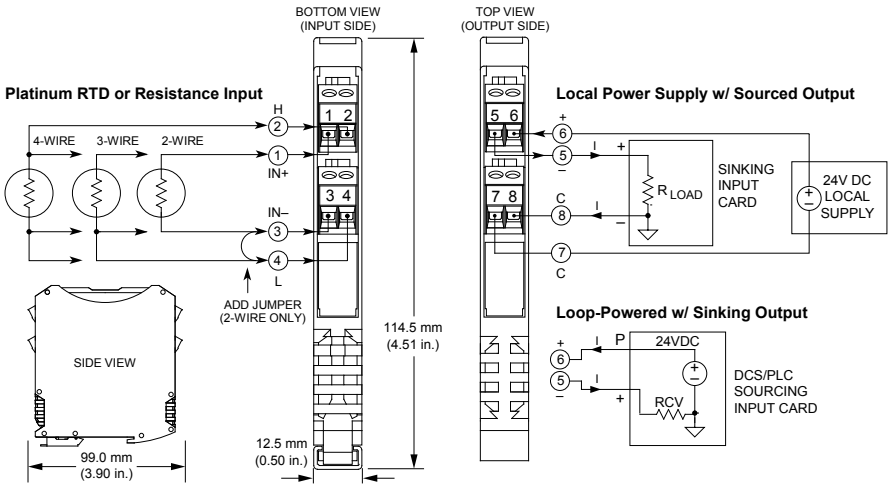
Transmitters: TT230 Series

TT231 RTD/resistance input two-wire/three-wire transmitter



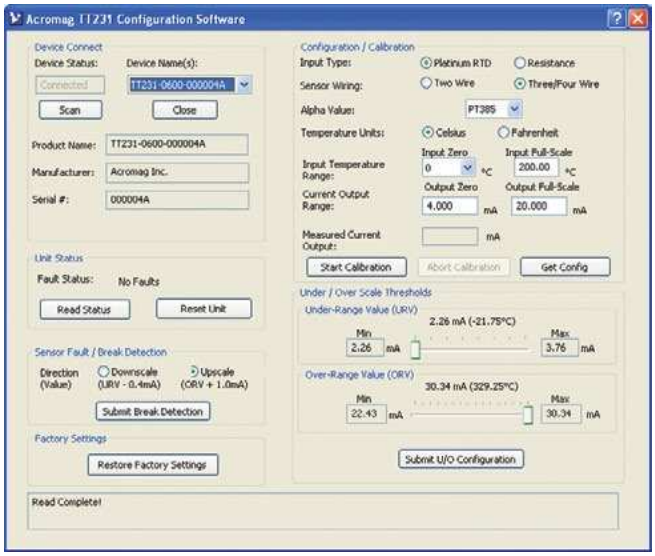
100 ohm Pt RTD or 0-900 ohm input ◆ 4-20mA output (sink/source) ◆ 12-32V DC loop/local power

Description

The TT231 model is a space-saving two-wire transmitter that converts a 100 ohm Platinum RTD sensor input to a proportional 4-20mA signal. Power is received from the output loop current or a DC supply when using a three-wire connection. The transmitter provides sensor excitation plus performs linearization, lead-wire compensation, and lead-break detection.

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.



TT230 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
- Flexible RTD or linear resistance input ranges (any 100 ohm Pt RTD with 375-393 alpha)
- Space-saving 12.5mm (0.5 inch) unit with pluggable terminals for convenient wiring
- High accuracy, linearity, stability, and reliability
- Advanced analog signal conditioning ASIC eliminates digitization errors
- Low temperature drift (<80ppm/°C)
- Supports sink or source output wiring
- Programmable over/under-range limits
- Selectable upscale or downscale operation for sensor errors and lead-break detection
- NAMUR-compliant output loop current
- 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

Acromag
THE LEADER IN INDUSTRIAL I/O

Tel 248-295-0880 ■ Fax 248-624-9234 ■ sales@acromag.com ■ www.acromag.com ■ 30765 Wixom Rd, Wixom, MI 48393 USA

Transmitters: TT230 Series

TT231 RTD/resistance input two-wire/three-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 TT230 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
100Ω Pt RTD, α=0.00385 Ω/Ω/°C, 0-200°C input, 4-20mA output, upscale break detection.

Input Configuration
Two-, three- or four-wire sensor input connections.

Input Ranges
100 ohm Platinum RTD, alpha = 375-393, 385 (default), -50 to 900°C (-58 to 1652°F).

0 to 900 ohms linear resistance.

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

Zero Adjust
RTD 3/4 wire: -50, -17.78, or 0°C (-58, 0, 32°F).
RTD 2 wire: 0°C (32°F) fixed.
RES: 0 or 100 ohms.

Full-Scale Adjust
RTD: up to 900°C (1652°F), 50°C (58°F) span minimum.
Resistance: up to 900 ohms, 8 ohm span minimum.

Excitation Current
0.5mA, nominal, each ± lead.

Lead-Wire Compensation
25 ohms per lead.

Lead Break (Sensor Burnout) Detection
Configurable for either upscale or downscale.

Input Filter Bandwidth
-3dB at 700Hz, typical, normal mode filter.

Output

Output Range
4 to 20mA DC.
Under-scale limit adjustable for 2.1 to 3.6mA, nominal.
Over-scale limit adjustable for 21 to 30mA, nominal.

Output Fault Limits (Sensor Fault)
0.4mA below selected under-scale threshold and 1.0mA above over-scale threshold, typical.

Output Compliance
$R_{LOAD} = (V_{SUPPLY} - 8.6V) / 0.020A$.
R_{LOAD} = 0 to 750 ohms @ 24V DC.

Output Accuracy
Better than ±0.1% of span, typical for spans less than 500°C. Includes the effects of repeatability, terminal point conformity, and linearization, but does not include sensor error.

Ambient Temperature Effect
Better than ±0.008% per °C of input span or ±80ppm/°C, typical. Includes the combined effects of zero and span drift over temperature.

Output Response Time (for step input change)
500µS, typical with 250 ohm load (to reach 98% of final output value).

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
9-32V DC SELV (Safety Extra Low Voltage), 30mA max.

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

Dimensions
12.5 x 114.5 x 99.0 mm (0.5 x 4.51 x 3.90 inches).

Shipping Weight
0.22 kg (0.5 pounds) packed.

Ordering Information

Models

TT231-0600
Transmitter, RTD/resistance input.

Services

TT230-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).

ISO9001
AS9100
MADE IN USA

Acromag
THE LEADER IN INDUSTRIAL I/O

Tel 248-295-0880 ■ Fax 248-624-9234 ■ sales@acromag.com ■ www.acromag.com ■ 30765 Wixom Rd, Wixom, MI 48393 USA