

# FC-35B Unipolar Voltage or Current to Bipolar Voltage Signal Conditioner



## Overview

The FC-35B is a 35 mm DIN-rail or side-mount, selectable unipolar input to bipolar output signal conditioner with isolation between input and output, and isolation between 24-volt power and input/output. The FC-35B field configurable isolated signal conditioner is useful in eliminating ground loops and interfacing sensors to PLC analog input modules. It translates unipolar voltage inputs or current inputs to bipolar voltage outputs. The input and output signal levels are selected via DIP switches. In addition, the outputs can be either a direct conversion of the inputs or a reverse acting operation.

The user also has the option of customizing the input OFFSET (zero) and SPAN (full scale) adjustments that can be set to a percentage of the full scale via a pushbutton on the front panel.



Click on the above thumbnail or go to [PS-0003](#) for a short introductory video for the FC Series Signal Conditioners.

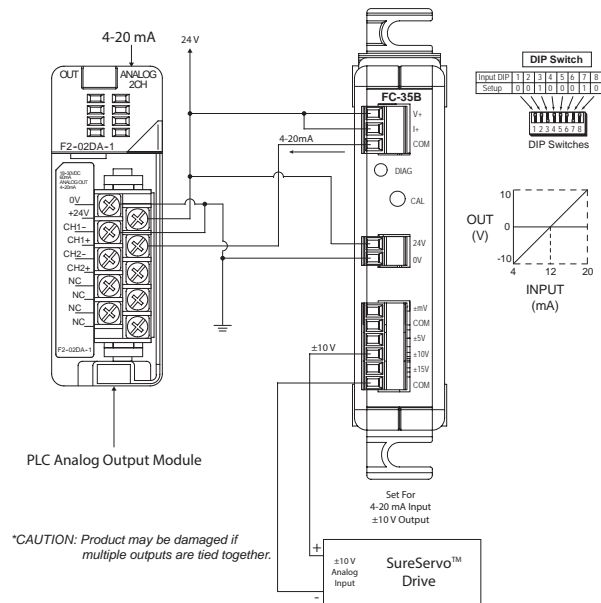
Specifications	
<b>Input Specifications</b>	
<b>Input Ranges</b>	0-5V, 0-10 V, 0-20 mA, 4-20 mA (DIP Switch Selectable/Invertable)
<b>Input Impedance</b>	410 kilohm voltage input, 250 ohm current input
<b>Protection Type, Component</b>	Polarity Protection Diode
<b>External DC Power Required</b>	24 VDC $\pm$ 10%, 40 mA, Class 2
<b>User Calibration Range</b>	OFFSET (zero): 0-20% (e.g. 0-1.0V / 5V mode) SPAN (full-scale): 80-102% (e.g. 4.0 - 5.1V / 5V mode)
<b>Output Specifications</b>	
<b>Output Ranges</b>	$\pm$ 50 mV, $\pm$ 100 mV, $\pm$ 5V, $\pm$ 10 V, $\pm$ 15 V
<b>Load Impedance</b>	2.5K $\Omega$ minimum on $\pm$ 50mV and $\pm$ 100mV Range 2K $\Omega$ minimum on $\pm$ 5V, $\pm$ 10V and $\pm$ 15V Range
<b>Sample Duration Time</b>	10 ms
<b>Maximum Inaccuracy</b>	0.1% FSO @ 25°C (1.0% 50 mV / 100 mV)
<b>Accuracy vs. Temperature</b>	$\pm$ 60 PPM of Full Scale / °C Maximum
<b>Output Current</b>	$\pm$ 50 mV/ $\pm$ 100 mV @ 2.5mA max, $\pm$ 5V, $\pm$ 10 V, $\pm$ 15 V @ 7.5mA max
<b>Terminal Block Specifications</b>	
<b>Field Wiring</b>	Removable Screw Type Terminal Blocks (Included)
<b>Number of Positions</b>	2 (Dinkle: EC350V-02P), 3 (Dinkle: EC350V-03P), 6 (Dinkle: EC350V-06P)
<b>Wire Range</b>	28-14 AWG solid or stranded conductor; wire strip length 1/4" (6-7mm)
<b>Screw Torque</b>	1.7 inch-pounds (0.19 Nm)
<b>General Specifications</b>	
<b>Surrounding Air Temperature</b>	0 to 60°C (32 to 140°F) IEC 60068-2-14 (Test Nb, Thermal Shock)
<b>Storage Temperature</b>	-20 to 70°C (-4 to 158°F) IEC 60068-2-1 (Test Ab, Cold) IEC 60068-2-2 (Test Bb, Dry Heat) IEC 60068-2-14 (Test Na, Thermal Shock)
<b>Enclosure Rating</b>	IP20
<b>Humidity</b>	5 to 95% (non-condensing) IEC 60068-2-30 (Test Db, Damp Heat)
<b>Environmental Air</b>	No corrosive gases permitted (EN61131-2 pollution degree 1)
<b>Vibration</b>	MIL STD 810C 514.2 IEC 60068-2-6 (Test Fc)
<b>Shock</b>	MIL STD 810C 516.2 IEC 60068-2-27 (Test Ea)
<b>Insulation Resistance</b>	>10M @ 500VDC
<b>Noise Immunity</b>	NEMA ICS3-304 IEC 61000-4-2 (ESD) Impulse 1000 V @ 1 $\mu$ S pulse IEC 61000-4-4 (FTB) RFI, (145 MHz, 440 MHz 5W @ 15 cm) IEC 61000-4-3 (RFI)
<b>Weight</b>	0.3lbs
<b>Isolation</b>	1000 VDC Power to Input 1800 VDC Power to Output 1800 VDC Input to Output applied for 1 second (100% tested)
<b>Agency Approvals</b>	UL508*, File Number: E157382, CE

