TEXMATE Measurement Control Automation Since 1976

MADE IN THE USA

MADE IN U.S.A. CE RoHS COMPLIANT

SM-Series FUNCTION SPECIFIC METERS

# SM-35

## Multirange 2V, 20V & 200V DC Easily-Scaled 5V DC Powered 3 1/2 Digit Panel Meter


0.56" LED Display

## General Features

The SM-Series meters have LCD or LED displays and offer many unique features designed to simplify installation, calibration and scaling. All SM-35 and SM-35X meters are pin-compatible, which enables LED and LCD meters to be interchanged within the same panel without necessitating wiring or panel cutout changes.

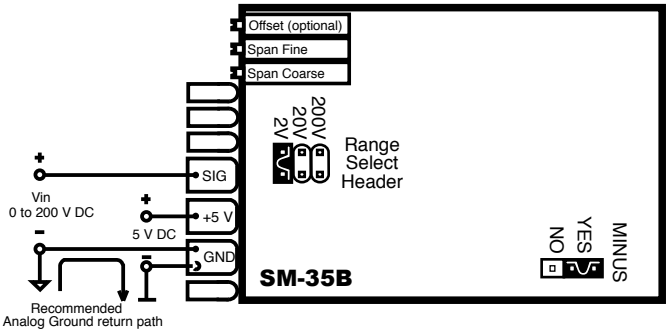
All SM-Series meters are powered with bipolar single-ended inputs. The meters feature Display Hold, Display Test and Auto-Polarity indication. The polarity indication may be disabled or reversed by repositioning jumper clips on internal header pins. The SM-series of meters are designed to be user scalable to almost any engineering unit of readout. On-site scaling and recalibration is facilitated by multi-turn potentiometers that provide continuous fine and coarse adjustment within each of the three header-programmable full scale ranges.

The three ranges provided with the SM-35 (LED display) and SM-35X (LCD display) are 2V, 20V and 200V full scale and both of these meters can be ordered with an optional zero-offset adjustment potentiometer.

The SM-35MV (LED display) and SM-35XMV (LCD display) are specially designed for low voltage inputs and provide three header-programmable input ranges of 20mV, 200mV and 2V full scale. Both the SM-35MV and SM-35XMV have zero-offset adjustment potentiometers as a standard feature and a unique constant current power supply that eliminates any ground loop noise.

## Typical Application Connections

### DC VOLTMETER




## Specifications

**Input Configuration:** .....Single-ended, with optional provision to offset the zero of the reading displayed

**Input Impedance:** .....1MΩ minimum

**Full Scale Ranges:** .....±2VDC (Meters shipped with 2V range selected) ±20VDC ±200VDC All ranges are header programmable

**A/D Converter:** .....12 Bit Dual Slope

**Accuracy:** .....±(0.05% of reading + 2 digits)

**Temperature Coefficient:** 100ppm/°C typical

**Warmup Time:** .....One minute to specified accuracy

**Conversion Rate:**.....3 readings per second

**Display:**.....0.56" High efficiency LED's "Display Hold" feature

**Decimal Selection:** .....User programmable to 3 positions

**Over-range Indication:** ...When input exceeds full scale on any range being used, most significant "1" digit and polarity symbol are displayed with all other digits blank

**Power Supply:** .....+4.5 to +5.5V DC at 200mA

**Operating Temperature:**.. 0˚C to +60˚C

**Storage Temperature:** .....-20˚ to +70˚C

**Relative Humidity:**.....95% (non-condensing)

**Case Dimensions:** .....Bezel 2.76" x 1.17" (69.75 x 29.7mm) Depth behind Bezel 3.32"(84mm) plus 0.68" (17.27mm) for connector.

