

Mapping of the DOROS collimator system (DIDRC)

P1 ###
v. 30/07/21 M. Gasior, SY-BI-QP

FE inputs 1, 3, 5, 7 are positive

A electrode = lowest number
B = A + 1
C = A + 2
D = A + 3

ctrl = NE26

BI and collimator polarity connection

H outside positive
H inside negative
V top positive
V bottom negative

Polarity

U+
U-
D+
D-

H collimator

OU = Outside Upsrea
IU = Inside Upsream
OD = Outside Downstre
ID = Inside Downstre

Location history	Collimator	Device name	Rack	DOROS FE ID active ch. config bits	FE MAC	ETH rack / sockets	Timing patch	Cable numbers	BPM	FE plane / pair	Electrode	Electrode code	Port	FE channel	FE channel theory
P1 L inst. 1/12/18	TCTPH.4L1.B1 (H.B1)	CFB-US152-BIDRC1A	BY01.US152	0x11FF 8 00	08:00:30:F6:11:FF socket -> location ->	BY01 3206/01 2127 2-0A01	CYFIB01.US152 socket #19 patch 10 m to BY01	1102531..34 1103058 ctrl	BPTUH.A4L1.B1	1	OU	B	U+	1	same
											IU	A	U-	2	
											OD	D	D+	3	
											ID	C	D-	4	
	TCTPV.4L1.B1 (V.B1)	same	same	same	same	same	same	BST1 OK	1102535..38 1103059 ctrl	3	TU	B	U+	6	5
											BU	A	U-	7	6
											TD	D	D+	5	7
											BD	C	D-	8	8
P1 L new 2018	as above redundant FE signals split connections copied	CFB-US152-BIDRC1B	as above	0x118F as above	08:00:30:F6:11:8F socket -> location ->	as above 3206/03 as above	as above as above	as above as above	as above as above	as above as above	as above as above	as above as above	as above as above	as above as above	as above as above
P1 R	TCTPH.4R1.B2 (H.B2)	CFB-US152-BIDRC2A	BY01.US152	0x1101 8 00	08:00:30:F6:11:01 socket -> location ->	BY01 3206/02 2127 2-0A01	as above socket #20 patch 10 m to BY01	1102539..42 1102539 ctrl	BPTUH.A4R1.B2	1	RU	D	U+	6	1
											LU	C	U-	5	2
											RD	B	D+	8	3
											LD	A	D-	7	4
	TCTPV.4R1.B2 (V.B2)	same	same	same	same	same	BST2 OK	1102543..46 1103061 ctrl	BPTUV.A4R1.B2	3	TU	D	U+	2	5
											BU	C	U-	1	6
											TD	B	D+	4	7
											BD	A	D-	3	8
P1 R new 2018	as above redundant FE signals split connections copied	CFB-US152-BIDRC2B	as above	0x1181 as above	08:00:30:F6:11:81 socket -> location ->	as above 3206/04 as above	as above as above	as above as above	as above as above	as above as above	as above as above	as above as above	as above as above	as above as above	as above as above
### REMOVED during LS2		### TCLVW.A5L1.B2 -> TCTPV.4L1.B1 with CFB-US152-BIDRC1A(B)													
P1 L new 2018	TCLVW.5L1.B2 (V.B2)	CFB-US152-BIDRC3	BY01.US152	0x11FE	08:00:30:F6:11:FE	TYCCR01 (BY01+1) 3406/04 2127 2-0A01	?	1128061..64 1128065 ctrl	BPTUV.A5L1.B2	1	TU	D	U+	1	
											BU	C	U-	2	
	*							BPTDV.A5L1.B2	2	TD	B	D+	3		
										BD	A	D-	4		

*
one collimator front-end
channels 5 - 8 disabled, CH config bits = "10"

3406/02, 03 free

UP and DOWN BPM cable swapped on 21/08/18
Polarity kept.

