STT controls status Update

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Work done 1

- EPICS IOCs implemented for hardware available @ IFIN-HH
  - 1 Gas line consisting of:
    - 2 MFCs for Ar and CO_2
    - 1 MFC and 1 PC for mix inlet/outlet
    - 1 MFM and 1PM for monitoring
  - 1 Wiener MPOD with :
    - 64 HV channels
    - 24 LV channels
- CS-Studio (v 4.5) interface implemented for everything mentioned

Main highlights

- Everything done at user level (no modification to EPICS and CS-Studio was necessary).

- IOCs and interface conceived to be extended (e. g. to 24 gas lines).

- All logic implemented in EPICS. CS-Studio used only for interface.

- Everything is "macro"-based. Any modification should be simple.
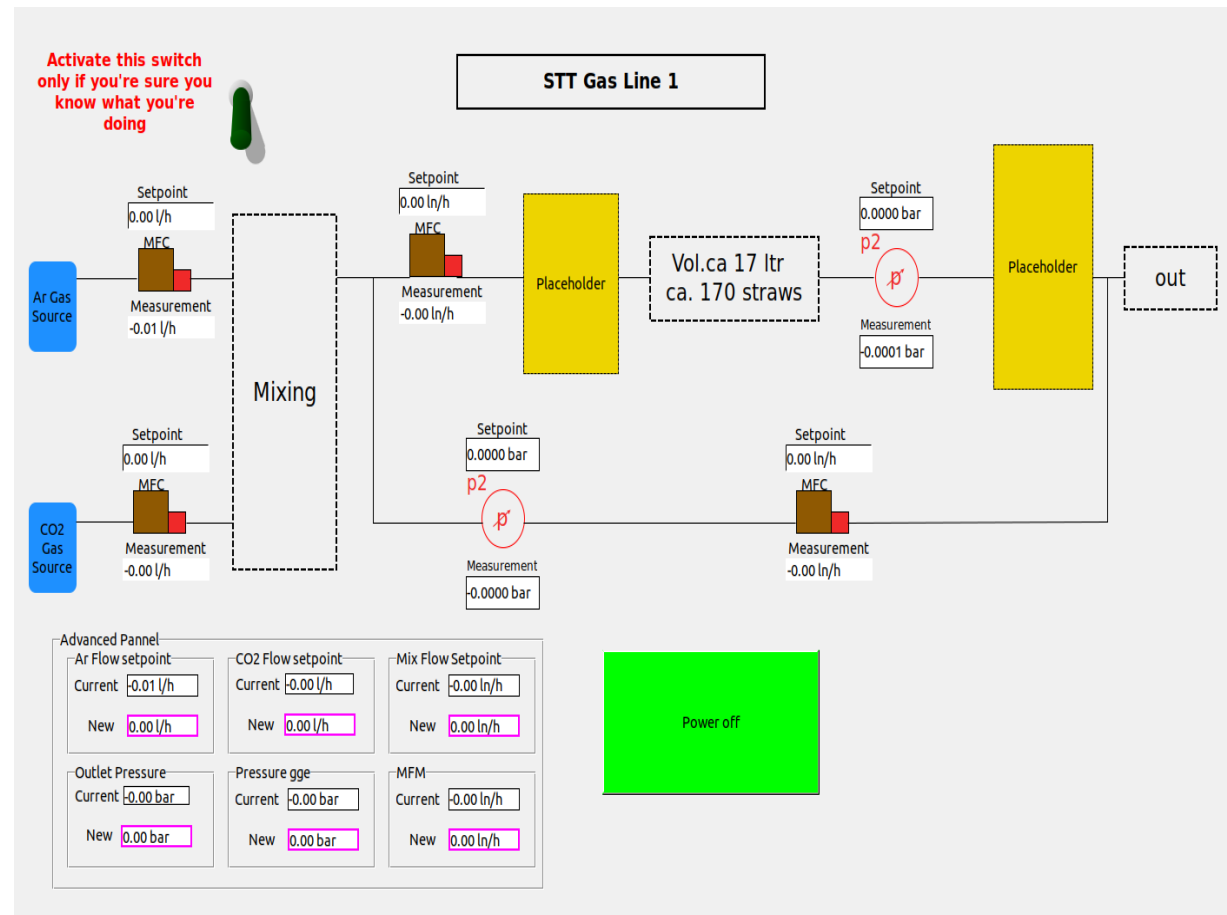
Final product

