Monitoring and Control Solutions

DT230 Series Brochure

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.

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.

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
• UL, cUL
• ATEX
• CSA
• Ethernet conformance
• Modbus conformance
• Profibus certification
• IECEx

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Acromag, Incorporated  ▪  30765 South Wixom Road ▪  Wixom, Michigan 48393 ▪  USA
### 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

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#### DT233 Thermocouple, Millivolt Input
- **Input**
  - Type J, K, T, R, S, E, B, N thermocouple
  - ±100mV

#### DT235 RTD/resistance Input
- **Input**
  - RTD
    - Pt (100/200/500Ω)
    - Ni (120Ω)
    - Cu (10Ω)
  - Resistance
    - 0-4500 Ω

#### DT236 Current/millivolt Input
- **Input**
  - ±20mA
  - ±500mV

#### DT237 Medium DC Voltage Input
- **Input**
  - 0-10V
  - ±10V

#### DT238 High Voltage Input
- **Input**
  - ±150V
  - 0 ±150V input

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#### 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 Zone2

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[See data sheet]

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[See data sheet]

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[See data sheet]

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[See data sheet]
Transmitters: DT Series

Key Features

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

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

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
- **mA**
- **±mV/V**
- **±mV/V**
- **mA**
- **TC**

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

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

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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- 3 -
General Operation and Performance Specifications

Transmitters: DT Series

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

### USB Interface

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB Connector</td>
<td>USB Mini-B type socket, 5-pin.</td>
</tr>
<tr>
<td>USB Data Rate</td>
<td>12Mbps. USB v1.1 and 2.0 compatible.</td>
</tr>
</tbody>
</table>

### Output

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Ranges</td>
<td>0-20mA, 4-20mA, ±5V, ±10V, 0-5V, 0-10V DC</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.05%, typical. ±0.1%, maximum.</td>
</tr>
</tbody>
</table>

### Environmental

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>DT230 Series: -40 to 80°C (-40° to 176°F).</td>
</tr>
<tr>
<td></td>
<td>DT330 Series: -40 to 70°C (-40° to 158°F).</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40 to 85°C (-40 to 185°F).</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>5 to 95% non-condensing.</td>
</tr>
<tr>
<td>Power Requirement</td>
<td>DT230 Series: 7-32V DC SELV, 24mA max, loop power.</td>
</tr>
<tr>
<td></td>
<td>DT330 Series: 6-32V DC SELV, 1.5W max.</td>
</tr>
<tr>
<td>Isolation</td>
<td>1500V AC peak. 250V AC (354V DC) continuous isolation between input, output, and power (5-way).</td>
</tr>
<tr>
<td>Shock and Vibration Immunity</td>
<td>Vibration: 4g, per IEC 60068-2-6</td>
</tr>
<tr>
<td></td>
<td>Shock: 25g, per IEC 60068-2-27.</td>
</tr>
<tr>
<td>Electromagnetic Compliance (EMC)</td>
<td>Radiated Emissions: BS EN 61000-6-4, CISPR 16.</td>
</tr>
<tr>
<td></td>
<td>RFI: BS EN 61000-6-2, IEC 61000-4-3.</td>
</tr>
<tr>
<td></td>
<td>Conducted RFI: BS EN 61000-6-2, IEC 61000-4-6.</td>
</tr>
<tr>
<td></td>
<td>ESD: BS EN 61000-6-2, IEC 61000-4-2.</td>
</tr>
<tr>
<td></td>
<td>EFT: BS EN 61000-6-2, IEC 61000-4-4.</td>
</tr>
<tr>
<td></td>
<td>Surge Immunity: BS EN 61000-6-1, IEC 61000-4-5.</td>
</tr>
<tr>
<td>Approvals</td>
<td>CE compliant. UL/cUL listed Class I Div. 2. Groups ABCD.</td>
</tr>
<tr>
<td></td>
<td>ATEX, IECEx certified Zone 2.</td>
</tr>
<tr>
<td></td>
<td>II 3 G Ex nA IIC T4 Gc -40°C ≤ Ta ≤ +80°C</td>
</tr>
</tbody>
</table>

### Dimensions

*in millimeters (inches)*

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOP VIEW (OUTPUT/POWER)</td>
<td>114.5 (4.51)</td>
</tr>
<tr>
<td>BOTTOM VIEW (INPUT)</td>
<td>99.0 (3.90)</td>
</tr>
</tbody>
</table>

### DT Series USB Transmitter Connections

Personal Computer Running Windows OS

- HOST PC RUNNING ACROMAG CONFIGURATION SOFTWARE
- USB-ISOLATOR (RECOMMENDED)
- CABLE Model 4001-112
- CABLE Model 4001-113

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Transmitters: DT Series

Module Configuration

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

Screen shots of the Agility App for Android, allowing for mobile configuration in the field.
## 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, configuration too mobile app for free download at the [Google Play Store](https://play.google.com/store).

