Procedure to adjust the gain (sensitivity) on Eurisys Clover detectors version 6 and BC using PSC823 preamplifiers.

OPERATING MANUAL

Ind.	Rédigé par / *Written by*		Vérifié par / *Verified by*		Approuvé par / *Approved by*	
A	**Date** / *Date*	14 mars 2005	**Date** / *Date*		**Date** / *Date*	
	Nom / *Name*	MUSTAPHA ALLALI	**Nom** / *Name*	ERIC PACHOUD	**Nom** / *Name*	PASCAL WENDLING
	Visa / *Visa*		**Visa** / *Visa*		**Visa** / *Visa*	

Procedure to adjust the gain (sensitivity) on Eurisys Clover detectors version 6 and BC using PSC823 preamplifiers.

OPERATING MANUAL

HISTORIQUE DES MODIFICATIONS / *MODIFICATIONS CHRONOLOGY*

Ind. *Rev.*	**Date** *Date*	**Origine des modifications** *Modifications origin*	**Paragraphes concernés** *Related sections*
A	14-03-05	Origin of the document	All

Procedure to adjust the gain (sensitivity) on Eurisys Clover detectors version 6 and BC using PSC823 preamplifiers.

OPERATING MANUAL

Note : this procedure should only be used for Clover version 6 equipped with PSC823 preamplifiers and Clover BC (458, 466). Older Clover version had PSC822 or PSC921 preamplifiers. An other procedure is available from Canberra Eurisys in this case.

To adjust the sensitivity of the PSC823 preamplifier, it is necessary to change the value of a resistor on the PSC823 board.
This resistor drives the feedback of a operational amplifier located on the second stage (output stage) of the preamplifier.

We suggest to use a high energy source like ^{60}Co to make this adjustment.
Although this element emits two gamma ray energies at 1173keV and 1332keV, it will be easier to trigger with the oscilloscope.

Take care about static electricity, by using adequate tooling and soldering iron connected to ground. Use a strap and a carpet for ground connection.

The resistor that you have to change is **R18**.
Have a look on the schematics for correct location.
The standard value is 5.1kohms and this procedure will help to find the new value of R18 to obtain a sensitivity of 200mV/MeV. R18 should be in the range 2.5kohms to 4kohms, depending on the feed-back capacitor of the cooled charge sensitive input stage.

Here is the best way to proceed is:

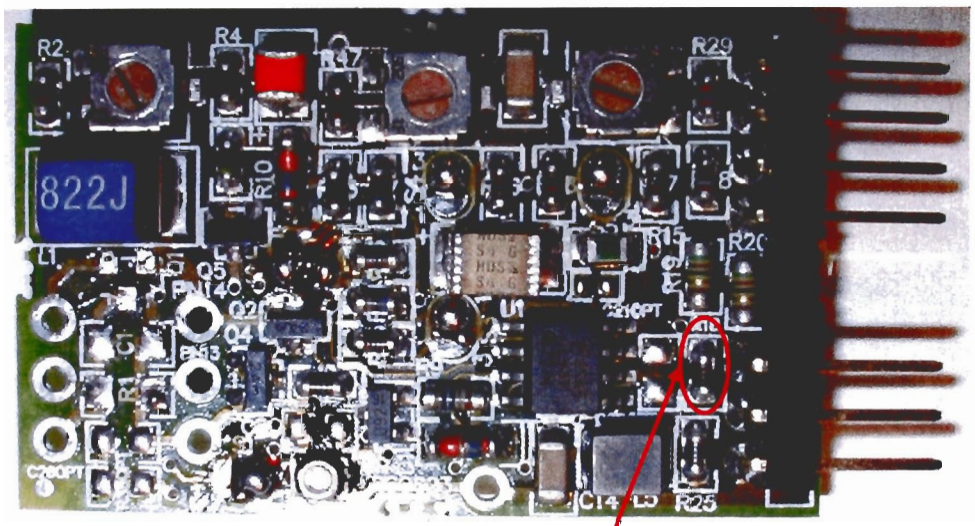
- Cool down the detector.
- Open the preamplifier covers.
- Replace the resistor **R18** by a small potentiometer with a range of 0-10kohms. We suggest at least a 10 turn or better for more accurate tuning. We suggest to do this for the four preamplifiers of the Clover detector if all of them have to be adjusted.
- Put the power supply cable and apply the recommended value of high-voltage. Follow recommendation in detector manual for correct and safe supply of the system.
- With an oscilloscope measure the sensitivity of each channel with the 1332.5keV gamma ray of the 60Co source. Note that you must visualize the preamplifier output and NOT the amplifier output.
- Turn slightly the potentiometer to adjust the value of the sensitivity until you get the right value. Normally you should measure 266mV for 1332.5keV. With this setting you must have 200mV per MeV.
- Unbias the detector. **NOTE** : we suggest to keep the HV connection but with the HV unit set to zero or off. This will keep the HV filtering network in preamp room at zero volt.
- Remove the power supply of the detector.
- Unsolder the potentiometer and measure the value of its resistance with a digital ohmmeter for best accuracy.
- Solder a new resistance having the nearest value of the measured value of the potentiometer. We suggest a SMD 1% metal film for best stability. In case SMD

components are not available use a standard resistor of a small size like 1/32W 1% metal film.

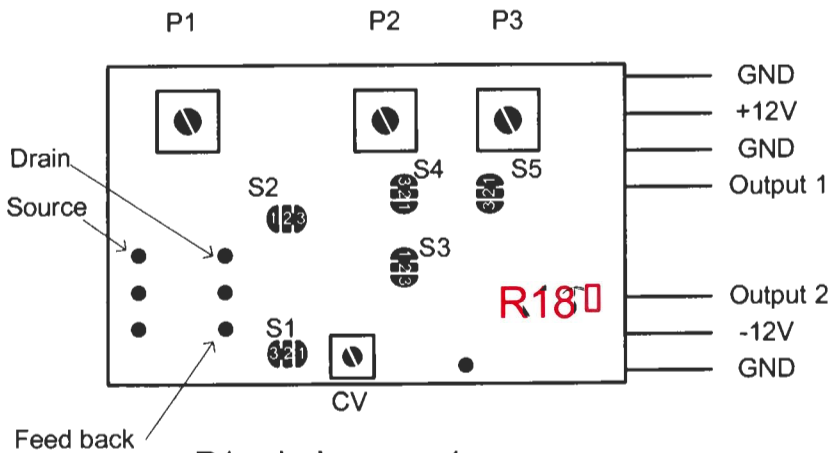
- Put the power supply cable and apply the recommended value of high-voltage.
- Verify that the value of the sensitivity is 200mV per MeV.
- Verify the offset of the preamplifier. It might change slightly because the gain of the output stage changed, therefore readjust it.
- Make a measurement with a Co60 and Co57 source to verify that the resolutions are still satisfactorily.

Procedure to adjust the gain (sensitivity) on Eurisys Clover detectors version 6 and BC using PSC823 preamplifiers.

OPERATING MANUAL



R18



P1 : drain current
P2 : pole zero
P3 : DC offset
CV : band width adjust

Procedure to adjust the gain (sensitivity) on Eurisys Clover detectors version 6 and BC using PSC823 preamplifiers.
OPERATING MANUAL