Outer Tracker Upgrade Group Meeting

23 Sep 2026

IP2I

Arnab Purohit

News

1. New versions of Ph2_ACF, GIPHT and POTATO are installed.
    - GIPHT runs smoothly but ~~POTATO is broken~~.
    - Latest version of POTATO is running.
- Problem with Occupancy above 50% at 0 MIP

Reception test

PS module
Full test: 1h20m - 2h00

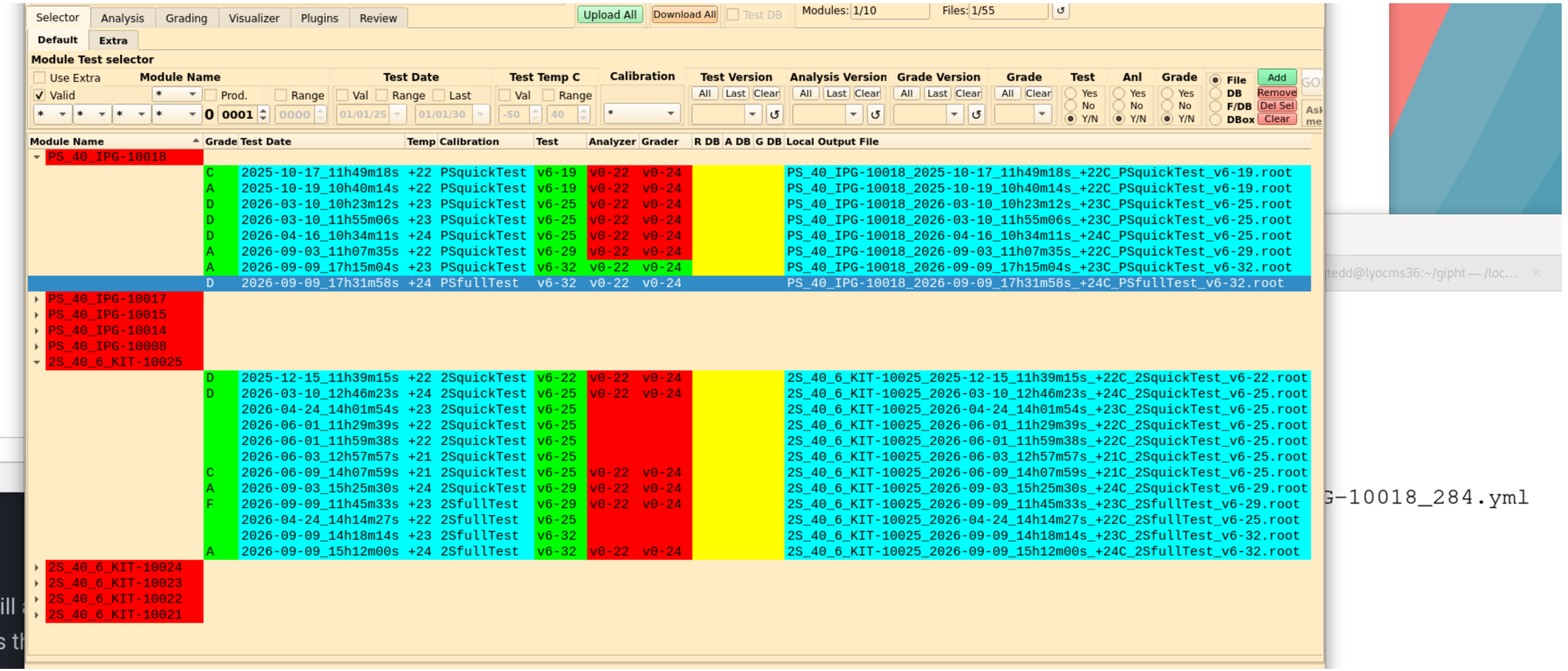
Quick test: 10m

2S Modules:
Full test: 28 min

Quick test: 3 min

Reception test Grading

Now we can have the Analysis and Grading of the Quick/Full tests.



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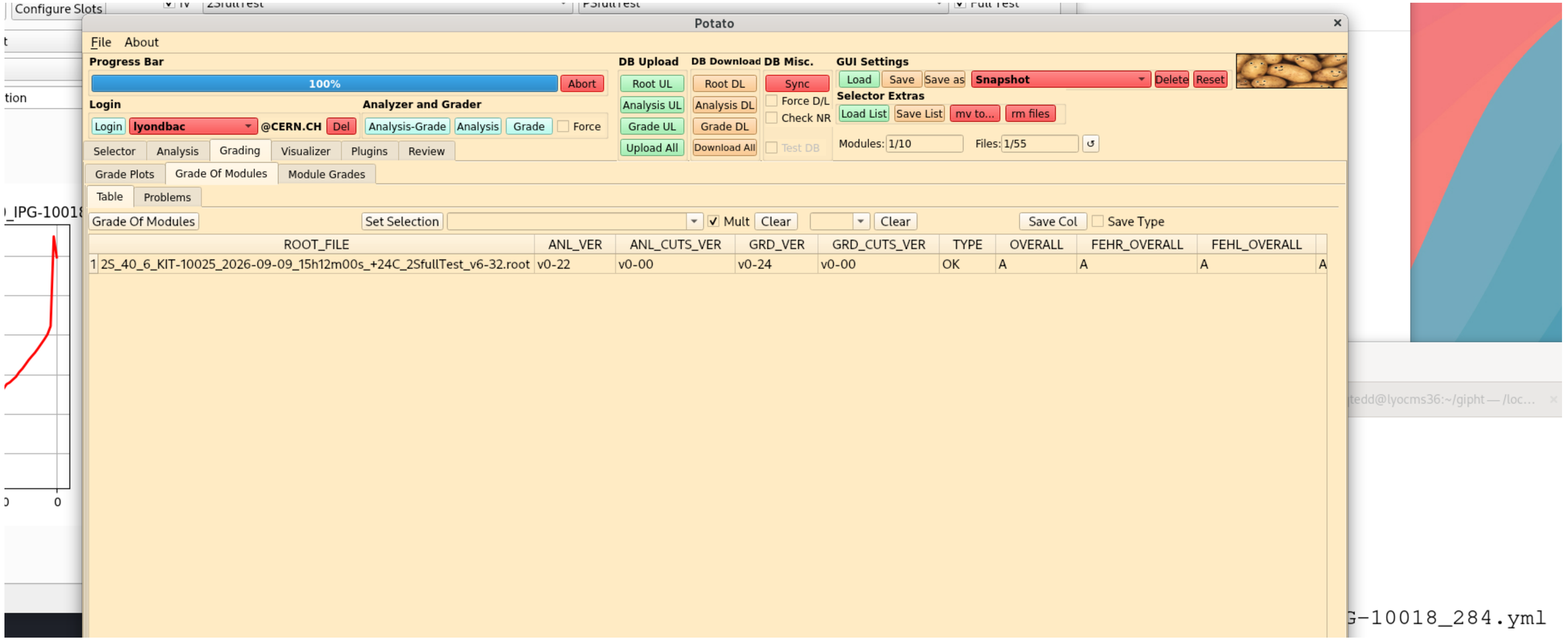

