

SP Series Signal Splitters

PROGRAMMABLE PROCESS LOOP SPLITTERS
(AKA REPEATERS, DUPLICATORS, MULTIPLIERS)

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Acromag [®]
THE LEADER IN INDUSTRIAL I/O

SP Series Signal Splitters

- **Introducing the SP Series**
 - Programmable Signal Splitter / Duplicators
 - Based on popular TT Series Transmitters
 - SP230: Loop-Powered Splitters (2-Wire)
 - SP330: External-Powered Splitters (4-Wire)
 - uBSP: microBlox Plug-in Module Splitters



SP230



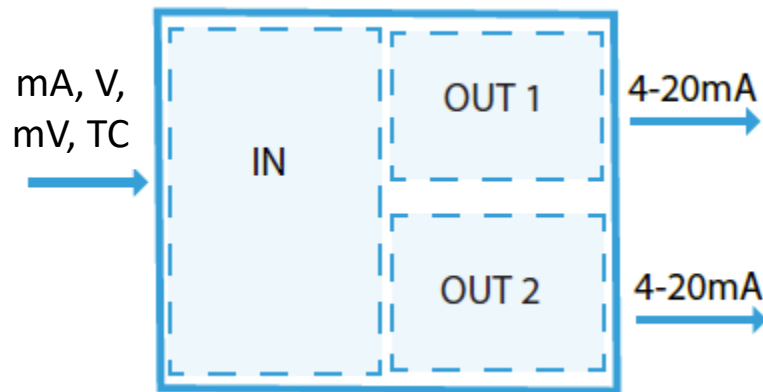
SP330



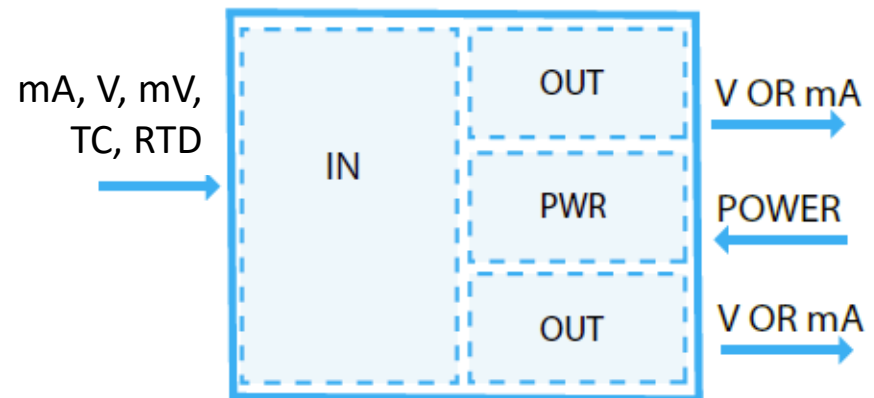
uBSP

SP Series: The Basics

- Like a TT Transmitter w/Two Outputs
 - One Input
 - Two Outputs
 - Loop or External Power
 - 1500V Isolation
 - USB configuration



SP230



SP330/uBSP

SP Series: The Basics

- Like a TT Transmitter w/Two Outputs

- Input

- Process Current: 0/4-20mA DC, 0-20A AC
 - Process Voltage: 0-5V, 0-10V, $\pm 5V$, $\pm 10V$ DC
 - Low Voltage: 0-500mV, $\pm 100mV$ DC
 - High Voltage: 0-15V, 0-75V, 0-150V, $\pm 15V$, $\pm 75V$, $\pm 150V$ DC
 - Thermocouple: Types J K T R S E B N
 - RTD Sensor: Pt 100 ohm, 2/3/4-wire (uB only)

- Dual Output

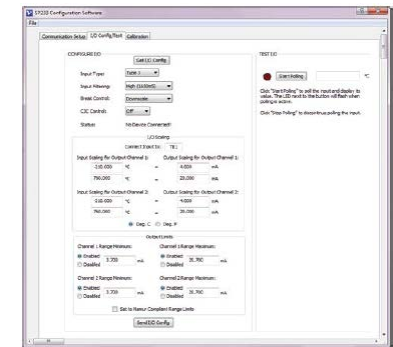
- Current: 0/4-20mA DC
 - Voltage: 0-10V, $\pm 10V$ DC

- Power

- Loop-powered: 7-32V DC
 - External power: 6-32V DC

- Software for easy setup

- Windows and Android app





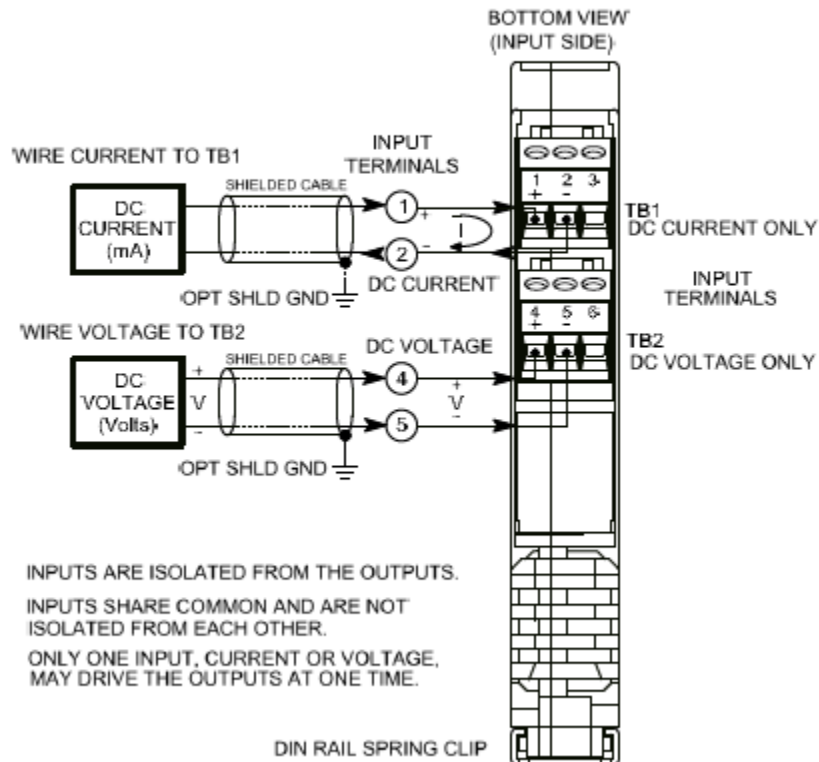
• SP Series Advantages

- USB-programmable flexibility and precision
 - Windows configuration software
 - Android Agility mobile app
- DC and Temperature splitters
- Can scale inputs differently for each output
- Selectable filtering levels
- Configurable output clamp levels (NAMUR)
- Removable terminal blocks
- Rail power bus and redundancy
- Supports sink/source wiring
- Hazloc approvals for UL C1D2, ATEX Z2
- -40 to 80 °C operation

