PyDM
Python Display Manager

EPICS Collaboration Meeting, June 2018

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PyDM

SLAC

- Open-Source Python-based Framework for Control System Graphical User Interfaces;

- It provides a system for the drag-and-drop creation of user interfaces using Qt Designer;

- Also allows for the creation of displays driven by Python code;

- Intended to span the range from simple displays without any dynamic behavior, to complex high level applications, with the same set of widgets;

PyDM

SLAC

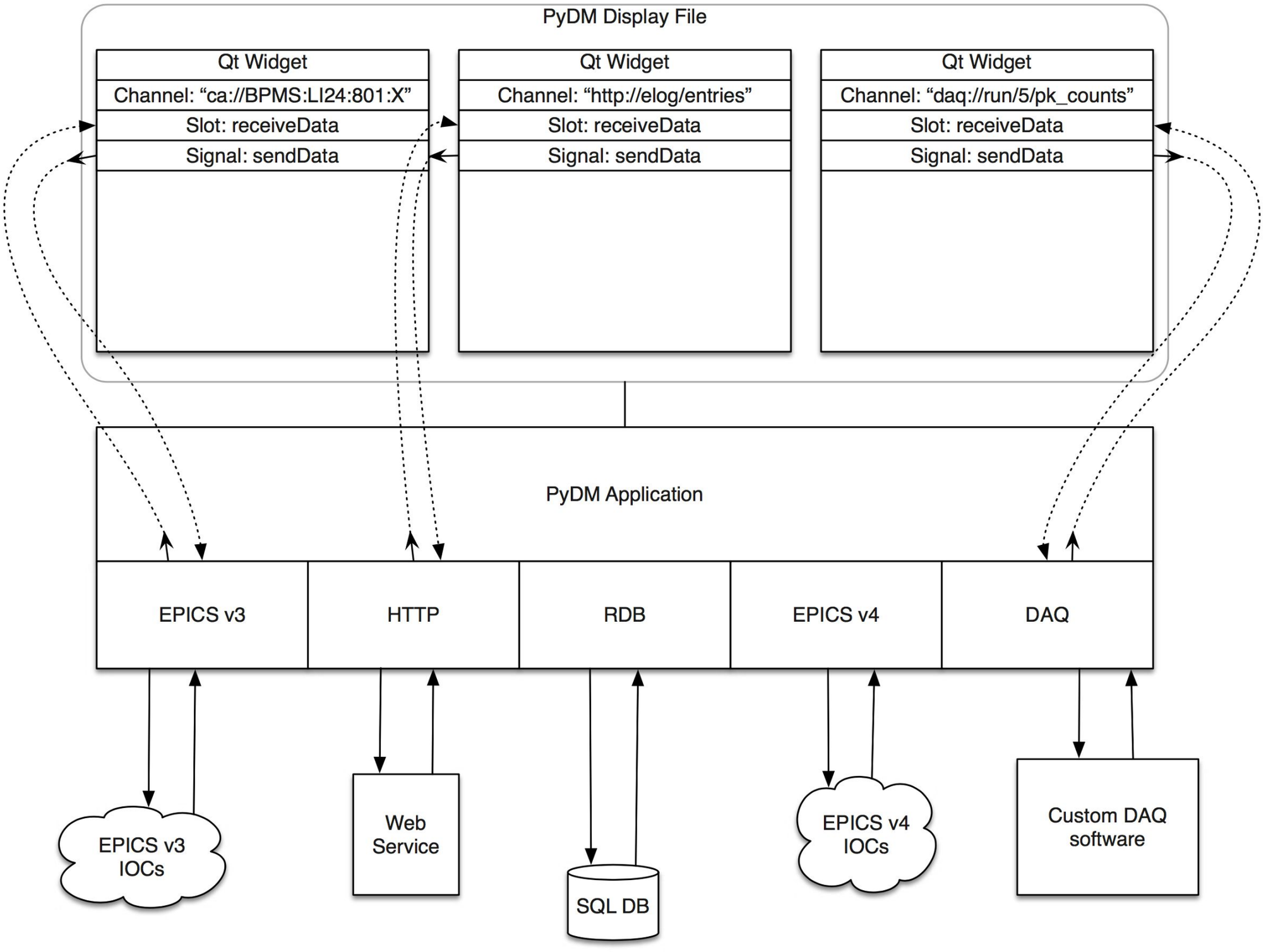
- Developers can extend the framework with custom widgets for site specific tasks, and plugins for multiple control systems and data sources;

- Makes building control system UIs more efficient;

- Makes operating control systems easier and faster;

- Bridges the gap between control system displays (e.g. EDM panels) and high level applications (e.g. MATLAB or PyQt applications);

