

# MM1820, 1821 AND 1824 POTENTIOMETER INPUT DUAL ALARM



## DESCRIPTION

The MM1820 Series Potentiometer Input Dual Alarms monitor the slide position of a potentiometer and provide two sets of spdt, 5 A alarm relays with two independently adjustable setpoints. Each setpoint has a set of red/green LEDs to indicate alarm status. When the signal exceeds a particular setpoint, the relay becomes energized. To provide a “fail-safe” operation (loss of power resulting in alarm state), select Option R. The module can be supplied as a HI/LO, HI/LO, or LO/LO alarm (HI/LO supplied if not specified).

Standard deadband on both alarms is fixed at 0.5% of span. Option A provides adjustable deadband of 0.5% to 100% of span. Option D, latching alarms has no deadband control. Once the limit has been reached, the alarm latches and power to the module must be momentarily interrupted to reset the alarm.

All Wilkerson products are designed with RFI filters and lightning protection to reduce susceptibility to electrical noise and damage by lightning. They also utilize a stable 1 V power supply to excite the potentiometer. Any value potentiometer from 100 ohms to 100 kilohms can be used.

## MODEL NUMBERS

These instructions cover the following setpoint styles:

- MM1820** Potentiometer Input Dual Alarm (25 turn screwdriver adj)
- MM1821** Potentiometer Input Dual Alarm (single turn dials)
- MM1824** Potentiometer Input Dual Alarm (ten turn precision dials)

## OPTIONS

These instructions cover the following options on the MM1820. Options installed are listed on the label attached to the side of the module.

### H/H, H/L, L/L

- H** High Alarm.  
Alarm occurs on an increasing signal.
- L** Low Alarm.  
Alarm occurs on a decreasing signal.
- A** Provides top-accessed screwdriver adjustable deadbands from 0.5% to 100% of span, instead of the normal fixed 0.5% deadbands.
- D** Latching alarms. Reset by momentary interruption of line power.
- DC** Power Inverter isolated 12 or 24 VDC power.
- R** The Normal condition for the relays is de-energized. They energize for alarm conditions. Option R (Reverse sense) reverses this logic (Failsafe).
- U** All circuit board conformal coated for protection against moisture.

## CONTROLS

The MM1820, 1821 and 1824 modules contain two setpoint controls, plus zero and span adjustments. An additional internal control adjusts the potentiometer excitation voltage.

The setpoint controls in the MM1820 are 25-turn blind trimpots. MM1821 and MM1824 contain 1-turn and 10-turn calibrated dials, respectively.

Modules with adjustable deadband (Option A) also contain two deadband controls.

## CALIBRATION

Modules are shipped with ZERO and SPAN precalibrated. The user needs only adjust the SETPOINTS and optional DEADBANDS for the desired levels.

Refer to the instrument's label to determine your instrument's supply voltage and input and output ranges. Refer to the "Block Diagram and Pin Connections" for pin connections. Connect a potentiometer to the input as shown.

*(Note: When calibrating latching alarms, Option D, it will be necessary to momentarily interrupt power to reset the alarm after each trip.)*

To calibrate the alarm setpoints, adjust the input potentiometer's position to the desired alarm 1 setpoint. Adjust the SETPOINT 1 control until its LED just turns red (ccw for a high alarm, cw for low).

Change the input potentiometer's position to the desired alarm 2 setpoint and similarly adjust the SETPOINT 2 control.

The MM1821 (single turn dial) and MM1824 (10-turn dial) may be set using their 0-100% dials.

Adjust the optional DEADBAND controls for the desired amount of deadband. Vary the input signal up and down to check the levels at which the relay trips and resets. the setpoint will remain approximately centered in the middle of the deadband.

If there is a need to recalibrate ZERO and SPAN, turn the optional DEADBAND controls fully ccw and proceed as follows:

Set the input potentiometer to the low end of its travel (fully ccw). Turn the SETPOINT 1 control fully ccw. Adjust the ZERO control until the SETPOINT 1 LED just changes color.

Change the potentiometer to the high end of its travel (fully ccw). Turn the SETPOINT 2 control fully ccw. Adjust the SPAN control until the SETPOINT 2 LED just changes color.

Repeat until the ZERO and SPAN settings are both correct.

After adjusting the ZERO and SPAN controls, the SETPOINT and DEADBAND controls will need to be reset as described above.

An internal control adjusts the potentiometer excitation voltage. It is factory-set and does not normally need to be adjusted. The excitation need not be precise as long as ZERO and SPAN are calibrated as described above.

If you should need to adjust this voltage, loosen the four screws at the bottom of the module and remove its cover. The excitation control is located on the small plug-in preamplifier board.

Connect power and monitor the voltage between pins 2 (+) and 4 (-) with a digital voltmeter. Adjust the excitation control for a reading of 1.000 volts.

Reassemble the cover and recalibrate as described above.

ALARM TYPE	HI/LO	HI/HI	LO/LO
SETPOINT 1	HI	HI	LO
SETPOINT 2	LO	HI	LO

## RELAY CONTACT PROTECTION

When inductive loads such as motors, relays or transformers are switched, voltage transients may be generated which exceed the ratings of the relay contacts. The resulting arcing can quickly destroy the contacts. (Refer to the SPECIFICATIONS section for the relay contact ratings).

Surge suppression is required across inductive loads to guard against premature relay failure. Figure 1 illustrates diode surge suppression for a DC load. The diode's operating (peak inverse) voltage should exceed the load's supply voltage by at least 50% and should have a current rating of at least one ampere.

