

August 14<sup>th</sup>, 2005

*Low Cost/Profile High Resolution Frequency Stability Measurement Test Set*

## **Pico Second Resolution Test Set**

**Easy-to-Use RF Device & User-Friendly Windows Software**



**Calibration | Oscillator/Clock Characterization | TIE Measurements | Instrument**

### **Applications**

**PicoTime Product Characteristics:**

- Power supply voltage : External 230V~/50Hz to +12V DC
- Small volume : 168 x 103 x 42 mm
- DUT Frequency Range : 1 MHz – 30 MHz
- Reference Frequency : 10 MHz
- Phase time resolution and noise :  $\leq 2\text{ps rms}$
- Input Signal Level; : +3dBm to +17dBm
- No calibration required
- Port : Standard PC (COM1 to COM4)
- Software : Windows 98, XP

**Main Features :**

- Easy to use
- Small volume
- High resolution
- COM standard interface
- Automatic operation
- Low noise performance
- External counter compatible
- User friendly software

**Main Applications :**

- Clock characterization such as quartz crystal oscillator, Rubidium atomic clocks and cesium clocks
- Network Time Interval Error (TIE)
- Calibration of quartz crystal oscillator, and atomic clocks

**System Description :**

The system is designed to make a direct frequency measurement in comparison with an external 10 MHz frequency reference. Picotime is based on a heterodyne system using direct digital synthesizer (DDS) technology to allow measurements in the range of up to 30 MHz. The external 10MHz reference divided by  $2 \times 10^7$  is used to make time interval measurement each second

Direct frequency measurement is used for programming DDS. The DDS divides the device frequency around 1KHz by using two mixers. As indicated in the block-diagram, the whole system is based on a heterodyne architecture with a double frequency conversion.

Three outputs are available:

- 1KHz where a crystal filter based PLL is used to restrict the bandwidth to only 1Hz
- 1KHz with about several 100KHz bandwidth.
- 1PPS reference

The system is controlled with the PC COM interface. When connecting an external counter, other types of measurements can be performed. The power is supplied by an external power supply converter (230V~/50Hz to +12V DC).

