Outer Tracker Upgrade Group Meeting

30 Sep 2026

IP2I

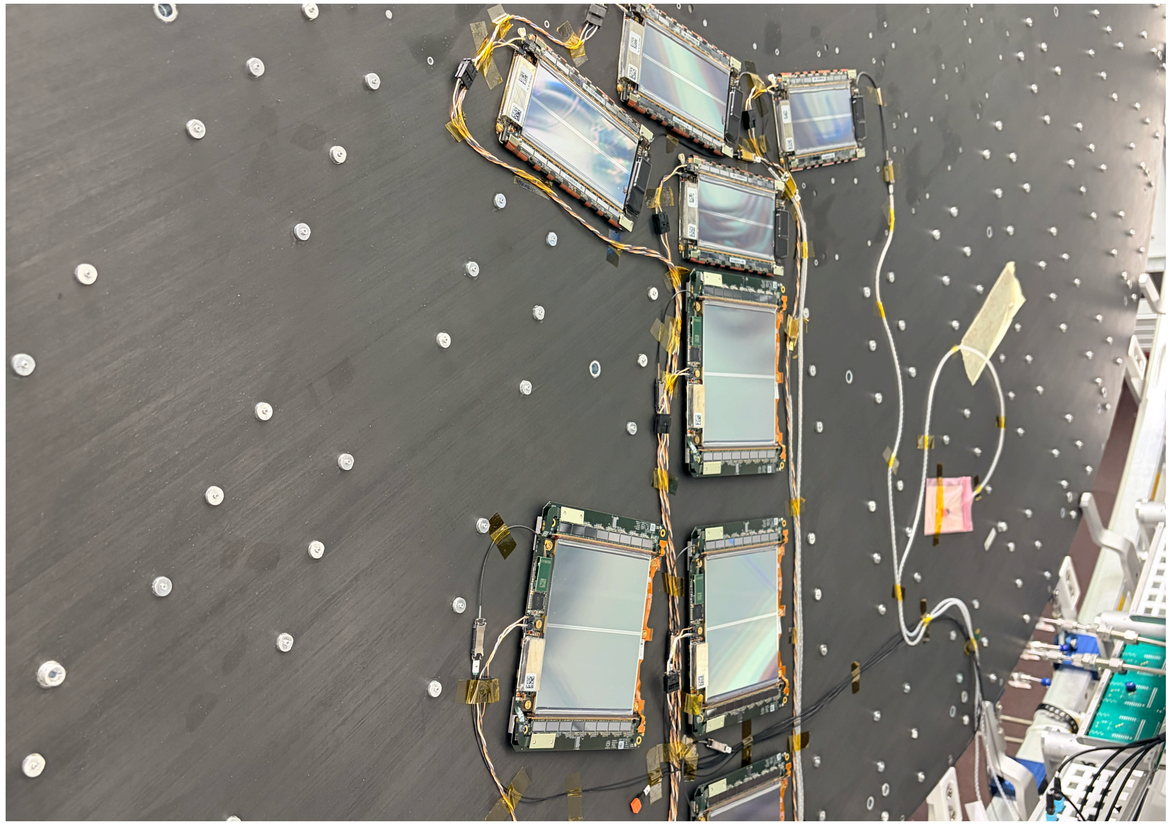
Arnab Purohit

Cold Test

News

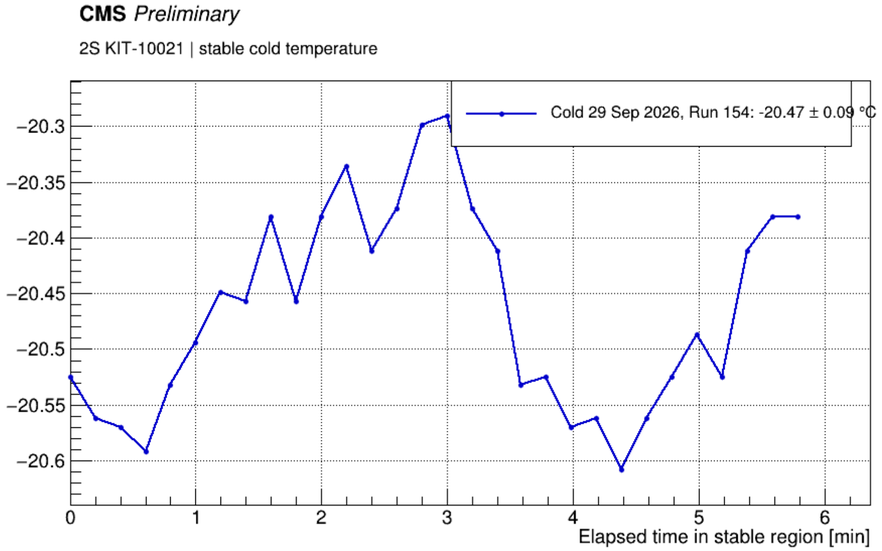
1. As before we could run optical communication test for all 2S modules.
2. ~~The quickest is not yet possible yet for PS modules.~~ Quick tests were performed on the PS modules.
    1. It seems we are using latest recommended (v6-32) version of Ph2_ACF.
    2. We are using the Firmware suggested by Favio Ravera.
    3. We can test at cold but the problem is occurring at room temperature.
3. Updated the DCS.

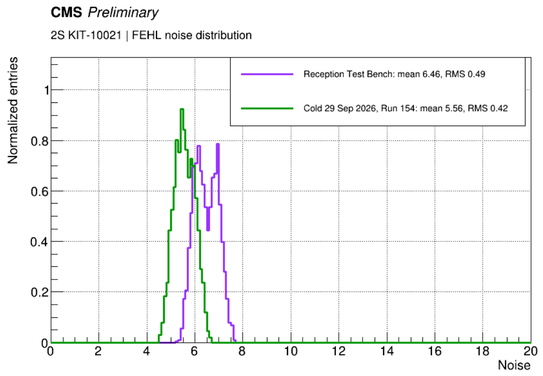
Latest measurements

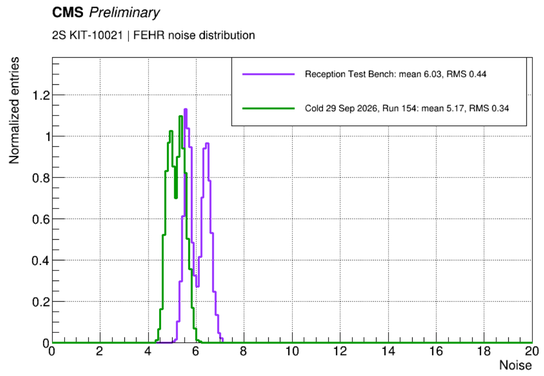


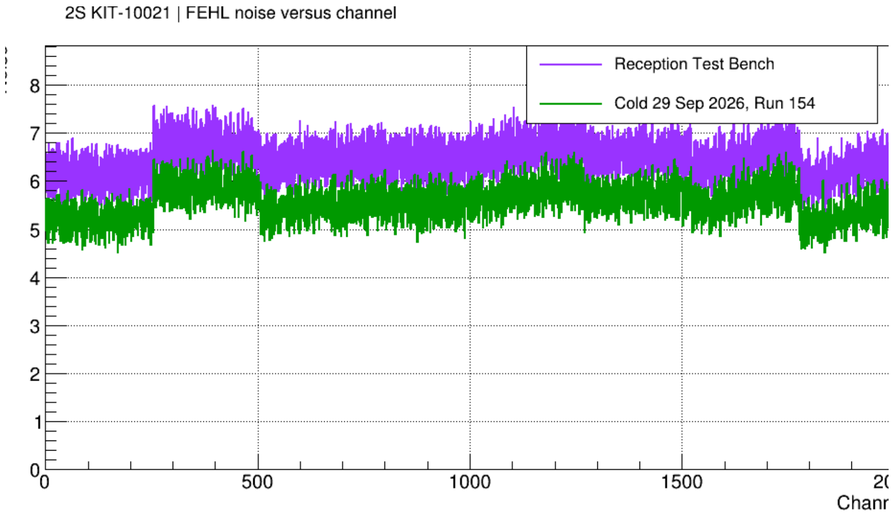
Module	OG	Successfully completed runs after 23 Sep
PS IPG-10014	1	126, 140, 145, 150, 158, 160
PS IPG-10008	2	125, 129–134, 136, 142, 146, 151, 156
PS IPG-10017	3	144, 147–149, 152, 157
PS IPG-10015	5	127
2S KIT-10024	3	143, 153, 154
2S KIT-10021	4	143, 153, 154
2S KIT-10022	5	143, 153, 154
2S KIT-10023	7	143, 153, 154

