SP Series Splitters
Loop / External Power

DIN-Rail Mount
Easy Configuration
Slim design

Space-Saving 2/4-Wire Isolated Signal Splitters
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.

All trademarks are the property of their respective owners.

Online Ordering
For your convenience, Acromag provides full product documentation and pricing information on our website. You can obtain quotes or even place your order directly on our website.

Fast Delivery from Stock
Most products can be shipped within 24 hours of receiving your order.

Special Services
We are happy to accommodate your special requirements and offer the following services:
• custom product development
• custom calibration
• source inspections, quality audits
• special shipping, documentation
• protective humiseal coating
• plastic and stainless steel tagging

Certification and Approvals
Many Acromag products carry globally recognized agency approvals and safety certifications.
• CE
• UL, cUL
• ATEX
• CSA
• Ethernet conformance
• Modbus conformance
• Profibus certification
• IECEx
**Signal Splitters: SP Series**

**SP Series** Thin 2/4-Wire Splitters

**Introduction**
The new **SP Series splitters** accommodate a broad variety of applications and are software-configurable for precise conditioning of current, voltage, or temperature input signals. Eight models provide dual isolated outputs proportional to a single input, with a choice of process control signal formats.

**Input**
Thermocouple, AC/DC current, millivolt/voltage

**Output**
SP230 Series: 4-20mA current (sink or source)
SP330 Series: scalable current or voltage output

**Power**
- SP230 Series: 7-32V DC loop/local power
- SP330 Series: 6-32V DC external power

**Key Features and Benefits**
- Space saving 17.5mm housing
- Easy setup via USB with Windows® configuration software
- Supports sink/source wiring
- 2-wire, loop-powered / 4-wire, externally powered
- SP230 Series: -40 to 80°C / SP330 Series: -40 to 75°C
- Current, voltage, and temperature splitters
- Adjustable filtering levels
- Ability to scale inputs differently for each output
- Shock and vibration resistant
- CE Compliant. UL/cUL Class 1 Div 2 Zone 2 approvals. ATEX and IECEx Certified.

**SP233**
**Thermocouple, Millivolt Input**
- Input
  - Type J,K,T,R,S,E,B,N thermocouple
  - ±100mV
- See data sheet

**SP236**
**Current, Millivolt Input**
- Input
  - ±1mA, ±20mA, ±500mA
  - 0-20mA, 4-20mA
  - 0-11.17mA (for AC sensor)
  - ±5V
- See data sheet

**SP237**
**Process Voltage Input**
- Input
  - ±1V DC
  - ±5V DC
  - ±10V DC
- See data sheet

**SP238**
**High Voltage Input**
- Input
  - ±15V DC
  - 0-15V DC
  - ±150V / ±75V DC
  - 0-5V DC
- See data sheet

**SP333**
**Thermocouple, Millivolt Input**
- Input
  - Type J,K,T,R,S,E,B,N thermocouple
  - ±100mV
- See data sheet

**SP336**
**Current, Millivolt Input**
- Input
  - ±1mA, ±20mA, ±500mA
  - 0-20mA, 4-20mA
  - 0-11.17mA (for AC sensor)
  - ±5V
- See data sheet

**SP337**
**Process Voltage Input**
- Input
  - ±1V DC
  - ±5V DC
  - ±10V DC
- See data sheet

**SP338**
**High Voltage Input**
- Input
  - ±15V DC
  - ±75V DC
  - ±150V DC
- See data sheet

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**Signal Splitters: SP Series**

**Key Features**

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

- **Scalable Current or Voltage Output**
  - SP230 Series: Supports sink or source 4-20mA output
  - SP330 Series: Supports scalable current or voltage output ranges: 0-20mA, 4-20mA, ±5V, ±10V, 0-5V, 0-10V

- **2-wire, Loop-powered**
  - SP230 Series: Power is received from the output loop (2-wire).
  - SP330 Series: 6-32V DC power connects (4-wire) on a terminal block, a rail bus, or both for redundancy.

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

- **Simple Configuration**
  A USB connection to a Windows PC or Android device enables simple, precise configuration of I/O ranges and a variety of operational settings with free software.

