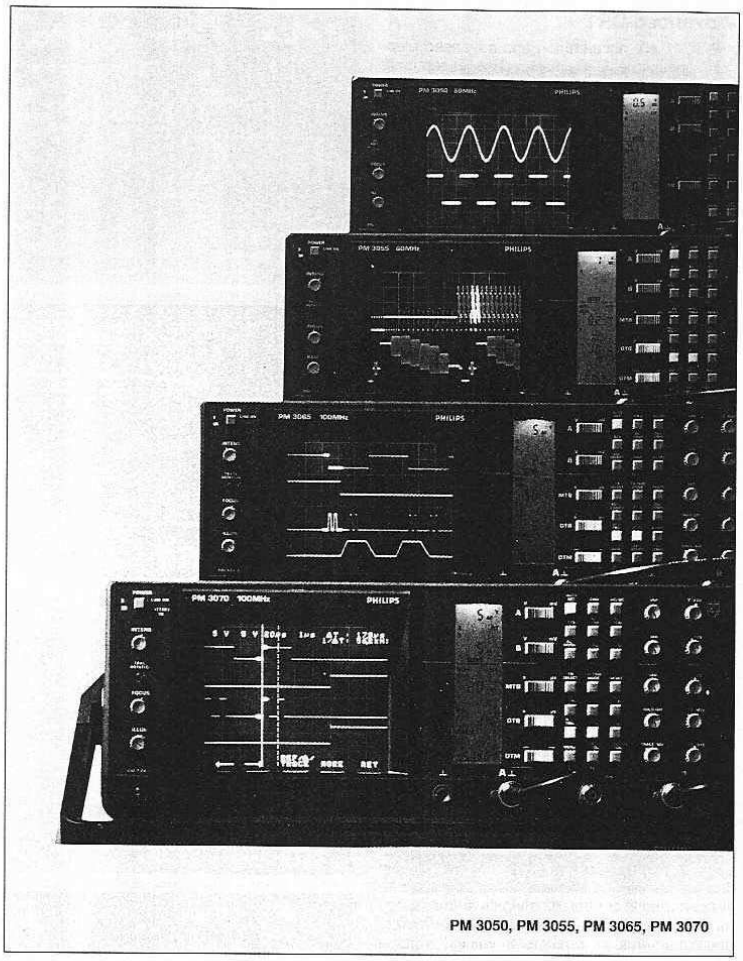
PM 3050, PM 3055, PM 3065 & PM 3070

GPIB IEEE-488



PM 3050, PM 3055, PM 3065, PM 3070

PM 3050/55 60 MHz & PM 3065/70 100 MHz Oscilloscopes

- AUTOSET for automatic amplitude,time,and trigger setting
- LCD panel displays status and settings
- 16 KV crt acceleration voltage
- Fast action up/down controls and cold switching
- GPIB/IEEE-488 interface option
- Single timebase, dual timebase and cursor versions

The New 60/100 MHz Standards

The PM 3050 to PM 3070 series of oscilloscopes set new standards in the 60 to 100 MHz oscilloscope range. A new standard in convenience and ease of use together with a new price/performance standard for instruments of this class.

The series consists of four models which are all optionally available in rackmount versions for systems use. These are;

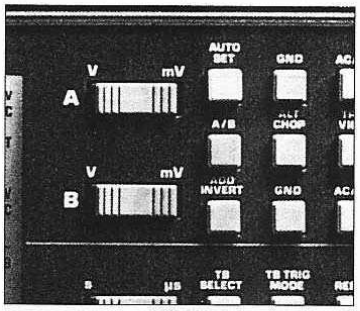
- PM 3050 60 MHz 2 channel, single time base
- PM 3055 60 MHz 2+1 channel, dual time base
- PM 3065 100 MHz 2+1 channel, dual time base
- PM 3070 100 MHz 2+1 channel, dual time base with clever cursors

Each unit represents a significant step forwards in 'scope technology through their use of microcomputer control to both speed up and simplify the task of signal measurements.

