MM440X
ADDER/SUBTRACTER
TRANSMITTER

DESCRIPTION

The MM440X provides a DC output voltage or current proportional to the sum and/or difference of up to four DC inputs. Typical input ranges are 4/20 mA, 10/50 mA, 0-1 V, 0-5 V and 0-10 VDC. Other ranges are available down to minimum spans of 1 V or 1 mA DC.

Nine modules are available, offering nine combinations of additive and subtractive inputs.

MODEL NUMBERS

MM4400 Output = (A+B+C+D)/4
MM4401 Output = (A+B+C)/3
MM4402 Output = (A+B)/2
MM4403 Output = (A+B+C–D)/3
MM4404 Output = (A+B–C–D)/2
MM4405 Output = A–B–C–D
MM4406 Output = (A+B–C)/2
MM4407 Output = A–B–C
MM4408 Output = A–B

Standard calibration provides 0% output when all inputs are at 0%. Full scale (100%) output occurs when all additive inputs are at 100% and all subtractive inputs are at 0%. Other calibrations are available.

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

TYPICAL APPLICATIONS

Adding and subtracting flows, weights, etc. for process monitoring, control and data acquisition.

OPTIONS

DC Power Inverter isolated 12 or 24 VDC power.

ISO Provides a DC output fully isolated from input, line power and ground.

RT Reverse-acting transmitter. The transmitter output decreases as the input increases. (Available only with ISO option.)

U Circuit boards conformal coated for protection against moisture.

CONTROLS

Two controls, ZERO and SPAN (gain), are available on top of the module. Precision input resistors eliminate the need for input-by-input calibration.

CALIBRATION

The transmitters are precisely calibrated at the factory and do not normally require user calibration. If there is a need to recalibrate, proceed as follows:

Voltage Inputs

Connect all additive inputs in parallel to a source of calibration voltage. Connect all subtractive inputs to input common (zero volts). Monitor the input and output with precision digital meters.

Set the input voltage to a value which will result in the low-end ("zero") output and set the ZERO adjustment for the proper output. Increase the input to a value which will result in full-scale output and set the SPAN adjustment for the proper output. Repeat the procedure: the controls may interact slightly.
(Note: On standard ranges, zero volts equals zero percent. If your input range is offset, keep in mind that the short-circuited subtractive inputs do not represent zero percent.

Current Inputs

Calibration of current-input transmitters is more difficult because current inputs cannot be paralleled and because the low end of the input range is usually offset from zero. If you have enough current calibration sources to supply all of your inputs, simply connect them all and set them to the proper values for low-end (ZERO) and full-scale (SPAN) calibration.

If you have only one current calibration source, connect all additive inputs in parallel to the calibration source. Leave all subtractive inputs open-circuit (zero mA). Keep in mind that the current will divide equally among the paralleled inputs, and that the zero inputs represent mA something other than zero percent *(minus 25% on 4/20 mA or 10/50 mA inputs).*

Set the input current to a value which will result in the low-end ("zero") output. Set the ZERO adjustment for the proper output. Increase the input current to a value which will result in full-scale output. *(If your calibrator will not produce this much current, set it for the highest current possible and calculate the corresponding output.)* Set the SPAN adjustment for the proper output. Repeat the procedure: the controls may interact slightly.

MOUNTING

The module is designed to plug into a standard 11-pin relay socket. (MP011) is a molded plastic socket suitable for mounting on a flat surface or snap into a 2 3/4 inch wide PVC track (TRK48).

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.

SPECIFICATIONS

INPUT RANGE

Voltage

select **any** range between ±250 V (min span 1 V)

Typical inputs: 0-1 V, 0-5 V, 0-10 V

Current

select **any** range between ±100 mA max (min span 1 mA)

Typical inputs: 4/20 mA or 10/50 mA

INPUT IMPEDANCE

Voltage

100 kilohms

Current

1.25 V drop typical, others available

OUTPUT RANGE

Voltage

select **any** range from –10 V to +15V, 10 mA max load (min span 0.2 V)

Current

select **any** range from 0 to 50 mA max, >24 V compliance (1200 ohms max at 20 mA)

18 V compliance for ISO option if full scale output >20 mA

RESPONSE TIME

≤100 ms (range dependent)

