



Digital Panel Meters and Controllers DPM

MF range

- measuring and displaying
- monitoring
- recording of events
- scaling
- communication

MF-range

The new class of microprocessor based universal Digital Panel Meter/Controllers

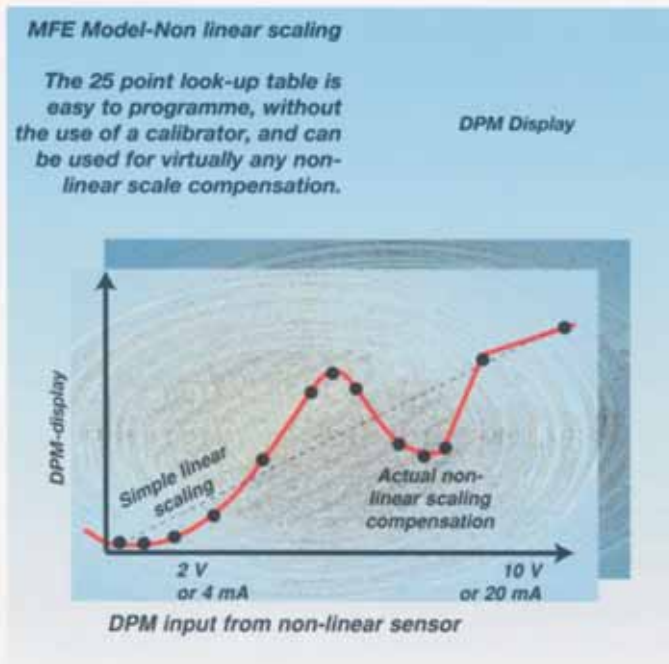
- Multi-range input, including temperature
- Flexible scaling/linearisation
- Simple configuration via buttons, ASCII commands or PC-software
- Microprocessor computations
- Powerful communications Addressable RS 232/RS 485 (E1)/ BCD (E2)
- Four alarm channels, relay/open collector outputs
- Isolated, scalable analogue output
- Datalogging memory and reports to PC/printer
- Digital filter

In short, the DPM MF are exceptionally powerful DPM/controllers adaptable for all modern applications.

A typical example :

The DPM is to measure 0/4...20 mA standardised signal from a pressure sensor and display the results in bar.

- In order that useful information is always displayed, the display is frozen when the unit is not being used. For this, a PLC signal 24 V from the controller is required, which is transmitted to the DPM as a **HOLD** command.
- An alarm is sounded via a relay if the 120 bar limit is exceeded. A 5 bar hysteresis is programmed to filter out any possible disturbances. A pressure loading of over 120 bar is permitted for 30 seconds, hence a 30 second delay is incorporated into the alarm circuit. The alarm signal is stored until it is acknowledged.
- A very rapid increase in pressure can lead to premature wear in the transmission elements. For this reason, a pressure-variation rate has been set at 20 bar/min. If this maximum value is exceeded a second relay sounds the alarm.



The display itself can be switched to the variation rate per minute.

- Measuring reports should be conducted over a week during which the time and max. and min. values are recorded.

In order to immediately inform the maintenance department, the actual measured values are transmitted via the isolated analogue output to an indicator in the supervisory console.

The following are printed at regular intervals :

- Time
- Actual measured value
- Min. & max. value during the time interval
- All alarm statuses during the time interval

Up to 180 data records can be stored in the memory of the DPM which can be polled on request "en bloc" via a standard V24 interface. To print the measurement report on site in the control cabinet, we recommend the Metrix industrial panel printer IPP 144-40.

The version IPP 144-40 E supports the printing of the measured value report together with date and time on document standard thermopaper. ISO 9000 concept. .

DPM 48/40000 MF E1

High-quality Polycarbonate and ABS housing. Facia IP 65 sealed.

