

OBSOLETE PRODUCT

Contact Factory for Replacement Model

GENERAL DESCRIPTION

The Datal Models DM-4000 and DM-4300, respectively, the world's smallest 4½ and 4¾ digit LED digital panel meters, and include input offset autozeroing.

Both models feature large, easy to read red LED displays that are 0.43" high in the DM-4000 and 0.3" high in the DM-4300. Input power for either model is +5VDC at 1 Amp max.

These DPM's employ a differential, optically isolated floating input that withstands ±300 volts common mode to digital ground with 120 dB common mode rejection from DC to 60 Hz. This provides high noise immunity in industrial applications.

The counter circuits are driven by a stable crystal controlled oscillator which may be specified to synchronize with either 50 or 60 Hz, the common AC power line frequencies. Dual slope integration synchronized to 50 or 60 Hz provides 60 dB of normal mode rejection to power hum on the signal input.

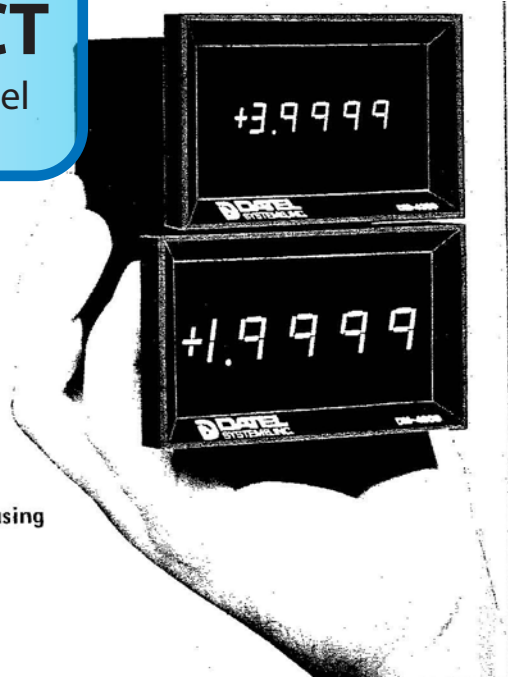
An internal ±6.4 VDC reference and the reference input may be externally connected for 3-wire, TC-tracking ratiometric measurements. This configuration reduces temperature drift errors by normalizing to a single positive reference voltage.

Model DM-4000 measures and displays a full scale input of ±1.9999V. The full scale input/display range of Model DM-4300 is ±3.9999V. Both models have an input impedance in excess of 100 megohms, input bias current of 100 pA max. — which doubles each 10°C.

Accuracy of Models DM-4000/4300 is ±0.01% of reading ±1 digit, with a temperature coefficient of 15 ppm/°C max. over the 0 to +50°C operating range. When operating from the internal clock both models update their display at a 2 sample per second rate, but when driven by an external start pulse the DM-4000 sampling rate can be varied from 0 to 5 per second and the DM-4300 from 0 to 3.3 per second. Calibration adjustments after a 15 minute warmup are easily accessible behind the front panel filter.

The red LED seven segment digits provide automatic display of overrange, overload, polarity and decimal point: Overload is indicated by alternate flashing of the center bars of the sign and 4 LSD displays. The decimal points are illuminated by grounding the appropriate connector pin.

