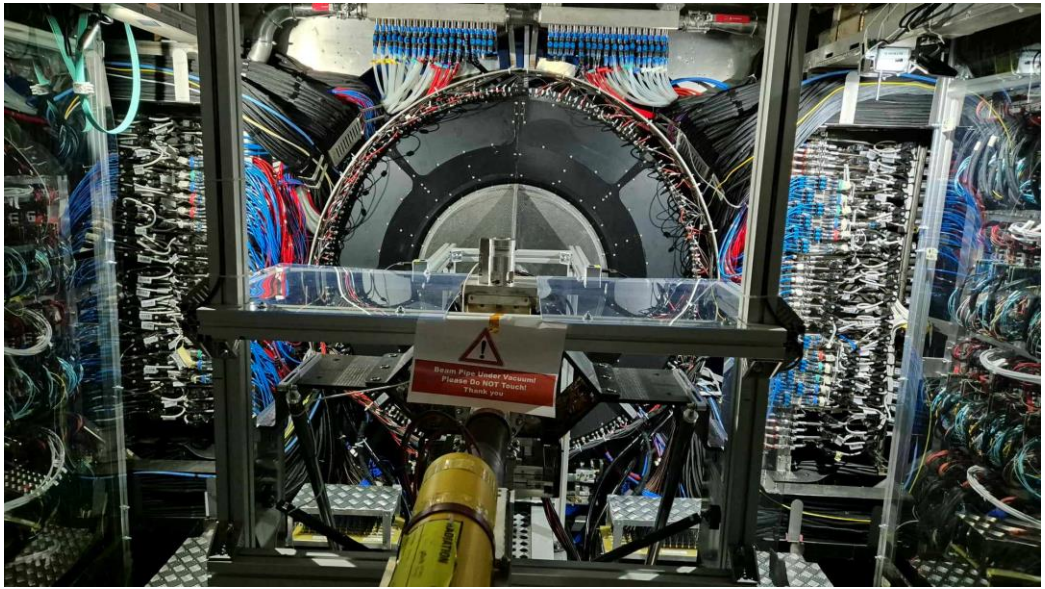
WinCC SCADA system

Przemysław Kinasz



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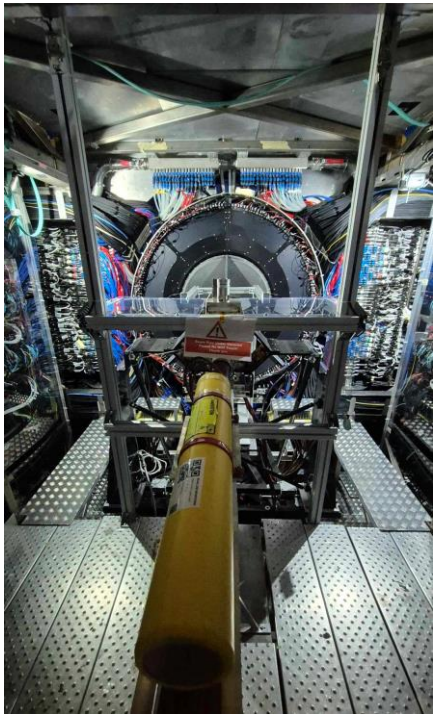


WinCC OA SCADA

and why we are copying a ready-made solution?

