Overview of EPICS drivers for DAQ boards

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Overview

- DAQ boards
- Requirements
- Framework
- Driver implementation
- Graphical interfaces
- Summary
DAQ boards

- Gigasample digitizers
- ADQ7
  - 1-2 14-bit channels
  - Up to 10 GSPS
- ADQ14
  - Up to 4 14-bit channels
  - Up to 2 GSPS
DAQ boards

- High-speed digitizer on all-in-one board

- ADC3110 FMC on IFC1410
  - 8 16-bit channels
  - 250 MSPS
DAQ boards

- High-speed ADC/DAC module
- AMC523 with MZ523B on MRT523
  - 12 ADC 16-bit channels
    - 125 MSPS
  - 2 DAC 16-bit channels
    - 250 MSPS
DAQ boards

Added support for MRF protocol in the firmware:

- direct link to EVM through SFP on the front panel

- supported functionality:
  - synchronize time with MRF to provide timestamping
  - trigger acquisition on event, generate pulse on event

- standard trigger on the backplane is still supported if an EVR is present in the crate
There are many different DAQ boards but…

…they share a common use-case:

digitizing analogue signals.
## Requirements

- Driver provides full support for main and board-specific functionalities:

<table>
<thead>
<tr>
<th>Software support</th>
<th>Driver supports a specific board model no matter what hardware interface it has.</th>
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</thead>
<tbody>
<tr>
<td>Automatic startup</td>
<td>Communication with DAQ board established automatically.</td>
</tr>
<tr>
<td>DAQ modes</td>
<td>Any available DAQ mode can be chosen.</td>
</tr>
<tr>
<td>DAQ parameters</td>
<td>DAQ can be configured with various available parameters.</td>
</tr>
<tr>
<td>Trigger modes</td>
<td>DAQ can be triggered with any available source.</td>
</tr>
<tr>
<td>Channel mask</td>
<td>Number of active channels is configurable.</td>
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</table>

- Support documentation has a standardized structure.
Framework

- Driver is based on community version of NDS3
- Three layered software application
- End user interacts with IOC application or GUI
Driver implementation

1. Board initialization
2. PV generation
3. Communication port
4. CS-to-port connection
Graphical interfaces
Summary

- During the past year we have got a lot of experience with different DAQ boards, also of MTCA.4 form factor.

- And despite the wide variety of DAQ boards, they can be operated in a unified way...

- ...A way, that can be developed and maintained with community supported software.
THANK YOU!

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