Mapping of the DOROS collimator system (DIDRC)

P2

FE inputs 1, 3, 5, 7 are positive

BI and collimator polarity connection

Polarity

H collimator

A electrode = lowest number
 B = A + 1
 C = A + 2
 D = A + 3

H outside positive
 H inside negative
 V top positive
 V bottom negative

U+ OU = Outside Upsrea
 U- IU = Inside Upsream
 D+ OD = Outside Downstre
 D- ID = Inside Downstre

ctrl = NE26

Location	Collimator	Device name	Rack	DOROS FE ID active ch. config bits	FE MAC	ETH rack / sockets	Timing patch	Cable numbers	BPM	FE plane / pair	Electrode	Electrode code	Port	FE channel	
P2 L	TCTPH.4L2.B1 (H.B1)	CFB-UA23-BIDRC1	BY02.UA23	0x12FF 8 00	08:00:30:F6:12:FF socket -> location ->	BY01 8905/04 2218 R-0000	BY02 UA23 A B1: socket #5 BST1 OK	1203587..90 1203008 ctrl	BPTUH.A4L2.B1	1		OU	C	U+	1
												IU	D	U-	2
												OD	A	D+	3
												ID	B	D-	4
	TCTPV.4L2.B1 (V.B1)	same	1203591..94 1203009 ctrl	BPTUV.A4L2.B1	3		TU	D	U+	5					
							BU	C	U-	6					
							TD	B	D+	7					
							BD	A	D-	8					
P2 L New LS2	TCLD.A11L2.B2 (H.B2)	CFB-UA23-BIDRC2	BY02.UA23	0x12FE 4 10	08:00:30:F6:12:FE socket -> location ->	BY01 8905/05 2218 R-0000	1217301..04	B8TUH.A11L2.B2	1		OU	D	U+	1	
											IU	C	U-	2	
											OD	B	D+	3	
											ID	A	D-	4	
	##### one collimator front-end								*	*	3 disabled				
	##### channels 5 - 8 disabled, CH config bits = "10"								*	*	4 disabled				
	Wait until the meeting to confirm the needed redundancy														
	P2 R	TCTPH.4R2.B2 (H.B2)	CFB-UA27-BIDRC1	BY04.UA27	0x1201 8 00	08:00:30:F6:12:01 socket -> location ->	BY04 9708/01 2239 R-9708	BY03 UA27 A B2: socket #6 BST2 OK	1203599..602 1203069 ctrl	BPTUH.A4R2.B2	1		OU	A	U+
IU													B	U-	2
OD													C	D+	3
ID													D	D-	4
TCTPV.4R2.B2 (V.B2)		same	1203595..98 1203068 ctrl	BPTUV.A4R2.B2	3		TU	B	U+	5					
							BU	A	U-	6					
							TD	D	D+	7					
							BD	C	D-	8					
P2 R New LS2	TCLD.A11R2.B1 (H.B1)	CFB-UA27-BIDRC2	BY04.UA27	0x1202 4 10	08:00:30:F6:12:02 socket -> location ->	BY04 9708/02 2239 R-9708	1217305..08	BPTUH.A11R2.B1	1		OU	B	U+	1	
											IU	A	U-	2	
											OD	D	D+	3	
											ID	C	D-	4	

cables on the GND

cables on the GND

*
one collimator front-end
channels 5 - 8 disabled, CH config bits = "10"

* * 3 disabled
* * 4 disabled

connections copied

Mapping of the DOROS collimator system (DIDRC)

BY03 in TZ76

ALL NEW LS2

FE inputs 1, 3, 5, 7 are positive

BI and collimator polarity connecton

Polarity

H collimator

A electrode = lowest number
 B = A + 1
 C = A + 2
 D = A + 3
 E = A + 4
 F = A + 5

H outside positive
 H inside negative
 V top positive
 V bottom negative

U+ OU = Outside Upsrea
 U- IU = Inside Upsream
 D+ OD = Outside Downstre
 D- ID = Inside Downstre
 D+ OT = Outside Tank
 D- IT = Inside Tank

