Monitoring and Control Solutions

DT Series Brochure

Dual Channel Transmitters

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 manufac-
turer 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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### Transmitters: DT Series

#### 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 0/4-20mA, 0-10V, or ±10V DC

**Power**
- DT230 Series: 7-32V DC loop/local power
- DT330 Series: 6-32V DC local/bus 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 (DT230 Series)
- -40 to 70°C operation (DT330 Series)
- Hazloc approvals UL C1D2, ATEX/IECEx Zone2

<table>
<thead>
<tr>
<th>Transmitter Type</th>
<th>Input Description</th>
<th>Output Description</th>
<th>Power Description</th>
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<tbody>
<tr>
<td>DT233</td>
<td>Thermocouple, Millivolt Input</td>
<td>mA/V</td>
<td>DT230 Series: 7-32V DC loop/local power</td>
</tr>
<tr>
<td>DT235</td>
<td>RTD/resistance Input</td>
<td>mA/V</td>
<td>DT230 Series: 7-32V DC loop/local power</td>
</tr>
<tr>
<td>DT236</td>
<td>Current/millivolt Input</td>
<td>mA/V</td>
<td>DT230 Series: 7-32V DC loop/local power</td>
</tr>
<tr>
<td>DT237</td>
<td>Medium DC Voltage Input</td>
<td>mA/V</td>
<td>DT330 Series: 6-32V DC local/bus power</td>
</tr>
<tr>
<td>DT238</td>
<td>High Voltage Input</td>
<td>mA/V</td>
<td>DT330 Series: 6-32V DC local/bus power</td>
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**See data sheet**

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- DT330 Series: 6-32V DC local/bus power

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- 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
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<td>mA/V</td>
<td>DT330 Series: 6-32V DC local/bus power</td>
</tr>
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</table>

**See data sheet**
Transmitters: DT Series

Key Features

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

Scalable Current or Voltage Output
DT230 Series: Supports sink or source 4-20mA output
DT330 Series: Supports scalable current or voltage output ranges: 0-20mA, 4-20mA, ±5V, ±10V, 0-5V, 0-10V DC

2-wire, Loop-powered
4-wire, External-powered
DT230 Series: 7-32V DC Power is received from the output loop (2-wire).
DT330 Series: 6-32V DC power connects (4-wire) on a terminal block, a rail bus, or both for redundancy.

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.

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.

Input Options

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Transmitters: DT Series

General Operation and Performance Specifications

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>
</tbody>
</table>
| 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 II Div. 2. Groups ABCD.  |
|                          | ATEX, IECEx certified Zone 2.  |
|                          | Ex II 3 G Ex nA IIC T4 Gc -40°C ≤ Ta ≤ +80°C   |

### Dimensions *in millimeters (inches)*

![Dimensions Diagram](image)

### DT Series USB Transmitter Connections

![Connection Diagram](image)

Personal Computer

HOST PC RUNNING ACROMAG CONFIGURATION SOFTWARE

USB ISOLATOR (RECOMMENDED)

CABLE Model 4001-113

USB-ISOLATOR

MODEL: USB-ISOLATOR

CABLE Model 4001-112

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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 tool mobile app for free download at the Google Play Store.

Ordering Information

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

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)

USB-to-USB Isolator
This compact, industrial-grade isolator provides a high-voltage isolation barrier between a computer and a connected USB device; protecting equipment from electrical surges, transient voltage spikes, and ground loop currents.

Ordering Information

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

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

Ordering Information

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

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

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

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

PSSR-VB24
Power supply, 15W, 0.65A at 24V DC
PSSR-VD24
Power supply, 60W, 2.5A at 24V DC
Visit www.acromag.com for additional models and more information.

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

Ordering Information

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

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

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

Save configuration files for convenient copy/restore capability.
**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

#### A/D Converters (ADC)
Two 24-bit Sigma Delta ADCs (only 16-bits used).

#### D/A Converters (DAC)
Two 16-bit D/A converters.

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

Output Over-Voltage Protection
- Bipolar Transient Voltage Suppression (TVS) and diode clamping.
- RC filter plus variable digital filter (none, low, medium, high).
- Common Mode: 100dB no filter (153dB high filter).
- Normal Mode: 0.5dB no filter (80dB high filter).

Output Accuracy
- ±0.05%, typical. ±0.1%, maximum.

Output Compliance
- R_{load} = (V_{supply} - 7V) / 0.020A.
- R_{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 (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°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 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 6068-2-6.
- Shock: 25g, per IEC 6068-2-27.

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, CISP3R 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.

### Software

**TTC-SIP** (Recommd 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.
DT230 Series

**Transmitters:**

**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.

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 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.

