

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

Product Guide

AUTOMATIONDIRECT.com

Description:

The FC-35B is a 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.

3505 HUTCHINSON ROAD
CUMMING, GA 30040-5860

Version: Rev. D
March, 2020

Specifications

Input Specifications

Input Ranges	0-5V, 0-10V, 0-20 mA, 4-20 mA (DIP Switch Selectable/Invertable)
Input Impedance	410KΩ voltage input, 250Ω current input
Protection Type, Component	Polarity Protection Diode
External DC Power Required	24VDC ±10%, 40 mA, Class 2
User Calibration Range	OFFSET (zero): 0-20% (e.g. 0-1.0V / 5V mode) SPAN (full-scale): 80-102% (e.g. 4.0 - 5.1V / 5V mode)

Output Specifications

Output Ranges	±50mV, ±100mV, ±5V, ±10V, ±15V
Load Impedance	2.5KΩ minimum on ±50mV and ±100mV Range 2KΩ minimum on ±5V, ±10V and ±15V Range
Sample Duration Time	10 ms
Maximum Inaccuracy	0.1% FSO @ 25°C (1.0% 50 mV / 100mV)
Accuracy vs. Temperature	±60 PPM of Full Scale/ °C Maximum
Output Current	±50mV / ±100mV @ 2.5 mA max ±5V, ±10V, ±15V @ 7.5 mA max

Terminal Block Specifications

Field Wiring	Removable Screw Type Terminal Block
Number of Positions	2 (Dinkle: EC350V-02P), 3 (Dinkle: EC350V-03P), 6 (Dinkle: EC350V-06P)
Wire Range	28-14 AWG solid or stranded conductor; wire strip length 1/4" (6-7mm)
Screw Torque	1.7 inch-pounds (0.19 Nm)

Specifications (continued)

General Specifications

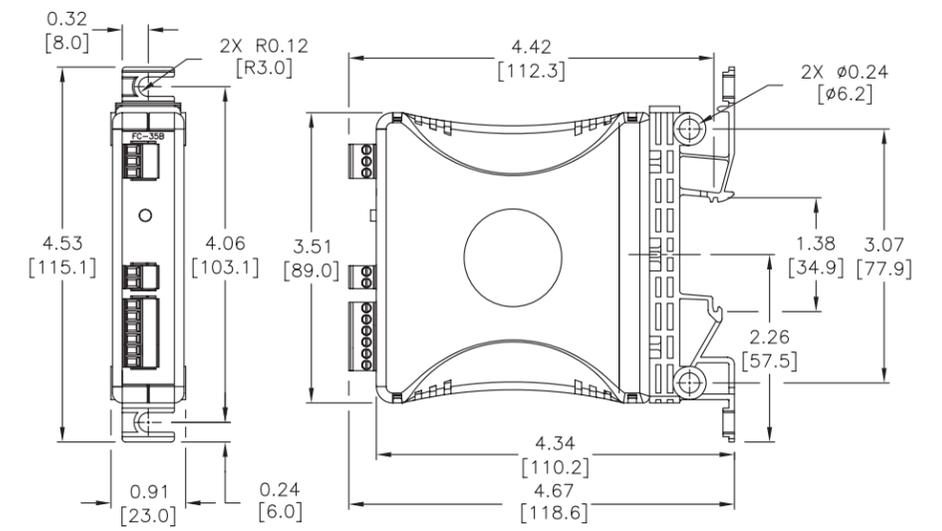
Surrounding Air Temperature	0 to 60°C (32 to 140°F) IEC 60068-2-14 (Test Nb, Thermal Shock)
Storage Temperature	-20 to 70°C (-4 to 158°F) IEC 60068-2-1 (Test Ab, Cold) IEC 60068-2-2 (Test Bb, Dry Heat) IEC 60068-2-14 (Test Na, Thermal Shock)
Humidity	5 to 95% (non-condensing) IEC 60068-2-30 (Test Db, Damp Heat)
Environmental Air	No corrosive gases permitted (EN61131-2 pollution degree 1)
Vibration	MIL STD 810C 514.2 IEC 60068-2-6 (Test Fc)
Shock	MIL STD 810C 516.2 IEC 60068-2-27 (Test Ea)
Insulation Resistance	>10M @ 500VDC
Noise Immunity	NEMA ICS3-304 IEC 61000-4-2 (ESD) Impulse 1000V @ 1μS pulse IEC 61000-4-4 (FTB) RFI, (145 MHz, 440 MHz 5W @ 15 cm) IEC 61000-4-3 (RFI)
Weight	0.3lbs
Isolation	1000VDC Power to Input 1800VDC Power to Output 1800VDC Input to Output *applied for 1 second
Agency Approvals	UL508*, File Number: E157382, CE