### Bus-Kit
**TT Bus-Kit**
DIN rail bus power connector and left/right terminal blocks. One kit supports multiple DT Series transmitters.

### 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.

### 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

### 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.

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

### Ordering Information

#### TTC-SIP
Software Interface Package for Acromag DT/SP/TT Series. Include configuration software CD-ROM, USB isolator and two USB cables (4001-112, 4001-113)

#### 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.

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

#### 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)

#### PSSR-VB24
Power supply, 15W, 0.65A at 24V DC

#### PSSR-VD24
Power supply, 60W, 2.5A at 24V DC
Visit [www.acromag.com](http://www.acromag.com) for additional models and more information.

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

#### 4001-112
USB Cable, Type A to Type B, 1 meter

#### 4001-113
USB Cable, Type A to Mini-B, 1 meter

#### 5028-565
USB Cable, USB OTG Cable, 6 inches

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Transmitters: DT230 Series

DT233  Thermocouple/millivolt input two-wire dual transmitter

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.

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 approvals pending.

Save configuration files for convenient copy/restore capability.

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

Android Agility™ app (FREE) at Google Play Store

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

DT233 Configuration Software

TC or V mA mA

IN 1 OUT 1

IN 2 OUT 2

USB Configured

Acromag
THE LEADER IN INDUSTRIAL I/O

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Bulletin #B400-974e
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.
- **USB Driver**
  - Not required. Uses built-in Human Interface Device (HID) USB drivers of the Windows operating system.

**Input (two channels)**

- **Default Configuration/Calibration**
  - Output: 4 to 20mA, upscale break detect.
- **A/D Converters (ADC)**
  - Two 24-bit Sigma Delta ADCs (only 16-bits used).

### Input Ranges

<table>
<thead>
<tr>
<th>Input</th>
<th>Range</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC J</td>
<td>-210 to 760°C (-346 to 1400°F)</td>
<td>±0.5°C</td>
</tr>
<tr>
<td>TC K</td>
<td>-200 to 1372°C (-328 to 2502°F)</td>
<td>±0.5°C</td>
</tr>
<tr>
<td>TC T</td>
<td>-260 to 400°C (-436 to 752°F)</td>
<td>±0.5°C</td>
</tr>
<tr>
<td>TC R</td>
<td>-50 to 1768°C (-58 to 3214°F)</td>
<td>±1.0°C</td>
</tr>
<tr>
<td>TC S</td>
<td>-50 to 1768°C (-58 to 3214°F)</td>
<td>±1.0°C</td>
</tr>
<tr>
<td>TC E</td>
<td>-200 to 1000°C (-328 to 1832°F)</td>
<td>±0.5°C</td>
</tr>
<tr>
<td>TC B</td>
<td>260 to 1820°C (500 to 3308°F)</td>
<td>±1.0°C</td>
</tr>
<tr>
<td>TC N</td>
<td>-230 to -170°C (-382 to -274°F)</td>
<td>±1.0°C</td>
</tr>
<tr>
<td>TC N</td>
<td>-230 to -1300°C (-274 to 2372°F)</td>
<td>±0.5°C</td>
</tr>
<tr>
<td>mV</td>
<td>-100 to 100mV</td>
<td>±0.05%</td>
</tr>
</tbody>
</table>

**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.

**Input Impedance**

- 15M ohms.

**Output 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 Response Time (for step input change)

<table>
<thead>
<tr>
<th>Time to reach 98% of output value (typical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No filtering</td>
</tr>
<tr>
<td>Low filter</td>
</tr>
<tr>
<td>Medium filter</td>
</tr>
<tr>
<td>High filter</td>
</tr>
</tbody>
</table>

**Output Ripple**

- Less than ±0.1% of output span.

**Environmental**

- **Operating temperature**
  - Operation: -40 to 80°F (-40 to 176°F).
  - Storage: -40 to 85°F (-40° to 185°F).
- **Relative humidity**
  - 5 to 95% non-condensing.
- **Power Requirement**
  - Loop-powered, 7-32V SELV, 24mA max.
- **Isolation**
  - Continuous isolation between input and output circuits.
- **Shock and Vibration Immunity**
  - Vibration: 4g, per IEC 60068-6-6.
  - Shock: 15g, per IEC 60068-2-6.

**Approvals (pending)**

- CE compliant. Designed for UL/cUL Class I Division 2 Groups A/B/C/D, 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.

**electrical conformity**

- BS EN 61000-6-2, IEC 61000-4-5.
- BS EN 61000-6-4, CISPR 16.
- BS EN 61000-4-2, IEC 61000-4-3.
- BS EN 61000-4-6, IEC 61000-4-4.
- BS EN 61000-6-2, IEC 61000-4-2.

