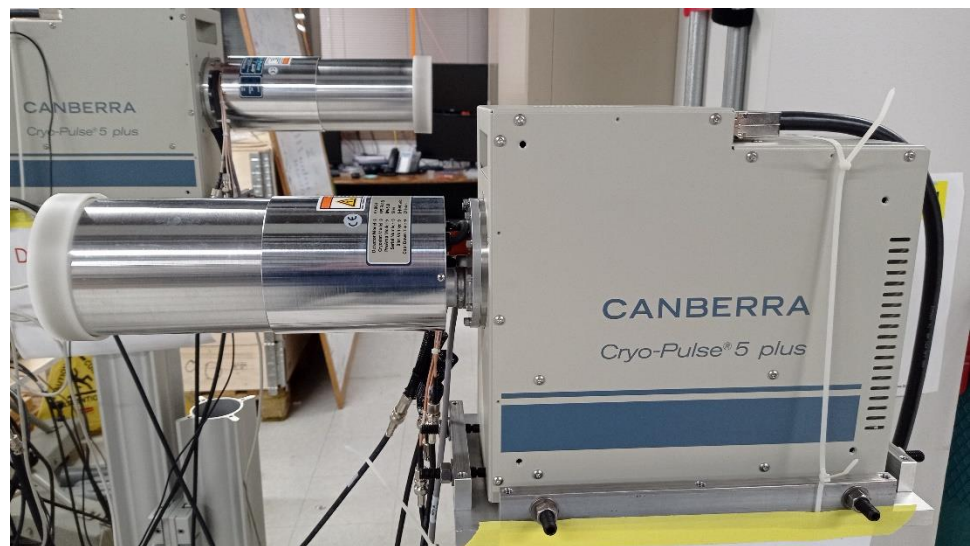
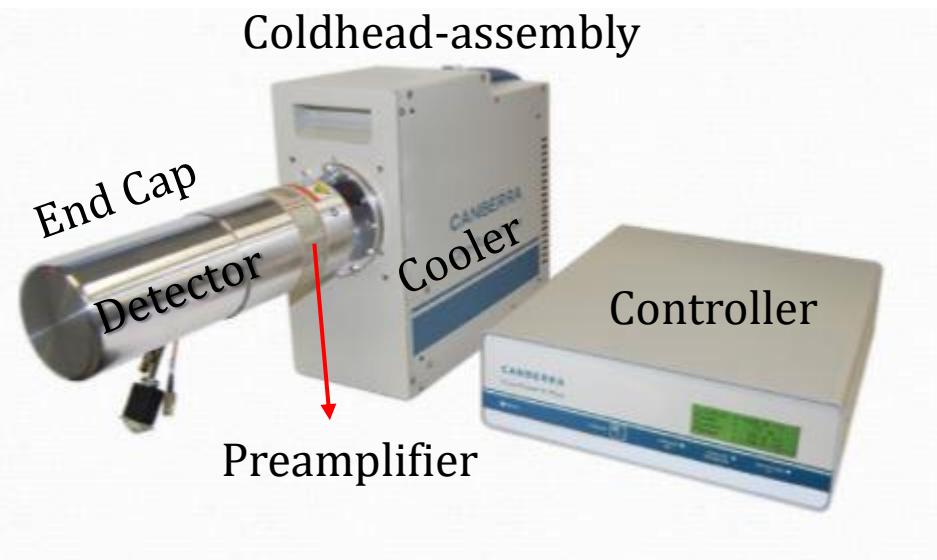


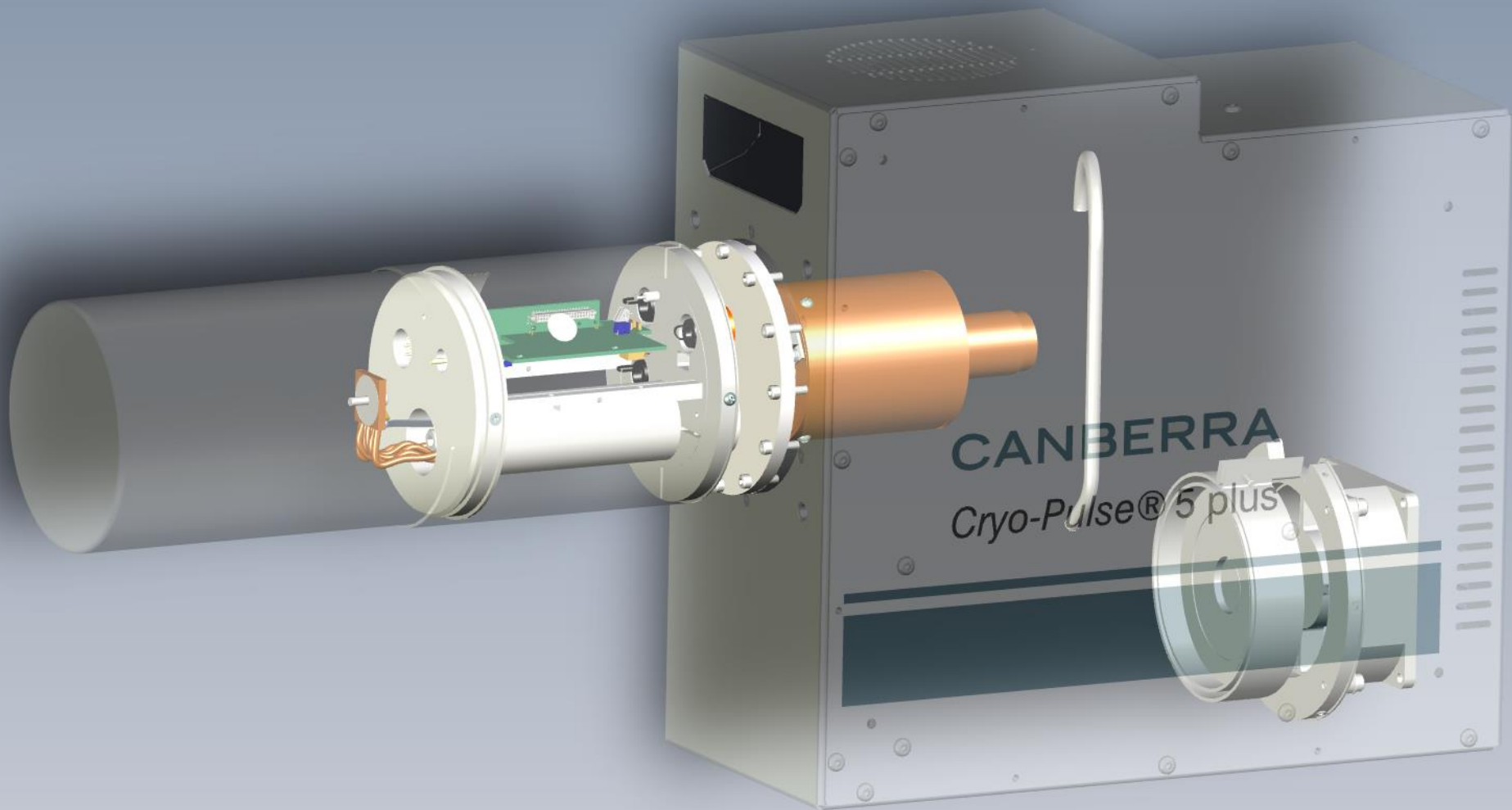
Extended Range Coaxial Ge Detector (GX10020) with Slimline Cryo-Pulse 5 Plus Electrically Refrigerated Cryostat



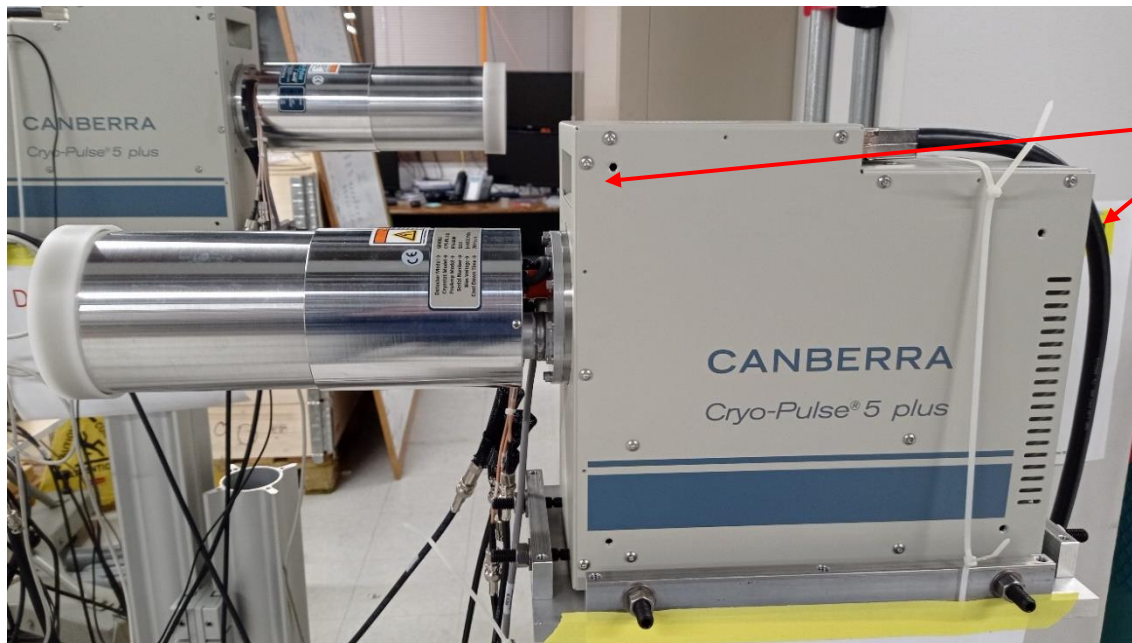
Unit price: 134,756.75 USD

Mirion Technologies (Canberra), Inc. is not liable for any operational malfunctions or personal injuries due to mishandling or unauthorized repair and maintenance.

* Mirion displays and logs all the temperature readings in Celsius.



