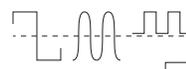


Transmitters: TT230 Series

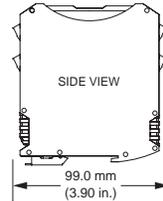
TT239 Frequency/pulse/PWM input two-wire transmitter



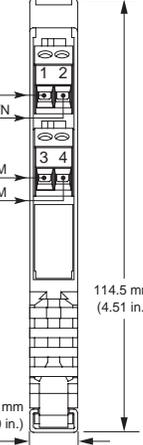
Frequency/Pulse Input



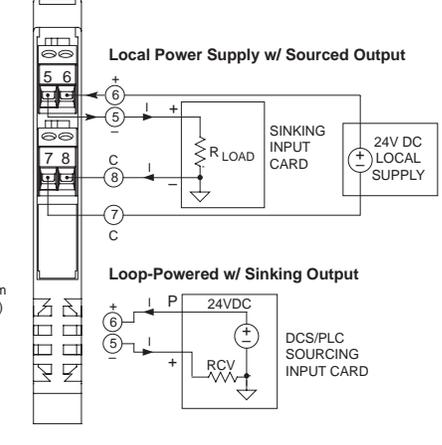
- MAG PICKUP
- ENCODER
- LINE FREQ
- TTL/PNP/NPN
- DRY CONTACT
- 2/3-WIRE PROX SWITCH
- TURBINE FLOWMETER
- PULSE UNI/BIPOLAR
- PWM/DUTY CYCLE



BOTTOM VIEW (INPUT SIDE)



TOP VIEW (OUTPUT SIDE)



Multi-range frequency/pulse input ◆ 4-20mA output (sink/source) ◆ 12-32V DC local/local power

Description

The TT239 model is a space-saving two-wire transmitter that isolates and converts a frequency, pulse, or pulse-width modulation (PWM) input to a proportional 4-20mA signal. You can select to measure either the input frequency or the duty cycle. Power is received from the output loop current or a DC supply when using a three-wire connection.

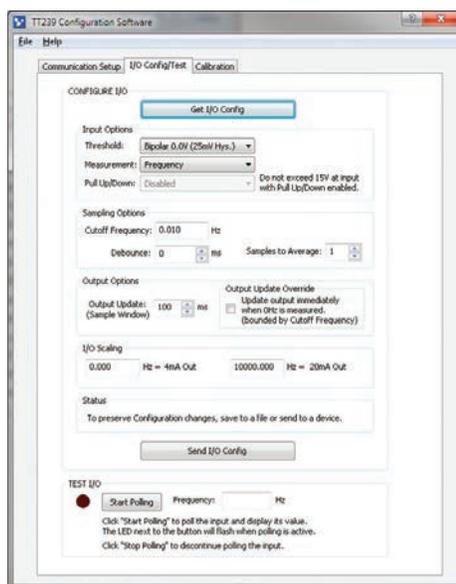
High-voltage isolation separates the input from the output circuit. Isolation protects from surges, reduces noise, and eliminates ground loop errors.

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.

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, and output update time
- Software configurable pull-up/down resistors (+4V DC input pull-up for sensors/transducers)
- 1500V isolation between input/output circuits
- Space-saving 12.5mm (0.5 inch) unit with pluggable terminals for convenient wiring
- Fast response time and high accuracy
- Supports normal or reverse-acting output
- Supports sink or source output wiring
- NAMUR-compliant output loop current
- 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



TT230 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

TT239 Model software allows you to configure transmitters offline, save the file, and download into units later, at your convenience.



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

Transmitters: TT230 Series

TT239 Frequency/pulse/PWM input two-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/Calibration

±5.0V Square Wave; Input Threshold = Bipolar 0.0V; Hysteresis ±25mV; Measurement = Frequency; 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. 10µs minimum pulse width.

Input Ranges

Frequency Input	Output Update	Input Resolution	Typical Accuracy
0 to 100Hz	Any rate	1 part in 60000	±0.05Hz
0 to 1KHz	Any rate	1 part in 6000	±0.5Hz
0 to 5KHz	Any rate	1 part in 1200	±1Hz
0 to 10KHz	10ms	1 part in 60000	±200Hz
0 to 10KHz	100ms	1 part in 600000	±20Hz
0 to 10KHz	1000ms	1 part in 6000000	±2Hz
0 to 100KHz	10ms	1 part in 60000	±400Hz
0 to 100KHz	100ms	1 part in 600000	±40Hz
0 to 100KHz	1000ms	1 part in 6000000	±4Hz

PWM Input Carrier Freq	Cycle Range	Input Resolution	Typical Accuracy
0 to 100Hz	1 to 99%	1 part in 60000	±0.02%
0 to 1KHz	10 to 90%	1 part in 6000	±0.2%
0 to 3KHz	20 to 80%	1 part in 1200	±2.0%

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.

Input Pull-up/Pull-down (internal, software-select)

Configurable 12.4KΩ pull-up to +4V and 1KΩ pull-down to -FRTN, or disabled. 15V DC maximum input. 4V pull-up with ±28mV hysteresis or 3V when ±84mV.

