

Identify and eliminate RF interference problems with PXIe data streaming and analysis

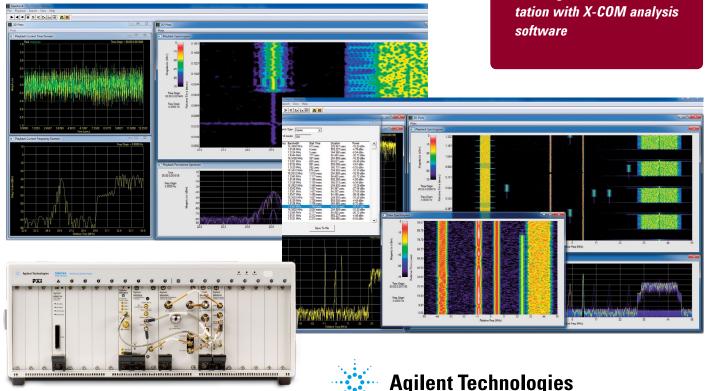
There are numerous potential sources of RF interference that can affect the operational performance of RF systems used in electronic warfare, surveillance, radar and wireless data communications.

These can include multipath or adjacent channel interference, Rayleigh channel fading or scintillation or rogue carriers transmitting in the band either intentionally or erroneously. RF interference can be transitory and challenging to observe in the operational environment, however, by capturing the RF spectrum over an extended period of time you can identify and analyze potential sources of RF interference.

A new PXIe data streaming and analysis solution from X-COM and Agilent Technologies can be used to record and analyze the operational spectral environment of an RF system in order to identify events causing RF interference. The solution utilizes the Agilent M9392A PXI vector signal analyzer and M9202A PXIe IF digitizer as the RF front end to capture the RF spectrum. This is stored in a directly attached RAID storage array for subsequent analysis using X-COM's Spectro-X signal analysis toolkit.

The Agilent M9392A PXI vector signal analyzer and M9202A PXIe IF digitizer

- · Find RF interference by capturing and analyzing the operational RF spectrum
- · Signal analysis software identifies potential causes of RF interference
- PXIe data streaming and storage captures operational RF spectrum
- · Large RAIDO storage array for extended data capture
- · Uses Agilent PXIe instrumentation with X-COM analysis software



RF Interference Analysis

provide a compact cost effective solution for the streaming of RF spectrum with bandwidths up to 100 MHz and center frequencies up to 26.5 GHz. This economical, high performance capability, when combined with JMR Electronics' BlueStor PCle RAIDO storage arrays can provide more than 13 hours of spectrum memory allowing long sequences of RF data to be captured under operational conditions.

An RF bandwidth of 100 MHz requires 500 MB/s to be streamed to the disk array and the resulting files can be terabytes in length. The X-COM Spectro-X signal analysis toolkit provides a comprehensive set of tools to search through the data in order to tag the location in time, frequency, duration and power of all carriers present. Using this data, an engineer can quickly parse the recording into time segments containing unknown carriers that may warrant further investigation.

There are three specific tools available in Spectro-X that facilitate this process. The first eliminates found carriers by applying user selected criteria such as power levels, center frequencies or time durations in combination with Boolean operators. This process can swiftly reduce the carrier list by discarding those far from the desired carrier in frequency or too low in power to cause interference. Some of the remaining carriers can be identified by comparing their training sequences to those of known wireless standards or by correlating them to arbitrary waveforms that the user has either created in, for example MATLAB, or that the engineer has "clipped" and saved from the RF

spectrum capture. The remaining time segments containing unknown carriers of interest can then be further investigated, and their effects quantified, using the Agilent 89600B VSA software.

The combination of extended RF spectrum capture with the ability to search for, parse and demodulate carriers of interest provides a very powerful tool kit to diagnose communication system anomalies and identify potential sources of RF interference. The complementary features of the Agilent PXIe data streaming solution and VSA software together with X-COM's Spectro-X signal

System Components

Agilent Technologies

M9392A PXI vector signal analyzer
M9202A-V10 100 MHz streaming
option to the M9202A
PXIe IF digitizer

89600B VSA software

M9018A PXIe chassis

M9036A PXIe embedded controller M9021A PCIe cabled interface Y1202A PCIe cable X8, 2.0 m

X-COM Systems

Spectro-X Signal analysis toolkit

JMR Electronics

AGIL-G4-8T BlueStor 8 TB HDD RAID0

AGIL-G4-16T BlueStor 16 TB

HDD RAID0

AGIL-G4-32T BlueStor 32 TB

HDD RAID0

AGIL-G4-0.4T BlueStor 400 GB

SLC SSD RAID0

analysis toolkit speeds the investigative process to help you determine rapidly the best path to a reliable, deployable system.



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X-COM Systems designs RF signal recording, analysis and playback solutions for system design, signal simulation and test applications..

www.xcomsystems.com

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