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3 GHz RF Signal Analyzer

ZT002PXI

- Three-in-one RF instrument
- Frequency range of 100 MHz to 3 GHz or 10 KHz to 500 MHz (Option 1)
- Frequency counter
- Peak power meter
- Time interval analyzer
- Flexible instrument configuration
- External synchronization input and output

Calibration Certificate Included

Driver Software

- National Instruments LabVIEW™



Overview

The ZT002PXI is a three-in-one PXI/CompactPCI instrument for ATE and field measurement of telecommunication and radar systems. Its 3 GHz frequency range covers the commercial telecommunication frequencies of cell-sites, base-stations, wireless modems, and digital radio links.

Testing, installing and maintaining RF systems typically requires three pieces of equipment including a frequency counter, a peak power meter, and a time interval analyzer. The ZT002PXI provides all three functions and can be added to a portable PXI chassis to reduce the cost, weight, size, and complexity of carrying multiple pieces of equipment into the field.

In ATE systems, valuable rack space and PXI slots can be saved with this miniature three-in-one instrument. The ZT002PXI is the first instrument to offer RF functions in PXI and comes with a

complete LabVIEW™ software interface that allows the user to begin taking RF measurements immediately.

Three-In-One RF Instrument

The ZT002PXI adds RF signal analysis capabilities to PXI/CompactPCI test sets by combining three of the most common measurements into one instrument. The single-wide, 3U PXI/CompactPCI card combines the functions of a frequency counter, peak-power meter, and time-interval analyzer. In ATE systems, the three-in-one ZT002PXI will save valuable PXI slots and rack space.

3 GHz RF Signal Analyzer

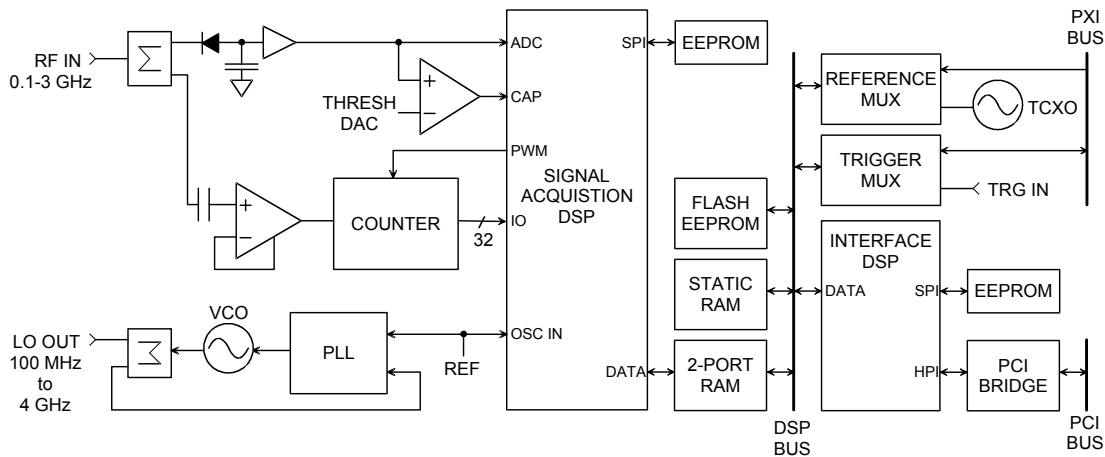


Figure 1: ZT002PXI block diagram

General Purpose ATE Measurements

For measurements used in RF component and RF assembly testing, the three-in-one ZT002PXI processes a continuous or pulsed RF signal up to 3 GHz.

The RF input is processed in parallel using an RF counter that measures frequency, a calibrated envelope detector that measures peak power, and time-capture circuitry that measures the pulse width and pulse repetition interval. Because the acquisition time is selectable between 100 nanoseconds and 1.25 seconds, measurement resolution and speed can be optimized for each application.

For better measurement accuracy over time and temperature, the PXI backplane clock can be selected as the reference timebase.

Pulsed RF Signal Analysis

Pulsed RF systems, such as radars, can be quickly characterized with the ZT002PXI. The

ZT002PXI is able to capture RF bursts as short as 100 nanoseconds.

In addition to measuring frequency and peak power, time-capture circuitry measures the width and repetition interval (PRI) of a pulsed RF input. Complex pulsed input signals such as radar triplet pulses can be acquired and characterized. An on-board digital signal processor performs the measurements of pulse-width, PRI, frequency, and peak power in less than 100 microseconds.

On-board memory allows the acquisition and analysis of multiple subsequent RF pulses without any lost data. This allows each and every RF pulse to be captured and downloaded over the PCI bus in block transfers. The continuous, non-interrupted data acquisition and download allows signals to be characterized in real-time, continuously and indefinitely for applications in electronic intelligence gathering and electronic signal characterization.

3 GHz RF Signal Analyzer

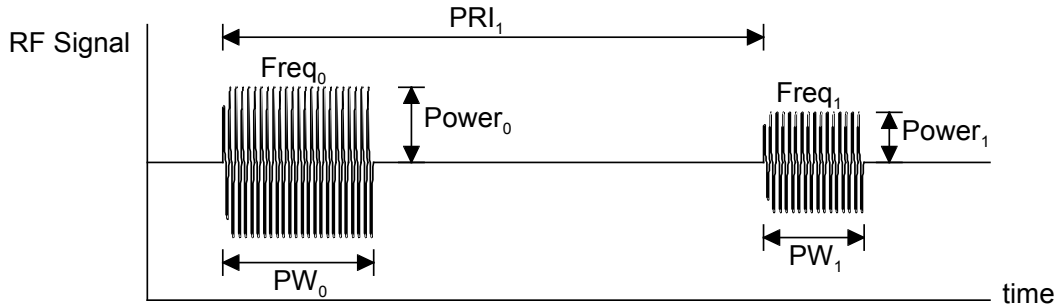


Figure 2: ZT002PXI measurements

Optional Fixed Local Oscillator Output

An optional phase-locked loop based fixed Local Oscillator (LO) output up to 4 GHz is also available on the ZT002PXI. The LO output can be used for signal generation or signal downconversion to extend the ZT002PXI input frequency range using an external mixer. Contact factory for options.

