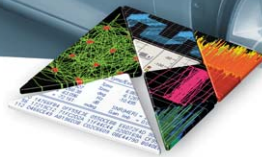


Accelerate interference detection and identification in wireless devices-overview



DISCOVER the Alternatives...

... Agilent **MODULAR** Products

Improve the ability to detect and identify sources of RF and Microwave interference with multichannel recording.

Create live multichannel captures of real world RF signals to playback in the lab for interference detection and identification.

Abstract

User environments for wireless devices are complex and include many sources of interference. As RF power is spread over wider bandwidths to increase data rates, wireless devices encounter increased interference. As designers look to create robust solutions that perform in these environments it is essential to recreate those conditions in the lab.

This application summary will present methods to:

- Identify interfering waveforms by creating high fidelity recordings that can be processed off-line.
- Create 100MHz BW recordings on each of two independent channels.
- Minimize the need for very long recordings with sophisticated triggering capability.
- Use automated signal identification software to tag significant signals within very long records.
- Tightly align phase on multiple channels using post processing. Select target signals for in-depth analysis with Agilent 89600 VSA Software.



Introduction

The user environment for wireless devices is complex and includes many sources of interference. When this interference occurs it is often transient in nature making it difficult to capture data that illuminates the problem. Modern non-real-time measurement equipment only captures the data that is stored in local "onboard" memory. When the local memory store is full, the data must be transferred to another location before further acquisitions can occur, causing "gaps" in the continuous acquisition of data. Significant events can easily be lost.

Application Overview

RF interference issues in today's complex channel environments can cause serious performance degradations in communication systems, reducing efficiency and increasing costs for service providers.

Wideband RF streaming shifts RF interference detection and identification from a potentially difficult task to a manageable solution.

This solution¹ provides capture of transient errors in real RF environments; then the ability to investigate the nature and cause in a controlled lab environment.

By using a flexible 2 channel VSA with independent tuning capability, a number of useful acquisition modes are enabled:

1. Two channel simultaneous recording on different frequency channels.
2. Two channel synchronous recording enabled by post processing.
3. Targeted acquisition by using the measurement on one channel to trigger a recording on the other.

1. Software tools for signal identification and analysis are required for a complete solution for the analysis of interference sources in the RF environment.

