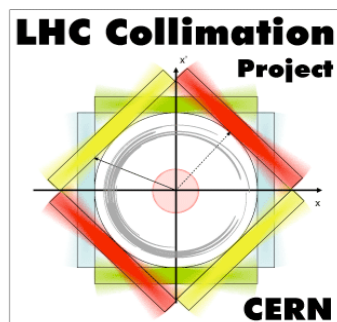


Status of CCC applications for the Roman pot controls

S. Redaelli, AB-OP

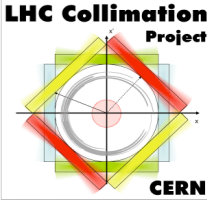
with M. Dutour, S. Ravat, I. Atanassov

Acknowledgments: M. Lamont, P. Palazzi + TOTEM controls teams





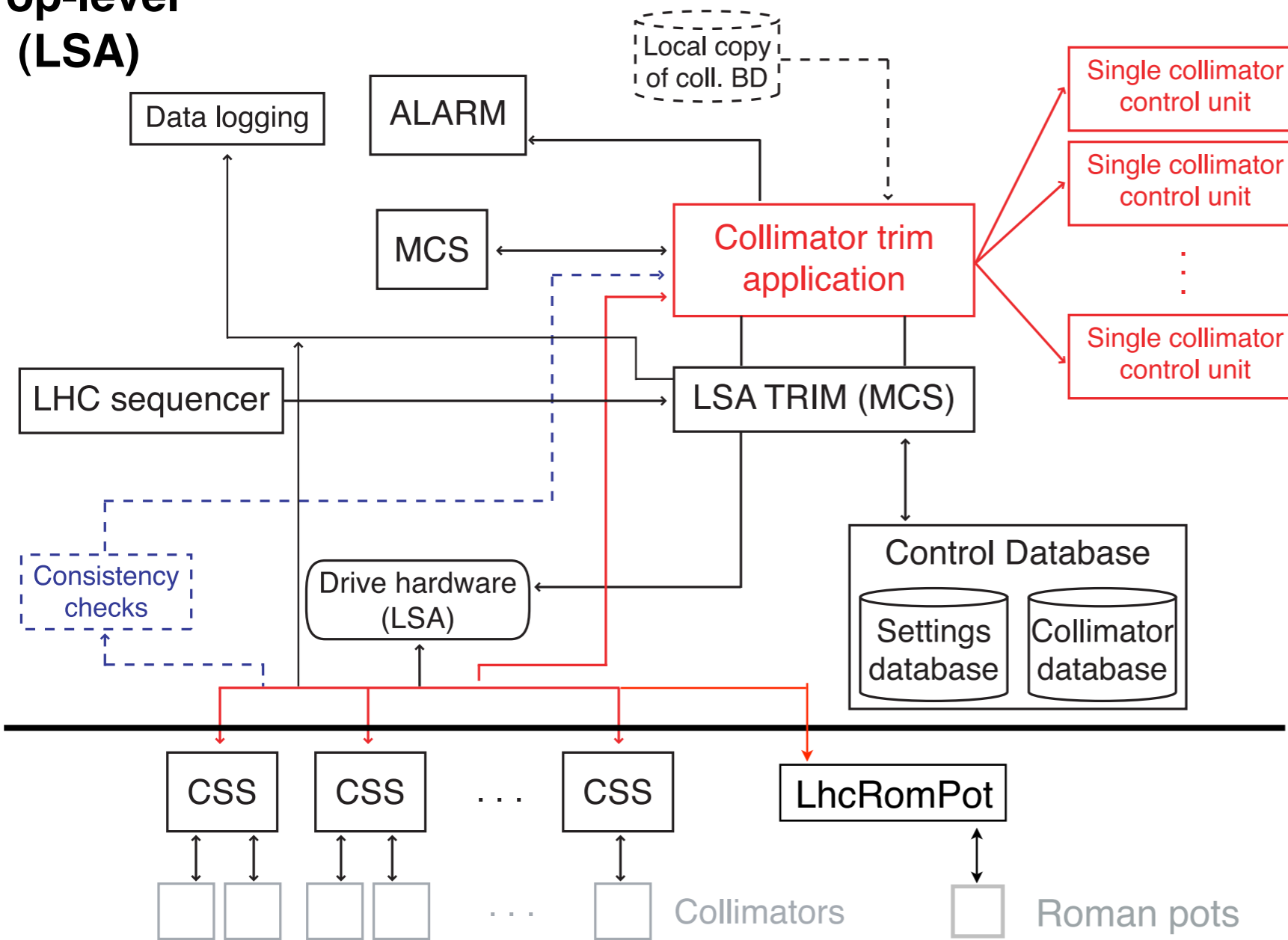
Outline



- Introduction**
- Results of integration tests**
- Status of CCC applications**
- Conclusions**

Collimator top-level controls architecture

Top-level (LSA)



Middleware (FESA)

OP provides the **top-level applications** for the Roman pot controls from the CCC.

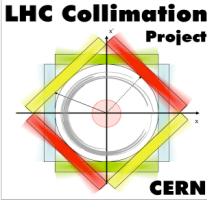
In particular:

- Movements performed by the OP crew from the CCC following TOTEM requests
- Definition of **operational windows** for RP movements
- Application for RP alignment based on BLM reading, to have procedure comparable to collimators
- Handling of settings

We agreed on the FESA interface to control the **Roman pots** with the applications developed for the **LHC collimators**.



Specs of FESA interface



LHC Project Document No. LHC-TC-ES-0002 rev 2.0
CERN Div./Group or Supplier/Contractor Document No. AB-OP
EDMS Document No. 934341



Date: 2008-07-25

Engineering Specification

MIDDLE-LEVEL INTERFACE TO CONTROL MOVABLE DEVICES LIKE LHC COLLIMATORS

Abstract

This document describes the interface between the collimator middleware controls and the application for the collimator control from the control room. This interface is proposed as an easy way to extend the applications developed within the LHC Application Software (LSA) for the LHC collimator control to other movable devices. In particular, the cases of the beam dump diluter (TCDQ) and of the TOTEM Roman pots are considered in some details.