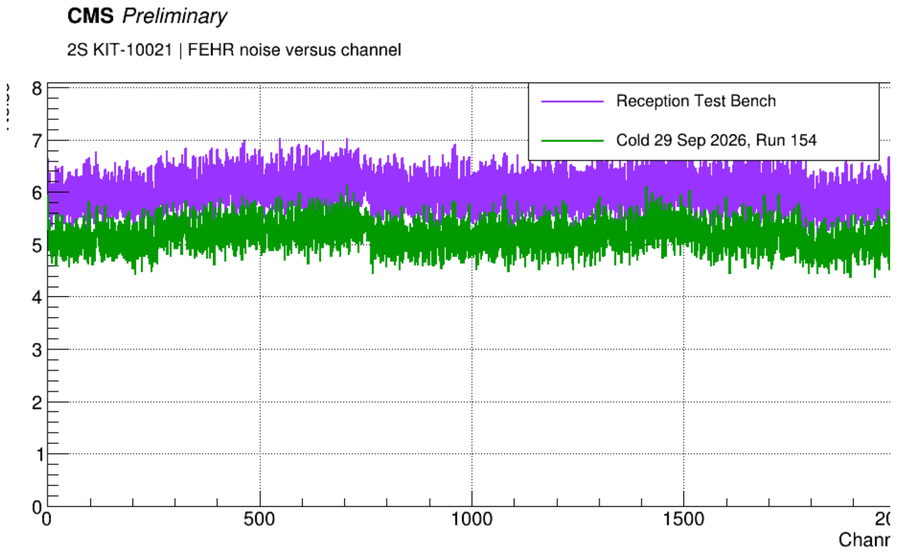
2S KIT-10021


CMS Preliminary
2S KIT-10021 | stable cold temperature
Cold 29 Sep 2026, Run 154: -20.47 ± 0.09 °C
Elapsed time in stable region [min]

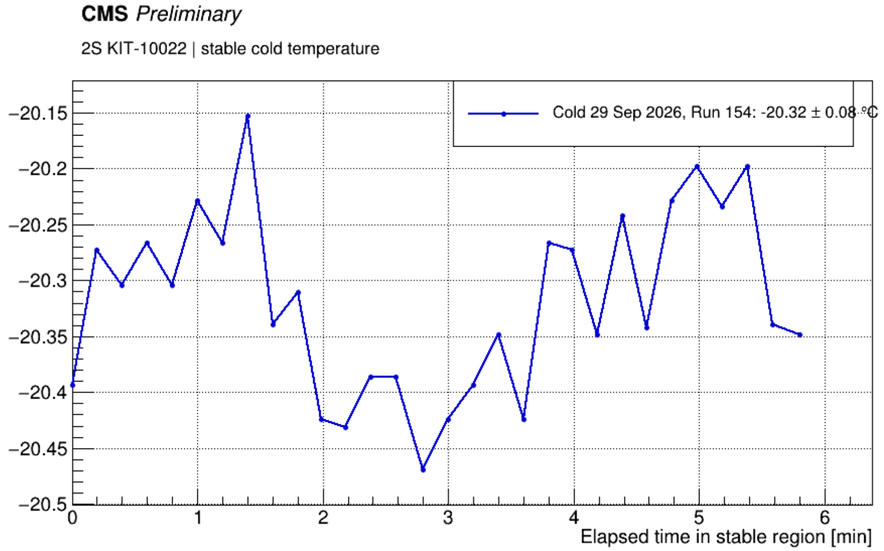

CMS Preliminary
2S KIT-10021 | FEHL noise distribution
Reception Test Bench: mean 6.46, RMS 0.49
Cold 29 Sep 2026, Run 154: mean 5.56, RMS 0.42
Normalized entries
Noise

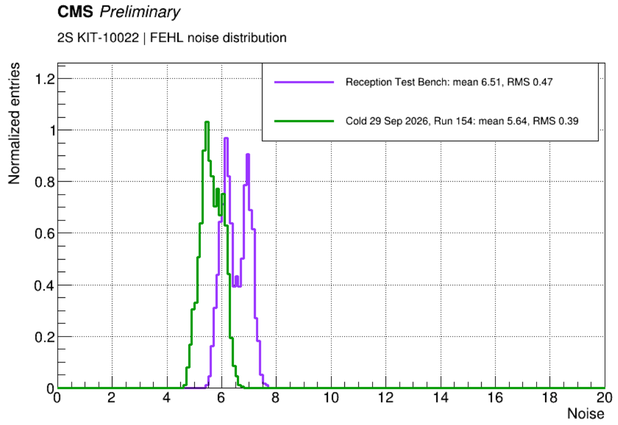

CMS Preliminary
2S KIT-10021 | FEHR noise distribution
Reception Test Bench: mean 6.03, RMS 0.44
Cold 29 Sep 2026, Run 154: mean 5.17, RMS 0.34
Normalized entries
Noise

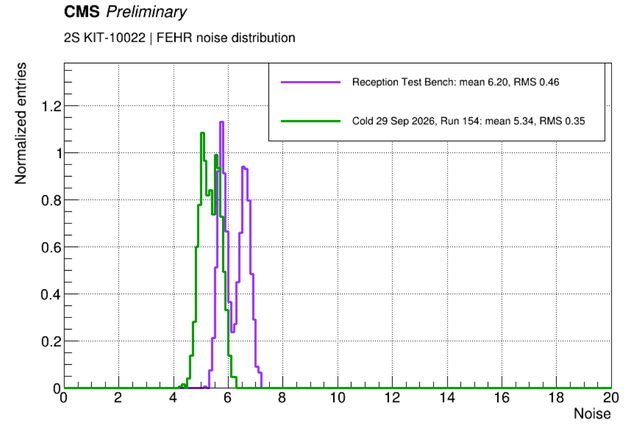

2S KIT-10021 | FEHL noise versus channel
Reception Test Bench
Cold 29 Sep 2026, Run 154

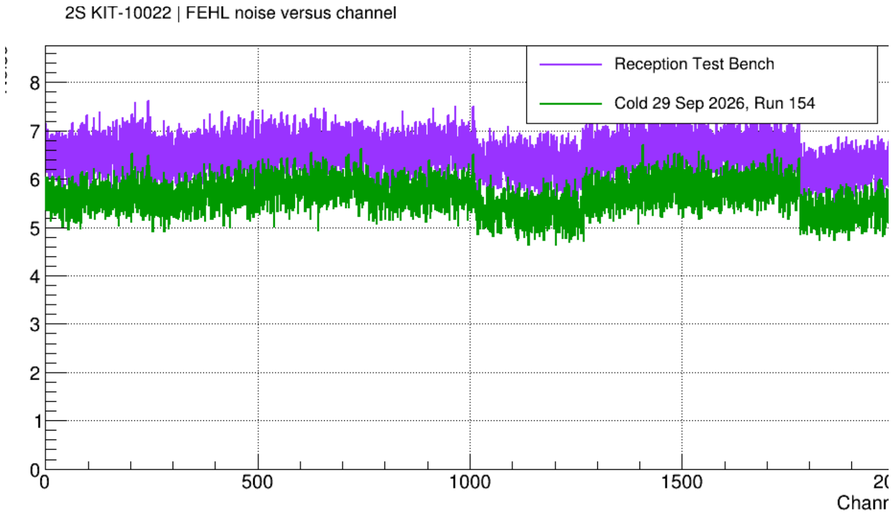

CMS Preliminary
2S KIT-10021 | FEHR noise versus channel
Reception Test Bench
Cold 29 Sep 2026, Run 154

