

LHC Timing Fixed Display

New LHC Vistar description

Overview



Header

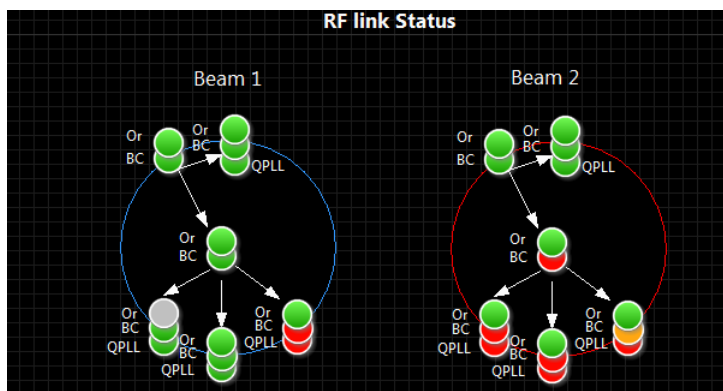
1 General usual data (date, time, fill #, energy, filling scheme, current beam mode)

1 19-Feb-2014 11:28:44
 2 FILL: 3655
 3 E: 3500 GeV
 4 B1: Proton, I: 2.84e+13
 5 B2: Proton, I: 2.79e+13
MACHINE MODE : BEAM MODE
10 INJECTION SCHEME: 75ns 1388 1300 0 1456 144bpl12in

Ref	Source (dip_path/PublicationName/ValueName)	type	Refresh rate
1	Date/time		Hz
2	Dip/acc/LHC/RunControl/RunConfiguration/FILL_NO	String	On change
3	Dip/acc/LHC/RunControl/RunConfiguration/TARGET_ENERGY	String	On change
4	Dip/acc/LHC/RunControl/RunConfiguration/PARTICLE_TYPE_B1	String	On change
5	Dip/acc/LHC/Beam/Intensity/Beam1/Value	String	On change
6	Dip/acc/LHC/RunControl/RunConfiguration/PARTICLE_TYPE_B2	String	On change
7	Dip/acc/LHC/Beam/Intensity/Beam2/Value	String	On change
8	Dip/acc/LHC/RunControl/MachineMode/Value	String	On change
9	Dip/acc/LHC/RunControl/BeamMode/Value	String	On change
10	Dip/acc/LHC/RunControl/RunConfiguration/ACTIVE_INJECTION_SCHEME	String	On change

RF link Status

2 Timing signal status over the TTC backbone



Parameter Names (beam x):

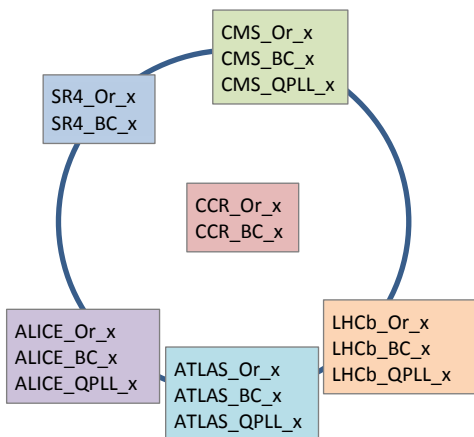


Table 1: color code wrt DIP publication status & value

DIP Publication Quality		DIP Publication Timestamp		Published Data
● good	&	changed between the 2 last publications	&	within the GREEN range (defined below)
● good	&	changed between the 2 last publications	&	within the ORANGE range (if defined)
● good	&	changed between the 2 last publications	&	within the RED range (defined below)
● NOT GOOD	Or	Did not change	x	x

Table 2: color code for each data type

Published Data Type	●	●	●	Units
Power	X > 171	X ∈ [150;171]	X < 150	none
Bunch Clock	X ∈ [40114.0 ; 40056.7]	-	X ∉ [40114.0 ; 40056.7]	kHz
Orbit	X ∈ [11.245 ; 11.246]	-	X ∉ [11.245 ; 11.246]	kHz
QPLL	1	-	0	