Prepared by:
S. Redaelli,
A. Masi

Checked by:
R. Bailey, C. Boucly,
E. Carlier, M. Deile,
M. Donze, M.P. Dutour,
B. Goddard, M. Jonker,
E. Radermacher,
F. Lucas Rodriguez,
J. Wenninger

Approved by:
R. Assmann,
P. Collier,
M. Lamont,
R. Losito

Definition of a minimum set of properties (summer 2008) that allow **plugging-in** the existing collimator applications onto the Roman pot middle-ware:

- (1) requested positions;
- (2) limit functions;
- (3) measured positions;
- (4) machine states, error, warnings;
- (5) stop bottom.

Development by M. Dutour, who translates the commands for the Roman pot low-level controls. *Details in the next talk...*

One **main difference** w.r. to collimators: Roman pots accept **discrete settings only**. No functions of time!

*Meetings started at the end of last year to follow up these aspects.
Integration tests done at the Roman pot control test stand in bld. 187
(Mathias, Sylvain, Ivan and myself)*

Results on integration tests, Feb. 09

Two V pots moved for the first time with the CCC application!

The screenshot displays the LHC Collimator Control Application interface. The main window is titled "LHC Collimator Control Application - LHC beam commissioning (Device: 'XRPV.187.TEST')".

Position setting panel: This panel allows setting single motor positions for the collimator jaws. It includes input fields for Left-UP (15.05 mm), Left-DW (0.0 mm), Right-UP (-13.0 mm), and Right-DW (0.0 mm). Buttons for "Apply!", "Cancel last", "Stop all!", and "Out switches" are present. A status indicator shows "Applying new jaw positions".

Switch statuses: This section shows the status of various collimator components: Left Jaw (UP-IN, UP-OUT, DW-IN, DW-OUT), Right jaw (UP-IN, UP-OUT, DW-IN, DW-OUT), and Anti COLL (UP, DOWN).

Positions readout from the low-level: This table displays the current positions and gaps for the collimator jaws:

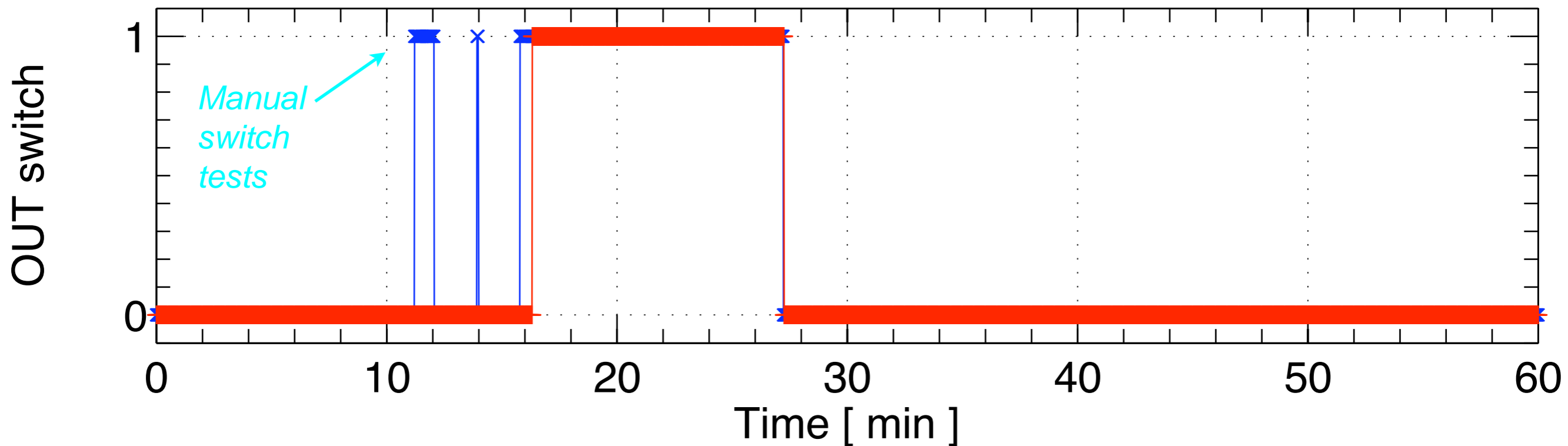
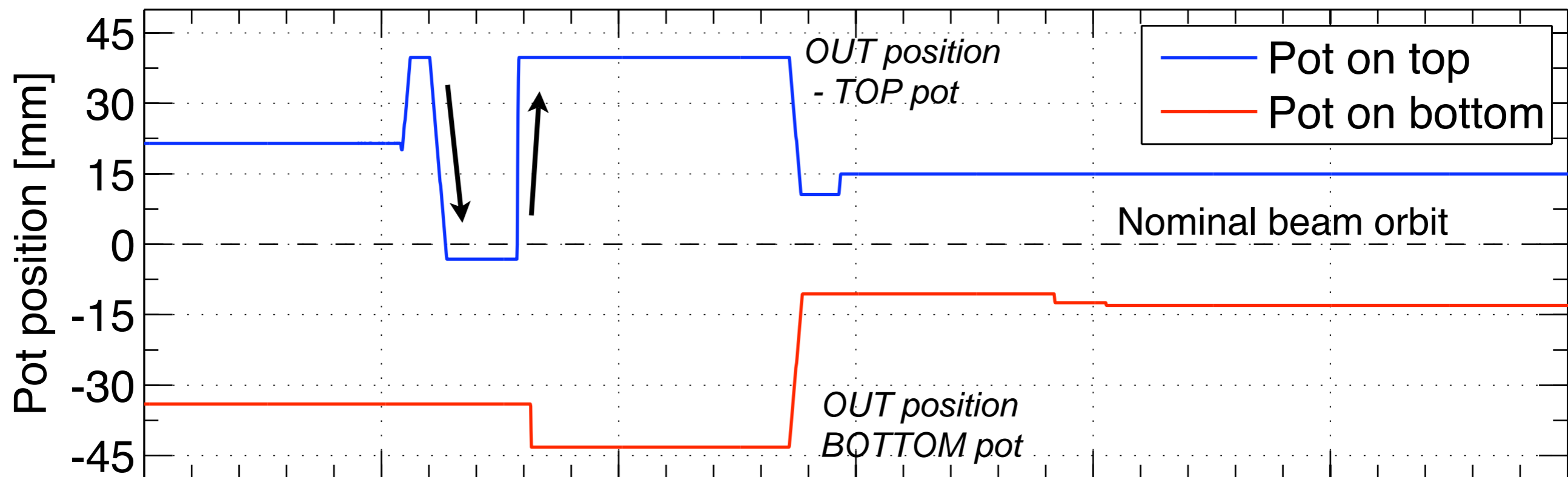
Component	Value	Component	Value
Left UP	15.042	Gap UP	0
Left DW	15.042	Gap DW	0
Right UP	-13.013	Centre UP	1.015
Right DW	-13.013	Centre DW	1.015