no ctrl cables

location -> 2743/U0-0001
 rack -> BY03

Location	Collimator	Device name	Rack	DOROS FE ID active ch. config bits	FE MAC	ETH rack / sockets	Timing patch	Cable numbers	BPM	FE plane / pair	Electrode	Electrode code	Port	FE channel		
BY03.TZ76	TCP.D6L7.B1 (V.B1) * * *	CFB-TZ76-BIDRC31A	ALL	0x1731 8 00	08:00:30:F6:17:31	7503/01		1711311..14	BPTUV.D6L7.B1	1	TU	D	U+	1		
			2							BU	C	U-	2			
			3							TD	B	D+	3			
			4							BD	A	D-	4			
	TCSM.6L7.B2 (H.B2)			BY03				1711325..28	BPTUH.6L7.B2	3	OU	C	U+	5		
				6						IU	D	U-	6			
				7						OD	A	D+	7			
				8						ID	B	D-	8			
BY03.TZ76	as above	CFB-TZ76-BIDRC31B		0x1732 as above	08:00:30:F6:17:32	7503/02		as above	BPTUV.D6L7.B1_B	as above	as above	as above	as above	as above		
										BPTDV.D6L7.B1_B						
										BPTUH.6L7.B2_B						
										BPTDH.6L7.B2_B						
BY03.TZ76	TCP.C6L7.B1 (H.B1) * * *	CFB-TZ76-BIDRC32A		0x1733 8 00	08:00:30:F6:17:33	7503/03		1711317..20	BPTUH.C6L7.B1	1	OU	D	U+	1		
										2	IU	C	U-	2		
										3	OD	B	D+	3		
										4	ID	A	D-	4		
	tank.C6L7.B1 *							1711321..22	BPTUV.C6L7.B1	3	TT	F	U+	5		
										6	BT	E	U-	6		
	tank.D6L7.B1							1711315..16	BPTUH.D6L7.B1	4	OT	F	D+	7		
										8	IT	E	D-	8		
BY03.TZ76	as above	CFB-TZ76-BIDRC32B		0x1734 6 01	08:00:30:F6:17:34	7503/04		as above	BPTUH.C6L7.B1_B	1	as above	as above	as above	as above		
										BPTDH.C6L7.B1_B	2					
										1711329..30	BPTUV.6L7.B2	3	TT	F	U+	5
												6	BT	E	U-	6
##### channels 7 - 8 disabled, CH config bits = "01"								*	*	4 disabled			7 disabled	8 disabled		

connections copied

BPTUV.D4L7.B1_B

BPTDV.D4L7.B1_B

BY04.TZ76	tank.ESR7.B1	CFB-TZ76-BIDRC44	0x1746	08:00:30:F6:17:46	7603/06	1711359..60	BPTUT.ESR7.B1	1	OT	F	U+	1
	*		6 01						IT	E	U-	2
	tank.D4L7.B1					1711341..42	BPTUH.D4L7.B1	2	OT	F	D+	3
	*								IT	E	D-	4
	*											
	tank.B4L7.B1					1711347..48	BPTUV.B4L7.B1	3	TT	F	U+	5
	*								BT	E	U-	6
#####	channels 7 - 8 disabled,	CH config bits = "01"				*	*	4 disabled				7 disabled
												8 disabled

BY04.TZ76	TCSM.B4L7.B1	CFB-TZ76-BIDRC45A	0x1747	08:00:30:F6:17:47	7603/07	1711343..46	BPTUH.B4L7.B1	1	OT	D	U+	1
	(H.B1)		8 00						IT	C	U-	2
	*						BPTDH.B4L7.B1	2	OT	B	D+	3
	*								IT	A	D-	4
	*											
	TCSM.B4R7.B2					1711349..52	BPTUH.B4R7.B2	3	OT	C	U+	5
	(H.B2)								IT	D	U-	6
							BPTDH.B4R7.B2	4	OT	A	D+	7
									IT	B	D-	8

BY04.TZ76	as above	CFB-TZ76-BIDRC45B	0x1748	08:00:30:F6:17:47	7603/08	as above	BPTUH.B4L7.B1_B	as above	as above	as above	as above	as above
	redundant FE		as above				BPTDH.B4L7.B1_B					
	signals split						BPTUH.B4R7.B2_B					
	connections copied						BPTDH.B4R7.B2_B					

Mapping of the DOROS collimator system (DIDRC)

