DAQ data structure for the Muon g-2 experiment

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Abstract

This document outlines the DAQ data structure of the Muon g-2 experiment.

1 DAQ output in a nutshell

The main DAQ framework for the Muon g-2 experiment is based on MIDAS [cite].

2 MIDAS Bank list

Table 1: *MIDAS bank list for the calorimetry data.*

Bank name			Description
muon fill	laser fill	pedestal fill	
CA	LA	PA	AMC13 Header
CB	LB	PB	WFD5 header
CC	LC	PC	GPU timing data
CF	LF	PF	GPU fitted data
CH	LH	PH	Per crystal Q-method data (N-th event, end of run)
CL	LL	PL	Clock data
CP	LP	PP	Pedestal
CQ	LQ	PQ	Per calo Q-method data (every event)
CR	LR	PR	WFD5 raw data
CT	LT	PT	T-method islands
CZ	LZ	PZ	AMC13 CDF trailers

Table 2: *MIDAS bank list for auxiliary T/Q data. This is mainly for the fiber harps, quads and kickers.*

Bank name	Description
KH	Per aux. detector channel Q-method data (N-th event, end of run)
KQ	Per aux. detector Q-method data (every event)
KT	T-method data

Table 3: *MIDAS bank list for the CCC data.*

TTCA	AMC13 Header
TTCR	CCC AMC13 Payload
TTCZ	AMC13 Trailer

3 Bank contents

This section details contents of each MIDAS bank.

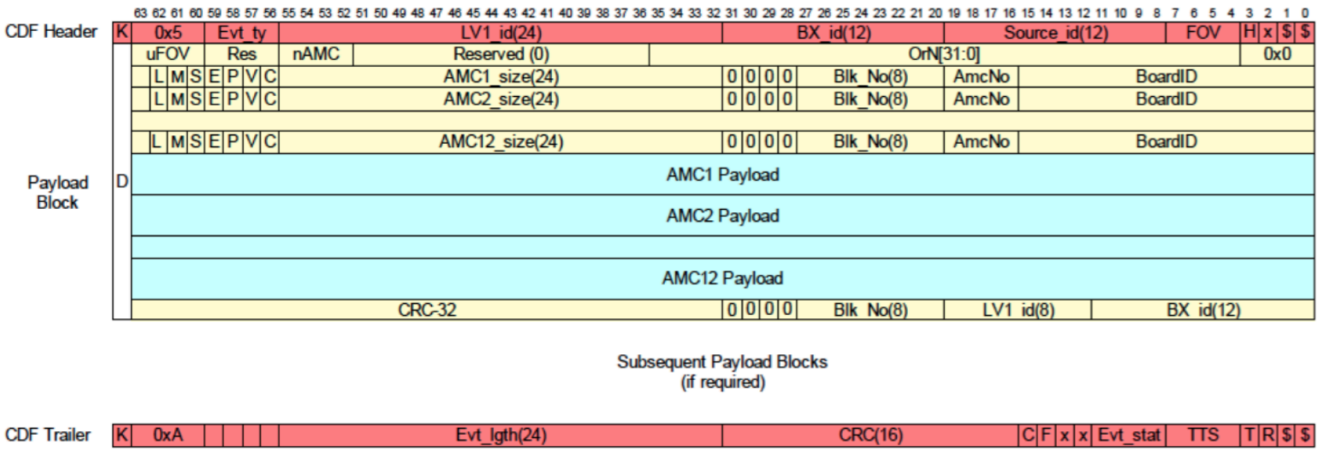

Figure 1: *Data structure for AMC13 to DAQ.*

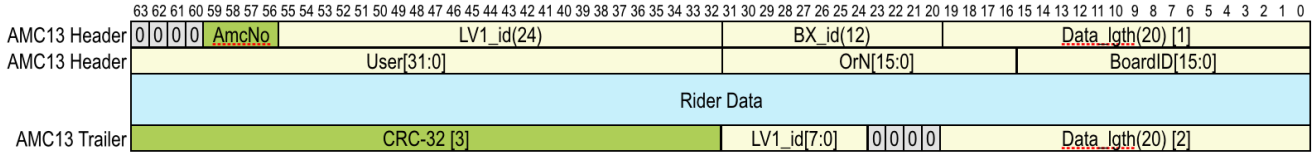

Figure 2: *Data structure for Rider to AMC13.*

4 C++ Parser

Muon g-2 offline analysis framework relies on parsers in the gm2parser namespace hosted under repository gm2unpacker to decode the data.

