G^0 French Data Format

D. Marchand, X. Grave

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This document presents the French Data Format which will be used during the commisioning. Compared to the one which was used up to now :

- we have added 2 words of 4Bytes in the Configuration Event,
- we have added information of the Sliding Gate and the logical address of each board plugged into the VXI crate without adding any words (no change in data format).

1 Configuration EVENT

Event Length = 1 + 3 + (18 x **N_DMCHs**)
with N_DMCHs being the total number of DMCH modules plugged into the VXI crate.

- Event Tag = **0xF0F0**
- Event Type = **1**
- ID Bank Number = **0**

The data format for the configuration event is presented on the figure 1.1 page 2.

1.1 Acquisition Mode :

This part contains 3 words of 4Bytes whatever the number of DMCH modules plugged into the VXI crate is. This piece of information is also saved into ~/orsay/manip/config.

NPN : ON (0) // OFF (1)

Configuration :

Value	Mode
0	Back alone
1	Front alone
2	Front.IF.Back (long)
3	Not used
4	Not used
5	Front.OR.Back (inclusive)
6	Front.IF.Back (short)
7	Front.IF.Back (short) - Buddy

In Front.IF.Back modes, short and long refer to the width of the coincidence window (resp. 7ns and 11ns).

Test Generator : ON (0) // OFF (1)

The Test Generator is an internal generator of DMCH module. There is one on each DMCH module and it is mainly used to check CFD thresholds.

GMS : ON (0) // OFF (1)

The GMS (laser) can be used during the 200μs helicity flip. This requires that the signal indicating that the laser has fired occurs (at least) 125μs after the end of MPS.

Test Generator/GMS window width :

The width of the window within which the signals of fired detectors have to occur.

Value	Mode
512ns	Jumper configured
64ns	Short

CONFIG EVENT (0xF0F0)

= 3 + (18 x N_DMCHs) Words of 4Bytes **(N_DMCHs = total number of DMCH modules plugged into the crate)**

	32	24	16	8	0	
# 1	NPN ON (0) // OFF (1)		Configuration			Acquisition Mode
# 2	Test Generator ON // OFF		GMS ON // OFF			
# 3	Test Generator/GMS window width					
# 4	RMK 0	RMK 2	RMK 4	RMK 6		DACs Settings
# 5	Lin. Diff. 0	Lin. Diff. 1	GDC	NA		Relative to first DMCH module (the one plugged into the crate having the lowest logical address)
# 6	RMK 8	RMK 10	RMK 12	RMK 14		
# 7	G. Ampl. L	G. Ampl. R	NA	NA		
# 8	CFD−L 0	CFD−R 0	CFD−L 1	CFD−R 1		
# 9	CFD−L 2	CFD−R 2	CFD−L 3	CFD−R 3		
# 10	CFD−L 4	CFD−R 4	CFD−L 5	CFD−R 5		
# 11	CFD−L 6	CFD−R 6	CFD−L 7	CFD−R 7		
# 12	CFD−L 8	CFD−R 8	CFD−L 9	CFD−R 9		
# 13	CFD−L 10	CFD−R 10	CFD−L 11	CFD−R 11		
# 14	CFD−L 12	CFD−R 12	CFD−L 13	CFD−R 13		
# 15	CFD−L 14	CFD−R 14	CFD−L 15	CFD−R 15		
# 16	RMT 0	RMT 1	RMT 2	RMT 3		
# 17	RMT 4	RMT 5	RMT 6	RMT 7		
# 18	RMT 8	RMT 9	RMT 10	RMT 11		
# 19	RMT 12	RMT 13	RMT 14	RMT 15		
# 20	HF 0			"New"		
# 21	HF 1			"New"		
# 22	RMK 0	RMK 2	RMK 4	RMK 6		DACs Settings
# 23	Lin. Diff. 0	Lin. Diff. 1	GDC	NA		Relative to second DMCH module
# 24	RMK 8	RMK 10	RMK 12	RMK 14		

Figure 1: Data Format of configuration event.

1.2 DACs Settings

This part contains 18 words of 4Bytes for **each** DMCH module plugged into the VXI crate. This piece of information is also saved into text files ~/orsay/manip/thresholds<slot_number> corresponding to each DMCH module.

As a reminder, each DMCH module holds 32 CFDs (16 "Left" $0 \rightarrow 15$ and 16 "Right" $0 \rightarrow 15$) and 16 Mean Timers ($0 \rightarrow 15$). "Left" and "Right" CFDs are also referenced respectively as "A" and "B" (e.g. on DMCH modules and splitters front panels). Concerning Mean Timers, even numbers refer always to "Front"detectors whereas odd number refer always to "Back" detectors.

These DACs (Digital Analogical Converters) control mainly CFD thresholds, internal delays, TDCs differential linearity and internal generator (G-DMCH) settings.

RMK : internal delay for differential buddy marker (in DAC unit). There is one RMK per MT corresponding to "Front" detector.

Lin. Diff. : controls the differential linearity of flash TDC. "Lin. Diff. 0" has influence on the first 8 MT channels ($0 \rightarrow 7$) and "Lin. Diff. 1" has influence on MT channels ($8 \rightarrow 15$).

GDC : controls the sliding gate motion (fixed value).

