

# Test Equipment Solutions Datasheet

Test Equipment Solutions Ltd specialise in the second user sale, rental and distribution of quality test & measurement (T&M) equipment. We stock all major equipment types such as Spectrum Analyzers, Signal Generators, Oscilloscopes, Power Meters, Network Analyzers etc from all the major suppliers such as Keysight, Tektronix, Anritsu and Rohde & Schwarz.

We are focused at the professional end of the marketplace, primarily working with customers for whom high performance, quality and service are key, whilst realising the cost savings that second user equipment offers. We fully test & refurbish equipment in our in-house, traceable Lab. Items are supplied with manuals, accessories and typically a full no-quibble 1 year warranty. Our staff have extensive backgrounds in T&M which enables us to deliver industry-leading service and support. We endeavour to be customer focused in every way right down to the detail, such as offering free delivery on sales, presenting flexible technical + commercial solutions and supplying a loan unit during warranty repair, if available.

As well as the headline benefit of cost saving, second user offers shorter lead times, higher reliability and multivendor solutions. Rental, of course, is ideal for shorter term needs and offers fast delivery, flexibility, try-before-you-buy, zero capital expenditure, lower risk and off balance sheet accounting. Both second user and rental improve the key business measure of Return On Capital Employed.

We are based in at Oakley, Bedfordshire in the UK from where we supply test equipment worldwide. Our facility incorporates Sales, Support, Admin, Logistics and our own in-house Lab.

All products supplied by Test Equipment Solutions include:

- No-quibble parts & labour warranty (we provide transport for UK mainland addresses).
- Free loan equipment during warranty repair, if available.
- Full electrical, mechanical and safety refurbishment in our 40GHz in-house Lab.
- Certificate of Conformance (calibration available on request).
- Manuals and accessories required for normal operation.
- Free insured delivery to your UK mainland address (sales).
- Support from our team of seasoned Test & Measurement engineers.
- ISO9001 quality assurance.

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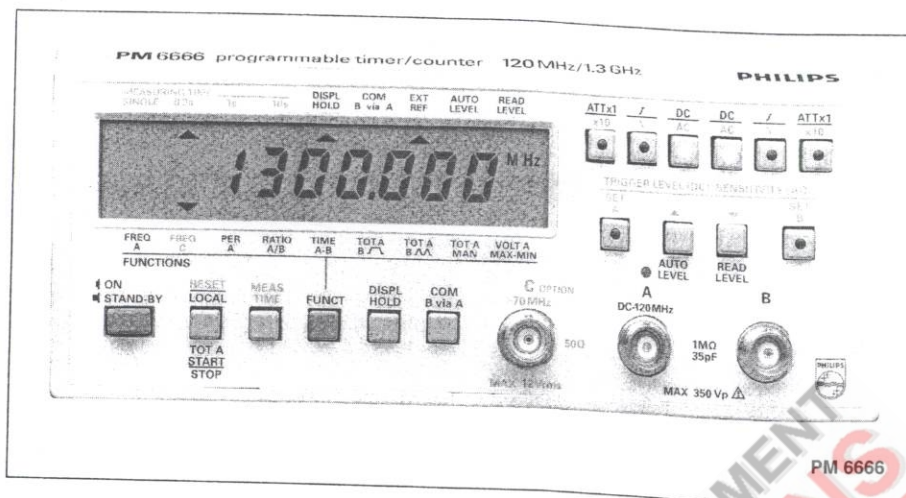


# Benchtop System Timer/Counters

## PM 6665 & PM 6666



Available through Distributors



### PM 6665 & PM 6666 Programmable Timer/Counters

Unrivalled price/performance

High resolution reciprocal counting

High trigger accuracy

PM 6666: Full GPIB/IEEE-488 programmability, Auto Trigger, Voltage Measurements

PM 6665: Continuously variable sensitivity, HF filter

High stability MTCXO:  $2 \times 10^{-7}$  over  $0^{\circ}\text{C}$  to  $50^{\circ}\text{C}$  - pushbutton calibration

9 measuring modes including high resolution time interval average

120 MHz/1.3 GHz option

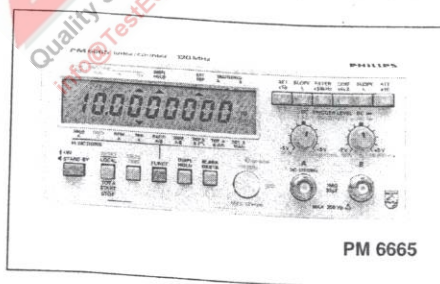
### Introduction

The PM 6665 and PM 6666 are very versatile timer/counters with many functions included as standard, spanning frequencies from 0.1 Hz to 120 MHz, and optionally up to 1.3 GHz. The measuring functions include FREQUENCY, PERIOD, FREQ RATIO, TOTALIZE pulses, TIME INTERVAL, RPM (PM 6665) and VOLT peak values (PM 6666).