**Windows configuration software (FREE) at**

www.acromag.com

**Android Agility™ app (FREE) at**

Google Play Store

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

**Save configuration files for convenient copy/restore capability.**

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Bulletin #8400-975d
**DT235** RTD/resistance input two-wire dual transmitter

**Performance Specifications**

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<thead>
<tr>
<th>Input Type</th>
<th>Input Range</th>
<th>Accuracy(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTD, Pt, 100Ω</td>
<td>-200 to 850°C</td>
<td>±0.25°C</td>
</tr>
<tr>
<td>RTD, Pt, 200Ω</td>
<td>-200 to 850°C</td>
<td>±0.30°C</td>
</tr>
<tr>
<td>RTD, Pt, 500Ω</td>
<td>-200 to 850°C</td>
<td>±0.50°C</td>
</tr>
<tr>
<td>RTD, Pt, 1000Ω</td>
<td>-200 to 850°C</td>
<td>±1.0°C</td>
</tr>
<tr>
<td>Ni 120Ω (Minco 7-120)</td>
<td>-80 to 320°C</td>
<td>±0.08°C</td>
</tr>
<tr>
<td>Cu 10Ω (Minco 16-9)</td>
<td>-200 to 270°C</td>
<td>±1.0°C</td>
</tr>
<tr>
<td>Resistance (linear)</td>
<td>0 to 25Ω</td>
<td>±0.05Ω</td>
</tr>
<tr>
<td>Resistance (linear)</td>
<td>0 to 45Ω</td>
<td>±0.1Ω</td>
</tr>
<tr>
<td>Resistance (linear)</td>
<td>0 to 900Ω</td>
<td>±0.5Ω</td>
</tr>
<tr>
<td>Resistance (linear)</td>
<td>0 to 2250Ω</td>
<td>±2.750</td>
</tr>
<tr>
<td>Resistance (linear)</td>
<td>0 to 4500Ω</td>
<td>±4.5Ω</td>
</tr>
</tbody>
</table>

**Environmental**

Operating temperature:
-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 continuous isolation between input and output circuits.
Shock and Vibration Immunity:
Vibration: 4g, per IEC 60068-2-6.
Shock: 25g, per IEC 60668-2-27.

**Approvals (pending)**

CE compliant. UL/cUL Listed Class I Division 2 Groups A, B, C, D. IECEx certified Zone 2.
IEC 60068-2-6,
IEC 60668-2-27.

**Electromagnetic Compatibility (EMC) Compliance**

Radiated Emissions: BS EN 61000-4-6, CISPR 16.
RFI: BS EN 61000-4-2, IEC 61000-4-3.
Conducted RFI: BS EN 61000-4-3, IEC 61000-4-3.
ESD: BS EN 61000-4-2, IEC 61000-4-2.
EFT: BS EN 61000-4-2, IEC 61000-4-4.
Surge Immunity: BS EN 61000-4-2, IEC 61000-4-5.

**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.

5028-565
USB-OTG 6 inch cable.

**Ordering Information**

**Models**

DT235-0600
Two-wire dual transmitter, RTD/resistance inputs, isolated current or voltage outputs.

<table>
<thead>
<tr>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>DT230-Config/Cal</td>
</tr>
<tr>
<td>Factory custom configuration/calibration service. Specify input type, input/output zero and full-scale values, filtering, and sensor fault settings on order.</td>
</tr>
</tbody>
</table>

**Specifications**

**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.

**Input (two channels)**

Default Configuration
Input: 100Ω RTD, 3-wire, =0.00385, -200 to 850°C, medium filter.
Output: 4 to 20mA, upscale break detect.

**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**

\[ \text{V}_{\text{out}} = \left( \text{V}_{\text{input}} - 7 \right) / 0.020A. \]

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

<table>
<thead>
<tr>
<th>Filter Type</th>
<th>Time to reach 98% of final output value (typical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No filter</td>
<td>34 milliseconds</td>
</tr>
<tr>
<td>Low filter</td>
<td>80 milliseconds</td>
</tr>
<tr>
<td>Medium filter</td>
<td>214 milliseconds</td>
</tr>
<tr>
<td>High filter</td>
<td>1238 milliseconds</td>
</tr>
</tbody>
</table>

**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.

**Specifications**

**Input (two channels)**

Default Configuration
Input: 100Ω 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**

<table>
<thead>
<tr>
<th>Input Type</th>
<th>Input Range</th>
<th>Accuracy(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTD, Pt, 100Ω</td>
<td>-200 to 850°C</td>
<td>±0.25°C</td>
</tr>
<tr>
<td>RTD, Pt, 200Ω</td>
<td>-200 to 850°C</td>
<td>±0.30°C</td>
</tr>
<tr>
<td>RTD, Pt, 500Ω</td>
<td>-200 to 850°C</td>
<td>±0.50°C</td>
</tr>
<tr>
<td>RTD, Pt, 1000Ω</td>
<td>-200 to 850°C</td>
<td>±1.0°C</td>
</tr>
<tr>
<td>Ni 120Ω (Minco 7-120)</td>
<td>-80 to 320°C</td>
<td>±0.08°C</td>
</tr>
<tr>
<td>Cu 10Ω (Minco 16-9)</td>
<td>-200 to 270°C</td>
<td>±1.0°C</td>
</tr>
<tr>
<td>Resistance (linear)</td>
<td>0 to 25Ω</td>
<td>±0.05Ω</td>
</tr>
<tr>
<td>Resistance (linear)</td>
<td>0 to 45Ω</td>
<td>±0.1Ω</td>
</tr>
<tr>
<td>Resistance (linear)</td>
<td>0 to 90Ω</td>
<td>±0.5Ω</td>
</tr>
<tr>
<td>Resistance (linear)</td>
<td>0 to 225Ω</td>
<td>±2.750</td>
</tr>
<tr>
<td>Resistance (linear)</td>
<td>0 to 450Ω</td>
<td>±4.5Ω</td>
</tr>
</tbody>
</table>