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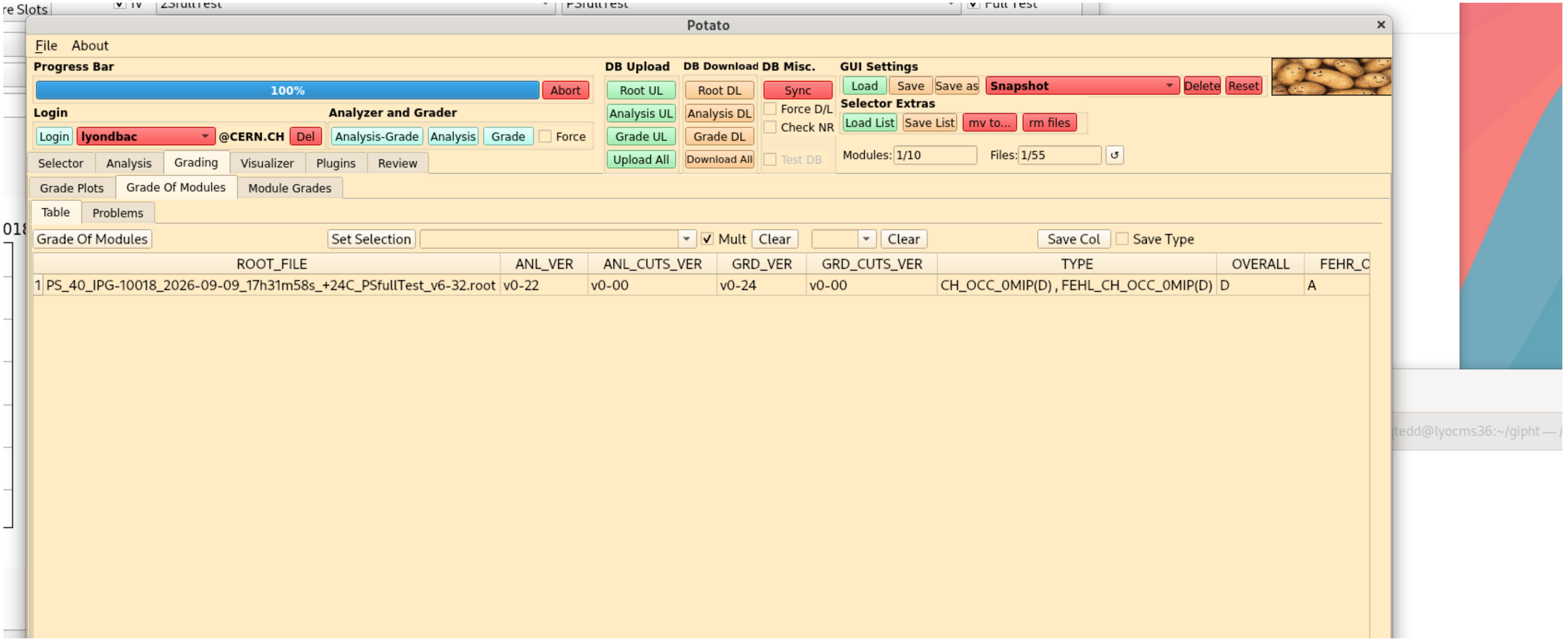
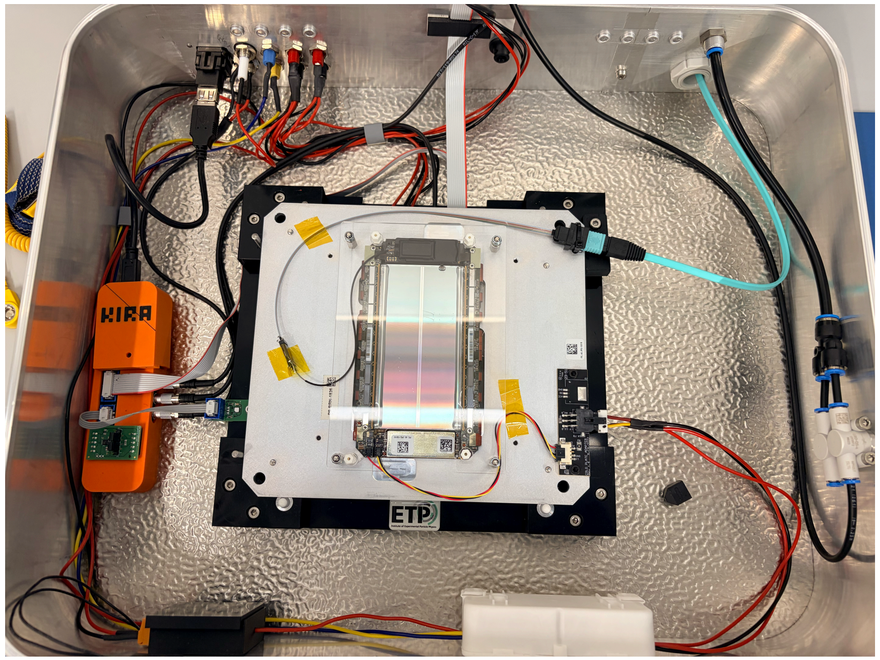
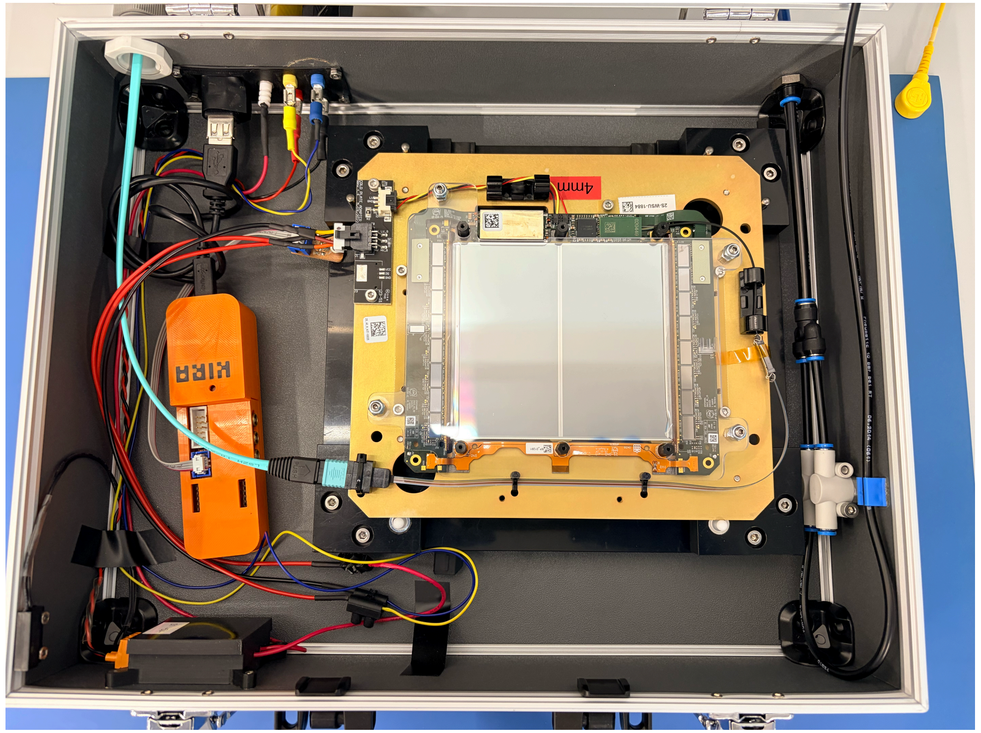