**survive to provide a second chance to work**

- Shock: 25g, per IEC 60068-2-7.
- Vibration: 4g, per IEC 60068-2-6.

**Shipping Weight**

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

**Dimensions**

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

**Ordering Information**

**Models**

- **DT233-0600**
  - Two-wire dual transmitter, thermocouple/millivolt inputs, isolated current or voltage outputs.
- **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.
- **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**

**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.
  - 5028-565 USB-OTG 6 inch cable.
**DT235**  
RTD/resistance input two-wire dual transmitter

**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.

**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 approvals pending.
### Transmitters: DT230 Series

**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**
    - Type: USB Mini-B type socket, 5-pin.
    - Data Rate: 12Mbps. USB v1.1 and 2.0 compatible.
  - **USB Connection**
    - Type: USB Mini-B type socket, 5-pin.
    - Data Rate: 12Mbps. USB v1.1 and 2.0 compatible.

- **Input (two channels)**
  - **Default Configuration**
    - Input: 100Ω Pt RTD, 3-wire, =0.00385, -200 to 850°C, medium filter.
  - **A/D Converters (ADC)**
    - 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**
    - Output = (Vinput - 7V) / 0.020A.
    - Output = 0 to 850 ohms @ 24V DC.
  - **Output Response Time (for step input change)**
    - Time to reach 98% of final output value (typical)
      - No filter: 34 milliseconds
      - Low filter: 80 milliseconds
      - Medium filter: 214 milliseconds
      - High filter: 1238 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 (pending)**
  - CE compliant. UL/CUL listed Class I Division 2 Groups A,B,C,D. ATEX, IECEx certified Zone 2.
  - Electromagnetic Compatibility (EMC) Compliance
    - Radiated Emissions: BS EN 61000-6-4, CISPR 16.
    - IMM: BS EN 61000-6-2, IEC 61000-4-4.
    - Conducted RF: BS EN 61000-6-2, IEC 61000-4-8.
    - ESD: BS EN 61000-4-2, IEC 61000-4-4.
    - Surge Immunity: BS EN 61000-6-2, IEC 61000-4-5.

#### 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 and full-scale values, filtering, and sensor fault settings on order.

**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).
  - USB cable, 1 meter, with Type A to Type B plugs.
  - USB cable, 1 meter, with Type A to Mini-B plugs.
  - DIN rail end stop for hazloc approvals.
- **USB-OTG 6 inch cable.**
- **USB-OTG 6 inch cable.**
- **USB-OTG 6 inch cable.**

#### Technical Details

- **Case Material**
  - Self-extinguishing polyamide, UL94 V-0 rated.
- **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.

#### Additional Information

- **Input Type**
  - Input Range: -200 to 85°C
  - Accuracy: ±0.25°C
- **Input Bandwidth**
  - 3dB @ 16Hz (no filtering).
- **Noise Rejection**
  - @ 60Hz, no filter
  - Common Mode: 101dB no filter.
  - Normal Mode: 11dB no filter.
- **Input Over-Voltage Protection**
  - Bipolar Transient Voltage Suppression (TVS) and Input Over-Voltage Protection
  - Upscale/downscale.
  - Lead Break (Sensor Burnout) Detection
  - Scaling Adjust
    - Better than ±80ppm/°C (±0.008%/°C).
- **Ambient Temperature Effect**
  - Better than ±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.
- **Isolation**
  - CE compliant. UL/CUL listed Class I Division 2 Groups A,B,C,D. ATEX, IECEx certified Zone 2.
  - Electromagnetic Compatibility (EMC) Compliance
    - Radiated Emissions: BS EN 61000-6-4, CISPR 16.
    - IMM: BS EN 61000-6-2, IEC 61000-4-4.
    - Conducted RF: BS EN 61000-6-2, IEC 61000-4-8.
    - ESD: BS EN 61000-4-2, 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 #28-12, 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.

#### Additional Resources

- **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)
  - 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).
  - **USB cable, 1 meter, with Type A to Type B plugs.**
  - **USB cable, 1 meter, with Type A to Mini-B plugs.**
  - **DIN rail end stop for hazloc approvals.**
- **USB-OTG 6 inch cable.**

#### Contact Information

- **Phone:** 877-214-6267
- **Email:** sales@acromag.com
- **Website:** www.acromag.com
- **Address:** 30765 Wixom Rd, Wixom, MI 48393 USA

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Transmitters: DT230 Series

DT236  Current/millivolt input two-wire dual transmitters

**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.

**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 approvals pending

**Dual channels**

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

**Windows configuration software (FREE) at**

[www.acromag.com](http://www.acromag.com)

**Android Agility™ app (FREE) at**

[Google Play Store](https://play.google.com/store)
**Performance Specifications**

**USB Interface**
- **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**
- **A/D Converters (ADC)**
  - Two 24-bit Sigma Delta ADCs (only 16-bits used).
- **Input Ranges**
  - 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).