Standard features in all models include AUTOSET for single push button set up; a large backlit LCD showing all operating parameters; fast up/down rocker keys and cold switching for high reliability.

Measurements In Seconds

Just press the green AUTOSET button and automatic setting of channel amplitude, time base sweep speed and triggering takes place, for any signal. If only one channel is connected only one channel is displayed but if both channels are being used then both are automatically scaled and displayed. Triggering takes place on the lower frequency channel to give a clear jitter free display. AUTOSET eliminates time consuming manual range finding and adjustment to give fast accurate results at the touch of one button.



Just press the green AUTOSET button and automatic setting of channel amplitude, time base, sweep speed and triggering takes place, for any signal.

Analog Oscilloscopes

PM 3050, PM 3055, PM 3065 & PM 3070

Clean and Simple Operation.

With up/down rocker keys for amplitude and time base speed selection and pushbuttons for display mode and trigger source selection the operation of this series of oscilloscopes is kept clean and simple. Upon each user action the backlit LCD display is immediately updated making at a glance review of the 'scopes current parameter settings possible rather than having to search the complete front panel to determine the operating conditions.

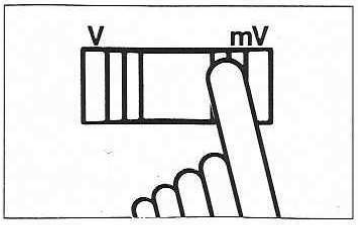
The internal microcomputer prevents illegal setups like incorrect main and delayed timebase settings and clearly identifies on the display non-calibrated amplitude settings or grounded inputs. This avoids incorrect measurements, wasted time and frustration.

To speed accurate measurements when using the delayed time base, the LCD gives a digital readout of the delay time so making the calculation of MTB sweep speed x delay time vernier redundant. For infrequent 'scope users the MENU key functions as a 'help' key showing the facilities offered by each key on the 'scope and quickly aquainting the user with its operation.

High Reliability and Easy Service

Behind the push button operation all input signals are switched by hermatically sealed long life reed relays. These keep out damp and dirt from the active signal paths and ensure long life and long term measurement stability.

The advanced modular construction of these 'scopes allows complete functional testing of each subassembly before they are built together to form a complete instrument. An extended burn in period lasting 48 hours then follows before another series of extensive tests takes place. This ensures that zero hour defects are almost completely eliminated and results in long term trouble free operation. In the unlikely event that a failure should occur the modular construction enables easy access to the suspect board without major disassembly.



Advanced CRT

With 16 KV acceleration and advanced electron optics the CRT display has exceptional brilliance combined with a small spot size making it ideal for measurements on high speed or low repetition rate signals. The effective screen area is a full 8 x 10 cm. An internally etched graticule is provided for accurate and parallax-free measurements. Graticule illumination is standard on all models.

Fast Computer Hook Up

For systems use this Smart Scope series can be simply controlled by the GPIB/IEEE-488* bus using the PM 8953A interface. This retrofittable interface enables the 'scopes to be automatically set up for production testing or QA applications.

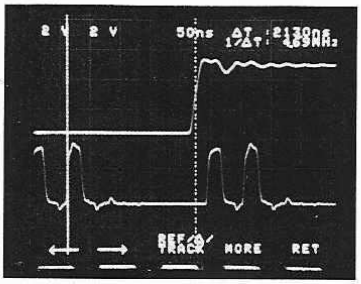
As the PM 8953A IEEE-488 interface is a separate unit which simply plugs onto the rear of the 'scope it is extremely interesting for fleet owners as it permits automatic IEEE based recalibration of the complete fleet with only one interface needing to be purchased, so saving time in recalibration, and money as well.

