

## VME Intensity Monitor - Feature #11031

Milestone # 10477 (New): ANUB Startup

Milestone # 11019 (Accepted): Cycle devices for anub

### Extraction sample device

11/30/2015 04:44 PM - John Diamond

<b>Status:</b>	Closed	<b>Start date:</b>	11/30/2015
<b>Priority:</b>	Normal	<b>Due date:</b>	
<b>Assignee:</b>	John Diamond	<b>% Done:</b>	100%
<b>Category:</b>		<b>Estimated time:</b>	8.00 hours
<b>Target version:</b>		<b>Spent time:</b>	10.50 hours
<b>Description</b>			
:BEAMXn[0:7]			
Similar to <a href="#">#11028</a> but each element represents a sample right before extraction.			

### History

#### #1 - 12/01/2015 11:20 AM - John Diamond

Possible implementation based on a circular buffer of the last n samples:

- reset() -
  1. Clear circular buffer
  2. Reset extraction samples to 0
  3. Attach to \$07
  4. Attach to extraction event
- sample() -
  1. Sample intensity device
  2. Push sample into the circular buffer
- exSample() -
  1. sample() one more time
  2. search backwards through circular buffer for extraction edge
  3. push edge sample into the sample buffer
- endOfBeam() -
  1. Detach from \$07
  2. Detach from extraction event

#### #2 - 12/01/2015 09:51 PM - John Diamond

- % Done changed from 0 to 20

Implemented CircularBuffer class and began implementing CycleDeviceEx.

#### #3 - 12/04/2015 09:54 PM - John Diamond

- % Done changed from 20 to 80

Complete implementation of extraction cycle device support.

Merged into origin/mirrdcct\_master.

Added configurations for MI and RR extraction devices to anubstartup.

Ready to test on anub.

#### #4 - 12/05/2015 01:48 PM - John Diamond

- % Done changed from 80 to 20

Refactored CycleDeviceEx and CycleDeviceInj to use a std::vector for the sample buffer instead of a native array.

Removed the size parameter from their constructors and cli commands.

#### #5 - 12/05/2015 01:48 PM - John Diamond

- % Done changed from 20 to 80

#### #6 - 12/06/2015 08:40 AM - John Diamond

- % Done changed from 80 to 90

Implemented ClassACNet accessors for CycleDeviceInj and CycleDeviceEx.

#### #7 - 12/09/2015 09:39 AM - John Diamond

Added a sanity check to CycleDeviceInj::sample() and CycleDeviceEx::exSample() to make sure we're not recording an infinite number of injection/extraction samples.

#### #8 - 12/09/2015 10:45 AM - John Diamond

Fixed a program exception bug in the circular buffer implementation.  
Verified that the CB is being filled but don't have events at the moment to test edge detection...

#### #9 - 12/09/2015 08:18 PM - John Diamond

Beams & events came backs this evening and it appears that the extraction sample on the \$E3 is being taken:

```
4: Machine: Recycler, reset: $e3, eob: $e6, inten ID: 1
   Injection: event: $e4, delay: 5, n: 6, samples: [20629,21661,22651,23548,24457,25347]
   Extraction: event: $f3, delay: 0, CB cap/size: 50/50, n: 1, samples: [32502]
0:  event: $e4 delay: 0 sample: 31265
1:  event: $e4 delay: 60 sample: 30238
2:  event: $fe delay: 0 sample: 0
3:  event: $fe delay: 0 sample: 0
4:  event: $fe delay: 0 sample: 0
5:  event: $f3 delay: 0 sample: 31401
```

However, the MI DCCT digitizer is returning 0xffff for intensity at the moment so CycleDeviceEx::exSample() can't find an edge:

```
3: Machine: Main Injector, reset: $2a, eob: $26, inten ID: 0
   Injection: event: $a3, delay: 5, n: 0, samples: []
   Extraction: event: $a9, delay: 0, CB cap/size: 50/50, n: 0, samples: []
0:  event: $a3 delay: 0 sample: 0
1:  event: $22 delay: 0 sample: -1
2:  event: $25 delay: 0 sample: -1
3:  event: $fe delay: 0 sample: 0
4:  event: $a9 delay: 0 sample: -1
5:  event: $2f delay: 0 sample: -1
```

So it appears that the algorithm is working properly. Also, the extraction array device is reporting correctly:

```
ACL> read R:DCCTX3[0:7]
```

```
R:DCCTX3 = 1637.05  0      0      0      0      0
           0      0      E12
```

The anub startup script is configured for and the following extraction array devices have been created:

- I:DCCTX0
- I:DCCTX1
- I:DCCTX3
- I:DCCTXA
- R:DCCTX3

#### #10 - 12/09/2015 08:19 PM - John Diamond

- Status changed from Assigned to Closed

- % Done changed from 90 to 100