

RPC numbering scheme in O2

MT11			MT12			MT21			MT22						
OUT		IN	OUT		IN	OUT		IN	OUT		IN				
MT 11 OUT 9	44	8	MT 11 IN 9	MT 12 OUT 9	53	17	MT 12 IN 9	MT 21 OUT 9	62	26	MT 21 IN 9	MT 22 OUT 9	71	35	MT 11 IN 9
MT 11 OUT 8	43	7	MT 11 IN 8	MT 12 OUT 8	52	16	MT 12 IN 8	MT 21 OUT 8	61	25	MT 21 IN 8	MT 22 OUT 8	70	34	MT 11 IN 8
MT 11 OUT 7	42	6	MT 11 IN 7	MT 12 OUT 7	51	15	MT 12 IN 7	MT 21 OUT 7	60	24	MT 21 IN 7	MT 22 OUT 7	69	33	MT 11 IN 7
MT 11 OUT 6	41	5	MT 11 IN 6	MT 12 OUT 6	50	14	MT 12 IN 6	MT 21 OUT 6	59	23	MT 21 IN 6	MT 22 OUT 6	68	32	MT 11 IN 6
MT 11 OUT 5	40	4	MT 11 IN 5	MT 12 OUT 5	49	13	MT 12 IN 5	MT 21 OUT 5	58	22	MT 21 IN 5	MT 22 OUT 5	67	31	MT 11 IN 5
MT 11 OUT 4	39	3	MT 11 IN 4	MT 12 OUT 4	48	12	MT 12 IN 4	MT 21 OUT 4	57	21	MT 21 IN 4	MT 22 OUT 4	66	30	MT 11 IN 4
MT 11 OUT 3	38	2	MT 11 IN 3	MT 12 OUT 3	47	11	MT 12 IN 3	MT 21 OUT 3	56	20	MT 21 IN 3	MT 22 OUT 3	65	29	MT 11 IN 3
MT 11 OUT 2	37	1	MT 11 IN 2	MT 12 OUT 2	46	10	MT 12 IN 2	MT 21 OUT 2	55	19	MT 21 IN 2	MT 22 OUT 2	64	28	MT 11 IN 2
MT 11 OUT 1	36	0	MT 11 IN 1	MT 12 OUT 1	45	9	MT 12 IN 1	MT 21 OUT 1	54	18	MT 21 IN 1	MT 22 OUT 1	63	27	MT 11 IN 1

- IN and OUT can be accessed by a variable called “isRight” if true it's inside, if false it's outside
- How to get this values:
 - Enter O2 environment
 - Enter root and type:
 - `#include "MIDBase/DetectorParameters.h"`
 - `cout << o2::mid::detparams::getDEId(isRight,plane,RPC) << endl`
 - isRight: can be true or false. If true -> RPC is inside else the RPC is outside
 - plane goes from 0 to 3 and 0 → MT11, 1 → MT12, 2 → MT21, 3 → MT22
 - RPC goes from 0 to 8 and 0 is the bottom RPC and 8 is the top one in each plane

Local Board scheme

- Column numbering starts from the center of MID and goes outward
- Line numbering is different for each RPC depending on the segmentation
- For example in RPC 1 in there is only one line (number 0) in all columns
 - In RPC 6 instead in column 0 we have 3 lines (0,1,2) and in column 1 we have 4 (0,1,2,3)
- Examples:
 - LB 67 → column 3, line 1
 - LB 9 → column 0, line 0
 - LB172 → column 2, line 3