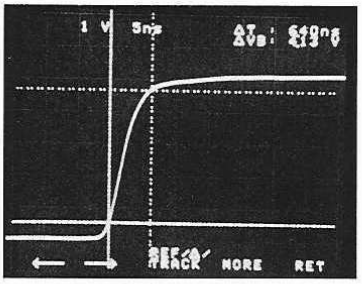
Clever Cursors

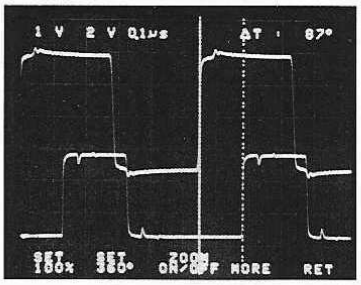
The PM 3070 offers full cursor measurement capabilities in both time and amplitude axes. Control of all cursor functions is by five keys in the bezel of the CRT which also are used to independently control the intensity of the alpha-numerics and the cursor intensity. Accurate measurements of peak-peak values, voltage ratios, rise times, phase relationships and time ratios are possible with direct numerical display on the CRT.

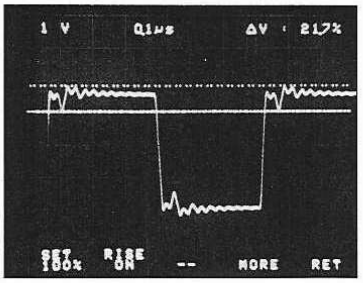
A special facility called the ZOOM function enables the signal between the cursors to be expanded to fill the full width of the screen by automatically adjusting the delay time and delay time base speed. This makes it easy to zoom in on a particular point of interest without having to consider how to set up the delay time section. In addition to the measured data both channel and time base status is displayed on screen and user text or messages can also be specified.

The terms GPIB and IEEE-488 may be used interchangeably throughout this catalog.

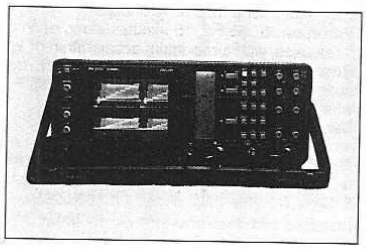






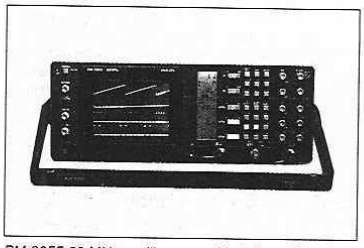


PM 3050 60 MHz 2 Channels, SingleTime Base



With all the standard facilities of the Smart Scope series this basic instrument provides comprehensive trigger facilities like TV line, TV frame, Peak-Peak Auto and DC coupling in addition to trigger hold off. Time base speeds to 5 nsec per division are standard as well as x 1 and x 10 probe identification. X deflection via either channel is possible.

PM 3055 60 MHz 2+1 Channels, Dual Time Base

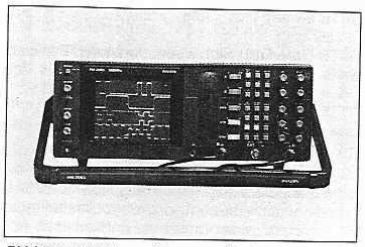


PM 3055 60 MHz oscilloscope with delayed time base and third channel trigger view.

The external trigger input of this 'scope doubles as a third input channel with a fixed attenuation. The Delayed Time Base facility can be directly triggered from the main time base or from either input channel. Display of MTB intensified and DTB is possible at the same time or independently.

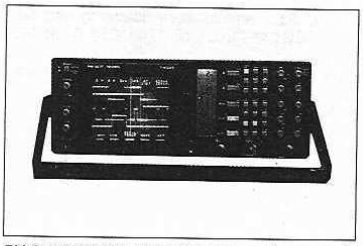
PM 3065 100 MHz 2+1 Channels, Dual Time Base

Triggering to 150 MHz plus the high intensity CRT makes this unit the ideal general purpose workhorse. The fast 3.5 nsec rise time and good pulse response characteristics make the PM 3065 the ultimate 100 MHz oscilloscope.



PM 3065 100 MHz oscilloscope with delayed time base and third channel trigger view.