Table 3: parameter table for field 2

Ref	Source (dip_path/PublicationName/ValueName)	description	data type for color coding	Refresh rate
SR4_Or_x	dip/acc/LHC/Timing/TxFrevPower/SR4_Bx/POWER_FREV_Bx	Optical power of the transceiver of the Revolution Frequency (Orbit) for beam x	Power	0.5Hz
SR4_BC_x	dip/acc/LHC/Timing/TxClocksPower/SR4_B1B2/POWER_B1	Optical power of the transceiver of the Bunch Clock for beam x	Power	0.5Hz
CCR_Or_x	Ax={dip/acc/LHC/Timing/RxFREV/FREV_Bx} and Bx={dip/acc/LHC/Timing/TxFrevPower/CCR_Bx/POWER_FREV_Bx}	Revolution Frequency status at the CCR: signal frequency received from the SR4 and power of the transmitter to the experiments	Ax in {Orbit} & Bx in {Power}	0.5Hz
CCR_BC_x	Ax={dip/acc/LHC/Timing/RxClocks/F40_Bx} and Bx={dip/acc/LHC/Timing/TxClocksPower/CCR_B1B2/POWER_Bx}	Bunch Clock status at the CCR: signal frequency received from the SR4 and power of the transmitter for to experiments	Ax in {Bunch Clock} & Bx in {Power}	0.5Hz
ALICE_Or_x	dip/ALICE/LHC/Timing/RFRX/FREV_Bx	Revolution Frequency (orbit) of beam x: signal frequency received at ALICE	Orbit	0.5Hz
ALICE_BC_x	dip/ALICE/LHC/Timing/RFRX/F40_Bx	Bunch Clock of beam x: signal frequency received at ALICE	Bunch Clock	0.5Hz
ALICE_QPLL_x	{dip/ALICE/LHC/Timing/BunchClock/ BCx_QPLL_Lock*}	ALICE QPLL Lock status of the RF2TTC for BCx (Registers 7FBE8 or 7FBB8)	QPLL	0.5Hz
ATLAS_Or_x	dip/ATLAS/LHC/Timing/RFRX/FREV_Bx	Revolution Frequency (orbit) of beam x: signal frequency received at ATLAS	Orbit	0.5Hz
ATLAS_BC_x	dip/ATLAS/LHC/Timing/RFRX/F40_Bx	Bunch Clock of beam x: signal frequency received at ATLAS	Bunch Clock	0.5Hz
ATLAS_QPLL_x	{dip/ATLAS/LHC/Timing/BunchClock/ BCx_QPLL_Lock*}	ATLAS QPLL Lock status of the RF2TTC for BCx (Registers 7FBE8 or 7FBB8)	QPLL	0.5Hz
CMS_Or_x	dip/CMS/LHC/Timing/RFRX/FREV_Bx	Revolution Frequency (orbit) of beam x: signal frequency received at CMS	Orbit	0.5Hz
CMS_BC_x	dip/CMS/LHC/Timing/RFRX/F40_Bx	Bunch Clock of beam x: signal frequency received at CMS	Bunch Clock	0.5Hz
CMS_QPLL_x	{dip/CMS/LHC/Timing/BunchClock/ BCx_QPLL_Lock*}	CMS QPLL Lock status of the RF2TTC for BCx (Registers 7FBE8 or 7FBB8)	QPLL	0.5Hz
LHCb_Or_x	dip/LHCb/LHC/Timing/RFRX/FREV_Bx	Revolution Frequency (orbit) of beam x: signal frequency received at LHCb	Orbit	0.5Hz
LHCb_BC_x	dip/LHCb/LHC/Timing/RFRX/F40_Bx	Bunch Clock of beam x: signal frequency received at LHCb	Bunch Clock	0.5Hz
LHCb_QPLL_x	{dip/LHCb/LHC/Timing/BunchClock/BCx_QPLL_Lock*}	LHCb QPLL Lock status of the RF2TTC for BCx (Registers 7FBE8 or 7FBB8)	QPLL	0.5Hz