Beam loss data plot: The top plot shows the beam loss signal in arbitrary units (a.u.) over time. The signal is stable at 0.000, indicating successful beam-based alignment. The plot is annotated with "BLM display for beam-based alignment".

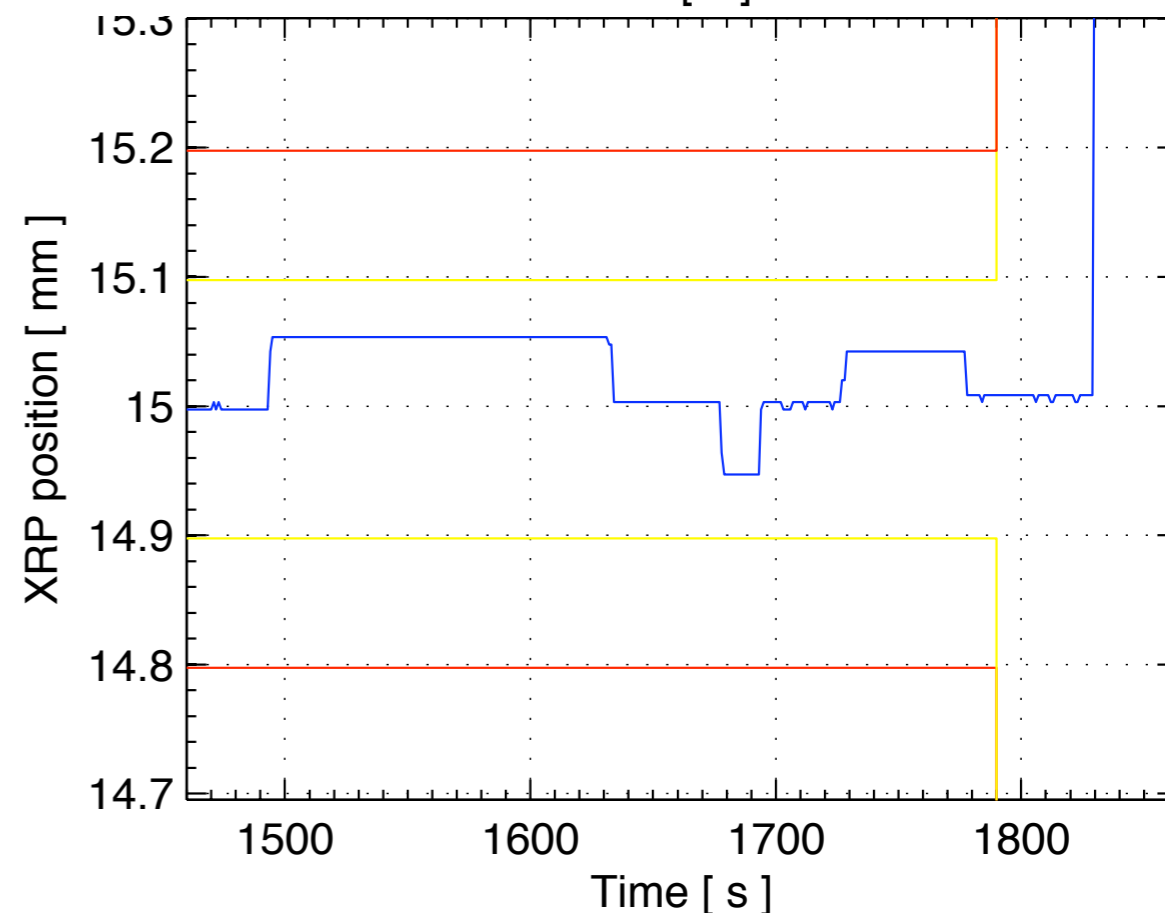
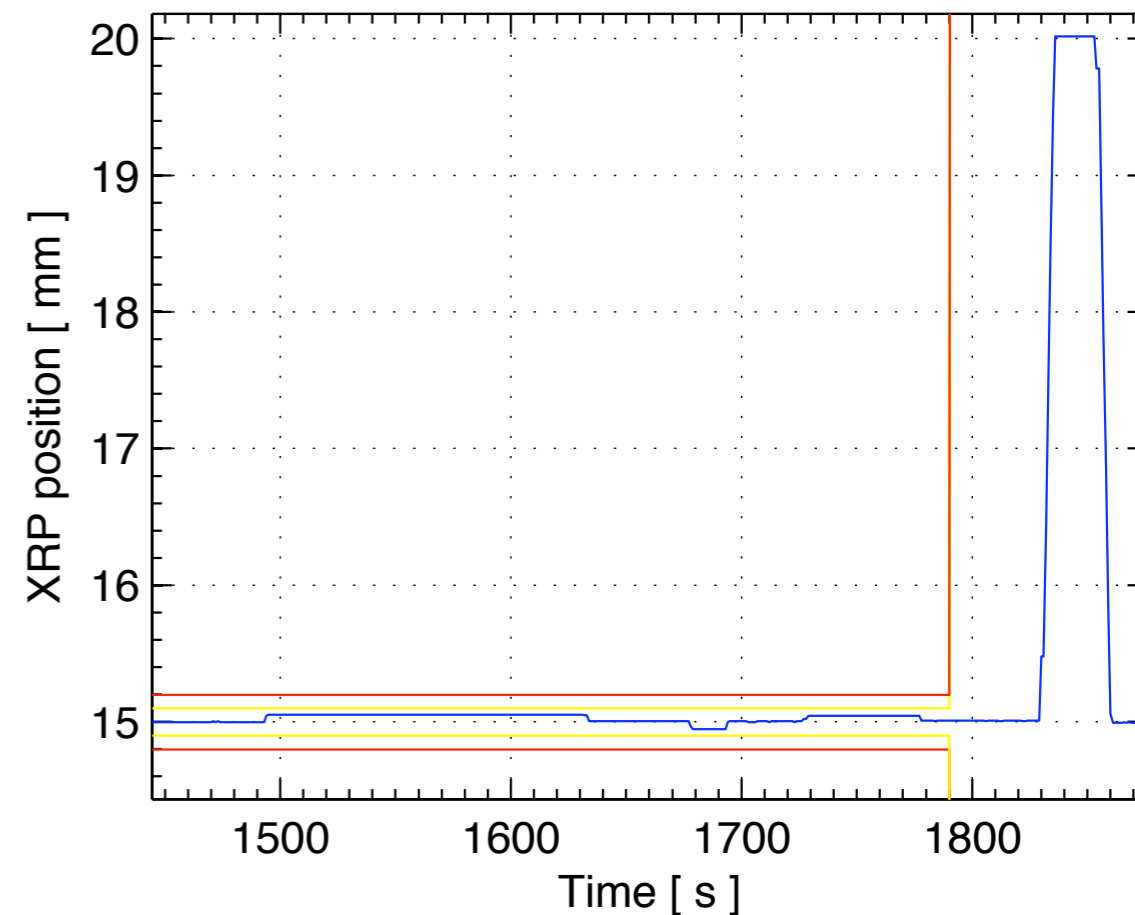
