Low Cost/Profile High Resolution Frequency Stability Measurement Test Set

Pico Second Resolution Instrument
Easy-to-Use RF Device & User-Friendly Windows Software

APPLICATIONS

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

PicoTime-1U Product Characteristics

●● Power supply voltage : AC input 85-264VAC / 47-63Hz

●● Compact : 1U rack mount chassis

●● DUT Frequency Range : 1 MHz – 30 MHz

●● Reference Frequency : 10 MHz

●● Phase time resolution and noise : $\leq$ 2ps 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 crystal and rubidium oscillators and cesium source.
- Short term stability measurements
- Phase comparator
- 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-1U 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 2×10^7 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.

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Fig.1 : Block diagram

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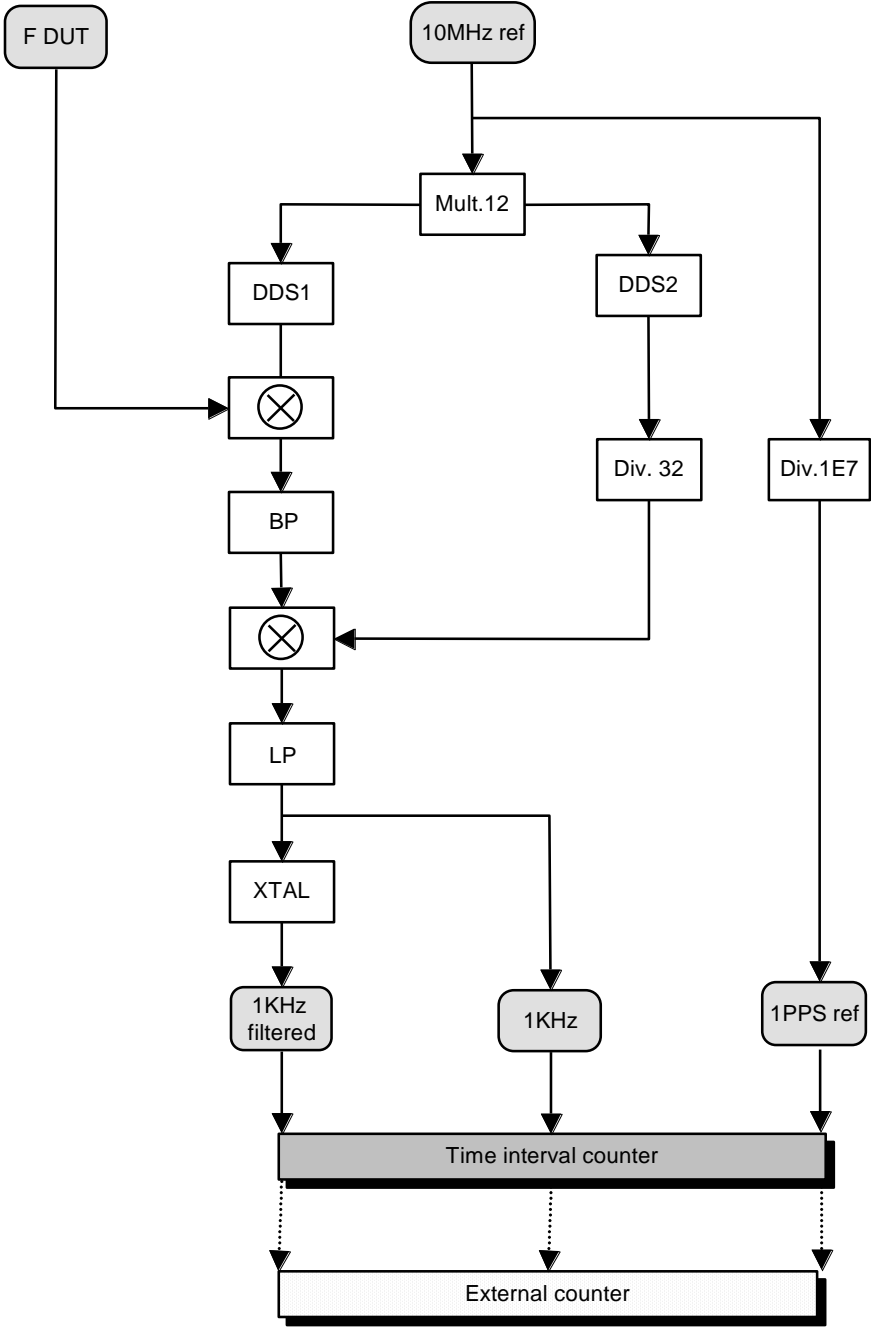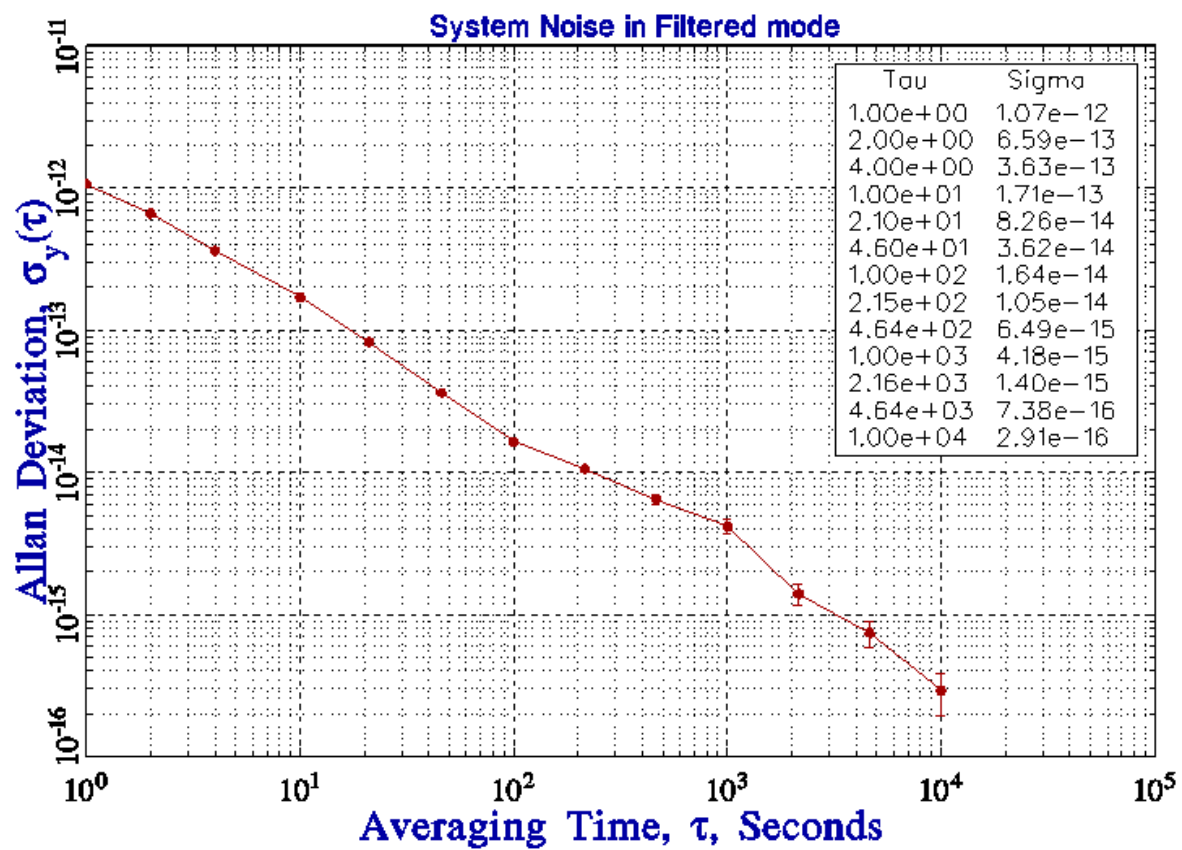
Figure 2 : System Noise in ideal conditions