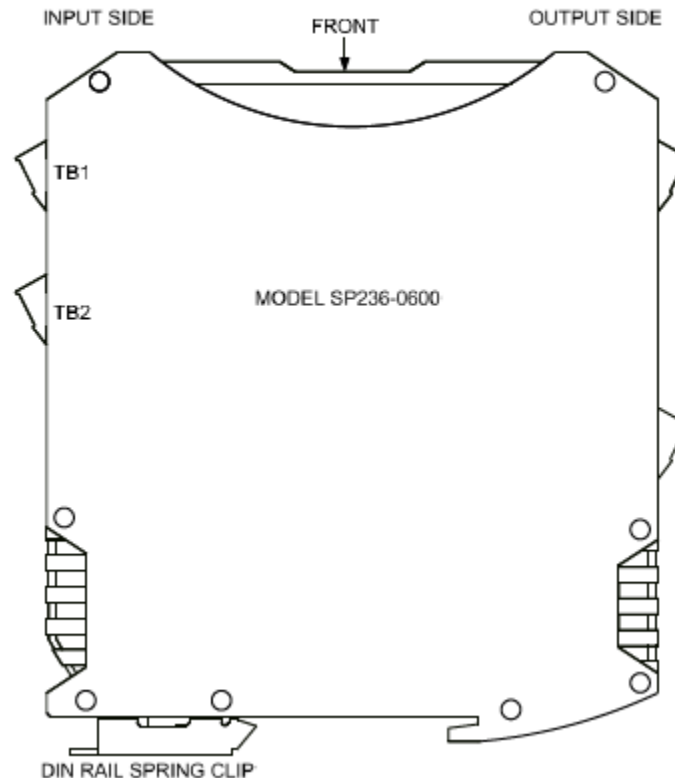
Wiring Connections

- Input connections

MODEL SP236-0600 INPUT SENSOR WIRING DC CURRENT AND DC MILLIVOLTAGE INPUT



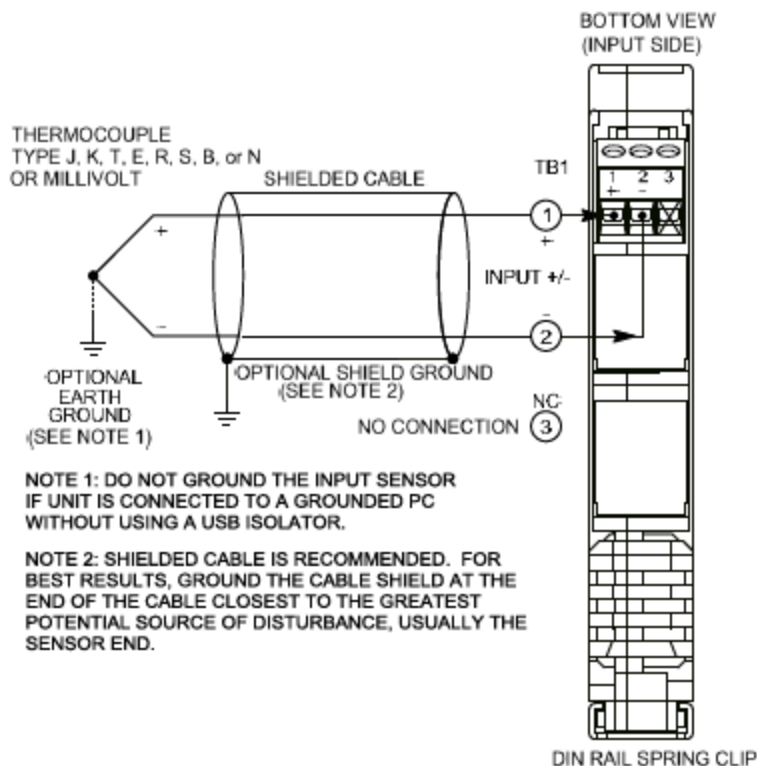
INPUTS ARE ISOLATED FROM THE OUTPUTS.
INPUTS SHARE COMMON AND ARE NOT
ISOLATED FROM EACH OTHER.
ONLY ONE INPUT, CURRENT OR VOLTAGE,
MAY DRIVE THE OUTPUTS AT ONE TIME.



