

Monitoring and Control Solutions

DT230 Series Catalog

Dual Channel Transmitter

Easy Configuration

Slim Design



USB-Programmable Saves Space and Cost



Experience counts:

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















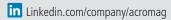












Depend on Acromag



Acromag: The I/O Leader

Acromag is a customer-driven manufacturer focused on developing process automation 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.

Top Quality and a 2-Year Warranty

We take every measure to guarantee you dependable operation and products that perform at or beyond their specifications. Our state-of-the-art manufacturing and military-grade components add an extra degree of ruggedness. Most products qualify for an extended 2-year warranty. And with ISO 9001/AS9100 certified quality control, you get full confidence.

All trademarks are the property of their respective owners.

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.

Fast Delivery from Stock

Most products can be shipped within 24 hours of receiving your order.

Special Services

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
- plastic and stainless steel tagging

Certification and Approvals

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

- CE
- Ethernet conformance
- UL, cUL
- Modbus conformance
- ATEX
- Profibus certification
- CSA
- IECEx



DT Series Programmable Dual-Channel Transmitters











Introduction

The new DT Series transmitters are designed to offer a cost-effective space-saving solution to interface a variety of process and sensor signals to your control systems. Each model supports several input ranges and can output proportional 0/4-20mA, 0-10V, or ±10V DC signals.

Input

Thermocouple/Millivolt, RTD/Resistance, Process Voltage, High Voltage, Current/Millivolt

Output

Proportional 4-20mA

Power

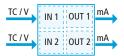
■ 7-32V DC loop/local power

Key Features and Benefits

- USB-programmable (allows easy selection of options that is not possible with pots or jumpers)
- Dual unit saves space and reduces costs
- Signal splitter capability
- Selectable filtering levels
- Configurable output clamp levels (NAMUR)
- Removable, front-facing terminal blocks (simplify your wiring tasks)
- Rail power bus and redundancy
- Supports sink/source wiring
- -40 to 80° C operation
- Hazloc approvals UL C1D2, ATEX/IECEx Zone 2



DT233 Thermocouple, Millivolt Input

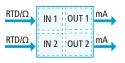


Input

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

See data sheet

DT235 RTD/resistance Input



Input

- RTD Pt (100/200/500Ω) Ni (120Ω) $Cu(10\Omega)$
- Resistance $0-4500 \Omega$

See data sheet

DT236 Current/millivolt Input

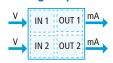


Input

- ±20mA
- ±500mV

See data sheet

DT237 Medium DC Voltage Input



Input

- 0-10V
- ±10V

See data sheet

DT238 High Voltage Input



Input

- ±150V
- 0 ±150V input

See data sheet





DT200 SERIES













Removable Terminal Blocks

Pluggable terminal blocks simplify wiring for easy installation and removal of modules.

4-20mA Output

DT230 Series: Supports sink or source 4-20mA output

2-wire, Loop-powered

DT230 Series: 7-32V DC Power is received from the output loop (2-wire).

Space Saving

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

Simple Configuration

A USB connection to a Windows® PC or Android™ device enables simple. precise configuration of I/O ranges and a variety of operational settings with free software.





Input Options









Rugged Design

Wide ambient temperature operation, shock and vibration-resistant, as well as CE Compliant, UL/cUL Class I Div 2, ATEX/IECEx Zone 2 approvals.







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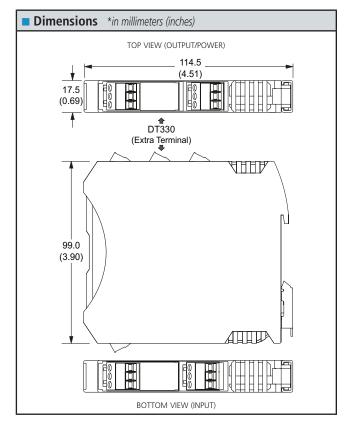
The following specifications are common to all DT Series transmitter modules.

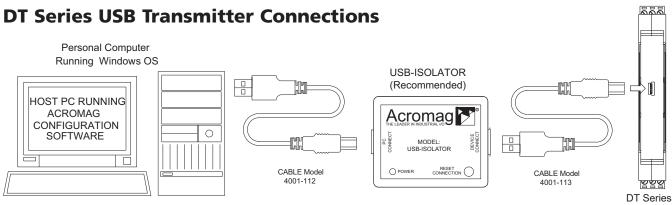
■ USB Interface	
USB Connector	USB Mini-B type socket, 5-pin.
USB Data Rate	12Mbps. USB v1.1 and 2.0 compatible.

Output	
Output Ranges	0-20mA, 4-20mA, ±5V, ±10V, 0-5V, 0-10V DC
Accuracy	±0.05%, typical. ±0.1%, maximum.

