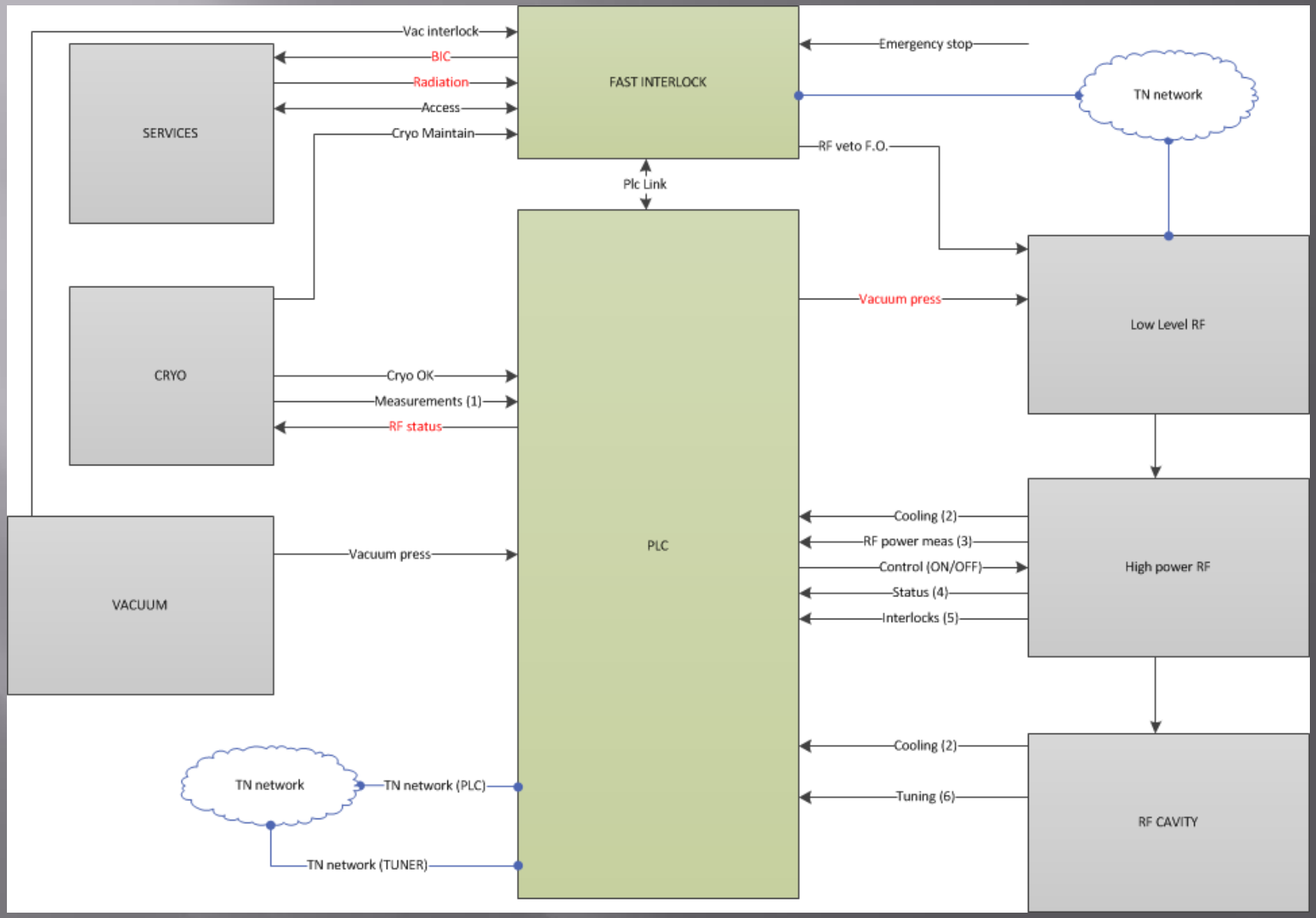
CRAB HIGH-POWER CONTROL AND INTERLOCKS

Overview

Interfaces

Planning

Overview

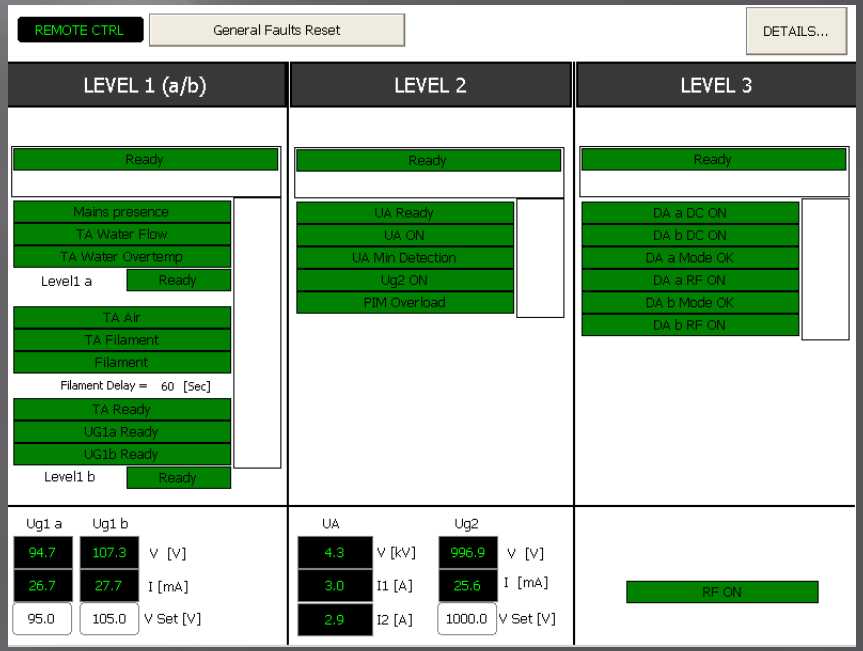

Vac interlock
BIC
Radiation
Access
Cryo Maintain
SERVICES
FAST INTERLOCK
Emergency stop
TN network
RF veto F.O.
Plc Link
CRYO
Cryo OK
Measurements (1)
RF status
Vacuum press
Low Level RF
VACUUM
Vacuum press
PLC
Cooling (2)
RF power meas (3)
Control (ON/OFF)
Status (4)
Interlocks (5)
High power RF
TN network
TN network (PLC)
TN network (TUNER)
Cooling (2)
Tuning (6)
RF CAVITY

Overview

- One PC to control 2 cavities in one cryo-module
- Standard PLC and hardware components

  Cavity to control rack distance ?
- Expected PLC cycle time 2ms
  - Do we need faster reaction time ?
    - Ex: the fast interlock is 15us but also pure hardware
      - my answer is yes!
- Space requirement for 1 cryo-module ½ 45U rack at human height
  - 3U for fast interlock
  - 18U for PLC
- Local control screen

