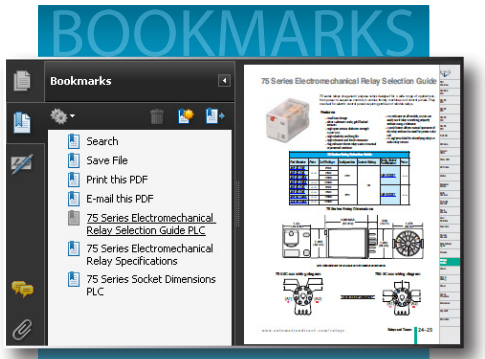
AUTOMATIONDIRECT.com

Process Control

SOLO®



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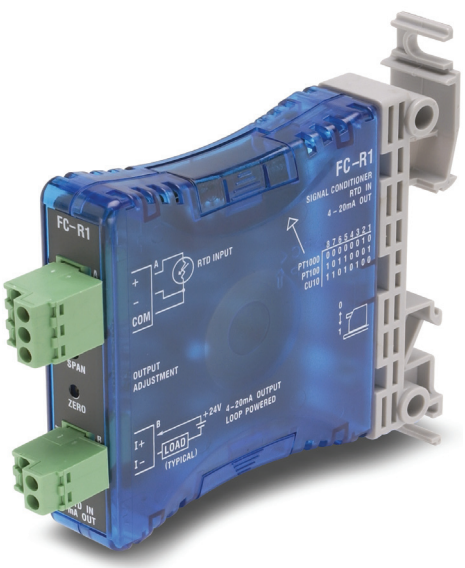


SOLO Process and Temperature Controllers

Choose from 22 models (starting under $100)

What is a temperature controller?

A temperature controller is simply a controller that takes an input signal from a temperature device, such as a thermo-couple RTD, or analog signal, and maintains a setpoint using an output signal. Temperature controllers are powerful control tools, but offer very simple operation. SOLO controllers offer four types of control modes: PID, ON/OFF, Ramp/Soak, and manual.

With the SOLO® series, you get:

- **Precise control**
- **Flexible connectivity**
- **The right size to fit your application**
- **An unbeatable price that includes award-winning technical support**
- **AC powered or 24VDC models**

Universal inputs

SOLO controllers support 13 types of temperature inputs and 5 types of analog inputs – all standard on each unit.

With the industry's best installation documentation, just follow a few simple steps and your process will be up and running in no time.

Simple navigation with pushbutton programming, or you can download the FREE software from our Web site for programming and monitoring the SOLO controllers.

Select the SOLO® controller that best fits your application

SOLO brand controllers offer you outstanding features at unbeatable prices:

- 4 standard DIN sizes with a dual 4-digit, 7-segment displays for Process Variable and Setpoint
- Dual output control for heating and cooling
- Built-in PID with Autotuning (AT) function for fast and easy startups
- Universal inputs, including T/C, RTD, mA, mV and DC voltage, are standard on all controllers
- Flexible control modes to fit your process include PID, Ramp/Soak, On/Off and Manual
- IP65 environmental rating (when mounted in appropriate enclosures)

Features	1/32 DIN SL4824	1/16 DIN SL4848	1/8 DIN SL4896	1/4 DIN SL9696
Display of PV & SP	Yes	Yes	Yes	Yes
RS-485, MODBUS RTU/ASCII	Yes	Yes	Yes	Yes
Two Separate Event Inputs	No	No	Yes	Yes
Dual Outputs for Heating & Cooling Loops	Yes	Yes	Yes	Yes
Available Alarms Groups	1	3	3	3
Auto Tuning Capability	Yes	Yes	Yes	Yes
Universal Inputs (T/C, RTD, mV & mA)	Yes	Yes	Yes	Yes
	go to page PS-9	go to page PS-10	go to page PS-11	go to page PS-12

Simple Configuration and Control

FREE configuration and monitoring software

That's right, FREE! Configuration and monitoring software (SL-SOFT, downloadable from our Web site) allows you to configure each controller with ease and gives you data analysis capabilities for up to 10 units simultaneously.

FREE software that's easy-to-use and intuitive, with a GUI that makes setting up the SOLO series of temperature controllers a breeze.
(Download at http://support.automationdirect.com/downloads.html)

Process control setup made easy

All units support RS-485 serial communications (up to 38.4K bps) , which allows you to use the free configuration software [SL-SOFT] to configure and monitor multiple SOLO controllers using Modbus RTU or Modbus ASCII protocols. For even simpler setup, the controller can be configured manually with the user-friendly keypad on each unit.

Collect and act on data

Using RS-485 communications, the SL-SOFT utility provides the ability to monitor and log historical data, using the built-in trending graph, from up to ten devices and save it to a .txt file.The RS-485 port can also provide connection to any HMI, PC or PLC supporting industry-standard Modbus RTU or Modbus ASCII protocol. This allows you to collect, monitor and have your application react to data being read from the SOLO controllers.

PLC Connection

Use a PLC to collect data from the controllers and then have your program trigger events based on the values

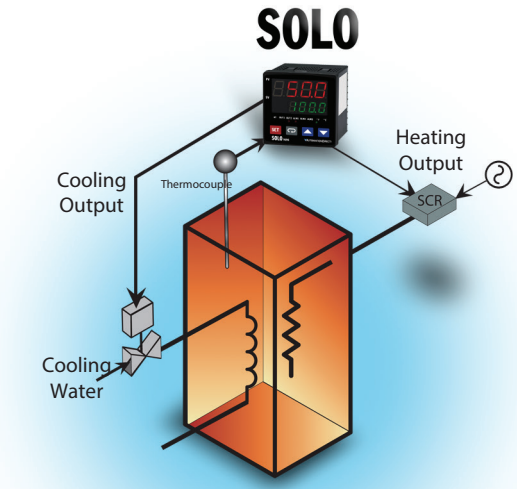
HMI Connection

Use an operator interface to collect data and monitor your process.

PC Connection

Use a PC to configure and monitor your SOLO controllers with SL-SOFT. Use the trending graph to monitor and log historical data.

SOLO Process and Temperature Controllers



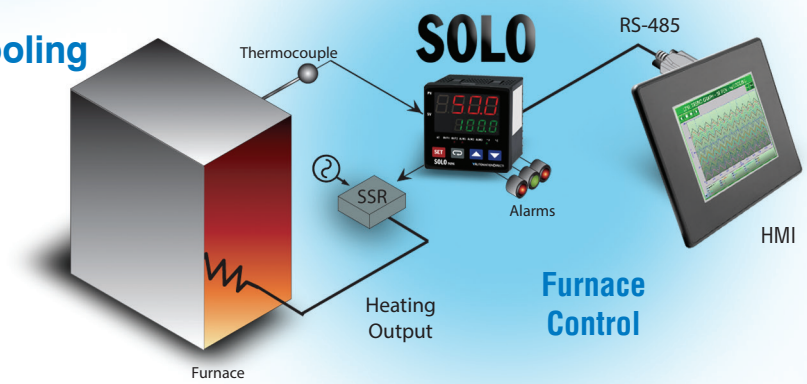
Heating/Cooling

Where can you put SOLO to work?

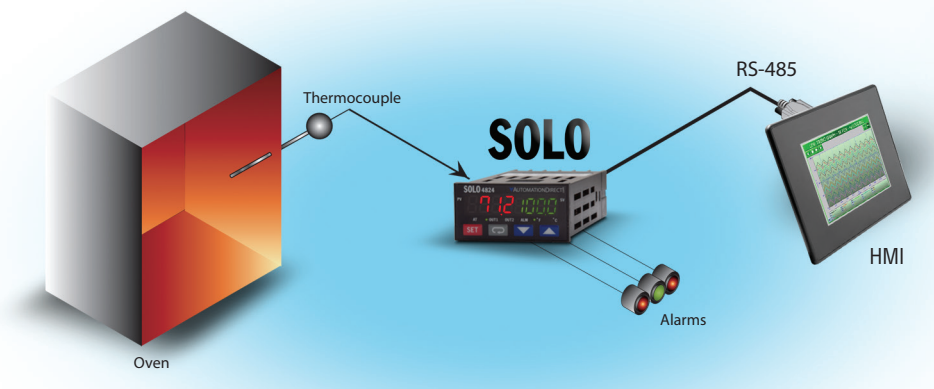
Process and temperature controllers are powerful process control tools, but they offer very simple operation. SOLO controllers can be used in a variety of applications, either as a stand-alone monitor or controller, or in conjunction with a PLC or other intelligent device.

For example, SOLO can perform simple monitoring (figure at bottom) and alert an operator to abnormal conditions via alarm LEDs on the unit or via a discrete relay alarm output.Data can also be collected and stored by an HMI such as C-more. For stand-alone control loops, SOLO can use a single output (such as furnace control shown below); the dual-output feature makes heating/cooling control straightforward (example at left).

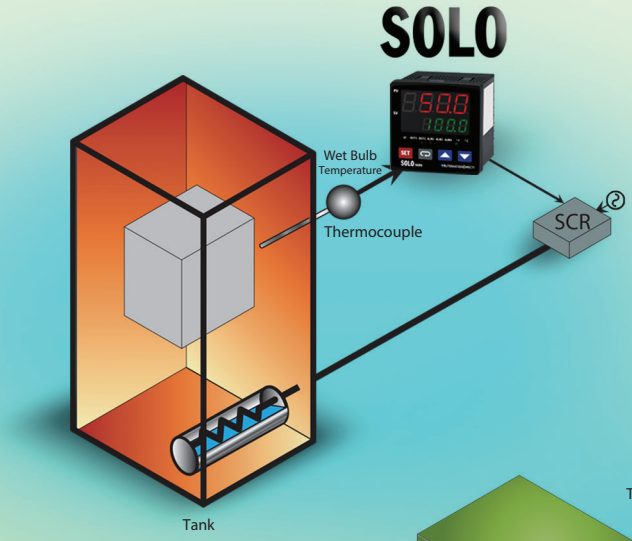
Industrial Heating/Cooling



Furnace Control



Oven Temperature Monitoring



Environmental Control

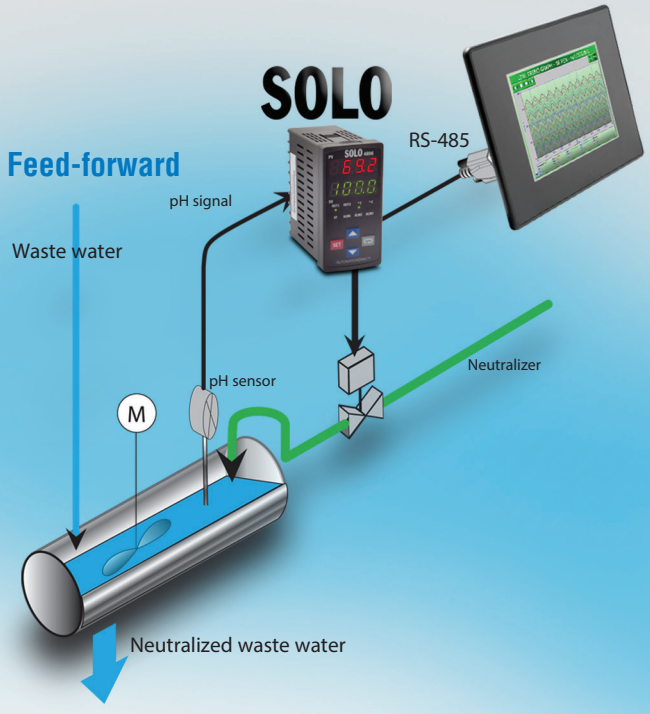
In this example, SOLO performs control using either configured setpoints or external setpoints received remotely via an operator interface. An event input is used to signal the controller which parameters to use.

Humidity Control

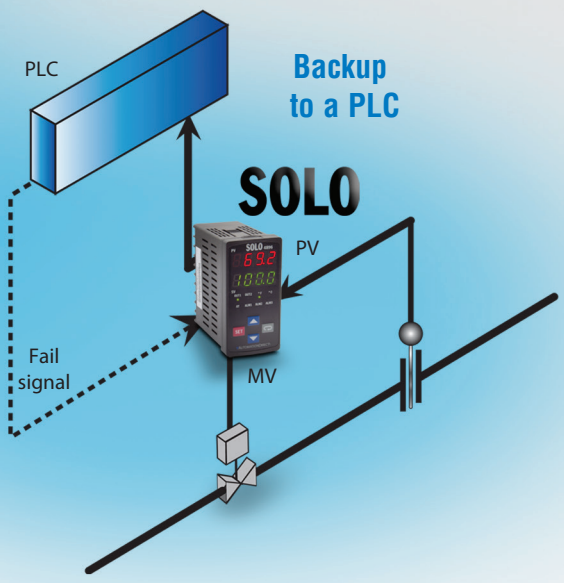
External Setpoints

Process Control

Feed-forward



Backup to a PLC



SOLO Temperature Controllers

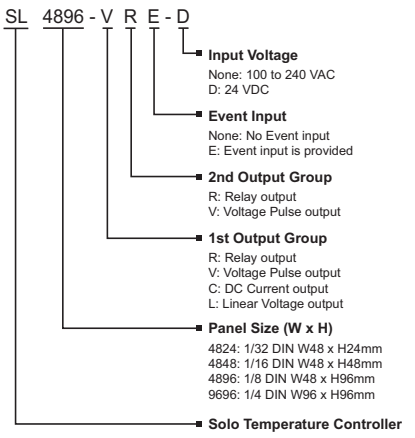
Overview

AutomationDirect's SOLO series includes single-loop dual-output temperature controllers that can control both heating and cooling simultaneously. There are four types of control modes: PID, ON/OFF, Ramp/Soak and Manual. Depending upon the model of controller, the available outputs include relay, voltage pulse, current, and linear voltage. There are up to three alarm outputs available. (The SL4824 series supports only one alarm output.) Select from seventeen alarm types in the initial setting mode. SOLO controllers can accept various types of thermocouple, RTD, or analog inputs. SOLO controllers have a built-in RS-485 interface using Modbus slave (ASCII or RTU) communication protocol.

Features

- 1/32 DIN, 1/16 DIN, 1/8 DIN, or 1/4 DIN panel size
- 2 line x 4 character 7-segment LED display for Process value (PV): Red color, and Set Point (SV): Green color
- PID control with Autotune (AT) function
- Accepts eleven types of thermocouples, two types of Pt100 RTD temperature sensors, and DC mA, mV, and Volt signals
- Selectable between°F and °C for thermocouple or RTD inputs.
- 0°C to 50 °C operating temperature range
- Up to three alarm groups, each with seventeen available alarm types.
- Four possible control output options depending on model; Relay, Voltage Pulse, Current, and Linear Voltage.
- Baud rates up to 38.4K bps.
- Thermocouple and Platinum RTD sample rates at 400 ms per scan
- Analog sample rate at 150 ms per scan
- 64 levels of Ramp / Soak control
- Two optional Event Inputs available in 1/8 DIN and 1/4 DIN sizes
- UL, CUL, and CE agency approvals

SOLO Controller Part Number Key



Specifications	
Input Power Requirements	100 to 240 VAC 50 / 60 Hz or 24 VDC
Operation Voltage Range	AC: 85 VAC to 264 VAC or DC: 21.6 VDC to 26.4 VDC
Power Consumption	5 VA Max
Memory Protection	EEPROM 4K bit, number of writes 100,000
Control Mode	PID, ON/OFF, Ramp / Soak control or Manual
Input Accuracy	Less than ± 0.2% full scale (except thermocouple R, S, & B types) Max ± 3° (thermocouple R, S, & B types)
Vibration Resistance	10 to 55 Hz, 10 m/s^2 for 10 min, each in X, Y and Z directions
Shock Resistance	Max. 300 m/s^2, 3 times in each 3 axes, 6 directions
Ambient Temperature Range	32°F to 122°F (0°C to 50°C)
Storage Temperature Range	-4°F to 149°F (-20°C to 65°C)
Altitude	2000m or less
Relative Humidity	35% to 80% (non-condensing)
RS-485 Communication	Modbus slave ASCII / RTU protocol
Transmission Speed	2400, 4800, 9600, 19.2K, 38.4K bps
IP Rating	IP65: Complete protection against dust and low pressure spraying water from all directions. (inside suitable enclosure)
Agency Approvals	UL, CUL, CE (UL file number E311366)
Pollution Degree	Degree 2 - Normally, only non-conductive pollution occurs. Temporary conductivity caused by condensation is to be expected
Input Types	
• Thermocouple*	K, J, T, E, N, R, S, B, L, U, TXK (400 ms per scan)
• Platinum RTD	3-wire Pt100, JPt100 (400 ms per scan)
• Analog	0-50 mV, 0-5V, 0-10V, 0-20 mA, 4-20 mA (150 ms per scan)**
Control Output Options	
• Relay (R)	SL4824: SPST max. resistive load 3A @ 250 VAC SL4848: SPST max. resistive load 5A @ 250 VAC SL4896, SL9696: SPDT max. resistive load 5A @ 250 VAC SL4824: SPST max. resistive load 3A @ 30 VDC SL4848: SPST max. resistive load 5A @ 30 VDC SL4896, SL9696: SPDT max. resistive load 5A @ 30 VDC
• Voltage Pulse (V)	DC 14V Max, output current 40mA Max
• Current (C)	DC 4-20 mA output (Load resistance: Max 600 Ω)
• Linear Voltage (L)	DC 0-10V (Load resistance Min 1KΩ)

Note: Use only ungrounded thermocouples.
****** Analog input impedance: 1.8M ohm***

SOLO Controller Selection Guide

SOLO Temperature Controller Selection Guide										
Series		**Part Number**	**Price**	**Dimensions**	**Input Voltage**	**Control Output 1**	**Control Output 2**	**Event Inputs**	**Alarm Outputs**	**RS-485 Port**
SL4824		SL4824-RR	$90.00	W - 48mm H - 24mm D - 103mm (1/32 DIN)	100 - 240 VAC	Relay - 3A, SPST	Relay - 3A, SPST	N/A	Control Output 2 can be used as Alarm 1	Yes
		SL4824-VR			100 - 240 VAC	Voltage Pulse				
		SL4824-CR			100 - 240 VAC	Current				
		SL4824-LR			100 - 240 VAC	Linear Voltage				
		SL4824-RR-D			24 VDC	Relay - 3A, SPST				
		SL4824-VR-D			24 VDC	Voltage Pulse				
		SL4824-CR-D			24 VDC	Current				
SL4848		SL4848-RR	$100.00	W - 48mm H - 48mm D - 90mm (1/16 DIN)	100 - 240 VAC	Relay - 5A, SPST	Relay - 5A, SPST		Alarm 1 and Alarm 2 are 3A, SPST Relays with a shared common. Control Output 2 can be used as Alarm 3	
		SL4848-VR			100 - 240 VAC	Voltage Pulse				
		SL4848-CR			100 - 240 VAC	Current				
		SL4848-LR			100 - 240 VAC	Linear Voltage				
		SL4848-RR-D			24 VDC	Relay - 5A, SPST				
		SL4848-VR-D			24 VDC	Voltage Pulse				
		SL4848-CR-D			24 VDC	Current				
		SL4848-VV			100 - 240 VAC	Voltage Pulse	Voltage Pulse		Alarm 1 and Alarm 2 are 3A, SPST Relays with a shared common.	
		SL4848-CV			100 - 240 VAC	Current				
		SL4848-LV			100 - 240 VAC	Linear Voltage				
SL4896		SL4896-RRE	$110.00	W - 48mm H - 96mm D - 92mm (1/8 DIN)	100 - 240 VAC	Relay - 5A, SPDT	Relay - 5A, SPDT	Event 1 / Event 2	Alarm 1 and Alarm 2 are 3A, SPST Relays. Control Output 2 can be used as Alarm 3	
		SL4896-VRE			100 - 240 VAC	Voltage Pulse				
		SL4896-CRE			100 - 240 VAC	Current				
		SL4896-LRE			100 - 240 VAC	Linear Voltage				
		SL4896-RRE-D			24 VDC	Relay - 5A, SPDT				
SL9696		SL9696-RRE	$130.00	W - 96mm H - 96mm D - 95mm (1/4 DIN)	100 - 240 VAC	Relay - 5A, SPDT				
		SL9696-VRE			100 - 240 VAC	Voltage Pulse				
		SL9696-CRE			100 - 240 VAC	Current				
		SL9696-LRE			100 - 240 VAC	Linear Voltage				
		SL9696-RRE-D			24 VDC	Relay - 5A, SPDT				
		SL9696-VVE			100 - 240 VAC	Voltage Pulse	Voltage Pulse		Alarm 1 and Alarm 2 are 3A, SPST Relays	
		SL9696-CVE			100 - 240 VAC	Current				
		SL9696-LVE			100 - 240 VAC	Linear Voltage				

***Notes: EVENT1 input is a normally open contact input that controls the output(s) of the controller. All controller outputs are disabled when the contact is closed.**

EVENT2 input is a normally open contact input that switches the control parameter group between two control parameter groups based on the state of EVENT2. If the contact is open, the primary control parameter group is used for all parameters and outputs. If the contact is closed, the secondary control parameter group is used for all parameters and outputs. Each temperature setting value has individual control parameters.

SOLO Controller Selection Guide, continued

Available Input Types

All SOLO temperature controllers support these input types.

Thermocouple Type and Range*	
Input Temperature Sensor Type	*Temperature Range*
Thermocouple TXK type	-328 to 1472°F (-200 to 800°C)
Thermocouple U type	-328 to 932°F (-200 to 500°C)
Thermocouple L type	-328 to 1562°F (-200 to 850°C)
Thermocouple B type	212 to 3272°F (100 to 1800°C)
Thermocouple S type	32 to 3092°F (0 to 1700°C)
Thermocouple R type	32 to 3092°F (0 to 1700°C)
Thermocouple N type	-328 to 2372°F (-200 to 1300°C)
Thermocouple E type	32 to 1112°F (0 to 600°C)
Thermocouple T type	-328 to 752°F (-200 to 400°C)
Thermocouple J type	-148 to 2192°F (-100 to 1200°C)
Thermocouple K type	-328 to 2372°F (-200 to 1300°C)
**Note: Use only ungrounded thermocouples.*	

RTD Type and Range	
Input Temperature Sensor Type	*Temperature Range*
Platinum Resistance (Pt100)	-328 to 1112°F (-200 to 600°C)
Platinum Resistance (JPt100)	-4 to 752°F (-20 to 400°C)

Voltage Input Type and Input Range	
Voltage Input Type	*Engineering Range*
0~50mV Analog Input	-999 to 9999
0V~10V Analog Input	-999 to 9999
0V~5V Analog Input	-999 to 9999

Current Input Type and Range	
Current Input Type	*Engineering Range*
4~20mA Analog Input	-999 to 9999
0~20mA Analog Input	-999 to 9999

User Configurable Output Options	
Control Output 1	*Control Output 2*
Heating	(Alarm 1)
Cooling	(Alarm 1)
Heating	Cooling
Cooling	Heating

Mounting Clips			
Series	*Part Number*	*Pkg. Qty.*	*Price*
SL4824	SL-CLP-1	8	$12.00
SL4848	SL-CLP-2	20	$9.00
SL4896			
SL9696			

SOLO Temperature Controllers 1/32 DIN

SL4824 Series $90.00

Features

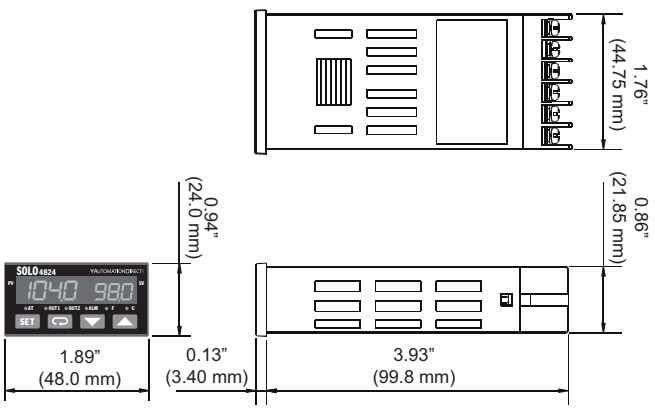
- 1/32 DIN panel size
- PID with Autotune
- Thermocouple, RTD, mA, mV and voltage inputs
- Output #1: Relay, Voltage Pulse, Current or Linear Voltage
- Output #2; Relay or Alarm Relay
- RS-485 communications port
- UL, CUL and CE approvals

Note: A set of mounting clips and a 249 Ω resistor are included.

Extra mounting clips are available (Part Number: SL-CLP-1, Qty: 20 per package)

Output Specifications				
Part Number	***Price***	***Input Voltage***	***Output #1***	***Output #2 / Alarm 1****
SL4824-RR	$90.00	110 - 240 VAC	Relay - SPST	Relay - SPST
SL4824-VR		110 - 240 VAC	Voltage Pulse	Relay - SPST
SL4824-CR		110 - 240 VAC	Current	Relay - SPST
SL4824-LR		110 - 240 VAC	Linear Voltage	Relay - SPST
SL4824-RR-D		24 VDC	Relay - SPST	Relay - SPST
SL4824-VR-D		24 VDC	Voltage Pulse	Relay - SPST
SL4824-CR-D		24 VDC	Current	Relay - SPST
Output #2 can be configured as control output #2 or as Alarm 1 output				

Dimensions



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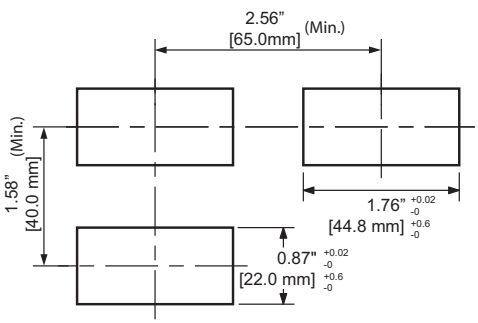


For wiring diagrams go to www.automationdirect.com's Documentation section.

SOLO Temperature Controllers 1/16 DIN

SL4848 Series $100.00

Features

- 1/16 DIN panel size
- PID with Autotune
- Thermocouple, RTD, mA, mV and voltage inputs
- Output #1: Relay, Voltage Pulse, Current or Linear Voltage
- Output #2: Relay or Voltage Pulse for control or Alarm output
- RS-485 communications port
- UL, CUL and CE approvals

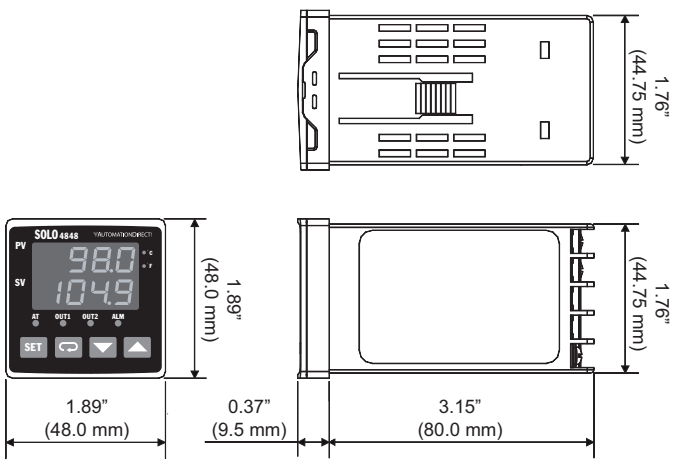
Note: A set of mounting clips and a 249 Ω resistor are included.

