# BIS & SMP readiness for MJ beams

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## *What is done*

- All Individual System Tests & commissioning

    - User interfaces tests (CIBU)

    - Beam Permit Optical Loops: characterisation of the optical budget

    - Capability of all User interfaces to open the Beam Permit Loops


- Modify the User Interfaces connections for Run2

    - Connections added (TDI, TCDQ, BCCM, WIC, FMCM, SPS Eco…)

    - Connections removed (LHCf, CNGS)

    - Connections merged (collimators)

## *What is still to do 1/2*

- BICs Timing alignment

    - Misalignment (few $10^{th}$ of us) between LHC and Injection BIS

    - Still under investigation, in collaboration with timing staff

- Change the plugging position of a BIS redundant power supply in point 4

- Software tool to update:

    - DiaMon: Monitor all redundant power supplies of the User Interfaces…

Expected next week TS
Expected for High Intensity beams

## *What is still to do 2/2*

- CIBDS revision

  - Arming sequence was too slow and the CIBG was generating the Beam Permit frequencies after the CIBDS timeout (5 sec) → CIBDS dump trigger

  → Problem solved by accelerating the arming sequences process (<= 1,5 sec)

  - Change of the functional specification:

  → Has to trigger a dump if no beam permit detected **when the beam permit is already present on the loops** (after the arming sequence)

  - Revision of the CIBDS behaviour within the LBDS is ongoing

    - Internally in collaboration with D. Calcoen

    - Externally with OP and ABT

  - New CIBDS version should be ready to install for the coming EYTS (as no other issue has been found)

## What is done

- All IST and most of the commissioning (except some tests with beam)

- New Setup Beam Flag (SBF) equations for Run 2

- BCT A and B are in service, each providing I1 and I2

  - SBF oscillations for high energies on channel B for I2

  → The noise on this channel reaches the threshold

  → Problem solved by filtering the intensity values for the SMP (16sec window instead of

  1sec) for energies higher than 500GeV (only on B-I2 channel).

- New Optics ID transmitted for the Transfer Lines

## *What is still to do*

- Commissioning with Beam:

    - Check more transitions of the SBF for the different equations and for different energies

    - Some parameters broadcasted on the Timing (MDI and STB flags, intensity2)

- Minor update of the monitoring part of the Arbiter board

- 4 Timing board to install in the Experiment FECs (Pt 1, 2, 5 & 8) to synchronize our Timing receivers (CISV)

- Wider the Beta* (squeezing factors) software window (actual is 10m)

    - Still need to define of how much and when to deploy

- Software tool to update:

    - Timber: Save properly decoded variables in the logging database

    - Diamon

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## Conclusion

- BIS and SMP systems <u>are ready</u> for high intensity beams <u>in terms of safety</u>

- The availability of the 2 systems still needs to be improved by implementing some software tool functionalities (DiaMon)

- The logging analysis of the SMP still needs to be improved by saving decoded data in Timber

- Future improvements are foreseen (CIBDS for the BIS, Beta* window for the SMP) but do not necessary need to be realized before having High Intensity Beams in the LHC.