Main Trigger Station　2024/08/06 更新

2006/03/15 作成
2020/09/14 更新
2021/01/06 更新
2021/04/15 更新
2021/05/06 更新
2021/09/17 更新
2021/09/30 更新
2021/11/10 更新
2022/02/16 更新
2022/09/20 更新
2024/07/19 更新
2024/08/06 更新

LLA　LOGIC LEVEL ADAPTER
2NTF　2CH NIM/TTL FANOUT
6TF　6ch TTL FANOUT
GDG　2CH GATE & DELAY GENERATOR
24PA　24V PULSE AMP TTL→24V
8LLF　8CH LOGIC LEVEL FANIN/FANOUT
50Hz　2CH 50Hz MONITOR
AND　NIM LOGIC AND/FANOUT
TLC　TRIGGER LEVEL CONVERTER 24V→5V TRIG I
4FOLD　3CH 4-FOLD 1-VETO

NIM信号
TTL信号
× 接続先なし

TD4V撤去への変更箇所

TRIPLE SYNC 導入への変更箇所

50Hz GENERATOR (N1-8)
2021/9/8 から使用
LLA chB-3 (N0-6)
1サブコンへ
2NTF CH1 (N3-1)
2NTF CH1 (N7-8)
GDG CH2 (N7-7)
50Hz ②左、②右
VISUAL SCALER (N7-5,6)
50Hz ⑧
50Hz ③
50Hz ⑦
50Hz ④
GDG CH2 (N6-6) 2019/05/30 追加 Delay 300μs
50Hz ⑧
50Hz CH:A (N6-1)
50Hz ⑩
Slow e+ 50Hz (MAIN1筐体 天井 COAX中継パネル No.1 ～ ABCサブコンへ)
8LLF CH3 (N4-11)
8LLF CH5 (N4-11)
Function Generator (TRIGGER STATION MAIN4 ラック 最下段) 50Hz
2021/4/14 変更
cRIO (MAIN1ラック 最下段)
2021/5/6追加 AC50Hz ±0.06ms
8LLF CH6 (N4-11)
8LLF CH3 (N6-12)
cRIO Gate ①
cRIO Gate ②
2021/9/8 50Hz Gen使用のため、未使用に変更
2NTF CH2 (N0-7)
GDG CH1 (N3-12)
EVG IOC TDCへ
DUAL GATE GENERATOR CH A (N2-1)
LLA chA-5 (N3-11)
LLA chA-6 (N3-11)
LLA chA-8 (N3-11)
LLA chA-7 (N3-11)
50Hz ⑤
50Hz ⑥
25Hz ①
25Hz ②

10.39MHz (マスターオシレータから)
RF AMP 10MHz – 1GHz (N5-8)
MCL ZFSC-2-5
MCL ZFSC-2-2
10.39MHz ①
10.39MHz ②
10.39MHz ③
114MHz (マスターオシレータ～) (MAIN1筐体裏トロンボーン経由)
114/571 DEVIDER (N1-3)
Mini-Circuits
POWER DIVIDER 114.24MHz (MAIN3ラック)
114MHz △
114MHz ②
114MHz ①
POWER DIVIDER 571MHz (MAIN1ラック)
571HMz ●
571MHz Optic Transmitter (N0-1,2)
GU_AT HV-ST へ 571MHz
2016/9/5 変更
571MHz ○
571MHz (マスターオシレータ～)
Mini-Circuits
CLK/TRIG TRANSMITTER (MAIN1ラック)
A～C セクター SBへ
1～5 セクター SBへ
MAIN1筐体裏トロンボーン
KLY 50Hz ①
AVB1 (Monocycle Pulser)
KLY 50Hz ③

A1 Beam AR (安全系PLC～)
A1 Beam KEKB (安全系PLC～)
A1 Beam PF (安全系PLC～)
24V Logic Level Converter CH1
24V Logic Level Converter CH2
24V Logic Level Converter CH3
24V Logic Level Converter CH4
A1 Beam AR ①
A1 Beam KEKB ①
A1 Beam KEKB ②
A1 Gate AR ①
A1 Beam PF ①
A1 Beam PF ②
8LLF CH8 (N8-6)
A1 Gate PF (安全系PLC～)
A1 Gate KEKB (安全系PLC～)
24V Logic Level Converter CH7
24V Logic Level Converter CH10
A1 Gate PF ①
A1 Gate KEKB ①