- **Input Options**

- **Rugged Design**
  Wide ambient temperature operation, shock and vibration-resistant, as well as CE and UL/cUL Class 1, Division 2, ATEX Zone 2 approved and IECex certified.
Signal Splitters: SP Series

General Operation and Performance Specifications

The following specifications are common to all SP Series splitter modules.

### USB Interface

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Ranges</td>
<td>0-20mA, 4-20mA, ±10V, 0-10V.</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.05% of span typical, ±1.0°C, ±0.1mV.</td>
</tr>
</tbody>
</table>

### Environmental

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>SP230 Series: -40 to 80°C (-40° to 176°F).</td>
</tr>
<tr>
<td></td>
<td>SP330 Series: -40 to 75°C (-40° to 167°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>SP230 Series: 7-32V DC SELV (Safety Extra Low Voltage), 24mA max, loop power.</td>
</tr>
<tr>
<td></td>
<td>SP330 Series: 6-32V DC external supply, 1.5W max.</td>
</tr>
<tr>
<td>Isolation</td>
<td>1500V AC peak. 250V AC (354V DC) continuous between input, output, and power circuits.</td>
</tr>
<tr>
<td>Shock and Vibration Immunity</td>
<td>Vibration: 4g, per IEC 60068-2-64.</td>
</tr>
<tr>
<td></td>
<td>Shock: 25g, per IEC 60068-2-27.</td>
</tr>
<tr>
<td>Electromagnetic Compatibility (EMC) Compliance</td>
<td>Radiated Emissions: BS EN 61000-6-3, CISPR 16.</td>
</tr>
<tr>
<td></td>
<td>RFI: BS EN 61000-6-1, IEC 61000-4-3.</td>
</tr>
<tr>
<td></td>
<td>Conducted RFI: BS EN 61000-6-1, IEC 61000-4-6.</td>
</tr>
<tr>
<td></td>
<td>ESD: BS EN 61000-6-1, IEC 61000-4-2.</td>
</tr>
<tr>
<td></td>
<td>EFT: BS EN 61000-6-1, 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 listing. ATEX Certified.</td>
</tr>
<tr>
<td></td>
<td>IECEx certification.</td>
</tr>
<tr>
<td></td>
<td>Designed for Class I; Division 2; Groups ABCD; 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>

### Physical

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>General-purpose enclosure designed for mounting on 35mm &quot;T-type&quot; DIN rail.</td>
</tr>
<tr>
<td>Case Material</td>
<td>Self-extinguishing polyamide, UL94 V-0 rated, color light gray. General-purpose NEMA Type 1 enclosure.</td>
</tr>
<tr>
<td>I/O Connectors</td>
<td>Removable plug-in terminal blocks rated for 12A/250V, AWG #26-12, stranded or solid copper wire.</td>
</tr>
<tr>
<td>Shipping Weight</td>
<td>0.5 pounds (0.22 Kg) packed.</td>
</tr>
</tbody>
</table>

### Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>*in millimeters (inches)</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>

### SP Series USB Splitter Connections

**Personal Computer Running Windows OS**

**HOST PC RUNNING ACROMAG CONFIGURATION SOFTWARE**

**USB-ISOLATOR** (Recommended)

**MODEL:**

- CABLE Model 4001-112
- CABLE Model 4001-113
Signal Splitters: SP Series

Module Configuration

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

Screen shots of the Agility App for Android, allowing for mobile configuration in the field.
Signal Splitters: SP Series

Accessories

◆ Configuration Software

SP 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.

◆ Bus-Kit

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

Universal Slimline Power Supplies
Input Power Requirement
Universal Input (85-264V AC / 100-370V DC)
Output
10W, 15W, 30W, 60W, 90W, 120W, 240W

◆ Power Supplies

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

◆ USB Cables

Ordering Information

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

SP230-Config/Cal, SP330-Config/Cal
Factory custom configuration/calibration service. Specify input type, input/output zero and full-scale values, filtering, and sensor fault settings on order.

Ordering Information

TTBUS-Kit
DIN rail bus power connector and left/right terminal blocks for SP or TT Series.

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)

Ordering Information

P55R-VB24
Power supply, 15W, 0.65A at 24V DC

P55R-VD24
Power supply, 60W, 2.5A at 24V DC

Visit www.acromag.com for additional models and more information.