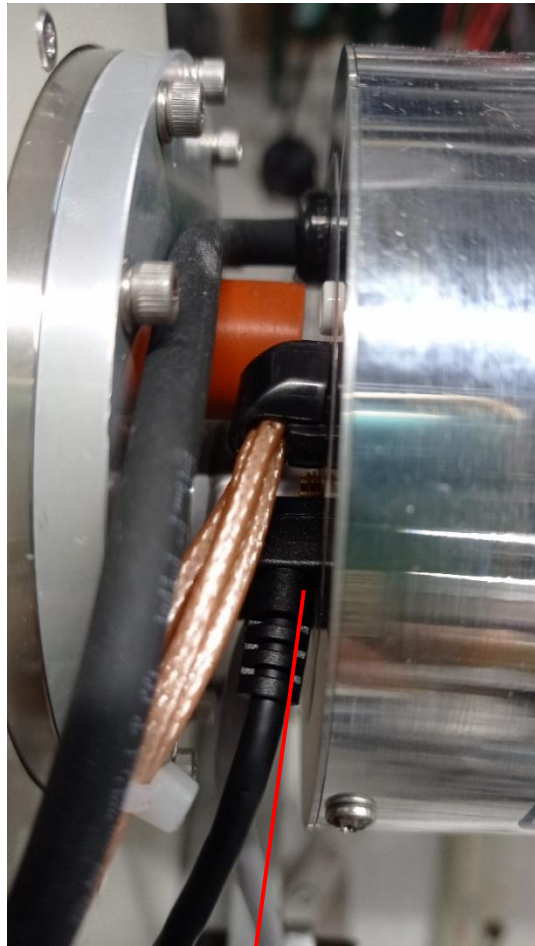
Care and Handling Instructions:



When lifting the Ge detector, always use the two handles. At least use the rear handle and place the other hand firmly under the detector hardware. Never lift by the detector endcap or preamplifier.

- ❑ The unit can operate in all orientations. The coldhead comes standard with 4 rubber feet attached to the bottom face of the housing, which ensures proper electrical and mechanical isolation between the cold head and the surrounding structure. If the detector is used in other orientations, these feet can be removed and mounted on the rear or side surfaces.
- ❑ Never disconnect the coldhead from the controller while the rear panel switch is ON. Never switch on the controller if it is not connected to the coldhead.
- ❑ Never cover or close fan openings or holes in the coldhead or controller housing, as this can cause an overheating and possible fire hazard.
- ❑ Never put any objects on top of the controller.
- ❑ Care should be taken to avoid exposing cryostats to high concentrations of helium for extended periods.

Care and Handling Instructions:



USB to Right Angle USB Mini



To prevent ground loop noise from entering the system, the H.V. Input and H.V. Inhibit output grounds are isolated.

To maintain this isolation on the iPA-SL preamps, slip the flexible sleeving included with the preamplifier over the BNC and SHV connector shells after connecting the cables.

High voltage ground is isolated from signal ground by 470Ω .
High voltage inhibit ground is isolated from signal ground by 47Ω to prevent introduction of ground loop noise.

Operating Instructions:



Under normal
operating
conditions:

Green
Off
Green

- ❑ If the temperature of the detector rises beyond the normal operating range, the High Voltage Inhibit LED will glow red.
- ❑ If preamp approaches the maximum count rate, the High Rate Indicator LED will glow red.
- ❑ Higher energy sources will cause preamplifier saturation at a lower count rate than lower energy sources.
- ❑ Count rate performance has been demonstrated up to 200,000 counts per second for ^{60}Co source (1.33 MeV).

Controller Rear Panel Layout:

DB37
Connect to the coldhead

Main power supply
Connect to brown outlets



The cooler can be started by switching ON the switch on the rear panel of the controller.
Switching OFF the main switch on the rear panel cuts power to the controller completely.

USB/RS-232 adapter
Connect to the computer

2 BNCs
Connect to the HV-inhibit of the Preamp
Connect to the BIAS SHUTDOWN on the rear panel of ORTEC 660

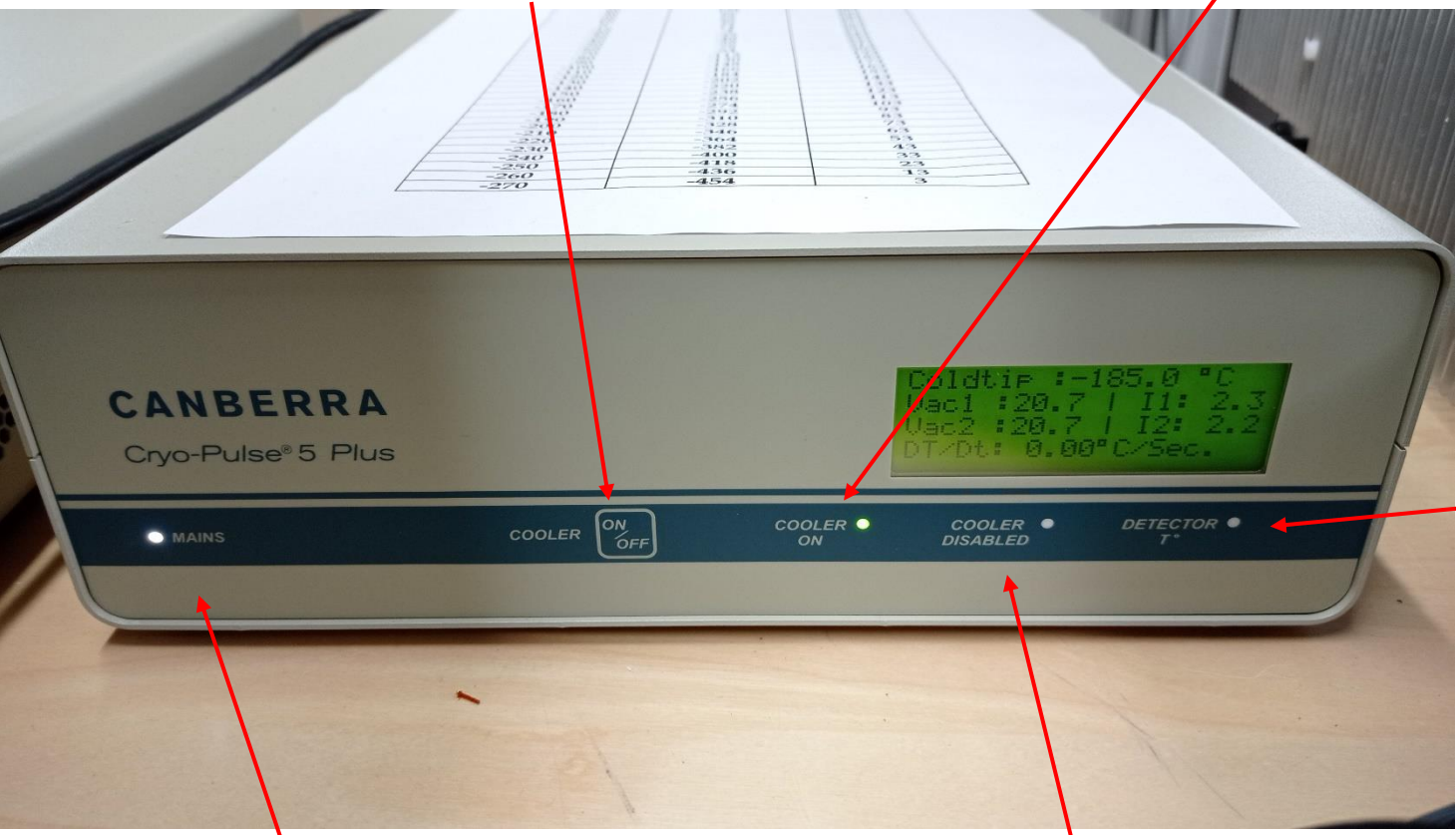
Both the detector and the coldhead are equipped with a temperature sensor that triggers the respective HV-inhibit signal from the preamplifier and controller.

Controller Front Panel Indicators:

The cooler can be turned off by pressing and holding the ON/OFF button on the controller's front panel for 3 seconds. This stops the cooler but keeps the controller and cooling fans in the coldhead powered.

Cooler ON: green LED, indicates the cooler is running.

Detector T: Red LED, indicates the cold tip temperature is above -160°C and also triggers the HV-inhibit output. The LED blinks when the cold tip temperature is above 0°C .



Mains: white LED, indicates the controller is connected to the power.

Cooler Disabled: yellow LED, indicates the cooler has stopped.

Controller Front Panel Display:

Cold tip temperature

Cooler power

Compressor temperature

Temperature of the warm end of the coldhead

Cold tip temperature

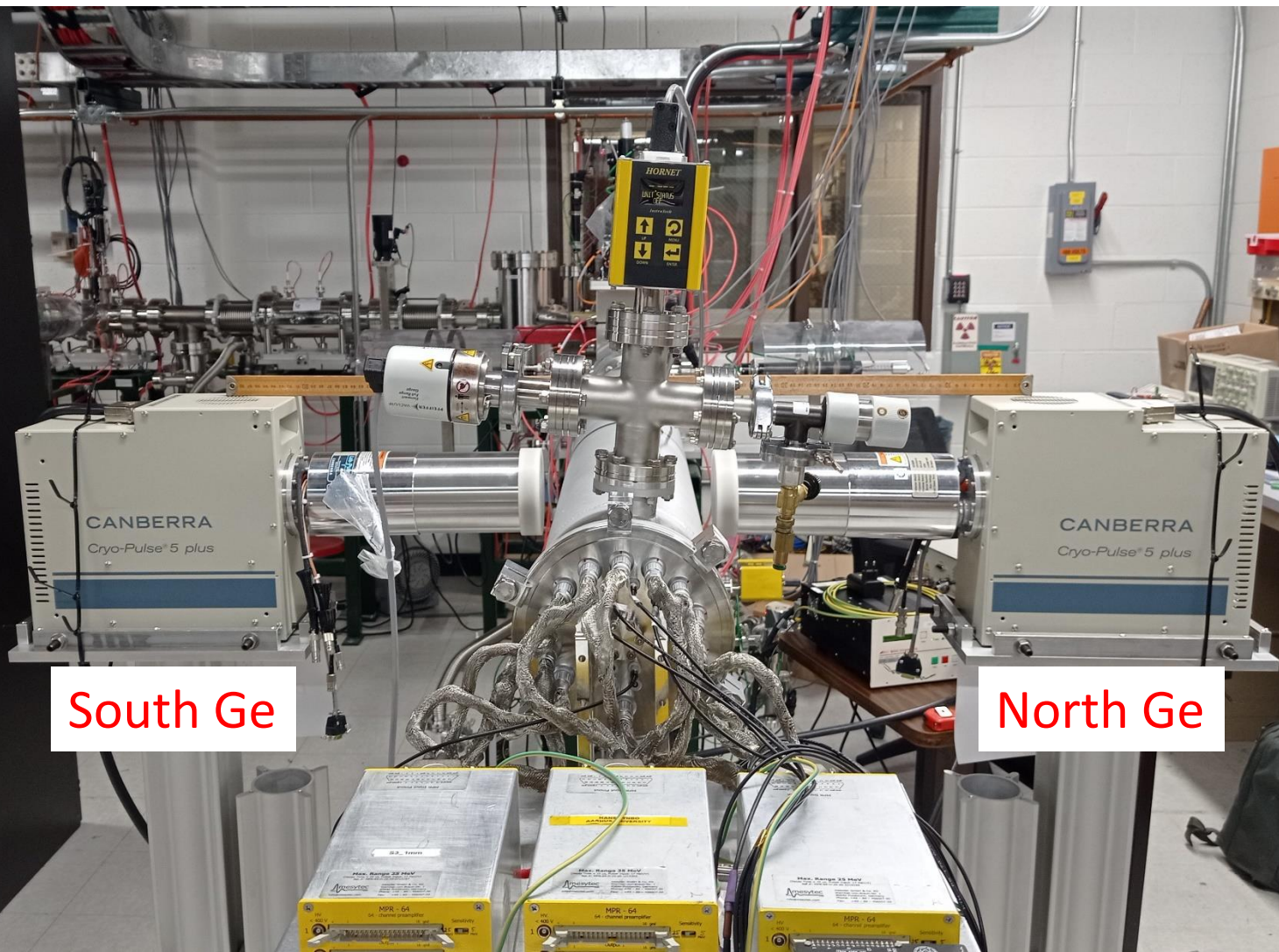
1st AC voltage output (V) and current output (A)

