DPM 300

4½ Digit LCD Module

A DPM offering levels of performance, low current consumption and compact size never previously available. Automatic low battery indication and 'continuity' flags are built into the display. Supplied complete with snap-in bezel, the DPM 300 will suit many applications calling for low cost, high accuracy measurements in portable instruments.

- 12.5mm (0.5") Digit Height.
- Programmable Decimal Points
- Auto-zero
- Auto-polarity
- 200mV d.c. or 2V d.c. Full Scale Reading (F.S.R.)
- Digital Hold
- Single Rail Version (DPM 300S)
- Autoranging Outputs

SCALING

Two resistors Ra and Rb may be fitted in order to alter the full scale reading (F.S.R.) of the meter - see table.

Required F.S.R.	Range Input	Ra	Rb
2V	HIGH	Link	(o/c)
20V Note	HIGH	910k	100k
200V Note	HIGH	1M	10k
2kV Note	HIGH	1M	1k
200µA	LOW(o/c)	Link	1k
2mA	LOW(o/c)	Link	100R
20mA	LOW(o/c)	Link	10R
200mA	LOW(o/c)	Link	1R

NOTE
Ensure that Link La is open if fitting Ra.

Standard Meter Single Rail Version					Stock Number DPM 300 DPM 300S
Specification		Min.	Typ.	Max.	Unit
Accuracy (overall error) *			0.005	0.01	% (±1 count)
Linearity				±1	count
Sample rate			1.6		samples/sec
Operating temperature range		0		50	°C
Temperature stability			30		ppm/°C
Supply voltage (V+ to V-)	DPM 300	7	9	10	V
	DPM 300S	3.5	5	6	
Supply current			1	2	mA
Input leakage current (Vin= 0V)			1	10	pA

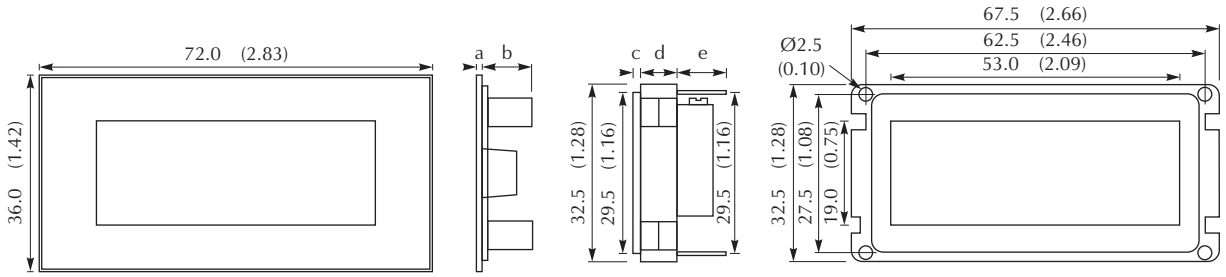
* To ensure maximum accuracy, re-calibrate periodically.

Unless otherwise noted, specifications apply at TA=25°C, Vsupply=9Vd.c. (5Vd.c. for 'S' versions) (fclock=100kHz) and are tested with the module configured for fully floating input mode.

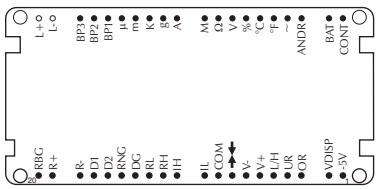
SAFETY

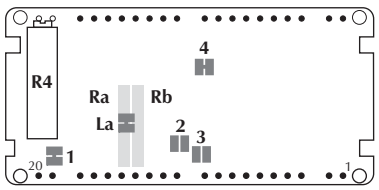
To comply with the Low Voltage Directive (LVD 93/68/EEC), input voltages to the module's pins must not exceed 60Vdc. If voltages to the measuring inputs do exceed 60Vdc, then fit scaling resistors externally to the module. The user must ensure that the incorporation of the DPM into the user's equipment conforms to the relevant sections of BS EN 61010 (Safety Requirements for Electrical Equipment for Measuring, Control and Laboratory Use).

DIMENSIONS All dimensions in mm (inches)



a = 1.0 (0.04) b = 9.0 (0.35) c = 1.0 (0.04) d = 5.5 (0.21) e = 8.5 (0.34)





ON BOARD SOLDER LINKS

OPTIONAL SCALING RESISTORS ON UNDERSIDE OF BOARD

Panel cut-out
68.0 x 33.0 (2.68 x 1.30)

PANEL FITTING

Locate the meter by passing it through the front of the panel cut-out and gently push until the rear of the bezel is flush with the panel (DO NOT PUSH ON THE LCD). The snap-in lugs will now automatically hold the meter firmly in position.

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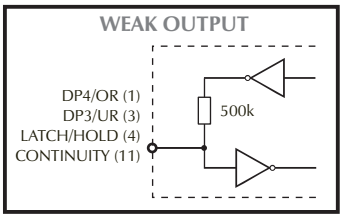
PIN FUNCTIONS

COMBINED INPUT/OUTPUT

Four pin connections have dual functions as both inputs and 'weak' outputs. In order to obtain data from a weak output, it should be connected to a high impedance input. Alternatively, to use as an input, it may be easily over driven. Should it be necessary to monitor the Under range/Over range signals and simultaneously display either of the two decimal points, DP3 and DP4, then outputs should be sensed for the duration of the LATCH (5) output and otherwise over driven as inputs.



