

SP Series Splitters Loop / External Power

DIN-Rail Mount

Easy Configuration

Slim design



Space-Saving 2/4-Wire
Isolated Signal Splitters

Depend on Acromag

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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
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reduce your costs.



ISO9001
AS9100



Acromag: The I/O Leader

Acromag is a customer-driven manufacturer focused on developing process automation I/O products that provide the best long term value in the industry. Compare and you'll find that Acromag products offer an unmatched balance of price, performance, and features.

60+ Years of I/O Experience

Acromag has more than 60 years of measurement and control experience. Since 1957, we have delivered nearly a million units to thousands of customers around the globe for manufacturing, power, environmental, transportation, and military applications.

Top Quality and a 2-Year Warranty

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

All trademarks are the property of their respective owners.

Online Ordering

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

Fast Delivery from Stock

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

Special Services

We are happy to accommodate your special requirements and offer the following services:

- custom product development
- custom calibration
- source inspections, quality audits
- special shipping, documentation
- protective humiseal coating
- plastic and stainless steel tagging

Certification and Approvals

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

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

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

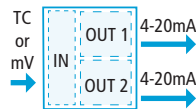
Power

- 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

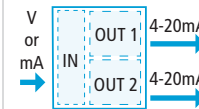


Input

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

[See data sheet](#)

SP236 Current, Millivolt Input

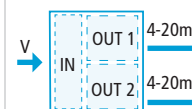


Input

- ±1mA, ±20mA
- 0-20mA, 4-20mA
- 0-11.17mA (for AC sensor)
- 0-500mV
- ±5V

[See data sheet](#)

SP237 Process Voltage Input

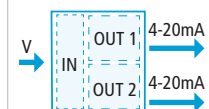


Input

- ±1V DC
- ±5V DC
- ±10V DC

[See data sheet](#)

SP238 High Voltage Input

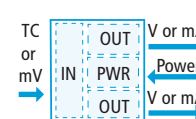


Input

- ±15V DC
- 0-15V DC
- ±150V / ±75 DC
- 0-150V
- 0-5V DC

[See data sheet](#)

SP333 Thermocouple, Millivolt Input

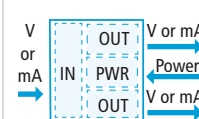


Input

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

[See data sheet](#)

SP336 Current, Millivolt Input

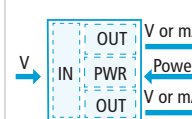


Input

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

[See data sheet](#)

SP337 Process Voltage Input

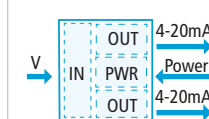


Input

- ±1V DC
- ±5V DC
- ±10V DC

[See data sheet](#)

SP338 High Voltage Input



Input

- ±15V DC
- ±75V DC
- ±150V DC

[See data sheet](#)



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, $\pm 5V$, $\pm 10V$, 0-5V, 0-10V

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

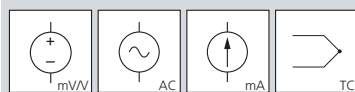
A USB connection to a Windows PC or Android device enables simple, precise configuration of I/O ranges and a variety of operational settings with free software.



Space Saving

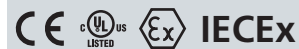
A strikingly thin enclosure, at only 17.5mm wide, to easily achieve high-density DIN-rail mounting.

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



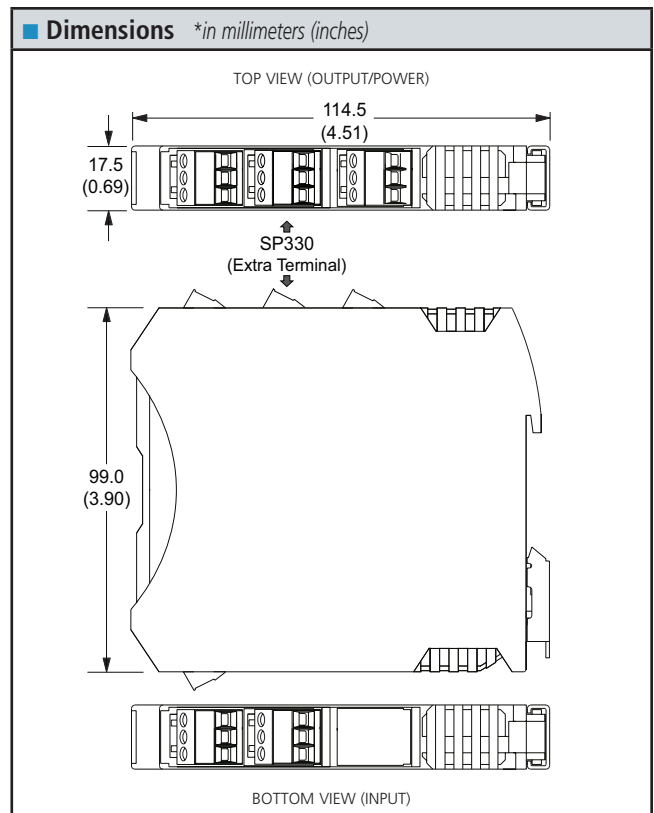
The following specifications are common to all SP Series splitter modules.