Ordering Information

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

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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**Process Loop Splitter: SP230 Series**

**SP233** Thermocouple/millivolt input signal splitter, two-wire

**Description**

The SP233 model is a high-performance signal splitter that converts one millivolt or thermocouple sensor input into two proportional isolated 4-20mA control signals. Power is received from one or both output loop currents.

Setup is fast and easy with a USB connection to your PC and our Windows software. Acromag’s Agility™ mobile app enables configuration on an Android smart phone or tablet. Software simplifies I/O range scaling, calibration, and advanced signal processing capabilities.

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

These rugged instruments withstand harsh industrial environments to operate reliably across a wide temperature range with very low drift. They feature high immunity to RFI, EMI, ESD, and EFT, plus low radiated emissions.

**Key Features & Benefits**

- Easy configuration via USB with Windows software or Agility app for Android
- Universal thermocouple or millivolt input (TC Type J, K, T, S, E, B, N or ±100mV)
- Input scales independently at each output
- User-selectable filtering (none, low, med, high)
- User-configurable output range clamp levels support NAMUR-compliant operation
- Supports reverse-acting (inverse) output
- Supports sink or source output wiring
- Very low 7V two-wire loop burden
- High accuracy, linearity, stability, and reliability
- 1500V isolation
- Space-saving 17.5mm (0.69 inch) design with pluggable terminals for easier wiring
- Shock (25g) and vibration (4g) resistant
- Wide ambient operation (-40 to 80°C)
- CE compliant. UL/cUL Class I Div 2, ATEX / IECEx Zone 2 approvals.
Process Loop Splitter: SP230

**Performance Specifications**

**Input (Passive)**
Default Configuration/Calibration
Input: TC J, -210 to 760°C, high filter, Break: up to 4 to 20mA.

<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 1800°C (500 to 3308°F)</td>
<td>±1.0°C</td>
</tr>
<tr>
<td>TC N</td>
<td>230 to 1300°C (-382 to 2372°F)</td>
<td>±1.0°C</td>
</tr>
<tr>
<td>mV</td>
<td>-100 to 100mV</td>
<td>±0.1mV</td>
</tr>
</tbody>
</table>

Error includes the effects of repeatability, terminal point conformity, and linearization. Does not include CJC error.

Thermocouple Reference
(Cold Junction Compensation)
±0.2°C typical, ±0.5°C maximum at 25°C.

Ambient Temperature Effect
Better than ±0.008%/°C.

Zero Scaling Adjust
0 to 95% of range, typical.

Full Scale Adjust
5 to 100% of full scale range, typical.

Lead Break (Sensor Burnout) Detection
Configurable for either upscale (24mA) or downscale (3.3mA) operation.

**Environmental**
Operating temperature
-40 to 80°C (-40 to 176°F).

Storage temperature
-40 to 85°C (-40 to 185°F).

Relative humidity
5 to 95% non-condensing.

Power Requirement
7-32V DC SELV (Safety Extra Low Voltage), 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 60068-2-64.
Shock: 25g, per IEC 60068-2-27.

Electromagnetic Compatibility (EMC) Compliance
Radiated Emissions: BS EN 61000-6-4, CISPR 16.
RFI: BS EN 61000-6-1, 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.

**Ordering Information**
Models
SP233-0600
Two-wire splitter, thermocouple/millivolt input.

Services
SP230-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
TTCSIP (recommend one kit per customer)
Windows Software Interface Package for Acromag SP Series signal splitters. 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.
Process Loop Splitter: SP230 Series

**SP236** Current/millivolt input signal splitter, two-wire

### Description

The SP236 model is a high-performance signal splitter that converts one DC current or millivolt input into two isolated proportional 4-20mA control signals. Power is received from one or both output loop currents.

Setup is fast and easy with a USB connection to your PC and our Windows software. Acromag's Agility™ mobile app enables configuration on an Android smart phone or tablet. Software simplifies I/O range scaling, calibration, and advanced signal processing capabilities.

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

These rugged instruments withstand harsh industrial environments to operate reliably across a wide temperature range with very low drift. They feature high immunity to RFI, EMI, ESD, and EFT, plus low radiated emissions.

