COMPASS

First steps in OctoView

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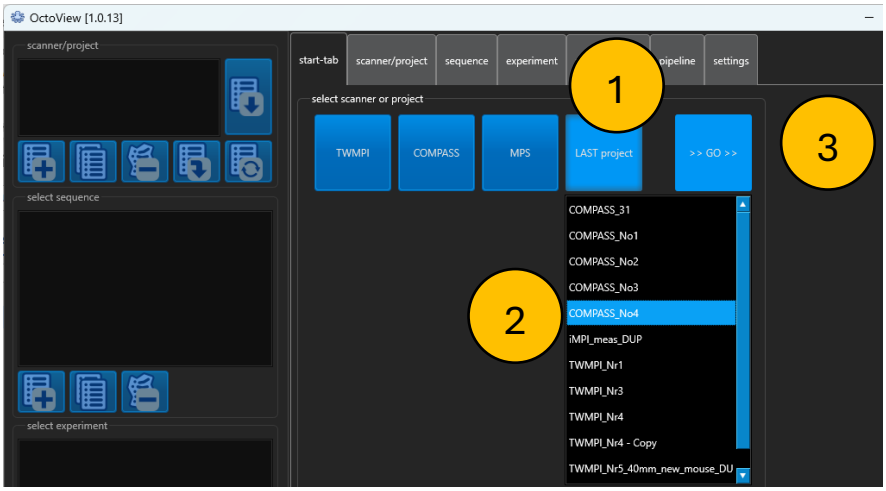
1. Cabling and software installation

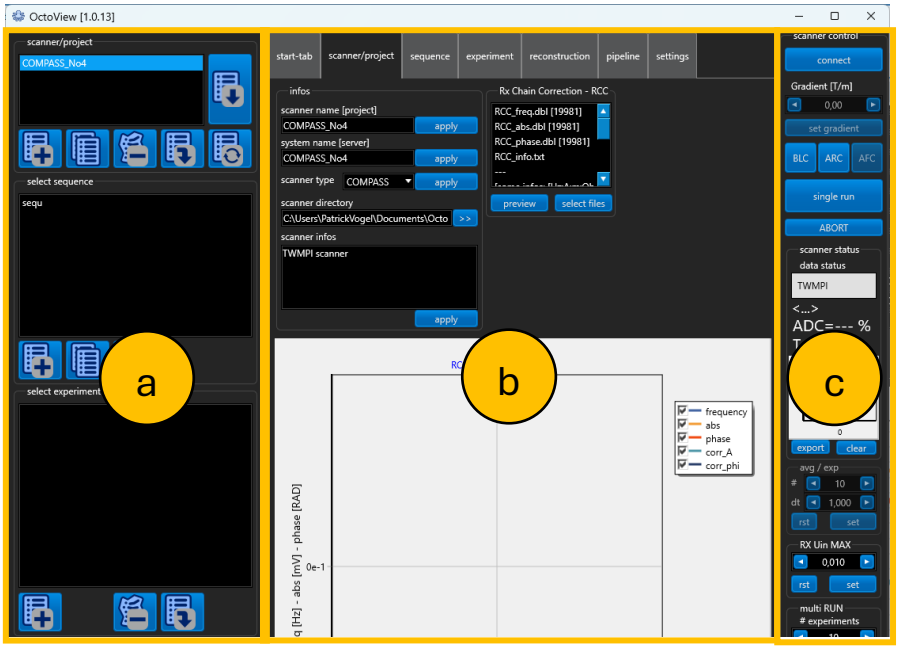
a. Please follow the cabling instruction provided with your device.
b. Install Octoview software via Setup_Octoview.exe. You can download the installation file from here.
c. Please follow the installation steps. Keep in mind that an additional Matlab (Mathworks) environment has to be installed.

2. Quick start

Start Octoview software



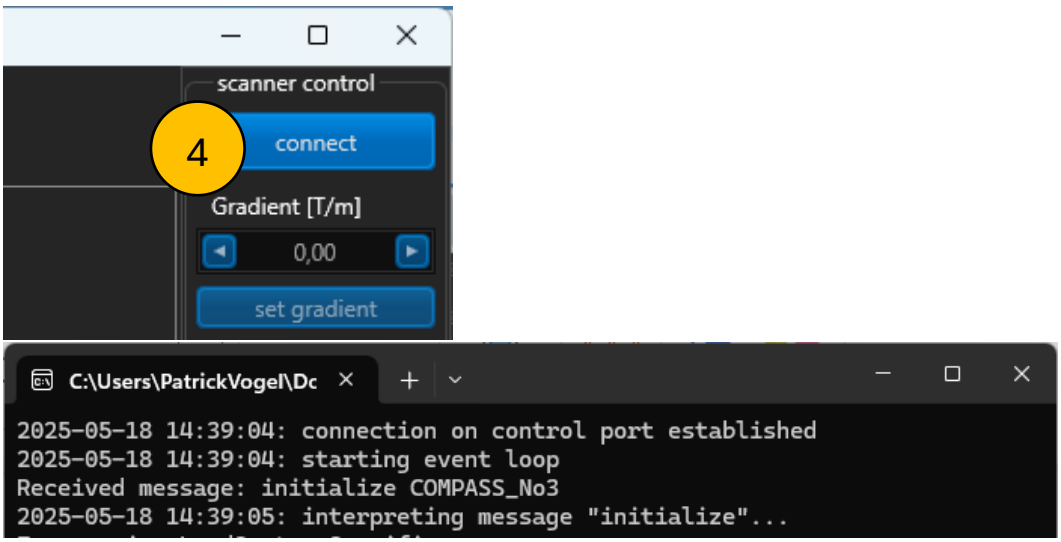
(1) Press „Last project“ button to enable the access to available/last-used projects
(2) Select your device (e.g. COMPASS_No4)
(3) Press “Go” button to load the parameters of the scanner