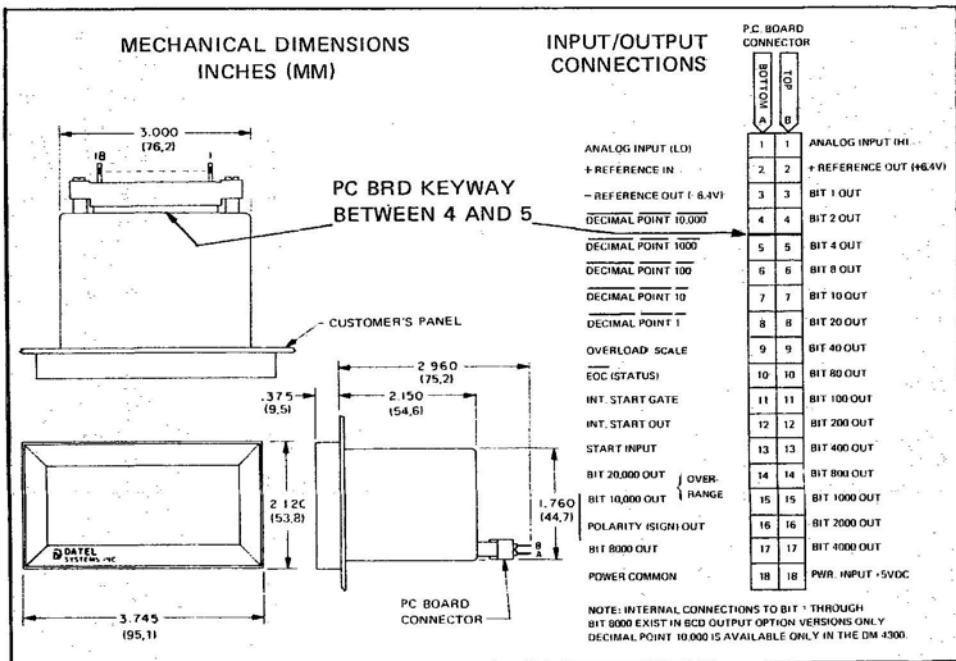
- ▶ **Miniature Case With 5 Large, Red LED Displays**
- ▶ **Autozeroing, Optoisolated Floating Input**
- ▶ **Operates From +5VDC Logic Power**
- ▶ **High Noise Immunity using 120 dB CMR, ±300 V_{CM} Bipolar Floating Input**
- ▶ **AC Hum Rejection (60 dB NMR) using Line-synchronized Quartz Crystal Counter**
- ▶ **3-Wire Ratiometric Input Reduces Drift Errors from Bridge Inputs**



DTL/TTL compatible overrange, polarity, overload and EOC outputs are available at the rear case, 18-pin dual PC board connector in both models. Sixteen lines of BCD data are optionally available at the rear connector in full parallel, 8-4-2-1 positive true format.

These DPM's are housed in a high-impact polycarbonate case that measures only 3" W x 1.75" H x 2.25" D.

High immunity to common mode and normal mode voltages combined with the ratiometric feature especially recommend these DPM's for use with many bridge transducers. Applications include temperature measurement, motion, stress and many other physical phenomena.



Specifications (Typical @ 25 °C unless noted)

INPUT CHARACTERISTICS

Input Voltage Range (Full Scale) DM-4000: ±1.9999 Volts
DM-4300: ±3.9999 Volts
Input Impedance Greater than 100 megohms
Input Bias Current 100pA max. @ 25°C
(doubles/10°C)
Input Configuration Single-ended floating. Optical isolation to digital ground employed for differential characteristics.
Input Polarity Automatic bipolar with polarity display indication.
Common Mode Rejection 120 dB, DC to 60 Hz with up to 1K ohm source unbalance.
Common Mode Voltage Range ±300 Volts to digital ground.
Input Overvoltage ±50V min. (sustained) between inputs without damage. ±100V to 5 seconds without damage.

PERFORMANCE

Accuracy (@ 25°C) ±.01% of reading ± 1 digit.
Resolution 100µV
Temperature Coefficient of Reading 15ppm/°C max.
Conversion Speed (Adjustable using ext. trigger) DM-4000: 0 to 5 conversions/sec.
DM-4300: 0 to 3-1/3 conversions/sec.
Input Settling Time 50 mS integration for 60 Hz line. 60 mS integration for 50 Hz line optional.
Operating Temperature Range 0 to +50°C.
Storage Temperature Range -55°C to +85°C.
Warm Up Time 15 minutes to rated accuracy.
Adjustments Full scale (Gain) trim located behind front bezel. Separate ± adjustment and ratio zero trim. Autozeroing.
Input Power +5 ± .25 VDC @ 1 Amp max. (with input logic spikes 10mV max.). Suggested power supply is a Datal UPM-5/1000B or equivalent highly regulated type. Power current varies rapidly with digits displayed, conversion rate, etc.