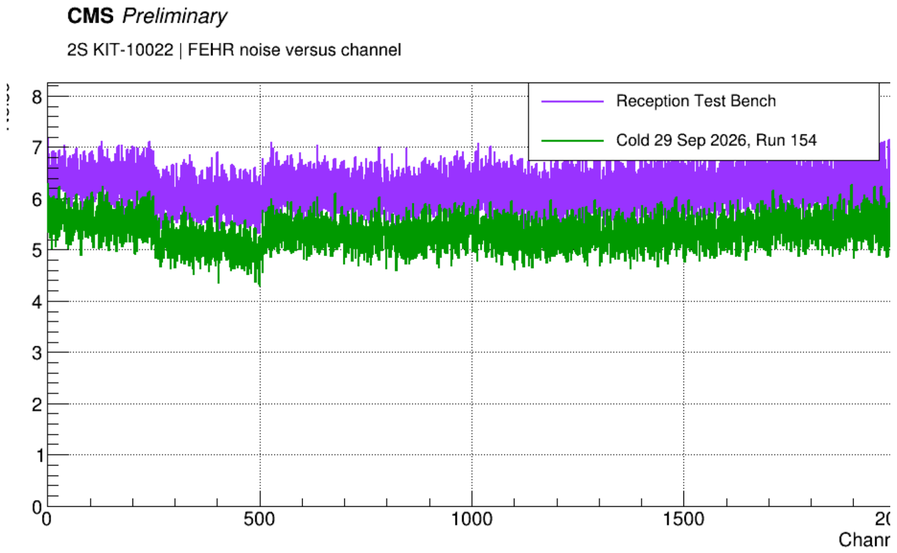
2S KIT-10022


CMS Preliminary
2S KIT-10022 | stable cold temperature
Cold 29 Sep 2026, Run 154: -20.32 ± 0.08 °C
Elapsed time in stable region [min]

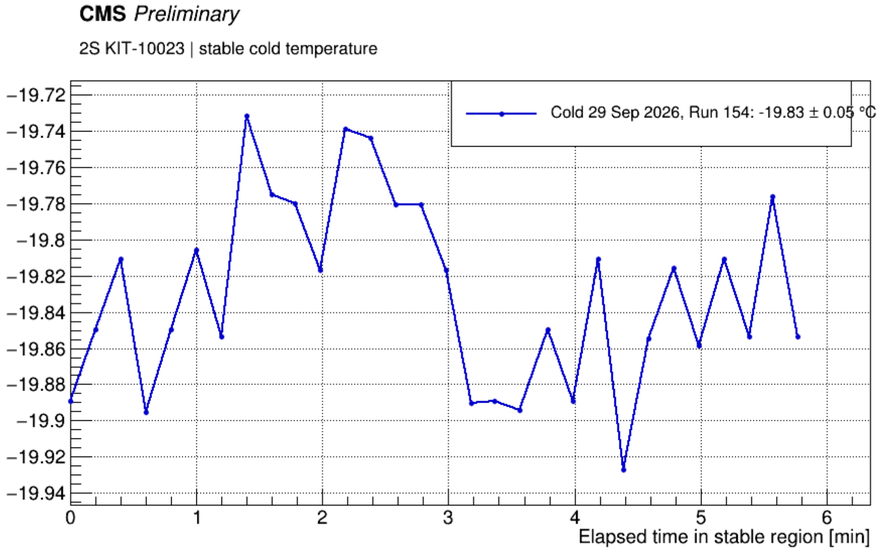

CMS Preliminary
2S KIT-10022 | FEHL noise distribution
Reception Test Bench: mean 6.51, RMS 0.47
Cold 29 Sep 2026, Run 154: mean 5.64, RMS 0.39
Normalized entries
Noise

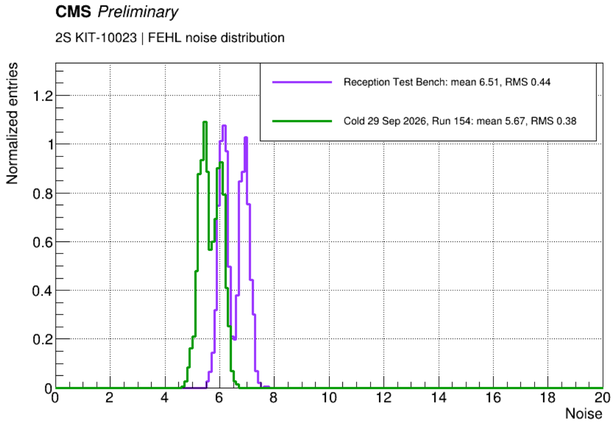

CMS Preliminary
2S KIT-10022 | FEHR noise distribution
Reception Test Bench: mean 6.20, RMS 0.46
Cold 29 Sep 2026, Run 154: mean 5.34, RMS 0.35
Normalized entries
Noise

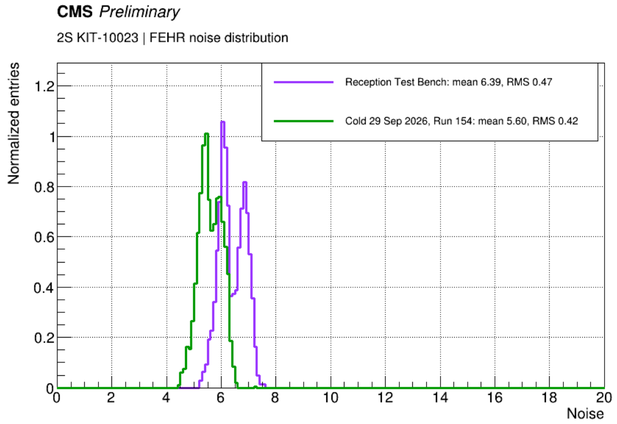

2S KIT-10022 | FEHL noise versus channel
Reception Test Bench
Cold 29 Sep 2026, Run 154
Chanr

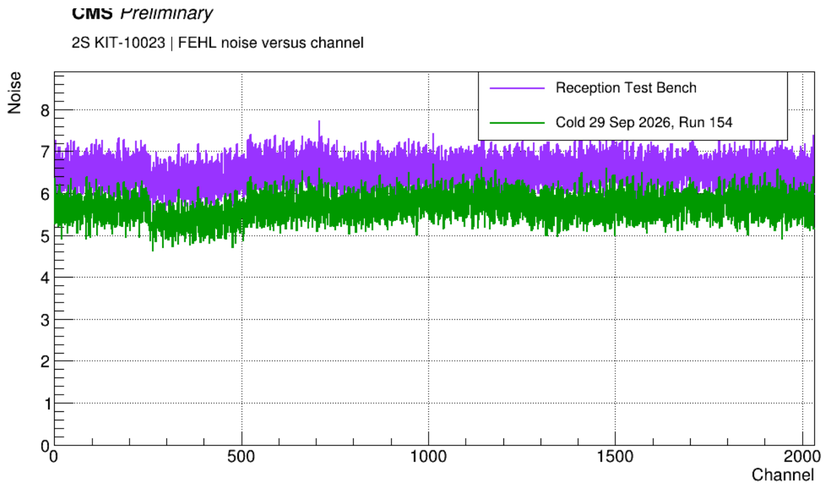

CMS Preliminary
2S KIT-10022 | FEHR noise versus channel
Reception Test Bench
Cold 29 Sep 2026, Run 154
Chanr