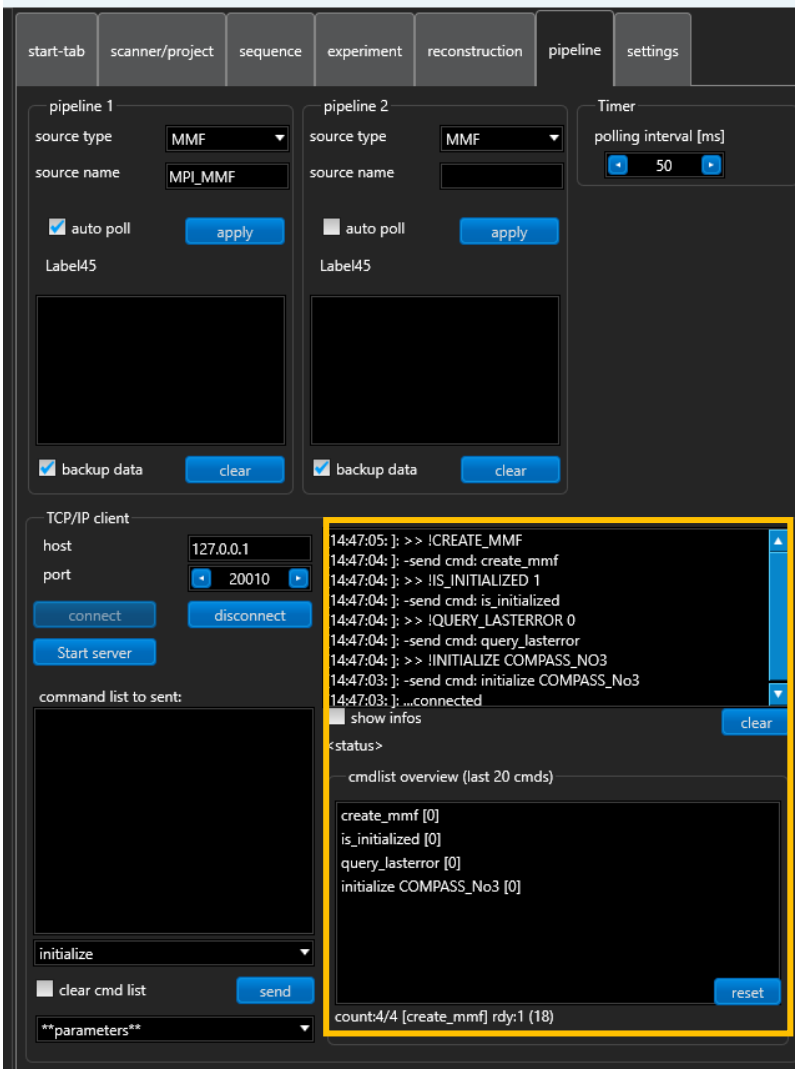
The **area (a)** provides access to scanner information, sequences, experiments, and reconstructions.

The **area (b)** provides more specific information about the scanner, data handling and data processing. It provides access to manipulate sequences and reconstruction parameters and more.

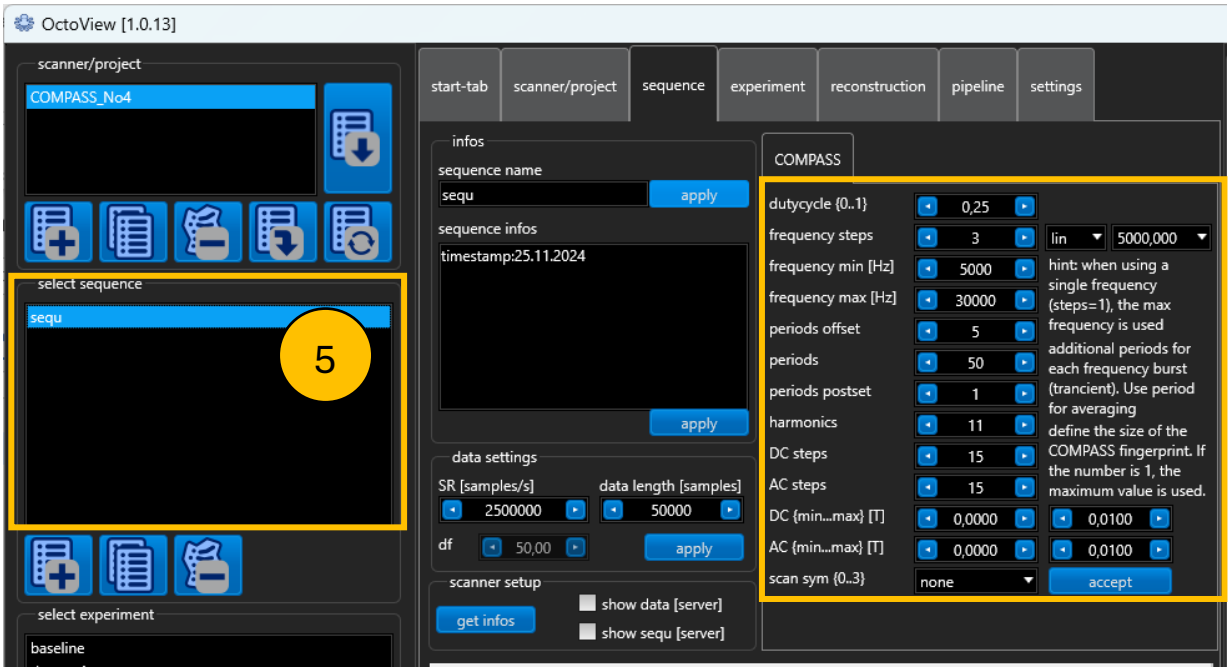
The **area (c)** provides direct access to control the scanner.



