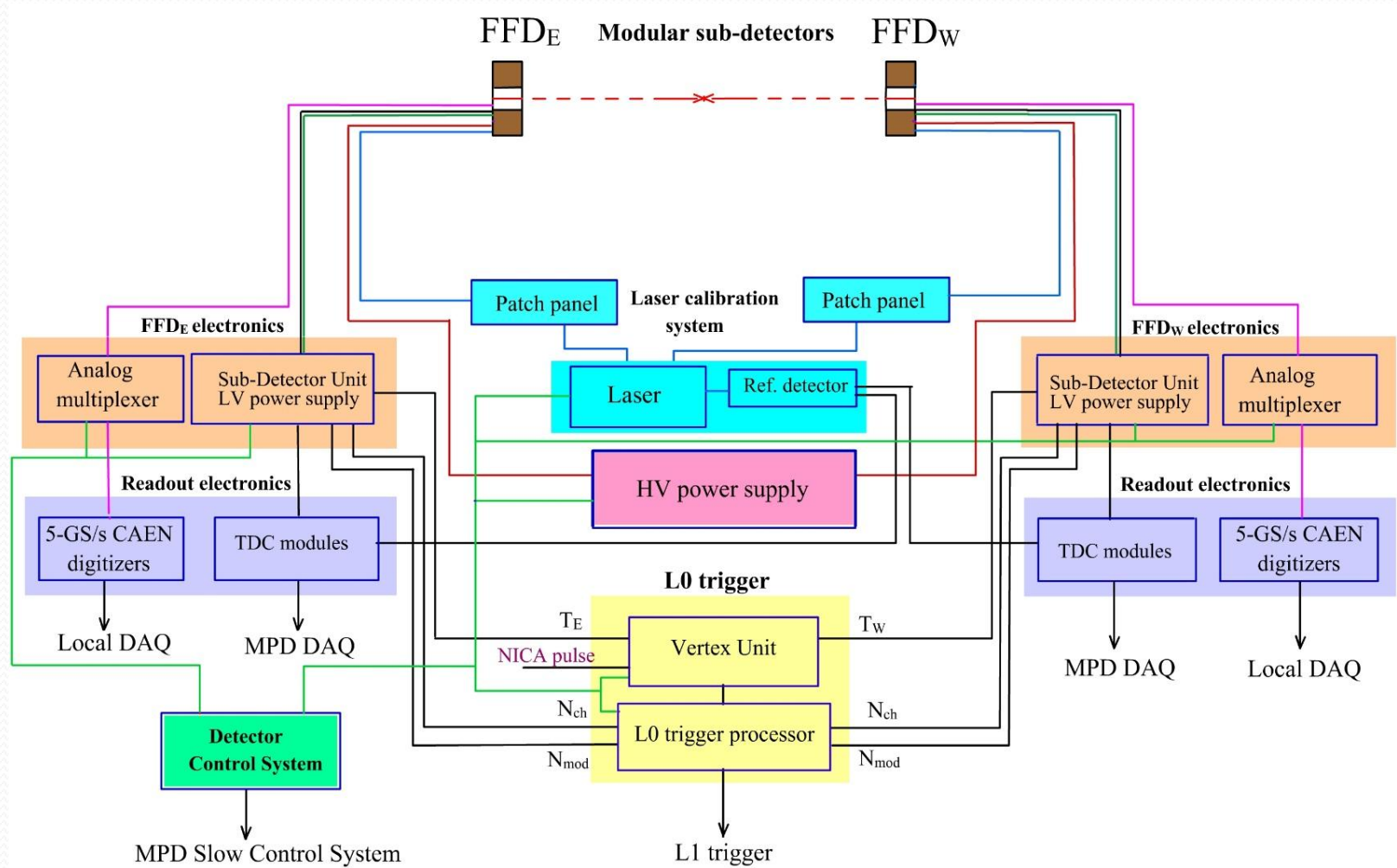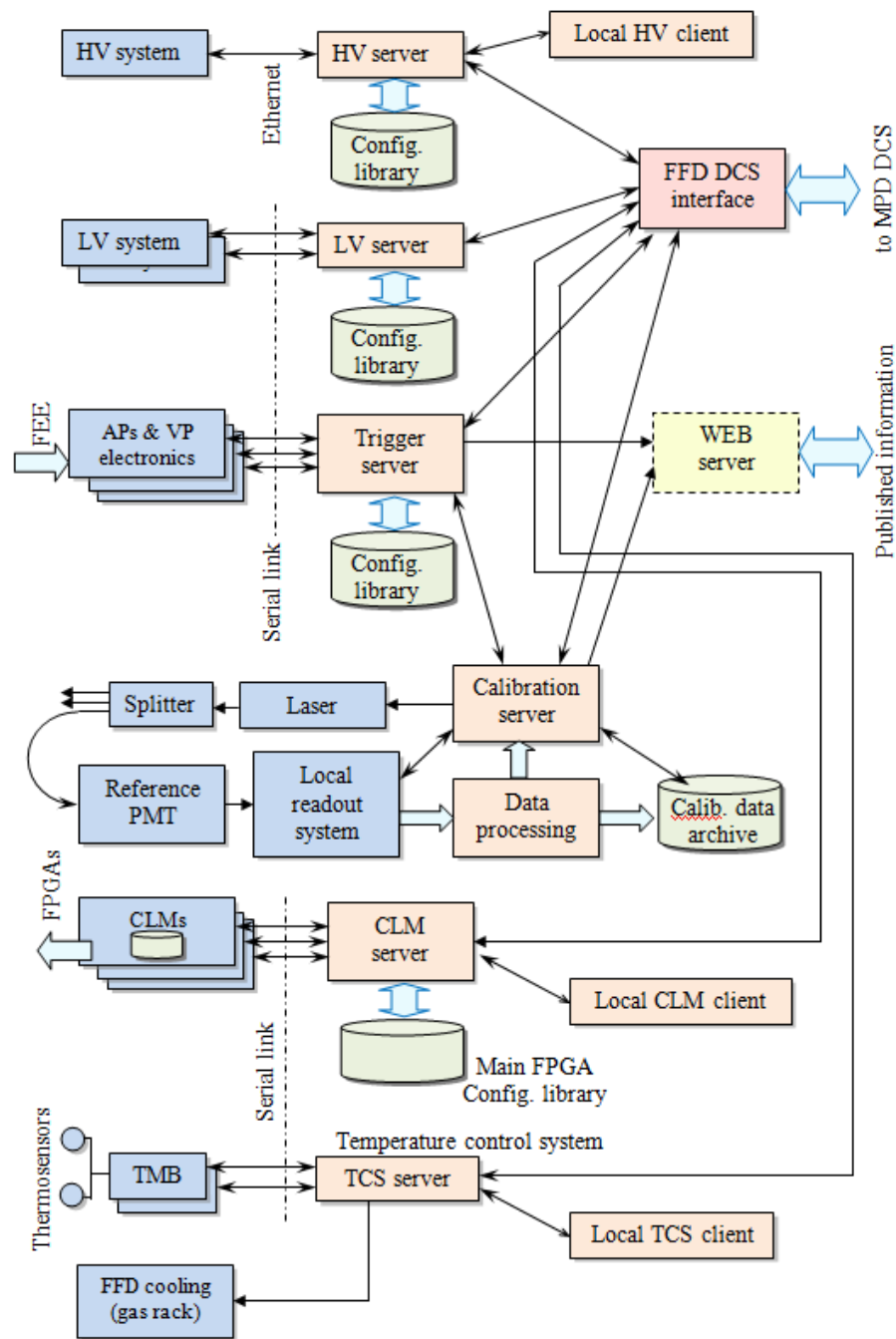# FFD slow control system

