

VME Intensity Monitor - Feature #13572

ACNET device support for new MPS features in ABB0F firmware

08/17/2016 01:37 PM - John Diamond

Status:	Assigned	Start date:	08/17/2016
Priority:	Normal	Due date:	
Assignee:	John Diamond	% Done:	80%
Category:	MPS	Estimated time:	10.00 hours
Target version:		Spent time:	16.00 hours
Description			
Ning has implemented new MPS features in the ABB0F firmware (see attached description). Create ACNET devices for accessing the new MPS registers.			

History

#1 - 08/17/2016 01:43 PM - John Diamond

- File *PXIE_Pulse_Mode_Machine_Protection_Scheme.pdf* added

#2 - 08/17/2016 02:52 PM - John Diamond

Create ACNET support for:

- Calculated Pulse Width
- Edge Detection Threshold

Create Commands for:

- Disabling/enabling timing check
- Setting the timing check margin
- Setting the Edge Detectoin threshold
- Setting the pulse direction

Add output the the MPS show routine for:

- Displaying the status of the timing check for each device
- Displaying the timing check margin of error
- Displaying the edge detection threshold
- Displaying the pulse direction for each device

Create ACNET devices for the Ring Pickup's calculated pulse width and edge detection threshold.

Enable the timing check for the Ring Pickup in the startup script.

Set the timing check margin to 0x80.

Initialize the edge detection threshold to 0x1000.

Set the pulse direction to 0.

#3 - 08/18/2016 04:34 PM - John Diamond

Moved cout's related to MPS status into Toroid::show().

Added lines to the MPS status display for all of the bullet points listed above.

Began implementing the necessary methods for accessing the new MPS features to IIntMonitorDev, Toroid, DAQPool, IIntDAQ and MirrTorDrv.

#4 - 08/23/2016 10:29 PM - John Diamond

- % Done changed from 0 to 30

Implemented output for the new MPS features in Toroid::show().

```
Toroid
```

```
Device ID: 0
```

```
ADC ID: 0, channel: 0
```

```
Readouts: BBB disabled, raw disabled
```

```
DAQ Source: 0
```

```
MPS: Enabled, Lower: 0, Upper: 0, Edge Threshold: 0, Pulse Direction: 1 (+), Time Check: Disabled NOT T  
RIPPED
```

#5 - 08/24/2016 12:18 PM - John Diamond

- % Done changed from 30 to 70

Implemented the following CLI commands:

```
vmeintMPSTimingCheckEnable device_id
```

Enables the check of calculated pulse length to the set gate width for device_id. If they are exceeded by the timing check margin then the board trips the MPS alarm.

```
vmeintMPSTimingCheckDisable device_id
```

Disables the timing check for device_id.

```
vmeintMPSTimingCheckMarginSet device_id, margin
```

Sets a margin of error for the timing check comparison for device_id. The margin parameter is given in ADC clock cycles.

```
vmeintMPSThresholdEdgeSet device_id, threshold
```

Sets a threshold to use when searching for the beam pulse for device_id. The threshold parameter should be a signed-16 bite integer representing raw ADC counts.

```
vmeintMPSPulseDirectionSet device_id, direction
```

Sets the expected beam pulse direction for device_id. The direction parameter should be 0 for a negative pulse and 1 for positive.

#6 - 08/25/2016 09:57 AM - John Diamond

ACNET device support:

Register	Device ID	ACNET Device Property	VMEInt method	SSDN Channel is
Edge Detection Threshold (0x2D8)	0x63	Reading of Setting	VMEInt::mpsThresholdEdgeGet	Intensity Device ID
..	..	Setting	VMEInt::mpsThresholdSet	..
Calculated Pulse Width (0x2e8..0x304, for channels 1 through 8)	0x64	Reading	VMEInt::mpsPulseWidthGet	Intensity Device ID

For nbeam:

Device ID	ACNET Device Name	Intensity Device ID	SSDN
0x63	Z:990MPE	0x00	0063/0020/0000/0000
0x64	Z:990MPW	0x00	0064/0020/0000/0000

For PXIE Ring Pickup:

Device ID	ACNET Device Name	Intensity Device ID	SSDN
0x63	P:MPRET	0x03	0063/0020/0000/0003
0x64	P:MPPRW	0x03	0064/0020/0000/0003

#7 - 10/24/2016 03:41 PM - Elliott McCrory

- File 125MHz_Digitizer_Firmware_Description_ABB12.pdf added

New documentation from N. Liu: "PXIE Toroid and Ring Pickups Changes in firmware version ABB12 / 125MHz Digitizer Firmware Description". This document is not internally dated, but I received it on October 24, 2016.

#8 - 10/24/2016 03:45 PM - Elliott McCrory

Notes for manipulating the VME registers (from N. Liu)

```
0xf0f012d0 -- Trips channel
0xf0f012c8 -- First MPS width channel has tripped (can be cleared to 0x00)
0xf0f013c2 -- set to 0xff to reset the trips
```

#9 - 10/25/2016 03:12 PM - Elliott McCrory

- % Done changed from 70 to 80

Hardware version number has incremented to abb12.

Have implemented and tested devices Z:990MPW and Z:990MPE.

Files

PXIE_Pulse_Mode_Machine_Protection_Scheme.pdf	212 KB	08/17/2016	John Diamond
125MHz_Digitizer_Firmware_Description_ABB12.pdf	827 KB	10/24/2016	Elliott McCrory