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Compact IF Data Acquisition System High-speed, High Resolution

Key Features

- Accepts IF signal input from 10 KHz to 300 MHz
- Up to 105 MHz signal collection bandwidth
- Deep 4 GBytes snapshot/buffer memory
- Direct integration with SignalWorks®
- Compact, rugged, portable packaging



TriSys Technologies' SigDigIII™ is a high-resolution, high-speed data acquisition system specifically tailored for digitizing radio IF signals.

The SigDigIII™ incorporates all the features that have made the SigDig line popular, such as deep memory, built in sampling clocks, combined wide band and narrow band capability, signal playback, and network connectivity. This newest generation provides 105MHz of bandwidth, 12-bit A/D resolution and a high speed USB 2.0 serial interface.

The compact size and ruggedness of the SigDigIII™ make it ideal for tactical and mobile surveillance applications. SigDigIII™ is housed in a compact, rugged, extruded-metal case, and is powered by DC or any worldwide AC source. Since it can be remotely accessed over any TCP/IP network, the digitizer can be deployed in a "leave-behind" scenario. As a companion to a laptop computer, it is the ultimate portable signal collection and analysis station.

- Ease of use is a hallmark of TriSys Technologies' Digitizers. Whether using the universal cross platform software, the premier SignalWorks™ analysis software, or writing custom software to the open network interface, nothing beats the simplicity of the SigDigIII™.

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SigDigIII™ Features

Receiver Interface

- The SigDigIII™ is designed to acquire intermediate frequency (IF) signals from standard surveillance receivers. It is capable of accepting any IF from 10 KHz to 300 MHz, using the IF filter of the receiver to prevent aliasing. With the appropriate receiver, the SigDigIII™ works well in the HF, VHF, UHF, microwave and satellite bands. The SigDigIII™ can be used directly as a “set-on” or drop receiver throughout the HF bands with no down conversion required.

Deep Memory

- With 4 GBytes of internal snapshot memory, the SigDigIII can take long gap-free snapshots for over 20 seconds at 200 MHz sampling rate. At lower sampling rates, even longer snapshots can be obtained. This table shows the maximum acquisition time for various sampling rates:

Sampling Rate	Sample Resolution	Maximum Acquisition Time
210 MHz	12 Bit	10.2 sec
210 MHz	8 Bit	20.4 sec
93.3 MHz	8 Bit	46.0 sec
80 MHz	8 Bit	53.68 sec
20.0 MHz	8 Bit	214.7 sec
3.0 MHz	16 Bit	11.9 min
200 KHz	16 Bit	3 hrs
20.0 KHz	16 Bit	29.8 hrs

Circular Buffer Snapshot Acquisition

- In circular snapshot mode, the SigDigIII™ continuously acquires signal to a circular buffer up to 4 GBytes long. During the circular acquisition, the signal activity can be monitored. Once the desired signal is acquired and in memory, the acquisition is stopped, and the digital signal – either the full snapshot or any part of it – can be downloaded for analysis.

Digital Tuner

- With the integral digital tuner, the SigDigIII™ can acquire signals with up to 16 bits resolution, either real or complex (I&Q). Continuous streaming acquisition is possible at rates of up to 15 MByte/sec, depending on the interface and computer performance.

Sampling Clocks

- The SigDigIII™ digitizes snapshots using either an external clock (20 to 210 MHz) or one of six internal low-jitter clocks. The frequencies of the internal clocks were selected to be appropriate to common IF centers, and eliminate the need for external synthesizers to provide a sampling clock.

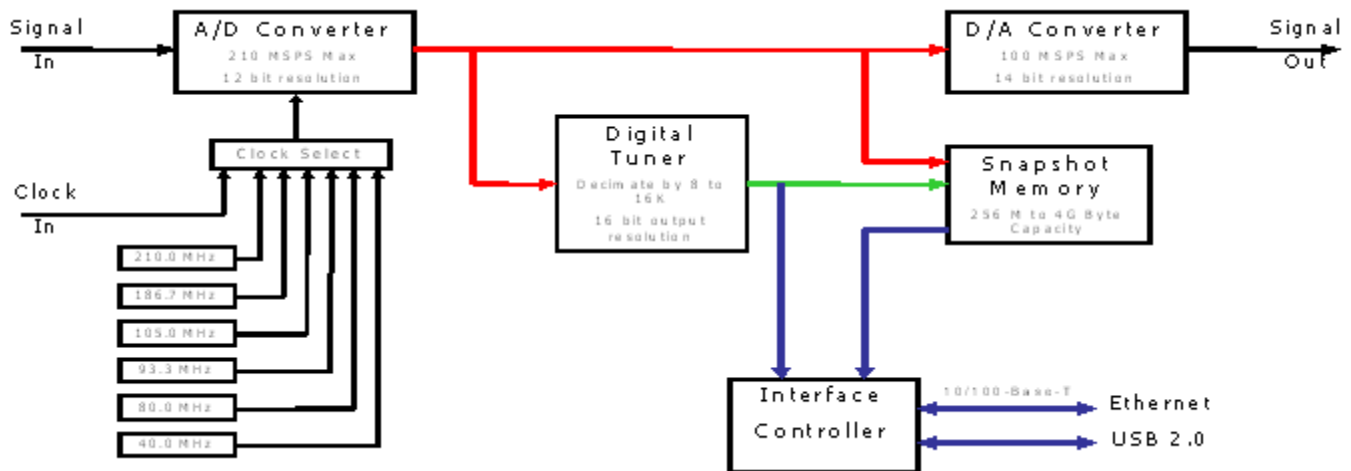
IF Center Frequency	Standard Internal Clock Frequency	Centered Bandwidth Available	Inverted?
10.7 MHz	80.0 MHz	21.4 MHz	N
21.4 MHz	80.0 MHz	37.2 MHz	N
70.0 MHz	210.0 MHz	80.0 MHz	N
70.0 MHz	93.3 MHz	46.6 MHz	Y
140 MHz	186.7 MHz	93.3 MHz	Y
160 MHz	210.0 MHz	100.0 MHz	Y