Architecture

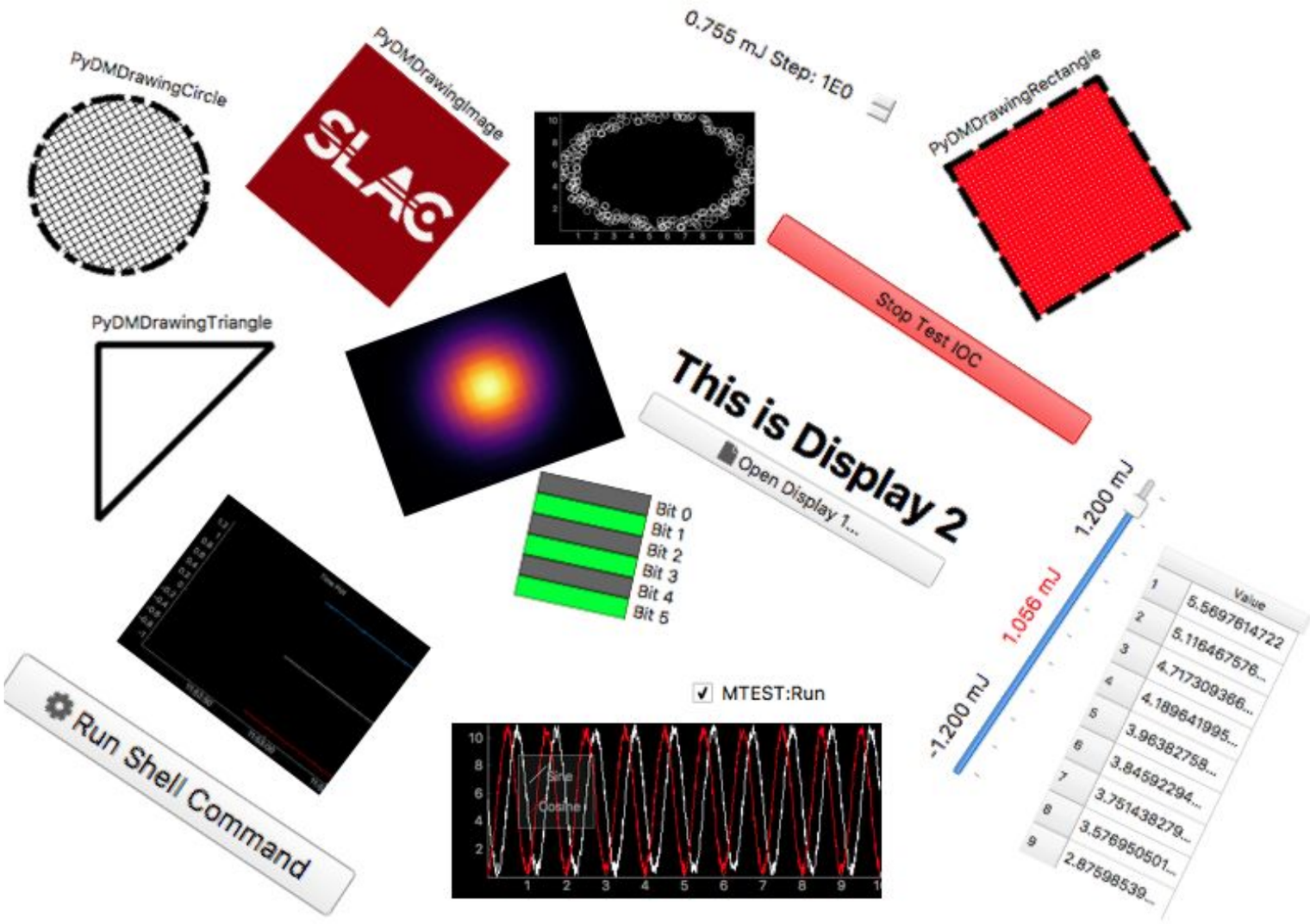


Data Plugins

- PyDM ships with the following Data Plugins:
  - Channel Access (ca://)
    - PyEpics
  - Archiver Appliance (archiver://)
- It can be easily extended to support other Data Plugins and protocols such as:
  - ModBus (modbus://) - See: https://github.com/slaclab/pydm_modbus

Widget Set

Display
Byte Indicator
Image View
Label
Log Display
Related Display Button
Scale
Symbol
Waveform Table



Drawing
Line
Rectangle
Triangle
Ellipse
Circle
Arc
Pie
Chord
Image

Input
CheckBox
Enum Combo Box
Line Edit
Push Button
Shell Command
Slider
Spinbox
Waveform Table