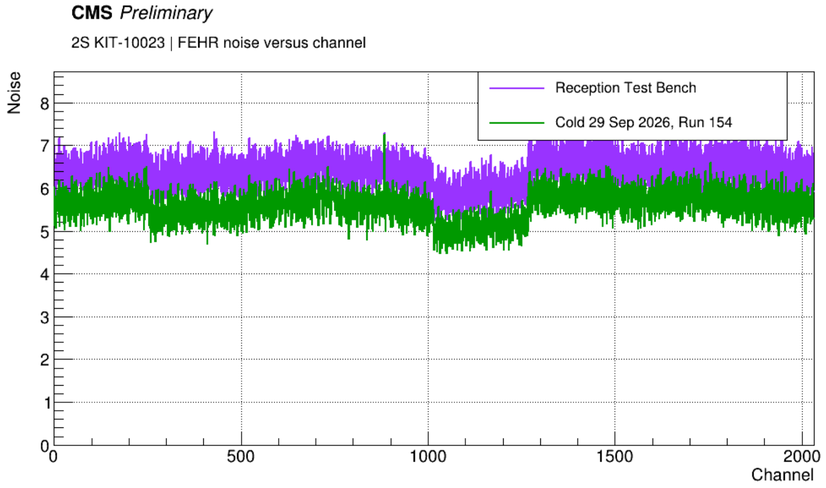
2S KIT-10023


CMS Preliminary
2S KIT-10023 | stable cold temperature
Cold 29 Sep 2026, Run 154: -19.83 ± 0.05 °C
Elapsed time in stable region [min]

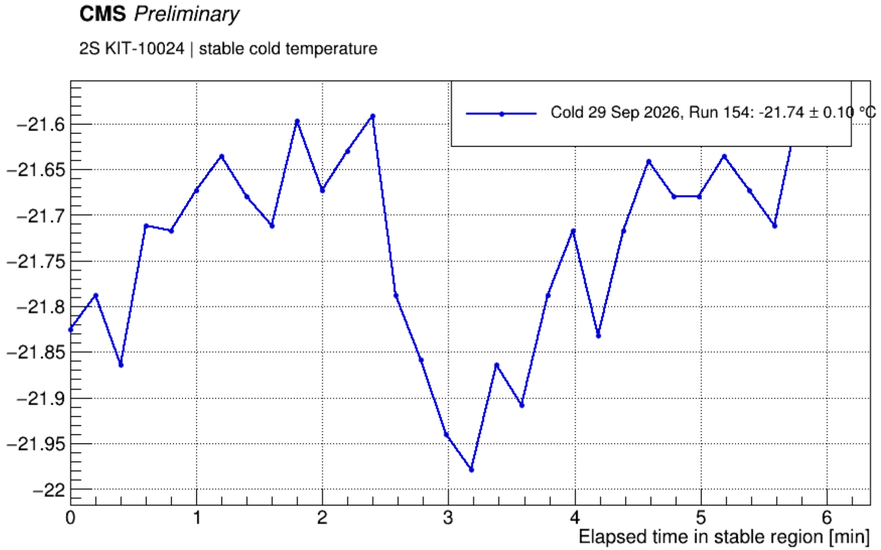

CMS Preliminary
2S KIT-10023 | FEHL noise distribution
Reception Test Bench: mean 6.51, RMS 0.44
Cold 29 Sep 2026, Run 154: mean 5.67, RMS 0.38
Normalized entries
Noise

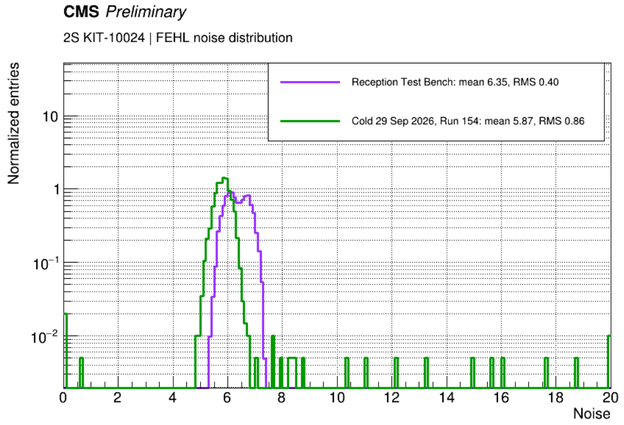

CMS Preliminary
2S KIT-10023 | FEHR noise distribution
Reception Test Bench: mean 6.39, RMS 0.47
Cold 29 Sep 2026, Run 154: mean 5.60, RMS 0.42
Normalized entries
Noise

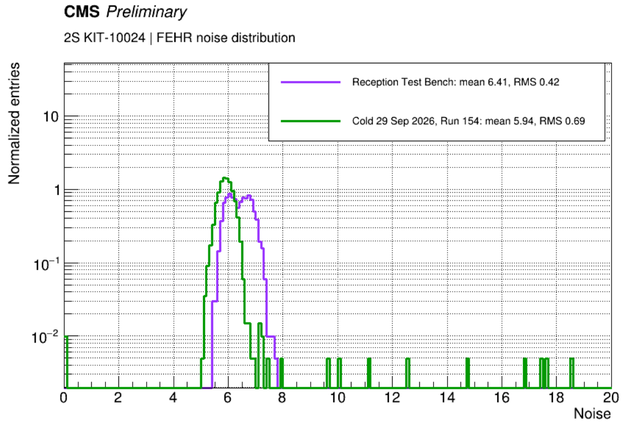

CMS Preliminary
2S KIT-10023 | FEHL noise versus channel
Reception Test Bench
Cold 29 Sep 2026, Run 154
Noise
Channel

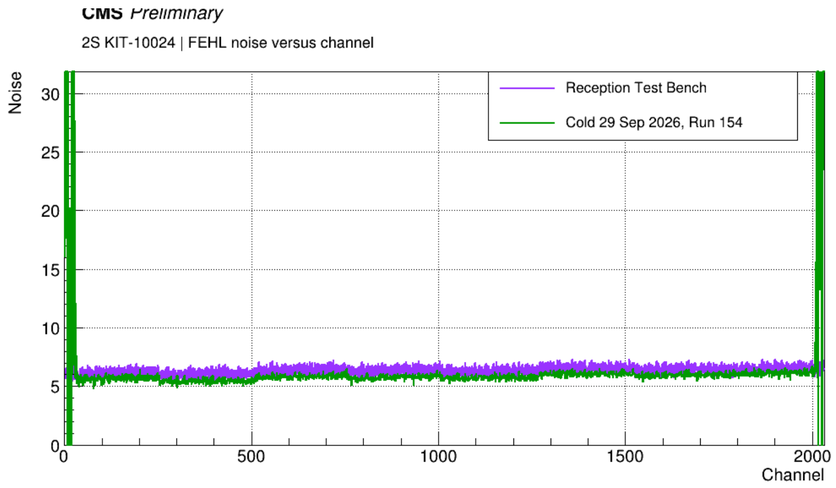

CMS Preliminary
2S KIT-10023 | FEHR noise versus channel
Reception Test Bench
Cold 29 Sep 2026, Run 154
Noise
Channel

