

# MM1520, 1521 and 1524 STRAIN GAUGE INPUT DUAL LIMIT ALARMS



## DESCRIPTION

The MM1520 Series Strain Gauge input alarms monitor a DC input signal from a strain gauge or bridge and provide dual setpoint alarm outputs when the input exceeds the alarm values. Each unit can be supplied as a HI/HI, HI/LO or LO/LO alarm. The output relays are normally de-energized, and energize for an alarm condition. Two sets of red/green LED indicate alarm status to make setup easier. Deadband on both alarms is fixed at 0.25% of span.

## MODEL NUMBERS

These instructions cover the following setpoint styles:

- MM1520** Strain Gauge Input Dual Alarm (25-turn screwdriver adj)
- MM1521** Strain Gauge Input Dual Alarm (Single turn dial)
- MM1524** Strain Gauge Input Dual Alarm (10-turn precision dial)

## OPTIONS

These instructions cover the following options on the MM1520. 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.

### NO/NC

Normally open or normally closed relay contacts: (see specifications)

- 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 boards conformal coated for protection against moisture.

## CONTROLS

The MM1520, MM1521 and MM1524 modules contain two setpoint controls, zero and span adjustments, plus a bridge excitation voltage adjustment. The setpoint control in the MM1520 is a 25-turn blind trimpot. MM1521 and MM1524 contain 1-turn and 25-turn respectively.

## CALIBRATION

Modules are shipped with ZERO, SPAN and excitation voltage precalibrated. The user needs only adjust the SETPOINT and DEADBAND for the desired response.

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 the alarm input to its mating input device, or to a precision resistance bridge capable of simulating the input device.

(If it is necessary to recalibrate using electronic inputs, refer to the ELECTRONIC CALIBRATION section.)

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

Change the input to the desired alarm 2 setpoint and similarly adjust the SETPOINT 2 control.

If there is a need to recalibrate ZERO, SPAN and excitation voltage, proceed as follows:

Measure the voltage between +EXC & -EXC VOLT ADJ control for the desired excitation voltage. The voltage is adjustable from 4 to 12 VDC.

Set the input to the low end of the input range. Turn the SETPOINT 1 control fully ccw. Adjust the ZERO control until the SETPOINT 1 LED color switches.

Change the input to the high end of the input range. Turn the SETPOINT 2 control fully cw. Adjust the SPAN control until the SETPOINT 2 LED color switches.

Repeat until the ZERO and SPAN settings are both correct.

After adjusting the ZERO and SPAN controls, the SETPOINT controls should be reset as described above.

## ELECTRONIC CALIBRATION

If it is necessary to recalibrate using electronic inputs, proceed as follows:

Measure the voltage between +EXC and -EXC using a precision digital voltmeter. Connect a calibrated millivolt signal source between the +SIG and -SIG inputs. Determine the input voltage required at each calibration point. The required voltage equals the bridge sensitivity in millivolts per volt, multiplied by the excitation voltage. For example, a sensitivity of 2 mV/V multiplied by 10 V excitation results in a 20 mV input signal.

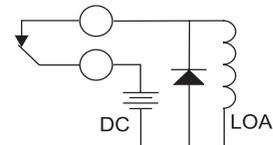
## RELAY CONTACT PROTECTION

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 for the relay contact ratings.)

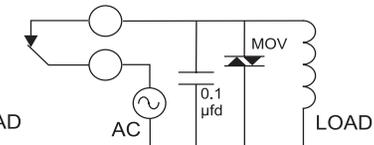
Surge suppression is required across inductive loads to guard against premature relay failure. FIGURE 1 illustrates diode surge suppression for a DC load. The diode's operating (peak inverse) voltage should exceed the load's supply voltage by at least 50% and should have a current rating of at least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

## SPECIFICATIONS

### Input Span Limits

0.5 mV/V to 1 V/V

### Input Impedance

200 kilohms

### Excitation

adjustable 4 V to 12 V, 40 mA max

### Excitation Stability

±0.005% per °C

### Deadband

0.25% to 100% of span

### Setpoint (Each alarm)

0 to 100% of span

### Response Time

100 milliseconds

### Stability

±0.04% of span per °C

### Common Mode Rejection

120 dB, DC to 60 Hz

### Operating Temperature

0 °C to 60 °C / 32 °F to 140 °F

### Relay Contacts (SPST)\*

**Resistive Load:** 5 A max, 150 W max,  
220 VAC max, 30 VDC max

**Inductive Load:** 1/8 HP max at  
120/240 VAC

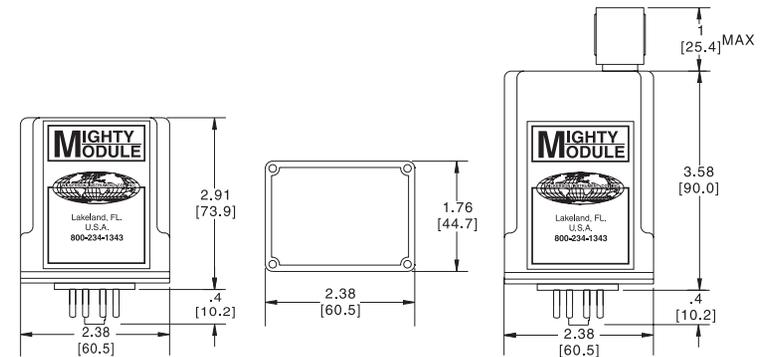
### Power Options

115 or 230 VAC, 50 or 60 Hz

12 V or 24 VDC, 2.5 W max

\*Due to pins available, only one set of contacts is available for each relay.

## CASE DIMENSIONS INCHES (mm)



MM1520, MM1521 and MM1524

## MOUNTING

MM1520, MM1521 and MM1524 are designed to plug into a standard 11-pin relay socket.

(MP011) is a 11-pin socket suitable for mounting on a flat surface or in a piece of PVC track.

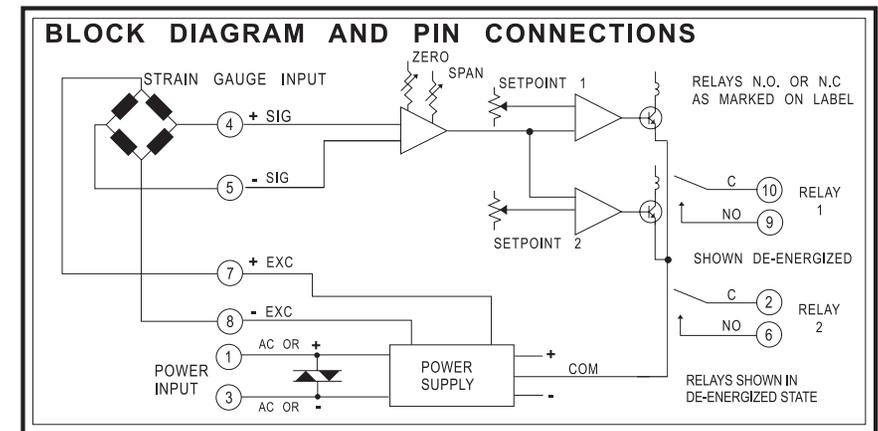
Spring hold-down clips are available for installations where vibration may be a problem. Use (CLP1) for MM1520 and (CLP2) for MM1521 and MM1524.

A DIN rail mounted socket (DMP011) is available for 35mm symmetrical rail.

## 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 purchase price.

Relays are not covered by the warranty.



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