Order code	Manufacturer code	Description
48-0695	n/a	LASCAR DPM 1AS-BL LCD VOLTMETER

Sales: 01206 751166
Sales@rapidelec.co.uk
Technical: 01206 835555
Tech@rapidelec.co.uk
Fax: 01206 751188
www.rapidonline.com

DPM 1AS-BL

3½ Digit Backlit LCD Voltmeter Module

PRODUCT DESCRIPTION

The DPM 1AS-BL features a 200mV d.c. measurement range with auto-zero and auto-polarity. Decimal points are user selectable. The DPM 1AS-BL features a negative rail generator which enables the meter to measure a signal referenced to its own power supply GND. LED backlighting ensures excellent readability under low light conditions. The design of the panel meter's housing allows the module to be easily snapped into a panel. The module's low cost means it will suit high and low volume applications. The DPM 1AS-BL is intended to replace the DPM 1, DPM 1S, DPM 1-BL and DPM 1S-BL in many applications, usually requiring only minor circuit modifications.

FEATURES

- 5.5mm (0.22") Digit Height
- 200mV d.c. Full Scale Reading
- 3.0 to 7.5V or 6.0 to 15.0V Operation
- Auto-zero and Auto-polarity
- Programmable Decimal Points
- LED Backlighting

TYPICAL APPLICATIONS

- Precision Instrumentation Systems
- Power Supply Monitoring
- Hand held instruments
- Panel-Mount Indication
- Low Power Voltage Measurement

ORDERING INFORMATION

	Stock Number
Standard Meter	**DPM 1AS-BL**

ELECTRICAL SPECIFICATIONS

Specification		Min.	Typ.	Max.	Unit
Accuracy (overall error) *			0.1		% (±1 count)
Linearity				±1	count
Sample rate			2.5		samples/sec
Operating temperature range		0		50	°C
Temperature stability			250		ppm/°C
Meter supply voltage	V+ to GND configuration	3.0	5.0	7.5	V d.c.
	V+ to V- configuration	6.0	9.0	15.0**	V d.c.
Meter supply current	V+ to GND configuration		350		µA
	V+ to V- configuration		175		µA
Backlight supply voltage		4.75	5.0	***	V d.c.
Backlight supply current @ 5V d.c.			15	30****	mA
Input leakage current (Vin = 0V)			1	10	pA

* To ensure maximum accuracy, re-calibrate periodically.

** Operation of the meter beyond the maximum supply voltage rating may cause permanent damage to the meter.

*** An external series resistor is required above 5V, see Applications.

**** This specification linearly derates to 20mA @ 50°C.

Unless otherwise noted, specifications apply at T_A=25°C, V_{supply}=5Vd.c. (f_{clock}=48kHz) and are tested with the module configured for single ended 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. The user must ensure that the incorporation of the panel meter 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).

LASCAR ELECTRONICS LTD.
MODULE HOUSE
WHITEPARISH
WILTSHIRE SP5 2SJ
UK
TEL: +44 (1794) 884567
FAX: +44 (1794) 884616
E-MAIL: sales@lascar.co.uk

LASCAR ELECTRONICS INC.
4258 WEST 12th STREET
ERIE
PA 16505
USA
TEL: +1 (814) 835 0621
FAX: +1 (814) 838 8141
E-MAIL: us-sales@lascarelectronics.com

LASCAR ELECTRONICS (HK) LIMITED
UNIT NOS. 6-8, 19/F FUTURA PLAZA,
111-113 HOW MING STREET,
KWUN TONG, KOWLOON,
HONG KONG
TEL: +852 2389 6502
FAX: +852 2389 6535
E-MAIL:purchasing@lascar.com.hk

10 SERIES

MINIATURE, ONE-PIECE SNAP-IN METERS

A series of digital panel meters with a one-piece, snap-in design, making installation a quick and easy procedure. Each meter has a large display in a miniature housing. All are backlit or use LED displays.

