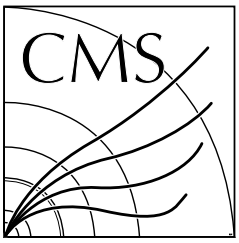

Definition uGT readout record

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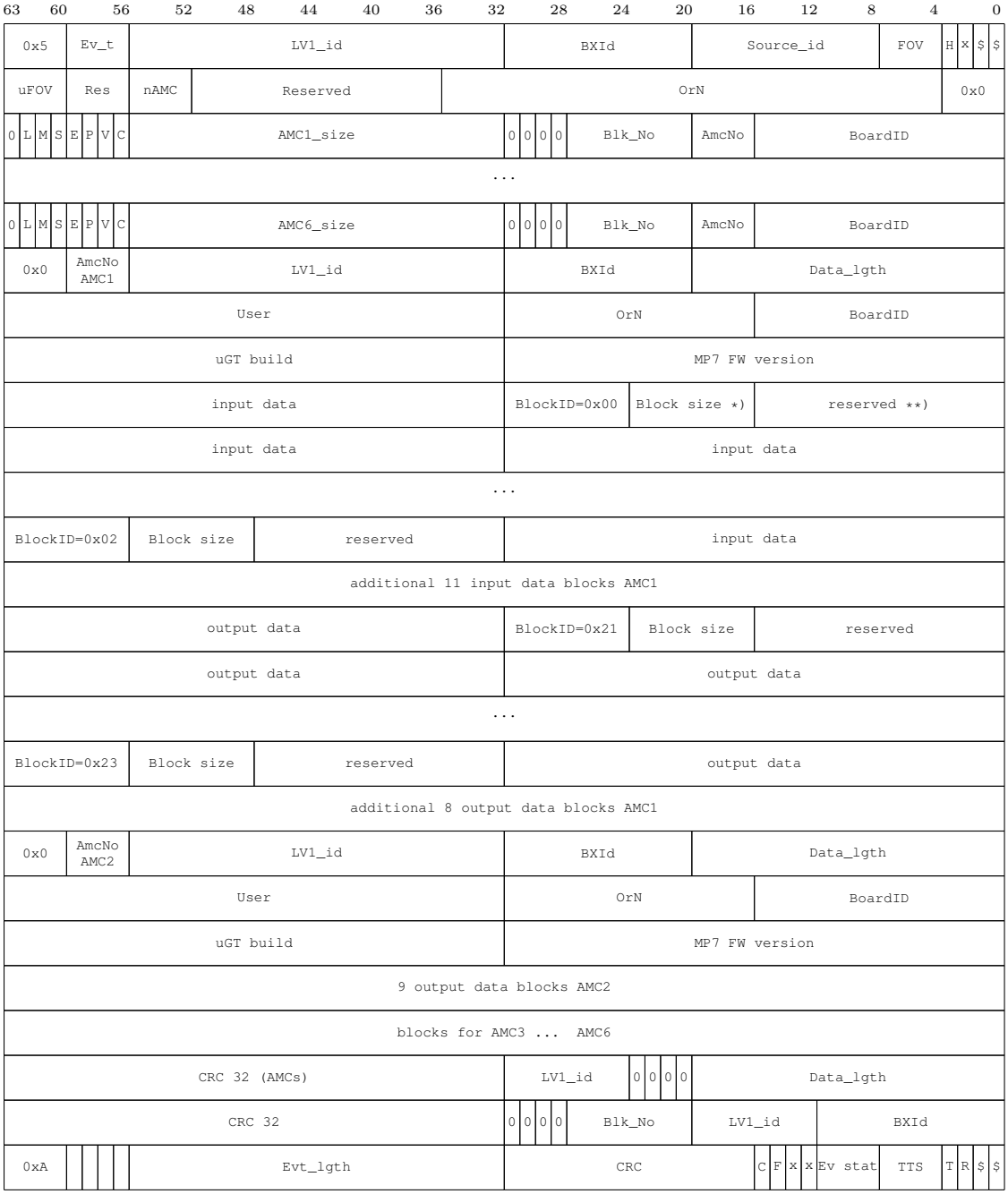
Contents

UNDER CONSTRUCTION !!!!

The following description is a copy from [1]:

The AMC13 DAQ path builds events from 12 AMC cards in a MicroTCA crate, and transmits the completed events to a central DAQ system over a fiber-optic link.
Events may also be stored in on-board SDRAM for testing or diagnostic purposes.
In response to a trigger signal, each enabled AMC transmits an event fragment to the AMC13. The AMC13 packages these fragments into a single event record. AMC13 firmware supports a maximum of 4k bytes from each AMC card. This document describes a revision to the event builder to support very large event fragments.
Large blocks (> 32kB) from one AMC are broken into smaller blocks by the AMC13. Each 32kB from each AMC are read across the backplane in parallel, then concatenated to form blocks, each with it's own header and sent to the output stream. The entire event is wrapped with header and trailer.



Remarks:

*) "Event type" is set in configuration key: "ugt infra mp7 base" with
`<param cmd="roLoadMenu" id="mode1:eventType" type="uint">0xc0</param>`.