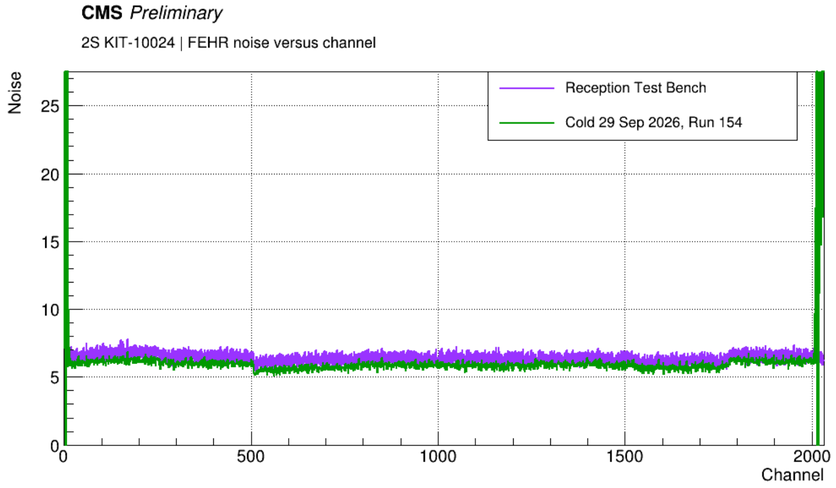
2S KIT-10024


CMS Preliminary
2S KIT-10024 | stable cold temperature
Cold 29 Sep 2026, Run 154: -21.74 ± 0.10 °C
Elapsed time in stable region [min]

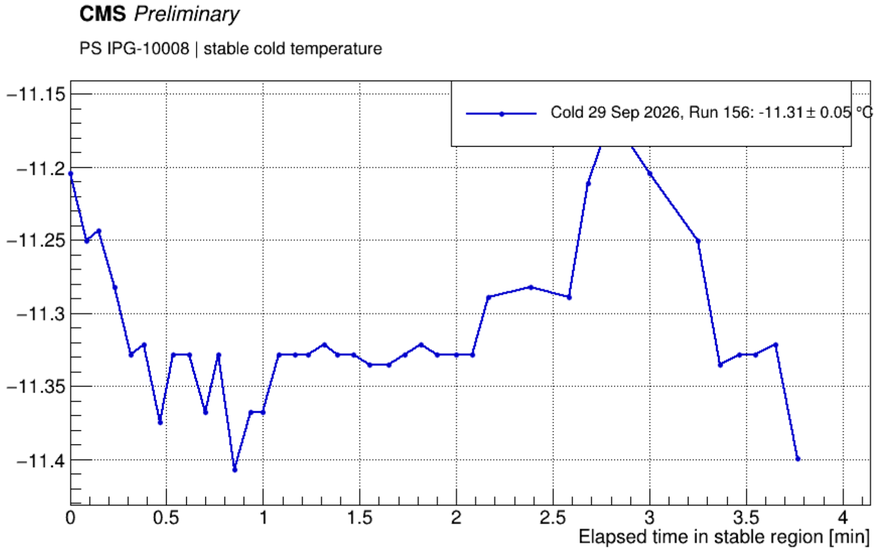

CMS Preliminary
2S KIT-10024 | FEHL noise distribution
Reception Test Bench: mean 6.35, RMS 0.40
Cold 29 Sep 2026, Run 154: mean 5.87, RMS 0.86
Normalized entries
Noise

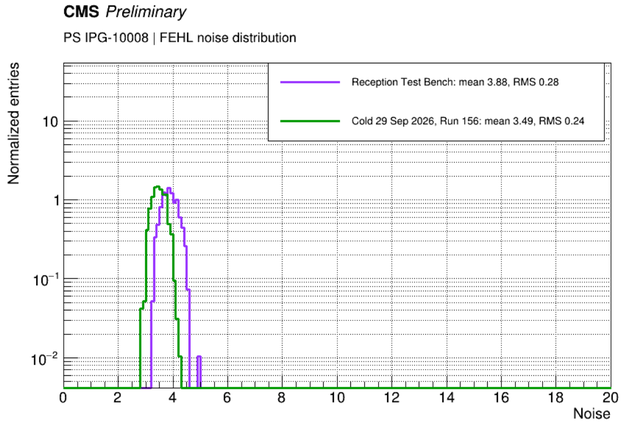

CMS Preliminary
2S KIT-10024 | FEHR noise distribution
Reception Test Bench: mean 6.41, RMS 0.42
Cold 29 Sep 2026, Run 154: mean 5.94, RMS 0.69
Normalized entries
Noise

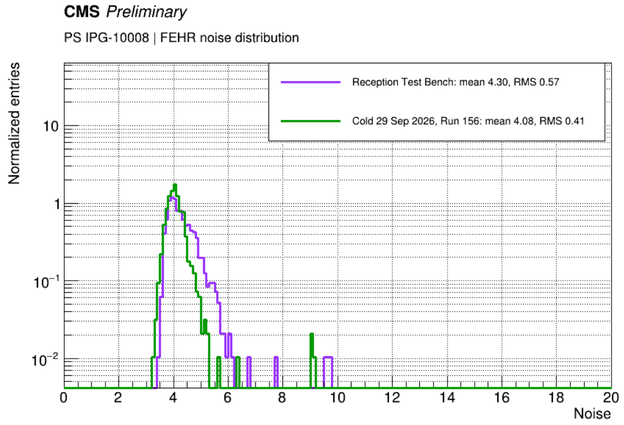

CMS Preliminary
2S KIT-10024 | FEHL noise versus channel
Reception Test Bench
Cold 29 Sep 2026, Run 154
Noise
Channel

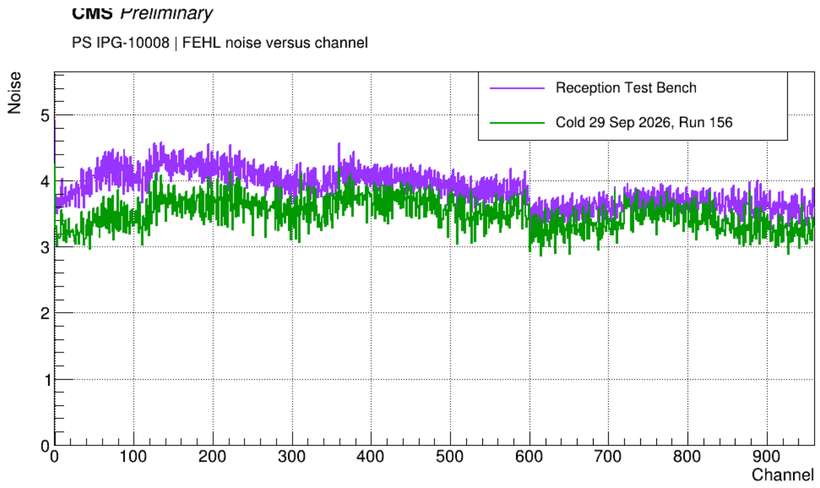

CMS Preliminary
2S KIT-10024 | FEHR noise versus channel
Reception Test Bench
Cold 29 Sep 2026, Run 154
Noise
Channel

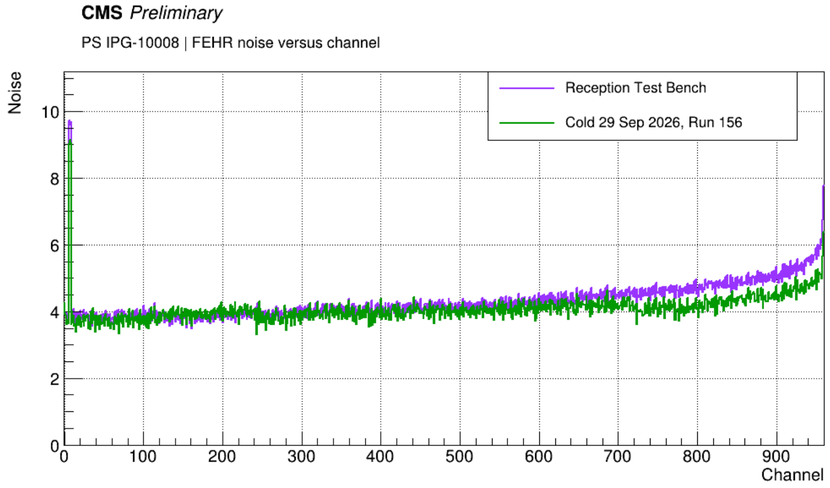
PS IPG-10008


CMS Preliminary
PS IPG-10008 | stable cold temperature
Cold 29 Sep 2026, Run 156: -11.31 ± 0.05 °C
Elapsed time in stable region [min]

