

# Technical Specifications

## PM 3082 / PM 3084 / PM 3092 / PM 3094

DISPLAY	8 X 10 cm viewing area, 16.5 kV acceleration voltage. Parallax free graticule with continuously variable illumination. On screen settings readout.
AUTOSET	Selects proper channel-, timebase- and trigger settings. Function can be customized by the user.
AUTOCAL	Automatic fine adjustment for enhanced accuracy to get optimal performance even under extreme environmental conditions.

<b>Vertical deflection</b>	
Input channels	Four fully attenuated channels or Four (2+2) channels (PM 3092/PM 3082)
On screen indicators	Channel identifiers with ground level indication
Display modes	CH1, (-)CH2, CH3, (-)CH4, Add: CH1 & (-) CH2, CH3 & (-)CH4 In ALternating or CHOPped mode (1 MHz)
Frequency response	DC...>200 MHz -3 dB or (+5... + 40°C) DC...>100 MHz -3 dB (PM 3084/PM 3082) (+5... + 40°C)
In AC mode	Lower -3 dB point: <10 Hz
Bandwidth limiter	20 MHz -3 dB
Rise time	<1.75 ns (calculated: 0.35/BW) or <3.50 ns (PM 3084/PM 3082)
Deflection coefficient	2 mV/div...5 V/div in a 1-2-5 sequence or continuously calibrated control: 2 mV/div... 12.5 V/div.
Channel 3 and 4	0.1 V/div and 0.5 V/div (PM 3092/PM 3082)
Error limit	1.3% (measured over central 6 divisions)
Input impedance	1 M $\Omega$ $\pm$ 1% // 25pF $\pm$ 2pF and 50 $\Omega$ $\pm$ 1% (PM 3094 and CH1 & 2 of PM 3092)
Max. rated input voltage	In 1 M $\Omega$ position: 150V (rms; <10 kHz) In 50 $\Omega$ position: 5V RMS; 50V AC-Peak (maximum of 50 mJ during any 100 ms interval)
Dynamic range	24 div at 50 MHz (25 MHz PM 3082/PM 3084) 8 div at full bandwidth (100 or 200 MHz)
CMRR	100 : 1 at 1 MHz, 25 : 1 at 50 MHz
Channel isolation	50 : 1 at full bandwidth (100 or 200 MHz)

<b>Horizontal</b>	
Display modes	Main TB and/or Delayed TB, X-defl.

<b>Main time base</b>	
Time coefficients	0.5 s/div...20 ns/div in a 1-2-5 sequence or continuously calibrated control: 1.25 s/div...20 ns/div. For PM 3084 and PM 3082 the fastest timebase setting is 50 ns/div.
Fastest sweep	2 ns/div (magn 10x) or 5 ns/div (PM 3084/PM 3082)
Error limit (magn 1x)	$\pm$ (1.3% of reading + 0.5% of 8 divisions)
Hold-off	up to 20 div. of MTB setting (max. 2 sec.)

<b>Delayed time base</b>	
Time coefficients	0.5 ms/div...20 ns/div in a 1-2-5 sequence or 0.5 ms/div...50 ns/div (PM 3084/PM 3082)
Fastest sweep	2 ns/div (MANG 10X) OR 5 ns/div (PM 3084/PM 3082)
Error limit (magn 1x)	$\pm$ (1.3% of reading + 0.5% of 8 divisions)
Trace separation	$\pm$ >4 div
<b>DELAY TIME MULTIPLIER</b>	
Resolution	1 : 40000
Error limit (magn 1x)	$\pm$ (0.8% of reading + 0.3% of 8 divisions + 4 ns)
Jitter	1: 25000

<b>Triggering (MTB &amp; DTB)</b>	
Trigger modes	Auto free run, Triggered, Single; Edge triggering, TV triggering.

<b>Edge triggering</b>	
MTB trigger source	CH1...CH4, Composite, Line (mains).
DTB trigger source	Starts, CH1...CH4.
Slope	positive (+) or negative (-)
Coupling	DC, AC (10 Hz), LF-rej (30 kHz), HF-rej (30 kHz).
Level range	$\pm$ 8 div or level within signal peak-peak range
Level indication	On screen level indicators and numeric readout
Trigger sensitivity:	
PM 3094/PM 3092	0.6 div up to 100MHz, 1.2 div up to 200 MHz, 2.0 div up to 300 MHz (+5...+40°C)
PM 3084/PM 3082	0.6 div up to 50 MHz, 1.2 div up to 100 MHz, 2.0 div up to 200 MHz (+5...+40°C)

<b>TV triggering</b>	
Video standard	HDTV, NTSC, PAL, SECAM.
MTB trigger source	CH1...CH4; Field 1, Field 2, TV-Lines
DTB trigger source	Starts, CH1... CH4... edge, TV-Lines.
Signal polarity	positive or negative
Sensitivity	0.7 div (sync.pulse)