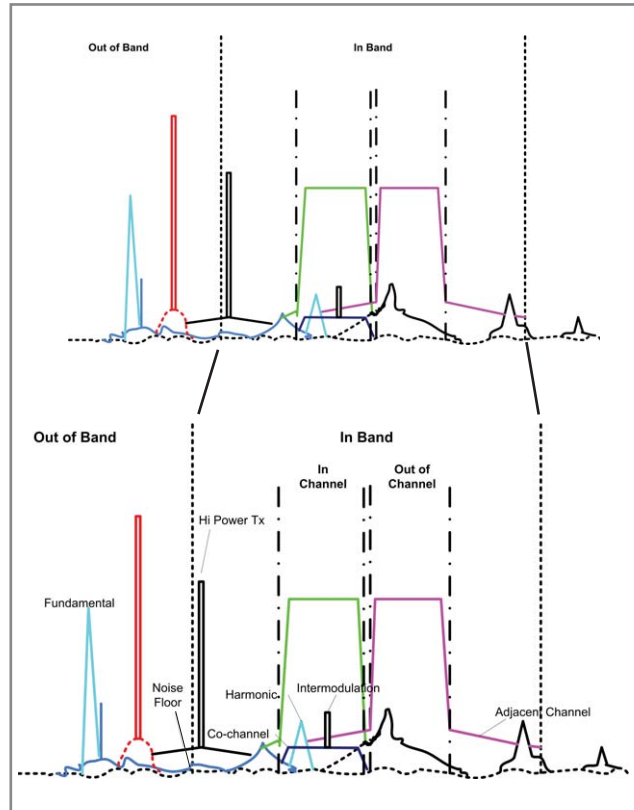


Figure 1. Typical RF interference sources

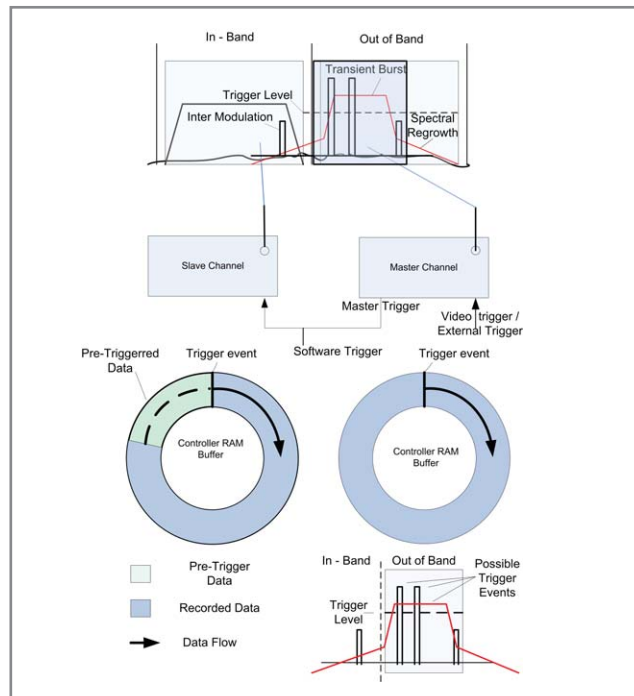


Figure 2. 2-channel data acquisition in master/slave mode with slave pre-trigger

Solution details

The combination of wide [100MHz] bandwidth and flexible configurations make the Agilent PXI 2 channel VSA recording solution a cost effective and efficient tool for identifying complex RF interference issues.

Achieve extended recording time by adding a high performance Dell T3500 / T5500 workstation and JMR storage system. This solution can record many hours of data at full bandwidth, simultaneously, from each vector signal analyzer (see M9392A Configuration Guide 5990-8254EN).

Each PXI M9392A VSA consists of 5 modules.

- M9202A 12bit 2GSa/s Digitizer w/ Hardware DDC
- M9360A Attenuator / Preselector 50MHz – 26.5GHz
- M9351A RF Downconverter 50MHz – 2.9GHz
- M9361A UW Downconverter 2.25GHz- 26.5GHz
- M9302A LO 2.75GHz – 10GHz

Multichannel recording is controlled programmatically through an -easy to use- IVI / COM interface. IVI / COM support is available for a number of programming environments including VisualStudio® (VB.NET, C#, C/C++), VEE, LabVIEW, LabWindows/CVI, and MATLAB.

Timing synchronization accuracy between VSA's is nominally better than ± 2 samples. By routing in a common signal to each digitizer at the beginning or end of the recording, a post process alignment routine provides timing synchronization accurate to 1% of the sample period.

Support for IRIG/GPS time stamping can be provided by adding an appropriate PXI card to either the Dell workstation or the PXI Chassis. The timing information can be generated by the same trigger signal that initiates the recording.

A simple serial port trigger is used to provide a software initiated trigger pulse of the streaming VSA based on the analysis of the data acquired by the channel monitoring VSA.

A Dataviewer application is provided for searching through records. For sophisticated automatic signal search and tag capability the Spectro-X software [from X-COM Systems] directly supports the native streaming file format.

Connect to the Agilent 89600 VSA Software for full signal analysis capability.

