MM1500,1501 and 1504 STRAIN GAUGE INPUT SINGLE LIMIT ALARMS

DESCRIPTION

The MM1500 Series Strain Gauge input alarms monitor a DC input signal from a strain gauge or bridge and provide an alarm output when the input exceeds the alarm value. Each unit can be supplied as a HI or LO alarm. The output relay is normally energized, and de-energizes for an alarm condition. This provides alarm indication upon loss of power to the alarm. A red/green LED indicates alarm status to make setup easier.

MM1500 Series alarms include a 25 turn deadband adjustment, allowing deadband settings between 0.25% and 100% of span. The deadband is symmetrical about the setpoint.

MODEL NUMBERS

These instructions cover the following setpoint styles:

MM1500 Strain Gauge Input Single Alarm (25-turn screwdriver adj)

MM1501 Strain Gauge Input Single Alarm (Single turn dial)

MM1504 Strain Gauge Input Single Alarm (10-turn precision dial)

OPTIONS

These instructions cover the following options on the MM1500 Series. Options installed are listed on the label attached to the side of the module.

H/L

H = High Alarm: Alarm occurs on an increasing signal
L = Low Alarm: Alarm occurs on a decreasing signal

R The Normal condition for the relay is energized. It de-energizes for an alarm condition (Failsafe). Option R (Reverse Sense) reverses this logic.

U All circuit boards conformal coated for protection against moisture.

CONTROLS

The MM1500, MM1501 and MM1504 modules contain setpoint, deadband, zero and span adjustments, plus a bridge excitation voltage adjustment. the setpoint control in the MM1500 is a 25-turn blind trimpot. MM1501 and MM1504 contain 1-turn and 10-turn calibrated dials, 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 setpoint, set the input to the desired setpoint and turn the DEADBAND control fully ccw. Adjust the SETPOINT control until the LED switches to red (ccw for a high alarm, cw for low).

Adjust the DEADBAND control for the desired amount of deadband. Vary the input up and down to check the level at which the alarm trips and resets. The setpoint will remain centered in the middle of the deadband.

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

Measure the voltage between +EXC and -EXC using a precision digital voltmeter. Adjust the VOLT ADJ control for the desired excitation voltage. The voltage is adjustable from 4 to 12 VDC.

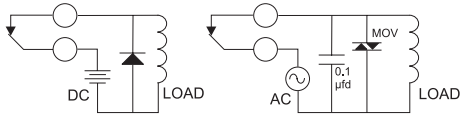


Figure 1
Surge Supression
Inductive DC Load

Figure 2
Surge Supression
Inductive AC Load

Set the input to the low end of the input range. Turn the SETPOINT and DEADBAND controls fully ccw. Adjust the ZERO control until the LED just changes color.

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

Repeat until the ZERO and SPAN settings are both correct.

After calibration, the SETPOINT and DEADBAND 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 supression is required across inductive loads to guard against premature relay failure. FIGURE 1 illustrates diode surge supression 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 115V AC power a 200 volt peak rating is recommended.

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
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 Contact (SPST and SPDT)
Resistive Load: 5 A max, 150 W max, 220 V AC max, 30 V DC max

Inductive Load (Power Factor 0.4): 2.5 A max, 75 W max, 220 VAC max, 30 VDC max

Power Options
115 or 230 VAC, 50 or 60 Hz
12V or 24 VDC, 2.5 W max

Option V
Open-collector NPN transistor sink 100 mA, 30 V supply max +16 V provided (unreg, 50 mA max)

MOUNTING

MM1500, MM1501 and MM1504 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 holddown clips are available for installations where vibration may be a problem. Use (CLP1) for MM1500 and (CLP2) for MM1501 and MM1504.

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

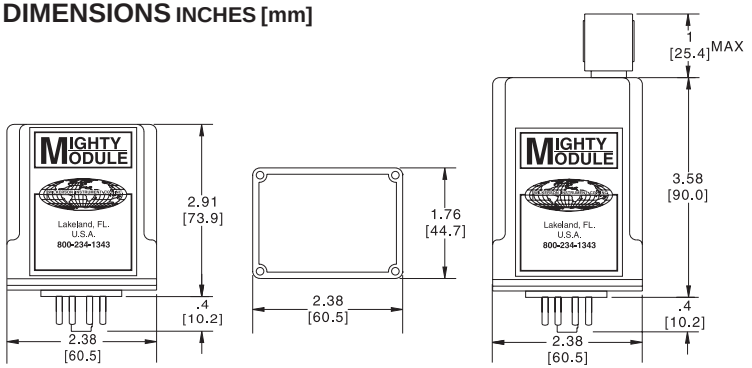
WARRANTY

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.

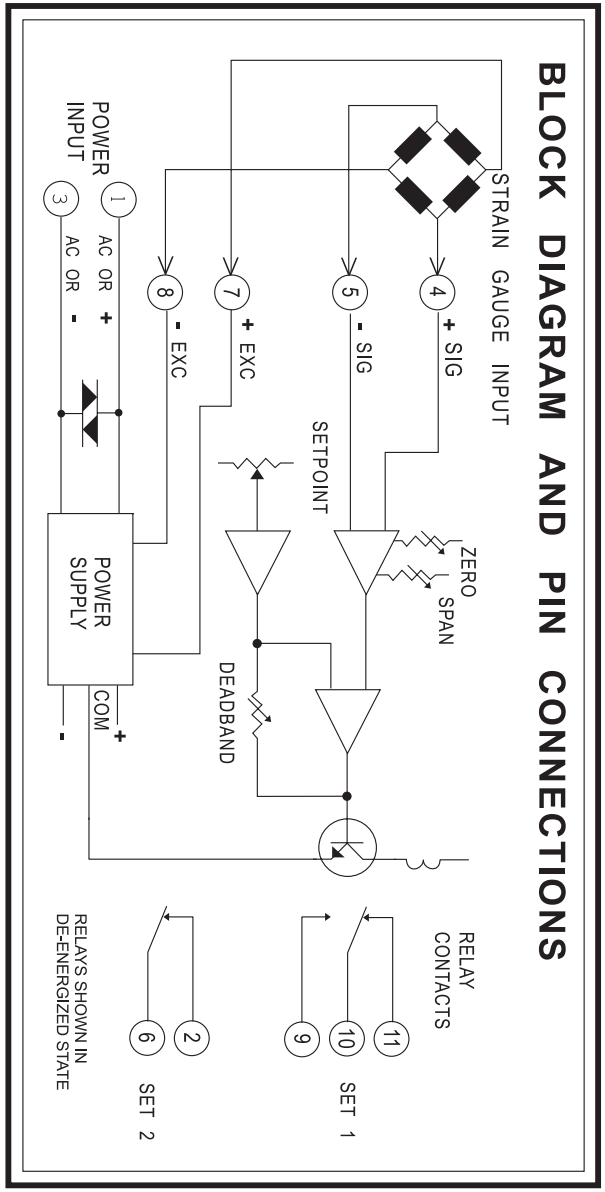
For a period of 5 years after the initial 10 year warranty, the unit will be repaired, if possible, for a cost of 10% of the original purchase price.

Relays are not covered by the warranty.

CASE DIMENSIONS INCHES [mm]



MM1500 MM1501 AND MM1504



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