

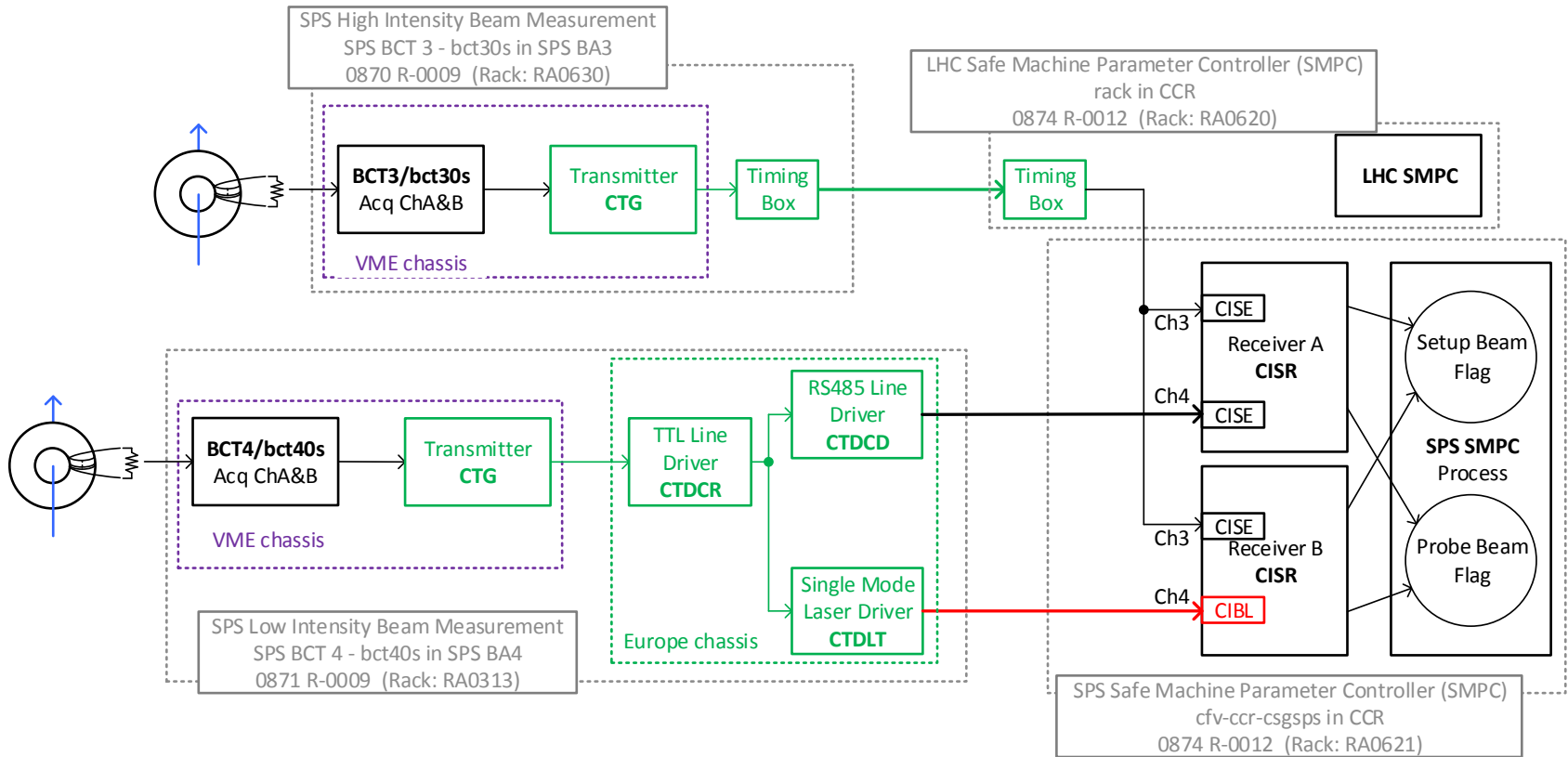
SPS and LHC BCTDCs link to the SMP

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Outline

- **SPS** BCTDCs and links to SMP
 - 2016
 - Layout
 - 2017
 - Status and layout
- **LHC** BCTDCs and links to SMP
 - 2016
 - Layout
 - 2017
 - Status and layout
- **Commissioning**

Layout of the SPS BCTDCs link to the SMP in 2016



S.Gabourin

Status of the SPS BCTDCs link to the SMP in 2017

BA3

- 1 industrial BCTDC
- High beam intensity measurement (protons); 14 bit; 100 S/s; rms noise $\sim 6 E9$ charges
- 1 copper **link to SMP**

