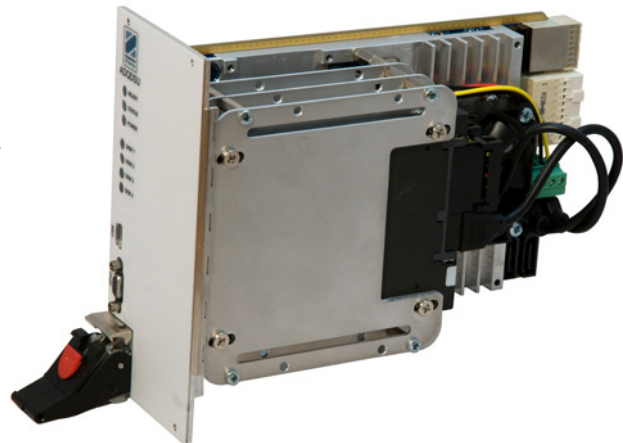


ADQDSU disk storage

The ADQ-series of digitizers is a leading family of high-speed digitizers. The unique combination of high sample rate and high dynamic range is achieved by SP Devices' proprietary ADC interleaving technology ADX. The high-speed digitizers are complemented with an ultra-compact disk storage system for streaming data, ADQDSU. The ADQDSU can store up to 2 TBytes of data at a rate of up to 1 GBytes/s.

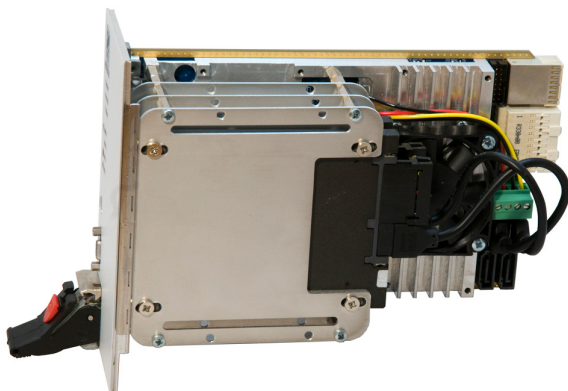


Introduction

The ADQDSU is a SSD-based disk storage unit for ADQ-series of digitizers. Since the SSD contains no moving parts, it is a robust solution. The system uses peer-to-peer streaming, that is, the data from the ADQ digitizer is written directly to the ADQDSU disk storage via the PCIe switch. The operation does not load the CPU and RAM of the controller and is thus very efficient. The compact unit has a write capacity of up to 1 GBytes/s.

The ADQDSU uses the same API as the ADQ-series of digitizers for simplified integration. The ADQDSU connects to the host via an eight-lane Generation 2 PCI Express interface. The ADQDSU is available in the mechanical form factors cPCIe/PXIe and PCIe (TBC).

The system can be complemented with a monitoring option. The main data stream is sent to the disk storage. A sub set of the data is sent to the host for monitoring. This can be used to ensure that the acquisition system is operating according to plan or to do an early selection of data.



Features

- Up to 2 TBytes disk storage
- Up to 1 GBytes/s write speed
- Up to 300 MBytes/s read speed
- Peer-to-peer streaming
- PCIe Gen2 x8 interface
- SSD technology
- Compact cPCIe/PXIe 3U form factor
- PCIe form factor (TBC)

Applications

- RADAR
- LIDAR
- Wireless communication
- Optical transmission
- High-speed data recording
- Test and measurement
- Ultrasonic ranging
- Time-of-flight

Ordering information

ORDERING INFORMATION	
ADQDSU PXIe interface	ADQDSU
AVAILABLE OPTIONS	
cPCIe/PXIe interface	-PXIe
PCIe interface (TBC)	-PCIe (TBC)
0.5 TBytes	-0T5
1 TBytes	-1T
2 TBytes	-2T
COMPLEMENTARY PRODUCTS	
Monitoring option	-Monitoring
ADQ Development Kit	See digitizer model

ADQDSU, a disk solution for ADQ-series of digitizers

The ADQ-series of digitizers is a leading family of high-speed digitizers. The unique combination of high sample rate and high dynamic range is achieved by SP Devices' proprietary ADC interleaving technology ADX.

The high speed digitizers are complemented with an ultra-compact disk storage system for streaming data, ADQDSU. Placed on the same PCIe switch as the digitizer, the load on the system is minimum and the write performance is optimized. It is possible to connect one digitizer to two ADQDSUs and get twice the write speed (this requires the monitoring option to be installed in the digitizer).

The ADQDSU operates together with the triggered streaming or a sample skip function in the digitizers, which is used for adjusting the data rate.

ADQDSU combined with ADQ Development Kit

The data set can be customized by installing the ADQ Development Kit in the digitizer. The ADQ Development Kit opens the FPGA in the digitizer for custom real-time signal processing.

ADQDSU software

The ADQDSU operates under the same API as the digitizer, which simplifies integration.

ADQDSU data flow

The storage system is based on peer-to-peer streaming in a chassis solution or in a PC backplane and do neither load the CPU nor require any access to the RAM in the host computer.

The user application sets up the data transfer to the disk and also controls if the data should be sent directly to the controller. Switching storage target from disk to controller is a software set-up process which is not done in real time. For a real-time scheduled switch between disk and controller, the data monitoring option is available.

Data is read from the ADQDSU by addressing the disk array from the application by using the ADQAPI commands.