4 lockable keys for configuration and important functions such as:

- Brightness adjustment
- Alarm limit entries
- Alarm acknowledgement
- Value transmission via the interface
- Display hold
- Alarm test

Universal DC and AC power supply

Stocked by RS Components

Model	RS Stock No.
DPM 24/40000 MF	312-325
DPM 48/40000 MF	313-227
DPM 48/40000 MFE1	313-233
DPM-MF CONFIG PACK	312-331

Display status captions to indicate :

- Special display functions
- Display hold
- Measurements are being recorded
- Minimum value display
- Maximum value display

5-digit display

- Floating or fixed decimal point
- 3-stage brightness adjustment

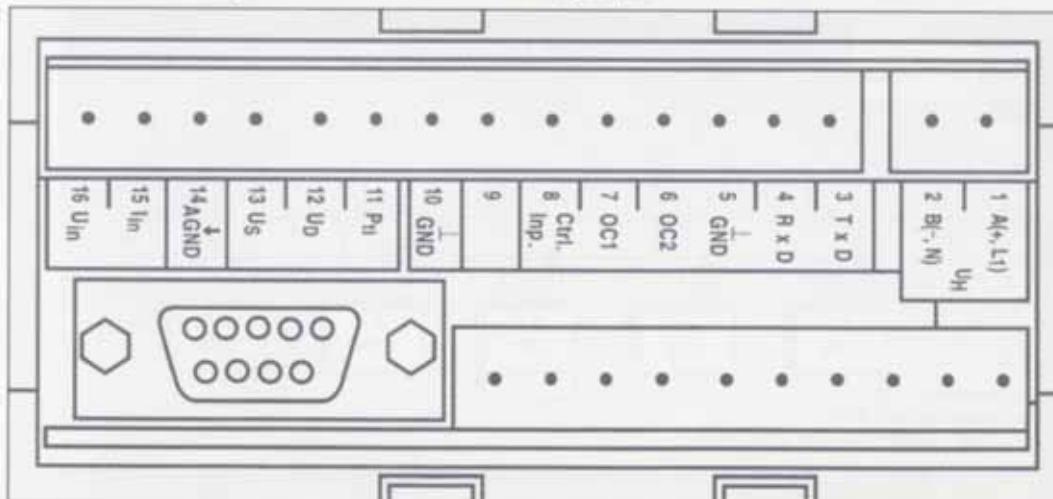


Directional arrows for trend display

Alarm signals

4 alarm relays

Analog output



RS-485 data system connection

Measurement inputs

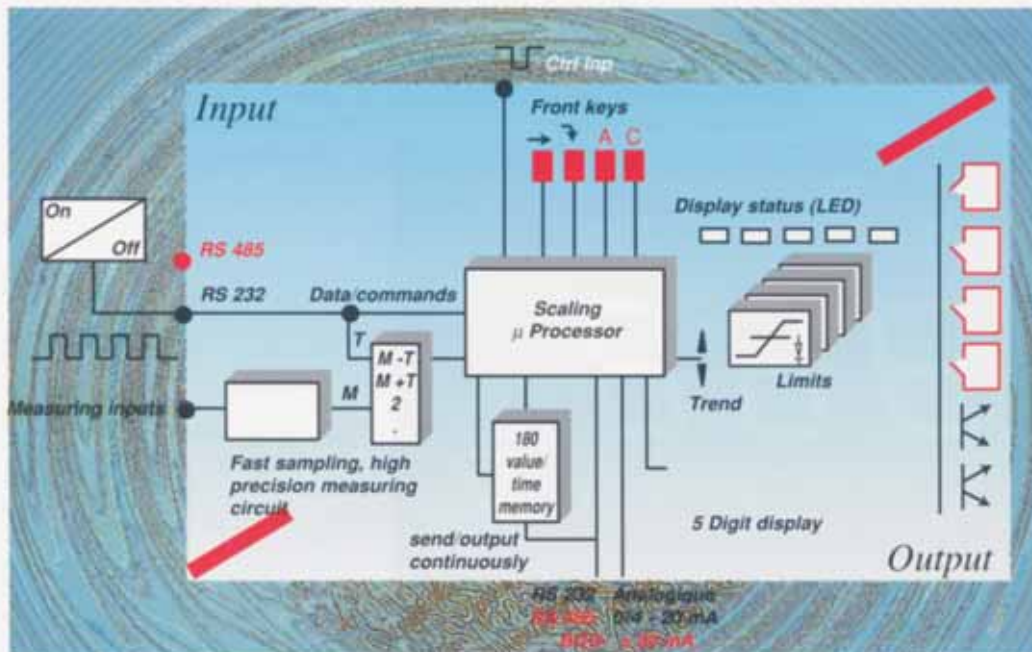
RS-232 C in/output

Alarm Open collectors

Multipurpose input (e.g. PLC control) or relay contact (can be assigned the same functions as the front keys).