PM 3070 100 MHz 2+1 Channels, Dual Time Base, Clever Cursors



PM 3070 100 MHz delayed sweep oscilloscope with clever cursors.

The Clever Cursors provide both amplitude and time measurement capabilities. In the amplitude mode peak-peak, ratio and 10% and 90% levels (for rise times) can be read directly from the display.

In the time mode rise times, ratio and phase measurements can be made and read from the display. In addition the ZOOM facility enables fast pinpointing and expansion of a specific section of the measured signal.

Specifications

Technical Specifications

Display: CRT 8 x 10 cm viewing area, P31 phosphor, 16 kV acceleration voltage. Parallax-free graticule with continuously variable illumination. Separate LCD for display of menus, settings, status indications etc. LCD is constantly illuminated by backlighting.

AUTOSET

Autoset selects proper channel, sets vertical deflection, timebase speed and triggering for easy-to-read display of input signals.

Vertical Deflection
Display Modes: Ya, Yb, - Yb, Ya + Yb, Ya - Yb, Yb
Trigger View: In any combination, chopped or alternate (not PM 3050).

Frequency Response
PM 3065/70: DC...>100 MHz -3 dB
PM 3050/55: DC...>60 MHz -3 dB (0...35°C)
(20 mV/div...10 V/div)
DC...>35 MHz -3 dB
(2 mV/div...10 mV/div)
In AC Mode: Lower -3 dB point is <10 Hz

Rise Time
PM 3065/70: <3.5 ns
PM 3050/55: <6 ns (20 mV/div...10 V/div)
<10 ns (2 mV/div...10 mV/div)
Deflection Coefficient: 2 mV/div...10 V/div in steps of 1, 2, 5 sequence
Error Limit: 3%
Continuous control between steps with > flashing in LCD as warning symbol for uncal. amplitude.
Input Impedance: 1 MΩ± 2%//20 pF ± 2 pF
Max. Rated Input Voltage: 400V (DC + AC peak)
Dynamic Range: >24 div. at 10 MHz > 8 div. at 100 MHz (PM 3065/70); 50 MHz (PM 3050/55)
CMRR: 100:1 at 1 MHz

Trigger View

Frequency Response:
PM 3065/70: DC...>100 MHz -3 dB (via ext)
DC...>75 MHz -3 dB (via Y_A or Y_B)
PM 3050/55: DC...> -3 dB (via ext 0...35°C)
DC...>50 MHz -3 dB (via Y_A or Y_B)
Deflection Coefficient: 100 mV/div. via Ext. Input 2 mV/div...10 V/div. via Ya or Yb

Horizontal Display Modes
PM 3055/65/70: MTB, MTBI, Alt TB, DTB, X-defl.
PM 3050: TB, X-defl.

Main Timebase (MTB) or Timebase (TB)

Time Coefficients: 0.5 s/div...50 ns/div. in steps of 1, 2, 5 sequence
Magnifier: x 10
Fastest Sweep Speed: 5 ns/div
Error Limit: 3%
Error Limit Magn. Sweep: 4%
Continuous control between steps with > flashing in LCD as warning symbol for uncal. sweep.
Hold-off: Continuously adjustable up to 10 x min. value

Delayed Timebase (DTB)
(not on PM 3050)
Time Coefficient: 1 ms/div...50 ns/div. in steps of 1, 2, 5 sequence
Magnifier: x 10
Fastest Sweep Speed: 5 ns/div
Error Limit: 3%
Error Limit Magn. Sweep: 4%
Trace Separation: >±4 div. DTB shift only

Delay Timebase Multiplier (DTM)
(not on PM 3050)
Resolution: 1:10,000
Error Limit Total: 4%
Delay Time Jitter: 1 ÷ 20,000

Triggering (MTB or TB)

Trigger Modes: Auto (free run), Non Auto Triggered, Single
Trigger Sources: A, B Composite (A, B), Ext. (DC or AC), Line
LCD indicates Not triggered, Triggered or Armed status
Trigger Coupling: Peak-to-peak (P-P), DC, TVL, TVF

