PRELIMINARY

50MHz Dual-Channel Pulse / Arbitrary Waveform Generator

PULSE MASTER SERIES

New



MODEL PM8572

- 50MHz Dual Channel Pulse / Pattern generator
- 100 MHz Function Generator for standard waveforms
- 300 MS/s, 16Bit Arbitrary Waveform / Sequence Generator
- 10ps pulse resolution with 4ns transition time (3ns typical)
- 32Vpp into open circuit with programmable impedance
- 16-bit Digital Pattern Generator with programmable level
- External pulse width control
- Internal AM, FM, FSK, ASK, PSK, PWM and sweep
- Ethernet, USB and GPIB interfaces
- High resolution 3.8" User Friendly color LCD display
- Multiple run modes including continuous, trigger, burst, gated, re-trigger with trigger and system delay control
- "Drop-in" Emulators for: Agilent 81101, Fluke 80/1, HP8116, HP8112, HP8160, HP8165, LeCroy LW410/420, Tabor 8500, Tabor 8550/1, Tek FG5010 and PG5110

Model PM8572 is very high performance, Dual channel pulse/pattern generator that stretch normal pulse generators' spec to the limit, becoming by far the most advanced Pulse/Waveform Source available in the market. In addition to its high performance pulse features, the new PM8572 generate a complete array of standard, arbitrary and sequenced waveforms in which are necessities in today's laboratories.

Versatile Pulse Controls

If your application requires more than just a fixed duty cycle or programmable pulse width, then you can modulate and control your leading edge with any standard or arbitrary waveform shape. Combine all of these features with external pulse width control and you have an extremely versatile pulse generation tool.

Extremely Accurate Resolution

Need to control pulse transitions and placement? Just program each channel to output pulses with linear or fast transitions and control edge placement with 10 ps resolution.

16-bit Digital Pattern Generator

16-bits are available as digital patterns from a rear-panel VHDC connector. The standard output level is LVDS which is efficient and sufficient for high speed digital data transmissions, however, programmable levels and impedances can be achieved by using a standard external accessory.

32Vpp Into Open Circuit

While typical pulse/function generators come with 10Vpp into 50 Ohm, model 8572 provides an unmatched output of 16Vpp into 50 ohm (32 Vpp into open circuit). On top of that, the 8572 output impedance can be programmed simply either from the front panel or through remote to fit the UUT requirement.

Smart, Small and Cost Effective Solution

The PM8572 offers unmatched performance even compared to instruments designed to generate fewer types of signals. Its smart, compact, 2U 1/2 rack size box design will allow designers and manufacturers to conserve substantial bench space, while benefiting from high performance, high bandwidth, signal integrity, reliability and the flexibility to adapt to a full spectrum of applications, for many years to come, offering never-before integration levels, which make it the best in its category for size-price-performance.

Emulating Legacy Products

Model PM8572 implements command emulators to both new and discontinued Pulse and Function Generators sold in the market, providing smooth transition for all the aging automatic test systems that face obsolescence and maintenance problems. The unique feature will allow clients to easily "drop-in" the PM8572 in slots vacated by out-of-order Agilent, Fluke, HP, LeCroy, Tabor, Tektronix or Wavetek models, solving TPS programmers' replacement issues.

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High Speed Function Generator

Care to use the instrument as a function generator? No need to calculate complex waveforms because the PM8572 does the work for you. Select the standard waveforms tab and start generating any of ten waveforms that are pre-computed and available for immediate use. Included are: sine, triangle, square, pulse, ramp, sinc and others at frequencies up to 100 MHz.

Waveform Memory

Waveform memory is the internal scratchpad where the waveforms reside. Larger memory banks provide for longer waveforms. One can use the entire memory (up to 4M) for a Single waveform or split the length to smaller segments. In this case, many waveforms can be stored in the same memory and replayed, one at a time, when recalled to the output. The memory segmentation feature may be combined with a sequence generator that can take different memory segments and link (and loop) them in any order as required for the test. The ability to loop waveform segments in a sequence can save a lot of memory to extend the capability of the generator to produce longer, more complex waveforms. The PM8572 has four sequence generators that can be loaded with unique sequences for each of its output channels.