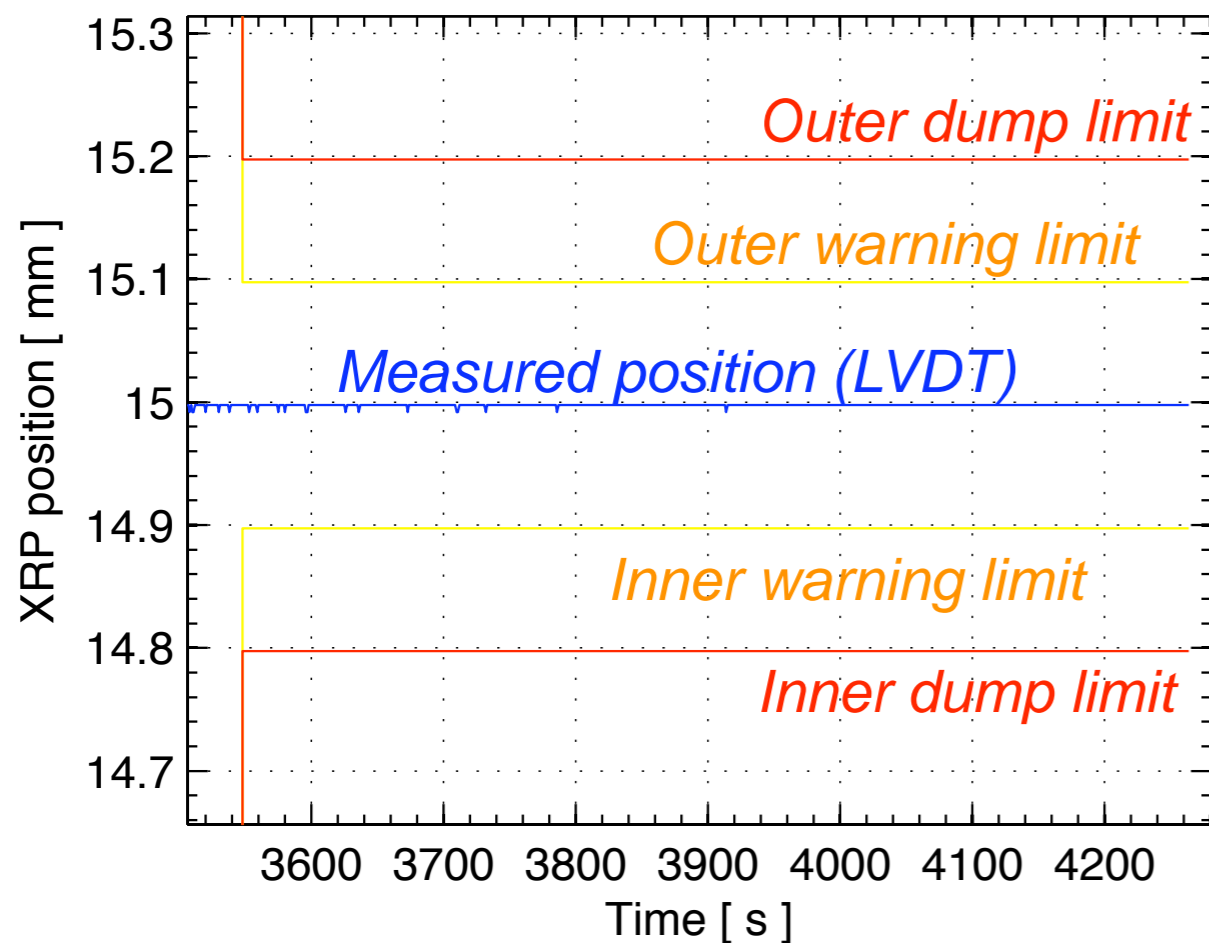
Jaw positions plot: The bottom plot shows the jaw positions in millimeters over time. The positions are stable at approximately 15.05 mm for the left jaw and -13.01 mm for the right jaw. The plot is annotated with "Monitoring of positions / limits".