The units have a built-in microprocessor that uses the reciprocal frequency counting technique, which yields high resolution measuring results under all conditions, even on low frequency measurements.

Measuring accuracy is increased by the high performance counter front-ends, providing variable sensitivity and noise immunity. Accuracy can be further improved with the optional high stability time-base.

Both units provide unmatched value for money and offer a high degree of programmability through the GPIB/IEEE-488\* interface. All major functions can be programmed with the PM 6665; and the PM 6666 offers 100% programmability including trigger level and sensitivity settings.



### PM 6665

The PM 6665 timer/counter is specifically designed for applications with a small budget but a demand for a broad range of high performance counting and timing. It is low cost and offers the same high quality as other Fluke test and measurement instruments. For example:

- Design is highly integrated, ensuring reliable, low power operation.

- Time base stability is exceptional with the MTCXO (mathematically temperature compensated crystal oscillator), which delivers stability comparable to that of costly oven stabilized oscillators at the price level of a conventional TCXO.
- An all-metal cabinet gives excellent RFI shielding and mechanical stability.
- The PM 6665 offers the best solution for both frequency and time measurements with its high quality inputs. Frequency measurements have continuously variable sensitivity and noise immunity and time measurements can be triggered within a wide  $\pm 5\text{V}/\pm 50\text{V}$  range. A noise rejection filter is included as standard, and digit blanking can be used to remove irrelevant or unstable digits from the display.

### Optimal Time Measurements

The inputs for time measurements in the PM 6665 incorporate high speed synchronizers and equalized input channels to eliminate differences in delay and risetime. High sensitivity inputs reduce the possibility of trigger errors; trigger levels can be selected in the range from  $-50\text{V}$  to  $+50\text{V}$  and trigger indicators simplify level setting.

### Frequency Measurements

Frequency measurements must have a variable noise immunity - which in practice means variable sensitivity - for correct triggering. On the PM 6665 this is accomplished with the continuously variable  $\times 1$  to  $\times 100$  input signal attenuator.

### Noise Rejection Filter Standard

The built-in noise rejection filter is useful for cleaning up noisy LF signals and for filtering off HF noise, even at levels higher than the input signal.

### PM 6666

The PM 6666 is the first low cost timer/counter with high accuracy frequency, time and voltage measurements that also offers 100% programmable GPIB/IEEE-488 operation. With the GPIB/IEEE-488 bus, all measurement functions including trigger level settings and sensitivity can be programmed. A bus learn mode is provided to speed and simplify programming.

The PM 6666 is also an excellent all-purpose instrument for bench-top use, with 9 front panel selectable measuring functions including voltage max./min. measurements.

Bus time-out and separator settings are also programmable on both the PM 6665 and PM 6666 and a high speed mode delivers high-speed output of unformatted data at over 100 measurements/s. An optional rack mount adapter is available for both units for integration into measuring systems.

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

### Error-Free Triggering

Triggering is error-free on the PM 6666 for all waveforms. Trigger-level setting can be automatic on all input signals over 100 Hz. Resolution is 20/200 mV, over a very wide range (-50V to +50V) that allows measurements to be accurate even on high voltage events. The trigger level can be displayed immediately with one keystroke; and inputs can be instantly checked for triggering with the tri-state LED trigger indicators.

To give the various noise immunity settings, input sensitivity has six steps, from 20 mV to 1V rms.

### Peak Voltage Measurements to 50 MHz

The PM 6666 has a unique capability for an instrument in this price range, i.e., Volt peak measurements (-50V to +50V) at up to 12 MHz at an error level of no more than a few percent. Vpeak measurements are possible over the range 12 MHz to 50 MHz with slightly higher errors. When displaying Vmax./min. measurements, positive and negative signal peaks of the input signal are shown simultaneously with a resolution of 20/200 mV.