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).

■ Output

Output Range

4 to 20mA DC, wired as sink or source.
Under-range capability 3.6mA. Over-range 24mA.

Output Compliance

$R_{LOAD} = (V_{SUPPLY} - 12V) / 0.020A$.
 $R_{LOAD} = 0$ to 600 ohms @ 24V DC.

Output DAC Resolution

16-bit D/A converter

Output Update

Software configurable from 10ms to 5000ms.
Determines the rate at which the output signal is updated, unless optionally overridden.

Output Settling Time

1ms, 0% to 98% for a step-change in input, typical.

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.

Ambient Temperature Effect

Better than ±0.0020% per °C of input span or ±20ppm/°C, typical. Includes the combined effects of zero and span drift over temperature.

■ Environmental

Temperature Range

Operation: -40 to 80°C (-40° to 176°F)
Storage: -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 maximum.

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. Designed for UL/cUL 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

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

TT239-0600

Transmitter, isolated frequency/pulse/PWM 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)



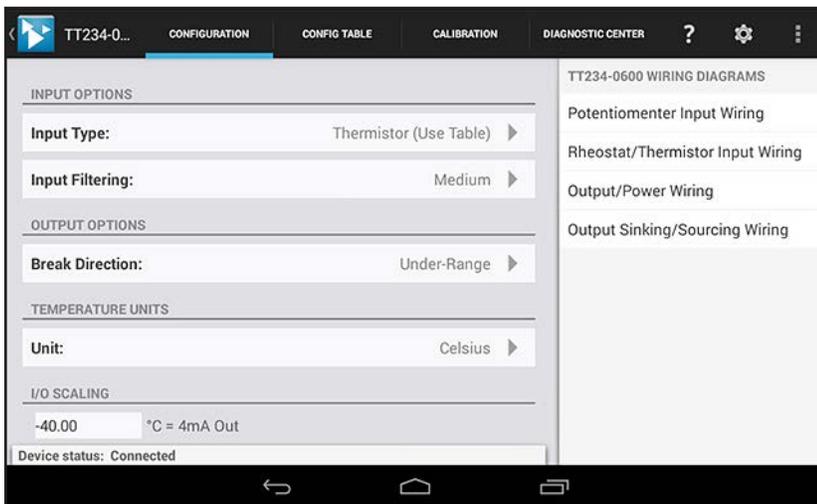
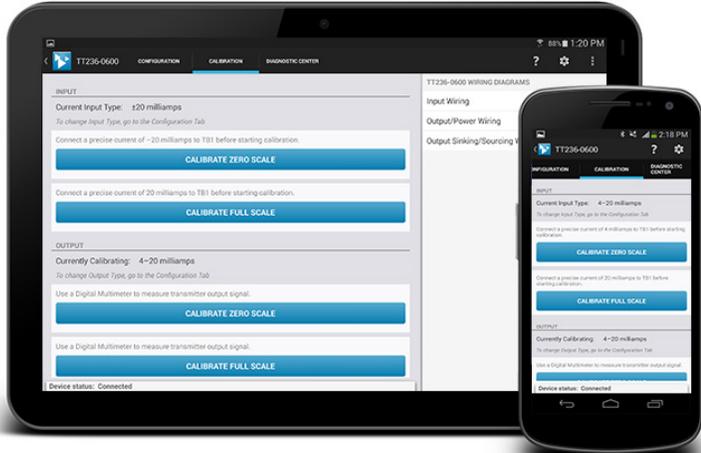
Transmitters: TT Series

Acromag Agility™ Config Tool Mobile Application

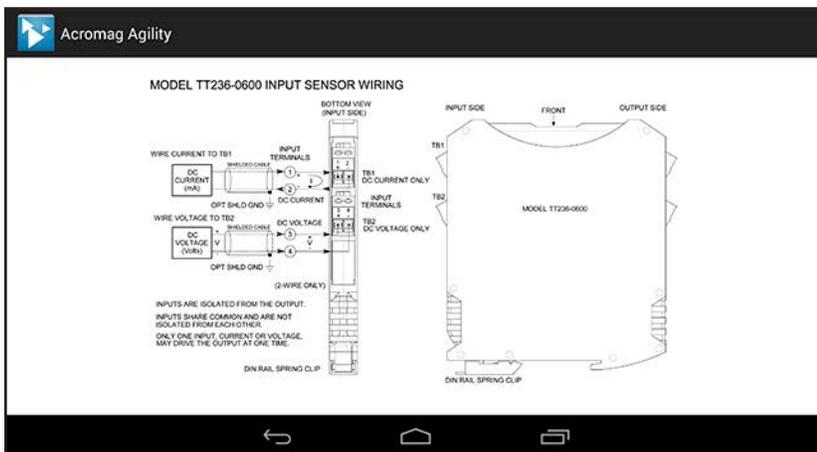
The Agility™ Config Tool is a mobile application that allows easy setup and configuration of Acromag TT Series transmitters via a tethered mobile device.

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



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