* In order to comply with UL508 Class 2 standards the supplied power must be less than 26 VDC and fused at a maximum of 3 amps.

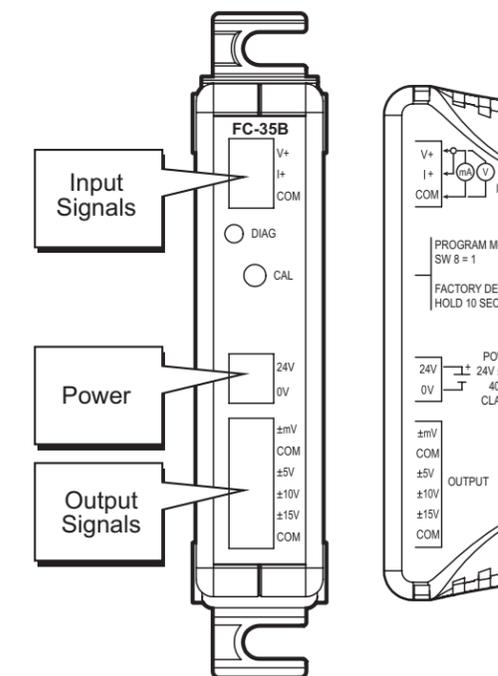


Scan or click the QR code for Click on the above thumbnail or go to <https://www.automationdirect.com/VID-PS-0003> for a short introductory video for the FC Series Signal Conditioners.

Dimensions inches [mm]



Wiring Connections



Input Terminal Block

Faceplate Label	Description
V+	Voltage In
I+	Current In
COM	Common

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

External Power Terminal Block

Faceplate Label	Description
24 V	24 VDC ±10% (Class 2)
0V	0V

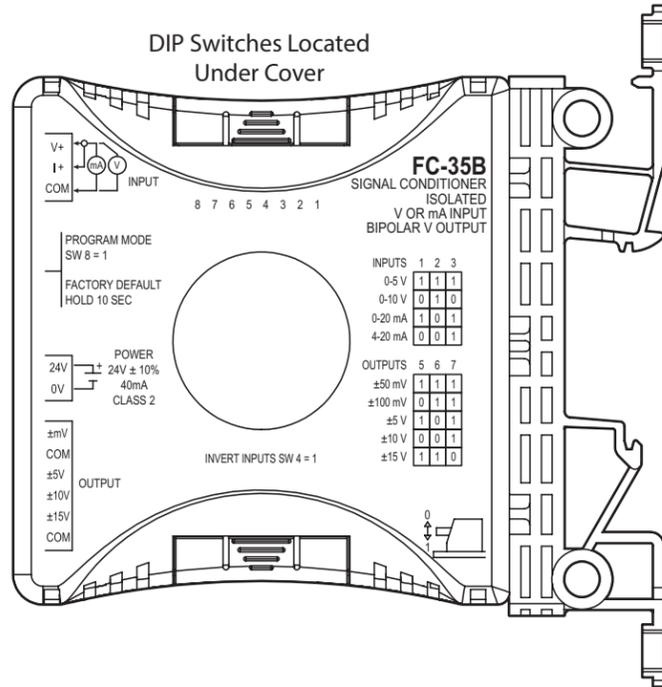
Output Terminal Block

Faceplate Label	Description
±mV	±50 mV or ±100 mV Output
COM	COM Connection (used with mV signals)
±5V	±5V Output
±10V	±10 V Output
±15V	±15 V Output
COM	COM Connection (used with non-mV signals)

Switch/LED Labels

Faceplate Label	Description
DIAG	Diagnostic LED flashing indication
CAL	Push button switch input to initiate calibration, etc.