Reception test

New KIT box with KIRA

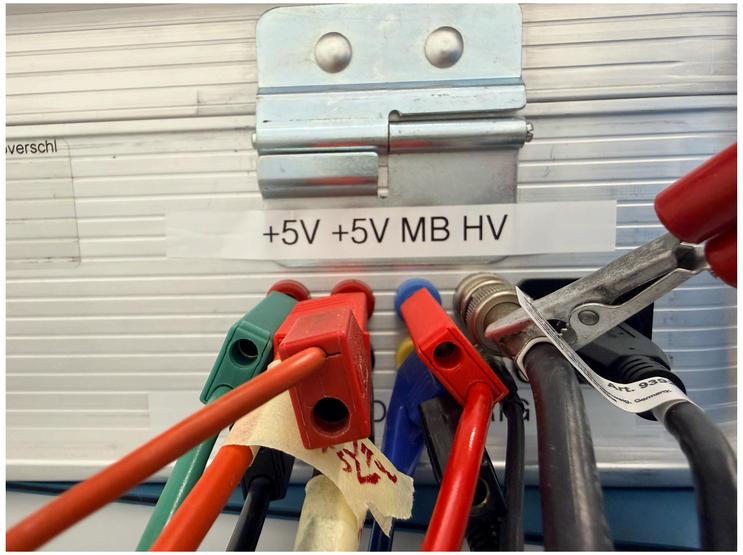


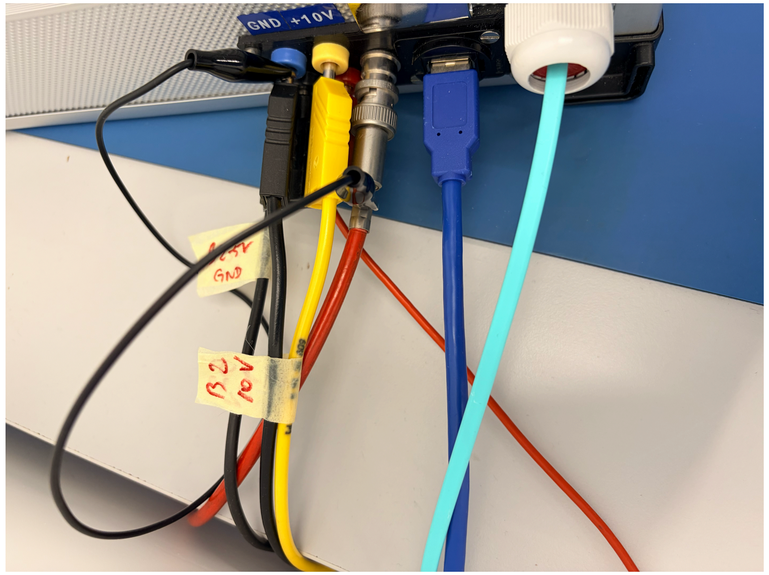
Old KIT box without KIRA



Reception test

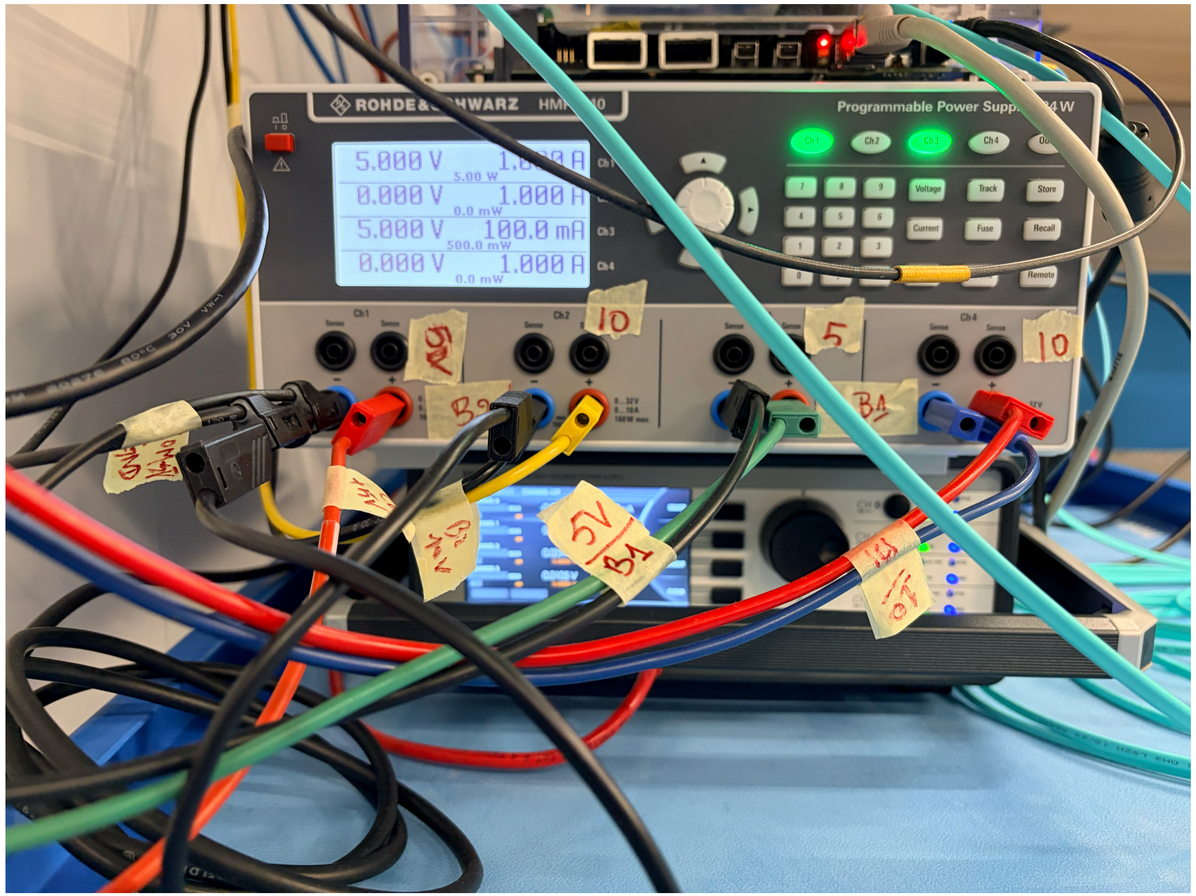
Common Ground for HV and LV





Reception test

HV and LV to the Power supply ground



Reception test

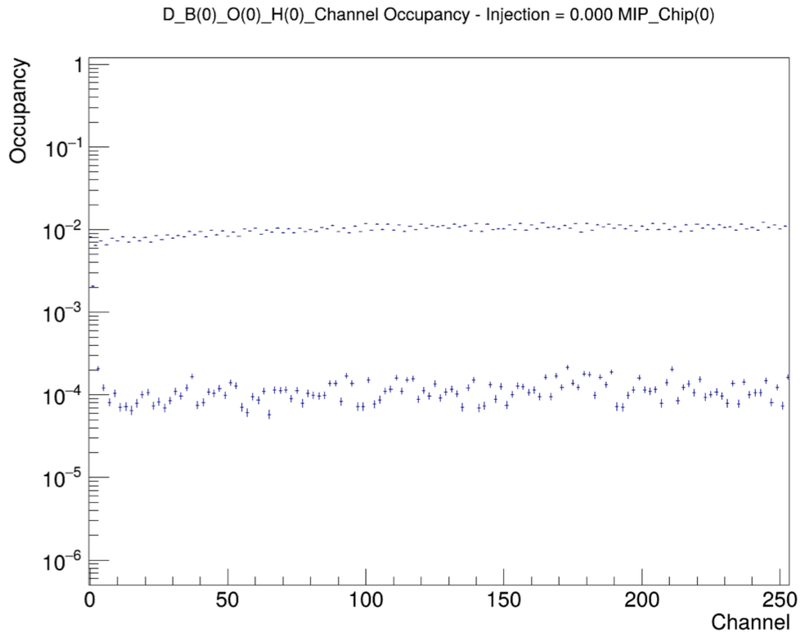
HV and LV to the Power supply ground

Reception test Issue

Original Setup

- LV- (module & KIRA box) and HV GND connected to GND of LV PS
- KIRA LED power unconnected
- trigger cable connected between KIRA and FC7

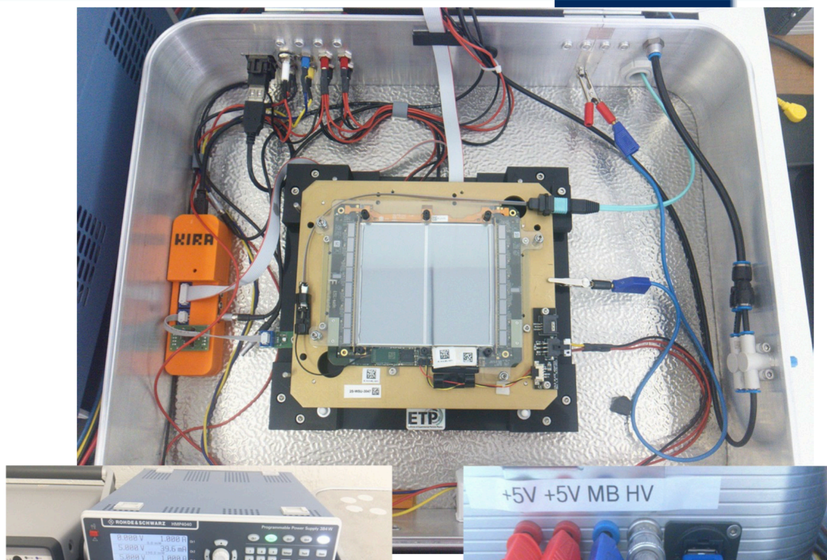
- observed increased 0 MIP occupancy
  - strongest in the bottom sensor

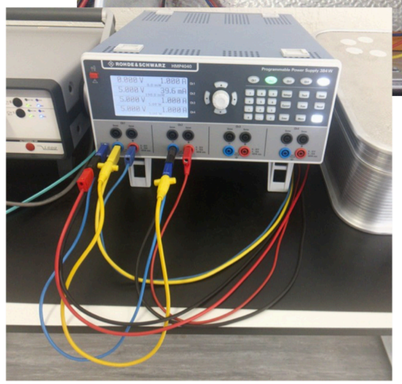


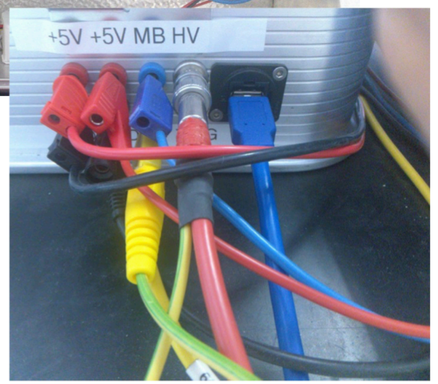
Reception test Issue

Testing & Fixes

- no improvement from:
  - connecting KIRA LED power
  - connecting carrier plate to box
- copletely disconnecting the KIRA LED arrays solved the issue
  - traced back to LED power & trigger
  - remove external trigger cable
  - connect both power plugs to GND

