VME Intensity Monitor - Task #14696

Support for PXIE digitizer firmware ABC02

11/29/2016 09:00 AM - John Diamond

Status:	Assigned	**Start date:**	11/29/2016
Priority:	Normal	**Due date:**	
Assignee:	John Diamond	**% Done:**	70%
Category:	DAQ	**Estimated time:**	24.00 hours
Target version:		**Spent time:**	14.40 hours

Description

Necessary upgrade for CW operation at PXIE.

History

#1 - 11/29/2016 09:01 AM - John Diamond

- File 125MHz_Digitizer_Firmware_Description_ABC02.pdf added

#2 - 11/29/2016 08:38 PM - John Diamond

- Subject changed from Supper for PXIE digitizer firmware ABC02 to Support for PXIE digitizer firmware ABC02

Implemented support for setting the ADC Arm mode. Command line utility is:

```
vmeintADCArmModeSet( adc_id, mode_str )
```

#3 - 11/29/2016 10:29 PM - John Diamond

Implemented support for setting the ADC trigger mode. Command line utility is:

```
vmeintADCTriggerModeSet( adc_id, mode_str )
```

#4 - 12/01/2016 06:52 PM - John Diamond

Forked PXIETorDrv from MirrTorDrv to support the ABCxx 125MHz digitizer firmware.
Created a command line utility for installing a PXIETorDrv device:

```
addPXIETorAdc adc_id, a16_base
```

Updated nbeamstartup to install PXIETorDrv.

#5 - 12/01/2016 08:22 PM - John Diamond

Implemented support for setting the ADC's gate mode. Command line utility is:

```
vmeintGateModeSet adc_id, gate_mode_str
```

#6 - 12/01/2016 10:37 PM - John Diamond

- % Done changed from 0 to 20

Implemented support for enabling/disabling the ADC's gated window mode. Command line utility is:

```
vmeintGateWindowModeSet adc_id, mode_str
```

Implemented support for enabling/disabling the ADC's CW mode. Command line utility is:

```
vmeintCWModeSet adc_id, mode_str
```

Implemented support for setting the number of integration windows to run per pulse. Command line utility is:

```
vmeintIntWindowNumSet dev_id, n
```

Added output to PXIETorDrv::show() that shows the status of: arm mode, trigger mode, gate mode, gated window mode and CW mode. Also shows the number of integration windows for pulse mode.

#7 - 12/01/2016 11:24 PM - John Diamond

Implemented support for setting the ADC's after-gate delay. Command-line utility is:

```
vmeintAfterGateDelaySet devId, delayStr
```

#8 - 12/03/2016 03:15 PM - John Diamond

Implemented commands for switching between the three operating modes supported by ABC02 firmware:

- Short Pulse (original operating mode)
- Long Pulse and Gated Long Pulse
- CW

The command utilities are:

```
vmeintOpShortPulse window_size_str
vmeintOpLongPulse num_windows, window_size_str, after_gate_delay_str
vmeintOpCW window_size_str
```

#9 - 12/03/2016 03:16 PM - John Diamond

Verified on nbeam that we are receiving interrupts while operating in CW, Short Pulse and Long Pulse mode.

#10 - 12/03/2016 03:47 PM - John Diamond

- % Done changed from 20 to 40

PXIETorDrv::readCurrent() now returns the data present in the average beam current register (+0x298) instead of calculating current by dividing integrated intensity by the gate width.

#11 - 12/03/2016 04:01 PM - John Diamond

Removed the mpsSoftTrip(..) kludge introduced in #14512 and replaced with the MPS Force Trip register (+0x2d5).

#12 - 12/04/2016 11:35 AM - John Diamond

- % Done changed from 40 to 50

Implemented support for displaying the MPS trip type and trip window number in the vs output.

#13 - 12/04/2016 04:35 PM - John Diamond

- % Done changed from 50 to 60

Implemented a command line utility for forcing an MPS trip:

```
vmeintMPSSoftTrip device_id
```

Tested on nbeam successfully.

#14 - 12/05/2016 10:40 AM - John Diamond

The firmware now provides a register (+0x2d1) that tells us what type of MPS trip occurred. I've added 3 bits to the IntensityAccessor digital status property that provides this information to ACNET:

- Bit 20: MPS Threshold OK/Tripped
- Bit 21: MPS Timing Check OK/Tripped
- Bit 22: MPS Software OK/Tripped

Added these to Z:TOR990 for testing on nbeam.

#15 - 12/05/2016 04:03 PM - John Diamond

- % Done changed from 60 to 70

Removed the gate width term from PXIERingMPSScaleFilter.
Switch to PXIETorDrv in pxintstartup for studies out at PXIE.

Reverted back to old code and old firmware out at PXIE.

Files

125MHz_Digitizer_Firmware_Description_ABC02.pdf	1.05 MB	11/29/2016	John Diamond