

Pulse Generators

PM 5785 & PM 5786



PM 5786



PM 5785

The difference in the PM 5785 and PM 5786 is the choice between speed and versatility in leading and trailing edge adjustment.

The PM 5785 offers the higher speed of the two. Its leading and trailing edges are equal. Pulse transition times can be selected from three values: 1 ns, 1.5 ns or 2 ns.

The PM 5786 offers a whole-spectrum of transition times from which to choose. It allows such versatility as independent and continuous variable settings of rise and fall times all the way from 2 ns ... 100 ms. In other words, the PM 5786 is best suited for high-speed general-purpose applications such as in research and development, where many different pulse response tests may need to be made.

On the other hand, the 1 ns performance of the PM 5785 is ideal for ultra high-speed testing in quality control (manufacturing), performance checks (maintenance) or testing to limits (development).

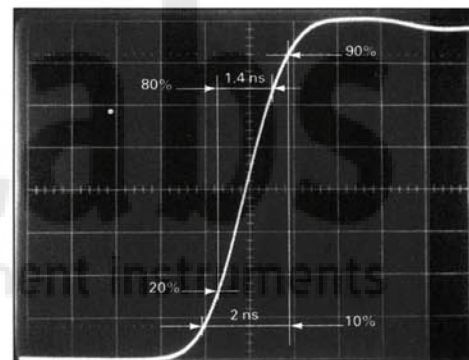


Fig. 1.

Ease of Operation

Both PM 5785 and PM 5786 offer features to simplify operation. Like the unique system of front panel time-setting-error indicator LEDs to provide clear confirmation that all time settings are correct. This prevents erroneous pulses, caused by incorrectly set pulse duration or pulse delay times (and additionally for the PM 5786, rise and fall times) with respect to pulse period.

Versatile Pulse Selection

Additional ease of use results from simple and versatile selection of the desired kind of output pulses: bipolar, positive or negative. Simultaneous positive and negative going pulses can be selected for linear applications, as well as complementary positive or negative pulses for digital applications.

This simple output selection means there is no need for time-consuming manual adjustment of inverter and offset controls. Further, logic '0' and '1' levels can be changed without the need for interchanging cables by using the COMPL (normal/complementary) switch. The table below, shows the possible output combinations that can be selected.

PM 5785/PM 5786 125 MHz Pulse Generators

1 Hz...125 MHz pulse frequencies
Rise and fall times from 1 ns
Time-setting-error indicators
Excellent 50Ω backmatching
Dual outputs for simultaneous + and - pulses
Full external control facilities
LED indicator for correct trigger levels
Presetable burst option

PM 5785 and PM 5786: top performance, top economy and assured time-settings.

The PM 5785 and PM 5786 have the speed and versatility to handle virtually any analog or digital circuit testing requirement. Yet, for instruments with such high performance, they are very com-

petitively priced. Fast digital circuitry such as TTL or ECL is easily handled by both generators, and the wide choice of external trigger and gate functions make the setting up of special test signals unbeatably easy.

PM 5785 & PM 5786

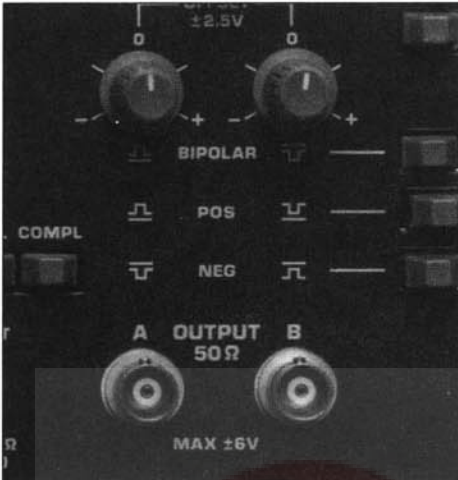


Fig. 2. Shows dual output arrangements with output and pulse mode selectors.



Fig. 3. Shows selection of various external control functions and the external control input.