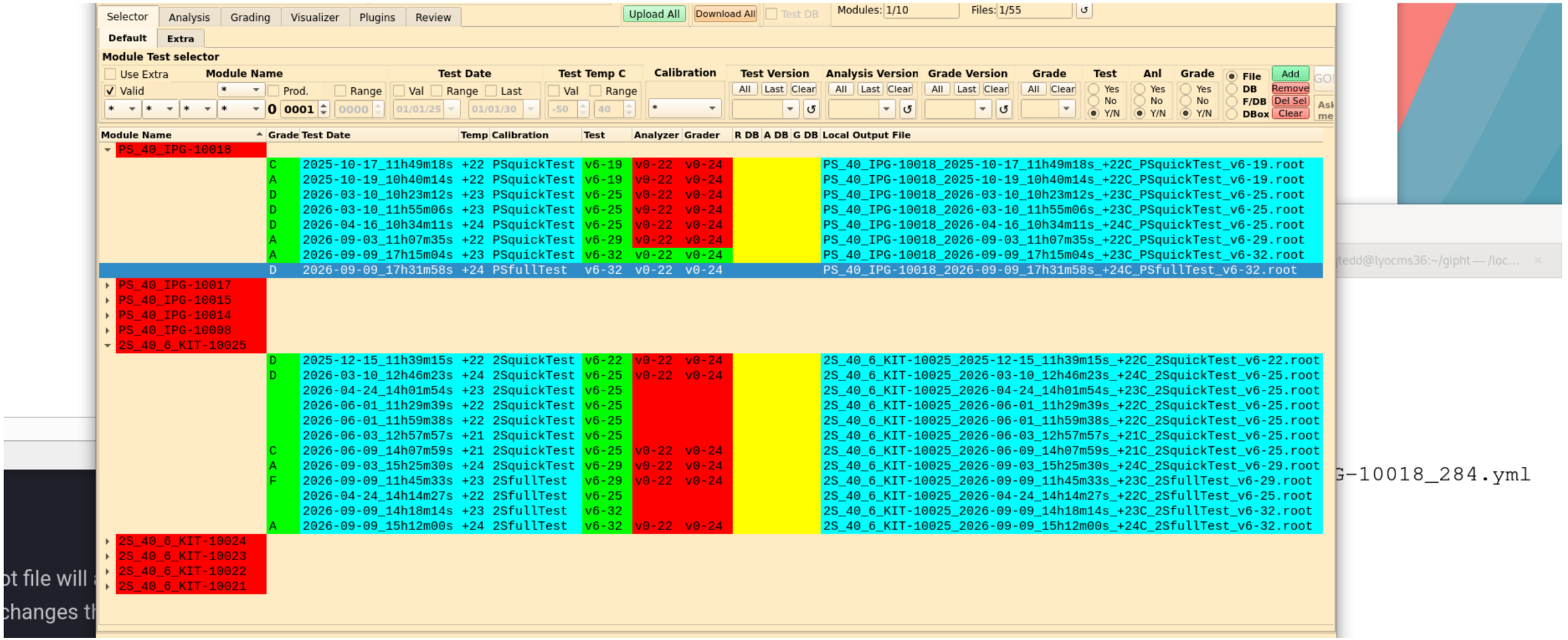






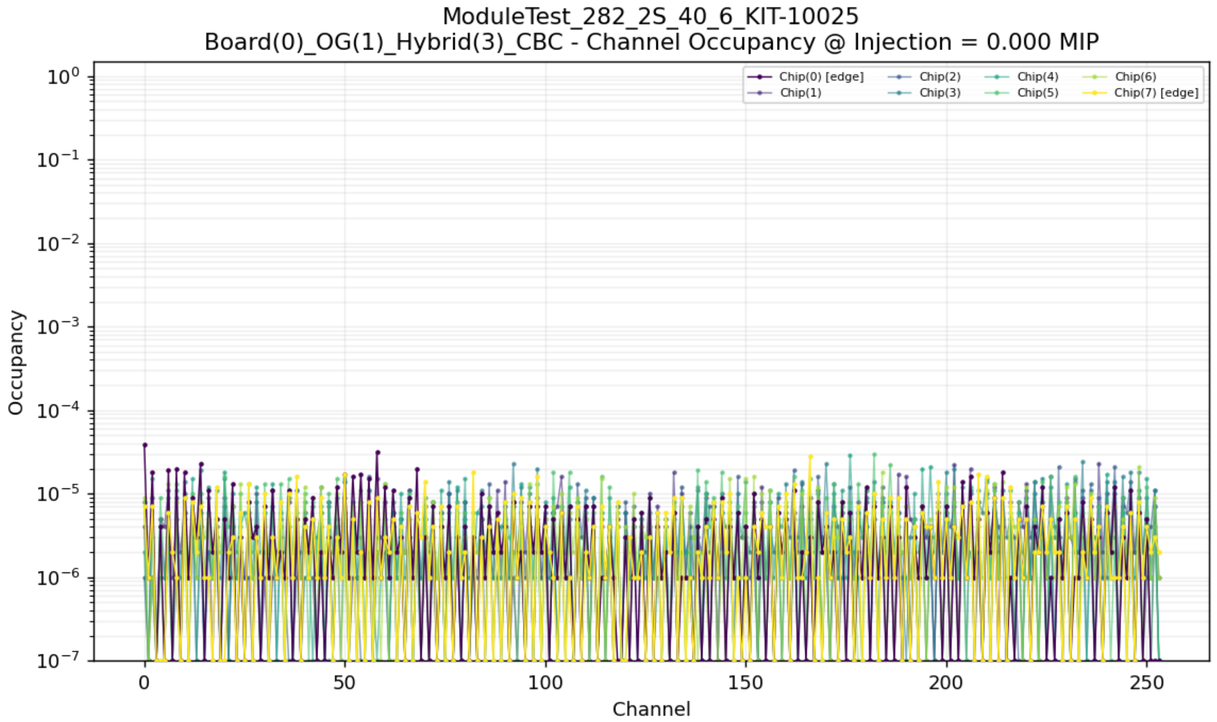
Reception test Grading

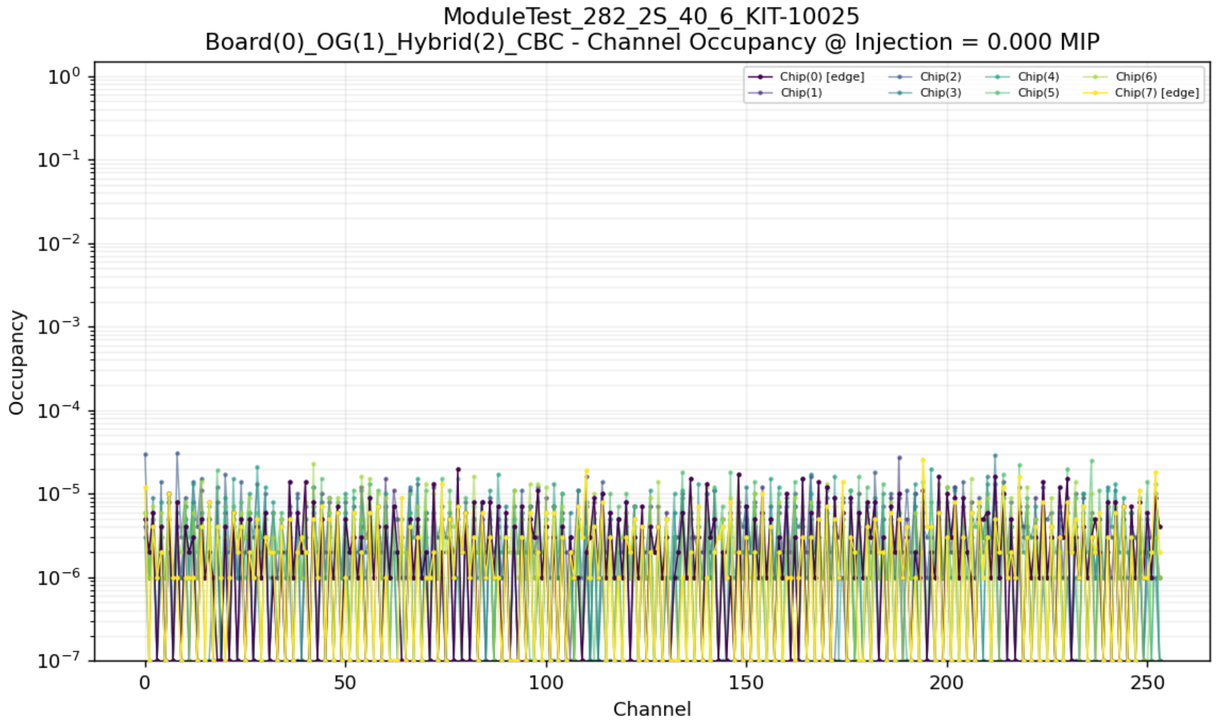
I see the issue in KIT box 1 with KIRA! I have tested a PS module.



Reception test Grading

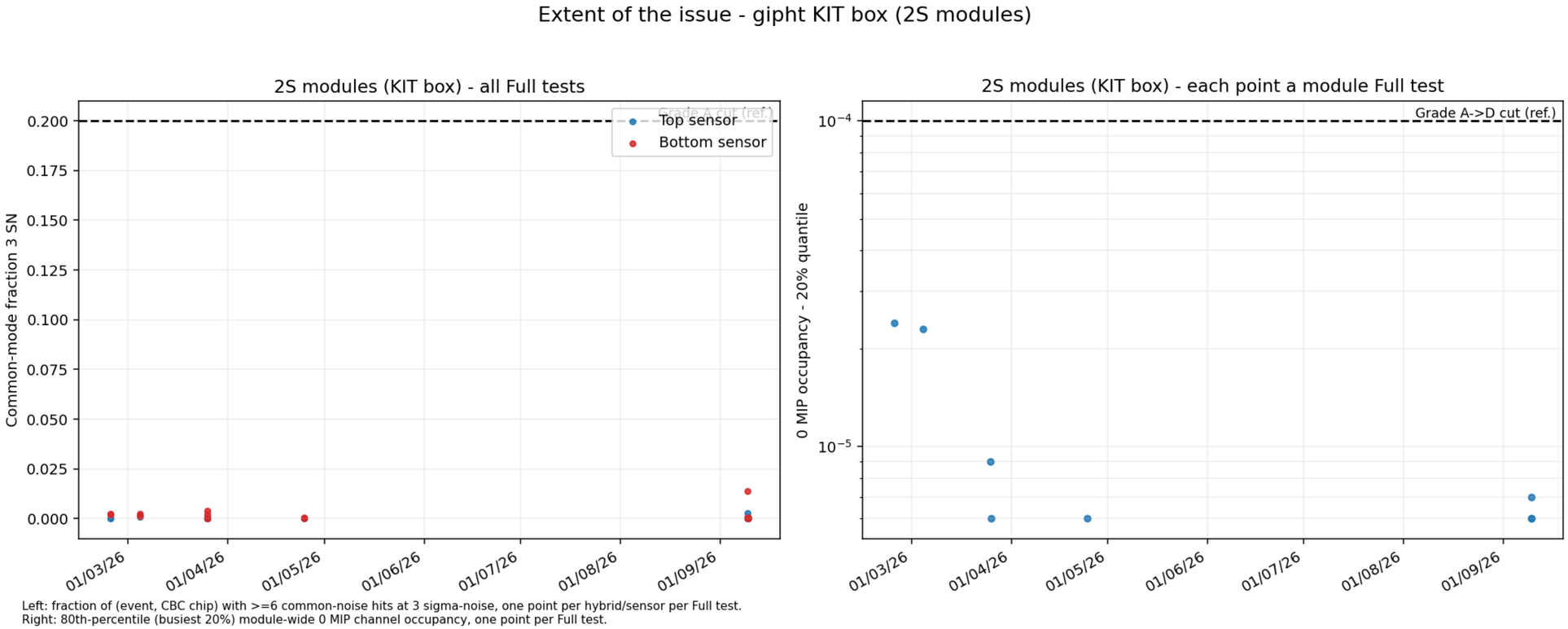
No problem with 2S module





Reception test Grading

No problem observed with 2S modules.



