SP Series Splitters
Loop / External Power

DIN-Rail Mount
Easy Configuration
Slim design

Space-Saving 2/4-Wire Isolated Signal Splitters
Depend on Acromag

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

Acromag, Incorporated ■ 30765 South Wixom Road ■ Wixom, Michigan 48393 ■ USA
Signal Splitters: SP Series

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

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

SP237 Process Voltage Input
- ±1V DC
- ±5V DC
- ±10V DC

SP238 High Voltage Input
- ±15V DC
- ±35V DC
- ±150V DC

See data sheet

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

SP336 Current, Millivolt Input
- ±1mA, ±20mA, ±500mA
- 0-20mA, 4-20mA
- 0-11.17mA (for AC sensor)
- 0-500mV

SP337 Process Voltage Input
- ±1V DC
- ±5V DC
- ±10V DC

SP338 High Voltage Input
- ±15V DC
- ±75V DC
- ±150V DC

See data sheet

Acromag®
The Leader in Industrial I/O

877-214-6267 sales@acromag.com www.acromag.com 30765 S Wixom Rd, Wixom, MI 48393 USA
Signal Splitters: SP Series

Key Features

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

2-wire, Loop-powered
4-wire, External-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.

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.

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

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 and UL/cUL Class 1, Division 2, ATEX Zone 2 approved and IECEx certified.

Input Options

877-214-6267  ■  sales@acromag.com  ■  www.acromag.com  ■  30765 S Wixom Rd, Wixom, MI 48393 USA
Signal Splitters: SP Series

General Operation and Performance Specifications

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

**USB Interface**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</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>Description</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>Feature</th>
<th>Description</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 SELV, 24mA max, loop power.</td>
</tr>
<tr>
<td></td>
<td>SP330 Series: 6-32V external supply, 1.5W max.</td>
</tr>
<tr>
<td>Isolation</td>
<td>1500V AC peak. 250V AC (354V DC) continuous</td>
</tr>
<tr>
<td></td>
<td>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>
</tbody>
</table>

**Electromagnetic Compatibility (EMC) Compliance**

Radiated Emissions: BS EN 61000-6-3, CISPR 16.
Rfi: BS EN 61000-6-1, IEC 61000-4-3.
Conducted Rfi: BS EN 61000-6-1, IEC 61000-4-6.
ESD: BS EN 61000-6-1, IEC 61000-4-2.
EFT: BS EN 61000-6-1, IEC 61000-4-4.
Surge Immunity: BS EN 61000-6-1, IEC 61000-4-5

**Approvals**

CE compliant. UL/cUL listing. ATEX Certified. IECEx certification.

SP Series USB Splitter Connections

![Diagram of Signal Splitters: SP Series](image)
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](https://play.google.com/store/apps).

#### 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.

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

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

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

### Ordering Information

#### TTC-SIP
- Software Interface Package for Acromag 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.

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

#### 20RM-16-DIN
- **19" rack-mount kit with DIN rail.**
- **DIN RAIL 3.0**
- **DIN RAIL 16.7**
  - DIN rail strip, Type T, 3 inches (75mm) or 16.7 inches (425mm)

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

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

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

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

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

#### 5028-565
- **USB Cable, USB OTG Cable, 6 inches**
Signal Splitter: SP330 Series

SP333 Thermocouple/millivolt splitter, four-wire

**Description**

The SP333 is a high-performance signal splitter that converts one millivolt or thermocouple input into two isolated proportional control signals. A variety of current and voltage output ranges are supported. Power connects on a terminal block, a rail bus, or both for redundancy.

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

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.

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.