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

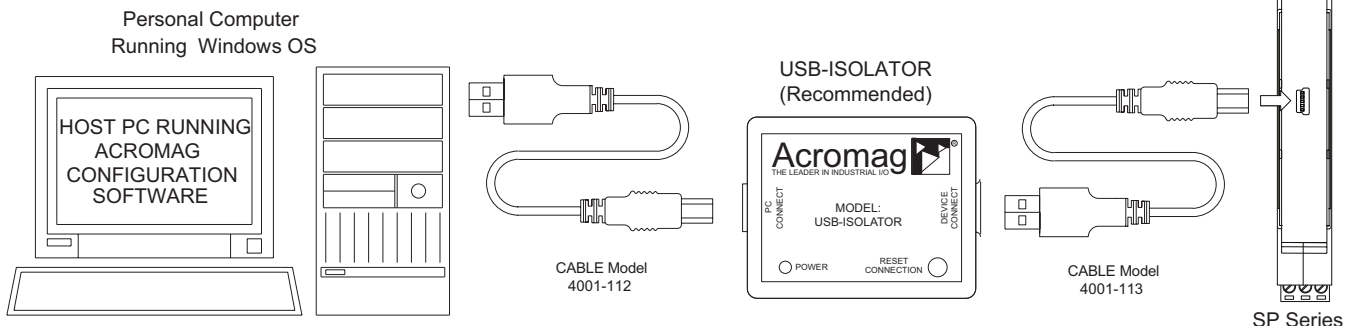
■ Output	
Output Ranges	0-20mA, 4-20mA, ±10V, 0-10V.
Accuracy	±0.05% of span typical, ±1.0°C, ±0.1mV.

■ Environmental	
Operating Temperature	SP230 Series: -40 to 80°C (-40° to 176°F). SP330 Series: -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	SP230 Series: 7-32V DC SELV (Safety Extra Low Voltage), 24mA max, loop power. SP330 Series: 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.
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. Designed for Class I; Division 2; Groups ABCD; Zone 2. Ex II 3 G Ex nA IIC T4 Gc -40°C ≤ 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, color light gray. General-purpose NEMA Type 1 enclosure.
I/O Connectors	Removable plug-in terminal blocks rated for 12A/250V; AWG #26-12, stranded or solid copper wire.
Shipping Weight	0.5 pounds (0.22 Kg) packed.

