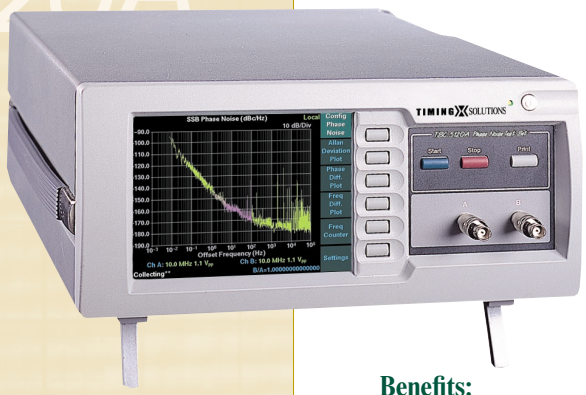
TIMING SOLUTIONS™

Direct-digital methods make SSB phase-noise measurements easy.



Benefits:

- Easy to learn and use: graphical user interface
- Simple, automatic operation: reduces need for skilled technicians
- Instant, real-time display of measurement results
- Reliable results: accurate, repeatable measurements
- No extra data processing: instant SSB phase noise calculations
- Saves time: preconfigured and self-calibrating
- Cost-effective solution: no additional hardware required
- Portable: weighs less than 10 kg
- Rapid data transfer: TCP/IP Ethernet port

TSC 5120A Phase Noise Test Set

With the advent of the TSC 5120A Phase Noise Test Set, Timing Solutions has successfully combined sophisticated timing technologies into a single advanced instrument for the measurement of single sideband (SSB) phase noise. The low-noise bench-top instrument combines the latest analog-to-digital converter, digital synthesizer, and cross-correlation techniques to capture precise, accurate SSB measurements.

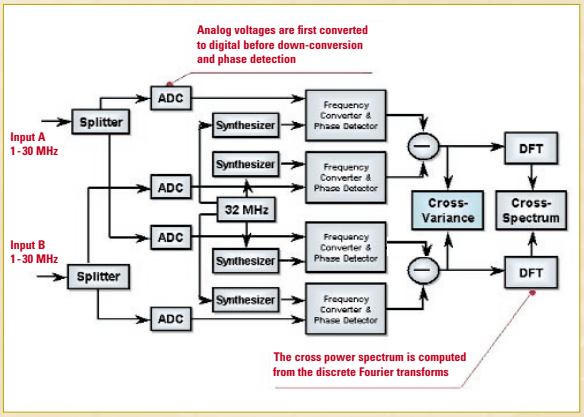
Breakthrough Ease of Use

The TSC 5120A is the first completely self-contained instrument of its kind to reduce this highly specialized, scientific task to a level manageable by a technician, in part because the system is preconfigured and includes self-calibration capabilities. Most other test sets must be calibrated before taking a measurement, but the TSC 5120A entirely eliminates this procedure with its built-in self-calibration. The straightforward, easy-to-learn user interface is another advantage, vastly improving the TSC 5120A's accessibility when compared with functionally equivalent instruments on the market. The VGA color LCD clearly displays phase noise data out to 100 kHz, including spurious levels and frequencies. The TSC 5120 breaks new ground for close-in phase-noise measurements, providing data for offset frequencies at 1 mHz and below. Finally, the TSC 5120A is compact and portable, and does not require any additional software or hardware in order to capture and analyze signal data.

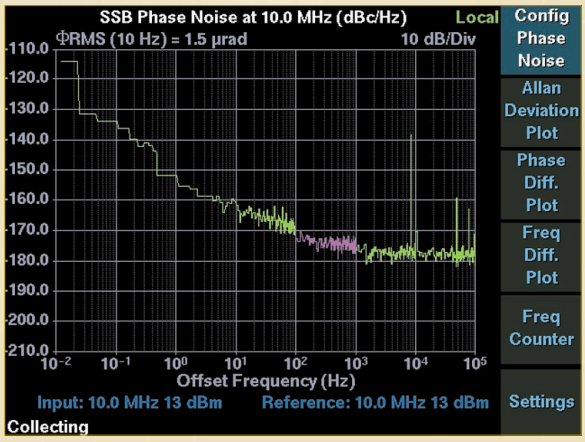
Operation

The TSC 5120A makes phase noise measurements using an extension of the usual technique – directly converting quadrature input signals to base-band – by mixing in a phase detector. Traditional phase noise measurement equipment requires equal frequency signals and external circuitry, such as phase-lock loops, to maintain the required input phase relationship. In contrast, the TSC 5120A directly converts the RF input signals to digital samples 64 million times per second. All subsequent down conversion and phase detection are performed by digital signal processing. The use of the arctan function as a phase detector results in infinite range and eliminates all need for phase locking the input source. The single-sideband phase noise is computed from two independent phase-difference measurements, using cross correlation in order to suppress the noise of the internal synthesizers. As a result, the TSC 5120A makes completely automatic, self-calibrating, state-of-the-art phase-noise measurements on any two input signals within a frequency range of one to 30 MHz, without any restrictions or operator set-up required.

BLOCK DIAGRAM



SCREEN SHOT



Specifications

Performance

SSB phase noise @ 10 MHz
< -145.0 dBc/Hz at 1 Hz
< -175.0 dBc/Hz at 10 kHz

Electrical

Frequency range
1- 30 MHz

Input signal level
3 dBm - 17 dBm

Input impedance
50 ohms

Input connectors
TNC (supplied with two BNC adapters)

USB (2)

LAN
Ethernet-controllable
10 or 100 base T

Physical

Weight
9.0 kg (20 lbs.)

Size
33.8 cm x 17.4 cm x 43.7 cm
(13.3" x 6.84" x 17.2")

Power Requirements

Input voltage
85 - 264 V~

Input frequency
47 - 63 Hz

Power consumption
60 W (max)

Connector type
IEC plug

Environmental

Temperature
15 - 40 degrees C (operational)
-25 - 55 degrees C (storage)

Options

OP001 Rack Mount