**Universal thermocouple or ±100mV input**
- 0-20mA, ±10V or 0-10V outputs
- 6-32V DC external power

**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, R, S, E, B, N or ±100mV)
- Input can scale differently for each output
- User-selectable filtering (none, low, med, high)
- Scalable current or voltage output ranges: 0-20mA, 4-20mA, ±5V, ±10V, 0-5V, 0-10V
- Normal or reverse-acting output
- Wide-range DC power input from 6-32V with support for rail power bus and redundancy
- 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 75°C)
- CE compliant. UL/cUL Class 1 Division 2 and ATEX Zone 2 approvals (pending).

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

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

Save configuration files for convenient copy/restore capability.

Tel 248-295-0885 Fax 248-624-9234 sales@acromag.com www.acromag.com 30765 Wixom Rd, Wixom, MI 48393 USA

Bulletin #8400-950b
Signal Splitter: SP330 Series

**SP330** Thermocouple/millivolt splitter, four-wire

### Performance Specifications

<table>
<thead>
<tr>
<th>Input Impedance</th>
<th>Current input: 24.9 ohms. Voltage input: 15M ohms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise Rejection (with high filter)</td>
<td>Normal mode @ 60Hz: &gt;80dB Common mode @ 60Hz: &gt;134dB</td>
</tr>
</tbody>
</table>

#### USB Interface

- **USB Connector**: USB Mini-B type socket, 5-pin. 5.0 meters cable length max. No driver required uses Windows HID drivers.
- **Data rate**: 12Mbps. USB v1.1 and 2.0 compatible.
- **USB Transient Protection**: Transient voltage suppression on power and data lines.

#### Input (Passive)

- **Default Configuration/Calibration**: Input: TC J, -210 to 760°C, med. filter, break: up. Output: 4 to 20mA.
- **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 (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 (346 to 752°F)</td>
<td>±0.5°C</td>
</tr>
<tr>
<td>TC R</td>
<td>-50 to 1768°C (58 to 3214°F)</td>
<td>±1.0°C</td>
</tr>
<tr>
<td>TC S</td>
<td>-50 to 1768°C (58 to 3214°F)</td>
<td>±1.0°C</td>
</tr>
<tr>
<td>TC E</td>
<td>-200 to 1000°C (328 to 1832°F)</td>
<td>±0.5°C</td>
</tr>
<tr>
<td>TC B</td>
<td>260 to 1820°C (500 to 3308°F)</td>
<td>±1.0°C</td>
</tr>
<tr>
<td>TC N</td>
<td>-230 to 1300°C (362 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 (but not CJC error).

- **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**: Zero: 0 to 95% of range, typical. Full scale: 5 to 100% of full scale range, typical.
- **Lead Break (Sensor Burnout) Detection**: Upscale/downscale ±5% full scale range typical.
- **Input Over-Voltage Protection**: Bipolar Transient Voltage Suppressors (TVS), 5.6V clamp level typical.
- **Input Resolution**: Millivolt input: 0.0025% (1 part in 40,000) Thermocouple input: 0.1°C.
- **Input Filter**: Selectable digital filtering (none, low, med., and high).

### Output (Two Signals, Active)

<table>
<thead>
<tr>
<th>Output Range</th>
<th>Over-Range</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>±10V</td>
<td>±10.5V</td>
<td>1 part in 62415</td>
</tr>
<tr>
<td>±5V</td>
<td>±5.25V</td>
<td>1 part in 31208</td>
</tr>
<tr>
<td>0 to 10V</td>
<td>0 to 10.5V</td>
<td>1 part in 59240</td>
</tr>
<tr>
<td>0 to 5V</td>
<td>0 to 5.25V</td>
<td>1 part in 60262</td>
</tr>
<tr>
<td>0 to 20mA</td>
<td>0 to 20.5mA</td>
<td>1 part in 58596</td>
</tr>
<tr>
<td>4 to 20mA</td>
<td>4 to 20.5mA</td>
<td>1 part in 46877</td>
</tr>
</tbody>
</table>

- **Output Response Time (for step input change)**:
  - No filter: 14 milliseconds
  - Low filter: 137 milliseconds
  - Medium filter: 1141 milliseconds
  - High filter: Less than ±0.1% of output span.