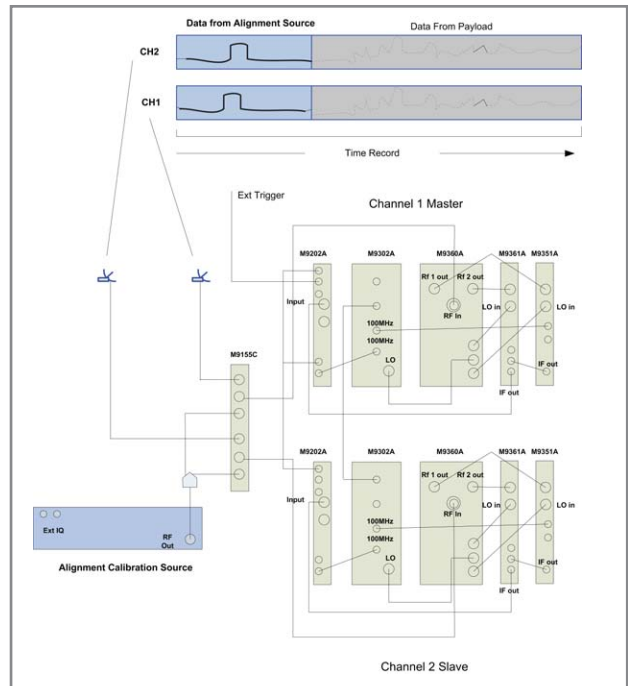


Figure 3. 2-Channel VSA with time alignment

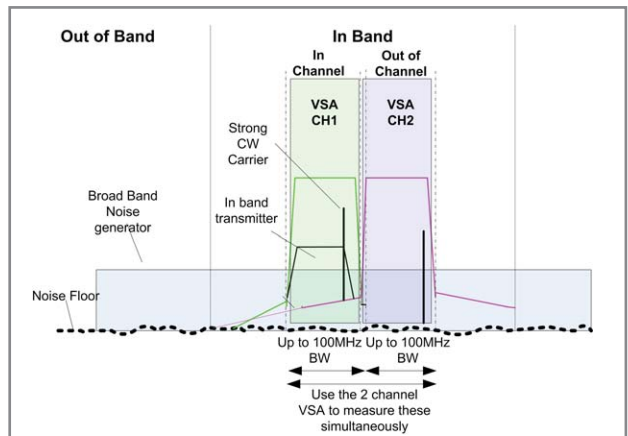


Figure 4. 2-Channel adjacent band measurement

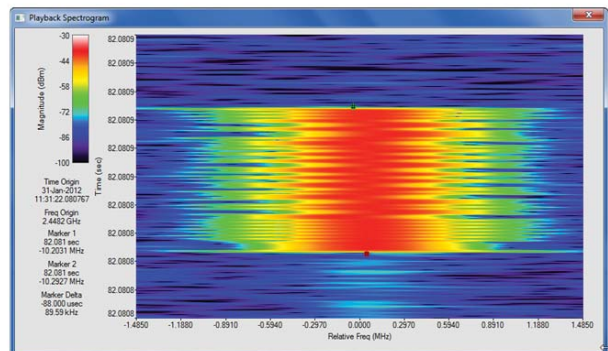


Figure 5. Spectro-X software from X-COM

APPLICATION NOTE

Overview

Ordering information

Quantity	Model	Description
2	M9392A ¹	PXI Vector Signal Analyzer: 50 MHz to 26.5 GHz
1	M9018A	18-slot PXIe Chassis
1	Dell T3500/ T5500	PC Workstation
Optional		
1	Choose the AGIL-G4-DC-16T, or AGIL-G4-DC-32T	JMR RAID Storage system(s)
1	89601B	89600 VSA Software, Transportable License
1	89601B-200	Basic Vector Signal Analyzer Hardware Connectivity Option
1	89601B-300	Vector Modulation Analysis
1	89601B-AYA	X-COM Signal Search Software

Want to know more

- *M9392A Streaming Application Note*
<http://cp.literature.agilent.com/litweb/pdf/5990-8872EN.pdf>
- *Connecting and Configuring a JMR RAID to work with M9392A*
<http://cp.literature.agilent.com/litweb/pdf/5990-9483EN.pdf>
- *M9392A Multichannel Streaming AN*
<http://cp.literature.agilent.com/litweb/pdf/5990-9872EN.pdf>
- *Symmetricon IRIG/GPS PCI Module*
<http://www.symmetricon.com/products/bus-level-timing/pci-express/>

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