

## Address Counter Register Group update

### CNT\_ETA – Eta Address Counter

This read/write register carries current value of the Address Counter for an array of Eta and Phi Track Constraints. The default register value on power-up is zero. The counter auto-increments on every access to the DAT\_ETA register. The counter can be reset with the ACT\_ACR command.

**Table 1: CNT\_ETA Data Format for SP\_FPGA for 090915 and later versions**

D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0	TRN
X	X	X	X	X	X	X	X	X	X	ETA5	ETA4	ETA3	ETA2	ETA1	ETA0	WR
0	0	0	0	0	0	0	0	0	0	ETA5	ETA4	ETA3	ETA2	ETA1	ETA0	RD
Not Used										ETA Address Counter						

Here:

- X – Don't care bit;
- ETA [5:0] = 0...42 – Address Counter.

## Data Register Group update

### DAT\_ETA – Eta and PHI Track Constraints

This read/write register provides access to the register file content, which keeps a set of angle constraints for collision and halo muons. The SP core logic uses these constraint, when it builds tracks from the input stubs. The total number of constraints in the register file is 41. As a rule, all constraints should be loaded or read out as an array of values, after resetting the register file address counter with ACT\_ACR/MA/SP/W/0x0008. Alternatively, when only single constraint should be updated, the user may first download a constraint number in the address counter with CNT\_ETA/MA/SP/W/D=constraint\_number, and then load a constraint value with DAT\_ETA/MA/SP/W/D=constraint\_value.

Constraint numbers, ranges and default values are listed in Table 2.

**Table 2: DAT\_ETA Data Format for SP\_FPGA (SP Core Version 2) for 090915 and later versions**

#	Constraint Name	Value Range	Default Value
0	Minimum eta difference for track cancellation logic	0-31	8
1	Minimum eta difference for halo track cancellation logic	0-31	8
2	Minimum eta for ME1-ME2 collision tracks	0-127	22
3	Minimum eta for ME1-ME3 collision tracks	0-127	22
4	Minimum eta for ME2-ME3 collision tracks	0-127	14
5	Minimum eta for ME2-ME4 collision tracks	0-127	14
6	Minimum eta for ME3-ME4 collision tracks	0-127	14
7	Minimum eta for ME1-ME2 collision tracks in overlap region	0-127	14
8	Minimum eta for ME2-MB1 collision tracks	0-127	10
9	Minimum eta for ME1-ME4 collision tracks	0-127	22

10	Minimum eta difference for ME1-ME2 (except ME1/1) halo tracks	0-127	8
11	Minimum eta difference for ME1-ME3 (except ME1/1) halo tracks	0-127	19
12	Minimum eta difference for ME1/1-ME2 halo tracks	0-127	19
13	Minimum eta difference for ME1/1-ME3 halo tracks	0-127	30
14	Maximum eta for ME1-ME2 collision tracks	0-127	127
15	Maximum eta for ME1-ME3 collision tracks	0-127	127
16	Maximum eta for ME2-ME3 collision tracks	0-127	127
17	Maximum eta for ME2-ME4 collision tracks	0-127	127
18	Maximum eta for ME3-ME4 collision tracks	0-127	127
19	Maximum eta for ME1-ME2 collision tracks in overlap region	0-127	24
20	Maximum eta for ME2-MB1 collision tracks	0-127	24
21	Maximum eta for ME1-ME4 collision tracks	0-127	127
22	Maximum eta difference for ME1-ME2 (except ME1/1) halo tracks	0-127	14
23	Maximum eta difference for ME1-ME3 (except ME1/1) halo tracks	0-127	25
24	Maximum eta difference for ME1/1-ME2 halo tracks	0-127	25
25	Maximum eta difference for ME1/1-ME3 halo tracks	0-127	36
26	Eta window for ME1-ME2 collision tracks	0-255	4
27	Eta window for ME1-ME3 collision tracks	0-255	4
28	Eta window for ME2-ME3 collision tracks	0-255	4
29	Eta window for ME2-ME4 collision tracks	0-255	4
30	Eta window for ME3-ME4 collision tracks	0-255	4
31	Eta window for ME1-ME2 collision tracks in overlap region	0-255	4
32	Eta window for ME1-ME4 collision tracks	0-255	4
33	Maximum phi difference for ME1-ME2 (except ME1/1) halo tracks	0-1023	64
34	Maximum phi difference for ME1-ME3 (except ME1/1) halo tracks	0-1023	64
35	Maximum phi difference for ME1/1-ME2 halo tracks	0-1023	64
36	Maximum phi difference for ME1/1-ME3 halo tracks	0-1023	64
37	Minimum phi difference for track cancellation logic	0-4095	128
38	Minimum phi difference for halo track cancellation logic	0-4095	128
39	Parameter for the correction of misaligned 1-2-3-4 straight tracks	0-4095	60
40	Parameter for the correction of misaligned 1-2-3-4 curved tracks	0-4095	200
41	Phi Offset for MB1A, D[12] – sign, D[11:0] – value	-4095 to 4095	0
42	Phi Offset for MB1D, D[12] – sign, D[11:0] – value	-4095 to 4095	2048