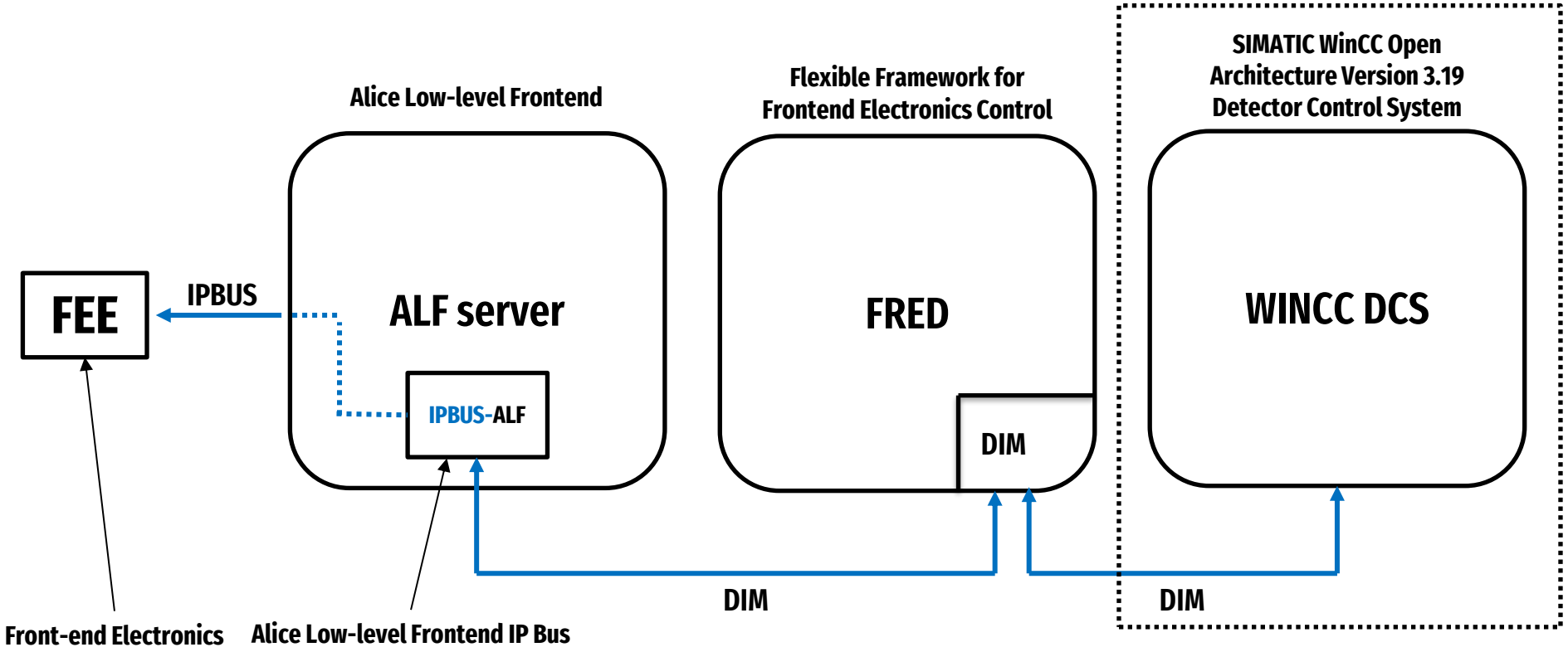
Old *Control Server*

- Not compatible with central DCS solutions
- Not reconfigurable
- Based with all software on localhost
- Without technical support from December 2024

New WinCC SCADA system

- Supported by central DCS solutions
- Easily reconfigurable
- Based on an independent unit
- It can be used to create a training station for On-Call

After modernisation

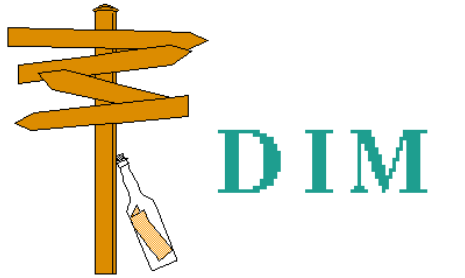


DIM preprocessing script - DIM

What is DIM?

DIM-Distributed Information Management System

DIM, is a portable, light weigth, package for information publishing, data transfer and inter-process communications. Like most communication systems, is based on the client/server paradigm.



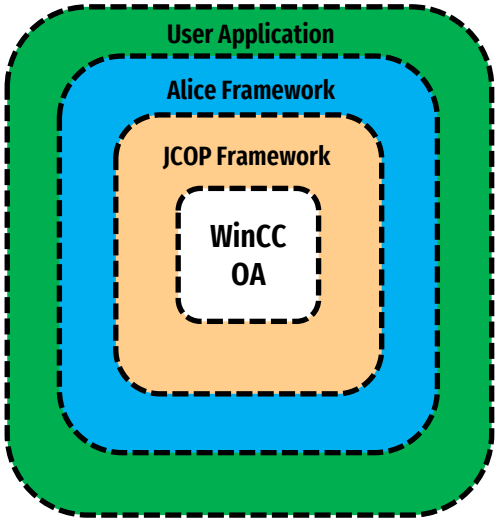
Source: https://dim.web.cern.ch/

DIM preprocessing script - JCOP

JCOP - Joint Controls Project

- JCOP provides, supports, and maintains a common framework of tools and components
- These tools and components allow for the configuration, monitoring, and operation of various sub-detectors
- The system includes communication mechanisms with Data Acquisition/Trigger systems
- It also interacts with external systems, such as CERN infrastructure services and the LHC

- In our system we use JCOP DIM and FSM (Finite State Machine) extensions.