Figure 2 shows surge suppression for an AC load, using an MOV (Metal Oxide Varistor) and a capacitor. The breakdown voltage ratings of both the MOV and the capacitor must exceed the peak AC voltage.

With normal sine-wave power, PEAK = 1.414 x RMS voltage. For 115 VAC power a 200 volt peak rating is recommended.

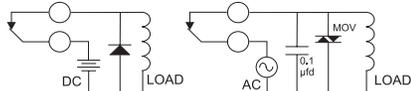


Figure 1  
Surge Suppression  
Inductive DC Load

Figure 2  
Surge Suppression  
Inductive AC Load

## WARRANTY

The Mighty Module Series of products carry a limited warranty of 10+5 years. In the event of a failure due to defective material or workmanship, during the 10 year period, the unit will be repaired or replaced at no charge. For a period of 5 years after the initial 10 year warranty, the unit will be repaired, if possible, for a cost of 10% of the original purchased price.

Relays are not covered by the warranty.

## MOUNTING

MM1820, MM1821 and MM1824 are designed to plug into a standard 11-pin relay socket. (MP011) is an 11-pin socket suitable for mounting on a flat surface or in a piece of PVC track, (TRK48).

Spring holddown clips are available for installations where vibration may be a problem. Use part number (CLP1) with MM1820, (CLP2) with MM1821 or MM1824.

## SPECIFICATIONS

### INPUT POTENTIOMETER RESISTANCE

any value from 100 ohms to 100 kilohms

### INPUT SPAN ADJUSTMENT

70% to 100% of pot rotation

### INPUT OFFSET ADJUSTMENT

0 to 25% of pot rotation

### INPUT IMPEDANCE

>10 megohms

### EXCITATION

1 V, 10 mA max load

### SETPOINT

each alarm 0 to 100% of span

### DEADBAND

Standard

fixed 0.5% of span

(Option A)

0.5% to 100% of span

(Option D)

Latching. Interrupt power to reset.

### RESPONSE TIME

20 ms typical

### ACCURACY

±0.1% of span

### COMMON MODE REJECTION

120 dB, DC to 60 Hz

### RELAY CONTACTS (spdt)

Resistive Load:

5 A max, 150 W max,

240 VAC, 30 VDC max

Inductive Load:

1/8 HP max at

120/240 VAC

### TRANSISTOR OUTPUT

(Option V)

open-collector, sink 100 mA,

30 V supply max

### OPERATING TEMPERATURE

14°F to 140°F / -10°C to 60°C

### TEMPERATURE STABILITY

±0.02% of span/°C max

### POWER

115 VAC ±10%, 50 or 60 HZ

(2.5 W max)

230 VAC ±10%, 50 or 60 HZ

(2.5 W max)

(DC Power Option)

24 VDC

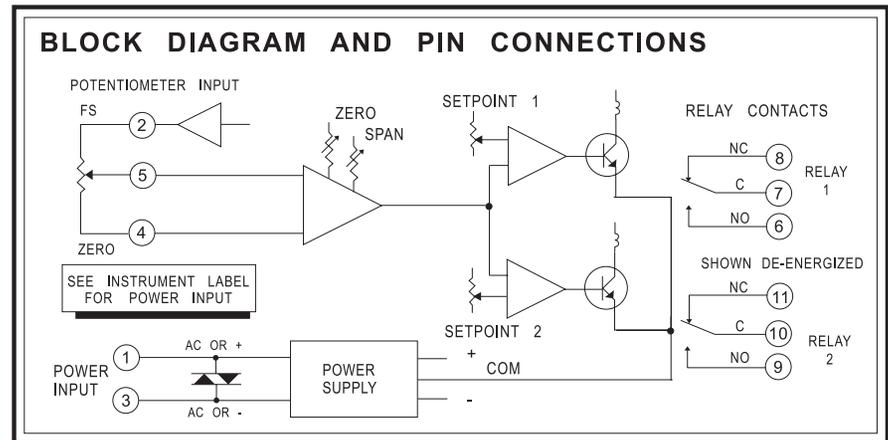
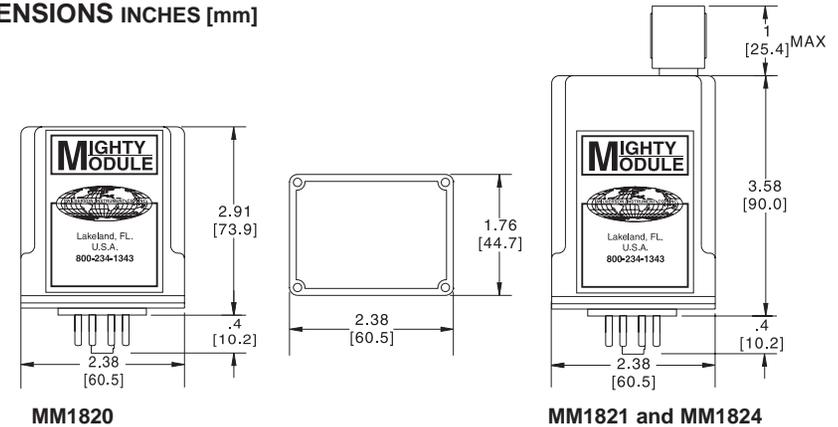
(limits 21 VDC to 32 VDC)

(2.5 W max)

Isolation, DC power supply

to input common: 10 megohms

## DIMENSIONS INCHES [mm]



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