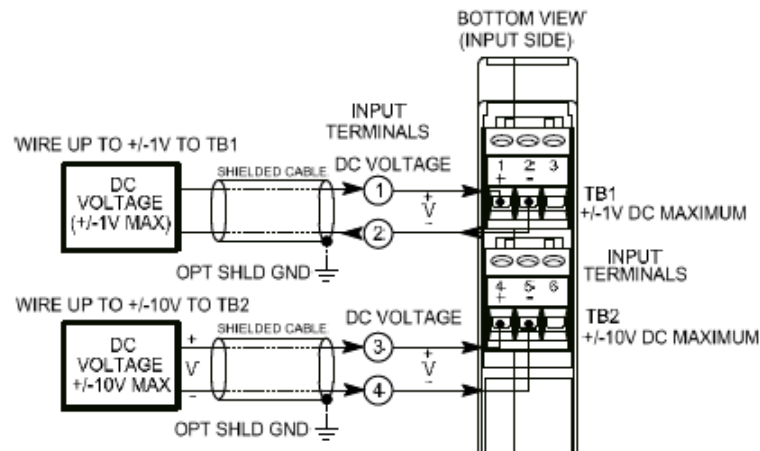
Wiring Connections

- Input connections

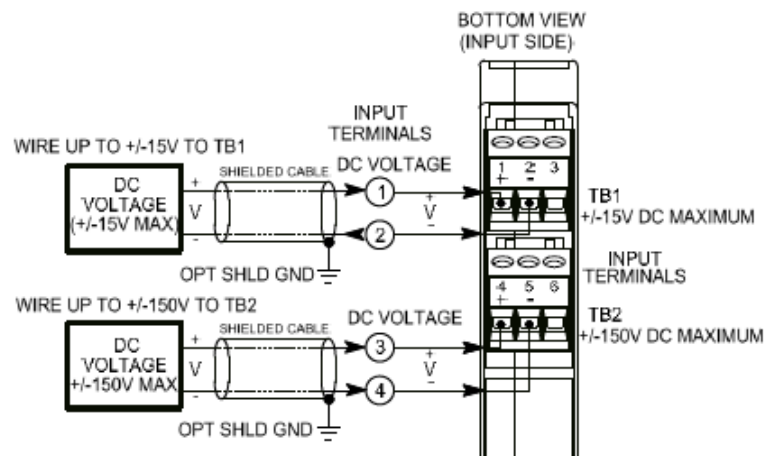
MODEL SP233-0600 INPUT SENSOR WIRING



MODEL SP237-0600 INPUT SENSOR WIRING MEDIUM DC VOLTAGE INPUT



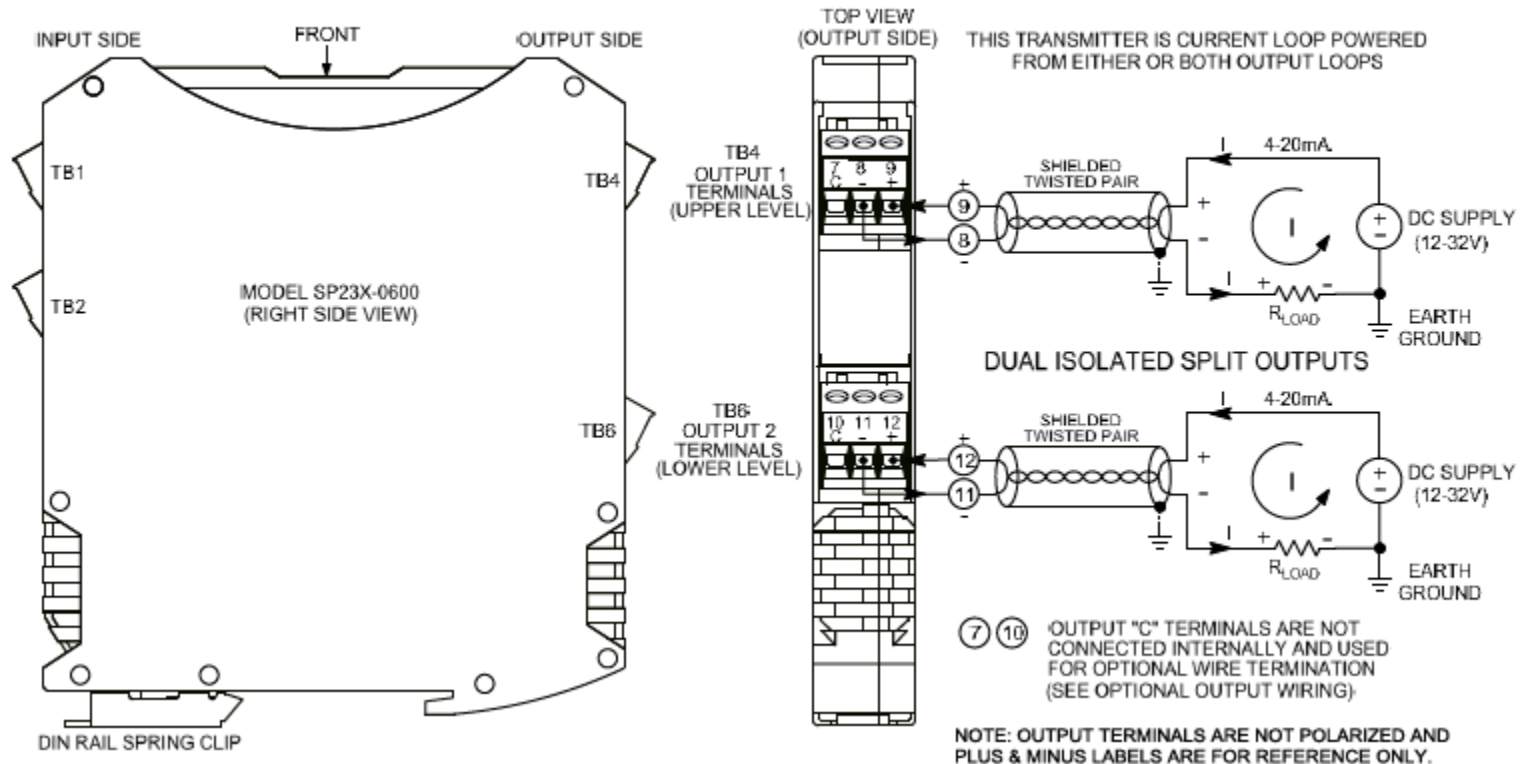
MODEL SP238-0600 INPUT SIGNAL WIRING HIGH-LEVEL DC VOLTAGE INPUT



Wiring Connections

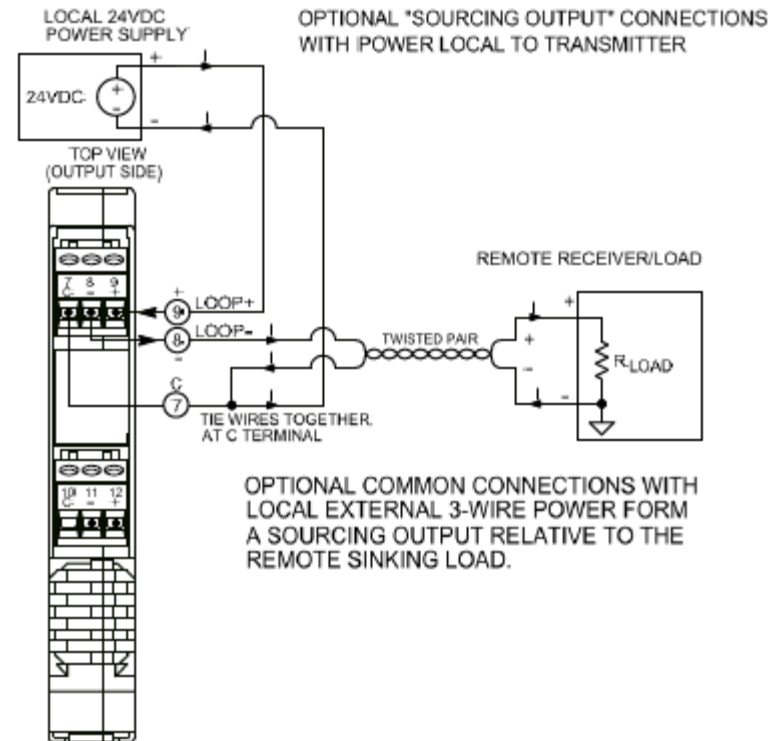
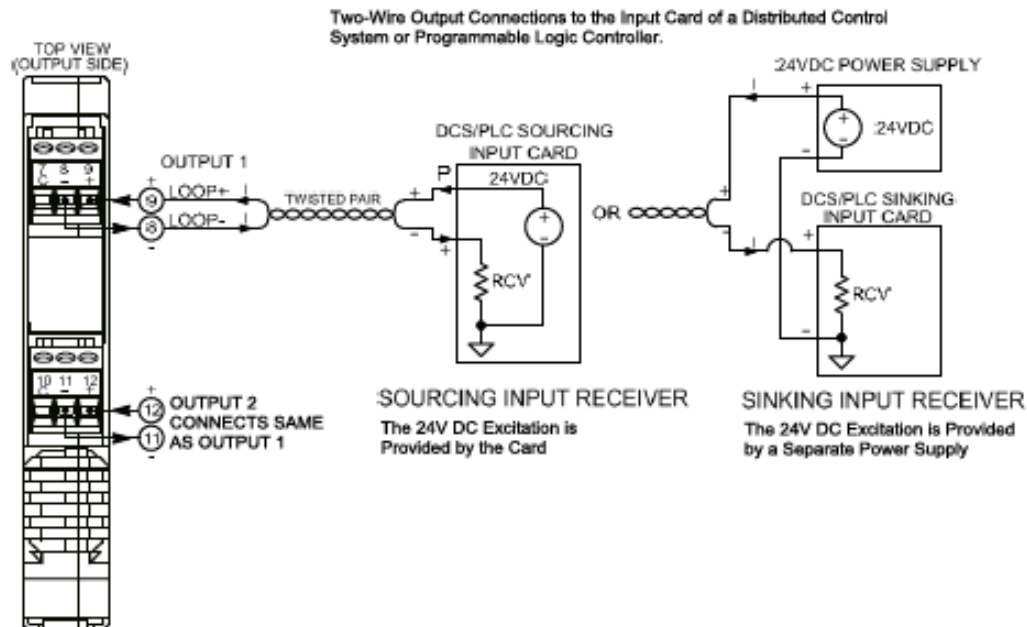
- Output connections for SP230 models

