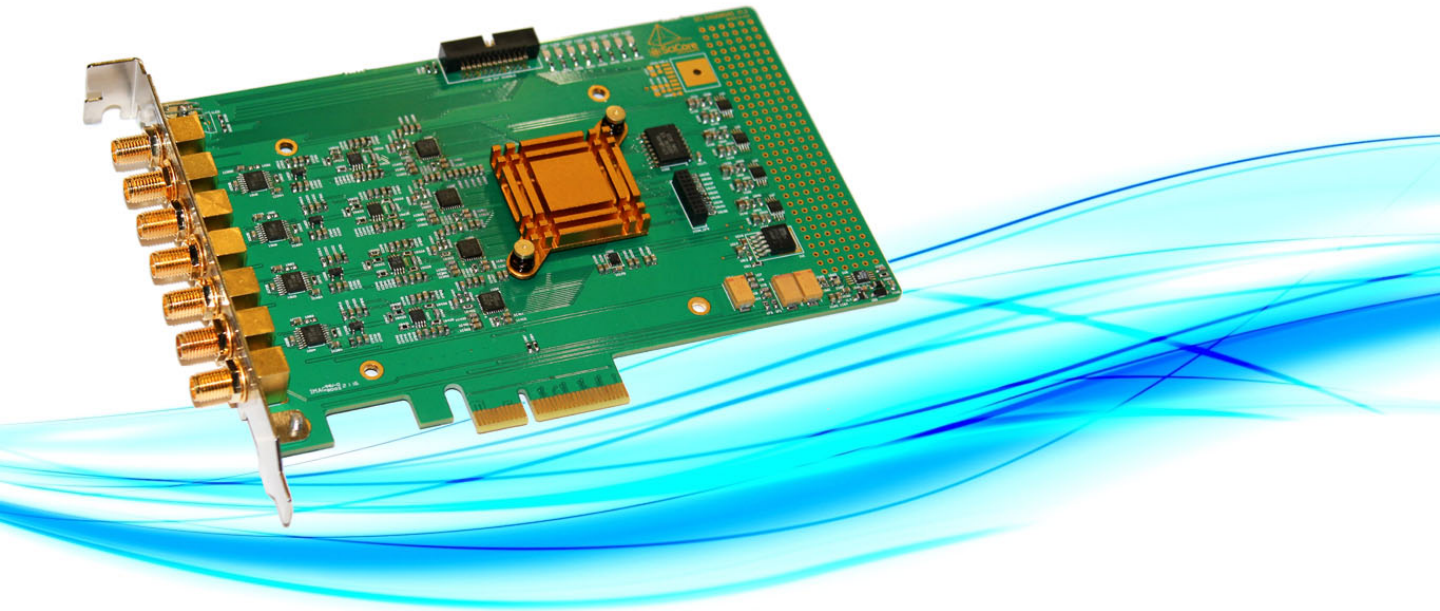


DAQ0754S Data Acquisition Card

- 4 simultaneous analog input channels
- 14 bit A/D resolution at 75 MS/s
- Selective gain x1 and x 10 input amplifier
- 4 lane PCI express interface to PC
- 600 MB/s sustained data throughput
- Nearly 100% measurement duty cycle
- Simplified software programming interface

Product Functions

DAQ0754S samples 4 analog input signals simultaneously at maximum 75MS/s with 14-bit A/D resolution, and transfers the digitized waveform data to application software via the 4-lane PCI express bus.