**Weight:** .....88 gms (3.1 oz)
143 gms (5 oz) when packed

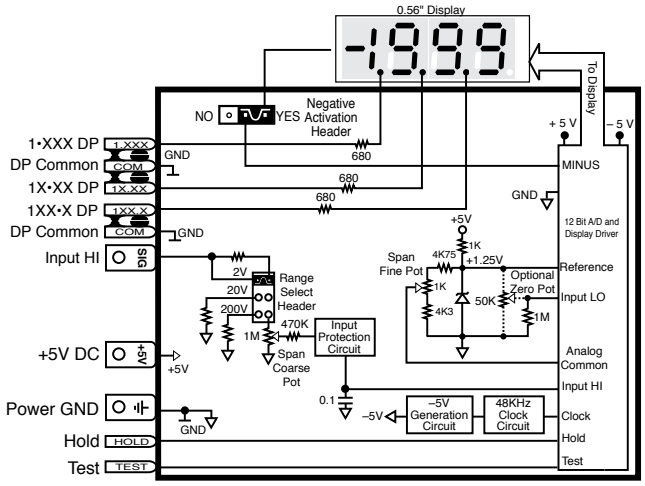
## SM-Series LED Displays

**SM-35**.....3.5 digit Red LED, **2**/20/200VDC, 5VDC Pwr
**SM-35MV**.....3.5 digit Red LED, 0.02/0.2/**2VDC**, 5VDC Pwr

## SM-Series LCD Displays

**SM-35X**.....3.5 digit LCD, **2**/20/200VDC, 5VDC Pwr

## Functional Diagram

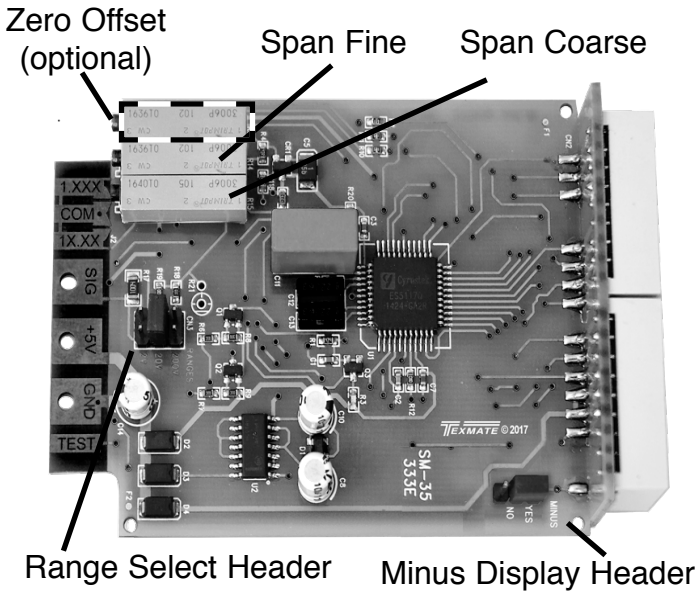



## Calibration Procedure

1) Select the DC Volt input range 20V or 200V by re-positioning the jumper clip on the range select headers indicated by and marked on the PCB Range select Header, shown on Component Layout section.
2) Input 0VDC , meter will automatically will display 000 or if Offset Pot (Optional) is installed, adjust pot until meter display 000.
3) Apply at least 95% of full voltage range, eg 19V for a 20 DCVolt range or 190 DCVolt for a 200V Range.
4) Adjust Span Coarse and Span Coarse Fine pot until meter displays 19.00 (20V Range) or 190.0 (200V Range)

**CAUTION - ELECTRICAL SHOCK HAZARD** All internal parts of the meter may be at the same electrical potential as the input signal and power supply. Do not reposition the signal conditioning components when input voltages are applied. When measuring dangerously high input voltages, extreme care must be taken to insulate the connector pins as well as all metal parts of the meter. A suitable high voltage warning notice should be affixed to those meters where there is any possibility that the meter could be removed from its case, or the internal components accessed, concurrent with the existence of a high voltage input signal.

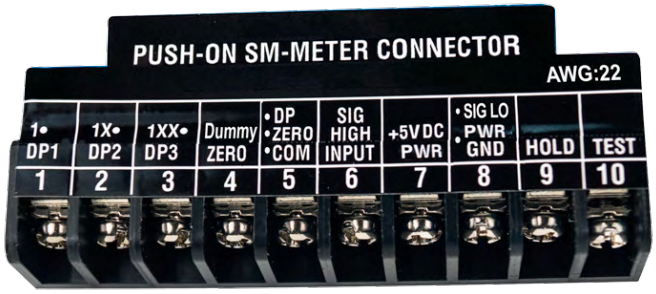
## Component Layout




## Push-On Screw Terminals

**They provide the greatest convenience and ease of use**

Texmate's exclusive Push-On Connectors combine an edge card connector and a 10 position screw terminal block.




