Product Information Sheet

Wideband Downconverters

With Signatec 14-Bit Digitizers

FEATURES

- 100 kHz – 20 GHz Frequency Tuning
- 100 MHz Wideband Analysis Bandwidth
- Real-Time Data Capture to High-Speed RAID Storage at up to 700 MS/s
- 14-Bit, 400 MS/s Digitizer Resolution
- Laptop Based Gap-Free Streaming with EC14150D Digitizer at up to 85 MS/s
- Pre-Selector Bandpass Filters (Switchable) to Limit Spurious Response
- Anti-Alias Filters for Signal Integrity
- Allows over 34 Hours of Real-Time Recording
- Multi-Channel Systems with 10 MHz In/Out Synchronization
- View and Record Gap-Free Data with No Programming Required
- Software SDKs for C and LabVIEW

APPLICATIONS

- Military Signal Intelligence (COMINT/SIGINT)
- Communications R&D
- Wireless Network Testing and Management
- Wideband Test & Measurement Spectrum Analysis
- Government Spectrum Licensing and Monitoring
- Wideband Stimulus / Response Testing
- Radar Design and Test
- Electronic Warfare
- Medical Research

OVERVIEW

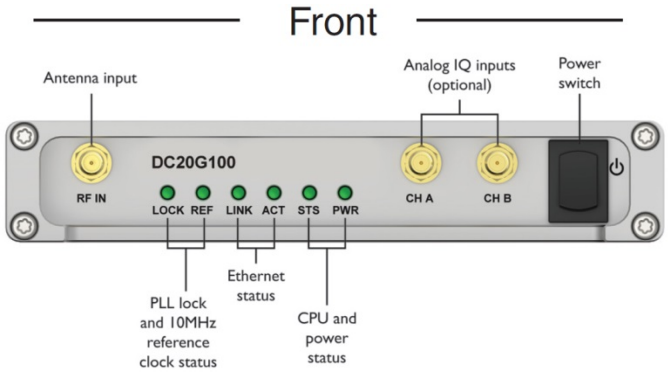
Signatec wideband downconverter product solutions feature breakthrough frequency and bandwidth coverage for their size and cost, and are available with two bandwidths covering two frequency ranges:

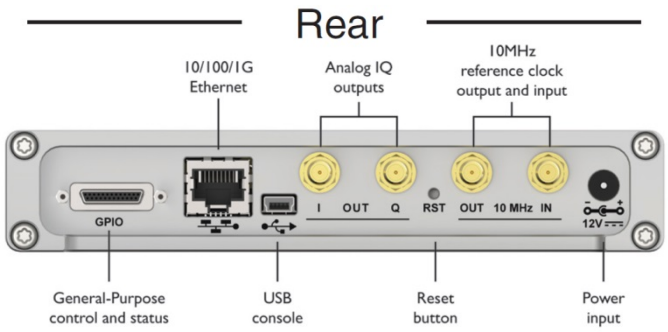
Model	Frequency Coverage	Bandwidth
DC8G10	100 kHz – 8 GHz	10 MHz BW (35 MHz IF)
DC8G100	100 kHz – 8 GHz	100 MHz BW (I, Q Outputs)
DC20G100	100 kHz – 20 GHz	100 MHz BW (I, Q Outputs)

The lowest cost model, the DC8G10, has a 10 MHz IF bandwidth centered at 35 MHz, 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 products, when combined with Signatec High Speed Digitizers, allow for complete real-time signal recording and analysis systems covering frequencies up to 20 GHz.





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HARDWARE DESCRIPTION

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 super-heterodyne techniques to provide greater RF coverage.