■ Environmenta	■ Environmental		
Operating Temperature	DT230 Series: -40 to 80°C (-40° to 176°F). DT330 Series: -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 Requirement	DT230 Series: 7-32V DC SELV, 24mA max, loop power. DT330 Series: 6-32V DC SELV, 1.5W max.		
Isolation	1500V AC peak. 250V AC (354V DC) continuous isolation between input, output, and power (5-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 61000-6-1, IEC 61000-4-5		
Approvals	CE compliant. UL/cUL listed Class I Div. 2. Groups ABCD. ATEX/IECEx Zone 2.		

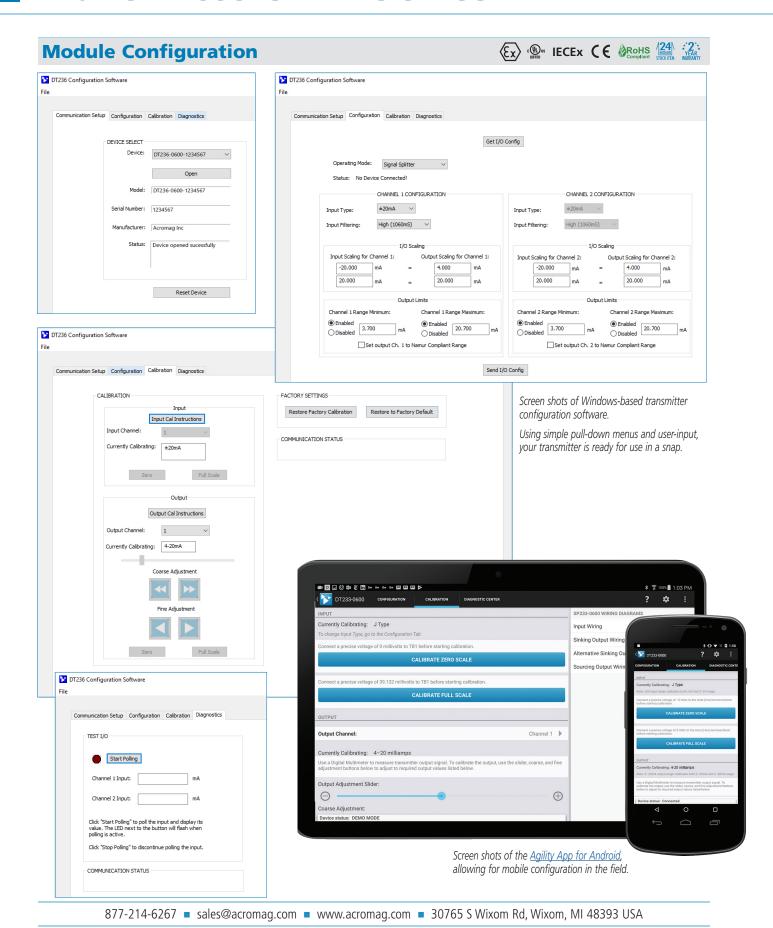
■ Physical	
General	General-purpose plastic enclosure designed for mounting on 35mm "T-type" DIN rail.
Case Material	Self-extinguishing polyamide, UL94 V-0 rated, color light gray. General-purpose NEMA Type 1 enclosure.
I/O Connectors	Removable plug-in terminal blocks rated for 12A/250V; AWG #26-12, stranded or solid copper wire.
Shipping Weight	0.5 pounds (0.22 Kg) packed.





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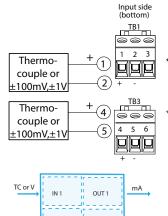


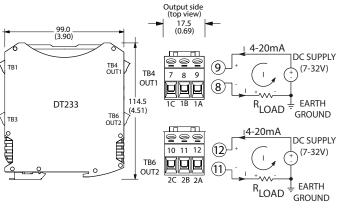
DT233 Thermocouple/millivolt input two-wire dual transmitter

TC or V









OUTPUT "C" TERMINALS ARE USED FOR OPTIONAL "SOURCING" LOOP WIRING TERMINATION (SEE USER MANUAL)

Dual channels ◆ Universal thermocouple, mV input ◆ 4-20mA outputs (sink/source) ◆ 7-32V DC loop/local power

mΑ

OUT 2

Description

DT230 series signal conditioners provide two independent I/O channels in a single, space-saving unit. The DT233 model is a dual two-wire transmitter that isolates and converts millivolt or thermocouple sensor inputs to proportional 4-20mA control signals. Power is received from the output loop current.

High-voltage isolation separates all input and output circuits from each other. Isolation protects from surges, reduces noise, and helps eliminate ground loop errors.

Setup and calibration are fast and easy with a convenient USB connection to your PC and Acromag's Windows configuration software. The Android app enables setup with mobile devices.

Advanced signal processing capabilities, variable range input/output, and convenient USB programming make this instrument very versatile. 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.