DIP Switch Settings



DIP Switch - 1, 2, 3

Input Ranges	1	2	3
0-5 V	1	1	1
0-10 V	0	1	0
0-20 mA	1	0	1
4-20 mA	0	0	1

DIP Switch - 5, 6, 7

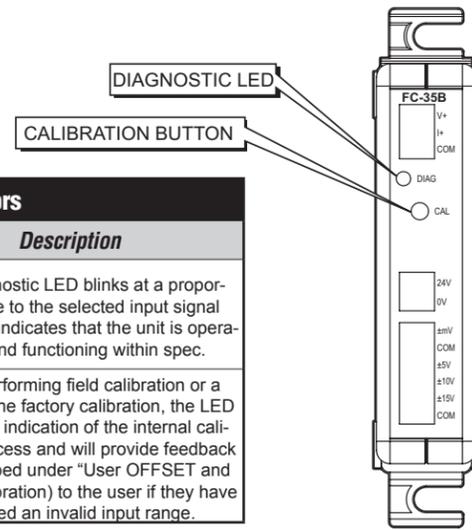
Output Ranges	5	6	7
±50mV	1	1	1
±100mV	0	1	1
±5V	1	0	1
±10V	0	0	1
±15V	1	1	0

DIP Switch - 4, 8

Input Connection Options	4	8
Invert Acting	1	0
Calibration Enable	0	1

Status Indicators

Indicator	Status	Description
Diagnostic LED	Normal Operation	The Diagnostic LED blinks at a proportional rate to the selected input signal level. This indicates that the unit is operational and functioning within spec.
	Calibration	When performing field calibration or a restore to the factory calibration, the LED is used for indication of the internal calibration process and will provide feedback (as described under "User OFFSET and SPAN Calibration") to the user if they have selected an invalid input range.



User OFFSET and SPAN Calibration

Application adjustments to calibrate the input signal level:

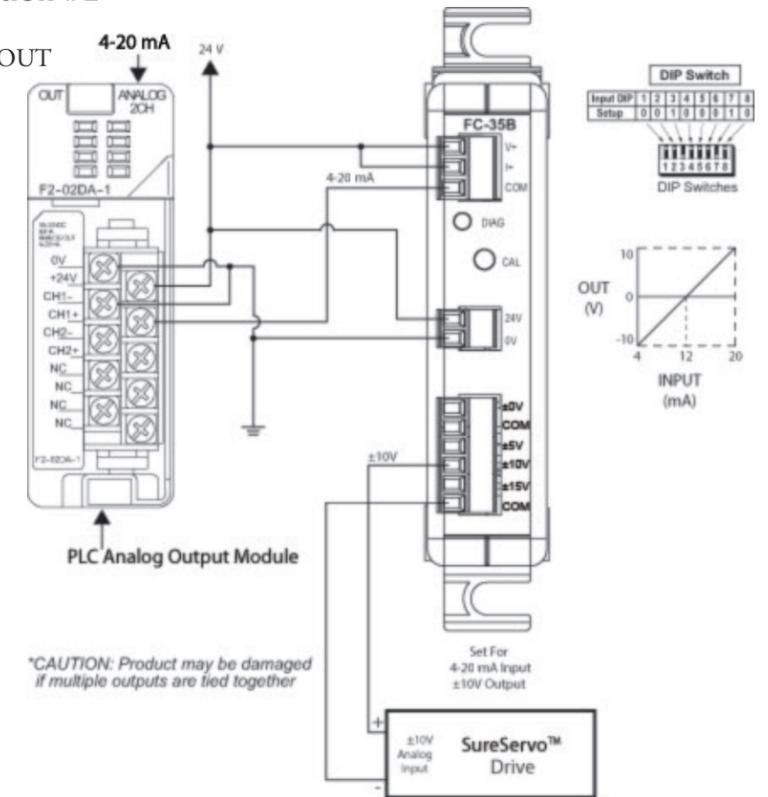
- 1) Select the input and output signal modes with the dip switches.
- 2) Connect the 24V power to the signal conditioner
- 3) Apply the minimum signal (4mA) to the input of the signal conditioner.
- 4) Move the CAL EN dip switch to the ON position. This can be done while the unit is powered.
- 5) Press the CAL button for 3 seconds. The DIAG LED will turn ON Steady.
- 6) Release the CAL button. If the DIAG LED turns OFF before you release the button, then you held it too long. Press the CAL button again and release at 3 seconds, but before the DIAG LED turns OFF.
- 7) If the minimum input signal is within range, the DIAG LED will flash twice, pause, then resume flashing at a normal rate. This indicates that the input signal was accepted and is in range.
- 8) Turn the CAL EN dip switch OFF
- 9) Apply the max signal to the Input of the signal conditioner.
- 10) Move the CAL EN dip switch to the ON position.
- 11) Press the CAL Button for 3 seconds. The DIAG LED will turn ON Steady.
- 12) Release the CAL button at 3 seconds, but before the DIAG LED turns OFF.
- 13) If the maximum input is within range, the DIAG LED will flash 2-3 times, pause for a bit, then resume flashing at a normal rate. If the DIAG LED flashes rapidly several times, then the input signal was not within range.
14. Turn the CAL EN dipswitch off