\* In order to comply with UL508, the supplied power must be less than 26 VDC and fused at a maximum of 3 amps.

# FC-35B Applications and Dimensions

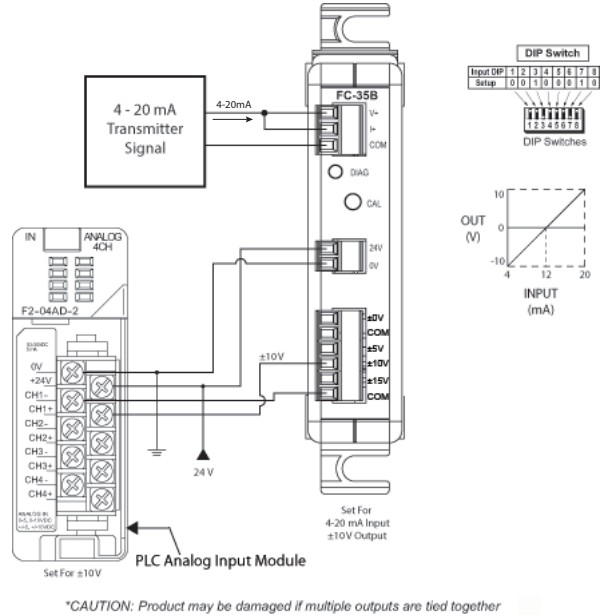
## Application Example 1

Use the FC-35B to convert a unipolar output from a PLC analog card to a bipolar  $\pm 10$  VDC signal to control a SureServo's External Velocity Command.



## Application Example 2

Use the FC-35B to convert and isolate a unipolar output from a 4-20 mA sensor or transmitter to a bipolar  $\pm 10$  VDC signal for a PLC input.