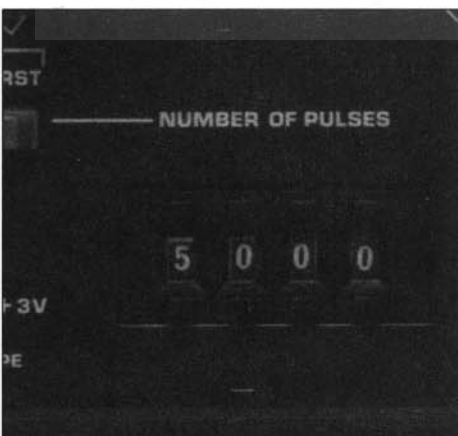


Fig. 4. Option burst function and thumbwheel control.

High-Speed, High-Fidelity Pulses

The PM 5785's ultra high-speed output waveforms have rise and fall times selectable from 1 ns, 1.5 ns and 2 ns, (and with the 20% ... 80% transition times for ECL testing, rise and fall times are 700 ps, 1 ns and 1.4 ns).

A choice of bipolar outputs and high-quality 4-range output attenuator in both the PM 5785 and PM 5786 make these generators very suitable for all kinds of linear applications. Very clean pulses are ensured by the PM 5786's excellent back-matching impedance that absorbs over 90% of reflections from mismatched loads, while the PM 5785 absorbs as much as 95% of reflections.

Burst Mode

The PM 5785 and PM 5786 are also available with burst mode options (PM 5785B and PM 5786B), that enable generation of bursts containing selectable numbers of pulses from 1...9999. Pre-selection of the required number of pulses is easily carried-out, using front panel digital switches. Bursts can be triggered either manually or remotely by a signal to the EXTERNAL INPUT on the front panel. The use of the presettable burst mode is particularly valuable, for testing memory circuits, shift registers, counters and other digital circuits.

Other functions which can be selected and carried out remotely through the external input include:

- Externally triggered pulses
- Externally gated pulses (gives synchronized bursts of pulses)
- Externally controlled pulse duration.

External control signals can be applied to define the start (and duration) of the various control options. Start/stop conditions can be adjusted with the EXT IN LEVEL control both to select +/- trigger slope and -3V...+3V trigger level. An LED indicates correct triggering.



Fig. 5. Pulse mode selectors.



Fig. 6. Time setting errors are indicated by LEDs.

Mode	Normal		Complementary	
	A	B	A	B
Output	A	B	A	B
Bipolar				
Pos				
Neg				

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External Triggering

External triggering enables the PM 5785/ PM 5786 to operate synchronously with external clock signals. All other parameters, such as pulse duration, amplitude etc. are as set on the pulse generator. External trigger signals can vary from 0...125 MHz, or, in the double pulse mode, 0...62.5 MHz.

External Gating

The external gate mode provides external synchronous on/off control of the pulse generator. As long as the external gate signal is present, output pulses are available with the preset pulse parameters.

External Duration

This mode allows the generators to function as input signal conditioners. The external input signal defines frequency and pulse duration, while amplitude, DC offset, rise and fall times and normal/complementary mode selection are defined by the pulse generator settings.

Squarewave Mode

A 'squarewave' mode provides pulses with a constant 0.5 duty factor. This facilitates a quick method of setting the required output repetition rate, without having to consider the other time parameters.

Specifications

Technical Specifications

Time Parameters

Pulse Repetition Period: 8 ns...1s (1 Hz...125 MHz)