FFD equipment

FFD DCS

Equipment controlled by Central DCS

- HV power supply (Wiener) - 40 channels
- FE LV power supplies (40 units in 2 custom VME crates) – 120 channels
- 2 Arm processors in 2 custom VME crates – 10 FPGAs
- Vertex processor (custom VME crate) – 1 FPGA
- FPGA configuration RAM loading system – 11 modules
- Laser calibration system
- FFD modules cooling system (dry nitrogen gas flow)

FFD DCS Commands

- STDBY – stop HV and laser
- ON – start HV
- LoadConfiguration <Configuration name>– download configuration files to HV, LV, laser and FPGA
- Possibly
  - RUN – to enable level zero trigger generation
  - STOP – to disable level zero trigger generation

FFD DCS states

- OFF – any of power supplies is OFF
- STDBY – all LV power supplies are ON, HV power supply is OFF
- ON (RDY) – system is ready for operation
- RUNNING - level zero trigger generation enabled
- NOTRDY – configuration loading in progress (including HV setting)
- ERROR – something is wrong

Partitioning

- FFD DCS could be disconnected from the Central DCS as a single unit only.
- In partitioned state commands are not accepted, state reporting is enabled

Misc. items

- The FFD control system also contains a hardware and software for FFD monitoring in local mode. For example analog multiplexer allowing to observe all FFD module individual channels
- Almost all servers do have local clients to edit/adjust configuration settings
- The system mainly uses RS485 and RS422 serial links
  - FPGA loading system – 921600 baud
  - Other lines have 115200 baud
- The system uses Ethernet->RS converters therefore DCS PC has only virtual com-ports

SCADA: PVSS II or Tango

- ETM company being PVSS II developer now belongs to Siemens => PVSS II (now called "WinCC OA") will be supported for a long time
- PVSS II is already adapted for HEP experiments => less work, it has
  - FSM
  - Partitioning system
  - ORACLE interface (or original fast DB RAMA)
  - A set of graphical tools for trending etc.
  - A set of templates for HV and LV power supplies (suitable for custom ones)
- Contains templates for gas control system (CERN Gas Working Group)
- PVSS II is not free but the license cost is ~1000 Euro per year per system (2010' information – to be confirmed). Probably we will need 2-3 system
- In case of PVSS II we will use the DIM/DIP protocol for custom servers to PVSS communication

PVSS II system architecture