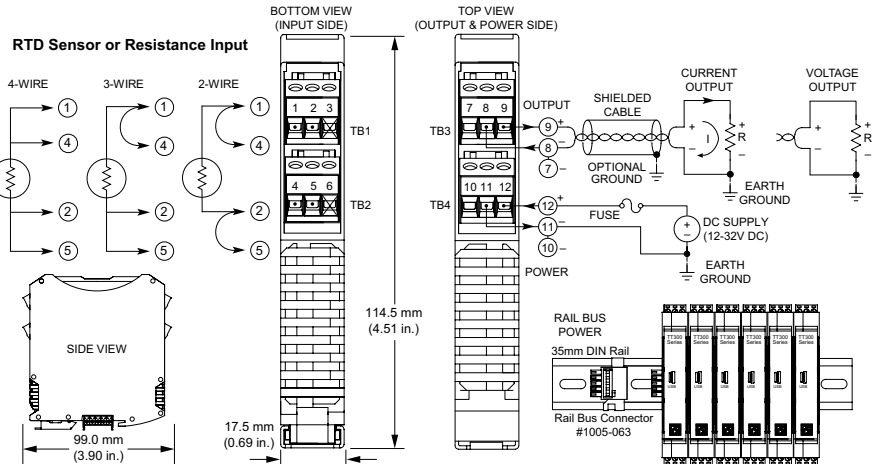
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Transmitters: TT330 Series

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.

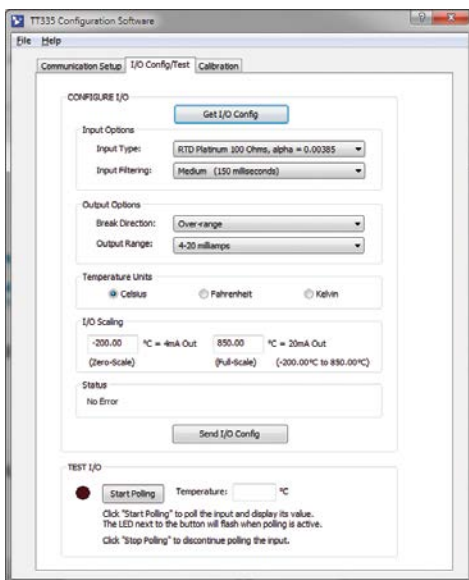
High-voltage isolation separates the input from the output circuit. Isolation protects from surges, reduces noise, and eliminates ground loop errors.

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 and 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

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 ²
RTD, Pt 100Ω	-200 to 850°C (-328 to 1562°F)	±0.2°C, ±0.019%
RTD, Pt 200Ω	-200 to 850°C	±0.3°C, ±0.029%
RTD, Pt 500Ω	-200 to 850°C	±0.5°C, ±0.048%
RTD, Pt 1000Ω	-200 to 850°C	±1.0°C, ±0.095%
RTD, Ni 120Ω (Minco 7-120)	-80 to 320°C (-112 to 608°F)	±0.08°C, ±0.020%
RTD, Cu 10Ω (Minco 16-9)	-200 to 270°C (-328 to 518°F)	±0.5°C, ±0.106%
Resistance (linear) ¹	0 to 450Ω	±0.05Ω, ±0.010%

Note 1: Linear resistance input range approaches but does not include 0Ω and 500Ω. If exactly 0Ω or 500Ω is measured, break detection is triggered.

Note 2: Rated accuracy (in °C and % of span) applies for input spans greater than 5% of input full-scale.

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 60068-2-64.
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 Class I Div. 2 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).

TTBUS-KIT

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

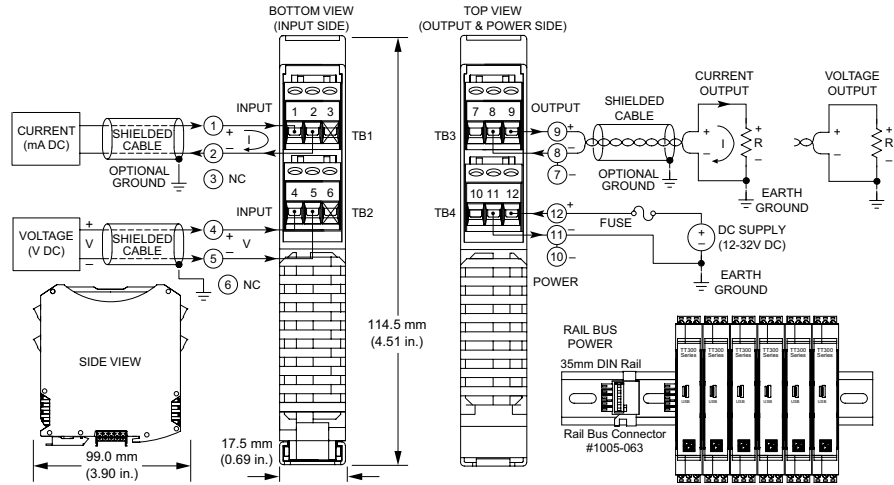
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Transmitters: TT330 Series

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.