Plot
Time plot
Scatter Plot
Waveform Plot

Container
Embedded Display
Frame
Tab Widget

PyDM at SLAC

- **Deployed:**
  - **LSST Camera Interlock** Monitoring and Test Suite;
    - Using the ModBus Data plugin;
  - UI for the **Skywalker Project** (Automatically delivery of the photon beam to a number of experimental hutches at LCLS);
  - **LCLS Lightpath** (UI to Quickly Guide Beam to Experimental End Stations);
- **Under Development:**
  - **Typhon** (Interface Generation for Ophyd Devices);
  - Building Operator Displays for **Bunch Length (BLEN)**;
  - Building Operator Displays for **Klystron Gallery** and **other subsystems**;

PyDM Beyond SLAC

- **Max Planck Institute for Nuclear Physics in Heidelberg, Germany**
  Using PyDM for a precision mass spectrometer named Pentatrap;

- **LNLS in Campinas, Brazil**
  Using PyDM for the beamlines at current accelerator (UVX) and PyDM will be the standard display manager for the accelerator and beamlines at Sirius, a 4th-generation Synchrotron Light Source;

PyDM Roadmap

- Support to Widget Actions:
  Act on properties (Visibility, Position, Enable Status, etc…)
  based on Channel Values;

- PVAccess Data Plugin:
  Support for Normative Types and Structured Data in general;
  New Widgets for NTTable and NTNDArray;

- PVAccess RPC Data Plugin:
  Support for Services through PVAccess;

- Expand support for Stylesheets;

- Increase Test Coverage and Documentation;

