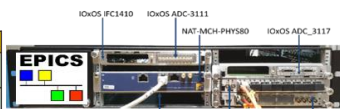


F. Gougnaud[†], F. Gohier[†], P. Bargueden, D. Darde, G. Desmarchelier, G. Ferrand, A. Gaget, P. Guiho, T. Joannem, A. Lotode, Y. Mariette, S. Monnereau, V. Nadot, N. Solenne, V. Silva CEA Irfu Saclay, France
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SNRC and CEA collaborate to the upgrade of the SARAF accelerator and control for the Injector, MEBT and Super Conducting Linac made up of 4 cryomodules hosting HWR cavities and solenoid packages.

Control hardware standards

DEVICES	Choice & standard for IEE
MTCA.4 crate base	NATIVE-R2 crate NAT MCH-PHY580 & COMex-E3
MRF Timing System MTCA.4 boards	mtca-EVM-300 mtca-EVR-300U THPV022
Faraday Cups, ACCTs	IOxOS FMC ADC-3117/MTCA.4 IFC1410 & Beckhoff modules
Neutron sensitive Beam Loss Monitors	IOxOS FMC ADC-3111/MTCA.4 IFC1410
LLRFs	Seven Solutions AMC board 2 LLRF/board
BPMs	Seven Solutions AMC board 2 BPM/board
Harp (Sem-Grids)	Proactive VME solution & Kontron IPC
Cryogenics, vacuum, current leads & interlocks	Siemens 1500 PLC series & Kontron IPC
Power supplies for MEBT quadrupoles, steers and superconducting solenoids	CAENels power converters/EPICS streamdevice