Extra mounting clips are available (Part Number: SL-CLP-2, Qty: 20 per package)

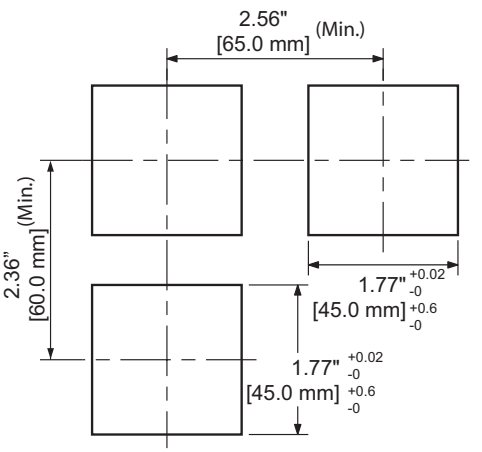
Output Specifications						
Part Number	***Price***	***Input Voltage***	***Output #1***	***Output #2 / Alarm #3****	***Alarm #1****	***Alarm #2****
SL4848-RR	$100.00	110 - 240 VAC	Relay - SPST	Relay - SPST	Relay - SPST	Relay - SPST
SL4848-VR		110 - 240 VAC	Voltage Pulse	Relay - SPST	Relay - SPST	Relay - SPST
SL4848-CR		110 - 240 VAC	Current	Relay - SPST	Relay - SPST	Relay - SPST
SL4848-LR		110 - 240 VAC	Linear Voltage	Relay - SPST	Relay - SPST	Relay - SPST
SL4848-RR-D		24 VDC	Relay - SPST	Relay - SPST	Relay - SPST	Relay - SPST
SL4848-VR-D		24 VDC	Voltage Pulse	Relay - SPST	Relay - SPST	Relay - SPST
SL4848-CR-D		24 VDC	Current	Relay - SPST	Relay - SPST	Relay - SPST
SL4848-VV		110 - 240 VAC	Voltage Pulse	Voltage Pulse	Relay - SPST	Relay - SPST
SL4848-CV		110 - 240 VAC	Current	Voltage Pulse	Relay - SPST	Relay - SPST
SL4848-LV		110 - 240 VAC	Linear Voltage	Voltage Pulse	Relay - SPST	Relay - SPST

****Output #2 can be configured as control output #2 or as Alarm #3***
***** Alarm #1 and Alarm #2 have a shared common***

Dimensions



Minimum Cutout and Spacing



For wiring diagrams go to www.automationdirect.com's Documentation section.

SOLO Temperature Controllers 1/8 DIN

SL4896 Series $110.00

Features

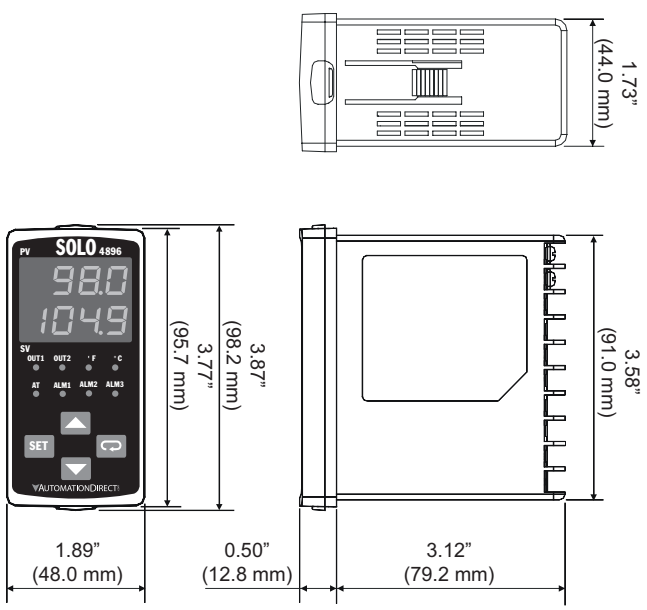
- 1/8 DIN panel size
- PID with Autotune
- Thermocouple, RTD, mA, mV and voltage inputs
- 2 event inputs
- Output #1: Relay, Voltage Pulse, Current or Linear Voltage
- Output #2: Relay or Alarm Relay
- RS-485 communications port
- UL, CUL and CE approvals

Note: A set of mounting clips and a 249 Ω resistor are included.

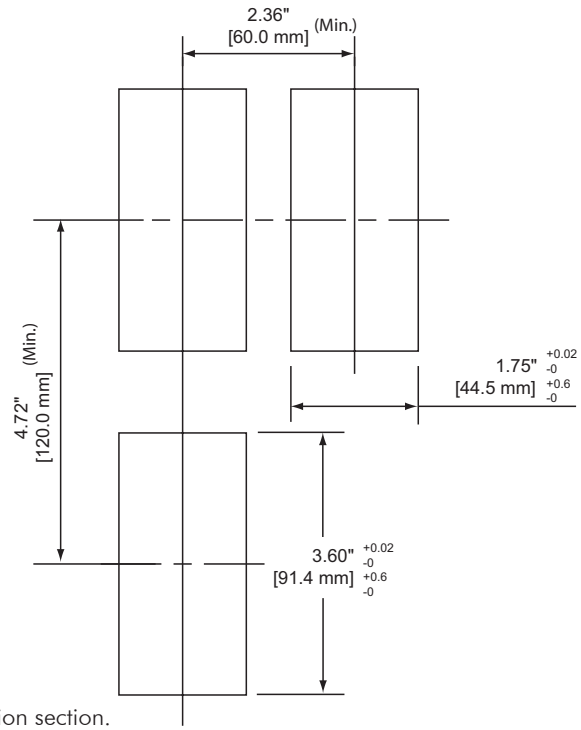
Extra mounting clips are available (Part Number: SL-CLP-2, Qty: 20 per package)

Output Specifications						
Part Number	***Price***	***Input Voltage***	***Output #1***	***Output #2 / Alarm #3****	***Alarm #1***	***Alarm #2***
SL4896-RRE	$110.00	110 - 240 VAC	Relay - SPDT	Relay - SPDT	Relay - SPST	Relay - SPST
SL4896-VRE		110 - 240 VAC	Voltage Pulse	Relay - SPDT	Relay - SPST	Relay - SPST
SL4896-CRE		110 - 240 VAC	Current	Relay - SPDT	Relay - SPST	Relay - SPST
SL4896-LRE		110 - 240 VAC	Linear Voltage	Relay - SPDT	Relay - SPST	Relay - SPST
SL4896-RRE-D		24 VDC	Relay - SPDT	Relay - SPDT	Relay - SPST	Relay - SPST
Output #2 can be configured as control output #2 or as Alarm #3						

Dimensions



Minimum Cutout and Spacing



For wiring diagrams go to www.automationdirect.com's Documentation section.

SOLO Temperature Controllers 1/4 DIN

SL9696 Series $130.00

Features

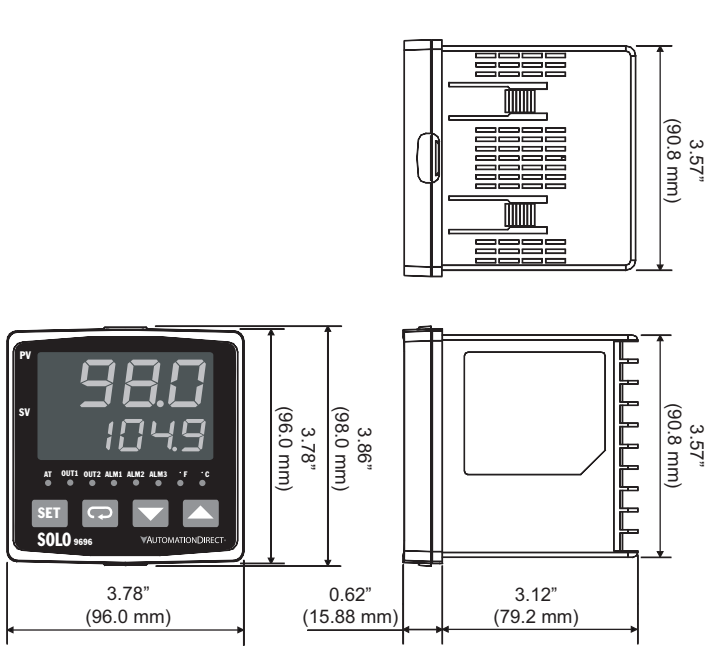
- 1/4 DIN panel size
- PID with Autotune
- Thermocouple, RTD, mA, mV and voltage inputs.
- 2 event inputs
- Output #1: Relay, Voltage Pulse, Current or Linear Voltage
- Output #2: Relay or Voltage Pulse for control or Alarm output
- RS-485 communications port
- UL, CUL and CE approvals

Note: A set of mounting clips and a 249 Ω resistor are included.

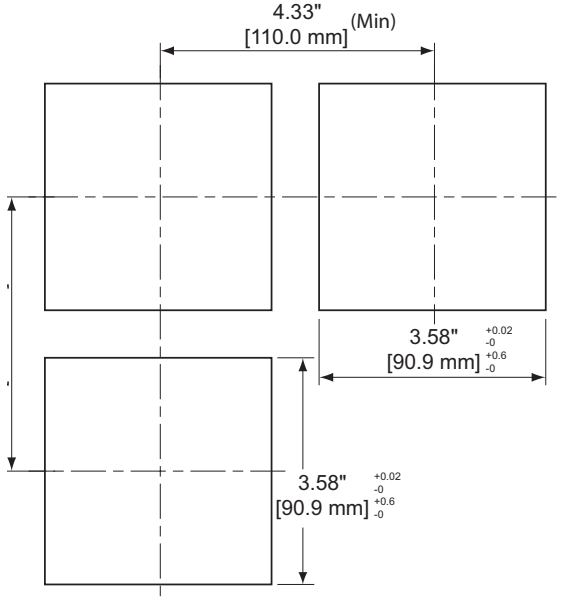
Extra mounting clips are available (Part Number: SL-CLP-2, Qty: 20 per package)

Output Specifications						
Part Number	***Price***	***Input Voltage***	***Output #1***	***Output #2 / Alarm #3****	***Alarm #1***	***Alarm #2***
SL9696-RRE	$130.00	100 - 240 VAC	Relay - SPDT	Relay - SPDT	Relay - SPST	Relay - SPST
SL9696-VRE		100 - 240 VAC	Voltage Pulse	Relay - SPDT	Relay - SPST	Relay - SPST
SL9696-CRE		100 - 240 VAC	Current	Relay - SPDT	Relay - SPST	Relay - SPST
SL9696-LRE		100 - 240 VAC	Linear Voltage	Relay - SPDT	Relay - SPST	Relay - SPST
SL9696-RRE-D		24 VDC	Relay - SPDT	Relay - SPDT	Relay - SPST	Relay - SPST
SL9696-VVE		100 - 240 VAC	Voltage Pulse	Voltage Pulse	Relay - SPST	Relay - SPST
SL9696-CVE		100 - 240 VAC	Current	Voltage Pulse	Relay - SPST	Relay - SPST
SL9696-LVE		100 - 240 VAC	Linear Voltage	Voltage Pulse	Relay - SPST	Relay - SPST
****Output #2 can be configured as control output #2 or as Alarm #3***						

Dimensions



Minimum Cutout and Spacing



For wiring diagrams go to www.automationdirect.com's Documentation section.

www.automationdirect.com/service **#1 Voted Service**

We do not charge for technical support . . . Period.

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Are you tired of calling a local distributor to discover their "product expert" is not in? How about waiting hours for technical service to return a message? Or paying for phone support service only to be placed on hold when you try to use it?

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Want to watch some videos to learn more about our products?

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YOU SAY-

- "As always, your service is stellar and your staff is very friendly and great to work with. Wish the rest of my vendors were as good to work with as AutomationDirect."
- "Your tech support is really excellent - the folks there are very knowledgeable and very willing to help. Please tell them they are doing a way better than average job."
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- "Very good technical support; much, much better than the distributor with whom we have previously worked."
- "Tech was outstanding, great advice on drives and also helped lower the cost of the system. You are my first choice for Automation and Power Transmission products. Keep up the great work."
- "Your presales (tech) folks helped me find the right parts the first time - terrific!"

ProSense® Digital Panel Meters

Digital Panel Meters with simple menu-driven pushbutton configuration

1/32 DIN and 1/8 DIN meter sizes

The ProSense DPM family of digital panel meters includes both 1/32 DIN and 1/8 DIN meter sizes with simple menu-driven pushbutton configuration. A wide variety of input signals can be accepted for process, temperature, load cell, and other applications. Available output options include alarm relays, analog signal retransmission, and sensor excitation voltage. Backed by a 3-year warranty, ProSense digital panel meters offer outstanding features and performance at an incredible price point.

Features

- **Display process variables like temperature. pressure, level, flow, weight, voltage, current, and others**
- **Manually enter scaling values or use the process teaching mode to scale the display for direct or reverse acting linear or non-linear processes**
- **Models are available with up to four relay outputs for high and low level alarm indication, analog signal retransmission output for connection to PLC inputs, and sensor excitation voltage to conveniently power sensors**

DPM1 Series 1/32 DIN

- 48 x 24 mm 1/32 DIN
- 4-digit (-1999 to 9999) red LED display
- Selectable decimal point
- Process (4-20mA, +/-20mA, +/-100mV, +/-10V, +/-20V, +/-200V)
- Temperature (RTD: Pt100 (3-wire); Thermocouple: J, K, T or N; Resolution: 1˚F, 0.1˚F, 1˚C, 0.1˚C)
- AC or DC powered, and loop powered versions
- Models with 2 relay outputs and 0/4-20mA analog output

DPM2 Series 1/8 DIN

- 96 x 48 mm 1/8 DIN
- 4-digit (-9999 to 9999) red LED display
- Selectable decimal point
- Process (+/-10V, +/-200V and +/-20mA)
- Temperature (RTD: Pt100, Pt1000; Thermocouple: J, K, T, N; Resolution: 1˚F, 0.1˚F, 1˚C, 0.1˚C)
- Potentiometer (100 Ohm to 100k Ohm)
- Resistance (999.9 Ohm, 9999 Ohm and 50k Ohm)
- AC or DC powered
- Model available with 2 relay outputs
- Sensor excitation voltage 24V

DPM3 Series 1/8 DIN

- 96 x 48 mm 1/8 DIN
- 5-digit (-19999 to 39999) tri-color (red, green, amber) LED display
- Selectable decimal point
- Process (+/-10V, +/-20mA)
- Temperature (RTD: Pt100; Thermocouple: J, K, T, N; Resolution: 1˚F, 0.1˚F, 1˚C, 0.1˚C)
- Potentiometer
- Load cell (+/-15mV, +/-30mV, +/-150mV)
- AC or DC powered
- Sensor excitation voltage 24V and 10V
- 4-20mA analog output and up to 4 relays on select models

ProSense® Digital Panel Meters

Type DPM1-A-LP

Type DPM1-A-T

Type DPM1-A-2R

Type DPM2

Type DPM3

Description

The ProSense DPM family of digital panel meters includes both 1/32 DIN and 1/8 DIN meter sizes with simple menu-driven pushbutton configuration. A wide variety of input signals can be accepted for process, temperature, load cell, and other applications. Available output options include alarm relays, analog signal retransmission, and sensor excitation voltage. Backed by a 3-year warranty, ProSense digital panel meters offer outstanding features and performance at an incredible price point.

DPM Series Digital Panel Meters Selection Guide

Model	Size	Display	Inputs	Outputs	Power	Price
DPM1-A-LP	1/32 DIN	Red LED*, -1999 to 9999 Selectable decimal point	4-20mA	None	Loop Powered	$65.00
DPM1-A-H			±20mA, ±100mV ±10V, ±20V ±200V		85-265VAC, 50/60 Hz 100-300VDC	$85.00
DPM1-A-L					21-53VAC 50/60 Hz 10.5-70VDC	$85.00
DPM1-T-H		Red LED, -1999 to 9999	RTD Pt100 (3-wire) TC Type J, K, T or N		85-265VAC, 50/60 Hz 100-300VDC	$85.00
DPM1-T-L					21-53VAC 50/60 Hz 10.5-70VDC	$85.00
DPM1-A-2R-H		Red LED, -1999 to 9999 Selectable decimal point	±20mA, ±100mV ±10V, ±60V	2 Relays Form A SPST Normally Open	85-265VAC, 50/60 Hz 100-300VDC	$95.00
DPM1-A-2R-L					21-53VAC 50/60 Hz 10.5-70VDC	$95.00
DPM1-A-A2R-H				2 Relays Form A SPST Normally Open 0/4-20mA	85-265VAC, 50/60 Hz 100-300VDC	$100.00
DPM1-A-A2R-L					21-53VAC 50/60 Hz 10.5-70VDC	$100.00
DPM2-AT-HL	1/8 DIN	Red LED, -9999 to 9999 Selectable decimal point	±20mA, ±10V ±200V, 100-100k Ohm potentiometer, 1k-50k Ohm resistance, RTD Pt100 (3-wire) RTD Pt1000 (4-wire) TC Type J, K, T or N	None	20-265VAC 50/60 Hz 11-265VDC	$100.00
DPM2-AT-2R-HL				2 Relays Form C SPDT		$110.00
DPM3-AT-H		Red, Green, Amber LED -19999 to 39999 Selectable decimal point	±20mA, ±10V RTD Pt100 (3-wire) TC Type J, K, T or N Load Cell ±15mV, ±30mV, ±150mV Potentiometer	None	85-265VAC 50/60Hz 100-300VDC	$125.00
DPM3-AT-2R-H				2 Relays Form C SPDT		$140.00
DPM3-AT-4R-H				4 Relays Form A Normally Open with shared common		$150.00
DPM3-AT-A-H				4-20mA		$140.00
DPM3-AT-A2R-H				2 Relays Form C SPDT 4-20mA		$155.00
DPM3-AT-L				None	22-53VAC 50/60 Hz 10.5-70VDC	$125.00
DPM3-AT-2R-L				2 Relays Form C SPDT		$140.00
DPM3-AT-4R-L				4 Relays Form A Normally Open with shared common		$150.00
DPM3-AT-A-L				4-20mA		$140.00
DPM3-AT-A2R-L				2 Relays Form C SPDT 4-20mA		$140.00

** Illumination based on available loop current and will not be as bright as the powered Digital Panel Meters*

ProSense® Digital Panel Meters - DPM1 Series 1/32 DIN

This model in the ProSense DPM1 series offers a simple, low cost digital display of an analog 4-20mA signal. The 4-digit red LED display is easily scaled into any engineering units from -1999 to 9999 with a selectable decimal point location. Two point direct or reverse acting linear scaling values can be entered manually or by introducing actual sensed process values in Teach mode. The meter is powered from the mA loop and requires no external power supply. The 1/32 DIN housing takes up minimal panel space and the meter face has an IP65 rating. Configuration parameters can be locked out to prevent unauthorized or accidental changes to the meter's operation. ProSense digital panel meters are backed by a 3 year warranty.

Features:

- 48 x 24mm 1/32 DIN
- Simple menu driven pushbutton configuration
- 4 digit (-1999 to 9999) red LED display
- Selectable decimal point
- Process (4-20mA DC)
- Loop powered
- Display scaling or process teaching modes
- Configuration for direct or reverse acting linear processes
- Total configuration lock out
- 3 year warranty

CE

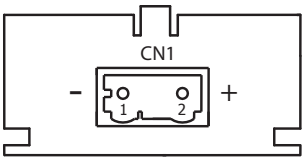
DPM1 Series Panel Meters			
Model	***Description***	***Weight (lbs)***	***Price***
DPM1-A-LP	ProSense digital panel meter, 1/32 DIN, 4-digit red LED, input current signal range(s) of 4 - 20 mA, loop powered.	0.2	$65.00

Technical Specifications		
Input	Current Range	4-20mA
	Current Resolution	±0.01mA
	Impedance	10Ω
Accuracy (@ 23ºC ±5ºC)	Maximum error	±(0.1% of reading ÷3 digits)
	Temperature coefficient	100 ppm/ºC
	Warm-Up time	5 minutes
Power Supply	Loop powered	
Voltage Drop on Input Loop	4-20 mA	<5V
Conversion	Technique	Single slope
	Resolution	16 bits
	Conversion rate	62 times per second
Display	Range	-1999 to 9999, selectable decimal point position
	Type	4 digit 10mm (0.4"), red*
	Display refresh rate	2 times per second
	Display/input overrange indication	OvE
Environmental Conditions	Operating temperature	-10ºC to +60ºC (14ºF to 140ºF)
	Storage temperature	-25ºC to +85ºC (-13ºF to 185ºF)
	Relative humidity (non-condensing)	<95% @ 40ºC (104ºF)
	Maximum altitude	2000m
	Frontal protection degree	IP65
Environmental Air	No corrosive gases permitted	
Agency Approvals	CE	

**** Illumination based on available loop current and will not be as bright as the powered Digital Panel Meters***

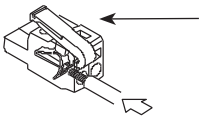
ProSense® Digital Panel Meters - DPM1 Series 1/32 DIN

Wiring



CN1	
1	(-) 4-20mA loop
2	(+) 4-20mA loop

Connection Terminal

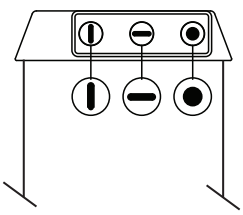


Insertion Tool (included with meter)

Insert wires into the proper terminal while using the insertion tool to open the clip inside the connector. Release the insertion tool to fix wire to the terminal.

Terminal	
Connector	**CN1**
Wire cross section	0.08 to 2.5mm² (28 to 12 AWG)
Strip length	8 to 9mm
Manufacturer	Wago 231-302/026-000
Cage clamp connection	Insertion tool or screwdriver with 0.5 mm x 3.0 mm blade

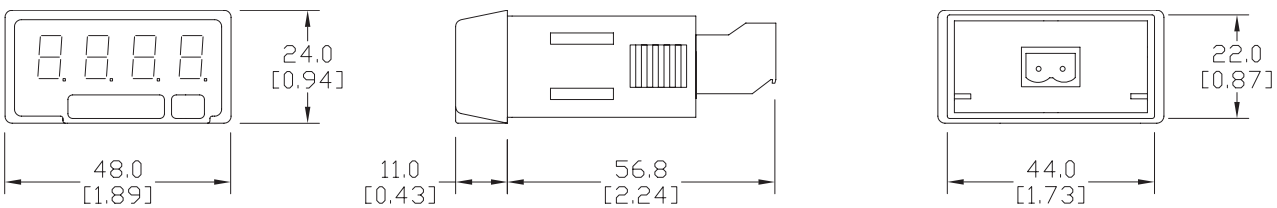
Programming Keys (Bottom View)



- **ENTER:** Enters configuration and validates data and parameters.
- **SHIFT:** Selects mode or shifts blinking digit in configuration.
- **UP:** Increases value of blinking digit in configuration.

Dimensions

mm [inches]



Installation	
Dimensions	48 x 24 x 56.8mm (1/32 DIN)
Panel Cutout	45 x 22mm (Max. panel thickness 7mm)
Case Material	Polycarbonate UL 94 V-0

See our website www.AutomationDirect.com for complete Engineering drawings.

For additional information and configuration details download the complete instructions from www.AutomationDirect.com

ProSense® Digital Panel Meters - DPM1 Series 1/32 DIN

These models in the ProSense DPM1 series offers a simple, low cost digital display of analog process and DC voltage signals. The 4-digit red LED display is easily scaled into any engineering units from -1999 to 9999 with a selectable decimal point location. Two point direct or reverse acting linear scaling values can be entered manually or by introducing actual sensed process values in Teach mode. The meter is powered from an external AC or DC power supply. The 1/32 DIN housing takes up minimal panel space and the meter face has an IP65 rating. Configuration parameters can be locked out to prevent unauthorized or accidental changes to the meter's operation. ProSense digital panel meters are backed by a 3 year warranty.

Features:

- 48 x 24mm 1/32 DIN
- Simple menu driven pushbutton configuration
- 4 digit (-1999 to 9999) red LED display
- Selectable decimal point
- Process (±10V, ±20mA, ±100mV)
- DC Voltage (±200V, ±20V)
- AC or DC powered
- Display scaling or process teaching modes
- Configuration for direct or reverse acting linear processes
- Total configuration lock out
- 3 year warranty

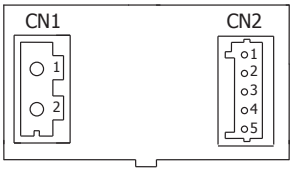
CE

DPM1 Series Panel Meters			
Model	**Description**	**Weight (lbs)**	**Price**
DPM1-A-H	ProSense digital panel meter, 1/32 DIN, 4-digit red LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 200 VDC, +/- 20 VDC, +/- 10 VDC, +/- 100 mVDC, 85 to 265 VAC / 100 to 300 VDC operating voltage.	0.2	$85.00
DPM1-A-L	ProSense digital panel meter, 1/32 DIN, 4-digit red LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 200 VDC, +/- 20 VDC, +/- 10 VDC, +/- 100 mVDC, 21 to 53 VAC / 10.5 to 70 VDC operating voltage.	0.2	$85.00

Technical Specifications						
Input	**Voltage**					**Current**
Range	±200V (fixed)		±20V (fixed)	±10V	±100mV	±20mA
Resolution	0.1V		0.01V	1mV	0.1mV	0.01mA
Input Impedance	Volts	1MΩ				
	mV	100MΩ				
	mA	20Ω				
Accuracy (@ 23°C ±5°C)	Maximum error	±(0.1% of reading ÷3 digits)				
	Temperature coefficient	100 ppm/°C				
	Warm-Up time	5 minutes				
Power Supply and Fuses	DPM1-A-H	85-265VAC 50/60Hz or 100-300VDC (Recommended fusing, 0.1A/250V, 5mm x 20mm glass miniature or DIN 41661 equivalent)				
	DPM1-A-L	21-53VAC 50/60Hz or 10.5-70VDC (Recommended fusing, 0.5A/250V, 5mm x 20mm glass miniature or DIN 41661 equivalent)				
Power Consumption	1.8W					
Conversion	Technique	Sigma-Delta				
	Resolution	±15 bits				
	Conversion rate	20 times per second				
Display	Range	-1999 to 9999, selectable decimal point position				
	Type	4 digit 10mm (0.4"), red				
	Display refresh rate	4 times per second				
	Display/input overrange indication	OvE				
Environmental Conditions	Operating temperature	-10°C to +60°C (14°F to 140°F)				
	Storage temperature	-25°C to +85°C (-13°F to 185°F)				
	Relative humidity (non-condensing)	<95% @ 40°C (104°F)				
	Maximum altitude	2000m				
	Frontal protection degree	IP65				
Environmental Air	No corrosive gases permitted					
Agency Approvals	CE					

ProSense® Digital Panel Meters - DPM1 Series 1/32 DIN

Wiring

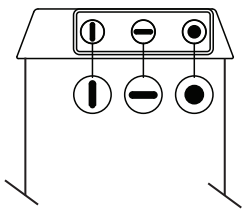


CN1			
AC Supply		DC Supply	
1	Neutral	1	-VDC
2	Line	2	+VDC

CN2	
1	- IN (common)
2	+100mV DC
3	+20mA
4	+10/20VDC
5	+200VDC

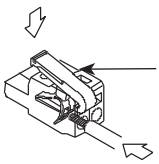
Terminals		
Connector	**CN1**	**CN2**
Wire cross section	0.08 to 2.5mm² (28 to 12 AWG)	0.08 to 0.5mm² (28 to 20 AWG)
Strip length	8 to 9mm	5 to 6mm
Manufacturer	Wago 231-202/026-000	Wago 733-105
Cage clamp connection	Insertion tool or screwdriver with 0.5 mm x 3.0 mm blade	Insertion tool or screwdriver with 0.3 mm x 1.8 mm blade

Programming Keys (Bottom View)



- **ENTER:** Enters configuration and validates data and parameters.
- **SHIFT:** Selects mode or shifts blinking digit in configuration.
- **UP:** Increases value of blinking digit in configuration.

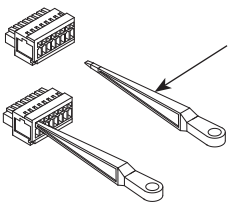
CN1 Terminals



Insertion Tool (included with meter)

Insert wires into the proper terminal while using the insertion tool to open the clip inside the connector. Release the insertion tool to fix wire to the terminal.