### PM 6665 & PM 6666; Leading Technology

The latest technology is used in these timer/counters to give them their unrivalled performance for instruments in their price class.

Special emphasis was placed on reliability and integration to decrease the component count, which reduces heat dissipation and gives a high MTBF figure. For example, the entire counting logic circuitry consists of just two chips – the LSI counter-on-a-chip and a single chip control microcomputer. Also, a unique crystal oscillator is used for the timebase facilities – the MTCXO (see below). All this combines to give very powerful instruments in a small package and low price.

The PM 6665 and PM 6666 have high input protection, allowing them to withstand inputs of 12V rms on the optional 50Ω RF input, and 350V (dc + ac peak) on the 1 MΩ LF input.

### Unique MTCXO Time Base

Until now, choice of the time base crystal oscillator, which determines the final accuracy of the counter, was only between the low-cost uncompensated standard crystal oscillators, medium price TCXOs (temperature compensated crystal oscillators) and high price, high stability oven-controlled oscillators.

Now, Fluke has developed a mathematically compensated crystal oscillator which costs the same as a normal TCXO yet has a stability of  $2 \times 10^{-7}$  (0°C to 50°C), comparable with that of an oven stabilized oscillator.

This new oscillator is called the MTCXO or Mathematically Temperature-Compensated Crystal Oscillator. It has an associated non-volatile memory in which are stored the frequency deviations from the factory measured temperature dependent frequency curve, at each temperature. During a measurement, the temperature of

the crystal is measured, the deviation for that temperature is retrieved from the memory and the result is automatically compensated before display. In addition, because the temperature of the crystal is always compensated for each measurement, no warm up time is required for high accuracy measurement. Calibration is performed with the touch of a button, without warm-up.

### High Resolution

Both the PM 6665 and PM 6666 can measure low frequency signals to high resolution with synchronized multiple period measurements and computing the reciprocal values.

Resolution is at least 7 digits on a 1s measuring time, because the traditional  $\pm 1$  input cycle error is eliminated by the built-in microprocessor. This high resolution applies to all input frequencies, whether high or low. Thus long gate times are no longer needed to obtain high resolution when measuring low frequency input signals. There is also no risk of instrument rounding error, because of the full 9-digit display.

Time interval measurements are high resolution as well as high accuracy, due to the time interval averaging technique. The 100 ns resolution is improved by a factor  $\sqrt{N}$  ( $N$  = number of time intervals averaged) when compared with single time interval measurements. The maximum obtainable  $N$  is  $4 \times 10^7$ , resulting in a resolution of better than 20 pico seconds.

### Versatility for All-Purpose Use

Several variations and options are available so the user can choose exactly the configuration required for his application. The options are factory installed and tested in each user configuration. However, all options can also be field installed by the user allowing upgrading of the counter at any time. The full range comprises:

- GPIB/IEEE-488 interface
- Highly stabilized time base (MTCXO)
- 1.3 GHz HF input
- Battery power pack
- Rack mount kit
- Carrying case

## Specifications

### Measuring Functions

#### Frequency A or C

(frequency B via GPIB/IEEE-488 only)

#### Range

**Freq A:** 0.1 Hz to 120 MHz; typically to 160 MHz

**Freq B:** 0.1 Hz to 12 MHz (via GPIB/IEEE-488 only)

**Freq C:** 70 MHz to 1.3 GHz (optional)

**Mode:** Reciprocal frequency counting

**LSD Displayed:**

$$2.5 \times 10^{-7} \times \text{FREQ}$$

measuring time

#### RPM A (PM 6665 only)

The FREQUENCY A measurement is taken, multiplied by 60 and shown on the display as revolutions per minute (rpm)

**Range:** 6 rpm to  $720 \times 10^6$  rpm

#### Period A

**Range:** 8 ns to  $2 \times 10^8$  s

**Mode:** Single period measurement (SINGLE) or average period measurement (at 0.2s, 1s or 10s measuring times)

**LSD Displayed:** SINGLE period measurement: 100 ns (TIME <100s); average period measurement:

$$2.5 \times 10^{-7} \times \text{PERIOD}$$

measuring time

**Ratio A/B** (ratio B/A, C/A or C/B via GPIB/IEEE-488 only)

**Range:**  $1 \times 10^{-7}$  to  $2 \times 10^9$  (A/B);  $1 \times 10^{-8}$  to  $2 \times 10^8$  (B/A);  $0$  to  $1 \times 10^{15}$  (A/B SINGLE and B/A SINGLE);  $8$  to  $6 \times 10^{10}$  (C/A, C/B)

