



## Mini-Max M235 Series Digital Panel Meter

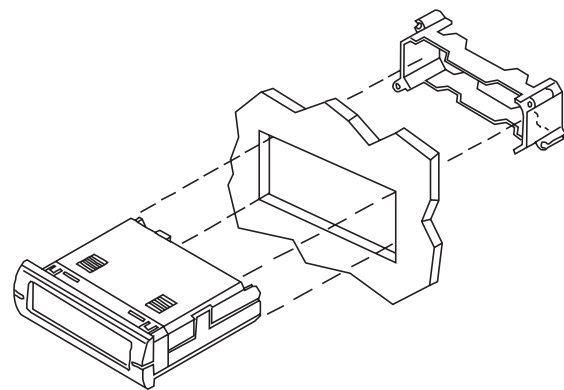
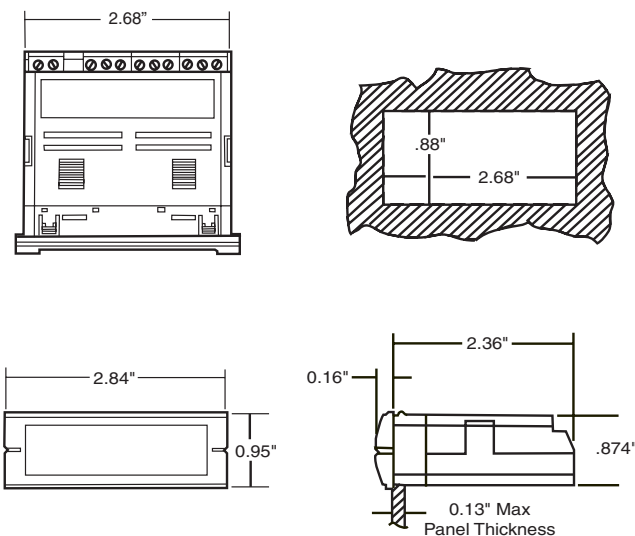
- **Minimum Depth Indicator - Less than 2.5" (60mm) of Space Required Behind the Panel**
- **Stackable Mounting Bracket Included for Easy Installation**
- **3-1/2 Digit, 0.5" (12.7mm) High LCD Display with Optional Negative Image, Bright Red Backlighting**
- **Limited Range Display Scaling and Adjustable Offset**
- **Standard Screw Terminals for Easy Installation**
- **Four Process Ranges: 4-20mA, 1-5VDC, 0-10VDC, 0-100VDC**
- **Scaled 0-100% Power**
- **85-250VAC or 9-32VDC Power Supply**



Simpson's Mini-Max Process Indicators provide high quality, accuracy and reliability in a compact, 60mm deep case. Units offer 3-1/2 digit, 0.5" (12.7mm) LCD display and are available with a bright red, negative image backlight option. All units feature user-selectable decimal point, auto zero and limited scaling capabilities.

A unique mounting bracket is provided to allow for vertical or horizontal stacking of multiple indicators. All Mini-Max units feature a 3/64 DIN, high-impact plastic case. The standard units have a clear viewing window, and the units with optional negative image, red backlighting have a red window.

### Installation and Panel Cutout



#### Mounting Requirements

Insert the Mini-Max through the panel, and then slide the mounting bracket on to the Mini-Max. The mounting bracket allows Mini-Max units to be stacked side-to-side or top-to-bottom and maintain the DIN standard panel arrangements in 24mm by 72mm multiples. Panel cutout instructions for stacking multiple units are provided under "stacking features."