光ファイバ接続箱 (MAIN1ラック上段)
No.1 PF Rev 1.6MHz
No.2 PF Kicker充電
No.3 未使用 (ケーブル損傷？)
No.4 PF 500MHz
No.5 AR Kicker, BPM (PF-RINGへ)
No.6 PF BPM
PF Rev ①
10.39MHz ②
50Hz ⑧
TRIPLE CLOCK SYNC (N6-9,10)
1:4 GATE SW:0C
10.39MHz DELAY SW:80
50Hz DELAY SW:E0
50Hz GATE SW:1A
PF SYNC VETO
TRIPLE SYNC OUT1
KLY OUT1
BEAM OUT2
GDG CH1 (N9-7)
GDG CH1 (N6-5)
GDG CH1 (N9-1)
LLA chA-6 (N8-7)
EVG IOC用 PF-KLY
PF-A1 KLY
PF-KLY
50Hz CH:A (N7-1)
cRIO Gate ①
4FOLD CH3 (N6-11)
8LLF CH3 (N7-9)
2021/5/6 追加
2021/9/8 IN B disable
2017/11/20 信号幅 13ms
PF-BEAM

A1 Gate PF ①
PF Beam Gate ①
8LLF CH8 (N8-4)
A1 Beam PF ②
QFE ①
4FOLD CH2 (N9-3)
PF-BEAM
PF-GU_AT
2016/9/14 変更
2017/11/20 PF-BEAM 追加
PF SYNC VETO
GDG CH1 (N6-6)
W=1ms
2016/11/22 INH 撤去
TD4V① (MAIN4ラック)
2019/9/25 ジッタを無くすため未使用に変更

計算機室 – Main Trigger Station 間のケーブル使用状況
2024/7/19 追記

Main Trigger Station	Main1 天井 中継版（左から）	ケーブルNo
114HMz △	ラック上	No.21
KL_51, 52 RFON (5サブコン～)	ラック上	No.22
KL_51, 52, 61 RFON (5サブコン～)	ラック上	No.23
PF Beam Gate ③	4	No.24
50Hz ⑩	5	No.25
Linac-AR Timing (CO-CL1ラック裏)	ラック上	No.26
	7	No.27
	8	No.28
	9	No.29
	10	No.30

PF 500MHz
RECEIVER (N5-7)
LIMITER AMP (Ver.2) (N5-6)
MINI-CIRCUIT (PFT)
各TD4へ ☆
MINI-CIRCUIT
PF 500MHz★
PF Rev 1.6MHz
OPTICAL RECEIVER (N5-11,12)
RF AMP A5/A7 (N5-10)
HIGH SPEED AMPLIFIER (N5-9)
8LLF CH8 (N9-8)
PF Rev ①

2017/1/27 変更
PF Beam Gate
OPT ADAPTER (N4-5)
2NTF CH2 (N8-1)
PF Beam Gate ②
NIM IO IN1 (N7-12)
LLA chB-8 (N8-6)
PF Beam Gate ①
PF Beam Gate ③

PF-Kicker充電
8LLF CH2 (N9-8)
OPT ADAPTER CH1 (N3-7)
PF Kicker充電
GDG CH1 (N9-5) Delay:22ns
GDG CH1 (N9-7) Width:18ns
GDG CH2 (N9-5) Width:5ms
4FOLD CH1 (N8-8)
4FOLD CH3 (N8-6)
8LLF CH1 (N6-12)
8LLF CH6 (N8-6)
2019/5/30 追加 PF-Kicker充電 と PF-BPM の間隔を 18ms から 22ms に制限するため
PF-BPM
8LLF CH2 (N6-12)
IOCEVMAIN PF用TDC STOP CH1
cRIO Gate ②
4FOLD CH2 (N6-11)
LLA chA-3 (N8-7)
2021/5/6 追加
2021/9/8 IN B disable
6TF CH4 (N1-1)
OPT ADAPTER CH1 (N3-6)
PF BPM
LLA chB-2 (N8-5)
8LLF CH3 (N7-9)
IOCEVMAIN PF用TDC STOP CH2

AR Rev 0.8MHz (CO-CL1ラック内 TD4V)
8LLF CH1 (N8-4)
GDG CH2 (N7-7)
LLA chA-1 (N8-5)
AR SYNC VETO
TRIPLE CLOCK SYNC (N6-7,8)
1:4 GATE SW:0C
10.39MHz DELAY SW:00
50Hz DELAY SW:00
50Hz GATE SW:10
10.39MHz ③
50Hz ⑦
GDG CH2 (N6-5)
8LLF CH4 (N7-9)
EVG IOC用 AR-KLY
50Hz CH:B (N7-1)
GDG CH2 (N9-1)
2017/11/20 信号幅 13ms
AR-BEAM