DISPLAY OUTPUT

Display Type Red, LED seven segment digits with automatic display of overrange, overload, polarity and decimal point:
DM-4000: Digits 0.43" high
DM-4300: Digits 0.30" high
Overload Scale Sign and 4 LSD's display center bars blink.
Decimal Points Selectable at rear connector. Left of each full digit.

OPTIONAL DATA OUTPUTS

BCD Outputs 16 parallel lines (8-4-2-1) positive true. Loading: 2 TTL loads.
Overrange DM-4000: 10000 to 19999 counts indicated by HIGH on pin A15 with LOW on overflow (pin A9).

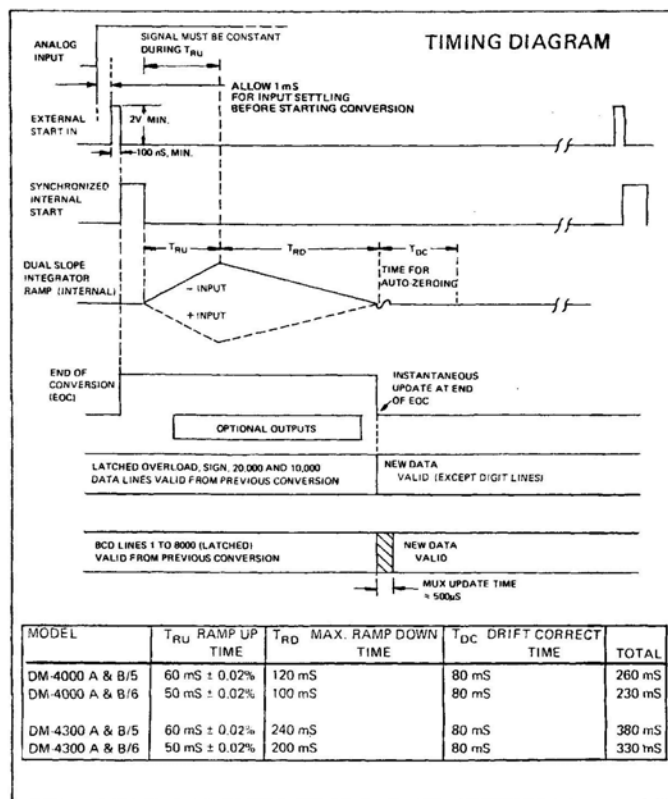
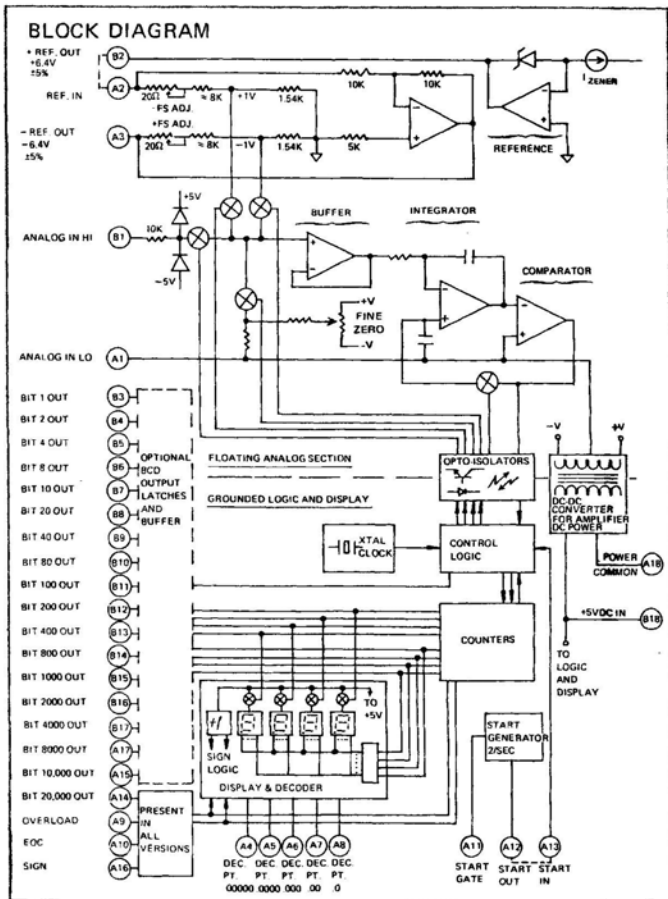
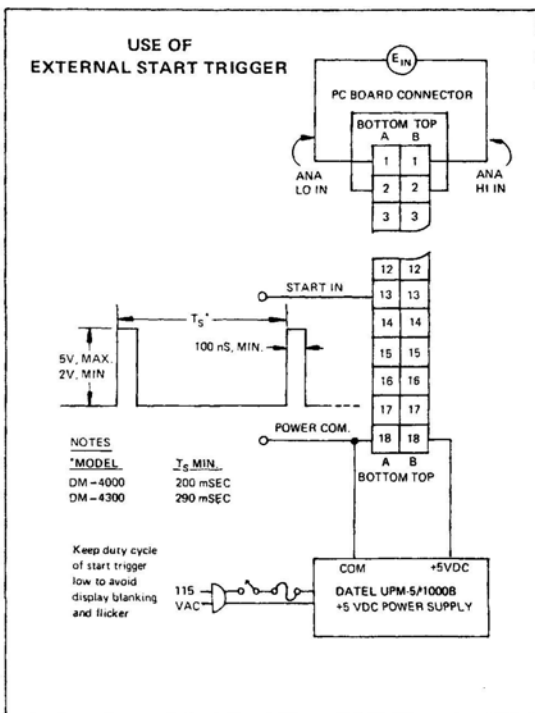
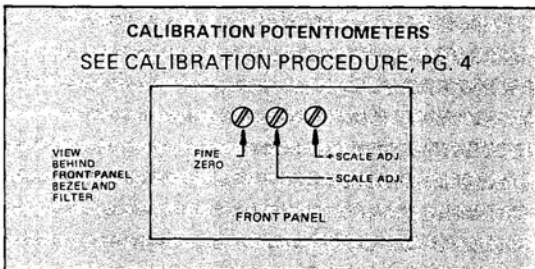