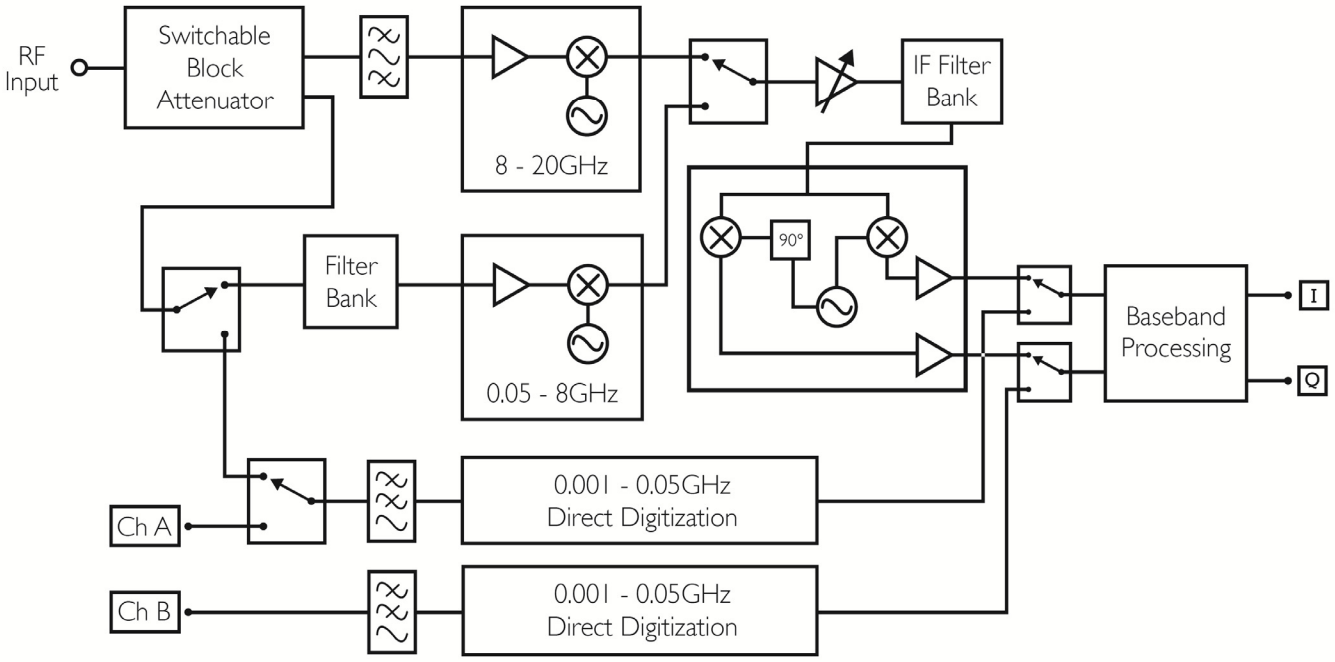
All front end processing blocks provide pre-selection filters, plus user selectable gain and attenuation to optimize noise figure and spurious free dynamic range. The block diagram for the DC20G100 RF front end is shown below.

For complete portability, a 12V battery pack option is available to power the Downconverter.

These solutions greatly extend the digitizers frequency range, and allow those developing applications in Surveillance, Signal Intelligence, Radar, EW, and R&D high performance, lower cost platforms for complex wideband RF and microwave signal analysis.

For manual control, testing and setup of the Ethernet connected Downconverters, programs are provided for network discovery, setting carrier frequency, RF / IF gain, and filters. Frequency and time domain signal analysis can be viewed with the furnished Signatec acquisition and control software. This enables real-time gap free recoding while monitoring waveforms.

Full control and data acquisition support is also available via software SDKs for C and LabVIEW.



DC20G100 RF Front End Block Diagram

Portable or Rackmount 20 GHz Wideband Signal Recording Systems

Signatec PX14400D PCIe Digitizer solutions, with 14-bit resolution and real-time stream to disk support, allow easily configured turnkey signal recording solutions for signals up to 20 GHz.

The PX14400D's frequency synthesized clock allows for the ADC sampling rate to be set to virtually any value from 20 MHz to 400 MHz, for maximum sampling rate flexibility with 14-bit A/D resolution.

The PX14400D supports real-time sustained PCIe data streaming at up to 700 MS/s per card, and is fully supported by mouse driven turn-key software featuring signal monitoring while recording.

The PX14400D also supports a 2nd optional FPGA, with an open programming environment, where user provided programs can perform signal processing operations in real-time before data is stored. Standard FPGA processing features that are furnished for typical applications include DDC, FIR Filter, and FFT.