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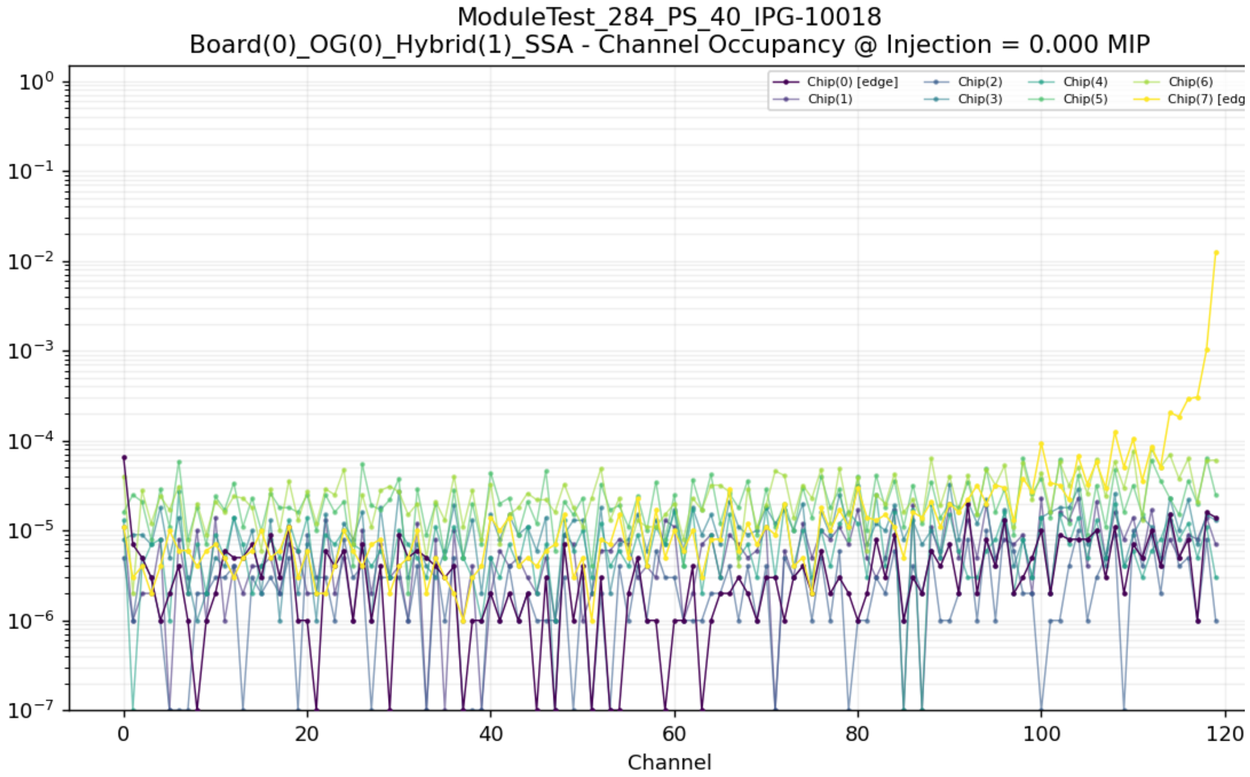
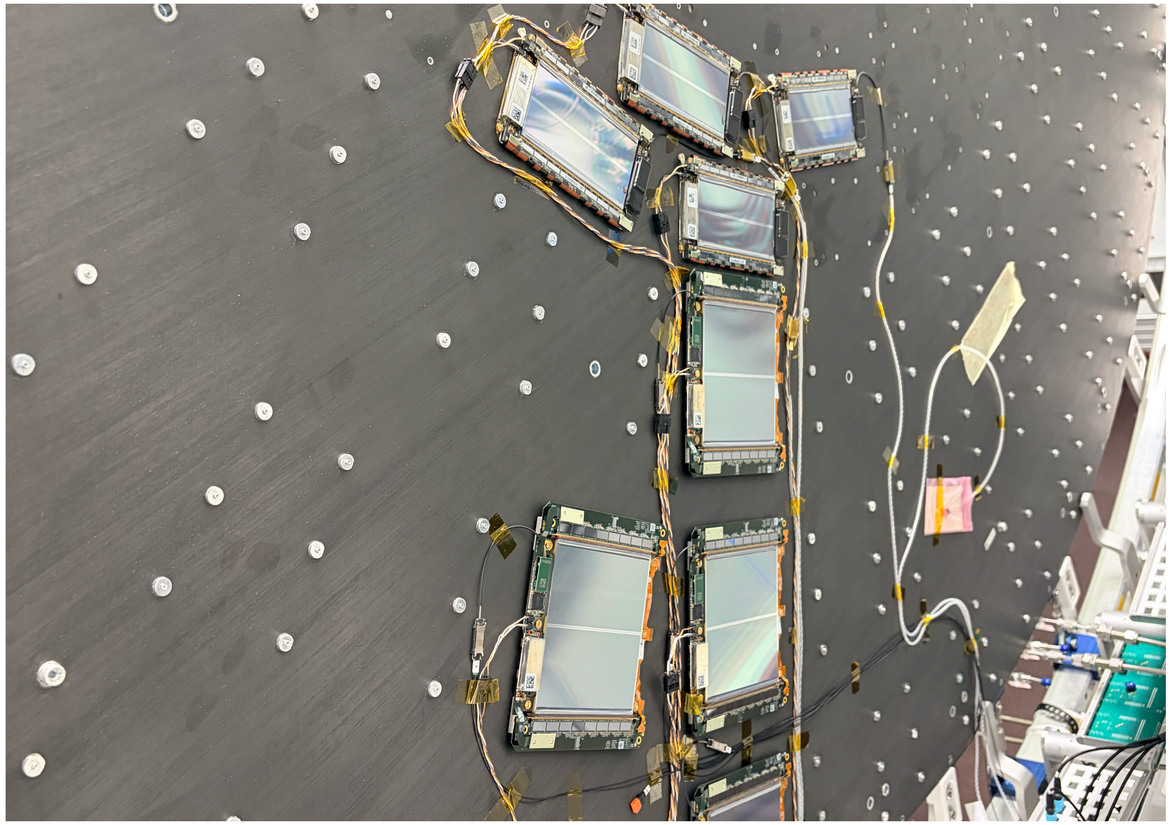


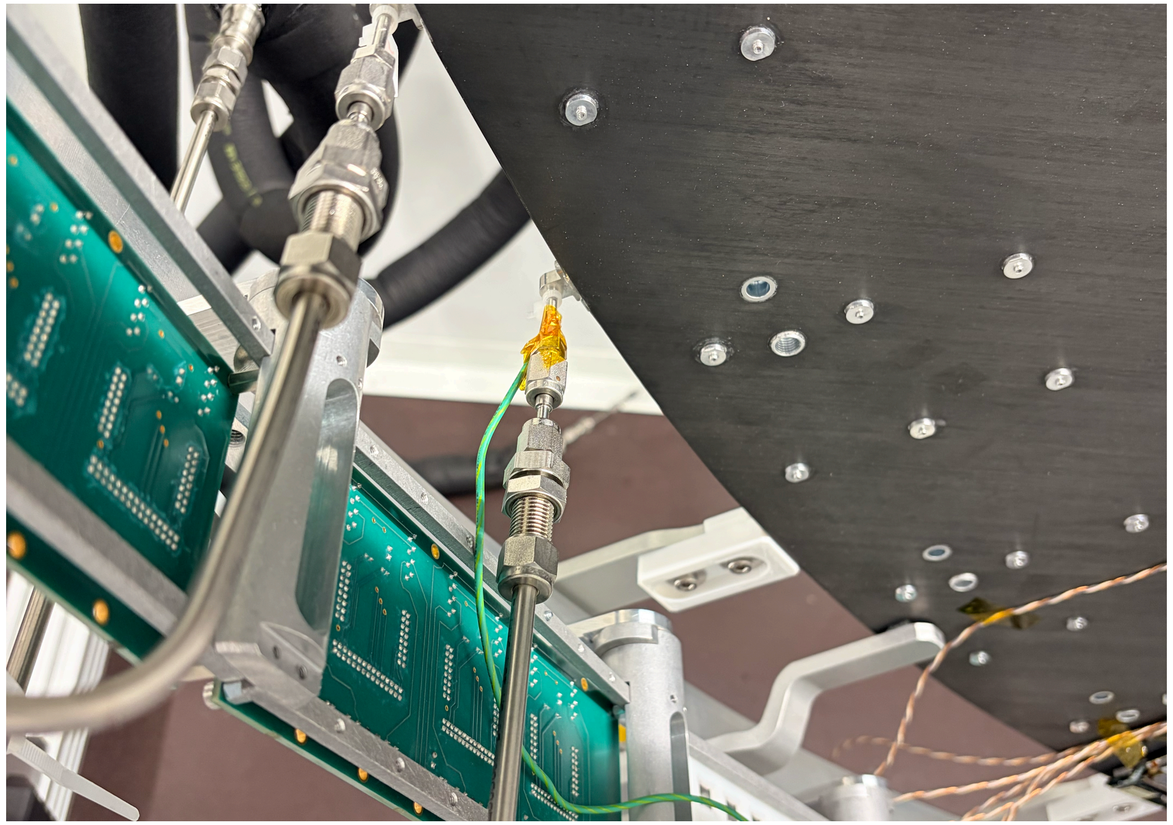
Cold Test

News

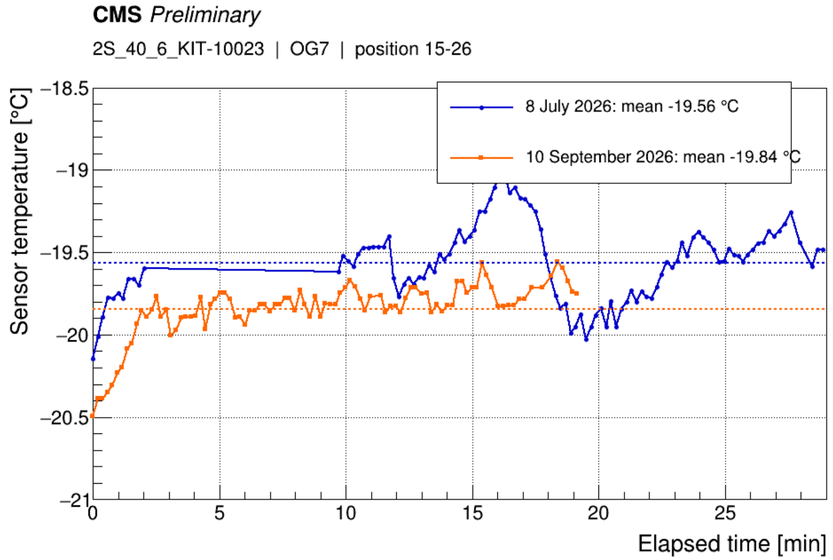
1. After summer vacation we started testing the integrated modules in Cold.
2. Analysing the results from the latest cold tests of the 4 2S.
3. As before we could run optical communication test for all 2S modules.
4. The quickest is not yet possible yet for PS modules.
    1. It seems we are using latest recommended (v6-32) version of Ph2_ACF.
    2. We should also investigate the last successful tests to see if we can find what has changed. Removed the monitoring.
5. Updated the DCS.