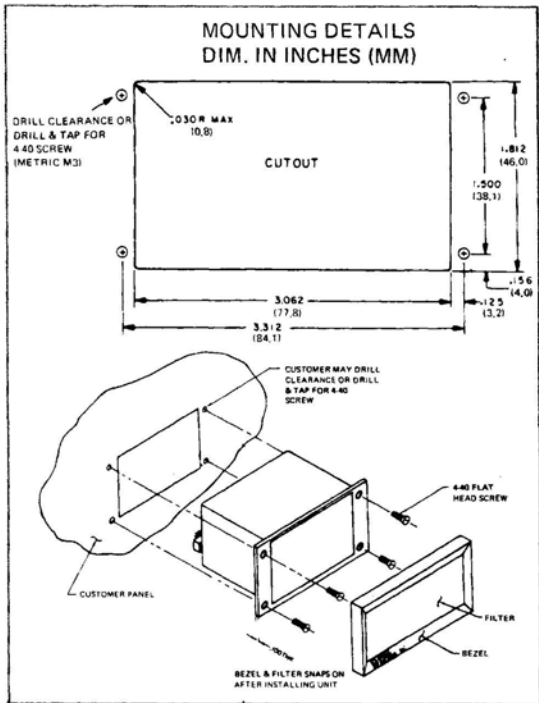
DM-4300: 10000 to 39999 counts indicated by a positive true 2-1 BCD code on pins A14 and A15 along with a LOW on overflow (pin A9)
Polarity Input signal polarity positive indicated with a HIGH. Negative polarity indicated with a LOW.
Overload Scale DM-4000: Greater than 19999 counts indicated by a HIGH (positive true) on overflow (pin A9). Less than 19999 counts indicated by a LOW.
DM-4300: Greater than 39999 indicated by HIGH on overflow (pin A9). Less than 39999 counts indicated by a LOW.
End of Conversion (EOC) HIGH – during conversion, BCD outputs counting and invalid.
LOW – conversion complete. BCD outputs valid 500 µsec after EOC. (See timing diagram)