Signal Playback

- In addition to being a signal capture device, the SigDigIII™ can also function as a deep memory arbitrary waveform generator. A signal can either be captured or uploaded into memory. Then the SigDigIII™ can play back the signal in memory in either single-shot or looping mode. The memory used for signal storage for playback can be up to the entire 4 GBytes of installed memory.

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SigDigIII™ Features



Key: Red – Wideband, Green – Mediumband, Blue - Narrowband

Network Interface

- One of the distinctive features of the SigDigIII™ is its network interface. Instead of a bus or proprietary interface, the SigDigIII™ uses a standard Ethernet interface for both control and data transfers. (USB 2.0 can be used for faster data transfer)
- This completely eliminates the need for special drivers, and is compatible with virtually any laptop, desktop, or workstation computer. Like any network device, the SigDigIII has an IP address, and functions like a server.
- The SigDigIII™ can be connected directly to a single computer using a standard Ethernet crossover cable and standard USB cable (both supplied). Alternatively, the SigDigIII™ can be installed on a LAN or WAN as a 'signal server'. This makes it ideal for remote operations.



Software Applications

There are a number of software applications that can be used to acquire data through the SigDigIII™ and to facilitate configuration and control of its functions. All of these applications communicate with the digitizer over the Ethernet interface using a TCP/IP messaging protocol. USB interface is used for high speed transfers

- TriaSys Technologies' provides a Windows Acquisition Application. This is native windows application that is installed on your computer and provide SigDigIII control and signal capture to file.
- For premium signal analysis capability, TriaSys Technologies' SignalWorks® suite of signal analysis applications provides seamless integration with the SigDigIII™. The combination of the SigDigIII and SignalWorks provides an unparalleled level of signal analysis power and ease of use. SignalWorks® is available separately.

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**SigDigIII™
Performance Specifications**

Wideband Sampling Rate:

Standard internal clock frequency
40.0, 80.0, 93.3, 105.0, 186.6, and 210 MHz
External clock frequency 20 to 210 MHz

Signal Storage:

Memory 4096 Mbytes
Data Format 8 or 16 bit 2's complement
Data Packing 12 bits sign extended into 16 bit words

Wideband Performance:

SFDR 80 dB
SNR 60 dB

Network Interface:

Interface 10/100 Base T
Connector RJ-45
Protocol Ethernet TCP/IP

Digital Tuner:

Tuning Resolution < 0.25 Hz
Decimation 8 to 8192 (real)
16 to 16384 (complex)
Output Sampling Rate 1.2 KHz to 12.5 MHz
Out of band rejection > 100 dB
SFDR > 115dB

Serial Interface:

Interface USB 2.0
Maximum sustained transfer rate 17.5 Mbytes/sec

Internal Clock Stability:

Accuracy 25 PPM
Jitter < 15 ps RMS

Resolution:

A/D Conversion and Digital Tuner input 12 bits
A/D to Snapshot 8 or 12 bits
Digital Tuner to Memory or Streaming 8 or 16 bits

Mechanical:

Enclosure Extruded Aluminum
Size 5.6" w x 1.9" h x 10.0" d
Weight < 3 lbs
Cooling Hi-reliability, low noise fan
Air flow Front intake, rear exhaust

Signal Input:

Analog bandwidth > 250 MHz
Coupling AC Coupled, 10 KHz cutoff
Impedance 50 Ohm
Level 1.0v P-P max.
Typical input signal power -20 to -3 dBm
Connector BNC

Environmental:

Operating temperature 0 to 40 C
Storage temperature -40 to 80 C

Signal Output:

Sampling rate Up to 100MHz
(Higher sampling rates with reduced performance)
Level 1 V P-P
Connector BNC

DC Power:

Voltage 10 to 18 VDC
Power < 20 W
Connector Locking Lemo connector

AC Power (external adapter)

Voltage 100-240VAC
Frequency 50/60 Hz

To Inquire or Order

For a demonstration, further information, or to contact a representative, please call 978.244.1060, or visit our website at www.triasys.us.

Product Formerly a Signami / Signami DCS Product