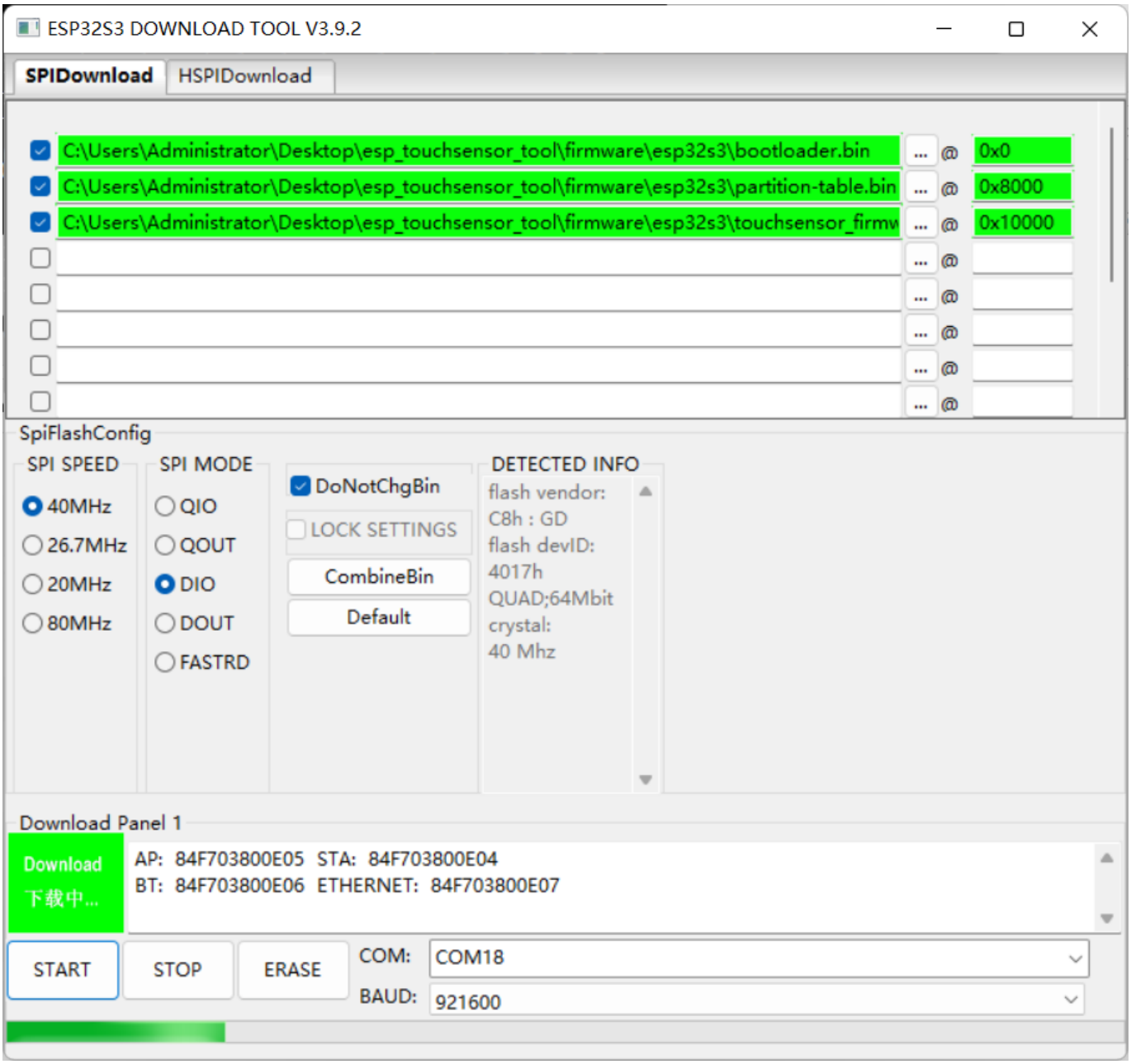
ESP TouchSensor Debugging Tool (Beta)