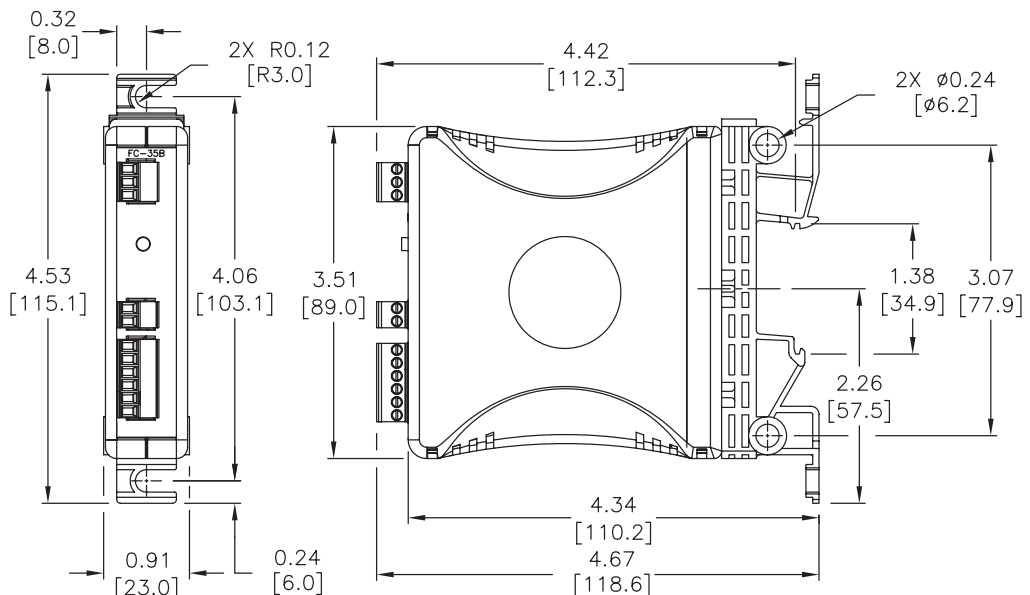
## Wiring Connections

Input Terminal Block		Output Terminal Block		External Power Terminal Block		Switch/LED Labels	
Faceplate Label	Description	Faceplate Label	Description	Faceplate Label	Description	Faceplate Label	Description
V+	Voltage In	$\pm mV$	$\pm 50$ mV or $\pm 100$ mV Output	24 V	24 VDC $\pm 10\%$ (Class 2)	DIAG	Diagnostic LED flashing indication
I+	Current In	COM	COM Connection (used with mV signals)	0V	0V	CAL	Push button switch input to initiate calibration, etc.
COM	Common	$\pm 5V$	$\pm 5$ V Output				
		$\pm 10 V$	$\pm 10$ V Output				
		$\pm 15 V$	$\pm 15$ V Output				
		COM	COM Connection (used with non-mV signals)				

NOTE: V+ and I+ must be jumpered for Current input

## Dimensions

inches [mm]



# FC-B34 Bipolar Voltage to Unipolar Voltage or Current Signal Conditioner



## Overview

The FC-B34 is a 35mm DIN-rail or side-mount, selectable bipolar input to unipolar output signal conditioner with isolation between input and output, and isolation between 24 volt power and input/output. The FC-B34 field configurable isolated signal conditioner is useful in eliminating ground loops and interfacing sensors to PLC analog input modules. It translates bipolar voltage input to unipolar voltage output or bipolar voltage input to a current output. The input and output signal levels are selected via DIP switches. In addition, the outputs can be either a direct conversion of the inputs or a reverse acting operation. The user also has the option of customizing the input OFFSET (zero) and SPAN (full scale) adjustments that can be set to a percentage of the full scale via a pushbutton on the front panel.



Click on the above thumbnail or go to [PS-0003](#) for a short introductory video for the FC Series Signal Conditioners.