<b>X-deflection</b>	
Deflection source	CH1...CH4, Line (mains)
Deflection coefficient	See vertical deflection
Dynamic range	20 div up to 100 kHz; >10 div up to 2 MHz.
Frequency response	2 MHz - 3 dB
Error limit	5% measured over central 6 divisions
Phase shift	<3° up to 100 kHz

<b>Cursor measurements</b>	
Cursor modes	Manual positioning: Horizontal, Vertical, Both Auto positioning: Vpp or 10-90% or 20-80%
Readout (mode dependent)	Vertical: dV, V1&V2 to GND, Ratio Horizontal: $\frac{1}{n}$ (in Hz), Ratio, Phase Auto positioning: Vpp, Vp& Vp- to GND, Vdc, and Trise
Accuracy (magn 1x)	1% of full scale. Within the central 8 horizontal and 6 vertical divisions for manual cursor positioning.

<b>Interfaces</b>	
RS-232-C	9 pin D connector
Handshake	DSR/DTR, CTS/RTS and Xon/Xoff
Baudrate	75...38400
Format	1 stopbit; 7 or 8 databits; odd/even/no parity
Protocol	CPL=Compact Programming Language = reduced set of powerful instructions for full remote control
GP/IB/IEEE-488.2	Factory installed option.
Protocol	SCPI = Standard Commands for Programmable Instruments = IEEE standardized protocol

<b>Miscellaneous</b>	
Setting memory	10 instrument setups, battery back-up
Calibration output	2 kHz square, 600 mV peak-peak
Z-modulation input	BNC, 10 k $\Omega$ , >2.4V = blanked, <0.5V = unblanked
Time between calibration	2000h or 1 year. (4000h or 2 years if error limits are doubled).

<b>Power supply</b>	
Line voltage	100...240V ( $\pm$ 10%)
Line frequency	50...400 Hz ( $\pm$ 10%)
Power consumption	60W (80W with all options installed)

<b>Mechanical data</b>	
Fan	Proportionally regulated forced air
Width x Height x Length	341 x 139 x 481 mm = 13.4 x 5.5 x 18.9 inch (excluding handle and feet) 391 x 147 x 551 mm = 15.4 x 5.8 x 21.7 inch (including handle and feet)
Weight	8.5kg = 19 lb

<b>Environmental data</b>	
Meets requirements of Temperature	MIL-T-28800D Type III, Clas 3, Style D, Color R 0°C... +50°C (operating), -40°C... +70°C (storage)
Humidity	95% (storage)
Altitude	4.6 km = 15.000 ft (operating), 12 km = 40.000 ft (transport)
Vibration	Frequency 5...55Hz. Max acceleration at 55Hz 30 m/s <sup>2</sup>
Shock	6 shocks along each axis, half sine wave, 6...9 msec, peak acceleration 400 m/s <sup>2</sup>
Bench handling	Meets MIL-STD-810, method 516, procedure V
Safety	Meets requirements of: EN 61010 CAT II Pol2, CSA C22.2 No 231, Low Voltage Directive 73/23/EEC.
EMC	Electromagnetic Compatibility Directive 89/336/EEC, MIL-STD-461C: CE01 Part 2 (narrow band), CE01 Part 4, CSO, Part 2, C506 (300 V max.), RE01 Part 5 and 6, RE02 Part 2 (1 GHz max.).
Magnetic susceptibility	Deflection for extreme conditions: <0.7 div/mT

<b>Safety</b>	
Meets requirements of	EN 61010-1 CAT II Pollution Degree 2, CSA C22.2 No231, Low Voltage Directive 73/23/EEC.
<b>Electromagnetic Compatibility (EMC)</b>	
Meets requirements of	EMC directive 89/336/EEC: emission EN50081.1, susceptibility EN50082.1
Meet requirements of	MIL-STD-461C: Part2 CE01 (narrow band), Part4 CE03 Part2 CS01, Part5 CS06 (limited to 300V) Part5 and 6 RE01, Part2 RE02 (max. 1 GHz)
<b>Auxiliary output option</b>	
Y-out (channel 1)	Factory installed option includes: BNC, 50 $\Omega$ , 10 mV/div in 50 $\Omega$ , 20 mV/div in 1 M $\Omega$
MTB-gate-out	BNC, 1 k $\Omega$ , TTL compatible levels
DTB-gate -out	BNC, 1 k $\Omega$ , TTL compatible levels
External trigger	External trigger input replacing line trigger source is available on request.
<b>Standard accessories</b>	
Included	Two 10:1 probes with readout (full BW), Operating guide, Reference manual, Front cover, Power cord; Free service manual on request. IEEE/SCPI manual when applicable

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