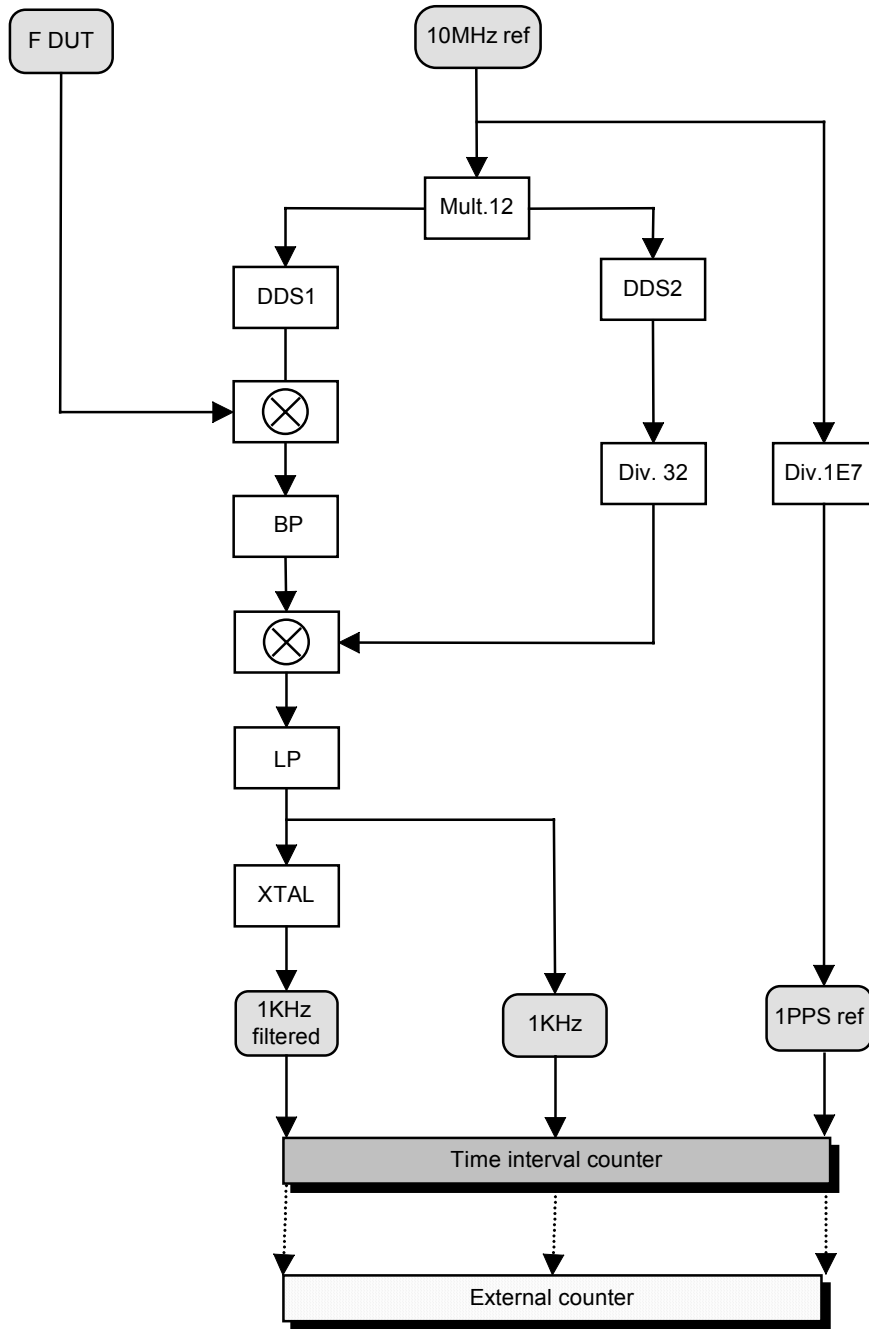


Fig.1 : Block diagram

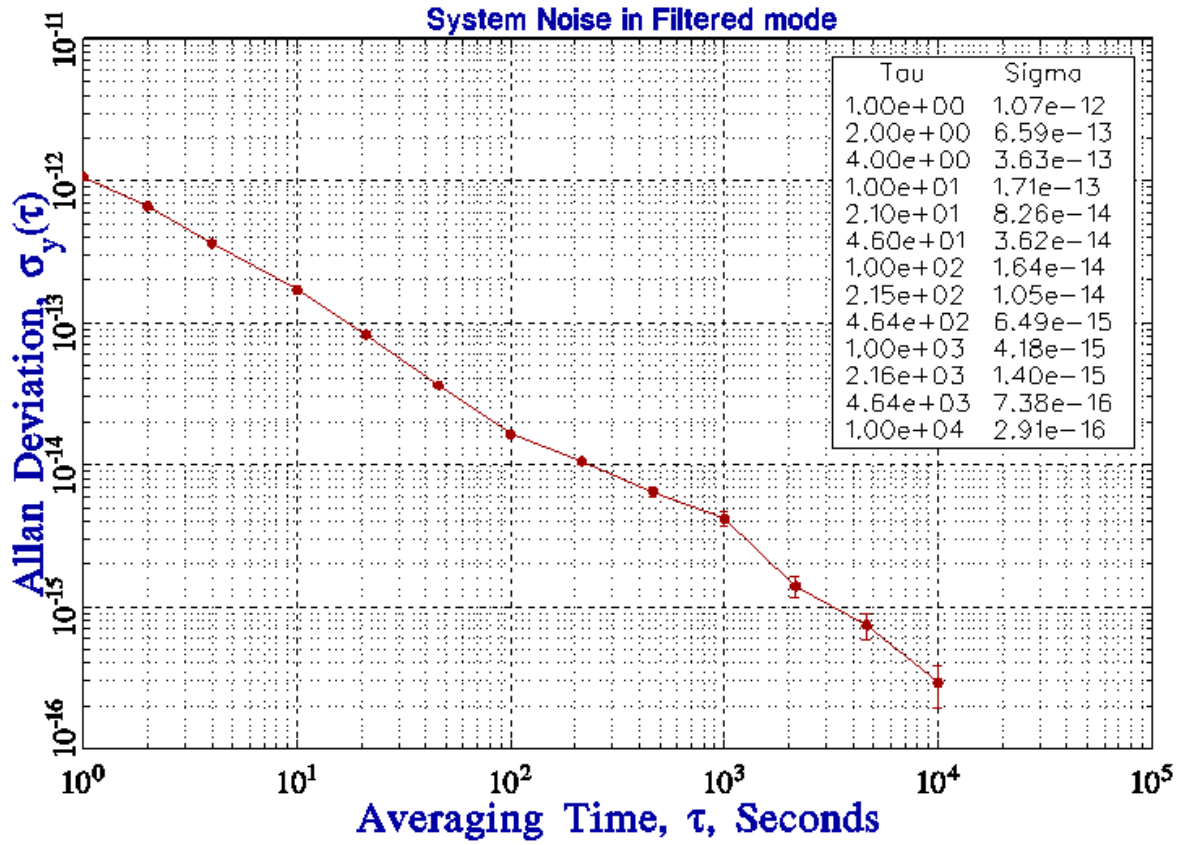


Figure 2 : System Noise in ideal conditions



Fig. 3 : PicoTime open box showing RF circuitry

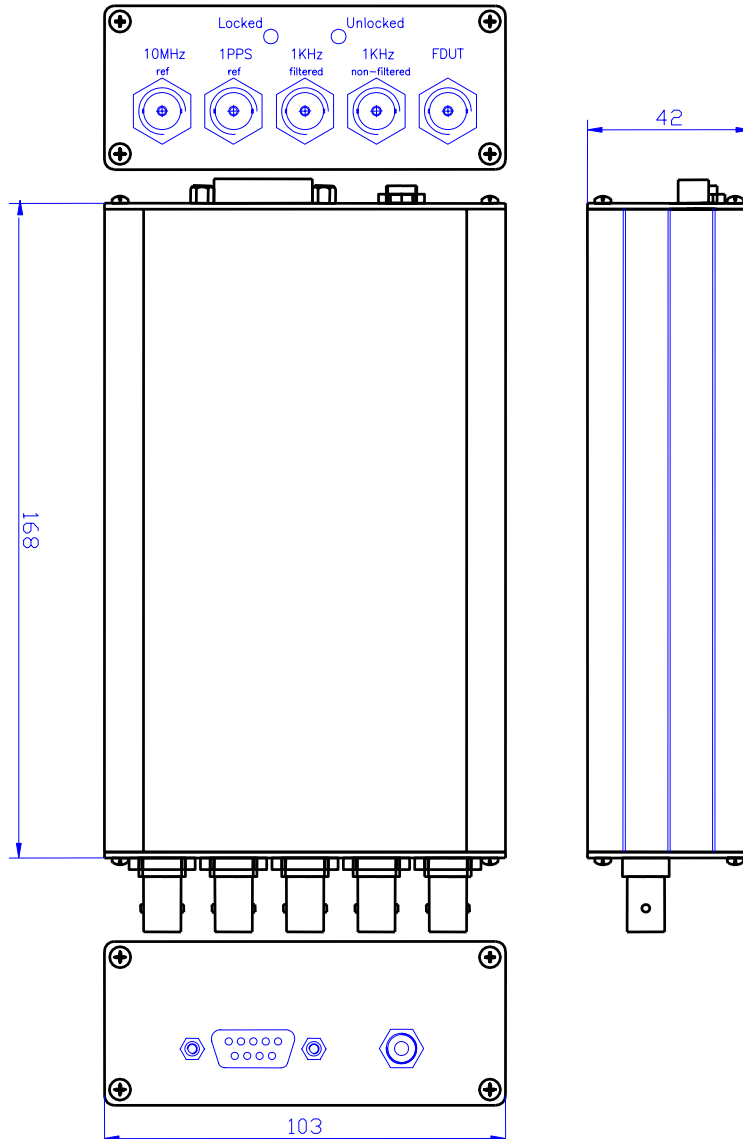


Fig.4: Mechanical

**SPECIFICATIONS**

**ELECTRICAL:**

Type	PICOTIME
	<b>Standard version</b>
DUT Center Frequency Range	1 MHz – 30 MHz
Measurement Noise in filtered mode (1Hz bandwidth)@10MHz (Maximum Relative Frequency Deviation During Measurements < 1x10 <sup>-9</sup> )	< 2ps
Measurement Noise in unfiltered mode (> 3 KHz bandwidth) @10MHz (Maximum Relative Frequency Deviation During Measurements < 1x10 <sup>-7</sup> )	< 10ps
Reference Frequency	10 MHz
Typical System Noise @10MHz (± 0.5°C very low temp. Change during measurement)	See typical measurement fig. 3
Phase time sensitivity versus temperature	< 20ps / °C
Input Signal Level	+3 dBm to 17 dBm
Input Impedance	50 Ohms
Connector Type	BNC
PC Port	Standard – Serial (COM1 or COM2 or COM3 or COM4)

**ENVIRONMENT:**

Type	PICOTIME	
