

# ATLAS Forward Detectors

## Beam Interlock System Validation

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All tests were done on 28/02/2024, **no failures were observed:**

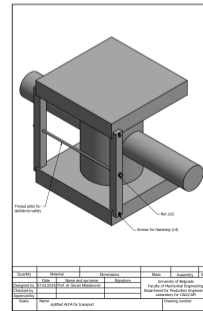
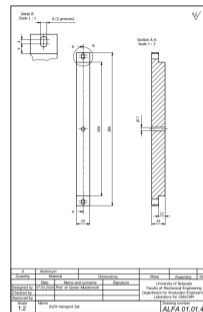
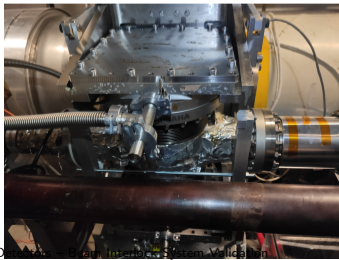
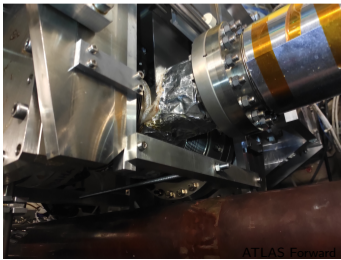
- ✓ test of the injection permit:
  - ensuring that injection permit is lost when pots are outside HOME switch position and restored once they are back,
- ✓ response to LVDT-to-limits comparison:
  - checking that in case of crossing the warning limit pot is retracted, but beam is not dumped,
  - in case of crossing dump limit pots is retracted and beam is dumped,
- test of USER\_PERMIT and automatic pot extraction as a function of all input flags:
  - behaviour of pots for various beam modes and override key status,
  - test not required since the movement system was not touched during YETS,
- ✓ test of the LVDT bypass box:
  - four scenarios of various movement system failures: *failure during the AFP run, the forbidden use case, the holiday mode, failure when AFP is in STANDBY.*
- ✓ test of hardware and software buttons:
  - pot extraction via ATLAS DCS and emergency butting in ATLAS Control Room.

LHC		AFP Roman pots	ALFA Roman pots
<ul style="list-style-type: none"> <li>✓ ARP</li> <li>Interlock functionalities</li> <li>Beam modes and flags</li> </ul>			
	MPP/ARP - 01 - Injection permit removal		
	MPP/ARP - 02 - User permit removal		
	MPP/ARP 03 - LVDT bypass		

CHERNALS	2024-02-22 16:57:33	
MTRZEBIN	2024-02-28 12:11:18	
MTRZEBIN	2024-02-28 12:11:25	

ALFA blocked in garage; during AFP tests we checked if injection permits are always given and beam permit is never lost due to ALF

- ATLAS-ALFA stations are decommissioned, see LHC-XAFP-EC-0007 (EDMS 2914324) for details:
  - stations removed from LHC section 1–2 in December 2023,
  - detector packages from Section 8–1 were removed in February 2024.
- ALFA is not intended to be inserted any more:
  - motors are switched off (bypass key is on),
  - a mechanical blockade was installed to prevent any accidental movement,
  - NE48 cable between ALFA and BIS systems (at the level of ATLAS BIS rack in USA15) was disconnected and the output was soldered to give always **true** (21/02),
  - ALFA inputs into the LHC Beam Interlock System were jumpered out (disabled) by Christophe Martin (05/03); corresponding BIC channels are:
    - input #2 on CIB.US15.R1.B1 (label: ATLAS\_ALFA),
    - input #2 on CIB.US15.R1.B2 (label: ATLAS\_ALFA).



## ATLAS:

- ALFA injection permits masked (28/02),
- ALFA DCS project decommissioned (29/02):
  - monitoring of secondary vacuum (the only remaining functional part of ALFA system; except cooling fans running all-time) is realized via AFP DCS,
- ALFA PXI switched off (29/02).

## LHC:

- ALFA signals disabled.

CBU\_US15.R1.B1 - BIS Device Overview (on csw-013-ep1300.com.it)