### Key Features & Benefits

- Easy configuration via USB with Windows software or Agility app for Android
- Single unit accepts input ranges up to ±500mV, ±20mA DC, or 0-20A AC (with external sensor)
- Input scales independently at each output
- User-selectable filtering (none, low, med, high)
- User-configurable output range clamp levels support NAMUR-compliant operation
- Supports reverse-acting (inverse) output
- Supports sink or source output wiring
- Very low 7V two-wire loop burden
- High accuracy, linearity, stability, and reliability
- 1500V isolation
- Space-saving 17.5mm (0.69 inch) design with pluggable terminals for easier wiring
- Shock (25g) and vibration (4g) resistant
- Wide ambient operation (-40 to 80°C)
- CE compliant. UL/cUL Class I Div 2, ATEX / IECEx Zone 2 approvals.

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

Android Agility™ app (FREE) at Google Play Store

Save configuration files for convenient copy/restore capability.
Process Loop Splitter: SP230 Series

**SP236** Current/millivolt input signal splitter, two-wire

### 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 SP230 Series transmitter.

#### USB Interface
- **USB Connector:** USB Mini-B type socket, 5-pin.
- **USB Data Rate:** 12Mbps. USB v1.1 and 2.0 compatible.
- **USB Transient Protection:** Transient voltage suppression on power and data lines.
- **USB Cable Length:** 5.0 meters maximum.
- **Driver:** Not required. Uses built-in Human Interface Device (HID) USB drivers of the Windows operating system.

#### Input (Passive)
- **Default Configuration/Calibration:**
  - Input: 4 to 20mA, medium filter.
  - Output: 4 to 20mA.

**Input Ranges and Accuracy**

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy (typical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>±20mA</td>
<td>±0.05% of span</td>
</tr>
<tr>
<td>0 to 20mA</td>
<td>±0.05% of span</td>
</tr>
<tr>
<td>4 to 20mA</td>
<td>±0.05% of span</td>
</tr>
<tr>
<td>0 to 11.17mA</td>
<td>±0.05% of span</td>
</tr>
<tr>
<td>±1mA</td>
<td>±0.05% of span</td>
</tr>
<tr>
<td>±0.5V</td>
<td>±0.05% of span</td>
</tr>
<tr>
<td>±0 to 500mV</td>
<td>±0.05% of span</td>
</tr>
</tbody>
</table>

Error includes the effects of repeatability, terminal point conformity, and linearization.

**Ambient Temperature Effect**
Better than ±0.008%/°C.

**Zero Scaling Adjust**
0 to 95% of range, typical.

**Full Scale Adjust**
5 to 100% of full scale range, typical.

**Input Impedance**
- **Current input:** 24.9 ohms.
- **Voltage input:** 15M ohms.

**Input Over-Voltage Protection**
Bipolar Transient Voltage Suppressors (TVS), 5.6V clamp level typical.

**Output (Two Signals, Passive)**
- **Output Range:** Dual isolated 4 to 20mA DC.
- **Output Compliance:**
  - **RLoad = (VSupply - 7V) / 0.020A:**
  - **RLoad = 0 to 850 ohms @ 24V DC:**
- **Output Response Time (for step input change):**
  - **Time to reach 98% of final output value (typical):**
    - **No filter:** 17 milliseconds
    - **Low filter:** 41 milliseconds
    - **Medium filter:** 138 milliseconds
    - **High filter:** 1,142 milliseconds

**Environmental**
- **Operating temperature:** -40 to 80°C (-40° to 176°F).
- **Storage temperature:** -40 to 85°C (-40° to 185°F).
- **Relative humidity:** 5 to 95% non-condensing.
- **Power Requirement:**
  - **Loop powered:** 7-32V DC SELV (Safety Extra Low Voltage), 24mA max.
  - **Conversion:** 1500V AC peak. 250V AC (354V DC) continuous isolation between input and output circuits.
- **Shock and Vibration Immunity**
  - **Vibration:** 4g, per IEC 60068-2-64.
  - **Shock:** 25g, per IEC 60068-2-27.
- **Electromagnetic Compatibility (EMC) Compliance**
  - Radiated Emissions: BS EN 61000-6-4, CISPR 16.
  - Conducted RFI: BS EN 61000-6-2, IEC 61000-4-3.
  - Conducted Susceptibility: 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 61000-4-4.

