

DOROS collimator system (DIDRC)

P1

M. Gasior, SY-BI-QP
v. 1/03/22

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 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
												A	U-	2	
												D	D+	3	
												C	D-	4	
	TCTPV.4L1.B1 (V.B1)	same	1102535..38 1103059 ctrl	BPTUV.A4L1.B1	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 patch 10 m to BY01	as above 1102539..42 1102539 ctrl	as above BPTUH.A4R1.B2	as above 1	as above RU	D	U+	6	1
												C	U-	5	2
												B	D+	8	3
												A	D-	7	4
	as above	same	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 patch 10 m to BY01	as above 1102539..42 1102539 ctrl	as above BPTUH.A4R1.B2	as above 1	as above RU	D	U+	6	1
												C	U-	5	2
												B	D+	8	3
												A	D-	7	4
	as above	same	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					

LS2: TCTPV.4L1.B1 becomes a wire collimator

DOROS collimator system (DIDRC)

P2

M. Gasior, SY-BI-QP
v. 1/03/22

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															
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 ##### channels 5 - 8 disabled, CH config bits = "10"	* * * *	* * * *	3 disabled	* * * *	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+	1														
												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 9708/03 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

DOROS collimator system (DIDRC)

BY03 in TZ76

ALL NEW LS2

M. Gasior, SY-BI-QP
v. 1/03/22

FE inputs 1, 3, 5, 7 are positive

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

BI and collimator polarity connecton

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

Polarity

U+
U-
D+
D-
D+
D-

H collimator

OU = Outside Upsrea
IU = Inside Upsream
OD = Outside Downstre
ID = Inside Downstre
OT = Outside Tank
IT = Inside Tank

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	D	U+	5							
				6						IU	C	U-	6								
				7						OD	B	D+	7								
				8						ID	A	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	C	U+	1							
										2	IU	D	U-	2							
										3	OD	A	D+	3							
										4	ID	B	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							

DOROS collimator system (DIDRC)

BY04 in TZ76

ALL NEW LS2

M. Gasior, SY-BI-QP
v. 1/03/22

FE inputs 1, 3, 5, 7 are positive

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

BI and collimator polarity connecton

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

Polarity

U+
U-
D+
D-
D+
D-

H collimator

OU = Outside Upsrea
IU = Inside Upsream
OD = Outside Downstre
ID = Inside Downstre
OT = Outside Tank
IT = Inside Tank

location -> 2743/U0-0001
rack -> BY04

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		
BY04.TZ76	TCSG.D4R7.B2 (V.B2) * * *	CFB-TZ76-BIDRC41A	ALL	0x1741 8 00	08:00:30:F6:17:41	7603/01		1710443..46	BPTUV.D4R7.B2	1	TU	D	U+	1		
			BY04						BPTDV.D4R7.B2	2	TD	B	D+	2		
												BD	A	D-	3	
															D-	4
	TCSM.E5L7.B2 (J.B2)							1711331..34	BPTUJ.E5L7.B2	3	OU	D	U+	5		
												IU	C	U-	6	
													OD	B	D+	7
													ID	A	D-	8
BY04.TZ76	as above	CFB-TZ76-BIDRC41B		0x1742 as above	08:00:30:F6:17:42	7603/02		as above	BPTUV.D4R7.B2_B	as above	as above	as above	as above	as above		
BY04.TZ76	tank.D4R7.B2 * tank.E5L7.B2 * * * tank.B4R7.B2 *	CFB-TZ76-BIDRC42		0x1743 6 01	08:00:30:F6:17:43	7603/03		1710447..48	BPTUH.D4R7.B2	1	OT	E	U+	1		
												IT	F	U-	2	
									1711335..36	BPTUJ.E5L7.B2	2	OT	F	D+	3	
												IT	E	D-	4	
							1711353..54	BPTUV.B4R7.B2	3	TT	F	U+	5			
											BT	E	U-	6		
														7 disabled		
														8 disabled		
BY04.TZ76	TCSM.E5R7.B1 (J.B1) * * * * TCSM.D4L7.B1 (V.B1)	CFB-TZ76-BIDRC43A		0x1744 8 00	08:00:30:F6:17:44	7603/04		1711355..58	BPTUJ.E5R7.B1	1	OU	C	U+	1		
												IU	D	U-	2	
													OD	A	D+	3
													ID	B	D-	4
							1711337..40	BPTUV.D4L7.B1	3	TU	D	U+	5			
											BU	C	U-	6		
											TD	B	D+	7		
											BD	A	D-	8		
BY04.TZ76	as above	CFB-TZ76-BIDRC43B		0x1745 as above	08:00:30:F6:17:45	7603/05		as above	BPTUJ.E5R7.B1_B	as above	as above	as above	as above	as above		

redundant FE
signals split
connections copied

channels 7 - 8 disabled, CH config bits = "01"

redundant FE
signals split

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	TT	F	U+	1
	*		6 01						BT	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	OU	C	U+	1
	(H.B1)		8 00						IU	D	U-	2
	*						BPTDH.B4L7.B1	2	OD	A	D+	3
	*								ID	B	D-	4
	*											
	TCSM.B4R7.B2					1711349..52	BPTUH.B4R7.B2	3	OU	D	U+	5
	(H.B2)								IU	C	U-	6
							BPTDH.B4R7.B2	4	OD	B	D+	7
									ID	A	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					