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Fig.4: Mechanical

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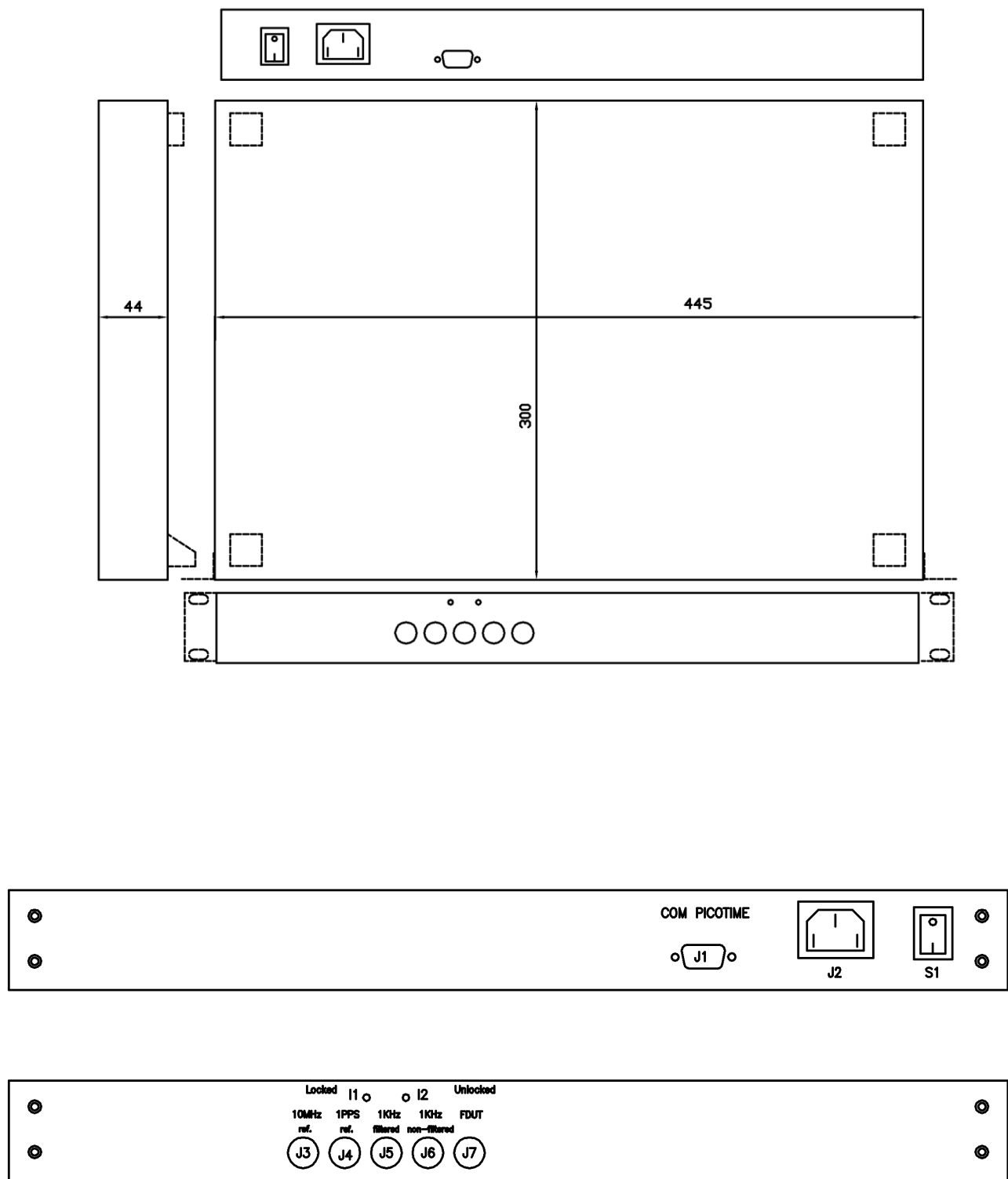
SPECIFICATIONS

ELECTRICAL

Type	PICOTIME-1U
	Standard version
DUT Center Frequency Range	1 MHz – 30 MHz
Measurement Noise in filtered mode (1Hz bandwidth)@10MHz (Maximum Relative Frequency Deviation During Measurements < $1x10^{-9}$)	< 2ps
Measurement Noise in unfiltered mode (> 3 KHz bandwidth) @10MHz (Maximum Relative Frequency Deviation During Measurements < $1x10^{-7}$)	< 10ps
Reference Frequency	10 MHz
Typical System Noise @10MHz ($\pm$ 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 grounded to chassis & earth
PC Port	Standard – Serial (COM1 or COM2 or COM3 or COM4)

ENVIRONMENT

Type	PICOTIME-1U	
	Temperature	Relative Humidity
Operating	15 to 30°C	10% - 85%
Storage	-25 to 55°C	
Transportation	-25 to 70°C	

POWER REQUIREMENTS

Type	PICOTIME-1U
	Standard version
Power Supply	AC input 85-264VAC
Power Input Fluctuation	$\pm$10% of nominal supply voltage (230V~)
Input Frequency	47 – 63 HZ
Power Consumption @25°C	< 10W after warm-up
Connector Type	IEC plug

PHYSICAL

Type	PICOTIME-1U
	Standard version
Size	445 x 300 x 44 mm (1U)
Weight	3.5 Kg
Mounting	Tabletop feet Option: 19" rack mountable ears (ordering code: E)

UNIT SUPPLY

Type	PICOTIME-1U	
	Standard version	
1x	Instrument unit	
1x	Cable SUB-D male/female for PC serial COM	
1x	Software – installation	
1x	Software – Stable32 (**Option code ST32**)	
1x	Operating Manual + Specifications	
1x	Euro Power Cable Standard	US Power Cable **(ordering code: US)** China Power Cable **(ordering code: CN)** Swiss Power Cable **(ordering code: CH)** Indian Power Cable **(ordering code: IN)**

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SOFTWARE UPGRADES

PICOTIME-1U
Download the latest software upgrades at http://www.spectratime.com

Ordering Information

PicoTime-1U / RS / ST32

Type   option   Stable32

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