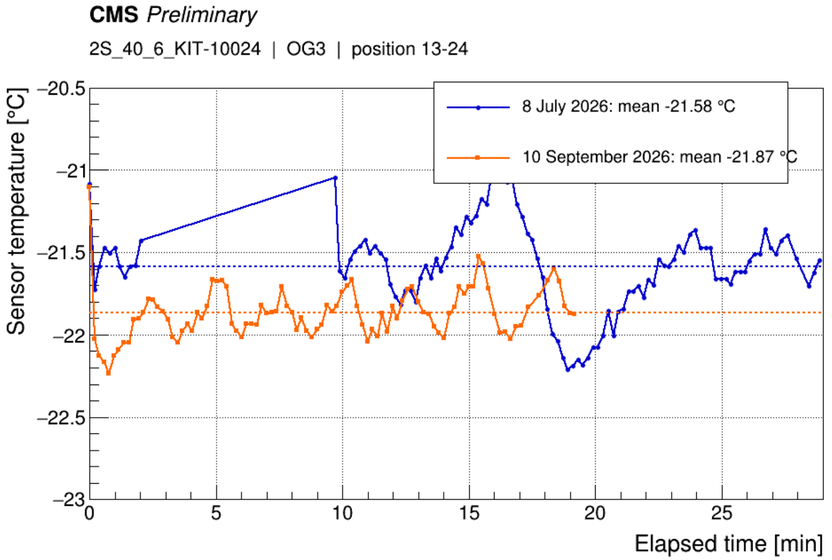
New configuration

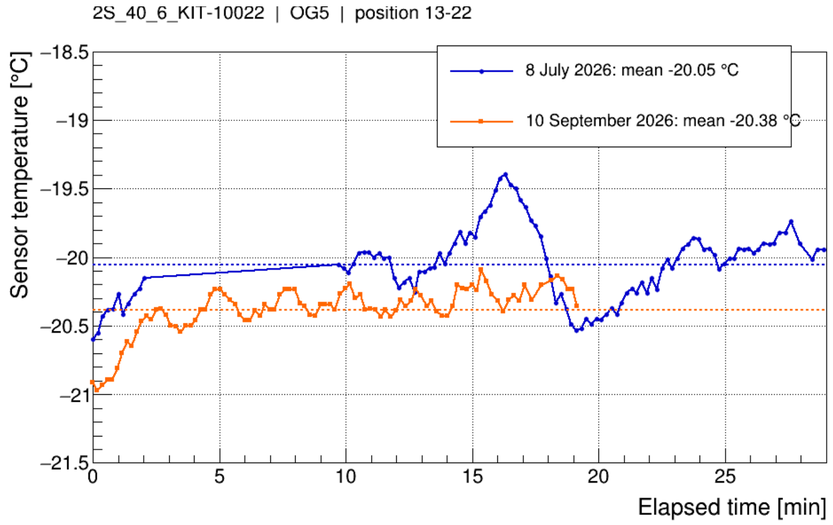


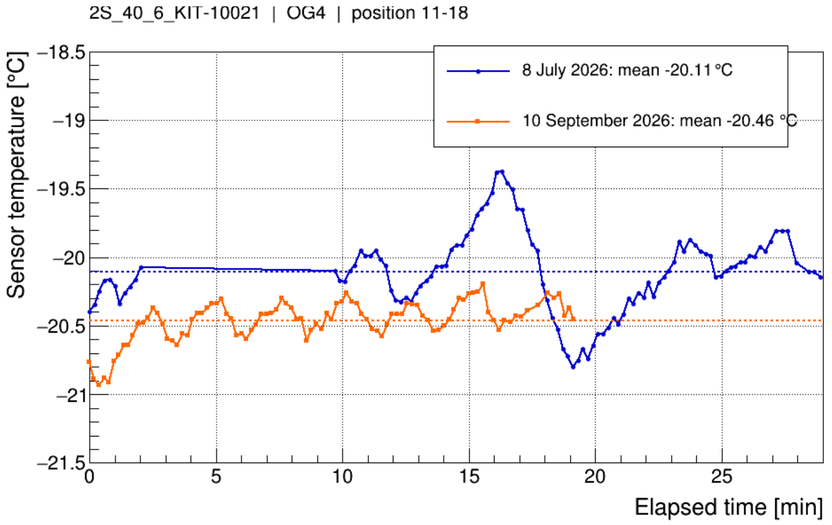


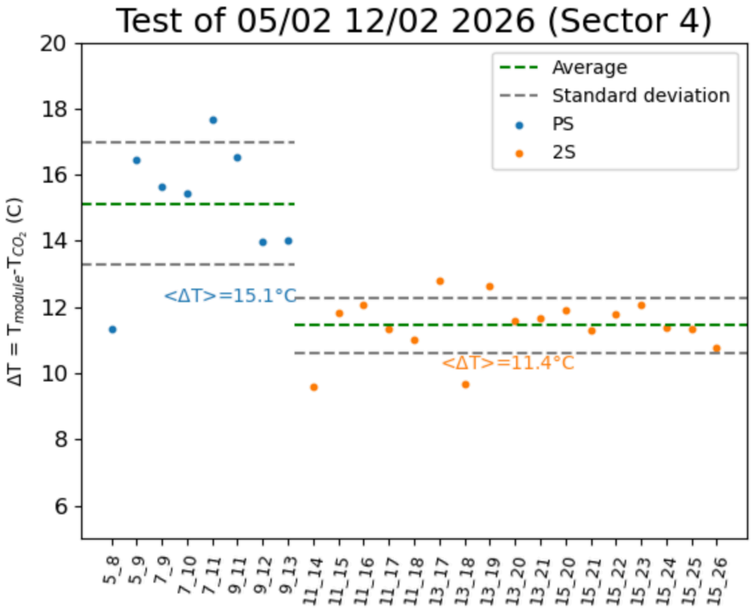
Temperature Measurements

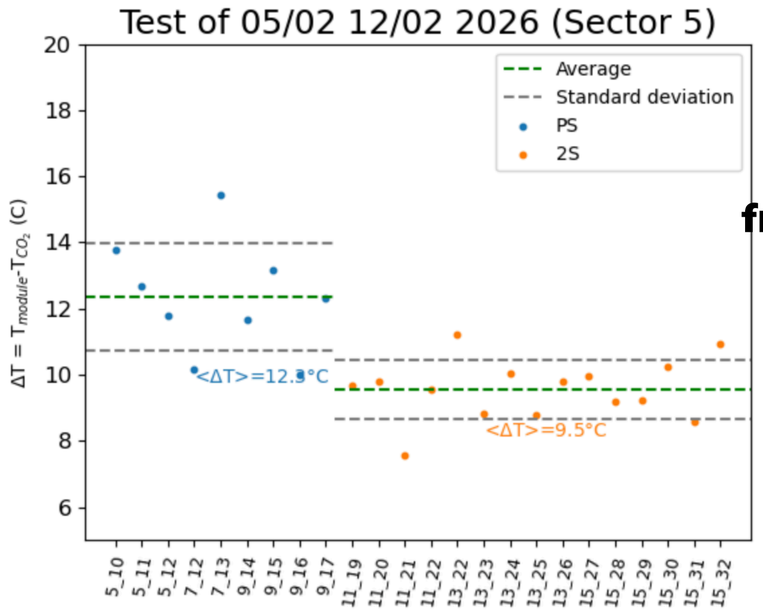




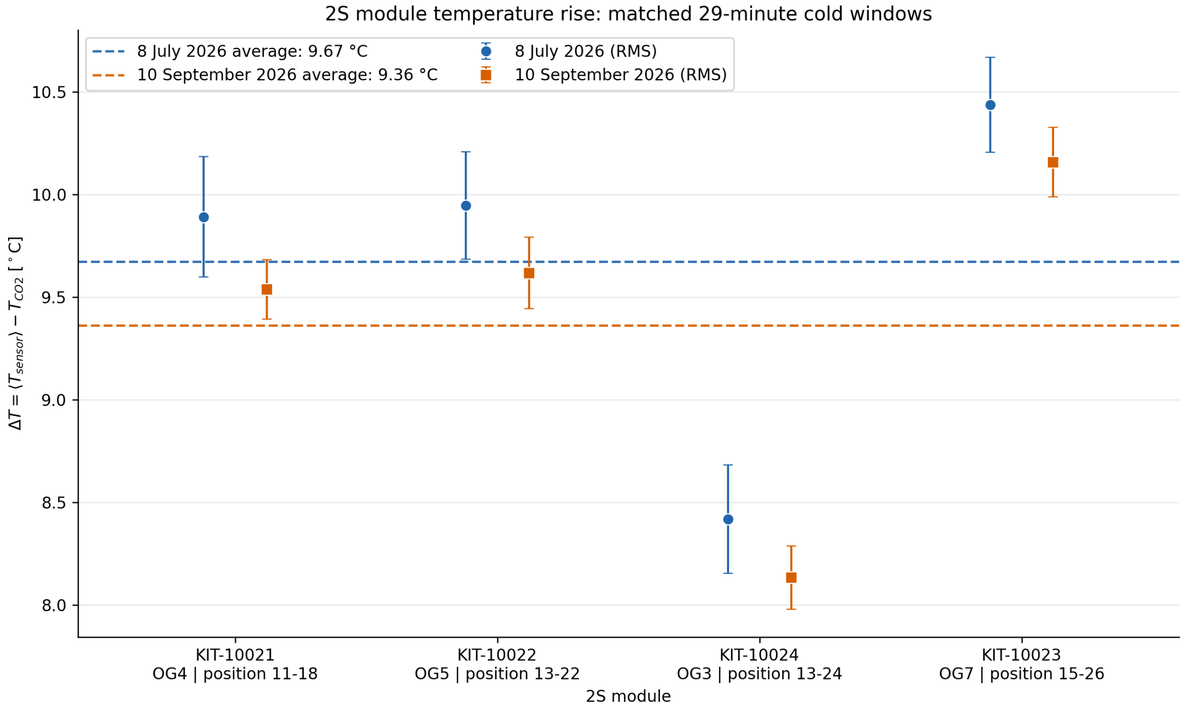






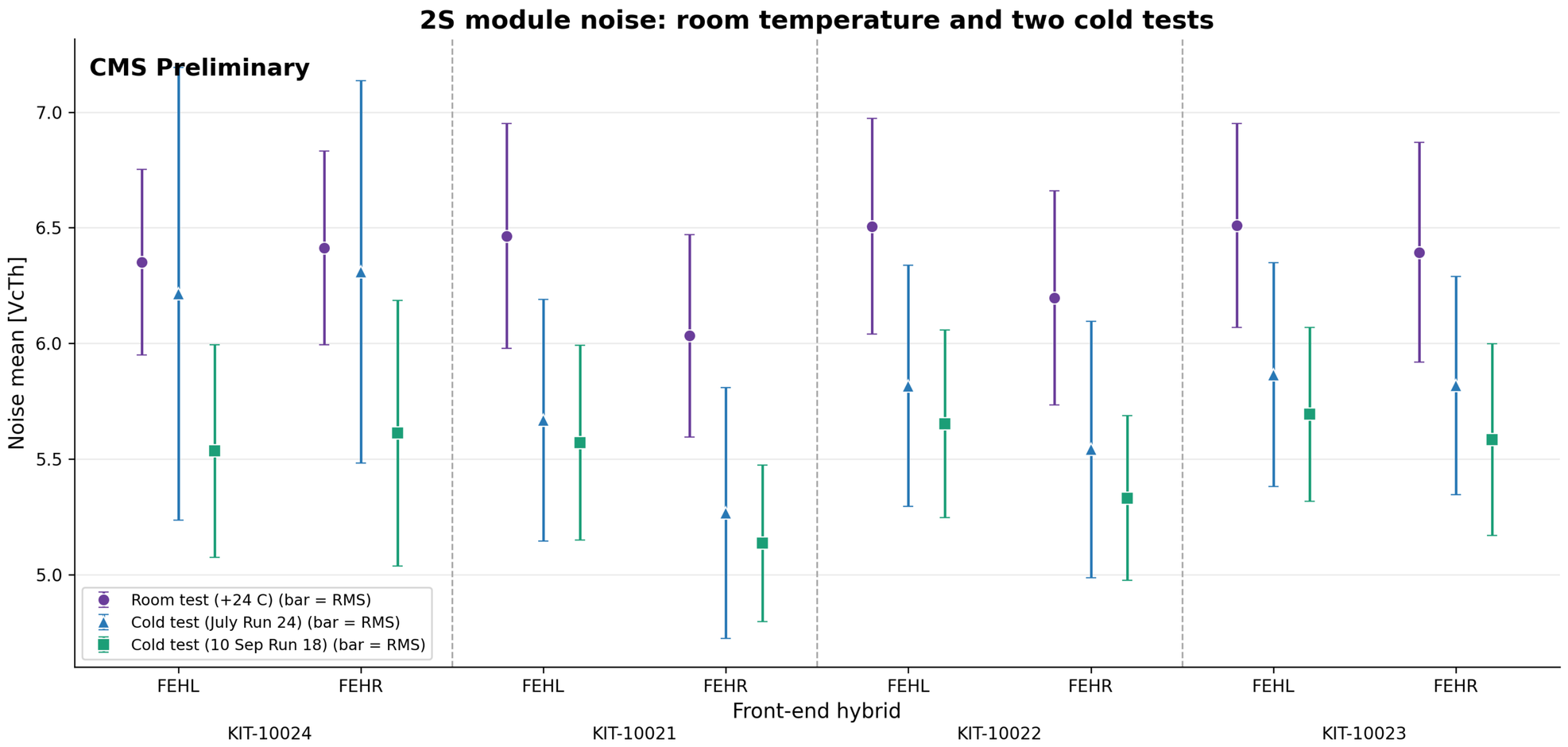


from Dummy module test
credit: Muriel



from Real module test

Pedestal Noise Measurements



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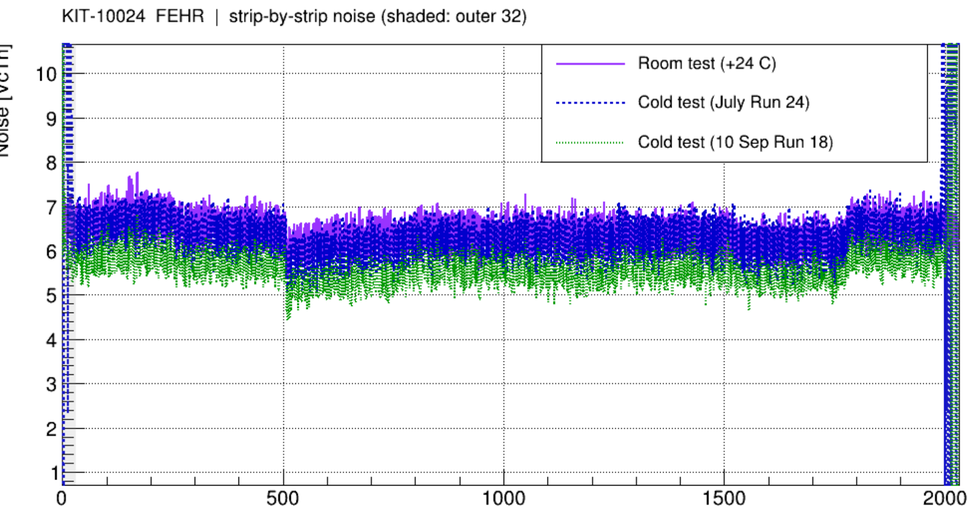
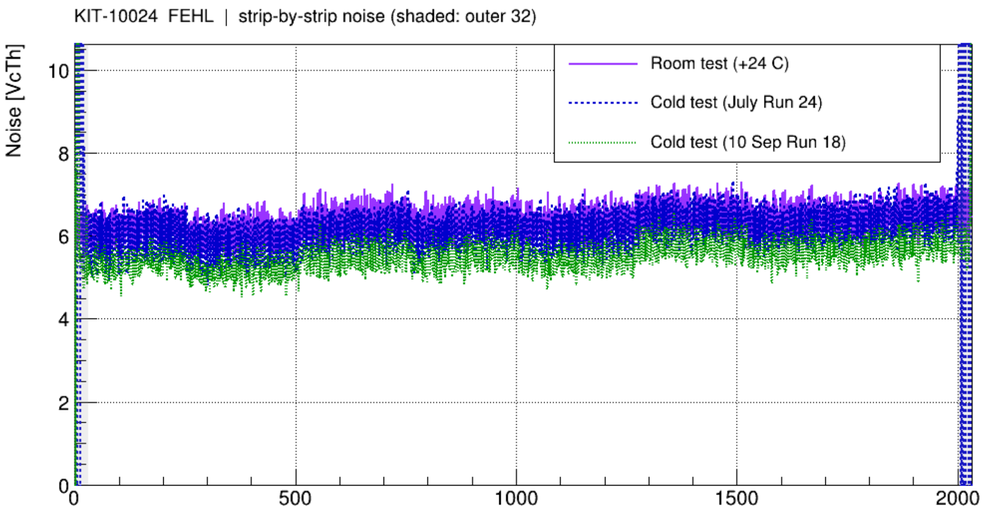
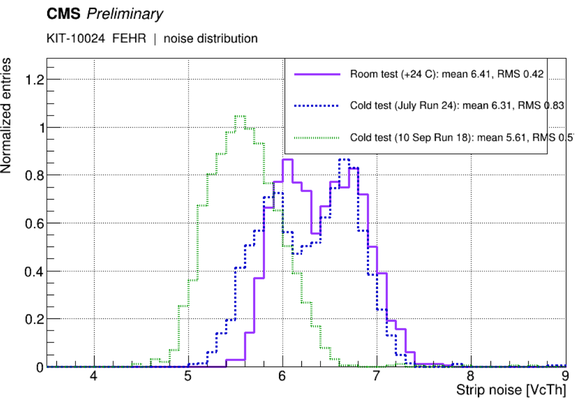