Signal Integrity

As technology evolves and new devices are developed each day, faster and more complex signals are needed to simulate and stimulate these new devices. With its wide sample clock generator range (up to 300 MS/s), 16-bit vertical resolution and wide output bandwidth (over 100 MHz), one can create mathematical profiles, download the coordinates to the instrument and re-generate waveforms without compromising signal fidelity and design integrity.

Easy to use

A large and user-friendly 3.8” back-lit color LCD display facilitates browsing though menus, updating parameters and displaying detailed waveform information. Combined with a numeric keypad, cursor position control and a knob, the front panel controls simplify the operation of this universal waveform source.

Remote Control

Access speed is an increasingly important requirement for test systems. Ethernet, USB and GPIB interfaces are available so that the most suitable interface for the application may be selected. Remote control of instrument functions, parameters and waveform downloads is easily tailored to specific system environments regardless of whether control is via a laptop computer or full-featured ATE system. IVI drivers and factory support will speed up system integration and minimize test development time and costs.

Remote Calibration

Normal calibration cycles in the industry range from one to three years where instruments are sent to a service center, opened to allow access to trimmers, calibrated and certified for repeated usage. Leading-edge technology was employed on the PM8572 to allow calibration from any PM8572 remote interface such as USB, GPIB or LAN. Calibration factors are stored in a flash memory thus eliminating the need to open instrument covers.

ArbConnection

Unlimited Source of Arbitrary Waveforms. With the ArbConnection software you can control instruments functions, modes and features. You can also create virtually an unlimited variety of test waveforms. Freehand sketch allows you to draw your own custom waveform for quick analysis of analog signals. You can use the built-in equation editor to create your own exotic functions. Add or subtract components of a Fourier series to characterize digital or analog filters or, inject random noise into a signal to test immunity to auxiliary noise.

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Service and Support

Beyond providing precision Test & Measurement instruments, Tabor Electronics provides unparalleled service and support, and is continuously finding new ways to bring added value to its customers.

Our after-sales services are comprehensive. They include all types of repair and calibration, and a Single point of contact that you can turn to whenever you need assistance. As part of our extensive support, we offer individualized, personal attention Help Desk, both online and offline, via e-mail, phone or fax.

Tabor Electronics maintains a complete repair and calibration lab as well as a standards laboratory in Israel and USA. Service is also available at regional authorized repair/calibration facilities.

Contact Tabor Electronics for the address of service facilities nearest you.

Applications

For expert technical assistance with your specific needs and objectives, contact your local sales representative or our in-house applications engineers.

Manuals, Drivers, and Software Support

Every instrument comes equipped with a dedicated manual, developer libraries, IVI drivers, and software. However, if your specific manual is lost or outdated, Tabor Electronics makes it possible to log-on to its Download Center and get the latest data “in a click”.

Product Demonstrations

If your application requires that you evaluate an instrument before you purchase it, a hands-on demonstration can be arranged by contacting your local Tabor Electronics representative or the Sales Department at our Corporate Headquarters.

Five-year Warranty

Every instrument from the Pulse Master series comes with a five-year warranty. Each one has full test results, calibration certificate, and CD containing product's manual and complete software package. Our obligation under this warranty is to repair or replace any instrument or part thereof which, within five years after shipment, proves defective upon examination. To exercise this warranty, write or call your local Tabor representative, or contact Tabor Headquarters and you will be given prompt assistance and shipping instructions.

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CONFIGURATION

Output Channels 2, semi-independent

INTER-CHANNEL DEPENDENCY

Separate controls: Output on/off, amplitude, offset, standard waveforms, user waveforms, user waveform size, sequence table

Common Controls: Sample clock (Arb), frequency (Std), period (Pulse) reference source, trigger modes, trigger advance source, SYNC output

LEADING EDGE OFFSET

Description: Channel 1 edge start trails channel 2 edge by a programmable number of points.

Range: 0 to 1Meg points, 2M/4M optional

Resolution and Accuracy: 1 point

Initial Skew: < 1ns

PULSE WAVEFORMS

Type: Normal, Complement, Inverted, Linear transitions

Mode: Single, Delayed, Double, Fixed duty cycle, External Width.