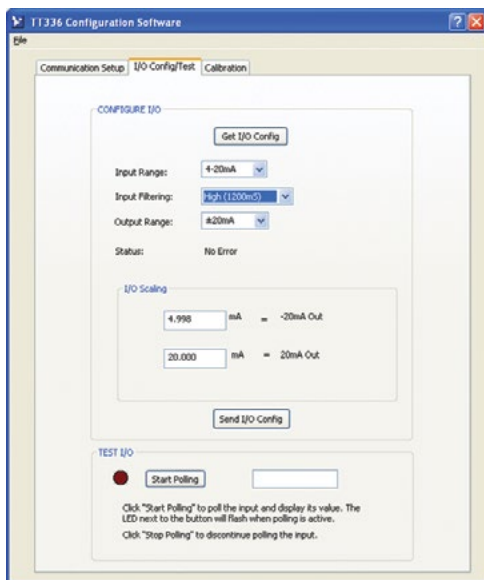
High-voltage isolation separates the input from the output circuit. Isolation protects from surges, reduces noise, and eliminates ground loop errors.

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 (50g) and vibration (5g) resistant
- Mounts on Type T DIN-rail
- 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

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 Suppressers (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 (±0.0080%/°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

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).

TTBUS-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.

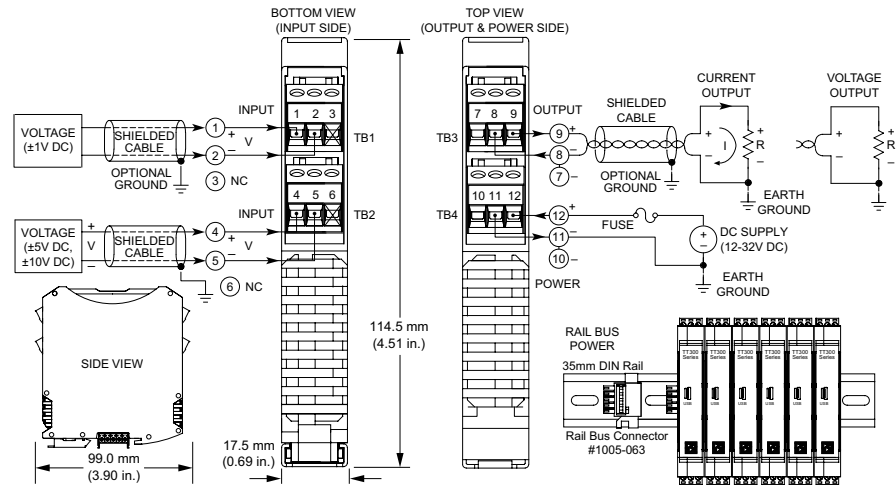


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Transmitters: TT330 Series

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.

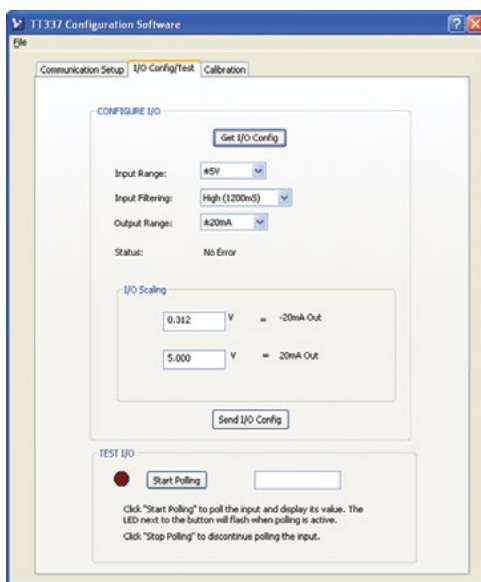
High-voltage isolation separates the input from the output circuit. Isolation protects from surges, reduces noise, and eliminates ground loop errors.

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 (50g) and vibration (5g) resistant
- Mounts on Type T DIN-rail
- Wide ambient operation (-40 to $80^{\circ}C$)
- 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

TT337 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

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 Suppressers (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
$\pm 20\text{mA}$	$\pm 21\text{mA}$	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)	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: 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

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).