Screenshots from LSST Camera Interlock

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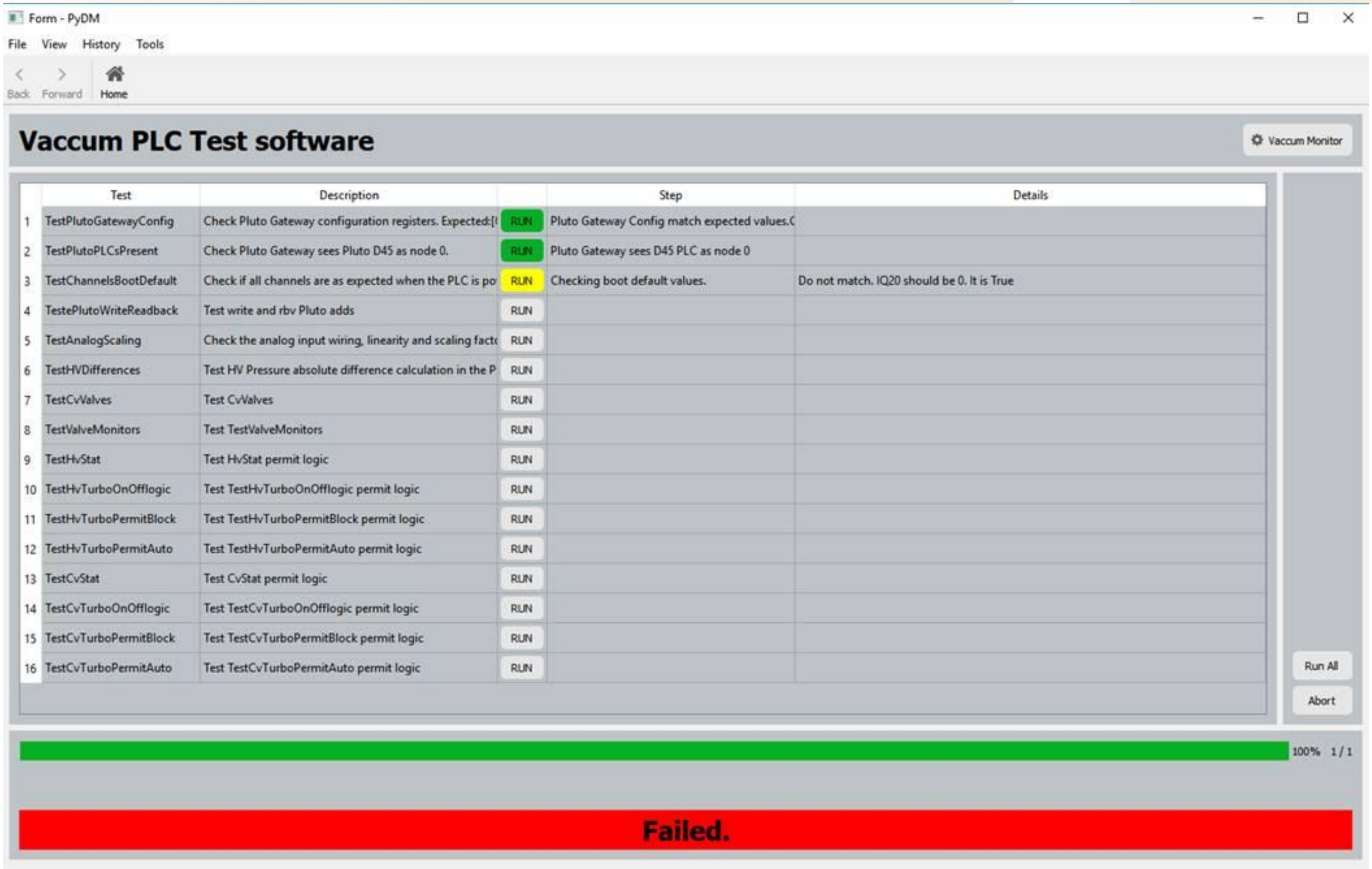
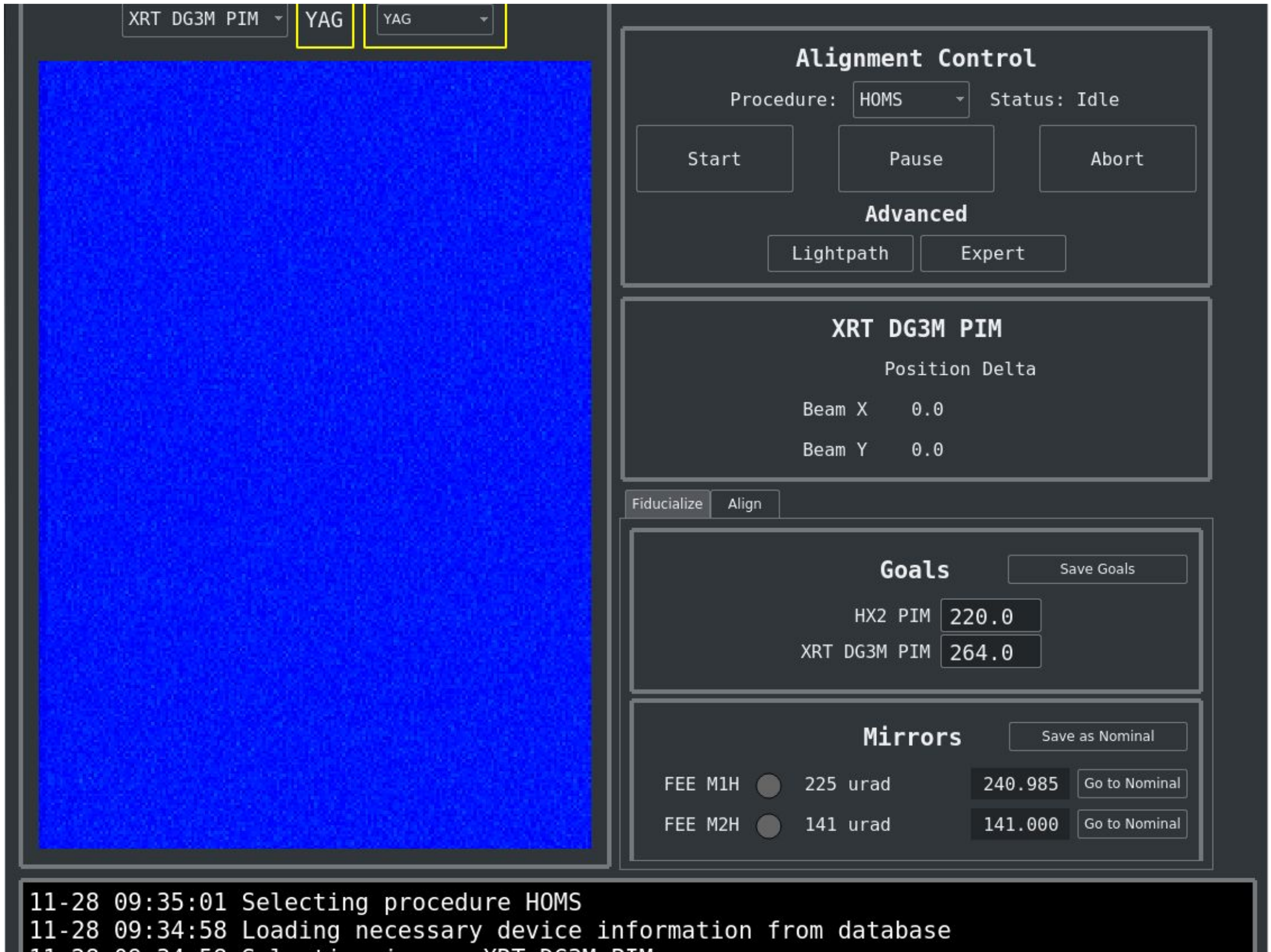
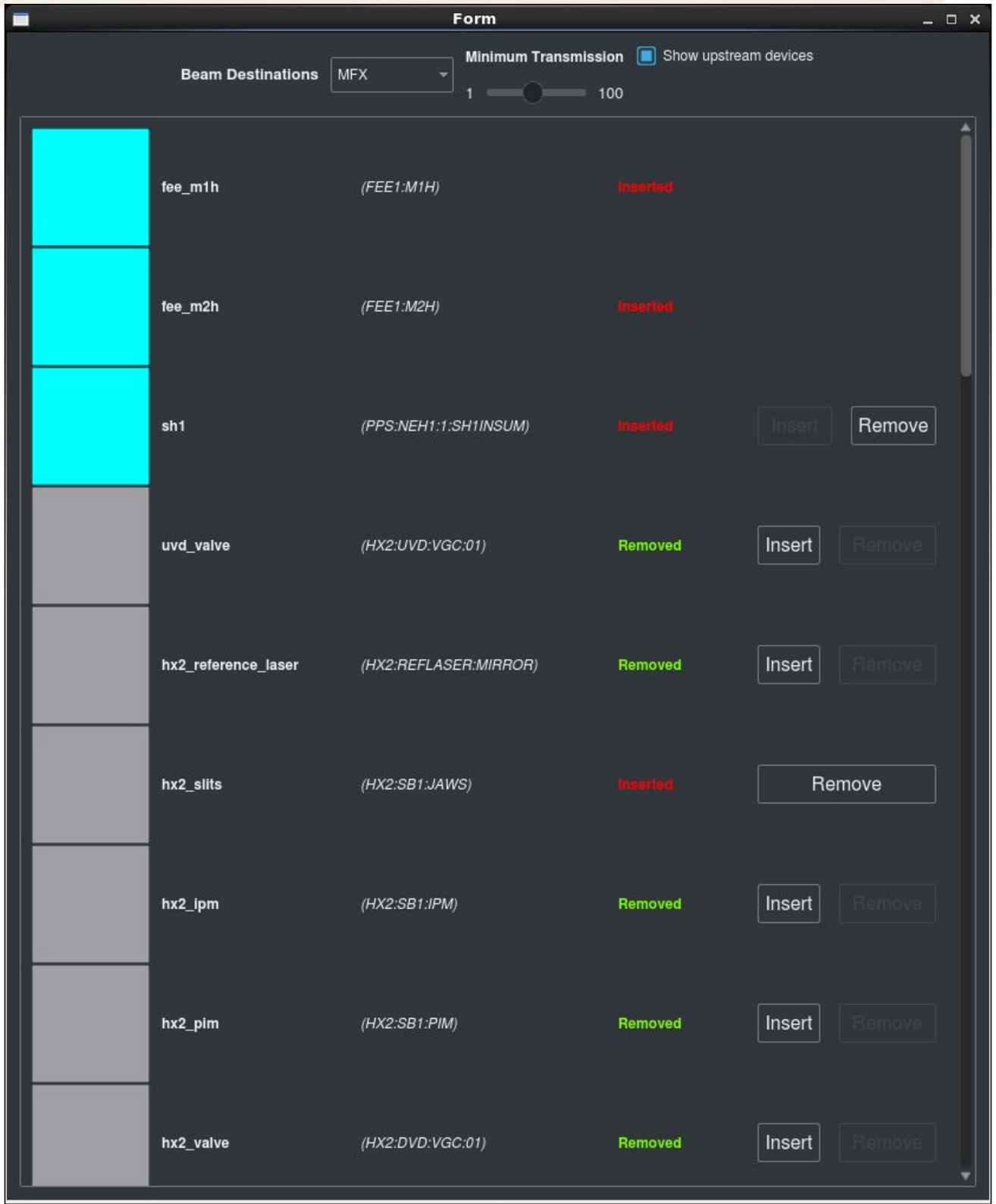