MODEL SP23X-0600 OUTPUTS/POWER WIRING TRADITIONAL LOOP-POWERED "SINKING OUTPUT" CONNECTIONS



- Output connections for SP230 models

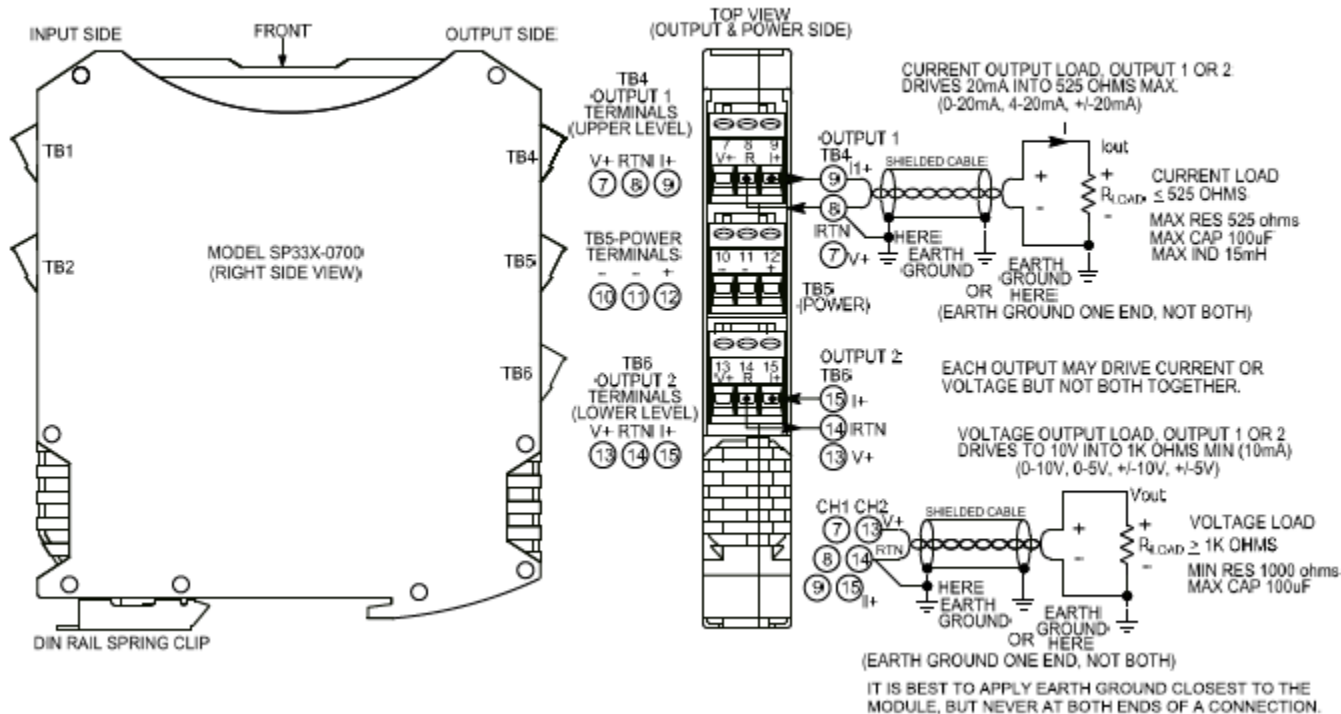
COMMON TWO-WIRE LOOP CONNECTION TO "SOURCING" AND "SINKING" INPUT RECEIVERS



Wiring Connections

- Output connections for SP330 models

MODEL SP33X-0700 OUTPUT WIRING
OUTPUT WIRED TO DC CURRENT OR DC VOLTAGE TERMINAL

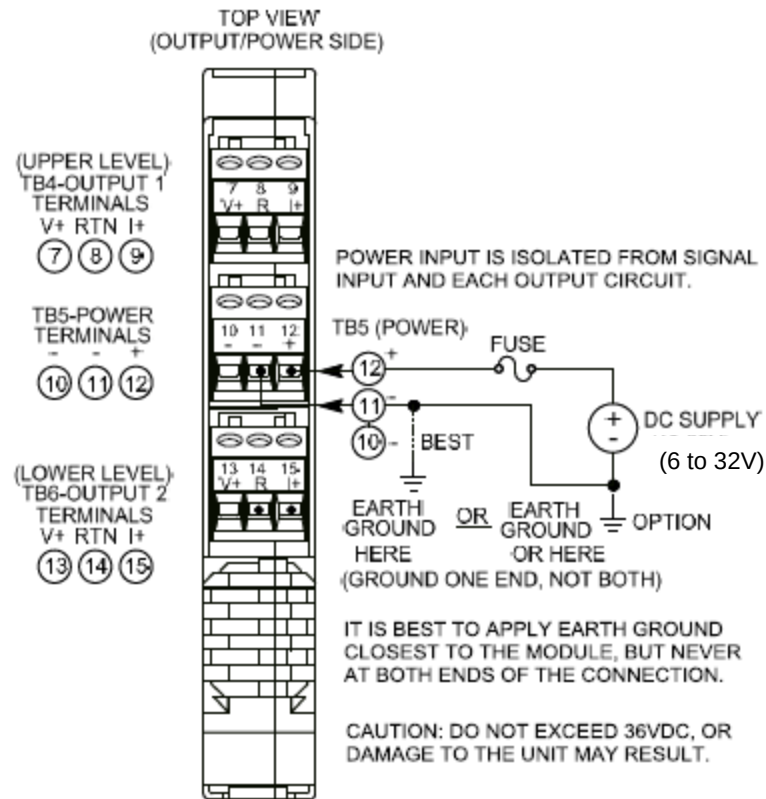
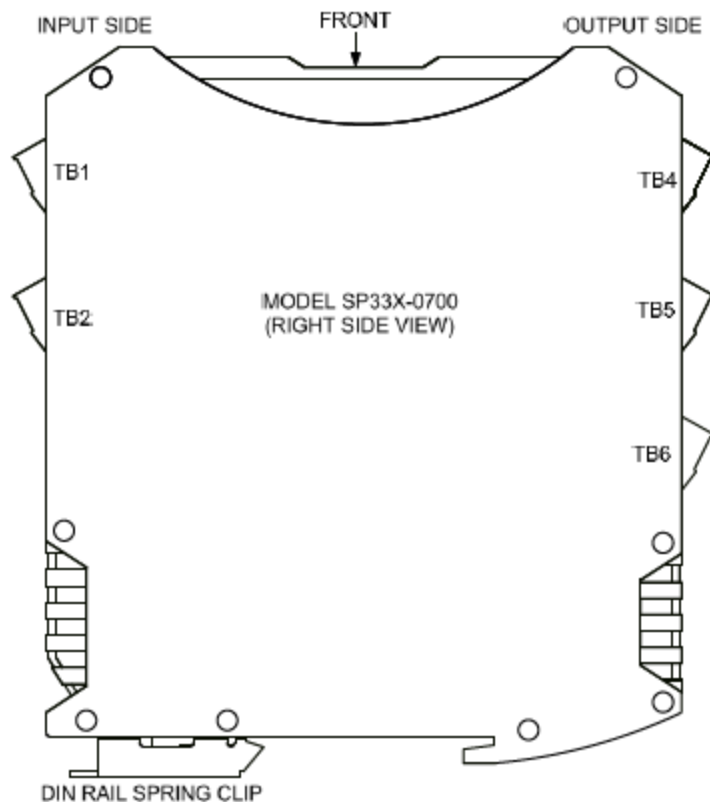


Wiring Connections

- Power connections for SP330 models

MODEL SP337-0700 POWER WIRING

UNIT IS DC-POWERED ONLY AT 6 to 32V DC.



* NOTE: IT IS RECOMMENDED THAT SUPPLIES CAPABLE OF DELIVERING MORE THAN 2.5A TO THE UNIT BE FUSED WITH A HIGH SURGE TOLERANT FUSE.