BA4

- 1 industrial BCTDC
- Low beam intensity measurement (ions, pilots); 14 bit; 100 S/s; rms noise $\sim 6 E7$ charges
- 2 optical **links to SMP** (2 CTDAB modules to replace 1 CTDCR and 1 CTDLT) **NEW**

BA5

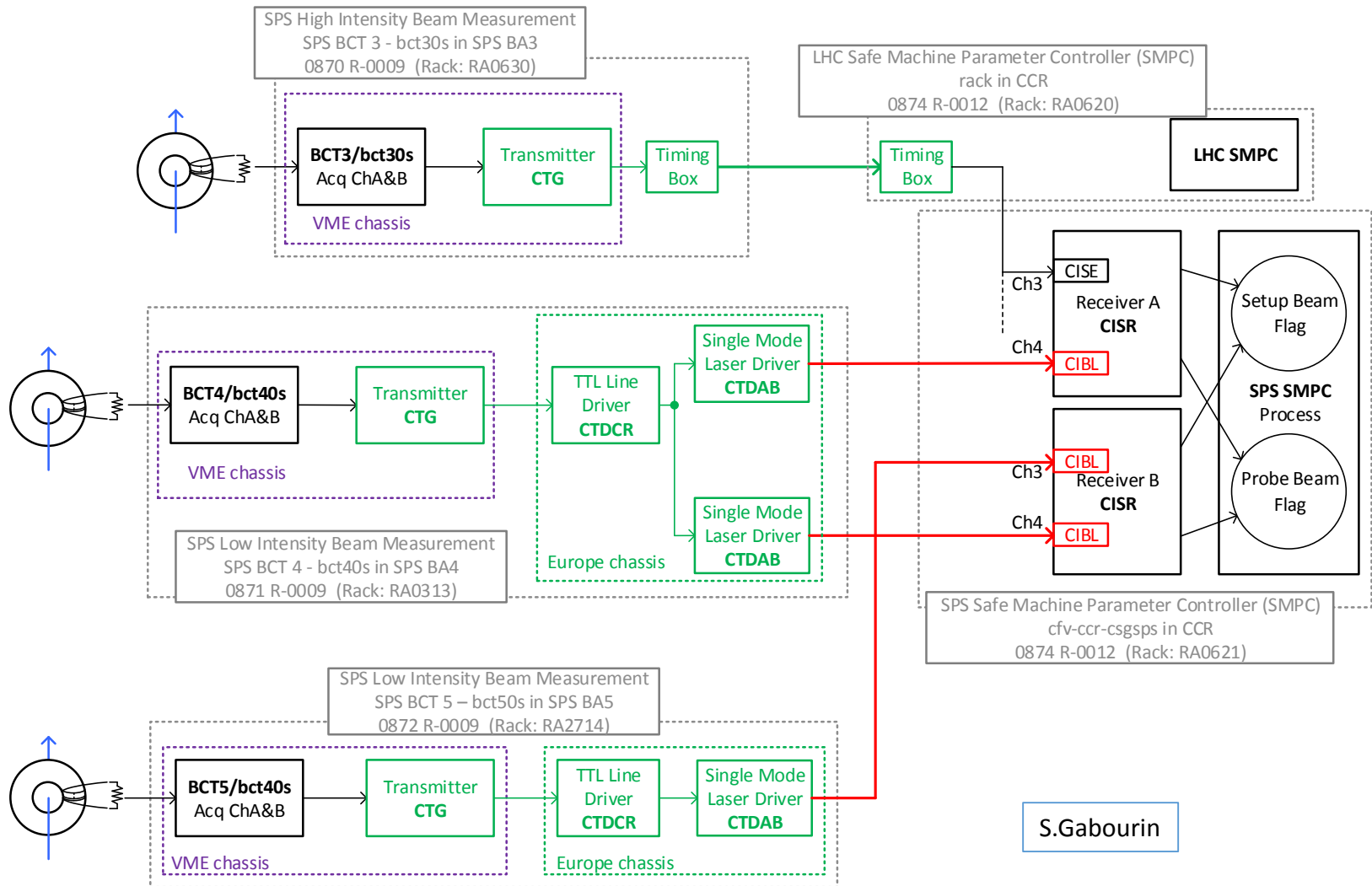
- 2 CERN made BCTDCs
- High beam intensity measurement (protons); 16 bit; 100 S/s; rms noise $\sim 1.5 E9$ charges
- 1 optical **links to SMP** **NEW**

HW modification to be tested in machine conditions for a potential reduction by a factor of ~ 4