**) Contains probably the "bank id" which is set in configuration key: "ugt infra mp7 base" with

<param cmd="roLoadMenu" id="mode1:capture1:bankId" type="uint">2</param>
for input data and
<param cmd="roLoadMenu" id="mode1:capture0:bankId" type="uint">1</param>
for output data.

Example of a readout record dump (with description):

```
5186f41767557c08 - AMC13 header:  Event type, LV1 id, BX id, FED#
1060424 0512ff30 - AMC13 header:  AMCs, Orbit nr (32 bits)
0f00014a00010000 - AMC13 header:  Data length, AMC#1
0f0009000020000 - AMC13 header:  Data length, AMC#2
0f00009000030000
0f00009000040000
0f00009000050000
0f00009000060000
0186f4176750014a - AMC#1 header:  AMC#1, LV1 id, BX id, Data length
000000c0ff300000 - AMC#1 header:  Ev.  type *), Orbit nr (16 bits)
0000115200030202 - AMC#1 header:  uGT FW build, MP7 FW version
00000000001e0200 - AMC#1 input:  Block ID, Block size, "bankId"=input
...  muon input data
021e020000000000 - Block ID, Block size, "bankId"=input **)
...  muon input data AMC#1
00000000041e0200
...  muon input data AMC#1
061e020000000000
...  muon input data AMC#1
06000200081e0200
...  e/gamma input data AMC#1
0a1e020006000200
...  e/gamma input data AMC#1
000008000c1e0200
...  jet input data AMC#1
0e1e020000000800
...  jet input data AMC#1
02000200101e0200
...  tau input data AMC#1
121e020002000200
...  tau input data AMC#1
0002a02a141e0200
...  esums data AMC#1
181e02000006f000
...  ext cond input data AMC#1
00000000211e0100 - AMC#1 output:  Block ID, Block size, "bankId"=output
...  algo output data AMC#1
231e010000000000
...  algo output data AMC#1
00000000251e0100
...  algo output data AMC#1
271e01005ca70bcc
...  algo output data AMC#1
00000000291e0100
...  algo output data AMC#1
```

```
2b1e010000000000
...  algo output data AMC#1
000000002d1e0100
...  algo output data AMC#1
2f1e010000000000
...  algo output data AMC#1
00000000311e0100
...  algo output data AMC#1
9ac23b7617000014a - AMC#1 trailer:  CRC, LV1 id (8 bits), Data length
0286f41767500090 - AMC#2 header
000000c0ff300000 - AMC#2 header
0000115200030202 - AMC#2 header
00000000211e0100
...  algo output data AMC#2
231e010000000000
...  algo output data AMC#2
00000000251e0100
...  algo output data AMC#2
271e01005ca70bcc
...  algo output data AMC#2
00000000291e0100
...  algo output data AMC#2
2b1e010000000000
...  algo output data AMC#2
000000002d1e0100
...  algo output data AMC#2
2f1e010000000000
...  algo output data AMC#2
00000000311e0100
...  algo output data AMC#2
cb79a76317000090 - AMC#2 trailer
0386f41767500090 - AMC#3 header
000000c0ff300000 - AMC#3 header
0000115200030202 - AMC#3 header
00000000211e0100
...
...  AMC#3 - AMC#6
...
36cb696317000090 - AMC#6 trailer
f6b9461200017675 - AMC13 trailer:  CRC, LV1 id (8 bits), BX id
a0000424846800000 - AMC13 trailer:  Ev.  length, CRC (16 bits)
```

Description of a block with "block size" = 0x1e (6 frames [32 bits] @ +/-2 bx = 30) of a certain "Block ID" (0x00, 0x02, ..., 0x21, 0x23, ...):

```
00000000001e0200 - bx-2:  frame 0
0000000000000000 - bx-2:  frame 2, frame 1
0000000000000000 - bx-2:  frame 4, frame 3
0000000000000000 - bx-1:  frame 0, bx-2:  frame 5
0000000000000000 - bx-1:  frame 2, frame 1
0000000000000000 - bx-1:  frame 4, frame 3
0000000000000000 - bx:  frame 0, bx-1:  frame 5
0000000000000000 - bx:  frame 2, frame 1
0000000000000000 - bx:  frame 4, frame 3
0000000000000000 - bx+1:  frame 0, bx:  frame 5
0000000000000000 - bx+1:  frame 2, frame 1
0000000000000000 - bx+1:  frame 4, frame 3
0000000000000000 - bx+2:  frame 0, bx+1:  frame 5
0000000000000000 - bx+2:  frame 2, frame 1
0000000000000000 - bx+2:  frame 4, frame 3
021e020000000000 - bx+2:  frame 5
```

Remark:
The order of +/-2 bx has to be verified!

List of Tables

List of Figures

References

[1] AMC13 Event Builder:
http://ohm.bu.edu/~hazen/CMS/AMC13/UpdatedDAQPath_2014-07-10.pdf (document)

[2] MP7 Readout & DAQ:
https://github.com/cms-l1-globaltrigger/mp7_ugt_legacy/blob/master/doc/mp7_ugt_firmware_specification/MP7Readout.pdf