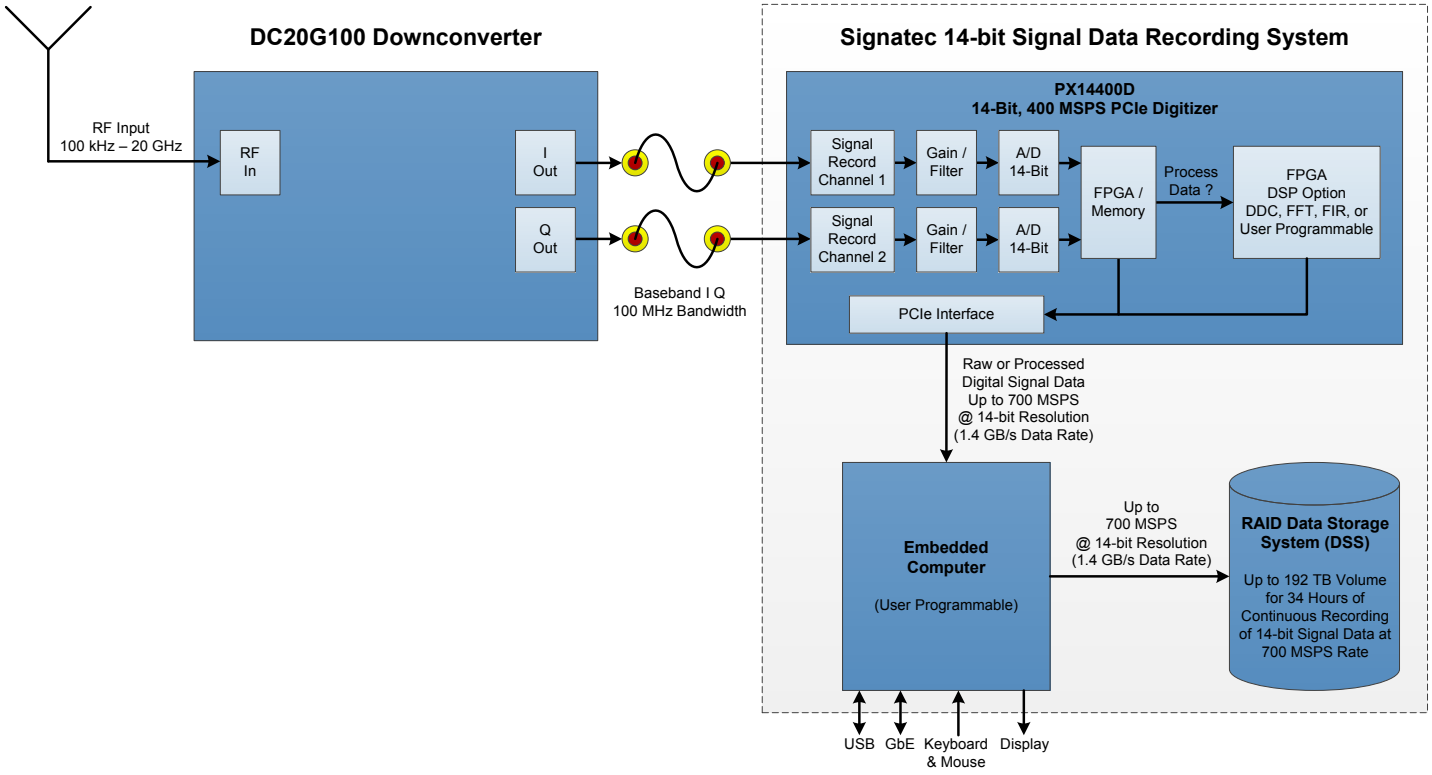
Signatec Digitizers include a complete Windows based Scope Application that provides a virtual oscilloscope and allows the operator to view or edit all digitizer hardware settings as well as record and display acquisition data.

Complete PX14400D Signal Recording Systems are furnished fully tested and fully integrated with high-speed real-time data recording RAID storage. These systems are specially designed to maximize the operations and the sustained data streaming transfer rates from Signatec Digitizers to the Embedded PC and Data Storage System (DSS) with either solid state or mechanical based enterprise storage drive arrays.

The DSS volume is configured by default as a single Windows NTFS drive volume. As a standard Windows recognized drive volume, all standard Windows operating system access and file operations may be performed on it.