2nd AC voltage output (V) and current output (A)

Cold tip temperature gradient °C/second

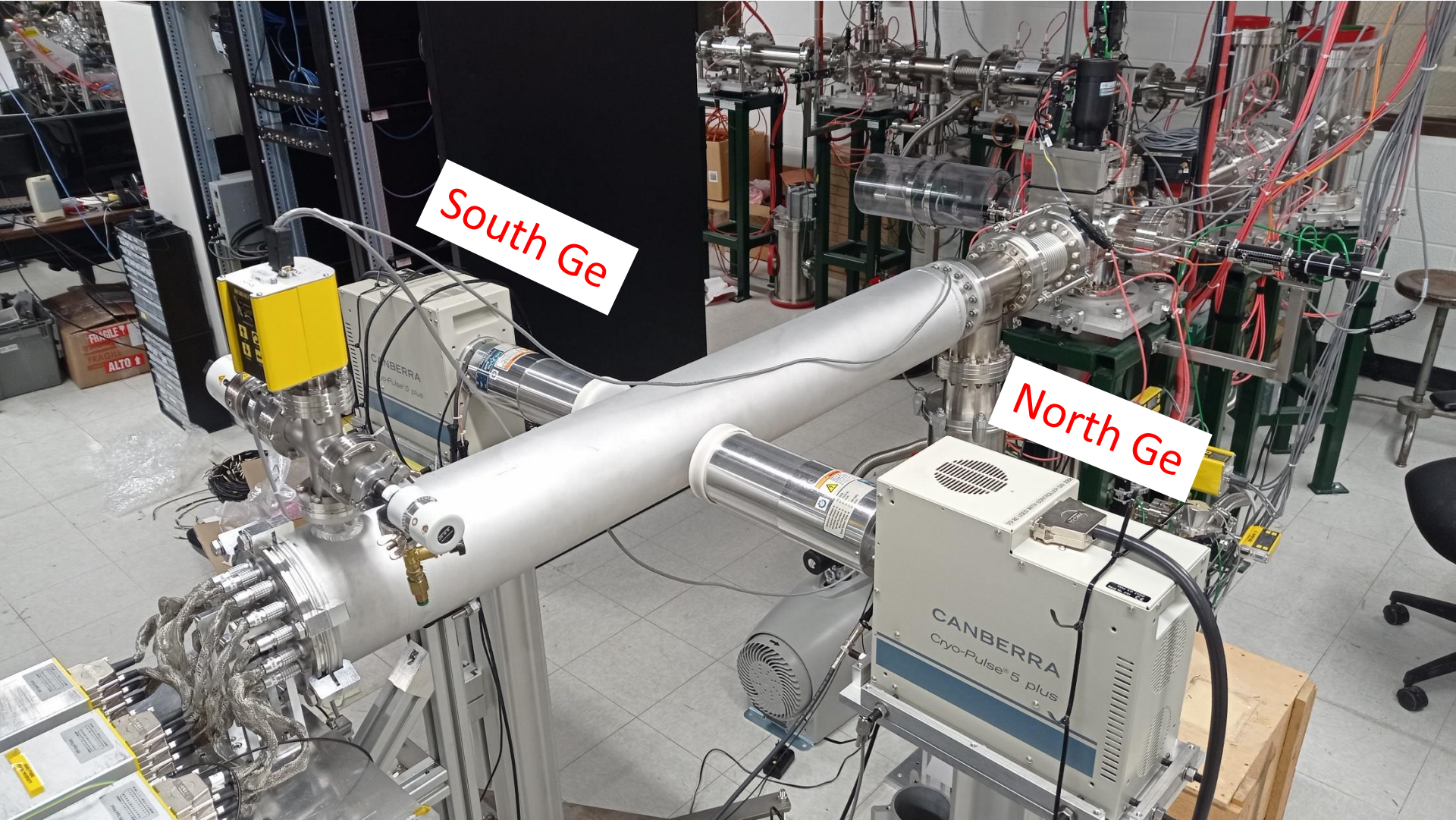


- The two screens can be switched by pressing the front panel ON/OFF button briefly.
- The desired temperature (-185°C) is preset by the factory and should not be modified.
- During the initial cooling process, the cooler will operate at high power near 180 W.
- Once the final temperature is reached, the cooler will maintain a stable temperature with an input power of ~ 100 W, depending on the ambient temperature and orientation.



South Ge

North Ge



South Ge

North Ge

CANBERRA
Cryo-Pulse[®] 5 plus

Controller Front Panel Status Messages:

North/Window
Detector S/N 5593
Cryostat S/N2749
Controller SN2358
COM3



Coldtip :-185.0 °C
Vac1 :22.5 | I1: 2.5
Vac2 :22.5 | I2: 2.4
DT/Dt: 0.00° C/Sec.

COOLER ON ● COOLER DISABLED ● DETECTOR T° ●

South/Inside
Detector S/N 5596
Cryostat S/N2750
Controller S/N2355
COM4



Coldtip :-185.0 °C
Vac1 :20.5 | I1: 2.3
Vac2 :20.4 | I2: 2.2
DT/Dt: -0.00° C/Sec.

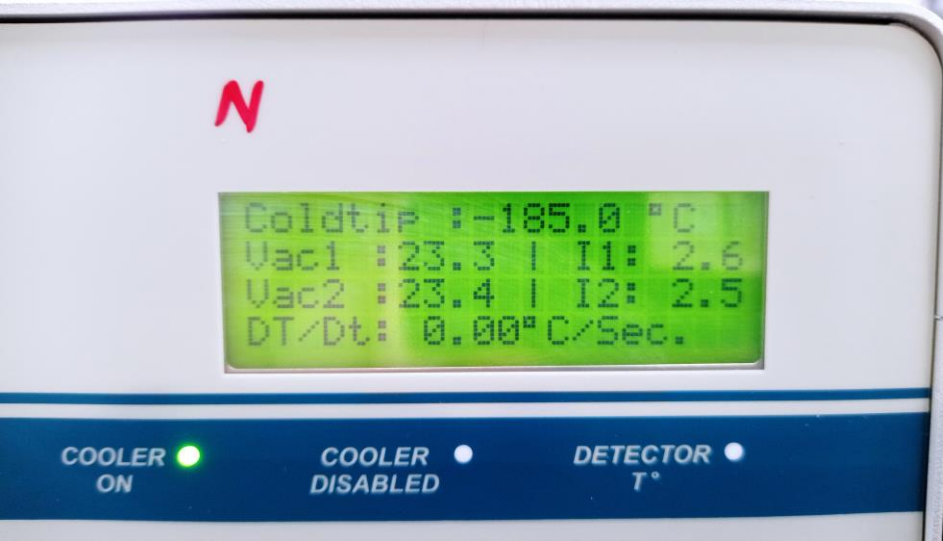
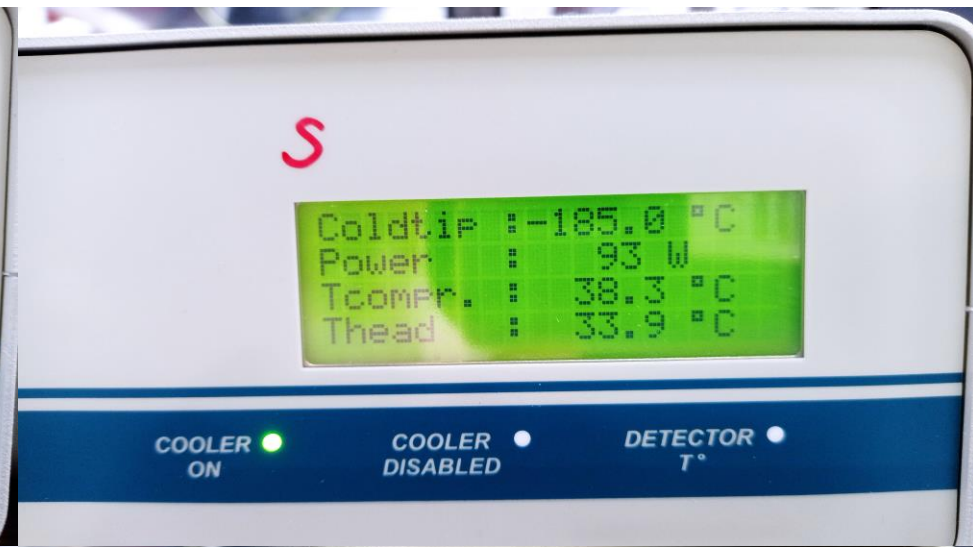
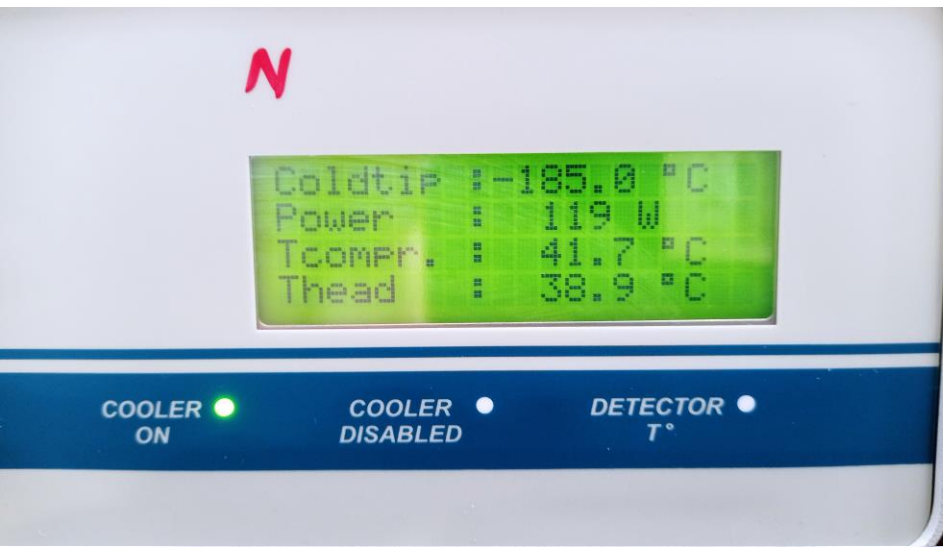
COOLER ON ● COOLER DISABLED ● DETECTOR T° ●

- As per the manual, restarting the controller using the rear panel button is the recommended course of action for all error messages except for two.
- The two errors related to temperature being too high or too low cannot be resolved by restarting. The coldhead/controller should be used within ambient temperatures ranging from 0-50°C. The warm end of the cooler should be below 55°C.
- If the message says, “The cryogenerator needs to warm up. Please wait., it means the detector has started to warm up and needs to complete a full thermal cycle before it can be restarted.

