



Product Demo

ADVANCES IN EMISSIONS SECURITY USING KEYSIGHT'S NEW SIGNAL ANALYZERS

Tuesday, April 26, 2016

3:30pm Eastern



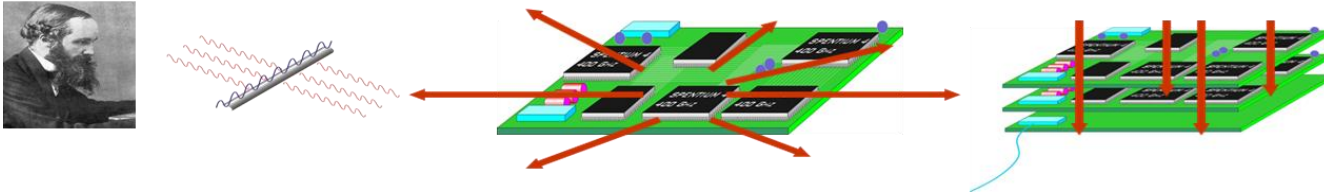
Luke Quesnel
Keysight Technologies

Agenda

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- The Problem
- System Configurations
- Introduction to X-Series B Version Analyzer
- Trade in Program
- Wrap up and Questions

The Security Problem:



– What is The Problem?

- All electronic circuits generate electric, magnetic and electromagnetic emanations during normal circuit operation.
- Classified information being processed within these circuits can be transmitted outside of the security environment and be intercepted and exploited.
- Emission Security involves the investigation, studies and prevention of these signals from being transmitted and intercepted.

Emission Security Requirements and Techniques

Emission Security are measures taken to prevent the unauthorized access to classified information through the interception of Compromising Emanations.

– **Prevention can be in the form of:**

- Zoning of a facility
- Shielding (Cabinets & Rooms)
- Emissions Security Equipment
- All of the above

Hardware Configuration

33500B Function / Arbitrary Waveform Generator

N5183B MXG Microwave Analog Signal Generator

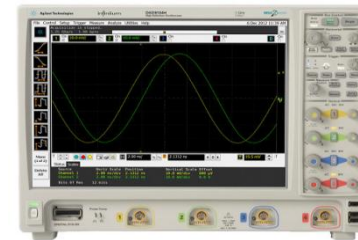


Controller - Monitor

Emission Analysis
Software (FastBreak)
Signal Survey Software
Audio Player/output
Standard Windows