? X DT233 Configuration Software Get I/O Config Operating Mode: Dual Transmitter Type J ▼ Input Type High (1141mS) -Input Filtering High (1141mS) ▼ © Enabled © Disabled © Enabled © Disabled Set output Ch. 2 to Namur Compliant Rang Celsius Send I/O Config

Windows configuration software (FREE) at www.acromag.com

Android Agility™ app (FREE) at Google Play Store

Key Features & Benefits

- Operate as a dual transmitter, a single transmitter, or a signal splitter
- Easy configuration via USB with Windows software or Agility™ app for Android
- Independently adjustable and scalable input and output ranges
- Selectable thermocouple/millivolt input types: (TC Type J, K, T, R, S, E, B, N, ±100mV, ±1V)
- 4-20mA current loop outputs support sinking or sourcing circuit configurations
- Supports reverse-acting (inverse) output
- User-configurable output range clamp levels support NAMUR-compliant operation
- Selectable up/downscale sensor break detection
- Very low 7V two-wire loop burden
- High accuracy, linearity, stability, and reliability
- User-selectable filtering (none, low, med, high)
- Space-saving 17.5mm (0.7 inch) unit with pluggable terminals for convenient wiring
- 1500V isolation, 4-way (inputs/outputs)
- Wide ambient operation (-40 to 80°C)
- CE compliant. UL/cUL Class I Div 2, ATEX / IECEx Zone 2

Save configuration files for convenient copy/restore capability.

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Transmitters: DT230 Series Series

DT233 Thermocouple/millivolt input two-wire dual transmitter

Performance Specifications

IMPORTANT: To prevent ground loop error between a grounded PC and a grounded input signal, Acromag strongly recommends use of a USB isolator like Acromag's USB-Isolator when configuring a DT230 Series transmitter.

USB Interface

USB Connection

Type: USB Mini-B type socket, 5-pin.

Data Rate: 12Mbps. USB v1.1 and 2.0 compatible.

Maximum cable length: 5.0 meters.

Transient voltage suppression on power and data lines.

USB Drive

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

Input (two channels)

Default Configuration/Calibration

Input: TC J, -210 to 760°C, medium filter. Output: 4 to 20mA, upscale break detect.

A/D Converters (ADC)

Two 24-bit Sigma Delta ADCs (only 16-bits used).

Input Ranges

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 -170°C (-382 to -274°F)	±1.0°C
TC N	-230 to -1300°C (-274 to 2372°F	±0.5°C
mV	-100 to 100mV	±0.05%

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

0 to 110% of nominal range.

Lead Break (Sensor Burnout) Detection

Upscale/downscale.

Imput Impedance

15M ohms.

Input Over-Voltage Protection

Bipolar Transient Voltage Suppression (TVS) and diode clamping.

Input Filter

RC filter plus variable digital filter (none, low, medium, high).

Noise Rejection (@ 60Hz)

Common Mode: 100dB no filter (135dB high filter). Normal Mode: 0.5dB no filter (>80dB high filter).

Output (two channels)

D/A Converters (DAC)

Two 16-bit D/A converters.

Output Ranges

4-20mA DC 3.5-24mA under/over-range capability.

Output Accuracy

±0.05%, typical. ±0.1%, maximum.

Output Compliance

RLOAD = (VSUPPLY - 7V) / 0.020A. RLOAD = 0 to 850 ohms @ 24V DC.

Output Response Time (for step input change)

Time to reach 98% of output value (typical)	
No filtering Low filter Medium filter High filter	14 milliseconds 47 milliseconds 156 milliseconds 1154 milliseconds

Output Ripple

Less than ±0.1% of output span.

Environmental

Operating temperature

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

Loop-powered, 7-32V DC SELV, 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.

Approvals

CE compliant. Designed for UL/cUL 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.

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). Unit weight: 0.16 kg (0.35 pounds). Shipping Weight: 0.22 kg (0.5 pounds) packed.

Ordering Information

Models

DT233-0600

Two-wire dual transmitter, thermocouple/millivolt inputs, isolated current or voltage outputs.

Services

DT230-Config/Cal

Factory custom configuration/calibration service. Specify input type, input/output, zero, full-scale values, filtering, and sensor fault settings* on order.

* Sensor fault settings are only available for models DT233, DT235, DT333 and DT335.

Software

TTC-SIP (recommend one kit per customer)

Windows Software Interface Package for Acromag DT Series transmitters. Includes configuration software CD-ROM (5040-944), isolator (USB-ISOLATOR) and two USB cables (4001-112, 4001-113).

Agility Mobile Application

Software configuration software for an Android smart device. Download for free from the Google Play Store. Requires 5028-565 and 4001-113 cables.

Accessories

USB-ISOLATOR

USB-to-USB isolator, includes USB cable (4001-112).

4001-112

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

<u>4001-113</u>

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

4001-252 DIN rail end stop for hazloc approvals.