Normal Operating Status for Reference:

North/Window
Detector S/N5593
Cryostat S/N2749
Controller SN2358
COM3

South/Inside
Detector S/N5596
Cryostat S/N2750
Controller S/N2355
COM4



Normal Operating Status for Reference:

North/Window
Detector S/N5593
Cryostat S/N2749
Controller SN2358
COM3

South/Inside
Detector S/N5596
Cryostat S/N2750
Controller S/N2355
COM4

The image displays two side-by-side screenshots of the CP5 Control Panel software interface. The left window is titled 'North_5593_2358_COM3 - CP5 Control Panel' and the right window is titled 'South_5596_2355_COM4 - CP5 Control Panel'. Both windows show a 'Main Status' section with 'Cooler Status ON', 'Fault Status No errors', and 'HV Status ON'. The 'Primary Parameters' section shows 'Cooler Power' (118.6 Watts for North, 92.94 Watts for South), 'Cold-tip Temperature' (-185 °C for North, -185.01 °C for South), and 'Cold-tip Setpoint' (-185 °C for both). The 'Secondary Parameters' section shows 'Coldhead Temperature' (38.8 °C for North, 33.8 °C for South), 'Compressor Temperature' (41.7 °C for North, 38.3 °C for South), and 'Controller Temperature' (36.5 °C for North, 36.6 °C for South). The status bars at the bottom indicate 'Connected to COM3' and 'S/N 2358' for the left window, and 'Connected to COM4' and 'S/N 2355' for the right window. The status bars also show 'User mode' and 'Logging to North_5593_2358_' for the left window, and 'User mode' and 'Logging to South_5596_2355_' for the right window.

Parameter	North (COM3)	South (COM4)
Cooler Status	ON	ON
Fault Status	No errors	No errors
HV Status	ON	ON
Cooler Power	118.6 Watts	92.94 Watts
Cold-tip Temperature	-185 °C	-185.01 °C
Cold-tip Setpoint	-185 °C	-185 °C
Coldhead Temperature	38.8 °C	33.8 °C
Compressor Temperature	41.7 °C	38.3 °C
Controller Temperature	36.5 °C	36.6 °C

On the controller's screen, you can only view the temperatures of the Coldhead (warm end) and the Compressor.

File → Save Log As: record the current status into a text file every 10 mins.

File → Close Log: stop logging.

Normal Operating Status for Reference:

***** Log started on 16 June 2023, 20:59:05

***** Connected to **North_5593_2358_COM3** on COM3, S/N 2358

Date	Time	Cooler power	Coldtip temp	Coldtip setp	Coldhead temp	Compressor temp	Controller temp	Fault status
DD.MM.YYYY	hh:mm:ss	Watts	Deg C	Deg C	Deg C	Deg C	Deg C	Text
16.06.2023	20:59:08	175.45	-183.69	-185.00	41.80	46.70	35.10	No errors
16.06.2023	21:09:14	141.09	-185.50	-185.00	42.80	48.00	35.30	No errors
16.06.2023	21:19:19	119.97	-185.15	-185.00	41.10	45.90	34.90	No errors
16.06.2023	21:29:24	123.20	-184.95	-185.00	40.20	44.40	34.50	No errors
.....								
17.06.2023	01:51:41	118.95	-185.00	-185.00	38.90	41.70	36.40	No errors
17.06.2023	02:01:46	118.53	-185.01	-185.00	38.80	41.60	36.50	No errors

***** Log started on 16 June 2023, 21:05:28

***** Connected to **South_5596_2355_COM4** on COM4, S/N 2355

Date	Time	Cooler power	Coldtip temp	Coldtip setp	Coldhead temp	Compressor temp	Controller temp	Fault status
DD.MM.YYYY	hh:mm:ss	Watts	Deg C	Deg C	Deg C	Deg C	Deg C	Text
16.06.2023	21:05:29	118.55	-185.70	-185.00	37.60	44.20	36.90	No errors
16.06.2023	21:15:34	90.40	-185.19	-185.00	36.20	42.40	35.10	No errors
16.06.2023	21:25:40	96.78	-184.91	-185.00	35.20	40.80	34.40	No errors
16.06.2023	21:35:45	97.04	-185.03	-185.00	34.90	40.20	34.10	No errors
.....								
17.06.2023	01:58:01	93.00	-185.01	-185.00	33.90	38.30	36.60	No errors
17.06.2023	02:08:07	92.70	-185.02	-185.00	33.80	38.30	36.70	No errors

Integrator Differentiator Amplifier

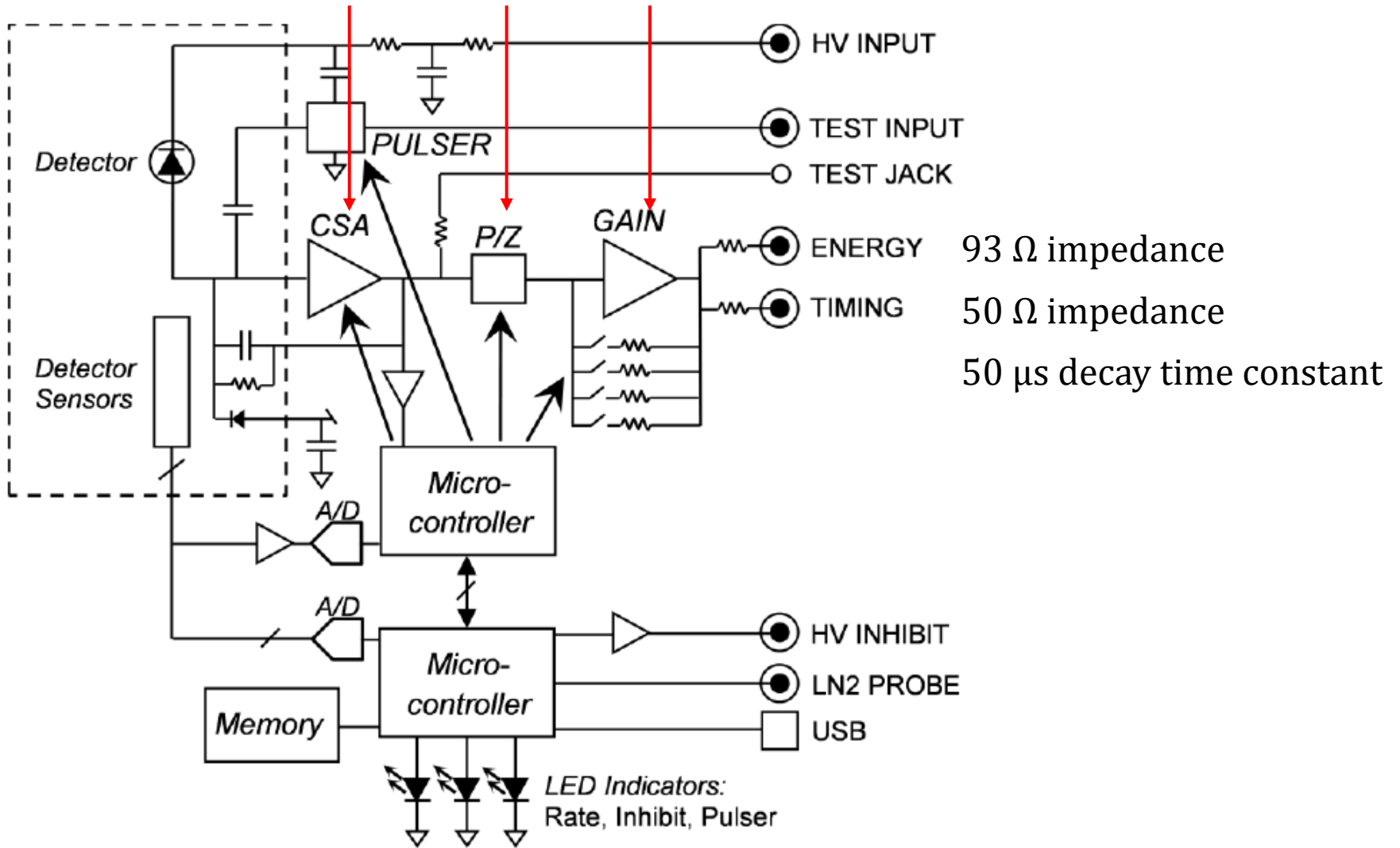


Figure 1 iPA Block Diagram

The first stage of the DC-coupled preamplifier can be used as an electrometer to measure the leakage current of a detector.