Screenshots from Bunch Length (BLEN)

Screenshots from Skywalker

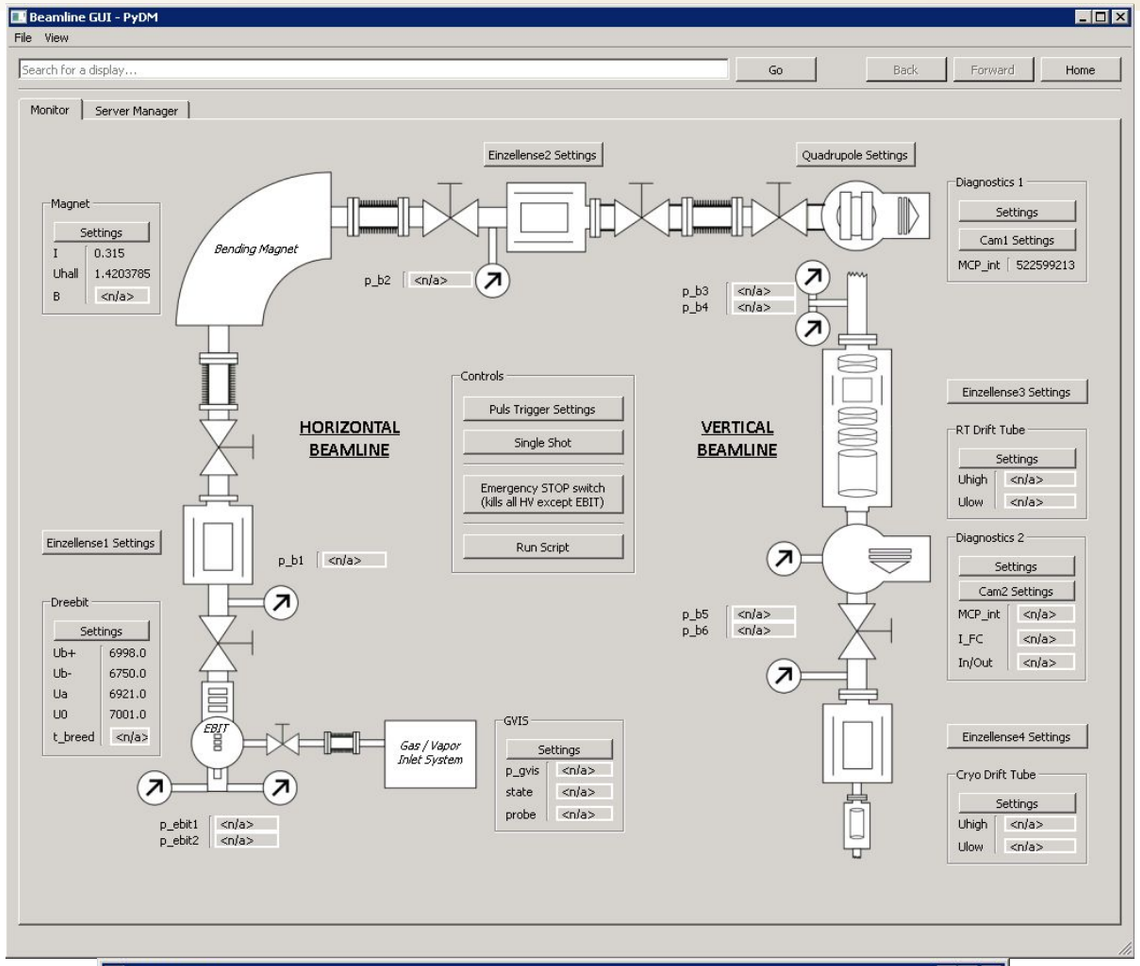


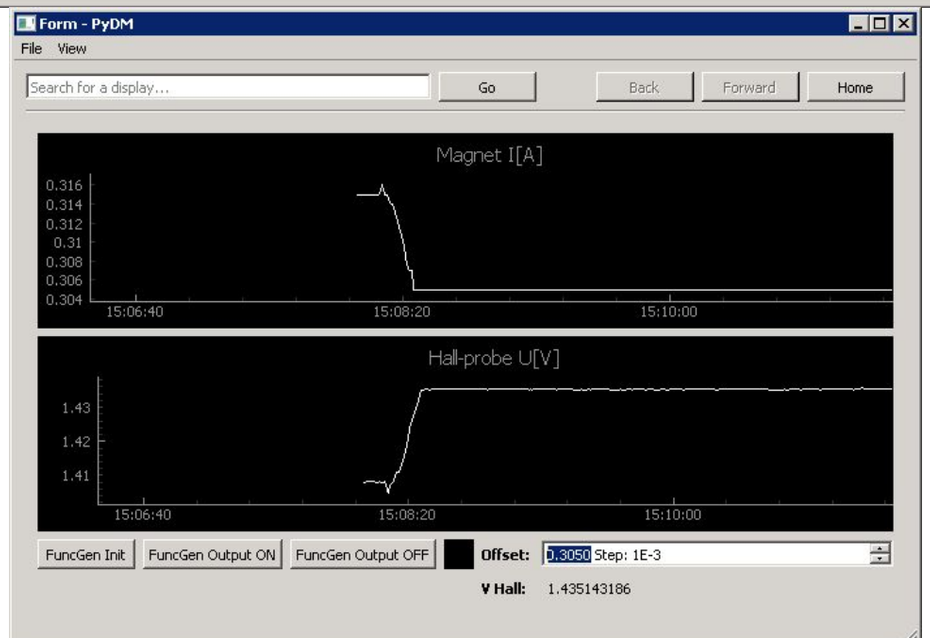
Screenshots from Lightpath

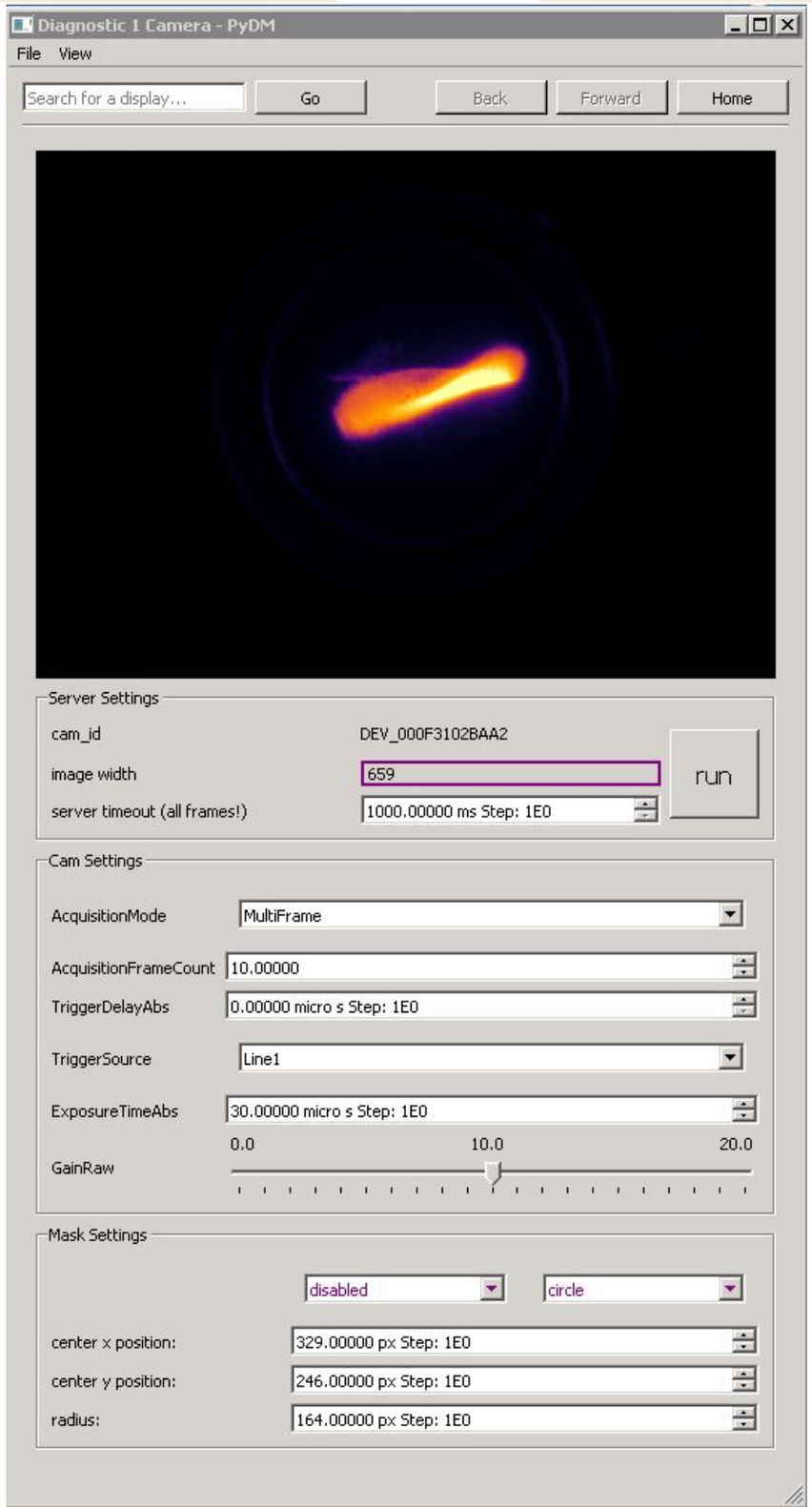


Screenshots from Typhon