E020 FCF

5028-565

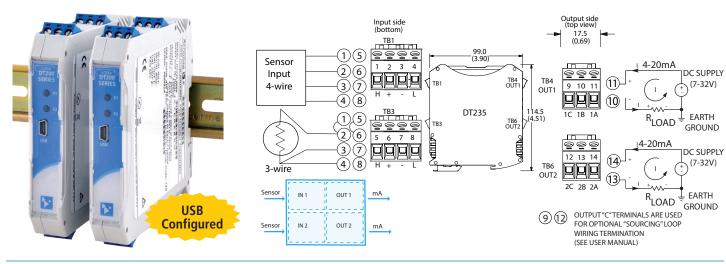






DT235 RTD/resistance input two-wire dual transmitter





Dual channels ◆ RTD (Pt, Ni, Cu), 0-4500 ohm inputs ◆ 4-20mA output (sink/source) ◆ 7-32V DC loop power

Description

DT230 series signal conditioners provide two independent I/O channels in a single, space-saving unit. The DT235 model is a two-wire dual transmitter that isolates and converts RTD or linear resistance sensor inputs to a proportional 4-20mA control signal. Power is received from the output loop current or a DC supply when using a three-wire connection.

High-voltage isolation separates all input and output circuits from each other. 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. The Android app enables setup with mobile devices.

Advanced signal processing capabilities, variable range input/output, and convenient USB programming make this instrument very versatile. 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.

? × DT235 Configuration Software Get I/O Config Operating Mode: Dual Transmitter RTD Pt100 T/O Scaling Channel 2 Ranne I

Windows configuration software (FREE) at www.acromag.com

Android Agility™ app (FREE) at Google Play Store

Key Features & Benefits

- Operate as a dual transmitter, a single transmitter, or a signal splitter
- Easy configuration via USB with Windows software or Agility™ app for Android
- Independently adjustable and scalable input and output ranges
- Selectable RTD and linear resistance input types: Pt 100/200/500Ω. Ni 120Ω. Cu 10Ω. 0-4500Ω
- 4-20mA current loop outputs support sinking or sourcing circuit configurations
- Supports reverse-acting (inverse) output
- User-configurable output range clamp levels support NAMUR-compliant operation
- Selectable up/downscale sensor break detection
- Very low 7V two-wire loop burden
- High accuracy, linearity, stability, and reliability
- User-selectable filtering (none, low, med., high)
- Space-saving 17.5mm (0.7 inch) unit with pluggable terminals for convenient wiring
- 1500V isolation, 4-way (inputs/outputs)
- Wide ambient operation (-40 to 80°C)
- CE compliant. UL/cUL Class I Div 2, ATEX/IECEx Zone 2

Save configuration files for convenient copy/restore capability.

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DT235 RTD/resistance input two-wire dual 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 DT230 Series transmitter.

USB Interface

USB Connection USB Connection

Type: USB Mini-B type socket, 5-pin.

Data Rate: 12Mbps. USB v1.1 and 2.0 compatible.

Maximum cable length: 5.0 meters.

Transient voltage suppression on power and data lines.

Input (two channels)

Default Configuration

Input: 100Ω Pt RTD, 3-wire, =0.00385, -200 to 850°C, medium filter.

Output: 4 to 20mA, upscale break detect.

A/D Converters (ADC)

Two 24-bit Sigma Delta ADCs (only 16-bits used).

Input Ranges

Input Type	Input Range	Accuracy ²
RTD, Pt 100Ω	-200 to 850°C	±0.25°C
RTD, Pt 200Ω	-200 to 850°C	±0.30°C
RTD, Pt 500Ω	-200 to 850°C	±0.50°C
RTD, Pt 1000Ω	-200 to 850°C	±1.0°C
Ni 120Ω (Minco 7-120)	-80 to 320°C	±0.08°C
Cu 10Ω (Minco 16-9)	-200 to 270°C	±1.0°C
Resistance (linear)	0 to 25Ω	±0.05Ω
Resistance (linear)	0 to 450Ω	±0.10Ω
Resistance (linear)	0 to 9000Ω	±0.90Ω
Resistance (linear)	0to 2250Ω	±2.25Ω
Resistance (linear)	0 to 4500Ω	±4.50Ω

Ambient Temperature Effect

Better than ±80ppm/°C (±0.008%/°C).

Scaling Adjust

Full range.

Lead Break (Sensor Burnout) Detection Upscale/downscale.

Input Over-Voltage Protection

Bipolar Transient Voltage Suppression (TVS) and diode clamping.

Input Filter

RC filter plus variable digital filter (none, low, medium, high).

Input Bandwidth

-3dB @ 16Hz (no filtering).

Noise Rejection (@ 60Hz, no filter)

Common Mode: 101dB no filter. Normal Mode: 11dB no filter.

Output (two channels)

D/A Converters (DAC)

Two 16-bit D/A converters.

Output Ranges

4-20mA DC. 3.5-24mA under/over-range capability.

Output Accuracy

±0.05%, typical. ±0.1%, maximum.

Output Compliance

RLOAD = (VSUPPLY - 7V) / 0.020A. RLOAD = 0 to 850 ohms @ 24V DC.

Output Response Time (for step input change)

Output Ripple

Less than ±0.1% of output span.

Environmental

Operating temperature

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

Loop-powered, 7-32V DC SELV, 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.

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.

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). Unit weight: 0.16 kg (0.35 pounds). Shipping Weight: 0.22 kg (0.5 pounds) packed.

Ordering Information

Models

DT235-0600

Two-wire dual transmitter, RTD/resistance inputs, isolated current or voltage outputs.