Console: The console shows the following message: "15:38:55 - Name of BLM date file: fileBLMSensors = /local/stefano/tmp/TestSDDS/XRPV-187-TEST_BLM_2009-02-27-15-38.txt".

Basic positioning tests



Private logging of position variables also available...



Set tight tolerance thresholds of 200 microns (warning levels at 100 μm).

Small movements within OP limits.

Checked that settings outside thresholds are REJECTED.



For a vertical unit with two pots, we could test successfully:

- Definition of position settings by the top level. Transmission to the PXI through the FESA layer.
Movements of the Roman pots as specified!
- Response of **switches** for the OUT positions (monitoring other switches not yet operational)
- Verification of the **ARMING/DISARMING mechanisms** (operator requests + monitoring)
- **Trigger** of movements via software trigger.
- **STOP** functionality.
- Precise movements below **50 microns**, within OP defined thresholds.
- Definition of **discrete interlock limits** by the top level. Transmission to the PXI through FESA.
- Zero-th order **check of machine protection tests**: rejection of position settings outside limits.



List of follow-ups:

- Implementation of monitoring of all switch statuses → Done: ready for tests
- Updated GUI s for Roman pots specific features → First prototype ready
- Implements appropriate FESA exceptions → Done: ready for tests
- Optimize reaction time of software trigger → Done: ready for tests
- Minor mistakes of variable assignments for limits (readout only) → Ongoing.

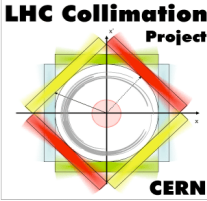


Not addressed yet:

- Protection of settings from unauthorized changes (Role-based access, RBAC, aspects)
- Full integration into the LSA TRIM application (**Done: ready for tests**)
- Finalize list of hardware alarms, warning and errors
- Trigger by hardware timing (not yet decided)



Outline



- Introduction
- Results of integration tests
- Status of CCC applications**
- Conclusions

Updated RP application

The screenshot shows the LHC Collimator Control Application interface. The window title is "LHC Collimator Control Application - LHC beam commissioning (Device: "XRPV.187.TEST")". The interface includes a menu bar (File, Settings, Reset, More displays, Help), a toolbar (Views, More), and several control panels.

Jaw corners: Includes "Increment" and "Set single motor positions" buttons. Below are input fields for "TOP (LU) [mm]" and "BOTTOM (RU) [mm]", both set to 0.0. Buttons for "Apply!", "Cancel last", "Stop all!", and "Out switches" are present.

Initialization: Includes radio buttons for "TOP (LU)" and "BOTTOM (R...)" with sub-options "UP-IN" and "UP-OUT".

Positions readout from the low-level: A table showing various LVDT and jaw edge positions:

LVDT's	Left UP	dflt aa	Gap UP	dflt ee
Jaw edges	Left DW	dflt bb	Gap DW	dflt ff
	Right UP	dflt cc	Centre UP	dflt TT
	Right DW	dflt dd	Centre DW	dflt FF

Display jaw: Checkboxes for "TOP (LU)" and "BOTTOM (RU)".

Positions: Checkboxes for "Set", "LVDT", "Warn", "Lim", "Res", and "Motor".

BLM: Checkboxes for "BLM 1", "BLM 2", "BLM 3", "BLM 4", and "LogY".

Beam loss data: A graph showing "Beam loss signal [a.u.]" vs "time [hh:mm:ss]". The signal is zero.

Jaw positions: A graph showing "Jaw positions [mm]" vs "time [hh:mm:ss]". The position is zero.

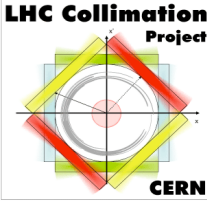
Console: Shows command output: "--> BLMEI.4L5.B1I1_TCTVA.4L5.B1" and "--> BLMES.4L5.B1I1_TCTVA.4L5.B1".

Status: "16:42:05 - Ready."

Annotation: A red text box in the bottom right of the graph area reads: "Needs further little improvements/tuning with users, but basic requirements available".



LSA-TRIM implementation



Setting generation and storage in OP database

Trim Editor

RBA: stefano LHC OP BP

Parameter selection - LHCRING

System: RF_NOT_USED, ROMAN POTS, SECTOR45, SECTOR56, SECTOR67, SECTOR_23, SEPARATION/RECOMBINATION, SMP, SPS FREQUENCY, SQUEW QUADRUPOLE, SQUEW SEXTUPOLES, TRIPLET CORRECTION, TRIPLETS

Type Groups: COLL_BBCentre, COLL_BBOptics, COLL_BBParam, COLL_HalfGap, COLL_HalfGap_TOL, COLL_JAW, COLL_JAW_TOLERANCE, COLL_NSIGMA, COLL_NSIGMA_TOL, COLL_MOTOR_POSITION, COLL_MOTOR_TOLERANCE

Parameters: XRPV.187.TEST/InterlockThresholdFunc, XRPV.187.TEST/RequiredAbsPositionFunc

Fields: warning_inner_right_upstream, warning_outer_gap_downstream

Setting part: Value Target Correction

Parameter	Value
XRPV.187.TEST/InterlockThresholdFunc#dump_inner_left_upstream	10.336428066964077
XRPV.187.TEST/InterlockThresholdFunc#dump_inner_right_upstream	-10.336347883004995
XRPV.187.TEST/InterlockThresholdFunc#dump_outer_left_upstream	11.424473147675007
XRPV.187.TEST/InterlockThresholdFunc#dump_outer_right_upstream	-11.424384481238176
XRPV.187.TEST/InterlockThresholdFunc#warning_inner_left_upstream	10.717243844530314
XRPV.187.TEST/InterlockThresholdFunc#warning_inner_right_upstream	-10.717160693069198
XRPV.187.TEST/InterlockThresholdFunc#warning_outer_left_upstream	11.043657368736604
XRPV.187.TEST/InterlockThresholdFunc#warning_outer_right_upstream	-11.043571672546143
XRPV.187.TEST/RequiredAbsPositionFunc#left_upstream	10.880450606565605
XRPV.187.TEST/RequiredAbsPositionFunc#right_upstream	-10.880366182875525