CN2 Terminals

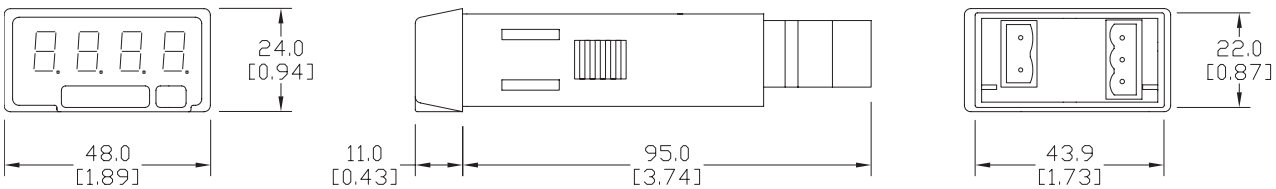


Insertion Tool (included with meter)

Insert wires into the proper terminal while using the insertion tool to open the clip inside the connector. Release the insertion tool to fix wire to the terminal.

Dimensions

mm [inches]



Installation	
Dimensions	48 x 24 x 95mm (1/32 DIN)
Panel Cutout	45 x 22mm (Max. panel thickness 7mm)
Case Material	Polycarbonate UL 94 V-0

See our website www.AutomationDirect.com for complete Engineering drawings.

For additional information and configuration details download the complete instructions from www.AutomationDirect.com

ProSense® Digital Panel Meters - DPM1 Series 1/32 DIN

These models in the ProSense DPM1 series offers a simple, low cost digital display of temperature in either Fahrenheit or Celsius from RTD or Thermocouple temperature sensors. The 4-digit red LED display is pre-configured for fixed temperature ranges based on the type of temperature sensor input. Thermocouples are displayed with 1 degree of resolution while RTDs can be displayed with either 0.1 or 1 degree of resolution. The meter is powered from an external AC or DC power supply. The 1/32 DIN housing takes up minimal panel space and the meter face has an IP65 rating. Configuration parameters can be locked out to prevent unauthorized or accidental changes to the meter's operation. ProSense digital panel meters are backed by a 3 year warranty.

Features:

- 48 x 24mm 1/32 DIN
- Simple menu driven pushbutton configuration
- 4 digit red LED display
- Temperature, ˚F or ˚C
- RTD: Pt100, Resolution: 1˚, 0.1˚
- TC: J, K, T, N, Resolution: 1˚
- AC or DC powered
- Total configuration lock out
- 3 year warranty

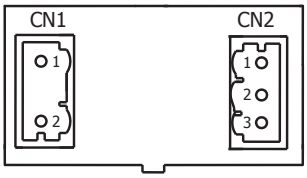
CE

DPM1 Series Panel Meters			
Model	**Description**	**Weight (lbs)**	**Price**
DPM1-T-H	ProSense digital panel meter, 1/32 DIN, 4-digit red LED, input thermocouple type(s): J, K, T, N, input RTD type(s): Pt100, 85 to 265 VAC / 100 to 300 VDC operating voltage.	0.2	$85.00
DPM1-T-L	ProSense digital panel meter, 1/32 DIN, 4-digit red LED, input thermocouple type(s): J, K, T, N, input RTD type(s): Pt100, 21 to 53 VAC / 10.5 to 70 VDC operating voltage.	0.2	$85.00

Technical Specifications			
	Type	**Resolution 1°**	**Resolution 0.1°**
Input / Resolution / Fixed Display Range	RTD: Pt100 (3-wire)	-200 to 800°C	-199.9 to 800.0°C
		-328 to 1472°F	-199.9 to 999.9°F
	TC "J"	-200 to 1100°C	N/A
		-328 to 2012°F	
	TC "K"	-200 to 1250°C	
		-328 to 2282°F	
	TC "T"	-200 to 400°C	
		-328 to 752°F	
	TC "N"	-200 to 1250°C	
		-328 to 2282°F	
TC Cold Junction Compensation Range	-10°C to 60°C (14°F to 140°F)		
Pt100 Measuring Current	1mA		
Pt100 Linearization (α=0.00385)	IEC 60751		
Pt100 Max. Lead Resistance	40Ω / wire (balanced)		
Accuracy	Pt100 1°	±(0.2%rdg + 1°C) / ±(0.2%rdg + 2°F); t<-50°C/-58°F ±(1%rdg+1°C) / ±(1%rdg+2°F)	
	Pt100 0.1°	±(0.2%rdg + 0.4°C) / ±(0.2%rdg + 0.7°F); t<-50.0°C/-58.0°F ±(1%rdg+0.4°C) / ±(1%rdg+0.7°F)	
	TC J, K, T, N	±(0.4%rdg + 2°C) / ±(0.4%rdg + 4°F); t<-50°C/-58°F ±(1%rdg+2°C) / ±(1%rdg+4°F)	
Accuracy Conditions	Temperature coefficient	100 ppm/°C	
	Warm up time	10 minutes	
	Temperature	23°C±5°C	
Power Supply and Fuses	DPM1-T-H	85-265VAC 50/60Hz or 100-300VDC (Recommended fusing, 0.1A/250V, 5mm x 20mm glass miniature or DIN 41661 equivalent)	
	DPM1-T-L	21-53VAC 50/60Hz or 10.5-70VDC (Recommended fusing, 0.5A/250V, 5mm x 20mm glass miniature or DIN 41661 equivalent)	
Power Consumption	1.8W		
Conversion	Technique	Sigma-Delta	
	Resolution	±15 bits	
	Conversion rate	25 times per second	
Display	Range	-1999 to 9999	
	Type	4 digit 10mm (0.4"), red	
	Display refresh rate	4 times per second	
	Display/input overrange indication	OvE	
Environmental Conditions	Operating temperature	-10°C to +60°C (14°F to 140°F)	
	Storage temperature	-25°C to +85°C (-13°F to 185°F)	
	Relative humidity (non condensing)	<95% @ 40°C (104°F)	
	Maximum altitude	2000m	
	Frontal protection degree	IP65	
Environmental Air	No corrosive gases permitted		
Agency Approvals	CE		

ProSense® Digital Panel Meters - DPM1 Series 1/32 DIN

Wiring

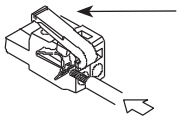


CN1			
AC Supply		DC Supply	
1	Neutral	1	-VDC
2	Line	2	+VDC

CN2	
1	-TC / Common Pt100
2	+TC / Common Pt100
3	Pt100

Terminals		
Connector	**CN1**	**CN2**
Wire cross section	0.08 to 2.5mm² (28 to 12 AWG)	0.08 to 2.5mm² (28 to 12 AWG)
Strip length	8 to 9mm	8 to 9mm
Manufacturer	Wago 231-202/026-000	Wago 231-303/026-000
Cage clamp connection	Insertion tool or screwdriver with 0.5 mm x 3.0 mm blade	Insertion tool or screwdriver with 0.5 mm x 3.0 mm blade

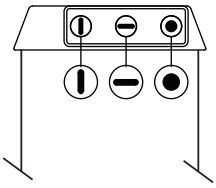
CN1 and CN2 Terminals



Insertion Tool (included with meter)

Insert wires into the proper terminal while using the insertion tool to open the clip inside the connector. Release the insertion tool to fix wire to the terminal.

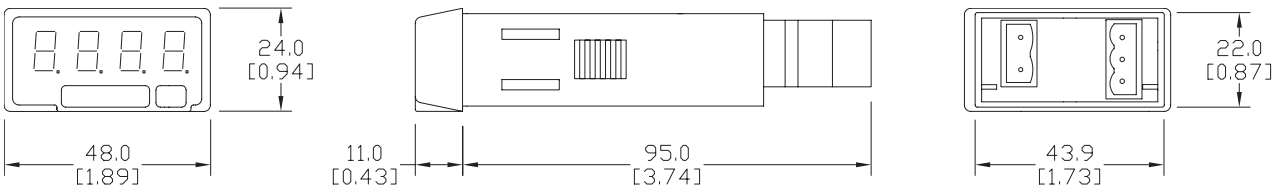
Programming Keys (Bottom View)



- **ENTER:** Enters configuration and validates data and parameters.
- **SHIFT:** Selects mode or shifts blinking digit in configuration.
- **UP:** Increases value of blinking digit in configuration.

Dimensions

mm [inches]



Installation	
Dimensions	48 x 24 x 95mm (1/32 DIN)
Panel Cutout	45 x 22mm (Max. panel thickness 7mm)
Case Material	Polycarbonate UL 94 V-0

See our website www.AutomationDirect.com for complete Engineering drawings.

For additional information and configuration details download the complete instructions from www.AutomationDirect.com

ProSense® Digital Panel Meters - DPM1 Series 1/32 DIN

These models in the ProSense DPM1 series offers a simple, low cost digital display of analog process signals. The 4-digit red LED display is easily scaled into any engineering units from -1999 to 9999 with a selectable decimal point location. Two point direct or reverse acting linear scaling values can be entered manually or by introducing actual sensed process values in Teach mode. Additionally non-linear processes can be scaled by entering up to 16 scaling points. Two SPST relay outputs are included that can be set to activate on an increasing or decreasing input signal with hysteresis or time delay operation. Models are also available with a 0/4-20mA analog output. The meter is powered from an external AC or DC power supply and provides 20VDC for external sensor excitation. The 1/32 DIN housing takes up minimal panel space and the meter face has an IP65 rating. Configuration parameters can be totally or selectively locked out to prevent unauthorized or accidental changes to the meter's operation. Other features include memory and reset of minimum and maximum display values, a tare function, filtering to minimize display bounce, and display brightness adjustment. ProSense digital panel meters are backed by a 3 year warranty.

Features:

- 48 x 24mm 1/32 DIN
- Simple menu driven pushbutton configuration
- 4 digit (-1999 to 9999) red LED display
- Selectable decimal point
- Process (±10V, ±60V, ±100mV, ±20mA)
- AC or DC powered
- Sensor excitation voltage 20V
- (2) Form A SPST normally open relays
  - Activation on increasing or decreasing input signal
  - Hysteresis or time delay operation
- 0/4-20mA analog output on select units
- Total or selective configuration lock out
- Display scaling or process teaching modes
- Configuration for direct or reverse acting linear processes and up to 16 point non-linear processes
- Minimum and maximum value memory
- Tare function
- Filtering to minimize display bounce
- Display brightness adjustment
- 3 year warranty

CE

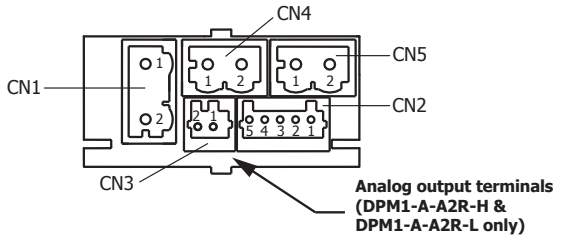
DPM1 Series Panel Meters			
Model	***Description***	***Weight (lbs)***	***Price***
DPM1-A-2R-H	ProSense digital panel meter, 1/32 DIN, 4-digit red LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 60 VDC, +/- 10 VDC, +/- 100 mVDC, (2) Form A (SPST) relay(s), 5A @ 250 VAC, 5A @ 30 VDC, 85 to 265 VAC / 100 to 300 VDC operating voltage.	0.3	$95.00
DPM1-A-2R-L	ProSense digital panel meter, 1/32 DIN, 4-digit red LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 60 VDC, +/- 10 VDC, +/- 100 mVDC, (2) Form A (SPST) relay(s), 5A @ 250 VAC, 5A @ 30 VDC, 21 to 53 VAC / 10.5 to 70 VDC operating voltage.	0.3	$95.00
DPM1-A-A2R-H	ProSense digital panel meter, 1/32 DIN, 4-digit red LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 60 VDC, +/- 10 VDC, +/- 100 mVDC, output current signal range(s) of 0/4-20 mA, (2) Form A (SPST) relay(s), 5A @ 250 VAC, 5A @ 30 VDC, 85 to 265 VAC / 100 to 300 VDC operating voltage.	0.3	$100.00
DPM1-A-A2R-L	ProSense digital panel meter, 1/32 DIN, 4-digit red LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 60 VDC, +/- 10 VDC, +/- 100 mVDC, output current signal range(s) of 0/4-20 mA, (2) Form A (SPST) relay(s), 5A @ 250 VAC, 5A @ 30 VDC, 21 to 53 VAC / 10.5 to 70 VDC operating voltage.	0.3	$100.00

ProSense® Digital Panel Meters - DPM1 Series 1/32 DIN

Technical Specifications				
	Range	**Resolution**	**Input Impedance**	**Accuracy**
Input	±10V	1mV	1MΩ	±(0.1% rdg+3mV)
	±60V	3mV	1MΩ	±(0.1% rdg+18mV)
	±100mV	10µV	100MΩ	±(0.1% rdg+30µV)
	±20mA	1µA	12.1Ω	±(0.1% rdg+6µA)
Sensor Excitation	20V±5VDC @ 30mA			
Accuracy Conditions	Temperature coefficient	100ppm/°C		
	Warm-up time	15 minutes		
	Temperature	23°C±5°C		
Conversion	Technique	Sigma-Delta		
	Resolution	±15 bits		
	Conversion rate	25 times per second		
Display	Range	-1999 to +9999, selectable decimal point position		
	Type	4 digit 8mm (0.31), red		
	LEDs	Relay 1, Relay 2, Tare, Programming Mode		
	Display refresh rate	5 times per second		
	Display / Input overrange indication	"-OuE" , "OuE"		
	Relays refresh, maximum and minimum value	10s		
Relays	2 Relays (Form A) SPST normally open	5A@250VAC / 30VDC		
Analog Output (0/4-20mA Sourcing) (Models DPM1-A-A2R-H & DPM1-A-A2R-L only)	Resolution	5.5µA		
	Accuracy	±(0.3% rdg+40µA)		
	Temperature coefficient	3µA/°C		
	Maximum load	≤500Ω		
Power Supply and Fuses	DPM1-A-2R-H, DPM1-A-A2R-H	85-265VAC 50/60Hz or 100-300VDC (Recommended fusing 0.2A/250V, 5mm x 20mm glass miniature or DIN 41661 equivalent)		
	DPM1-A-2R-L, DPM1-A-A2R-L	21-53VAC 50/60Hz or 10.5-70VDC (Recommended fusing 1.0A/250V, 5mm x 20mm glass miniature or DIN 41661 equivalent)		
Filter	Cutoff frequency	0.4Hz to 0.004Hz		
	Slope	20dB/Dec.		
Environmental Conditions	Operating temperature	-10°C to +60°C (14°F to 140°F)		
	Storage temperature	-25°C to +85°C (-13°F to 185°F)		
	Relative humidity (non condensing)	<95% @ 40°C (104°F)		
	Maximum altitude	2000m		
	Frontal protection degree	IP65		
Environmental Air	No corrosive gases permitted			
Agency Approvals	CE			

ProSense® Digital Panel Meters - DPM1 Series 1/32 DIN

Wiring



CN1			
AC Supply		DC Supply	
1	Line	1	-VDC
2	Neutral	2	+VDC

CN2	
1	+60V / +10VDC
2	+20mA DC
3	+100mV
4	-IN / - Excitation
5	+Excitation (20V±5VDC @ 30mA)

CN3*	
1	-0/4-20mA
2	+0/4-20mA

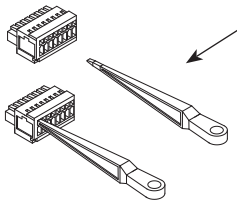
** Analog output terminals (DPM1-A-A2R-H & DPM1-A-A2R-L only)*

Terminals					
Connector	**CN1**	**CN2**	**CN3**	**CN4**	**CN5**
Wire cross section	0.08 to 2.5mm² (28 to 12 AWG)	0.08 to 0.5mm² (28 to 20 AWG)	0.08 to 0.5mm² (28 to 20 AWG)	0.08 to 2.5mm² (28 to 12 AWG)	0.08 to 2.5mm² (28 to 12 AWG)
Strip length	8 to 9mm	5 to 6mm	5 to 6mm	8 to 9mm	8 to 9mm
Manufacturer	Wago 231-202/026-000	Wago 733-105	Wago 733-102	Wago 231-102/026-000	Wago 231-302/026-000
Cage clamp connection	Insertion tool or screwdriver with 0.5 mm x 3.0 mm blade	Insertion tool or screwdriver with 0.3 mm x 1.8 mm blade	Insertion tool or screwdriver with 0.3 mm x 1.8 mm blade	Insertion tool or screwdriver with 0.5 mm x 3.0 mm blade	Insertion tool or screwdriver with 0.5 mm x 3.0 mm blade

CN4	
Relay 1	
1	N.O. Contact
2	

CN5	
Relay 2	
1	N.O. Contact
2	

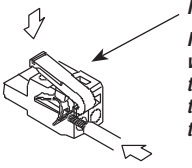
CN2 and CN3 Terminals



Insertion Tool (included with meter)

Insert wires into the proper terminal while using the insertion tool to open the clip inside the connector. Release the insertion tool to fix wire to the terminal.

CN1, CN4 and CN5 Terminals

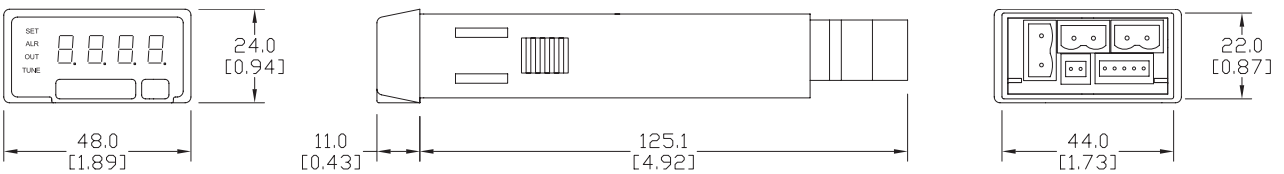


Insertion Tool (included with meter)

Insert wires into the proper terminal while using the insertion tool to open the clip inside the connector. Release the insertion tool to fix wire to the terminal.

Dimensions

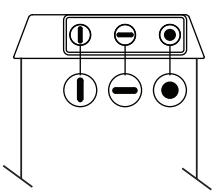
mm [inches]



Installation	
Dimensions	48 x 24 x 125.1mm (1/32 DIN)
Panel Cutout	45 x 22mm (Max. panel thickness 7mm)
Case Material	Polycarbonate UL 94 V-0

See our website www.AutomationDirect.com for complete Engineering drawings.

Programming Keys (Bottom View)



- **ENTER:** Enters configuration and validates data and parameters.
- **SHIFT:** Selects mode or shifts blinking digit in configuration.
- **UP:** Increases value of blinking digit in configuration.

For additional information and configuration details download the complete instructions from www.AutomationDirect.com

ProSense® Digital Panel Meters - DPM2 Series 1/8 DIN

The ProSense DPM2 series offers a simple, low cost digital display of analog process signals, temperature in either Fahrenheit or Celsius from RTD or thermocouple temperature sensors, or potentiometer inputs. The 4-digit red LED display is easily scaled into any engineering units from -9999 to 9999 with a selectable decimal point location. Two point direct or reverse acting linear scaling values can be entered manually or by introducing actual sensed process values in Teach mode. Temperature inputs are pre-configured for fixed temperature ranges based on the type of temperature sensor and can be displayed with 1 or 0.1 degree of resolution. One model includes two SPDT relay outputs that can be set to activate on an increasing or decreasing input signal with hysteresis or time delay operation. The meter is powered from an external wide range AC or DC power supply and provides 24VDC for external sensor excitation. The 1/8 DIN housing is easy to install in a panel and the meter face has an IP65 rating. Configuration parameters can be totally or selectively locked out to prevent unauthorized or accidental changes to the meter's operation. Additionally, the DPM2 meters include memory and reset of minimum and maximum display values. ProSense digital panel meters are backed by a 3 year warranty.

Features:

- 96 x 48mm 1/8 DIN
- Simple menu driven pushbutton configuration
- 4 digit (-9999 to 9999) red LED display
- Selectable decimal point
- Process (±10V, ±200V and ±20mA)
- Temperature (RTD: Pt100, Pt1000, TC: J, K, T, N, Resolution: 1°F, 0.1°F, 1°C, 0.1°C)
- Potentiometer (100Ω to 100kΩ)
- Resistance (999.9Ω, 9999Ω and 50kΩ)
- AC or DC powered
- Sensor excitation voltage 24V
- Optional (2) Form C SPDT relays
  - N.O. or N.C. operation
  - Activation on increasing or decreasing input signal
  - Hysteresis or time delay operation
- Display scaling or process teaching modes
- Configuration for direct or reverse acting linear processes
- Minimum and maximum value memory
- Total or selective configuration lock out
- 3 year warranty

CE

DPM2 Series Panel Meters

Model	Description	Weight (lbs)	Price
DPM2-AT-HL	ProSense digital panel meter, 1/8 DIN, 4-digit red LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 200 VDC, +/- 10 VDC, input thermocouple type(s): J, K, T, N, input RTD type(s): Pt100 and Pt1000, input potentiometer signal range(s) of 100 to 100k Ohms, 20 to 265 VAC / 11 to 265 VDC operating voltage.	0.6	$100.00
DPM2-AT-2R-HL	ProSense digital panel meter, 1/8 DIN, 4-digit red LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 200 VDC, +/- 10 VDC, input thermocouple type(s): J, K, T, N, input RTD type(s): Pt100 and Pt1000, input potentiometer signal range(s) of 100 to 100k Ohms, (2) Form C (SPDT) relay(s), 8A @ 250 VAC, 8A @ 24 VDC, 20 to 265 VAC / 11 to 265 VDC operating voltage.	0.6	$110.00

Technical Specifications

	Range	Input Impedance	Resolution	Accuracy
Process Input	±20mA	<20Ω	2µA	±(0.1% rdg+15µA)
	±10V	2MΩ	1mV	±(0.1% rdg+6mV)
	±200V	2MΩ	20mV	±(0.1% rdg+0.1V)
Sensor Excitation	24V±3V @ 30mA			
Potentiometer	Range	Maximum Measurement Current	Resolution	Accuracy
	100-100kΩ	<0.4mA	0.01% F.S.	±(0.1% rdg+0.05% F.S.)
Resistance	999.9Ω	2.3mA	0.1Ω	±(0.1% rdg+0.7Ω)
	9999Ω	230µA	1Ω	±(0.1% rdg+6Ω)
	50kΩ	23µA	10Ω	±(0.1% rdg+35Ω)

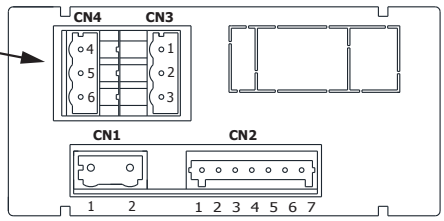
ProSense® Digital Panel Meters - DPM2 Series 1/8 DIN

Technical Specifications Continued					
Temperature	***RTD***	***Pt100 (3 wire)***	***Pt1000 (2 wire)***		
	Fixed Display Range / Resolution	-200.0°C to 800.0°C / 0.1°C -200°C to 800°C / 1°C -328.0°F to 999.9°F / 0.1°F -328°F to 1472°F / 1°F			
	Measurement current	1mA	100µA		
	Maximum resistance per wire	40Ω (balanced)	-		
	Linearization	IEC 60751			
	Coefficient	0.00385			
	Accuracy	±(0.15% rdg+0.5°C), t<-50°C ±(1% rdg+0.5°C) ±(0.15% rdg+0.9°F), t<-58°F ±(1% rdg+0.9°F)			
	Thermocouple	***J***	***K***	***T***	***N***
	Fixed Display Range / Resolution	-150.0°C to 999.9°C / 0.1°C -150°C to 1100°C / 1°C -238.0°F to 999.9°F / 0.1°F -238°F to 2012°F / 1°F	-150.0°C to 999.9°C / 0.1°C -150°C to 1200°C / 1°C -238.0°F to 999.9°F / 0.1°F -238°F to 2192°F / 1°F	-150.0°C to 400.0°C / 0.1°C -150°C to 400°C / 1°C -238.0°F to 752.0°F / 0.1°F -238°F to 752°F / 1°F	-150.0°C to 999.9°C / 0.1°C -150°C to 1300°C / 1°C -238.0°F to 999.9°F / 0.1°F -238°F to 2372°F / 1°F
	Cold junction compensation range	-10°C to 60°C (14°F to 140°F)			
	Accuracy	±(0.1% rdg+0.6°C) ±(0.1% rdg+1.1°F)		±(0.2% rdg+0.8°C) ±(0.2% rdg+1.5°F)	±(0.1% rdg+0.6°C) ±(0.1% rdg+1.1°F)
Conversion	Technique	Sigma-Delta			
	Resolution	±16 bits			
	Conversion rate	20 times per second			
Display	Range	-9999 to +9999, selectable decimal point position			
	Type	4 digit 14mm (0.55"), red			
	LEDs	Relay 1, Relay 2			
	Display refresh rate	20 times per second			
	Display / Input overrange indication	"-OuE" , "OuE"			
Accuracy Conditions	Temperature coefficient	100 ppm/°C			
	Warm-up time	5 minutes			
	Temperature	23°C±5°C			
Relays (DPM2-AT-2RL-HL only)	2 Relays SPDT	Nominal contact rating.....8A at 250VAC / 24VDC Maximum switching current (resistive load).....8A Maximum switching power.....2000VA / 192W Maximum switching voltage.....400VAC / 125VDC Contact resistance.....≤100mΩ at 6VDC @ 1A Contact type.....SPDT Operate time.....≤10ms			
Power Supply and Fuses	20-265VAC 50/60 Hz or 11-265VDC (Recommended fusing 3A/250V, 5mm x 20mm glass miniature or DIN 41661 equivalent)				
Power Consumption	3W				
Filter	Cutoff frequency (-3dB)	7.3Hz to 0.2Hz			
	Slope	-20dB/Dec.			
Environmental Conditions	Operating temperature	-10°C to +60°C (14°F to 140°F)			
	Storage temperature	-25°C to +85°C (-13°F to 185°F)			
	Relative humidity (non-condensing)	<95% @ 40°C (104°F)			
	Maximum altitude	2000m			
	Frontal protection degree	IP65			
Environmental Air	No corrosive gases permitted				
Agency Approval	CE				

ProSense® Digital Panel Meters - DPM2 Series 1/8 DIN

Wiring

Output relay terminals (DPM2-AT-2R-HL only)



CN1			
AC Supply		DC Supply	
1	Line	1	VDC
2	Neutral	2	VDC

Polarity insensitive for DC power

CN2	
1	Common / RTD B / -TC / Pot. Term. 1
2	RTD A / +TC / 10kΩ res. / Pot. center
3	50kΩ res. / Pot. Term. 2
4	RTD B Pt100
5	+20mA
6	Excitation +24V
7	+10/200VDC

Note: For additional wiring information download complete manual from www.AutomationDirect.com

Terminals			
Connector	**CN1**	**CN2**	**CN3 & CN4**
Wire cross section	0.08 to 2.5mm² (28 to 12 AWG)	0.08 to 1.5mm² (28 to 14 AWG)	0.08 to 2.5mm² (28 to 12 AWG)
Strip length	8 to 9mm	6 to 7mm	8 to 9mm
Manufacturer	Wago 231-202/026-000	Wago 734-107	Wago 231-303/026-000
Cage clamp connection	Insertion tool or screwdriver with 0.5 mm x 3.0 mm blade	Insertion tool or screwdriver with 0.3 mm x 1.8 mm blade	Insertion tool or screwdriver with 0.5 mm x 3.0 mm blade

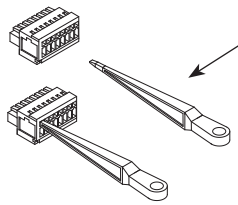
(DPM2-AT-2R-HL only)

CN4 (Relay 2)	
4	NO2
5	CM2
6	NC2

CN3 (Relay 1)	
1	NO1
2	CM1
3	NC1

NO: Normally open contact.
CM: Common
NC: Normally closed contact.