**Approvals**
- **CE compliant.** Designed for UL/cUL Class I Division 2 Groups A/B/C/D, ATEX / IECEx Zone 2.
- **II 3 G Ex nA IIC T4 Gc -40°C ≤ Ta ≤ +80°C**
- **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, color light gray. General-purpose NEMA Type 1 enclosure.
- **I/O Connectors:** Removable plug-in terminal blocks rated for 12A/250V; AWG #26-12, stranded or solid copper wire.
- **Dimensions:** 17.5 x 114.5 x 99.0 mm (0.69 x 4.51 x 3.90 inches).
- **Shipping Weight:** 0.22 kg (0.5 pounds) packed.

### Ordering Information

**Models**
- **SP236-0600**
  - Two-wire splitter, current/millivolt input.

**Services**
- **SP230-Config/Cal**
  - Factory custom configuration/calibration service.

**Software**
- **TTC-SIP** (recommend one kit per customer)
  - Windows Software Interface Package for Acromag SP Series signal splitters. 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.
  - **5020-350**
    - AC current sensor (toroidal transformer); converts 0-20A AC to 0-11.17mA DC.
  - **5028-S65**
    - USB-OTG 6 inch cable.
  - **5040-944**
    - SP230 signal splitting panel, 2 inputs, 2 outputs.

**Approvals**
- **ISO9001**
  - *Made in USA*
Process Loop Splitter: SP230 Series

SP237  Process voltage input signal splitter, two-wire

Description

The SP237 model is a high-performance signal splitter that converts one process-level DC voltage input into two proportional isolated 4-20mA control signals. Power is received from one or both output loop currents.

Setup is fast and easy with a USB connection to your PC and our Windows software. Acromag’s Agility™ mobile app enables configuration on an Android smart phone or tablet. Software simplifies I/O range scaling, calibration, and advanced signal processing capabilities.

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

These rugged instruments withstand harsh industrial environments to operate reliably across a wide temperature range with very low drift. They feature high immunity to RFI, EMI, ESD, and EFT, plus low radiated emissions.

Key Features & Benefits

- Easy configuration via USB with Windows software or Agility app for Android
- Single unit accepts ±1V, ±5V, and ±10V DC input ranges
- Input scales independently at each output
- User-selectable filtering (none, low, med, high)
- User-configurable output range clamp levels support NAMUR-compliant operation
- Supports reverse-acting (inverse) output
- Supports sink or source output wiring
- Very low 7V two-wire loop burden
- High accuracy, linearity, stability, and reliability
- 1500V isolation
- Space-saving 17.5mm (0.69 inch) design with pluggable terminals for easier wiring
- Shock (25g) and vibration (4g) resistant
- Wide ambient operation (-40 to 80°C)
- CE compliant. UL/cUL Class I Div 2, ATEX / IECEx Zone 2 approvals.

Multi-range ±1V, ±5V, or ±10V input  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.
SP237  Process voltage input signal splitter, two-wire

Performance Specifications

**Input Filter**
- Selectable digital filtering settings (low, medium, high).
- Bandwidth: Normal mode plus digital filtering within the ADC. Bandwidth (-3dB) varies with digital filter setting from 4Hz without filtering to 0.33Hz with high filtering.
- Noise Rejection (Common Mode, High Filter) 138dB @ 60Hz, typical with 100 ohm input unbalance.

**Output**
- **Output Range**: 4 to 20mA DC.
- **Output Compliance**: $\frac{V_{LOAD}}{\Delta V_{LOAD}} = \frac{(V_{SUPPLY} - 11V)}{0.020A}$. $\frac{V_{LOAD}}{\Delta V_{LOAD}} = 0$ to 850 ohms @ 24V DC.
- **Output Response Time (for step input change)**: Time to reach 98% of final output value (typical)
  - No filter: 13 milliseconds
  - Low filter: 34 milliseconds
  - Medium filter: 133 milliseconds
  - High filter: 956 milliseconds

**Environmental**
- **Operating temperature**: -40 to 80°C (-40° to 176°F).
- **Storage temperature**: -40 to 85°C (-40° to 185°F).
- **Relative humidity**: 5 to 95% non-condensing.

**I/O Connectors**
- **USB Connector**: USB Mini-B type socket, 5-pin.
- **USB Data Rate**: 12Mbps. USB v1.1 and 2.0 compatible.
- **USB Transient Protection**: Transient voltage suppression on power and data lines.
- **USB Cable Length**: 5.0 meters maximum.