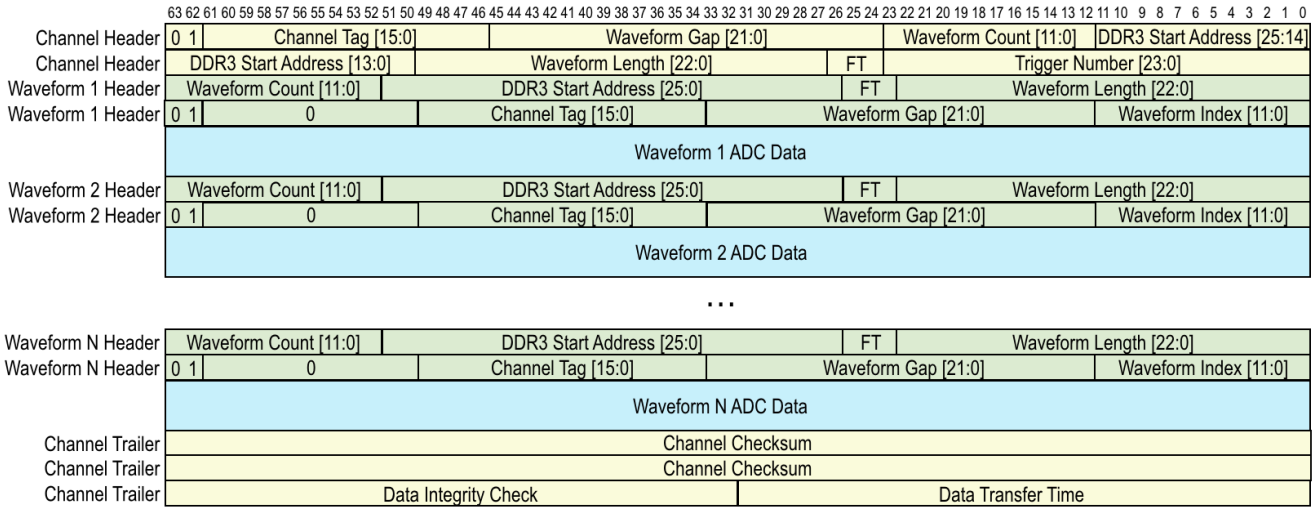

Figure 3: *Data structure for Rider.*

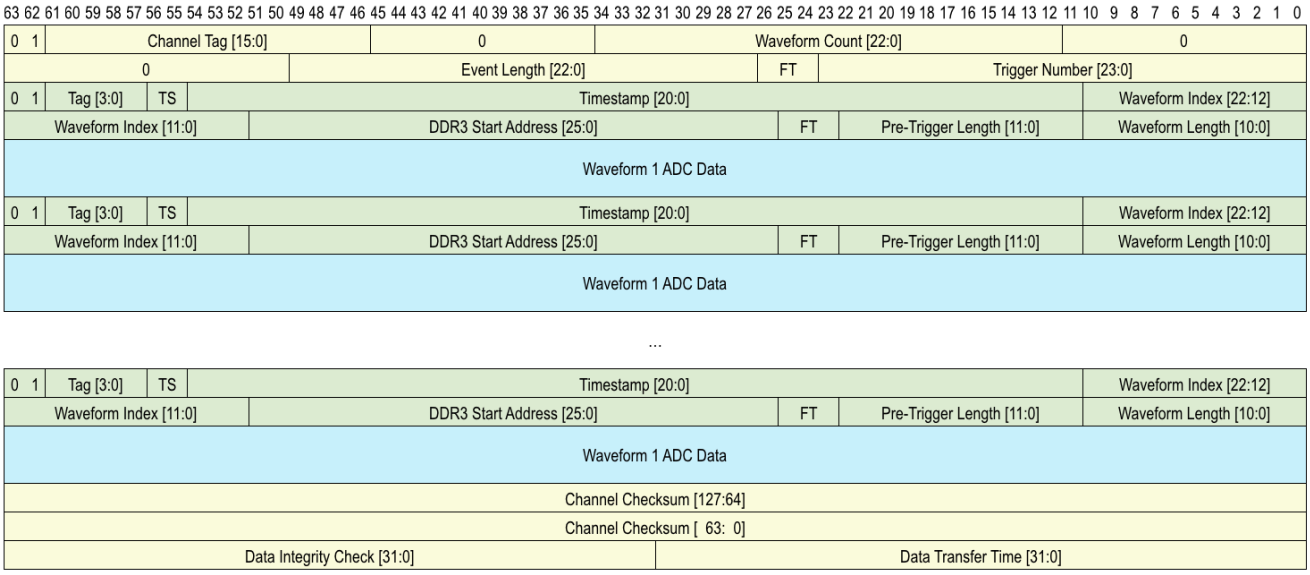

Figure 4: *Data structure for asynchronous mode for Rider.*

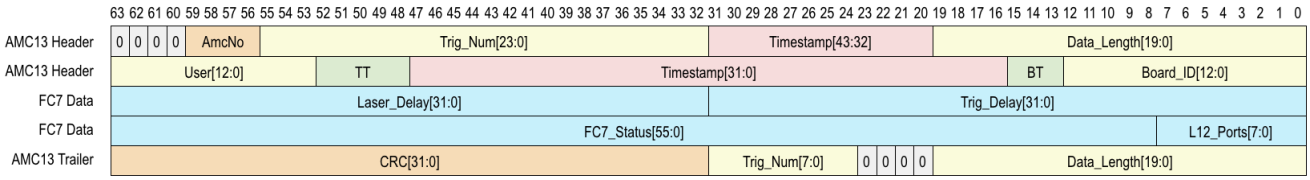

Figure 5: *Data structure for encoder FC7.*

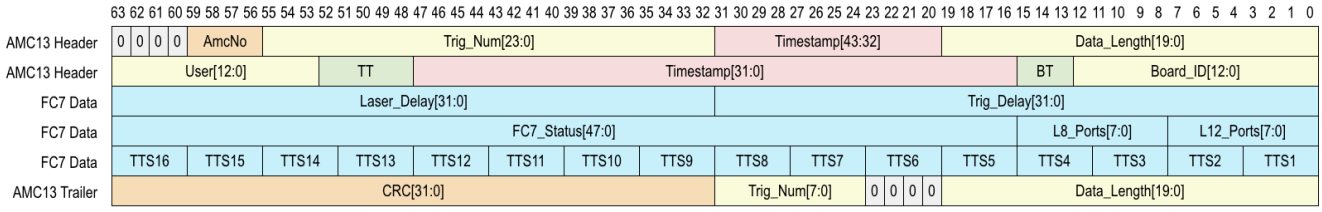

Figure 6: *Data structure for fanout FC7.*