	Temperature	Relative Humidity
Operating	15 to 30°C	10% - 85%
Storage	-25 to 55°C	
Transportation	-25 to 70°C	

**POWER REQUIREMENTS:**

Type	PICOTIME
	<b>Standard version</b>
Power Supply	External Converter
Input	100-240V~ 50/60 Hz
Output	12V- 2,92A
Power Input Fluctuation	±10% of nominal supply voltage (230V~)
Input Frequency	47 – 63 Hz
Power Consumption @25°C	< 10W after warm-up
Connector Type	+12V- Jack
	230V~ IEC plug

**PHYSICAL:**

Type	PICOTIME
	<b>Standard version</b>
Size	168 x 103 x 42 mm
Weight	0.8 Kg

**UNIT SUPPLY:**

Type	PICOTIME
	<b>Standard version</b>
1x	PICOTIME FSMS unit
1x	Power supply 230V~50Hz / 12V DC
1x	Cable SUB-D male/female for PC serial COM
1x	Software – PICOTIME installation on CD-ROM
1x	Software – Stable32 ( <b>Option code ST32</b> ) on CD-Rom
1x	Operating Manual + Specifications on CD-Rom
1x	Euro Power cable
1x	US Power cable

**SOFTWARE UPGRADES:**

**PICOTIME**

The latest software upgrades can be down loaded – free of charge from the TNT web page <http://www.spectratime.com>

**Ordering Information :**