Gas System

- 1 line configured with additional Ar and CO_2 MFCs also present
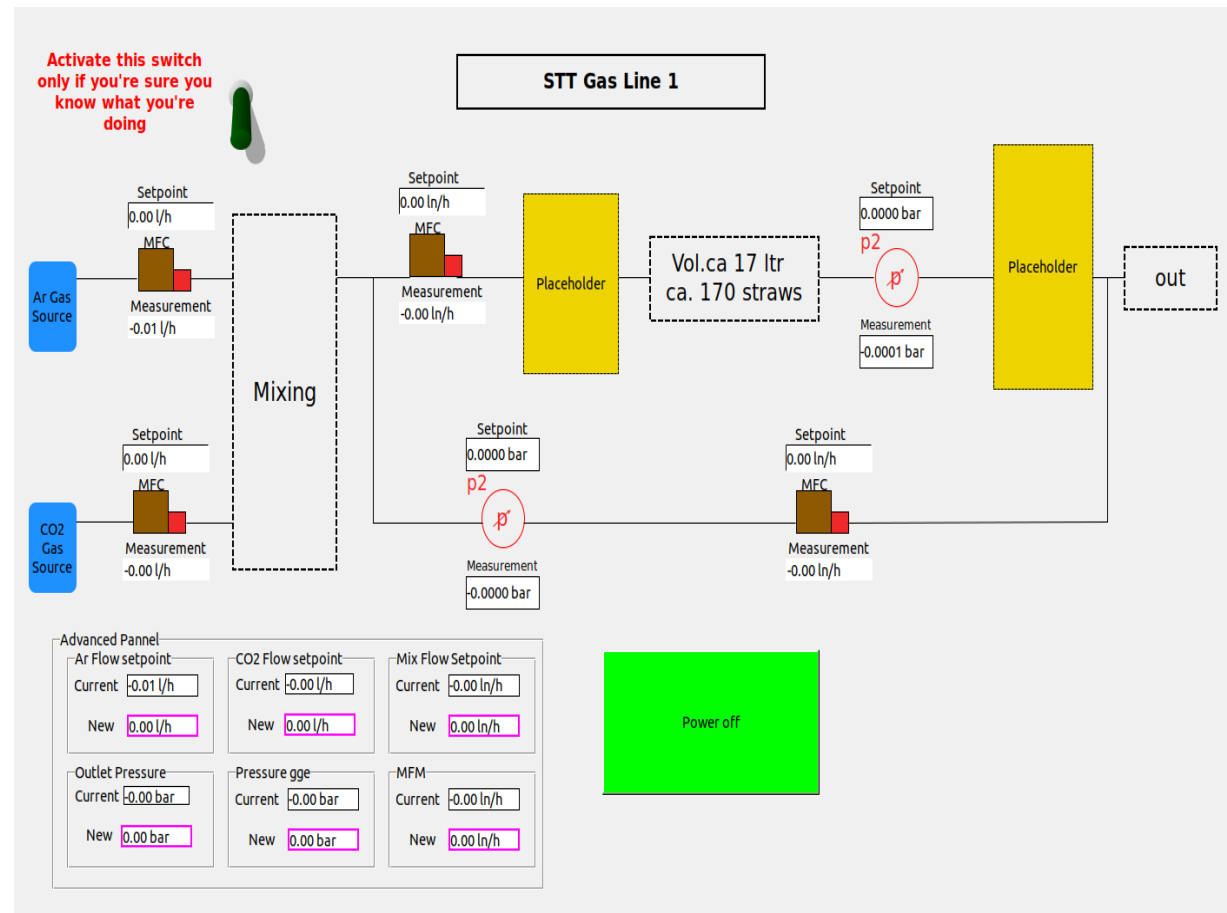
