

DM4001

RTD INPUT ISOLATED FIELD RANGEABLE TRANSMITTER



The *DM4001* provides an isolated output voltage or current proportional to the temperature as measured with most RTDs.

Input connections for 2 wire, 3 wire and 4 wire operation are provided. The module compensates for the lead resistance in the 3 wire configuration and provides true measurement of the resistive element without wire lead error in the four wire configuration. Linearization is furnished for .00385 and .00393 alpha platinum resistance elements.

The output is fully isolated from input, line power, and ground. The unit is useful for eliminating ground loops and for isolating from common mode voltages. The *DM4001* utilizes a feedback voltage controlled oscillator to develop a digital signal with a duty cycle proportional to the input signal amplitude. This signal is coupled through an isolating pulse transformer to the output circuitry, where the duty cycle data is converted to a proportional output signal level.

The module includes filtering and conditioning to reduce susceptibility to transients and noisy environments.

Input and output ranges are fully user-settable. With handy gold plated jumper connections, the user selects and sets - RTD excitation, the choice of none or two linearization compensations for platinum RTDs, upscale/downscale burnout indication, suppressed and elevated full range of input offsets, full range of input spans, voltage/current output, output range, and normal/reverse acting output. Input span and zero adjustments provide full range adjustability. All adjustments, settings, and input and output connections are easily accessed from

under a pull off/push on cover panel. A write-on label is supplied on the front panel for the user's convenience.

The DIN Rail package snaps onto the rail and is easily removed from the front side by using a screwdriver to release the spring loaded snap.

OPTIONS

(User specified)

AC Power 24, 115 or 230 VAC

DC Power 12 or 24 VDC

U All circuit boards conformal coated for protection against moisture.

INSTALLATION

DM4001 mounts on standard DIN Rail. Install it by hooking the top of the module's latch onto the top of the rail, then use a downward rotating motion to snap the module onto the rail. To remove the module, insert a screwdriver into the slot on the spring loaded snap which is located on the lower backside of the unit. Apply a downward pressure on the release and rotate the module up and off of the rail.

1. Remove the front panel by spanning the top and bottom edges between the thumb and index finger. Use a rocking motion to pull the front panel away from the module.
2. Input, Output and Power connections are shown on the terminal block labels.

CAUTION: BEFORE PROCEEDING, REMOVE ALL POWER TO THE WIRES AND MODULE TO AVOID THE DANGER OF SHOCK AND/OR DAMAGE TO THE UNIT.

To access input and output terminals, the connecting wires are inserted into the top of the top terminal block, and into the bottom of the bottom terminal block. The terminal blocks unplug. Wiring can be completed before the product is installed. Recommended wire sizes are 22-14 AWG Cu, with a strip length of 0.25 inches.

3. Replace the front panel by inserting the pins into the slotted holes located on the bezel and pushing it into position.
4. The front panel label provides space for the user to make application notes.

CALIBRATION

The *DM4001* is factory calibrated to the input and output noted on the side label.

The *DM4001* allows the user to calibrate the module to operate as required for a specific application.

Field adjustments can be made by using the following recommended procedure.

CAUTION: BE SURE ALL RANGE SELECT JUMPERS ARE SET TO THEIR PROPER POSITIONS BEFORE APPLYING INPUT OR POWER.

1. Remove the front panel and disconnect the power.
2. Using the label on the side of the module (*Figure 1*) as a guide, position the jumper blocks for the desired operation of the following functions:

RTD type - Select the excitation for the RTD.

linearized or non-linearized output - Linearization is provided for .00385 and .00393 alpha platinum resistance elements.

up-scale/down-scale burnout indication - If an open is sensed in the RTD wiring the module will constantly output full scale if up-scale is selected or minimum level if down-scale is selected.

input - Select 3 wire or 2/4 wire to be compatible with the input wiring. See *Figure 2*

temperature span - Choose the lowest span selection which includes the input span. Span is the difference between the highest input and the lowest input. With the SPAN adjustment, the module's amplification can be calibrated to give the full output range for the input span.