**Electromagnetic Compatibility (EMC) Compliance**

Radiated Emissions: BS EN 61000-4-6, CISPR 16.
RFI: BS EN 61000-4-2, IEC 61000-4-3.
Conducted RFI: BS EN 61000-4-3, IEC 61000-4-3.
ESD: BS EN 61000-4-2, IEC 61000-4-2.
EFT: BS EN 61000-4-2, IEC 61000-4-4.
Surge Immunity: BS EN 61000-4-2, IEC 61000-4-5.

**Shock and Vibration Immunity**
Vibration: 4g, per IEC 60068-2-6.
Shock: 25g, per IEC 60668-2-27.

**Approvals (pending)**

CE compliant. UL/cUL Listed Class I Division 2 Groups A, B, C, D. IECEx certified Zone 2.

**Software**

**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.

**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).

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.
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

**Windows configuration software (FREE) at**

www.acromag.com

**Android Agility™ app (FREE) at**

Google Play Store

Save configuration files for convenient copy/restore capability.
## 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).

**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).

**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**

\[ \text{LOAD} = \frac{\text{V_{supply}}}{0.020A} \]

\[ \text{LOAD} = 0 \text{ to 850 ohms} \text{ @ 24V DC.} \]

**Output Response Time**

Time to reach 98% of output value (typical)

<table>
<thead>
<tr>
<th>Filter</th>
<th>Time (milliseconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No filter</td>
<td>31</td>
</tr>
<tr>
<td>Low filter</td>
<td>51</td>
</tr>
<tr>
<td>Medium filter</td>
<td>152</td>
</tr>
<tr>
<td>High filter</td>
<td>1100</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/UL listed Class I Division 2 Groups ABCD. ATEX, IECEx certified 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 61000-4-4.

ESD: BS EN 61000-4-2, IEC 61000-4-2.

EFT: BS EN 61000-4-2, IEC 61000-4-4.

Surge Immunity: BS EN 61000-4-6, IEC 61000-4-5.

**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

### Physical

**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**

**USB-ISOLATOR**

USB-to-USB isolator, includes USB cable (4001-112, 4001-113).

**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.
DT230 Series

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

Transmitters: DT230 Series

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

Windows configuration software (FREE) at www.acromag.com
Android Agility™ app (FREE) at Google Play Store

Save configuration files for convenient copy/restore capability.
### DT237 Medium DC voltage input two-wire dual transmitter

#### Performance Specifications

**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.

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.

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.

- 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 ABCD. ATEX, IECEx certified Zone 2.
- II 3 G Ex nA IIC T4 Gc ≤ Ta ≤ +80°C.

**Physical**

General
- General-purpose enclosure designed for mounting on 35mm “T-type” DIN rail.

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

#### Models

<table>
<thead>
<tr>
<th>Models</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DT237-0600</td>
<td>Two-wire dual transmitter, medium DC voltage inputs, isolated current or voltage outputs.</td>
</tr>
</tbody>
</table>

#### 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.

**5028-565**
- DIN rail end stop for hazloc approvals.

**5028-56S**
- USB-OTG 6 inch cable.
Transmitters: DT230 Series

DT238 High 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 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.

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.

Windows configuration software (FREE) at www.acromag.com
Android Agility™ app (FREE) at Google Play Store

Save configuration files for convenient copy/restore capability.
DT238  High voltage input two-wire dual transmitter

**Performance Specifications**

**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
- $\text{LOAD} = \left( \text{Vsupply} - 7V \right) / 0.020A$.
- $\text{LOAD} = 0$ to 850 ohms @ 24V DC.

Output Response Time (for step input change)

<table>
<thead>
<tr>
<th>Filter Type</th>
<th>Time to Reach 98% of Output Value (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/UL listed Class I Division 2 Groups A/BCD, ATEX, IECEx certified Zone 2.
- IIL 3 G Ex nA IIC T4 Gc -40°C $\leq T_a \leq +80°C$.

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 61000-4-2, 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.
**Transmitters: DT330 Series**

**DT333 Thermocouple/millivolt input four-wire dual transmitter**

**Description**
DT330 series signal conditioners provide two independent I/O channels in a single, space-saving unit. The DT333 model is a four-wire dual transmitter that isolates and converts millivolt or thermocouple sensor inputs to proportional control signals. Each channel supports DC current or voltage output. An optional DIN rail bus can deliver primary or redundant power to multiple units.