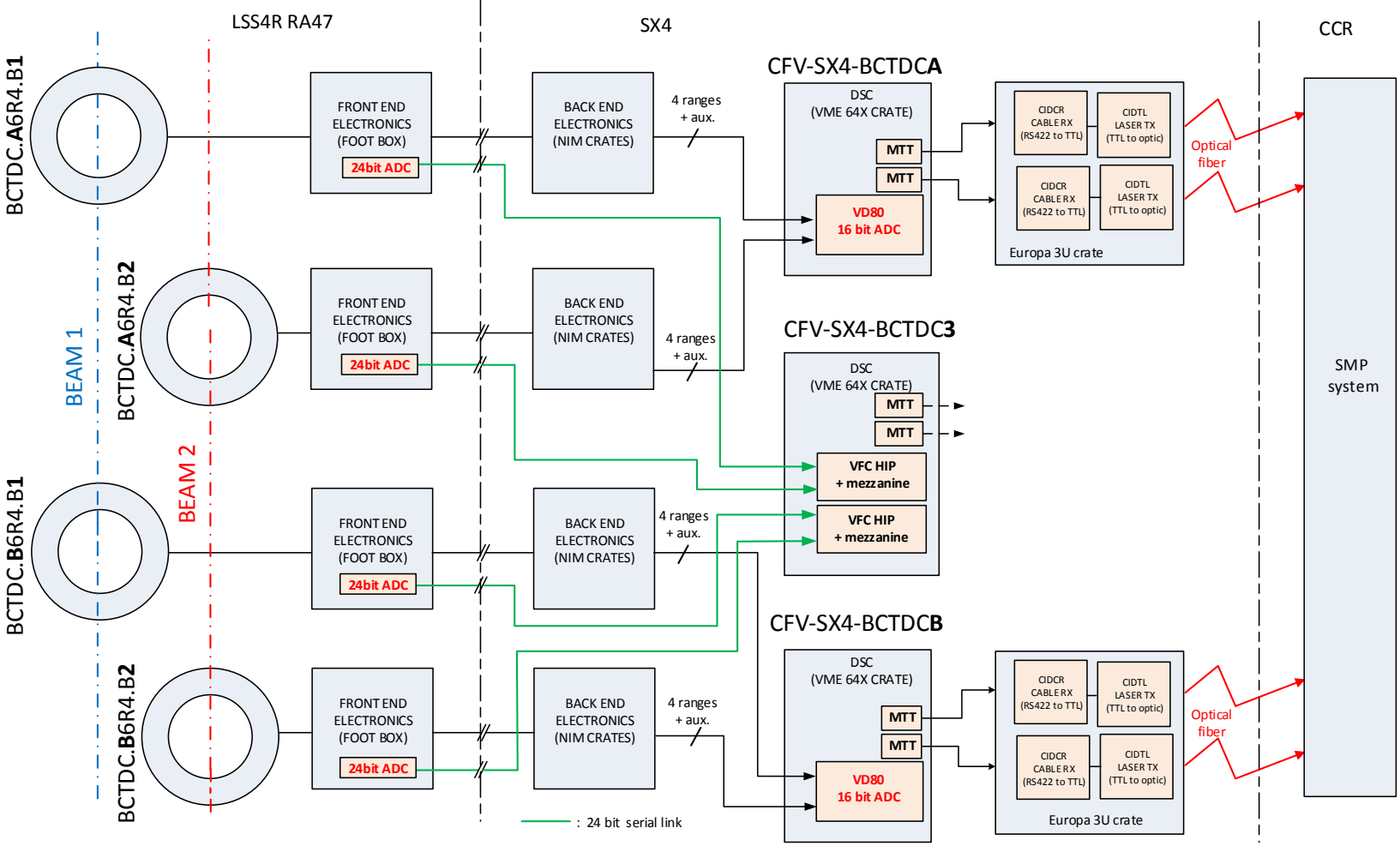
Improved level of redundancy for high intensity: 2 separate systems

- monitors
- electronics
- acquisition crates
- FESA class

Layout of the SPS BCTDCs and link to the SMP in 2017



Layout of the LHC BCTDC link to the SMP in 2016



Status of the LHC BCTDC and link to the SMP in 2017

System A Beam 1 & 2

2 CERN made BCTDCs

- **16 bit** ADC located in surface; 4 ranges + aux signals; 1 S/s; rms noise $\sim 8 \text{ E8}$ charges
 - MTT modules remain in place (links to SMP in 2016 still available)
- **24 bit** ADC located next to the monitors; 1S/s; rms noise $\sim 8 \text{ E8}$ charges
 - **2 optical links to SMP. NEW.** Successfully tested in 2016 TS3
 - no experience with ageing due to radiations