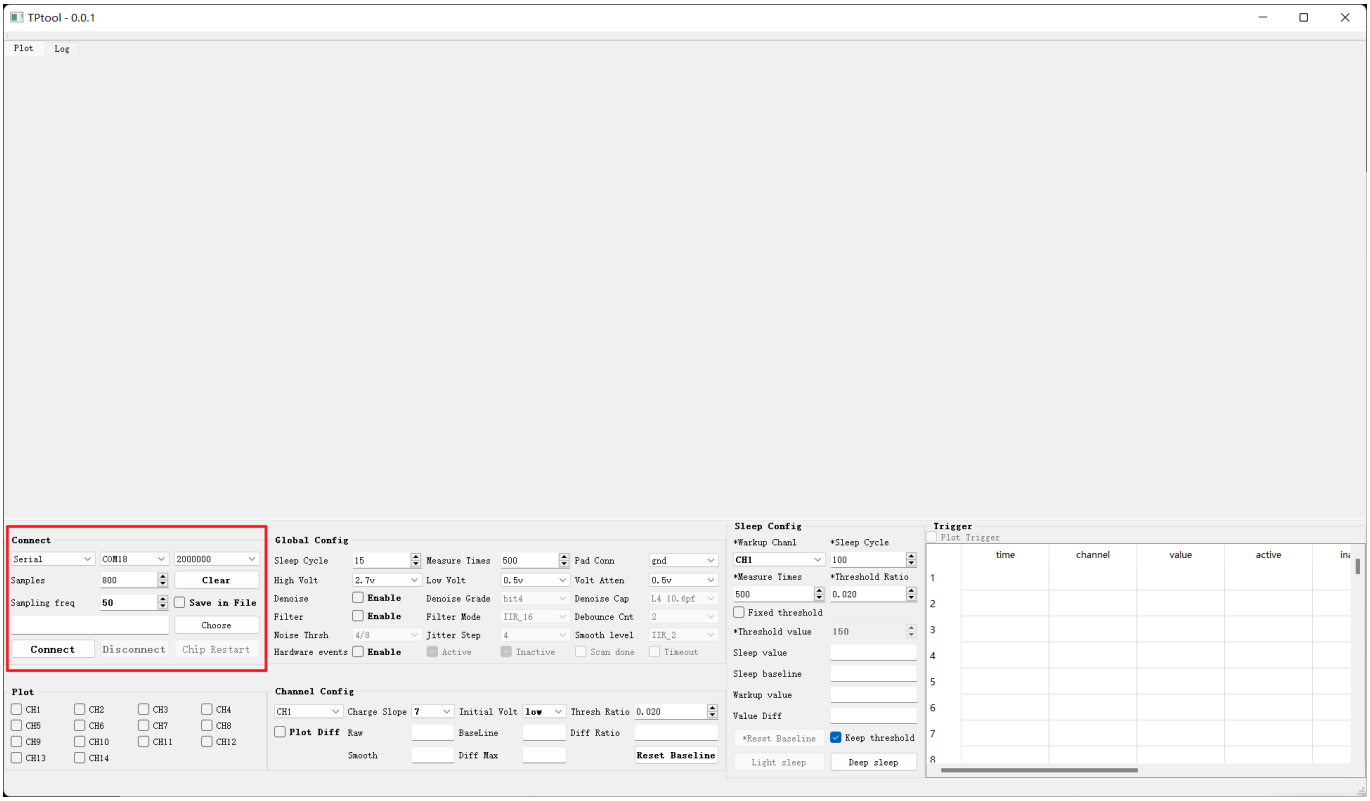
> There are some known issues in current Beta version, if you encounter any problems, please find help or add issues in https://esp32.com/viewforum.php?f=22

Firmware Download

Currently only supports the special firmware (`./firmeware/esp32sx/xxxx.bin`) for touchsensor debugging, please using ESP download tool then following the below configuration for download.