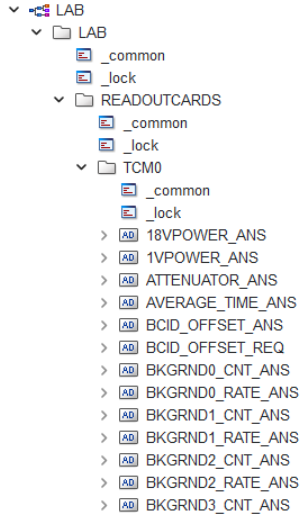
DIM preprocessing script

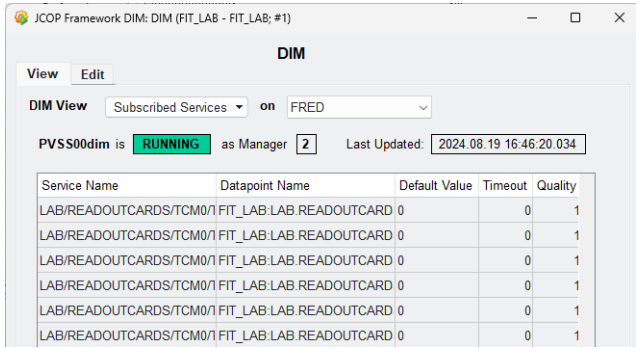
```
113  //_____________________________________MAIN_____________________
114  main()
115  {
116
117    fwDim_deleteConfig(CONFIG_NAME);
118    fwDim_createConfig(CONFIG_NAME);
119    string vartype;
120    filetosortarray();
121    int maxx=maxsizedp();
122    file f;
123    string dummy;
124    int indexJ=1;
125    dyn_string vars;
126    int firstIteration = 1;
127    for(int g=1;g<flong;g++)
128    {
129      dyn_string parts = (devpart[g]);
130      dp = parts[1];
131      value = parts[2].trimmed();
132      string type = parts[3].trimmed();
133    dimtype=parts[4].trimmed();
134       if ((dimtype!="s")&&(dimtype!="c"))  {
135           errorflag=1;
136      DebugN("ERROR: DIM type error in line: "+g);
137    }
138      if (type=="int") vartype=DPEL_INT;
139          else
140      if (type=="string") vartype=DPEL_STRING;
141          else
142      if (type=="float") vartype=DPEL_DYN_FLOAT;
143          else
144      if (type=="b32") vartype=DPEL_BIT32;
145          else
146      if (type=="char") vartype=DPEL_CHAR;
147          else {
148            errorflag=1;
149      DebugN("ERROR: DIM type error in line: "+g);
150    }
151
152  parts[1]=parts[1].trimmed();
153      dyn_string dpparts = strsplit(parts[1], "/");
154
155      int tabsize=dynlen(dpparts);
156
157      string gen;
158    int cont=1;
159    int indexJp;
160      if(firstIteration==1){
```

- Downloading DIM service and command data from a file or database
- Creation of DPs (Data Points)
- Creation of the configuration
- Linking DIM services and commands to DP
- Subscribing to a DNS server
- Error checking

DIM preprocessing script

```
LAB/READOUTCARDS/TCM0/BCID_OFFSET_ANS;0;string;s
LAB/READOUTCARDS/TCM0/BCID_OFFSET_REQ;0;string;c
LAB/READOUTCARDS/TCM0/DATA_SEL_TRG_MASK_ANS;0;string;s
LAB/READOUTCARDS/TCM0/DATA_SEL_TRG_MASK_REQ;0;string;c
LAB/READOUTCARDS/TCM0/DG_TRG_RESPOND_MASK_ANS;0;string;s
LAB/READOUTCARDS/TCM0/DG_TRG_RESPOND_MASK_REQ;0;string;c
LAB/READOUTCARDS/TCM0/DG_BUNCH_PATTERN_ANS;0;string;s
LAB/READOUTCARDS/TCM0/DG_BUNCH_PATTERN_REQ;0;string;c
LAB/READOUTCARDS/TCM0/TG_PATTERN_1_ANS;0;string;s
LAB/READOUTCARDS/TCM0/TG_PATTERN_1_REQ;0;string;c
LAB/READOUTCARDS/TCM0/TG_PATTERN_0_ANS;0;string;s
```