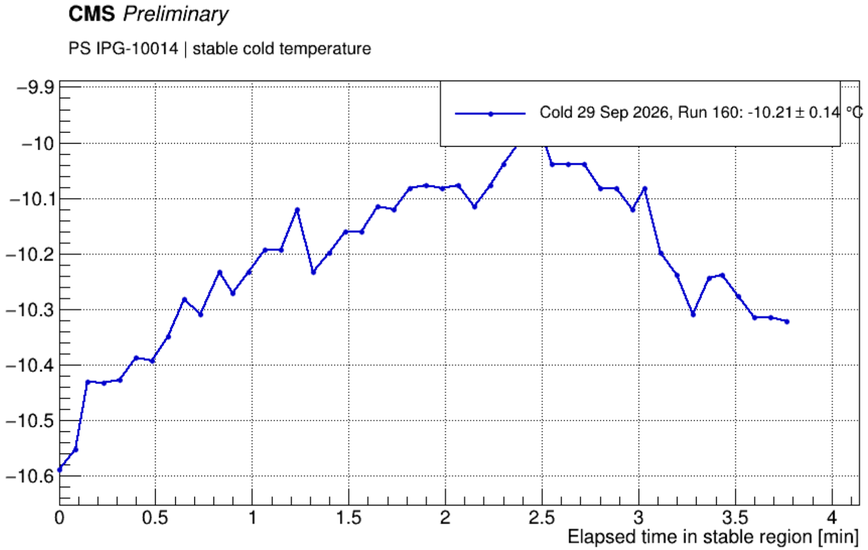

CMS Preliminary
PS IPG-10008 | FEHL noise distribution
Reception Test Bench: mean 3.88, RMS 0.28
Cold 29 Sep 2026, Run 156: mean 3.49, RMS 0.24
Normalized entries
Noise

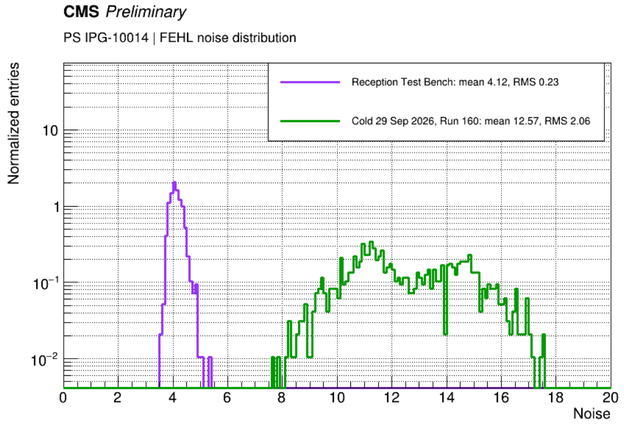

CMS Preliminary
PS IPG-10008 | FEHR noise distribution
Reception Test Bench: mean 4.30, RMS 0.57
Cold 29 Sep 2026, Run 156: mean 4.08, RMS 0.41
Normalized entries
Noise

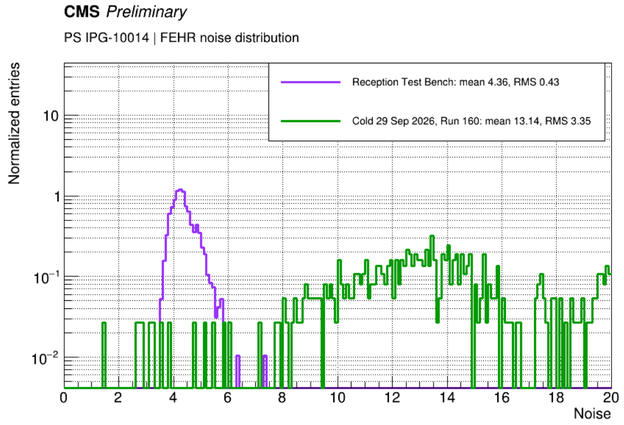

CMS Preliminary
PS IPG-10008 | FEHL noise versus channel
Reception Test Bench
Cold 29 Sep 2026, Run 156
Noise
Channel

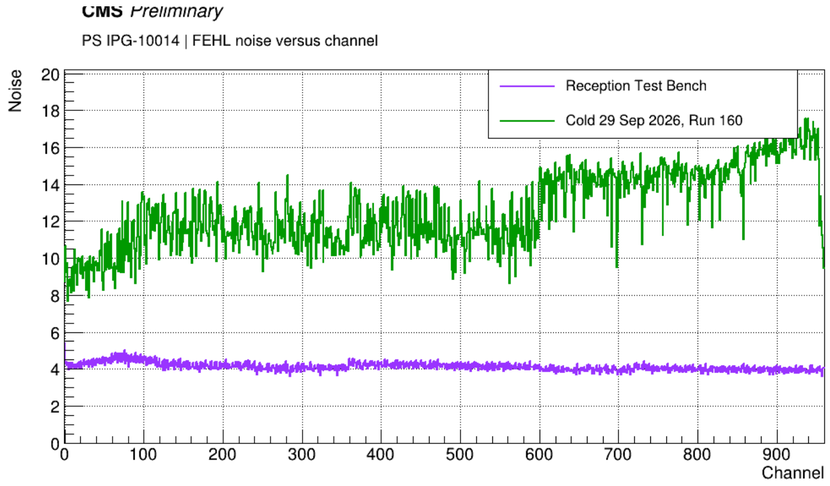

CMS Preliminary
PS IPG-10008 | FEHR noise versus channel
Reception Test Bench
Cold 29 Sep 2026, Run 156
Noise
Channel

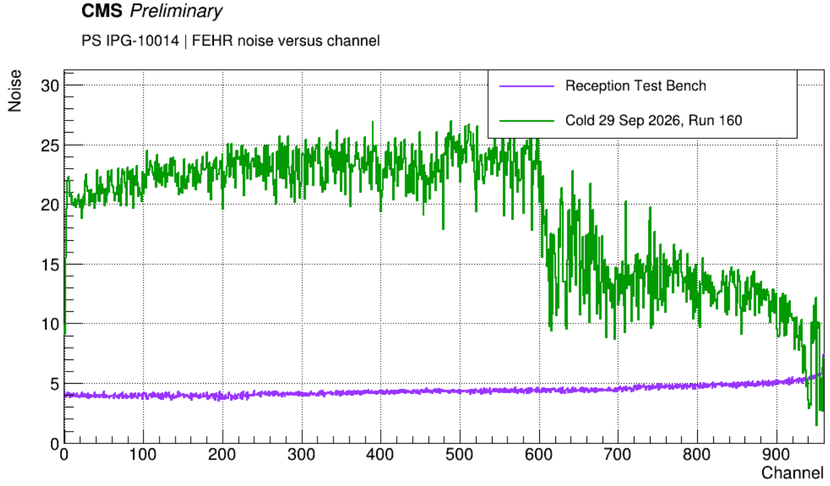
PS IPG-10014


CMS Preliminary
PS IPG-10014 | stable cold temperature
Cold 29 Sep 2026, Run 160: -10.21 ± 0.14 °C
Elapsed time in stable region [min]