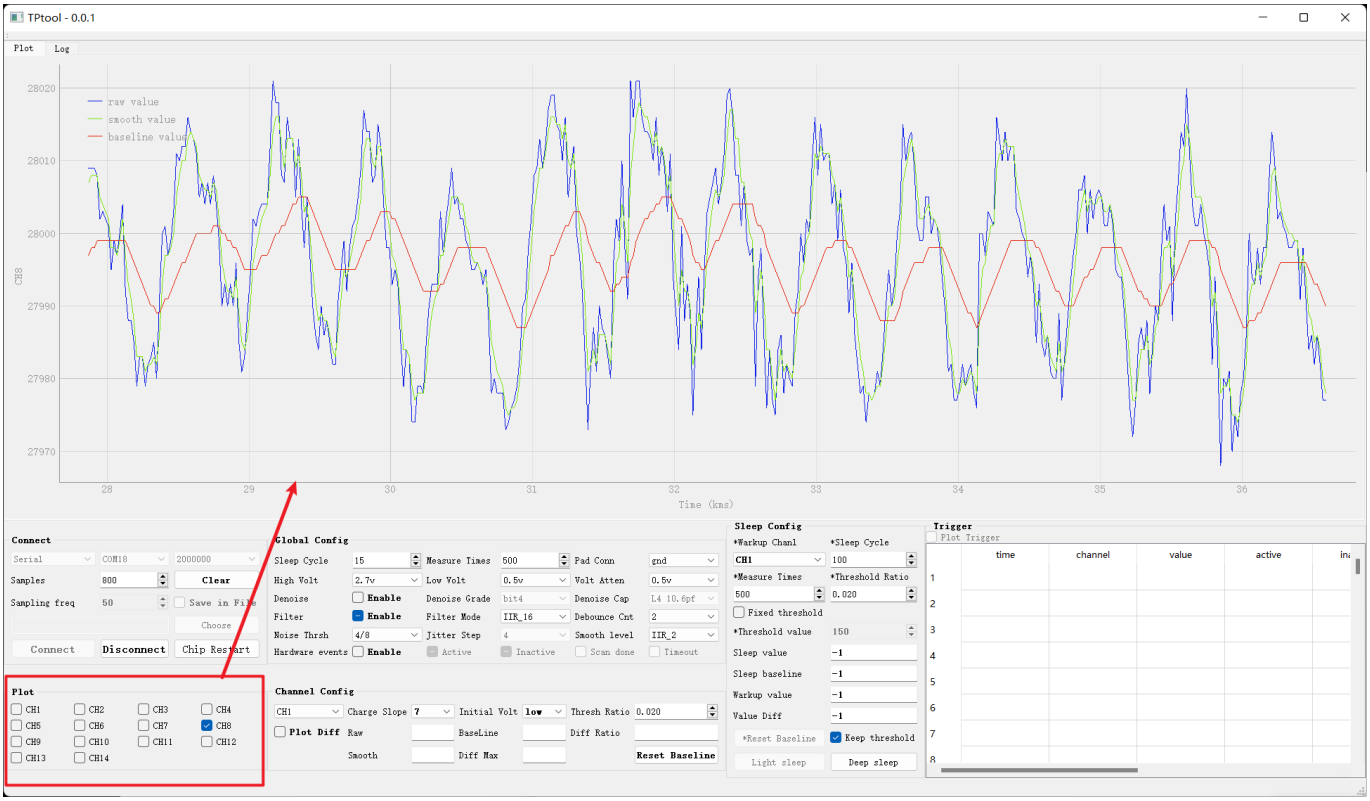
Device Connection



1. Please connect the ESP32SX device through UART to the PC, and choose the baud rate `2000000` .
2. `Save in File` can be selected for storing original data, `Choose` button can be used to select the storage location.
3. `Sampling Freq` is used to control the output frequency of the original data. It is recommended to use the frequency of `50` and below, which means `50` frames data will be output per second. Each frame includes a sampling data of all channels.
4. `Samples` is used to control the size of the Buffer drawn by graphics. `500` represents 500 points for each channel, if the `Sampling Freq` is `50` , which means each channel will draw the latest 10 seconds of data.
5. Click `Connect` to connect device