Driver Software

To enable quick and simple system integration with other PXI instruments, LabVIEW™ application software and drivers are provided with the ZT002PXI. This application software allows

continuous, non-interrupted RF data to be captured, downloaded and displayed on the graphical user interface.

Ordering Information

Standard Configuration

PXI ZT002PXI-00

Options

Low Frequency PXI ZT002PXI-01

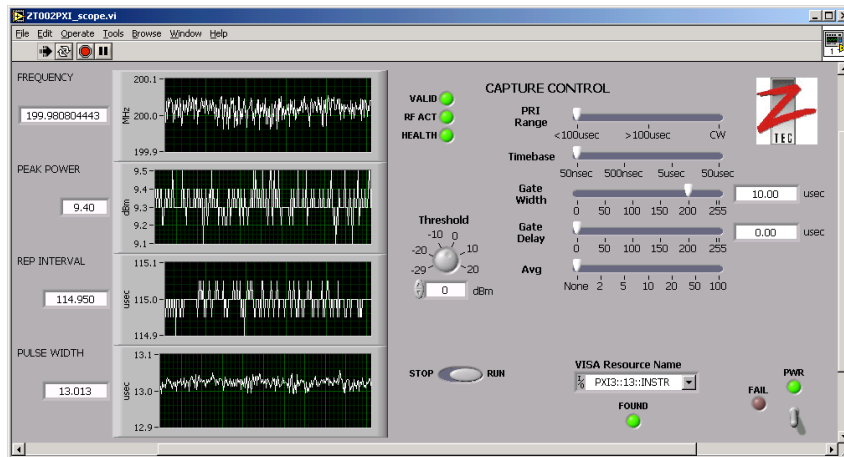


Figure 3: ZT002PXI LabVIEW™ application software

3 GHz RF Signal Analyzer

Performance Characteristics

RF Input

Frequency	100 MHz to 3.0 GHz
Signal Range	-34 dBm to +16 dBm
Input Impedance	50 Ω
Input Coupling	AC
Input Connector	SMA
Input VSWR	< 1.2:1 0.1 to 2.5 GHz < 1.4:1 2.5 to 3.0 GHz
Modulation	Continuous Wave or Pulsed

Low Frequency RF Input (Option 1)

Frequency	10 kHz to 500 MHz
Signal Range	-34 dBm to +16 dBm
Input Impedance	50 Ω
Input Coupling	AC
Input Connector	SMB
Input VSWR	< 1.4:1
Modulation	Continuous Wave or Pulsed

RF Frequency Measurements

Acquisition Gate	100 nanoseconds to 1.25 seconds
Range	100 MHz to 3.0 GHz 10 kHz to 500 MHz (Option 1)
Resolution	1 Hz
Relative Accuracy	9 digits/second (0.001 ppm/s)
Absolute Accuracy	0.001 ppm/s + timebase accuracy
Internal Timebase	± 2.5 ppm
PXI Timebase	Timebase accuracy can be improved to ± 0.001 ppm with PXI reference

Peak Power Measurement

Range	-34 dBm to +16 dBm
Resolution	± 0.01 dB
Accuracy	± 0.25 dB (-20 dBm to +10dBm) ± 1.00 dB (-34 dBm to +16 dBm)

Low Frequency Peak Power Measurement (Option 1)

Range	-34 dBm to +16 dBm
Resolution	± 0.01 dB
Accuracy	± 0.5 dB (-20 dBm to +10dBm) ± 1.0 dB (-34 dBm to +16 dBm) ± 2.5 dB < 20 MHz

RF Pulse Width Measurements

(Pulse-Modulated Inputs)

Minimum Width	100 nanoseconds
Accuracy	± 1 nanosecond
Resolution	1 nanosecond

RF Pulse Repetition Interval Measurements

(Pulse-Modulated Inputs)

Minimum PRI	100 microseconds
Accuracy	± 1 nanosecond
Resolution	1 nanosecond

Data Acquisition

Acquisition	Programmable Aperture Window, Aperture Delay, Signal Threshold
Auto Detect	Automatic Detection & Control of Aperture Window & Signal Threshold
Data Processing	< 100 microseconds for complete measurement
Data Memory	32 kbytes for multiple RF pulse acquisition

Reference Input

Clock Source	Internal TCXO, PXI Backplane
Internal TCXO	± 2.5 ppm accuracy

Trigger

Trigger Source	Front Panel, PXI Backplane, Software
Trigger Edge	Rising or Falling
External Trigger	Trigger Input or Output
Trigger Input	TTL Compatible, 10 k Ω Input Impedance, SMB Connector
Input Function	Synchronous Data Acquisition
Trigger Output	TTL Compatible into 50 Ω , SMB Connector
Output Function	Acquisition Window for Detected RF Envelope

PXI Interface

PCI Interface	33 MHz, 32-bit Address, 16-bit Data
PCI Voltage	Universal, +3.3V or +5V
PCI Compatibility	Version 2.2
PXI Signals	PXI_TRIGn input/output selectable PXI_STAR input selectable 10 MHz reference input selectable Left and right side buses not used

Physical and Environmental

Physical size	Single-Wide 3U CompactPCI/PXI Instrument
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