- RS232 interface used for communication
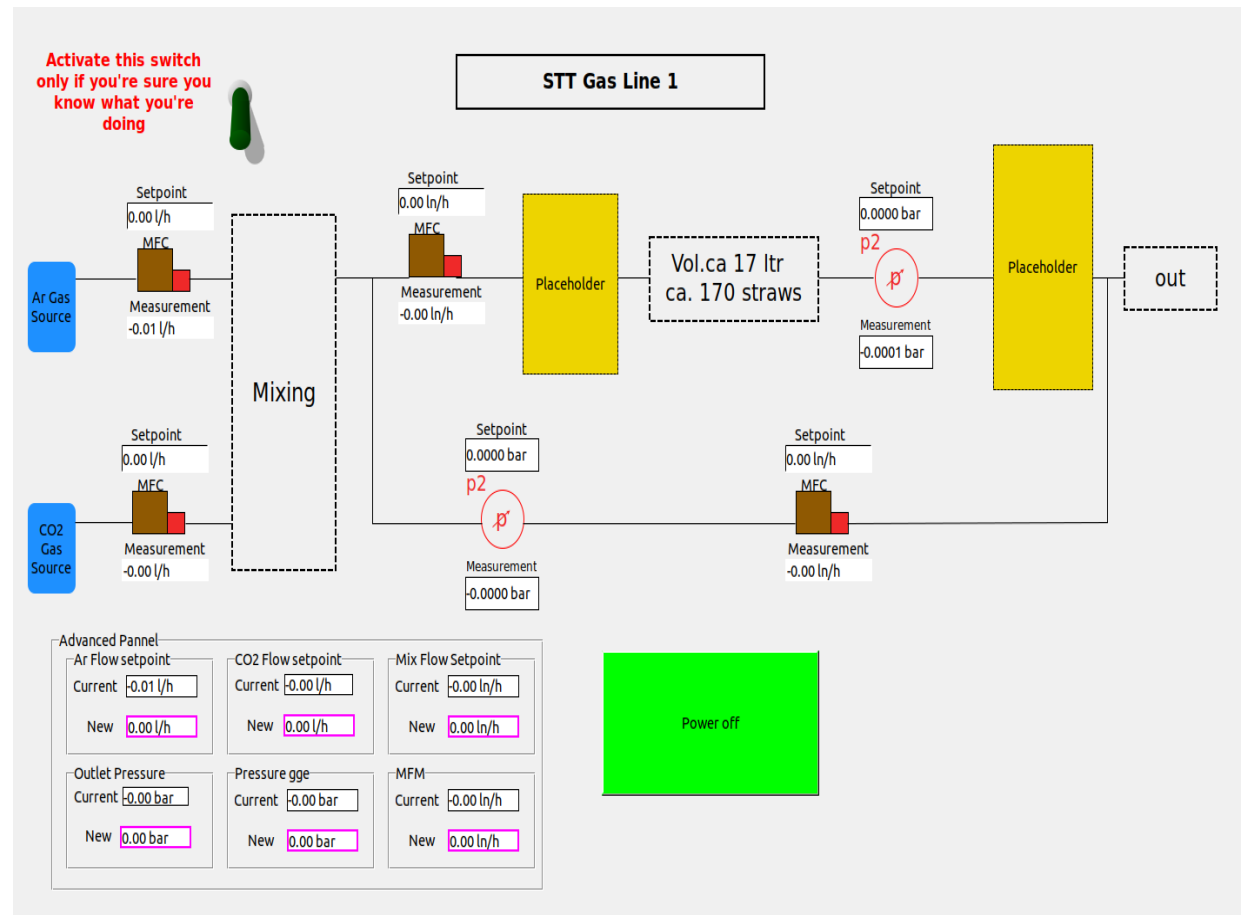
Gas System

