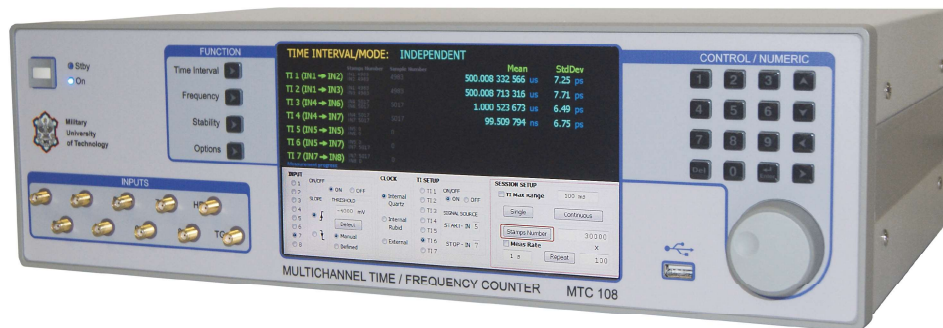


Time/Frequency Counter Model MTC 108

High Performance Autonomous Multichannel Time Interval Counter

- ◆ Eight precise measurement channels
- ◆ Time interval measurement range: **> 1 hour**
- ◆ Precision (standard deviation) **< 6.5 ps** at time interval measured from 0 to 1 ms
- ◆ Frequency range up to **3.5 GHz**
- ◆ Measurement rate **$11 \cdot 10^6$ time stamps./s** per channel
- ◆ Five time measurement modes that increase precision or measurement rate
- ◆ Measurement of Allan Deviation (ADEV), Time Interval Error (TIE), Maximum Time Interval Error (MTIE) and Time Deviation (TDEV)
- ◆ Selectable pulse edge and polarity
- ◆ Selectable input threshold level or automatic threshold search
- ◆ User friendly front panel interface
- ◆ Remote control with the use of USB/Ethernet/RS-232/RS-485 interfaces
- ◆ **Easy export of data to USB stick**
- ◆ Built-in automatic calibrator
- ◆ Built-in highly stable rubidium generator (optional)
- ◆ Dedicated inputs for external trigger and 10 MHz clock

VERSATILE TIME INTERVAL COUNTER WITH PICOSECOND PRECISION

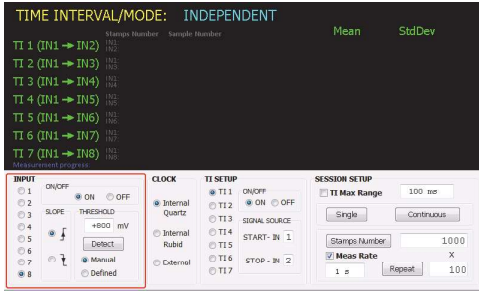


MTC108 is a unique, state of the art, autonomous system for high-precision metrology of time and frequency. This system allows for: (1) fast and accurate registering of physical events on a common time scale; (2) measuring the time intervals between any registered events; (3) measuring the frequency within a wide range; (4) evaluating the stability of frequency sources, especially reference atomic clocks; (5) transferring the measurement data for further external processing. A user-friendly control of the system is provided either locally, through the built-in keyboard or/and color touch panel, or remotely, with the aid of USB or Ethernet interfaces. The successful combination of programmable devices technology and sophisticated measurement method results in the broad functionality and exceptional parameters that meet the virtually all fundamental needs of time/frequency laboratory or Automatic Test Equipment environment.

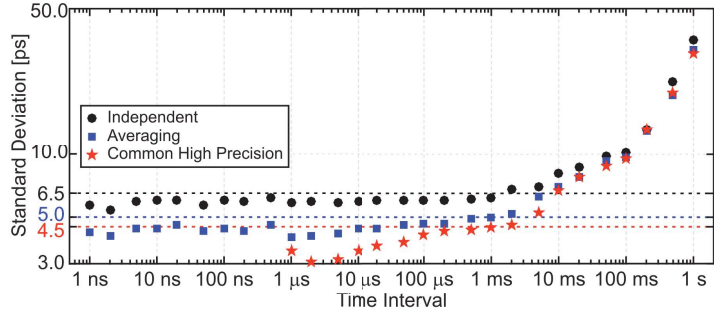


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Display in Time Interval mode



Precision (Standard Deviation of TI measurements)

Specifications

Functions

Time Interval (between pulses at up to eight inputs or pulses appearing consecutively at a single, common input)

Time Interval Error, Maximum Time Interval Error, Time Deviation

Frequency

Allan Deviation

Statistics

Mean, Min and Max Values, Standard Deviation

Time Interval

Range

73 min

Resolution (LSB)

1.9 ps in single-shot measurements, Independent, Common High Speed and Source Comparison modes

0.95 ps in single-shot measurements, Averaging Mode

0.67 ps in single-shot measurements, Common High Precision Mode

Precision (Standard Deviation)

< 6.5 ps at time interval measured from 0 to 500 μ s (internal rubidium)

up to 4.5 ps in Common High Precision mode

Systematic Error

< $\pm (1 \text{ ns max} + (\text{Timebase Error} \times \text{Interval}) + \text{Trigger Level Timing Error})$

Range Limit (Overflow)

presettable: 1 s, 10 s, 100 s, 1000 s (*w liczniku jest od 100ms do 10s!*)

Start Enable

internal (controlled by software)

Dead Time

< 90 ns

Measurement Rate

up to $11 \cdot 10^6$ time stamps/sec/channel

up to $50 \cdot 10^6$ time stamps/sec (Common High Speed, consecutive pulses delayed less than 10 ns to)

up to $90 \cdot 10^6$ time stamps/sec (Common High Speed, consecutive pulses delayed less than 10 ns to)

up to $250 \cdot 10^6$ time stamps/sec (Common High Speed, first 8 pulses)

Frequency & Period

Range

Inputs 1 - 8: 1 MHz to 250 MHz

Sensitivity < 75 mV RMS typ. (0.01 to 250 MHz)

Minimum slew rate: 10 V/ μ s

Input F: 100 MHz to 3.5 GHz

Sensitivity < -12 dBm (< 55 mV RMS) from 400 MHz to 3 GHz

Sensitivity < -3 dBm (< 160 mV RMS) from 100 MHz to 3.5 GHz

Gate Time

selected from 1 μ s to 10 s (reciprocal method)

Dead Time

0 ns between consecutive measurements

Measurement Rate

up to 10^6 measurements/sec (depends on selected gate)

Inputs 1 - 8

Impedance: 50 Ω , DC coupled; SMA sockets

Amplitude: within ± 4 V

Pulse edge: selectable, rising or falling

Threshold: manually adjustable from -4 V to +4 V with 8 mV resolution, or set automatically

Internal Clock Generator

10 MHz TCXO, stability 5×10^{-7} (-40 to +85 $^{\circ}$ C), ageing 1×10^{-6} /year

10 MHz rubidium (optional), stability 2×10^{-11} (-55 to +85 $^{\circ}$ C), ageing 5×10^{-10} /year

External Clock Generator

10 MHz, min. 100 mV on 50 Ω input impedance, DC coupled; SMA socket

Capacity of on-board memory

32 M time stamps

Interfaces

USB

Type A and B, USB 2.0

Ethernet

RJ-45

Series

RS-232/RS-485

Power Supply

230 V, 50 Hz, 100W

Software

example program and documentation (*Programming Manual*)

Size

444 (L) \times 137 (W) \times 330 (H) mm / Rack 19" 3U

Weight

8 kg (9,7 kg with build-in rubidium clock)