PERIOD PARAMETERS

Range: 20ns to 10s

Resolution:
- Continuous: 11 digits
- Gated, and Burst: 3 digits

Accuracy:
- Continuous: Same as reference
- Gated, and Burst: ±2% of programmed value

RMS Jitter:
- Continuous: < (10ppm+20ps)
- Gated, and Burst: < (100ppm+20ps)

PULSE WIDTH, DOUBLE PULSE

Range: 8ns to 10s

Delay: 0 to 10s

Resolution: 10ps; limited by 11 digits

Accuracy: ±(0.2% of setting + 250ps)

RMS Jitter: < 100ppm

FIXED DUTY CYCLE MODE

Mode: Output duty cycle remains constant regardless of pulse width setting

Range: 1% to 95%.

Accuracy: ±(2% of setting + 250ps).

OUTPUT LEVELS

High Level Range: -7.9V to +8V, into 50Ω; -15.8V to +16V, into open circuit.

Low Level Range: -8V to +7.9V, into 50Ω; -16V to +15.8V, into open circuit.

Amplitude: 16mV to 16Vpp, into 50Ω; 32mV to 32Vpp, into open circuit.

Resolution: 4 digits.

Accuracy (1KHz): ±(2% of amplitude p-p + 70mV).

Output Protection: protected against continuous short to case ground.

PULSE PERFORMANCE

Transition Time:
- Fast: < 5ns (typically < 4ns)
- Linear: Selectable

Aberration:
- 16mV to 10Vpp: < 6%
- 10Vpp to 16Vpp: < 8%

Impedance: 50Ω

LINEAR TRANSITION TIMES

Range: 5ns to 5ms, in 5 overlapping ranges

In-range Span: 20:1

Resolution: 3 digits

Linearity: ±3% of setting above 100ns

Accuracy: ±(5% of setting + 2ns).

EXTERNAL WIDTH CONTROL

Description: The pulse shape can be recovered whilst the period and width of an external input signal are maintained

Input: Rear panel TRIG IN connector

STANDARD WAVEFORMS

Waveforms: Sine, Triangle, Square, Ramp, Sinc (Sine(x)/x), Gaussian, Exponential, Repetitive Noise, DC, Half-Cycle.

Frequency Range: Waveform dependent

Source: Internal synthesizer

SINE

Frequency Range: 700µHz to 100MHz

Phase Range: 0-360°

Phase Resolution: 0.01°

Harmonics Distortion:

	≤ 3Vpp	≤5Vpp	≤10Vpp
DC to 1MHz	-55dBc	-48dBc	-37dBc
1 to 10MHz	-50dBc	-43dBc	-35dBc
10 to 50MHz	-35dBc	-30dBc	-28dBc
50 to 100MHz	-28dBc	-25dBc	-23dBc

Non-Harmonic Distortion:
- DC to 50MHz: -65dBc
- 50 to 100MHz: -60dBc

Total Harmonic Distortion:
- DC to 20MHz: 0.1%

Flatness (1kHz):
- DC to 1MHz: 1%
- 1MHz to 10MHz: 3%
- 10MHz to 25MHz: 5%
- 25MHz to 80MHz: 10%
- 80MHz to 100MHz: 15%

Phase Noise - Internal SCLK
- 100Hz Offset: -70dBc/Hz
- 1kHz Offset: -85dBc/Hz
- 10kHz Offset: -92dBc/Hz
- 100kHz Offset: -112dBc/Hz
- 1MHz Offset: -140dBc/Hz

TRIANGLE

Frequency Range: 700µHz to 32MHz

Phase Range: 0-360°

Phase Resolution: 0.01°

SQUARE

Frequency Range: 700µHz to 100MHz

Duty Cycle Range: 0% to 99.9%

Rise/Fall Time:
- DC to 10Vpp: <4ns
- 10Vpp to 16Vpp: <5ns

Aberration:
- DC to 10Vpp: <5%+10mV
- 10Vpp to 16Vpp: <7%

RAMP

Frequency Range: 700µHz to 32MHz

Delay, Rise/Fall Time Ranges: 0%-99.9% of period (each independently)

SINC (Sine(x)/x)