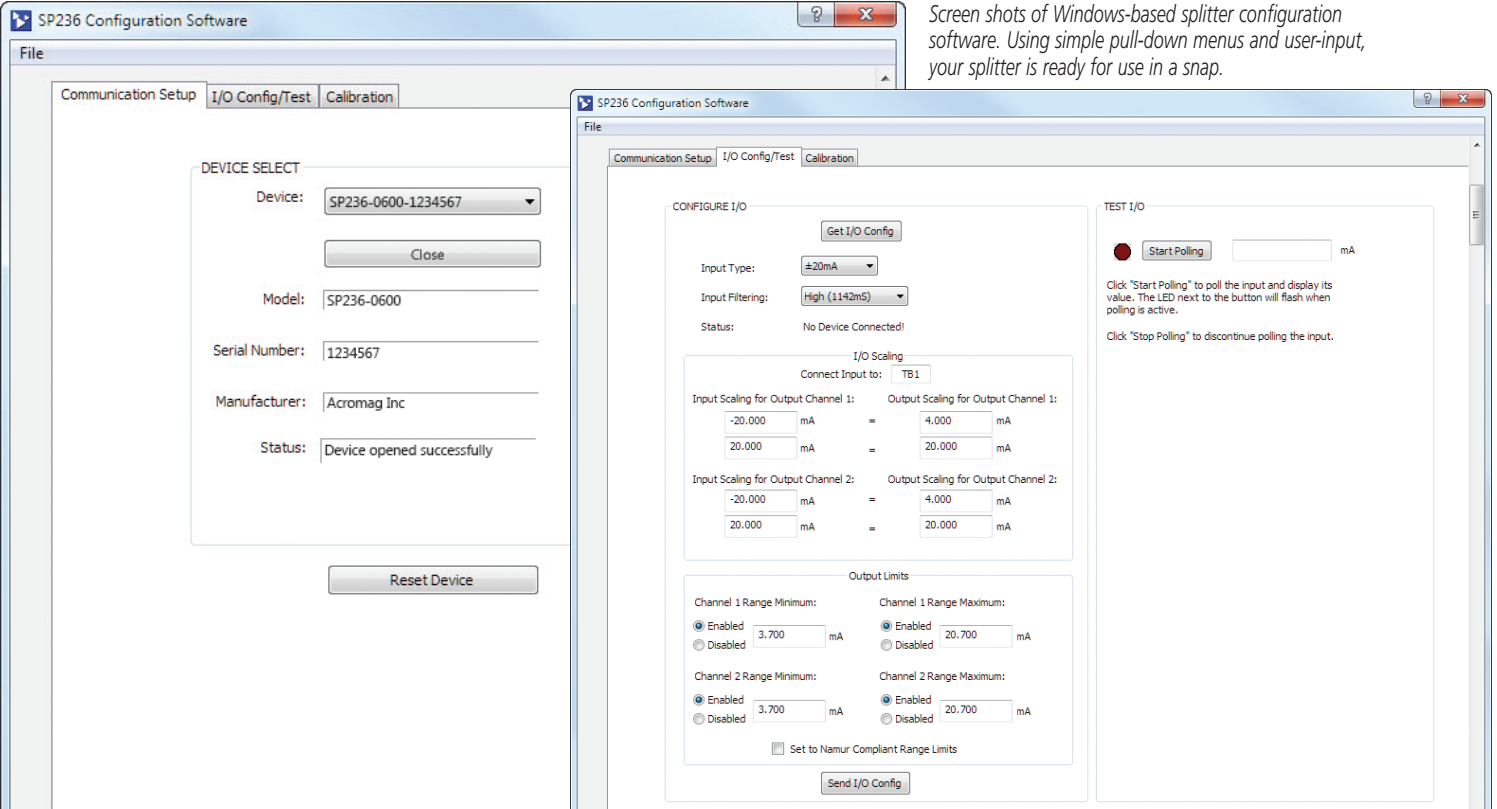


SP Series USB Splitter Connections

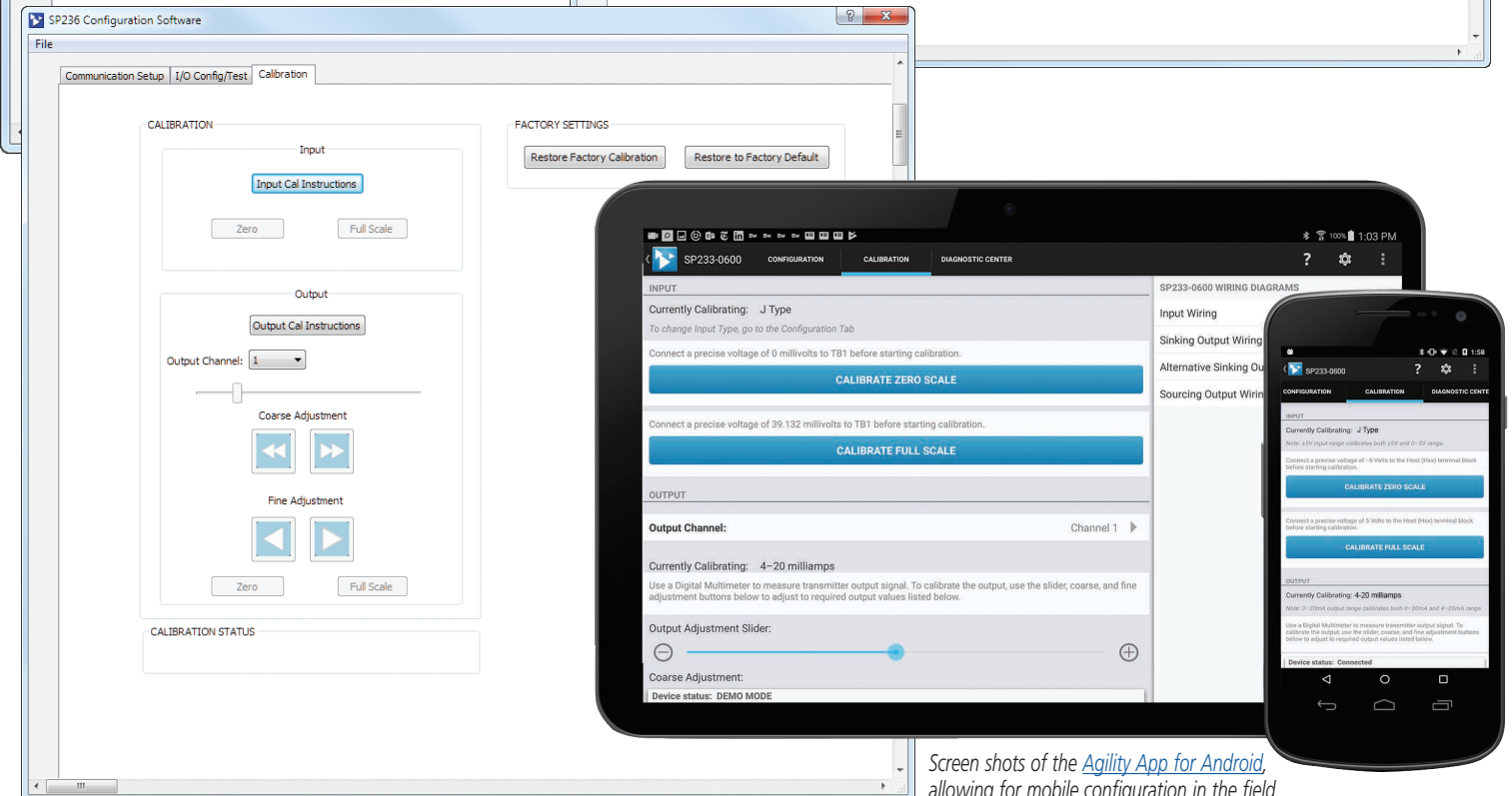


Signal Splitters: SP Series

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 tool mobile app for free download at the [Google Play Store](#).

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.

◆ Bus-Kit



TT Bus-Kit

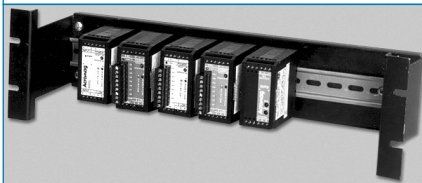
DIN rail bus power connector and left/right terminal blocks. One kit supports multiple SP Series Splitters or TT Series transmitters.

Ordering Information

[TTBUS-Kit](#)

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

◆ Mounting Hardware



Din-Rail Mounting

For your convenience, Acromag offers several mounting accessories to simplify your system installation. Our 19" rack-mount kit provides a clean solution for mounting your I/O modules and a power supply. Or you can buy precut DIN rail strips for mounting on any flat surface.

Ordering Information

[20RM-16-DIN](#)

19" rack-mount kit with DIN rail.