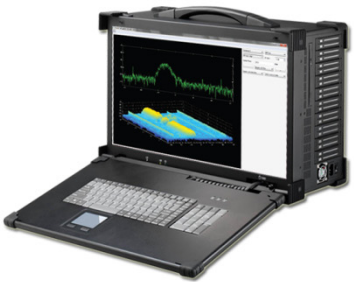
Rugged portable systems are typically configured with solid state based drive arrays with support for up to 18 solid state drives (maximum volume of 8.64 TB) that provides up to 1.5 hours of continuous signal data recording at the maximum 14-bit 700 MSPS rate without missing any data.

Rackmount systems can be configured with solid state or mechanical based drive arrays with support for up to 48 drives (maximum volume of 192 TB) that provides up to 34 hours of continuous signal data recording at the maximum 14-bit 700 MSPS rate without missing any data.



DC20G100

PX14400D



Portable Signal Data Recorder

4U Rackmount 48 Drive Signal Data Recorder

Laptop 20 GHz Wideband Signal Recording Systems

Signatec EC14150D ExpressCard Digitizer solutions, with 14-bit resolution and real-time stream to disk support, allow easily configured turnkey signal recording solutions for signals up to 20 GHz for mobile laptop based systems.

The EC14150D is a dual-channel digitizer card that provides a remarkable combination of high-speed 14-bit 150 MS/s sampling in a very compact, low power ExpressCard/54 form factor.

The EC14150D's frequency synthesized clock allows for the ADC sampling rate to be set to virtually any value from 45 MHz to 150 MHz, for maximum sampling rate flexibility with 14-bit A/D resolution.

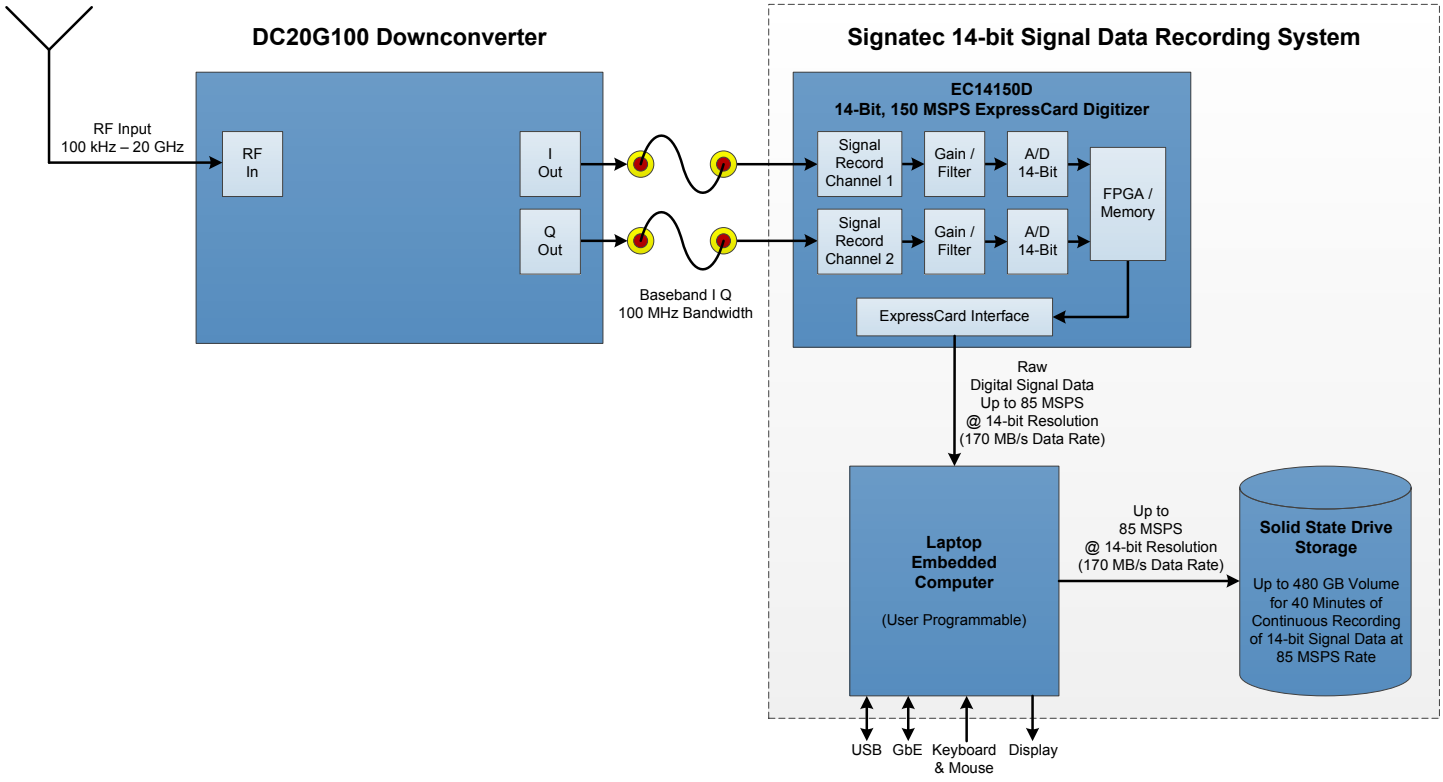
The EC14150D represents one of the lowest power consuming high-speed digitizer card for mobile laptop use, at 4.0 to 4.5 Watts, with support for real-time sustained ExpressCard data streaming at up to 85 MS/s.