**Part Number: CN-PUSH/SM**

**Pins 1,2 and 3 - Decimal Select:** Connect either one of these pins to Pin 5 (common) to show decimal point.

**Pin 4 - Dummy Zero:** used only SM-35X model only.

**Pin 5 - Decimal Select Common:** Common return pins for decimal point selection, Hold, and Test.

**Pin 6 - Signal High Input:** Signal inputs for all voltage ranges are applied to these pins. Maximum overvoltage protection is ±400V DC or 280V AC.

**Pins 7 - +5V DC System Power Input:** The meter requires a regulated low-ripple 5V DC power supply applied to these pins.

**Pin 8 - Signal Low Input / Power Ground:** Signal low input of the analog to digital converter circuits (Note: When measuring input signals (on the 2V range) that are not isolated from the +5V DC supply used to power the meter, a ground loop can be created that will cause the least significant digit to exhibit errors and instability. To avoid this problem, the ground return path of the analog signal should be connected to the power supply ground only at the Signal Low Input Pins 8 of the meter.).

**Pin 9 - Display Hold Input (CMOS compatible):** If Pin 9 is left open, the meter will operate in a free-running mode. Whilst Pin 9 is connected to Common Pins 5, the meter will latch up; A/D conversions will continue but the display will not be updated until Pin 9 is released.

**Pin 10 - Display Test Input:** All numeric display segments will operate when Pin 10 is connected to Common Pins 5. **CAUTION:** The Display Test function is only intended for momentary operation. Continuous application of Display Test will, in time, damage the display.

## Minus Sign Header

NO ▫▪▫ YES
Activates Minus sign on display

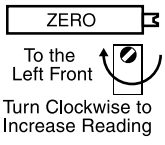
NO ▪▫▪ YES
Disable Minus sign on display*

***Minus Sign Header***

This header allows the Minus Sign to work normally.

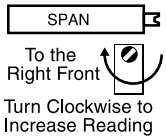
*Note: Removing the header disables Minus Sign

## Signal Conditioning Components



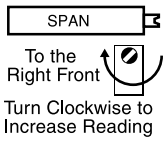

***ZERO Potentiometer (Pot) Optional***

The Optional ZERO pot when installed is to the left of the SPAN pots (as viewed from the back of the meter). Typically it enables the displayed reading to be offset ±1000 counts.



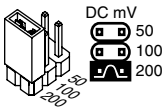

***SPAN Fine Potentiometer (Pot)***

The 15 turn SPAN Fine pot is the middle pot (as viewed from the back of the meter). Typical adjustment is 10% of the input signal range.




***SPAN Coarse Potentiometer (Pot)***

The 15 turn SPAN Coarse pot is on the right side (as viewed from the back of the meter). Typical adjustment is 100% of the input signal range.




***RANGE SELECT Header***

Range values are marked on the PCB. Three positions are provided. After selecting a new range with the single jumper clip, recalibration is required.

## Meters in Dashboard Case Enclosure

**AM-20**..... 20 segment LED bargraph, 5V DC power


**CM-35XTL**..... Less than 1V DC loop drop and 1 Joule energy storage

**CM-35XT** ..... Economical 4-20mA loop-powered meter



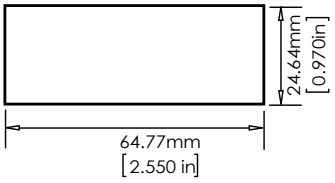
**PM-45X** ..... 4.5 digit 0.48” LCD DPM
**PM-45XU** ..... Lower cost version of PM-45X
**PM-45L** ..... 4.5 digit 0.4” LED DPM
**PM-45LU**..... Lower cost version of PM-45L


