

## Charm-Testing the detector - CHARMing Software Suite

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In the last year I worked on implementing a new software (<https://github.com/zweistein-frm2/CHARMing>) for fast Data Acquisition of Neutron X-Y data. It is called the CHARMing software suite. This software interfaces with the new CHARM detector and with existing Mesytec hardware as used for example in the SANS1 detector. The software was newly designed with the goal of highest data throughput, easy installation, highest reliability and full integration into the Entangle framework.

### Testing the new Charm detector, software setup:

For testing the new Charm detector at a minimum the CHARMing software suite must be installed and the HV power supply must be set up.

Here the installation steps for a x86\_64 Linux machine:

1. Install [Entangle](#) on the target machine.
2. Please download the correct binary for your Linux distribution form [https://github.com/zweistein-frm2/CHARMing\\_binaries](https://github.com/zweistein-frm2/CHARMing_binaries) and install the file.

To install a .deb file use `"sudo apt-get install ./CHARMing-package.deb"` .

To install a .rpm file use `"sudo rpm -i ./CHARMing-package.rpm"` .

This installation creates several files in /usr/local/bin needed to finalize the installation:

```
/usr/local/bin/charm  
/usr/local/bin/sudo-charm.sh  
/usr/local/bin/entangle-install-charming  
/usr/local/bin/entangle-install-isegCC2x
```

3. run `"sudo /usr/local/bin/entangle-install-charming"` to install the entangle-charming device support for [Entangle](#)
4. Default configuration of the charming device parameters:  
It is good practice to run the standalone app `"sudo /usr/local/bin/charm"` first with "sudo" rights.  
This will create a default file `/etc/CHARMing/charmsystem.json` which you can then edit to adapt the charm device connection parameters.
5. Optional : Default configuration for Mesytec device support:  
Run `"sudo /usr/local/bin/charm --mesytecdevice"` first. This will create a default file `/etc/CHARMing/mesytecsystem.json` that you can then edit to adapt the mesytec device connection parameters.
6. After 3. You should find the file `ERWIN_detector.res` in the directory specified in `/etc/entangle/entangle.conf` . If not then copy the file [https://github.com/zweistein-frm2/CHARMing/blob/master/entangle-charming/entangle/example/ERWIN\\_detector.res](https://github.com/zweistein-frm2/CHARMing/blob/master/entangle-charming/entangle/example/ERWIN_detector.res)

to `/etc/entangle/ERWIN_detector.res`

and edit the file to suite your parameters.

7. Done: run `"entangle-server ERWIN_detector.res"` to start the entangle server for CHARMing .

The Charm device is now available as a Tango Instrument using the CHARMing software suite.

For highest data rates it is necessary to run as root:

`"sudo entangle-server ERWIN_detector.res"`

8. Install the iseg CC2x device support for entangle: I would suggest to install iseg CC2x device support on a different computer as described in [https://github.com/zweistein-frm2/CHARMing\\_binaries/blob/master/linux/x86\\_64/entangle%20iseg%20CC2x%20interface.pdf](https://github.com/zweistein-frm2/CHARMing_binaries/blob/master/linux/x86_64/entangle%20iseg%20CC2x%20interface.pdf) .

Copy the file `Erwin_2seg.res` to `/etc/entangle` with the command

`"sudo cp /etc/entangle/iseg/CC2xlib/example/Erwin_2seg.res /etc/entangle/Erwin_2seg.res"` .

Edit the file `/etc/entangle/Erwin_2seg.res` to suite your configuration.

Edit the file `Hardlimits.py` inside the entangle installation if needed.

Run `"entangle-server Erwin_2seg.res"` to start the entangle server.

9. Installation of Client Program:

For real measurements Nicos will be used with a –probably by then further developed- `nicos_mlz/erwin_charming` . See the project [https://github.com/zweistein22/erwin\\_charming](https://github.com/zweistein22/erwin_charming)

For a first use it is best to use the [QuangoPlus](https://github.com/zweistein-frm2/QuangoPlus/blob/master/README.md) client, see project <https://github.com/zweistein-frm2/QuangoPlus/blob/master/README.md> .

[QuangoPlus](https://github.com/zweistein-frm2/QuangoPlus/blob/master/README.md) allows real-time display of histogram data and control of the high voltage supply using the Tango instrument network protocol.