

# Experiment Monitor

## Content

- [Content](#)
- [Login](#)
- [Setup environment](#)
- [Run application](#)
- [Configuration](#)
  - Main control window started from scratch and with configured fields:
  - Set application configuration parameters in main GUI
  - Set signal and background ROI
    - [Waveform detector](#)
    - [Area detector](#)
  - [Monitoring plots](#)
- [Saved files](#)
- [What if something does not work?](#)
- [References](#)

## Login

In order to work with data on shared memory one has to login on specific monitoring node which is set in sxr experiment configuration file. Currently monitoring node is `daq-sxr-mon06`. It can be accessed through the chain of nodes (depending on where you are now):

```
ssh -Y [<user-login-name>@]psdev
e.g.-> dubrovin@psdev7a

ssh -Y [<user-login-name>@]sxr-daq
e.g.-> dubrovin@sxr-daq

ssh -Y [<user-login-name>@]daq-sxr-mon06
e.g.-> dubrovin@daq-sxr-mon06
```



Account `sxropr` do not have a permission to see the data and can't be used to run this app in full scale...

Make sure that your login name have a permission to see xtc and calib data for your experiment, e.g.

```
ls /reg/d/psdm/SXR/srx22915/xtc/
ls /reg/d/psdm/SXR/srx22915/calib/
see the list of files w/o permission issues or check permission directly
id <username>
getfacl /reg/d/psdm/SXR/srx22915/xtc/
```

If you can't see xtc files or calib directory, talk to POC.

## Setup environment

```
source /reg/g/psdm/bin/conda_setup
source conda_setup --reldir /reg/neh/home/dubrovin/LCLS/con-ana-emon
```

First command sets regular psana-conda environment for current default release. Second command is required in current development mode to use updated version of code on the top of stable release `con-ana-emon`.

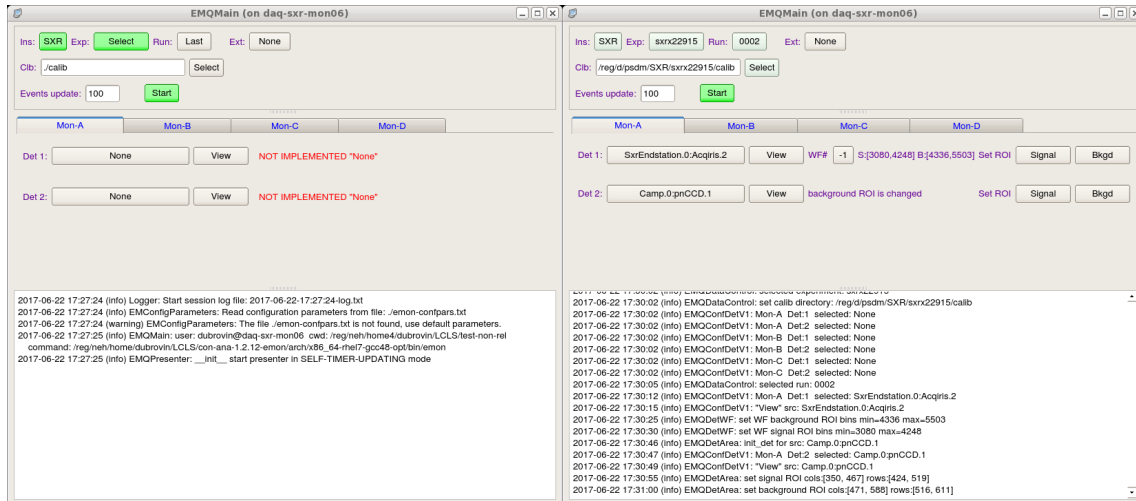
## Run application

```
cd <any-directory>
emon
```

Application saves/reads a file with configuration parameters in local directory (should have write/read permission).  
The file with configuration parameters makes life easy at restart application - most of parameters selected in previous session are already defined.