Wiring Connections

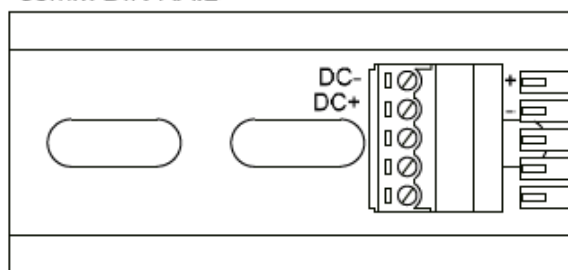
- Power connections for SP330 models

YOU CAN OPTIONALLY CONNECT POWER TO A DIN RAIL BUS CONNECTOR 1005-063 ALONG THE DIN RAIL USING THE OPTIONAL TERMINALS AS SHOWN.

35mm DIN RAIL

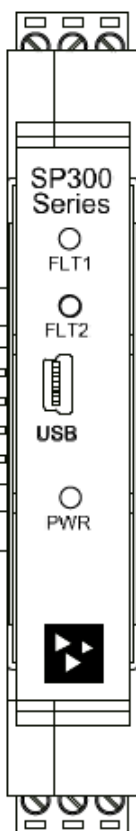
LEFT

RIGHT

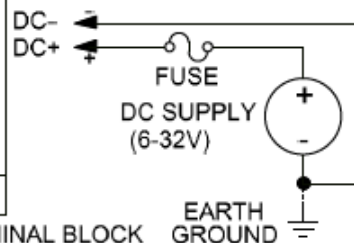


FEMALE TERMINAL BLOCK
ACROMAG 1005-220
(LEFT-SIDE CONNECTION)

FOR REDUNDANT POWER, CONNECT POWER TO BUS AS SHOWN AND WIRE POWER TO POWER TERMINAL OF MODULE AT TB5.



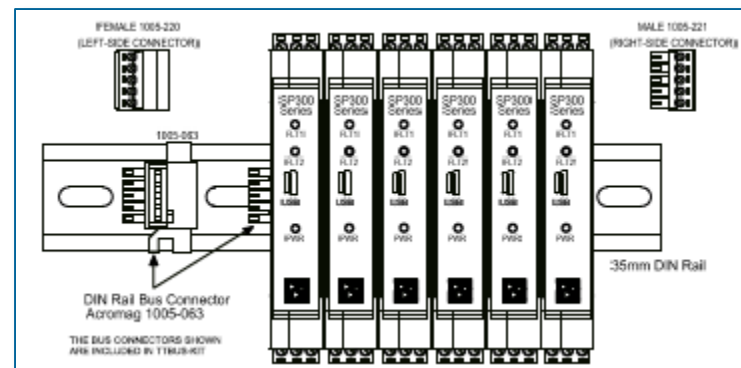
DIN RAIL BUS POWER



MALE TERMINAL BLOCK
ACROMAG 1005-221
(RIGHT-SIDE CONNECTION)