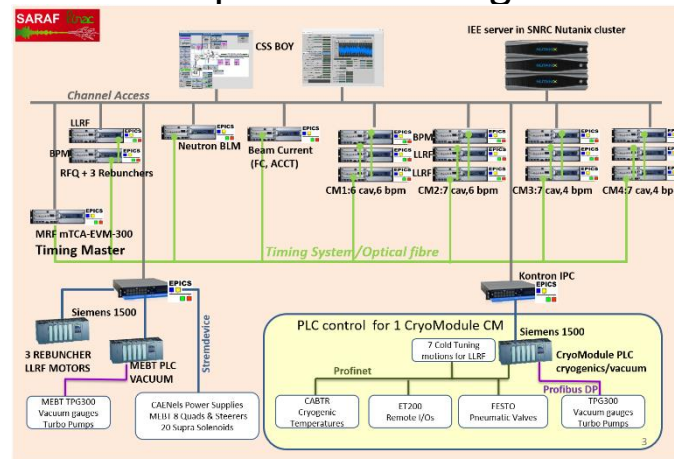


MTCA.4 standard platform based on NAT-R2 & IOxOS boards

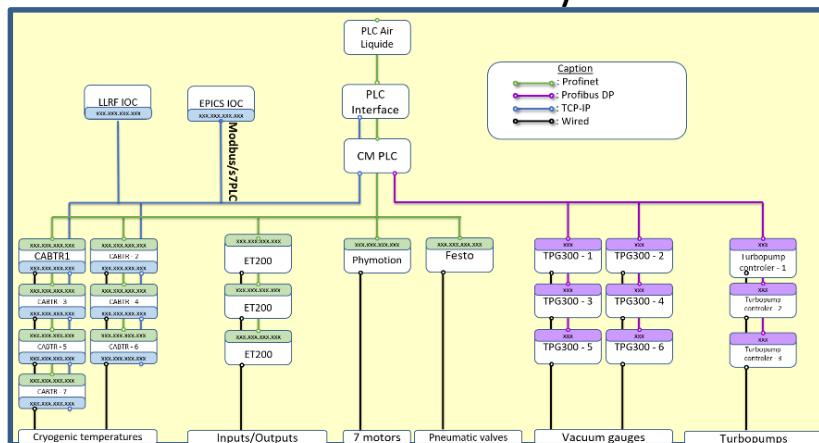


LLRF cabinet based on NAT-R2 and Seven Solutions AMC board

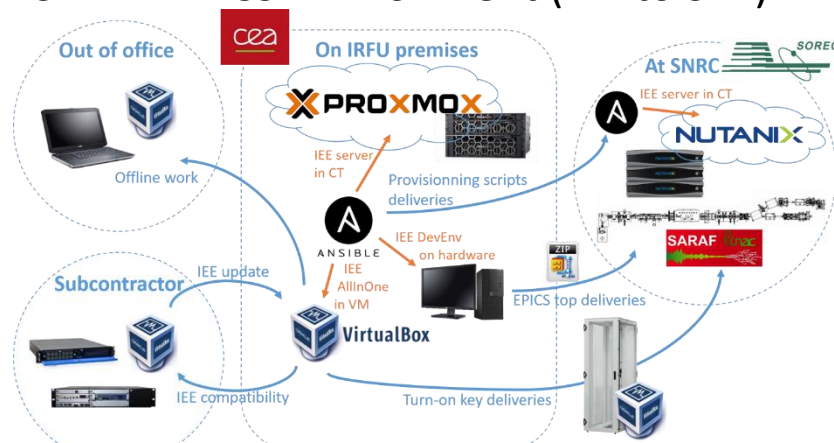
MEBT and Super Conducting Linac control



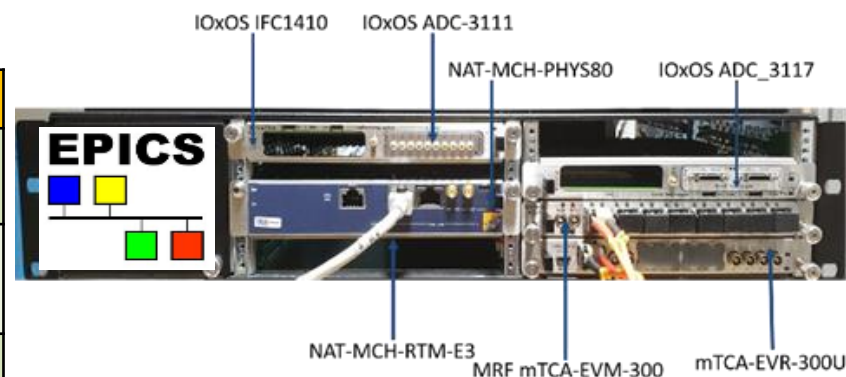
PLC architecture for 1 CryoModule



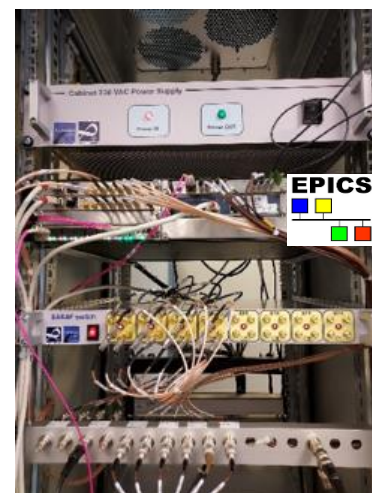
SARAF EPICS Environment (IEE to SEE)



