



### Side Channel Hardware RF Emissions Spectrum Monitoring/RF Security



## PCIe, PXIe Digitizers

- 8 to 16 bits Resolution
- 1 to 8 Channels per Card
- 10 MS/s to 6 GS/s Sampling Speed



To profile and test how well a device can resist attacks that use its electromagnetic signals, or to check if there are unwanted transmissions of data or hacking attempts in an area, requires the capability to record the signals in real-time for long durations of time.

Renowned for sustaining the maximum effective number of bits (ENOB) over a wide signal frequency range, GaGe Digitizers allow for captured real-time streaming signal recordings to host based high-speed storage arrays, thus eliminating the bottleneck of traditional box-based oscilloscope and signal analyzers with limited recording capacity.

## Turnkey System Solutions

- RF & IF Real-Time Analysis & Recording
- Analyze Frequencies 9 kHz - 40 GHz
- Record RF Bandwidths 10 MHz-1000 MHz
- Multi-Channel Recording Systems



Sig-Stations come with all GaGe instruments, features, and software fully tested and installed so that the user can be up and running with their system solution right out of the box, saving time and minimizing risks of self-integrated systems, with high-speed storage capacities up to 368 TB!

These custom systems are designed to maximize operational performance of GaGe instruments with available desktop, laptop, portable and rackmount form factors, and integrated high-speed storage tailored for real-time streaming recording applications that require guaranteed continuous sustained data streaming transfer rates with no missing data.

## System Software

- SpectraScopeRT SpectraViewRT
- Real-Time RF Recording Control
- Playback Viewing with Data Export
- Windows User Interface for All Applications



RF & IF signal recording applications that require no programming and allows for integrated operational control of both downconverter receivers and digitizers for signal capture, analysis, and real-time streaming signal recordings with live monitoring capability.

All GaGe digitizers include a complete library of software development kits (SDKs) for C/C#, Python, LabVIEW, and MATLAB featuring several programming examples with source code illustrating the use of digitizer hardware in different operating modes to serve as a starting point for users to develop customized applications optimized for their specific requirements.





## 16-Bit High-Speed A/D Digitizers

GaGe 16-bit resolution digitizer models divide the input voltage range into 65,536 different digitization levels, which improves the detectability limit by a factor of 4 over the 16,384 levels of a 14-bit resolution digitizer model.

GaGe 16-bit digitizers feature sampling rates at up to 1 GigaSample per second and are available with 2, 4 or 8 digitizing channels, input bandwidths of up to 600 MHz, deep onboard sample memory up to 8 GS (16 GB), and true ENOBs up to 12.2 bits.



## 14-Bit High-Speed A/D Digitizers

GaGe 14-bit resolution digitizer models divide the input voltage range into 16,384 different digitization levels, which improves the detectability limit by a factor of 4 over the 4,096 levels of a 12-bit resolution digitizer model.

GaGe 14-bit digitizers feature sampling rates at up to 200 MegaSamples per second and are available with 2, 4 or 8 digitizing channels, input bandwidths of up to 1.2 GHz, deep onboard sample memory up to 8 GS (16 GB), and true ENOBs of 11 bits.



## 12-Bit High-Speed A/D Digitizers

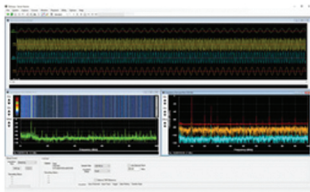
GaGe 12-bit resolution digitizer models divide the input voltage range into 4,096 different digitization levels, which improves the detectability limit by a factor of 16 over the 256 levels of an 8-bit resolution digitizer model.

GaGe 12-bit digitizers feature sampling rates at up to 2 GigaSamples per second and are available with 1, 2, or 4 digitizing channels, input bandwidths of up to 700 MHz, deep onboard sample memory up to 8 GS (16 GB), and true ENOBs up to 10.3 bits.



## 8-Bit High-Speed A/D Digitizers

GaGe 8-bit resolution digitizer models provide the highest possible sampling rates at up to 4 GigaSamples per second with 1 or 2 digitizing channels, input bandwidths of up to 1.5 GHz, deep onboard sample memory up to 16 GS (16 GB), and true ENOBs of over 7 bits.



## IF Signal Recording App

DsScope is a Windows based PC oscilloscope application that requires no programming for digitizer operation, display acquired signal data for analysis, and conduct IF real-time streaming signal recordings to storage with live monitoring. Analysis displays include Time Domain, Frequency Spectrum, and Persistence.

The companion DsScopeView application allows an operator to open/view and conduct playback of previous signal recordings to the display monitor for analysis, with additional display capabilities that include persistence and histogram modes.



## RF Signal Recording App

SpectraScopeRT is a Windows based spectrum analyzer application that requires no programming and allows for integrated operational control of both the downconverter receiver and the digitizer for signal capture, analysis, and conduct RF real-time streaming signal recordings with live monitoring. Any tuner, downconverter, or receiver with an IF output or a virtual receiver is supported. Analysis displays include Time Domain, Frequency Spectrum, Power Spectrum, Constellation, Spectrogram, Persistence, & Histogram.

The companion SpectraViewRT application allows an operator to open/view and conduct playback of previous signal recordings to the display monitor for analysis.



## RF Downconverters

Today's high-band signal standards are using higher frequencies and wider bandwidths than ever before for applications such as next generation 5G wireless services, satellite communications, electronic warfare, and more.

GaGe offers a selection of RF Downconverter models that can cover narrowband frequencies starting at 9 kHz to wideband frequencies up to 40 GHz, with instantaneous bandwidths (IBW) that range from 10 MHz up to 500 MHz. The outputs of the RF Downconverters are connected to the channel inputs of high-speed PCIe Digitizers with suitable input bandwidth and A/D sampling rates for the targeted application.



## Ultra-Portable RF Signal Recorders

These real-time spectrum analyzer solutions feature ultra-portable configurations for real-time, long-term recording of RF signals. Wideband signals up to 27 GHz can be viewed, analyzed, and recorded using system-based packages that weigh up to 10.8 kg / 24 lb.

Capabilities include broadband spectrum viewing, waterfall displays, frequency domain triggering, and signal averaging, with many cursor and display options and real-time recordings up to 160 MHz in bandwidth, or selectable recorded bandwidths of 100, 80, 40, and 10 MHz, depending on configuration.