1. -5V — Negative rail generator circuit output voltage (DPM 300S only). It mirrors the positive supply voltage V+. For DPM 300 -5V is connected to V-.
2. VDISP — Drive voltage for triplexed LCD, set by R9.
3. DP4/OR — Input: Connect to V+ to display DP 1.9999 otherwise connect to DGND. Output: Driven HIGH (V+) if reading exceeds ±19999.
4. DP3/UR — Input: Connect to V+ to display DP 19.999 otherwise connect to DGND. Output: Driven HIGH (V+) if reading less than ±1000.
5. HOLD/LATCH — Input: Connect to V+ to hold last displayed reading, otherwise leave floating. Output: A negative going pulse (duration 100 clock cycles) occurs when data in display latches is updated.
6. V+ — Positive power supply input.
7. V- — Negative power supply input.

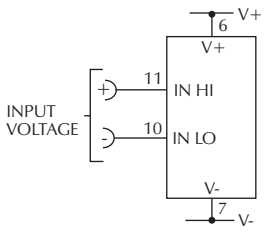
   Note: Absolute maximum differential power supply voltage V+ to V- (DPM 300 = 5V, DPM 300S = 7.5V)
8. CONT — Input: Connect to DGND to disable continuity symbol on display. Output: If differential analogue input voltage between IN HI and IN LO is less than a nominal +200mV, output will be driven HIGH (V+). Otherwise it will remain LOW (DGND).
9. COM — This is the ground for the analogue section of the A/D converter and is held actively at a nominal 3.2V below V+. User may pull this pin down to a lower voltage than its quiescent level but care should be taken NOT to exceed the absolute maximum sink current of 2mA.
10. IN LO — Negative differential measuring input.
11. IN HI — Positive differential measuring input.

    Inputs must be lower than V+, and higher than 1.5V above V-. (1.5V above -5V (Pin 1) for DPM 300S)
12. REF HI — Positive input for reference voltage, connected by Link 1 to REF+.
13. REF LO — Negative input for reference voltage, connected by Link 4 to REF-.
14. DGND — This is the ground for the digital section of the module, held actively at approximately 4.5V to 5.8V below V+. It may be used as a convenient reference level to power external CMOS circuitry subject to a maximum load of 1mA.
15. RANGE — Connect to V+ to select range of 2V FSR, otherwise connect to DGND or leave floating to select default range of 200mV FSR.
16. DP2 — 199.99
17. DP1 — 1999.9

    Note: Take to V+ to display required DP. If not required may be left floating (internal 3µA pull down).
18. REF- — Negative input of bandgap reference circuit. MUST be tied to a suitable ground return to bias bandgap (normally COM). REF- is connected by Link 4 to REF LO.
19. REF+ — Positive output from bandgap circuit (normally 1V) connected by Link 1 to REF HI.
20. REF BG — Output voltage developed across bandgap (1.22V nom).
21. CONT — Three LCD annunciators are respectively driven from continuity, low battery and polarity sections of the circuitry.
23. AN DR — Annunciator driver. Connect to required annunciator(s) to display.

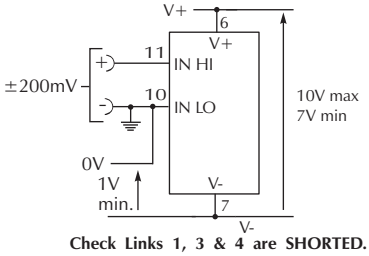
VARIOUS OPERATING MODES

ON-BOARD LINKS: In order to quickly and easily change operating modes for different applications the meter has several on-board links. They are designed to be easily opened (cut) or shorted (soldered). Do not connect more than one meter to the same power supply if the meters cannot use the same signal ground. Taking any input beyond the power supply rails will damage the meter.



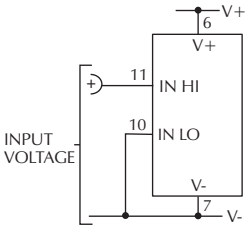
Check Links 1, 2, 3 & 4 are SHORTED

Measuring a floating voltage source of 200mV full scale.



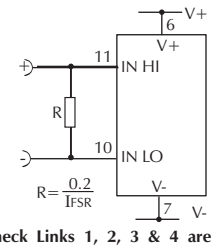
Check Links 1, 3 & 4 are SHORTED.

Split supply operation (DPM 300).



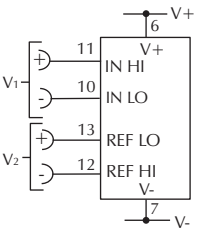
Check Links 1, 3 & 4 are SHORTED.

Measuring a single ended input referenced to supply (DPM 300S).



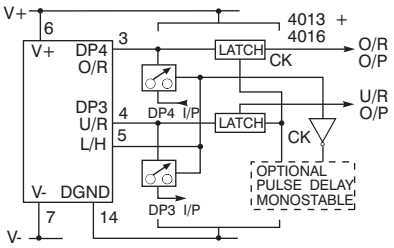
Check Links 1, 2, 3 & 4 are SHORTED

Measuring current.
Supply MUST be isolated.



Check Links 1 & 4 are OPEN.

Measuring the ratio of two voltages.
200mV F.S.R. reading = 10^5 V_1/V_2
2V F.S.R. reading = 10^4 V_1/V_2.



Driving DP2 and DP3 inputs while monitoring Under range and Over range outputs.