#### Frequency Range

**Input A:** 0 MHz to 120 MHz (A/B); 0 MHz to 12 MHz (B/A, C/A, A/B SINGLE)

**Input B:** 0 MHz to 12 MHz

**Input C:** 70 MHz to 1.3 GHz

**Time Interval A/B** (time interval B-A via GPIB/IEEE-488 only)

**Range:** 100 ns to  $2 \times 10^8$  s (SINGLE); 0 ns to 20s (average)

**Mode:** Single time interval (SINGLE) for time interval measurements (at 0.2s, 1s or 10s measuring times)

**LSD Displayed:** SINGLE time interval measurement: 100 ns (TIME <100s); Average time interval measurements:

$$2.5 \times 10^{-7} \times$$

N

#### Averaged Number of Intervals N:

measuring time

pulse repetition time

*Note: Input signals must be repetitive and asynchronous with respect to the time base.*

**Min Dead Time from Stop to Start:** 250 ns

**Timing Difference A-B Channels:** 4 ns max

**Totalize A** (totalize B via GPIB/IEEE-488 only)

**Range:** 0 to  $1 \times 10^{15}$  with indication of k or M (kilopulses or Megapulses) the result is truncated if out of display range

**Frequency Range:** 0 Hz to 12 MHz

**Pulse Pair Resolution:** 80 ns

**LSD Displayed:** 1 unit count (counts <10<sup>9</sup>); 5x counts/10<sup>8</sup> (counts ≥10<sup>9</sup>)

**Gated by B (A) Mode:** Event counting on input A (B) during the duration of a pulse on input B (A)

**Start/Stop by B (A) Mode:** Event counting on input A (B) between two consecutive pulses on input B (A)

# Benchtop System Timer/Counters

## PM 6665 & PM 6666

**Manual Mode:** Event counting is controlled by the START/STOP button. Sequential start-stop counts are accumulated. RESET closes the gate and resets the timer/counter to zero.

**Volt Max/Min A** (PM 6666 only; volt max/min B via GPIB/IEEE-488 only)

**Range:** -51V to +51V

**Frequency Range:** DC and 100 Hz to 50 MHz (input A); dc and 100 Hz to 5 MHz (input B)

**Resolution:** Input signals within  $\pm 5V$ , 20 mV; input signals outside  $\pm 5V$ , 200 mV

**Inaccuracy DC and 100 Hz to 12 MHz (A), or to 1 MHz (B):** Input signals within  $\pm 5V$ , 30 mV  $\pm 1\%$  of reading  $\pm 3\%$  of V p-p; input signals outside  $\pm 5V$ , 300 mV  $\pm 3\%$  of reading  $\pm 3\%$  of V p-p

**Inaccuracy 12 MHz to 50 MHz (A) or 1 MHz to 5 MHz (B):** Input signals within  $\pm 5V$ , 30 mV  $\pm 10\%$  of reading  $\pm 10\%$  of V p-p; input signals outside  $\pm 5V$ , 300 mV  $\pm 10\%$  of reading  $\pm 10\%$  of V p-p

### Input Specifications

**Input-A and Input-B** (PM 6665 only)

**Frequency Range**

**DC-Coupled:** DC to 120 MHz, typ. to 160 MHz

**AC-Coupled:** 20 Hz to 120 MHz, typ. to 160 MHz

**Minimum Pulse Duration:** 4 ns

**Coupling:** AC- or dc-coupled, switch selectable

**Impedance:** 1 M $\Omega$ /35 pF

**Channel Input:** Separate A and B, or common via A

**Maximum Voltage Without Damage:** 350V (dc + ac peak) between 0 Hz and 440 Hz, falling to 8V rms at 1 MHz.

**Sensitivity, DC-Coupled**

**Sine:** 20 mV rms, 0 Hz to 100 MHz; 30 mV rms, 100 MHz to 120 MHz

**Pulse:** 60 mV p-p, 0 Hz to 100 MHz; 90 mV p-p, 100 MHz to 120 MHz; sensitivity decreases to 60 mV rms at 160 MHz typically