[DIN RAIL 3.0](#)

[DIN RAIL 16.7](#)

DIN rail strip, Type T, 3 inches (75mm) or 16.7 inches (425mm)

◆ Power Supplies



Universal Slimline Power Supplies

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

Ordering Information

[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 Isolator



USB-to-USB Isolator

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

Ordering Information

[USB-Isolator](#)

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

◆ USB Cables



USB Cables

Cables for PC-to-USB isolator, USB isolator-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](#)

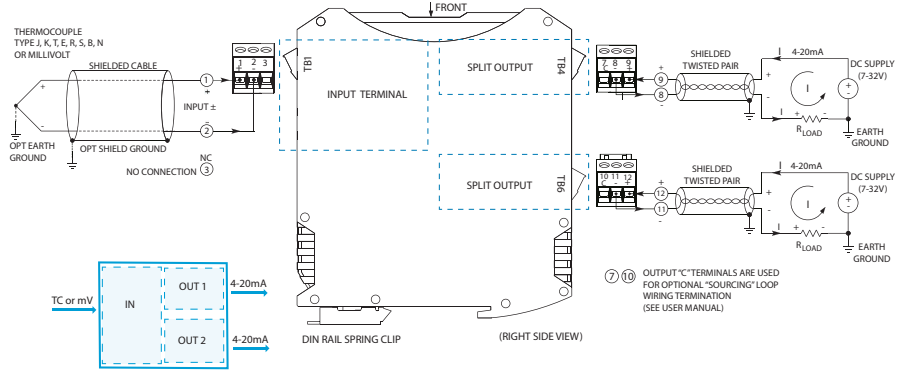
USB Cable, USB OTG Cable, 6 inches

Process Loop Splitter: SP230 Series

SP233 Thermocouple/millivolt input signal splitter, two-wire



USB Configured



Universal thermocouple or $\pm 100\text{mV}$ input ◆ 4-20mA outputs (sink/source) ◆ 7-32V DC loop/local power

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.

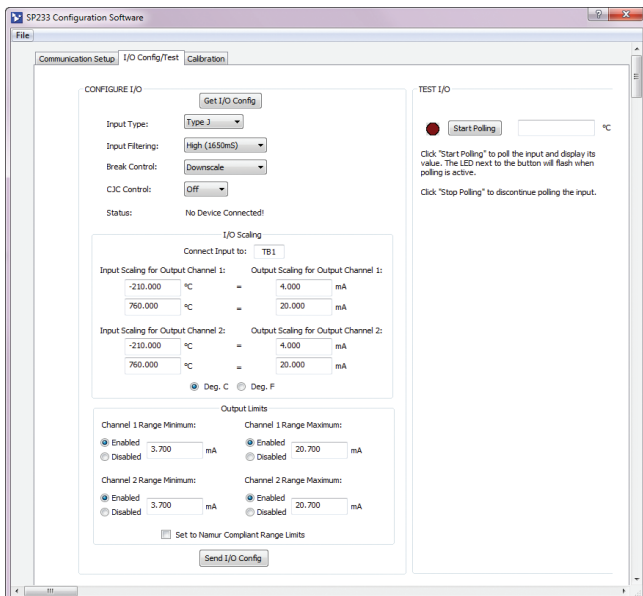
Setup is fast and easy with a USB connection to your PC and our Windows software. Acromag's Agility™ mobile app enables configuration on an Android smart phone or tablet. Software simplifies I/O range scaling, calibration, and advanced signal processing capabilities.

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, R, S, E, B, N or $\pm 100\text{mV}$)
- 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](https://play.google.com/store/apps/details?id=com.acromag.agility)

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



Process Loop Splitter: SP230

SP233 Thermocouple/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: TC J, -210 to 760°C, high filter, Break: up

Output: 4 to 20mA.

Input Ranges and Accuracy

Input	Range	Accuracy
TC J	-210 to 760°C (-346 to 1400°F)	±0.5°C
TC K	-200 to 1372°C (-328 to 2502°F)	±0.5°C
TC T	-260 to 400°C (-436 to 752°F)	±0.5°C
TC R	-50 to 1768°C (-58 to 3214°F)	±1.0°C
TC S	-50 to 1768°C (-58 to 3214°F)	±1.0°C
TC E	-200 to 1000°C (-328 to 1832°F)	±0.5°C
TC B	260 to 1820°C (500 to 3308°F)	±1.0°C
TC N	-230 to 1300°C (-382 to 2372°F)	±1.0°C
mV	-100 to 100mV	±0.1mV

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 ±80ppm/°C (±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.

Input Over-Voltage Protection

Bipolar Transient Voltage Suppressors (TVS), 5.6V clamp level typical.

Resolution

Millivolt input: 0.0025% (1 part in 40,000)
Thermocouple input: 0.1°C.

Input Filter

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

Input Filter 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 (Two Signals, Passive)

Output Range

4 to 20mA DC.

Output Compliance

$R_{LOAD} = (V_{SUPPLY} - 7V) / 0.020A$.

$R_{LOAD} = 0$ to 850 ohms @ 24V DC.

Output Response Time (for step input change)

Time to reach 98% of final output value (typical)	
No filtering	21 milliseconds
Low filter	48 milliseconds
Medium filter	149 milliseconds
High filter	1138 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

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 ≤ 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, 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

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

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.



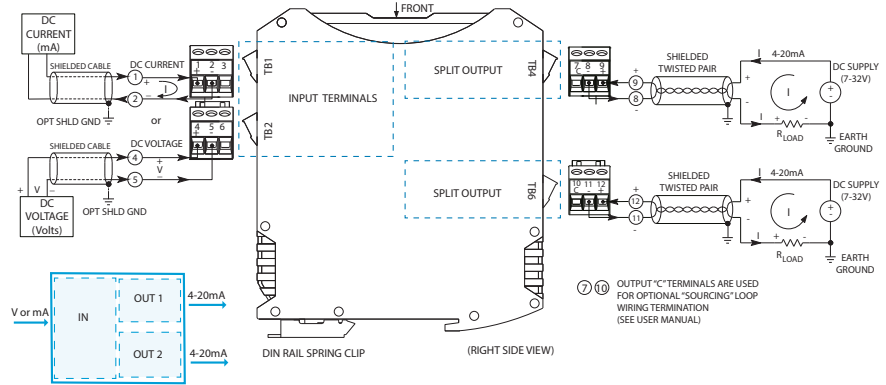
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Process Loop Splitter: SP230 Series

SP236 Current/millivolt input signal splitter, two-wire



USB Configured



DC current and low voltage input ◆ 4-20mA outputs (sink/source) ◆ 7-32V DC loop power

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.