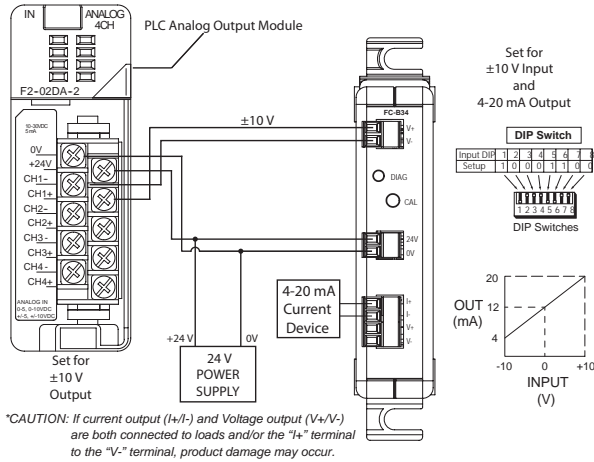
Specifications	
<b>Input Specifications</b>	
<b>Input Ranges</b>	$\pm 15V, \pm 10V, \pm 5V, \pm 100mV, \pm 50mV$ (DIP Switch Selectable)
<b>Input Impedance</b>	5K $\Omega$ maximum for ranges $\pm 15V, \pm 10V, \pm 5V$ 500 $\Omega$ maximum for ranges $\pm 100mV$ and $\pm 50mV$
<b>Protection Type, Component</b>	Polarity Protection Diode
<b>External DC Power Required</b>	24VDC $\pm 10\%$ , 50mA, Class 2
<b>User Calibration Range</b>	OFFSET (zero): 0-20% (e.g. -4V / $\pm 5V$ mode) SPAN (full-scale): 80-102% (e.g. 4.0 - 5.1V / $\pm 5V$ mode)
<b>Output Specifications</b>	
<b>Output Ranges</b>	0-5V, 0-10 V, 0-20 mA, 4-20 mA (DIP Switch Selectable)
<b>Load Impedance</b>	2K $\Omega$ Minimum, Voltage Output 550 $\Omega$ Maximum, Current Output
<b>Sample Duration Time</b>	10 ms
<b>Maximum Inaccuracy</b>	0.1% FSO ( $\pm 15V, \pm 10V, \pm 5V$ Inputs), 1.5% FSO ( $\pm 100mV, \pm 50mV$ Inputs) @ 25°C
<b>Accuracy vs. Temperature</b>	+/-60 PPM of Full Scale/ °C Maximum
<b>Output Current</b>	21mA max for mA-Out mode/ 10mA max for Volt-out mode
<b>Terminal Block Specifications</b>	
<b>Field Wiring</b>	Removable Screw Type Terminal Blocks, (included)
<b>Number of Positions</b>	2 (Dinkle: EC350V-02P), 2 (Dinkle: EC350V-02P), 4 (Dinkle: EC350V-04P)
<b>Wire Range</b>	28-14 AWG solid or stranded conductor; wire strip length 1/4" (6-7mm)
<b>Screw Torque</b>	1.7 inch-pounds (0.19 Nm)
<b>General Specifications</b>	
<b>Surrounding Air Temperature</b>	0 to 60°C (32 to 140°F) IEC 60068-2-14 (Test Nb, Thermal Shock)
<b>Storage Temperature</b>	-20 to 70°C (-4 to 158°F) IEC 60068-2-1 (Test Ab, Cold) IEC 60068-2-2 (Test Bb, Dry Heat) IEC 60068-2-14 (Test Na, Thermal Shock)
<b>Enclosure Rating</b>	IP20
<b>Humidity</b>	5 to 95% (non-condensing) IEC 60068-2-30 (Test Db, Damp Heat)
<b>Environmental Air</b>	No corrosive gases permitted (EN61131-2 pollution degree 1)
<b>Vibration</b>	MIL STD 810C 514.2 IEC 60068-2-6 (Test Fc)
<b>Shock</b>	MIL STD 810C 516.2 IEC 60068-2-27 (Test Ea)
<b>Insulation Resistance</b>	>10M $\Omega$ @ 500VDC
<b>Noise Immunity</b>	NEMA ICS3-304 IEC 61000-4-2 (ESD) Impulse 1000V @ 1 $\mu$ S pulse IEC 61000-4-4 (FTB) RFI, (145 MHz, 440 MHz 5W @ 15 cm) IEC 61000-4-3 (RFI)
<b>Weight</b>	0.3lbs
<b>Isolation</b>	1800VDC Power to Input 1800VDC Power to Output 1800VDC Input to Output applied for 1 second (100% tested)
<b>Agency Approvals</b>	UL508*, File Number: E157382, CE

\* In order to comply with UL508, the supplied power must be less than 26 VDC and fused at a maximum of 3 amps.

# FC-B34 Applications and Dimensions

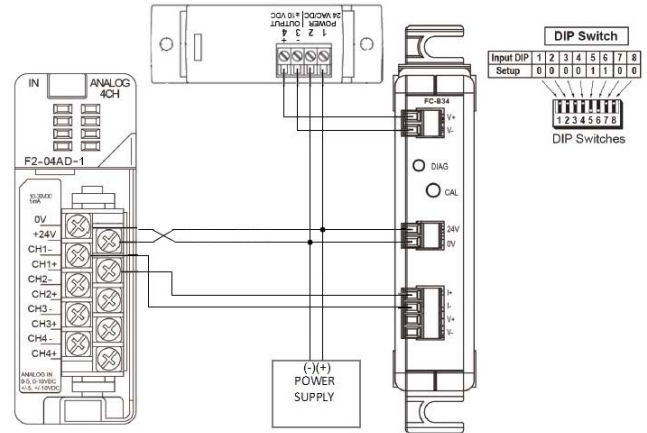
## Application Example 1

The FC-B34 can be used to convert a bipolar  $\pm 10\text{VDC}$  signal to a 4-20 mA signal.