Services

DT230-Config/Cal

Factory custom configuration/calibration service. Specify input type, input/output, zero, full-scale values, filtering, and sensor fault settings* on order.

* Sensor fault settings are only available for models DT233, DT235, DT333 and DT335.

Software

TTC-SIP (recommend one kit per customer)

Windows Software Interface Package for Acromag SP Series transmitters. Includes configuration software CD-ROM (5040-944), isolator (USB-ISOLATOR) and two USB cables (4001-112, 4001-113).

Agility Mobile Application

Software configuration software for an Android smart device. Download for free from the Google Play Store. Requires 5028-565 and 4001-113 cables.

Accessories

USB-ISOLATOR

USB-to-USB isolator, includes USB cable (4001-112).

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.

4001-252

DIN rail end stop for hazloc approvals.

<u>5028-565</u>

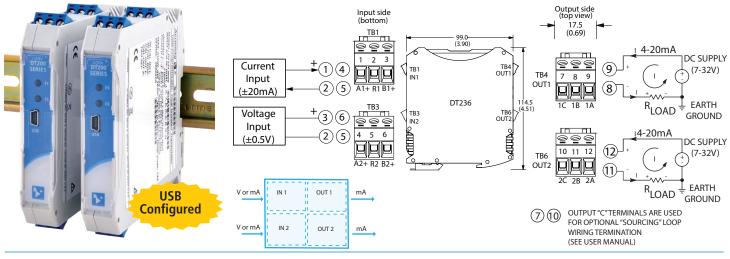






DT236 Current/millivolt input two-wire dual transmitters





Dual channels ◆ ±20mA, ±500mV inputs ◆ 4-20mA outputs (sink/source) ◆ 7-32V DC loop power

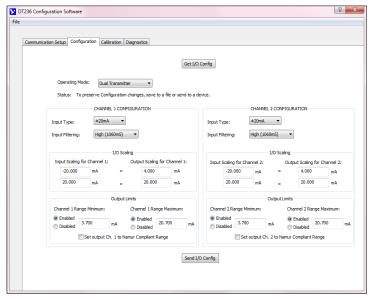
Description

DT230 series signal conditioners provide two independent I/O channels in a single, space-saving unit. The DT236 model is a dual two-wire transmitter that isolates and converts DC current or low voltage inputs to proportional 4-20mA control signals. Power is received from the output loop current or a DC supply when using a three-wire connection.

High-voltage isolation separates all input and output circuits from each other. Isolation protects from surges, reduces noise, and helps eliminate ground loop errors.

Setup and calibration are fast and easy with a convenient USB connection to your PC and Acromag's Windows configuration software. The Android app enables setup with mobile devices.

Advanced signal processing capabilities, variable range input/output, and convenient USB programming make this instrument very versatile. 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.



Windows configuration software (FREE) at www.acromag.com

Android Agility™ app (FREE) at <u>Google Play Store</u>

Key Features & Benefits

- Operate as a dual transmitter, a single transmitter, or a signal splitter
- Easy configuration via USB with Windows software or Agility™ app for Android
- Independently adjustable and scalable input and output ranges
- Selectable current and voltage input ranges: 0/4-20mA, ±1mA, ±20mA, ±0.5V, 0-500mV DC
- Compatible with Acromag 0-20A AC sensor input
- 4-20mA current loop outputs support sinking or sourcing circuit configurations
- User-configurable output range clamp levels support NAMUR-compliant operation
- Very low 7V two-wire loop burden
- High accuracy, linearity, stability, and reliability
- User-selectable filtering (none, low, med, high)
- Space-saving 17.5mm (0.7 inch) unit with pluggable terminals for convenient wiring
- 1500V isolation, 4-way (inputs/outputs)
- Wide ambient operation (-40 to 80°C)
- CE compliant. UL/cUL Class I Div 2, ATEX/IECEx Zone 2

Acromag The Leader IN INDUSTRIAL I/O

Save configuration files for convenient copy/restore capability.

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DT236 Current/millivolt input two-wire dual transmitters

Performance Specifications

IMPORTANT: To prevent ground loop error between a grounded PC and a grounded input signal, Acromag strongly recommends use of a USB isolator like Acromag's USB-Isolator when configuring a DT230 Series transmitter.

USB Interface

USB Connection

Type: USB Mini-B type socket, 5-pin.

Data Rate: 12Mbps. USB v1.1 and 2.0 compatible.

Maximum cable length: 5.0 meters.

Transient voltage suppression on power and data lines.

Input (two channels)

Default Configuration/Calibration

Input: 4 to 20mA, medium filter.

Output: 4 to 20mA.

A/D Converters (ADC)

Two 24-bit Sigma Delta ADCs (only 16-bits used).

Path A: ±1mA, ±20mA, 0 to 11.17mA, 0-20mA, 4-20mA DC.

Path B: ±0.5V, 0-500mV DC.

Ambient Temperature Effect

Better than ±80ppm/°C (±0.008%/°C).