System B Beam 1 & 2

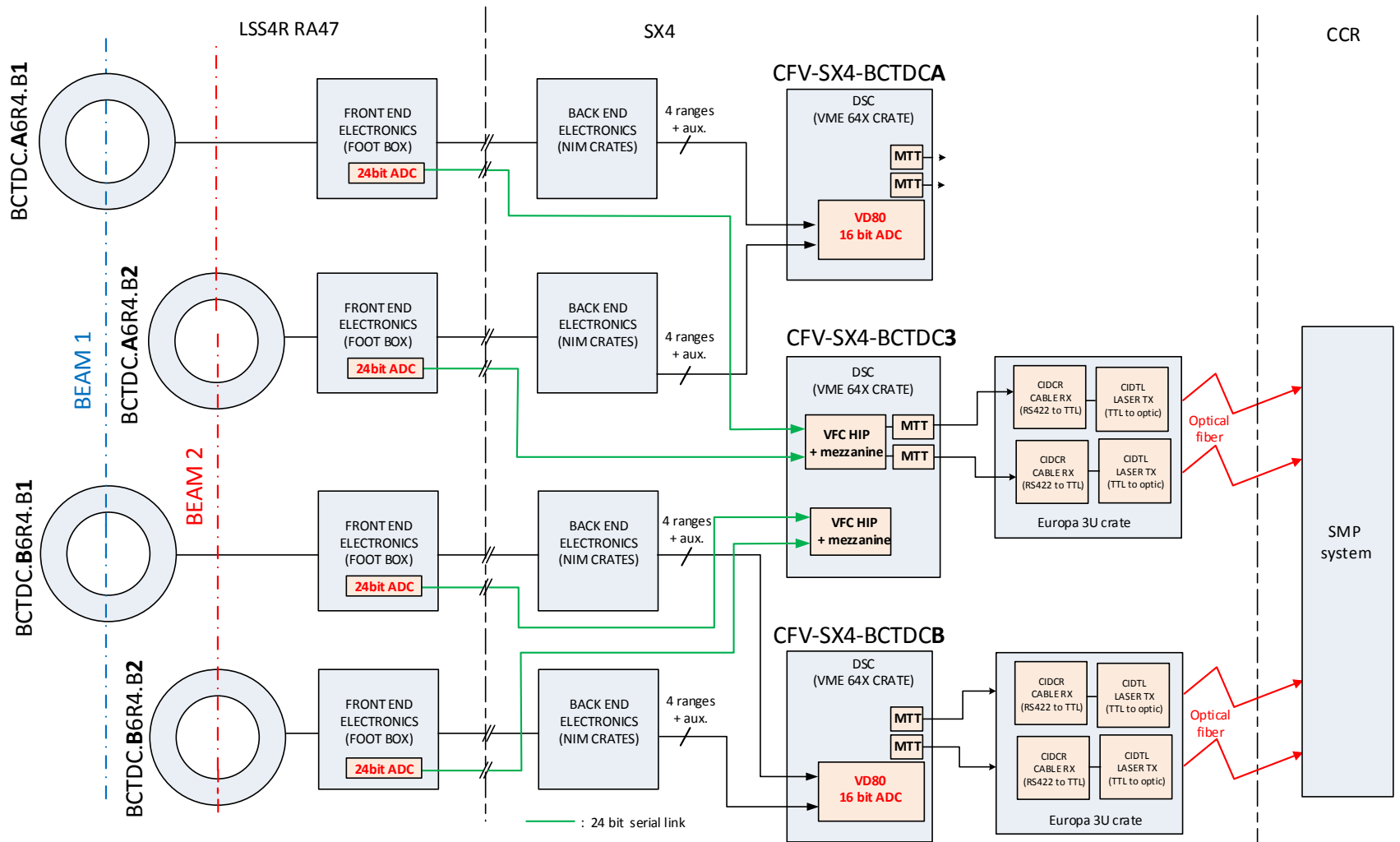
2 CERN made BCTDCs

- **16 bit** ADC located in surface; 4 ranges + aux signals; 1 S/s; rms noise $\sim 8.0 \text{ E8}$ charges (B1)
 $\sim 1.6 \text{ E9}$ charges (B2)
 - **2 optical links to SMP**; 10 S/s; SW filter on B2
- **24 bit** ADC located next to the monitors; 1S/s; rms noise $\sim 8.0 \text{ E8}$ charges (B1)
 $\sim 1.6 \text{ E9}$ charges (B2)

Again good level of redundancy: 2 separate systems

- monitors
- electronics
- acquisition crates
- FESA class

Layout of the LHC BCTDC link to the SMP in 2017



Commissioning

Precise calibration of the BCTDCs

Reference current injected into the monitors, averaging over 60s for the offset and scaling factors measurement

- 16 bit, 4 ranges
- 24 bit 1 range

Check of the data transmission to the SMP

SPS and LHC: week 14 (3rd to 7th of April), to be discussed / confirmed