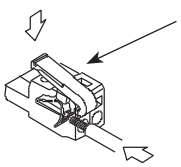
CN2 Terminals



Insertion Tool (included with meter)

Insert wires into the proper terminal while using the insertion tool to open the clip inside the connector. Release the insertion tool to fix wire to the terminal.

CN1, CN3, CN4 Terminals

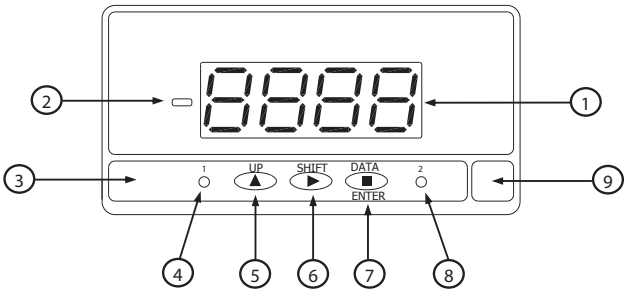


Insertion Tool (included with meter)

Insert wires into the proper terminal while using the insertion tool to open the clip inside the connector. Release the insertion tool to fix wire to the terminal.

ProSense® Digital Panel Meters - DPM2 Series 1/8 DIN

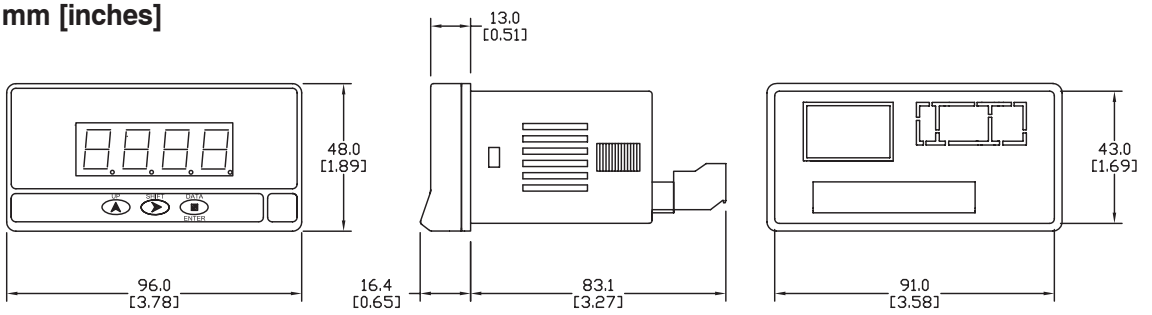
Programming Panel



Programming Panel			
#	**Description**	**Run Mode**	**Programming Mode**
1	4 digit display Red	Shows value according to configuration.	Shows steps and data during configuration.
2	Minus sign	Illuminates for negative readings.	Illuminates for negative values.
3	Keyboard	---	---
4	Setpoint 1 LED	Illuminates when setpoint 1 turns active.	Illuminates when setpoint 1 turns active.
5	UP key	No application	Shows setpoint value. Increases value of active digit.
6	SHIFT key	Displays maximum and minimum stored values. After 3s of pressing, sets maximum and/or minimum memorized value to current display value.	Shifts active digit to the next right digit.
7	DATA/ENTER key	Changes to PRO mode.	Validates selected data and parameters. Moves one step forward in configuration menu. Changes to RUN mode.
8	Setpoint 2 LED	Illuminates when Setpoint 2 turns active.	Illuminates when Setpoint 2 turns active.
9	Free space for units label	---	---

Dimensions

mm [inches]



Installation	
Dimensions	96 x 48 x 83.1mm (1/8 DIN)
Panel Cutout	92 x 45mm (Max. panel thickness 10mm)
Case Material	Polycarbonate UL 94 V-0

See our website www.AutomationDirect.com for complete Engineering drawings.

For additional information and configuration details download the complete instructions from www.AutomationDirect.com

ProSense® Digital Panel Meters - DPM3 Series 1/8 DIN

The ProSense DPM3 series offers a simple, feature packed digital display of analog process signals, temperature in either Fahrenheit or Celsius from RTD or thermocouple temperature sensors, load cell, or potentiometer inputs. The 5-digit tri-color red, green or amber LED display is easily scaled into any engineering units from -19999 to 39999 with a selectable decimal point location. Two point direct or reverse acting linear scaling values can be entered manually or by introducing actual sensed process values in Teach mode. Non-linear processes can be scaled by entering up to 11 scaling points. Models are available with two SPDT or four SPST relay outputs that can be set to activate on an increasing or decreasing input signal with hysteresis or time delay operation. Additionally the display color can be set to change on relay operation. Models are also available with a 4-20mA analog output. The meter is powered from an external AC or DC power supply and provides both 24VDC and 10VDC for external sensor excitation. The 1/8 DIN housing is easy to install in a panel and the meter face has an IP65 rating. Configuration parameters can be totally or selectively locked out to prevent unauthorized or accidental changes to the meter's operation. Other features include memory and reset of minimum and maximum display values, three tare functions, display hold function, filtering to minimize display bounce, and display brightness adjustment. ProSense digital panel meters are backed by a 3 year warranty.

Features:

- 96 x 48mm 1/8 DIN
- Simple menu driven pushbutton configuration
- 5 digit (-19999 to 39999) tri-color (red, green, amber) LED display
- Selectable decimal point
- Process (±10V, ±20mA)
- Temperature (RTD: Pt100, TC: J, K, T, N, Resolution: 1°F, 0.1°F, 1°C, 0.1°C)
- Potentiometer
- Load cell (±15mV, ±30mV, ±150mV)
- AC or DC powered
- Sensor excitation voltage 24V and 10V
- Display scaling or process teaching modes
- 4-20mA analog output on select models
- (2) Form C SPDT or (4) Form A SPST relays on select models
  - Activation on increasing or decreasing input signal
  - Hysteresis or time delay operation
  - Display color change on relay operation
- Configuration for direct or reverse acting linear processes and up to 11 point non-linear processes
- Total or selective configuration lock out
- Programmable functions include:
  - Minimum and maximum value memory
  - Minimum and maximum value reset
  - Tare
  - Hold
- Filtering to minimize display bounce
- Display brightness adjustment
- 3 year warranty

CE

ProSense® Digital Panel Meters - DPM3 Series 1/8 DIN

DPM3 Series Panel Meters			
Model	***Description***	***Weight (lbs)***	***Price***
DPM3-AT-H	ProSense digital panel meter, 1/8 DIN, 5-digit tri-color (red, green, amber) LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 10 VDC, +/- 150 mVDC, +/- 30 mVDC, +/- 15 mVDC, input thermocouple type(s): J, K, T, N, input RTD type(s): Pt100, 85 to 265 VAC / 100 to 300 VDC operating voltage.	0.6	$125.00
DPM3-AT-2R-H	ProSense digital panel meter, 1/8 DIN, 5-digit tri-color (red, green, amber) LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 10 VDC, +/- 150 mVDC, +/- 30 mVDC, +/- 15 mVDC, input thermocouple type(s): J, K, T, N, input RTD type(s): Pt100, (2) Form C (SPDT) relay(s), 8A @ 250 VAC, 8A @ 24 VDC, 85 to 265 VAC / 100 to 300 VDC operating voltage.	0.7	$140.00
DPM3-AT-4R-H	ProSense digital panel meter, 1/8 DIN, 5-digit tri-color (red, green, amber) LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 10 VDC, +/- 150 mVDC, +/- 30 mVDC, +/- 15 mVDC, input thermocouple type(s): J, K, T, N, input RTD type(s): Pt100, (4) Form A (SPST) relay(s), 5A @ 250 VAC, 5A @ 30 VDC, 85 to 265 VAC / 100 to 300 VDC operating voltage.	0.7	$150.00
DPM3-AT-A-H	ProSense digital panel meter, 1/8 DIN, 5-digit tri-color (red, green, amber) LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 10 VDC, +/- 150 mVDC, +/- 30 mVDC, +/- 15 mVDC, input thermocouple type(s): J, K, T, N, input RTD type(s): Pt100, output current signal range(s) of 4 - 20 mA, 85 to 265 VAC / 100 to 300 VDC operating voltage.	0.7	$140.00
DPM3-AT-A2R-H	ProSense digital panel meter, 1/8 DIN, 5-digit tri-color (red, green, amber) LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 10 VDC, +/- 150 mVDC, +/- 30 mVDC, +/- 15 mVDC, input thermocouple type(s): J, K, T, N, input RTD type(s): Pt100, output current signal range(s) of 4 - 20 mA, (2) Form C (SPDT) relay(s), 8A @ 250 VAC, 8A @ 24 VDC, 85 to 265 VAC / 100 to 300 VDC operating voltage.	0.7	$155.00
DPM3-AT-L	ProSense digital panel meter, 1/8 DIN, 5-digit tri-color (red, green, amber) LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 10 VDC, +/- 150 mVDC, +/- 30 mVDC, +/- 15 mVDC, input thermocouple type(s): J, K, T, N, input RTD type(s): Pt100, 22 to 53 VAC / 10.5 to 70 VDC operating voltage.	0.6	$125.00
DPM3-AT-2R-L	ProSense digital panel meter, 1/8 DIN, 5-digit tri-color (red, green, amber) LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 10 VDC, +/- 150 mVDC, +/- 30 mVDC, +/- 15 mVDC, input thermocouple type(s): J, K, T, N, input RTD type(s): Pt100, (2) Form C (SPDT) relay(s), 8A @ 250 VAC, 8A @ 24 VDC, 22 to 53 VAC / 10.5 to 70 VDC operating voltage.	0.7	$140.00
DPM3-AT-4R-L	ProSense digital panel meter, 1/8 DIN, 5-digit tri-color (red, green, amber) LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 10 VDC, +/- 150 mVDC, +/- 30 mVDC, +/- 15 mVDC, input thermocouple type(s): J, K, T, N, input RTD type(s): Pt100, (4) Form A (SPST) relay(s), 5A @ 250 VAC, 5A @ 30 VDC, 22 to 53 VAC / 10.5 to 70 VDC operating voltage.	0.7	$150.00
DPM3-AT-A-L	ProSense digital panel meter, 1/8 DIN, 5-digit tri-color (red, green, amber) LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 10 VDC, +/- 150 mVDC, +/- 30 mVDC, +/- 15 mVDC, input thermocouple type(s): J, K, T, N, input RTD type(s): Pt100, output current signal range(s) of 4 - 20 mA, 22 to 53 VAC / 10.5 to 70 VDC operating voltage.	0.7	$140.00
DPM3-AT-A2R-L	ProSense digital panel meter, 1/8 DIN, 5-digit tri-color (red, green, amber) LED, input current signal range(s) of +/- 20 mA, input voltage signal range(s) of +/- 10 VDC, +/- 150 mVDC, +/- 30 mVDC, +/- 15 mVDC, input thermocouple type(s): J, K, T, N, input RTD type(s): Pt100, output current signal range(s) of 4 - 20 mA, (2) Form C (SPDT) relay(s), 8A @ 250 VAC, 8A @ 24 VDC, 22 to 53 VAC / 10.5 to 70 VDC operating voltage.	0.7	$155.00

prosense® Digital Panel Meters - DPM3 Series 1/8 DIN

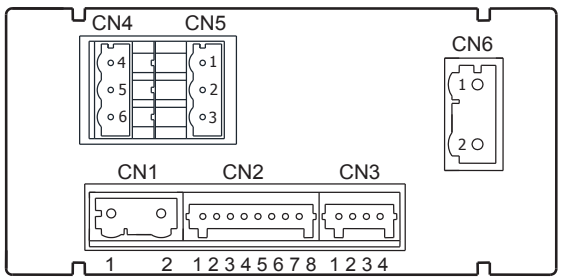
<table>
<tr><th colspan="6">Technical Specifications</th></tr>
<tr><td rowspan="3">Process</td><td>Range</td><td>Input Impedance</td><td>Accuracy</td><td colspan="2">Resolution</td></tr>
<tr><td>±10VDC</td><td>1MΩ</td><td>±(0.1% rdg + 1 digit)</td><td colspan="2">1mV</td></tr>
<tr><td>±20mA DC</td><td>15Ω</td><td>±(0.1% rdg + 1 digit)</td><td colspan="2">1μA</td></tr>
<tr><td>Sensor Excitation</td><td colspan="5">24V@60mA, 10V @ 60mA</td></tr>
<tr><td rowspan="2">Potentiometer</td><td>Range</td><td>Input Impedance</td><td>Accuracy</td><td colspan="2">Resolution</td></tr>
<tr><td>200Ω minimum</td><td>1MΩ</td><td>±(0.1% rdg + 1 digit)</td><td colspan="2">0.005%</td></tr>
<tr><td>Sensor Excitation</td><td colspan="5">10V @ 60mA</td></tr>
<tr><td rowspan="2">Load Cell</td><td>Range</td><td>Input Impedance</td><td>Accuracy</td><td colspan="2">Resolution</td></tr>
<tr><td>±15mV, ±30mV, ±150mV</td><td>100MΩ</td><td>±(0.1% rdg + 1 digit)</td><td colspan="2">1μV</td></tr>
<tr><td>Sensor Excitation</td><td colspan="5">10V @ 60mA</td></tr>
<tr><td rowspan="10">Temperature</td><td>RTD</td><td colspan="4">Pt100 (3-Wire)</td></tr>
<tr><td>Fixed display range / resolution</td><td colspan="4">-200.0°C to 800.0°C / 0.1°C
-200°C to 800°C / 1°C
-328.0°F to 1472.0°F/ 0.1°F
-328°F to 1472°F / 1°F</td></tr>
<tr><td>Accuracy / resolution</td><td colspan="4">±(0.2% rdg+0.6°C) / 0.1°C
±(0.2% rdg+1°C) 1°C
±(0.2% rdg+1°F) / 0.1°F
±(0.2% rdg+2°F)</td></tr>
<tr><td>Pt100 sensor excitation</td><td colspan="4"><1mA DC</td></tr>
<tr><td>Max lead resistance</td><td colspan="4">40Ω / cable (balanced)</td></tr>
<tr><td>Thermocouple</td><td>J</td><td>K</td><td>T</td><td>N</td></tr>
<tr><td>Fixed display range / resolution</td><td>-150.0°C to 1100.0°C / 0.1°C
-150°C to 1100°C / 1°C
-238.0°F to 2012.0°F / 0.1°F
-238°F to 2012°F / 1°F</td><td>-150.0°C to 1200.0°C / 0.1°C
-150°C to 1200°C / 1°C
-238.0°F to 2192.0°F / 0.1°F
-238°F to 2192°F / 1°F</td><td>-200.0°C to 400.0°C / 0.1°C
-200°C to 400°C / 1°C
-328.0°F to 752.0°F / 0.1°F
-328°F to 752°F / 1°F</td><td>-150.0°C to 1300.0°C / 0.1°C
-150°C to 1300°C / 1°C
-238.0°F to 2372.0°F / 0.1°F
-238°F to 2372°F / 1°F</td></tr>
<tr><td>Accuracy / resolution</td><td>±(0.4% rdg+0.6°C) / 0.1°C
±(0.4% rdg+1°C) 1°C
±(0.4% rdg+1°F) / 0.1°F
±(0.4% rdg+2°F) / 1°F</td><td>±(0.4% rdg+0.6°C) / 0.1°C
±(0.4% rdg+1°C) 1°C
±(0.4% rdg+1°F) / 0.1°F
±(0.4% rdg+2°F) / 1°F</td><td>±(0.4% rdg+0.6°C) / 0.1°C
±(0.4% rdg+1°C) 1°C
±(0.4% rdg+1°F) / 0.1°F
±(0.4% rdg+2°F) / 1°F</td><td>±(0.4% rdg+0.6°C) / 0.1°C
±(0.4% rdg+1°C) 1°C
±(0.4% rdg+1°F) / 0.1°F
±(0.4% rdg+2°F) / 1°F</td></tr>
<tr><td>Cold junction compensation range</td><td colspan="4">-10°C to 60°C (14°F to 140°F)</td></tr>
<tr><td>Offset programmable</td><td colspan="4">-19.9° / +99.9°</td></tr>
<tr><td rowspan="3">Conversion</td><td>Technique</td><td colspan="4">Sigma-Delta</td></tr>
<tr><td>Resolution</td><td colspan="4">±15 bits</td></tr>
<tr><td>Conversion rate</td><td colspan="4">20 times per second</td></tr>
<tr><td rowspan="3">Accuracy Conditions</td><td>Temperature coefficient</td><td colspan="4">100 ppm/°C</td></tr>
<tr><td>Warm-up time</td><td colspan="4">10 minutes</td></tr>
<tr><td>Temperature</td><td colspan="4">23°C±5°C</td></tr>
</table>

ProSense® Digital Panel Meters - DPM3 Series 1/8 DIN

Technical Specifications Continued			
Display	Range	-19999 / +39999, 5 LED digits 14mm (Programmable color Red, Green, Amber)	
	LEDs	8, functions and outputs status	
	Display refresh rate	Process / Load cell	20 times per second
		Pt100	20 times per second
		TC	10 times per second
	Display / Input overrange indication	"-oUEr" , "oUEr"	
Relays	***-2R: (2) Form C SPDT***		***-4R: (4) Form A SPST Normally Open with shared common***
	Nominal contact rating.....8A at 250VAC / 24VDC Maximum switching current (resistive load).....8A Maximum switching power.....2000VA / 192W Maximum switching voltage.....400VAC / 125VDC Contact resistance.....≤100mΩ at 6VDC at 1A Operate time.....≤10ms		Nominal contact rating.....5A at 250VAC / 30 VDC Maximum switching current (resistive load).....5A Maximum switching power.....1250VA / 150W Maximum switching voltage.....250VAC / 30VDC Contact resistance.....≤100mΩ at 6VDC at 1A Operate time.....≤10ms
Analog Output -A & -A2R Only	Type	4-20 mA Sourcing	
	Maximum load	≤500Ω	
	Resolution	13 bits	
	Accuracy	0.1%FS ±1 bit	
	Response time	10ms	
	Thermal drift	0.5µA / °C	
Power Supply and Fuses	-H High Voltage: -L Low Voltage:	85-265 VAC 50/60 Hz (100-300 VDC), (recommended fusing 0.5A/250V, 5mm x 20mm glass miniature or DIN 41661 equivalent) 22-53 VAC 50/60 Hz (10.5 - 70 VDC), (recommended fusing 2A/250V, 5mm x 20mm glass miniature or DIN 41661 equivalent)	
Power Consumption	5W without options, 8W max.		
Filter	Cutoff frequency	4Hz to 0.05Hz	
	Slope	-20dB/Dec.	
Environmental Conditions	Operating temperature	-10°C to +60°C (14°F to 140°F)	
	Storage temperature	-25°C to +85°C (-13°F to 185°F)	
	Relative humidity (non-condensing)	<95% @ 40°C (104°F)	
	Maximum altitude	2000m	
	Frontal protection degree	IP65	
Environmental Air	No corrosive gases permitted		
Agency Approvals	CE		

ProSense® Digital Panel Meters - DPM3 Series 1/8 DIN

Wiring



Note: For additional wiring information download complete manual from www.AutomationDirect.com

CN1			
AC Supply		DC Supply	
1	Line	1	VDC
2	Neutral	2	VDC

Polarity insensitive for DC power

CN3	
1	Common
2	Tare
3	Tare reset
4	Hold

CN2				
	Input Signal / Excitation			
	Process	Temperature		Load Cell
1	-EXC24V	---		-EXC10
2	+EXC24V	---		---
3	---	---		+EXC10
4	---	Pt100 A		---
5	+mA	---		---
6	+V	---		---
7	---	Pt100 B	+TC	+mV
8	-V / -mA (COM)	Pt100 B	-TC	-mV (COM)

Terminals					
Connector	**CN1**	**CN2**	**CN3**	**CN4 & CN5**	**CN6**
Wire cross section	0.08 to 2.5mm² (28 to 12 AWG)	0.08 to 0.5mm² (28 to 20 AWG)	0.08 to 0.5mm² (28 to 20 AWG)	0.08 to 2.5mm² (28 to 12 AWG)	0.08 to 2.5mm² (28 to 12 AWG)
Strip length	8 to 9mm	5 to 6mm	5 to 6mm	8 to 9mm	8 to 9mm
Manufacturer	Wago 231-202/026-000	Wago 733-108	Wago 733-104	Wago 231-303/026-000	Wago 231-302/026-000
Cage clamp connection	Insertion tool or screwdriver with 0.5 mm x 3.0 mm blade	Insertion tool or screwdriver with 0.3 mm x 1.8 mm blade	Insertion tool or screwdriver with 0.3 mm x 1.8 mm blade	Insertion tool or screwdriver with 0.5 mm x 3.0 mm blade	Insertion tool or screwdriver with 0.5 mm x 3.0 mm blade

2 SPDT Relays (-2R)

CN4 (Relay 2)	
4	NO2
5	CM2
6	NC2

CN5 (Relay 1)	
1	NO1
2	CM1
3	NC1

4 SPST Relays (-4R)

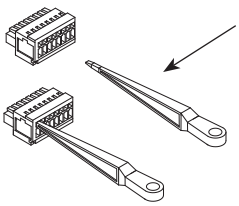
CN4	
4	NO4
5	Unused
6	CM (All)

CN5	
1	NO1
2	NO2
3	NO3

NO: Normally open, CM: Common, NC: Normally closed

CN6	
Analog Output	
1	(-) 4-20mA
2	(+) 4-20mA

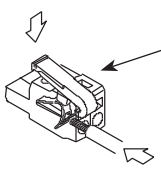
CN2 and CN3 Terminals



Insertion Tool (included with meter)

Insert wires into the proper terminal while using the insertion tool to open the clip inside the connector. Release the insertion tool to fix wire to the terminal.

CN1, CN4, CN5 and CN6 Terminals

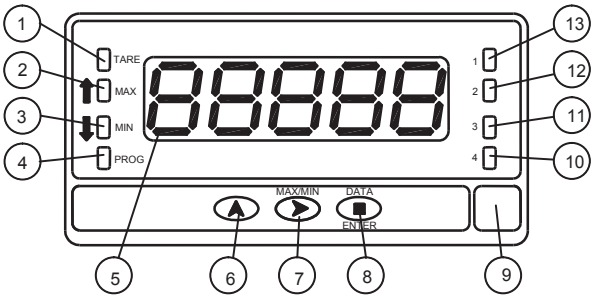


Insertion Tool (included with meter)

Insert wires into the proper terminal while using the insertion tool to open the clip inside the connector. Release the insertion tool to fix wire to the terminal.

ProSense® Digital Panel Meters - DPM3 Series 1/8 DIN

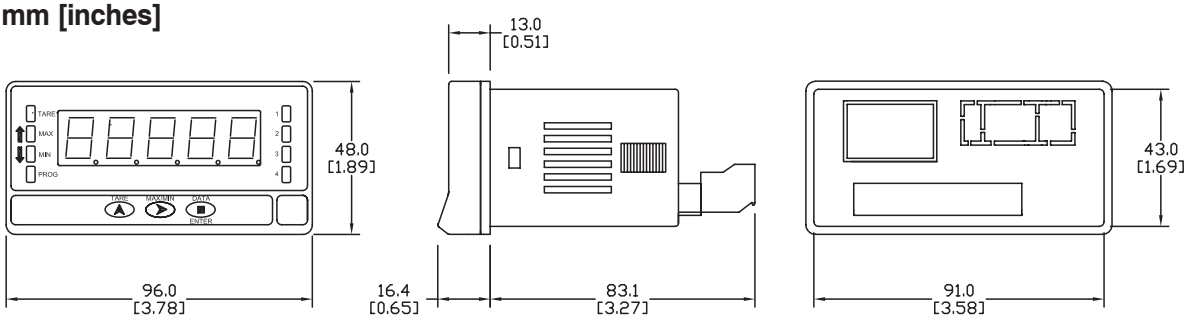
Programming Panel



Programming Panel			
#	Description	Run Mode	Programming Mode
1	TARE	Indicates tare in the memory	---
2	MAX	Indicates peak displayed	---
3	MIN	Indicates valley displayed	---
4	PROG	---	Indicates programming mode
5	DISPLAY	Displays the input variable	Displays programming parameters
6	UP/TARE KEY	Takes on the display value as tare	Increments the value of the flashing digit
7	SHIFT/MAX/MIN KEY	Recalls Max/Min values	Moves to the right
8	ENTER KEY	Enters in PROG mode. Displays data	Accepts data. Advances program
9	Free space for units label	---	
10	LED Output 4	Activation output 4	Programming output 4
11	LED Output 3	Activation output 3	Programming output 3
12	LED Output 2	Activaton output 2	Programming output 2
13	LED Output 1	Activation output 1	Programming output 1

Dimensions

mm [inches]



Installation	
Dimensions	96 x 48 x 83.1 mm (1/8 DIN)
Panel Cutout	92 x 45mm (Max. panel thickness 10mm)
Case Material	Polycarbonate UL 94 V-0

See our website www.AutomationDirect.com for complete Engineering drawings.

For additional information and configuration details download the complete instructions from www.AutomationDirect.com

Other products you might want to consider

Process Sensing

from top to bottom

PRESSURE

ProSense pressure switches and sensors monitor hydraulic, pneumatic and other process applications reliably and accurately. A wide selection of models are available:

Starting at: **$69.00** u.s.

- Mechanical or electronic pressure switches for low-cost indication and switching
- Gauge and vacuum pressure transmitters with ceramic or stainless steel sensing elements
- Digital pressure switches/transmitters with integral LCD display
- Air differential sensors also available

LEVEL

Starting at: **$260.00** u.s.

Flowline non-contact ultrasonic liquid level sensors use proven technology that won't fail because of dirty, sticky or scaling liquids.

- Continuous level measurement, switching and level control
- Automatic temperature compensation for accurate measurement
- Output options include current, voltage, frequency and relay
- Pushbutton configured models, or PC configured models using free software

Starting at: **$9.50** u.s.

- ProSense float level switches provide a low-cost general purpose solution for single point monitoring of liquid level in a variety of applications.

Starting at: **$299.00** u.s.

- **NEW!** ProSense SLT series submersible level sensors provide continuous liquid level measurement using the hydrostatic pressure exerted by the liquid above the sensor
- 4-20 mA output signal compatible with PLCs, panel meters, data loggers, and other electronic equipment
- Intrinsically safe with a +/-0.25% accuracy standard

TEMPERATURE

ProSense family of temperature sensing components includes:

Starting at: **$15.25** u.s.

- Thermocouple and RTD probes and sensors
- Transmitters with integral sensors, or thermocouple or RTD input
- Thermowells and fittings
- Thermocouple and RTD extension wire

FLOW

The ProSense FSD Series flow switches monitor liquid media and provide reliable flow detection for industrial applications.

Starting at: **$125.00** u.s.

- Ranges available up 26.4 GPM
- Fast 10ms response time
- Easy-to-turn dial to choose setpoint
- Integrated check valve prevents back flow in horizontal or vertical mounting
- LED output status indicator
- IP65 / IP67

Research, price, and buy at
www.automationdirect.com/process-controllers

AUTOMATIONDIRECT.com

FC Series Signal Conditioners

FC-33

DC Selectable Signal Conditioner with 3-way isolation

Field configurable input and output ranges of 0-5V, 0-10 V, 0-20 mA and 4-20 mA with 1500 VDC isolation between input and output, and 1500 VDC isolation from 24 volt power and input/output. LED indicates normal operation and is used in conjunction with the calibration pushbutton for the internal calibration process.

- 3-way 1500 V isolation
- Push button calibration

FC-T1

Thermocouple/mV Isolated Signal Conditioner

Field configurable input for type J, K, E, T, R, S, B, N and C thermocouples or ±156.25 mV inputs with 1500 VDC isolation between input and the 4-20 mA output. Cold junction compensation and burnout detection. Alarm/run LED.