(4) Press the “connect” button to start the server and device control.
A “cmd” window in the background (MPI_Server.exe) opens and shows the communication between the OctoView client and the server/device.

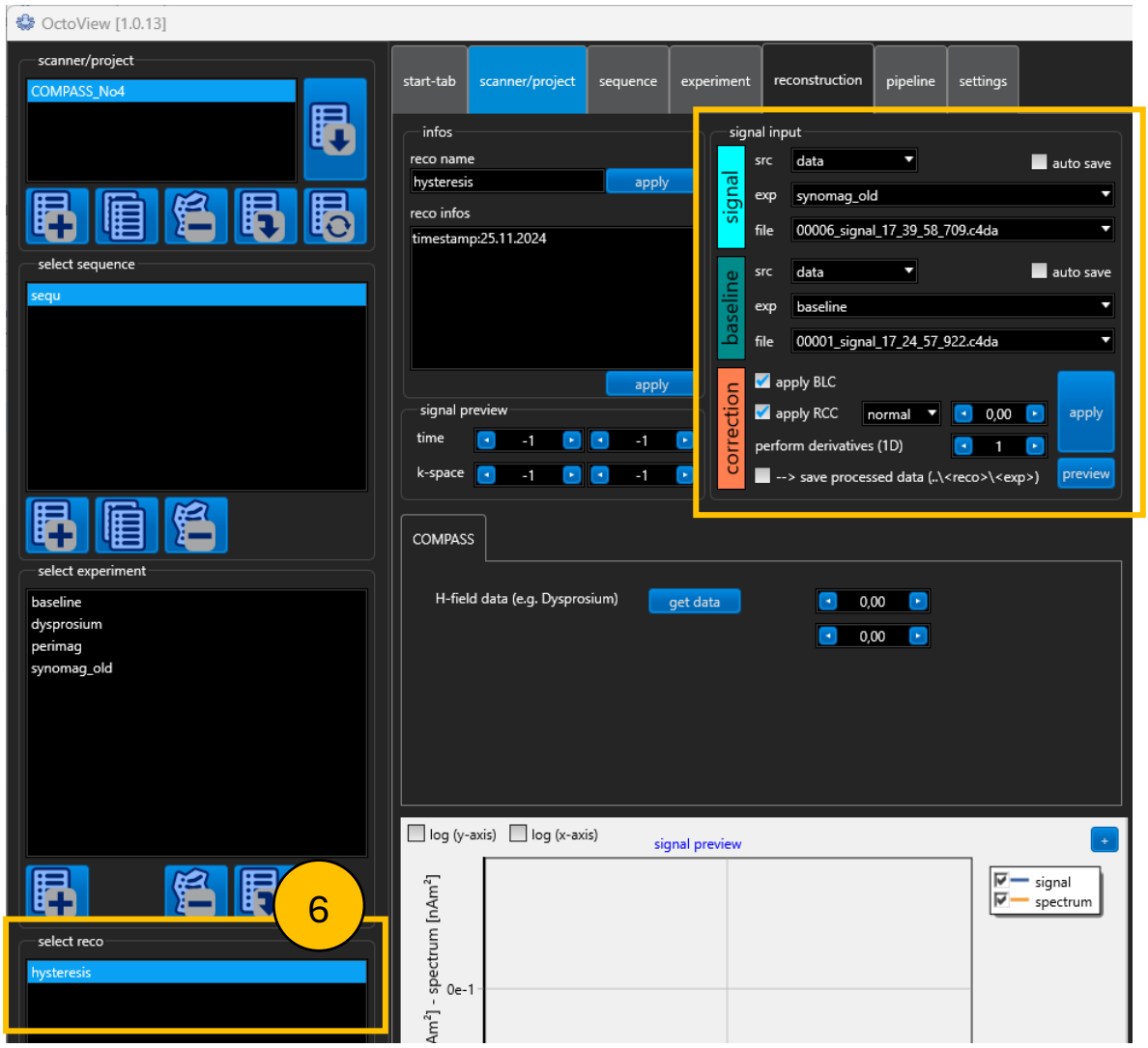


Also on the “pipeline” tab, the communication log between OctoView client and server/device can be found.

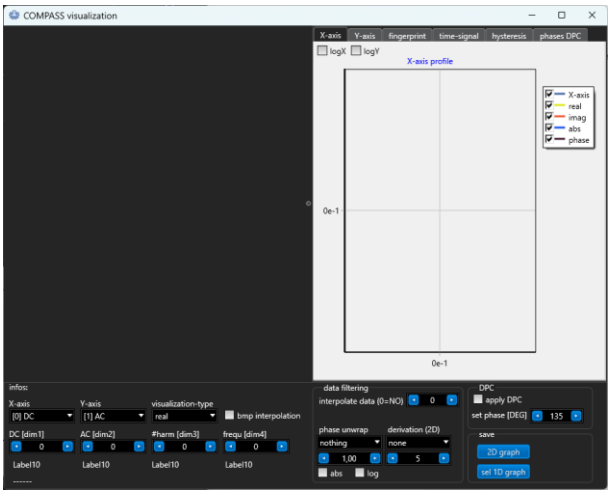


(5) Select in the “select sequence” area on the left the sequence “sequ”: the software shows the sequence parameters in the “sequence” tab.