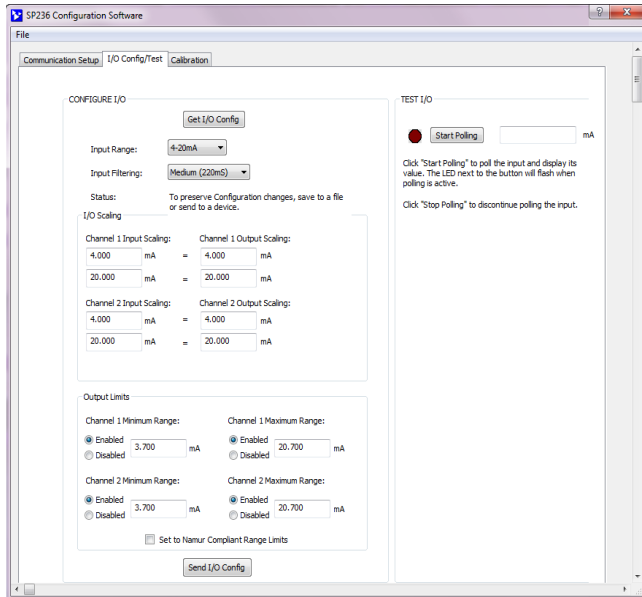
Setup is fast and easy with a USB connection to your PC and our Windows software. Acromag's Agility™ mobile app enables configuration on an Android smart phone or tablet. Software simplifies I/O range scaling, calibration, and advanced signal processing capabilities.

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 $\pm 500\text{mV}$, $\pm 20\text{mA DC}$, 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.



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Android Agility™ app (FREE) at [Google Play Store](https://play.google.com/store/apps/details?id=com.acromag.agility)

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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

Range	Accuracy (typical)
±20mA	±0.05% of span
0 to 20mA	±0.05% of span
4 to 20mA	±0.05% of span
0 to 11.17mA (for AC sensor)	±0.05% of span
±1mA	±0.05% of span
±0.5V	±0.05% of span
0 to 500mV	±0.05% of span

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

Ambient Temperature Effect

Better than ±80ppm/°C (±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.

Input Resolution

Bipolar input: 1 part in 50000 (±25000).

Unipolar input: 1 part in 25000.

Input Filter

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

Input Filter 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 (Two Signals, Passive)

Output Range

Dual isolated 4 to 20mA DC.

Output Compliance

$R_{LOAD} = (V_{SUPPLY} - 7V) / 0.020A$.

$R_{LOAD} = 0$ to 850 ohms @ 24V DC.

Output Response Time (for step input change)

Time to reach 98% of final output value (typical)	
No filter	17 milliseconds
Low filter	41 milliseconds
Medium filter	138 milliseconds
High filter	1142 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.

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 ≤ 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, 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.

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.

5020-350

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

5028-565

USB-OTG 6 inch cable.

ISO9001
AS9100



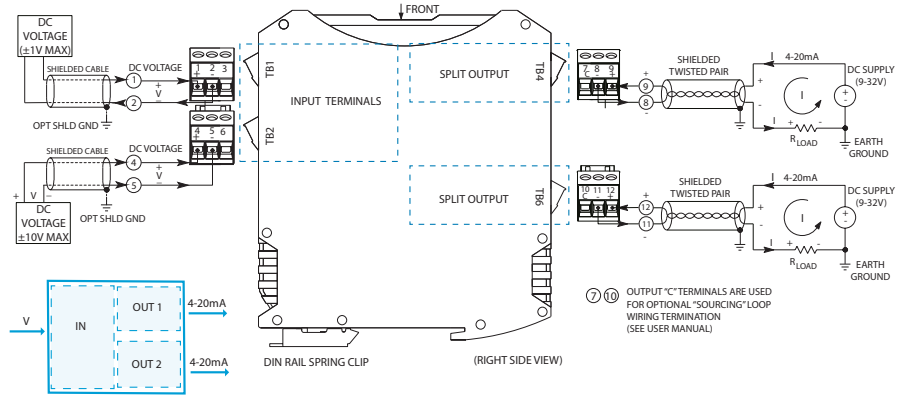
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Process Loop Splitter: SP230 Series

SP237 Process voltage input signal splitter, two-wire



USB Configured



Multi-range $\pm 1V$, $\pm 5V$, or $\pm 10V$ input 4-20mA outputs (sink/source) 7-32V DC loop power

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.