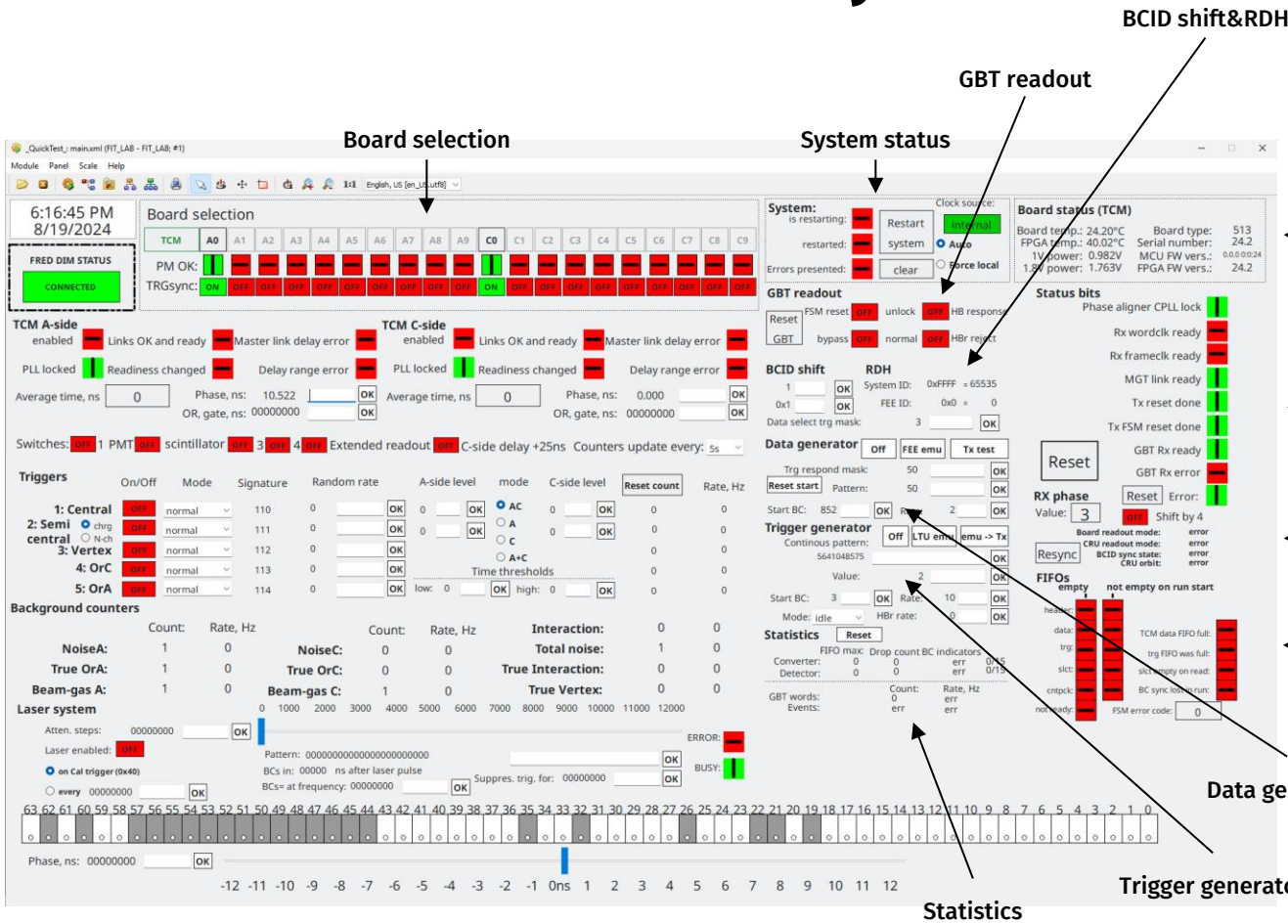


Input text file/database

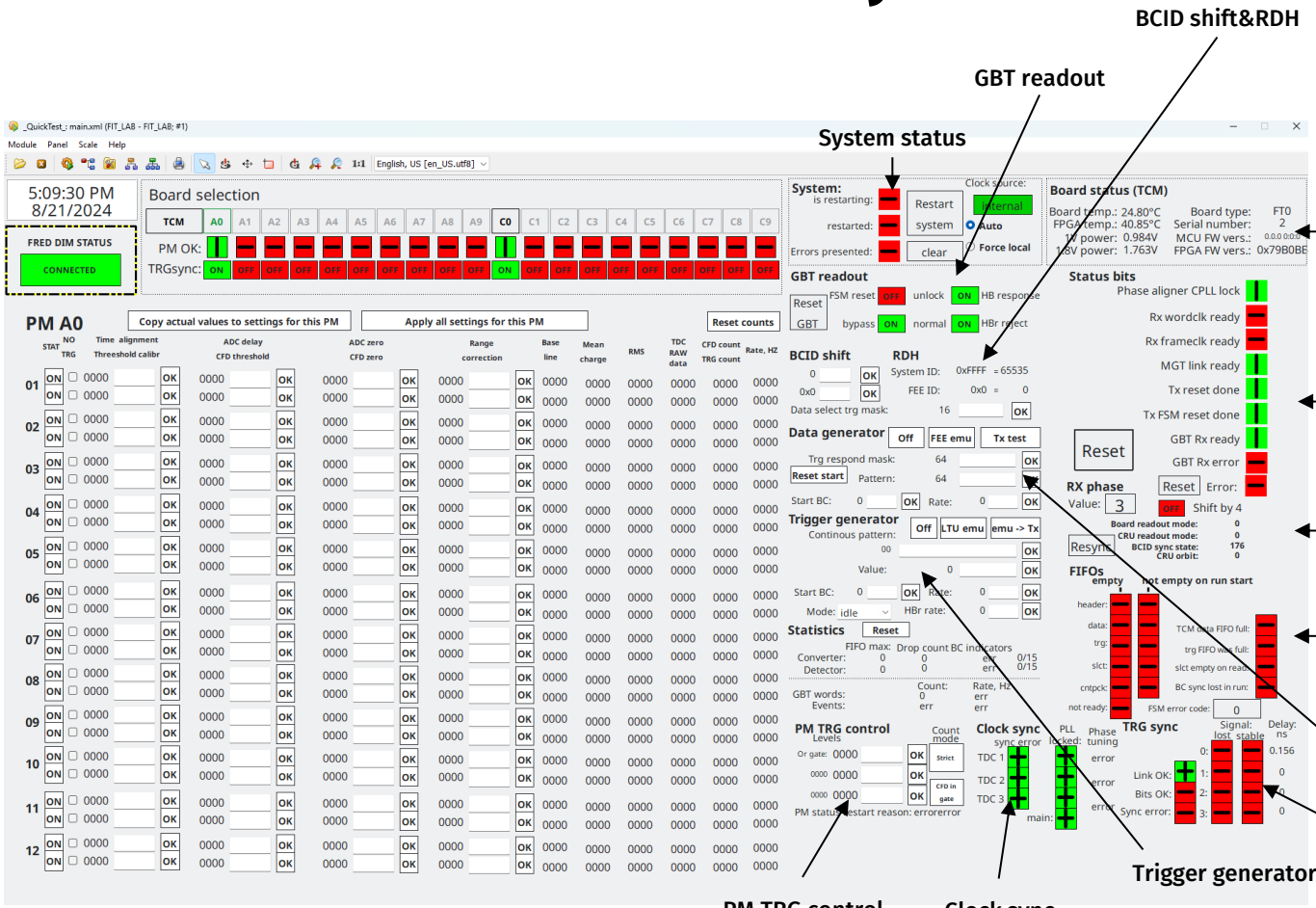
Generated WinCC Para DP structure

Automatic subscription to DIM services and commands

New WinCC SCADA system



New WinCC SCADA system



PM options

Progress of work

FIT electronics

TCM module

Trigger and Clock Module

PM module

PM channel

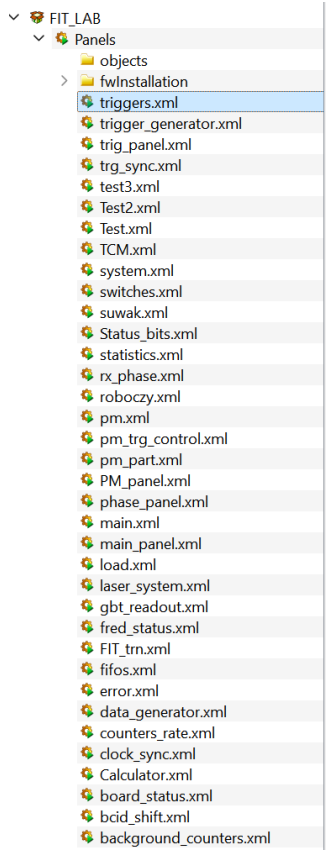