- Placeholders with widgets inactive in case of modifications

- Setpoints/ Measurements conversion done in IOC

- Operating modes using SNC

Gas System

- ~100 PVs per Line

- >80% of them are soft. Most of them CALC records used for conversions

- Operating modes using SNC. Maybe use Subroutine (depending on how they scale)

Gas System – drawbacks and work needed

- Huge amount of parameters in RS232 (~250).

- General decoder by brute-force is unrealistic

- Calibration should be done on-site

- Operating modes using SNC. Maybe use Subroutine (depending on how they scale)
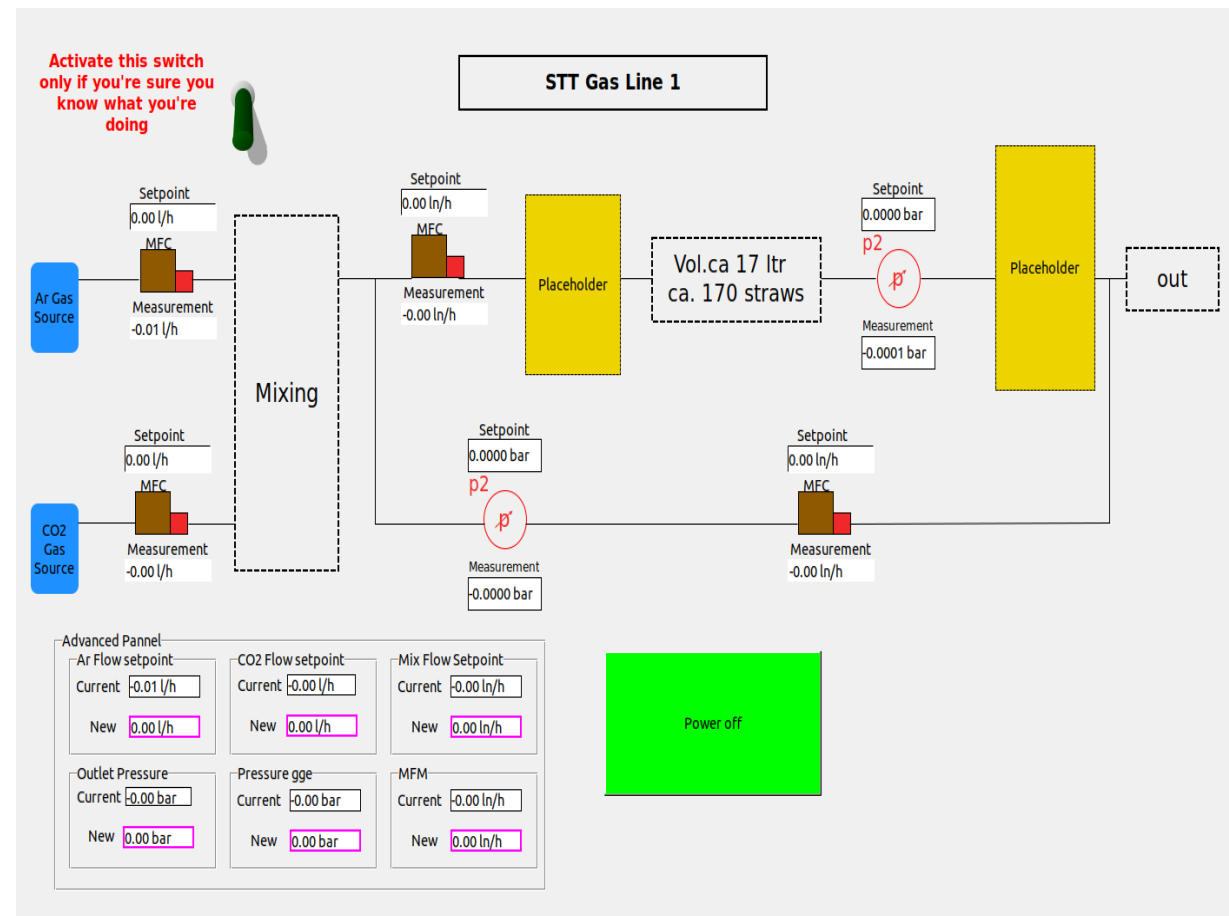
Wiener Crate