High-voltage isolation separates inputs, outputs, and power 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 thermocouple/millivolt input types: (TC Type J, K, T, R, S, E, B, N, ±100mV, ±1V)
- Selectable current and voltage output ranges: 0-20mA, 4-20mA, ±5V, ±10V, 0-5V, 0-10V DC
- Supports reverse-acting (inverse) output
- High accuracy, linearity, stability, and reliability
- User-selectable filtering (none, low, med., high)
- Selectable up/downscale fault detection
- Bus power, local power, or both (redundancy)
- Space-saving 17.5mm (0.7 inch) unit with pluggable terminals for convenient wiring
- 1500V input isolation, 5-way, (power/input/output)
- Wide ambient operation (-40 to 70°C)
- CE compliant. UL/cUL Class I Div 2, ATEX/IECEx Zone 2 approvals pending

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.
DT333 Thermocouple/millivolt input four-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 DT330 Series transmitter.

**USB Interface**

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
Output: 4 to 20mA, upscale break detect.

### Input Ranges and Accuracy

<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</td>
<td>±0.5°C</td>
</tr>
<tr>
<td>TC K</td>
<td>-200 to 1372°C</td>
<td>±0.5°C</td>
</tr>
<tr>
<td>TC T</td>
<td>-260 to 400°C</td>
<td>±0.5°C</td>
</tr>
<tr>
<td>TC R</td>
<td>-50 to 1768°C</td>
<td>±1.0°C</td>
</tr>
<tr>
<td>TC S</td>
<td>-50 to 1768°C</td>
<td>±1.0°C</td>
</tr>
<tr>
<td>TC E</td>
<td>-200 to 1000°C</td>
<td>±0.5°C</td>
</tr>
<tr>
<td>TC B</td>
<td>260 to 1820°C</td>
<td>±1.0°C</td>
</tr>
<tr>
<td>TC N</td>
<td>-230 to 170°C</td>
<td>±1.0°C</td>
</tr>
<tr>
<td>TC N</td>
<td>-230 to 1300°C</td>
<td>±0.5°C</td>
</tr>
<tr>
<td>mV</td>
<td>-100 to 100mV</td>
<td>±0.5%</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
Full range.

Lead Break (Sensor Burnout) Detection
Upscale/downscale full range.

Input 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, med., high).

Noise Rejection
Common Mode: 96dB no filter (134dB high filter).
Normal Mode: 0.12dB no filter, 60Hz (>80dB med/high filter).

**Output (two channels)**

D/A Converters (DAC)
Two 16-bit D/A converters.

### Output Ranges

<table>
<thead>
<tr>
<th>Output</th>
<th>Range</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>11V</td>
<td></td>
<td>±0.05%, typical ±0.1%, maximum.</td>
</tr>
<tr>
<td>0V</td>
<td>4 to 20mA</td>
<td>±0.05%, typical ±0.1%, maximum.</td>
</tr>
</tbody>
</table>

### Output Accuracy

±0.05%, typical ±0.1%, maximum.

### Output Load

Voltage output: 1K ohms minimum.
Current output: 0-550 ohms.

### Output Compliance

11V, typical.

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

Time to reach 98% of final output value (typical)
- No filter: 13 milliseconds
- Low filter: 38 milliseconds
- Medium filter: 122 milliseconds
- High filter: 1158 milliseconds

### Environmental

- **Relative humidity:** 5 to 95% non-condensing.
- **Operation:** -40 to 70°C (-40° to 158°F).
- **Storage:** -40 to 85°C (-40° to 185°F).
- **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).
- **Shock:** 25g, per IEC 60068-2-27.
- **Vibration:** 4g, per IEC 60068-2-6.

### I/O Connectors

- **TT BUS-KIT**
  - DIN rail bus power connector and left/right terminal blocks.
  - DIN rail end stop for hazloc approvals.
  - Requires 5028-565 and 4001-113 cables.
- **Accessories**
  - TT BUS-KIT
  - DIN rail bus power connector and left/right terminal blocks.
  - One kit supports multiple transmitters.
  - 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.

**Ordering Information**

**Models**

| DT333-0700 |
| Four-wire dual transmitter, thermocouple/millivolt inputs, isolated current or voltage outputs. |

**Services**

**Models**

- **DT330-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**

- **TT-CSP** (recommend one kit per customer)
- **Agility Mobile Application**
  - Software configuration software for an Android smart device. Download for free from the Google Play Store.

**Accessories**

- **TT BUS-KIT**
  - DIN rail bus power connector and left/right terminal blocks.
  - One kit supports multiple transmitters.
- **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.**
Transmitters: DT330 Series

**DT335** RTD/Resistance input four-wire dual transmitter

**Description**
DT330 series signal conditioners provide two independent I/O channels in a single, space-saving unit. The DT335 model is a four-wire dual transmitter that isolates and converts RTD or linear resistance sensor inputs to proportional control signals. Each channel supports DC current or voltage output. An optional DIN rail bus can deliver primary or redundant power to multiple units.