Modules shown actual size

DC Voltmeter

Stock No.	**DPM 1AS-BL**

- 3½ digit LCD
- 5.5mm *(0.22")* digit height
- LED backlighting
- 3.0 to 7.5V or 6.0 to 15.0V supply option
- Programmable decimal points
- 200mV full scale reading
- Auto-zero, auto-polarity
- SIL connection

DC Voltmeter

Stock No.	**DPM 2AS-BL**

- 3½ digit LCD
- 8.25mm *(0.32")* digit height
- LED backlighting
- 3.0 to 7.5V or 6.0 to 15.0V supply option
- Programmable decimal points
- 200mV full scale reading
- Auto-zero, auto-polarity
- SIL connection

DC Voltmeter

Stock No.	**DPM 3AS-BL**

- 3½ digit LCD
- 11.0mm *(0.43")* digit height
- LED backlighting
- 3.0 to 7.5V or 6.0 to 15.0V supply option
- Programmable decimal points
- 200mV full scale reading
- Auto-zero, auto-polarity
- SIL connection

DC Voltmeter

Stock No.	**DPM 340**

- 3½ digit LED
- 7.6mm *(0.30")* digit height
- Programmable decimal points
- 200mV full scale reading
- Auto-zero, auto-polarity
- SIL connection

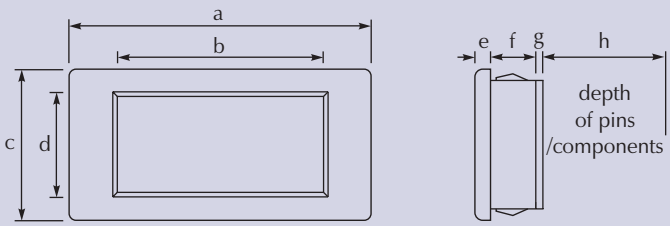
4-20mA Loop Powered Meter

Stock No.	**DPM 342**

- 3½ digit LCD
- 11.0mm *(0.43")* digit height
- LED backlighting (loop powered)
- Programmable decimal points
- Wide adjustment range
- Auto-polarity on display
- Screw terminal connection

Mechanical Specification

All dimensions in mm *(inches)*



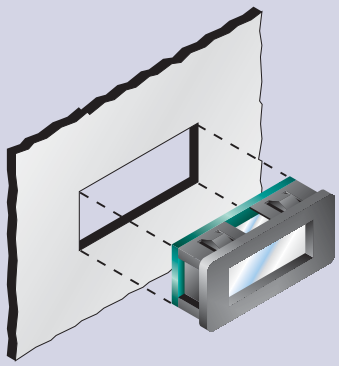
	DPM 1AS-BL	DPM 2AS-BL	DPM 3AS-BL	DPM 340	DPM 342
a.	30.0 *(1.18)*	35.0 *(1.38)*	40.0 *(1.57)*	40.0 *(1.57)*	40.0 (1.57)
b.	18.6 *(0.73)*	22.3 *(0.88)*	27.3 *(1.07)*	27.3 *(1.07)*	27.3 (1.07)
c.	14.0 *(0.55)*	17.0 *(0.67)*	20.0 *(0.79)*	20.0 *(0.79)*	20.0 (0.79)
d.	7.0 *(0.28)*	9.7 *(0.38)*	12.7 *(0.5)*	12.7 *(0.5)*	12.7 (0.5)
e.	2.0 *(0.08)*	2.0 *(0.08)*	2.0 *(0.08)*	2.0 *(0.08)*	2.0 (0.08)
f.	6.0 *(0.24)*	6.0 *(0.24)*	6.0 *(0.24)*	6.0 *(0.24)*	6.0 (0.24)
g.	1.6 *(0.06)*	1.6 *(0.06)*	1.6 *(0.06)*	1.6 *(0.06)*	1.6 (0.06)
h.	6.0 *(0.24)*	6.0 *(0.24)*	6.0 *(0.24)*	9.5 *(0.37)*	11.0 (0.43)