*: new publication - not settled yet

3 Last QPLL unlock event

Last QPLL unlock events	B1	B2
ALICE:	19-Feb-2014 09:03:45	19-Feb-2014 09:03:45
ATLAS:	19-Feb-2014 09:03:45	19-Feb-2014 09:03:45
CMS:	19-Feb-2014 09:03:45	19-Feb-2014 07:03:45
LHCb:	19-Feb-2014 09:03:45	15-Feb-2014 19:03:45

Table 4: Parameter table for field 3

Ref	Source (dip_path/PublicationName/ValueName)	type	description	Refresh rate
ALICE /Bx	dip/ALICE/LHC/Timing/BunchClock/ BCx_QPLL_Timestamp*	time	Time of the beginning of the last unlocking period	0.5Hz
ATLAS /Bx	dip/ATLAS/LHC/Timing/BunchClock/ BCx_QPLL_Timestamp*	time	Time of the beginning of the last unlocking period	0.5Hz
CMS /Bx	dip/CMS/LHC/Timing/BunchClock/ BCx_QPLL_Timestamp*	time	Time of the beginning of the last unlocking period	0.5Hz
LHCb /Bx	dip/LHCb/LHC/Timing/BunchClock/ BCx_QPLL_Timestamp*	time	Time of the beginning of the last unlocking period	0.5Hz

*: new publication - not settled yet

4 RF and Beam Status

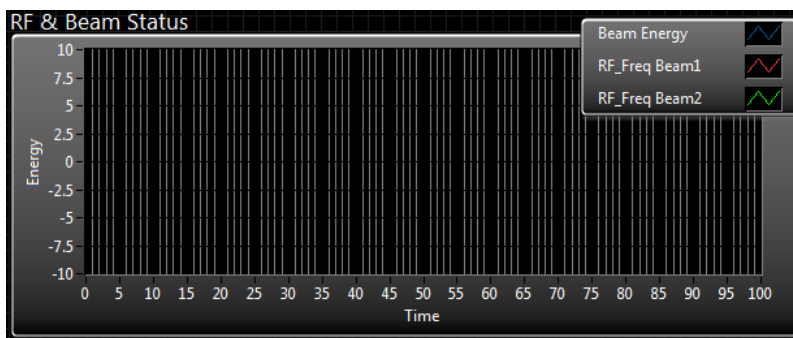


Table 5: Parameter table for field 4

Ref	Source (dip_path/PublicationName/ValueName)	type	units	description	Refresh rate
Beam Energy	dip/acc/LHC/Beam/Energy/payload	int	GeV	0-7000	Hz
RF_Freq Beam1	dip/acc/LHC/Timing/FGC/freq_B1*	Int	Hz	400788800-400789900	Hz
RF_Freq Beam2	dip/acc/LHC/Timing/FGC/freq_B2*	int	Hz	400788800-400789900	Hz

*: new publication - not settled yet

Horizontal Graph Scale:

- Displays date and time on the scale
- If Beam Mode = STABLE BEAM, then scales with time (accumulates from start of STABLE BEAM until current). If necessary (long runs), then some sort of filtering or averaging of the data should be applied to allow displaying the full Stable Beam duration.
- Else: displays the last 30mn only

Vertical Graph Scale:

- autoscales within a min/max limit of 400788800/400789900
- If a deltaT exceeds the above-defined limits, displays the points at the max or min limit of the window

Display points of a plot only if

- DIP quality of the publication is "GOOD"
- The DIP publication timestamp as changed between the 2 last points

5 BC and Orbit phase shift versus temperature

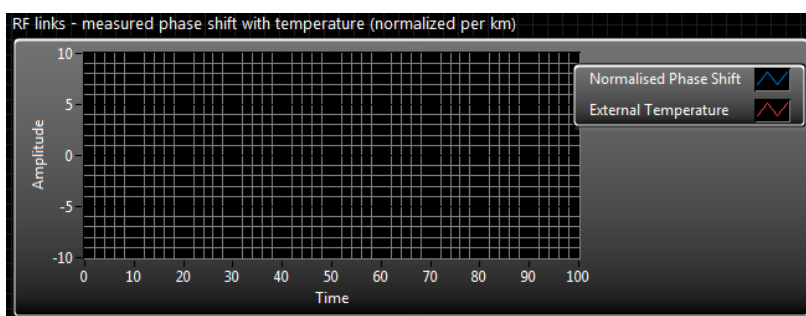


Table 6: Parameter table for field 5

Ref	Source (dip_path/PublicationName/ValueName)	type	units	description	Refresh rate
Normalised Phase Shift	dip/ATLAS/LHC/Timing/PhaseShift*	int	ps	-3000/+3000	0.1Hz
External Temperature	dip/RAMESSES/METEO/MSPA901/MSPA901_T	double	C	-30 /+40	0.1Hz