High-voltage isolation separates inputs, outputs, and power 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 RTD and linear resistance input types: Pt 100/200/500 Ω, Ni 120 Ω, Cu 10 Ω, 0-4500 Ω
- Supports 2, 3, and 4-wire sensor connections
- Selectable current and voltage output ranges: 0-20mA, ±10V, ±5V, ±10V, 0-5V, 0-10V DC
- High accuracy, linearity, stability, and reliability
- User-selectable filtering (none, low, med., high)
- Selectable up/downscale break detection
- Bus power, local power, or both (redundancy)
- Space-saving 17.5mm (0.7 inch) unit with pluggable terminals for convenient wiring
- 1500V input isolation, 5-way, (power/input/output)
- Wide ambient operation (-40 to 70°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

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**Dual channels**

◆ RTD (Pt, Ni, Cu) or 0-4500 ohm input  ◆ 0-20mA, ±10V outputs  ◆ 6-32V DC local/bus power
DT335  RTD/Resistance input four-wire dual transmitter

**Performance Specifications**

**USB Interface**
- 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
  - Input: 100Ω
  - A/D Converters (ADC)
    - Two 24-bit Sigma Delta ADCs (only 16-bits used).
  - Input Ranges
    - Two 24-bit Sigma Delta ADCs (only 16-bits used).

**Input Type** | **Input Range** | **Accuracy**
--- | --- | ---
Pt 100Ω | -200 to 850°C | ±0.25°C
Pt 200Ω | -200 to 850°C | ±0.30°C
Pt 500Ω | -200 to 850°C | ±0.50°C
Pt 1000Ω | -200 to 850°C | ±1.00°C
Ni 120Ω (Minco 7-120) | -80 to 320°C | ±0.08°C
Cu 102Ω (Minco 16-9) | -200 to +270°C | ±1.00°C
Linear Resistance | 0 to 250Ω | ±0.05Ω
Linear Resistance | 0 to 450Ω | ±0.10Ω
Linear Resistance | 0 to 900Ω | ±0.20Ω
Linear Resistance | 0 to 2250Ω | ±0.50Ω
Linear Resistance | 0 to 4500Ω | ±0.50Ω

**Ambient Temperature Effect**
Better than ±80ppm/°C (±0.008%/°C).

**Input Bandwidth**
- -3dB @ 16Hz (no filtering).

**Noise Rejection**
- Common Mode: 106dB no filter.
- Normal Mode: 1dB no filter, 60Hz (>80dB med./high filter).

**Output (two channels)**
- D/A Converters (DAC)
  - Two 16-bit D/A converters.
- Output Ranges
  - ±10V (±11V maximum).
  - ±5V (±5.5V maximum).
  - 0 to 10V (11V maximum).
  - 0 to 5V (5.5V maximum).
  - 0 to 20mA (24mA maximum).
  - 4 to 20mA (24mA maximum).
- Output Accuracy
  - ±0.05% typical, ±0.1% maximum.
- Output load
  - Voltage output: 1K ohms minimum.
  - Current output: 0-550 ohms.
- Output Compliance
  - 11V, typical.
- Output Response Time (for step input change)
  - Time to reach 98% of final output value (typical)
  - No filter: 25 milliseconds
  - Low filter: 44 milliseconds
  - Medium filter: 146 milliseconds
  - High filter: 1068 milliseconds
- Output Ripple
  - Less than ±0.1% of output span.

**Environmental**
- Operating Temperature Range
  - Operation: -40 to 70°C (-40 to 158°F).
  - Storage: -40 to 85°C (-40 to 185°F).
- Relative humidity
  - 5 to 95% non-condensing.
- Power Requirement
  - 6-32V DC SELV, 1.6W max.
- Isolation
  - 1500V AC peak.
  - 250V AC (354V DC) continuous isolation between inputs, outputs, and power (5-way).
- Shock and Vibration Immunity
  - Vibration: 4g, per IEC 60686-2-6.
  - Shock: 25g, per IEC 60686-2-27.
- Approvals (pending)
  - CE compliant. UL/UL listed Class I Division 2 Groups IBCD, ATEX, IECEx certified Zone 2.
  - 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, EF: 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 (0.49 pounds) packed.

**Ordering Information**
- Models
  - DT335-0700
  - Four-wire dual transmitter, isolated RTD/Resistance input, isolated current or voltage outputs.

- Services
  - DT330-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**
- TT BUS-KIT
  - DIN rail bus power connector and left/right terminal blocks.
  - One kit supports multiple transmitters.
- 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.

