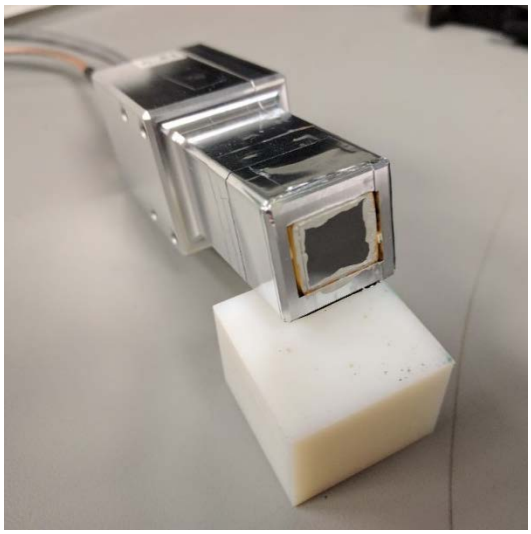
APS Detector Pool's APD QUICK GUIDE

The system is composed of two parts:

- **The APD.** It is a Silicon APD 10 x 10 mm^2 and thickness of ~ 180 microns (Part # C30703FH from Excelitas). The APD is packaged with a multi-stage preamplifiers by ATIM in France (Contacts: Thanh Deschaux and Francis Raimbert)

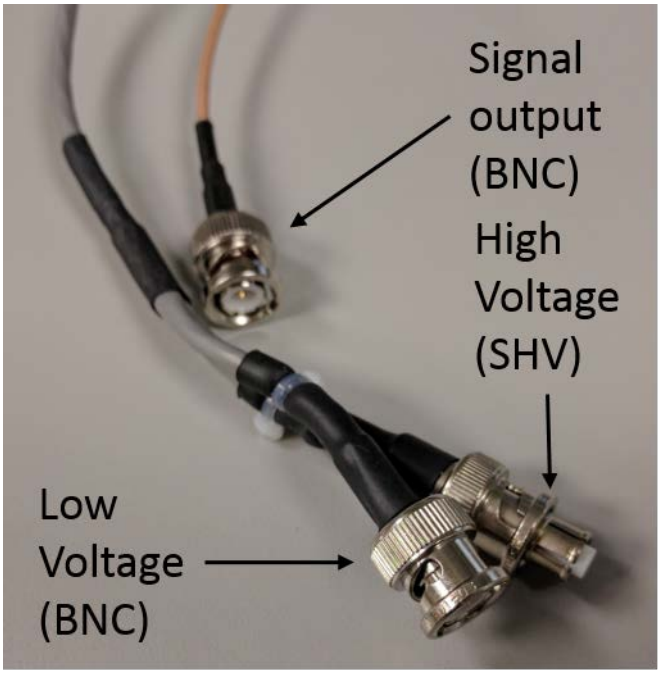


- **The NIM crate** with HV and 12V power supplies to bias the APD and internal electronics.

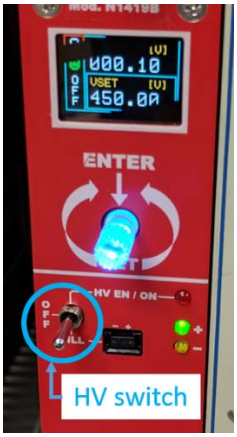
The APD has three lines:

- A 12 V bias line for the preamplifier integrated in the APD case – BNC connector.
- A high voltage bias line for the APD sensor – SHV connector.
- A signal output line – BNC connector.

The two bias lines are bundled together:



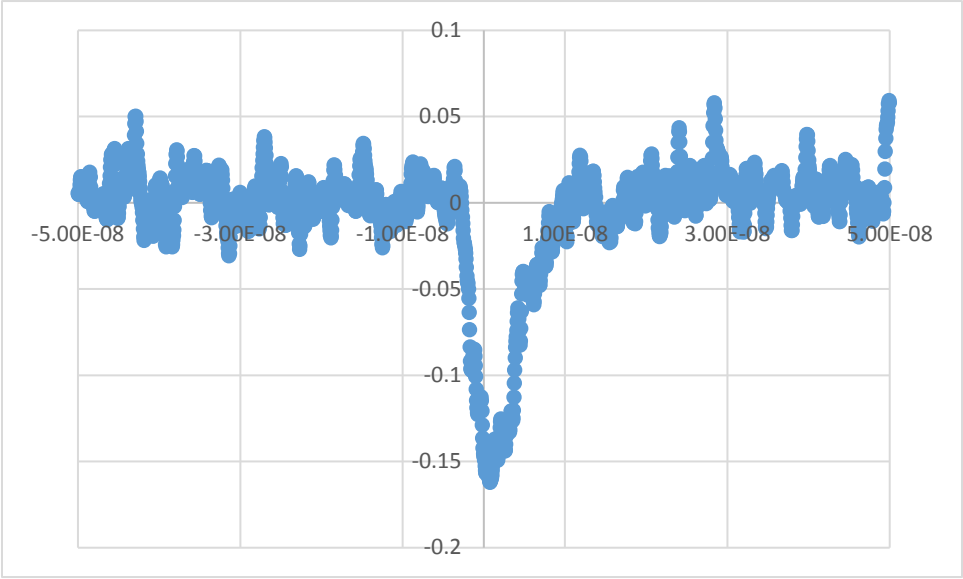
TURN ON SEQUENCE

1. The bias box must be off.
2. Check that the HV switch is on the off position 

3. Connect the low voltage bias line to the bias box through the provided DB9 to BNC cable and barrel connector.
4. Connect the high voltage bias line to the bias box through the provided SHV cable and barrel connector.
5. Connect the signal output to an oscilloscope or constant fraction discriminator (not supplied by the DP) as needed.
6. Turn on the bias box. This will bias the APD preamp to the right voltage and will turn on the high voltage power supply.
7. At this stage the high voltage is still off. The HV power supply should be already set to the optimal bias: 450 V. This should correspond to a sensor current of about 200 nA. In case the bias point need to be changed please refer to the HV power supply manual in attachment.
8. Turn on the HV by switching to the upper position the HV switch. The power supply will ramp the voltage up to the set value at a rate compatible with the APD. At the same time the HV LED will light up. The voltage can be monitored on the upper half of the display. When the supply has reached the set voltage the APD is ready to be used.

TYPICAL RESPONSE

When the APD is biased pulses of about -150 mV / -200 mV and 10 ns durations can be seen on the output line:



A trigger set at -100 mV should be able to easily count the pulses without being influenced by the noise.

TURN OFF SEQUENCE

1. Turn off the HV by switching to the center position the HV switch. The power supply will ramp the voltage down to zero at a rate compatible with the APD. At the same time the HV LED will go off. Wait until the voltage has reached 0 V.
2. Turn off the bias box.
3. Disconnect all cables.