**Sensitivity, AC-Coupled**

**Sine:** 20 mV rms to 200 mV rms, 20 Hz to 100 MHz; 30 mV rms to 300 mV rms, 100 MHz to 120 MHz, continuously variable; sensitivity decreases to 60 mV rms at 160 MHz typically

**Filter:** Switchable 50 kHz low pass noise filter with approx 40 dB suppression at 1 MHz

**Attenuation:** x1 or x10

**Trigger Slopes:** Positive or negative, switch selectable

**Trigger Level Range**

**DC-Coupled:** +5V to -5V (attenuator x1); -50V to +50V (attenuator x10); adjustable by potentiometer

**AC-Coupled:** 0V fixed

**Trigger Indicators:** Indication on LCD display when triggering on inputs A or B occurs

**Input-A and Input-B** (PM 6666 only)

**Frequency Range**

**DC-Coupled:** DC to 120 MHz, typ. to 160 MHz

**AC-Coupled:** 20 Hz to 120 MHz, typ. to 160 MHz

**Minimum Pulse Duration:** 4 ns

**Coupling:** AC or dc

**Impedance:** 1 M $\Omega$ /35 pF

**Channel Input:** Separate A and B, or common via A

**Maximum Voltage Without Damage:** 350V (dc + ac peak) between 0 Hz and 440 Hz, falling to 8V rms at 1 MHz

**Sensitivity, DC-Coupled**

**Sine:** 20 mV rms, 0 Hz to 30 MHz; 40 mV rms, 30 MHz to 120 MHz

**Pulse:** 60 mV p-p, 0 Hz to 30 MHz; 110 mV p-p, 30 Hz to 120 MHz; sensitivity decreases to 60 mV rms at 160 MHz typically

**Sensitivity, AC-Coupled**

Sensitivity is selectable in 6 steps: 20 mV, 50 mV, 100 mV, 200 mV, 500 mV and 1V rms (sine) nominal

**Maximum Sensitivity:** 20 mV rms, 20 Hz to 30 MHz; 40 mV rms, 30 MHz to 120 MHz; sensitivity decreases to 60 mV rms at 160 MHz typically

**Attenuation:** x1 or x10, switch selectable or AUTO

**Trigger Slopes:** Positive or negative

**Trigger Level Range**

**DC-Coupled:** -51V to +51V, adjustable via up/down control

**AC-Coupled:** 0V fixed or AUTO level

**Trigger Level Resolution:** 20 mV, signals within  $\pm 5V$ ; 200 mV, signals outside  $\pm 5V$

**Trigger Level Setting Accuracy:**  $\pm 10$  mV  $\pm 1\%$  of setting

**AUTO Trigger Level:** Trigger Level on input A (and B when required) is automatically set to 50% of input signal amplitude.

**Frequency range:** 100 Hz to 120 MHz

**Trigger Indicators:** Tri-state LED indicators

**Input C** (Option PM 9608B)

**Frequency Range:** 70 MHz to 1.3 GHz

**Coupling:** AC

**Operating Input Voltage Range:** 10 mV rms to 12V rms, 70 MHz to 900 MHz; 15 mV rms to 12V rms, 900 MHz to 1100 MHz; 40 mV rms to 12V rms, 1100 MHz to 1300 MHz

**AM Tolerance:** 94% at max 100 kHz modulation frequency; minimum signal must exceed minimum operating input voltage requirement

**Input Impedance:** 50 $\Omega$  nominal, VSWR  $< 2:1$

**Max Voltage Without Damage:** 12V rms, overload protection with pin diodes

### External Reference Input

**Input Frequency:** 10 MHz  $\pm 0.1$  MHz

**Coupling:** AC

**Sensitivity:** 500 mV rms

**Input Impedance:** Approx 300 $\Omega$  at 10 MHz

**Maximum Input Voltage:** 15V rms

### Auxiliary Functions

#### RESET

The RESET button has three functions:

**RESET:** Starts a new measurement. The settings are not changed.

**LOCAL:** Makes the counter go to LOCAL operation, when in remote operation (unless Local Lock-Out is programmed).

**START/STOP:** Opens/closes the gate in TOTALIZE A, manual mode.

### Measuring Time

A measuring time of 0.2s, 1s, 10s or SINGLE can be selected

### Display Hold

The current measuring result is frozen on the display. A new measurement starts when the RESET button is pressed.