  SPS Damper example >>>



Interfaces External Services

External service interface based on LHC model

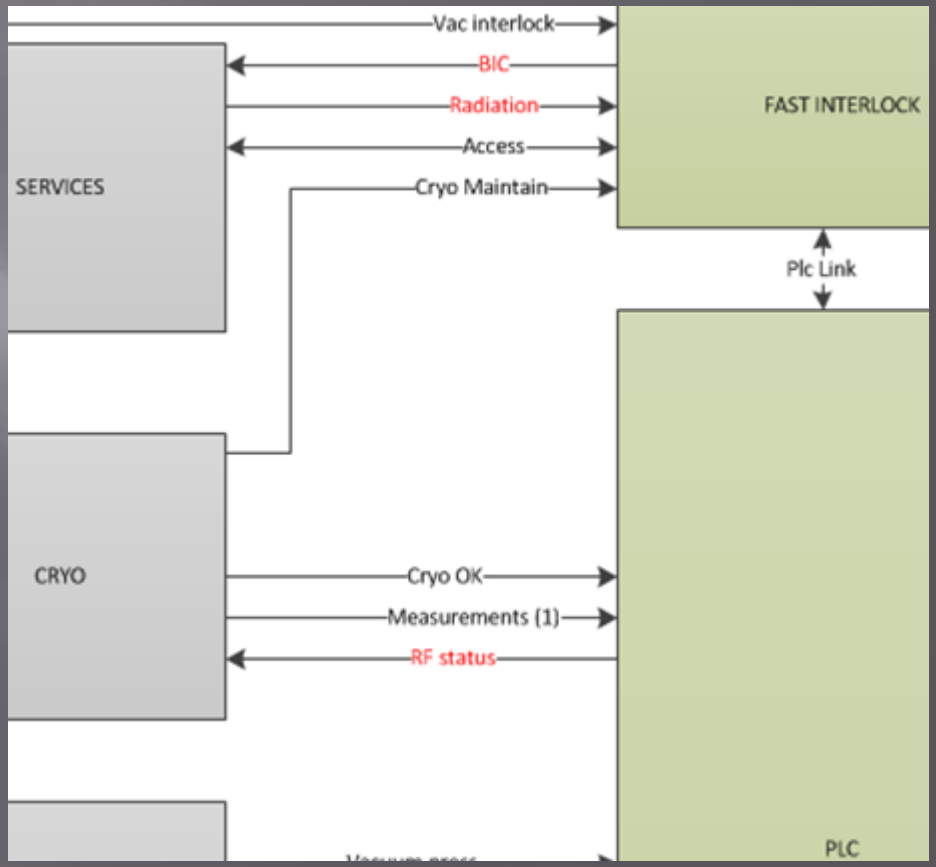
Signals to RF:
Access
Radiation

Signals RF to .. :
Access
BIC

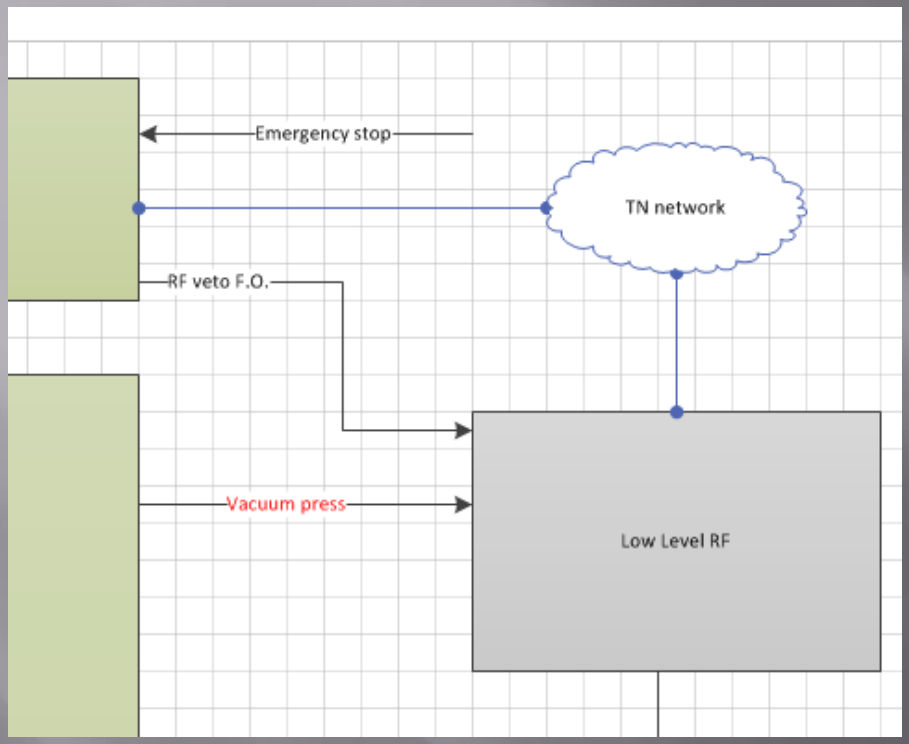
CRYO interface based on the LHC ACS model

Signals Cryo to RF:
Cryo_OK
Cryo_Maintain
Level and pressure acquisition

Signals RF to Cryo :
RF_ON status
Warm_up command
Cool_DN command



Interfaces LLRF



Standard fast interlock to Switch and protect LLRF module fiber optic link

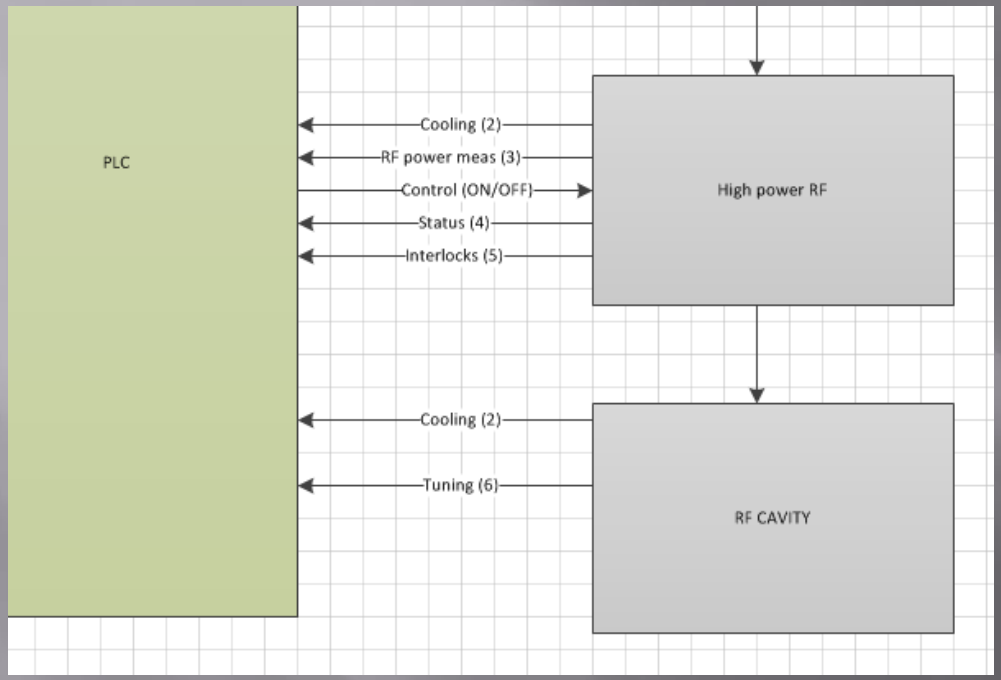
One per cavity with common interlocks (cryo, access, vac…)

Correct ?

Vacuum pressure acquisition for conditioning

Needed ?

Interfaces RF power & Cavity



Standard fast interlock to Switch and protect LLRF module fiber optic link
One per cavity with common interlocks (cryo, access, vac…)
Correct ?

Vacuum pressure acquisition for conditioning
Needed ?

Cavity cooling system
air/water temp/flow
Any ?

Tuning motor control standard stepper one per cavity
Any Piezo tuner needed ?

Any movable coupler ?

DC coupler polarization controllable ?

HOM power interlock ?

Planning

BB3 RF power amplifier test
local partial control for one RF amplifier system
in 2015

SM18 validation
full control system for 2 cavity in cryo-module
in first ½ 2016

SPS installation and test
a second full control system operational for 2 cavity in cryo-module
ready for installation in LS2