AR BEAM GATE (CO-CL1筐体内 端子台 No.1)
KEKB BEAM GATE (電気) (CO-CL1筐体内 端子台 No.7)
TRIGGER GATE DISTRIBUTER ① (N1-12)
LLA chB-4 (N9-10)
8LLF CH3 (N9-8)
LLA chA-2 (N9-10)
AR BEAM GATE1
AR BEAM GATE2-1
AR BEAM GATE2-2
AR BEAM GATE2-3 EVG IOCへ
AR BEAM GATE 安全系PLCへ (MAIN1筐体内 端子台 No.2)
KEKB BEAM GATE 安全系PLCへ (MAIN1筐体内 端子台 No.1)
※2014/09～ 安全 系では未使用

A1 Gate AR ①
AR BEAM GATE2-2
A1 Beam AR ①
AR-BEAM
8LLF CH7 (N9-8)
ARE ①
4FOLD CH2 (N9-3)
AR-GU_AT
2016/11/08 暫定 接続に変更 (AR用安全系未整備のため)
2017/02/08 正規 接続に変更
2017/11/20 AR-BEAM 追加

AR-Septum
AR-Kicker
6TF CH3 (N7-11)
6TF CH1 (N7-11)
LLA chB-4 (N8-5)
AR BEAM GATE1
TRIGGER GATE ① (N1-11)
AR BEAM GATE2-1
LLA chB-1 (N8-5)
LLA chB-5 (N8-5)
IOCEVMAIN AR用TDC STOP CH1
IOCEVMAIN AR用TDC STOP CH2
AR Septum (CO-CL1筐体内 BUFFER FANOUT ch1 TTL)
AR Kicker, BPM (CO-CL1筐体内 BUFFER FANOUT ch2 TTL)
4FOLD CH1 (N9-3)
LLA chA-2 (N8-5)
OPT ADAPTER CH1 (N3-5)
AR Kicker, BPM (PF-RINGへ)
2017/01/13 追加

KEKB 508MHz
POWER DIVIDER CH2 (N3-1)
POWER DIVIDER CH2 (N3-1)
4WAY POWER DIVIDER (N3-2, N3-3)
2016/1/13 撤去
各TD4へ ◎
KEKB 44Hz Rev2kHz/46
2021/01/06 2kHzから4kHzに変更
OPT ADAPTER (N4-7)
8LLF CH8 (N0-8)
LLA chA-1 (N3-11)
2CH DELAY CH2 (N3-10)
2017/11 4ns
EVG-1 (EVG IOC slot3)

EVG IOC用 PF-KLY
EVG IOC用 AR-KLY
IOCEVMAIN PF用TDC START
IOCEVMAIN AR用TDC START
8LLF CH2 (N7-9)
8LLF CH7 (N7-9)
8LLF CH2 (N2-8)
8LLF CH1 (N2-8)
50Hz CH:B (N7-2)
50Hz CH:A (N7-2)
LLA chA-6 (N0-6)
LLA chA-4 (N0-6)
LLA chA-2 (N0-6)
LLA chA-8 (N0-6)
DUAL VARIABLE DELAY CH1 (N0-10)
DUAL VARIABLE DELAY CH2 (N0-10)
2017/11 20ns
2017/11 22ns
EVG-2 (EVG IOC slot6)
EVG-3 (EVG IOC slot7)
EVR (EVG IOC Slot5)

PB_AT レベル信号 (MAIN1ラック 中継板 1)
6TF CH1 (N1-1)
LLA chB-3 (N3-11)
8LLF CH1 (N9-9)
8LLF CH3 (N0-8)
PB_AT ①
PB_AT ②
PB_AT ③
2018/10 追加