Cancel Last Trim

RF_NOT_USED, ROMAN POTS, SECTOR45, SECTOR56, SECTOR67, SECTOR_23, SEPARATION/RECOMBINATION, SMP, SPS FREQUENCY, SQUEW QUADRUPOLE, SQUEW SEXTUPOLES, TRIPLET CORRECTION, TRIPLETS

COLL_BBCentre, COLL_BBOptics, COLL_BBParam, COLL_HalfGap, COLL_HalfGap_TOL, COLL_JAW, COLL_JAW_TOLERANCE, COLL_NSIGMA, COLL_NSIGMA_TOL, COLL_MOTOR_POSITION, COLL_MOTOR_TOLERANCE

XRPV.187.TEST/NSIGMA, XRPV.187.TEST/NSIGMA_DUMP_IN, XRPV.187.TEST/NSIGMA_DUMP_OUT, XRPV.187.TEST/NSIGMA_WARN_IN, XRPV.187.TEST/NSIGMA_WARN_OUT

Setting part: Value Target Correction

Parameter	Value
XRPV.187.TEST/NSIGMA	10.0
XRPV.187.TEST/NSIGMA_DUMP_IN	9.5
XRPV.187.TEST/NSIGMA_DUMP_OUT	10.5
XRPV.187.TEST/NSIGMA_WARN_IN	9.85
XRPV.187.TEST/NSIGMA_WARN_OUT	10.15

Time base: SuperCycle Cycle/Beamprocess Injection

Definition of settings in beam size units w.r. to local beam orbit, like the other collimators

System: RF_NOT_USED, ROMAN POTS, SECTOR45, SECTOR56, SECTOR67, SECTOR_23, SEPARATION/RECOMBINATION, SMP, SPS FREQUENCY, SQUEW QUADRUPOLE, SQUEW SEXTUPOLES, TRIPLET CORRECTION, TRIPLETS

Type Groups: COLL_BBCentre, COLL_BBOptics, COLL_BBParam, COLL_HalfGap, COLL_HalfGap_TOL, COLL_JAW, COLL_JAW_TOLERANCE, COLL_NSIGMA, COLL_NSIGMA_TOL, COLL_MOTOR_POSITION, COLL_MOTOR_TOLERANCE

Parameters: XRPV.187.TEST/BBCentre, XRPV.187.TEST/BBParam

Setting part: Value Target Correction

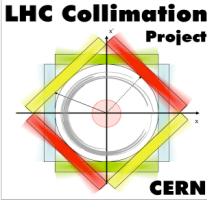
Parameter	Value
RPV.187.TEST/BBCentre	0.0
RPV.187.TEST/BBParam#sigma_x	0.76103531877731
RPV.187.TEST/BBParam#sigma_xp	0.009591811659307918
RPV.187.TEST/BBParam#sigma_y	1.0880408394720564
RPV.187.TEST/BBParam#sigma_yp	0.008422397080899058

Trim period:

Trim



Configuration / RP names



TOTEM names

**Official LHC
Layout names**

**“display” name for
communication**

CMS relative	Roman Pot Product Breakdown Structure	Roman Pot order	RP mechanical design name	LHC layout name	Collimator application name	Roman Pot position	Left up	Right up	Collimator ID (index)	CCC name	CCC "expert" name
	EDMS 906715	EDMS 901060			EDMS 934341		EDMS 934341	EDMS 934341	EDMS 934341		
Left	tot.Rp.45.220.fr.hr	3	Station 3	XRPT1.6L5.B2	XRPTOT04	Horizontal			0	XRPH.B6L5.B2	XRPT1.6L5.B2-XRPTOT04
	tot.Rp.45.220.fr.tp	1			XRPTOT05	Vertical up			1	XRPV.B6L5.B2	XRPT1.6L5.B2-XRPTOT05/06
	tot.Rp.45.220.fr.bt	2			XRPTOT06	Vertical down					
	tot.Rp.45.220.nr.hr	4	Station 3	XRPT2.6L5.B2	XRPTOT10	Horizontal			2	XRPH.A6L5.B2	XRPT2.6L5.B2-XRPTOT10
	tot.Rp.45.220.nr.tp	5			XRPTOT07	Vertical up			3	XRPV.A6L5.B2	XRPT2.6L5.B2-XRPTOT07/11
	tot.Rp.45.220.nr.bt	6			XRPTOT11	Vertical down					
	tot.Rp.45.147.fr.hr	9	Station 1	XRPT1.4L5.B2	XRPTOT12	Horizontal			4	XRPH.B4L5.B2	XRPT1.4L5.B2-XRPTOT12
	tot.Rp.45.147.fr.tp	7			XRPTOT14	Vertical up			5	XRPV.B4L5.B2	XRPT1.4L5.B2-XRPTOT14/13
	tot.Rp.45.147.fr.bt	8			XRPTOT13	Vertical down					
	tot.Rp.45.147.nr.hr	10	Station 1	XRPT2.4L5.B2	XRPTOT15	Horizontal			6	XRPH.A4L5.B2	XRPT2.4L5.B2-XRPTOT15
	tot.Rp.45.147.nr.tp	11			XRPTOT09	Vertical up			7	XRPV.A4L5.B2	XRPT2.4L5.B2-XRPTOT09/08
	tot.Rp.45.147.nr.bt	12			XRPTOT08	Vertical down					
Right	tot.Rp.56.147.nr.hr	15	Station 1	XRPT1.4R5.B1	XRPTOT25	Horizontal			8	XRPH.A4R5.B1	XRPT1.4R5.B1-XRPTOT25
	tot.Rp.56.147.nr.tp	13			XRPTOT27	Vertical up			9	XRPV.A4R5.B1	XRPT1.4R5.B1-XRPTOT27/26
	tot.Rp.56.147.nr.bt	14	Station 1	XRPT2.4R5.B1	XRPTOT26	Vertical down					
	tot.Rp.56.147.fr.hr	16			XRPTOT23	Horizontal			10	XRPH.B4R5.B1	XRPT2.4R5.B1-XRPTOT23
	tot.Rp.56.147.fr.tp	17			XRPTOT28	Vertical up			11	XRPV.B4R5.B1	XRPT2.4R5.B1-XRPTOT28/22
	tot.Rp.56.147.fr.bt	18	Station 3	XRPT1.6R5.B1	XRPTOT22	Vertical down					
	tot.Rp.56.220.nr.hr	21			XRPTOT24	Horizontal			12	XRPH.A6R5.B1	XRPT1.6R5.B1-XRPTOT24
	tot.Rp.56.220.nr.tp	19			XRPTOT17	Vertical up			13	XRPV.A6R5.B1	XRPT1.6R5.B1-XRPTOT17/20
	tot.Rp.56.220.nr.bt	20	Station 3	XRPT2.6R5.B1	XRPTOT20	Vertical down					
	tot.Rp.56.220.fr.hr	22			XRPTOT16	Horizontal			14	XRPH.B6R5.B1	XRPT2.6R5.B1-XRPTOT16
tot.Rp.56.220.fr.tp	23	XRPTOT19			Vertical up			15	XRPV.B6R5.B1	XRPT2.6R5.B1-XRPTOT19/18	
tot.Rp.56.220.fr.bt	24			XRPTOT18	Vertical down						