% of offset cancel- The ZERO adjustment provides $\pm 30\%$ offset canceling. For larger offsets, select the % OFFSET CANCEL needed to zero the input signal. The ZERO adjustment will provide 30% variation above and below the selected offset cancel.

suppressed or elevated offset - select OFFSET CANCEL ELV if the input offset is positive and select OFFSET CANCEL SUP if the input offset is negative.

output range - Select the voltage or current range to obtain the desired output.

output mode - Select either voltage or current, this selection must be made in conjunction with the output range selection. There are two jumper positions for this selection, both must be selected.

normal or reverse acting output - Select normal for the output to increase as the input increases, select reverse for the output to decrease with increasing input.

3. Connect a precision decade resistance, potentiometer, or RTD simulator to the input; and meters to the input and output terminals. To avoid errors due to the resistance of the connecting wires use a three wire connection as shown in the included block diagram. Apply power to the module.
4. Set the input resistance to represent the zero level, the lowest value of the input span.
5. Observe the output meter. Use the ZERO adjustment to raise or lower the output to the desired zero level.
6. Set the input resistance to represent the upper limit of the SPAN, the highest value of the input span.
7. Observe the output monitor. Use the SPAN adjustment to raise or lower the output to the desired maximum level.
8. Repeat steps 4 to 7 to fine tune the output. Usually 3 repetitions will give the desired results.
9. Remove power, disconnect test equipment and install the module for operation. Replace the front panel.

Examples for Span and Offset Selection:

- 1- Temperature range input: 100°C to 300°C
Actual Span: 300°C
-100°C=200°C
Select Span Jumper for 256°C
Actual Offset: (100°C/256°C)x100%=39%
Select Offset Jumper for 40%
100°C is elevated from zero
Select Elevated Jumper
- 2- Temperature range input: -100°C to 0°C
Actual Span: 0°C-(-100°C)=100°C
Select Span Jumper for 128°C
Actual Offset: (-100°C/128°C)x100%=-78%
Select Offset Jumper for 60%
-100°C is suppressed from zero
Select Suppressed Jumper

SPECIFICATIONS

INPUT

RTD Types
Almost any commercially available RTD
RTD Type Select (User settable)
10 ohm cu., 100 ohm pt., and 1000 ohm pt. provides 10 mA, 1 mA, 0.1 mA excitation respectively
RTD Configuration (User settable)
2, 3, and 4 wire
Linearity Select (User settable) none, 0.00385 alpha platinum, and 0.00392 alpha platinum. Linearity compensation to within 0.25% of span
Burnout Indication (User settable) Upscale or downscale indication
Span Select (User settable)
8, 16, 32, 64, 128, 256, 512, and 1024 °C
Span adjustment +5%, -55% of selected span
Zero adjustment ±30% of selected span

Offsets (User settable)
Suppressed or elevated at 0%, 20%, 40% & 60% of selected span
OUTPUT
Modes (User settable)
Voltage/current
Normal/reverse acting
Range (User settable)
0/25, 0/1, 0/5, 0/10, -5/5, & -10/10 VDC
0/1, 0/4, 0/20, & 4/20 mAdc
Accuracy ±0.1% of span
Step response time <2 seconds
Ripple (peak-to-peak) <0.1%
Input to Output Linearity ±0.0005%/°C of span
COMMON MODE REJECTION
120 dB DC to 60 Hz
ISOLATION, OUTPUT/INPUT BREAKDOWN, OUTPUT TO INPUT
>500 megohms
BREAKDOWN, POWER CIRCUITRY
>1500 volts RMS sinewave
OPERATING TEMPERATURE
14° to 140°F (-10° to 60°C)
TEMPERATURE STABILITY
±(0.01% of span)/°C
POWER
Wattage 2.5 W max
AC (standard)
115 VAC ±10%, 50/60 Hz
230 VAC ±10%, 50/60 Hz
24 VAC ±10%, 50/60 Hz
DC (optional)
12 VDC nominal (10 to 15 VDC)
24 VDC nominal (21 to 28 VDC)