KL_51, 52 RFON (5サブコン～、計算機室地下経由)
2024/08/06 追加
LLA chB-8 (N8-11)
8LLF CH8 (N8-12)
NIM IO IN4 (N7-12)
sKEKB HER BEAM GATE (EVG IOC 上 WR～)
sKEKB HER BEAM GATE (CO-CL1筐体内)
8LLF CH1 (N8-6)
HER BEAM GATE 1-2
LLA chA-1 (N8-7)
EVG-1 IN1 (EVG IOC slot3)
EVG-2 OUT1 (EVG IOC slot6)
LLA chB-1 (N8-7)
4FOLD CH3 (N8-2)
2024/08/06 2つのANDを1つに変更
sKEKB HER BEAM GATE 2
sKEKB LER BEAM GATE (EVG IOC 上 WR～)
sKEKB LER BEAM GATE (CO-CL1筐体内)
2021/9/17 WRから に変更
2021/11/10 WRから元に戻す
8LLF CH2 (N8-6)
LER BEAM GATE 1-2
LLA chA-2 (N8-7)
EVG-1 IN0 (EVG IOC slot3)
EVG-2 OUT0 (EVG IOC slot6)
LLA chB-2 (N8-7)
8LLF CH3 (N8-4)
NIM IO IN3 (N7-12)
4FOLD CH2 (N8-8)
2024/08/06 2つのANDを1つに変更
sKEKB LER BEAM GATE 2
DR BEAM GATE
8LLF CH5 (N8-4)
NIM IO IN2 (N7-12)
KL_51, 52, 61 RFON (5サブコン～、計算機室地下経由)
2022/02/16 追加
LLA chB-7 (N8-7)
8LLF CH8 (N8-12)
NIM IO IN1 (N7-12)

HER BEAM GATE 1-2
LER BEAM GATE 1-2
8LLF CH3 (N8-6)
8LLF CH4 (N8-6)
50Hz ⑥
50Hz ⑤
EVG-2 Rear2 (EVG IOC slot6)
EVG-3 Rear2 (EVG IOC slot7)
EVG-2 Rear3 (EVG IOC slot6)
EVG-3 Rear3 (EVG IOC slot7)
2018/04/26 追加
25Hz ①
25Hz ②
EVG-2 Rear4 (EVG IOC slot6)
EVG-3 Rear4 (EVG IOC slot7)
2018 追加

PF Beam Gate (計算機室光BOX光源棟SM port1)
C8 SM port 1
光BOX
MainTrig SM port 1
OPT ADAPTER (N4-5)
PF Beam Gate
GR_A1用 HER Beam Gate
GR_A1 用 1st bunch
2020/9/11 追加
GR_A1 用 2nd bunch
DR BEAM GATE (計算機室光BOX DR SM port1)
OPT ADAPTER (N4-1)
OPT ADAPTER (N4-2)
OPT ADAPTER (N4-3)
OPT ADAPTER (N4-4)
A-A A1 GUN SM port 1
C8 SM port 2
C8 SM port 3
C8 SM port 4
C8 SM port 5
O/E (A1電子銃室 GR_A1レーザ ハット内)
GR_A1 Protection Shutterへ
GR_A1 2nd bunch 制御用機器へ
DR BEAM GATE
2020/9/11 計算 機室地下 IDF経由から光BOX C8経由に経路 変更

A1 Beam KEKB ②
AND CH3 (N8-10)
2019/05/29 追加
GR_A1用 HER Beam Gate
2018/01/30 変更
A1 Gate KEKB ①
8LLF CH1 (N9-8)
sKEKB HER BEAM GATE 2
8LLF CH4 (N8-4)
NIM IO IN2 (N3-2)
sKEKB LER BEAM GATE 2
8LLF CH7 (N8-6)
NIM IO IN3 (N3-2)
KBE ④
KBP ⑤
4FOLD CH1 (N8-2)
4FOLD CH2 (N8-2)
2016/01/18 追加
8LLF CH8 (N9-9)
A1 Beam KEKB ①

Bunch Control 1st bunch (EVG IOC EVG0)
Bunch Control 2nd bunch (EVG IOC EVG0)
6TF CH2 (N1-1)
6TF CH3 (N1-1)
LLA chA-1 (N9-10)
LLA chB-1 (N3-11)
LLA chB-2 (N3-11)
GR_A1 用 1st bunch
GR_A1 用 2nd bunch
8LLF CH1 (N0-8)
8LLF CH2 (N0-8)
8LLF CH4 (N0-8)
8LLF CH5 (N0-8)
AND CH2 (N8-10)
INHのため 反転
PB_AT ③
PB_AT ②
PB_AT ①
LLA chA-3 (N0-6)
LLA chA-5 (N0-6)
LLA chA-4 (N8-7)
OPTICAL DATA LINK CH1 (N0-3)
OPTICAL DATA LINK CH2 (N0-3)
OPTICAL DATA LINK CH1 (N0-4)
B1 (MM)
B2 (MM)
B3 (MM)
GU_AT HV-STへ TD4V-1 INH (1st bunch)
GU_AT HV-STへ TD4V-2 INH (2nd bunch)
GU_AT HV-STへ TD4V-3 INH (PF-A1, AR)
AR-GU_AT
PF-GU_AT
2016/9/16 変更