### Definitions

#### LSD Displayed

LSD = unit value of the least significant digit displayed. All calculated LSDs (see Measuring Functions section) should be rounded to the nearest decade (e.g., 0.3 Hz is rounded to 0.1 Hz and 5 Hz to 10 Hz) and cannot exceed the 9th digit.

#### Resolution

Resolution = smallest increment between two measuring results on the display, due to the  $\pm 1$  count error.

**Freq A, Freq C, Period A:** Resolution can be 1 LSD or 2 LSD if:

$$\frac{\text{LSD} \times \text{measuring time}}{\text{FREQ or PERIOD}} < 10^{-7}$$

the resolution is 2 LSD units (30% probability). Otherwise resolution is 1 LSD unit (70% probability).

**Ratio A/B:** Resolution can be 1 LSD or 2 LSD. If:

$$\frac{\text{LSD} \times \text{measuring time}}{\text{RATIO}} < \frac{10}{\text{FREQ A}}$$

the resolution is 2 LSD units (30% probability). Otherwise resolution is 1 LSD unit (70% probability).

**SINGLE Period A and SINGLE Ratio A/B:** Resolution equals 1 LSD unit

**Time A-B:** Resolution (95% confidence level) equals 1 LSD unit or 100 ns/ $\sqrt{N}$ , whichever is greater

### Inaccuracy

Inaccuracy, i.e., the relative error, depends on the following factors:

$$\pm \frac{\text{Resolution}}{\text{FREQ, PERIOD RATIO or TIME}}$$
$$\pm \text{relative trigger error}$$
$$\pm \text{relative time base error}$$
$$\pm \text{relative systematic error}$$

#### Relative Trigger Error

**Freq A, Period A:**

$$\pm \frac{\text{noise voltage A (V p-p)}}{\text{signal slope A (V/s)} \times \text{meas time}}$$

**Ratio A/B:**

$$\pm \frac{\text{noise voltage B (V p-p)}}{\text{signal slope B (V/s)} \times \text{meas. time}}$$

### Totalize A, Gated or Start/Stop by B:

± noise voltage B (V p-p)  
signal slope B (V/s) x gate time B

### Time A-B:

± noise voltage A (V p-p)  
signal slope A (V/s) x TIME x  $\sqrt{N}$   
± noise voltage B (V p-p)  
signal slope B (V/s) x TIME x  $\sqrt{N}$

### Relative Time Base Error:

deviation from 10 MHz  
± 10 MHz

**Relative Time A-B Systematic Error:** Inaccuracy caused by timing difference between A and B channels  $<\pm 4$  ns/TIME

## General Specifications

### Power Requirements

**Line Voltage:** 115V or 230V rms  $\pm 15\%$ ; 46 Hz to 440 Hz;  $<22$  VA (PM 6665); resp  $<24$  VA (PM 6666) including all options

**Safety:** In accordance with IEC 348 Class I and CSA 556B

**Line Interference:** Below VDE 0871 B and MIL STD 461

**Battery Unit:** See PM 9605 option

| Oscillator Version  | Standard            | MTCXO               |
|---------------------|---------------------|---------------------|
| Stability Against   |                     |                     |
| Aging               |                     |                     |
| Per Month           | $<5 \times 10^{-7}$ | $<1 \times 10^{-7}$ |
| Per Year            | $<5 \times 10^{-6}$ | $<5 \times 10^{-7}$ |
| Temperature         |                     |                     |
| Changes 0°C to 50°C | $<1 \times 10^{-5}$ | $<2 \times 10^{-7}$ |
| Line Voltage        |                     |                     |
| Changes 10%         | $<1 \times 10^{-8}$ | $<1 \times 10^{-9}$ |

### Display

**Readout:** 9-digit LCD with unit and cursor indication

**GATE Indicator:** Indicates that the counter is measuring

**REMOTE Indicator:** Indicates when the counter is remotely controlled via an installed GPIB/IEEE-488 interface (PM 9604)