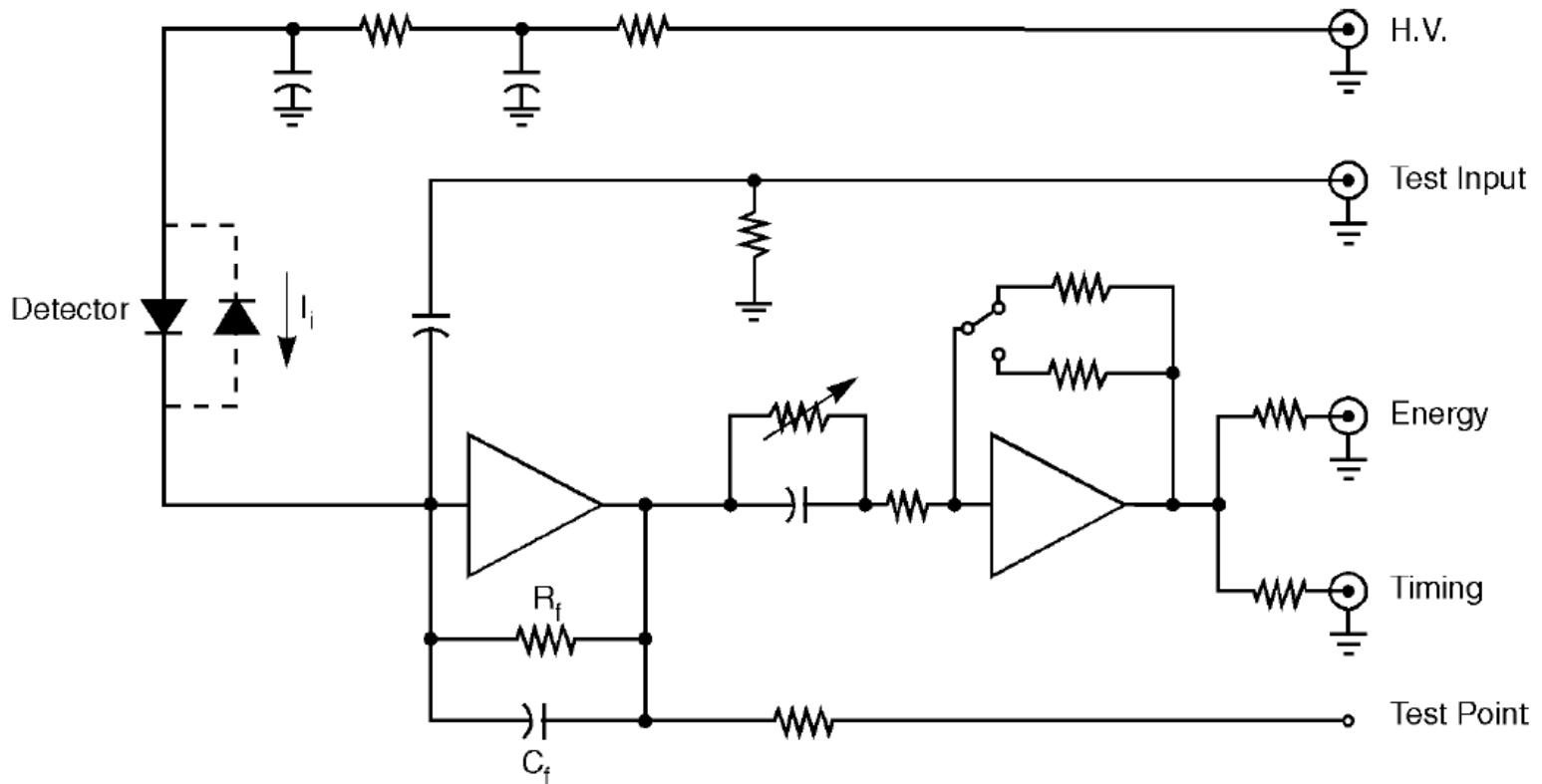


Figure 37 RC Preamplifier Block Diagram

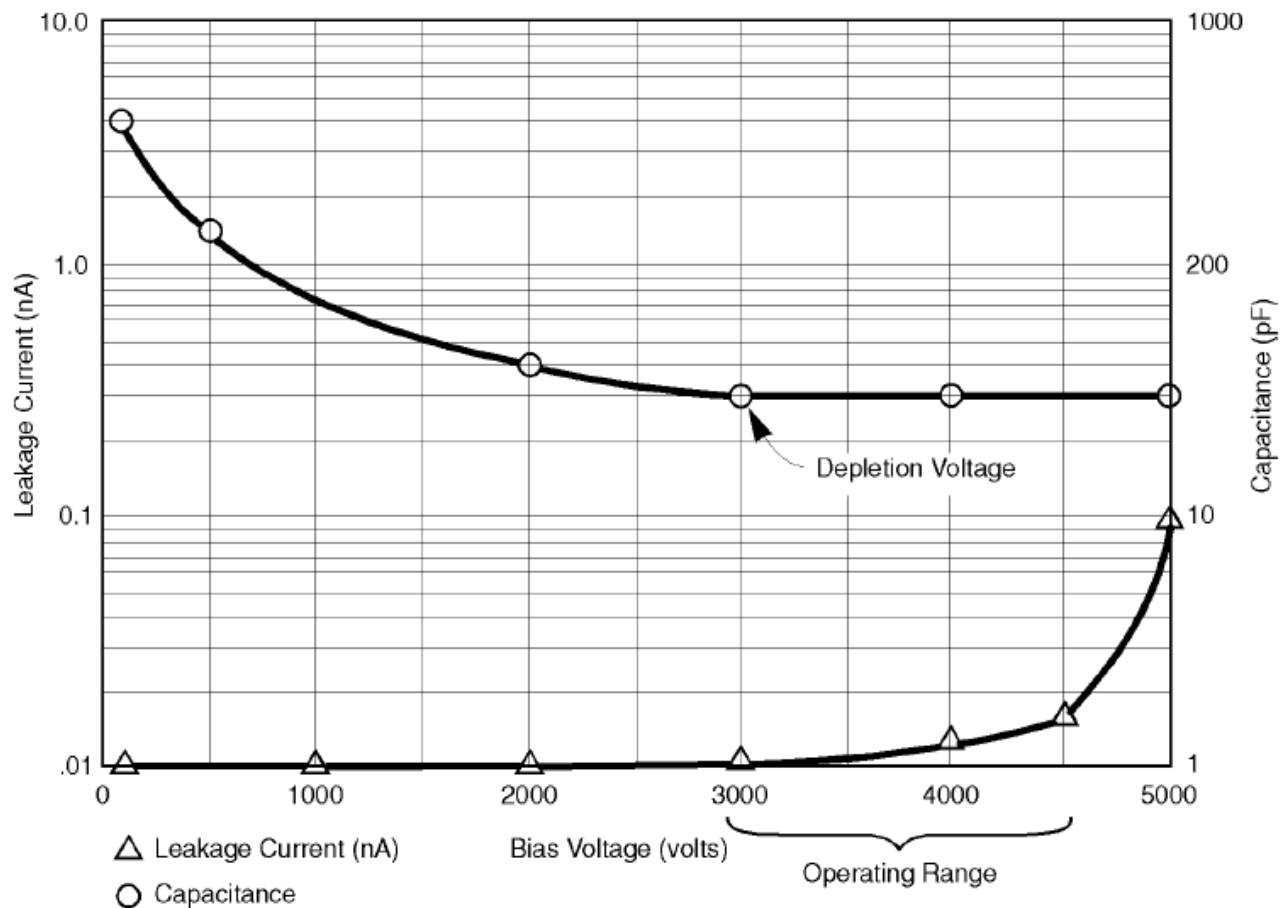


Figure 36 Typical Coaxial I-V and C-V Curves

- ❑ The most important indication of the condition of a Ge detector element is the reverse leakage current. Although the capacitance cannot be measured readily, you can observe reduced noise at the amplifier output as the capacitance is reduced with increasing bias.
- ❑ Detected radiation results in detector current, so measurements of leakage current should be done with no radioactive sources in the presence of the detector.

iPA Control Panel Application:

iPA Control Panel-North_iPA

The screenshot displays the iPA Control Panel application interface. It is divided into several sections:

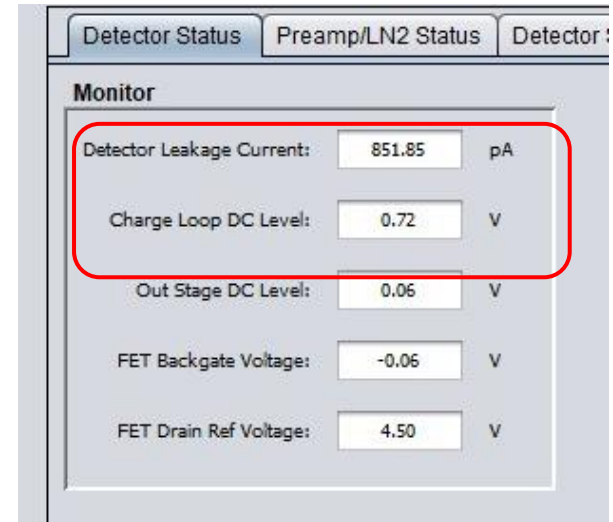
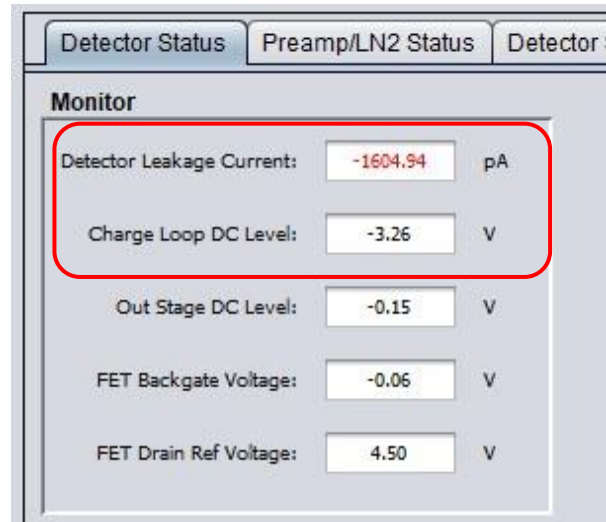
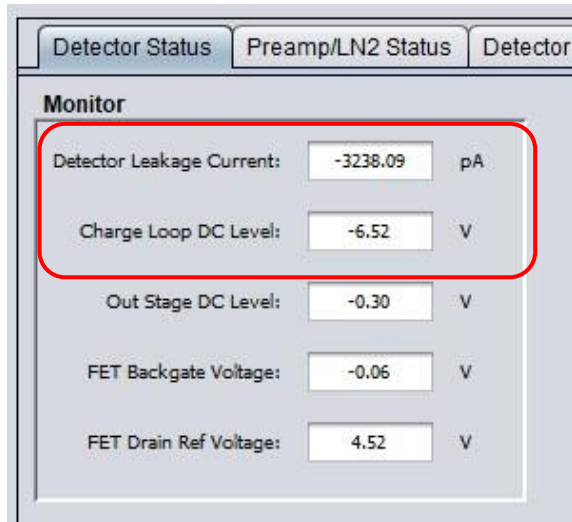
- Device Connection:** Shows the selected serial port as COM7, with the Auto Detect checkbox checked. The status is 'Connected'. Buttons for 'Open' and 'Close' are present.
- Device Information:** Lists various parameters for the detector and preamp, including serial numbers, detector type (XtRa), cryostat model (CP5-PLUS-SL), bias voltage (4500 V), bias polarity (Positive), and output polarity (Negative). Recommended settings for rise time, flat top, ADC gain, ADC offset, and cool down time are also shown.
- Navigation Tabs:** Includes Detector Status, Preamp/LN2 Status, Detector Settings, Logging, Firmware Update, LN2 Settings, and Factory Settings.
- Monitor Section:** Displays real-time data for Detector Leakage Current (10.58 pA), Charge Loop DC Level (-0.38 V), Out Stage DC Level (-0.01 V), FET Backgate Voltage (-0.06 V), and FET Drain Ref Voltage (4.52 V).
- Pulsar Section:** Shows Pulsar State (Disabled), Selected Pulsar (External), Pulsar Frequency (1000 Hz), and Pulsar Ref Voltage (-0.103 V).
- Indicator Status Section:** Shows H.V. Inhibit (OFF) and High Count Rate (OFF).
- Temperature Monitor Section:** Displays temperatures for PRTD 1 (-158.54 C), PRTD 2 (-198.52 C), and Ambient Temperature (31.69 C).