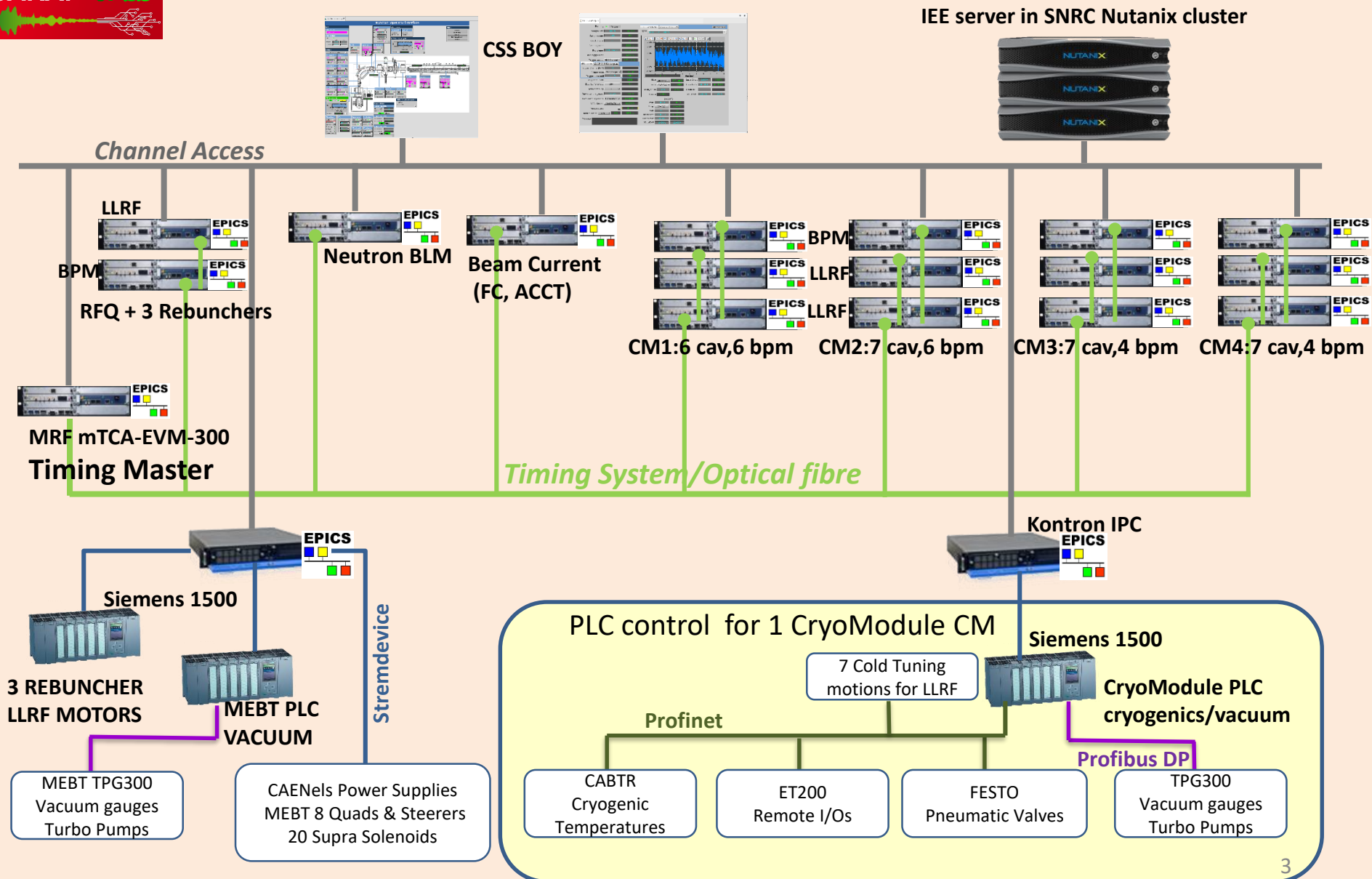
DEVICES	Choice & standard for IEE
MTCA.4 crate base	NATIVE-R2 crate NAT MCH-PHYS80 & COMex-E3
MRF Timing System MTCA.4 boards	mtca-EVM-300 THPV022 mtca-EVR-300U
Faraday Cups, ACCTs	IOxOS FMC ADC-3117/MTCA.4 IFC1410 & Beckhoff modules
Neutron sensitive Beam Loss Monitors	IOxOS FMC ADC-3111/MTCA.4 IFC1410
LLRFs	Seven Solutions AMC board 2 LLRF/board WEPV031
BPMs	Seven Solutions AMC board 2 BPM/board
Harps (Sem-Grids)	Proactive VME solution & Kontron IPC
Cryogenics, vacuum, current leads & interlocks	Siemens 1500 PLC series & Kontron IPC TUPV007
Power supplies for MEBT quadrupoles, steerers and superconducting solenoids	CAENels power converters/EPICS streamdevice