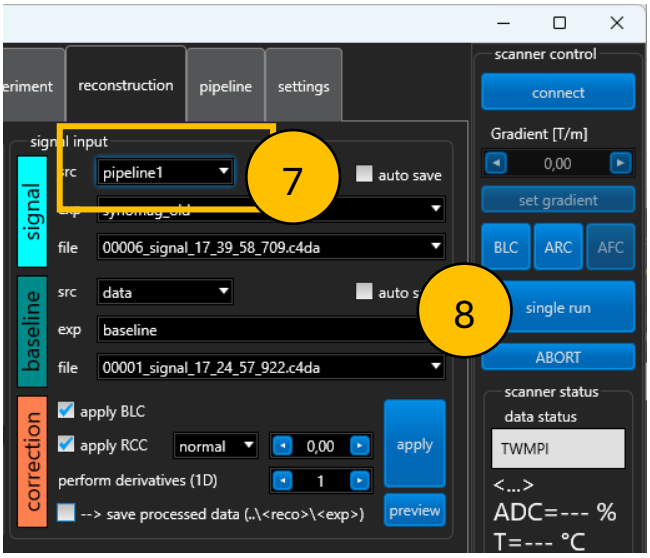
(6) Select in the “select reco” area on the left the reconstruction “hysteresis”: the software shows information about the data processing parameters in the “reco” tab.



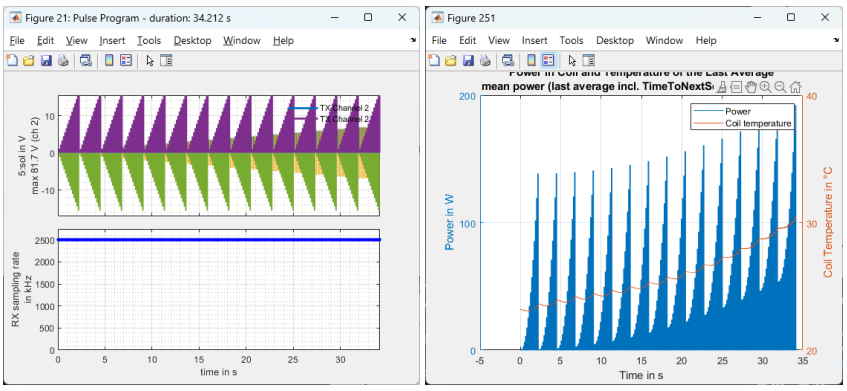
Furthermore, a new window opens for data preview.



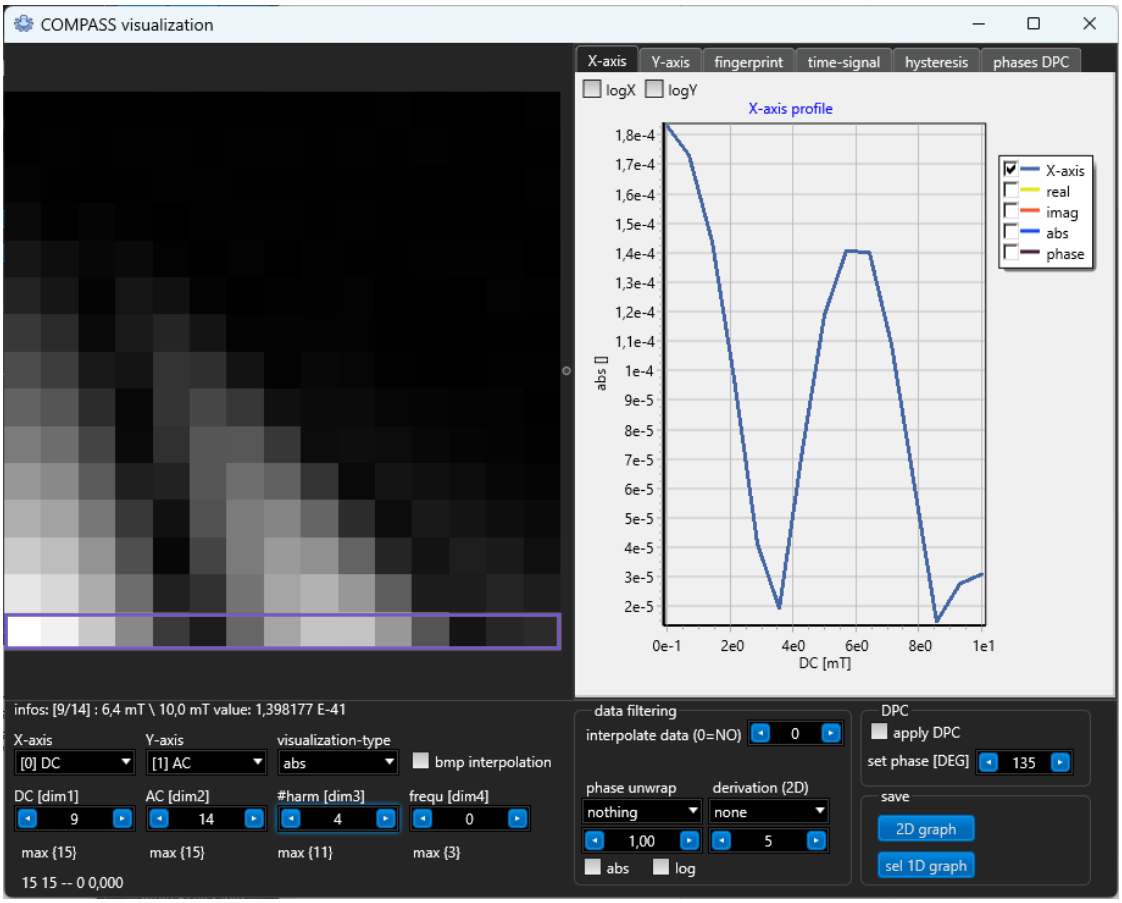
(7) Select from the drop-down menu “pipeline1”.