- 1500 V isolation
- Cold junction compensation (CJC)
- Internal diagnostics (burnout detection or calibration errors)

FC-35B

Unipolar Voltage or Current to Bipolar Voltage Signal Conditioner

Field configurable input and output, unipolar input ranges of 0-5V, 0-10 V, 0-20 mA or 4-20 mA, and bipolar output ranges of ±100 mV, ±50 mV, ±5V, ±10V, ±15V. Field calibrated with offset and span adjustments.

FC-3RLY2

Analog Input, 2-Relay, Limit Alarm

Field configurable analog to relay limit alarm powered by 24VAC/VDC and Input signal ranges of 0-15V, 0-30V or 0-20mA. Trip/Release Point programmed via DIP switches. LED's indicate operating status.

FC-ISO-D

Encoder Signal Conditioner and Optical Isolator - Differential Line Driver Output

Ideal for use with single-ended (open collector, NPN, pull-up, push-pull, totem pole) or differential line driver encoders. Three complementary inputs (A, B, Z, A-not, B-not, Z-not) are rated for 4.5-7.5 and 12-26 VDC and frequency response up to 1 MHz.

Optical isolation separates the input signals from three differential line driver outputs (A, B, Z, A-not, B-not, Z-not) rated for 5VDC.

FC-11

4-20 mA Isolated Signal Conditioner

Loop powered 4-20 mA input/output signal with 1500 VDC isolation between input and output.

- 1500 V isolation
- Loop powered

FC-R1

RTD Input Signal Conditioner

Loop powered, non-isolated, 3-wire unit converts an RTD input to a linear 4-20 mA signal. User selectable CU10, PT100 or PT1000 input.

FC-P3

Potentiometer Input, Analog Output Signal Conditioner

Field configurable input and output, input ranges of 3-wire potentiometer 0 to 100 ohms through 0 to 100 kilohms, and output ranges of 0-5V, 0-10 V, 0-20 mA or 4-20 mA. Field calibrated to 10% of potentiometer full range.

FC-B34

Bipolar Voltage to Unipolar Voltage or Current Signal Conditioner

Field configurable input and output, bipolar input ranges of ±100 mV, ±50 mV, ±5V, ±10V, ±15V, and unipolar output ranges of 0-5V, 0-10 V, 0-20 mA or 4-20 mA. Field calibrated with offset and span adjustments.

FC-3RLY4

Analog Input, 4-Relay, Limit Alarm

Field configurable analog to relay limit alarm powered by 24VAC/VDC and Input signal ranges of 0-15V, 0-30V or 0-20mA. Trip/Release Point programmed via DIP switches. LED's indicate operating status.

FC-ISO-C

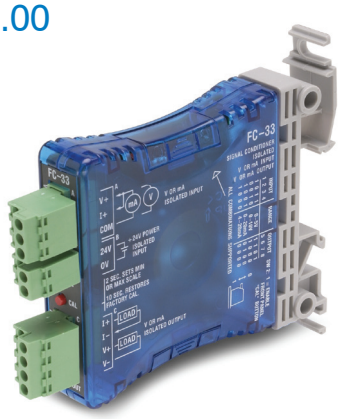
Encoder Signal Conditioner and Optical Isolator - Open Collector Output

Ideal for use with single-ended (open collector, NPN, pull-up, push-pull, totem pole) or differential line driver encoders. Three complementary inputs (A, B, Z, A-not, B-not, Z-not) are rated for 4.5-7.5 and 12-26 VDC and frequency response up to 1 MHz.

Optical isolation separates the input signals from three complementary open collector outputs (A, B, Z, A-not, B-not, Z-not) rated for 5-36 VDC that can be used in single-ended configurations.

FC-33 DC Selectable Signal Conditioner

$120.00



c UL us *UL file E200031*

Overview

The FC-33 is a DIN-rail or side-mount, selectable input/output signal conditioner with 1500 VDC isolation between input and output, and 1500 VDC isolation between 24-volt power and input/output. The field configurable input/output types allow a wide ranging capability for 0-5V, 0-10V, 0-20 mA and 4-20 mA signals.

The FC-33 has built-in self-calibration, but also has OFFSET (zero) and SPAN (full scale) adjustments of the output signal. The OFFSET has an adjustment range of 0 to 25% of full scale input and the SPAN has an adjustment of 80% to 102%.

Level LED: The LED is a powerful tool when setting up the signal conditioner. During normal operation the LED will blink at a proportional rate to the selected input signal level. When performing field calibration the LED is used for indication of the internal calibration process.

CAL-Pushbutton: This pushbutton, along with various switch settings, allows you to calibrate the OFFSET and/or SPAN for your application or to restore factory default calibration.

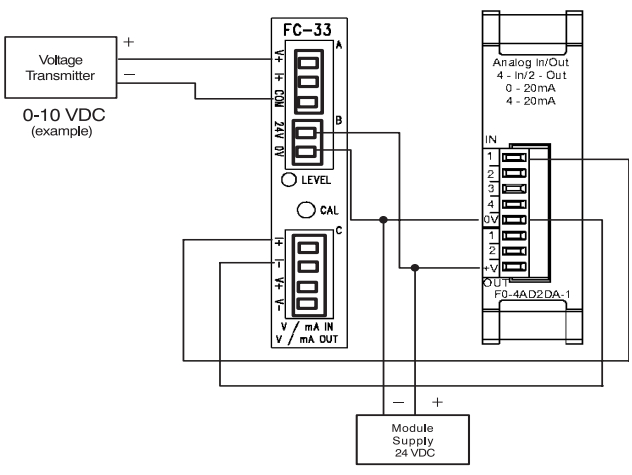
Specifications	
Input Ranges	0-5 V, 0-10 V, 0-20 mA, 4-20 mA
Input Impedance	250 Ω, ±0.1% current input 200 KΩ / 400 KΩ Voltage input
Output Ranges	0-5 V, 0-10 V, 0-20 mA, 4-20 mA
Load Impedance	2 KΩ minimum, voltage output 0 Ω minimum, current output
Maximum Load / Current	550 Ω @ 24 VDC (sink/source)
Sample Duration Time	10 mS
Filter Characteristic	-3 dB @ 3 Hz, -6 dB/octave
Linearity Error	0.05% FSO maximum
Stability	0.05% FSO maximum
Accuracy vs. Temperature	0.005%/ °C, (50ppm/°C)
Input Power	24 VDC, ±10% @ 50 mA
Recommended Fuse	0.032 mA, Series 217, current inputs
Isolation	1500 VDC input - output* 1500 VDC power - input* 1500 VDC power - output* *applied for 1 second
Maximum Inaccuracy of Output	0.05% @ 25°C, FSO maximum 0.25% @ 0-60°C, FSO maximum
Output Current	21 mA maximum (for mA output)
Approx. Field Cal. Range	0 - 25% (0 - 1.5 V / 5 V mode) 80% - 102% (4 - 5.1 V / 5 V mode)
Operating Temperature	0-60°C (32 to 140°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)
Relative Humidity	5 to 90% (non-condensing)
Vibration	ML STD 810C 514.2
Shock	ML STD 810C 516.2
Noise Immunity	NEMA ICS3-304

Application

The FC-33, field configurable isolated input/output signal conditioner, is useful in eliminating ground loops and interfacing sensors to PLC analog input modules. The FC-33 has 3-way isolation; this feature solves many types of configuration problems. For example, the signal conditioner can be configured for a sinking input and a sourcing output. It also allows signal translation from current input to voltage output or voltage input to current output.

This feature would be useful in a system design with a limited type and number of channels – for example: eight channels of 0-10 VDC, seven of which are used, and one 4-20 mA input transmitter.

Typical User Wiring



Voltage Input and Current Output (example)

FC-11 4-20mA Isolated Signal Conditioner

$90.00

c UL us *UL file E200031*

Overview

The FC-11 is a DIN-rail or side-mount, 4-20 mA Input/Output loop powered signal conditioner with 1500 VDC isolation between input and output.

The FC-11 has a user-selectable factory calibration. The output can also be calibrated with OFFSET (zero) and SPAN (full scale) adjustments. The OFFSET has an adjustment range of 0 to 25% of full scale input and the SPAN has an adjustment of 80% to 102%.

Application

The FC-11 isolated input/output signal conditioner is useful in eliminating ground loops and sinking/sourcing issues when interfacing to PLC analog input modules. The FC-11 design feature solves many types of configuration problems. For example, the signal conditioner can solve the problem of connecting a sinking input transmitter to a sinking analog input module.

Specifications	
Input Ranges ***Extended Input range[1]***	4-20 ma 3.5 mA to 20.6 mA, ± 1%
Input Burden Voltage[2]	6.8 VDC
Maximum Input Current	34 mA @ 9.7 VDC
Output Burden Voltage[3]	8.5 VDC minimum
Output Range ***Extended Output Range[1]***	4-20 mA 3.5 mA to 20.6 mA, ± 1%
Maximum Load Impedance	650 Ω @ 24 VDC, 1000 Ω 29 VDC
Maximum Output Current	23 mA @ 29 VDC
Sample Duration Time	18 mS maximum
Linearity Error	0.1% FSO maximum
Max Inaccuracy of Output	0.05% @ 25°C, FSO maximum, 0.3% @ 0-60°C, FSO maximum
Filter Characteristics	-3 dB @ 200 Hz, -6 dB / octave
Stability	0.1% FSO maximum
Accuracy vs. Temperature	± 0.0065% / °C (65ppm / °C)
Isolation	1500 VDC Input - Output
Operating Temperature	0 to 60°C (32 to 140°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)
Relative Humidity	5 to 90% (non-condensing)
Vibration	ML STD 810C 514.2
Shock	ML STD 810C 516.2
Noise Immunity	NEMA ICS3-304

NOTES:

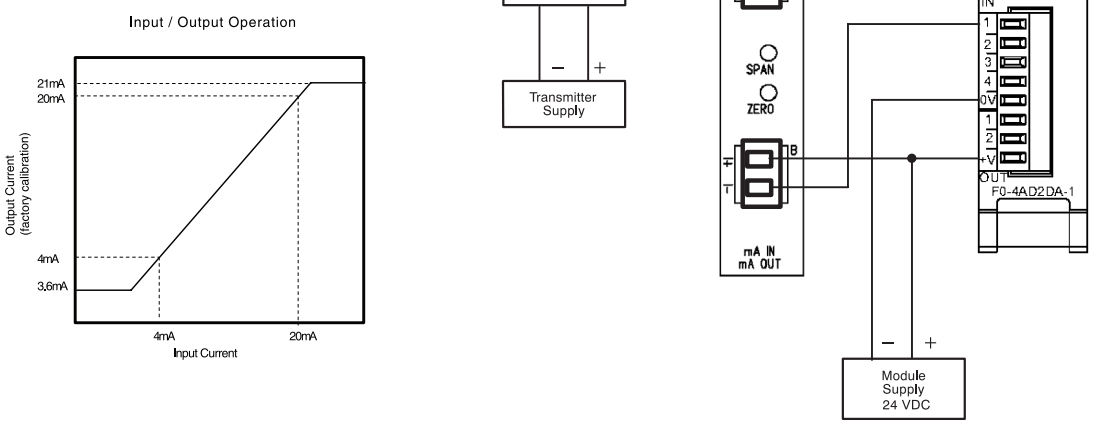
1. When adjusting SPAN and OFFSET potentiometer

2. Voltage required to power internal circuitry

3. Formula, [(output load) x 20 mA] + 8.5 V,.i.e.: 13.5 VDC @ 250 Ω

4. Internal analog converter resolution is 12-bit

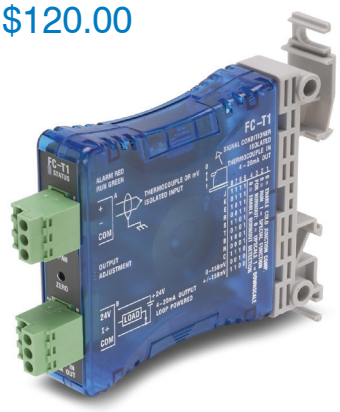
Typical User Wiring



4-20 mA Input Isolated to 4-20 mA Output (example)

FC-T1 Thermocouple/mV Input Isolated Signal Conditioner

$120.00



c UL us *UL file E200031*

Overview

The FC-T1 is a DIN-rail or side-mount thermocouple/mV input signal conditioner with 1500 VAC isolation between input and output.

The field configurable input allows a wide ranging capability for a type J, K, E, R, S, T, B, N and C thermocouple, or 0-156.25 mV and ±156.25 mV signals.

The FC-T1 has built-in self-calibration, but also offers OFFSET (zero) and SPAN (full scale) potentiometer for adjustment of the output signal.

The FC-T1 is also equipped with cold junction compensation (CJC) circuitry to provide an internal ice-point reference.

The temperature calculation and linearization are based on data provided by the National Institute of Standards and Technology (NIST).

ALARM and RUN LED: This LED is bicolor (red and green). A red LED indicates either power up, a fault with internal calibration, or a thermocouple burnout condition, while a green LED indicates normal operation.

Burnout Function: The output current can be selected to provide either upscale (20mA) or downscale (4mA) detection whenever thermocouple burnout occurs.

Specifications				
Input Ranges	***T/C***	***°C***	***°F***	***Resolution[1]***
	J	-190 to 760	-310 to 1400	0.23°C
	K	-150 to 1372	-238 to 2502	0.37°C
	E	-210 to 1000	-345 to 1832	0.295°C
	R	65 to 1768	149 to 3214	0.42°C
	S	65 to 1768	149 to 3214	0.42°C
	T	-230 to 400	-382 to 752	0.15°C
	B	529 to 1820	984 to 3308	0.315°C
	N	-70 to 1300	-94 to 2372	0.33°C
	C	65 to 2320	149 to 4208	0.55°C
	0 to 156.25 mV			0.038 mV
	-156.25 mV to +156.25 mV			0.076 mV
Output Range	4 to 20 mA			
External Power Supply	15 mA, 22 to 26 VDC			
Input Impedance	>5 MΩ			
Absolute Maximum Rating	Fault protected input ±50 V			
Maximum Inaccuracy	±3°C, Temperature Input ±0.1%, Voltage Input			
Linearity Error	0.1%			
Over Temperature Error	0.1 X 10^{-5}% (10 ppm)/°C			
Insulation Resistance	≥100 Mr with 500 VDC (Input to output power)			
Isolation	1500 VAC @ 1 Sec. (Input to output commons)			
Sample Duration Time	120 mS Voltage Input 250 mS Thermocouple Input			
Common Mode Rejection	-100 dB @ DC, -90 dB @ 50/60 Hz			
Input Filter (FIR)	-3 dB @ 15 Hz, -100 dB @ 50 Hz, -100 dB @ 60 Hz			
Broken Thermocouple	Up/Down Scale Red/Green LED			
Over Range	Up Scale			
Under Range	Down Scale			
Burnout Time	≤3 Seconds			
Cold Junction Compensation	Automatic			
Warm-up Time	30 min. typical ±1°C repeatability			
Operating Temperature	0 to 60°C (32 to 140°F)			
Storage Temperature	-20 to 70°C (-4 to 158°F)			
Relative Humidity	5 to 90% (non-condensing)			
Environmental Air	No corrosive gases permitted			
Vibration	ML STD 810C 514.2			
Shock	ML STD 810C 516.2			
Noise Immunity	NEMA ICS3-304			

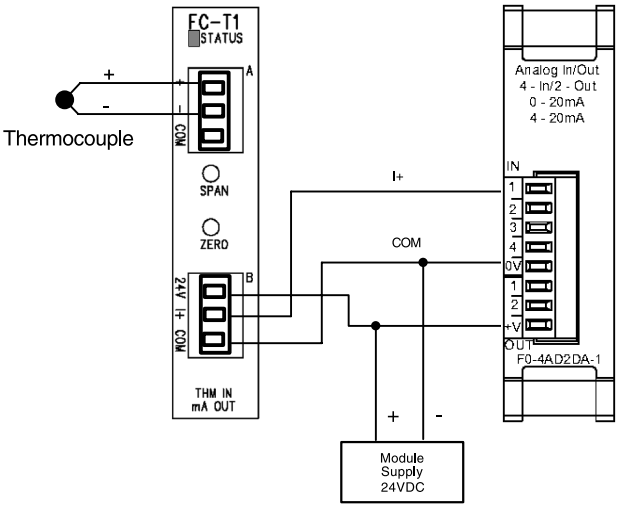
Note:
[1] Internal analog converter resolution is 12-bit.

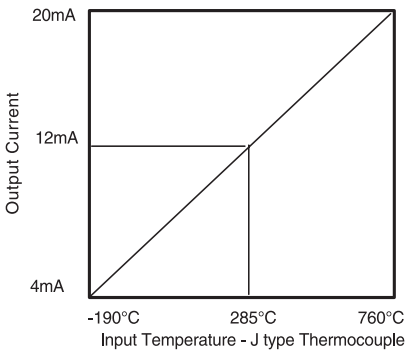
FC-T1 Thermocouple/mV Input Isolated Signal Conditioner

Application

The FC-T1, field configurable thermocouple/mV signal conditioner, is useful in eliminating ground loops and for interfacing to PLC analog input modules. If your requirements are only for one channel of temperature, you can add the signal conditioner to your 4-20 mA input module. Or, if your requirements are for a single millivolt signal source, you have the option of adding this input to your analog module.

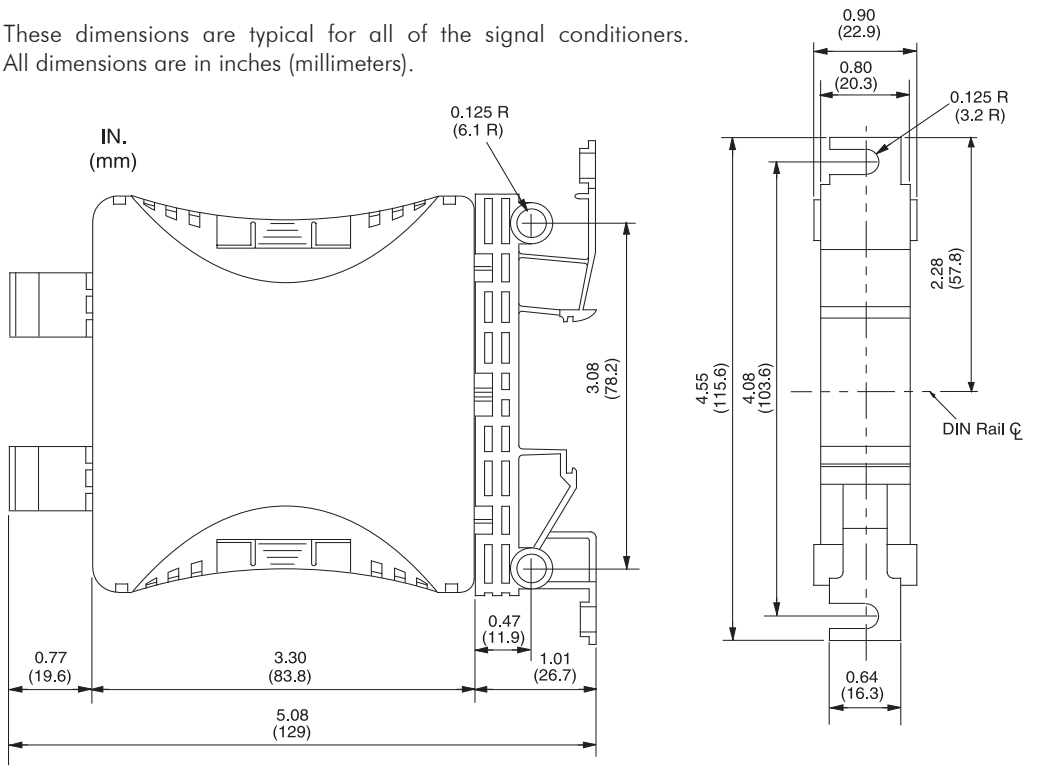
Typical User Wiring





Signal Conditioner Dimensions

These dimensions are typical for all of the signal conditioners. All dimensions are in inches (millimeters).



FC-R1 RTD Input Loop Powered Signal Conditioner

$120.00

UL file E200031

Overview

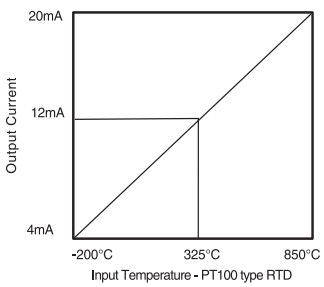
The FC-R1 is a DIN-rail or side-mount Resistive Temperature Detector signal conditioner. It is a non-isolated signal conditioner which converts a 3-wire RTD to a linearized 4-20 mA current loop signal.

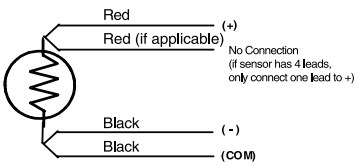
The FC-R1 has a user selectable CU10 (10 Ohm copper), PT100 (100 Ohm platinum) or PT1000 (1000 Ohm platinum) RTD input, and also offers OFFSET (zero) and SPAN (full scale) adjustments of the output signal. The OFFSET has an adjustment range of 0 to 25% of full scale output and the SPAN has an adjustment of 80% to 102%.

Specifications			
Input Ranges	CU10	-200°C to 260°C	-328°F to 500°F
	PT100	-200°C to 850°C	-328°F to 1562°F
	PT1000	-200°C to 595°C	-328°F to 1103°F
RTD Excitation Current	CU10, PT100 500 µA ±50 µA PT1000 80 µA ±20 µA		
Common Mode Range	0 - 3.5 VDC		
Output Range	4-20 mA (linearized)		
Maximum Inaccuracy	0.35% FSO / CU10 0.2% FSO @ 25°C / PT100 & PT1000 0.26% FSO @ 60°C / PT100 & PT1000		
Maximum Loop Supply	30 VDC		
Load Impedance	0 Ω minimum		
Maximum Load/Power Supply	203 Ω / 12 V, 745 Ω / 24 V		
Linearity Error	0.35% FSO / CU10 0.2% FSO / PT10 & PT1000		
Output Slew Rate	1% @ 20 mS		
Filter Characteristics	105 dB @ DC, 60 dB @ 10 Hz, 40 dB @ 60Hz		
Stability	0.05% FSO maximum		
Operating Temperature	0 to 60°C (32 to 140°F)		
Storage Temperature	-20 to 70°C (-4 to 158°F)		
Relative Humidity	5 to 90% (non-condensing)		
Environmental Air	No corrosive gases permitted		
Vibration	ML STD 810C 514.2		
Shock	ML STD 810C 516.2		
Noise Immunity	NEMA ICS3-304		

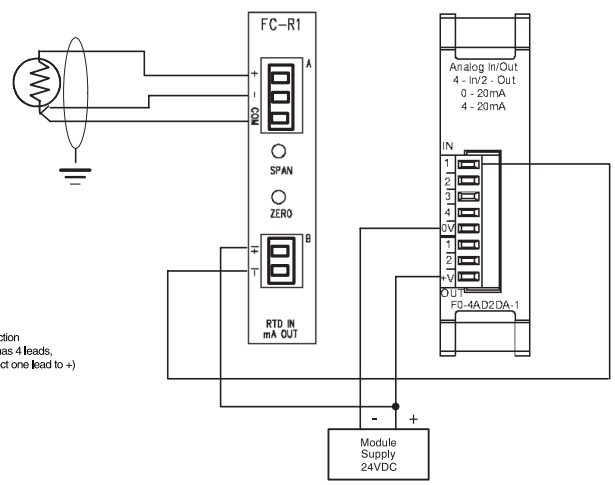
Application

The FC-R1 field configurable input signal conditioner is useful for interfacing RTD sensors to PLC analog current input modules. It is recommended that shielded RTDs be used whenever possible to minimize noise on the input signal.





Typical User Wiring



RTD Signal Conditioner to 4-20 mA DL05/06 analog module
Only use three wire and four wire RTDs.

FC-P3 Potentiometer Input, Analog Output Signal Conditioner

$115.00

UL file E157382

Overview

The FC-P3 is a resistive input to isolated analog output signal conditioner. The input resistive range (high end resistivity, low end resistivity) is set through the use of a push-button programming routine.

The FC-P3 is field configurable for 3-wire potentiometer/slide-wire inputs with end-to-end resistance ranges from 0-100 ohms to 0-100 kilohms. The input adjustment range can be scaled down to a minimum of 10% of the potentiometer being used. Switch selectable, analog output options include 0-20 mA, 4-20 mA, 0-5V, and 0-10 V. The PGM LED provides an indication of operating status and is used during the field programming process.

The MAX and MIN LED's indicate OVER and UNDER range status. The module can be 35 mm DIN rail or side mounted and is UL listed. Power for the unit is provided by a customer supplied 24 VAC or 24 VDC Class 2 power supply.

Specifications	
Input Specifications	
Input Ranges	0 - 100 ohms up to 0-100 kilohms, 3-wire potentiometer/slide-wire
Programmable Range Minimum	Pushbutton Adjustable to 10% of full range of applied potentiometer
Excitation	>100 uA @ 2.5VDC
External Power Required	24 VDC ±10% @ 120 mA or 24 VAC ±10% @ 120 mA, Class 2
Output Specifications	
Output Ranges	0-5 V, 0-10 V, 0-20 mA, 4-20 mA (DIP Switch Selectable/Invertable)
Maximum Output Current	21 mA (for mA OUT ONLY)
Response Time	35 ms for mA Out, 100 ms for V Out
Load Impedance	2 kilohm minimum, voltage output 550 ohms maximum current output
Output Drive	Voltage: 10 mA maximum Current: 21 mA maximum
Maximum Inaccuracy	±0.75% @ 0-60°C, FSO maximum
Output Stability and Repeatability	0.05% FSO maximum

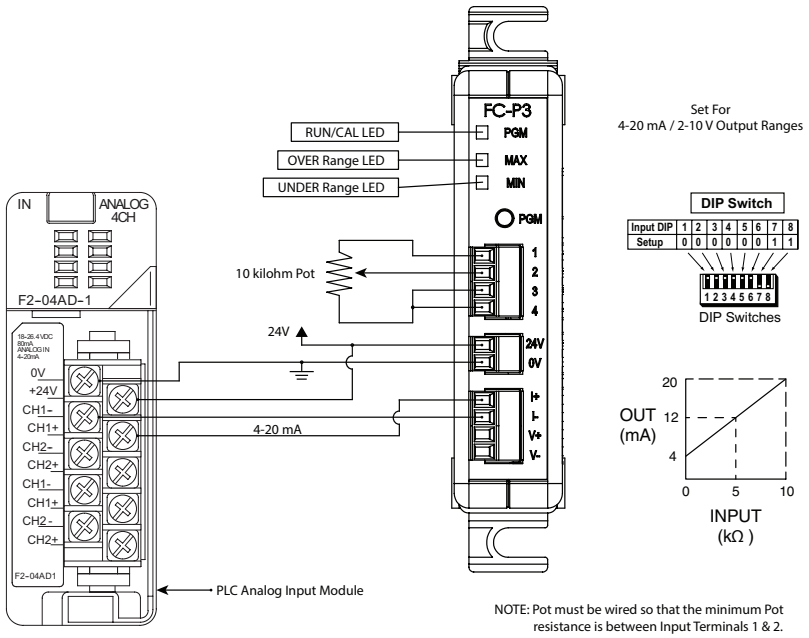
Specifications (continued)	
Output Specifications (continued)	
Output Ripple	0.05% of full scale
Output Protection	Outputs short circuit protected
Inverted Outputs	Invert Outputs using DIP Switch 6
Terminal Block Specifications	
Field Wiring	Removable Screw Terminal Blocks (included)
Number of Positions	2 (Dinkle EC350V-02P), 4 (Dinkle EC350V-04P), 4 (Dinkle EC350V-04P)
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)
General Specifications	
Accuracy vs. Temperature	±50 PPM of full scale/°C Maximum
Response Time	35 ms, 100 ms for 0-10V range
Power Dissipation within Module	3W Maximum
Thermal Dissipation	9.42 BTU/hr
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)
Enclosure Rating	IP20
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
Shock	MIL STD 810C 516.2
Isolation	1500 VDC Input to Output 1000 VDC Power to Input 1000 VDC Power to Output applied for 1 second (100% tested)
Insulation Resistance	>10 M ohm @ 500 VDC
Noise Immunity	NEMA ICS3-304 IEC 61000-4-2 (ESD) Impulse 1000 V @ 1µS pulse IEC 6100-4-4 (FTB) RFI, (145 MHz, 440 MHz 5W @ 15 cm) IEC 61000-4-3 (RFI)
Weight	0.25 lbs
Agency Approvals	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-P3 Application and Dimensions

Application

Use the FC-P3 to eliminate the challenge of getting a variable set by a machine operator into the PLC. Using the FC-P3 to convert the resistive signal from a 10 kilohm potentiometer to a 4-20 mA signal that can be used by a PLC is simple.