INPUT/OUTPUT CONTROL

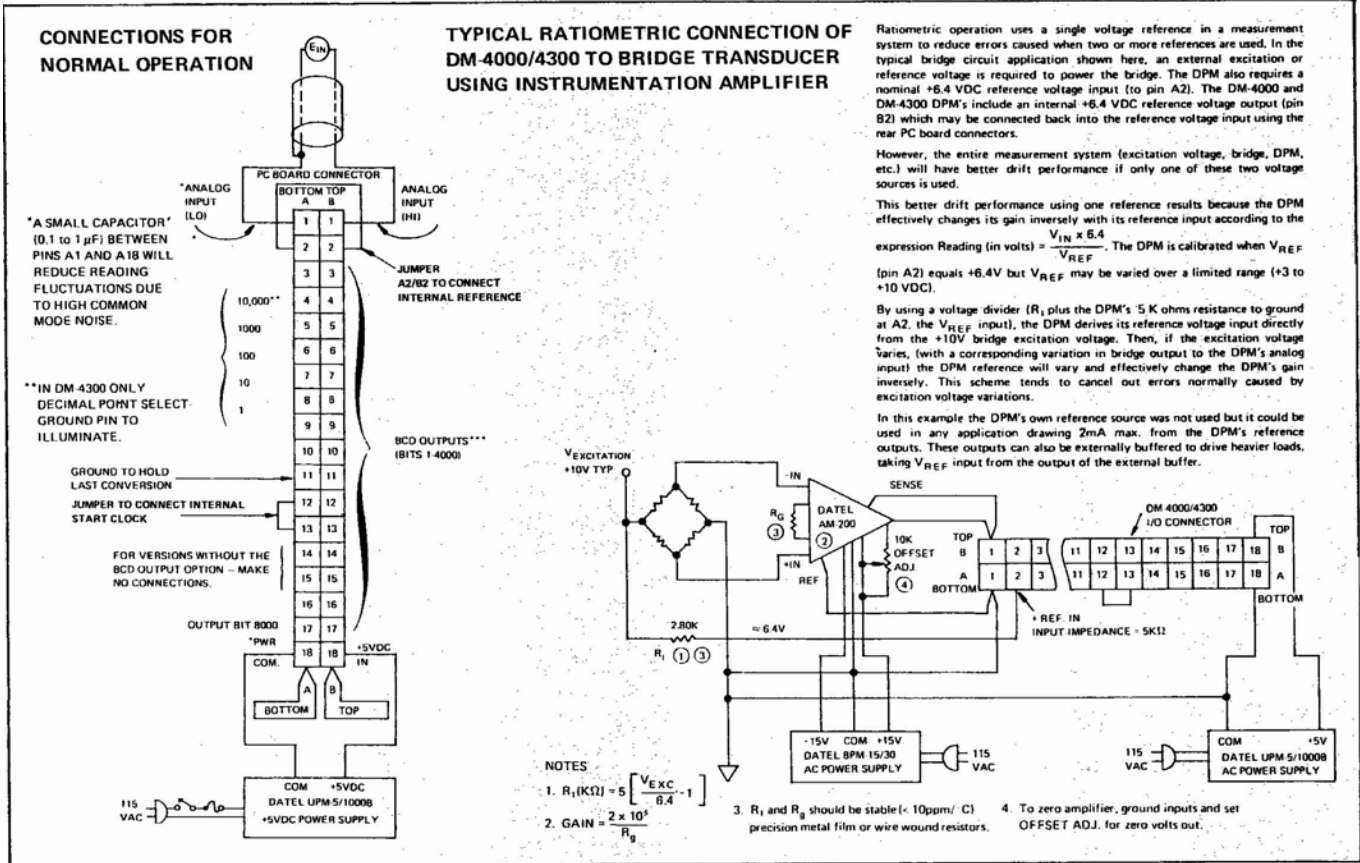
External Start Conversion Command Positive pulse 100 nsec. min. width. 2.0V min. 5V max. height. Conversion initiated upon return from "HIGH" to "LOW".
Internal Clock Start Gate Controls internal start clock "HIGH" – Run
"LOW" – Stop
Loading – 1 TTL load.
Internal Start Output Positive pulse output of internal start clock. 2 pulses/second.
Decimal Point Inputs Grounding these inputs illuminates corresponding decimal points on the display.
Ratiometric Output Derived from internal reference for TC-tracking. Provides ±6.4V @ 2mA max. for 3-wire ratiometric measurement. Ratiometric inputs can be normalized to a single positive reference voltage.
Ratiometric Input Calibrated for $V_{IN} \pm 5\%$ input (avail. from ratiometric output, above). May be varied from +3V to +10 VDC for TC-tracking bridge applications. Reading (volts) = $\frac{V_{IN} \times 6.4}{V_{REF IN}}$