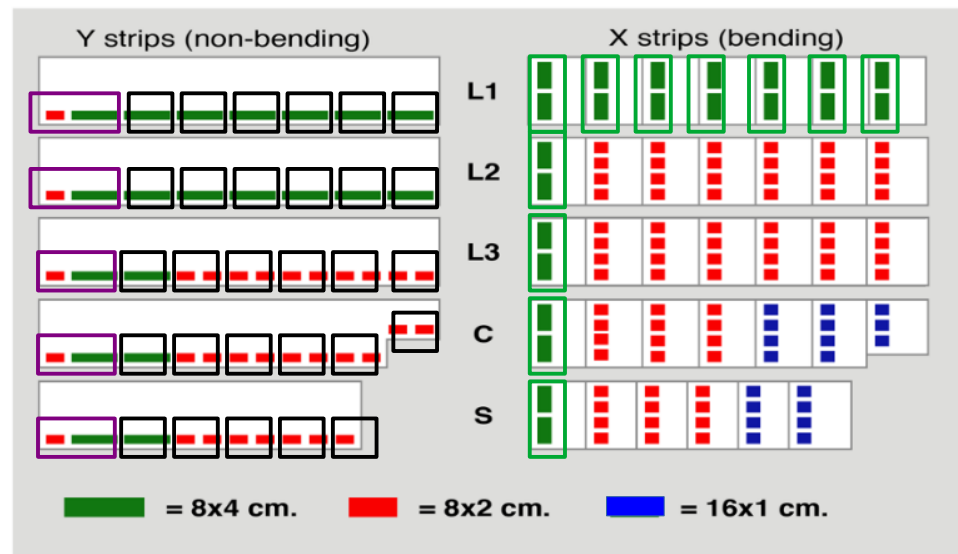
COL 6							COLO		COLO							COL 6	
05 9.Out	234	225	209	193	177	155	133	16	38	60	76	92	108	117	04 9.In				
	LC7L9B1	LC6L9B1	LC5L9B1	LC4L9B1	LC3L9B1	LC2L9B1	LC1L9B1	RC1L9B1	RC2L9B1	RC3L9B1	RC4L9B1	RC5L9B1	RC6L9B1	RC7L9B1					
06 8.Out	233	224	208	192	176	154	132	15	37	59	75	91	107	116	03 8.In				
	LC7L8B1	LC6L8B2	LC5L8B2	LC4L8B2	LC3L8B2	LC2L8B2	LC1L8B2	RC1L8B2	RC2L8B2	RC3L8B2	RC4L8B2	RC5L8B2	RC6L8B2	RC7L8B1					
	223	207	191	175	153	131	14	36	58	74	90	106	LC6L8B1	LC5L8B1		LC4L8B1			
07 7.Out	232	222	206	190	174	152	130	13	35	57	73	89	105	115	02 7.In				
	LC7L7B1	LC6L7B2	LC5L7B2	LC4L7B2	LC3L7B2	LC2L7B2	LC1L7B1	RC1L7B1	RC2L7B2	RC3L7B2	RC4L7B2	RC5L7B2	RC6L7B2	RC7L7B1					
	221	205	189	173	151	129	12	34	56	72	88	104	LC6L7B1	LC5L7B1		LC4L7B1			
08 6.Out	231	220	204	188	172	150	128	11	33	55	71	87	103	114	01 6.In				
	LC7L6B1	LC6L6B2	LC5L6B2	LC4L6B2	LC3L6B3	LC2L6B3	LC1L6B3	RC1L6B3	RC2L6B4	RC3L6B4	RC4L6B2	RC5L6B2	RC6L6B2	RC7L6B1					
	219	203	187	171	149	127	10	32	54	70	86	102	LC6L6B1	LC5L6B1		LC4L6B1			
	218	202	186	170	148	126	9	31	53	69	85	101	LC6L5B1	LC5L5B1		LC4L5B1			
	217	201	185	169	147	125	8	30	52	68	84	100	LC6L4B1	LC5L4B1		LC4L4B1			
09 5.Out	230	218	202	186	170	148	126	10	32	54	70	86	102	113	00 5.In				
	LC7L5B1	LC6L5B2	LC5L5B2	LC4L5B2	LC3L5B3	LC2L5B3	LC1L5B3	RC2L5B4	RC3L5B4	RC4L5B2	RC5L5B2	RC6L5B2	RC7L5B1	LC6L5B1					
	217	201	185	169	147	125	8	29	51	67	83	99	LC6L4B1	LC5L4B1		LC4L4B1			
	216	200	184	168	146	124	7	28	50	66	82	98	LC6L3B1	LC5L3B1		LC4L3B1			
	215	199	183	167	145	123	6	27	49	65	81	97	LC6L2B1	LC5L2B1		LC4L2B1			
10 4.Out	229	216	200	184	168	146	125	8	24	46	62	78	94	112	17 4.In				
	LC7L4B1	LC6L4B2	LC5L4B2	LC4L4B2	LC3L4B3	LC2L4B3	LC1L4B3	RC1L4B3	RC2L4B3	RC3L4B3	RC4L4B2	RC5L4B2	RC6L4B2	RC7L4B1					
	215	199	183	167	145	123	6	23	45	61	77	93	LC6L3B1	LC5L3B1		LC4L3B1			
11 3.Out	228	214	198	182	160	138	122	5	21	43	65	81	97	111	16 3.In				
	LC7L3B1	LC6L3B2	LC5L3B2	LC4L3B2	LC3L3B2	LC2L3B2	LC1L3B2	RC1L3B2	RC2L3B2	RC3L3B2	RC4L3B2	RC5L3B2	RC6L3B2	RC7L3B1					
	213	197	181	159	137	121	4	20	42	64	80	96	LC6L3B1	LC5L3B1		LC4L3B1			
12 2.Out	227	212	196	180	158	136	120	3	19	41	63	79	95	110	15 2.In				
	LC7L2B1	LC6L2B2	LC5L2B2	LC4L2B2	LC3L2B2	LC2L2B2	LC1L2B2	RC1L2B2	RC2L2B2	RC3L2B2	RC4L2B2	RC5L2B2	RC6L2B2	RC7L2B1					
	211	195	179	157	135	119	2	18	40	62	78	94	LC6L2B1	LC5L2B1		LC4L2B1			
13 1.Out	226	210	194	178	156	134	118	1	17	39	61	77	93	109	14 1.In				
	LC7L1B1	LC6L1B1	LC5L1B1	LC4L1B1	LC3L1B1	LC2L1B1	LC1L1B1	RC1L1B1	RC2L1B1	RC3L1B1	RC4L1B1	RC5L1B1	RC6L1B1	RC7L1B1					