Frequency Range: 700µHz to 32MHz

"0 Crossings": 4-100

GAUSSIAN

Frequency Range: 700µHz to 32MHz

Time Constant: 10-200

EXPONENTIAL PULSE

Frequency Range: 700µHz to 32MHz

Time Constant: -100 to 100

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REPETITIVE NOISE

Bandwidth: 50MHz

DC

Range: -8V to 8V

HALF-CYCLE WAVEFORMS

Function Shape: Sine, Triangle, Square
Frequency Range: 0.01Hz to 1MHz
Phase Range: 0 to 360°
Phase Resolution: 0.01°
Duty Cycle Range: 0% to 99.9%
Run Modes: Continuous, Triggered
Delay Between Half Cycles (Continuous only): 200ns to 20s
Delay Resolution 20ns

ARBITRARY WAVEFORMS

Sample Rate:
Continuous Mode 1.5S/s to 250MS/s (typically 300MS/s)
All Other Modes 1.5S/s to 225MS/s (typically 250MS/s)
Vertical Resolution: 16 bits
Waveform Memory: 1M points (2M or 4M optional)

MEMORY SEGMENTATION

No. of Segments: 1 to 10k
Min. Segment Size: 16 points
Resolution: 4 points size increments from 16 to 1M points (2M/4M optional)

SEQUENCED WAVEFORMS

Operation: Segments may be linked and repeated in a user-selectable order to generate extremely long waveforms. Segments are advanced using either a command or a trigger

ADVANCE MODES

Automatic Sequence Advance: No trigger required to step from one segment to the next. Sequence is repeated continuously per a pre-programmed sequence table.

Stepped Sequence Advance: Current segment is sampled continuously until a trigger advances the sequence to the next programmed segment and sample clock rate.

Single Sequence Advance: Current segment is sampled the specified number of repetitions and then idles at the end of the segment. Next trigger samples the next segment the specified repeat count, and so on.

Mixed Sequence Advance: Each step of a sequence can be programmed to advance either a) automatically (Automatic Sequence Advance), or b) with a trigger (Stepped Sequence Advance).

Sequencer Steps: 1 to 4096
Segment Loops: 1 to 1Meg
Minimum Segment Duration: 600ns
Multi Sequence: 1 to 10, Selectable

DIGITAL PATTERN OUTPUT

Pattern Width: 16-bits, differential
Output Level: LVDS
Pattern Length:
Dedicated Memory 1 to 128k
Arbitrary Memory 16 to 1M (2M or 4M optional)
Update Frequency: 100µpps to 250Mpps

COMMON CHARACTERISTICS

FREQUENCY

Resolution:
Front Panel 11 digits (limited by 1µHz)
Remote 14 digits (limited by 1µHz)
Accuracy & Stability: Same as reference

10MHz REFERENCE CLOCK

Internal 0.0001% (1 ppm TCXO) initial tolerance over a 19°C to 29°C temperature range; 1ppm/°C below 19°C and above 29°C; 1ppm/year aging rate
External 10MHz TTL, 50% ±2% duty cycle or 50Ω ±5% 0dBm

AMPLITUDE

Range: 16mV to 16Vp-p into 50Ω; Double into open circuit
Impedance Display: Programmable from 50Ω to 1MΩ
Resolution: 4 digits
Accuracy (1kHz):
16mV to 159.9mVp-p ±(1% + 5mV)
160mV to 1.599Vp-p ±(1% + 10mV)
1.6V to 11.99Vp-p ±(1% + 70mV)
12V to 16Vp-p ±2%

OFFSET

Range: 0 to ±7.992V, into 50Ω
Resolution: 1mV
Accuracy: ±(1%+1% of Amplitude +5mV)

FILTERS

Type: 25MHz Bessel
50MHz Bessel
60MHz Elliptic
120MHz Elliptic

OUTPUTS

MAIN OUTPUTS

Connector: Front panel BNC, each channel
Impedance: 50Ω ±1%
Protection: Short Circuit to Case Ground, 10s max
Standby: Output On or Off (Output Disconnected)

SYNC OUTPUT

Connector: Front panel BNC
Level: TTL
Sync Type: Pulse with Arbitrary and Standard Waves; LCOM in Sequence and Burst Modes (including Burst Modulation); Marker with Modulation Mode only, programmable position
Position: 0 to 1M (2M or 4M optional)
Resolution: 4 points