(8) Put in a sample, e.g., perimag, and press “single run” button.
The first sequence start requires a couple of seconds. When the system is ready, the OctoView client shows a countdown, and the server provides additional information about the sequence and temperature estimation.



After finishing the experiment, the data are automatically processed and displayed in the preview window:



Hint: Check some parameters of the experiment:

(a) Data status: get information about the data quality: ADC value should be between 20% and 80%. Temperature control must be below 50°C.

(b) The graph shows the acquired data representing the complex numbers for all AC/DC/harmonic/ frequency steps (**see section *COMPASS – a short introduction* in the documentation**).

3. Start a high-precision measurement

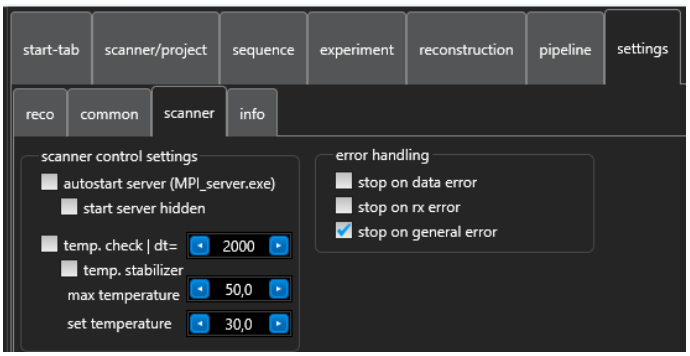
Goal

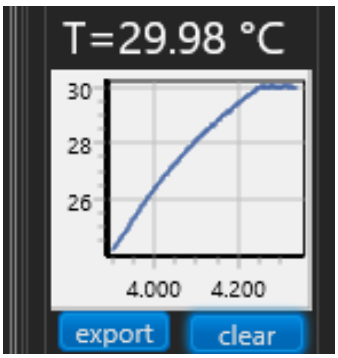
Running a COMPASS experiment with different frequencies for checking hysteresis of the sample.

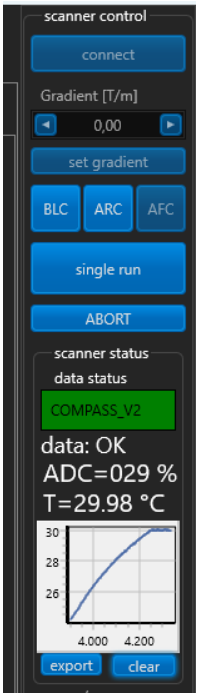
Requires

Dysprosium sample

(a) Set up the temperature control of the scanner:

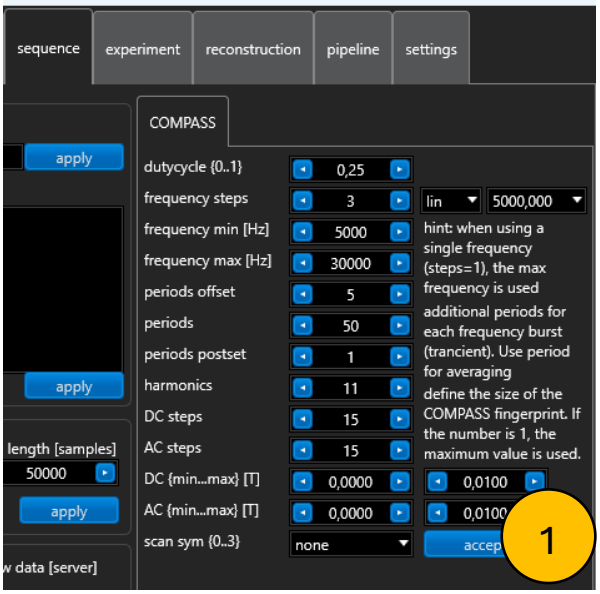






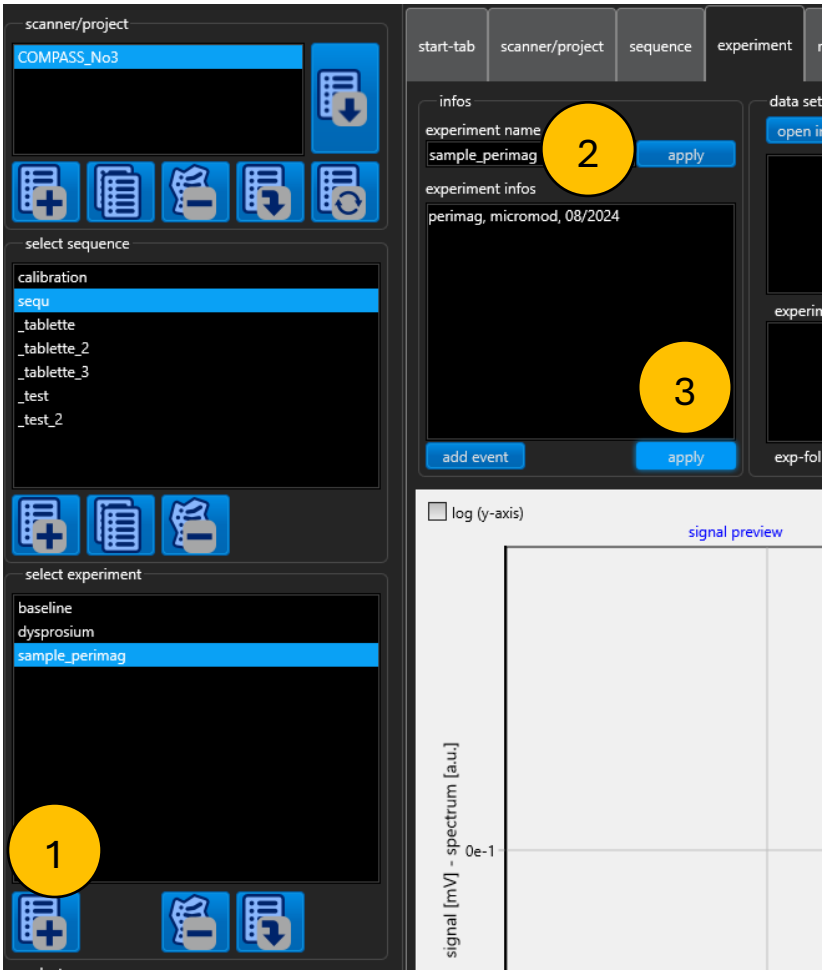
Check “temp. check” box & “temp. stabilizer” box to pre-heat the system to a temperature of 30°C.
The system now runs a heating sequence. You can follow the temperature in the device control area on the right.
Please wait until the system reaches the desired temperature.

(b) Set up the desired sequence



After setting the desired values, press the “accept” button to transfer the information to the server/device.
For more information about the COMPASS parameters, please see the OctoView documentation.

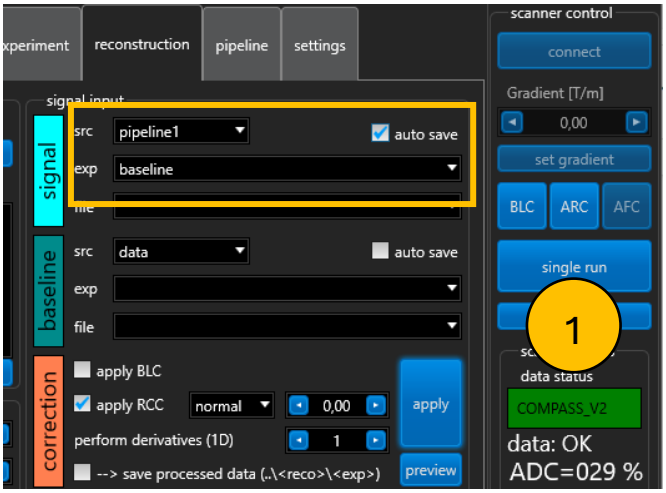
(c) Set up the experiment folders



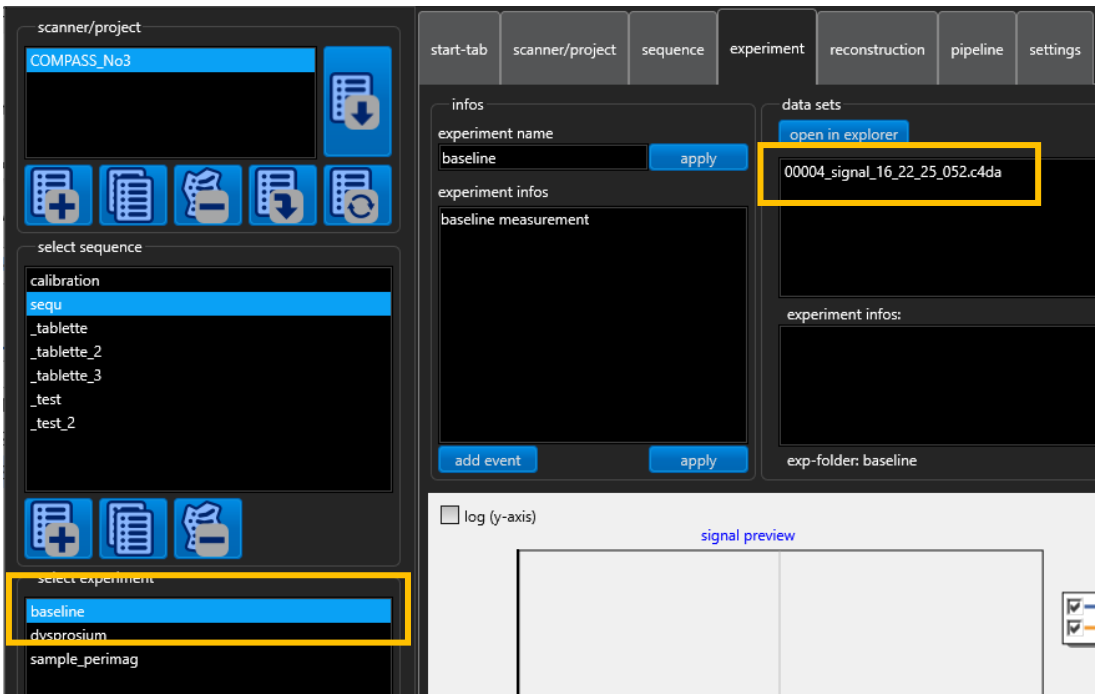
(1) Create new experiment folders by pressing the “+” button.
(2) Change the name of the experiment folder: confirm with “accept” button.
(3) Add additional information about the experiment and confirm with "accept" button.