#### Environmental

- **Operating temperature**: -40 to 75°C (-40° to 167°F).
- **Storage temperature**: -200 to 1372°C (-328 to 2502°F).
- **Relative humidity**: 5 to 95% non-condensing.
- **Power Requirement**: 6-32V DC external supply, 1.5W max.
- **Isolation**: 1500V AC peak. 250V AC (354V DC) continuous between input, output, and power circuits.
- **Shock and Vibration Immunity**:<br>
  - Shock: 25g, per IEC 60068-2-27
  - Vibration: 4g, per IEC 60068-2-64.

#### Accessories

- **USB-OTG 6 inch cable.**
- **DIN rail end stop for hazloc approvals.**
- **Multiple splitters.**

#### Ordering Information

- **Models**<br>  SP333-0700: Four-wire splitter, thermocouple/millivolt input.
- **Services**<br>  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.
- **Software**<br>  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).

#### 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 (0.7 x 4.51 x 3.90 inches).
- **Shipping Weight**: 0.22 kg (0.5 pounds) packed.

ISO9001  AS9100  The Leader in Industrial I/O
**SP336** Current/millivolt input signal splitter, four-wire

**Description**

The SP336 is a high-performance signal splitter that converts one DC current or millivolt input into two isolated proportional control signals. A variety of current and voltage output ranges are supported. Power connects on a terminal block, a rail bus, or both for redundancy.

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

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.

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 can scale differently for each output
- User-selectable filtering (none, low, med, high)
- Scalable current or voltage output ranges: 0-20mA, 4-20mA, ±5V, ±10V, 0-5V, 0-10V
- Normal or reverse-acting output
- Wide-range DC power input from 6-32V with support for rail power bus and redundancy
- 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 75°C)
- CE compliant. UL/cUL Class 1 Division 2 and ATEX 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**

**DC current and low voltage input** • 0-20mA, ±10V outputs • 6-32V DC external power
**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 SP330 Series splitter.

**USB Interface**

USB Connector
USB Mini-B type socket, 5-pin. 5.0 meters cable length maximum. No driver required.

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

USB Transient Protection
Transient voltage suppression on power and data lines.

**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>±500mV</td>
<td>±0.05% of span</td>
</tr>
<tr>
<td>0 to 500mV</td>
<td>±0.05% of span</td>
</tr>
<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 (for AC sensor)</td>
<td>±0.05% of span</td>
</tr>
<tr>
<td>±1mA</td>
<td>±0.05% of span</td>
</tr>
</tbody>
</table>

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

**Environmental**

Operating temperature
-40 to 75°C (-40° to 167°F).

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

Relative humidity
5 to 95% non-condensing.

**Power Requirement**

6-32V DC external supply, 1.5W max.

**Isolation**

1500V AC peak. 250V AC (354V DC) continuous between input, output, and power circuits.

**Shock and Vibration Immunity**

Vibration: 4g, per IEC 60668-2-64.
Shock: 25g, per IEC 60668-2-27

**Approvals (pending)**

CE compliant. UL/cUL listing. ATEX Certified.
 Designed for Class I; Division 2; Groups ABCD; Zone 2.

**Electromagnetic Compatibility (EMC) Compliance**

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

**Physical**

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

**Input Filter**

Selectable digital filtering (none, low, med., and high).

**Ordering Information**

Models
SP336-0700
Four-wire signal splitter, current/millivolt input.

Services
SP336-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
TTCUS-KIT
DIN rail bus power connector, left/right terminal blocks & two end stops #1027-222. One kit supports multiple splitters.

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

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

USB-OTG 6 inch cable.

USB cables (4001-112, 4001-113).

CD-ROM (5040-944), isolator (USB-ISOLATOR) and two Series signal splitters. Includes configuration software TTC-SIP and 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).

35mm "T-type" DIN rail.

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

USB-OTG 6 inch cable.