DIGITAL PATTERN OUTPUTS

Connector: Rear panel SCSI-2, 68-pin VHDC
Pattern Width: 16 bit differential outputs
Source: Channel 1 only
Level: LVDS

SAMPLE CLOCK OUTPUT

Connector: Rear panel SMB
Level: 400mVp-p
Impedance: 50Ω

COUPLE OUTPUT

Connector: Rear panel SMB
Level: LVPECL
Impedance: 50Ω, terminated to +1.3V

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INPUTS

TRIGGER INPUT

Connector:	Rear panel BNC
Impedance:	10kΩ
Slope:	Positive or Negative (selectable)
Programmable Level:	±5V
Sensitivity:	100mV
Damage Level:	±12V
Pulse Width:	>10ns minimum

EXTERNAL REFERENCE INPUT

Connector:	Rear panel SMB
Frequency:	10MHz
Impedance&Level:	
Default	10kΩ ±5%, TTL, 50% ±2%
Option	50Ω ±5%, 0dBm Sinewave

SAMPLE CLOCK INPUT

Connector:	Rear panel SMB
Input Level:	300mVp-p to 1Vp-p
Impedance:	50kΩ
Min. Pulse Width:	4 ns

COUPLE INPUT

Connector:	Rear panel SMB
Input Level:	LVPECL
Impedance:	50Ω, terminated to +1.3V
Min. Pulse Width:	4 ns

MODULATION

Modulation Source:	Internal
Run Modes:	Off (Outputs CW), Continuous, Triggered, Delayed Trigger, Burst, Re-trgger and Gated
Advance Source:	Front panel button, Software commands, Rear panel TRIG IN
Carrier Idle Mode:	On or Off, programmable
Marker Position:	TTL, Programmable at selectable frequency

FM

Carrier Waveform:	Sine wave
Carrier Frequency:	10Hz to 100MHz
Modulating Waveforms:	Sine, square, triangle, ramp
Modulating Frequency:	10mHz to 100kHz
Peak Deviation:	Up to 50MHz

AM

Carrier Waveform:	Sine wave
Carrier Frequency:	10Hz to 100MHz
Envelop Waveform:	Sine, square, triangle, ramp
Envelop Frequency:	10mHz to 100kHz
Modulation Depth:	0% to 100%

FSK

Carrier Waveform:	Sine wave
Carrier Frequency:	10Hz to 100MHz
Baud Rate Range:	1bits/sec to 10Mbits/sec
FSK Data Bits Length:	2 to 4,000

PSK

Carrier Waveform:	Sine wave
Carrier Frequency:	10Hz to 100MHz
Carrier phase:	0 to 360°
Baud Rate Range:	1bits/sec to 10Mbits/sec
FSK Data Bits Length:	2 to 4,000

FREQUENCY HOPPING

Carrier Waveform:	Sine wave
Carrier Frequency:	10Hz to 100MHz
Hop Table Size:	2 to 1,000
Dwell Time Mode:	Fixed or Programmable for each step
Dwell Time:	200 ns to 20 s
Dwell Time Resolution:	20 ns
Hop Frequency:	10Hz to 100MHz

PULSE WIDTH MODULATION

Carrier Waveform:	Pulse
Width Range:	8ns to 500ms
Resolution:	625ps
Standard Modulating Waveforms:	Sine, square, triangle, ramp
Period	100ns to 1s
Resolution	Pulse width period
Accuracy	Reference + 1 Pulse width period
Arbitrary Modulating Waveforms:	Any shape
Period	Pulse Width x Number of Points
Size	5 to 512k
Resolution	Pulse width period
Accuracy	Same as Reference

SWEEP

Carrier Waveform:	Sine wave
Sweep Step:	Linear, log or Arb
Sweep Direction:	Up or Down
Sweep Range:	10Hz to 100MHz
Sweep Time:	1.4s to 40s

