Wideband Downconverter Solutions

With GaGe 16-bit Digitizers

GaGe wideband downconverter solutions feature a single RF input and wideband bandwidth coverage of 10 MHz and 100 MHz with signal tuning from 100 kHz to 20 GHz.

Full control and data acquisition support are provided via Mathworks' MATLAB, with example programs furnished to facilitate rapid signal processing and modulation analysis program development. Additional software SDK and example programs are available for C/C# and LabVIEW.

APPLICATIONS

Communications R&D, manufacturing test

Wireless network testing and management

Wideband test and measurement spectrum analysis

Government spectrum licensing and monitoring

Military signal intelligence (COMINT/ SIGINT)

Wideband stimulus / response testing

Radar Design and Test

Medical Research

FEATURES

- 100 kHz – 20 GHz frequency tuning
- 100 MHz wideband analysis bandwidth
- Real-Time Data capture to digitizer memory – up to 16GS
- 16 bit, 200MS/s digitizer resolution
- Matlab support for control, acquisition, and signal processing
- High Speed gap-free PCIe X8 streaming to PC memory at 3.1 GB/s
- Pre-selector bandpass filters (switchable) to limit spurious response
- Anti-alias filters with software controlled bandwidth reduction
- Allows up to 160 seconds of real-time recording to digitizer memory (100 MS/s)
- Multi-channel systems with 10 MHz in/out synchronization
- View FFTs, Record and Store via GaGeScope, no programming required
- Software SDKs for C, MATLAB, LabVIEW

GaGe

Gage Wideband Downconverters - Main Specifications

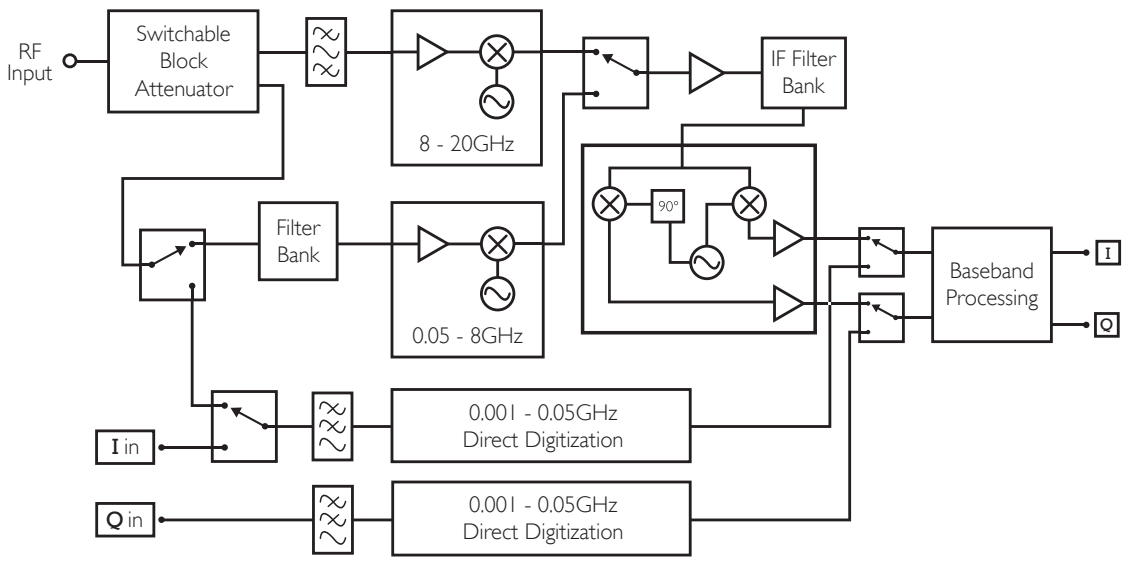
Model	Frequency Coverage	Bandwidth
DC8G10	100 kHz - 8 GHz	10 MHz BW (35 MHz IF)
DC8G100	100 kHz - 8 GHz	100 MHz BW (I, Q outputs)
DC20G100	100 kHz - 20 GHz	100 MHz BW (I, Q outputs)

These new products, featuring breakthrough frequency and bandwidth coverage for their size and cost, are available with two bandwidths, covering two frequency ranges. The lowest cost model, the DC8G10, has a 10 MHz IF bandwidth centered at 35MHz, covers up to 8 GHz, and is primarily directed at digital radio applications.

The DC8G100 and DC20G100 cover up to 8 GHz and 20 GHz respectively, both with 100 MHz of baseband I and Q output bandwidth. These products are engineered for analyzing wideband digital communications, like cell phone standards 3G/4G/LTE, WiFi, or general Vector Signal Analysis (VSA) applications involving broadband signals.

The Downconverter RF front end is a unique architecture, consisting of super-heterodyne and direct conversion technologies. The direct-conversion receiver stage acts as a back-end for all but the directly digitized range of frequencies up to 50 MHz. This approach provides the major benefits of direct conversion receivers, namely wide bandwidth, but extends the frequency range using superheterodyne techniques to provide greater RF coverage. All front end processing blocks provide preselection filters, plus user selectable gain and attenuation to optimize noise figure and spurious free dynamic range. The block diagram for the DC20G100 RF front end is shown below.