FIGURE 1

DM4001 RTD ISOLATED TRANSMITTER			
INPUT CONFIGURATION		OUTPUT CONFIGURATION	
RTD TYPE	100Ω pt. 1KΩ pt.	10 Ω cu. NONE	
ALPHA	.00385	.00392	
BURNOUT	DOWN	UP	
INPUT	3-WIRE	2,4-WIRE	
SPAN °C	1024	512	
	256	128	
	64	32	
	16	8	
OFFSET CANCEL	% SPAN 60	40	
	SUP	0	
		ELV	
<input type="checkbox"/> ZERO <input type="checkbox"/> SPAN			
FACTORY SETUP		FIELD SETUP	
MODEL	_____	INPUT	_____
INPUT	_____	OUTPUT	_____
OUTPUT	_____	POWER	_____ V
POWER	_____		_____ HZ
	_____ VA _____ HZ		
CODE	_____		

CAUTION: THE DIN/RAIL SHOULD BE EARTH GROUNDED (GREEN WIRE) TO ENSURE SAFEST OPERATION AND TO PROVIDE OPTIMUM PERFORMANCE.

MOUNTING

The DIN Rail package is installed by snapping it onto the rail and it is removed from the front side by using a screwdriver to release the spring loaded snap (located on the lower backside of the unit).

WARRANTY

The **DIN/MOD** Series of products carry a limited permanent warranty. In the event of a failure due to defective material or workmanship, the unit will be repaired or replaced at no charge. Relays are not covered by the warranty.

CASE DIMENSIONS INCHES [mm]

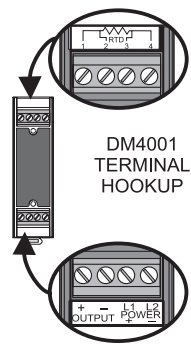
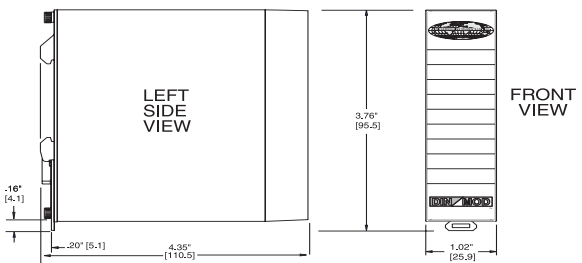
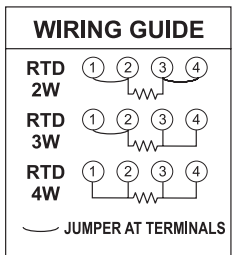
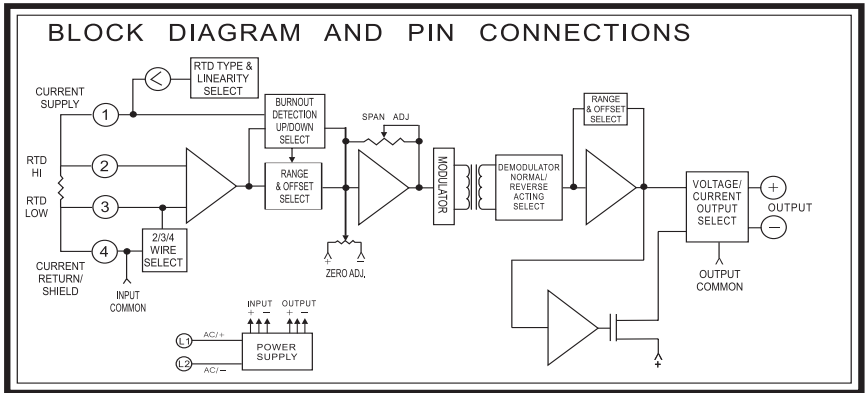


Figure 2



All connections must be made correctly for proper operation. See installation for details.



Specifications are subject to change without notice. ©2007 Wilkerson Instrument Co., Inc. DWG#W102735C 3/07

2915 Parkway Street
Lakeland, FL 33811-1391 · USA
800-234-1343
Tel: 863-647-2000 · Fax: 863-644-5318
www.wici.com · E-mail: sales@wici.com