### Environmental Data

#### Temperature

**Operating:** 0°C to +50°C  
**Storage:** -40°C to +70°C

#### Altitude

**Operating:** 5000m (53.3 kN/m<sup>2</sup>)  
**Storage:** 15,000m (15.2 kN/m<sup>2</sup>)

#### Humidity

**Operating:** 10% to 90% RH, no condensation  
**Storage:** 5% to 95% RH

### Mechanical Data

**Size:** 186 mm W x 88 mm H x 270 mm L (7.3 in W x 3.5 in H x 10.6 in L)

**Weight:** 2.1 kg (4.6 lb)

## Optional Accessories

### GPIB/IEEE-488 Interface, PM 9604

**Mounting:** Inside counter cabinet

**Interface Functions:** SH1, AH1, T5, L4, SR1, RL1, DC1, DT1, E2

### Max Data Output Rate

**Normal Mode:** Approx 5 readings/s

**High-Speed Dump:** Approx 100 readings/s. The highest output rate is obtained at SINGLE measuring time.

**High-Speed Dump:** The contents of the counting registers are transferred to the controller, without being processed by the counter. The processing must be done in the controller instead.

### Output Time for Measuring Data

**Normal Mode:** Approx 9 ms (20 bytes)

**High-Speed Mode:** Approx 4 ms (15 bytes)

**Response Time for Addressing:** Approx 600  $\mu$ s

**Response Time for Trigger Command (GET):** Approx 10 ms

### Typical Read Time for Programming Data:

Approx 1 ms/byte

### Battery Unit PM 9605

The PM 9605 is a rechargeable battery unit for mounting inside the counter. The unit contains a standard 6V sealed lead-acid battery and an automatic battery charger.

**Battery Capacity (20°C):** Approx 15 Wh

**Operating Time When Battery Powered:** Approx 2 hours (PM 6666) or 2.5 hours (PM 6665) of continuous operation

**Recharging Time:** 5 hours to approx 75% of full capacity

**Battery Protection:** Overcharge protection and deep discharge (auto shut-off) protection

### Temperature

**Operating:** 0°C to +40°C

**Storage:** -40°C to +50°C

**Weight:** 0.8 kg (1.8 lb)

### Carrying Case PM 9609

The PM 9609 is a leather-like carrying case, for protection of the counter during transportation.

## Ordering Information

### Models

PM 6665 Timer/Counter

PM 6666 Timer/Counter

### Included with the Instrument

One-year product warranty, line cord, operator manual, and Certificate of Calibration Practices.

### Optional Configurations

When ordering, select basic "PM" Model desired from above, plus construct a 3-digit/suffix by selecting 1-digit in each suffix column to identify Input Frequency, Reference Oscillator, and Interface.

### Input Frequency Option

/0-- Standard 160 MHz

/4-- 1.3 GHz (PM 9608B/00)

### Reference Oscillator Option

/1- Standard

/3- MTCXO (PM 9607/00)

### Interface Option

/--1 Standard line voltage, non GPIB/IEEE-488

/--3 Battery (PM 9605/00)

/--6 GPIB/IEEE-488 (PM 9604/00)

### Example, Ordering Configuring

To order the PM 6666 with standard 160 MHz input, MTCXO Oscillator, and standard interface, select:

| Configuration                | Model       |
|------------------------------|-------------|
| Option Suffix - Input        | PM 6666     |
| Oscillator                   | /0--        |
| Interface                    | /--3        |
|                              | /--1        |
| Yields Complete Model Number | PM 6666/031 |

### Options and Accessories

PM 2255/001 Instrument Driver Software

PM 9581/01 50 $\Omega$  Termination 3W

PM 9585/01 50 $\Omega$  Termination 1W

PM 9604/00\* GPIB Interface

PM 9605/00\* Battery Unit

HM 9606/00 Rack Kit for PM 6665/6 and

8840A/42A, PM 2525/34/35 DMMs

HM 9606/01 Rack Kit for PM 6665/6

PM 9607/00 MTCXO Time Base

PM 9608B/00 1.3 GHz HF-Input

PM 9609 Carrying Case

PM 9665B/01 50 kHz Low-Pass Filter

BNC-BNC (for PM 6666)

All options can be field installed by the user.

\*The GPIB interface PM 9604 and the battery unit PM 9605 cannot be installed together in a PM 6665/66 counter.

### Manuals

PM 6665 Operator\*

PM 6666 Operator\*

PM 6665/66/69 Pocket Guide

PM 6665/66 Service

\*No charge with purchase of unit

## Customer Support Services

Also see Section 20.

### Factory Warranty

One-year product warranty.



AVAILABLE THROUGH  
DISTRIBUTORS