Scaling Adjust

Full range.

Input Impedance

Current input: 24.9 ohms. Voltage input: 15M ohms.

Input Over-Voltage Protection

Bipolar Transient Voltage Suppression (TVS) and

diode clamping.

Input Filter

RC filter plus variable digital filter (none, low, medium, high).

Input Bandwidth

-3dB @ 16Hz (no filtering).

Noise Rejection (@ 60Hz, no filter)

Common Mode: 93dB no filter (139dB high filter). Normal Mode: 6dB no filter (>80dB high filter).

Output (two channels)

D/A Converters (DAC)

Two 16-bit D/A converters.

Output Ranges

4-20mA DC. 3.5-24mA under/over-range capability.

Output Accuracy

±0.05%, typical. ±0.1%, maximum.

Output Compliance

RLOAD = (VSUPPLY - 7V) / 0.020A.RLOAD = 0 to 850 ohms @ 24V DC.

Output Response Time (for step input change)

Time to reach 98% of output value (typical)

Low filter 51 Medium filter 15	milliseconds milliseconds 2 milliseconds 00 milliseconds
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Output Ripple

Less than ±0.1% of output span.

Environmental

Operating temperature

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

Loop-powered, 7-32V DC SELV, 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.

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.

I/O Connectors

Removable plug-in terminal blocks rated for 12A/250V; AWG #26-12, stranded or solid copper wire.

17.5 x 114.5 x 99.0 mm (0.7 x 4.51 x 3.90 inches). Unit weight: 0.16 kg (0.35 pounds). Shipping Weight: 0.22 kg (0.5 pounds) packed.

Ordering Information

Models

DT236-0600

Two-wire dual transmitter, current/millivolt inputs, isolated current or voltage outputs.

Services

DT230-Config/Cal

Factory custom configuration/calibration service. Specify input type, input/output, zero and full-scale values, and filtering, on order.

Software

TTC-SIP (recommend one kit per customer)

Windows Software Interface Package for Acromag DT Series transmitters. Includes configuration software CD-ROM (5040-944), isolator (USB-ISOLATOR) and two USB cables (4001-112, 4001-113).

Agility Mobile Application

Software configuration software for an Android smart device. Download for free from the Google Play Store. Requires 5028-565 and 4001-113 cables.

Accessories

USB-ISOLATOR

USB-to-USB isolator, includes USB cable (4001-112).

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. 4001-252

DIN rail end stop for hazloc approvals.

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

5028-565

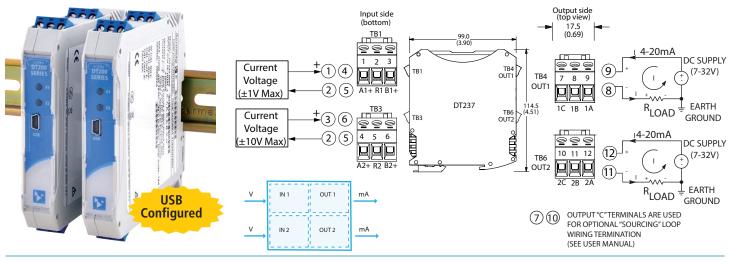






DT237 Medium DC voltage input two-wire dual transmitter





Dual channels ◆ 0-10V, ±10V inputs ◆ 4-20mA outputs (sink/source) ◆ 7-32V DC loop power

Description

DT230 series signal conditioners provide two independent I/O channels in a single, space-saving unit. The DT237 model is a two-wire dual transmitter that isolates and converts high-level DC voltage inputs to a proportional 4-20mA control signal. Power is received from the output loop current or a DC supply when using a three-wire connection.

High-voltage isolation separates all input and output circuits from each other. 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. The Android app enables setup with mobile devices.

Advanced signal processing capabilities, variable range input/output, and convenient USB programming make this instrument very versatile. 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.

Windows configuration software (FREE) at www.acromag.com

Android Agility™ app (FREE) at <u>Google Play Store</u>

Key Features & Benefits

- Operate as a dual transmitter, a single transmitter, or a signal splitter
- Easy configuration via USB with Windows software or Agility™ app for Android
- Independently adjustable and scalable input and output ranges
- Selectable voltage input ranges:
 ±1V, ±5V, ±10V, 0-1V, 0-5V, 0-10V DC
- 4-20mA current loop outputs support sinking or sourcing circuit configurations
- Supports reverse-acting (inverse) output
- User-configurable output range clamp levels support NAMUR-compliant operation
- Very low 7V two-wire loop burden
- High accuracy, linearity, stability, and reliability
- User-selectable filtering (none, low, med, high)
- Space-saving 17.5mm (0.7 inch) unit with pluggable terminals for convenient wiring
- 1500V isolation, 4-way (inputs/outputs)
- Wide ambient operation (-40 to 80°C)
- CE compliant. UL/cUL Class I Div 2, ATEX/IECEx Zone 2



Save configuration files for convenient copy/restore capability.