Create three folders: baseline, dysprosium, sample

(d) Perform baseline measurement

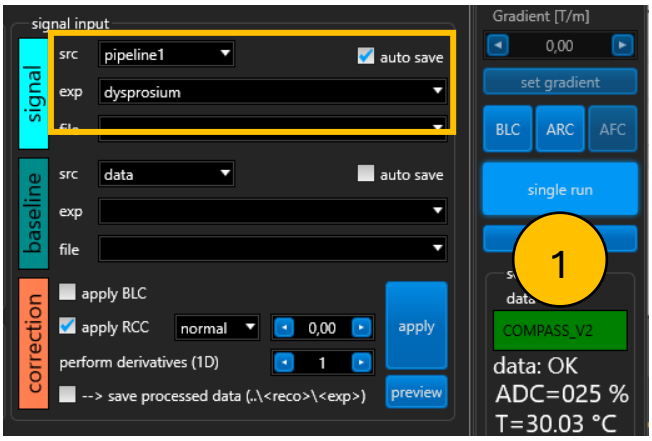


Go to the “reconstruction” tab and select from the drop-down menu:
Signal src: pipeline1
Signal exp: baseline
Check “auto save” box
Remove any sample from the system and press “single run” (1).



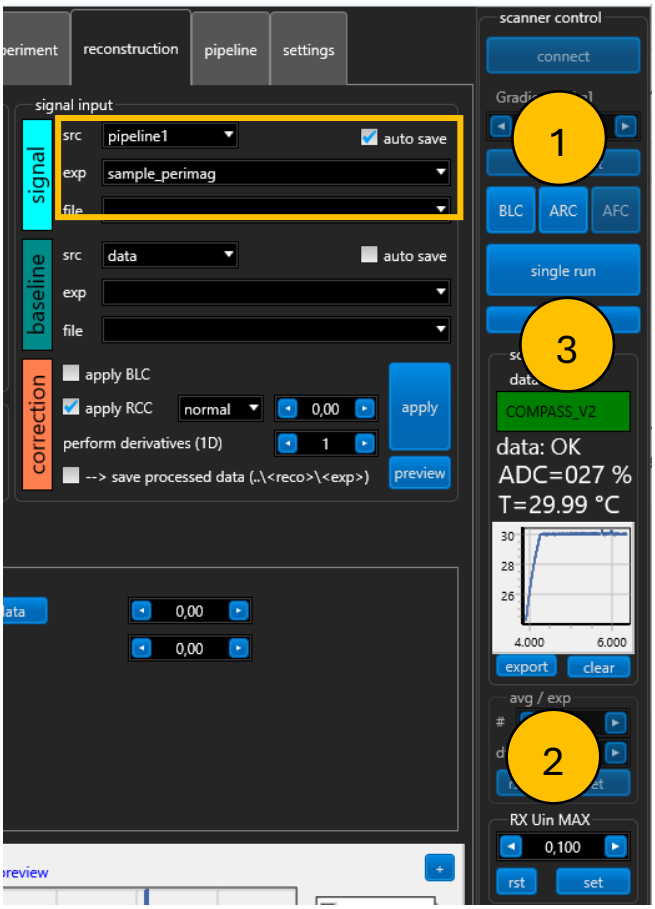
After finishing, in the baseline folder now a new data set appeared.

(e) Perform Dysprosium measurement
Repeat step (d) for dysprosium



(f) Perform sample measurement

Hint: Before measurement, you can set the optimal ADC range for your sample:
Put in the sample and press “ARC” for automatically setting the ADC sensitivity.
The ADC is set to a value of 80% of the maximum value → RX Uin MAX

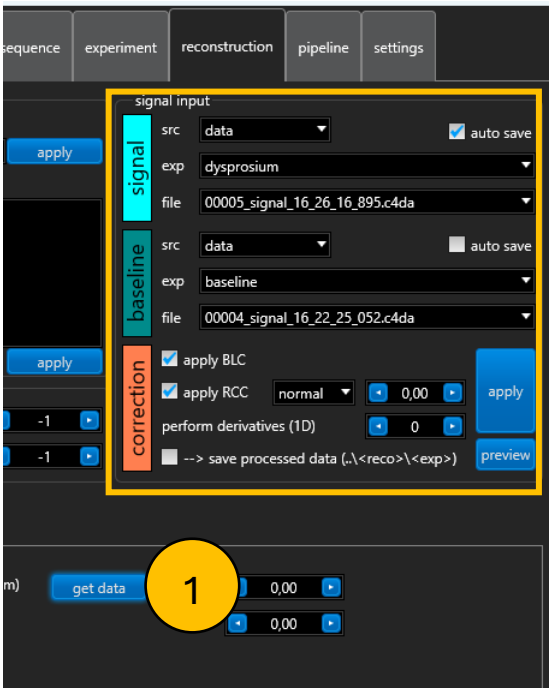


Repeat step (d) for the sample

(g) Put together the data for hysteresis visualization

- Select the dysprosium data set:
  Signal src: data
  Signal exp: dysprosium
  Signal file: <select the saved dysprosium data set>
- Select the baseline data set:
  Baseline src: data
  Baseline exp: baseline
  Baseline file: <select the saved baseline data set>
- Set checkbox: apply BLC
- Set checkbox: apply RCC
- Set “perform derivatives (1D)” = 0