# Specifications

## DISPLAY

**Type:** 7-segment LCD  
**Height:** 0.5" (12.7mm)  
**Decimal point:** 3-position programmable  
**Overrange indication:**  
 Most significant digit = "1"  
**Backlighting:**  
 Optional negative image, red backlighting  
**Polarity:** Auto with "-" indication, "+" implied

## POWER REQUIREMENTS

**AC Volt:** 24-250VAC @40-440Hz  
**DC Volt:** 9-30VDC

## Power Consumption:

85-250VAC: 2.5VA min/4VA max  
 9-32VDC: 1.5VA min/3VA max

**Rated Circuit to Ground Voltage:** 750VRMS

## ACCURACY @ 25°C

±(0.1% of reading + 1 count)

## ENVIRONMENTAL

**Operating Temperature:** 0 to 55°C  
**Storage Temperature:** -10 to 60°C  
**Relative Humidity:**  
 0 to 85% non condensing @ 40°C  
**Temperature Coefficient:**  
 (± 0.02% of input ± 0.2 digits)/°C  
**Warmup time:** Less than 20 minutes

## NOISE REJECTION

**NMRR:** 60dB, 50/60Hz  
**CMRR:** (w/1KΩ unbalanced @ 60Hz): 90dB min

## ANALOG TO DIGITAL CONVERSION

**Technique:** Integrating  
**Rate:** 3 samples/second-typical

## MECHANICAL

**Bezel:** 0.95" x 2.84"  
 (24mm x 72mm)  
**Depth:** 2.36" (60mm)  
**Panel Cutout:** 0.88" x 2.68"  
 (22.2mm x 68mm)  
**Weight:** 3.5oz (99.2g)

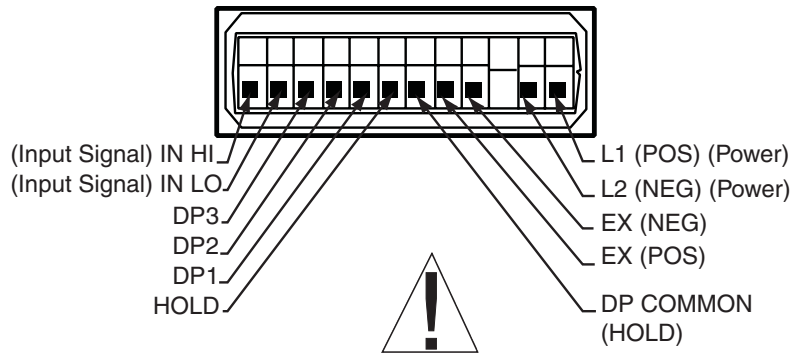
## Case Material:

94-0,UL-rated, glass-filled thermoplastic

## INPUTS: DC Process

Range	Resolution	Voltage Drop	Max Input (unfused)
4-20 mA	0.1%	200 mV	100 mA
Range	Resolution	Input Impedance	Maximum Input
1-5 VDC	0.1%	10 MΩ	750 V
0-10 VDC	0.1%	10 MΩ	750 V
0-100 VDC	0.1%	10 MΩ	750 V

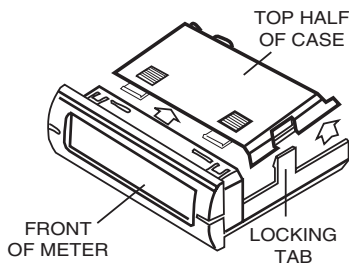
# Wiring Display



These instruments are designed for maximum safety to the operator when mounted in a panel according to instructions. They are not to be used unmounted or for exploratory measurements in unknown circuits.

- Decimal Point:** To select a decimal point, connect the appropriate DP pin (DP1, DP2, or DP3) to the DP COMMON (HOLD). Unused DP inputs may remain unconnected (open).
- Display Hold:** Connect HOLD to DP COMMON (HOLD). If this feature is not required, the DP COMMON (HOLD) pin may remain unconnected (open).
- Input Signal:** Connect the IN HI and IN LO to the signal to be monitored.
- Input Power:** Connect power to the L1 and L2 terminals. For AC powered units, L1 and L2 are not polarized. **For 9-32 DC powered units, L1 must be positive with respect to L2.**

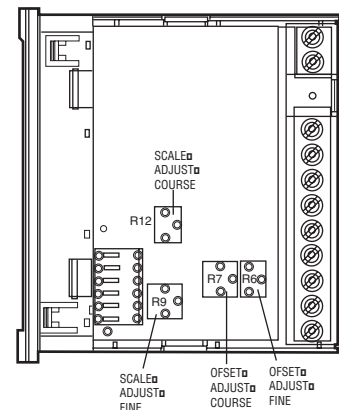
# Display Scaling



Using a screwdriver or thumbnail, spread tab on each side of case to unlock top half. Lift rear top half and slide away from front of meter.