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DT237 Medium DC voltage input two-wire dual transmitter

Performance Specifications

IMPORTANT: To prevent ground loop error between a grounded PC and a grounded input signal, Acromag strongly recommends use of a USB isolator like Acromag's USB-Isolator when configuring a DT230 Series transmitter.

USB Interface

USB Connection

Type: USB Mini-B type socket, 5-pin.

Data Rate: 12Mbps. USB v1.1 and 2.0 compatible.

Maximum cable length: 5.0 meters.

Transient voltage suppression on power and data lines.

USB Drive

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

Input (two channels)

Default Configuration/Calibration

Input: ±10V, medium filter.

Output: 4 to 20mA.

A/D Converters (ADC)

Two 24-bit Sigma Delta ADCs (only 16-bits used).

Input Ranges

Path A: ±1V, 0-1V.

Path B: ±5V, ±10V, 0-5V, 0-10V DC.

Ambient Temperature Effect

Better than ±80ppm/°C (±0.008%/°C).

Scaling Adjust

Full range.

Input Impedance

Path A: 15MΩ

Path B: 1MΩ.

Input Over-Voltage Protection

Bipolar Transient Voltage Suppression (TVS) and diode clamping.

Input Filter

RC filter plus variable digital filter (none, low, medium, high).

Input Bandwidth

-3dB @ 16Hz (no filtering).

Noise Rejection (@ 60Hz, no filter)

Common Mode: 71dB no filter (119dB high filter). Normal Mode: Path A 7dB, Path B 28dB no filter (>80dB high filter).

Output (two channels)

D/A Converters (DAC)

Two 16-bit D/A converters.

Output Ranges

4-20mA DC. 3.5-24mA under/over-range capability.

Output Accuracy

±0.05%, typical. ±0.1%, maximum.

Output Compliance

RLOAD = (VSUPPLY - 7V) / 0.020A.RLOAD = 0 to 850 ohms @ 24V DC.

Output Response Time (for step input change)

Time to reach 98% of output value (typical)

No filter Low filter High filter High filter 136 milliseconds 147 milliseconds 317 milliseconds 1109 milliseconds

Output Ripple

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

Environmental

Operating temperature

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

Loop-powered, 7-32V DC SELV, 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.

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.

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). Unit weight: 0.16 kg (0.35 pounds). Shipping Weight: 0.22 kg (0.5 pounds) packed.

Ordering Information

Models

DT237-0600

Two-wire dual transmitter, medium DC voltage inputs, isolated current or voltage outputs.

Services

DT230-Config/Cal

Factory custom configuration/calibration service. Specify input type, input/output, zero and full-scale values, and filtering, on order.

Software

TTC-SIP (recommend one kit per customer) Windows Software Interface Package for Acromag DT Series transmitters. Includes configuration software CD-ROM (5040-944), isolator (USB-ISOLATOR) and two USB cables (4001-112, 4001-113).

Agility Mobile Application

Software configuration software for an Android smart device. Download for free from the Google Play Store. Requires 5028-565 and 4001-113 cables.

Accessories

<u>USB-ISOLATOR</u>

USB-to-USB isolator, includes USB cable (4001-112).

<u>4001-112</u>

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

4001-113

USB cable, 1 meter, with Type A to Mini-B plugs. 4001-252

DIN rail end stop for hazloc approvals.

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5028-565

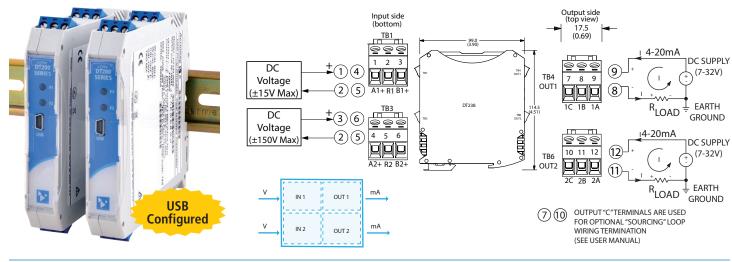






DT238 High DC voltage input two-wire dual transmitter





Dual inputs ◆ 0±150V input ◆ 4-20mA outputs (sink/source) ◆ 7-32V DC loop/local power

Description

DT230 series signal conditioners provide two independent I/O channels in a single, space-saving unit. The DT238 model is a two-wire dual transmitter that isolates and converts high-level DC voltage inputs to proportional 4-20mA control signals. Power is received from the output loop current or a DC supply when using a three-wire connection.

High-voltage isolation separates all input and output circuits from each other. 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. The Android app enables setup with mobile devices.

Advanced signal processing capabilities, variable range input/output, and convenient USB programming make this instrument very versatile. 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.