- Easy navigation

- HV and LV accessible from main window

- Communication through snmp

- Monitoring of Interlock status

- **Services –** will contain useful information
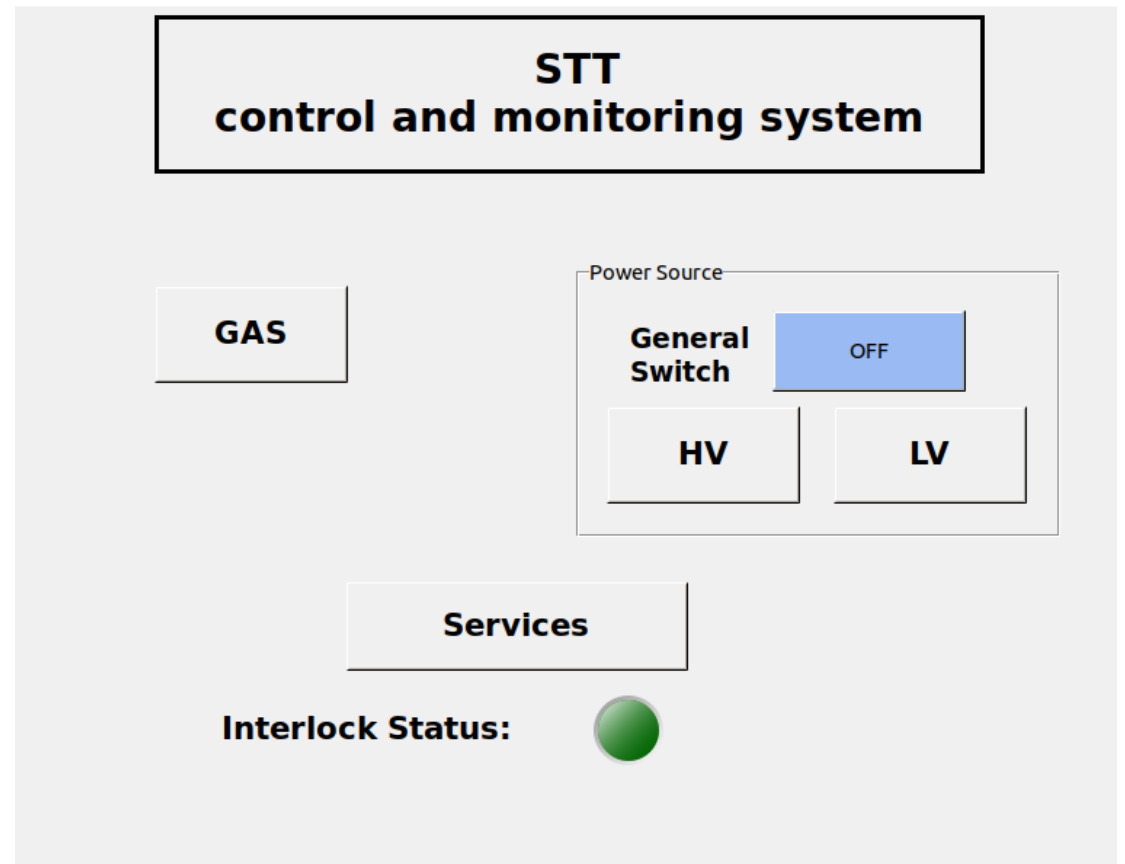
Wiener Crate - HV

- 64 channels implemented

- Adding and removing is trivial

- This OPI contains hundreds of widgets. Filling table by script is very slow

- Text widgets in CSS are very scalable. Use them instead

Wiener Crate - HV

- Possibility to control each channel (ON/OFF/Reset/Set voltage)