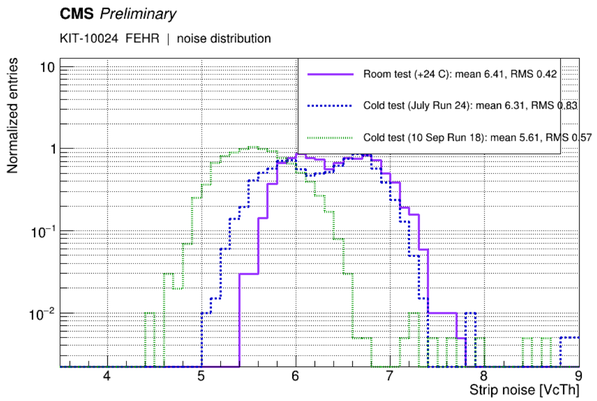
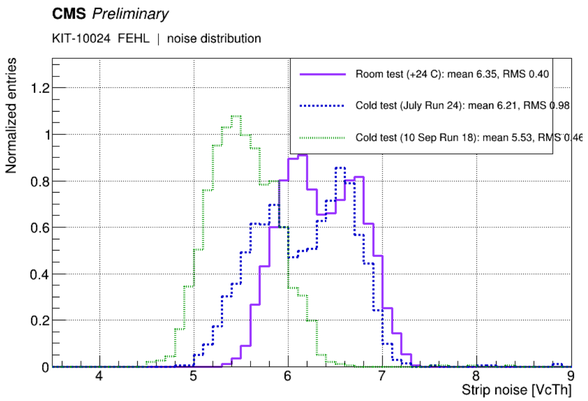
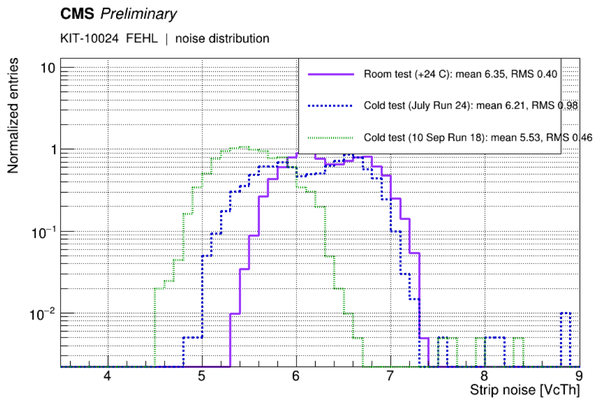












Common mode noise study

CMS *Preliminary* Common-mode noise: Cold test (10 Sep, Run 18) Γ [%], Feld et al. Eq. (19)

Optical group	Combined	FEH0	FEH1
OG 3	9.9%	18.6%	18.9%
OG 4	1.6%	14.2%	16.6%
OG 5	2.2%	12.3%	13.9%
OG 7	2.2%	13.4%	16.5%

Common-mode noise: Cold test (8 July)

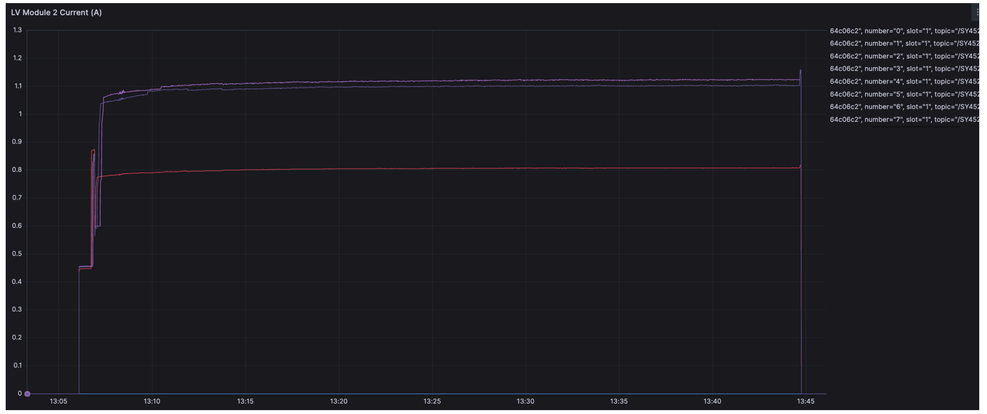
Optical group	Combined	FEH0	FEH1
OG 3	22.0%	29.6%	28.6%
OG 4	13.4%	23.3%	23.5%
OG 5	8.9%	20.7%	21.8%
OG 7	9.6%	29.7%	30.1%