TTBUS-KIT

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

ISO9001
AS9100

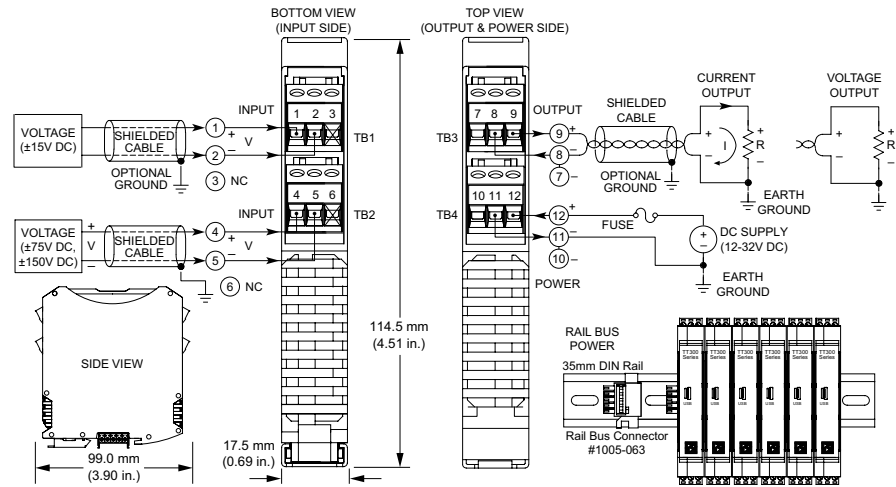


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Transmitters: TT330 Series

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.

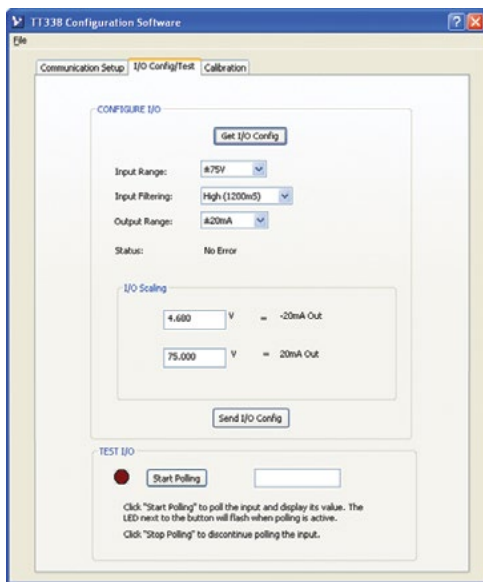
High-voltage isolation separates the input from the output circuit. Isolation protects from surges, reduces noise, and eliminates ground loop errors.

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 (50g) and vibration (5g) resistant
- Mounts on Type T DIN-rail
- 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

TT338 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

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

■ 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: 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

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).

TTBUS-KIT

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

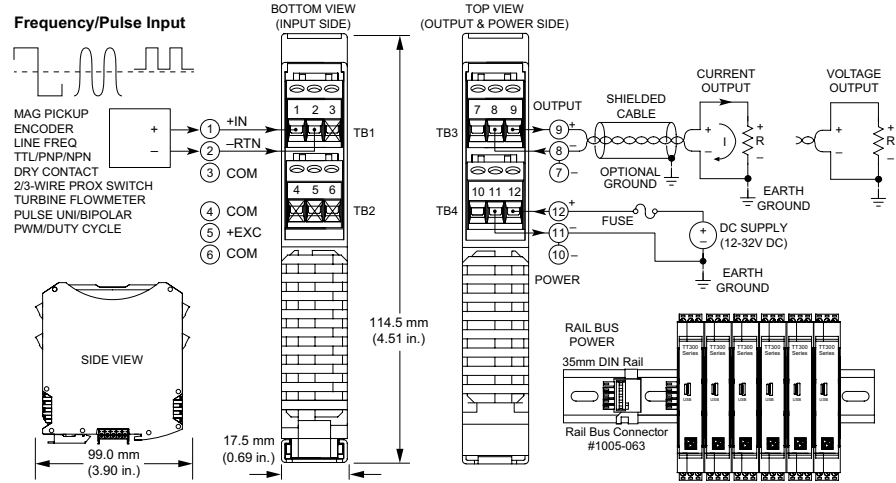
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Transmitters: TT330 Series

TT339 Frequency/pulse/PWM input four-wire transmitter



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:

