DPM 60

4½ Digit LCD Module

The DPM 60 is a low cost, low power LCD meter offering high levels of performance which make it particularly suitable for high accuracy applications in portable equipment. The meter has a DIN compatible bezel incorporating an integral protective window and is supplied complete with mounting kit.

- 10mm Digit Height.
- Programmable Decimal Points
- Auto-zero
- Auto-polarity
- Logic Selectable 2V d.c or 200mV d.c Full Scale Reading (F.S.R.)
- Digital Hold
- Single Rail Version (DPM 60S)
- Autoranging Outputs

SCALING

Ra and Rb may be fitted in order to alter the full scale reading (F.S.R.) of the meter.
The meter will have to be re-calibrated.

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 link 15 is cut if fitting Ra.

Stock Number Standard Meter Single Rail Version				DPM 60 DPM 60S	
Specification		Min.	Typ.	Max.	Unit
Accuracy (overall error) *			0.005	0.01	% (±1 count)
Linearity				±1	count
Sample rate			1.6		samples/sec
Temperature range		0		35	°C
Operating temperature stability			30		ppm/°C
Supply voltage	DPM 60	7.5	9	15	V
	DPM 60S	3.8	5	7	
Low battery threshold	DPM 60	6.3	7.2	7.7	V
	DPM 60S	3.2	3.6	3.9	
Supply current			1		mA
Input leakage current			1	10	pA
Continuity flag threshold		100	200	400	mV

* To ensure maximum accuracy, re-calibrate periodically.

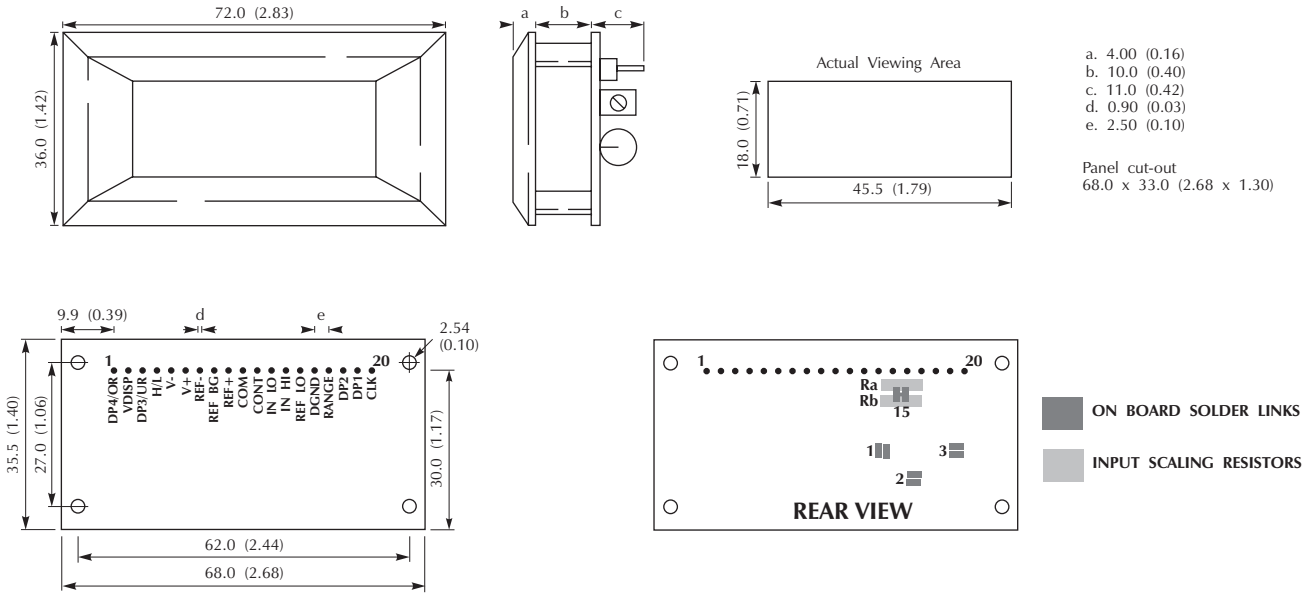
CONNECTOR SOURCING GUIDE

METHOD	FARNELL	MOLEX	PANDUIT	RS	SAMTEC
PCB socket	SUPPLIED WITH PRODUCT				
IDC			CE 100 F28-20		HCSS SERIES

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)