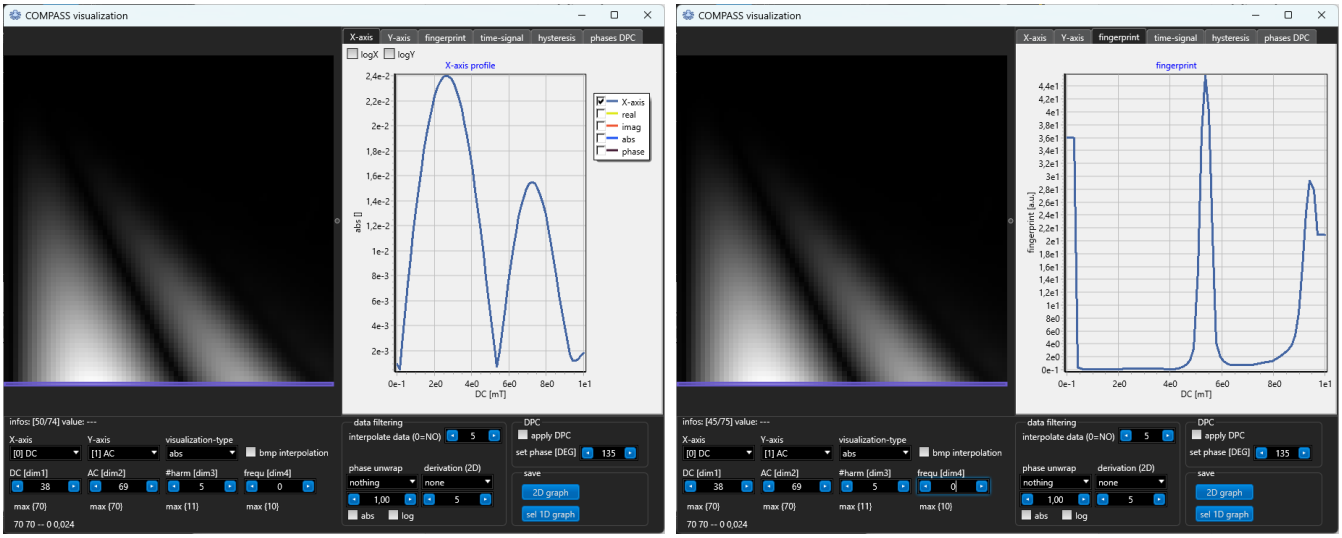
(1) Press the “get data” button for storing the dysprosium data for further visualization.



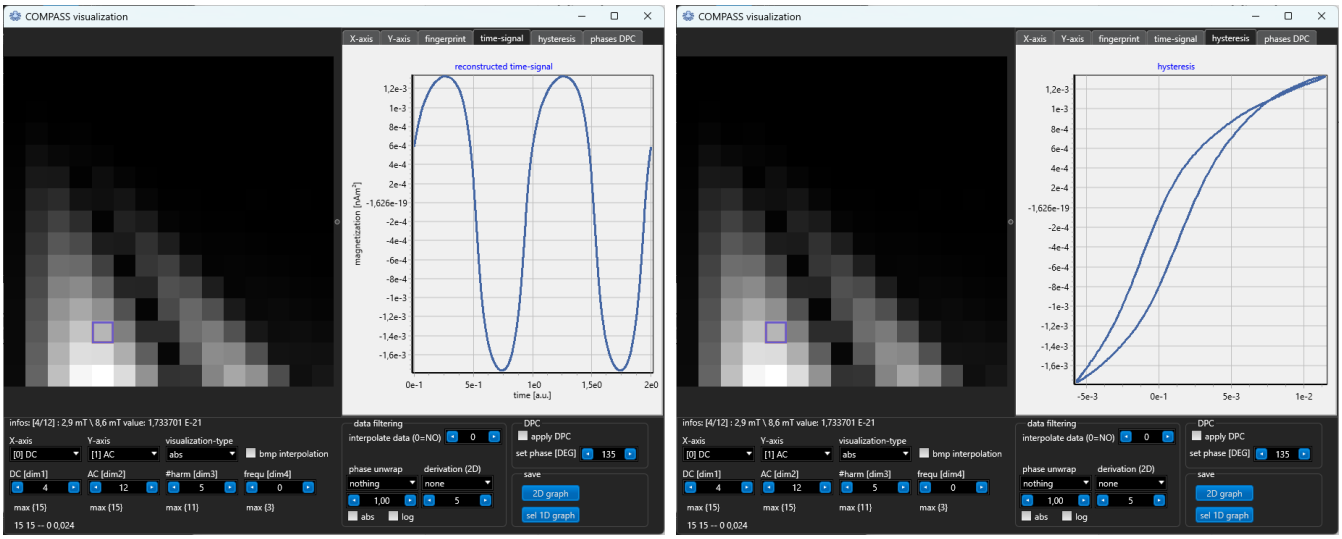
(h) Select the sample:
Signal src: data
Signal exp: sample_perimag
Signal file: <select the saved dysprosium data set>

(i) Examples for different visualizations in the COMPASS preview window

- Chebyshev poynomial and fingerprint for the 5th higher harmonic



- Magnetization curve (M(t)) and hysteresis loop for DC/AC ratio={2.9 mT; 8.6 mT}



- To visualize the induced signal (dM/dt), perform an additional derivation on the signal on the main window