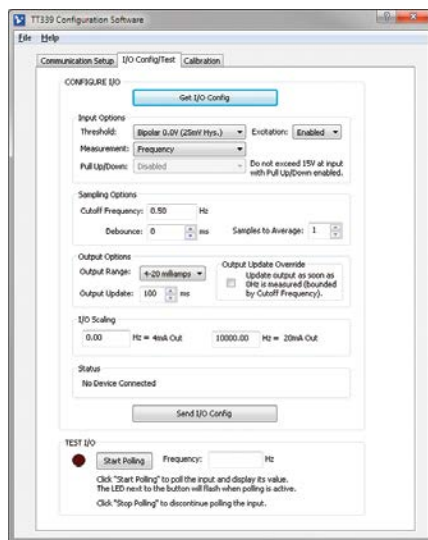
- Speed pickup
- Line frequency monitoring
- Turbine flowmeter interface
- PWM sensing/feedback circuits
- Shaft encoder interface

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

Windows® XP, Vista, 7, 8

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 120V_{RMS} ($\pm 170V$ 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 and UL/cUL Class 1 Div 2 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), 120V_{RMS} 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 60068-2-64.

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

Approvals

CE compliant. UL/cUL Class I Div. 2 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).

TTBUS-KIT

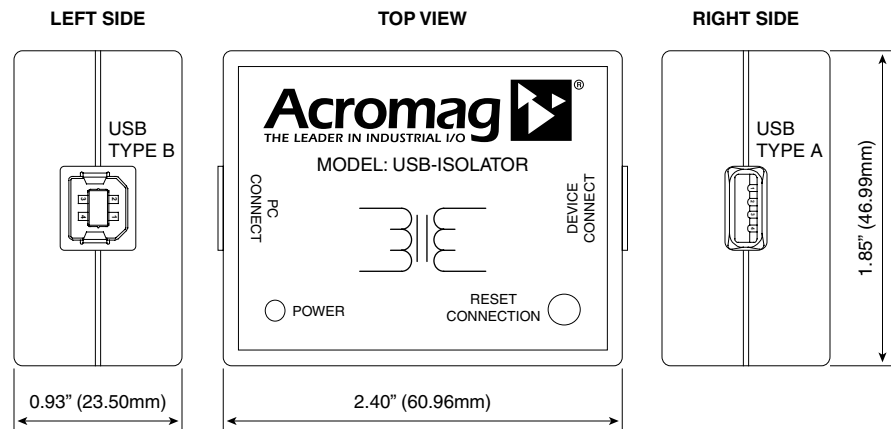
DIN rail bus power connector and left/right terminal blocks. One kit supports multiple transmitters.

ISO9001
AS9100  MADE IN USA

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USB-ISOLATOR USB-to-USB Isolator



USB-powered, USB 2.0 and 1.1 compatible ◆ 1500V AC / 2100V DC isolation ◆ No drivers required

Description

This compact, industrial-grade isolator provides a high-voltage isolation barrier between a computer and a connected USB device. The isolation protects equipment from electrical surges and transient voltage spikes. It also eliminates ground loop currents flowing between the PC and peripherals which can cause damage and inaccurate measurements. Additionally, isolation minimizes conducted noise from static discharge, magnetic fields, and radio frequency interference.

Acromag's USB isolator is very easy to use. The isolator inserts in-line with the USB connection and operates transparently. No special software drivers are required. The unit receives power from the PC's USB port and isolates that power to the connected device. High noise immunity and low radiated emissions ensure reliable data transfer in sensitive applications.

A number of high-performance features help provide convenient and dependable operation. The green LED indicates that power is being received and blinks if the connected device draws too much current. An internal jumper lets you switch from Full Speed (12 Mbps) to Low Speed (1.5 Mbps) communication. The reset button offers a simple way to reinitialize a connected device without breaking the cable connection. High-retention USB sockets keep cables securely attached under shock and vibration.

Key Features & Benefits

- Isolates and protects a USB peripheral from a USB host
- Electrical isolation up to 1500V AC / 2100V DC
- Common mode filtering on all data lines
- Built-in surge/transient suppression up to 8kV on all ports
- Self-powered through the USB port
- Supports USB 2.0 full speed (12 Mbps) and USB 1.1 low speed (1.5 Mbps) data rates with jumper-selection
- LED for power indication and diagnostics
- Reset button to reinitialize and re-enumerate peripheral devices
- Output short circuit protection with auto-retry
- No software or configuration required (transparent operation)
- Uses standard high-retention USB Type A/B cable connections (includes 1m cable)
- Compact size and rugged design for harsh environments
- Wide ambient temperature operation -40 to 70°C (-40 to 158°F)
- CE, FCC, UL/cUL approvals