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Tel 877-214-6267  sales@acromag.com  www.acromag.com  30765 Wixom Rd, Wixom, MI 48393  USA
Transmitters: DT330 Series

DT336 Current/millivolt input four-wire dual transmitter

Description
DT330 series signal conditioners provide two independent I/O channels in a single, space-saving unit. The DT336 model is a four-wire dual transmitter that isolates and converts DC current or low voltage inputs to proportional control signals. Each channel supports DC current or voltage output. An optional DIN rail bus can deliver primary or redundant power to multiple units.

High-voltage isolation separates inputs, outputs, and power 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 current and voltage input ranges: 0/4-20mA, ±1mA, ±20mA, ±0.5V, 0-500mV DC
- Compatible with 0-20A AC sensor input
- Selectable current and voltage output ranges: 0-20mA, 4-20mA, ±5V, ±10V, 0-5V, 0-10V DC
- Supports reverse-acting (inverse) output
- 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
- Bus power, local power, or both (redundancy)
- 1500V input isolation, 5-way, (power/input/output)
- Wide ambient operation (-40 to 70°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 ◆ ±20mA, ±500mV inputs ◆ 0-20mA, ±10V outputs ◆ 6-32V DC local/bus power
Transmitters: DT330 Series

DT336  Current/millivolt input four-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 DT330 Series transmitter.

- **USB Interface**
  - 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: Input: 4 to 20mA, medium filter. Output: 4 to 20mA.
  - A/D Converters (ADC): Two 24-bit Sigma Delta ADCs (only 16-bits used).
  - Input Ranges:
    - Path A: ±1mA, ±20mA, 0 to 11.7mA, ±20mA, 4-20mA DC.
    - Path B: ±0.5V, 0-500mV DC.
  - Ambient Temperature Effect: Better than ±50ppm/°C (±0.0005%/°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, med., high).
    - Input Bandwidth: -3dB at 34Hz (no filtering).
  - Noise Rejection:
    - Common Mode: 100dB, no filter (120dB, high filter).
    - Normal Mode: 7dB @ 60Hz, no filter (>80dB med., high filter).

- **Output (two channels)**
  - D/A Converters (DAC): Two 16-bit D/A converters.
  - Output Ranges:
    - ±10V (±11V maximum).
    - ±5V (±5.5V maximum).
  - Time to reach 98% of final output value (typical):
    - Low filter: 25 milliseconds
    - Medium filter: 140 milliseconds
    - High filter: 1140 milliseconds
  - Output Ripple:
    - Less than ±0.1% of output span.
  - Environmental:
  - Operating Temperature Range: Operation: -40 to 70°C (-40° to 158°F).
    - Storage: -40 to 85°C (-40° to 185°F).
  - Relative humidity: 5 to 95% non-condensing.
  - Power Requirement:
    - 6-32V DC SELV, 1.6W max.
  - Isolation:
    - 1500V AC peak. 250V AC (354V DC) continuous isolation between inputs, outputs, and power (5-way).
  - 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 ABCD. ATEX, IECEx certified Zone 2.
    - 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:
      - Removal 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**
  - DT336-0700
  - Four-wire dual transmitter, current/millivolt inputs, isolated current or voltage outputs.

- **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**
  - TT BUS-KIT
  - DIN rail bus power connector and left/right terminal blocks.
  - One kit supports multiple transmitters.
  - 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.
  - 5020-350
  - AC current sensor (toroidal transformer); converts 0-20A AC to 0-11.17mA DC.
Transmitters: DT330 Series

DT337  Medium DC voltage input four-wire dual transmitter

Description
DT330 series signal conditioners provide two independent I/O channels in a single, space-saving unit. The DT337 model is a four-wire dual transmitter that isolates and converts process-level DC voltage inputs to proportional control signals. Each channel supports DC current or voltage output. An optional DIN rail bus can deliver primary or redundant power to multiple units.

High-voltage isolation separates inputs, outputs, and power 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 medium voltage input ranges: ±1V, ±5V, ±10V, 0-1V, 0-5V, 0-10V DC
- Selectable current and voltage output ranges: 0-20mA, 4-20mA, ±5V, ±10V, 0-5V, 0-10V DC
- Supports reverse-acting (inverse) output
- High accuracy, linearity, stability, and reliability
- User-selectable filtering (none, low, med., high)
- Bus power, local power, or both (redundancy)
- Space-saving 17.5mm (0.7 inch) unit with pluggable terminals for convenient wiring
- 1500V input isolation, 5-way, (power/input/output)
- Wide ambient operation (-40 to 70°C)
- CE compliant. UL/cUL Class I Div 2, ATEX/IECEx Zone 2 approvals pending.

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

Android Agility™ app (FREE) at Google Play Store

Save configuration files for convenient copy/restore capability.

Transmitters: DT330 Series

Dual channels ◆ ±1V, ±10V inputs ◆ 0-20mA, ±10V outputs ◆ 6-32V DC local/bus power
**Performance Specifications**

**USB Interface**
- 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, 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, med., high).
- Input Bandwidth
  - -3dB @ 34Hz (no filtering).
- Noise Rejection
  - Common Mode: 100dB, no filter (120dB high filter).
  - Normal Mode: Path A 7dB, Path B 29dB, 60Hz, no filter.
  - (>80dB med./high filter).