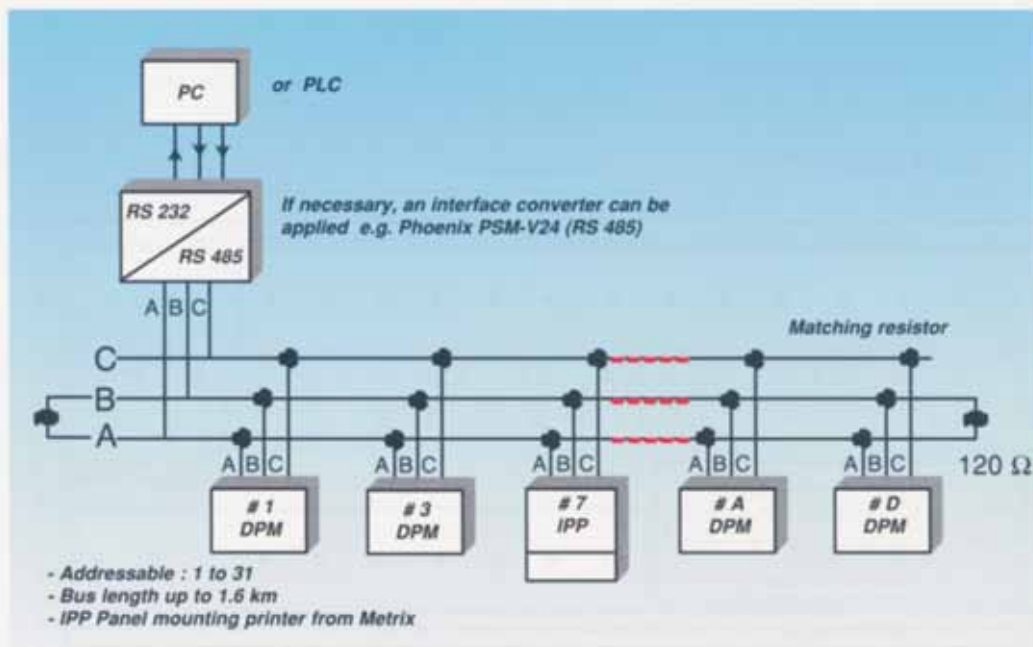
The MF-range

The new class of universal Digital Panel Meters and controllers - DIN Format, IP 65 sealed facia



The functions which are highlighted in red are only available with the versions E1 and E2.

Communication with the units in a serial bus is possible by simply using their addresses: e.g. via the 3-letter command: 5:M (supply measurement) or 5:? (transmit measurement) permits a systematic poll.



Modern production procedures, e.g. SMD equipment, guarantee high reliability. Hence the multifunction DPM is the right measuring device for your demanding applications.

Testing methods in:

- Air and space technology
- Nuclear research
- Textile industry
- Energy supply
- Control circuit monitoring in special machinery

Flexibility in :

- Laboratories
- Special machinery manufacturing

These programmable instruments are supplied with simple default settings, e.g. 20 mA process current input.

They can be readily configured by the user for dedicated applications using the front keys (menu tree), or via the serial interface with a PC using our menu mask editor software (see PC Configuration package accessory).

In more sophisticated applications, "remote control" and dynamic reconfiguration can be achieved by sending short ASCII string commands.

Several DPMs can also be individually addressed in a loop configuration.

The front keys can be programmed to provide defined operator functions and, if required, restricted access to the menu tree, with code protection.



24 mm compact size
Green display
2 open collectors



24 mm compact size
Red display
2 open collectors

Incorporating sophisticated digital technology and ITT Instruments extensive experience in the field of measuring techniques, the MF range represents the most powerful, yet easy-to-use, range of DPMs available today.



48 mm housing
2 open collectors



True RMS, RS-485 interface
4 relays



48 mm housing
2 relays



True RMS, BCD output
4 relays

Computer functions :

- Auto zero
- Combining of two DPM measurement results :
A + B, A - B, A * B, A/B,
 $\frac{A+B}{2}$, $\frac{A-B}{B} \times 100$
(percent deviation).
A : measured value (DPM 1)
B : received value (DPM 2)
- Digital filter
- Auto-ranging
- Linear scaling (2 points)
- Non-linear scaling (E1/E2) in terms of 25 points

- Predefined functions such as : x^2 , \sqrt{x} , $\sin x$, $\tan x$, $\cos x$, $\log x$, $\ln x$
- Temperature rate of change $\frac{\Delta T}{\Delta t}$
in degrees C/min.
- Tare function for weighing application
- Cascading (chain switching permits the processing of multiple analog values).