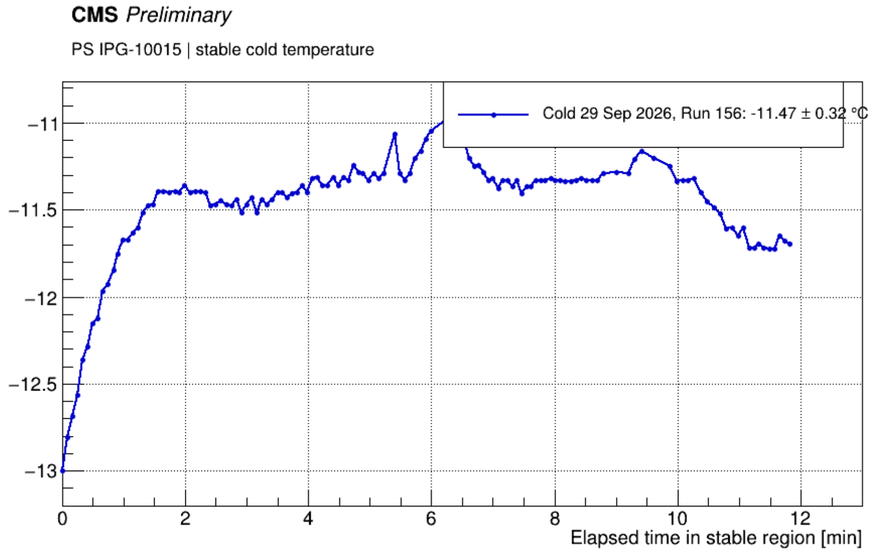

CMS Preliminary
PS IPG-10014 | FEHL noise distribution
Reception Test Bench: mean 4.12, RMS 0.23
Cold 29 Sep 2026, Run 160: mean 12.57, RMS 2.06
Normalized entries
Noise

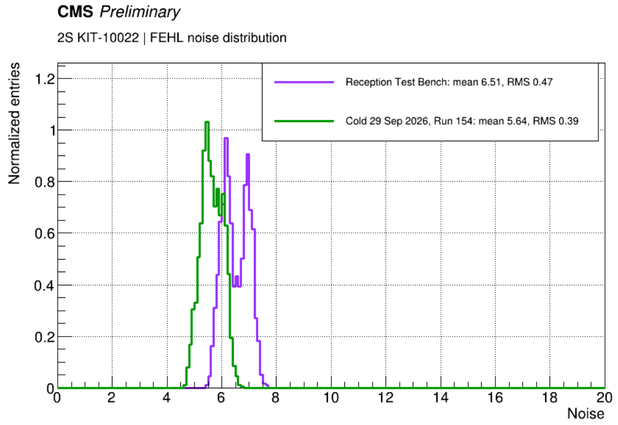

CMS Preliminary
PS IPG-10014 | FEHR noise distribution
Reception Test Bench: mean 4.36, RMS 0.43
Cold 29 Sep 2026, Run 160: mean 13.14, RMS 3.35
Normalized entries
Noise

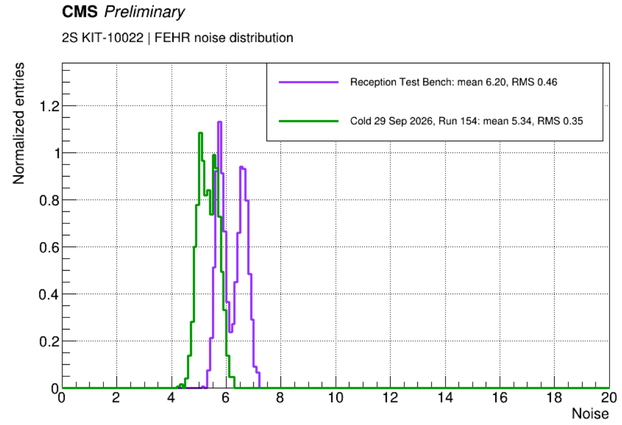

CMS Preliminary
PS IPG-10014 | FEHL noise versus channel
Reception Test Bench
Cold 29 Sep 2026, Run 160
Noise
Channel

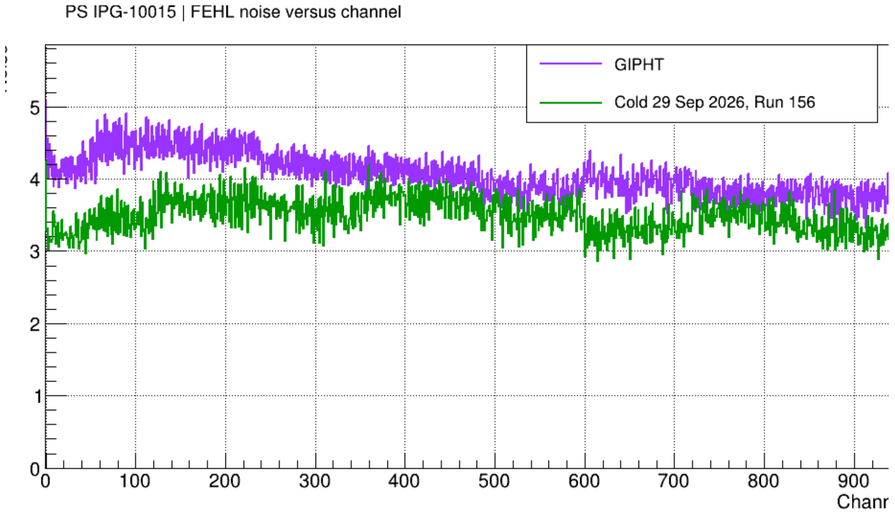

CMS Preliminary
PS IPG-10014 | FEHR noise versus channel
Reception Test Bench
Cold 29 Sep 2026, Run 160
Noise
Channel

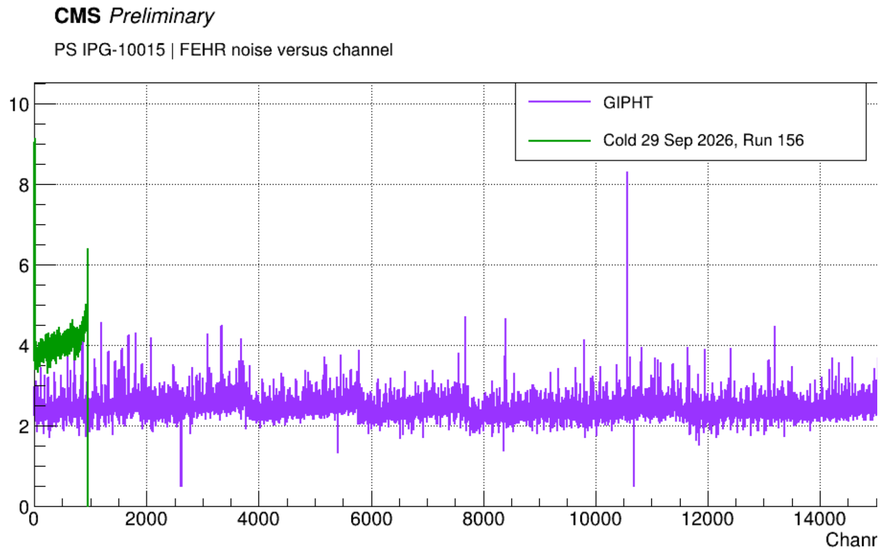
PS IPG-10015


CMS Preliminary
PS IPG-10015 | stable cold temperature
Cold 29 Sep 2026, Run 156: -11.47 ± 0.32 °C
Elapsed time in stable region [min]

