

SCINTILLATION mode for searching with NaI(Tl) / CsI probe.

In firmware 1.03a we have added scintillation mode for the MCA module. The mode allows you to use your NaI(Tl) probe for searching of low contaminated areas. First time you activate the scintillation mode the software will run 5 minutes calibration to calculate average and standard deviation for your probe. Calibration need to be performed on natural background without introducing any sources around.

During calibration you'll see screen with following data accumulated/calculated:

$\Sigma = x \dots x00$ (summing of CPS)

$\bar{x} = xxx$ (result for mean)

$\sigma = xxx$ (result for standard deviation)

To avoid floating point calculation the result is presented in result*100 form. That mean standard deviation of 123 should be read as 1.23 CPS.

After calibration done, the MCA will show mean and standard deviation result during 10 seconds and will automatically restart. It will use calculated values for triggering alert during searching. Mean and standard deviation are saved to memory, but cannot be seen later through menu.

Menu Functions related to Scintillation mode:

SCINT MODE – activate scintillation mode, restart applied by auto.

BEEP FREQ.HZ – set for sounder clicker frequency.

DEALAY N-pulses – the module will click on every N particle detected.

CONFIDENCE SIGMA – set 2 for fast searching or 3 for more accurate search but slower response of alert.

CALIBRATE SD – will trigger 5 minute scintillation re-calibration on the next restart.

AVERAGING SEC – 2 or 3 seconds to average CPS results. Use 2 for faster search.

Take note, some MCA menu settings for acquisition spectrum is not active in scintillation mode! Switch back to spectrum mode by setting SCINT MODE to OFF.

Spectrum Acquisition mode (default mode).

DUMP to SD – will write spectrum to SD on demand. Require only if you want to save the data before waiting spectrum collection is ended.

RESTART – restart new spectrum, all previous data of current collected spectrum will be erased.

RETURN – exit from menu without making and changes.

SET MAX CNT – set maximum counts in one channel. You can set from 1000 up to 65000 counts in one channel. The value will stop spectrum measurement when number is reached in particular channel and will trigger auto-dumping to SD.

SET MAX TIME – set maximum time of spectrum measurement in seconds. You can set from 100 up to 3600. The value will stop spectrum measurement when number is reached and will trigger auto-dumping to SD. In **firmware 1.03** the upper time limit increased to 7200 seconds.

The first reached value between MAX CNT or MAX TIME will trigger auto-dumping spectrum to SD.

DC OFFSET – this what you read on TP1, but in ADC units! By default it set to recommended 0 (zero). If your DC offset in amplifier is higher than 100mV it suggested to try that function for better display view of spectrum. How to calculate ADC unit? Use $V_{REF}/1024$. For example $3300/1024 = 3.22$; Then $100mV/ 3.22 = 31$ ADC units. So you can set DC OFFSET = 31 Beware, wrong settings here may lead to software instability! That's way be careful and not increase that value in large steps.

SET MIN CH – this is minimal channel number you want to view on spectrum. It works to filter out PMT noise on energy below 20keV. Trial and error method. Default is 10.

SET MAX CH – same as previous function, but from the top side of spectrum. If dynamic range of the amplifier gather all highest energies above 1700keV into one big bump on the spectrum right side then you can cut-off it with that filter.

SET MIN CH and **SET MAX CH** functions where updated in **firmware 1.03**. Previously it was used only to filter out noise channels on top/end of a spectra. Now it also allows to select a specific region and ignore all peaks beyond. On SD file, all filtered channels will be saved with zero value.

Be careful not to overlap minimum and maximum channels, otherwise the MCA will not capture any spectra.

REMOVE NOISE CPS - when enabled, allows to show on LCD only relevant CPS counts in range of minimum / maximum channels. When disabled, all CPS events are counted for LCD. This function can be useful when you debug the noise level of your system or want to estimate full spectra CPS vs. activity for selected region. Available in **firmware 1.03**.

LCD ZOOM RANGE - added LCD zoom. You can set number of channels to display on LCD from 128 to 1024. Available in **firmware 1.03**.

LCD FIRST CH - Related to LCD zoom, you can set the first channel for LCD zoom range. LCD zoom settings has no influence on SD data file. As before, the log. file will contain all 1024 channels. Available in **firmware 1.03**.

SAVE&RESET – you need to make software reset if any of functions above where changed to get it works.

During spectra measurement you can switch between linear or logarithmic scale by pressing right button shortly.

After dumping to SD make long press on right button to restart new measurement.

Adding Buzzer/Clicker for PCB ver. 1.00