BALANCE BETWEEN INPUTS

≤0.2%

LINEARITY

±0.01% of span

BREAKDOWN, PWR/CIRCUITRY

>1500 VAC rms

OPERATING TEMPERATURE

14°F to 140°F/ –10°C to 60°C

TEMPERATURE STABILITY

±0.02% of span/°C max

POWER (2.5 W max)

115 VAC ±10%, 50 or 60 Hz

230 VAC ±10%, 50 or 60 Hz

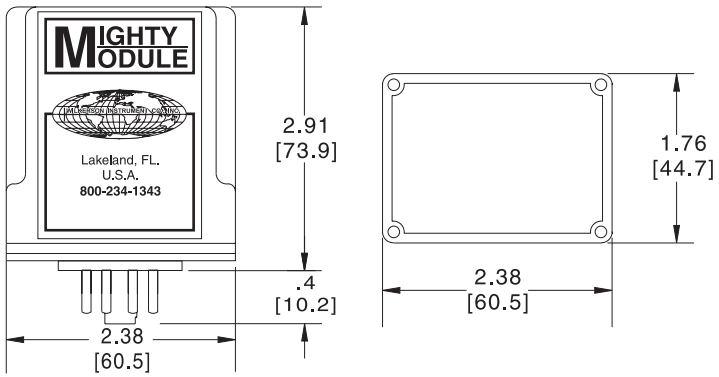
(DC Power Option)

12 VDC (limits 10 VDC to 15 VDC)

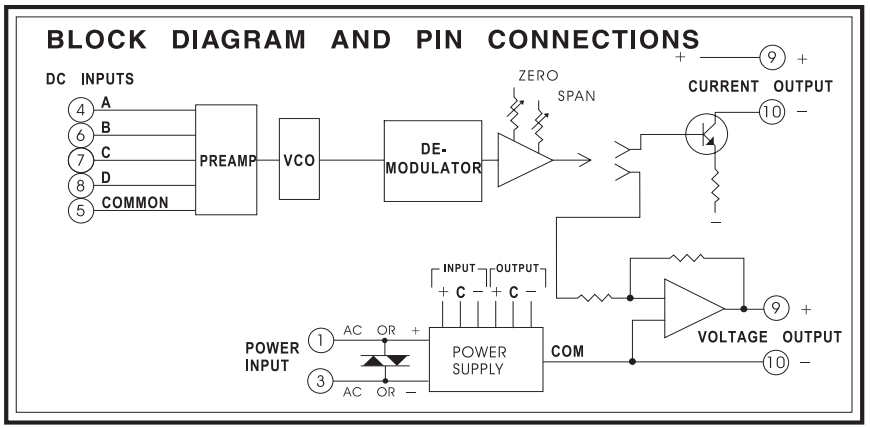
24 VDC (limits 21 VDC to 32 VDC)

Isolation, DC power supply to input common: 10 megohms

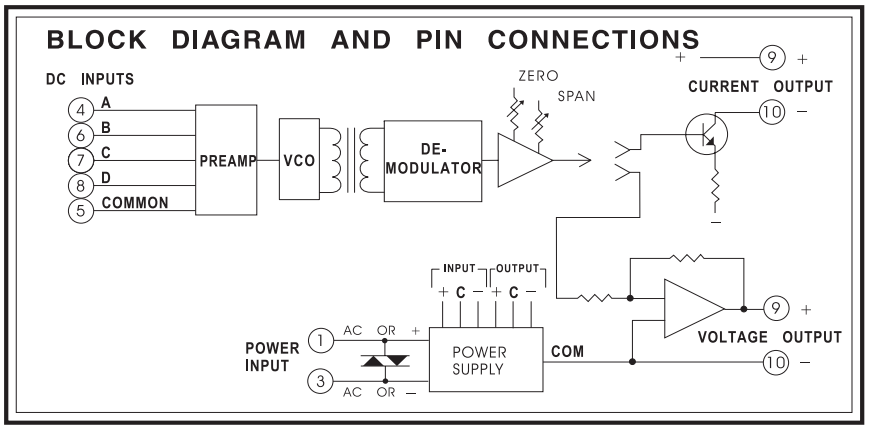
CASE DIMENSIONS INCHES [mm]



MM440X



MM440X ISO



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