**Span Adjustment:** Mini-Max indicators have limited range coarse and fine adjustments for display scaling. There are no optional connections required for these to function. The "coarse" calibration R12 will allow a limited range of scaling values. The meter can be scaled up to 2 times, or down to 1/2 the value of the input or a maximum reading of 1.999 whichever is lower. Example: a 2 volt input has a maximum reading of 1.999 counts, so you can't double the 2 volts, but you can make 1 volt read 1.999. The "fine" calibration R9 allows for an approximate range of 1% of the "coarse" calibration. Apply the full scale input to the meter. Adjust R12 to within 1% of the desired scaled value, then use R9 to obtain the final desired result.

**Offset Adjustment:** To adjust the offset, apply the offset input signal. (e.g. 4 mA on 4-20 mA input) Use R7 for a "coarse" adjustment of the offset. The offset can be scaled up or down approximately 250 counts. Adjust R7 to within 1% of the desired scaled value, then use R6 to obtain the final desired result.



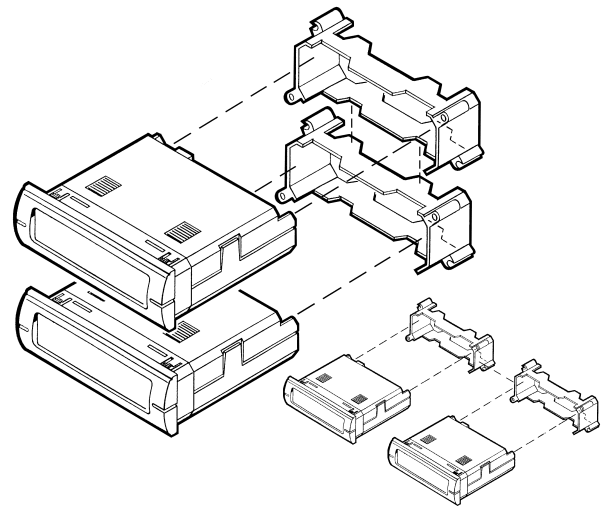
**Note:** Any physical damage to the meter during calibration will void the warranty.

## Stacking Features

The mounting brackets, included with every Mini-Max, can be connected together. Multiple units can be mounted in a single opening, allowing perfect alignment.

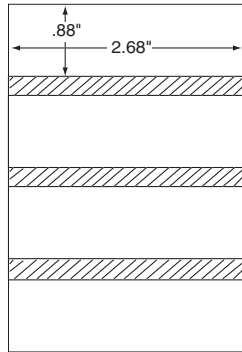
To punch one hole for multiple units, be sure to adjust the standard panel cutout dimensions as shown here; otherwise the meters will not fit properly in the hole.

Mounting multiple units is quick and easy. Install the first meter (bottom unit first if stacking vertically). Position the next mounting bracket snugly against the first one, and slide the second meter into place. Repeat for remaining units.



### Vertical

Standard cutout



.071"  
Add to standard  
when stacking

### Vertical

### Horizontal

Standard cutout



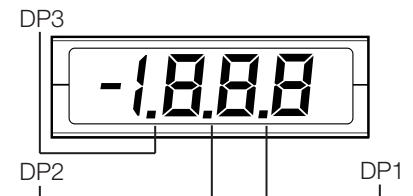
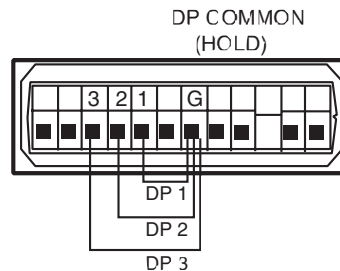
16"  
Add to standard when stacking

### Horizontal

## Backlight Option and Decimal Point Selection

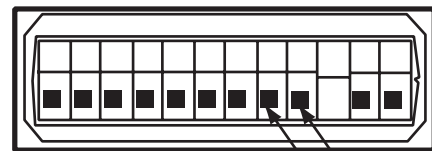
Negative image, bright red backlighting is available in the Mini-Max. This illumination allows the unit to be read in low light areas. Backlighting power is supplied by the Mini-Max, so no additional external power is required.