Signatec Digitizers include a complete Windows based Scope Application that provides a virtual oscilloscope and allows the operator to view or edit all digitizer hardware settings as well as record and display acquisition data.

Complete EC14150D Signal Recording Laptop Systems are furnished fully tested and fully integrated with high-speed solid state drive storage. These laptop based systems are specially designed to maximize the operations and the sustained data streaming transfer rates from Signatec ExpressCard Digitizers to the Embedded PC and Solid State Drive Storage.

The dedicated solid state drive storage volume is configured by default as a single Windows NTFS drive volume. As a standard Windows recognized drive volume, all standard Windows operating system access and file operations may be performed on it.

Signatec laptop systems are typically configured with a secondary high-performance solid state drive (maximum volume of 480 GB) that provides up to 40 minutes of continuous signal data recording at the maximum 14-bit 85 MSPS rate without missing any data. Sampling at reduced rates increases the duration of data recording time available.



DC20G100

EC14150D

Laptop Signal Data Recorder

SPECIFICATIONS AND ORDERING INFORMATION

Wideband Downconverter Specifications

Maximum Dynamic Range	: 100 dB
Noise Figure	: < 15 dB
Absolute Maximum RF Input Power	: + 15 dBm
Maximum RF Gain	: 20 dB
Maximum 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 RB W
RF PLL Lock Time	: < 100 µs
Power Supply	: +12 VDC
Power Consumption	: 18 W
Operating Temperature Range	: -4°F to +158°F 0°C to 50°C
Enclosure Dimensions	: 9.8" L x 6.5" W x 1.2" H 24.9cm L x 16.5cm H x 3.0cm W

14-Bit Digitizer Specifications

PX14400D	: Please refer to PX14400D product data sheet for full specification details
EC14150D	: Please refer to EC14150D product data sheet for full specification details

Signal Recording System Specifications

Please refer to IC2000 and DSS product data sheet for complete range of portable, desktop, and rackmount high-performance PC workstations and data storage system options and specification details.

Wideband Downconverter Ordering Information

DC8G10	: 10 MHz (35 MHz IF) Signal Analyzer Bandwidth 100 kHz – 8 GHz Frequency Coverage
DC8G100	: 100 MHz (I,Q) Signal Analyzer Bandwidth 100 kHz – 8 GHz Frequency Coverage
DC20G100	: 100 MHz (I,Q) Signal Analyzer Bandwidth 100 kHz – 20 GHz Frequency Coverage

14-Bit Digitizer Ordering Information

PX14400D	: Please refer to PX14400D product data sheet for complete configuration options and ordering information
EC14150D	: Please refer to EC14150D product data sheet for complete configuration options and ordering information

Signal Recording System Ordering Information

Please refer to IC2000 and DSS product data sheet for complete system configuration options and ordering information.

Product Warranty

All Signatec products carry a standard full 1-year warranty. During the warranty period, DynamicSignals will repair or replace any defective product at no cost to the customer. Warranties do not cover customer misuse or abuse of the products.

Notes:

DynamicSignals reserves the right to make changes in this specification at any time without notice. The information furnished herein is believed to be accurate, however no responsibility is assumed for its use.

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