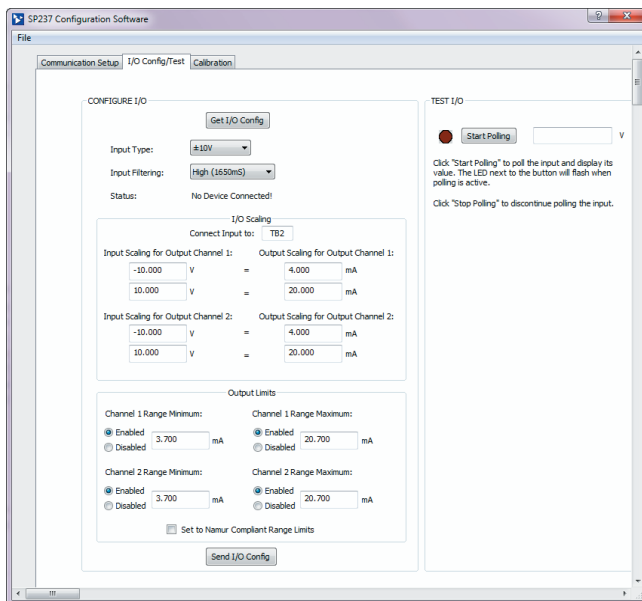
Setup is fast and easy with a USB connection to your PC and our Windows software. Acromag's Agility™ mobile app enables configuration on an Android smart phone or tablet. Software simplifies I/O range scaling, calibration, and advanced signal processing capabilities.

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 $\pm 1V$, $\pm 5V$, and $\pm 10V$ 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.



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

Android Agility™ app (FREE) at [Google Play Store](https://play.google.com/store/apps/details?id=com.acromag.agility)

Save configuration files for convenient copy/restore capability.

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Process Loop Splitter: SP230 Series

SP237 Process 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

Default Configuration/Calibration

Input: $\pm 10V$ DC, medium filtering.

Output: 4 to 20mA.

Input Ranges and Accuracy

Range	Accuracy (typical)
$\pm 1V$ DC	$\pm 0.05\%$ of span
$\pm 5V$ DC	$\pm 0.05\%$ of span
$\pm 10V$ DC	$\pm 0.05\%$ of span

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

Ambient Temperature Effect

Better than $\pm 80\text{ppm}/^\circ\text{C}$ ($\pm 0.008\%/^\circ\text{C}$).

Zero Scaling Adjust

0 to 95% of range, typical.

Full Scale Adjust

5 to 100% of full scale range, typical.

Input Impedance

$\pm 1V$ input: 15M ohms.

$\pm 5V$ input: $>1M$ ohms.

$\pm 10V$ 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.

Input Filter

Selectable digital filtering settings (low, medium, high).

Input Filter 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

$R_{LOAD} = (V_{SUPPLY} - 11V) / 0.020A$.

$R_{LOAD} = 0$ 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.

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 $-40^\circ\text{C} \leq T_a \leq +80^\circ\text{C}$

■ 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

[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).

[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.

ISO9001
AS9100



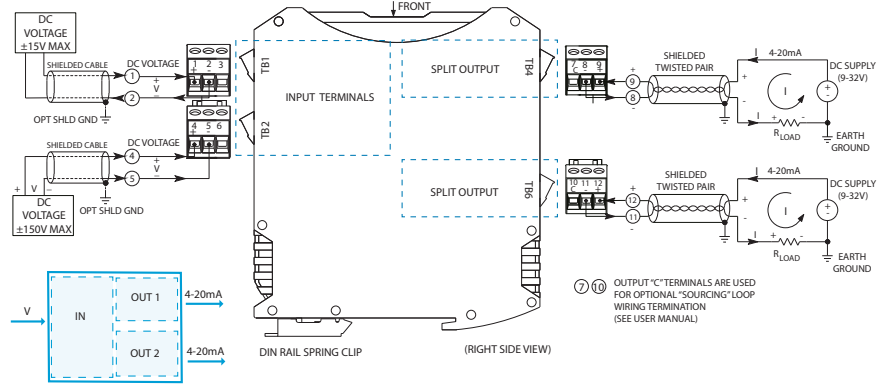
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Process Loop Splitter: SP230 Series

SP238 High voltage input signal splitter, two-wire



USB Configured



Multi-range $\pm 15V$, $\pm 75V$, or $\pm 150V$ input ◆ 4-20mA outputs (sink/source) ◆ 7-32V DC loop/local power

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.

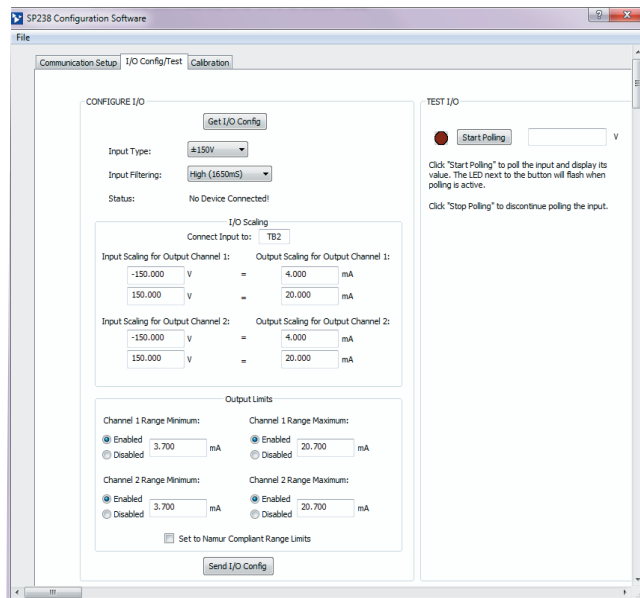
Setup is fast and easy with a USB connection to your PC and our Windows software. Acromag's Agility™ mobile app enables configuration on an Android smart phone or tablet. Software simplifies I/O range scaling, calibration, and advanced signal processing capabilities.

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 $\pm 15V$, $\pm 75V$, and $\pm 150V$ 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.



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

Android Agility™ app (FREE) at [Google Play Store](https://play.google.com/store/apps/details?id=com.acromag.agility)

Save configuration files for convenient copy/restore capability.

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Process Loop Splitter: SP230

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: $\pm 150V$, medium filtering.