- Colors reflect state. Very easy to spot errors

- Global control also implemented

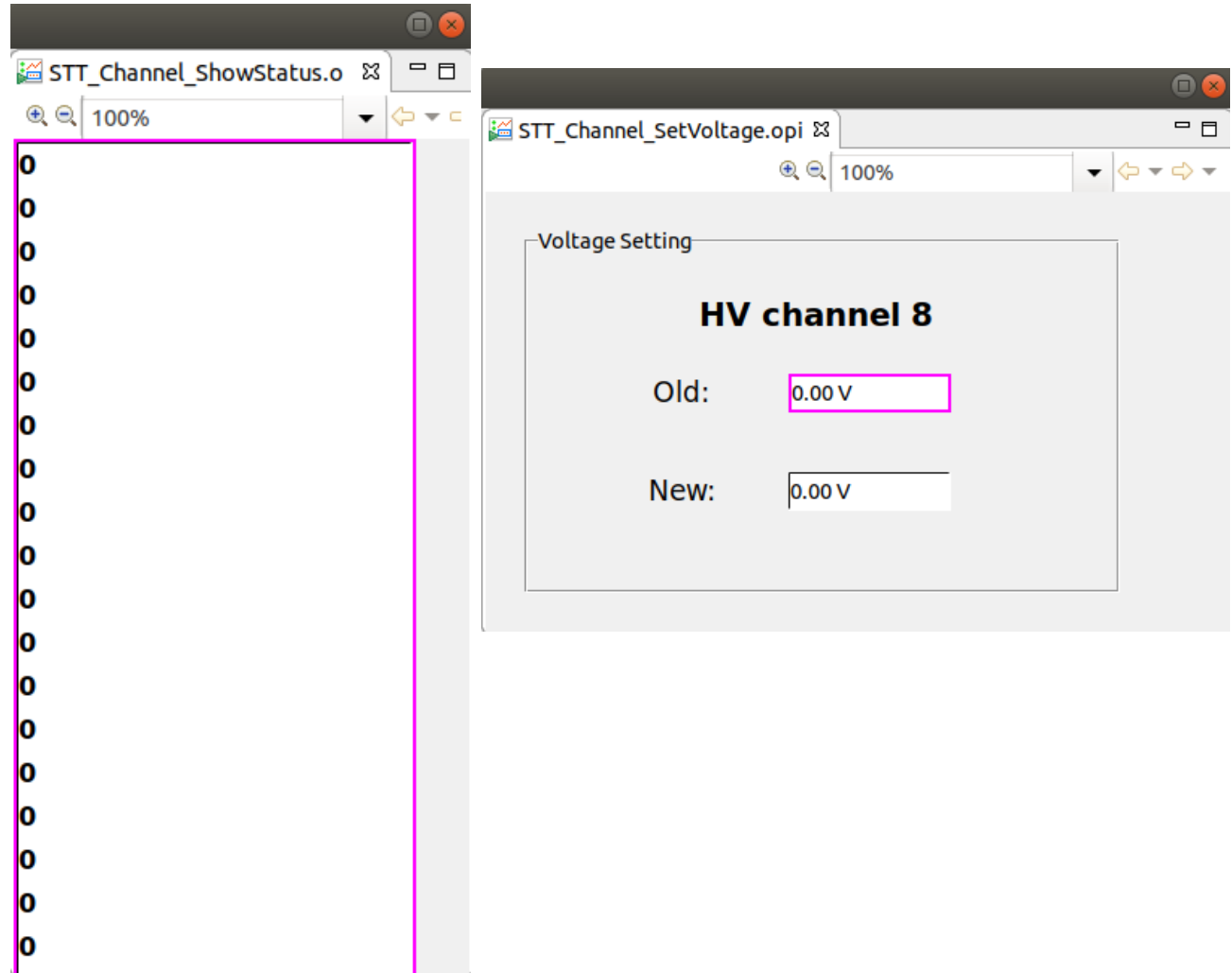- 13-16 states possible. Decoder already implemented (see next slide)

Wiener Crate - HV

- Channel status in separate OPI.

- When something happens, the status text is displayed

- Voltage setting in different OPI

- Text input configured to be error-proof (e.g. can't set too high voltage)

Wiener Crate - LV

- 24 channels implemented

- All functionality the same as in the case of HV

- Use Rules anytime it is possible as they are faster than scripts.

- Everything is "macro"-based. Major changes take a day at most.

Alarm Configuration

- All PVs to be monitored are written to an .xml file by a script. Easy to extend

- Use AlarmConfigTool and AlarmServer as described in CSS documentation

Alarm Configuration

- No way (as far as I know) to monitor global status of a system

- Hence, no single LED to announce errors

- Solution: Alarms and OPI in same window

Alarm Configuration

- Gas System and Wiener crate: 2 separate subsystems.

- Gas System:

  – One subsystem for admission

  – One subsystem for each line

- MPOD:

  – One subsystem for global crate status

  – One subsystem for HV and one for LV

  – For HV and LV:

    • One subsystem for each channel

Alarm Configuration

- Gas System:

  - One subsystem for admission

  - One subsystem for each line

  - Parameters for alarms: Measurement and Setpoint Display values (converted from integers)

  - Status to be implemented: huge number of parameters, don't know where to begin

Alarm Configuration

- MPOD:

  – Crate status decoded. Each state has a PV.

  – Channel status decoded. Each state has a PV

  – Additionally: measurements are also used for alarms

Final remarks

- EPICS IOCs fully functional

- Final Product includes ~2000 Pvs. Most of them soft (not very heavy on the machine)

- CSS interface prepared for available hardware. Will need extensions, but it will be easy

- Few things could be improved: e.g. Global state button

- Takes ~ 1 hour to build from scratch.

- Tools provided to extend alarm configuration and IOC databases.