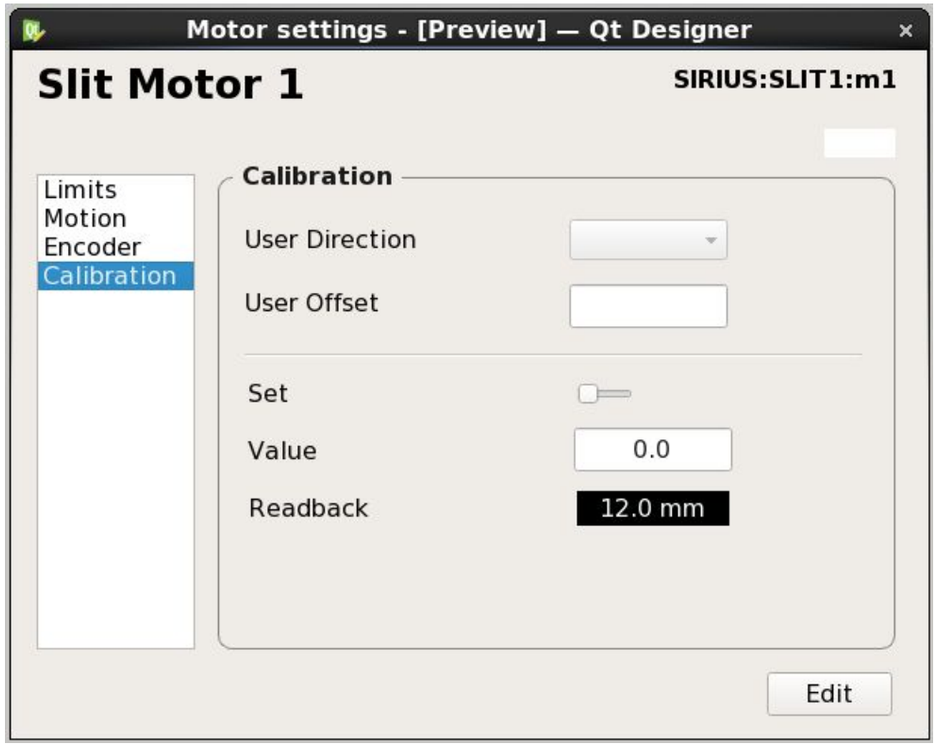
Screenshots from Max Planck Institute

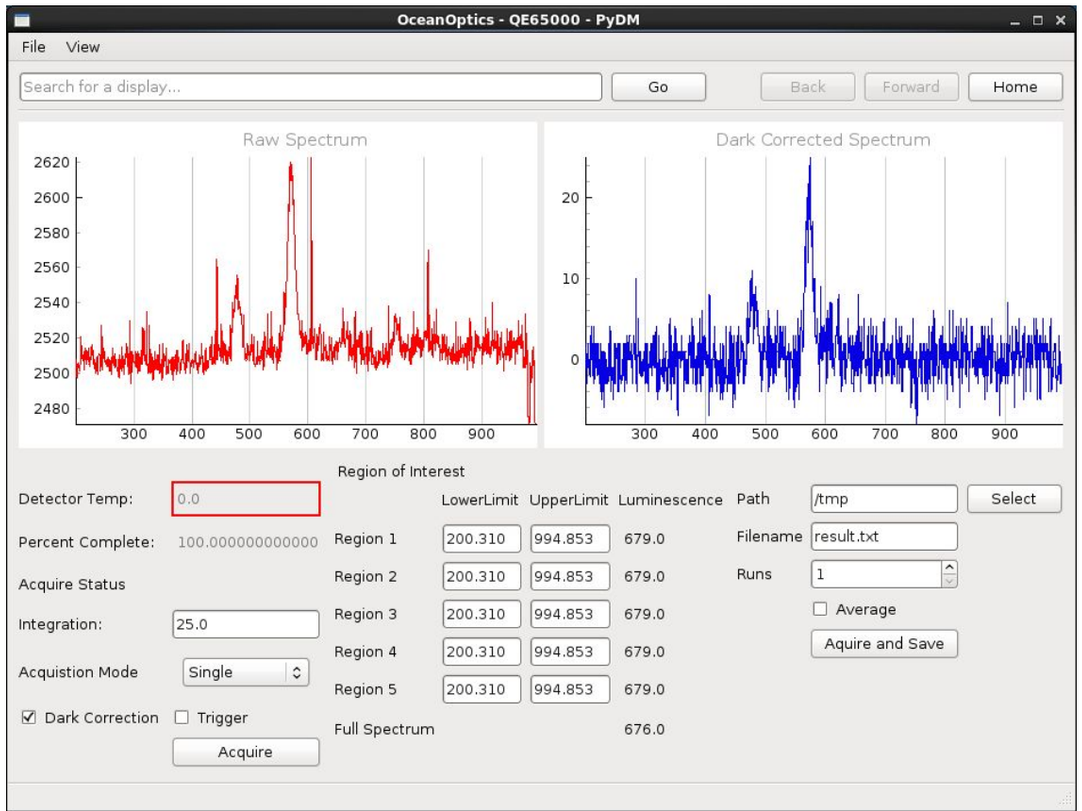






Screenshots from LNLS





Where is PyDM?

GitHub

Code: https://github.com/slaclab/pydm

Docs: https://slaclab.github.io/pydm

Tutorial: https://slaclab.github.io/pydm-tutorial

Gitter

Open Chat: https://gitter.im/pydm/General

Install with Anaconda: conda install -c pydm-tag -c conda-forge pydm

Available for:

Questions? Suggestions? Comments?