Triggering (DTB) (not PM 3050)

Starts, A, B, Composite (A, B), Ext. TVL (only if MTB TV selected)

Trigger Sensitivity

PM 3050/55		
	Int.	Ext.
10 MHz	0.5 div	50 mV
50 MHz	1 div	150 mV
100 MHz	3 div	500 mV
TVF/TVL	0.7 div sync.	70 mV sync.
Level range	±8 div	±800 mV

PM 3065/70		
	Int.	Ext.
10 MHz	0.5 div	50 mV
100 MHz	1.2 div	150 mV
150 MHz	2 div	500 mV
TVL/TVF	0.7 div sync.	70 mV sync.
Level range	±8 div	±800 mV

Slope pos. (_/‾), or neg. (‾_), TVF or TVL pos. (+) or neg. (-)

X-Deflection

Deflection Coefficient: Via channel A or B 2 mV/div...10 V/div.
via Ext. input 100 mV/div
Frequency Response: DC...2 MHz
Error Limit: 5%
Phase Shift: <3° (at 100 kHz)
Ext. Input: 1 MΩ ±2%//20 pF ±2 pF
Max. Input Voltage: 400V (DC + AC peak)

Cursor Measurements PM 3070
Features: V, t, 1/t
Ratio
Phase
Rise Time (4 way cursors)
Zoom
User text
Settings read-out
Intensity control independent of trace

Output Options

Y Signal out from Channel A (Not PM 3065/70)
Deflection Coefficient: 100 mV/div.; load 10 kohm 40 m/div.; load 508

Frequency Response
PM 3050/55: >60 MHz -3 dB

MTB Sweep Out: Output voltage 0.5 V/div; load 1 MΩ
MTB Gate Out: High when running MTB sweep; otherwise low; voltage output high > 2.4v; low <0.4V
DTB Gate Out: High when running MTB sweep; otherwise low; voltage output high >2.4V; low <0.4V

Check the comprehensive range of system oriented accessories for the PM 3065/PM 3070 to specify exactly the configuration you need. These options add extra functions, convenience and transportability to everyday work with your oscilloscope.

General Specifications

Power Supply

Safety requirements meet following specifications: IEC 348 Class I, UL 1244, CSA 556B, VDE 0411
Line Voltage: 100...240V ±10% in one range
Line Frequency: 50...400 Hz ±10%
DC Nominal Voltage: 145...335V

Power Consumption (AC source)
PM 3050/55: 50W
PM 3065/70: 60W

Miscellaneous
Cal. Output: 1.2V ±1%
Frequency: 2 KHz
Z-modulation Input: TTL-compatible
>2.0V blanks display
<0.8 max. intensity, analog control possible between 2.0V and 0.8V

Mechanical Data

Width
Incl. Handle: 387 mm (15.2 in)
Excl. Handle: 350 mm (13.8 in)

Length
Incl. Handle, Excl. Knobs: 518 mm (20.4 in)
Excl. Handle and Knobs: 433.5 mm (17.1 in)
Incl. Handle and Knobs: 530.5 mm (20.9 in)
Excl. Handle, Incl. Knobs: 455.7 mm (17.9 in)

Height
Incl. Feet: 146.5 m (5.8 in)
Excl. Feet: 134.5 mm (5.3 in)
Excl. Lower Cabinet: 132.5 mm (5.2 in)
Weight: Approx. 7.5 kg (16.5 lb) excl. access.

Environmental Data

Temperature
Rated Range of Use: +10°C...+40°C
Limited Range of Operation: 0°C...+50°C
Storage: -40°C...+75°C

Altitude
Operating: 15,000 ft (4,500 m)
Non-Operating: 40,000 ft (12,000 m)
Humidity: 95% RH
EMI: Meets requirements of MIL-STD-461 Class B, VDE 0871 and VDE 0875 Grenzwert- klasse B

Shock
Operating and Non-operating: 30g, 1/2 sine, 11 ms duration, 6 shocks in each direction (3 each face), for a total of 18 shocks
Vibration: 5...55 Hz, 15 minutes along each of three axes, with a maximum acceleration of 3g. Resonance dwell of 10 minutes at each frequency where resonance occurs, or at 33 Hz when no resonance found
Bench Handling: MIL-STD-810, method 516, procedure V
The PM 3050/55/65/70 are designed to meet the requirements of MIL-T-28800 D, Type III, Class 5, Style D.

