Sanitization procedure

This application note describes how to sanitize the ADQ series of digitizers. The application note is valid for

- All versions of ADQ14DC
- All versions of ADQ14AC
- All versions of ADQ7DC
1 ADQ hardware sanitization

1.1 Definition

ADQ Hardware
The ADQ hardware is the hardware included in the delivery from Teledyne SP Devices. It does not include the host PC. The ADQ hardware is available in different form factors which defined the host PC interface (for example stand-alone box or plug-in card). See the datasheet of respective ADQ model for a complete listing of available form factors.

Sanitization
The methods of sanitization will erase acquired data from this device so that it cannot be accessed anymore. The sanitization procedure only includes recorded data. It does not include settings of the ADQ hardware.

Storage object
Places where the acquired data is available.

1.2 Data storage objects on the ADQ hardware

During the acquisition data is stored in three objects
- Registers functions in the FPGA
- Block RAM in the FPGA
- DRAM in the board

1.3 Erasing data by power cycle

All the three data storage objects (Registers, Block RAM and DRAM) are volatile and will be erased if the power is off. The power cycle procedure will erase the content of the ADQ digitizer. The power cycle is performed differently on the different form factors:
- USB3.0: shut off the power to the external power supply or remove the power cable from the ADQ box.
- 10GbE: shut off the power to the external power supply or remove the power cable from the ADQ box.
- PCIe: shut off the power of the PC. Make sure that the power is shut off. A soft reset of the PC will not erase the digitizer.
- PXIE: shut off the power to the chassis. A soft reset of the PC in the chassis is not enough.
- MTCA: shut off the power to the chassis. A soft reset of the PC in the chassis is not enough.

Indications on the digitizer during the procedure:
- Check that the green light is on before shutting off the power. This is to verify that the green light LED is working.
- During the power off, the green light will turn off.
- When restarting the board, the green light turns on again.

Note that a DRAM is slowly discharged and there is no guaranteed time after which data cannot be accessed. To guarantee erase of data, use the overwrite procedure in Section 1.4.

1.4 Erasing data without power cycle

The data is in the digitizer can be overwritten. Then a power cycle is not required.
Set up a triggered streaming data acquisition on all channels for acquiring a set of data which is larger than the DRAM on the ADQ model.
Set the digital gain to 0 (zero) by using the SetGainAndOffset command. This will force all data to 0.
Run the acquisition. The data is now overwritten by zeros.
2 Host PC sanitization.

The host PC contains data buffers with data. The electrical properties of these buffers may vary for different PCs. The most common is that the data is stored in volatile memory which is erased during power off, but this is not guaranteed by Teledyne SP Devices.

There are 2 sets of buffers; transfer buffers and user’s buffers.

2.1 Transfer buffers

The transfer buffers are owned by the ADQAPI and allocated by the ADQAPI. The user can set the size of the buffer but has no direct access to the memory space. When the application is closed, the memory space is handed over to the operating system. The content of these buffers is not clear.

There are two ways to erase the data in these buffers.

- It may work to power cycle the PC. This depends on the hardware of the PC. Teledyne SP Devices cannot guarantee that this method works. This method has to be clarified with the supplier of the PC hardware.
- These buffers can be erased by overwriting data with zeros. This is performed by following the procedure in Section 1.3. Note that the total amount of recorded data has to be larger that the total allocated transfer buffer size.

2.2 User’s buffers

The user’s buffer are allocated by the user and owned by the user. These buffers has also to be handles by the user. Since the user has the pointer to these buffers, they can be erased by software command.
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