Output: 4 to 20mA.

Input Ranges and Accuracy

Range	Accuracy (typical)
$\pm 15V$ DC	$\pm 0.05\%$ of span
0-15V DC	$\pm 0.05\%$ of span
$\pm 150V$ / ± 75 DC	$\pm 0.05\%$ of span
0-150V	$\pm 0.05\%$ of span
0-5V DC	$\pm 0.05\%$ of span

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

Ambient Temperature Effect

Better than $\pm 80\text{ppm}/^\circ\text{C}$ ($\pm 0.008\%/^\circ\text{C}$).

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.

Input Filter

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

Input Filter 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 (Two Signals, Passive)

Output Range

4 to 20mA DC.

Output Compliance

$R_{LOAD} = (V_{SUPPLY} - 7V) / 0.020A$.

$R_{LOAD} = 0$ to 850 ohms @ 24V DC.

Output Response Time (for step input change)

Time to reach 98% of final output value (typical)	
No filter	88 milliseconds
Low filter	100 milliseconds
Medium filter	237 milliseconds
High filter	1762 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

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 \leq Ta \leq +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, 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

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.

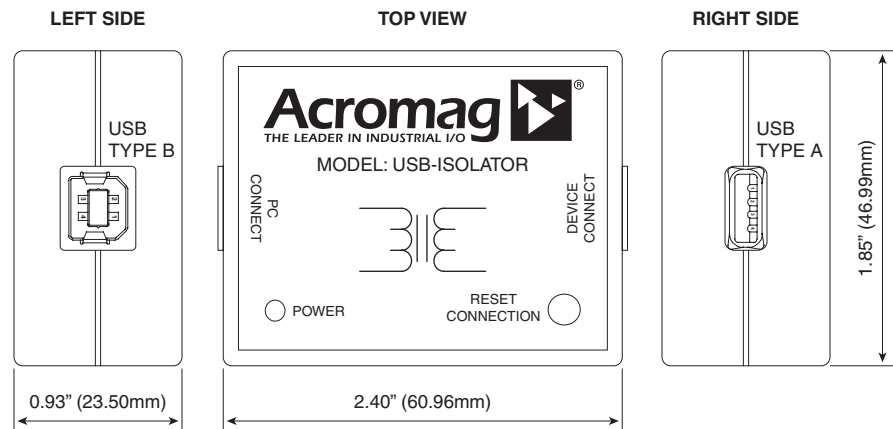
ISO9001
AS9100



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USB-ISOLATOR USB-to-USB Isolator



USB-powered, USB 2.0 and 1.1 compatible ◆ 1500V AC / 2100V DC isolation ◆ No drivers required

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



USB-ISOLATOR USB-to-USB Isolator



Performance Specifications

■ USB Port Interface

Standards

USB 1.1 and 2.0 compatible, full speed (12Mbps, default) and low speed (1.5Mbps) data rates supported. For low speed data rates, an internal jumper is provided for user setting. Connection is transparent, no software or configuration is required. Isolator will not be enumerated in the device manager.

■ Physical

Dimensions

2.40" Length x 1.85" Wide x 0.925" High
(60.96mm x 46.99mm x 23.495mm).

Connectors

Standard high retention USB A/B connectors with minimum withdrawal force of 15 Newtons. 1 meter A/B cable included.

PC Connector

USB Type B receptacle

Device Connector

USB Type A receptacle

LED Indicator

Green LED indicates isolator receiving 5V power from the USB computer bus. Flashing indicates short circuit/ retries on peripheral side.

Reset Button

Resets the connection to the USB peripheral device for reinitialization and re-enumeration.

Enclosure Material

ABS Resin, UL94 rated, IP30 plastic case.

■ Environmental

Operating temperature
-40 to 70°C (-40° to 158°F).

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

Relative humidity
5 to 95% non-condensing.

Power

PC Connect Side: Standard USB bus power (5V DC).

Device Connect Side: 5V DC / 120mA with full power connection from PC. Includes over-current protection with auto-retry.

Isolation

1500V AC / 2100V DC peak isolation.
250V AC continuous safety isolation.

Agency Approvals:

CE and FCC compliant. UL/cUL Class 1 Div. 2 Zone 2.

Radiated Field Immunity (RFI)

Designed to comply with IEC1000-4-3 Level 3 and EN50082-1.

Electromagnetic Compatibility (EMC)

Minimum immunity per EN61000-6-2:2001

Electrostatic Discharge (ESD) Immunity

Per IEC61000-4-2.

Radiated Field Immunity (RFI)

Per IEC61000-4-3.

Electrical Fast Transient Immunity (EFT)

Per IEC61000-4-4. Complies with IEC1000-4-4 Level 3 and EN50082-1.

Surge Immunity

Complies with IEC1000-4-5 Level 3 and EN50082-1. Per IEC61000-4-5.

Conducted RF Immunity (CRFI)

Per IEC61000-4-6.