Dimensions	DPM 1AS-BL	DPM 2AS-BL	DPM 3AS-BL	DPM 340	DPM 342
Digit height	5.5mm 0.22″	8.25mm 0.32″	11mm 0.43″	7.6mm 0.30″	11mm 0.43″
Panel cut-out (W x H)	28.4 x 11.4mm 1.12 x 0.45″	33.0 x 15.0mm 1.30 x 0.59″	38.0 x 18.0mm 1.50 x 0.71″	38.0 x 18.0mm 1.50 x 0.71″	38.0 x 18.0mm 1.50 x 0.71″
Bezel (W x H)	30.0 x 14.0mm 1.18 x 0.55″	35.0 x 17.0mm 1.38 x 0.67″	40.0 x 20.0mm 1.57 x 0.79″	40.0 x 20.0mm 1.57 x 0.79″	40.0 x 20.0mm 1.57 x 0.79″

Specification						
Accuracy (overall error)*		0.1% (±1 count) (typ.)	0.1% (±1 count) (typ.)	0.1% (±1 count) (typ.)	0.05% (±1 count) (typ.)	0.1% (±1 count) (max.)
Full scale reading		±200mV d.c.	±200mV d.c.	±200mV d.c.	±200mV d.c.	1000 (typ.)
Resolution		100µV	100µV	100µV	100µV	1 count
Supply voltage	V+ to GND config.	3.0 to 7.5V d.c.	3.0 to 7.5V d.c.	3.0 to 7.5V d.c.	5V d.c. (typ.)	5.6V loop drop (typ.)
	V+ to V- config.	6.0 to 15.0V d.c.	6.0 to 15.0V d.c.	6.0 to 15.0V d.c.	-	-
Supply current	V+ to GND config.	350µA (typ.)	350µA (typ.)	350µA (typ.)	50mA (typ.)	4-20mA (inc. backlighting)
	V+ to V- config.	175µA (typ.)	175µA (typ.)	175µA (typ.)	-	-
Backlight current		15mA (typ.) @ 5V d.c.	15mA (typ.) @ 5V d.c.	40mA (typ.) @ 5V d.c.	-	inc.
Sample rate		2.5 samples/sec.	2.5 samples/sec.	2.5 samples/sec.	2.5 samples/sec.	2.5 samples/sec.
Operating temperature range		0°C to 50°C	0°C to 50°C	0°C to 50°C	0°C to 50°C	0°C to 50°C
Temperature stability		100ppm/°C	100ppm/°C	100ppm/°C	150ppm/°C	200ppm/°C

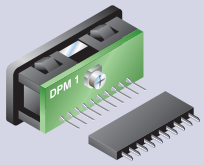
* To ensure maximum accuracy, re-calibrate periodically.

Mounting Method

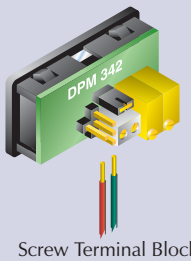


Panel thickness:
1.0 to 2.5mm
0.04″ to 0.10″

Connection



SIL - Single in Line
(DPM 1AS-BL, DPM 2AS-BL,
DPM 3AS-BL & DPM 340)



Screw Terminal Block
(DPM 342)

Connector Pitch
(DPM 1AS-BL & DPM 2AS-BL): **2.00mm** ***0.08″***
(DPM 3AS-BL & DPM 340): **2.54mm** ***0.1″***

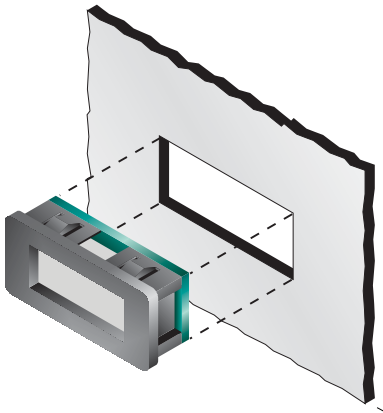
Lascar Electronics Limited
Module House, Whiteparish, Salisbury,
Wiltshire SP5 2SJ UK
Tel: +44 (0)1794 884567 Fax: +44 (0)1794 884616
E-mail: sales@lascar.co.uk

