Dump Signals Link and Machine Protection

Specification

BLM – BIC link

BLM schematic

Loss Levels and Required Accuracy

Relative loss levels		
	450 GeV	7 TeV
Damage to components	320/5	1000/25
Quench level	1	1
Beam dump threshold for quench prevention	0.3	0.3/0.4
Warning	0.1	0.1/0.25

Absolute precision (calibration)	< factor 2 initial < factor 5)
Relative precision for quench prevention	< 25%

Functional specification:
https://edms.cern.ch/file/328146/2.0/LHC-BLM-ES-0001-20-00.pdf

Reliability and Time Resolution

| Type	Area of use	Criticality	Time resolution
BLMC	Collimation sections	yes	1 turn
BLMS	Critical aperture limits or critical positions	yes	1 turn (89 us)
BLMA	All along the rings (ARC, ...)	no	2.5 ms (7.4.4)

Definition (specs):

By criticality, we mean that the system must be 100% operational to allow beam injection and that the beam is dumped if it fails.

- In case of a non working monitor this monitor has to be repaired before the next injection

Definition of BLM – BIC links

- **BLM – BIC link:**
  - redundant
  - fail save
  - non mask able link

- **BLM – BIC link:**
  - fail save
  - mask able link

- **Old: for all monitors**
- **New: only for "critical monitors"**

- **New: "non critical monitors"**

- **Mask applied in BIC depending on "save beam flag"**

BLM – BIC Signal Exchange
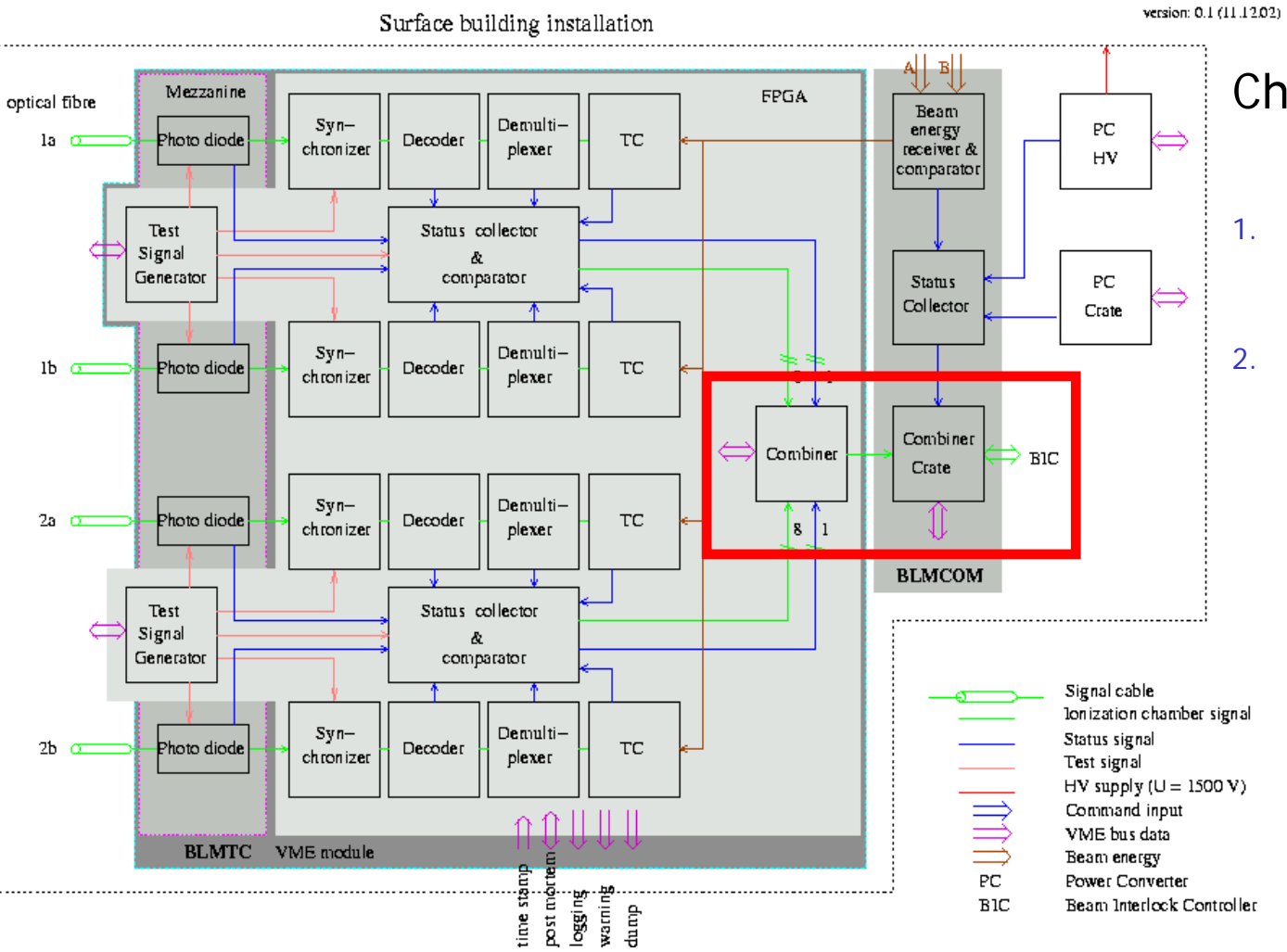
Changes in BLM design:

1. Combiner in TC will be doubled
2. Combiner in COM will be doubled