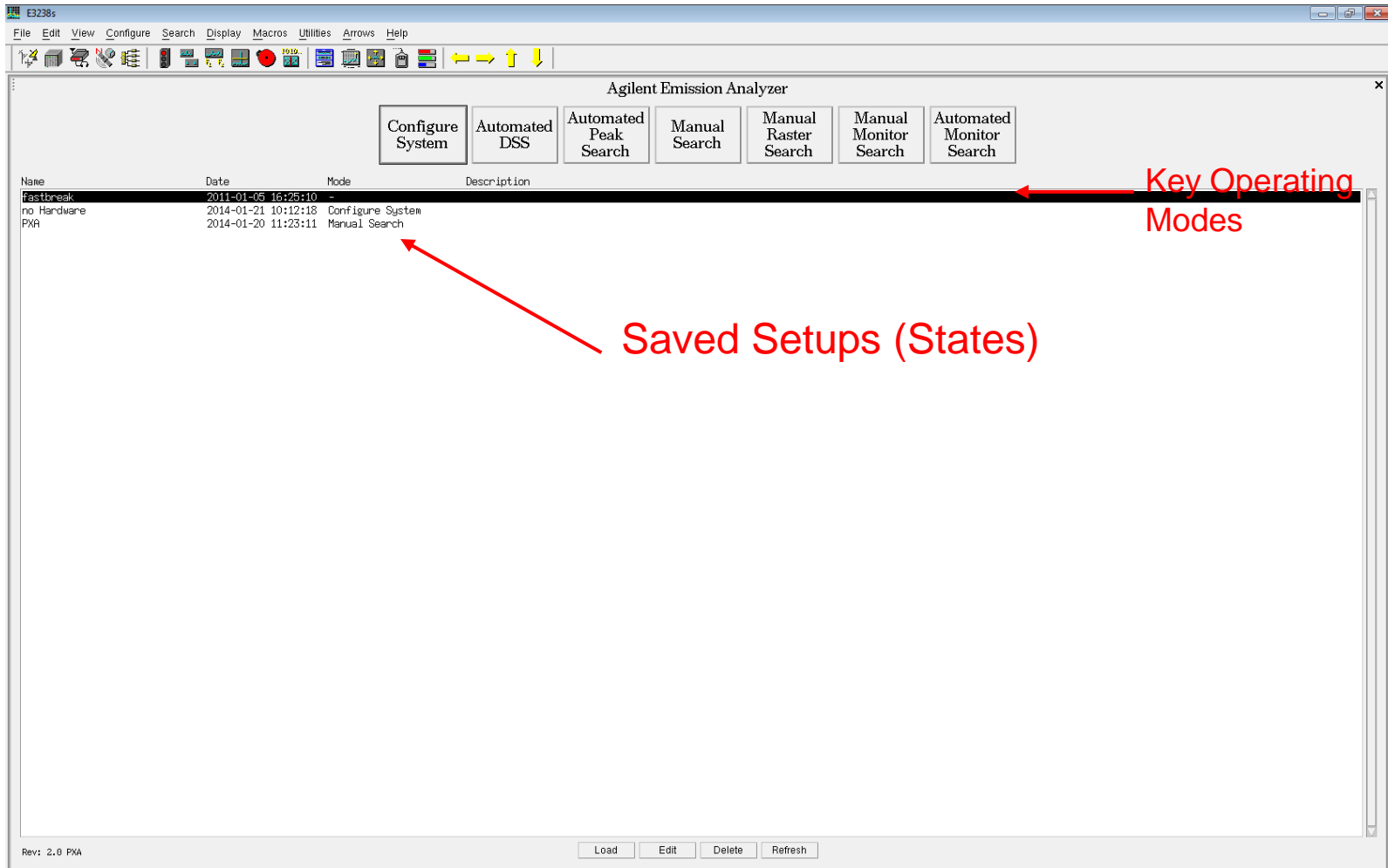


DSOX6002A Oscilloscope



DSOS204A Oscilloscope: 900 MHz BW
Expandable N9030B PXA Signal Analyzer
Frequencies: 13.6, 26.5, 50 GHz

Start Up Main Page



Configurations:

Z2090B-734 – Basic System consisting of X-Series Analyzer, CPU, and FastBreak Software

Z2090B-735 – System Consisting of X-Series Analyzer, Arbitrary Waveform Generator, Signal Generator, CPU, FastBreak and VSA software

Z2090B-740 – Advanced System with X-Series Analyzer, Signal Generator, Arbitrary Waveform generator, monitor Oscilloscope, CPU with Fastbreak and VSA Software



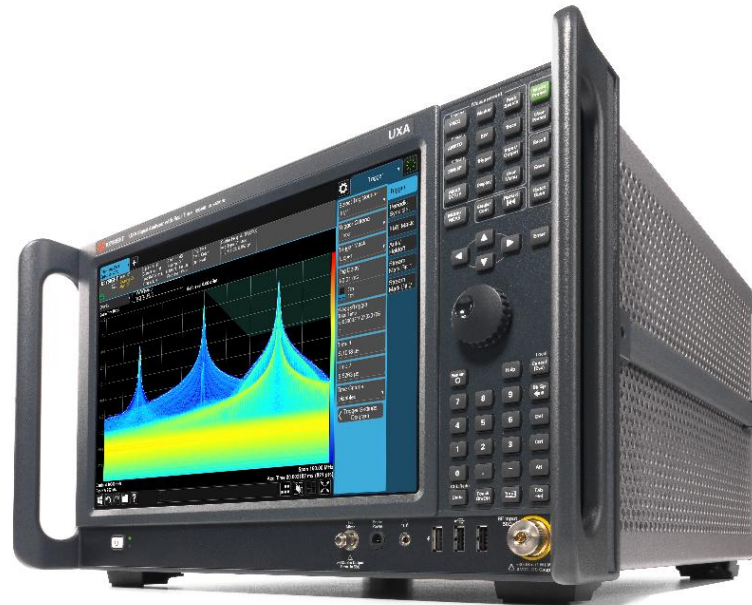
The Keysight Emission Analyzer System consists of a receiver/signal analyzer (PXA or UXA) capable of meeting the detection requirements (Bandwidth, Sensitivity etc) required for TEMPEST testing

In addition to the analyzer, Keysight also provides a suite of peripheral equipment (signal generators, oscilloscopes etc) that work with the software and are required perform all requirements of the above mentioned standards.