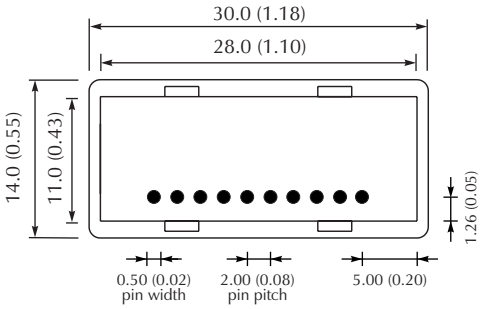
Lascar Electronics, Inc.
3750 West 26th Street,
Erie, PA 16506
Tel: +1 (814) 835 0621 Fax: +1 (814) 838 8141
E-mail: us-sales@lascarelectronics.com

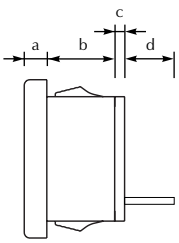
Lascar Electronics (HK) Limited
Flat C, 5/FL., Lucky Fty. Bldg., 63-65 Hung To Road,
Kwun Tong, Kowloon, Hong Kong
Tel: +852 2797 3219 Fax: +852 2343 6187
E-mail: b4lascar@samsongroup.com.hk

DIMENSIONS

All dimensions in mm (inches)





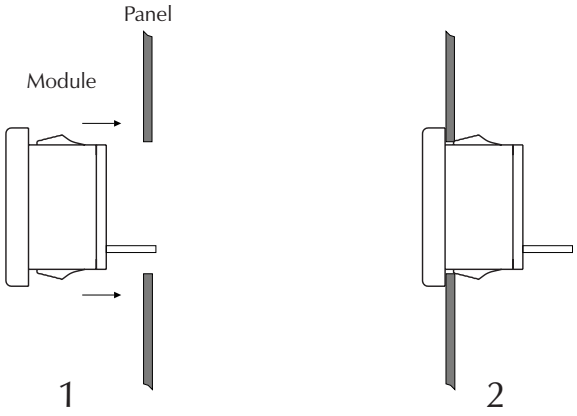


a. 2.00 (0.08)
b. 6.00 (0.24)
c. 1.60 (0.06)
d. 6.00 (0.24)

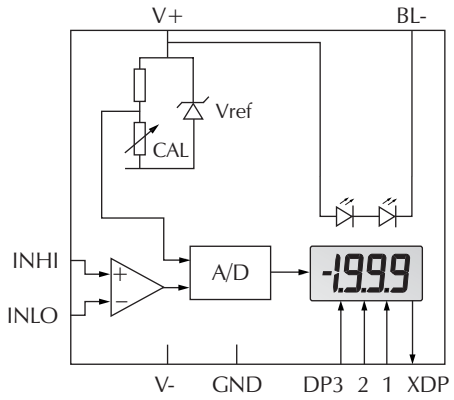
Panel cut-out: 28.4 x 11.4
(1.12 x 0.45)

Panel thickness: 1.0 - 2.5
(0.04 - 0.10)