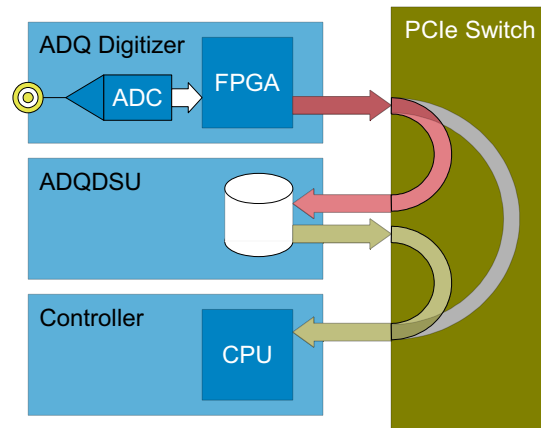


Figure 1: ADQDSU data links in a PXIe/PCIe based system.

Controller / host PC

The ADQDSU does not impose any specific requirements on the controller/host PC. The controller has to run the ADQAPI commands in the same way as controlling a digitizer. But the real-time data flow does not pass the controller.

cPCIe/PXle form factor

The standard form factor for ADQDSU is cPCIe/PXle for 3U chassis.



Figure 2: ADQDSU in PXle form factor

Order code: -PXle

PCIe form factor

The ADQDSU is also available as 2/3 slots PCIe boards for integration in a PC.



Figure 3: Showing a typical PCIe unit

Release date of ADQDSU-PCIe is TBC.

Order code: -PCIe

Disk size options

The ADQDSU disk system is available in three different sizes, 0.5, 1 and 2 TBytes.

500 GBytes

Table 1:

PARAMETER	VALUE
Size	500 MBytes
Data rate write	250 MBytes/s
Data rate read	300 MBytes/s
Data interface	PCIe Gen2 x8 / Gen1 x4
Size	2 slots (8TE), 3U

Order code: -0T5

1 TBytes

Table 2:

PARAMETER	VALUE
Size	1 TBytes
Data rate write	500 MBytes/s
Data rate read	300 MBytes/s
Data interface	PCIe Gen2 x8 / Gen1 x4
Size	3 slots (12TE), 3U

Order code: -1T

2 TBytes

Table 3:

PARAMETER	VALUE
Size	2 TBytes
Data rate write	1000 MBytes/s
Data rate read	300 MBytes/s
Data interface	PCIe Gen2 x8 / Gen1 x4
Size PXle	4 slots (12TE), 3U

Order code: -2T

Monitoring option

The monitoring option is a function installed in the digitizer and enhances the possibilities with the ADQDSU. (Contact an SP Devices' sales representative for more details about the availability on a specific digitizer model).

The monitoring option contains 2 DMA channels in the ADQ series digitizer. One channel connects to the ADQDSU and one to the controller, **Figure 4**. The monitoring option firmware contains triggered streaming to disk. A subset of records is sent to the monitoring unit. The density of records to be sent to the monitoring unit is software controlled.

The monitoring option can also be used for doubling the write capacity by connecting two ADQDSU to one digitizer, **Figure 5**.

For more advanced functions, the monitoring option can be combined with ADQ Development Kit. Two customized data sets can then be transmitted on the different channels.

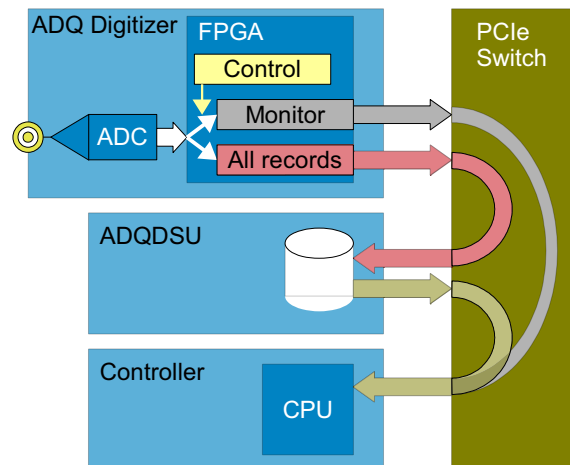


Figure 4: ADQDSU monitoring option

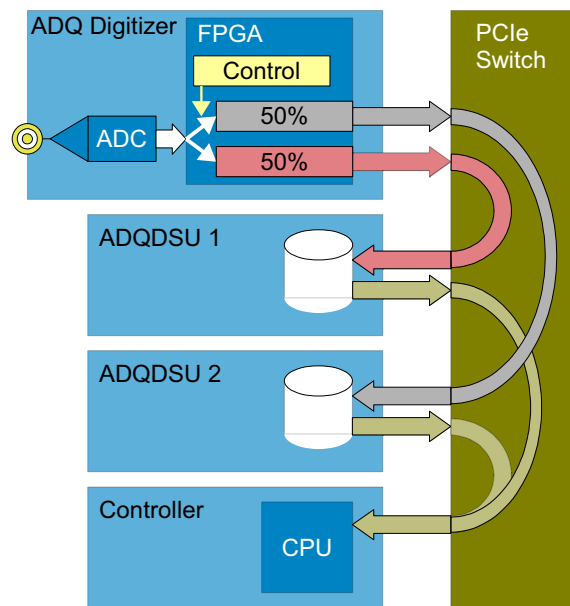


Figure 5: Using monitoring option to drive 2 ADQDSU.

Order code: -Monitoring