Pulse Delay: 8 ns...100ms

Pulse Duration: 3.5 ns...100 ms or fixed square wave

Jitter: <0.1% of setting ± 50 ps

Main Output Pulse Characteristics

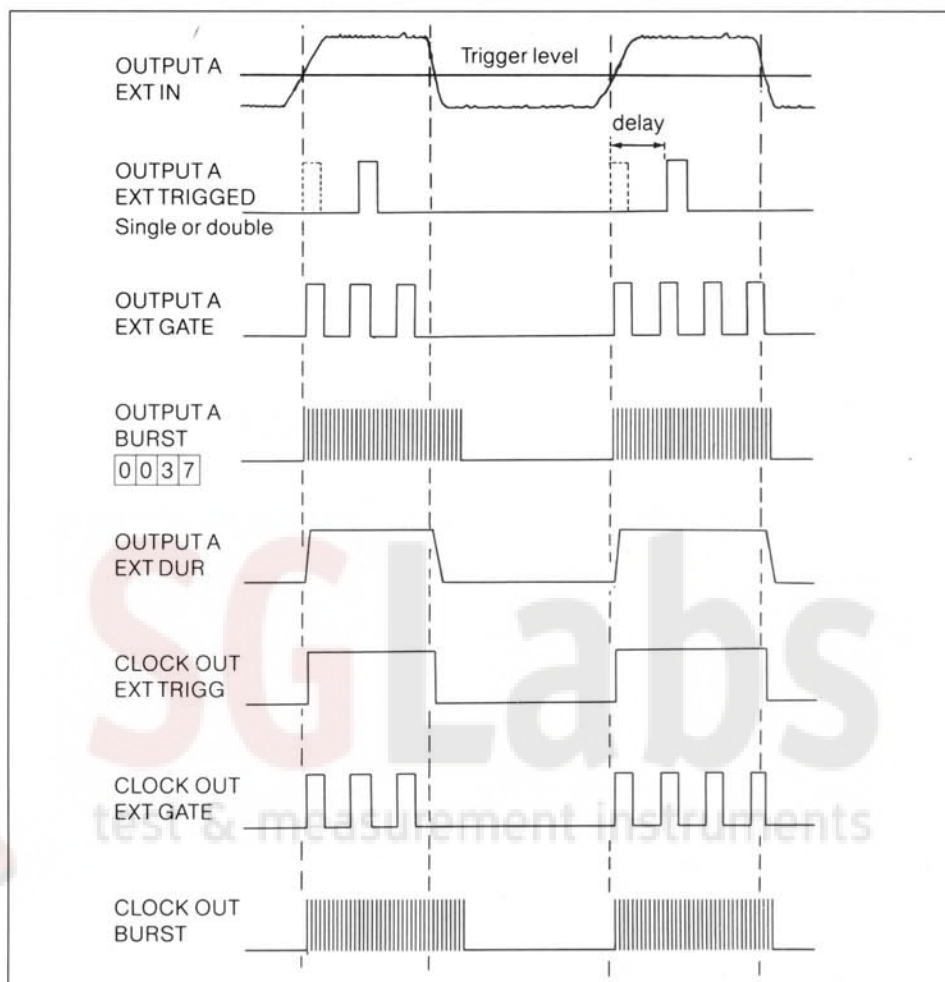
Outputs: 2 channels, A and B

Transition Times: At $Z_L = 50\Omega$

PM 5785: 1 ns, 1.5 ns or 2 ns fixed selectable, corresponding to 10%...90% of pulse amplitude.
For ECL testing: 700 ps, 1 ns or 1.4 ns fixed selectable, corresponding to 20%...80% of pulse amplitude.

Transition Time Accuracy: $\pm 10\%$ (PM 5785)

PM 5786: <2 ns...>100 ms, continuously variable, corresponding to 10%...90% of pulse amplitude.



For ECL testing: the minimum transition time is 1.4 ns, corresponding to 20%...80% of pulse amplitude.

Pulse Amplitude: 0.2V...5V (at $Z_L = 50\Omega$), double amplitude at open output

DC Offset: -2.5V...+2.5V (at $Z_L = 50\Omega$), $\pm 5V$ at open output

Max. Output Voltage: Pulse amplitude plus DC offset is $\pm 6V$ at max. Maximum 10V open output voltage within the -6V...+6V range.