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

**USB Interface**
- **USB Connector**: USB Mini-B type socket, 5-pin.
- **USB Data Rate**: 12Mbps. USB v1.1 and 2.0 compatible.
- **USB Cable Length**: 5.0 meters maximum.
- **Driving**: Not required. Uses built-in Human Interface Device (HID) USB drivers of the Windows operating system.

**Output Response Time**
- For a step input change, time to reach 98% of final output value (typical)
  - No filter: 13 milliseconds
  - Low filter: 34 milliseconds
  - Medium filter: 133 milliseconds
  - High filter: 956 milliseconds

**Error**
- Includes the effects of repeatability, terminal point conformity, and linearization.

**Ambient Temperature Effect**
- Better than ±0.008%/°C.

**Input Impedance**
- 5 to 100% of full scale range, typical.

**Full Scale Adjust**
- 0 to 95% of range, typical.

**Zero Scaling Adjust**
- 5 to 100% of full scale range, typical.

**Input Impedance**
- ±1V input: 15M ohms.
- ±5V input: >1M ohms.
- ±10V input: >1M ohms.

**Input Over-Voltage Protection**
- Bipolar Transient Voltage Suppressors (TVS), 14V working and 18V clamp level typical.

**Input Resolution**
- Bipolar input: 1 part in 50000 (±25000).
- Unipolar input: 1 part in 25000.

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

**Material**
- Self-extinguishing polyamide, UL94 V-0 rated, color light gray. General-purpose NEMA Type 1 enclosure.

**Approvals**
- CE compliant. Designed for UL/cUL Class I Division 2 Groups ABCD, ATEX / IECEx Zone 2.
- Surge Immunity: BS EN 61000-6-2, IEC 61000-4-5.
- EFT: BS EN 61000-6-2, IEC 61000-4-4.
- ESD: BS EN 61000-6-2, IEC 61000-4-2.
- Conducted RFI: BS EN 61000-6-2, IEC 61000-4-6.
- Radiated Emissions: BS EN 61000-6-4, CISPR 16.

**Dimensions**
- 17.5 x 114.5 x 99.0 mm (0.69 x 4.51 x 3.90 inches).

**Shipping Weight**
- 0.22 kg (0.5 pounds) packed.

**Ordering Information**

**Models**
- SP237-0600
  - Two-wire splitter, process voltage input.

**Services**
- SP230-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 signal splitters. 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.
- 5028-565
  - USB OTG 6 inch cable.
Process Loop Splitter: SP230 Series

SP238  High voltage input signal splitter, two-wire

Description
The SP238 model is a high-performance signal splitter that converts one high-level DC voltage input into two proportional isolated 4-20mA control signals. Power is received from one or both output loop currents.

Setup is fast and easy with a USB connection to your PC and our Windows software. Acromag’s Agility™ mobile app enables configuration on an Android smart phone or tablet. Software simplifies I/O range scaling, calibration, and advanced signal processing capabilities.

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

These rugged instruments withstand harsh industrial environments to operate reliably across a wide temperature range with very low drift. They feature high immunity to RFI, EMI, ESD, and EFT, plus low radiated emissions.

Key Features & Benefits
- Easy configuration via USB with Windows software or Agility app for Android
- Single unit accepts ±15V, ±75V, and ±150V DC input ranges
- Input scales independently at each output
- User-selectable filtering (none, low, med, high)
- User-configurable output range clamp levels support NAMUR-compliant operation
- Supports reverse-acting (inverse) output
- Supports sink or source output wiring
- Very low 7V two-wire loop burden
- High accuracy, linearity, stability, and reliability
- 1500V isolation
- Space-saving 17.5mm (0.69 inch) design with pluggable terminals for easier wiring
- Shock (25g) and vibration (4g) resistant
- Wide ambient operation (-40 to 80°C)
- CE compliant. UL/cUL Class I Div 2, ATEX / IECEx Zone 2 approvals.

Multi-range ±15V, ±75V, or ±150V input ◆ 4-20mA outputs (sink/source) ◆ 7-32V DC loop/local 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.
**SP238** High voltage input signal splitter, two-wire

### 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 SP230 Series transmitter.

**USB Interface**

- **USB Connector**
  - USB Mini-B type socket, 5-pin.
- **USB Data Rate**
  - 12Mbps. USB v1.1 and 2.0 compatible.
- **USB Transient Protection**
  - Transient voltage suppression on power and data lines.
- **USB Cable Length**
  - 5.0 meters maximum.