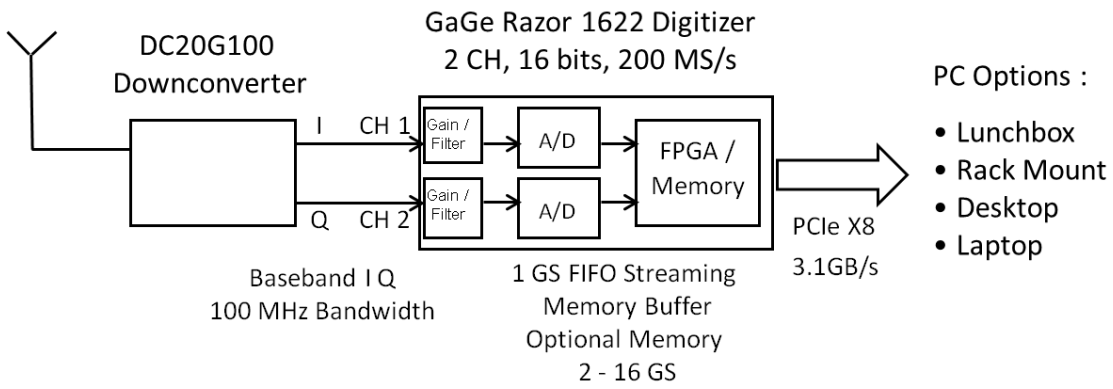
DC20G100 Block Diagram



The Downconverter products, when combined with GaGe High Speed Digitizers, allow for complete real-time signal recording and analysis systems covering frequencies up to 20GHz. These solutions greatly extend the digitizers frequency range, and allow those developing applications in R&D, Manufacturing Test, and Field Service high performance, lower cost platforms for complex wideband RF and microwave signal analysis.

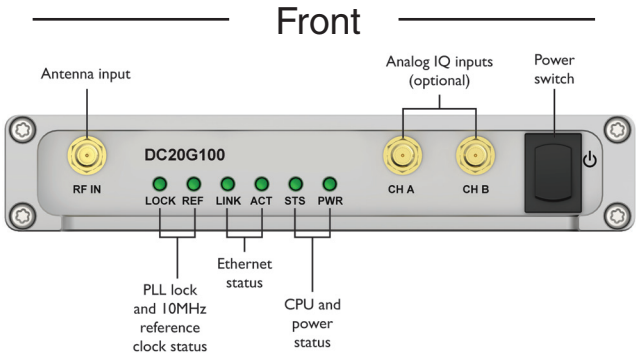
The GaGe Razor PCIe digitizers feature 16 bit resolution, along with up to 16 GS onboard memory for real-time gap free signal recording at 100 MHz bandwidth. This large FIFO memory also allows for real-time streaming I and Q baseband signals at 3.1 GB/s over PCI Express to PC memory for post processing, display, and storage. The 4 channel CSE1642 digitizer supports two downconverters, while 10MHz reference inputs and outputs on both units provides a single frequency reference for synchronized system performance. A typical Razor CSE1622 and DC20G100 configuration is shown below.

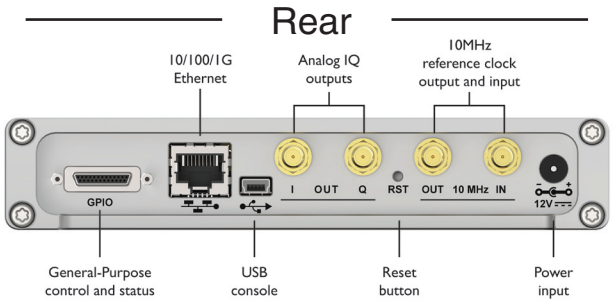
20 GHz Wideband Signal Analyzer System



The Digitizers and Downconverters have full control and data acquisition support via Mathworks Matlab, with example programs furnished to facilitate rapid signal processing and modulation analysis program development. Additional software SDK and example programs are available for C/C# and Labview.

For manual control, testing and setup of the Ethernet connected Downconverters, programs are provided for network discovery, setting carrier frequency, RF / IF gain, filters, etc. Frequency domain signal analysis of the Downconverter baseband output signals is done with the GaGe Scope Professional FFT capability, supporting zoom frequency display, cursors, averaging, and waveform signal storage/printing.





SPECIFICATIONS

Max. Dynamic Range	100 dB
Noise Figure	< 15 dB
Absolute Max. RF input power	+15 dBm
Max. RF gain	20 dB
Max. IF gain	20 dB
Gain control	30 dB; 0.5 dB steps
RF PLL phase noise (2 GHz)	100 dBc @ 100 kHz offset
Spectrum scan rate	200 GHz/s @ 122 kHz RBW
RF PLL lock time	< 100 µs
Power Supply	+12 VDC
Power Consumption	18 W
Operating Temperature Range	0°C to +50°C
Enclosure dimensions	9.8 (L) x 6.5 (W) x 1.2 (H) inches

WARRANTY

One year parts and labor

Certificate of NIST Traceable Calibration is included.

Unless otherwise specified, all dynamic performance specs have been qualified on engineering boards. All specifications subject to change without notice.

The GaGe Razor Digitizer series can support up to 4 downconverters per board. The most typical wideband system solutions are shown below. Please Contact your GaGe representative for help in configuring your system.

ORDERING INFORMATION

Hardware

GaGe Razor 16-Bit Digitizer	Downconverter	Signal Analyzer Bandwidth	Frequency Coverage
1621 - 2 CH, 100 MS/s	DC8G10	10 MHz (35 MHz IF)	100kHz - 8 GHz
1622 - 2 CH, 200 MS/s	DC8G100	100 MHz (I,Q)	100kHz - 8 GHz
1622 - 2 CH, 200 MS/s	DC20G100	100 MHz (I,Q)	100kHz - 20 GHz

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