

PXI Studio Sales Specification



Ideal for R&D and production test system engineering applications using Aeroflex 3000 Series PXI modular RF instruments.

Vector Signal Generator and Vector Signal Analyzer/ Spectrum Analyzer application software with options for wireless data and cellular standards:

- GSM/EDGE
- UMTS/HSPA+
- LTE (FDD)
- LTE (TDD)
- CDMA2000, 1xRTT and EV-DO Rev O, A, B
- TD-SCDMA (3GPP LCR)
- WiMAX OFDMA
- WLAN a, b, g, n, ac
- Bluetooth®
- Generic Modulation*

*including support for Zigbee® (IEEE 802.15.4) and FM stereo

INTRODUCTION

PXI Studio is a Windows™ software application for use with the Aeroflex 3000 Series of PXI modular RF instruments. This highly flexible application allows you to simultaneously generate and analyze complex modulated RF signals. Measurement tools enable difficult problems to be tracked down quickly and help simplify design verification or test system development.

PXI Studio installed on your PXI system controller and used with PXI3000 hardware modules forms a tightly coupled high performance laboratory measurement instrument. PXI Studio presents a single integrated graphical user interface to control almost any configuration of Aeroflex PXI 3000 Series modules. As standard it provides Signal Generator and/or RF Digitizer control with

general purpose spectrum or time domain analysis for RF component testing or alignment of radio communications transceivers.

Optional measurement plug-ins extend measurement support to cater for a wide variety of communication standards within the same application framework making the test solution extremely versatile. In each case the plug-in extends the capabilities to provide power, spectrum and modulation analysis with results displayed in user configurable tiles. A variety of trace displays are provided as appropriate to the communication standard each permitting close examination of underlying problems beyond the scope of traditional measurement instruments. When used synchronously with complex signal generation, stimulus and response component measurements or complete transceiver characterization can be accomplished with ease.

All measurement processing is performed within the host PC. Performance is therefore directly enhanced as PC processing power improves.

PXI Studio plug-ins each have an associated remote programming interface (.dll with .net assemblies) for use in a wide variety of application development environments such as National Instruments LabView/LabWindows CVI/Test Stand, Microsoft Visual Studio and Visual Basic. In addition, each measurement suite provides hardware independent low-level function libraries enabling more experienced programmers the option to maximize test system flexibility by coding PXI hardware control and measurement functions independently.

For the very latest specifications visit www.aeroflex.com

STANDARD PXI STUDIO PLUG-INS

PXI Studio automatically determines how many and what type of logical instruments can be formed from the Aeroflex PXI hardware resources connected. Any number of logical instruments may be formed and controlled simultaneously from the same application making PXI Studio adaptable to whatever 3000 Series PXI modules are in use. Three basic logical instrument types are defined RF Digitizer, Signal Generator and RF Combiner. The performance and operating range of each is determined by which module variant is used.

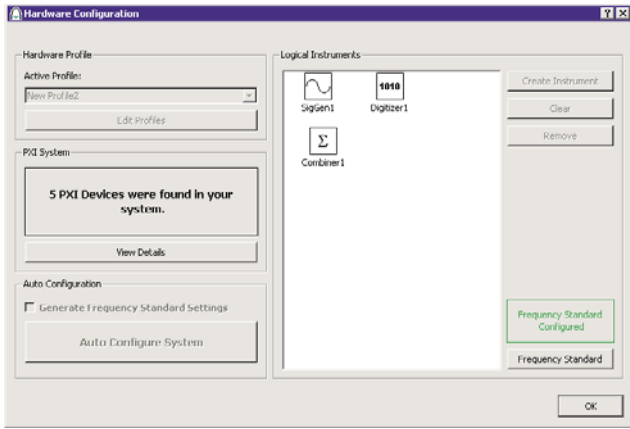


Figure 1. PXI Studio hardware configuration

Digitizer Plug-in

The digitizer plug-in is a general purpose interface to control any 3030 Series digitizer and output or plot the acquired signal in a variety of ways. A zoom feature allows you to examine the signal viewed in fine detail without acquiring new data.

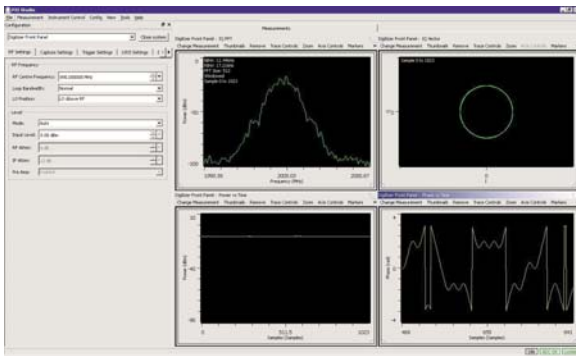


Figure 2. RF Digitizer screenshot

The digitizer plug-in provides a drag and drop facility to view the spectrum in one tile for a user defined time window from another tile as shown in Figure 3 or to simultaneously view multiple narrow spans of a single spectrum in detail.