DIN rail bus power connector, left/right terminal blocks & two end stops #1027-222. One kit supports multiple splitters.

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

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.

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

5028-565
USB-OTG 6 inch cable.

ISO9001
AS9100
Made in USA

Tel 248-295-0880 Fax 248-624-9234 sales@acromag.com www.acromag.com 30765 Wixom Rd, Wixom, MI 48393 USA

All trademarks are property of their respective owners. Copyright © Acromag, Inc. 2018. Data subject to change without notice. Printed in USA 3/2018
Signal Splitter: SP330 Series

SP337  Process voltage input signal splitter, four-wire

Description
The SP337 is a high-performance signal splitter that converts one process-level DC voltage input into two isolated proportional control signals. A variety of current and voltage output ranges are supported. Power connects on a terminal block, a rail bus, or both for redundancy. High-voltage isolation separates the input from power and each output circuit. The isolation protects from surges, reduces noise, and eliminates ground loop errors.

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.

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.

Multi-range ±1V, ±5V, or ±10V input  ◆  0-20mA, ±10V or 0-10V outputs  ◆  6-32V DC external power

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 can scale differently for each output
- User-selectable filtering (none, low, med, high)
- Scalable current or voltage output ranges: 0-20mA, 4-20mA, ±5V, ±10V, 0-5V, 0-10V
- Normal or reverse-acting output
- Wide-range DC power input from 6-32V with support for rail power bus and redundancy
- 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 75°C)
- CE compliant. UL/cUL Class 1 Division 2 and ATEX Zone 2 approvals (pending).

Save configuration files for convenient copy/restore capability.
# Signal Splitter: SP330 Series

## SP337 Process voltage input signal splitter, four-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 SP330 Series splitter.

### 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: ±10V, 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>±1V DC</td>
<td>±0.05% of span</td>
</tr>
<tr>
<td>±5V DC</td>
<td>±0.05% of span</td>
</tr>
<tr>
<td>±10V 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 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

### Input Impedance
- ±1V input: 15M ohms (TB1).
- ±5V / ±10V input: >1M ohms (TB2).

### Input Filter
- Selectable digital filtering (none, low, med., and high).

### Output (Two Signals, Active)

<table>
<thead>
<tr>
<th>Range</th>
<th>Over-Range</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>±10V</td>
<td>±10.5V</td>
<td>1 part in 62415</td>
</tr>
<tr>
<td>±5V / ±10V</td>
<td>±5V / ±10.5V</td>
<td>1 part in 31205</td>
</tr>
<tr>
<td>0 to 20mA</td>
<td>-1.054 to 21mA</td>
<td>1 part in 59293</td>
</tr>
<tr>
<td>4 mA to 20mA</td>
<td>-1.1054 to 21mA</td>
<td>1 part in 47434</td>
</tr>
</tbody>
</table>

### Output Load
- Voltage output: 1K ohms minimum.
- Current output: 0-525 ohms for 21mA.

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

<table>
<thead>
<tr>
<th>Filter Type</th>
<th>Response Time (typical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No filter</td>
<td>11 milliseconds</td>
</tr>
<tr>
<td>Low filter</td>
<td>38 milliseconds</td>
</tr>
<tr>
<td>Medium filter</td>
<td>121 milliseconds</td>
</tr>
<tr>
<td>High filter</td>
<td>1050 milliseconds</td>
</tr>
</tbody>
</table>

### Environmental

#### Operating temperature
- -40 to 75°C (-40° to 167°F).

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

### Relative humidity
- 5 to 95% non-condensing.

### Power Requirement
- 6-32V DC external supply, 1.5W max.

### Isolation
- 1500V AC peak. 250V AC (354V DC) continuous between input, output, and power circuits.

### Shock and Vibration Immunity
- Vibration: 4g, per IEC 60068-2-64.
- Shock: 25g, per IEC 60068-2-27

### Approvals (pending)
- CE compliant. UL/cUL listing. ATEX Certified.
- Designed for Class I; Division 2; Groups ABCD; Zone 2.
- 2G IIC 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, colored 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 (0.7 x 4.51 x 3.90 inches).