NOTE: Pot must be wired so that the minimum Pot resistance is between Input Terminals 1 & 2.

Wiring Connections

Input Terminal Block	
Faceplate Label	***Description***
1	Pot End Terminal
2	Pot Wiper
3	Pot End Terminal
4	Shield Connection

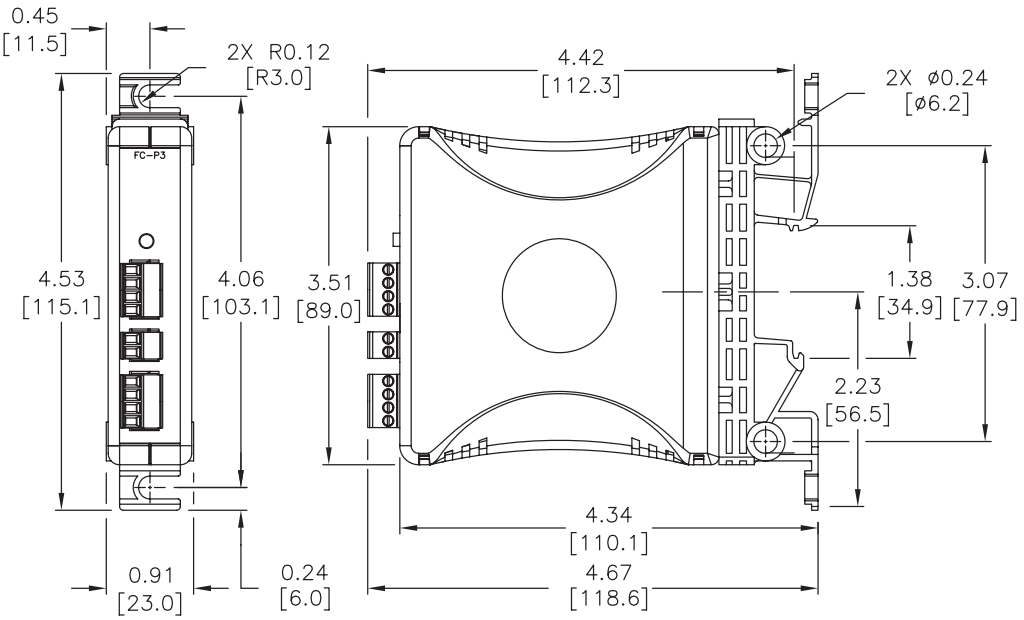
NOTE: Pot must be wired so that the minimum Pot resistance is between Input Terminals 1 & 2.

External Power Terminal Block	
Faceplate Label	***Description***
24 V	24 VDC or 24 VAC ±10%, Class 2
0V	0V

Output Terminal Block	
Faceplate Label	***Description***
I+	Current
I-	Current
V+	Voltage
V-	Voltage

Dimensions

inches [mm]



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

$129.00

UL file E157382

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 an inversion (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.

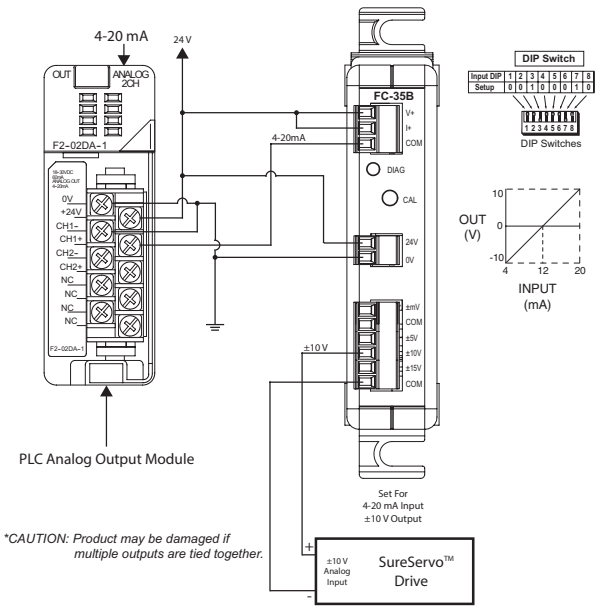
Specifications	
Input Specifications	
Input Ranges	0-5V, 0-10 V, 0-20 mA, 4-20 mA (DIP Switch Selectable/Invertable)
Input Impedance	410 kilohm voltage input, 250 ohm current input
Protection Type, Component	Polarity Protection Diode
External DC Power Required	24 VDC ±10%, 40 mA, Class 2
User Calibration 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	±50 mV, ±100 mV, ±5V, ±10 V, ±15 V
Load Impedance	2 kilohm Minimum
Sample Duration Time	10 ms
Maximum Inaccuracy	0.1% FSO @ 25°C (1.0% 50 mV / 100 mV)
Accuracy vs. Temperature	±60 PPM of Full Scale / °C Maximum
Output Current	±50 mV/±100 mV @ 2.5mA max, ±5V, ±10 V, ±15 V @ 7.5mA max
Terminal Block Specifications	
Field Wiring	Removable Screw Type Terminal Blocks (Included)
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)
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)
Enclosure Rating	IP20
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 1000 V @ 1µS pulse IEC 61000-4-4 (FTB) RFI, (145 MHz, 440 MHz 5W @ 15 cm) IEC 61000-4-3 (RFI)
Weight	0.3lbs
Isolation	1800 VDC Power to Input 1800 VDC Power to Output 1800 VDC Input to Output applied for 1 second (100% tested)
Agency Approvals	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

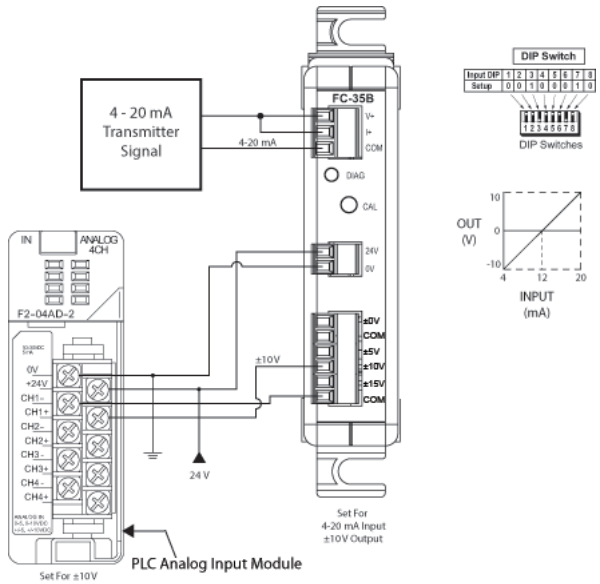
Application Example 1

Use the FC-35B to convert a unipolar output from a PLC analog card to a bipolar ±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 ±10 VDC signal for a PLC input.



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

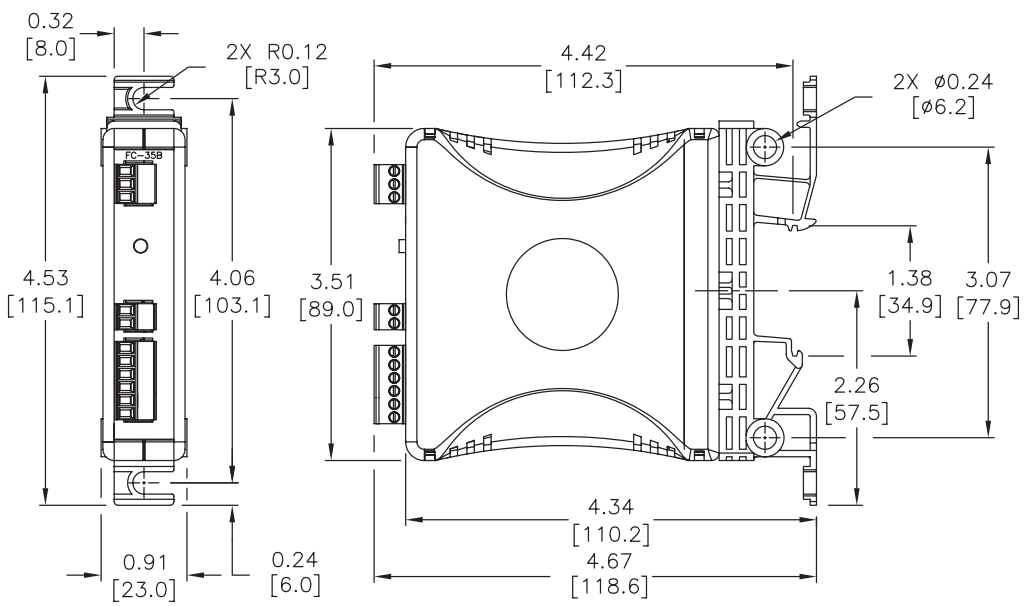
Output Terminal Block	
Faceplate Label	**Description**
±mV	±50 mV or ±100 mV Output
COM	COM Connection (used with mV signals)
±5V	±5V Output
±10 V	±10 V Output
±15 V	±15 V Output
COM	COM Connection (used with non-mV signals)

External Power Terminal Block	
Faceplate Label	**Description**
24 V	24 VDC ±10% (Class 2)
0V	0V

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

Dimensions

inches [mm]



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

$129.00

UL file E157382

Overview

The FC-B34 is a 35 mm 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 an inversion (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.

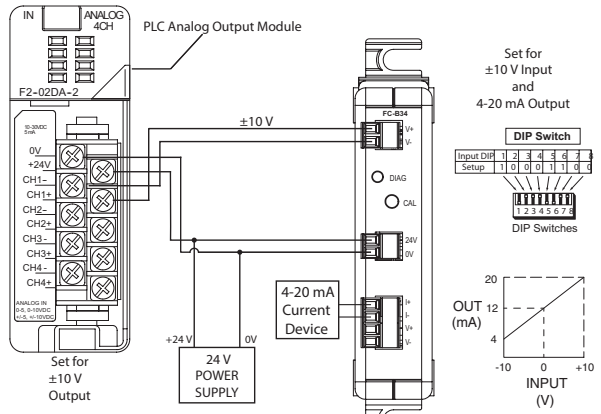
Specifications	
Input Specifications	
Input Ranges	±15 V, ±10 V, ±5V, ±100 mV, ± 50 mV (DIP Switch Selectable)
Input Impedance	2 M ohm
Protection Type, Component	Polarity Protection Diode
External DC Power Required	24 VDC ±10%, 50 mA, Class 2
User Calibration Range	OFFSET (zero): 0-20% (e.g. -4V / ±5V mode) SPAN (full-scale): 80-102% (e.g. 4.0 - 5.1V / ±5V mode)
Output Specifications	
Output Ranges	0-5V, 0-10 V, 0-20 mA, 4-20 mA (DIP Switch Selectable)
Load Impedance	2 kilohm Minimum, Voltage Output 550 ohm Maximum, Current Output
Sample Duration Time	10 ms
Maximum Inaccuracy	0.1% FSO (±15 V, ±10 V, ±5V Inputs), 1.5% FSO (±100 mV, ±50 mV Inputs) @ 25°C
Accuracy vs. Temperature	+/-60 PPM of Full Scale/ °C Maximum
Output Current	21 mA max for mA-Out mode/ 10 mA max for Volt-out mode
Terminal Block Specifications	
Field Wiring	Removable Screw Type Terminal Blocks, (included)
Number of Positions	2 (Dinkle: EC350V-02P), 2 (Dinkle: EC350V-02P), 4 (Dinkle: EC350V-04P)
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)
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)
Enclosure Rating	IP20
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	>10 M Ω@ 500 VDC
Noise Immunity	NEMA ICS3-304 IEC 61000-4-2 (ESD) Impulse 1000 V @ 1µS pulse IEC 61000-4-4 (FTB) RFI, (145 MHz, 440 MHz 5W @ 15 cm) IEC 61000-4-3 (RFI)
Weight	0.3lbs
Isolation	1800 VDC Power to Input 1800 VDC Power to Output 1800 VDC Input to Output applied for 1 second (100% tested)
Agency Approvals	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

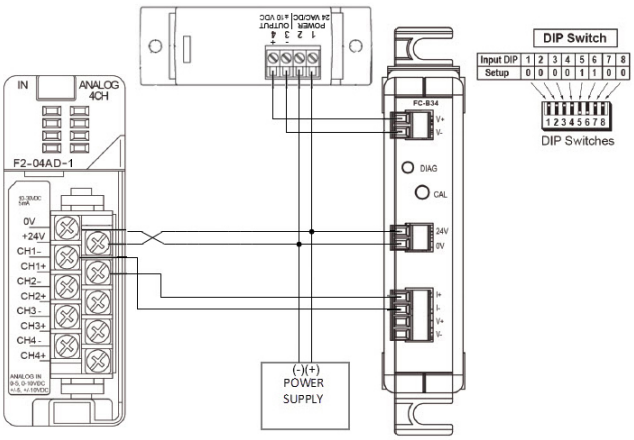
The FC-B34 can be used to convert a bipolar ±10 VDC signal to a 4-20 mA signal.



*CAUTION: If current output (I+/I-) and Voltage output (V+/V-) are both connected to loads and/or the "I+" terminal to the "V-" terminal, product damage may occur.

Application Example 2

The FC-B34 can be used to convert the bipolar ±10 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	
Faceplate Label	*Description*
V+	Signal In +
V-	Signal In -

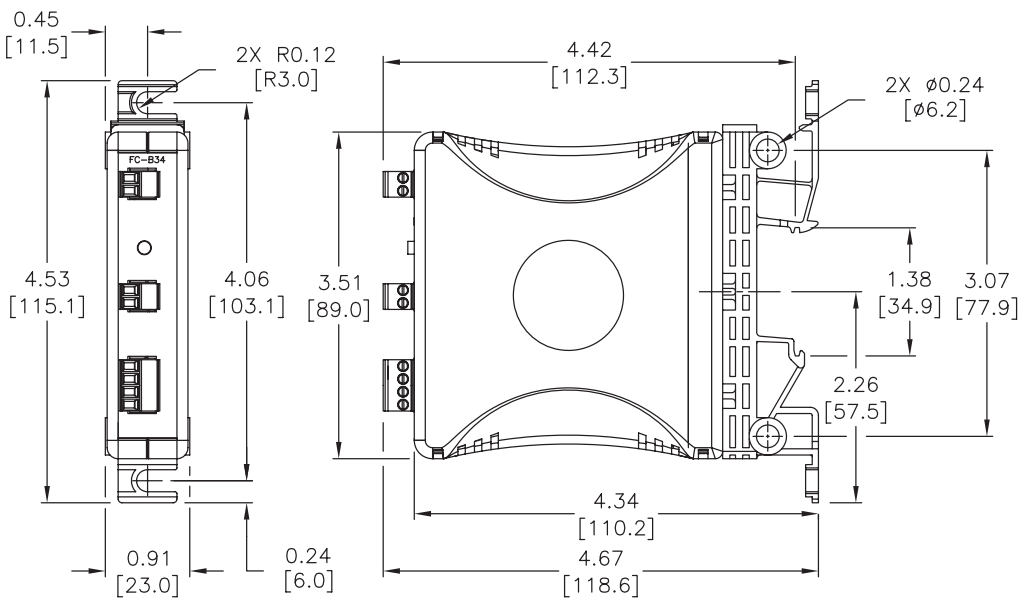
Output Terminal Block	
Faceplate Label	*Description*
I+	Current
I-	Current
V+	Voltage
V-	Voltage

External Power Terminal Block	
Faceplate Label	*Description*
24 V	24 VDC ±10% (Class 2)
0V	0V

Switch/LED Labels	
Faceplate Label	*Description*
DIAG	Diagnostic LED flashing indication
CAL	Pushbutton switch input to initiate calibration, etc.

Dimensions

inches [mm]



FC-3RLY2 Analog Input, 2-Relay, Limit Alarm Module

$89.00

CE c UL us *UL file E157382*

Overview

This is an Analog to Relay Limit Alarm module that is field configurable for a variety of alarm and control applications. The FC-3RLY2 can be powered by 24VAC or 24VDC and accept input signals of 0-15V, 0-30V, or 0-20mA. Configuration and Trip/Release Point programming is accomplished with DIP Switches, and a single PGM-pushbutton. LED's provide an indication of operating status and are used during the Trip/Release Point programming. The module can be 35mm DIN rail or side mounted.

Specifications	
Input Specifications	
Number of Inputs and Type	(1) Single Ended, (1) Common
Input Ranges	0-15VDC, 0-30VDC, 0-20mA (DIP Switch Selectable)
Input Impedance	100KΩ voltage input / 250 Ohms current input
External DC Power Required	24 VAC or 24VDC @ 100mA ±10%
Low-pass Filtering	-3dB at 100Hz, (-6dB per octave)
Set/Release Point Voltage Repeatability	0.05% of full scale Voltage range (Constant temperature)
Set/Release Point Current Repeatability	0.1% of full scale Current range (Constant temperature)
Output Specifications	
Relay Contacts	2 SPDT, Form C, non-latching
Current Contact Rating	250VAC @ 5A, 30VDC @ 5A (Resistive Load)
Relay Operation	DIP Switch selectable
Relay Trip Point Setting	Program Mode enabled by pushbutton
Relay Release Point Setting	
Relay Dead-band = Trip Point ± Release Point	0-15VDC Range: 1.0% minimum deadband (150mV) 0-30VDC Range: 1.0% minimum deadband (300mV) 0-20mA Range: 3.0% minimum deadband (600µA)
Terminal Block Specifications	
Field Wiring	Removable Screw Type Terminal Blocks, (included)
Number of Positions	(2) Two Position (Dinkle: EC350V-02P) (2) Three Position (Dinkle: EC350V-03P)
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)
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	>10 M Ω@ 500 VDC
Noise Immunity	NEMA ICS3-304 IEC 61000-4-2 (ESD) Impulse 1000 V @ 1µS pulse IEC 61000-4-4 (FTB) RFI, (145 MHz, 440 MHz 5W @ 15 cm) IEC 61000-4-3 (RFI)
Weight	0.3lbs
Isolation	1800 VDC Power to Input 1800 VDC Power to Output 1800 VDC Input to Output applied for 1 second (100% tested)
Agency Approvals	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-3RLY2 Modes of Operation

Independent and Simultaneous Relay Control Modes

Independent Relay Control Mode

Relays A and B are controlled with independent Trip Points and Release Points for each relay. Relays A and B can be independently set to operate in Increasing or Decreasing mode (see next section). This mode can be used to control two loads in sequence, or monitor for multilevel alarm conditions.

Simultaneous Relay Control Mode

Relays A and B operate simultaneously, both controlled by Trip Point A and Release Point A settings. Both relays operate in Increasing or Decreasing mode (see next section).

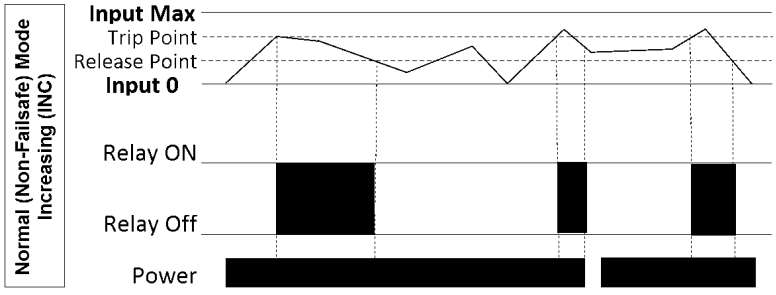
This mode can be used where it is desired to have both relays controlled by common Trip and Release points such as using one relay for local alarm indication with a horn or strobe and the other relay for remote alarm monitoring by a PLC.

Relay Trip/Release Point Control Modes
Normal (Non-failsafe)

Increasing (INC) Mode

The relay will turn ON when the input signal increases to the programmed Trip Point. The relay will remain ON until the input signal decreases below the Release Point.

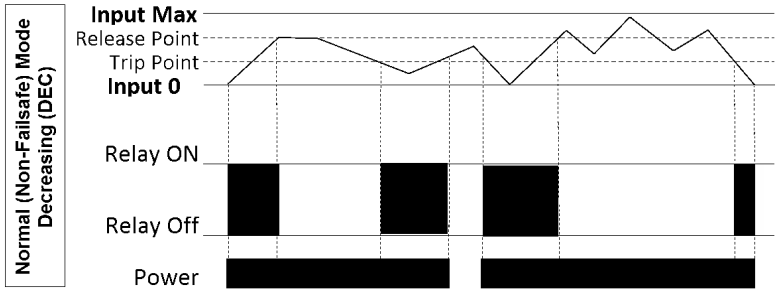
In INC mode, the Trip Point must always be greater than the Release Point (TP > RP).



Decreasing (DEC) Mode

The relay will turn ON when the input signal decreases below the programmed Trip Point. The relay will remain ON until the input signal increases above the Release Point.

In DEC mode, the Trip Point must always be less than the Release Point (TP < RP).

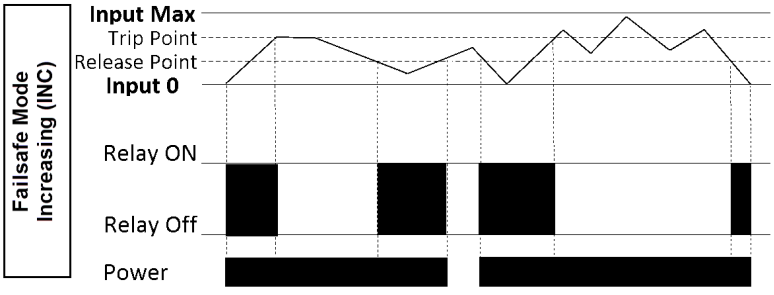


Failsafe Mode

Increasing (INC) Mode

The relay will turn OFF when the input signal increases to the programmed Trip Point. The relay will remain OFF until the input signal decreases below the Release Point.

In INC mode, the Trip Point must always be greater than the Release Point (TP > RP).



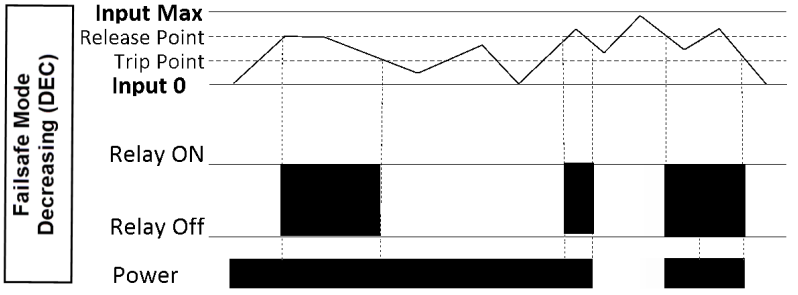
FC-3RLY2 Modes of Operation (continued)

Failsafe Mode (continued)

Decreasing (DEC) Mode

The relay will turn OFF when the input signal decreases below the programmed Trip Point. The relay will remain OFF until the input signal increases above the Release Point.

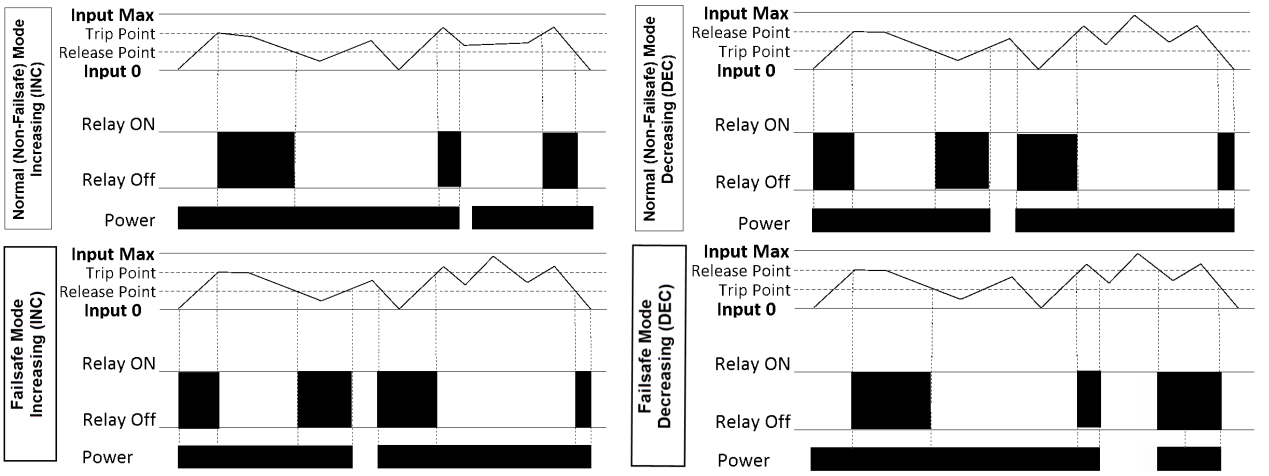
In DEC mode, the Trip Point must always be less than the Release Point (TP < RP).



Non-Latching and Latching Relay Control Modes

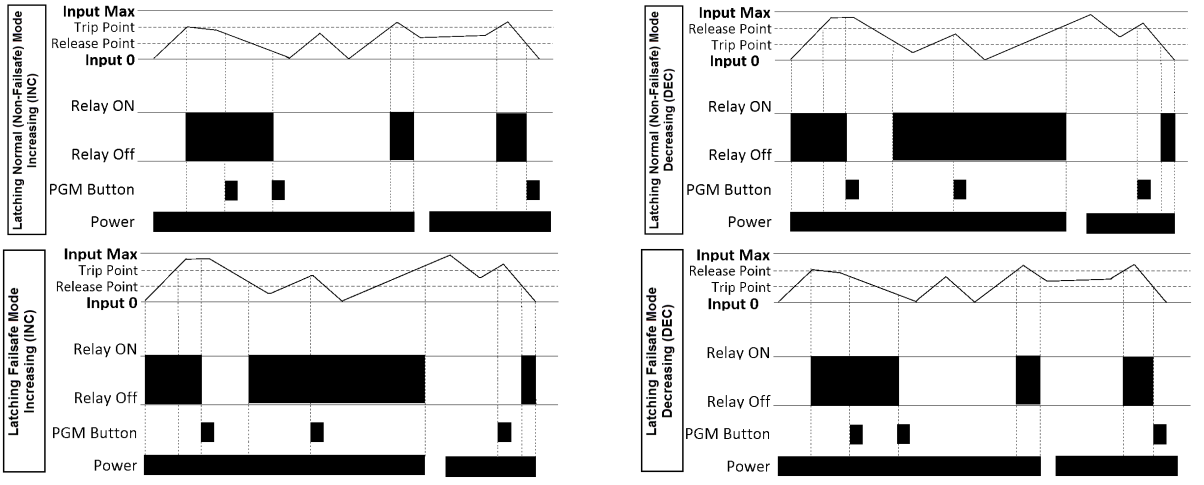
Non-Latching Relay Control Mode

Relays A and B operate automatically at the Trip and Release Point settings.



Latching Relay Control Mode

Relays A and B operate automatically at the Latch Trip Point settings and remain <u>electrically</u> latched until the input signal reaches the Manual Release Point, at which time the FC-3RLY2 relays can be manually reset by pressing the PGM-button as shown in the following diagrams. Latching Relay Control Mode is available in both Normal and Failsafe modes.

