

NP04 PDS data taking planning

Antonio Verdugo, Jose Ignacio Crespo, **Ignacio López de Rego**
CIEMAT

PDS Self-Trigger

11th April 2024

Self-Trigger Frame Format

	K/D	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	0	Link				Slot				CratID				DetID				Version															
1	0000	Timing master Time stamp [31:0]																															
2	0000	Timing master Time stamp [63:32]																															
3	0000	Trigger Sample Value (14 bits, so 2 high order bits are 0)														RI	TBD	Algorithm # (=1)		Channel													
4	0000	Baseline (running average; 14 bits, 2 high order bits are 0)														Threshold (user defined 14 bit #; 2 high order bits are 0)																	
5	0000	ADC([3:0],2)				ADC([7:0],4)				ADC([11:0],6)				ADC([13:0],3)				ADC([13:0],0)															
6	0000	ADC([1:0],9)				ADC([5:0],11)				ADC([9:0],13)				ADC([13:0],10)				ADC([13:0],7)															
7	0000	ADC([3:0],1010)				ADC([7:0],1012)				ADC([11:0],1014)				ADC([13:0],1011)				ADC([13:0],1008)															
8	0000	ADC([5:0],1019)				ADC([9:0],1021)				ADC([13:0],1016)				ADC([13:0],1018)				ADC([13:0],1015)															
9	0000	ADC([7:0],1012)				ADC([11:0],1014)				ADC([13:0],1016)				ADC([13:0],1018)				ADC([13:0],1017)															
10	0000	ADC([9:0],1021)				ADC([13:0],1023)				ADC([13:0],1020)				ADC([13:0],1019)				ADC([13:10],1021)															
11	0000	ADC([13:0],15)																															
...	0000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
446	0000	ADC([3:0],1010)				ADC([7:0],1012)				ADC([11:0],1014)				ADC([13:0],1011)				ADC([13:0],1010)															
447	0000	ADC([5:0],1019)				ADC([9:0],1021)				ADC([13:0],1016)				ADC([13:0],1018)				ADC([13:0],1015)															
448	0000	ADC([7:0],1012)				ADC([11:0],1014)				ADC([13:0],1016)				ADC([13:0],1018)				ADC([13:0],1017)															
449	0000	ADC([9:0],1021)				ADC([13:0],1023)				ADC([13:0],1020)				ADC([13:0],1019)				ADC([13:10],1021)															
450	0000	Time_Pulse_UB([8:0],0)				Charge([22:0],0)				Time_Peak([8:0],0)				Max_Peak([13:0],0)				Num_Peak_OB([3:0],0) Num_Peak_UB([3:0],0)															
451	0000	DA(1)				Charge([22:0],1)				Time_Peak([8:0],1)				Max_Peak([13:0],1)				Num_Peak_OB([3:0],1) Num_Peak_UB([3:0],1)															
452	0000	Time_Pulse_UB([8:0],1)				Charge([22:0],2)				Time_Peak([8:0],2)				Max_Peak([13:0],2)				Num_Peak_OB([3:0],2) Num_Peak_UB([3:0],2)															
453	0000	DA(2)				Charge([22:0],3)				Time_Peak([8:0],3)				Max_Peak([13:0],3)				Num_Peak_OB([3:0],3) Num_Peak_UB([3:0],3)															
454	0000	Time_Pulse_UB([8:0],2)				Charge([22:0],4)				Time_Peak([8:0],4)				Max_Peak([13:0],4)				Num_Peak_OB([3:0],4) Num_Peak_UB([3:0],4)															
455	0000	DA(3)				Charge([22:0],0)				Time_Peak([8:0],0)				Max_Peak([13:0],0)				TBD															
456	0000	Time_Pulse_UB([8:0],3)				Charge([22:0],1)				Time_Peak([8:0],1)				Max_Peak([13:0],1)				TBD															
457	0000	Time_Pulse_UB([8:0],0)				Time_Pulse_OB([9:0],0)				Time_Pulse_OB([9:0],1)				Time_Pulse_OB([9:0],2)				TBD															
458	0000	Time_Pulse_UB([8:0],1)				Time_Pulse_OB([9:0],3)				Time_Pulse_OB([9:0],4)				TBD																			
459	0000	Trailer 13(current all 1s = 0xFFFFFFFF)																															

Self-Trigger Algorithm ID

- **Version 1.4** → There was reduced space for adding meta data in headers 3 and 4.
- **Version 1.5** → 12 extra trailer words (32 bits) are added.
 - Metadata is placed in those 12 trailer words (32 bits) and headers 3 and 4.
 - Self-Trigger Algorithm ID is added
- NP04 purification and cosmic data taking period.
 - Headers → Jamieson Self-Trigger Algorithm Metadata
 - 12 Trailer words → CIEMAT Self-Trigger Algorithm Metadata