50Hz event1
EVR C6 RearOUT0 (IOCEVMAIN)
6TF CH2 (N7-11)
50Hz CH:B (N7-2)
50Hz eventxx5
EVR C6 RearOUT0 (IOCEVMAIN)
8LLF CH7 (N8-4)
LLA chA-1 (N0-6)
50Hz CH:B (N6-1)
KLY 50Hz ①
2NTF ① ch1 (N0-7)
??? (CO-CL1 筐体 中段中継板 No.12?)
8LLF CH6 (N7-9)
IOCEVMAIN PF用TDC STOP CH0
IOCEVMAIN AR用TDC STOP CH0
KBE/JBE
EVR C6 RearOUT8 (IOCEVMAIN)
2NTF CH1 (N8-3)
KBE ①
KBE ②
KBE ④
KBP ①
KBP ②
KBP ⑤
KBP/JBP
EVR C6 RearOUT9 (IOCEVMAIN)
2NTF CH2 (N8-3)
KBE ①
KBP ①
CO-CL1筐体 横 NIM-7 DIGITEX CH1 INPUT KEKB e+(光)
CO-CL1筐体 横 NIM-7 DIGITEX CH2 INPUT KEKB e-(光)
KBE ②
KBP ②
8LLF CH6(N8-4)
LLA chA-6 (N8-7)
LLA chB-3 (N8-7)
CO-CL1筐体 中段中継板 No.10 (KEKB BEAM GATE(光))
QFE/SFE
EVR C6 RearOUT10 (IOCEVMAIN)
2NTF CH2 (N7-8)
QFE ①
ARE
EVR C6 RearOUT12 (IOCEVMAIN)
8LLF CH2 (N8-4)
ARE ①
ZRE
EVR C6 RearOUT13 (IOCEVMAIN)
PF-RING向け
EVR C6 RearOUT2 (IOCEVMAIN)
PF-Kicker充電
EVR C6 RearOUT3 (IOCEVMAIN)
PF-BPM
AR向け
EVR C6 RearOUT4 (IOCEVMAIN)
AR-Septum
EVR C6 RearOUT5 (IOCEVMAIN)
AR-Kicker

x1(Pre) 50Hz
EVR C6 RearOUT7 (IOCEVMAIN)
LLA chB-3 (N8-11)
8LLF CH1 (N8-12)
LLA chA-1 (N8-11)
LLA chA-5 (N8-11)
LLA chA-5 (N8-5)
M.O. F.B Trig (恒温槽へ)
M.O. F.B Trig テスト用
M.O. F.B Trig (恒温槽へ)
KBP,JBP pre
EVR C6 RearOUT11 (IOCEVMAIN)
LLA chB-3 (N8-11)
8LLF CH2 (N8-12)
LLA chA-2 (N8-11)
LLA chA-6 (N8-11)
M.O. F,B Level KBP (恒温槽へ)
M.O. F,B Level KBP テスト用
QFE pre
EVR C6 RearOUT14 (IOCEVMAIN)
8LLF CH3 (N8-12)
LLA chA-3 (N8-11)
LLA chA-7 (N8-11)
M.O. F,B Level QFE (恒温槽へ)
M.O. F,B Level QFE テスト用
ARE pre
EVR C6 RearOUT15 (IOCEVMAIN)
8LLF CH4 (N8-12)
LLA chA-4 (N8-11)
LLA chA-8 (N8-11)
M.O. F,B Level ARE (恒温槽へ)
M.O. F,B Level ARE テスト用
2024/7/16 変更

MAIN1端子台 SB1
MAIN1端子台 SA1
MAIN3端子台 ABCサブコン
MAIN3端子台 1サブコン
MAIN3端子台 2サブコン
MAIN3端子台 3サブコン
MAIN3端子台 4サブコン
MAIN3端子台 5サブコン
8LLF CH2 (N6-12)
8LLF CH1 (N6-12)
8LLF CH3 (N6-12)
8LLF CH4 (N6-12)
8LLF CH5 (N6-12)
8LLF CH6 (N6-12)
8LLF CH7 (N6-12)
8LLF CH8 (N6-12)
GDG CH1 (N6-8)
4CH 8-IN OR LOGIC CH1 (N6-10)
GDG CH2 (N6-8)
50Hz CH:B (N6-2)
50Hz CH:A (N6-3)
50Hz CH:A (N6-4)
50Hz CH:B (N6-4)