G. Ampl. : Amplitude (in DAC unit, cf. G-DMCH calibration curve) of the signal delivered by the internal generator (G-DMCH). The amplitude of the signals sent to CFD "L" and "R" are controlled independently.

CFD-L / CFD-R : CFD thresholds (in DAC unit : 255 - thresholds in mV).

RMT : Mean Timer internal delay to tune Front Back coincidence (in DAC unit : ~175ps/DAC unit).

HF 0 : controls the position of downstream cut-off associated to Next Pulse Neutralization (NPN). The position of upstream cut-off is fixed relatively to downstream cut-off.

HF 1 : controls the end of differential buddy marker.

2 DMCH-16X Physics EVENT (ROC 3)

Fragment Length = (1263 + 1) x **N_DMCHs**
with N_DMCHs being the total number of DMCH modules plugged into the VXI crate.

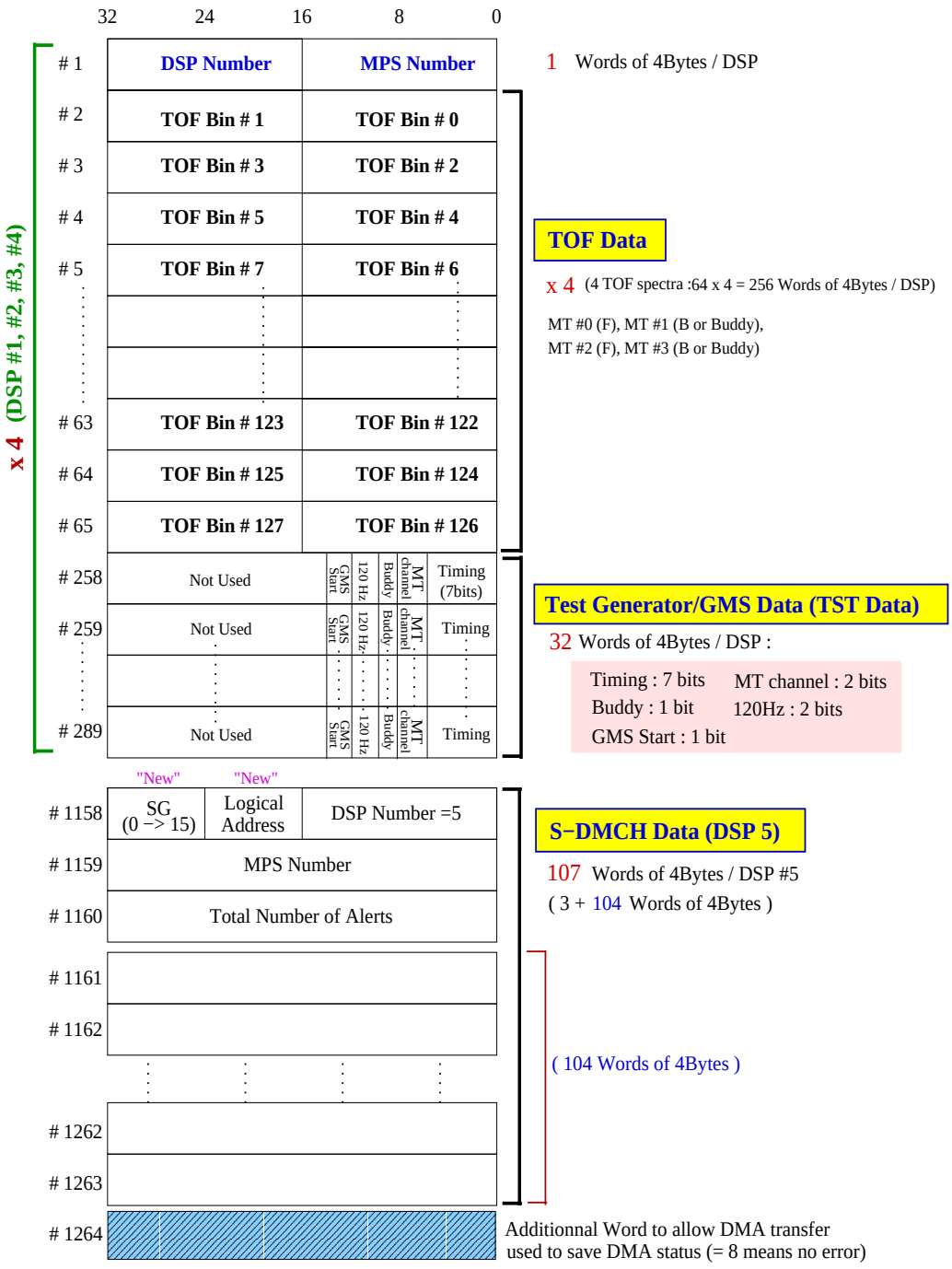

Figure 2: Datastream corresponding to 1 DMCH-16X.

2.0.1 30Hz Acquisition Mode

Each DMCH-16X module holds 16 Mean-Timers (MT channel 0 → MT channel 15). Whatever the acquisition mode is there are 64 words of 4Bytes per MT channel.

2.0.2 120Hz Acquisition Mode

Whatever the acquisition mode is there are 16 words of 4Bytes per MT channel.

2.1 Test Generator / GMS Data

2.2 S-DMCH Data