Restore Factory Calibration

- 1) Move switch 8 "CAL EN" to ON, press and hold CAL pushbutton. Once the push button is held and released after 10 seconds, the LED will flash several times indicating a valid restore has taken place. The unit has now been returned to factory calibration. If the push button is released before the 10 seconds has expired, the press will be ignored and go back to regular signal processing based on previous calibration coefficients.
- 2) Move Switch 8 "CAL EN" to OFF.
- 3) Start conversion with no power cycle required.

Typical Application #1

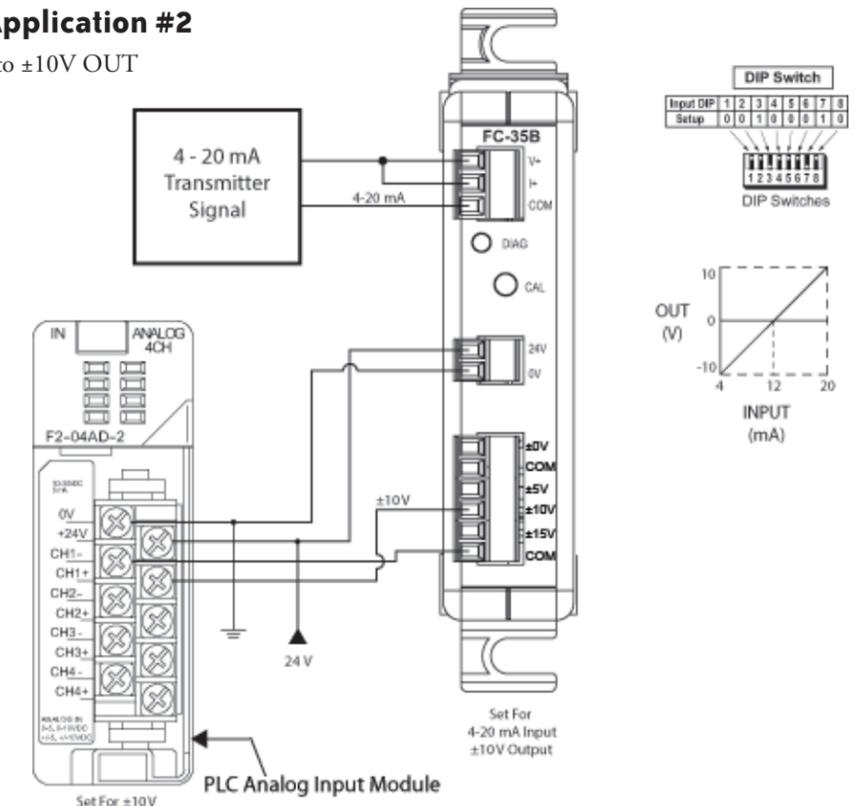
DC Motor Drive
4-20 mA IN to ±10 V OUT



*CAUTION: Product may be damaged if multiple outputs are tied together

Typical Application #2

4-20 mA IN to ±10V OUT



*CAUTION: Product may be damaged if multiple outputs are tied together