Horizontal Graph Scale:

- Displays date and time on the scale
- Last 24h

Vertical Graph Scale:

- autoscale

Display points of a plot only if

- DIP quality of the publication is “GOOD”
- The DIP publication timestamp as changed between the 2 last points

Longitudinal data from Experiments

6 Recap table (current values)

	BC MAIN	DeltaT (ns)	Phase1 (ns)	Phase2 (ns)	Zcentroid (mm)
ALICE	BC1	0.2	0.2	0.2	0.3
ATLAS	BC1	0.01	-	0.01	0.1
CMS	INTERNAL	0.1	0	0	0
LHCb	BC2	1	1	1	0.5

Table 7: Parameter table for field 6

Ref	Source (dip_path/PublicationName/ValueName)	type	units	description	Refresh rate
1	dip/LHCb/LHC/Timing/BunchClock/BCMainSource*	string		BCMain selection: INTERNAL/ BC1/ BC2	On change
2	dip/EXPT/LHC/Timing/BPTX/deltaT	float	ns	Delay between 2 BPTX	Hz
3	dip/EXPT/LHC/Timing/BPTX1/Phase	float	ns	Delay between BPTX1 and BCmain	Hz
4	dip/EXPT/LHC/Timing/BPTX2/Phase	float	Ns	Delay between BPTX2 and BCmain	Hz
5	dip/EXPT/LHC/LuminousRegion/Centroid[3]	float	mm	Luminous region longitudinal position (z)	Hz

*: new publication - not settled yet

Note: if DIP quality is not “Good” or if the publication timestamp did not change since last publication, display “-”

7 DeltaT graph

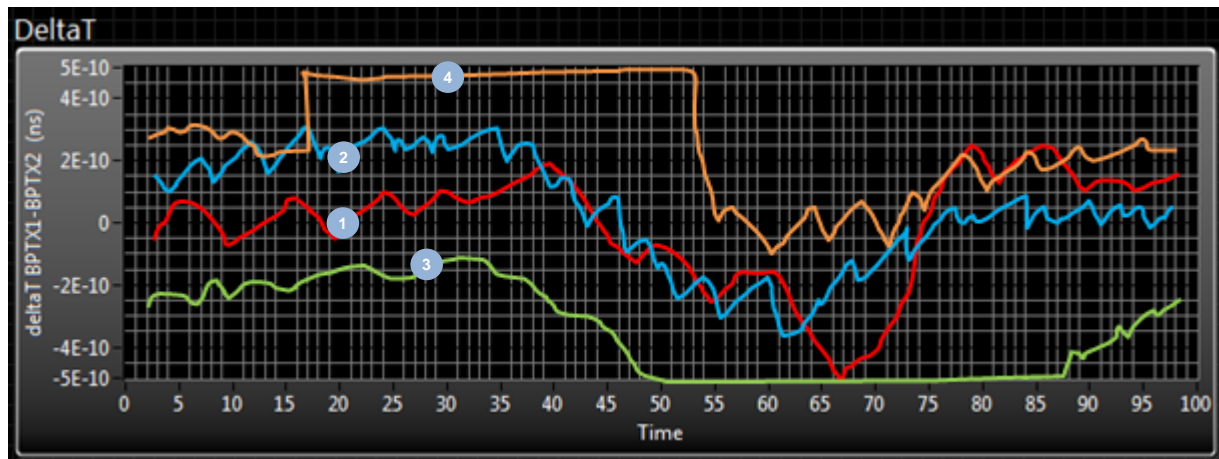


Table 8: Parameter table for field 7

Ref	Source (dip_path/PublicationName/ValueName)	type	units	description	Refresh rate
1	dip/ALICE/LHC/Timing/BPTX/deltaT	Float	ns		Hz
2	dip/ATLAS/LHC/Timing/BPTX/deltaT	Float	ns		Hz
3	dip/CMS/LHC/Timing/BPTX/deltaT	Float	ns		Hz
4	dip/LHCb/LHC/Timing/BPTX/deltaT	Float	ns		Hz