**Output (two channels)**
- D/A Converters (DAC)
  - Two 16-bit D/A converters.
- Output Ranges
  - ±10V (±11V maximum).
  - ±5V (±5.5V maximum).
  - 0 to 10V (11V maximum).
  - 0 to 5V (5.5V maximum).
  - 0 to 20mA (24mA maximum).
  - 4 to 20mA (24mA maximum).
- Output Accuracy
  - ±0.05% typical, ±0.1% maximum.
- Output Load
  - Voltage output: 1K ohms minimum.
  - Current output: 0-550 ohms.
- Output Compliance
  - 11V, typical.
- Output Response Time (for step input change)
  - Time to reach 98% of final output value (typical)
    - No filter: 25 milliseconds
    - Low filter: 41 milliseconds
    - Medium filter: 140 milliseconds
    - High filter: 1140 milliseconds
- Output Ripple
  - Less than ±0.1% of output span.

**Environmental**
- Operating Temperature Range
  - Operation: -40 to 70°C (-40° to 158°F).
  - Storage: -40 to 85°C (-40° to 185°F).
- Relative Humidity
  - 5 to 95% non-condensing.
- Power Requirement
  - 6-32V DC SELV, 1.6W max.
- Isolation
  - 1500V AC peak. 250V AC (354V DC) continuous isolation between inputs, outputs, and power (5-way).
- 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 ATEX.
  - IECEx certified Zone 2.
  - IEC 1008-2-27.
  - Conducted RFI: BS EN 61000-4-6, IEC 61000-4-3.
  - Radiated Emissions: BS EN 61000-4-6, IEC 61000-4-3.
  - Conducted EFT: BS EN 61000-4-6, IEC 61000-4-6.
  - Surge Immunity: BS EN 61000-4-4.

**Physical**
- General
  - General-purpose enclosure designed for mounting on 35mm “T-type” DIN rail.

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**Models**
- **DT337-0700**
  - Four-wire dual transmitter, medium voltage DC inputs, isolated current or voltage outputs.

**Services**
- **DT330-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**
- **T3 BUS-KIT**
  - DIN rail bus power connector and left/right terminal blocks.
  - One kit supports multiple transmitters.
- **USB-ISOLATOR**
  - USB-to-USB isolator, includes USB cable (4001-112).
  - 4001-112
  - USB cable, 1 meter, with Type A to Mini-B plugs.
  - 4001-113
  - USB cable, 1 meter, with Type A to Type B plugs.
  - 4001-252
  - DIN rail end stop for hazloc approvals.
  - 5028-565
  - USB-OTG 6 inch cable.

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**Ordering Information**

**USB Interface**
- 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, 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, med., high).
- Input Bandwidth
  - -3dB @ 34Hz (no filtering).
- Noise Rejection
  - Common Mode: 100dB, no filter (120dB high filter).
  - Normal Mode: Path A 7dB, Path B 29dB, 60Hz, no filter.
  - (>80dB med./high filter).

**Output (two channels)**
- D/A Converters (DAC)
  - Two 16-bit D/A converters.
- Output Ranges
  - ±10V (±11V maximum).
  - ±5V (±5.5V maximum).
  - 0 to 10V (11V maximum).
  - 0 to 5V (5.5V maximum).
  - 0 to 20mA (24mA maximum).
  - 4 to 20mA (24mA maximum).
- Output Accuracy
  - ±0.05% typical, ±0.1% maximum.
- Output Load
  - Voltage output: 1K ohms minimum.
  - Current output: 0-550 ohms.
- Output Compliance
  - 11V, typical.
- Output Response Time (for step input change)
  - Time to reach 98% of final output value (typical)
    - No filter: 25 milliseconds
    - Low filter: 41 milliseconds
    - Medium filter: 140 milliseconds
    - High filter: 1140 milliseconds
- Output Ripple
  - Less than ±0.1% of output span.

**Environmental**
- Operating Temperature Range
  - Operation: -40 to 70°C (-40° to 158°F).
  - Storage: -40 to 85°C (-40° to 185°F).
- Relative Humidity
  - 5 to 95% non-condensing.
- Power Requirement
  - 6-32V DC SELV, 1.6W max.
- Isolation
  - 1500V AC peak. 250V AC (354V DC) continuous isolation between inputs, outputs, and power (5-way).
- 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 ATEX.
  - IECEx certified Zone 2.
  - IEC 1008-2-27.
  - Conducted RF: BS EN 61000-4-6, IEC 61000-4-3.
  - Radiated Emissions: BS EN 61000-4-6, IEC 61000-4-3.
  - Conducted EFT: BS EN 61000-4-6, IEC 61000-4-6.
  - Surge Immunity: BS EN 61000-4-4.