**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**
  - $\text{ROAD} = (V_{\text{supply}} - 7V) / 0.020A$.
  - $\text{ROAD} = 0$ to 850 ohms @ 24V DC.
- **Output Response Time**
  - Time to reach 98% of output value (typical)
    - No filter: 31 milliseconds
    - Low filter: 51 milliseconds
    - Medium filter: 152 milliseconds
    - High filter: 1100 milliseconds
- **Output Ripple**
  - Less than ±0.1% of output span.

**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**
  - 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, filtering, and sensor fault settings on order.
- **Software**
  - TTC-SIP
  - 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.
  - 5020-350
  - AC current sensor (toroidal transformer); converts 0-20A AC to 0-11.17mA DC.
  - 5028-565
  - USB-OTG 6 inch cable.

**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.
**Transmitters: DT230 Series**

**DT237**  Medium DC voltage input two-wire dual transmitter

**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.

**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 approvals pending

**Windows configuration software (FREE) at** [www.acromag.com](http://www.acromag.com)

**Android Agility™ app (FREE) at** [Google Play Store](https://play.google.com)

Save configuration files for convenient copy/restore capability.

**Dual channels**

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

**Diagram**

- Setup and configuration using USB connection
- Input and output terminals labeled
- Protection features indicated

**Contact Information**

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

Bulletin #8400-977e
### DT230 Series 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 Driver**
- 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 @ 16kHz (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**
- \[ R_{\text{load}} = \frac{(V_{\text{supply}} - 7V)}{0.020A} \]
- \[ R_{\text{load}} = 0 \text{ to } 850 \text{ ohms} @ 24V \text{ DC} \]

**Output Response Time (for step input change)**
- No filter: 136 milliseconds
- Low filter: 147 milliseconds
- Medium filter: 317 milliseconds
- High filter: 1109 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 (pending)**
- CE compliant. UL/cUL listed Class I Division 2 Groups AB/CD. ATEX, IECEx certified Zone 2.

**Electromagnetic Compatibility (EMC) Compliance**
- Radiated Emissions: BS EN 61000-6-4, CISPR 16.
- Conducted EMI: BS EN 61000-6-2, IEC 61000-4-4.
- Surge Immunity: BS EN 61000-6-2, IEC 61000-4-4.
- EFT: BS EN 61000-6-2, IEC 61000-4-4.

**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, filtering, and sensor fault settings 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**

**Accessories**

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

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

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

**DIN rail end stop for hazloc approvals.**

**5028-565**
- USB-OTG 6 inch cable.
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.

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

Description

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.

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 approvals pending.
# 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: 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: 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**
- **Load** = \( \frac{(V_{supply} - 7V)}{0.020A} \).
- **Load** = 0 to 850 ohms @ 24V DC.

**Output Response Time (for step input change)**

<table>
<thead>
<tr>
<th>Time to reach 98% of output value</th>
<th>Typical</th>
</tr>
</thead>
<tbody>
<tr>
<td>No filter</td>
<td>34 milliseconds</td>
</tr>
<tr>
<td>Low filter</td>
<td>62 milliseconds</td>
</tr>
<tr>
<td>Medium filter</td>
<td>195 milliseconds</td>
</tr>
<tr>
<td>High filter</td>
<td>1109 milliseconds</td>
</tr>
</tbody>
</table>

**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 (pending)**
- CE compliant. UL/CSA listed Class I Division 2 Groups ABCD. ATEX, IECEx certified Zone 2.
- Ex II 3 G Ex nA IIC T4 Gc -40°C < Ta < +80°C.

**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, filtering, and sensor fault settings 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.
- **5028-565**
  - USB-OTG 6 inch cable.
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 DT, TT and ST Series Transmitters, and SP and uBSP Series Signal Splitters.

**XT-SIP**
CD-ROM (Part #5041-094), USB isolator, two USB cables (Part # 4001-112, 4001-113), and one Ethernet cable (Part # 5035-360) for configuration of Acromag BusWorks XT Series Ethernet modules.

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
## Accessories

### 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.

### Example USB Connections (TT Series, SP Series, uBSP Series, XT Series, or ST Series)

![Example USB Connections Diagram](attachment:example_diagram.png)

**Personal Computer Running Windows OS**

- **Signal Splitter Carrier**

**microBlox uBSP Series**

**ST Series Transmitter Model ST131-0600**

**Busworks XT Series**

**SP / TT Series**

**USB-Mini B**

**4001-112 Cable 1 Meter**

**4001-113 Cable 1 Meter**

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**ISO9001 AS9100**

**Made in USA**

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