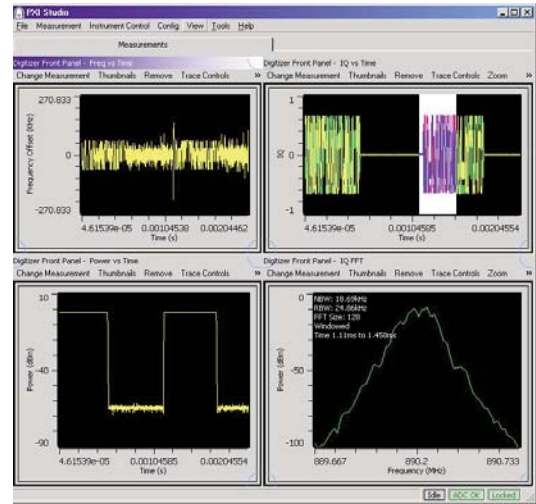


Figure 3. Using drag and drop to see time gated spectra

Signal Generator Plug-in

The signal generator plug-in is a general purpose interface to control any 3020 Series digital signal generator. RF output and modulation settings, triggering and list mode operation are just a few of the primary controls provided to the user.

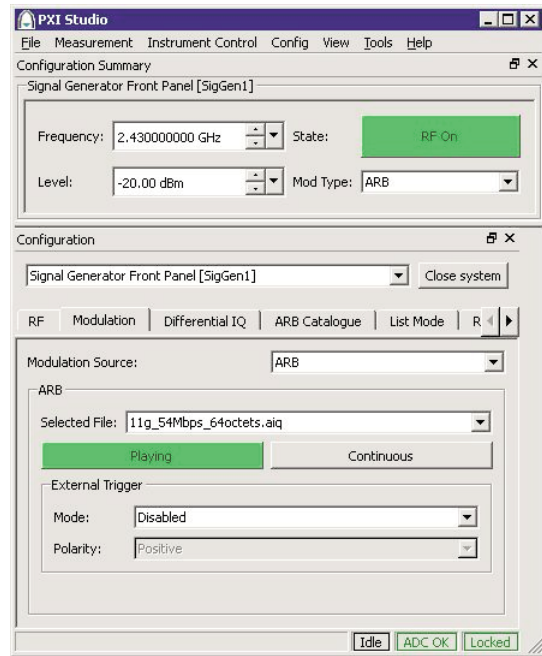


Figure 4. Signal Generator plug-in main screen

Combiner Plug-in

The combiner plug-in is used to combine up to 4 instruments together at a single calibrated reference port. For example, to provide connection to a full duplex transceiver, to test amplifier intermodulation products or it can be used simply as a switch to multiplex PXI resources between test interfaces.

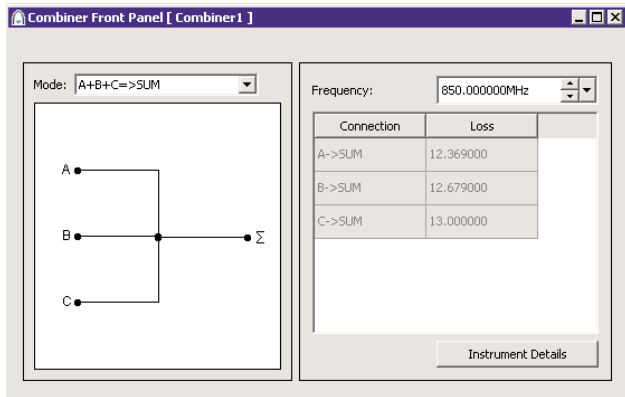


Figure 5. RF Combiner plug-in

Spectrum Analyzer Plug-in

The spectrum analyzer plug-in enables spectrum and time domain measurements to be performed within PXI Studio on acquired I & Q data from 3030 Series RF digitizers.