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

### Ordering Information

#### Models
- **SP337-0700**
  - Four-wire splitter, process voltage input.

#### Services
- **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.

### 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

**TTBUS-KIT**
- DIN rail bus power connector, left/right terminal blocks & two end stops #1027-222. One kit supports multiple splitters.

**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.
- **30765 Wixom Rd, Wixom, MI 48393 USA**

---

**Acromag**
- The Leader in Industrial I/O

**ISO9001**
- Made in USA

**AS9100**
- Tel 248-295-0885 • Fax 248-624-9234 • sales@acromag.com • www.acromag.com • 30765 Wixom Rd, Wixom, MI 48393 USA
Signal Splitter: SP330 Series

SP338 High voltage input signal splitter, four-wire

Description
The SP338 is a high-performance signal splitter that converts one high-level DC voltage input into two isolated proportional control signals. A variety of current and voltage output ranges are supported. Power connects on a terminal block, a rail bus, or both for redundancy.

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

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.

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 can scale differently for each output
- User-selectable filtering (none, low, med, high)
- Scalable current or voltage output ranges: 0-20mA, 4-20mA, ±5V, ±10V, 0-5V, 0-10V
- Normal or reverse-acting output
- Wide-range DC power input from 6-32V with support for rail power bus and redundancy
- 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 75°C)
- CE compliant. UL/cUL Class 1 Division 2 and ATEX Zone 2 approvals (pending).

Multi-range ±15, ±75, or ±150V input ◆ 0-20mA, ±10V or 0-10V outputs ◆ 6-32V DC external power

Save configuration files for convenient copy/restore capability.
Signal Splitter: SP330 Series

SP338 High voltage input signal splitter, four-wire

Performance Specifications

IMPORTANT: To prevent ground loop error between a grounded PC and a grounded input, Acromag strongly recommends use of a USB isolator like Acromag's USB-Isolator when configuring a SP330 Series splitter.

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: ±15V, 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>±15V DC</td>
<td>±0.05% of span</td>
</tr>
<tr>
<td>±7.5V DC</td>
<td>±0.05% of span</td>
</tr>
<tr>
<td>±150V 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 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

Input Impedance
Greater than 1M ohms.

Input Filter
Selectable digital filtering settings (none, low, medium, and high).

Output (Two Signals, Active)

Output Range

<table>
<thead>
<tr>
<th>Range</th>
<th>Over-Range</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>±10V</td>
<td>±15.5V</td>
<td>1 part in 62415</td>
</tr>
<tr>
<td>±5</td>
<td>±5V</td>
<td>1 part in 31208</td>
</tr>
<tr>
<td>0 to 10V</td>
<td>-0.5527 to +10.5V</td>
<td>1 part in 59240</td>
</tr>
<tr>
<td>0 to 5V</td>
<td>-0.27634 to +5.25V</td>
<td>1 part in 60262</td>
</tr>
<tr>
<td>0 to 20mA</td>
<td>-1.1054 to 21mA</td>
<td>1 part in 58596</td>
</tr>
<tr>
<td>4 to 20mA</td>
<td>-1.1054 to 21mA</td>
<td>1 part in 46877</td>
</tr>
</tbody>
</table>

Output Load
Voltage output: 1K ohms minimum.
Current output: 0.525 ohms for 21mA.

Output Response Time (for step input change)

Time to reach 98% of final output value (typical)

| No filter  | 39 milliseconds |
| Low filter | 59 milliseconds |
| Medium filter | 158 milliseconds |
| High filter | 1168 milliseconds |

Output Ripple
Less than ±0.1% of output span.

Environmental

Operating temperature
-40 to 75°C (-40° to 167°F).