Processing Module

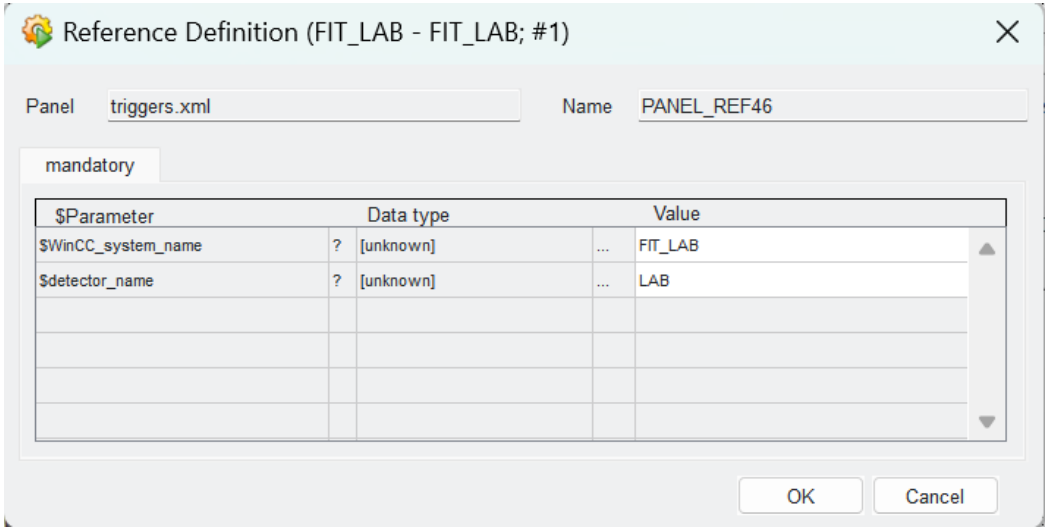
Progress of work

Laboratory station

Laboratory simulator of the FIT detectors

New WinCC SCADA system



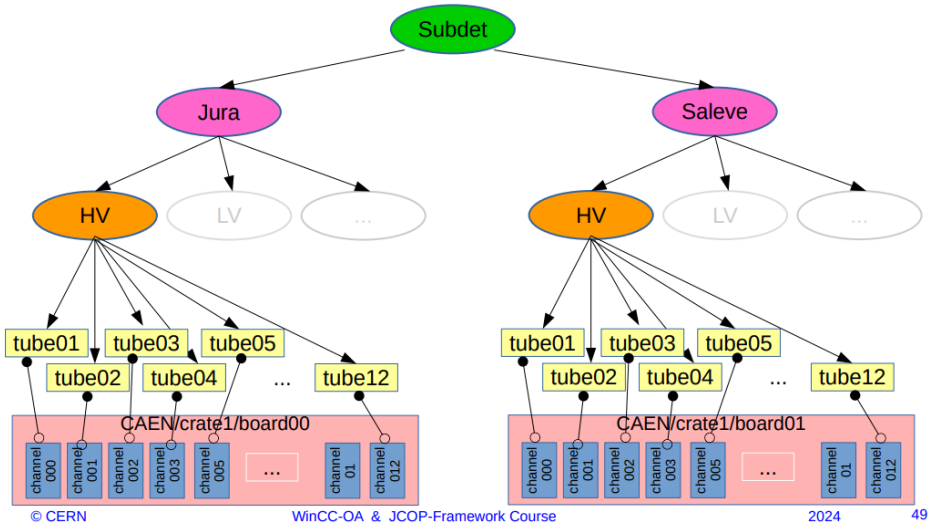


Parameterisation of panels **arguments:** → **System name**, **Detector name**

Upcoming works

We are currently working on:

- completing the PM part
- implementing the FSM (Finite State Machine)



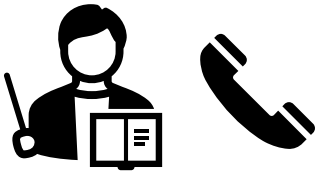
Source: https://edms.cern.ch/ui/file/1029856/latest/part4Slides.pdf

Future of the WinCC SCADA system

-Launch of the training station for On-Call Experts

-Future implementation to the new FIT detector control solution

Source: https://home.cern/news/news/experiments/alice-opens-its-new-nerve-centre



Thank you!

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