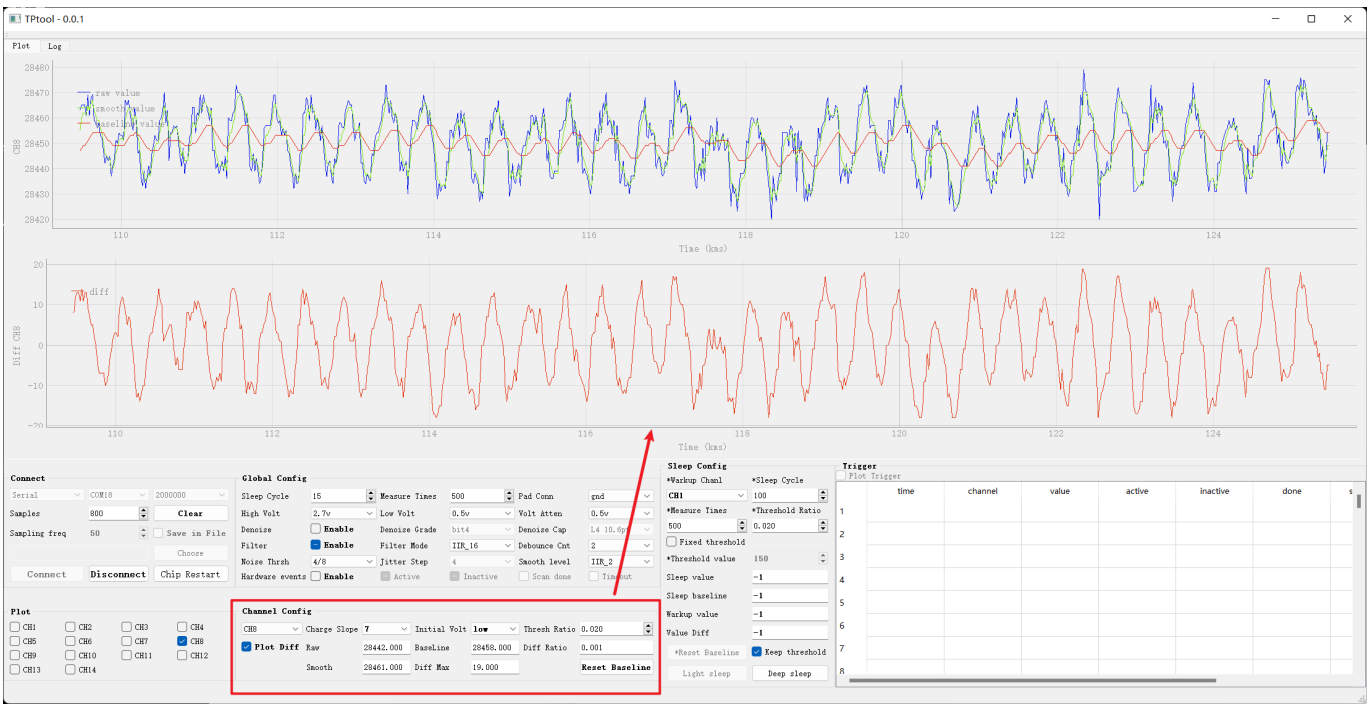
> It is recommended that after the connection, click the `Chip Restart` once, the software will get the initial configurations when the chip restarts, and update it to the UI.

Draw the Touchsneosr Data



1. Please check the channel number from the `Plot`, and then the data of the corresponding channel will be drawn on the screen in real time.

2. You can check up to all 14 channels, but please note that if the Touch IO is used for other usage (eg. used for motor control), please **Do Not Check** it to avoid the Possible Damage.