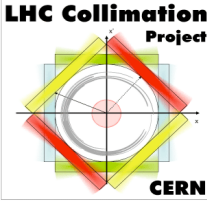
Detailed mapping of device names worked out.

Will provide both names every time to be sure that there are no communication errors...

Need to be EXTREMELY careful!!!



OP database for HW parameters



<http://lh-operation.web.cern.ch/lhc-operation/collimator/LHCCollimatorOPdatabase.asp>

Template for collimator HW parameters

LHC Collimation Project

Home of the Project for the LHC Collimation System

Top	Project Team	Notes	Collimator List	Sounds/Movies	Meetings
Links	Papers	Talks (WG)	Layout IR3/7	AB Departm.	Pictures

Collimator operational information

Select by IP			Select collimators	
IP/BEAM	B1	B2	Family	FAMILY
1	X	X	TCP	TCLP
2	X	X	TCSG	INJP
3	X	X	TCLA	TCDI
5	X	X	TCT	TCDQ
6	X	X	OTHERS	
7	X	X	XRP	
8	X	X		
TI	X	X		
ALL	X	X		

CERN name (MTF) HCTCT_001-CQ000316
CERCA name TCT_065
MADX name TCLA.7R3.B1

ID 1013894
Angle 0.0
Material W
Length 1.0
Beam B1
Family TCLA
IP 3

BLMI BLMEI.7R3.B1I1_TCLA.7R3.B1
BLMS BLMES.7R3.B1I1_TCLA.7R3.B1

Jaw corner notation

LEFT UP	B
LEFT DOWN	D
RIGHT UP	A
RIGHT DOWN	C

AXIS LEFT UP	1
AXIS LEFT DOWN	1
AXIS RIGHT UP	1
AXIS RIGHT DOWN	1
AXIS TANK	0

AXIS_A	1
AXIS_B	1
AXIS_C	1
AXIS_D	1
AXIS_E	0

Mechanical STOPS

	OUT	IN
LEFT UP	29.9806	-6.0609
LEFT DOWN	29.9867	-6.0624
RIGHT UP	-30.0021	6.0435
RIGHT DOWN	-29.9979	6.0441
ANTI - UP	0.6339	
ANTI - DOWN	0.6293	

Switches

	OUT	IN
LEFT UP	29.3256	-5.3839
LEFT DOWN	29.3327	-5.3984
RIGHT UP	-29.3541	5.3875
RIGHT DOWN	-29.3359	5.3841
ANTI - UP	0.7469	
ANTI - DOWN	0.7393	

Maximum flatness error

Left	-0.0334
Right	0.0412

Mechanical plays

Left UP	0.0180
Left DOWN	0.0150
Right UP	0.0080
Right DOWN	0.0070

Auto-retraction

Left UP	0.0070
Left DOWN	0.0030
Right UP	0.0040
Right DOWN	0.0050

Maximum tilt angle

Left Plus	3.00
Left Minus	-3.00
Right Plus	3.00
Right Minus	-3.00

ELEMENT_NAME	MTF links	FAMILY	IP	BEAM	ANGLE	Jaw Orientation	Summary	Photo 252	Photo LHC
TCLA.7L3.B2	+HCTCT_001-CQ000315 +Acceptance +ProDB	TCLA	IP3	B2	0.0	B/D/A/C	xls/pdf		
TCLA.6L3.B2	+HCTCT_001-CQ000313 +Acceptance +ProDB	TCLA	IP3	B2	0.0	B/D/A/C	xls/pdf		
TCLA.B5L3.B2	+HCTCT_001-CQ000318 +Acceptance +ProDB	TCLA	IP3	B2	0.0	B/D/A/C	xls/pdf		