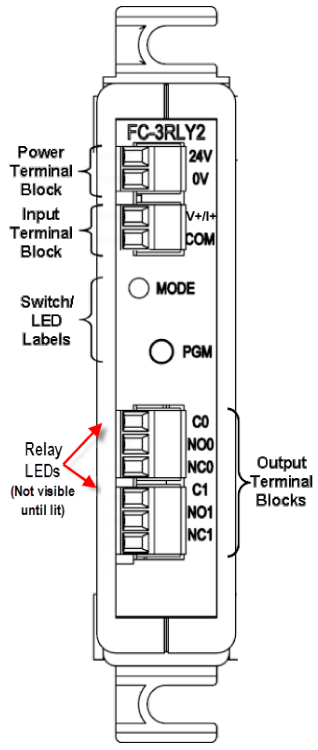


FC-3RLY2 Dimensions

Wiring Connections

External Power Terminal Block	
Faceplate Label	*Description*
24V	24VAC/VDC ±10% (Class 2)
0V	0V

Intput Terminal Block	
Faceplate Label	*Description*
V+ / I+	Voltage + / Current In
COM	Input Common

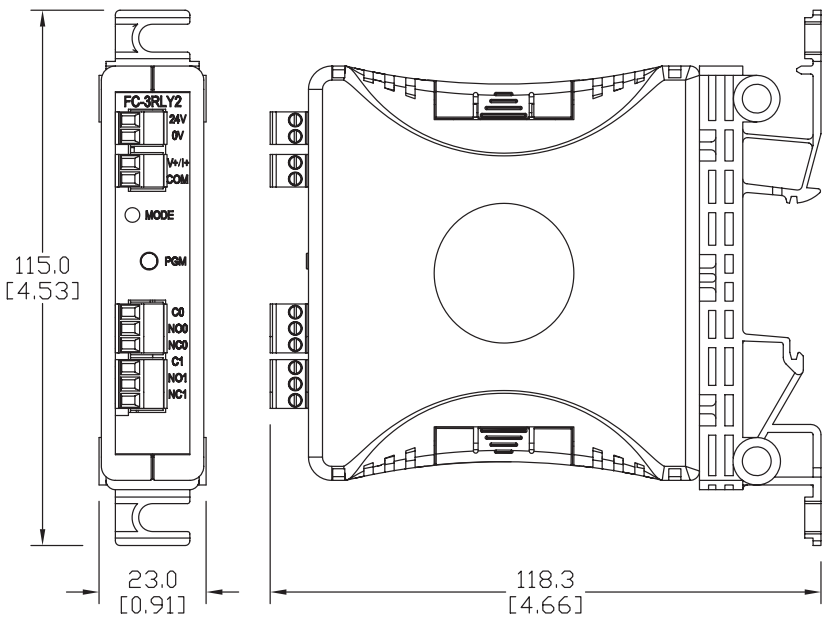


Switch/LED Labels	
Faceplate Label	*Description*
MODE	Programming Diagnostic LED indication
PGM	Pushbutton switch input to initiate programming, etc.

Output Terminal Block	
Faceplate Label	*Description*
C0/NO0/ NC0	Common # / Normally Open # / Normally Closed #
C1/NO1/ NC1	

Dimensions

mm [inches]



FC-3RLY4 Analog Input, 4-Relay, Limit Alarm Module

$95.00

UL file E157382

Overview

This an Analog to Relay Limit Alarm module that is field configurable for a variety of alarm and control applications. The FC-3RLY4 can be powered by 24VAC or 24VDC and accept input signals of 0-15V, 0-30V, or 0-20mA. Configuration and Trip/Release Point programming is accomplished with DIP switches, and a single PGM-pushbutton. LED's provide an indication of operating status and are used during the Trip/Release Point programming. The module can be 35mm DIN rail or side mounted.

Specifications	
Input Specifications	
Number of Inputs and Type	(1) Single Ended, (1) Common
Input Ranges	0-15VDC, 0-30VDC, 0-20mA (DIP Switch Selectable)
Input Impedance	100KΩ voltage input / 250 Ohms current input
External DC Power Required	24 VAC or 24VDC @ 100mA ±10%
Low-pass Filtering	-3dB at 100Hz, (-6dB per octave)
Set/Release Point Voltage Repeatability	0.05% of full scale Voltage range (Constant temperature)
Set/Release Point Current Repeatability	0.1% of full scale Current range (Constant temperature)
Output Specifications	
Relay Contacts	4 SPDT, Form A, non-latching
Current Contact Rating	250VAC @ 5A, 30VDC @ 5A (Resistive Load) 380VAC Max.,30VDC Max.
Relay Operation	DIP Switch selectable
Relay Trip Point Setting	Program Mode enabled by pushbutton
Relay Release Point Setting	
Relay Dead-band = Trip Point ± Release Point	0-15VDC Range: 1.0% minimum deadband (150mV) 0-30VDC Range: 1.0% minimum deadband (300mV) 0-20mA Range: 3.0% minimum deadband (600µA)
Terminal Block Specifications	
Field Wiring	Removable Screw Type Terminal Blocks, (included)
Number of Positions	(6) Two Position (Dinkle: EC350V-02P)
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)
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	>10 M Ω@ 500 VDC
Noise Immunity	NEMA ICS3-304 IEC 61000-4-2 (ESD) Impulse 1000 V @ 1µS pulse IEC 61000-4-4 (FTB) RFI, (145 MHz, 440 MHz 5W @ 15 cm) IEC 61000-4-3 (RFI)
Weight	0.3lbs
Isolation	1800 VDC Power to Input 1800 VDC Power to Output 1800 VDC Input to Output applied for 1 second (100% tested)
Agency Approvals	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-3RLY4 Modes of Operation

Independent and Simultaneous Relay Control Modes

Independent Relay Control Mode

Relays A, B, C and D are controlled with independent Trip Points and Release Points for each relay. All relays can be independently set to operate in Increasing or Decreasing mode (see next section). This mode can be used to control multiple loads in sequence, or monitor for multilevel alarm conditions.

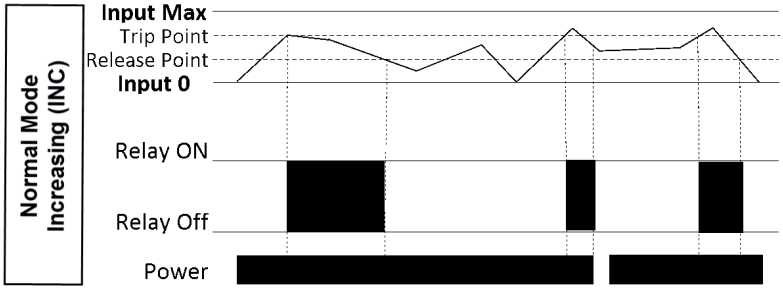
Simultaneous Relay Control Mode

Relays A and B operate simultaneously, both controlled by Trip Point A and Release Point A settings. Both relays operate in Increasing or Decreasing mode (see next section).
Relays C and D operate simultaneously, both controlled by Trip Point B and Release Point B settings. Both relays operate in Increasing or Decreasing mode (see next section).
This mode can be used where it is desired to have two relays controlled by common Trip and Release Points such as using one relay for local alarm indication with a horn or strobe and the other relay for remote alarm monitoring by a PLC.

Relay Trip Point / Release Point Control Modes

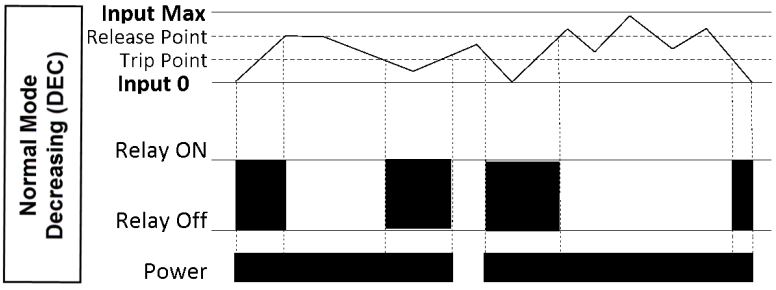
Increasing (INC) Mode

The relay will turn ON when the input signal increases to the programmed Trip Point. The relay will remain ON until the input signal decreases below the Release Point. In INC mode, the Trip Point must always be greater than the Release Point (TP > RP).



Decreasing (DEC) Mode

The relay will turn on when the input signal decreases below the programmed trip point. The relay will remain on until the input signal increases above the release point.
In DEC mode, the Trip Point must always be less than the release point (TP < RP).

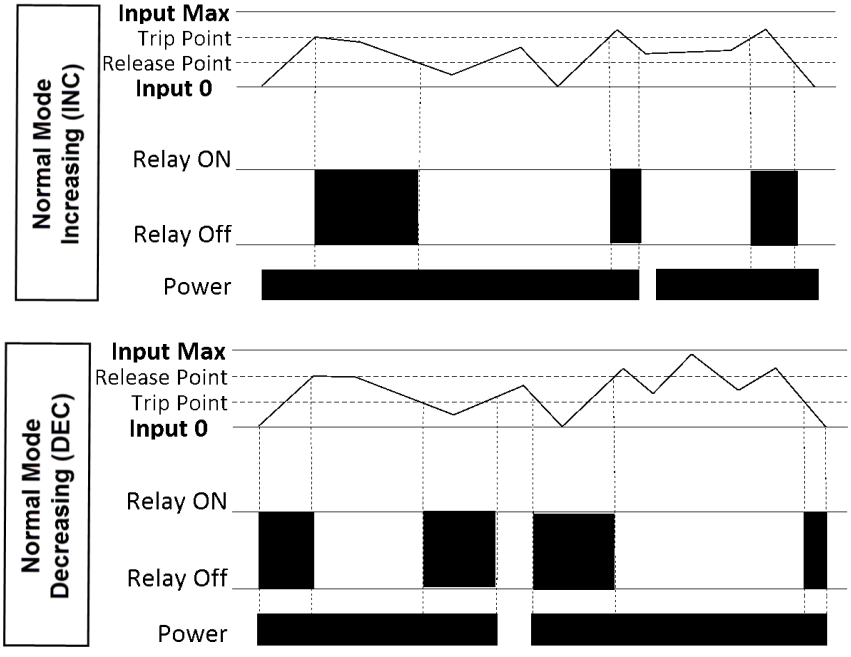


FC-3RLY4 Modes of Operation (continued)

Non-Latching and Latching Relay Control Modes

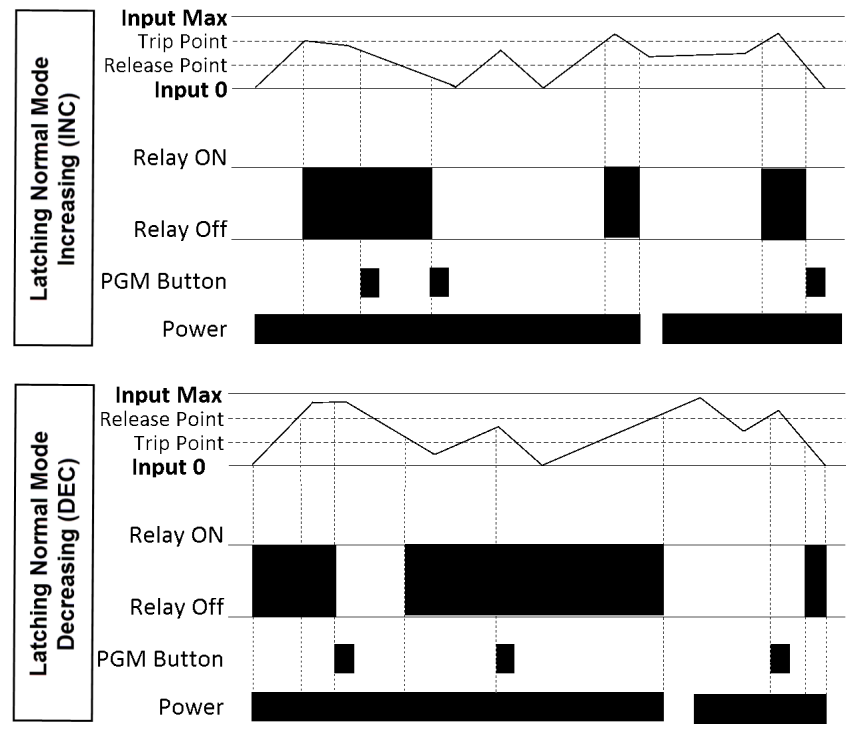
Non-Latching Relay Control Mode

All relays operate automatically at the Trip and Release Point settings.



Latching Relay Control Mode

All relays operate automatically at the Latch Trip Point settings and remain *electrically* latched until the input signal reaches the Manual Release Point, at which time the FC-3RLY4 relays can be manually reset by pressing the PGM-pushbutton as shown in the following diagrams.

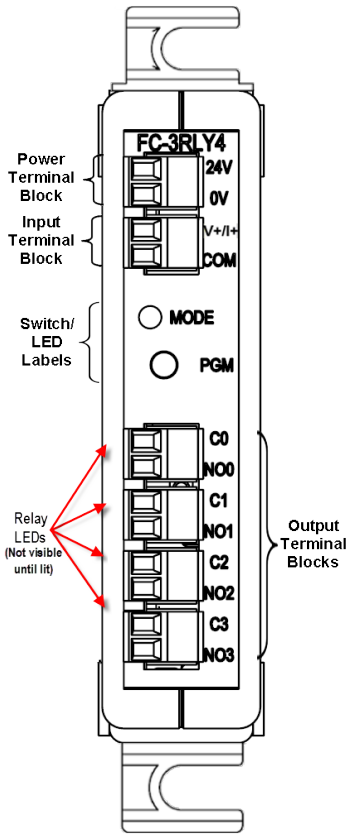


FC-3RLY4 Dimensions

Wiring Connections

Power Terminal Block	
Faceplate Label	*Description*
24V	24VAC/VDC ±10% (Class 2)
0V	0V

Intput Terminal Block	
Faceplate Label	*Description*
V+ / I+	Voltage + / Current In
COM	Input Common

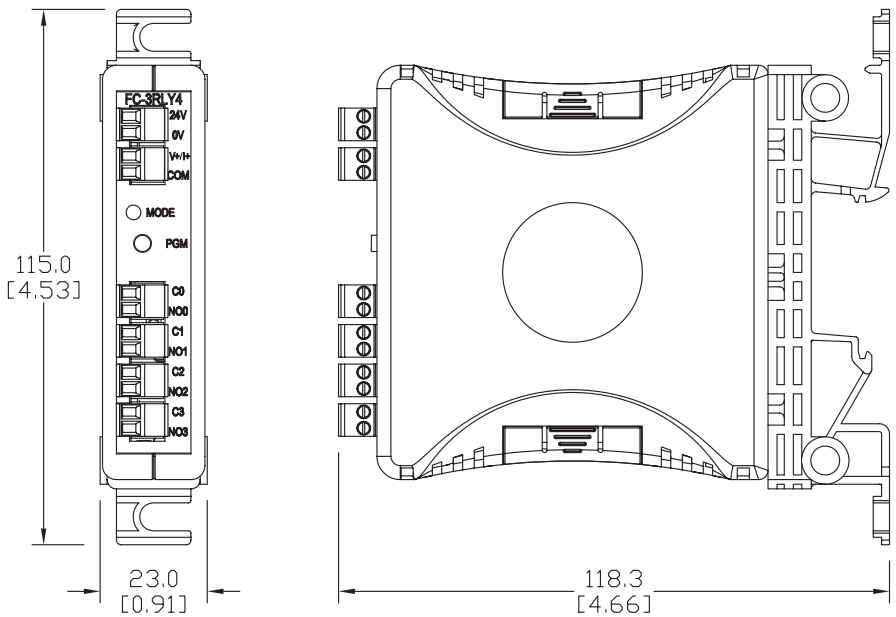


Switch/LED Labels	
Faceplate Label	*Description*
MODE	Diagnostic LED flashing indication
PGM	Pushbutton switch input to initiate programming, etc.

Output Terminal Block	
Faceplate Label	*Description*
C0/NO0	Common # / Normally Open #
C1/NO1	
C2/NO2	
C3/NO3	

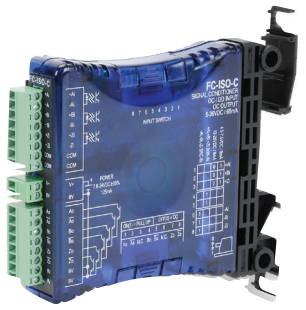
Dimensions

mm [inches]



FC-ISO-C Encoder Signal Conditioner and Optical Isolator - Open Collector Output

$89.00



Overview

The FC-ISO-C high speed optical isolator module has the versatility to solve various interface problems between an incremental encoder signal and a PLC, servo drive, or other input device. Ideal for use with single-ended (open collector, NPN, pull-up, push-pull, totem pole) or differential line driver encoder signals, the three complementary inputs (A, B, Z, A-not, B-not, Z-not) are rated for 4.5-7.5 VDC and 12-26 VDC and frequency response up to 1 MHz. Input terminals A, B, and Z can be internally connected together and complementary input terminals A-not, B-not, and Z-not can be internally connected to common through DIP switches for simplified wiring.

The FC-ISO-C has three complementary open collector outputs (A, B, Z, A-not, B-not, Z-not) rated for 5-36 VDC that can be used in single ended configurations. The open collector output terminals can be connected to internal pull-up resistors through DIP switches for quick troubleshooting. Optical isolation rated at 1800V separates the input signals from the outputs. The slim-line plastic housing includes an integral 35mm DIN rail mounting adapter, LED indication, and removable screw terminal blocks for easy installation and wiring. The FC-ISO-C module is UL508 listed and CE marked.

Applications:

- Provide optical isolation between an encoder signal and PLC, servo drive, or other input device
- Solve electrically noisy signal problems
- Use as a repeater to allow longer cable runs
- Convert a differential line driver encoder signal to an open collector single-ended signal
- Change encoder signal voltage to match receiving electronics input
- Ideal for use with encoders, servo drive encoder signal inputs and outputs, or as a multi-channel, high speed optically isolated interface for sensors like photoelectric and proximity switches

Specifications		
Input Specifications		
Input Voltage (DIP selectable)	4.5-7.5 VDC	12-26 VDC
Input Current	9mA typical, 18mA maximum	
Protection Type, Component	Surge, Suppressor Diode; Over current/temperature, Microprocessor	
Switching Threshold "0" Signal	< 2.2 VDC	< 3.9 VDC
Switching Threshold "1" Signal	> 2.6 VDC	> 4.8 VDC
Output Specifications		
Output Circuit	Open collector: 2-wire - floating or pull-up (DIP switch selectable); Sinking	
Output Rating	5-36 VDC	
Continuous Output Current	65mA maximum	
Overcurrent Trip Level	76mA minimum	
Quiescent Current	25µA maximum	
Output Voltage Protection	Polarity reversal, surge voltage protection	
Output Current Protection	Short circuit/Over Current/Over Current Limiting/Thermal Shutdown	
Timing Specifications		
Input to Output Response Time	1.3µs (max w/ 4.7k ohm internal pull-up resistor)	
Output Timing Difference (Ch. to Ch. Lag)	<20ns channel to channel (max)	
Rise Time (t_{on} w/ 1k ohm Load)	250ns	
Fall Time (t_{off} w/ 1k ohm Load)	38ns	
Max Frequency Response w/ 1k ohm Load	1 MHz	
Rise Time (t_{on} w/ 2.2k ohm Load)	512ns	
Fall Time (t_{off} w/ 2.2k ohm Load)	56ns	
Max Frequency Response w/ 2.2k ohm Load	750 kHz	
Rise Time (t_{on} w/ 4.7k Internal Pull-Up)	1.2µs	
Fall Time (t_{off} w/ 4.7k Internal Pull-Up)	25ns	
Max Frequency Response w/ 4.7k Internal Pull-Up	200 kHz	
Terminal Block Specifications		
Number of Positions	2 pole (Dinkle: EC350V-02P), 8 pole (Dinkle: EC350V-08P)	
Wire Range	28-16AWG Solid or Stranded Conductor; Wire strip length 9/32" (6-7mm)	
Screw Size (Slotted)	M 2.5 size, 0.4 T x 2.5 W mm (Screwdriver part number DN-SS1)	
Screw Torque	1.7 inch-pounds (0.19 Nm)	

FC-ISO-C Specifications Continued

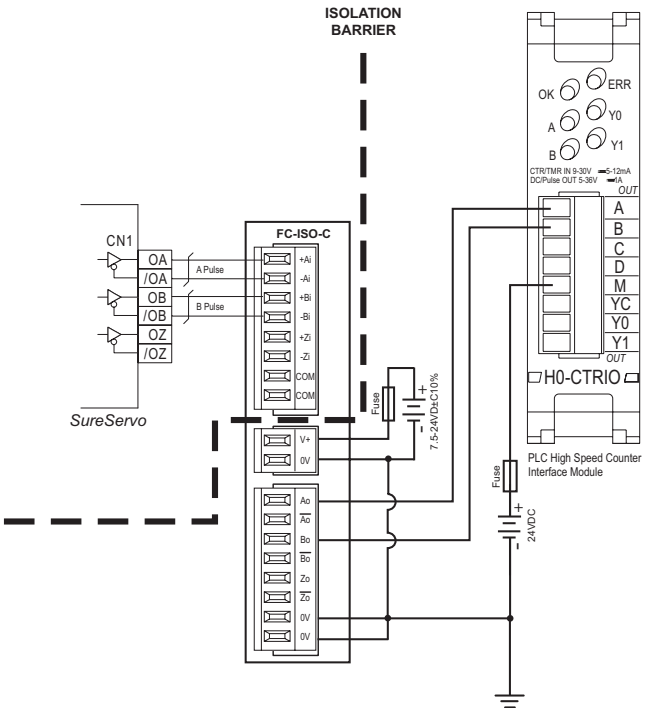
Specifications (continued)	
General Specifications	
External DC Power Required	7.8-24VDC ± 10% @ 125mA, 3.5W*
Power Dissipation Within Module	10W (maximum power with all outputs at max current and max voltage)
Thermal Dissipation	34.13 BTU/hr (1W = 3.413 BTU/hr)
Isolation	1800VAC input-output applied for 1 second
Mounting	35mm DIN Rail or panel mount (with no restrictions)
Operating 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 Ω @ 500 VDC
Noise Immunity	NEMA ICS3-304 IEC 61000-4-2 (ESD) Impulse 1000V @ 1µS pulse IEC 61000-4-4 (FTB) RFI, (145MHz, 440MHz 5W @ 15cm) IEC 61000-4-3 (RFI)
Weight	0.3 lbs
Agency Approvals	UL*, cUL (File # E157382), CE

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

Unit Front Face

Applications

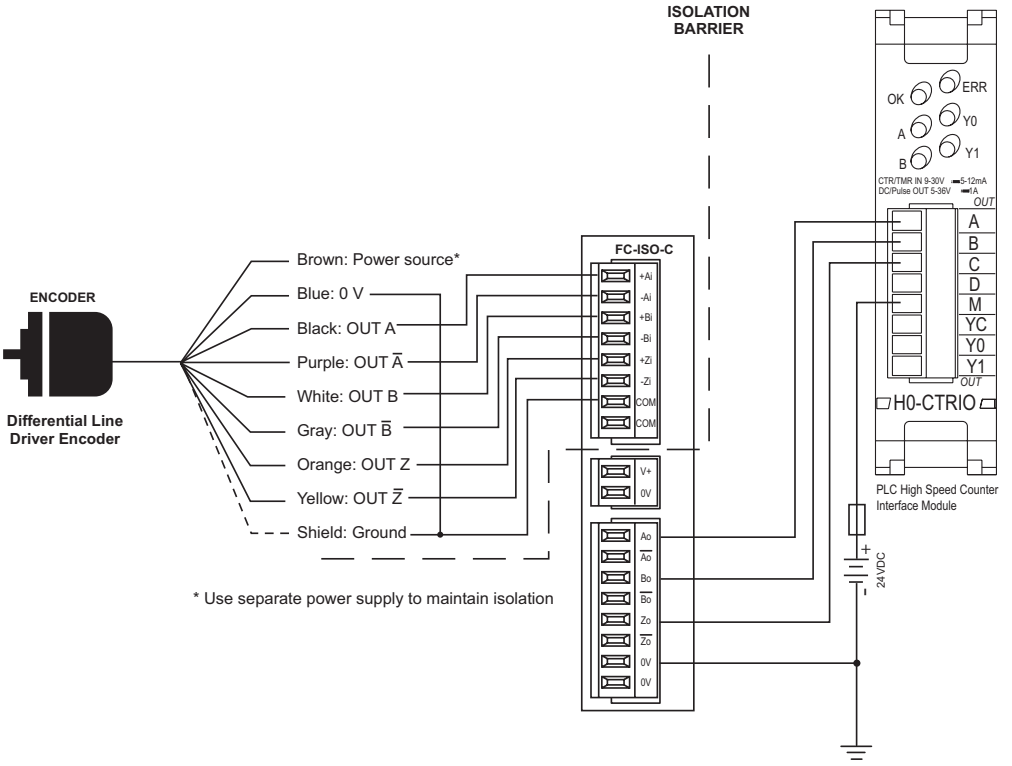
Convert *SureServo* line driver Input/Output Terminals (CN1) to a 24VDC open collector single ended signal that is compatible with a PLC high speed counter interface module.



FC-ISO-C Applications and Dimensions

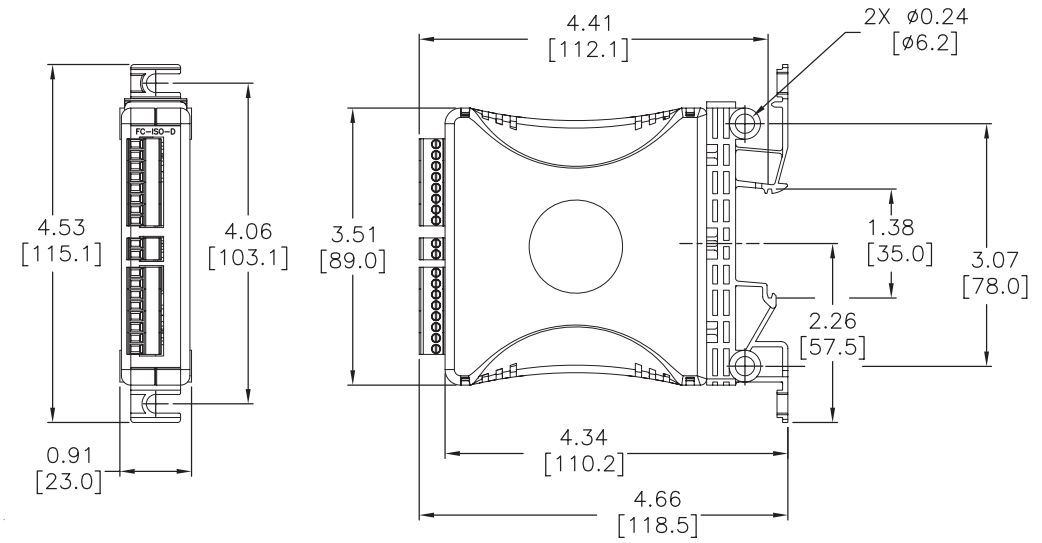
Applications Continued

Convert a 5VDC differential line driver encoder signal to a 24VDC open collector single-ended signal that is compatible with a PLC high speed counter interface module.



Dimensions

inches [mm]



FC-ISO-D Encoder Signal Conditioner and Optical Isolator - Differential Line Driver Output

$89.00

Overview

The FC-ISO-D high speed optical isolator module has the versatility to solve various interface problems between an incremental encoder signal and a PLC, servo drive, or other input device. Ideal for use with single-ended (open collector, NPN, pull-up, push-pull, totem pole) or differential line driver encoder signals, the three complementary inputs (A, B, Z, A-not, B-not, Z-not) are rated for 4.5-7.5 VDC and 12-26 VDC and frequency response up to 1 MHz. Input terminals A, B, and Z can be internally connected together and complementary input terminals A-not, B-not, and Z-not can be internally connected to common through DIP switches for simplified wiring.