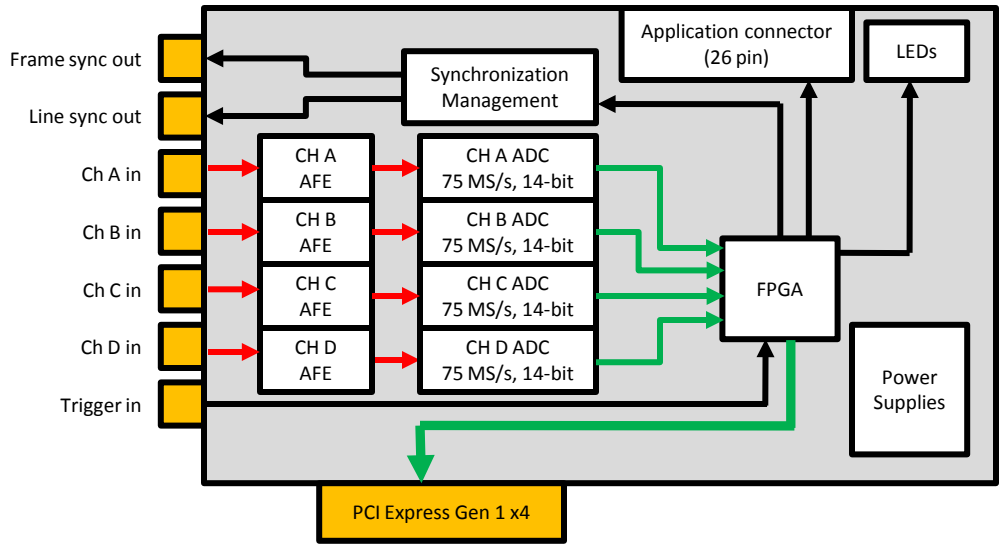
DAQ0754S has a PCI express gen1 x 4 interface with the PC and supports high measurement duty cycle in continuous acquisition mode. When running at 75MS/s sampling rate with 14-bit A/D resolution, this board can achieve a sustained data transfer rate of ~600MB/s to the PC memory, which corresponds to nearly 100% measurement duty cycle with no dead time between transferred data records.

DAQ0754S has a simplified and optimized software programming interface. The digitized waveform data is transferred in the format of data frames. Each data frame consists of a number of data records and each data record consists of a number of data points. Both the number of data points per record and the number of records per frame can be programmed by the user. DAQ0754S supports various triggering methods including free-run and edge (rising edge or falling edge) triggering mode. In the edge triggering mode, the data in every record is synchronized with the trigger event. After initialization, the application software only need to call a few library functions to start the data acquisition and get the latest data frame or data volume. These library functions are non-blocking which means the application software can continue work on data processing and other important tasks, when the data acquisition process is running in parallel in the background. For quick development of user application software, example software projects with source code samples compatible with Microsoft Visual Studio® software development tool are provided.