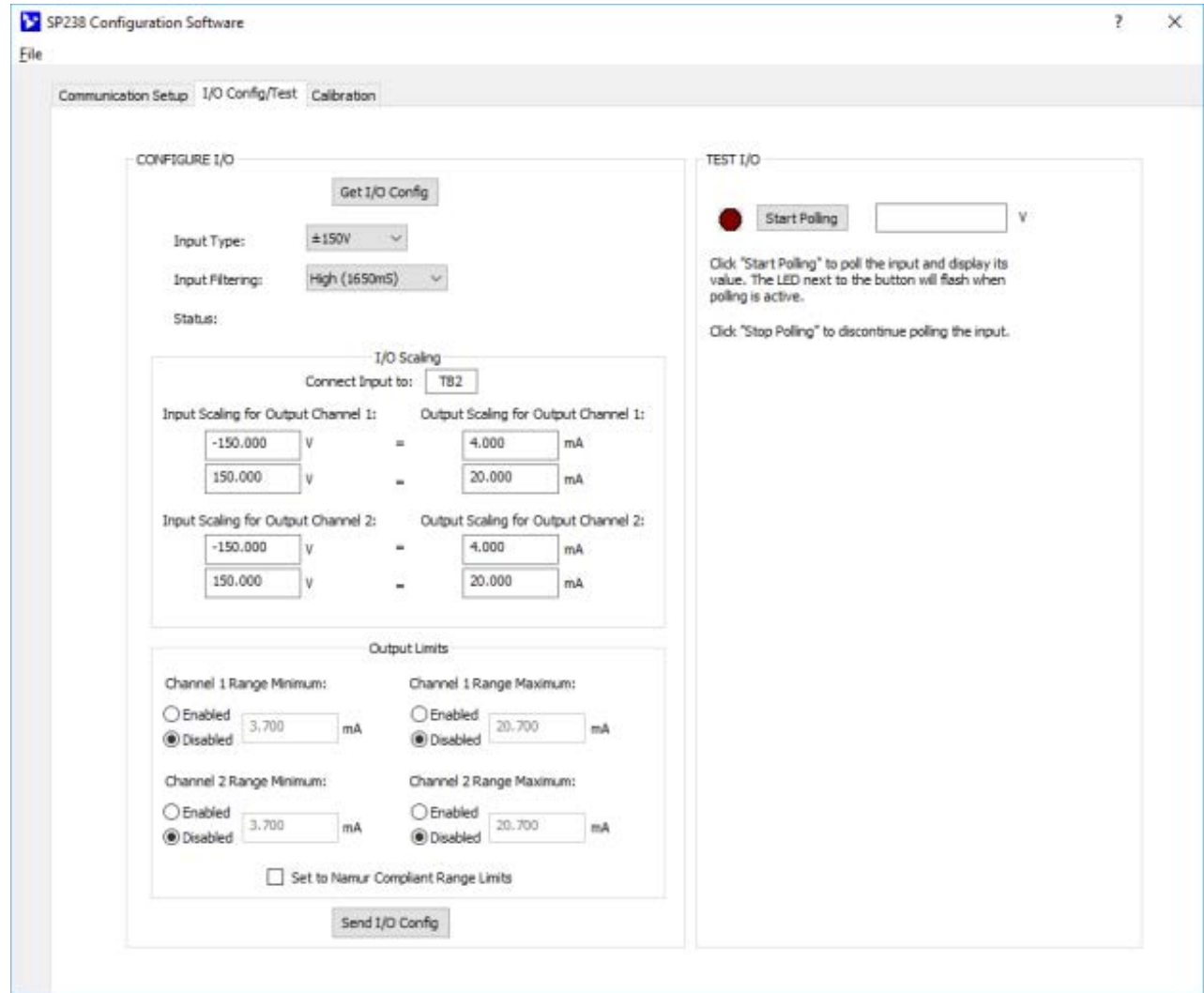
CAUTION: DO NOT EXCEED 36VDC, OR DAMAGE TO THE UNIT MAY RESULT.

NOTE: IT IS RECOMMENDED THAT SUPPLIES CAPABLE OF DELIVERING MORE THAN 2.5A TO THE BUS BE FUSED WITH A HIGH SURGE TOLERANT FUSE.



SP230 Two-Wire

- Scale each channel separately
- Configurable output limits
- NAMUR-compliant
- Visually verify input readings
- Save configuration file to copy/restore



Agility Android App Configuration

USB tethered connection (on-the-go cable)

SP236-0600 ? ⚙️ ⋮

CONFIGURATION CALIBRATION DIAGNOSTIC CENTER

INPUT OPTIONS

Input Type: ±500 millivolts ▶

Input Filtering: High ▶

I/O SCALING

Output Channel 1:

-500.00	mV =	4.00	mA
500.00	mV =	20.00	mA

Output Channel 2:

-500.00	mV =	4.00	mA
500.00	mV =	20.00	mA

Device status: Connected

SP236-0600 ? ⚙️ ⋮

CONFIGURATION CALIBRATION DIAGNOSTIC CENTER

Output Adjustment Slider:

Coarse Adjustment:

Fine Adjustment:

Adjust the output until multimeter reads 4.00 millamps. Press the CALIBRATE ZERO SCALE button to send calibration.

CALIBRATE ZERO SCALE

Adjust the output until multimeter reads 20.00 millamps. Press the CALIBRATE FULL SCALE button to send calibration.

CALIBRATE FULL SCALE

Device status: Connected

SP236-0600 ? ⚙️ ⋮

CONFIGURATION CALIBRATION DIAGNOSTIC CENTER

TEST I/O

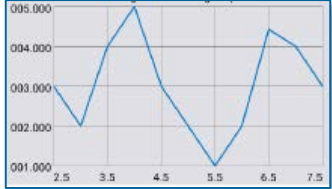
Current Input Type: ±500 millivolts
To change Input Type go to the Configuration Tab

Indicator: Digital ▶

START POLLING CLEAR DATA

☐ Save Data Polling Period = 500 ms

-1.413mV



Device status: Connected

Temperature Splitter (TC)

- Thermocouple In: SP233/333
- Scale each channel separately
- Same or different output types

SP333-0700

CONFIGURATION CALIBRATION DIAGNOSTIC CENTER

INPUT OPTIONS

Input Type: J Type ▶

Input Filtering: High ▶

OUTPUT OPTIONS

Break Direction: Downscale ▶

TEMPERATURE UNITS

Unit: Celsius ▶

OUTPUT CHANNEL 1 CONFIGURATION

Current Output Range: 4-20 milliamps ▶

Voltage Output Range: Disabled ▶

OUTPUT CHANNEL 2 CONFIGURATION

Current Output Range: Disabled ▶

Voltage Output Range: 0-10 Volts ▶

I/O SCALING

The selected input range determines which input terminal (TB1 or TB2) the input must be connected to.