Horizontal Graph Scale:

- Displays date and time on the scale
- If Beam Mode = STABLE BEAM, then scales with time (accumulates from start of STABLE BEAM until current). If necessary (long runs), then some sort of filtering or averaging of the data should be applied to allow displaying the full Stable Beam duration.
- Else: displays the last 30mn only

Vertical Graph Scale:

- Centred around 0
- If Beam Mode = STABLE BEAM, then autoscales within a max/min limit of +0.3ns/-0.3ns
- Else: autoscales within a max/min limit of +1ns/-1ns
- If a deltaT exceeds the above-defined limits, displays the points at the max or min limit of the window

Display points of a plot only if

- DIP quality of the publication is "GOOD"
- The DIP publication timestamp as changed between the 2 last points

8 *Phase graph*

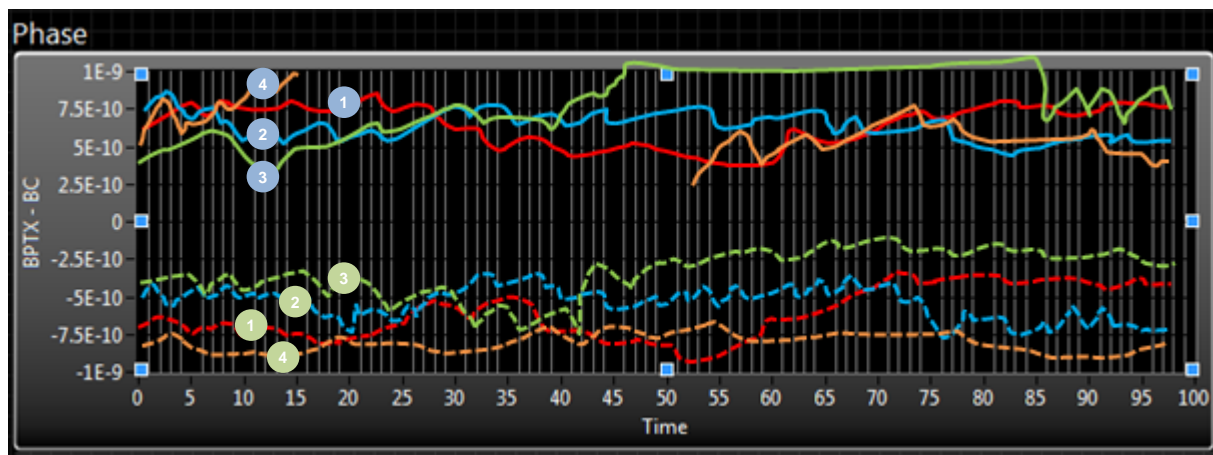


Table 9: Parameter table for field 8

Ref	Source (dip_path/PublicationName/ValueName)	type	units	description	Plot color	Refresh rate
1	dip/ALICE/LHC/Timing/BPTX1/phase	Float	ns	ALICE: Delay between BPTX1 and BCmain		Hz
1	dip/ALICE/LHC/Timing/BPTX2/phase	Float	ns	ALICE: Delay between BPTX2 and BCmain		Hz
2	dip/ATLAS/LHC/Timing/BPTX1/phase	Float	ns	ATLAS: Delay between BPTX1 and BCmain		Hz
2	dip/ATLAS/LHC/Timing/BPTX2/phase	Float	ns	ATLAS: Delay between BPTX2 and BCmain		Hz
3	dip/CMS/LHC/Timing/BPTX1/phase	Float	ns	CMS: Delay between BPTX1 and BCmain		Hz
3	dip/CMS/LHC/Timing/BPTX2/phase	Float	ns	CMS: Delay between BPTX2 and BCmain		Hz
4	dip/LHCb/LHC/Timing/BPTX1/phase	Float	ns	LHCb: Delay between BPTX1 and BCmain		Hz
4	dip/LHCb/LHC/Timing/BPTX2/phase	Float	ns	LHCb: Delay between BPTX2 and BCmain		Hz