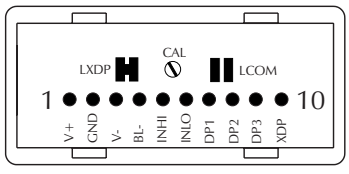
PANEL FITTING



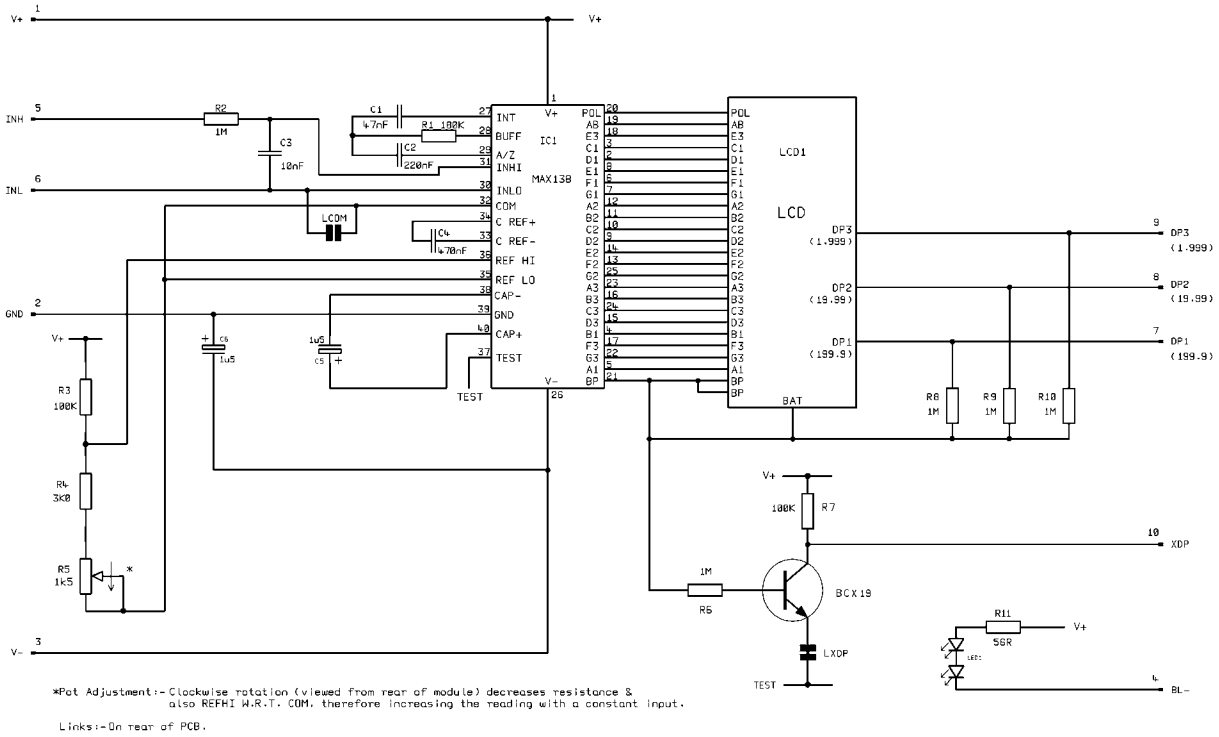
FUNCTIONAL BLOCK DIAGRAM



PIN CONFIGURATION (rear view)



CIRCUIT DIAGRAM



PIN FUNCTIONS

1. V+ Positive power supply to the meter.
2. GND 0V power supply to the meter (3.0 to 7.5V meter power supply applications only).
3. V- Negative power supply to the meter (6.0 to 15.0V meter power supply applications only).
4. BL- Connect to the meter's negative supply voltage to switch on the LED backlighting. For meter supply voltages above 5V, add a series resistor Rs. See Applications for suitable circuit diagrams.
5. INHI Positive measuring input.
6. INLO Negative measuring input.
7. DP1 Connect to XDP to display DP1 (199.9).
8. DP2 Connect to XDP to display DP2 (19.99).
9. DP3 Connect to XDP to display DP3 (1.999).
10. XDP Connect to pin 7, 8 or 9 to display required decimal point.

Note:

A negative supply is generated internally and mirrors the positive supply. For example: if V+ is +5V, then the internally generated V- is -5V. When measuring with the input referenced to the same supply rail as that of the panel meter, then the limitations on the input range are (V- + 1.5V) to (V+ - 1.5V).

Solder Links:

LCOM Normally Open. Connects INLO to COM.

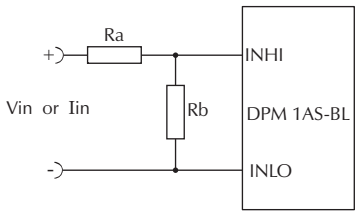
LXDP Normally Closed. Cut this link to disable the internal decimal point drive circuit and thereby reduce the meter's current consumption.

SCALING

Two external resistors Ra and Rb may be used to alter the full scale reading (FSR) of the meter - see table. The meter will have to be re-calibrated by adjusting the calibration potentiometer on the rear of the module.

	FSR	Ra	Rb
Voltage (Vin)	2V	910k	100k
	20V	1M	10k
	200V	1M	1k
	2000V*	1M	100R
Current (Iin)	200µA	0R	1k
	2mA	0R	100R
	20mA	0R	10R
	200mA	0R	1R

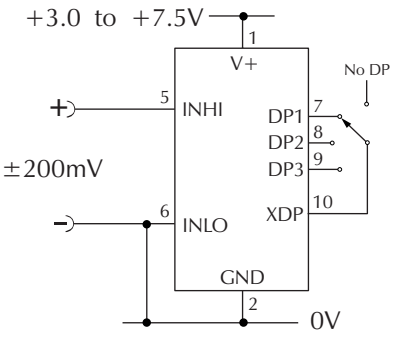
*Ensure that Ra is rated for high voltage use.