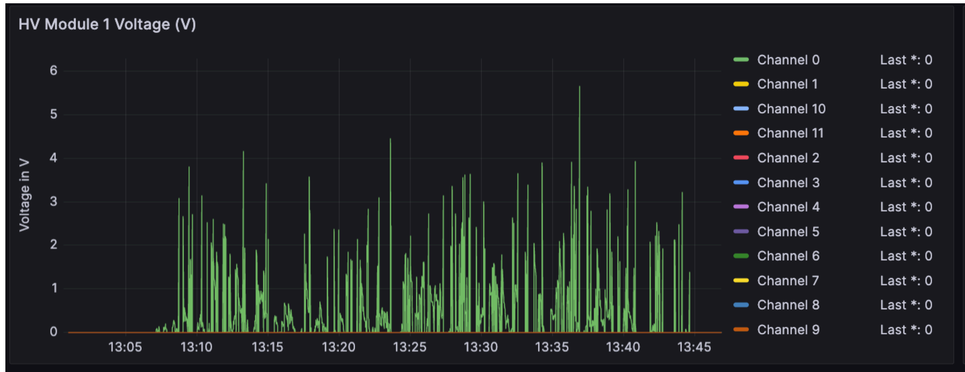
PS modules

1. Increased LV current threshold from 1.0 A (shared by Louvain group) to 1.5A
2. The Minimal tests and LPGBTID is working now



PS modules


LV Module 2 Current (A)
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
13:05
13:10
13:15
13:20
13:25
13:30
13:35
13:40
13:45


HV Module 1 Voltage (V)
Voltage in V
6
5
4
3
2
1
0
13:05
13:10
13:15
13:20
13:25
13:30
13:35
13:40
13:45
Channel 0 Last *: 0
Channel 1 Last *: 0
Channel 10 Last *: 0
Channel 11 Last *: 0
Channel 2 Last *: 0
Channel 3 Last *: 0
Channel 4 Last *: 0
Channel 5 Last *: 0
Channel 6 Last *: 0
Channel 7 Last *: 0
Channel 8 Last *: 0
Channel 9 Last *: 0


HV Module 1 Current (µA)
0
-0.1
-0.2
-0.3
-0.4
13:05
13:10
13:15
13:20
13:25
13:30
13:35
13:40
13:45
ireq {host="0f0d864c06c2", number="0",
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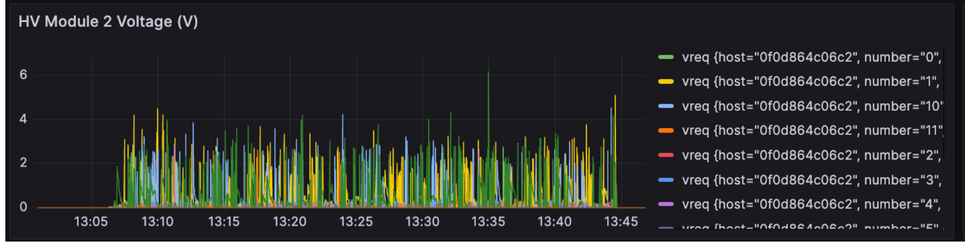
HV Module 2 Voltage (V)
6
4
2
0
13:05
13:10
13:15
13:20
13:25
13:30
13:35
13:40
13:45
vreq {host="0f0d864c06c2", number="0",
vreq {host="0f0d864c06c2", number="1",
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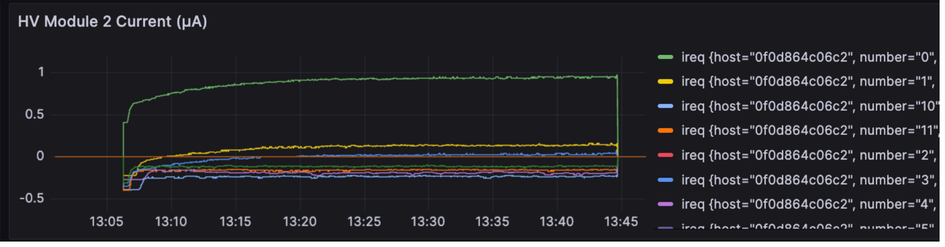
HV Module 2 Current (µA)
1
0.5
0
-0.5
13:05
13:10
13:15
13:20
13:25
13:30
13:35
13:40
13:45
ireq {host="0f0d864c06c2", number="0",
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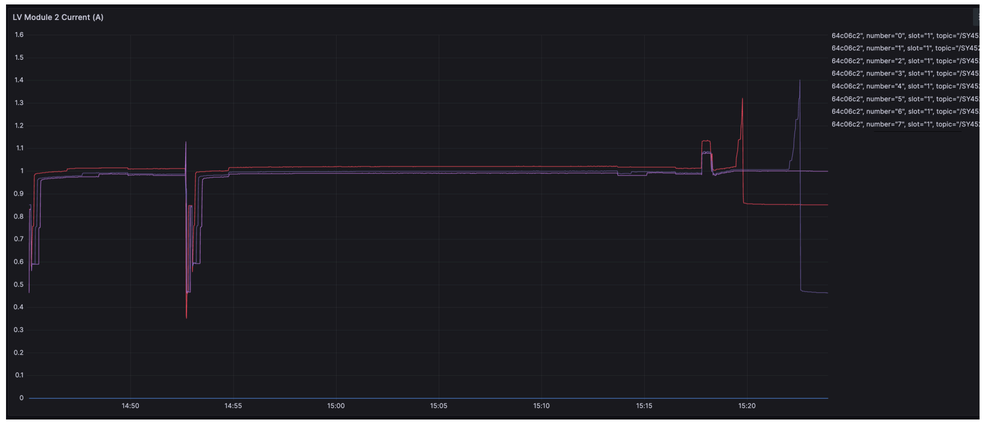
PS modules


LV Module 2 Current (A)
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
14:50
14:55
15:00
15:05
15:10
15:15
15:20


HV Module 1 Voltage (V)
Voltage in V
350
300
250
200
150
100
50
0
14:00
14:10
14:20
14:30
14:40
14:50
15:00
15:10
15:20
15:30
Channel 0 Last *: 0.470
Channel 1 Last *: 0
Channel 10 Last *: 0
Channel 11 Last *: 0
Channel 2 Last *: 0
Channel 3 Last *: 0
Channel 4 Last *: 0
Channel 5 Last *: 0
Channel 6 Last *: 0
Channel 7 Last *: 0
Channel 8 Last *: 0
Channel 9 Last *: 0
HV Module 1 Current (µA)
1
0.5
0
-0.5
-1
-1.5
ireq {host="0f0d864c06c2", number="0",
ireq {host="0f0d864c06c2", number="1",
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ireq {host="0f0d864c06c2", number="7",
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ireq {host="0f0d864c06c2", number="9",
HV Module 2 Voltage (V)
300
200
100
0
vreq {host="0f0d864c06c2", number="0",
vreq {host="0f0d864c06c2", number="1",
vreq {host="0f0d864c06c2", number="10"
vreq {host="0f0d864c06c2", number="11"
vreq {host="0f0d864c06c2", number="2",
vreq {host="0f0d864c06c2", number="3",
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HV Module 2 Current (µA)
4
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ireq {host="0f0d864c06c2", number="2",
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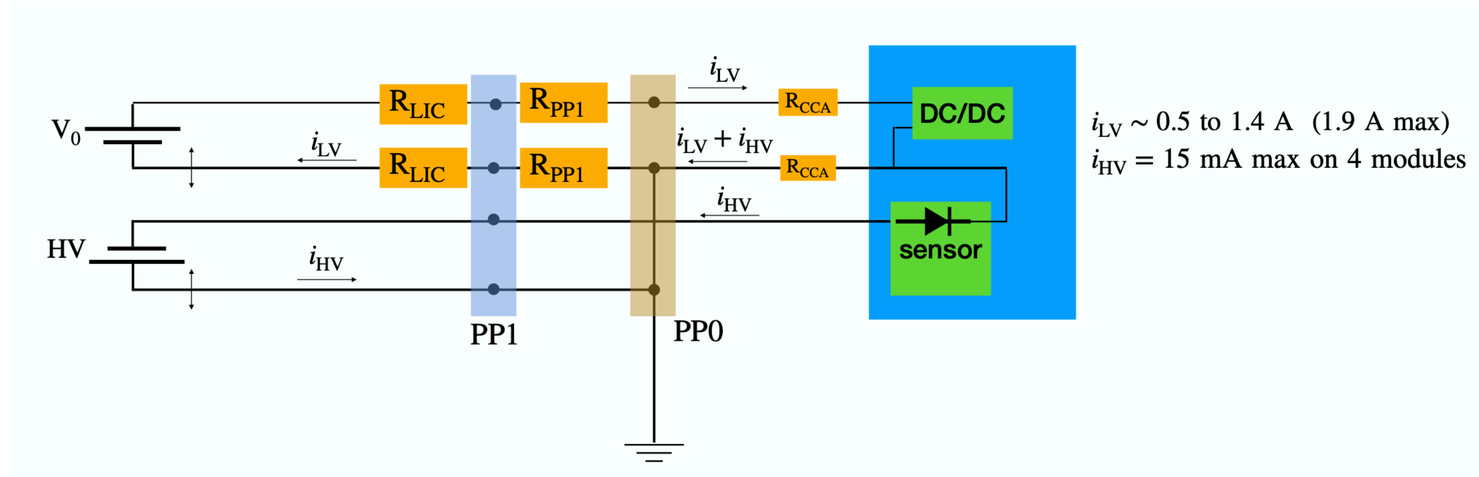
PS modules







Common Ground for PP0 to CAEN

PS modules


LV Module 2 Current (A)
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
12:10
12:15
12:20
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12:35
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