TECHNICAL DATA

DPM MF range common specifications :

Supply	Wide range power supply : via two connectors for desired voltage sources from : DC : 19 to 60 V Power : 2.5 W max. AC : 19 to 260 V Power : 3 W max.
Measurement types	- U, I, DC or AC Basic versions : 40-400 Hz (sinewave) E1 and E2 : 30 Hz-5 KHz (TRMS) - Pt100 : 2,3 or 4 wire - Thermocouples : K, J, T, E, U, L, N, R, S, B with built-in reference junction
Measurement ranges	- Udc : 200 mV to 650 V (9 ranges) - Idc : 20 mA to 40 mA (2 ranges) - Uac : 500 mV to 650 V (8 ranges) - Iac : 50 mA and 100 mA (2 ranges) - Pt100 : - 200 to + 850 degrees C
Resolution	± 40 000 measurement points (corresponds to 4 3/4 digits) Display range : -19999 to +99999
Measurement rate	Min.: 10 measurements/sec. Max.: 20 measurements/sec. Display : 4 measurements/sec.
Filter	- Digital filter over 1....250 measured values
Basic precision	- DC : 0.03% of full scale ± 3d - AC : 0.2% of full scale ± 4d - Pt100 : 0.2 to 0.4 degrees C (2 or 4 wire), 0.4 to 0.8 (3 wire) - Thermocouples : 1 to 2 degrees C
Temperature	- reference : 23 °C ± 2 °C - operating : 0 °C to + 50 °C - storage : - 40 °C to 80 °C
Humidity	<80% relative humidity at + 40 °C
Safety standards	IEC 1010-1 class 1; Overvoltage category II 264 V degree of pollution 2
EMC	IEC 801; VDE 871 class B

Measured value memory	- Hold function (freeze display) - Min./max. display																																					
Data logging	- Report storage of 180 values (ring buffer) Overwrite-protect after "trigger" event Sample rate adjustable from 1 per sec. to 1 per 18 hrs. Corresponds to a total recording time of 3 minutes to 136 days.																																					
Limit values	- 4 levels																																					
Non-linear scaling	x^2 , \sqrt{x} , $\sin x$, $\cos x$, $\tan x$, $\ln x$, $\log x$, $\Delta T/\Delta t$																																					
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Technical Data (Cont.)

DPM MF range model specifications :

MODEL	DPM 24/40000 MF	DPM 48/40000 MF	DPM 48/40000 MF/R2	DPM 48/40000 MF/E1	DPM 48/40000 MF/E2
Dimensions (W x H x D) in mm	96 x 24 x 151	96 x 48 x 151		96 x 48 x 151	
Panel cut-out (DIN) in mm	92+0.8 x 22.2+0.3	92+0.8 x 45.5+0.6		92+0.8x45.5+0.6	
Mounting	Clip-on mounting brackets supplied (mosaic option)				
Display	5-digit, LED red			5-digit, LED red	
Digit height	13 mm			13 mm	
Display status captions	-			5	
Alarm status captions	-			4	
LEDs (trend/alarm)	2			2	
Front keys	2			4	
Serial interface (Tx = transmitter only)	RS-232 C			RS-232 C RS-485 RS-422 Tx	RS-232 C
BCD output 6 digits	-			-	yes I _H = 1 mA
Analog output	> 2000 steps 0.5 % 0/4 ... 20 mA			> 4000 steps 0.15 % -20 ... + 20 mA	
Open Collector (max 50 V, 50 mA)	2 OC		-	2 OC	
Built-in relay (max 50 Vac, 1 A, 30 Vdc, 1 A)	-		2 relays	4 relays	
Voltage/current AC	average			true RMS	
Special linearisation	-			25 point table	

Options

Green display (for DPM 48/40000 MF only)

Front window with standard captions, A, mA, μ A, V, kV, mV, W, kW, kWh, g, kg, m, mm, km, °C, %, m/mm, U/min, RPM, °C/min ; others available on request

Accessories

Panel scaling gasket for the DPM 48/40000MF, R2, E1, E2

PC configuration package with PC cable (9 or 25-pole) and mask editor software for simple and rapid configuration of your DPM.

Report printer IPP 144-40 or version 144-40 E with date and time.

DPM MF alarm outputs can trigger messages on DAA 144-120; 288-240B, C, S text displays.

Stocked by RS Components

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Specifications are subject to change without prior notice.

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