



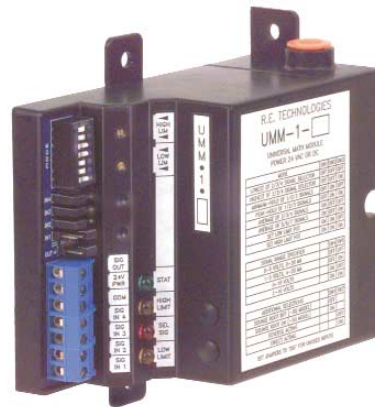
OUTPUT TRANSDUCERS

UNIVERSAL MATH MODULE MODELS UMM-1, UMM-2



DESCRIPTION

The **Universal Math Module** is a unique multifunction micro-computer-based interface that can be utilized to solve a variety of signal selection and manipulation applications. The **Model UMM-1** is furnished in a unique slim-line design housing, which saves panel space, and can be ordered with an optional DIN rail mounting adapter. The **Model UMM-2** is a snap-track mounted version, and its operation is identical to the **Model UMM-1**. The **UMM** models accept up to four analog inputs, providing a single analog output according to the operating mode selected. This versatile product allows the user to select from many operating modes.



UMM-1
UMM-1-SQ



UMM-2
UMM-2-SQ

USER-SELECTABLE OPERATING MODES

- **Highest or lowest signal selection**
- **Minimum or peak signal hold selection**
- **Multiple signal averaging**
- **Multiple signal summing**
- **High and low limit control**
- **Action reversal**
- **Square root extraction (SQ model)**

FEATURES

- **DIP switch-selectable operating modes**
- **Voltage or milliamp input signals**
- **LED status indication**
- **User-selectable direct or reverse acting**
- **24 VAC/DC power**
- **Slim-line design housing or snap-track mounted models**
- **Furnished with detailed setup instructions**

SPECIFICATIONS			
Power	24 VDC $\pm 10\%$ @ 50 mA 24 VAC $\pm 10\%$ @ 120 mA	Accuracy	$\pm 1\%$ of full scale (except Square Root) Square Root: 1% F.S. @ 25% to 100% of range 1.5% F.S. @ 10% to 25% of range 2% F.S. @ 5% to 10% of range 5% F.S. @ 0% to 5% of range
Inputs	4 analog: 0-5 VDC, 1-5 VDC, 0-10 VDC, 2-10 VDC, 0-20 mA, or 4-20 mA	Operating temp	32° to 158°F (0 to 70°C)
Input impedance	mA input: 250 Ω V input: 70k Ω	Humidity	5% to 95% noncondensing
Output	1 analog: 0-5 VDC, 1-5 VDC, 0-10 VDC, 2-10 VDC, 0-20 mA, or 4-20 mA	Dimensions	
Output loading	5 VDC range: 500 Ω min 10 VDC range: 1000 Ω min 20 mA range: 650 Ω max	UMM-1	3.4"H* x 2"W x 4.8"D (8.6 x 5.1 x 12.4 cm)
Action	Direct or reverse acting; DIP switch selectable	UMM-2	3.25"H x 4.6"W x 1"D (8.3 x 11.8 x 2.54 cm)
		Weight	0.44 lb (0.2 kg) *Add 1.2" (3.0 cm) for mounting tabs

OUTPUT TRANSDUCERS



UNIVERSAL MATH MODULE MODELS UMM-1, UMM-2

USER-SELECTABLE OPERATING MODES

High and Low Signal Selection

The **UMM** configured for this mode will accept 2, 3, or 4 analog input signals and output the signal that is either the highest or lowest of the input signals. To increase the number of input signals, **UMM's** may be cascaded by wiring the output of one **UMM** to the input of another **UMM**. Two **UMM's** wired in this fashion would allow up to 7 input signals. No calibration is required; however, high and low limits can be set on the output.

Minimum and Peak Hold Signal Selection

In the peak hold operating mode, up to 3 analog inputs are monitored. The highest (peak) input signal is remembered, passed to the output, and held until a higher input signal level occurs. In the minimum hold mode, up to 3 inputs are monitored. The lowest input signal is remembered, passed to the output, and held until a lower input signal level occurs. A contact closure will reset the output signal.

Multiple Signal Averaging (Summing)

The **UMM** configured for this operating mode will accept 2, 3, or 4 analog input signals and output a signal that is the average (sum) of the input signals. To average (sum) up to 7 inputs, the primary **UMM** accepts four inputs, and its output is wired to the first input of the secondary **UMM**. The output of the secondary **UMM** is the average (sum) of up to 7 inputs (sum = Average x number of inputs).

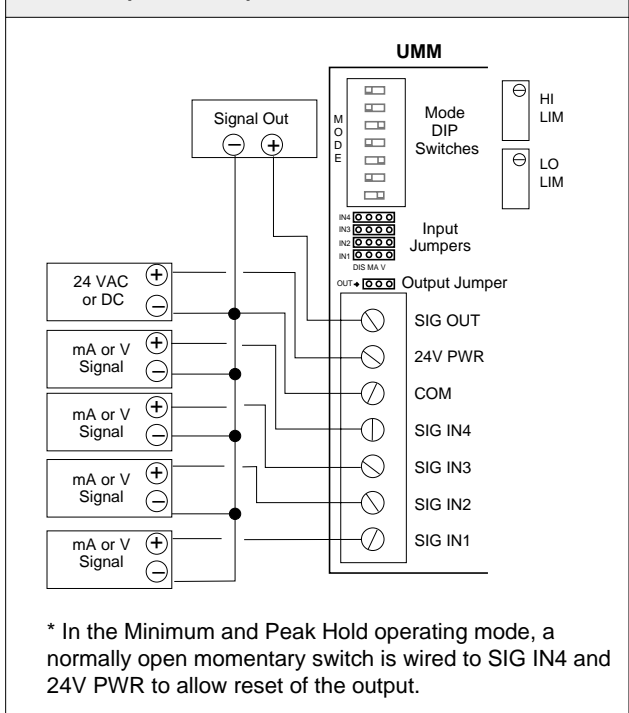
High/Low Limit Control and Signal Reversal

The **UMM** may be used as a single input limit control, allowing the output to be limited to an adjustable upper and/or lower limit. When the input signal reaches the upper or lower limit setting, the output will remain at that particular limit setting. The high/low limit function can also be combined with other operating modes such as high/low signal selection, peak/minimum hold selection, or signal averaging. The output of the **UMM** can be selected to increase as the input increases (direct action), or the output can be reversed to decrease as the input increases (reverse action).

Square Root Extraction

When the **UMM** is ordered with the optional square root function (**SQ** option), it may be used as a single input square root extractor, providing an output proportional to the square root of the input signal. The square root function can also be combined with other operating modes such as high/low signal selection, peak/minimum hold selection, or signal averaging.

WIRING (TYPICAL)



APPLICATION NOTES

- **All input signals wired to the SIG IN terminals must be of the same type and range.**
- **The output signal from the SIG OUT terminal must be of the same type and range as the input signals.**
- **Always disable (jumper to DIS position) any input that is not to be used.**

ORDERING INFORMATION

MODEL	DESCRIPTION
UMM-1	Universal Math Module Enclosed in Slim-Line Housing
UMM-2	Universal Math Module Snap-Track Mounted
OPTIONS (factory installed only)	
SQ	Square root extractor
47	DIN rail mounting adapter (UMM-1 & UMM-1-SQ only)

Example: **UMM-1-SQ-47** Universal math module with square root option and DIN rail mounting adapter