Connect Input to: Ch. 1 (TB1)

I/O Scaling for Output Channel 1

Input	Output
210.00 °C =	4.00 mA
760.00 °C =	20.00 mA

I/O Scaling for Output Channel 2

Input	Output
100.00 °C =	0.00 V
500.00 °C =	10.00 V

Temperature Splitter (RTD)

- RTD Input, Pt 100
- uBSP-P-1 Carrier
uB34: 2-/3-wire
uB35: 4-wire
- Scale each channel separately
- Same or different output types

The screenshot displays the configuration interface for the uBSP-uB34 device. The interface is divided into three main sections: CONFIGURATION, CALIBRATION, and DIAGNOSTIC CENTER. The CONFIGURATION section is currently active and contains several sub-sections:

- INPUT OPTIONS:** Input Type is set to -148 to 392°F.
- OUTPUT OPTIONS:** Break Direction is set to Upscale.
- TEMPERATURE UNITS:** Unit is set to Fahrenheit.
- OUTPUT CHANNEL 1 CONFIGURATION:** Current Output Range is 4-20 milliamps, and Voltage Output Range is Disabled.
- OUTPUT CHANNEL 2 CONFIGURATION:** Current Output Range is 4-20 milliamps, and Voltage Output Range is Disabled.
- I/O SCALING:** This section is highlighted with a red box and contains two tables for scaling the input and output for each channel.

I/O Scaling for Output Channel 1

Input	Output
-148.000 °F	4.000 mA
392.000 °F	20.000 mA

I/O Scaling for Output Channel 2

Input	Output
32.000 °F	4.000 mA
212.000 °F	20.000 mA

The Models

LOOP-POWERED

SP233-0600

Thermocouple/mV input

SP236-0600

Current/mV input

SP237-0600

Process voltage input

SP238-0600

High-voltage input



EXTERNAL POWER

SP333-0700

Thermocouple/mV input

SP336-0700

Current/mV input

SP337-0700

Process voltage input

SP338-0700

High-voltage input



MICROBLOX

uBSP-P-1

Carrier panel (plug-in uB)

uB30/40-x

Millivolt input

uB31/41-x

Voltage input

uB32-x

Current input

uB42-x

Two-wire transmitter input
w/excitation

uB34/35-x

RTD input

uB37/47-x

Thermocouple input

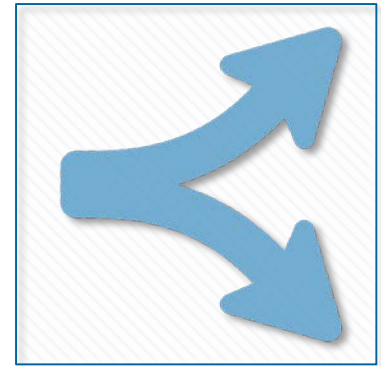


Industries

- Chemical / Batch Processing
- Oil, Gas, Mining
- Water/Wastewater
- Power Gen and Alt Energy
- Factory Automation
- Building/Facilities/HVAC
- Defense/Aerospace

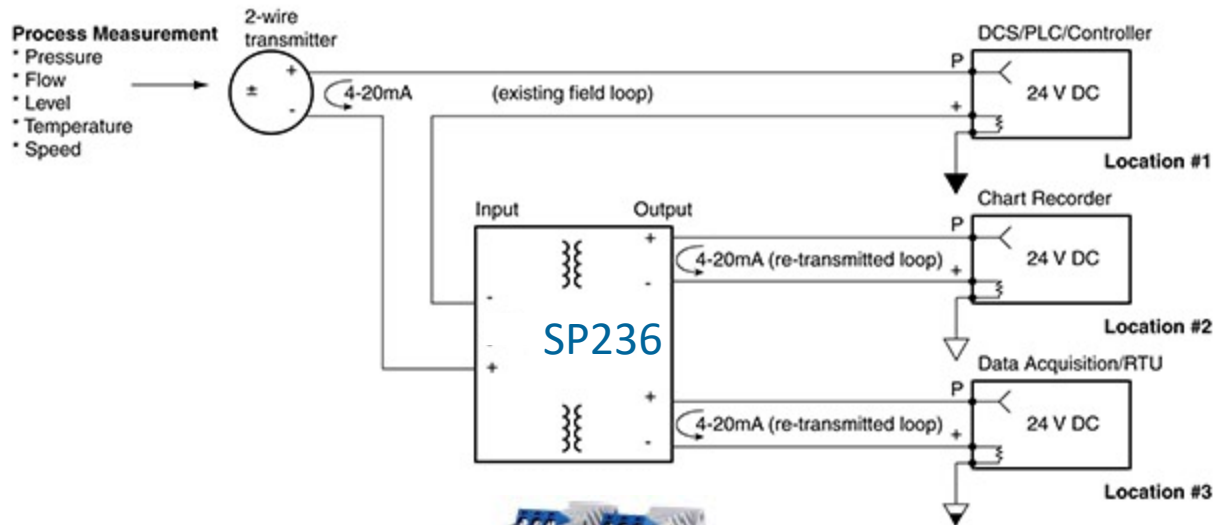


- **Multiple receivers monitor one process signal**
 - Chart recorder, data logger
 - Panel meter, indicator, display
 - Control valve, limit alarm
 - PLC, DCS, HMI, RTU, SCADA, IIoT
- **Custody transfer where two parties require identical signal for accountability/billing**
- **A fault or interruption on one loop does not affect the operation of the other loop**
- **Eliminating noise in long loop runs**