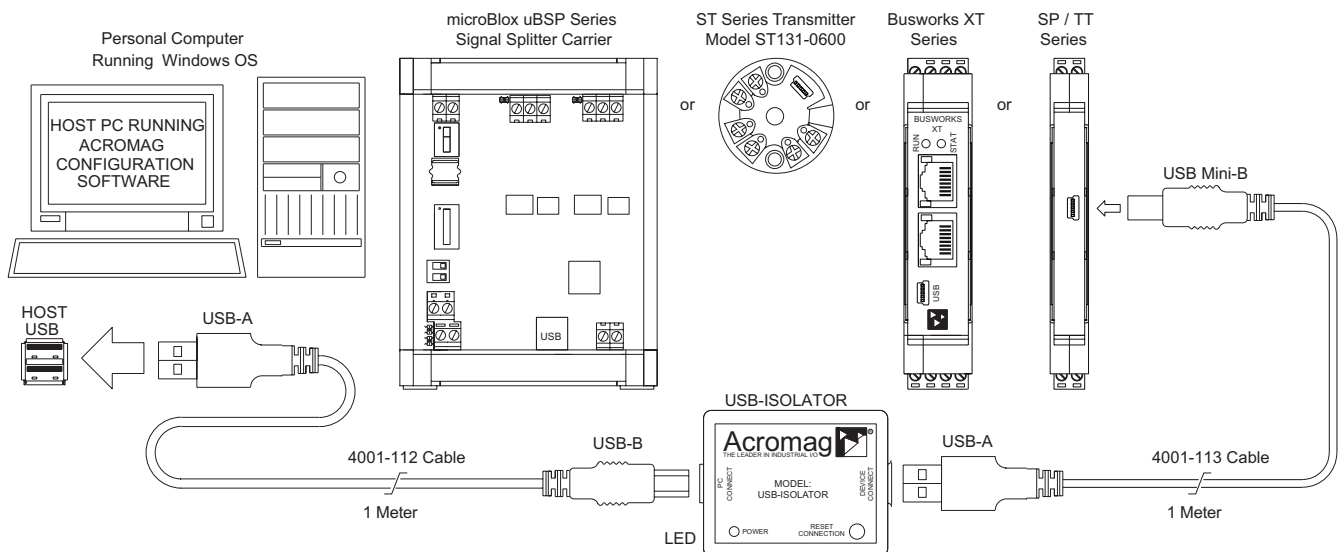
Emissions

Per EN61000-6-4:2001.

Radiated Frequency Emissions

Per CISPR11 Class A. Meets or exceeds EN50081-1 for Class B equipment.

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




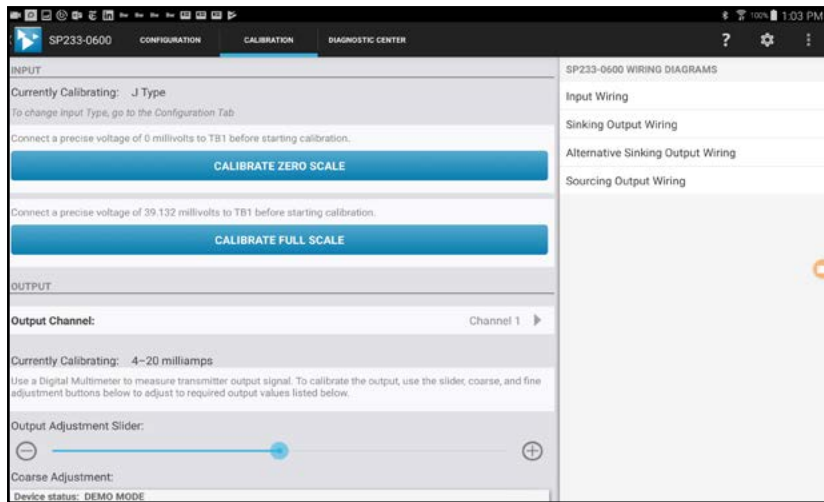
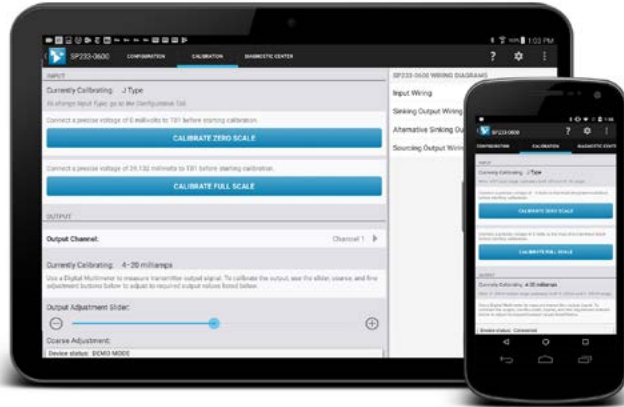
Signal Splitters: SPx30 Series

Acromag Agility™ Config Tool Mobile Application

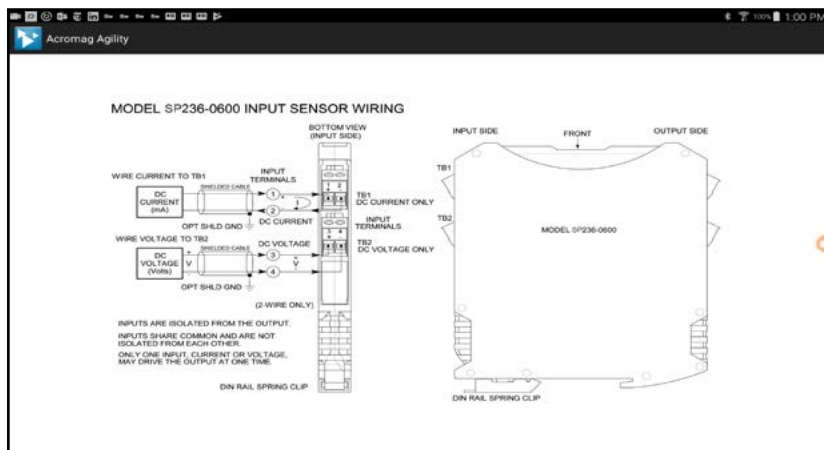
The Agility™ Config Tool is a mobile application that allows easy setup and configuration of Acromag SP Series signal splitters via a tethered mobile device.

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.



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.

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