Specifications

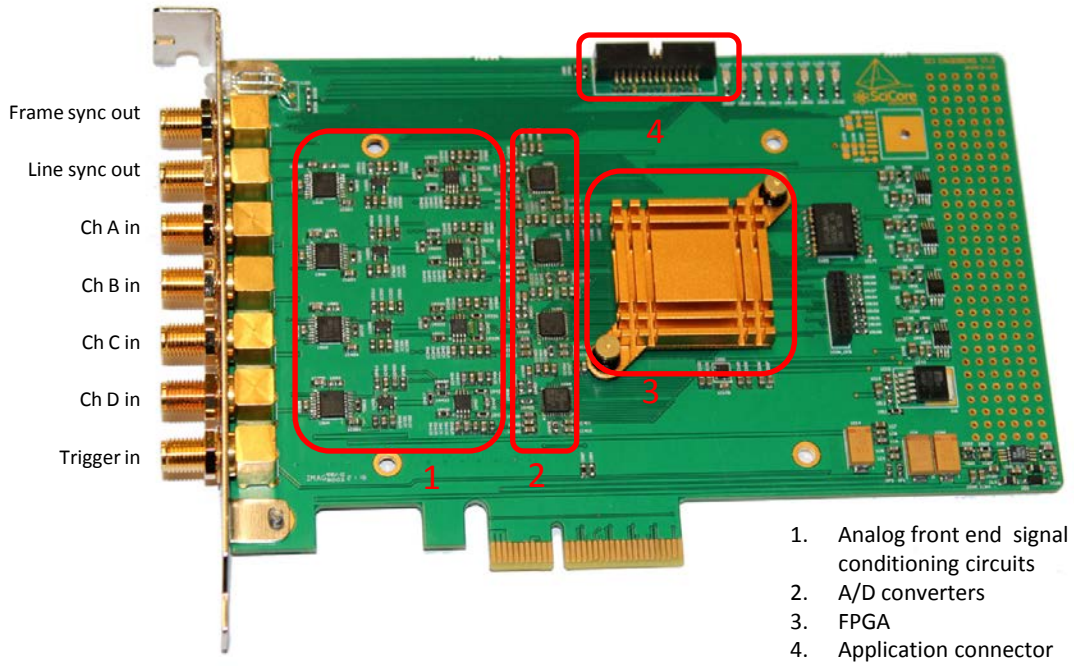
Analog Input	
Channels	4 (Simultaneous)
Sample Rate	75 MS/s, 50 MS/s, 25 MS/s, 40 MS/s, 20 MS/s, 12.5 MS/s, 10 MS/s, 8 MS/s, 5 MS/s, 4 MS/s, 2 MS/s, 1 MS/s
Vertical Resolution	14 bit
Input Impedance	50 Ohm, 1M Ohm
Input Coupling	DC coupling or AC coupling
Input Bandwidth (-3 dB)	100 MHz
Input Amplifier Gain	x1, x10
Input Connector	SMA (Female)
SNR	62 dB
Trigger Input	
Trigger Methods	Free run, rising edge, falling edge
Input Connector	SMA (Female)
Data Transfer (DMA)	
Record Length	32 – 8,192
Record Number	1 – 32,768
Maximum Data Transfer Rate	600 MB/s
PC Requirements	
Data Interface	PCI express x4
PC Operating System supported	Windows 7 64 bit, Windows 8
CPU	Quad-core, >1GHz
Memory	4GB
Power and Environment	
Power Supply Voltage	3.3V, 12V
Power Connector	PCI express x4 edge connector
Power Consumption	15 W
Mechanical Dimensions (L x W x H)	108 mm x 70 mm x 11 mm
Net Weight	400 g

Block Diagram



Above diagram shows the details of the data paths and control signal paths on the data acquisition card. Four analog input signals are connected to CH A to CH D connectors. Each signal is conditioned by an analog front end (AFE) module using the desired termination (either 50 Ohm or 1MOhm), coupling method (DC or AC), and amplifier gain (x1 or x 10), before the signal is digitized by a 14 bit A/D converter running at 75 MS/s. A FPGA chip accepts the data stream from four ADCs simultaneously. A PCI express gen 1 x4 interface is established between the FPGA chip and the computer mother board to transfer the acquired data at sustained data transfer rate of 600 MB/s, achieving 100% measurement duty cycle.