<div data-bbox="446 239 568 261" data-label="Caption"> <p>PXA/UXA</p> </div> <div data-bbox="330 277 614 386" data-label="Image"> </div>	<p>As a “stand alone” instrument, PXA/UXA covers the necessary frequency ranges, bandwidths and measurement sensitivity (DSS) and provides demodulation and Peak Measurement capability. Frequency tuning and other controls are performed using the front panel or an attached USB keyboard and mouse.</p>
<div data-bbox="459 422 554 444" data-label="Caption"> <p>Software</p> </div> <div data-bbox="83 468 231 565" data-label="Image"> </div> <div data-bbox="598 462 882 572" data-label="Image"> </div>	<p>The Emission Analyzer Software (Fastbreak) application is run on a laptop or computer running Microsoft Win 7 and communicates via Ethernet with the PXA. FASTBREAK includes modules that perform Automated DSS, Spectrum Sweeps, display of Demodulated Signals, Rastering, Correlation and Report Generation. Display of the detected signals occurs on the controller (laptop) display without the need for an external oscilloscope. In addition, the Spectrum Sweeps and the I&Q data can be saved to disk for further analysis and report generation</p>
<div data-bbox="411 696 602 718" data-label="Caption"> <p>Signal Generators</p> </div> <div data-bbox="83 761 231 868" data-label="Image"> </div> <div data-bbox="320 805 533 893" data-label="Image"> </div> <div data-bbox="598 781 882 891" data-label="Image"> </div>	<p>Accurate signal level measurements can be made using the signal substitution from a signal source (ie calibrated signal generator). Using the PXA as a stand-alone or “single box” solution the user can use any appropriate signal generators and manually adjust them.</p> <p>To improve workflow, Keysight offers a series of Signal Generators that are controlled by the software to provide an integrated measurement capability for Calibration, DSS Measurements and Signal Substitution,</p>
<div data-bbox="432 1036 581 1058" data-label="Caption"> <p>Oscilloscopes</p> </div> <div data-bbox="83 1096 231 1193" data-label="Image"> </div> <div data-bbox="386 1110 575 1210" data-label="Image"> </div> <div data-bbox="598 1143 882 1253" data-label="Image"> </div> <div data-bbox="127 1219 316 1305" data-label="Image"> </div>	<p>The optional oscilloscopes provide two functions. First, the scope can provide the ability to capture Live Monitor from the EUT that enables the ability to display the monitor signal directly on the controller display in real time for visual comparison to the detected signal</p> <p>The second function of the oscilloscope is to act as an external digitizer to increase the overall system bandwidth. In this mode, the IF from the PXA is directly connected to the oscilloscope. The digitized I & Q data is then passed to the PXA for further processing. Using this configuration, measurement bandwidths greater than 900 MHz can be achieved.</p>

X-Series Signal Analyzers Make an Inspired Connection

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Multi-touch X-Series Signal Analyzers...

Deliver Superior User Experience and Performance

- Streamlined multi-touch interface enables optimization of measurement parameters in two touches or less
- First integrated 1 GHz analysis bandwidth simplifies test setup for analysis of wideband systems in radar and 5G research
- Widest real-time streaming up to 255 MHz bandwidth enhances analysis of intermittent and highly elusive signals
- Industry-best phase noise performance in all models addresses emerging needs in radar, LTE, and more

X-Series Benchtop Signal Analyzers

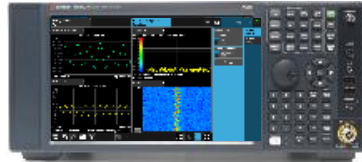
The Benchmark for Accessible Performance



CXA

Leading low-cost tool

- 9 kHz to 26.5 GHz, 25 MHz BW
- **Enhanced phase noise**
- Cost-effective testing in general-purpose and educational applications