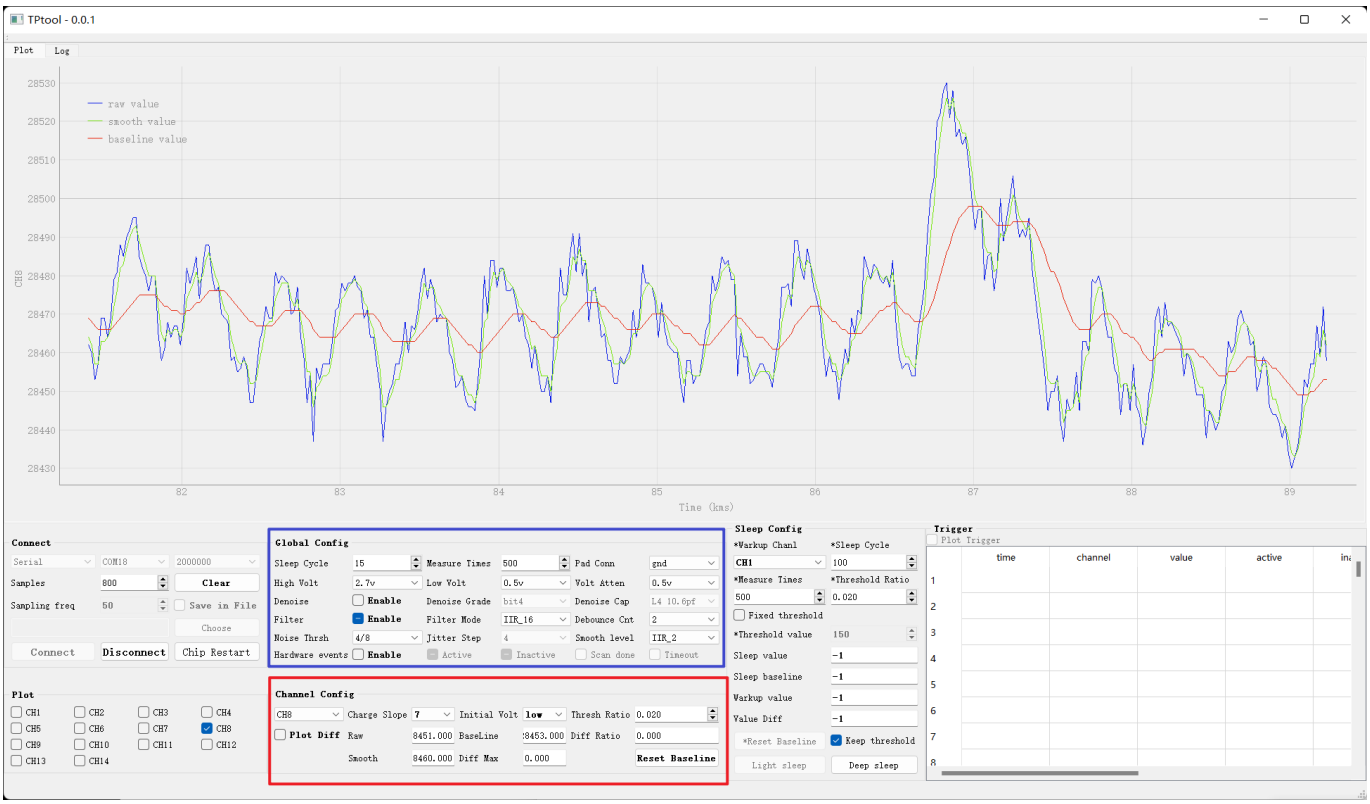


1. Select the Channel of interest in the `Channel Config`, then a number of measurement data of the channel will be displayed in the editing lines.

2. Checking `Plot Diff` will display the `Diff` values of the Channel. `Diff = smooth - baseline`, just in brief when the `Diff` is greater than `Baseline * Thresh Ratio`, the `Active` event will be triggered.

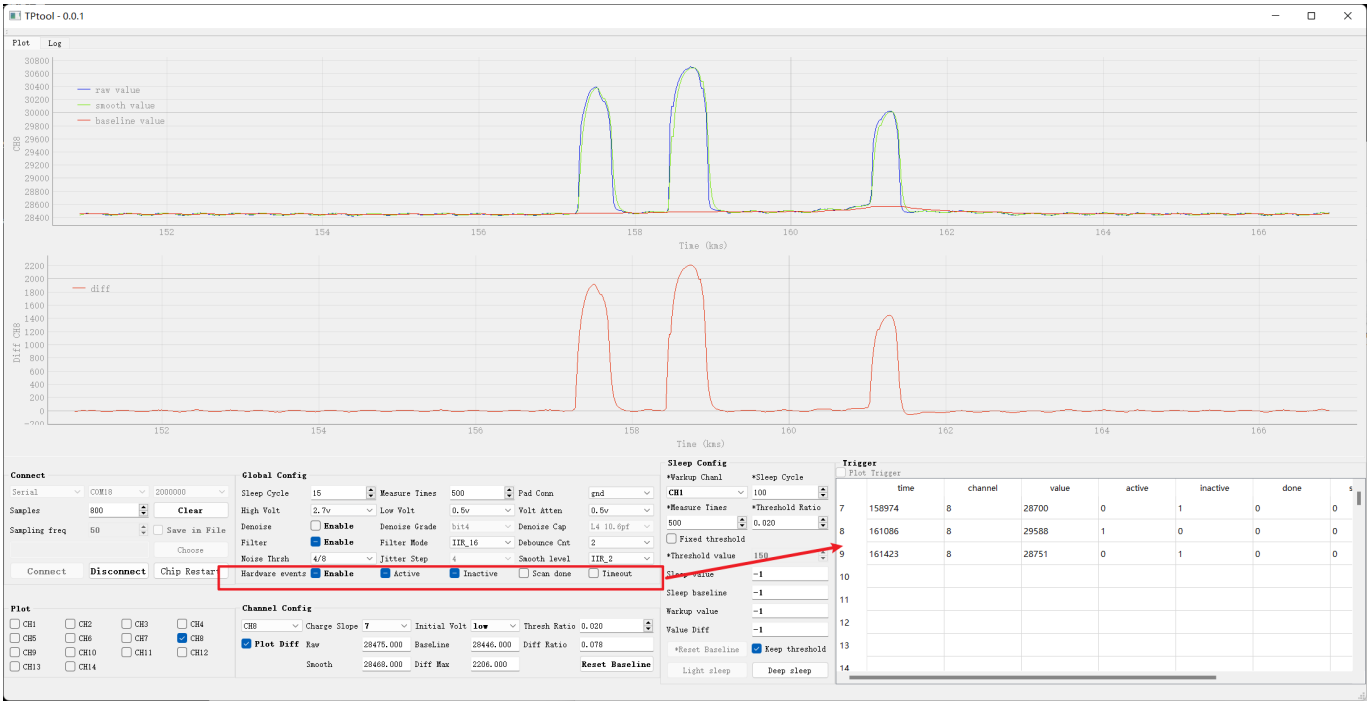
3. Click `Reset Baseline` will force update the current `Baseline` to `Smooth` value.