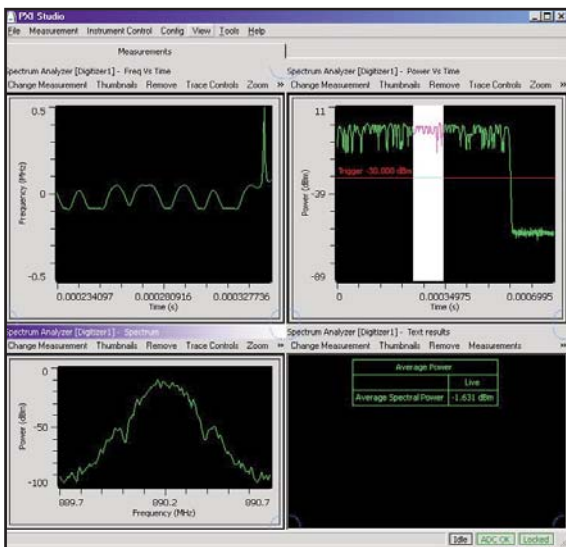


Figure 6. Spectrum Analyzer plug-in screenshot

Spectrum measurements can be made over a maximum span width of 200 MHz with continuously variable resolution bandwidths from 1 Hz to 10 MHz (limited by span).

The spectrum analyzer supports measurement of occupied bandwidth and adjacent channel power where up to 99 channels can be specified each with arbitrary channel spacing and channel bandwidth.

The spectrum analyzer provides display traces of power, frequency and phase vs. time, power spectrum, spectrum mask and CCDF.

Optional System Specific Measurement Plug-ins

Each optional measurement plug-in provides a complete set of measurement functions to characterize the RF parametric performance of components and devices in accordance with the requirements of the relevant communications standard.

Fast Sequence Tuning (FST)

Fast sequence tuning (FST) is an application program interface common to each of 2G, 3G and 4G cellular measurement suites.

FST supports high speed alignment/tuning of transmitters and receivers using list mode to control synchronous switching between multiple PXI3000 module hardware states. The FST measurement library is installed automatically with the relevant measurement suites.

To learn more about FST operation download “Simultaneous Transmitter and Receiver Calibration Using PXI 3000 Fast Sequence Tuning Software” application note from www.aeroflex.com/pxi.

SPECIFICATIONS

RF DIGITIZER

Reference: 3030 Series RF Digitizer Specification

Capture Settings

Range as determined by RF Digitizer model

Sampling Frequency (Hz)

Capture Duration

Samples/Time (μ s)

Sample Resolution

16 bit / Auto (16/32 bit)

In Auto mode 16 bit sample are used for high sample rates and 32 bit samples for low sample rates to provide lower noise.

Dither

On/Off (3030A only)

Capture

Continuous/Single

Triggering

Software, Timer, Internal IF / IQ, External

Common Settings for Timer, Internal, External

Trigger Type: Edge / Gated

Trigger Polarity: +ve / -ve

Hold off time: 0 to 65.535 ms

Trigger Delay: Samples/ μ s

Timer Specific Settings

Period and Phase

Internal IF / IQ Specific Settings

Absolute / relative level

Absolute: Threshold (dBm), Time Constant (μ s)

Relative: Threshold (dB), Fast Time Constant (μ s), Slow Time Constant (μ s)

External Trigger Source

PXI backplane: Trigger bus (0-7), Star Trigger, Local Bus

Front Panel: Digital output marker and Aux (0-4), SMB (TTL)

Acquisition

Single / Repeat

Start / Stop

Save Data

Filename

File type: VS.A / User

File Format: ASCII, 32bit float, 14/16/32 bit signed or unsigned integer

RF Settings

Ranges as determined by RF Digitizer model

Center Frequency (tuned frequency)

Loop bandwidth: Narrow / Normal

LO: above/below RF

Level Mode

Manual / Auto IF / Auto

Auto – User specified Input level (dBm)

Auto IF – User control of Pre-amp and IF attenuation

Manual – User control of Pre-amp, IF and RF attenuation

Display Traces

IQ FFT, IQ Vector, IQ vs. Time, Power (dB) vs. Time, Phase vs. Time, Frequency vs. Time

SIGNAL GENERATOR

Reference 3020 Series RF Signal Generator specification for full details

RF Settings

Range as determined by RF Signal Generator model

Frequency

Loop bandwidth: Narrow / Normal

Output: On / Off, RF Level (dBm)

Levelling mode: Auto, Frozen, Peak, RMS

Modulation

Internal source: CW, AM / FM, ARB⁽¹⁾

External source: LVDS, Analog⁽²⁾

AWG Play Settings

Continuous, single shot, repeat N, start / stop, gated, retrigger

List Mode

AWG sequencing mode / hopping mode

Differential I&Q Inputs/Output (option 01)

Output control: Level, Gain, IQ bias, I&Q offset

⁽¹⁾ requires 3020 option 100

⁽²⁾ requires 3020 option 01

ROUTING MATRIX

Synchronization interconnection plug board between RF Digitizer and Signal Generator functions

Refer to RF digitizer and signal generator for full details.

RF COMBINER

Selection of RF path routing

query of RF path calibrated loss (dB)

Reference 3060 series RF Signal Generator specification for full details

SPECTRUM ANALYZER

All specifications are defined when used in conjunction with the 3030 Series PXI RF digitizer.