Ordering Information

Models

USB-ISOLATOR

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

TTC-SIP

CD-ROM (Part #5040-944), USB isolator and two USB cables (Part # 4001-112, 4001-113) for configuration of Acromag TT2XX Series transmitters

Accessories

4001-112

USB cable, 1 meter, with Type A to Type B plugs

4001-113

USB cable, 1 meter, with Type A to Mini-B plugs



USB-ISOLATOR USB-to-USB Isolator

Performance Specifications

■ USB Port Interface

Standards

USB 1.1 and 2.0 compatible, full speed (12Mbps, default) and low speed (1.5Mbps) data rates supported. For low speed data rates, an internal jumper is provided for user setting. Connection is transparent, no software or configuration is required. Isolator will not be enumerated in the device manager.

■ Physical

Dimensions

2.40" Length x 1.85" Wide x 0.925" High (60.96mm x 46.99mm x 23.495mm).

Connectors

Standard high retention USB A/B connectors with minimum withdrawal force of 15 Newtons. 1 meter A/B cable included.

PC Connector

USB Type B receptacle

Device Connector

USB Type A receptacle

LED Indicator

Green LED indicates isolator receiving 5V power from the USB computer bus. Flashing indicates short circuit/ retries on peripheral side.

Reset Button

Resets the connection to the USB peripheral device for reinitialization and re-enumeration.

Enclosure Material

ABS Resin, UL94 rated, IP30 plastic case.

■ Environmental

Operating temperature

-40 to 70°C (-40° to 158°F).

Storage temperature

-40 to 85°C (-40 to 185°F).

Relative humidity

5 to 95% non-condensing.

Power

PC Connect Side: Standard USB bus power (5V DC).

Device Connect Side: 5V DC / 120mA with full power connection from PC. Includes over-current protection with auto-retry.

Isolation

1500V AC / 2100V DC peak isolation.
250V AC continuous safety isolation.

Agency Approvals:

CE and FCC compliant. UL/cUL Class 1 Div. 2 Zone 2.

Radiated Field Immunity (RFI)

Designed to comply with IEC1000-4-3 Level 3 and EN50082-1.

Electromagnetic Compatibility (EMC)

Minimum immunity per EN61000-6-2:2001

Electrostatic Discharge (ESD) Immunity

Per IEC61000-4-2.

Radiated Field Immunity (RFI)

Per IEC61000-4-3.

Electrical Fast Transient Immunity (EFT)

Per IEC61000-4-4. Complies with IEC1000-4-4 Level 3 and EN50082-1.

Surge Immunity

Complies with IEC1000-4-5 Level 3 and EN50082-1. Per IEC61000-4-5.

Conducted RF Immunity (CRFI)

Per IEC61000-4-6.

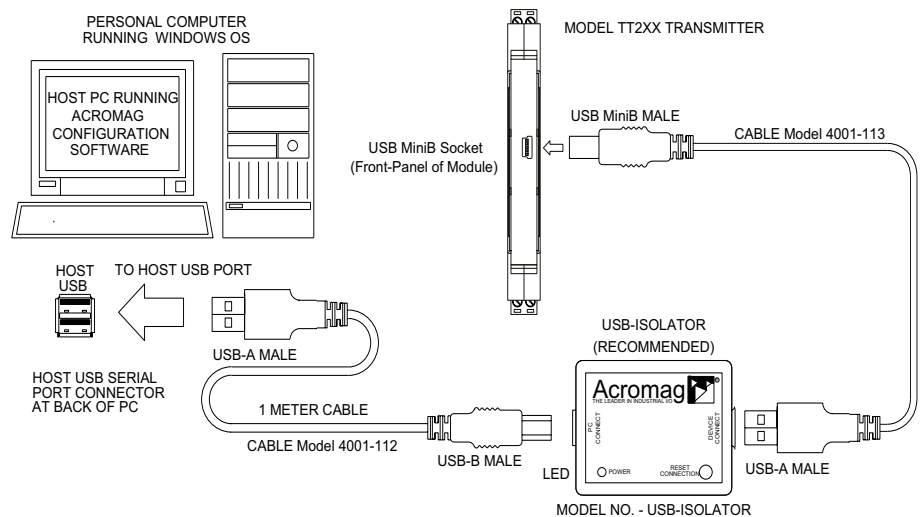
Emissions

Per EN61000-6-4:2001.

Radiated Frequency Emissions

Per CISPR11 Class A. Meets or exceeds EN50081-1 for Class B equipment.

TT SERIES USB TRANSMITTER CONNECTIONS



ISO9001
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