Decimal point selection is accomplished by connecting the appropriate DP terminal to the DP Common terminal.



## Excitation Output

Excitation output is available in the Mini-Max for powering external transmitters or transducers. Excitation is available from the EX POS and EX NEG terminals. This source is isolated from the measurement input as well as the input power circuits. The voltages available are 12VDC or 24VDC, with a maximum load current of 25 milliamps. This feature eliminates the need to mount an external DC power source for transducers or sensors used in your application.



EX NEG  
EX POS



Do not exceed an excitation  
load current of 25mA!

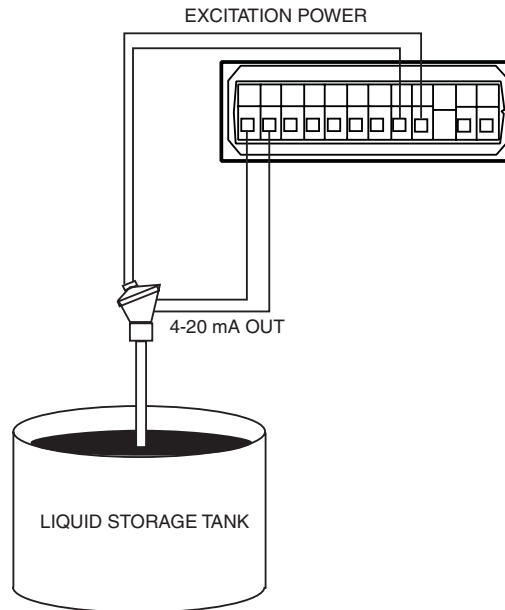
## Application Example

Remote temperature (0-300°) monitoring of a liquid storage tank is required.

A 4-20mA transmitter is placed in a thermal protection head. The thermocouple located in the thermal head gives a mV signal to the transmitter, which sends out to the Mini-Max a 4-20mA signal. This allows the Mini-Max to be in a remote location, such as a control room. The Mini-Max inputs and display must be scaled prior to connecting the 4-20mA signal.

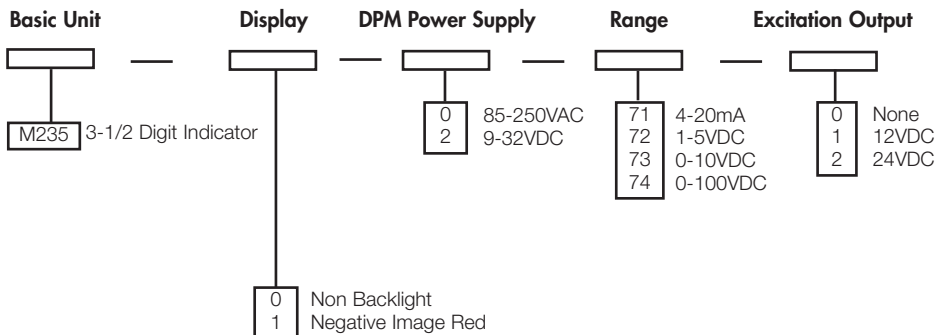
1. Apply a 4mA signal
2. Adjust R6/R7 to 0
3. Apply 20mA signal
4. Adjust R9/R12 to 300

The 4-20mA signal is connected to the IN HI and IN LO terminals, and the Mini-Max will display the temperature of the tank.



## Ordering Information

Your Mini-Max Voltage Indicator can be configured by making an entry for each box.



**Note:** Models for DC current and voltage, AC TRMS voltage and current, AC frequency and temperature are also available.

**Note:** Special scaling is available from the factory at the time of ordering.

## Safety Symbols



The WARNING sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury.



The CAUTION sign denotes a hazard. It calls attention to an operating procedure, practice, or the like, which, if not correctly adhered to, could result in damage to or destruction of part or all of the instrument.