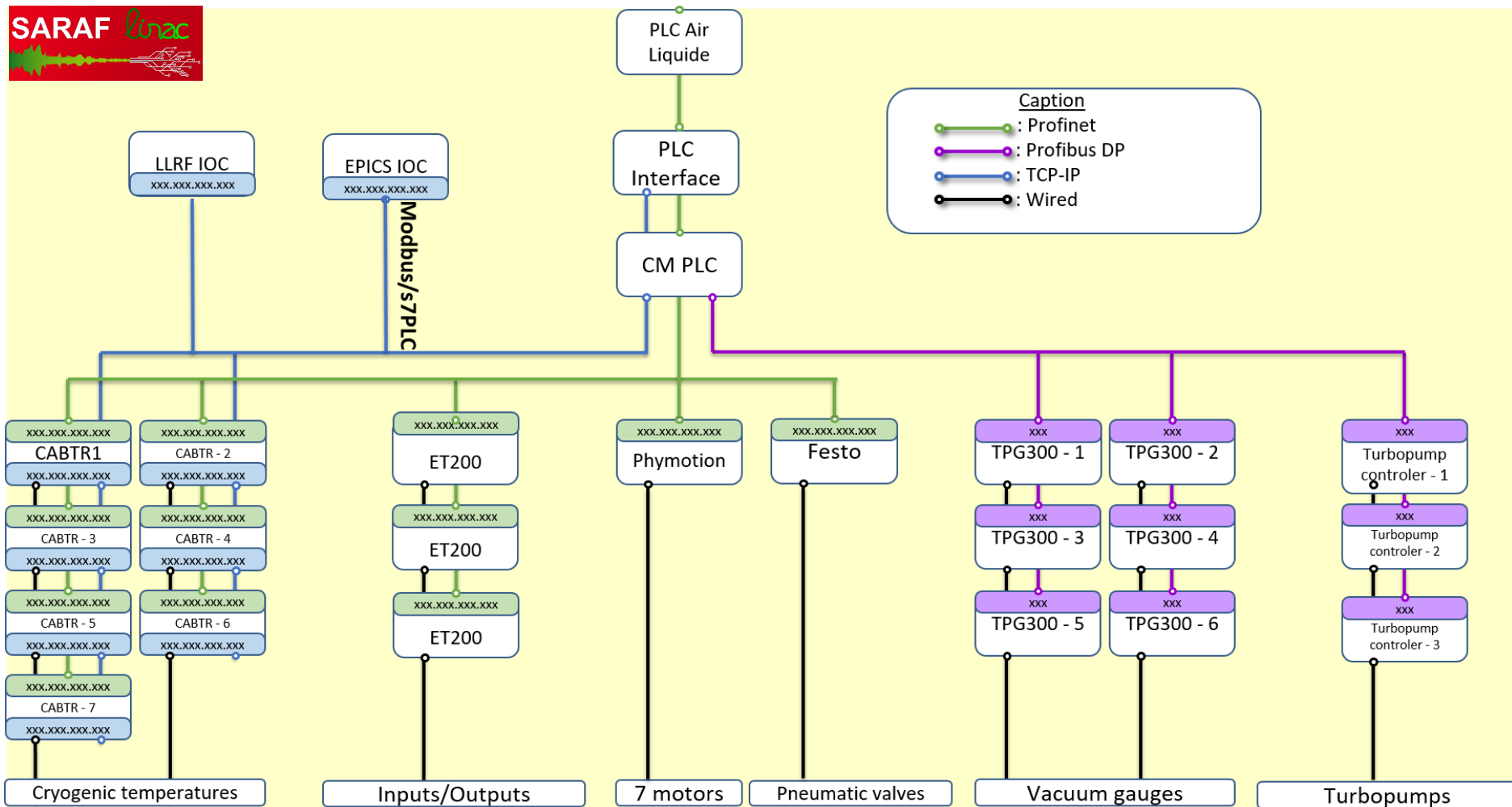
MTCA.4 standard platform based on NAT-R2 & MRF & IOxOS boards



LLRF cabinet based on NAT-R2, MRF and Seven Solutions AMC board



The SARAF Super Conducting Linac offers four CryoModules (including 6 cavities for CM1 and 7 cavities for CM2, CM3 and CM4 and 20 superconducting solenoids (6 solenoids for CM1 and CM2 and 4 for CM3 and CM4). Each cryomodule can be divided into four control type applications for the PLC architecture part: cryogenics, vacuum, solenoid current lead and LLRF cold tuning system.



IEE guaranties homogenous EPICS developments and devices' OS via network boot.
IEE Ansible scripts were successfully run on premise beginning of 2021.
Production environment uses containers for EPICS and boot server, within an high availability cluster.
Machine developments rely either on local install, or virtual machine within VirtualBox.

