

Dated: November 24, 2021

Initial setup: Setup assistant

- On the first startup, the setup assistant will automatically start and guide you through the initial setup.
- During the process, all required settings for the interferometer are automatically detected and all calibration routines are started automatically.
- Motor calibration: If you like, you can calibrate the directions of the motors inside the TFPI. With this calibration, when centering the piezos, TFPDAS6 will tell you in which direction you need to adjust the motors.

Piezo control via keyboard

- Select piezo group via the keyboard by pressing "1", "2" or "3" (the color of the according slider on the front panel will change)
- Press and hold *Ctrl* and use the arrow keys to move the piezo
- Press "0" to deselect all piezo groups

New and changed keyboard shortcuts

- Ctrl+Shift+A: Start the autoalignment
- Ctrl+A: Toggle the display of accumulated spectra or single scan (previously Ctrl+W)
- Ctrl+W will now close the software (as in all other thaTEC:driver modules). But don't worry, there will be a popup and ask you if you really want to close the application, except if TFPDAS6 is in idle mode

FO signal

- The FO signal is now normalized by the time/channel and the channels/FSR
- The FO signal won't change any more (almost) when changing these parameters or when the alignment parameters differ from the scan settings
- Below the indicator of the FO signal on the left side of the main window, a graph displays the progress of the FO signal
- The red line in the FO graph depicts the current FO threshold value
- The FO threshold value is now located on the front panel right below the FO graph
- Double clicking on the graph opens the graph in a new window which is useful for alignment purposes
- Next to the FO threshold settings, the button "Set" will automatically set the FO threshold value to 80 % of the current FO signal (averaged over the last 20 scans)

Stabilization

- The new stabilization routine has 16 instead of 12 steps to account for the higher sensitivity of the TFP-2 on changed of the dz-piezo.
- The stabilization steps are always performed in a continuous order, even when the TFPDAS6 mode is changed → No lower limit for number of scans any more (previous: 12 scans)
- The parameters time/channel and channels/FSR can still be set in the alignment parameter window but must not be changed any more with respect to the scan settings (FO threshold) due the normalization of the FO signal
- To allow for a fast stabilization, the time/channel can be set as low as 0.25 ms while a minimum of 200 channels/FSR is required
- The new button "dynamic" in the alignment parameter window will switch between the alignment parameters and scan parameters for the time/channel and channels/FSR when certain thresholds are overcome. This allows for a very fast initial stabilization but reduces the initial shift when starting a spectrum.

Scan settings and hardware settings

- Many parameters which were located in the scan settings window have been moved to the new "Hardware settings" window (e.g. z- and dz-calibration values)
- The retrace parameter has been changed from a fixed time to a velocity (V/s) which will speed up the scanning when using a smaller scan range and make scans with a large range more stable
- You can now select your detector from the dropdown list to automatically set the maximum countrate (please note that ≈ 16 Mcounts/s is the limit for the DAQ hardware, thus, the upper limit is currently set to 14 Mcounts/s)

Scan parameters

- The scan parameter window is rather identical to the previous version
- New "Auto adjust" feature: If this button is activated, the scan borders are automatically adjusted to the current ROI settings
- Color code: In TFPDAS6, the first column of the ROI table is either green or red. Green indicates that the parameters are valid while the red color indicates invalid parameter for the corresponding ROI
- In the case of invalid parameters, click on the first column for more information
- On the lower right of the window, a roughly estimated time for a single scan is displayed

Acquisition

- After each acquisition, TFPDAS6 will now automatically switch to transmission mode while the spectrum is still being displayed (stabilization only in background)
- You might notice that, if the "dynamic" parameter is switched off in the *Alignment parameters* window, the number of scans starts with -3 when starting a scan. This is to compensate a drift that occurs when the scan speed in transmission mode differs from the scan speed for the acquisition.
- To prevent any drift, activate the "dynamic" setting in the alignment parameters

Auto alignment

- Keyboard shortcut: Ctrl+Shift+A
- The autoalignment routine is completely new and works much faster compared to TFPDAS5
- When switched into transmission mode, the autoalignment routine is still not finished but there are additional steps performed as indicated by the red message in the upper right window. After the message has disappeared, the autoalignment is finished.
- For best performance, start with a stepsize of 0.5 in the autoalignment tab of the alignment parameters and a threshold of 50 % and adjust them depending on the alignment of your interferometer.

Aux channels at the breakout box

- In the menu, there is an entry "DAQ aux channels" which will open a new window to set the outputs of the Aux channels of our breakout box (3x TTL out, 3x Analog out)
- The outputs are also available via thaTEC:OS