Parameter Debugging



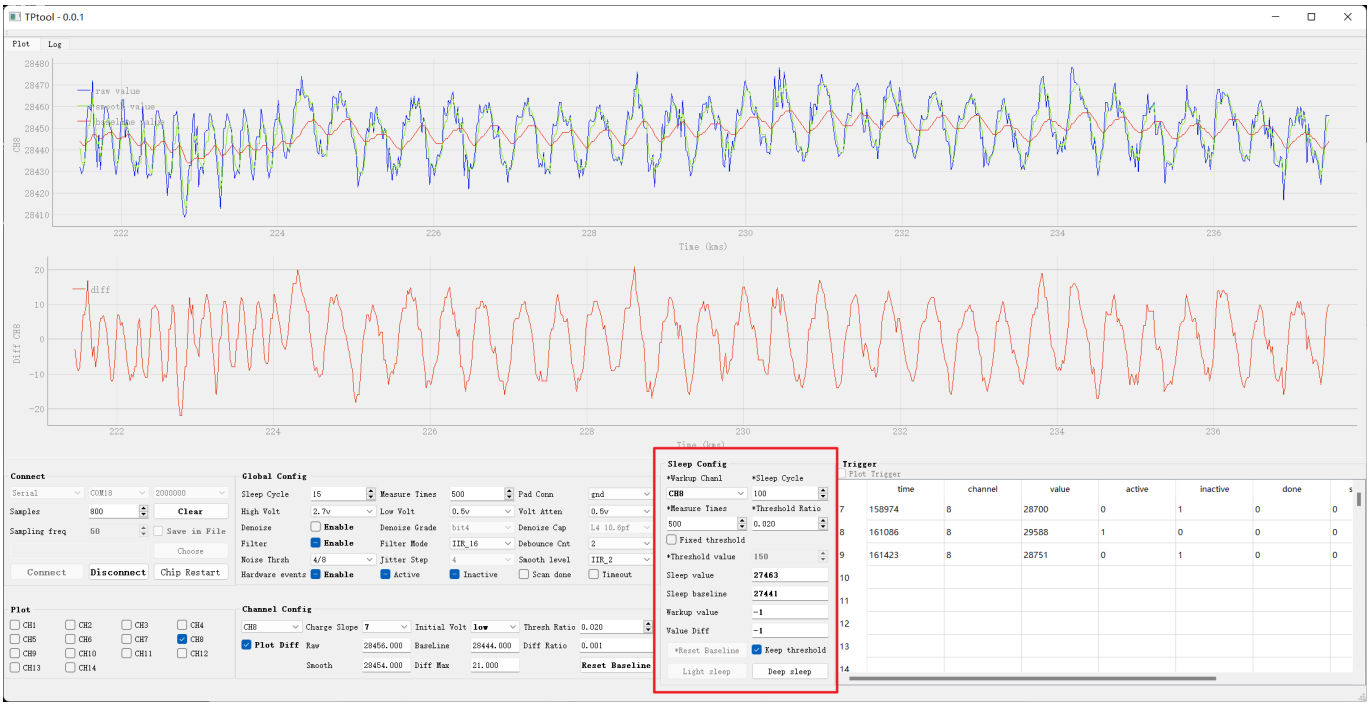
1. The parameter settings in `Global Config` will affect all channels.These parameters include `filter` and `denoise` parameters, which will directly affect the update strategy of `Baseline` and `Smooth` data.
2. The parameters in the `Channel Config` only affect the current channel, including the threshold of `Active` event.
3. Please adjust the parameters until you meet the requirements of stability and sensitivity. In the current version, the final parameters will **Not Saved** by the software. Please record the relevant parameters manually and configure it to the ESP touch driver

Events Record



1. Check the `Hardware events` will enable the hardware interrupt to post events
2. The hardware events will be captured by the software and recorded in the `triggers` form.