TRIGGER CHARACTERISTICS

RUN MODES

Continuous:	Free-run output of a waveform.
Triggered:	Upon trigger, outputs one waveform cycle. Last cycle always completed.
Gated:	External signal transition enables or disables generator output. Last cycle always completed
Burst:	Upon trigger, outputs a Single or multiple pre-programmed number of waveform cycles from 1 through 1M (65,535 Pulse only).
Mixed:	First output cycle is initiated by a software trigger. Consequent output requires external triggers through the rear panel TRIG IN

TRIGGER SOURCE

EXTERNAL

Source:	Rear panel BNC
Trigger Level:	±5V
Resolution:	1mV
Input Frequency:	DC to 2.5MHz
Min. Pulse Width:	>10ns
Slope:	Positive/Negative transitions, selectable
Trigger Jitter:	±1 sample clock period

DELAYS (Trigger input to waveform output)

System Delay:	6 sample clock cycles+150ns
Trigger Delay:	
Pulse	[(0; 100ns to 20s) + system delay]
All Others	[(0; 200ns to 20s) + system delay]
Trigger Resolution:	20ns
Trigger Delay Error:	6 sample clock cycles+150ns

INTERNAL / RETRIGGER (BUS)

Range:	
Pulse	20ns to 1000s
All Others	200ns to 20s
Resolution:	20ns
Error:	3 sample clock cycles+20ns

MANUAL

Source:	Soft trigger command through the front panel or external interface

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FREQUENCY COUNTER / TIMER

Measurements:	Frequency, Period, Avaraged Period, Pulse Width and Totalize
Modes:	Repetitive, Hold, Gated
Source:	Trigger Input
Range:	20Hz to 100MHz (typically 120MHz)
Sensitivity:	500mVpp
Accurcay:	1ppm
Slope:	Positive/Negative transitions
Gate Time:	100µSec to 1 Sec
Input Range:	±5V
Trigger Modes:	Continious, Hold and Gated
Period Avaraged	
Range	10ns to 50ms
Resolution	7 digits / Sec
Period and Pulse Width	
Range	500ns to 50ms
Resolution	100ns
Totalize	
Range	10^{12}-1
Overflow	Led indication

MULTI-INSTRUMENT SYNCHRONIZATION

Description:	Multiple instruments can be daisy-chained together and synchronized to provide multi-channel synchronization. Not application to Pulse Mode.
Initial Skew:	<25 ns + 1 sample clock cycle, depending on cable length and quality, typically with 1m cables
Waveform Types:	Standard, Arbitrary and Sequenced using the automatic sequence advance mode only
Run Modes:	Continuous, Triggered, Gated and Counted Burst

LEADING EDGE OFFSET

Description:	Leading edge offset is programmable for master and slave units.
Run Mode:	Continuous run mode only
Offset Range:	200 ns to 20 s
Resolution&Accuracy:	20 ns

GENERAL

Power Supply:	85 to 265Vac, 47-63 Hz
Power Consumption:	60W
Front Panel Display:	Color LCD, 3.8" reflective, 320 x 240 pixels, back-lit
Operating temperature:	0°C - 50°C
Humidity (non-condensing):	11°C - 30°C 85% 31°C - 40°C 75% 41°C - 50°C 45%
Storage temperature:	-40°C to + 70°C.
Interface:	Ethernet 10/100, USB 2.0 and GPIB standard
Language:	IEEE-488.2 - SCPI – 1993.0
Dimensions:	212 x 88 x 415 mm (WxHxD)
Weight:	Approximately 7 lb
Safety:	EN61010-1, 2nd revision
EMC:	CE marked. Designed to meet VDE 0411/03.81 and UL 1244
Reliability:	MTBF per MIL-HDBK-217E, 25°C, Ground Benign
Workmanship Std:	Conform to IPC-A-610D
Supplied Accessories:	Power Cord, USB cable, CD containing Operating Manual, ArbConnection software and developer libraries.
Warranty:	5 years standard

ORDERING INFORMATION

MODEL	**PM8572**

50MHz Dual-Channel Pulse / Waveform Generator

OPTIONS

2Meg:	2 Meg Memory
4Meg:	4 Meg Memory

ACCESSORIES

S-Rack mount:	19" Single Rack Mounting Kit
D-Rack mount:	19" Dual Rack Mounting Kit
Case Kit:	Professional Carrying Bag

Note: Options and Accessories must be specified at the time of your purchase.