Horizontal Graph Scale:

- Displays date and time on the scale
- If Beam Mode = STABLE BEAM, then scales with time (accumulates from start of STABLE BEAM until current). If necessary (long runs), then some sort of filtering or averaging of the data should be applied to allow displaying the full Stable Beam duration.
- Else: displays the last 30mn only

Vertical Graph Scale:

- Centred around 0
- If Beam Mode = STABLE BEAM, then autoscales within a max/min limit of +0.3ns/-0.3ns
- Else: autoscales within a max/min limit of +1ns/-1ns
- If a deltaT exceeds the above-defined limits, displays the points at the max or min limit of the window

Display points of a plot only if

- DIP quality of the publication is "GOOD"
- The DIP publication timestamp as changed between the 2 last points

- Example on the graph: 4 was not displayed between 15 and 50 because at least one of the above conditions was not met

9 *Lumi Centroid z graph*

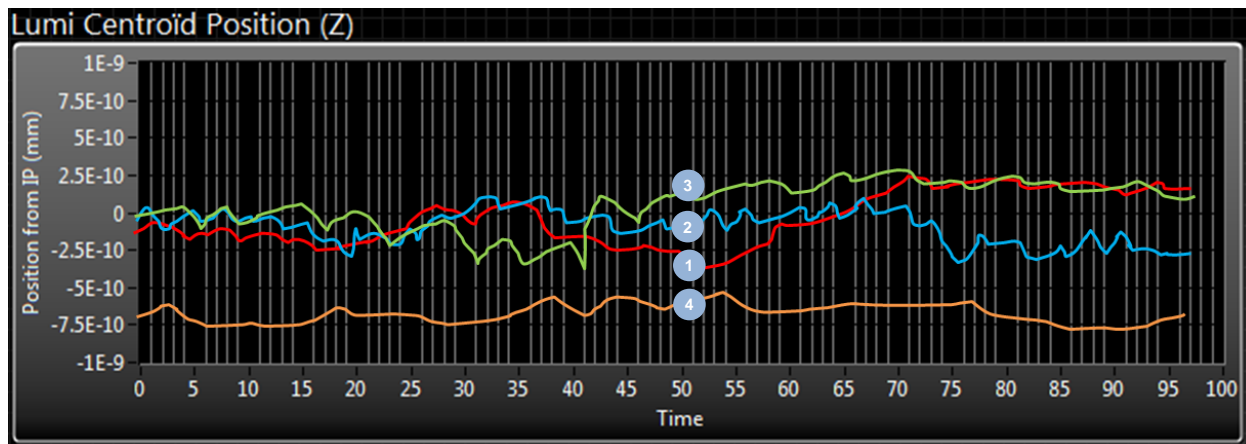


Table 10: Parameter table for field 9

Ref	Source (dip_path/PublicationName/ValueName)	type	units	description	Publication Frequency
1	dip/EXPT/LHC/LuminousRegion/Centroid[3]	Float	mm		Hz
2	dip/EXPT/LHC/LuminousRegion/Centroid[3]	Float	mm		Hz
3	dip/EXPT/LHC/LuminousRegion/Centroid[3]	Float	mm		Hz
4	dip/EXPT/LHC/LuminousRegion/Centroid[3]	Float	mm		Hz

Update Graph only during STABLE BEAM

Horizontal Graph Scale:

- Displays date and time on the scale
- If Beam Mode = STABLE BEAM, then scales with time (accumulates from start of STABLE BEAM until current). If necessary (long runs), then some sort of filtering or averaging of the data should be applied to allow displaying the full Stable Beam duration.

Vertical Graph Scale:

- Centred around 0
- If Beam Mode = STABLE BEAM, then autoscales within a max/min limit of +50mm/-50mm
- If a Centroid position exceeds the above-defined limits, displays the points at the max or min limit of the window

Display points of a plot only if

- DIP quality of the publication is "GOOD"
- The DIP publication timestamp as changed between the 2 last points