Waveform Aberrations: at $Z_L = 50\Omega$

PM 5785: <5% ± 10 mV

PM 5786: <5% ± 10 mV, <10% for transition times <5 ns

Source Resistance: $50\Omega \pm 5\%$

Source Impedance:

PM 5785: $50\Omega \pm 5\%$

PM 5786: $50\Omega \pm 10\%$

Output Protection: against short- or open- circuit and transients

Pulse Modes:

•Single pulse (delayable)

•Double pulse

•Square wave: 50% $\pm 1\%$ (1 Hz...1 MHz);

50% $\pm 10\%$ (1 MHz...125 MHz)

•Normal or complementary switchable

Output Modes:

Bipolar: simultaneously positive and negative polarity

Pos: positive polarity, normal and complementary

Neg: negative polarity, normal and complementary

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External Operating Modes

TRIGG: Ext. triggered pulse repetition: DC...125 MHz or manual single shot

GATE: Synchronous gating. Ext. input signal starts and stops the generator

BURST: Internally generated burst with digital switch selection of number of pulses: 0...9999, started by ext. input signal or manual control

EXT DUR: External duration gives pulses with same duration and repetition rate as external input signal, all other pulse parameters are set via the generator

External Input

Range: DC...125 MHz; min. pulse duration 3.5 ns

Operating Input Voltage Range: 0.5...15 Vpp

Coupling: DC

Input Impedance: 1 M Ω /25 pF

Trigger Level: -3V...+3V

Trigger Slope: + and -

Trigger Indicator: Tri-state LED indicator for correct trigger level setting

Max. Input Voltage Without Damage: 260 Vrms at \leq 440 Hz, declining to 15 Vpp at 125 MHz

Internal Clock Output

Main output pulse is delayable with respect to internal clock output, which can thus be used as pre-trigger

Amplitude: +2.5V into 50 Ω

Output Impedance: 50 Ω (typ)

Transition Time: Approx. 1 ns

Pulse Duration: Square wave, 50% \pm 1% (1 Hz... 1 MHz), 50% \pm 10% (1...125 MHz)

Output Protection: Against short- or open- circuit and transients

Time Setting Error Indicators

Warning with LED indicators for erroneous settings of too long times for pulse delay and/or pulse duration (on PM 5785 and PM 5786) as well as for leading- and trailing edge transition times (PM 5786 only).

General Specifications

Power Requirements

Line: 100V, 120V, 220V and 240 Vrms \pm 10%; 120 VA, 50...60 Hz

Safety: According to IEC 348 and CSA 556B

Mains Interference: Below VDE 0871 (B) and MIL STD 461A

Environmental Conditions

Temperature:

Rated Range of Use: 0°C...+50°C

Storage and Transport: -40°C...+70°C

Humidity:

Operating: 10...90% RH, no condensation

Storage: 5...95% RH

Altitude/Barometric Pressure:

Operating: 5000m (15000 ft) - 53.3 kN/m²

Storage: 15000m (50000 ft) - 15.2 kN/m²

Size: 300 mm W x 145 mm H x 470 mm L (11.8 in W x 5.7 in H x 18.5 in L)

Weight:

Net: 9.5 kg (21 lbs)

Shipping: 11.5 kg (25 lbs)

Included with instrument: Manual, power cord

Ordering Information

Models

January 1989 prices

PM 5785/00 1 ns Pulse Generator;
excluding preset burst unit \$3385

PM 5785B/00 1 ns Pulse Generator;
including preset burst unit 3790

PM 5786/00 2 ns Pulse Generator;
excluding preset burst unit 3385

PM 5786B/00 2 ns Pulse Generator;
including preset burst unit 3790

Accessories (Also see page 485)

PM 9581/01 50 Ω Feed-through
Termination; 3W 60

PM 9584/02 50 Ω T-piece (matched
power-splitter) 52

PM 9585/01 50 Ω Feed-through
Termination; 1W 30

PM 9588/01 50 Ω Coaxial Cable Set with
calibrated delay times 265

Service & Support

Warranty

One-year product warranty. (See Page 470 for further information on warranty terms and conditions.)

Note: The above configurations meet North American power requirements. For other power options, see Introduction Section, page 491.