

BPMs for LHC sector test

- Hardware acquires individual LHC bunches (@ 40 MHz)
- LHC system is exact copy of BPMI (TI8) trajectory system in terms of hardware
- We can provide calibrated position data:
 - Bunch-by-Bunch (B selected bunches over T selected turns)
 - Turn-by-turn (average of all valid bunches in 1 turn)
 - Closed-orbit (average of all valid bunches over N turns)
- Hardware works in one of two acquisition modes:
 - Synchronous (needs BST timing and correct phases)
 - Asynchronous (safer, but 40MHz information lost)
- Sensitivity switch in the tunnel controlled over WorldFIP to handle big intensity variations (high for pilots, low for $I > ??$)
- BPM sum signal or not and how to handle ??

BPM timing events:

- We will need these LHC timing events:
 - Fore-warning before FIRST LHC injection takes place
 - Setup hardware modules (phases) etc
 - Short warning to arm acquisition modules before each LHC injection LHC. We can publish the data for each injection based on this event

BPM properties (from T18)

BI Config File BUILDER

File Edit Generate

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Data preview

```

char monNames[NUMOF_BPMIRESLTDABCRATEAVERAGE_MONNAMES_1][NUMOF_BPMIRESLTDABCRATEAVERAGE_MONNAMES_2]; /* The name of the BPMs (40*20) comma sepa
int chanNumber; /* The number of channels returned */
int scNumber; /* The supercycle number for the data */
short dataTypes[NUMOF_BPMIRESLTDABCRATEAVERAGE_DATATYPES]; /* The type of data returned (HOR, VER, INT) */
float averagePositions[NUMOF_BPMIRESLTDABCRATEAVERAGE_AVERAGEPOSITIONS]; /* The average position data for each BPM */
float minPositions[NUMOF_BPMIRESLTDABCRATEAVERAGE_MINPOSITIONS]; /* The minimum position data for each BPM */
float maxPositions[NUMOF_BPMIRESLTDABCRATEAVERAGE_MAXPOSITIONS]; /* The maximum position data for each BPM */
int statusFlags[NUMOF_BPMIRESLTDABCRATEAVERAGE_STATUSFLAGS]; /* The status flag for the data */
}BPMResultDabCrateAverage_t;
    
```

Total valid items 8

Definition entry

CLASS BPMI PROCESS Result DEFINITION DabCrateAverage MAX_INSTANCES 1 DESCRIPTION set back average Position data SCOPE HwExp VERSION 1

Field Idx	Field Comment	Field Type	Field ID	Size/Value	Viewa...	Editab...	Nav gr...	Flag
1	The name of the BPMs (40*20) comma separated	CHAR_ARR2D	monNames	40,20	User	Hidden	ALL	
2	The number of channels returned	INT	chanNumber	1	User	Hidden	ALL	
3	The supercycle number for the data	INT	scNumber	1	User	Hidden	ALL	
4	The type of data returned (HOR, VER, INT)	ENUM_SHORT_ARRAY	dataTypes	40,NOT_CON=-1,HORPOS,VERPOS,INTENSITY	User	Hidden	ALL	
5	The average position data for each BPM	FLOAT_ARRAY	averagePositions	40	User	Hidden	ALL	
6	The minimum position data for each BPM	FLOAT_ARRAY	minPositions	40	User	Hidden	ALL	
7	The maximum position data for each BPM	FLOAT_ARRAY	maxPositions	40	User	Hidden	ALL	
8	The status flag for the data	ENUM_INT_ARRAY	statusFlags	40,NO_DAB=-3,NO_TRIGGER,NO_DATA,DATA_OK	User	Hidden	ALL	
9				1				
10				1				
11				1				
12				1				
13				1				
14				1				
15				1				
16				1				
17				1				
18				1				
19				1				
20				1				
21				1				
22				1				
23				1				

Create config structure Create/Modify config data View Tree

- We would add to this property:
 - cycleStamp (UTC timestamp linked to ? for LHC)