DT236 Configuration Software File Communication Setup Configuration Calibration Diagnostics Get I/O Config Operating Mode: Dual Transmitter Status: To preserve Configuration changes, save to a file or send to a device. CHANNEL 1 CONFIGURATION Input Type: #20mA | Input Filtering: High (1050mS) | Input Filtering: High (1050m

Windows configuration software (FREE) at www.acromag.com

Android Agility™ app (FREE) at <u>Google Play Store</u>

Key Features & Benefits

- Operate as a dual transmitter, a single transmitter, or a signal splitter
- Easy configuration via USB with Windows software or Agility™ app for Android
- Independently adjustable and scalable input and output ranges
- Selectable voltage input ranges:
 ±15V, ±75V, ±150V, 0-15V, 0-75V, 0-150V DC
- 4-20mA current loop outputs support sinking or sourcing circuit configurations
- Supports reverse-acting (inverse) output
- User-configurable output range clamp levels support NAMUR-compliant operation
- Very low 7V two-wire loop burden
- High accuracy, linearity, stability, and reliability
- User-selectable filtering (none, low, med, high)
- Space-saving 17.5mm (0.7 inch) unit with pluggable terminals for convenient wiring
- 1500V isolation, 4-way (inputs/outputs)
- Wide ambient operation (-40 to 80°C)
- CE compliant. UL/cUL Class I Div 2, ATEX/IECEx Zone 2



Save configuration files for convenient copy/restore capability.

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DT238 High voltage input two-wire dual transmitter

Performance Specifications

IMPORTANT: To prevent ground loop error between a grounded PC and a grounded input signal, Acromag strongly recommends use of a USB isolator like Acromag's USB-Isolator when configuring a DT230 Series transmitter.

USB Interface

USB Connection

Type: USB Mini-B type socket, 5-pin.

Data Rate: 12Mbps. USB v1.1 and 2.0 compatible.

Maximum cable length: 5.0 meters.

Transient voltage suppression on power and data lines.

Input (two channels)

Default Configuration/Calibration

Input: ±150V, medium filter. Output: 4 to 20mA.

Scaling Adjust

Full range.

Input Impedance

Path A: $500KM\Omega$ Path B: $1M\Omega$.

Input Over-Voltage Protection

Bipolar Transient Voltage Suppression (TVS) and diode clamping.

Input Filter

RC filter plus variable digital filter (none, low, medium, high).

Input Bandwidth

-3dB @ 16Hz (no filtering).

Noise Rejection (@ 60Hz, no filter)

Common Mode: 70dB no filter (113dB high filter). Normal Mode: Path A 32dB, Path B 51dB no filter (>80dB high filter).

Output (two channels)

D/A Converters (DAC)

Two 16-bit D/A converters.

Output Ranges

4-20mA DC. 3.5-24mA under/over-range capability.

Output Accuracy

±0.05%, typical. ±0.1%, maximum.

Output Compliance

RLOAD = (VSUPPLY - 7V) / 0.020A. RLOAD = 0 to 850 ohms @ 24V DC

Output Response Time (for step input change)

Time to reach 98% of output value (typical)

No filter
Low filter
Medium filter
High filter

No filter
A milliseconds
High filter
A milliseconds
High filter
A milliseconds
High milliseconds
High milliseconds

Output Ripple

Less than ±0.1% of output span.

Environmental

Operating temperature

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

Loop-powered, 7-32V DC SELV, 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.

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.

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). Unit weight: 0.16 kg (0.35 pounds). Shipping Weight: 0.22 kg (0.5 pounds) packed.

Ordering Information

Models

DT238-0600

Two-wire dual transmitter, high DC voltage inputs, isolated current or voltage outputs.

Services

DT230-Config/Cal

Factory custom configuration/calibration service.

Specify input type, input/output, zero and full-scale values, and filtering, on order.

Software

TTC-SIP recommend one kit per customer)

Windows Software Interface Package for Acromag DT Series transmitters. Includes configuration software CD-ROM (5040-944), isolator (USB-ISOLATOR) and two USB cables (4001-112, 4001-113).

Agility Mobile Application

Software configuration software for an Android smart device. Download for free from the Google Play Store. Requires 5028-565 and 4001-113 cables.

Accessories

USB-ISOLATOR

USB-to-USB isolator, includes USB cable (4001-112).

<u>4001-112</u>

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

4001-113

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

4001-252

DIN rail end stop for hazloc approvals.

5028-565







Accessories

Configuration Software



DT 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, configuation too mobile app for free download at the <u>Google Play Store</u>.

Ordering Information

TTC-SIP

Software Interface Package for Acromag DT/SP/TT Series. Includes configuration sofware CD-ROM, UBSisolator and two USB cables (4001-112, 4001-113)

Ex Brohs 124 22.

DT230-Config/Cal

Factory custom configuration/calibration service. Specify input type, input/output zero and full-scale values, filtering, and sensor fault settings on order.

Bus-Kit



TT Bus-Kit

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

Ordering Information

TT BUS-Kit

DIN rail bus power connector and left/right terminal blocks for DT, SP, or TT Series.

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 Universal Input (85-264V AC / 100-370V DC) Output

10W, 15W, 30W, 60W, 90W, 120W, 240W

Ordering Information

PS5R-VB24

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

PS5R-VD24

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

Visit <u>www.acromag.com</u> 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

<u>USB-Isolator</u>

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

USB Cables



USB Cables

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

Ordering Information

<u>4001-112</u>

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

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