EXA

Maximum value up to millimeter-wave

- 10 Hz to 44 GHz, 40 MHz BW
- **Enhanced phase noise**
- Find answers faster with tighter margins and shorter test times



MXA

Optimum choice for wireless

- 10 Hz to 26.5 GHz, 160 MHz BW
- Real-time spectrum analysis
- Flexibility to quickly adapt to evolving test requirements today and tomorrow



PXA

Benchmark for demanding applications

- 3 Hz to 50 GHz, 510 MHz BW
- **DDS LO**
- Real-time spectrum analysis
- Measurement options that range from excellent to exceptional



UXA

Wide-open performance

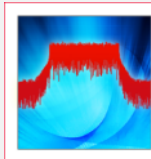
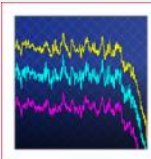
- 3 Hz to 50 GHz, 1 GHz BW
- Real-time spectrum analysis
- Deeper views of elusive and wideband signals
- See more and take your design farther

Download your next insight

X-Series applications

Ready-to-use measurements

- Phase noise, noise figure, analog demod
- **Pulse, LTE/LTE-Advanced, W-CDMA**



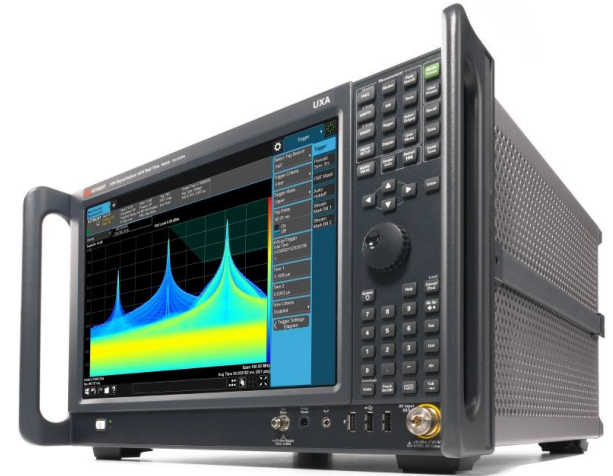
89600 VSA software

Comprehensive demodulation & vector signal analysis

Move to Higher Frequencies & Wider Bandwidths

Extending High Performance Signal Analysis

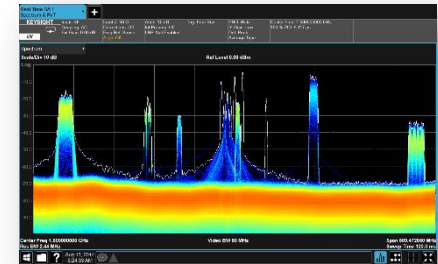
- Introducing higher frequency coverage on the UXA
 - New 44 & 50 GHz frequency range options
 - New preamplifier options for better sensitivity
 - 159 dBm DANL @ 50 GHz (typical, with noise floor extension)
 - Extend up to 1.1 THz with external mixing
- Introducing wider analysis bandwidth for UXA and PXA
 - New 1 GHz analysis bandwidth option on 50GHz UXA
 - Widest integrated analysis bandwidth on the market
 - New 255 and 510 MHz analysis bandwidth options on PXA up to 26.5GHz
 - Widest bandwidth in compact classic 4U form-factor for drop-in legacy replacement
 - 25 MHz now standard on UXA and PXA
 - Increased from 10 MHz



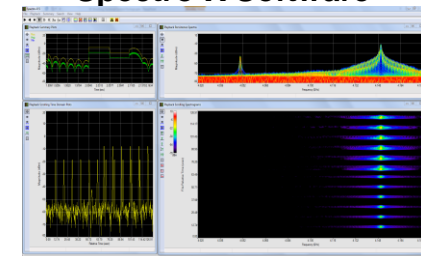
See, Capture, Analyze Dynamic Signals

View elusive signals with real-time capabilities

- Gap-free spectrum analysis to identify interferers or characterize frequency hopping signals
 - 255 and 510 MHz real-time bandwidth options now on PXA as well as UXA
 - See small signals in the presence of large ones with excellent dynamic range
 - Detect signals with durations as short as 3.57 us with 100% probability of intercept
- Catch rare or unpredictable events with long duration RF recording
 - IQ real-time streaming up to 255 MHz bandwidth on UXA and PXA
 - Gap-free 16-bit I+Q capture to X-COM digital recorder
 - Record, analyze, and playback with up to 15 TB capture memory
 - Complete solution with software to quickly zoom in on events of interest and export to 89600 VSA software for in-depth analysis