□ = RPC

□ = Board

LB and strips

- If the strip pitch is 4 cm → a LB reads 8 strips
- If the strip pitch is 2 cm → a LB reads 16 strips
- If the strip pitch is 1 cm → a LB reads 16 strips
- **Exception 1**
 - One LB reads 8 strips with 4 cm pitch + 8 strips with 2 cm pitch
- **Exception 2**
 - One LB reads 16 strips with 2 cm pitch

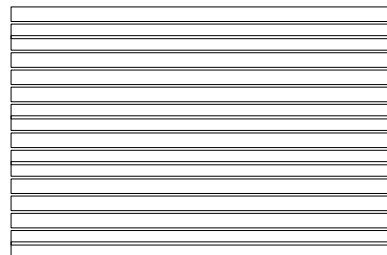


Column data format

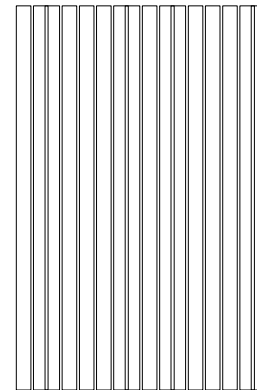
- Way in which the MID data is saved
- Stored in
[O2 >> DataFormats >> Detectors >> MUON >> MID include >> DataFormatsMID >> ColumnData.h](#)
- What is important for us is the *pattern*
 - We also have to indicate the detector element, line and column
 - It is an `std::array` with 5 elements
 - Each element is a base 16 number (0x....)
 - The first four elements represent the bending plane strips from the bottom to the top
 - There are four elements because at most there are 4 lines (see slide 2). If in the specified detector element there are less than 4 lines, the absent lines are discarded
 - The last one the non-bending plane strips from left to right
 - If in the specified detector element there are only 8 strips one should be careful to set the values only for them

Ceiling

Bending plane



Non-bending plane



Floor

Column data format

- Way in which the MID data is saved
- Stored in
[O2 >> DataFormats >> Detectors >> MUON >> MID include >> DataFormatsMID >> ColumnData.h](#)
- What is important for us is the *pattern*
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 - The last one the non-bending plane strips from left to right
 - If in the specified detector element there are only 8 strips one should be careful to set the values only for them

11	33	MT11 IN 6 deld = 5
10	32	
9	31	
	30	

- LB 9 → column 0, line 0, 16 strips BP
- LB 10 → column 0, line 1, 16 strips BP
- LB 11 → column 0, line 2, 16 strips BP
- LB 30 → column 0, line 0, 16 strips BP
- LB 31 → column 0, line 1, 16 strips BP
- LB 32 → column 0, line 2, 16 strips BP
- LB 33 → column 0, line 3, 16 strips BP
- Same NBP pattern read by LBs 9,10,11
- Same NBP pattern read by LBs 30,31,32,33
- Example of pattern for LB 10 on BP:
 - 0x1FB0 → 0001 1111 1011 0000

Top strips

Bottom strips