The FC-ISO-D has three differential line driver outputs (A, B, Z, A-not, B-not, Z-not) rated for 5 VDC. Optical isolation rated at 1800V separates the input signals from the outputs. The slim-line plastic housing includes an integral 35mm DIN rail mounting adapter, LED indication, and removable screw terminal blocks for easy installation and wiring. The FC-ISO-D module is UL508 listed and CE marked.

Applications:

- Provide optical isolation between an encoder signal and PLC, servo drive, or other input device
- Solve electrically noisy signal problems
- Use as a repeater to allow longer cable runs
- Convert a single ended encoder signal to a differential line driver signal
- Convert a differential line driver encoder signal to a single-ended signal
- Change encoder signal voltage to match receiving electronics input
- Ideal for use with encoders and servo drive encoder signal inputs and outputs

Specifications		
Input Specifications		
Input Voltage (DIP selectable)	4.5-7.5 VDC	12-26 VDC
Input Current	7.5mA typical, 14mA maximum	
Protection Type, Component	Output Short Circuit Protection, Output Current Limiting, Output Thermal Shutdown, 15kV ESD protection; Differential Driver Chip	
Switching Threshold "0" Signal	< 2.2 VDC	< 3.9 VDC
Switching Threshold "1" Signal	> 2.6 VDC	> 438 VDC
Output Specifications		
Output Circuit	Differential line drive; Sourcing	
Output	5 VDC	
Continuous Output Current	70mA maximum	
Overcurrent Level	Limited to 70mA	
Quiescent Current	1.0mA maximum	
Output Voltage Protection	None (not reverse polarity protected); Voltage less than -9 V or greater than 14V will damage chip	
Voltage Drop at Max Continuous Current	1.75VDC	
Output Current Protection	Short Circuit, Current Limiting, Thermal Shutdown, 15kV ESD Protection	
Timing Specifications		
Input to Frequency Response Time	1.3µs	
Output Timing Difference (Ch. to Ch. Lag)	<20ns	
Output Rise Time (t_{on})	<15ns	
Output Fall Time (t_{off})	<15ns	
Max Frequency Response	1 MHz	
Terminal Block Specifications		
Number of Positions	2 pole (Dinkle: EC350V-02P), 8 pole (Dinkle: EC350V-08P)	
Wire Range	28-16 AWG Solid or Stranded Conductor; Wire strip length 5/16" (7-8mm)	
Screw Size (Slotted)	M 2.5 size, 0.4 T x 2.5 W mm (Screwdriver part number DN-SS1)	
Screw Torque	1.7 inch-pounds (0.19 Nm)	

FC-ISO-D Specifications Continued

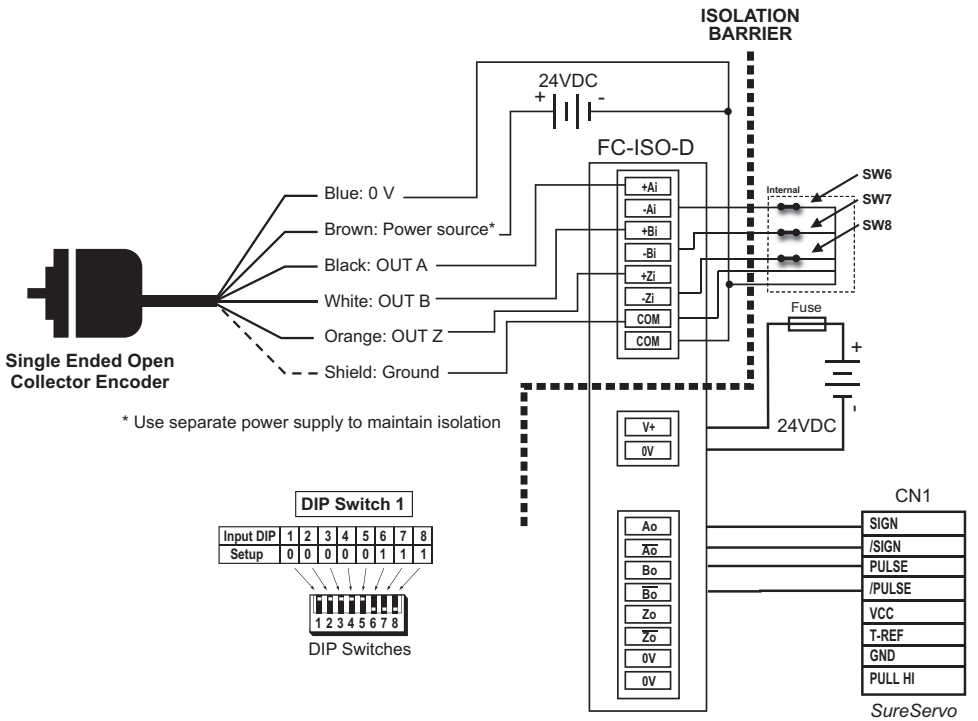
Specifications (continued)	
General Specifications	
External DC Power Required	24VDC ±10% @ 105mA*
Power Dissipation Within Module	9W (all outputs at max current at max voltage)
Thermal Dissipation	30.72 BTU/hr (1W = 3.413 BTU/hr)
Isolation	1800VAC input-output applied for 1 second
Mounting	35mm DIN Rail or panel mount (with no restrictions)
Operating 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 Ω @ 500 VDC
Noise Immunity	NEMA ICS3-304 IEC 61000-4-2 (ESD) Impulse 1000V @ 1µS pulse IEC 61000-4-4 (FTB) RFI, (145MHz, 440MHz 5W @ 15cm) IEC 61000-4-3 (RFI)
Agency Approvals	UL*, cUL (File # E157382), CE

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

Unit Front Face

Applications

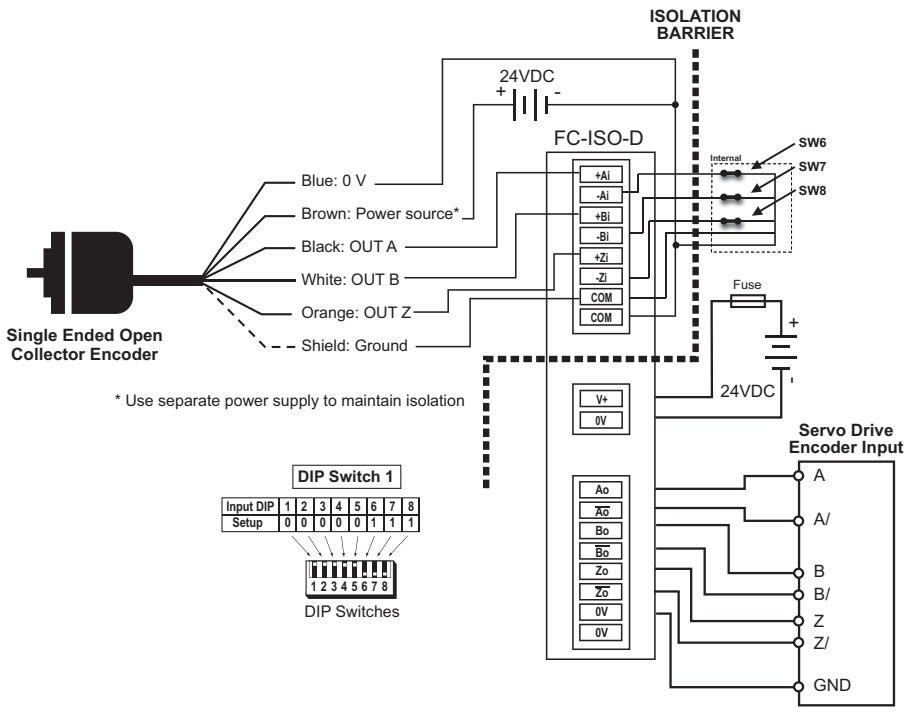
Convert a 24VDC single ended open collector encoder signal to a 5VDC differential line driver signal compatible with *SureServo* Input/Output Terminals (CN1).



FC-ISO-D Applications and Dimensions

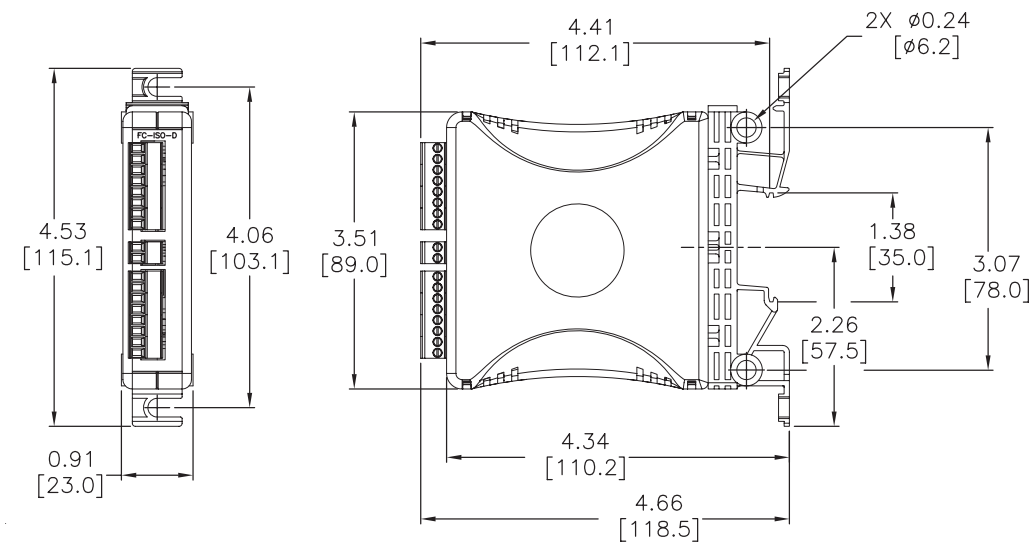
Applications Continued

Convert a 24VDC single-ended open-collector encoder signal to a 5VDC differential line driver signal compatible with the encoder input on a servo drive.



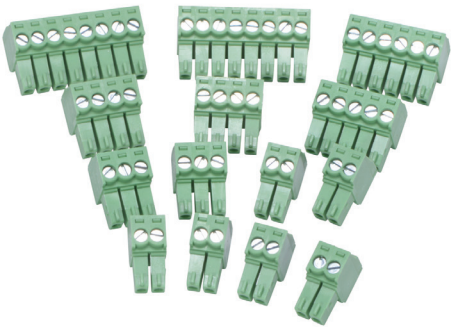
Dimensions

inches [mm]



FC Series Accessories

FC-5MM



FC-35MM

Description

Universal terminal block replacements for the FC Series signal conditioners. Each packcage 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***	***Weight (Lbs)***	***Price***
FC-5MM	Terminal block, replacement, 5mm. Package of 5. For use with FC Series signal conditioners.	0.1	$10.00
FC-35MM	Terminal block, replacement, 3.5mm. Package of 14. For use with FC Series signal conditioners.	0.1	$21.00

Universal Signal Conditioners

Universal Signal Conditioners

Features

- Flexibility to accept mA, VDC, thermocouple, RTD, linear resistance or potentiometer signal types
- Selectable input ranges and two point field scalability to handle hundreds of applications
- Direct and reverse acting mA and VDC analog output signal The 884116 also includes two programmable SPST relay outputs.
- Universal supply voltage, 21.6 to 253 VAC or 19.2 to 300 VDC, polarity insensitive
- 3-way isolation between input, output, and power
- Auxiliary power supply output for 2-wire transmitters and 3-wire potentiometers
- Easy-to-use detachable LCD programming/display module 884501 (Sold separately and required for programming)
- Transfer configuration settings from one signal conditioner to another
- LEDs indicate operation and relay status (884116) when display module is not installed
- Integral 35mm DIN rail mounting adapter
- Removable screw terminal blocks are keyed to ensure correct installation
- UL508 listed, CE marked
- 5 year warranty

The Universal Signal Conditioners from AutomationDirect are extremely, versatile providing the flexibility to convert, transmit, scale and isolate signals from a wide variety of process sensors and controller I/O. With models 884114 and 884116, scalable input signal types supported include mA, VDC, thermocouple with internal cold junction compensation, 2-, 3-, 4-wire RTDs, linear resistance or potentiometer signals. Numerous selectable input ranges and two point field scalability will handle hundreds of applications. Outputs include mA, VDC; two individually programmable relays on the 884116 are used for alarming and control functions. The isolated universal supply voltage input eliminates the need for separate transformers or power supplies. Isolation is also provided between input and output.

The signal conditioners are easily configured with the 884501 menu-structured LCD programming/display module (a computer running special calibration software is not required and there are no confusing DIP switches or jumpers to set). Automatic scrolling Help text identifies each menu item. The detachable programming/display module can store and transfer configuration parameters from one signal conditioner to another, minimizing set-up time in multiple unit applications. Programming is available in seven different languages and the programming/display module can be password protected to prevent unauthorized changes to the configuration. When not used for configuration, the programming/display module can remain on the signal conditioner to display the input signal value and engineering units, output signal, and relay status (if equipped). A process simulation function allows manual manipulation of the input signal to control the output signal for trouble-shooting and checkout.

Universal Signal Conditioners		
Part No.	**Description**	**Price**
884114	Signal conditioner and isolator, single input • Accepts milliamps, volts, RTD, thermocouple or potentiometer • Single analog output supports 16 selectable signal ranges • Plastic slim-line housing • Detachable 884501 programming/display module (purchased separately) is required for unit configuration; module may remain affixed for operational display of input and output values	$185.00
884116	Signal conditioner and isolator, single input • Accepts milliamps, volts, RTD, thermocouple or potentiometer • Single analog output supports 16 selectable signal ranges • Two programmable Form A relay outputs • Plastic slim-line housing • Detachable 884501 programming/display module (purchased separately) is required for unit configuration; module may remain affixed for operational display of input and output values	$199.00
884501	Programming/display module, detachable, use with 884114 and 884116.	$51.00

Universal Signal Conditioners

Universal Signal Conditioners 884114/884116 Specifications (with or without 884501)		
General Specifications		
Temperature Range	-20°C to + 60°C [-4°F to 140°F]	
Power	AC Power	21.6 to 253 VAC, 50/60 Hz
	DC Power	19.2 to 300 VDC
Consumption	≤ 2.5W	
Fuse	400 mA slow blow / 250 VAC (Not user replaceable)	
Auxiliary Power Supply Output	16-25 VDC, 20 mA max (Terminal 43 and 44)	
Isolation Voltage, Test/Operation	2.3 kVAC/250 VAC	
Configuration Interface	Programming/display module, 884501	
Signal/noise Ratio	Min. 60 dB (0 to 100 kHz)	
Response Time (0 to 90%, 100 to 10%)	Temperature input	≤ 1 sec
	mA / V input	≤ 400 ms
Calibration Temperature	20 to 28°C (68 to 82.4°F)	
Accuracy	The greater of the general and basic values (See Accuracy Table 1)	
Shock	EN61010-1	
Vibration	IEC 60068-2-6, IEC 60068-2-64	
EMC Immunity	≤ ±0.5% of span	
Extended EMC Immunity: NAMUR NE 21, A criterion, burst	≤ ±0.1% of span	
Environmental Conditions	Operating and Storage Temperature	-20 to +60°C [-4 to 140°F]
	Operating and Storage Humidity	95% relative humidity (non-condensing)
Approvals	CE, UL (#E314521, UL 508), EMC 2004/108/EC (EN 61326-1) LVD 2006/95/EC (EN61010-1) RoHS	
Construction	IP 50 enclosure, IP 20 terminals Touch Safe, case body is black high impact plastic. Pollution degree 1.	
Connections	Wire strip length	7.5mm [0.3 in]
	Wire gauge	26 - 14 AWG standard wire
	Torque	0.5 N-m [4.5 inch-lbs]
Weight	884114	145g [5.1 oz], 160 g [5.6 oz]
	884116	170g [5.9 oz], 185 g [6.5 oz]
	884501	15g [0.5 oz]
Dimensions	109 x 23.5 x 100mm [4.3 x .93 x 3.93 in], 109 x 23.5 x 116mm [4.3 x .93 x 4.6 in] with programming module	

Accuracy Table 1		
General Values		
Input Type	***Absolute Accuracy***	***Temperature Coefficient***
All	≤ ± 0.1% of span	≤ ± 0.01% of span/°C [0.01% of span/°F]
Basic Values		
Input Type	***Basic Accuracy***	***Temperature Coefficient***
mA	≤ ± 4 µA	≤ ± 0.4 µA/°C [±0.22µA/°F]
Volt	≤ ± 20 µV	≤ ± 2 µV/°C [±1.1µV/°F]
Pt100	≤ ± 0.2°C [±0.36°F]	≤ ± 0.01°C/°C [±.01°F/°F]
Linear resistance	≤ ± 0.1 Ω	≤ ± 0.01 Ω/°C [±.0056Ω/°F]
Potentiometer	≤ ± 0.1 Ω	≤ ± 0.01 Ω/°C [±.0056Ω/°F]
TC Type: E, J, K, L, N, T, U	≤ ± 1°C [±1.8°F]	≤ ± 0.05°C/°C [±.05°F/°F]
TC Type: B, R, S, W3, W5, LR	≤ ± 2°C [3.6°F]	≤ ± 0.2°C/°C [±0.2°F/°F]

Universal Signal Conditioners

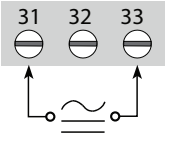
Inputs			
Current Input			
Programmable Ranges		0 to 20 and 4 to 20 mA DC	
Measurement Range		-1 to 25 mA	
Input Resistance		Nom. 70 Ω	
Sensor Error Detection		4 to 20 loop break, ≤3.6mA; ≥21mA	
Voltage Input			
Programmable Ranges		0 to 1, 0.2 to 1, 0 to 5, 1 to 5, 0 to 10, and 2 to 10 VDC	
Measurement Range		-20 mV to 12 VDC	
Input Resistance		Nom. 10 MΩ	
Thermocouple Inputs			
Thermocouple Type		B, E, J, K, L, N, R, S, T, U, W3, W5, and LR	
Cold Junction Compensation		Via internally mounted sensor < ± 2.0°C [< ± 3.6°F]	
Sensor Error Detection		Sensor break, >750kOhm/(1.25V)	
Sensor Error Current		When detecting 2µA, otherwise 0 µA	
Type	***Min. value***	***Max. value***	***Standard***
B	+400°C [+752°F]	+1820°C [+3308°F]	IEC 60584-1
E	-100°C [-148°F]	+1000°C [+1832°F]	IEC 60584-1
J	-100°C [-148°F]	+1200°C [+2192°F]	IEC 60584-1
K	-180°C [-292°F]	+1372°C [+2502°F]	IEC 60584-1
L	-200°C [-328°F]	+900°C [+1652°F]	DIN 43710
N	-180°C [-292°F]	+1300°C [+2372°F]	IEC 60584-1
R	-50°C [-58°F]	+1760°C [+3200°F]	IEC 60584-1
S	-50°C [-58°F	+1760°C [+3200°F]	IEC 60584-1
T	-200°C [-328°F]	+400°C [+752°F]	IEC 60584-1
U	-200°C [-328°F]	+600°C [+1112°F]	DIN 43710
W3	0°C [+32°F]	+2300°C [+4172°F]	ASTM E988-90
W5	0°C [+32°F]	+2300°C [+4172°F]	ASTM E988-90
LR	-200°C [-328°F]	+800°C [+1472°F]	GOST 3044-84
RTD, Linear Resistance, Potentiometer Inputs			
RTD Types		Pt10, Pt20, Pt50, Pt100, Pt200, Pt250, Pt300, Pt400, Pt500, Pt1000, Ni50, Ni100, Ni120, and Ni1000	
Cable Resistance per Wire		RTD, 50 Ω max	
Sensor Current		RTD, Nom. 0.2 mA	
Sensor Error Detection		Sensor break >15 kOhm Sensor short <15 Ohm (N/A for Pt10, Pt20, Pt50)	
Input type	***Min. value***	***Max. value***	***Standard***
Pt100	-200°C [-328°F]	+850°C [+1562°F]	IEC60751
Ni100	-60°C [-76°F]	+250°C [+482°F]	DIN 43760
Linear Resistance	0 Ω	10kΩ	–
Potentiometer	10 Ω	100kΩ	–

Universal Signal Conditioners

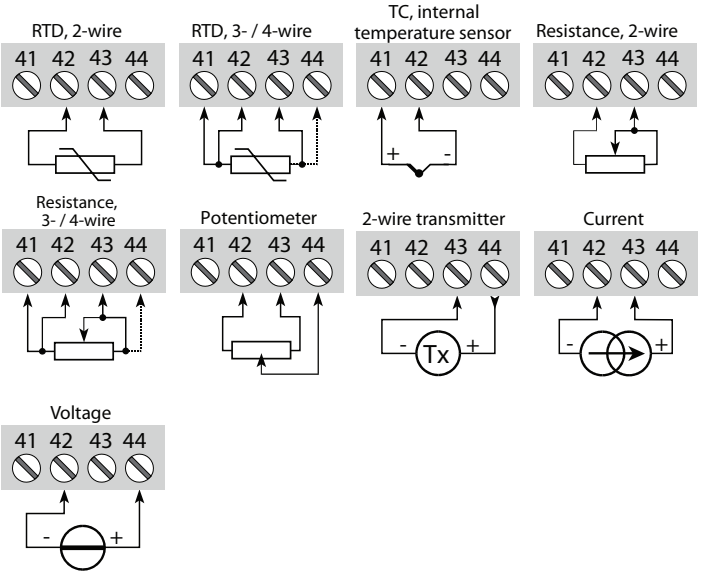
Outputs	
Analog Output - Current	
Signal Range	0 to 20 mA
Programmable Signal Range	0 to 20, 4 to 20, 20 to 0, and 20 to 4 mA
Load Resistance	800 Ω max, 20mA, 16 VDC
Load Stability	0.01% of span, 100 Ω load
Output state on sensor error detection	0 / 3.5 mA / 23 mA / none selectable
Output Limitation	For 4 to 20 and 20 to 4 mA signals: 3.8 to 20.5 mA
	For 0 to 20 and 20 to 0 mA signals: 0 to 20.5 mA
Current Limit	≤28 mA
Analog Output - Voltage	
Signal Range (Span)	0 to 10 VDC
Programmable Signal Ranges	0 to 1, 0.2 to 1, 0 to 10, 0 to 5, 1 to 5, 2 to 10, 1 to 0, 1 to 0.2, 5 to 0, 5 to 1, 10 to 0, and 10 to 2 V
Load	500k Ω min
Relay outputs (884116 only)	
Relay Functions	Setpoint, Window, Sensor Error, Power and Off
Hysteresis	0.1 to 25% (1 to 2999 display counts)
On and Off Delay	0 to 3600 sec
Relay state on sensor error detection	Break / Make / Hold selectable
Relay contact ratings	250 Vrms max; 2 A AC or 1 A DC max; 500 VA max

Wiring Diagrams

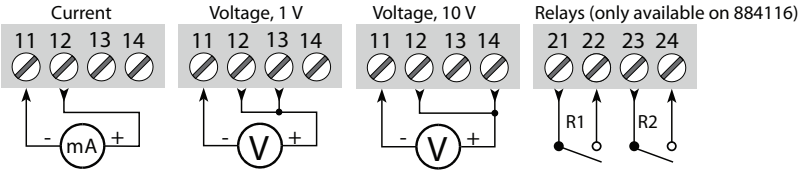
Supply:



Inputs:

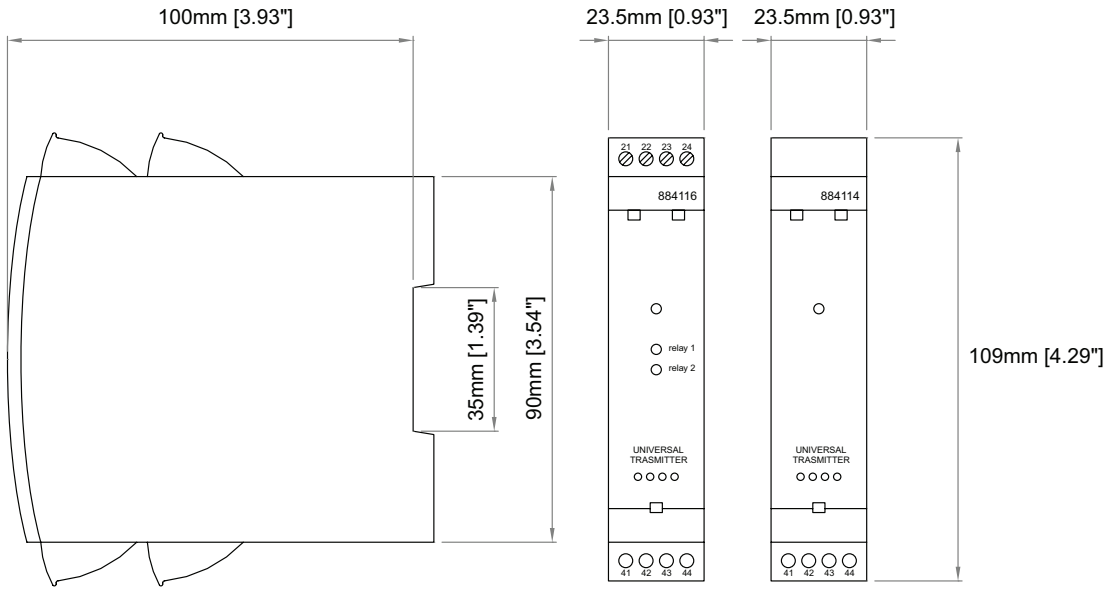


Outputs:



Universal Signal Conditioners

Dimensions 884114 and 884116



Programming/Display Module 884501

Application:

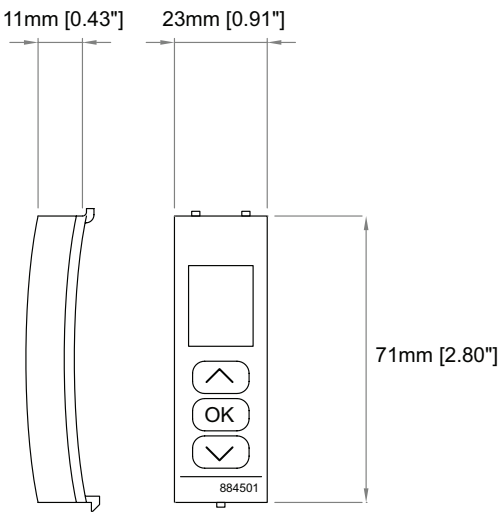
- The AutomationDirect 884501 module easily connects to the front of the Universal Signal Conditioners 884114 and 884116 and is used to enter or adjust the programming of the module.
- Can be moved from one module to another and download the configuration of the first transmitter to subsequent transmitters.
- Fixed display for visualization of process data and status.
- Required for programming modules 884114 and 884116.

Technical characteristics:

- LCD display with 4 lines; Line 1 (H = 5.57 mm, 0.22 in) shows input signal, line 2 (H = 3.33 mm, 0.13 in) shows units, line 3 (H = 3.33 mm, 0.13 in) shows analog output or user defined text and line 4 shows communication and relay status.
- Programming access can be blocked by assigning a password. The password is saved in the transmitter in order to ensure against unauthorized modifications to the configuration.
- Not capable of standalone or remote operation.

Mounting/Installation:

- Snap 884501 onto the front of the 884114 or 884116 signal conditioners



Selectable Engineering Units

°C	hp	kW	mA	pH
°F	hPa	kWh	mbar	rpm
%	Hz	l	mils	s
A	in	l/h	min	S
bar	in/h	l/min	mm	t
cm	in/min	l/s	mm/s	t/h
ft	in/s	m	mol	uA
ft/h	ips	m/h	MPa	um
ft/min	K	m/min	mV	uS
ft/s	kA	m/s	MW	V
g	kg	m/s2	MWh	W
gal/h	kJ	m3	N	Wh
gal/min	kPa	m3/h	Ohm	yd
GW	kV	m3/min	Pa	