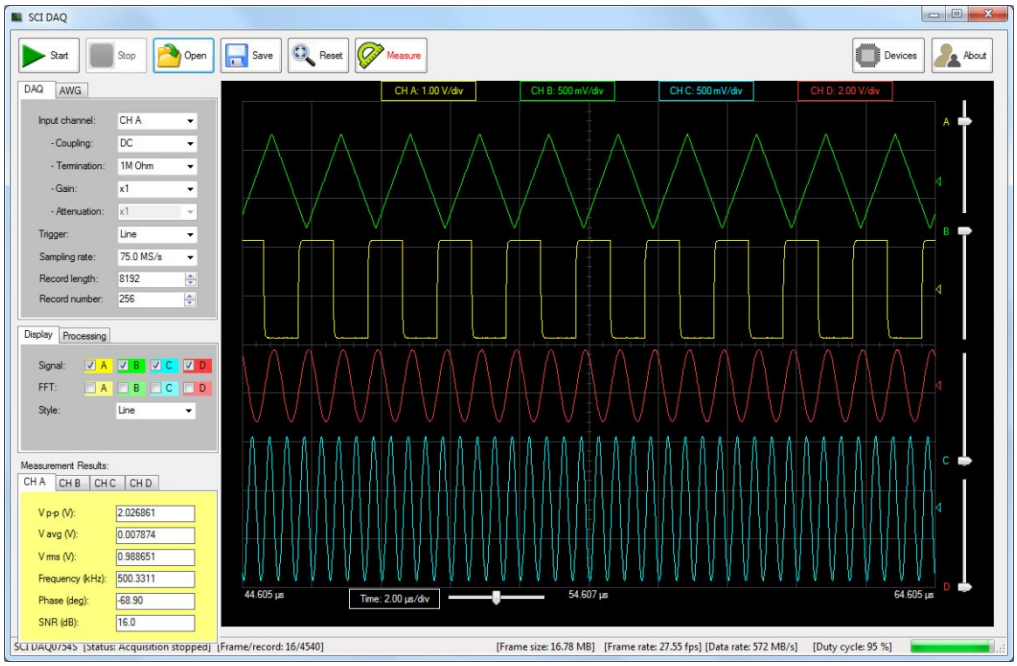
Product Picture



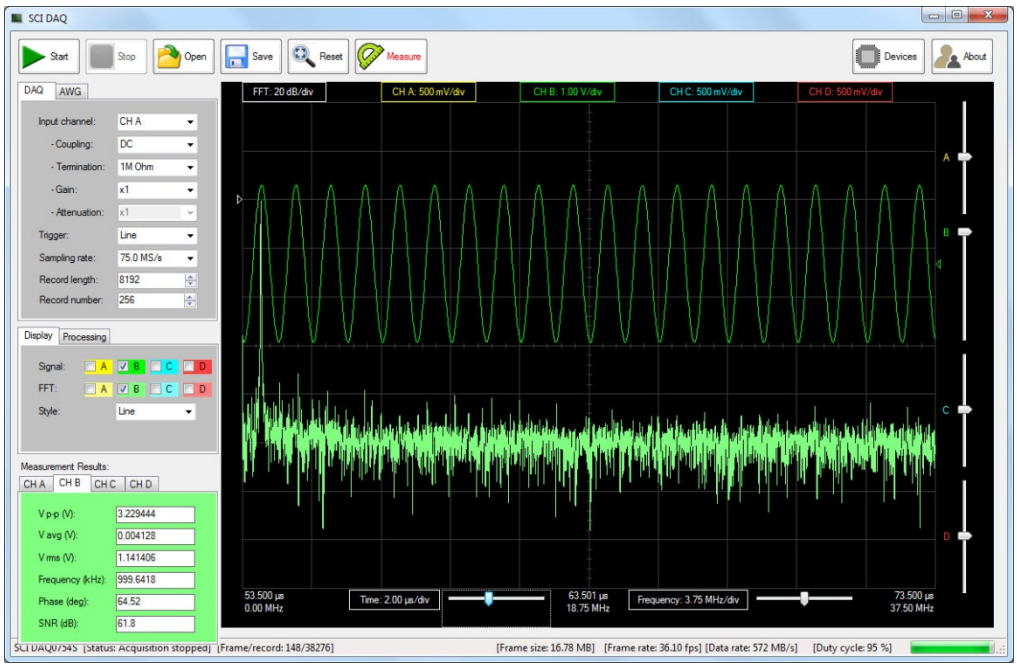
1. Analog front end signal conditioning circuits
2. A/D converters
3. FPGA
4. Application connector

Control Software Interface

A software program allows the user to quickly test the functions of the DAQ board and evaluate its performance. The software screen below shows the acquiring of four different waveforms measured by the card at 75 MS/s.



The Fourier transformed spectrum of each signal channel can be displayed after checking the corresponding software control.



Ordering Information

Part number	Description
DAQ0754S	75 MS/s data acquisition card, 14 bit A/D resolution, 4 channels

Contact Information
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