PHYSICAL

Case Size 3"W x 1.75"H x 2.25"D
Case Material Black high-impact polycarbonate plastic.
Weight 8-10 oz.
Mounting Through a 1.812" x 3.062" cutout secured with four 4-40 screws.
Connector Dual 18-pin PC edgeboard type, 0.1" centers (not included, see ordering guide)



NOTE: BCD OUTPUTS NOT VALID UNTIL 500 µSEC AFTER EOC FALLING EDGE.



JUMPER A12/A13 TO USE INTERNAL START CLOCK, JUMPER A2/B2 TO CONNECT INT. REFERENCE

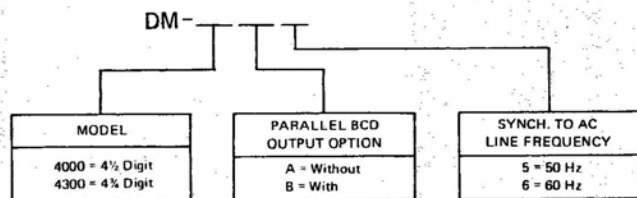
CALIBRATION PROCEDURE (see figure, middle left, pg. 3)

- For normal operation (see figure) jumper pin A12 to A13 and pin A2 to B2.
- Apply power to the DPM and a precision calibrated DC voltage source and allow both at least fifteen minutes for warm up before proceeding.
 - Short the input leads (A1 and-B1) to ground. Adjust the FINE ZERO so that the display reads all zero's and the sign flickers between plus and minus. Disconnect the input leads from ground and connect them to the precision voltage source.
- For both models, zeroing is automatic and the calibration adjustments are accessible after the front panel bezel and filter are removed.
 - FOR MODEL DM-4000: Apply an input of +1.99905 volts and set the + SCALE ADJ. potentiometer so that the display flickers equally between +1.9990 and +1.9991 VDC. Reverse the input polarity and set the -SCALE ADJ. potentiometer for a display that flickers between -1.9990 and -1.9991.
 - FOR MODEL DM-4300: Apply an input of +3.99905 Volts and set the +SCALE ADJ. potentiometer so that the display flickers between +3.9990 and +3.9991 VDC. Reverse the input polarity and Set -SCALE ADJ. for display that flickers between -3.9990 and -3.9991 VDC.
- For ratiometric operation (see figure showing typical connection) the previous steps must first be performed.

PRICES (1-9)

	Without BCD Option	With BCD Option
(4½ digit)	DM-4000A . . . \$219.00	DM-4000B . . . \$239.00
(4¾ digit)	DM-4300A . . . \$235.00	DM-4300B . . . \$255.00
Suggested Power Supply:		
UPM-5/1000B +5VDC Modular Power Supply	(\$49.00 (115VAC Input))	
UPM-5/1000BE +5VDC Modular Power Supply	(\$54.00 (230 VAC Input))	
MS-7 Mating Power Supply Socket	(\$3.50)	
Connectors (Not included with DPM. Please order with your DPM)		
Solder Tab, Datel #2335-1 (Viking 3VH18/1JN-5	(\$4.95 or equivalent with key)	
Wire Wrap, Datel #2335-2 (Viking 3VH18/1JHD-5	(\$4.95 or equivalent with key)	

ORDERING GUIDE



GSA Contracted: Datel's Digital Panel Meters are covered by GSA Contract GS-00S-27959