## Configuration

**Main control window started from scratch and with configured fields:**



## Set application configuration parameters in main GUI

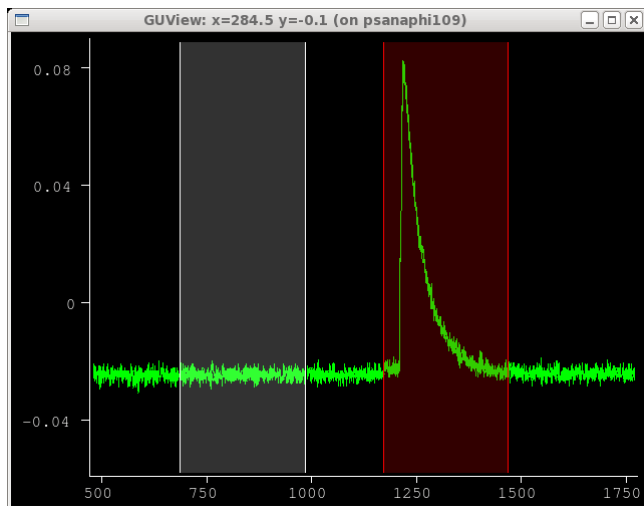
- Exp: Select ->
- Run -> 2
- Ext -> shmem ### make sure that daq is running or use None to load data from xtc file
- Select one of three monitor tabs, e.g. Mon-A
  - Det1: -> GMD, WF or Area -> View -> scroll/drag for signal, set ROI Signal; scroll/drag for background, set ROI Background,
  - Det2: -> GMD, WF or Area -> View -> ...
- Select one of three monitor tabs, e.g. Mon-B
  - Det1: ->...
  - Det2: ->...
- Events update (type in (int) number ~100 or 200)
- Start

## Set signal and background ROI

Setting ROI is very similar for Waveform and area detectors as shown below.

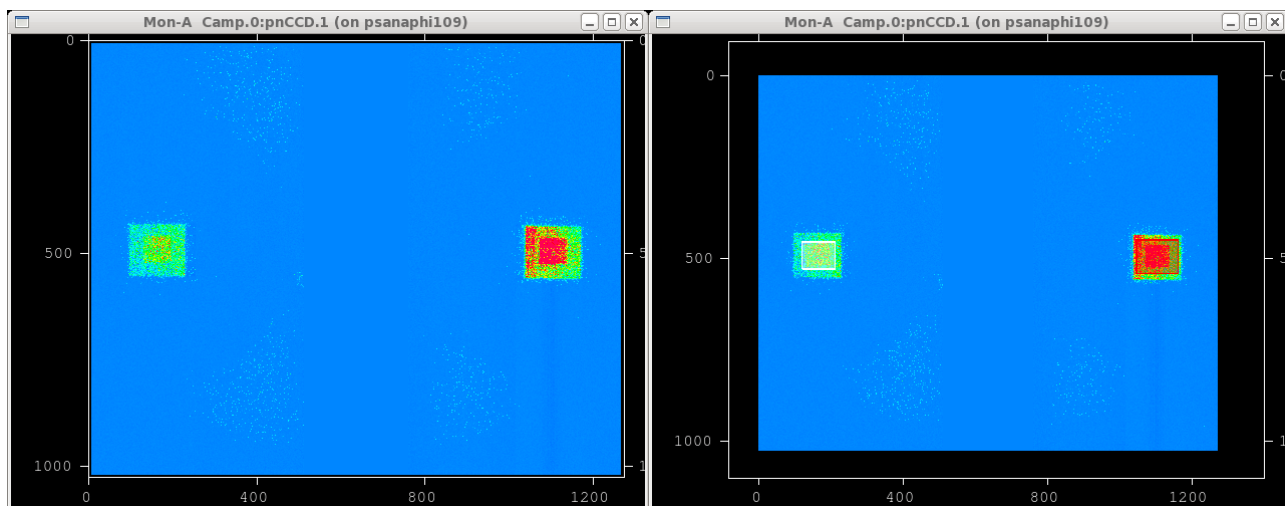
### Waveform detector

- View waveform for selected source and channel
- Select ROI on image by click-drag-and-drop image and scrolling mouse to change zoom.
- Click Set ROI Signal/Bkgd button
- Zoom out to see entire selection