P8

FE inputs 1, 3, 5, 7 are positive

BI and collimator polarity connecton

Polarity

H collimator

A electrode = lowest number
 B = A + 1
 C = A + 2
 D = A + 3

H outside positive
 H inside negative
 V top positive
 V bottom negative

U+ OU = Outside Upsrea
 U- IU = Inside Upsream
 D+ OD = Outside Downstre
 D- ID = Inside Downstre

ctrl = NE26

Location	Collimator	Device name	Rack	DOROS FE ID active ch. config bits	FE MAC	ETH rack / sockets	Timing patch	Cable numbers	BPM	FE plane / pair	Electrode	Electrode code	Port	FE channel	
P8 L	TCTPH.4L8.B1 * * * *	CFB-UA83-BIDRC1	BY02.UA83	0x18FF 8 00	08:00:30:F6:18:FF socket -> location ->	BY02 7606/01 2818 RA-0000	BY02 UA83 A socket #3 BST1 OK	1802842..45 1803669 ctrl	BPTUH.A4L8.B1	1		OU	C	U+	1
												IU	D	U-	2
												OD	A	D+	3
												ID	B	D-	4
	TCTPV.4L8.B1	same	1802846..49 1804279 ctrl	BPTUV.A4L8.B1	3		TU	D	U+	5					
							BU	C	U-	6					
							TD	B	D+	7					
							BD	A	D-	8					
P8 R	TCTPH.4R8.B2 * * * *	CFB-UA87-BIDRC1	BY03.UA87	0x1801 8 00	08:00:30:F6:18:01 socket -> location ->	BY03 5104/01 2839 RA-0000	BY02 UA87 socket #17 BST2 OK	1802854..57 1804282 ctrl	BPTUH.A4R8.B2	1		OU	A	U+	1
												IU	B	U-	2
												OD	C	D+	3
												ID	D	D-	4
	TCTPV.4R8.B2	same	1802850..53 1804280 ctrl	BPTUV.A4R8.B2	3		TU	B	U+	5					
							BU	A	U-	6					
							TD	D	D+	7					
							BD	C	D-	8					

FE channel	Plane	Input
1	1	collimator 1, positive upstream
2	1	collimator 1, negative upstream
3	2	collimator 1, positive downstream
4	2	collimator 1, negative downstream
5	3	collimator 2, positive upstream
6	3	collimator 2, negative upstream
7	4	collimator 2, positive downstream
8	4	collimator 2, negative downstream

DOROS FE ID convention

bit	length	function	value
15 ... 12	4	system ID	0 forbidden 1 collimator BPMs 8 standard BPMs
11 ... 8	4	location	0 forbidden 1 LHC point 1 2 LHC point 2 3 LHC point 3 4 LHC point 4 5 LHC point 5 6 LHC point 6 7 LHC point 6 8 LHC point 8 ... 10 SPS ... 15 development systems

DOROS MAC address = 08:00:30:F6: + FE ID

FE names	loc = location, e.g. USC55 xx = sequential number 1, 2, 3, ...
CFB-loc-BIDRCxx	DOROS for collimator BPMs
CFB-loc-BIDRSxx	DOROS for standard BPMs
CFB-loc-BIDRDxx	DOROS for development

DOROS FE possible configurations:

- collimator 1/2 = B1/B2
- collimator 1/2 = B1/B1
- collimator 1/2 = B2/B2
- collimator 1/2 = H/V
- collimator 1/2 = H/H
- collimator 1/2 = V/V

bit	length	function	value	... FB - FC - FD - FE - FF - ### POINT ### - 01 - 02 - 03 - 04 - 05 ...	### DIFFRENT in TZ76 with a lot of FEs; there the numbering is "per rack". ### rack 1 = 1x, rack 2 = 2x, etc.
7 ... 0	8	unit ID	0 forbidden		
1 ... 127		LHC right IP side			
255 ... 128		LHC left IP side (U2 negative numbers)			

Channel config bits (MSB, MSB-1 on the "FPGA SW" bits)

- 00 - all 1..8 channels enabled (most of the front-ends)
- 01 - channels 7..8 disabled (now only one case, FE for TCSPM.D4R7.B2)
- 10 - channels 5..8 disabled (one collimator front-ends, like FEs for TCSPs at P6)
- 11 - channels 3..8 disabled (no such a case yet)