The temperature sensor is a 100- Ω platinum resistance temperature detector (PRTD).

Fluctuating between 0-70 pA

The measured temperature for PRTD1 and 2.

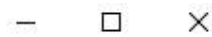
iPA Control Panel Application, Currents & Voltages:



- ❑ The leakage current can reach <-1000 pA during biasing and >1000 pA during unbiasing especially when the bias voltage is low.
- ❑ The Charge Loop DC Level (CSA DC voltage) falls and rises accordingly, equivalent to the Test Jack/Test Point, which is normally in the range of -0.5 to -2.0 V.
- ❑ Once the current stabilizes, the DC offset of the preamplifier output (Out Stage DC Offset) should be restored to zero.

iPA Control Panel Application, Detector Settings:

iPA Control Panel-iPA



File Help

Device Connection

Select Serial Port:

COM5

Auto Detect

Status: Connected

Open

Close

Device Information

Preamp Serial #: 210610-0560

Detector Serial #: 5596

Detector Type: GX10020

Cryostat Model: CP5-PLUS-SL

Bias Voltage: 4500 V

Bias Polarity: Positive

Output Polarity: Negative

Recommended Rise Time: 10.80 us

Recommended Flat Top: 1.20 us

Recommended ADC Gain: 8024

Recommended ADC Offset: 0

Recommended Cool Down Time: 24 Hrs

Detector Status

Preamp/LN2 Status

Detector Settings

Logging

Firmware Update

LN2 Settings

Factory Settings

Device Name

South_IPA

Apply

Pulsar Setup

Select Pulsar

Internal

Frequency (20-2000Hz)

0 Hz

Apply

Pulsar REF Voltage (0-1.025)

0.000 V

Apply



Pulsar Enable / Disable

Enabled

Disabled

HV Inhibit Mode Select

Canberra

Other

Output Stage Gain

Select Gain

x1

Output Stage DC Offset (-1 to +1 V)

0.000 V

Apply

gain (x1, x2, x5, or x10)
x2 is selected for E21010

iPA Control Panel Application, Logging:

The screenshot displays the 'Logging' tab of the iPA Control Panel. On the left, a 'Log Files' panel lists 'NVRam Log (Index:0)', 'Log_001.dat', and 'Log_000.dat'. The main area is a table of log records with the following columns: Time Stamp, Record Type, Channel, Parameter Code, and Parameter Value. The table contains 12 rows of data, with the 6th row highlighted in blue. Below the table are two buttons: 'Get Log File Data' and 'Save Log File'.

Time Stamp	Record Type	Channel	Parameter Code	Parameter Value
0:00:39:14	1	0	14:LN2 Level	-42.497272
0:00:39:20	1	0	14:LN2 Level	-42.500427
0:01:00:00	3	0	11:PRTD 1	-168.75626
0:01:00:00	3	0	12:PRTD 2	-197.5446
0:01:00:00	3	0	13:Ambient Temperature	34.551575
0:01:00:00	3	0	14:LN2 Level	-42.529865
0:01:00:00	3	1	15:AC Detector Leakage Current	-296.0
0:01:00:00	3	1	73:DC Detector Leakage Current	12.345704
0:01:00:00	3	1	16:Charge Loop DC Level	-0.64
0:01:09:54	1	1	73:DC Detector Leakage Current	-5259.259
0:01:10:49	2	1	73:DC Detector Leakage Current	-901.23444

- A log record 1 is created each time a parameter value goes out of range.
- A log record 2 is created if the parameter returns back within its range.
- Additionally, a record 3 is created periodically for PRTD1 Temperature, PRTD2 Temperature, Ambient Temperature, LN2 Level, Detector Leakage Current, and Charge Loop (CSA) Average DC Level once every hour, regardless of whether or not they are within their normal operating range.
- The Log file can be saved as a CSV file.

North Ge. Normal Power Status for Reference:

iPA Control Panel-North_iPA

File Help

Device Connection

Select Serial Port: COM7

Auto Detect

Status: Connected

Open Close

Device Information

Preamp Serial #:	201216-0207
Detector Serial #:	5593
Detector Type:	XtRa
Cryostat Model:	CP5-PLUS-SL
Bias Voltage:	4500 V
Bias Polarity:	Positive
Output Polarity:	Negative

Recommended Rise Time:	10.80 us
Recommended Flat Top:	1.20 us
Recommended ADC Gain:	8192
Recommended ADC Offset:	0
Recommended Cool Down Time:	12 Hrs

Detector Status Preamp/LN2 Status **Detector Settings** Logging Firmware Update LN2 Settings Factory Settings

Power Supply Status

USB Input Current:	0.01 A	USB Input Voltage:	5.03 V
+3.3V Supply:	3.31 V		
+5V Supply:	4.99 V	-5V Supply:	-5.03 V
+12V Supply:	11.75 V	-12V Supply:	-12.29 V
+24V Supply:	23.54 V	-24V Supply:	-23.66 V

LN2 Monitor

LN2Monitor:	Disabled
LN2 Level:	0.00 %
LN2 Status:	

South Ge. Normal Power Status for Reference:

iPA Control Panel-South_iPA

File Help

Device Connection

Select Serial Port: COM5

Auto Detect

Status: **Connected**

Open Close

Device Information

Preamp Serial #:	210610-0560
Detector Serial #:	5596
Detector Type:	GX10020
Cryostat Model:	CP5-PLUS-SL
Bias Voltage:	4500 V
Bias Polarity:	Positive
Output Polarity:	Negative

Recommended Rise Time:	10.80 us
Recommended Flat Top:	1.20 us
Recommended ADC Gain:	8024
Recommended ADC Offset:	0
Recommended Cool Down Time:	24 Hrs

Detector Status Preamp/LN2 Status **Detector Settings** Logging Firmware Update LN2 Settings Factory Settings

Power Supply Status

USB Input Current:	0.01 A	USB Input Voltage:	5.02 V
+3.3V Supply:	3.31 V		
+5V Supply:	5.01 V	-5V Supply:	-5.07 V
+12V Supply:	11.54 V	-12V Supply:	-12.26 V
+24V Supply:	23.48 V	-24V Supply:	-23.64 V

LN2 Monitor

LN2Monitor:	Disabled
LN2 Level:	0.00 %
LN2 Status:	

South Ge. Normal Leakage Current, Voltage, and Temperature for Reference:

iPA Control Panel-South_iPA

File Help

Device Connection

Select Serial Port: COM5

Auto Detect

Status: Connected

Open Close

Device Information

Preamp Serial #:	210610-0560
Detector Serial #:	5596
Detector Type:	GX10020
Cryostat Model:	CP5-PLUS-SL
Bias Voltage:	4500 V
Bias Polarity:	Positive
Output Polarity:	Negative

Recommended Rise Time:	10.80 us
Recommended Flat Top:	1.20 us
Recommended ADC Gain:	8024
Recommended ADC Offset:	0
Recommended Cool Down Time:	24 Hrs

Detector Status Preamp/LN2 Status Detector Settings Logging Firmware Update LN2 Settings Factory Settings

Monitor

Detector Leakage Current:	0.00 pA
Charge Loop DC Level:	-0.66 V
Out Stage DC Level:	-0.01 V
FET Backgate Voltage:	-0.06 V
FET Drain Ref Voltage:	4.50 V

Pulser

Pulser State:	Disabled
Selected Pulser:	Internal
Pulser Frequency:	1000 Hz
Pulser Ref Voltage:	-0.102 V

Indicator Status

H.V. Inhibit:	OFF
High Count Rate:	OFF

Temperature Monitor

PRTD 1:	-168.89 C
PRTD 2:	-197.54 C
Ambient Temperature:	32.51 C

Normal leakage current and voltage for reference. Whether w/ or w/o bias, they should remain the same.

The image displays two side-by-side screenshots of the iPA Control Panel software interface. The left window is titled "iPA Control Panel-North_iPA" and the right window is titled "iPA Control Panel-South_iPA". Both windows show the "Device Connection" section with "Select Serial Port" set to "COM7" (left) and "COM5" (right), and "Auto Detect" checked. The "Status" field in both is "Connected". Below the connection section are tabs for "Detector Status", "Preamp/LN2 Status", and "Detector Set". The "Monitor" section shows the following readings:

Parameter	Value	Unit
Detector Leakage Current	0.00	pA
Charge Loop DC Level	-0.40	V
Out Stage DC Level	-0.01	V
FET Backgate Voltage	-0.07	V
FET Drain Ref Voltage	4.52	V

The right window shows similar readings:

Parameter	Value	Unit
Detector Leakage Current	0.00	pA
Charge Loop DC Level	-0.66	V
Out Stage DC Level	-0.02	V
FET Backgate Voltage	-0.08	V
FET Drain Ref Voltage	4.50	V

Normal leakage current and voltage for reference. Sometimes they fluctuate between 0, 10+, and 20+ pA.