**Physical**
- General
  - General-purpose enclosure designed for mounting on 35mm “T-type” DIN rail.
Transmitters: DT330 Series

DT338  High DC voltage input four-wire dual transmitter

**Description**
DT330 series signal conditioners provide two independent I/O channels in a single, space-saving unit. The DT338 model is a four-wire dual transmitter that isolates and converts high-level DC voltage inputs to proportional control signals. Each channel supports DC current or voltage output. An optional DIN rail bus can deliver primary or redundant power to multiple units.

High-voltage isolation separates inputs, outputs, and power 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 high voltage input ranges: ±15V, ±75V, ±150V, 0-15V, 0-75V, 0-150V DC
- Selectable current and voltage output ranges: 0-20mA, 4-20mA, ±5V, ±10V, 0-5V, 0-10V DC
- Supports reverse-acting (inverse) output
- High accuracy, linearity, stability, and reliability
- User-selectable filtering (none, low, med., high)
- Bus power, local power, or both (redundancy)
- Space-saving 17.5mm (0.7 inch) unit with pluggable terminals for convenient wiring
- 1500V input isolation, 5-way, (power/input/output)
- Wide ambient operation (-40 to 70°C)
- CE compliant. UL/cUL Class I Div 2, ATEX / IECEx Zone 2 approvals pending.

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

Android Agility™ app (FREE) at Google Play Store

Save configuration files for convenient copy/restore capability.

Save configuration files for convenient copy/restore capability.

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

Bulletin #8400-985c
### Performance Specifications

**DT338**  High DC voltage input four-wire dual 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**
- **A/D Converters (ADC)**
  - Two 24-bit Sigma Delta ADCs (only 16-bits used).
- **Input Ranges**
  - Path A: ±15V, 0-15V.
  - Path B: ±75V, ±150V, 0-150V DC.
- **Ambient Temperature Effect**
  - Path A: ±15V, 0-15V.
  - Path B: ±75V, ±150V, 0-150V DC.
- **Input Over-Voltage Protection**
  - Bipolar Transient Voltage Suppression (TVS) and diode clamping.
- **Input Filter**
  - RC filter plus variable digital filter (none, low, med., high).
- **Input Bandwidth**
  - 3dB @ 34Hz (no filtering).
- **Noise Rejection**
  - Common Mode: 100dB no filter (120dB high filter).
  - Normal Mode: Path A 32dB, Path B 52dB, 60Hz no filter.
  - >80dB med./high filter.

**Output (two channels)**
- **D/A Converters (DAC)**
  - Two 16-bit D/A converters.
- **Output Ranges**
  - ±10V (±11V maximum).
  - ±5V (±5.5V maximum).
  - ±1V (±1V maximum).
- **Output Accuracy**
  - ±0.05% typical, ±0.1% maximum.
- **Output Load**
  - Voltage output: 1K ohms minimum.
  - Current output: 0-550 ohms.
- **Output Compliance**
  - 1V, typical.
- **Output Response Time (for step input change)**
  - Time to reach 98% of final output value (typical)
  - No filter: 25 milliseconds
  - Low filter: 41 milliseconds
  - Medium filter: 140 milliseconds
  - High filter: 1140 milliseconds
- **Output Ripple**
  - Less than ±0.1% of output span.

**Environmental**
- **Operating Temperature Range**
  - Operation: ±40 to 70°C (-40° to 158°F).
  - Storage: -40 to 85°C (-40° to 185°F).
- **Relative Humidity**
  - 5 to 95% non-condensing.
- **Power Requirement**
  - 6-32V DC SELV, 1.6W max.
- **Isolation**
  - 1500V AC peak. 250V AC (354V DC) continuous isolation between inputs, outputs, and power (5-way).
- **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, IECEx certified Zone 2.
  - 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 61000-4-6, IEC 61000-4-3.
  - Conducted RFI: BS EN 61000-4-6, IEC 61000-4-6.ESD: BS EN 61000-4-2. EFT: BS EN 61000-4-2. 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 polynamide, 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**
- **DT338-0700**
  - Four-wire dual transmitter, high voltage DC inputs, isolated current or voltage outputs.

**Services**
- **DT330-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, 2001-113).

**Agility Mobile Application**

**Accessories**
- **TT BUS-KIT**
  - DIN rail bus power connector and left/right terminal blocks. One kit supports multiple transmitters.
- **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.
- **4001-565**
  - USB-OTG 6 inch cable.

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**Transmitters: DT330 Series**
**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

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**Accessories**

**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
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.

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

- **Personal Computer Running Windows OS**
  - **HOST USB**
  - **HOST PC RUNNING ACROMAG CONFIGURATION SOFTWARE**
- **microBlox uBSP Series Signal Splitter Carrier**
  - **HOST USB**
  - **HOST PC RUNNING ACROMAG CONFIGURATION SOFTWARE**
- **ST Series Transmitter Model ST131-0600**
  - **ST SERIES TRANSMITTER**
  - **BUSWORKS XT SERIES**
- **SP / TT Series**
  - **SP / TT TRANSMITTER**

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