Sleep Mode Test

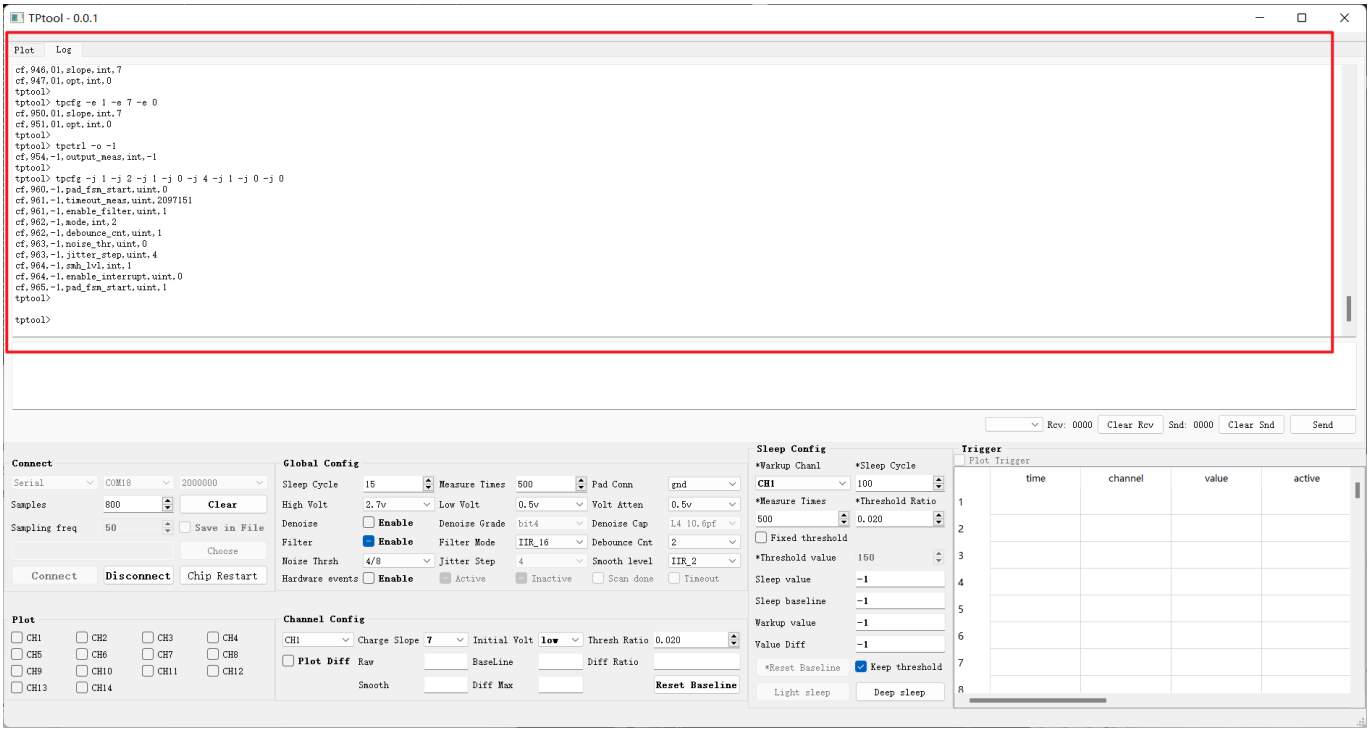


1. In `Sleep Config` a channel can be choosed for wakeup from sleep (Deepsleep only supports one wakeup channel, Lightsleep supports all channels to wake up)
2. Before entering sleep, user can choose the threshold of wakeup. The tool provide two options, threshold ratio or absolute threshold value. If choose threshold ratio, which will

multiply the current smooth value as the final threshold.

3. Click the `Deep Sleep` button will control the chip into sleep immediatly
4. Then only the touch channel or hardware reset can wake up the chip
5. The values before sleep and after wakeup will be captured by the software

Device Terminal



Click to show the `Log` tab, where will display all the log printed by ESP32SX, which will help with the debugging process.