The image displays two side-by-side screenshots of the iPA Control Panel software. The left window is titled 'iPA Control Panel-North_iPA' and the right window is titled 'iPA Control Panel-South_iPA'. Both windows have a 'File Help' menu bar. The 'Device Connection' section in both windows shows 'Select Serial Port' set to 'COM7' (North) and 'COM5' (South), with 'Auto Detect' checked and 'Status' displayed as 'Connected'. Below this are 'Open' and 'Close' buttons. The 'Monitor' section at the bottom of each window shows various parameters:

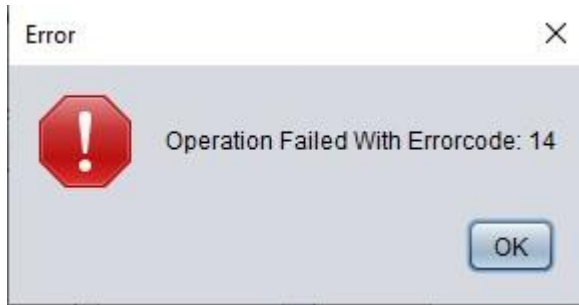
Parameter	North iPA Value	South iPA Value
Detector Leakage Current	10.58 pA	12.35 pA
Charge Loop DC Level	-0.38 V	-0.64 V
Out Stage DC Level	-0.01 V	-0.02 V
FET Backgate Voltage	-0.07 V	-0.08 V
FET Drain Ref Voltage	4.52 V	4.50 V

Normal leakage current and voltage for reference. There is a ^{152}Eu source, causing the current to fluctuate between -50 and -70 pA.

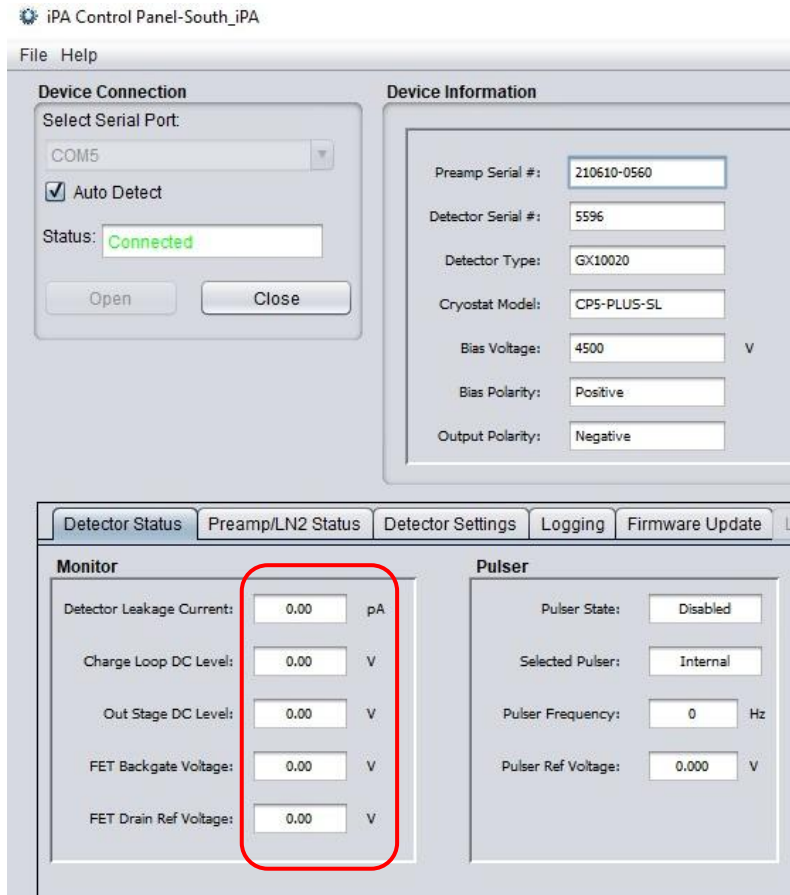
The image displays two side-by-side screenshots of the iPA Control Panel software interface. Both windows show the 'Device Connection' section with 'COM7' and 'COM5' selected, respectively, and 'Auto Detect' checked. The 'Status' is 'Connected' in both. The 'Monitor' section shows the following data:

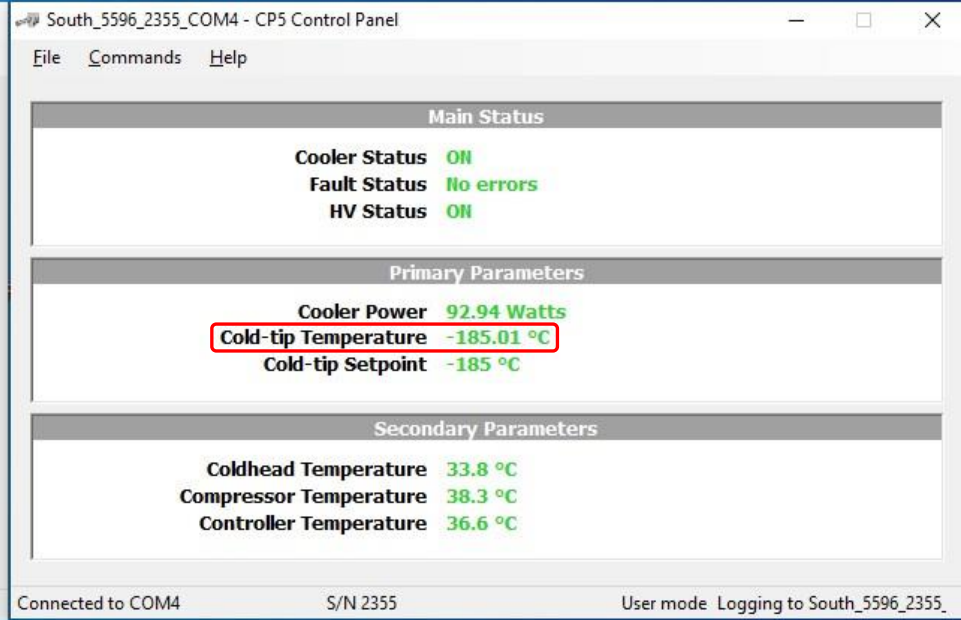
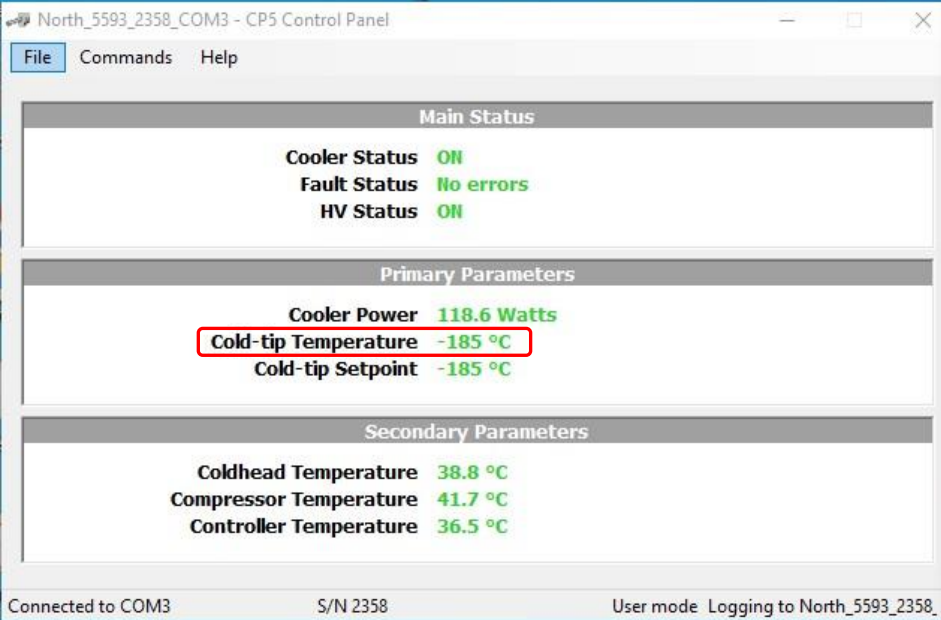
Parameter	North_iPA Value	South_iPA Value
Detector Leakage Current	-63.49 pA	-61.73 pA
Charge Loop DC Level	-0.52 V	-0.76 V
Out Stage DC Level	-0.01 V	-0.03 V
FET Backgate Voltage	-0.07 V	-0.08 V
FET Drain Ref Voltage	4.52 V	4.50 V

Troubleshoot:



We experienced this issue with the 2nd channel of the MNV-4 power supply, but it was resolved once we switched to the 3rd channel. This error has not recurred since then.





If the temperature reading at Coldtip rises beyond -160°C ,
The HV inhibit will be triggered.
The HV inhibit LED on the preamp will glow red.
The high voltage output of the bias supply will be shut down.

Device Connection

Select Serial Port:

COM5

 Auto DetectStatus: **Connected**

Open

Close

Device Information

Preamp Serial #: 210610-0560

Detector Serial #: 5596

Detector Type: GX10020

Cryostat Model: CP5-PLUS-SL

Bias Voltage: 4500 V

Bias Polarity: Positive

Output Polarity: Negative

Recommended Rise Time: 10.80 us

Recommended Flat Top: 1.20 us

Recommended ADC Gain: 8024

Recommended ADC Offset: 0

Recommended Cool Down Time: 24 Hrs

Detector Status

Preamp/LN2 Status

Detector Settings

Logging

Firmware Update

LN2 Settings

Factory Settings

Monitor

Detector Leakage Current: 0.00 pA

Charge Loop DC Level: -0.66 V

Out Stage DC Level: -0.01 V

FET Backgate Voltage: -0.06 V

FET Drain Ref Voltage: 4.50 V

Pulsar

Pulsar State: Disabled

Selected Pulsar: Internal

Pulsar Frequency: 1000 Hz

Pulsar Ref Voltage: -0.102 V

Indicator Status

H.V. Inhibit: OFF

High Count Rate: OFF

Temperature Monitor

PRTD 1: -168.89 C

PRTD 2: -197.54 C

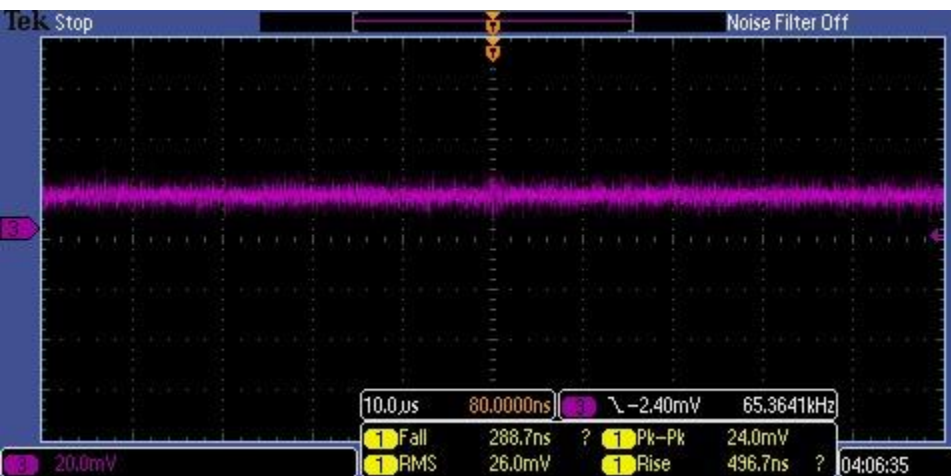
Ambient Temperature: 32.51 C

If there is a failure reading the measured temperature, the value "+999.90" will be displayed and the HV Inhibit will be automatically set active.