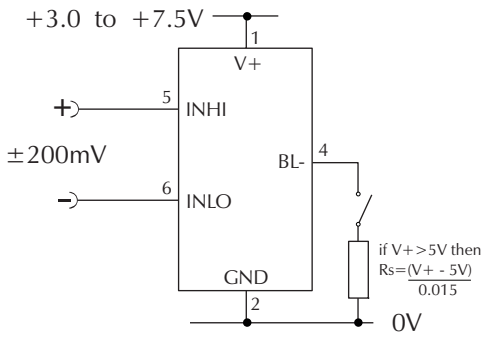
APPLICATIONS

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.

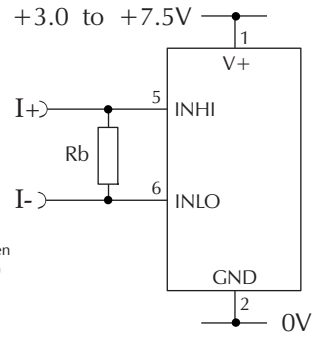
5V supply operation (3.0 to 7.5V Meter Power Supply)



Measuring a single ended input voltage referenced to supply, i.e. the input voltage and the meter's power supply share the same 0V rail.
Ensure solder link LCOM is open.

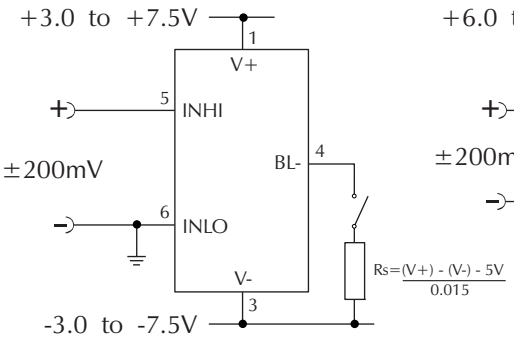


Measuring an input voltage referenced to a floating supply, i.e. the input voltage and the meter's power supply are isolated from each other.
Ensure solder link LCOM is closed.

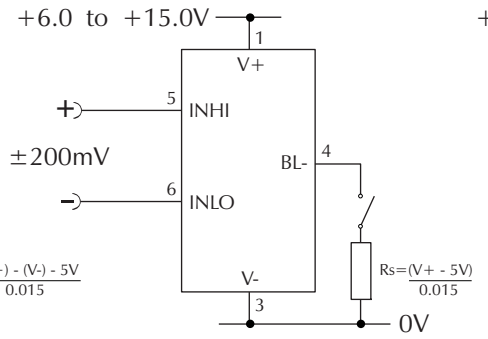


Measuring a current from a circuit which is floating with respect to the DPM's supply, i.e. the current and the meter's power supply are isolated from each other.
Ensure solder link LCOM is closed.

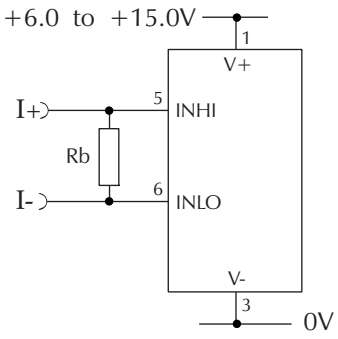
9V supply operation (6.0 to 15.0V Meter Power Supply)



Measuring a single ended input voltage referenced to supply, i.e. the input voltage and the meter's power supply share the same 0V rail.
Ensure solder link LCOM is open.



Measuring an input voltage referenced to a floating supply, i.e. the input voltage and the meter's power supply are isolated from each other.
Ensure solder link LCOM is closed.



Measuring a current from a circuit which is floating with respect to the DPM's supply, i.e. the current and the meter's power supply are isolated from each other.
Ensure solder link LCOM is closed.