BIC Overview | History Buffer | Expert View | CBU Monitoring

Commands | Mask/Unmask

Software Permit	SAFE BEAM FLAG		MATRIX	PERMIT A		PERMIT B	
	DISABLED	MASKED		DISABLED	PERMITTED	DISABLED	PERMITTED
1/A	not used	YES	YES	FALSE	FALSE	FALSE	FALSE
1/B	not used	YES	YES	FALSE	FALSE	FALSE	FALSE
2/A	ATLAS_ALFA	YES	YES	FALSE	FALSE	FALSE	FALSE
2/B	not used	YES	YES	FALSE	FALSE	FALSE	FALSE
3/A	ATLAS_APP	YES	NO	FALSE	FALSE	FALSE	FALSE
3/B	not used	YES	NO	FALSE	FALSE	FALSE	FALSE
4/A	Vacuum 1012	NO	NO	FALSE	FALSE	FALSE	FALSE
4/B	not used	NO	NO	FALSE	FALSE	FALSE	FALSE
5/A	PIC_LHM	NO	NO	FALSE	FALSE	FALSE	FALSE
5/B	not used	NO	NO	FALSE	FALSE	FALSE	FALSE
6/A	ATLAS_Det	NO	NO	FALSE	FALSE	FALSE	FALSE
6/B	not used	NO	NO	FALSE	FALSE	FALSE	FALSE
7/A	not used	YES	NO	FALSE	FALSE	FALSE	FALSE
7/B	not used	YES	NO	FALSE	FALSE	FALSE	FALSE
8/A	COLL4MOT-01	NO	NO	FALSE	FALSE	FALSE	FALSE
8/B	not used	NO	NO	FALSE	FALSE	FALSE	FALSE
9/A	COLL4EMV-01	NO	NO	FALSE	FALSE	FALSE	FALSE
9/B	not used	NO	NO	FALSE	FALSE	FALSE	FALSE
10/A	not used	YES	NO	FALSE	FALSE	FALSE	FALSE
10/B	not used	YES	NO	FALSE	FALSE	FALSE	FALSE
11/A	not used	YES	NO	FALSE	FALSE	FALSE	FALSE
11/B	not used	YES	NO	FALSE	FALSE	FALSE	FALSE
12/A	PIC_MSK	NO	NO	FALSE	FALSE	FALSE	FALSE
12/B	not used	NO	NO	FALSE	FALSE	FALSE	FALSE
13/A	ATLAS_Mag	NO	NO	FALSE	FALSE	FALSE	FALSE
13/B	not used	NO	NO	FALSE	FALSE	FALSE	FALSE
14/A	not used	YES	NO	FALSE	FALSE	FALSE	FALSE
14/B	not used	YES	NO	FALSE	FALSE	FALSE	FALSE

CBU\_US15.R1.B2 - BIS Device Overview (on csw-013-ep1300.com.it)

BIC Overview | History Buffer | Expert View | CBU Monitoring

Commands | Mask/Unmask

Software Permit	SAFE BEAM FLAG		MATRIX	PERMIT A		PERMIT B	
	DISABLED	MASKED		DISABLED	PERMITTED	DISABLED	PERMITTED
1/A	not used	YES	YES	FALSE	FALSE	FALSE	FALSE
1/B	not used	YES	YES	FALSE	FALSE	FALSE	FALSE
2/A	ATLAS_ALFA	YES	YES	FALSE	FALSE	FALSE	FALSE
2/B	not used	YES	YES	FALSE	FALSE	FALSE	FALSE
3/A	ATLAS_APP	YES	NO	FALSE	FALSE	FALSE	FALSE
3/B	not used	YES	NO	FALSE	FALSE	FALSE	FALSE
4/A	Vacuum 1012	NO	NO	FALSE	FALSE	FALSE	FALSE
4/B	not used	NO	NO	FALSE	FALSE	FALSE	FALSE
5/A	PIC_LHM	NO	NO	FALSE	FALSE	FALSE	FALSE
5/B	not used	NO	NO	FALSE	FALSE	FALSE	FALSE
6/A	ATLAS_Det	NO	NO	FALSE	FALSE	FALSE	FALSE
6/B	not used	NO	NO	FALSE	FALSE	FALSE	FALSE
7/A	not used	YES	NO	FALSE	FALSE	FALSE	FALSE
7/B	not used	YES	NO	FALSE	FALSE	FALSE	FALSE
8/A	COLL4MOT-02	NO	NO	FALSE	FALSE	FALSE	FALSE
8/B	not used	NO	NO	FALSE	FALSE	FALSE	FALSE
9/A	COLL4EMV-02	NO	NO	FALSE	FALSE	FALSE	FALSE
9/B	not used	NO	NO	FALSE	FALSE	FALSE	FALSE
10/A	not used	YES	NO	FALSE	FALSE	FALSE	FALSE
10/B	not used	YES	NO	FALSE	FALSE	FALSE	FALSE
11/A	not used	YES	NO	FALSE	FALSE	FALSE	FALSE
11/B	not used	YES	NO	FALSE	FALSE	FALSE	FALSE
12/A	PIC_MSK	NO	NO	FALSE	FALSE	FALSE	FALSE
12/B	not used	NO	NO	FALSE	FALSE	FALSE	FALSE
13/A	ATLAS_Mag	NO	NO	FALSE	FALSE	FALSE	FALSE
13/B	not used	NO	NO	FALSE	FALSE	FALSE	FALSE
14/A	not used	YES	NO	FALSE	FALSE	FALSE	FALSE
14/B	not used	YES	NO	FALSE	FALSE	FALSE	FALSE