**SP-35X**..... Signal Power DC voltage measurement from 5.0V DC to 199.9V DC

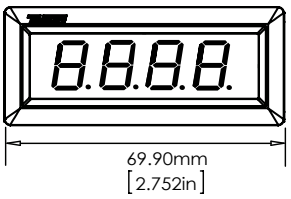
**PS-505** . . . . . .5V DC Regulated Power Supply, 0.5A Output
**PS-510** . . . . . .5V DC Regulated Power Supply, 1A Output

## SM Case Dimensions and Panel Cutouts

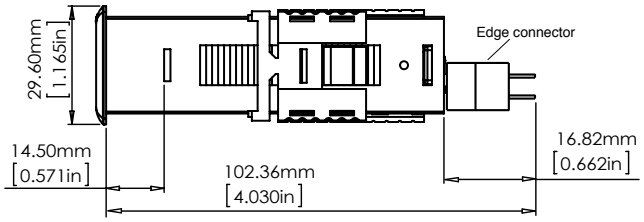
**PANEL CUTOUT**

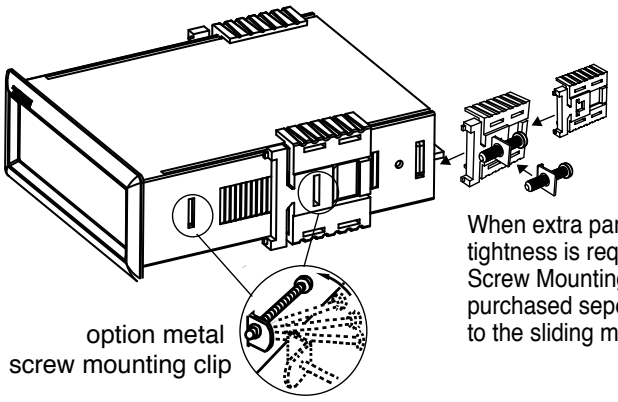



**FRONT VIEW**



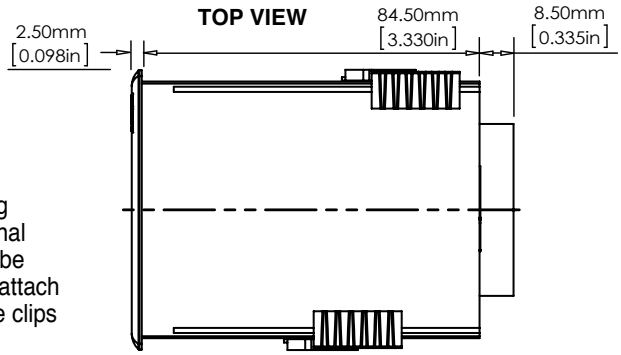

**SIDE VIEW**




When extra panel mounting tightness is required, optional Screw Mounting Clips can be purchased seperately and attach to the sliding mounting side clips

**TOP VIEW**




## Ordering Information

### Standard Options for this Model Number

| *Part Number* | *Description* |
|---|---|

**▸BASIC MODEL NUMBER** Includes plug in type screw terminals, standard display and standard power supply unless optional versions are ordered.

**SM-35**.....3.5 digit Red LED, **2**/20/200VDC, 5VDC Pwr . . .

**▸DISPLAY**

**STANDARD .....Red LED, 0.96 inch high.** . . . . . .

SM-GREEN . . . Green LEDs, for SM-35/35MV only . . . . . .

SM-BLUE . . . . Blue LEDs, for SM-35/35MV only. . . . . .

### Special Options and Accessories

| *Part Number* | *Description* |
|---|---|

**▸SPECIAL OPTIONS (Specify Inputs & Req. Reading)**

Z50K . . . . . Zero offset 50 K Pot.
ZR-SM35-20V . Range change 0 to 20V DC. Display scaling 1999
ZR-SM35-200V Range change 0 to 200V DC. Display scaling 1999

**▸ACCESSORIES**

CN-PUSH/SM. . Push-0n Screw Terminal Block Connector . . . . .
TB-KIT. . . . . Terminal Block Connector Kit (3) . . . . . .
SL.CASERED. . Slim Bezel Case, Red Faceplate w/Mtg Hrdwre
PS-505 . . . . . 5V DC Regulated Power Supply, 0.5A Output . .
PS-510 . . . . . 5V DC Regulated Power Supply, 1A Output . . .

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