DOROS collimator system (DIDRC)

BY05 in TZ76

M. Gasior, SY-BI-QP
v. 1/03/22

ALL NEW LS2

FE inputs 1, 3, 5, 7 are positive

BI and collimator polarity connecton

Polarity

H collimator

Polarity

V collimator

Connections

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

H outside
H inside
V top
V bottom

positive
negative
positive
negative

U+
U-
D+
D-
D+
D-

OU = Outside Upstream
IU = Inside Upstream
OD = Outside Downstream
ID = Inside Downstream
OT = Outside Tank
IT = Inside Tank

U+
U-
D+
D-
D+
D-

TU = Top Upstream
BU = Bottom Upstream
TD = Top Downstream
BD = Bottom Downstream
TT = Top Tank
BT = Bottom Tank

U+ = Upstream posi
U- = Upstream negati
D+ = Downstream po
D- = Downstream po

no ctrl cables

CHANGES !!!

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

Location	Collimator	Device name	Rack	DOROS FE ID active ch. config bits	FE MAC	ETH rack / sockets	Timing path	Cable numbers	BPM	FE plane / pair	Electrode	Electrode code	Port	FE channel
BY05.TZ76	TCSM.6R7.B1 (H.B1) * * * * * tank.6R7.B1 *	CFB-TZ76-BIDRC51A	ALL	0x1751 6 01	08:00:30:F6:17:51	7703/01		1711361..64	BPTUH.6R7.B1	1	OU	C	U+	1
									IU	D	U-	2		
									BPTDH.6R7.B1	2	OD	A	D+	3
									ID	B	D-	4		
								1711365..66	BPTUV.6R7.B1	3	TT	F	U+	5
									BT	E	U-	6		
														7 disabled
														8 disabled
##### channels 7 - 8 disabled, CH config bits = "01"														
BY05.TZ76	as above * * * * * tank.D6R7.B2 * tank.C6R7.B2	CFB-TZ76-BIDRC51B	ALL	0x1752 8 00	08:00:30:F6:17:52	7703/02		as above	BPTUH.6R7.B1_B		as above	as above	as above	as above
									BPTDH.6R7.B1_B					
								1711377..78	BPTUH.D6R7.B2	3	OT	E	U+	5
									IT	F	U-	6		
								1711371..72	BPTUV.C6R7.B2	4	TT	F	D+	7
									BT	E	D-	8		
##### channels 7 - 8 disabled, CH config bits = "01"														
BY05.TZ76	TCP.D6R7.B2 (V.B2) * * * * * TCSM.C6R7.B2 (H.B2)	CFB-TZ76-BIDRC52A	ALL	0x1753 8 00	08:00:30:F6:17:53	7703/03		1711373..76	BPTUV.D6R7.B2	1	TU	D	U+	1
									BU	C	U-	2		
									BPTDV.D6R7.B2	2	TD	B	D+	3
									BD	A	D-	4		
								1711367..70	BPTUH.C6R7.B2	3	OU	D	U+	5
									IU	C	U-	6		
									BPTDH.C6R7.B2	4	OD	B	D+	7
									ID	A	D-	8		
##### channels 7 - 8 disabled, CH config bits = "01"														
BY05.TZ76	as above redundant FE signals split connections copied	CFB-TZ76-BIDRC52B	ALL	0x1754 as above	08:00:30:F6:17:54	7703/04		as above	BPTUV.D6R7.B2_B	as above	as above	as above	as above	as above
									BPTDV.D6R7.B2_B					
									BPTUH.C6R7.B2_B					
									BPTDH.C6R7.B2_B					
##### channels 7 - 8 disabled, CH config bits = "01"														
BY05.TZ76	TCSM.A4R7.B2 (V.B2) * * * * * its tank BPM *	CFB-TZ76-BIDRC53	ALL	0x1755 6 01	08:00:30:F6:17:55	7703/05		1709470..73	BPTUV.A4R7.B2	1	TU	D	U+	1
									BU	C	U-	2		
									BPTDV.A4R7.B2	2	TD	B	D+	3
									BD	A	D-	4		
								1709474..75	BPTUH.A4R7.B2	3	OT	F	U+	5
									IT	E	U-	6		
														7 disabled
														8 disabled
##### channels 7 - 8 disabled, CH config bits = "01"														

Cable path:

BY05.TZ76 <- 17094 70-75 <= BY01.RR77 K connected with 3 ns + adapters
tunnel => 17139 03-06 (x4) => BY02.RR77 7

prototype collimator, not redundant
moved from RR77, the forgotten one for the beam test !!!
RENAMED: TCSPM.D4R7.B2 -> TCSPM.A4R7.B2 (Gaby's mail of 19/10/21)

DOROS collimator system (DIDRC)

P8

M. Gasior, SY-BI-QP
v. 1/03/22

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 connecton

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	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
														2
														3
														4
	TCTPV.4L8.B1	same	1802846..49 1804279 ctrl	BPTUV.A4L8.B1 BPTDV.A4L8.B1	3 4	TU BU TD BD	D C B A	U+ U- D+ D-	5					
									6					
									7					
									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
														2
														3
														4
	TCTPV.4R8.B2	same	1802850..53 1804280 ctrl	BPTUV.A4R8.B2 BPTDV.A4R8.B2	3 4	TU BU TD BD	B A D C	U+ U- D+ D-	5					
									6					
									7					
									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)