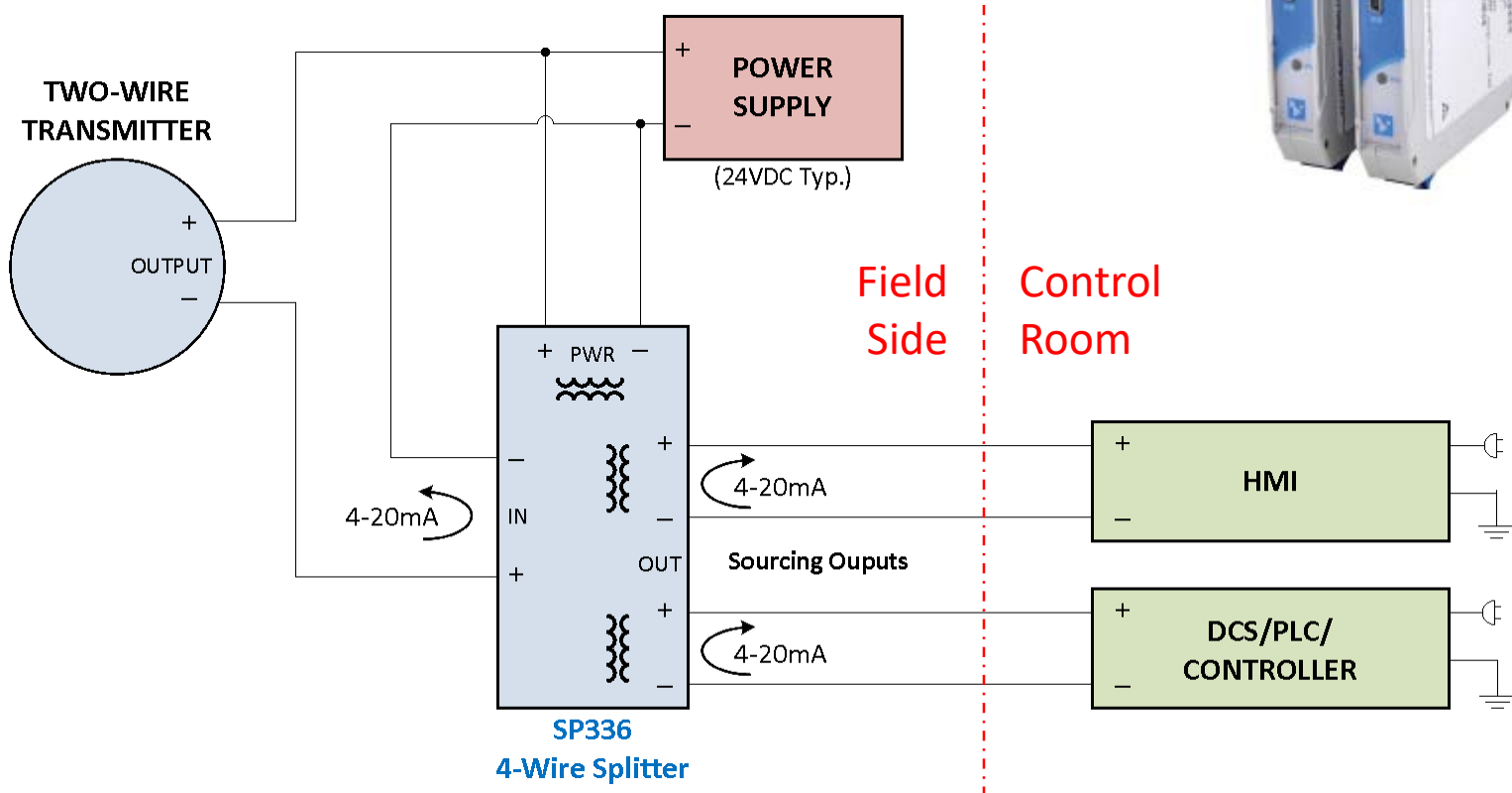
Applications

- Loop-powered signal duplicator
 - SP236 two-wire splitter
 - Very low 7V loop burden



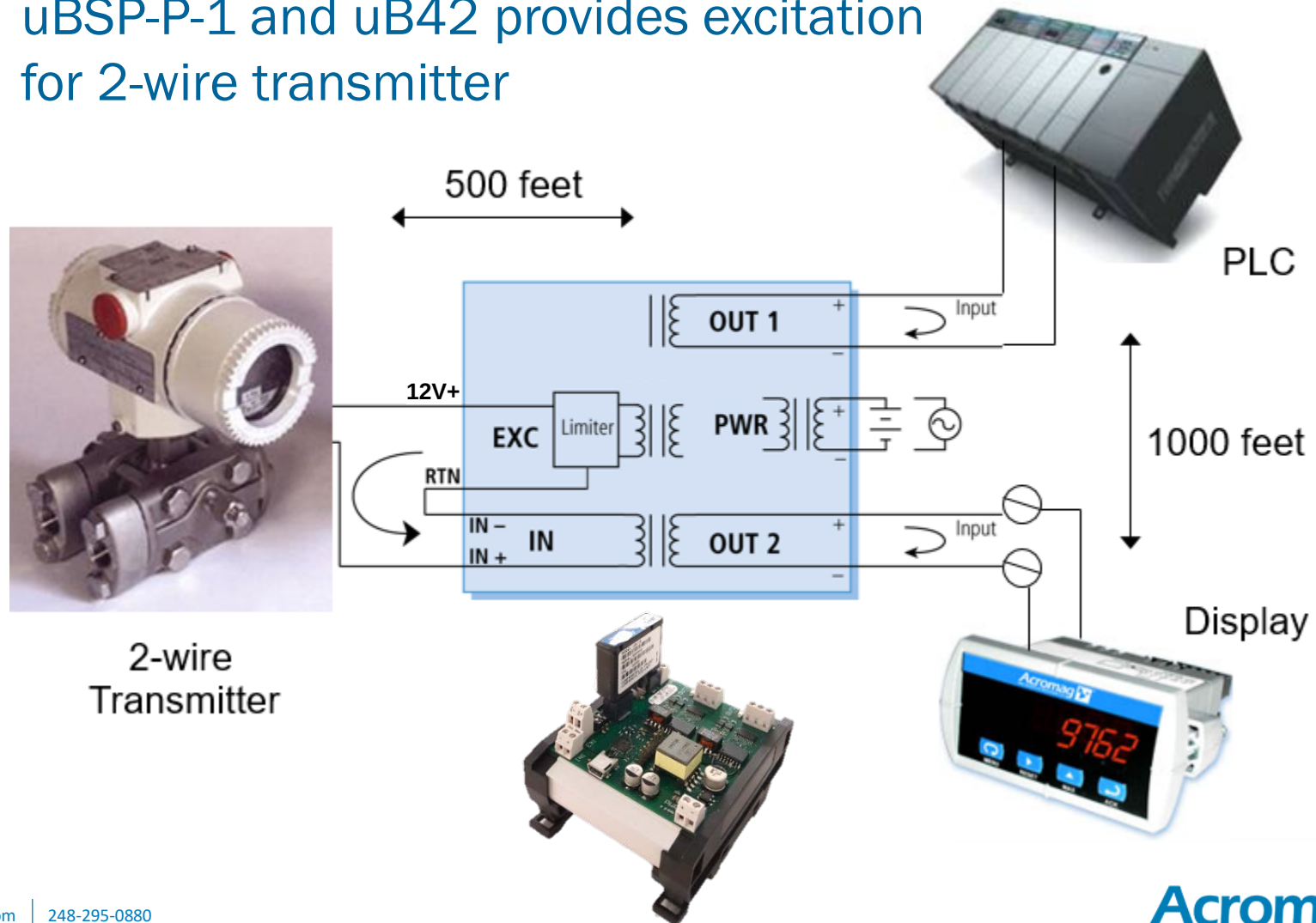
Applications

- **Externally-powered signal duplicator**
 - SP336 four-wire splitter
 - Passive input, active output



Applications

- **Splitter sources input and output loops**
 - uBSP-P-1 and uB42 provides excitation for 2-wire transmitter



Technical Resources

- Application Notes
- White Papers



Thank you.

ACROMAG: I/O SOLUTIONS