Configuration Issues for the BFEM Tracker

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1 Configuration

1.1 Controller and Cable Addresses

Table 1 shows for every read out cable the address of the last controller. It also lists the controller type that a cable reads.

Table 1: Last Controller Address, controller type.

Read-out Cable Address	Last Controller controller type	
0	7	R0
1	7	R1
2	7	R1
3	7	R0
4	6	R1
5	6	R0
6	5	R0
7	5	R1

The controller addresses on a cable are not consecutive any more because some trays were removed from the beam test tower. Table 2 shows the controller addresses. Position p0 is the closest to the bottom of the tracker. Cable zero to three read out seven controller whereas cable four to seven read only six controller.

The table 3 shows the correspondence between tracker layer, read out cable and controller address. The index is random and was chosen to have even numbers for Y-layers and odd numbers for X-layers.

Table 2: Controller Addresses for a cable

cable	p0	p1	p2	p3	p4	p5	p6
0,1	0	1	2	3	4	5	7
2,3	0	1	2	3	4	5	7
4,5	0	1	2	3	4	6	none
6,7	0	1	2	3	4	5	none

Table 3: Correspondence between tracker layer and cable/GTRC addresses.

Layer Index	View	R0 Controller		R1 Controller	
		cable	gtrc	cable	gtrc
0	Y	0	0	1	0
1	X	3	0	2	0
2	Y	5	0	4	0
3	X	6	0	7	0
4	Y	0	1	1	0
5	X	3	1	2	0
6	Y	5	1	4	0
7	X	6	1	7	0
8	Y	0	2	1	0
9	X	3	2	2	0
10	Y	5	2	4	0
11	X	6	2	7	0
12	Y	0	3	1	0
13	X	3	3	2	0
14	Y	5	3	4	0
15	X	6	3	7	0
16	Y	0	4	1	0
17	X	3	4	2	0
18	Y	5	4	4	0
19	X	6	4	7	0
20	Y	0	5	1	0
21	X	3	5	2	0
22	Y	5	6	4	0
23	X	6	5	7	0
24	Y	0	7	1	0
25	X	3	7	2	0

1.2 Known Problems

The front end chips (GTFE) and controller chips (GTRC) have to be configured before sensible data are read out. The purpose to configure the tracker is to ensure that all layers are read out, there is a valid fastOr signal for every layer and that noisy channels are masked from the trigger (or data if required).

The following list summarizes known problems for the eight read out cables.

Cable 0 : No problems.

Cable 1 : R1 controller type.

1. GTRC4: The fastOr is stuck high between GTFE 3 and 4. If these chips are read to cable 1 the fastOr will always be high. If only GTFE 5 - 24 are read to the controller the fastOr is good.

2. GTRC1: If read out there are always about 63 hits, mostly from GTFE 24. This means that data of this layer can't be read from this side but should be read from cable 0.

Cable 2 : No problems.

Cable 3 : No problems.

Cable 4 : R1 controller type.

1. GTRC2: The fastOr is stuck high between GTFE 23 and 24. In order to obtain a valid fastOr only GTFE 24 is allowed to be read.

Cable 5 : R0 controller type.

1. GTRC3: The fastOr is stuck high between GTFE 0 and GTRC. No valid fastOr is possible.

Cable 6 : No problems.

Cable 7 : No problems.

2 Testing

The two main tools to insure that the tracker is working properly are strip maps and cosmic trigger. Another possibility is to inject charges into the amplifier channels. However charge injection is more complex than simple wire maps and not discussed here.

2.1 Strip Maps

Strip maps show the occupancy for every channel for each tracker layer. Data are collected using random trigger or particle trigger. The main purpose of the strip maps is to find noisy and dead channels. Random trigger data are taken with different thresholds.

2.2 Cosmic Particles

Cosmic trigger are collected using the tracker self trigger or external scintillation counter. A single event display is needed to view the tracks. Cosmic tracks provide a rough estimation about the efficiency of the detectors.