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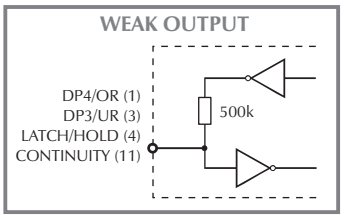
PIN FUNCTIONS



1. DP4/OR* — Input: Connect to V+ to display DP 1.9999, otherwise connect to DGND.
   Output: Driven HIGH (V+) if reading exceeds +19999.
2. VDISP — Drive voltage for triplexed LCD, internally linked to DGND.
3. DP3/UR* — Input: Connect to V+ to display DP19.999, otherwise leave floating.
   Output: Driven HIGH (V+) if reading is less than ±1000.
4. HOLD/LATCH* — Input: Connect toV+ to hold last display reading, otherwise leave floating.
   Output: A negative going pulse occurs when data in display latches is updated.
5. V- — Negative power supply connection.
6. V+ — Positive power supply connection.
7. REF- — Negative output from internal reference. MUST be tied to a suitable ground return to bias bandgap (normally COM).
8. REF BG — Output of bandgap reference (1.22V nom).
9. REF+ — Positive output from on-board reference circuit (normally 1V).
10. 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.
11. CONTINUITY* — 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).
12. IN LO — Negative differential measuring input.
13. IN HI — Positive differential measuring input.

    } Inputs must be lower than 0.5V below V+, and higher than 1.5V above V-.

14. REF HI — Positive input for reference voltage.
15. REF LO — Negative input for reference voltage.
16. DGND — This is the ground for the digital section of the module, held actively at approximately 4.2 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 0.5mA.
17. RANGE — Connect to V+ to select 2V F.S.R. range, otherwise connect to DGND or leave floating to select 200mV F.S.R. range.
18. DP2 — 199.99
19. DP1 — 1999.9

    } Take to V+ to display required DP. If not required may be left floating (it has an internal 3mA pull down).

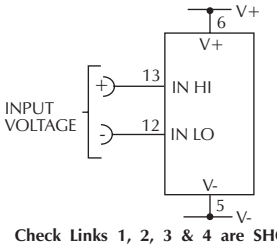
20. CLK — This input can be used to override the internal clock in order to synchronise the meter with external systems.

NOTE - COMBINED INPUT/OUTPUT

Four pin connections of the DPM 60 have dual function 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 overridden. Should it be necessary to monitor the underrange/overrange signals and simultaneously display either of the two decimal points DP3 and DP4, then outputs should be sensed for duration of LATCH (4) output and otherwise overdriven as inputs - see VARIOUS OPERATING MODES.

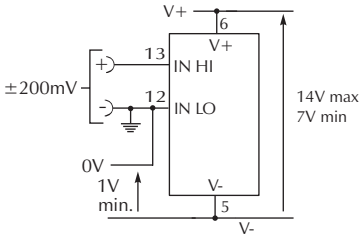
VARIOUS OPERATING MODES

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.



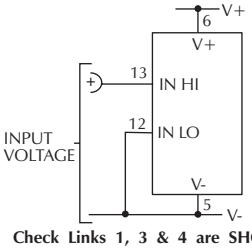
Check Links 1, 2, 3 & 4 are SHORTED.

Measuring a floating voltage source of 200mV full scale.



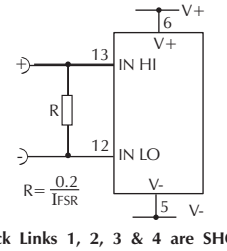
Check Links 1, 3 & 4 are SHORTED.

Split supply operation (DPM 60).



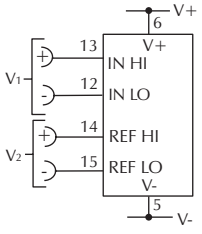
Check Links 1, 3 & 4 are SHORTED.

Measuring a single ended input referenced to supply (DPM 60S).

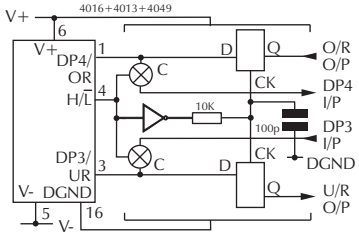


Check Links 1, 2, 3 & 4 are SHORTED.

Measuring current.
(Supply MUST be isolated.)



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 DP3 and DP4 inputs while monitoring underrange and overrange outputs.