MM1020, MM1021, MM1024
DC INPUT DUAL ALARMS

DESCRIPTION

The MM1020 Series DC Input Dual Alarms monitor a DC input signal 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 input is between the setpoints, the relays are normally de-energized. When the signal exceeds a particular setpoint, the relay becomes energized.

Each module can be supplied as a H/H, H/L, or L/L alarm (H/L is supplied if not specified).

The modules include filtering and conditioning to reduce susceptibility to transients and noisy operations.

MODEL NUMBERS

These instructions cover the following setpoint styles:

MM1020 DC Input Dual Alarm
(25 turn screwdriver adj)
MM1021 DC Input Dual Alarm
(Single turn dials)

MM1024 DC Input Dual Alarm
(Ten turn precision dials)

OPTIONS

These instructions cover the following options on the MM1020. 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).

S Low input voltage (not available with wide range input).

U All circuit boards conformal coated for protection against moisture.

WR Wide range input

CONTROLS

The MM1020, MM1021 and MM1024 modules contain two setpoint controls, plus zero and span adjustments. The setpoint controls in the MM1020 are 25-turn blind trimpots. MM1021 and MM1024 contain 1-turn and 10-turn calibrated dials, respectively.

CALIBRATION

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

To calibrate the module a calibrated DC signal source covering the range of the input signal is required. 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 connections.

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

The MM1021 (single turn dial) and MM1024 (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 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 to the low end of the input range. Turn the SETPOINT 1 control fully ccw. Adjust the ZERO control until the SETPOINT 1 LED just changes color.

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 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.

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 ' SPECIFICATIONS' below 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.

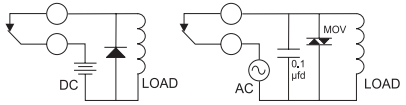


Figure 1
Surge Supression
Inductive DC Load

Figure 2
Surge Supression
Inductive AC Load

WIDE RANGE INPUT (OPTION WR)

The wide range (WR) input option allows a choice of several voltage or current input ranges. To change ranges unplug the module, remove the cover by unscrewing the four screws in the base and set the 10 DIP switches according to the table below. ZERO and SPAN must be recalibrated per the above instructions after changing switch settings.

WIDE RANGING INPUT (WR OPTION)			
INPUT	CLOSE SWITCH POSITION	INPUT	CLOSE SWITCH POSITION
0/50 mV	none	0/1 mA	9
0/100 mV	1	0/5 mA	10
0/500 mV	2	0/10 mA	1,10
0/1 V	3	4/20 mA	7,9
1/5 V	6	0/20 mA	3,9
0/1 V	4	10/50 mA	8,10
0/10 V	5	0/50 mA	2,10

SPECIFICATIONS

Input Range
Voltage
select any range between ±250 V max (min span 50 mV)
Current
select any range between ±5 A max (min span 1 mA, internal shunt)
Low Input (Option S)
select any range between ±20 V max (min span 10 mV)

Input Impedance
Voltage
200 Kilohms
Current
see table in block diagram

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, WR £200 ms (range dependent)

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 max, 30 VDC max
Inductive Load:
1/8 HP max at 120/240 VAC

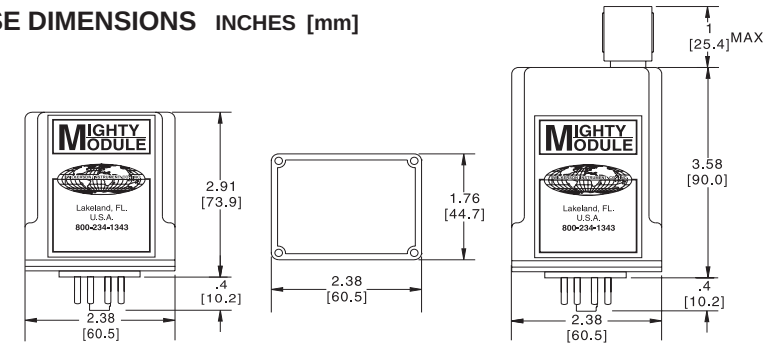
Operating Temperature
14°F to 140°F/ -10°C to 60°C

Temperature Stability
±(0.02% of span + 30 µV)/°C max
Low Input (Option S)
±(0.02% of span + 1.3 µV)/°C max

Power (2.5 W max)
115 VAC ±10%, 50 or 60 Hz
230 VAC ±10%, 50 or 60 Hz
(DC Power Option)
12 VDC (limits 10 VDC to 15 VDC)
24 VDC (limits 21 VDC to 32 VDC)

Isolation, DC power supply to input common:10 megohms.

CASE DIMENSIONS INCHES [mm]



MM1020 & MM1021 **MM1024**

MOUNTING

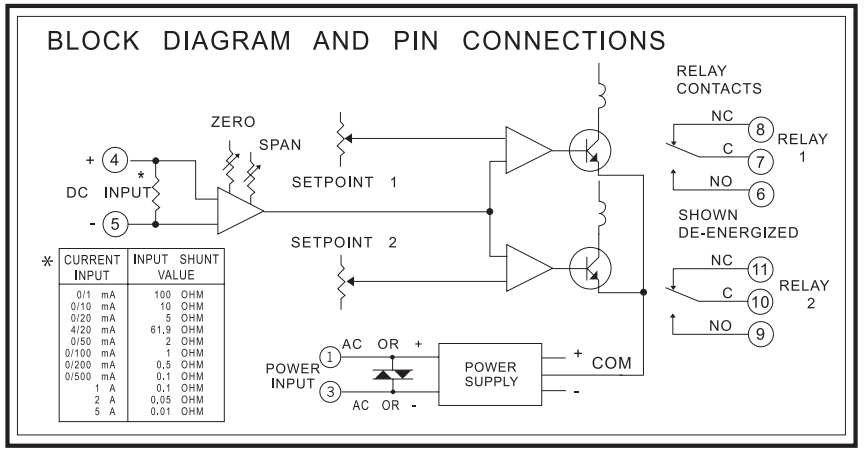
MM1020, MM1021 and MM1024 are designed to plug into a standard 11-pin relay socket. (MP011) is an 11-pin socket suitable for mounting on a flat surface or in a piece of PVC track.

Spring hold-down clips are available for installations where vibration may be a problem. Use (CLP1) with MM1020, (CLP2) with MM1021 or MM1024.

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.



 DWG#W102207D 3/15

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