## Application Example 2

The FC-B34 can be used to convert the bipolar  $\pm 10\text{VDC}$  from a DCT100-10B-24S current transducer to a 4-20 mA or 0-10 VDC that can be used by a PLC.

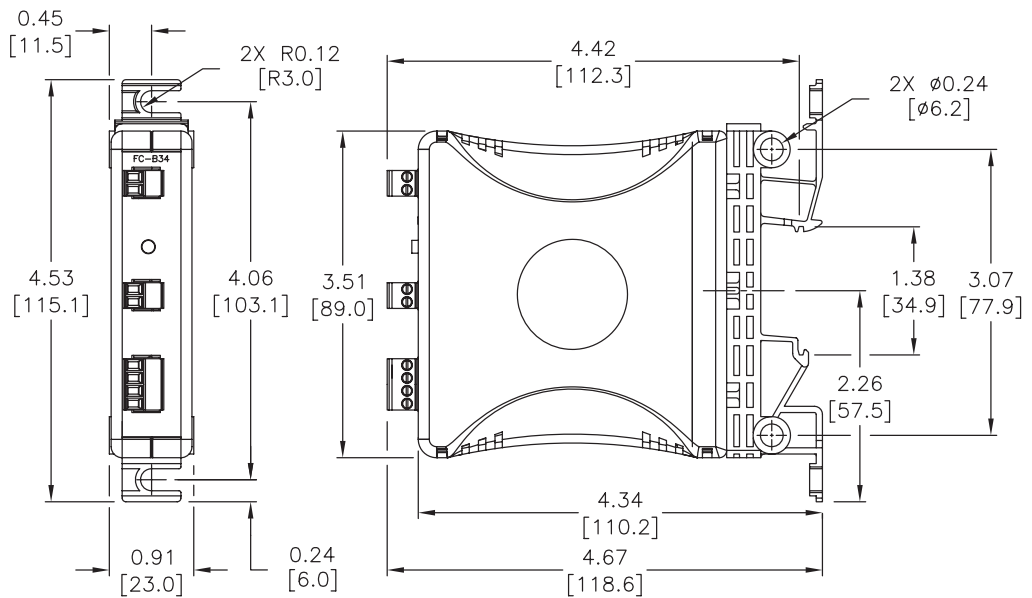


## Wiring Connections

Input Terminal Block		Output Terminal Block		External Power Terminal Block		Switch/LED Labels	
Faceplate Label	Description	Faceplate Label	Description	Faceplate Label	Description	Faceplate Label	Description
V+	Signal In +	I+	Current	24 V	24VDC $\pm 10\%$ (Class 2)	DIAG	Diagnostic LED flashing indication
V-	Signal In -	I-	Current	0V	0V	CAL	Pushbutton switch input to initiate calibration, etc.
		V+	Voltage				
		V-	Voltage				

## Dimensions

inches [mm]



# FC Series Accessories



FC-5MM



FC-35MM

## Description

Universal terminal block replacements for the FC Series signal conditioners. Each package includes enough terminal blocks to replace all the terminal blocks on any FC Series signal conditioner according to the following table:

FC Series Terminal Blocks		
FC Series Model	Terminal Block Replacement Part Number	Package Includes
FC-11	FC-5MM	(2) 2-pole blocks (2) 3-pole blocks (1) 4-pole blocks
FC-33		
FC-R1		
FC-T1		
FC-ISO-C	FC-35MM	(6) 2-pole blocks (2) 3-pole blocks (2) 4-pole blocks (1) 5-pole blocks (1) 6-pole blocks (2) 8-pole blocks
FC-ISO-D		
FC-B34		
FC-35B		
FC-P3		
FC-3RLY2		
FC-3RLY4		

Note: Depending on the model, some terminal blocks in the package may be unused.

Universal Signal Conditioners				
Part No.	Description	Rated Torque (N·m)	Weight (Lbs)	Price
FC-5MM	Terminal block, replacement, 5mm. Package of 5. For use with FC Series signal conditioners.	0.5	0.1	
FC-35MM	Terminal block, replacement, 3.5mm. Package of 14. For use with FC Series signal conditioners.	0.2	0.1	