ELEMENT_NAME	MTF links	FAMILY	IP	BEAM	ANGLE	Jaw Orientation	Summary	Photo 252	Photo LHC	3D Layout
XRPV.B6L5.B2	+Unknown-Roman-Pot19 +Acceptance +ProDB	XRPV	IP5	B2	90.0	///	xls/pdf			
XRPV.B6L5.B2	+Unknown-Roman-Pot20 +Acceptance +ProDB	XRPV	IP5	B2	0.0	///	xls/pdf			
XRPV.A6L5.B2	+Unknown-Roman-Pot21 +Acceptance +ProDB	XRPV	IP5	B2	0.0	///	xls/pdf			
XRPV.A6L5.B2	+Unknown-Roman-Pot22 +Acceptance +ProDB	XRPV	IP5	B2	90.0	///	xls/pdf			
XRPV.B4L5.B2	+Unknown-Roman-Pot23 +Acceptance +ProDB	XRPV	IP5	B2	90.0	///	xls/pdf			
XRPV.B4L5.B2	+Unknown-Roman-Pot24 +Acceptance +ProDB	XRPV	IP5	B2	0.0	///	xls/pdf			
XRPV.A4L5.B2	+Unknown-Roman-Pot25 +Acceptance +ProDB	XRPV	IP5	B2	0.0	///	xls/pdf			

Input expected from TOTEM: provide the mechanical references for the OP database (switch positions, mechanical references, mechanical plays, ...)
BD tables ready to be filled!

Logging of Roman pot positions

Sign In Data Source preferences: LDB (PRO->TEST) -> MDB (PRO->DEV) Elapsed: 239ms

Query Output Query Variable Hierarchies Variable Search Variable Lists Settings About?

Hierarchy Variable Selection

- ROOT
 - ADE
 - ATLAS
 - CMS
 - CNGS
 - COLLIMATOR
 - CRYO
 - CTF3
 - Fundamental Data
 - LEIR
 - LHC
 - BLM
 - BPM
 - Beam Instrumentation
 - Beam Interlocks
 - Beam dump
 - Collimators
 - Positions
 - B1
 - IP1
 - TCL
 - TCTH
 - DiscreteSettings
 - DiscreteThresholds
 - FunctionSettings
 - FunctionThresholds
 - MeasuredCornerPositions
 - MeasuredVerticalQuota
 - QuotaSettings
 - Status
 - expertMDCDiagnostics
 - expertPRSDiagnostics
 - TCTV
 - IP2
 - IP3
 - IP5
 - IP6
 - IP7
 - IP8
 - B2
 - Temperatures

Variable Filters

Name: % Type: %

Search Results

Variable Name	De...	Unit	Datatype
TCTH.4L1.B1:MEAS_LIMIT_DUMP_INNER_GD	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_DUMP_INNER_GU	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_DUMP_INNER_LD	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_DUMP_INNER_LU	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_DUMP_INNER_RD	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_DUMP_INNER_RU	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_DUMP_OUTER_GD	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_DUMP_OUTER_GU	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_DUMP_OUTER_LD	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_DUMP_OUTER_LU	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_DUMP_OUTER_RD	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_DUMP_OUTER_RU	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_WARN_INNER_GD	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_WARN_INNER_GU	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_WARN_INNER_LD	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_WARN_INNER_LU	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_WARN_INNER_RD	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_WARN_INNER_RU	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_WARN_OUTER_GD	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_WARN_OUTER_GU	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_WARN_OUTER_LD	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_WARN_OUTER_LU	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_WARN_OUTER_RD	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LIMIT_WARN_OUTER_RU	Val...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LVDT_GD	LV...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LVDT_GU	LV...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LVDT_LD	LV...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LVDT_LU	LV...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LVDT_RD	LV...	mm	NUMERIC
TCTH.4L1.B1:MEAS_LVDT_RU	LV...	mm	NUMERIC
TCTH.4L1.B1:MEAS_MDCERRORS	Err...		NUMERIC
TCTH.4L1.B1:MEAS_MDCSTATE	Stat...		NUMERIC
TCTH.4L1.B1:MEAS_MDCWARNINGS	War...		NUMERIC
TCTH.4L1.B1:MEAS_MOTOR_LD	Mot...	mm	NUMERIC
TCTH.4L1.B1:MEAS_MOTOR_LU	Mot...	mm	NUMERIC
TCTH.4L1.B1:MEAS_MOTOR_RD	Mot...	mm	NUMERIC
TCTH.4L1.B1:MEAS_MOTOR_RU	Mot...	mm	NUMERIC
TCTH.4L1.B1:MEAS_PROFILE_TIME	Tim...	ns	NUMERIC
TCTH.4L1.B1:MEAS_PRESERVED	---		NUMERIC

Select All Select None Add Selected

10:30:08 - Found 57 Variables for Hierarchy 'LHC->Collimators->Positions->B1->IP1->TCTH->MeasuredCornerPositions'

Ready to define the same logging structure for the Roman pots.

Implementation by R. Billen, C. Roderick

Will save:

- Requested settings for positions
- Requested settings for interlocks
- Statuses

Additional requirements?

E.g.: for the collimators we also save expert properties for diagnostics purposes...

Post-mortem requirements?

- ☑ **We have set-up a nice working environment for testing the various aspects related to the Roman pot controls**
- ☑ **First controls integration tests were very **successful**:**
 - *Profited from the availability of the controls test stand on surface.*
 - *3-tier controls architecture deployed and fully tested: saw the first RP movements!*
 - *Could set thresholds with the CCC application. Preliminary checks done.*
- ☑ **What comes next:**
 - *Follow-up open issues. Configure the 2009 system (24 pots).*
 - *More integration tests on surface - ToDo s being followed-up:*
 - Web-based tracing of issues at <https://savannah.cern.ch/projects/rpcs>*
 - *Remote commissioning of the system and machine protection tests (will take inspiration from the validation tests developed for collimators).*
- ☑ **What we expect from TOTEM:**
 - *Provide HW parameters for OP database for all the pots of the 2009 system*
 - *Handle the critical calibration data (discussed in the next talk)*
 - *HW commissioning in the tunnel, in particular machine protection functionality*
 - *Provide OP with the final set of “as-installed” operational parameters*
 - *Clarify procedures for the communication with the CCC...*
- ☑ **Still a lot of work ahead...**