### Area detector

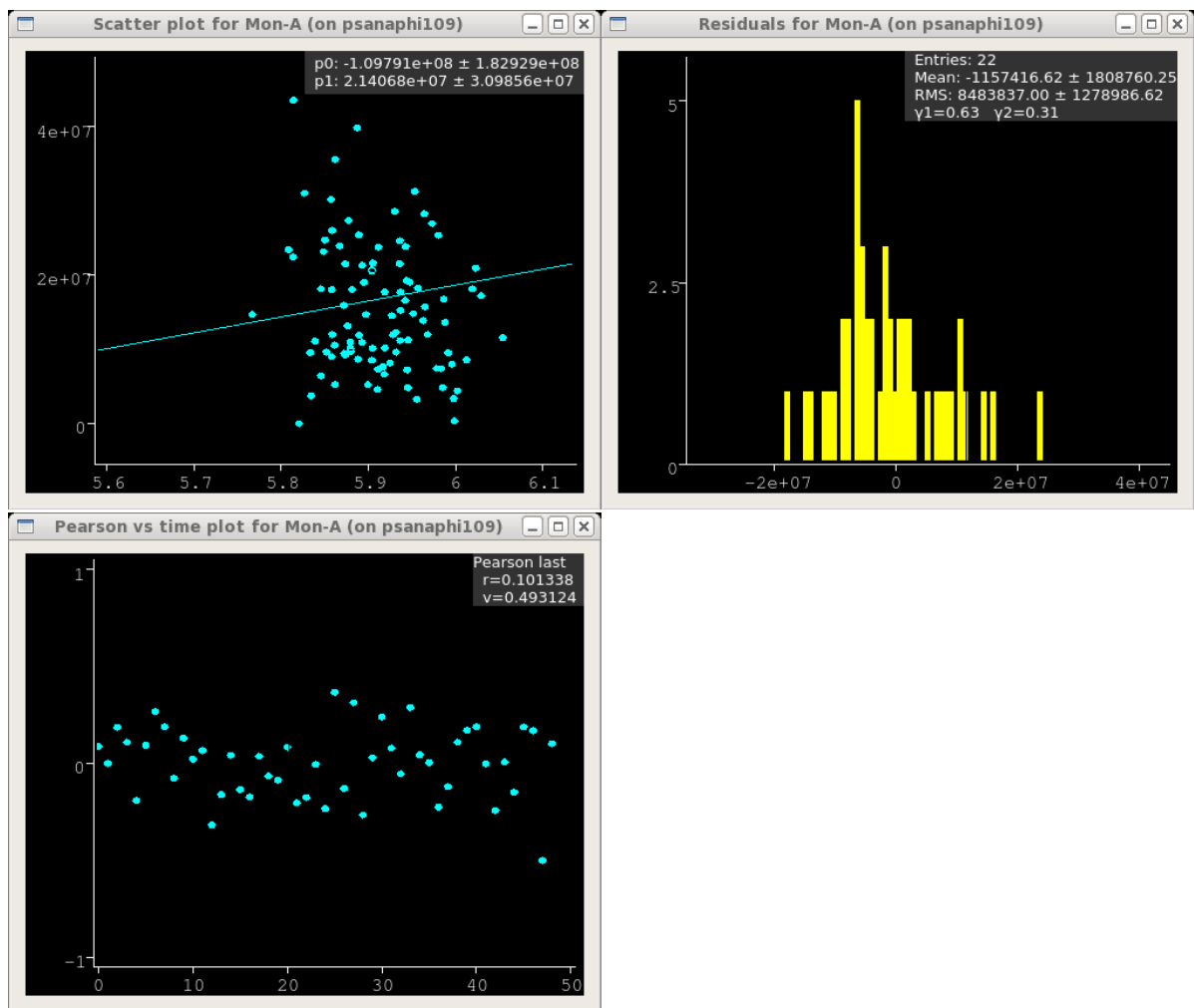
- View area detector image for selected source
- Select ROI on image by click-drag-and-drop image and scrolling mouse to change zoom.
- Click Set ROI Signal/Bkgd button
- Zoom out to see entire selection



### Monitoring plots

When both detectors of the monitor are set, monitoring plots will show up and update automatically after collection of desired number of events.

Three plots are implemented: correlations, residuals, and pearson-r vs time:



If any of plots need in minor scale correction, it can be done by click-drag-and-drop image. For completely off-scale plot it could be easier to close it, then plot will be re-drawn in the next update with current scale.

## Saved files

At exit emon saves a couple of useful files with configuration parameters and session log-file:

```
./emon-confpars.txt
/reg/g/psdm/logs/emon/2017/06/<log-file>.txt
```

## What if something does not work?

This is a new app, so it is not perfect and some glitches are very possible. Many protections for different situation are included, but most likely not all. Below is a most probable list of problems with recommendations what to do if it happens.

#	Problem	Reason	Solution
1	Everything is frozen and app does not respond on any button	<ol style="list-style-type: none"> <li>problem with event source (shared memory)</li> <li>something else is possible</li> </ol>	kill and restart app: <ul style="list-style-type: none"> <li>Ctrl-Z</li> <li>kill %1</li> <li>emon</li> </ul>
2	Plot does not show anything	<ol style="list-style-type: none"> <li>went off-scale due to changed parameters</li> <li>no-data</li> </ol>	close plot, at next update it will be re-opened with current scale

3	Plot shows two graphics...	It happens due to non-synchronous access to graphic objects. Previous event is not cleaned up.	Wait for next event for monitoring plots or click "Next" button for detector plot
4	Configuration should be completely different...	May be needed in changing run or experiment, or in order to start configuration from scratch	rm emon-confpars.txt

## References

- [Calibration Management Tool](#)
- [Geometry History](#)
- [Gain History](#)