Included with instrument: 1 set 100 MHz, 10:1 probes with 5 ft. (1.5m) cable and scale factor readout (unless noted); Blue CRT contrast filter; Operating Manual

Ordering Information

Models

PM 3050/00n 60 MHz Oscilloscope
PM3052/00n 60 MHz Oscilloscope, rackmounted
PM 3055/00n 60 MHz Oscilloscope with 2+1 channels and delayed sweep
PM 3057/00n Same, rackmounted
PM 3065/00n 100 MHz Oscilloscope with 2+1 channels and delayed sweep
PM 3067/00n 100 MHz Oscilloscope with 2+1 channels and delayed sweep, rackmounted
PM 3070/00n 100 MHz Oscilloscope with 2+1 channels, cursors and delayed sweep
PM 3072/00n 100 MHz Oscilloscope with 2+1 channels, cursors and delayed sweep, rackmounted

Optional Configurations

When ordering, select one of the standard model numbers listed above, and add configuration option number listed below as a suffix:
PM ..../11n CRT with P7 long persistence phosphor
PM ..../70n Y-Signal Output (only available on 60 MHz models)
PM ..../74n MTB Sweep + MTB gate + DTB gate outputs
PM ..../75n MTB Sweep + MTB gate + DTB gate outputs, P7 phosphor
PM ..../76n Y-Signal Output plus MTB gate + DTB gate outputs (only available on 60 MHz models)
PM ..../77n Y-Signal Output plus MTB gate + DTB gate outputs, P7 phosphor (only available on 60 MHz models)
PM ..../79n Y-Signal Output, P7 phosphor (only available on 60 MHz models)

Example, Ordering Configuration
To order the 60 MHz, dual timebase oscilloscope in a rackmount configuration with MTB Sweep + MTB Gate + DTB Gate Out:

	Model
Oscilloscope	PM 3072
Configuration Option Suffix	/743
Complete Model Number	PM 3072/743

Accessories (See page 57)

Passive Probes
PM 8922/501 1:1 or 10:1 Probe, cable length 1.2m (4 ft)
PM 8924/001 1:1 Probe, cable length 1.5m (5 ft)
PM 8924/201 1:1 Probe, cable length 2.5m (8 ft)
PM 8926/091 10:1 Probe with readout, cable length, 1.5m (5 ft)
PM 8926/291 10:1 Probe with readout, cable length 2.5m (8 ft)
PM 8926/501 10:1 Probe, cable length 1.2m (4 ft)
PM 8926/591 10:1 Probe with readout, cable length 1.2m (4 ft)
PM 8931/091 20 MΩ, 100:1 Probe with readout
PM 8936/091 Set of 2 PM 8926/09 cables

Active Probes
PM 8940/09n High Voltage Isolation Amplifier with readout
PM 8943/00n 650 MHz FET Probe
PM 9355/09n AC Current Probe with readout

Other Accessories
PM 8901/00n Rechargeable Battery Pack
PM 8917/00n Video Sync Separator and Line Selector
PM 8953A/001 External, retrofittable IEEE-488 (GPIB) Interface
PM 8988/001 Protective Front Panel Cover
PM 8991/041 Oscilloscope Cart
PM 8999/001 Oscilloscope Stand
PM 8992/801 Accessory Pouch
PM 8998/001 Front panel memory for PM 3050...70
PM 9051/001 BNC to 4 mm Banana Adapter
PM 9381/001 Oscilloscope Camera
PM 2195/09 Probe Switch
400 MHz ..... See page 62
PM 2122 50Ω Coaxial Switch ..... See page 382
Power Options (See Page 576)