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

Relative humidity
5 to 95% non-condensing.

Power Requirement
6-32V DC external supply, 1.5W max.

Isolation
1500V AC peak. 250V AC (354V DC) continuous between input, output, and power circuits.

Shock and Vibration Immunity
Vibration: 4g, per IEC 66068-2-64.
Shock: 25g, per IEC 66068-2-27.

Approvals
CE compliant. UL/cUL listing. ATEX Certified.

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, 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 (0.7 x 4.51 x 3.90 inches).

Shipping Weight
0.22 kg (0.5 pounds) packed.

Ordering Information

Models

SP338-0700
Four-wire splitter, high voltage input.

Services

SP338-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

Accessories

TTBUS-KIT
DIN rail bus power connector, left/right terminal blocks & two end stops #1027-222. One kit supports multiple splitters.

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

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

DIN rail end stop for hazloc approvals.

USB-OTG 6 inch cable.

USB-OTG 6 inch cable.
**Description**

This compact, industrial-grade isolator provides a high-voltage isolation barrier between a computer and a connected USB device. The isolation protects equipment from electrical surges and transient voltage spikes. It also eliminates ground loop currents flowing between the PC and peripherals which can cause damage and inaccurate measurements. Additionally, isolation minimizes conducted noise from static discharge, magnetic fields, and radio frequency interference.

Acromag's USB isolator is very easy to use. The isolator inserts in-line with the USB connection and operates transparently. No special software drivers are required. The unit receives power from the PC's USB port and isolates that power to the connected device. High noise immunity and low radiated emissions ensure reliable data transfer in sensitive applications.

A number of high-performance features help provide convenient and dependable operation. The green LED indicates that power is being received and blinks if the connected device draws too much current. An internal jumper lets you switch from Full Speed (12 Mbps) to Low Speed (1.5 Mbps) communication. The reset button offers a simple way to reinitialize a connected device without breaking the cable connection. High-retention USB sockets keep cables securely attached under shock and vibration.

**Key Features & Benefits**

- Isolates and protects a USB peripheral from a USB host
- Electrical isolation up to 1500V AC / 2100V DC
- Common mode filtering on all data lines
- Built-in surge/transient suppression up to 8kV on all ports
- Self-powered through the USB port
- Supports USB 2.0 full speed (12 Mbps) and USB 1.1 low speed (1.5 Mbps) data rates with jumper-selection
- LED for power indication and diagnostics
- Reset button to reinitialize and re-enumerate peripheral devices
- Output short circuit protection with auto-retry
- No software or configuration required (transparent operation)
- Uses standard high-retention USB Type A/B cable connections (includes 1m cable)
- Compact size and rugged design for harsh environments
- Wide ambient temperature operation -40 to 70°C (-40 to 158°F)
- CE, FCC, UL/cUL approvals

**Ordering Information**

**Models**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB-ISOLATOR</td>
<td>USB isolator, includes USB cable (Part # 4001-112) for isolator-to-PC connection</td>
</tr>
<tr>
<td>TTC-SIP</td>
<td>CD-ROM (Part #5040-944), USB isolator and two USB cables (Part # 4001-112, 4001-113) for configuration of Acromag TT Series transmitters and SP Series Signal Splitters.</td>
</tr>
</tbody>
</table>

**Accessories**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4001-112</td>
<td>USB cable, 1 meter, with Type A to Type B plugs</td>
</tr>
<tr>
<td>4001-113</td>
<td>USB cable, 1 meter, with Type A to Mini-B plugs</td>
</tr>
</tbody>
</table>
**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.
  - Conducted RF Immunity (CRI)
    - Per IEC61000-4-6.
  - Emissions
    - Per EN61000-6-4:2001.
  - Radiated Frequency Emissions
    - Per CISPR11 Class A. Meets or exceeds EN50081-1 for Class B equipment.

### EXAMPLE USB CONNECTION DRAWING
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.