Specifications are defined with the input signal at the RF digitizer tuned frequency and at the reference level unless otherwise stated.

Frequency Span

Variable between 2 kHz to 200 MHz

Resolution 1 Hz

Resolution Bandwidth (RBW)

Variable between 1 Hz to 10 MHz (depending on span)

Resolution 1 Hz

Auto RBW

Enable or disable. If enabled, RSW is automatic calculated based on the Span/RBW ratio.

Span/RBW ratio (1-1000)

Window Type

NEBW: Gaussian 3 dB, Gaussian noise and Blackman Harris

Auto Capture Time

Enable or disable

When enabled, the capture time is automatically determined based on the RBW settings.

When disabled, the capture time, FFT averaging and gating configuration setting are defined by the user

Capture Time (search length)

Up to 1 second (sample rate dependent)

Resolution 1 ns

Use FFT Averaging

Enable or disable. When enabled, FFT overlap is defined by the user (0-99.99%)

Gating

Enable or disable. When enabled, the start position and length are defined by the user.

MEASUREMENTS

Channel Power and Adjacent Channel Power

Adjacent channels: 2 upper and 2 lower or user defined up to 99

Total measurement span up to 200 MHz

Channel filter: None, Raised Cosine or Root Raised Cosine

Channel filter alpha: 0.0 to 1.0

Channel spacing: MHz

Channel width: MHz

Occupied Bandwidth (OBW)

Range setting: 1% to 99.9%

Spectrum Mask

Channel Filter Type: None, Raised Cosine or Root Raised Cosine

When Raise Cosine or Root Raised Cosine is chosen, Channel Filer Alpha is defined by the user (0-1)

Mask Level Units: Absolute, Relative or a mixture of absolute and relative User Defined

N Peaks

Frequency and power output for up to 10 signal peaks sorted in order of descending power

Average Power

The RMS average power over the selected search length

Markers

4 markers plus delta marker

Marker Functions

Marker power and frequency with peak search, next peak, peak track

Power and time

Frequency and time

Traces

Spectrum trace, Spectrum Mask, Occupied Bandwidth, Adjacent channel power, Power vs. time trace, Frequency vs. time trace, Phase vs. time, CCDF.

Measurement Results

Adjacent Channel Power (dBc)

Occupied Bandwidth (Hz)

Average Power (dBm)

Peak Values (dBm)

Spectrum mask: Pass or Failed

GENERAL

Operating System

Windows® XP (service pack 2) and 32-bit Vista.

Required Memory

512 Mbytes minimum, 1024 Mbytes recommended

Display Resolution

Minimum 1024 x 768

Other

Aeroflex 3000 Series modules require NI VISA version 3.1 or later (NI Visa 4.2 or later under Windows® Vista).

Aeroflex 3000 Series module drivers version 5.4.0 or later

ORDERING

PXI Studio is supplied as standard with plug-ins for RF Digitizer, Signal Generator, RF Combiner and Spectrum Analyzer.

Optional measurement plug-ins may be purchased with the 303x at time of order or purchased as an upgrade to the 303x.

Note: To be able to use measurement plug-ins within PXI Studio, associated options must be enabled in the 303x digitizer.

GSM/EDGE

When purchased with a 303x, order as: 3030 option 100

When purchased as an upgrade, then order as: RTROPT100/3030

UMTS Uplink

When purchased with a 303x, order as: 3030 option 101

When purchased as an upgrade, then order as: RTROPT101/3030

CDMA2000/1xEVDO Rev A/B

When purchased with a 303x, order as: 3030 option 102

When purchased as an upgrade, then order as: RTROPT102/3030

WLAN

When purchased with a 303x, order as: 3030 option 103

When purchased as an upgrade, then order as: RTROPT103/3030

WiMAX

When purchased with a 303x, order as: 3030 option 104

When purchased as an upgrade, then order as: RTROPT104/3030

Bluetooth

When purchased with a 303x order as: 3030 option 106

When purchased as an upgrade, then order as: RTROPT106/3030

LTE (FDD)

When purchased with a 303x order as: 3030 option 107

When purchased as an upgrade, then order as: RTROPT107/3030

LTE (TDD)

When purchased with a 303x order as: 3030 option 108

When purchased as an upgrade, then order as: RTROPT108/3030

TD-SCDMA

When purchased with a 303x order as: 3030 option 109

When purchased as an upgrade, then order as: RTROPT109/3030

Generic Measurement

When purchased with a 303x order as: 3030 option 111

When purchased as an upgrade, then order as: RTROPT111/3030

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Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven and customer-focused.