**Driver**

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

**Input (Passive)**

- **Default Configuration/Calibration**
  - Input: ±150V, medium filtering.
  - Output: 4 to 20mA.
- **Input Ranges and Accuracy**

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy (typical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>±15V DC</td>
<td>±0.05% of span</td>
</tr>
<tr>
<td>0-15V DC</td>
<td>±0.05% of span</td>
</tr>
<tr>
<td>±150V / ±75 DC</td>
<td>±0.05% of span</td>
</tr>
<tr>
<td>0-150V</td>
<td>±0.05% of span</td>
</tr>
<tr>
<td>0-5V DC</td>
<td>±0.05% of span</td>
</tr>
</tbody>
</table>

Error includes the effects of repeatability, terminal point conformity, and linearization.

**Ambient Temperature Effect**

- Better than ±0.008%°C.

**Zero Scaling Adjust**

- 0 to 95% of range, typical.

**Full Scale Adjust**

- 5 to 100% of full scale range, typical.

**Input Impedance**

- Greater than 1M ohms.

**Input Over-Voltage Protection**

- Bipolar Transient Voltage Suppressors (TVS), 220V working typical.

**Input Resolution**

- Bipolar input: 1 part in 50000 ±25000.
- Unipolar input: 1 part in 25000.

### Output (Two Signals, Passive)

- **Output Range**
  - 4 to 20mA DC.
- **Output Compliance**
  - $R_{load} = \frac{(V_{supply} - 7V)}{0.020A}$.
  - $R_{load} = 0$ to 850 ohms @ 24V DC.
- **Output Response Time (for step input change)**

<table>
<thead>
<tr>
<th>Filter</th>
<th>Time to 98% of final output value (typical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No filter</td>
<td>88 milliseconds</td>
</tr>
<tr>
<td>Low filter</td>
<td>100 milliseconds</td>
</tr>
<tr>
<td>Medium filter</td>
<td>237 milliseconds</td>
</tr>
<tr>
<td>High filter</td>
<td>1762 milliseconds</td>
</tr>
</tbody>
</table>

### Environmental

- **Operating temperature**
  - -40 to 80°C (-40° to 176°F).
- **Storage temperature**
  - -40 to 85°C (-40° to 185°F).
- **Relative humidity**
  - 5 to 95% non-condensing.
- **Power Requirement**
  - 7-32V DC SELV (Safety Extra Low Voltage), 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 60068-2-64.
- Shock: 25g, per IEC 60068-2-27.

### Electromagnetic Compatibility (EMC) Compliance

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

### Approvals

- CE compliant. Designed for UL/cUL Class I Division 2 Groups ABCD, ATEX / IECEx Zone 2.
- II 3 G Ex nA IIC T4 Gc -40°C

### Ordering Information

**Models**

- **SP238-0600** Two-wire splitter, high voltage input.

**Services**

- **SP230-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 signal splitters. 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.

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ISO9001 AS9100

MADE IN USA

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Accessories

USB-ISOLATOR USB-to-USB Isolator

**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 (CRI)
  Per IEC61000-4-6.
  Emissions
  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)
Signal Splitters: SPx30 Series

Acromag Agility™ Config Tool  Mobile Application

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

This free app is available for Android devices at the Google Play store at Acromag Agility™ Config Tool.

Demo the software, no need for a module. To enter demo mode simply tap the icon in the upper left corner 8 times.

Key Features & Benefits

- Connects to Acromag SP230 and SP330 Series signal splitters
- Requires the use of USB OTG Cable (Acromag part #: 5028-565) and USB A to Mini B Cable (Acromag part #: 4001-113)
- Configures and calibrates SP230 and SP330 Series products via phone or tablet running Android 4.3 ICS (Ice Cream Sandwich) or later.
- View wiring diagrams, even without an internet connection
- Perform quick and easy field diagnostics and troubleshooting
- Ideal for field technicians

With a couple of taps, quickly configure input, output, unit and scaling options.

Quick and easy access to the wiring diagram, even offline without internet access.