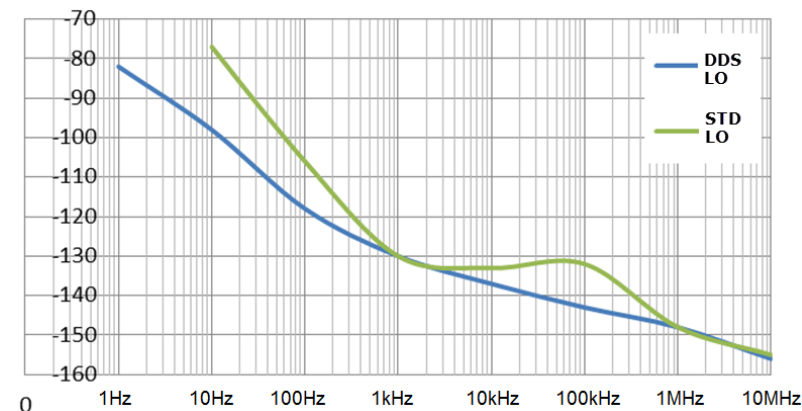
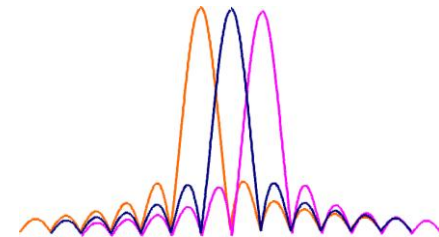
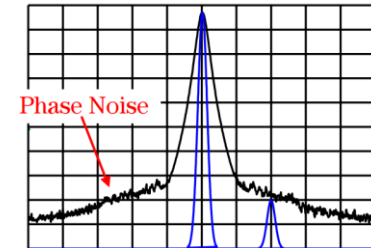
**X-COM
Spectro-X Software**



Analyze Your True Signal or Device Performance

Continuing leadership in spectral purity

- Phase noise creates skirting which can:
 - Obscure low-level signals close to the carrier
 - Slow-moving targets in radar
 - Cause interference between closely spaced carriers
 - OFDM signals like those used in WLAN, LTE, DOCSIS 3.1
- Phase noise in spectrum analyzers is determined primarily by the local oscillator (LO)
- Down-deploying technology for improved phase noise
 - Direct digital synthesis (DDS) LO now optional on PXA to improve pedestal region
 - 136 dBc/Hz @ 1 GHz, 10 kHz offset
 - EXA & CXA Phase noise improvements



Keysight Technologies

When Bandwidth Matters.

PXA-based Tempest testing is here.

Are you using the Agilent/Keysight VXI-based E3238S signal intercept and collection system?

Trade-in your VXI-based E3238S solution for the latest Fastbreak PXA-based solution and receive a 10% discount on the new system.

Keysight Fastbreak Tempest Test Solution

Higher frequency capability	VXI upper frequency is 6 GHz (using a PXA on the front end as a down converter is possible).
	PXA frequency coverage is 3 Hz to 26 GHz (optional to 50 GHz).
Wider bandwidth	Maximum bandwidth for VXI chassis is 40 MHz (external digitizing via oscilloscopes is required to extend bandwidth).
	PXA bandwidth to 1 GHz.
Contiguous coverage (over the full frequency range)	VXI uses three separate receivers/digitizers for complete frequency coverage. Each receiver requires a separate software module be loaded and run.
Security	PXA has removable hard drive for secure locations.
Improved measurement sensitivity	
PXA Series B supports I & Q streaming for additional signal recording and analysis	
PXA supports many additional software applications	

Experience the bandwidth. See a live demo today.

www.keysight.com/find/adsystems

USA: 800.829.4444



Contact Information

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- Luke Quesnel
- Keysight Technologies
- Phone – 613-271-4007
- Luke_Quesnel@Keysight.com

- Thank you!