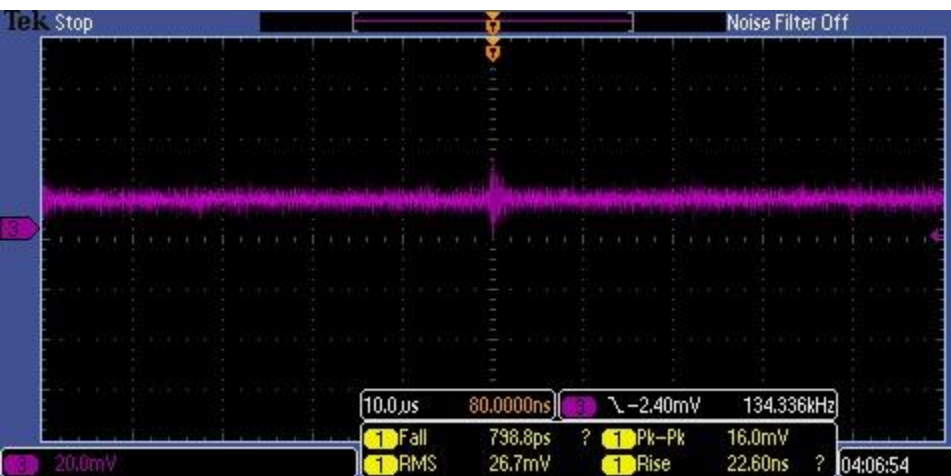
Specifications	North/Window Ge	South/Inside Ge
Detector Model	GX10020	GX10020
Detector S/N	5593	5596
Preamplifier Model	iPA SlimLine10	iPA SlimLine10
Preamplifier S/N	201216-0207	210610-0560
Cryostat Model	Cryo-Pulse 5 Plus SL	Cryo-Pulse 5 Plus SL
Cryocooler S/N	2749	2750
Controller S/N	2358	2355
Endcap Diameter	101.6 mm	101.6 mm
Endcap Length	171.45 mm	171.45 mm
Ge Diameter	84.8 mm	79.8 mm
Ge Length	65.2 mm	80.0 mm
Distance from Window	6.8 mm	6.3 mm
Carbon Window Thickness	0.6 mm	0.6 mm
Depletion Voltage	+4000 V	+2200 V
Recommended Bias Voltage	+4500 V	+4500 V
Reported Test Point Voltage	-2.40 V	-0.66 V
Measured Test Point Voltage	-0.40 V	-0.66 V
Measured Leakage Current	0-20 pA	0-20 pA
Measured Leakage Current w/ Source	50-70 pA	50-70 pA
Preamp Output Polarity	Negative	Negative
Digital Shaping Time Rise Time	10.2 μ s	10.8 μ s
Digital Shaping Time Flat Top	1.8 μ s	1.2 μ s
Bias Supply	ORTEC 660 Channel A	ORTEC 660 Channel B
Maximum Controller Power	180 W	180 W
Operating Controller Power	120-130 W	90-100 W
Factory Reported PRTD1	-163.6°C	-170.9°C
Measured PRTD1	-157°C	-168°C
Cold-tip Setpoint	-185°C	-185°C
Measured Cold-tip Temperature	-185°C	-185°C
Recommended Cool-down Time	24 hours	24 hours
Typical Warm-up Time	12-24 hours	12-24 hours

South Ge Preamp Noise. Oscilloscope 1MΩ input impedance.

Output Stage Gain x1



Output Stage Gain x2



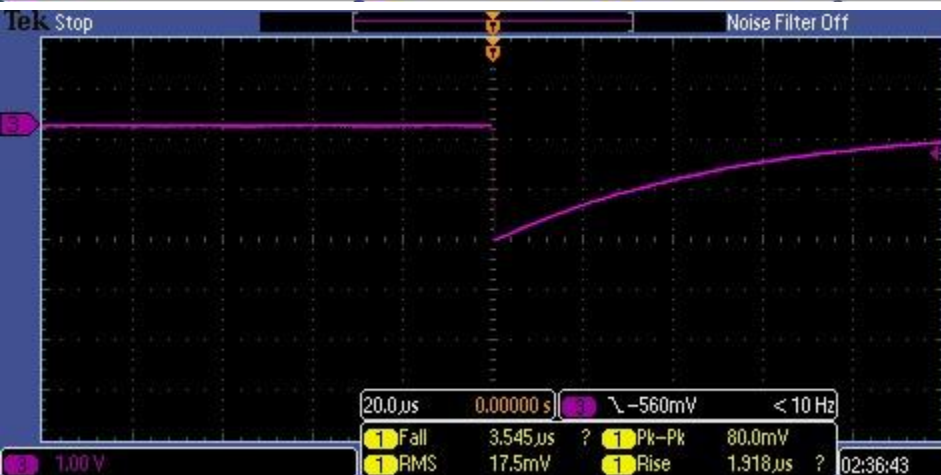
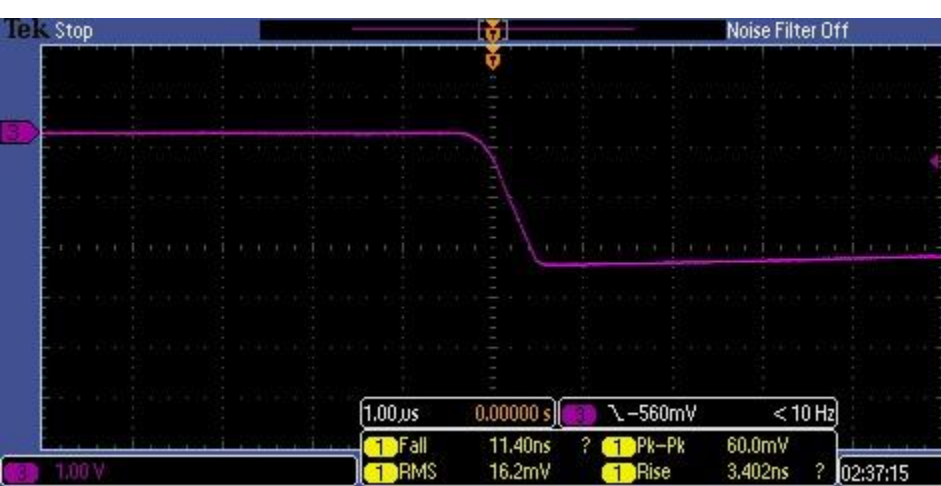
Output Stage Gain x5



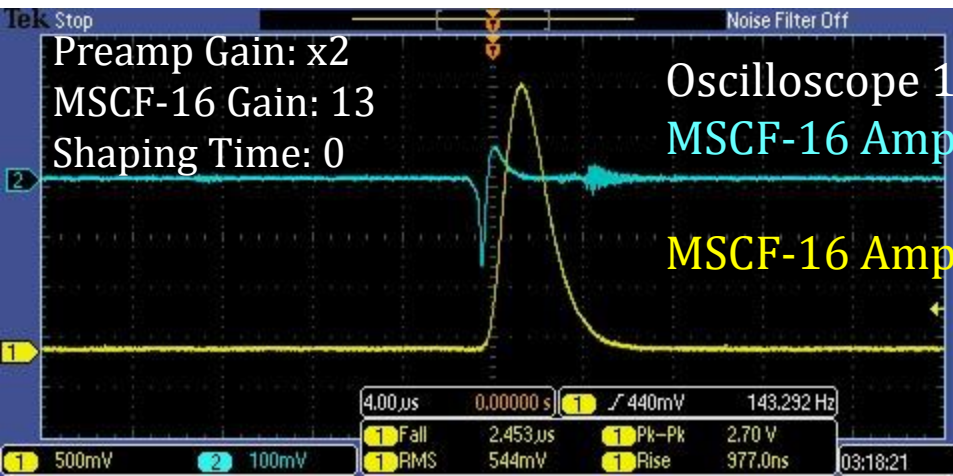
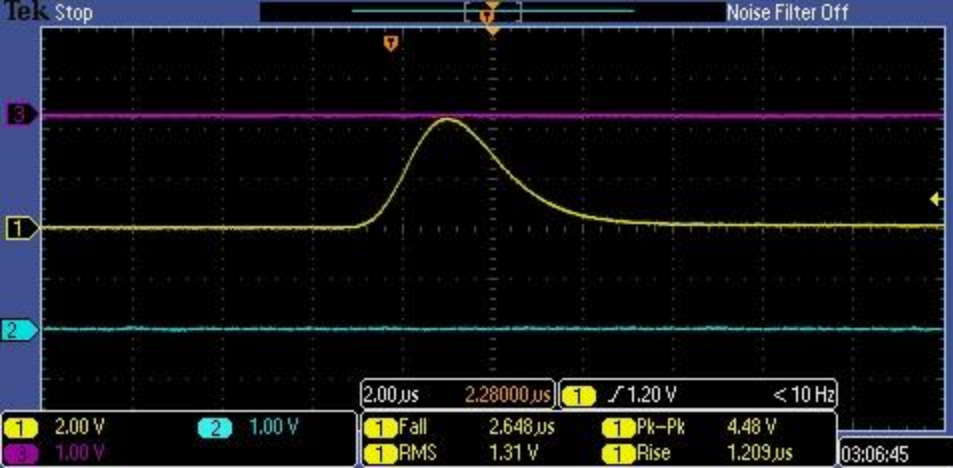
Output Stage Gain x10



The nominal voltage gain through the preamplifier test input is 1X for the output scale factor of 100 mV/MeV, 0.5X for 50 mV/MeV, 2.5X for 250 mV/MeV, and 5X for 500 mV/MeV.



North vs South
 Oscilloscope 1M Ω input impedance.



Oscilloscope 1M Ω input impedance.
MSCF-16 Amplifier Timing
MSCF-16 Amplifier Energy