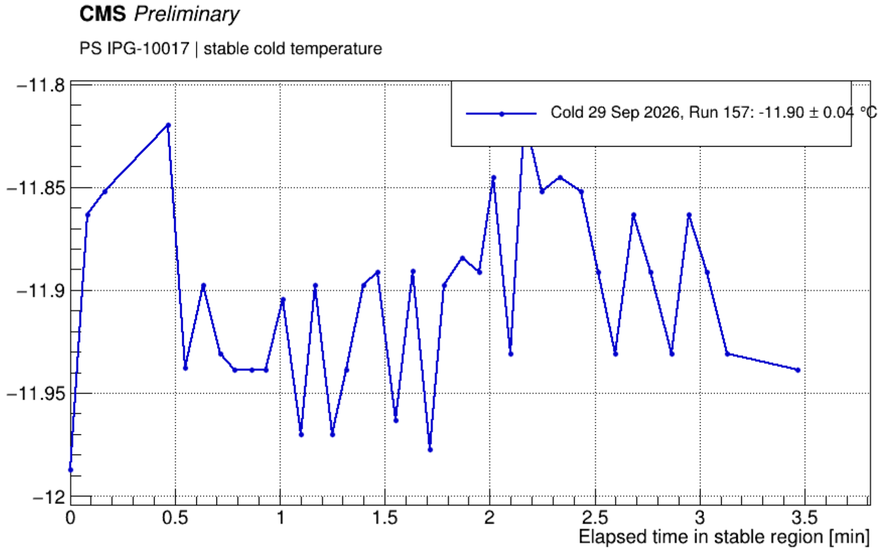

CMS Preliminary
2S KIT-10022 | FEHL noise distribution
Reception Test Bench: mean 6.51, RMS 0.47
Cold 29 Sep 2026, Run 154: mean 5.64, RMS 0.39
Normalized entries
Noise

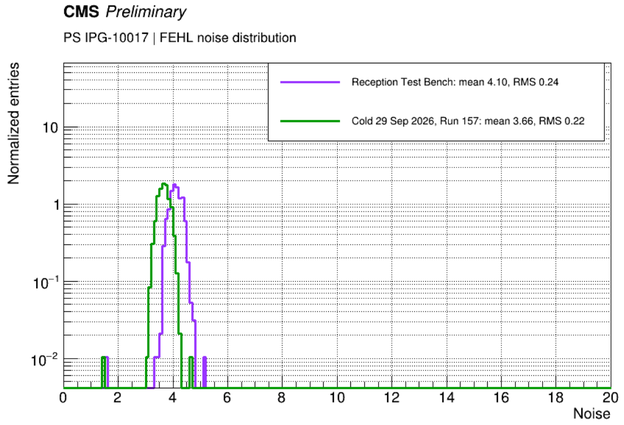

CMS Preliminary
2S KIT-10022 | FEHR noise distribution
Reception Test Bench: mean 6.20, RMS 0.46
Cold 29 Sep 2026, Run 154: mean 5.34, RMS 0.35
Normalized entries
Noise

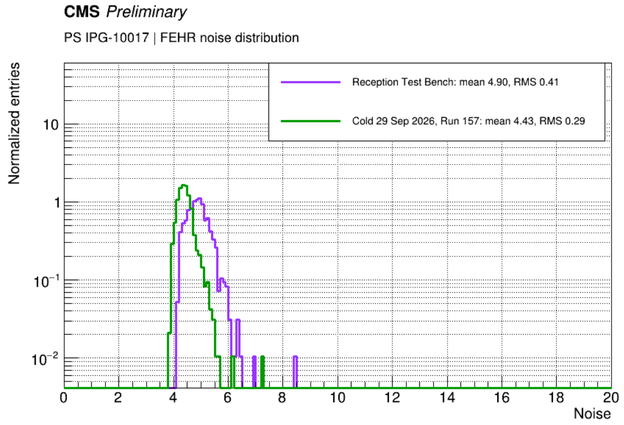

PS IPG-10015 | FEHL noise versus channel
GIPHT
Cold 29 Sep 2026, Run 156
Chanr

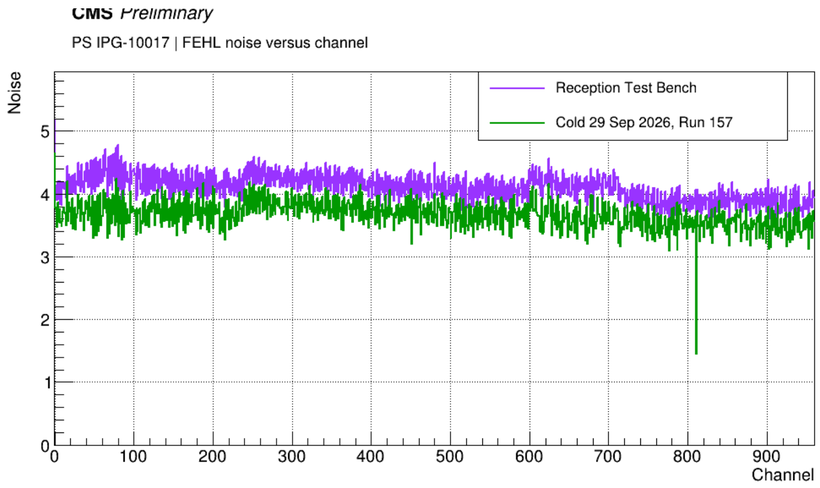

CMS Preliminary
PS IPG-10015 | FEHR noise versus channel
GIPHT
Cold 29 Sep 2026, Run 156
Chanr

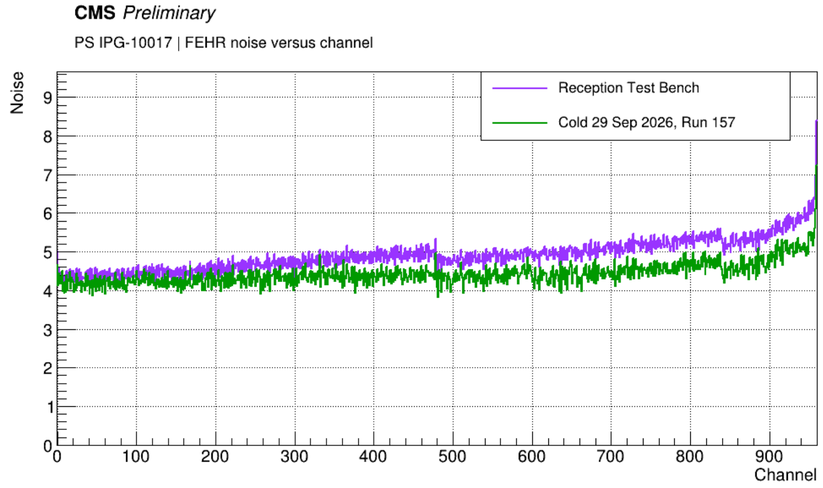
PS IPG-10017

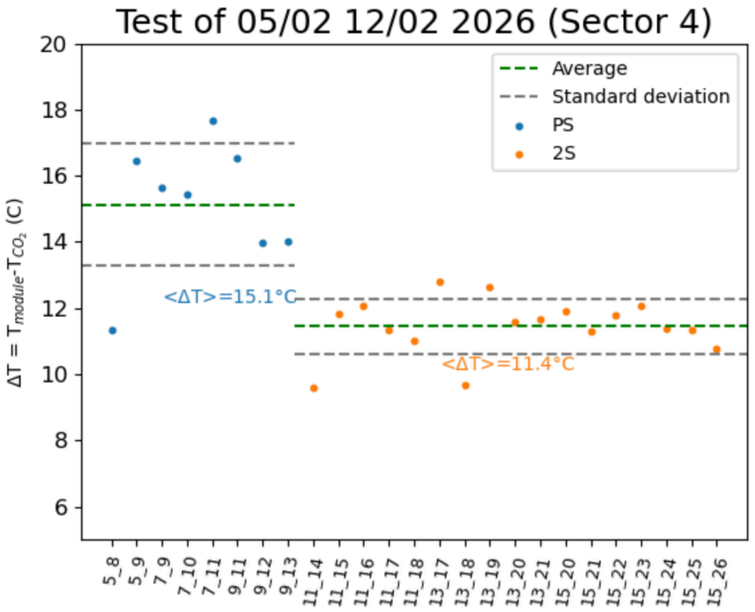

CMS Preliminary
PS IPG-10017 | stable cold temperature
Cold 29 Sep 2026, Run 157: -11.90 ± 0.04 °C
Elapsed time in stable region [min]

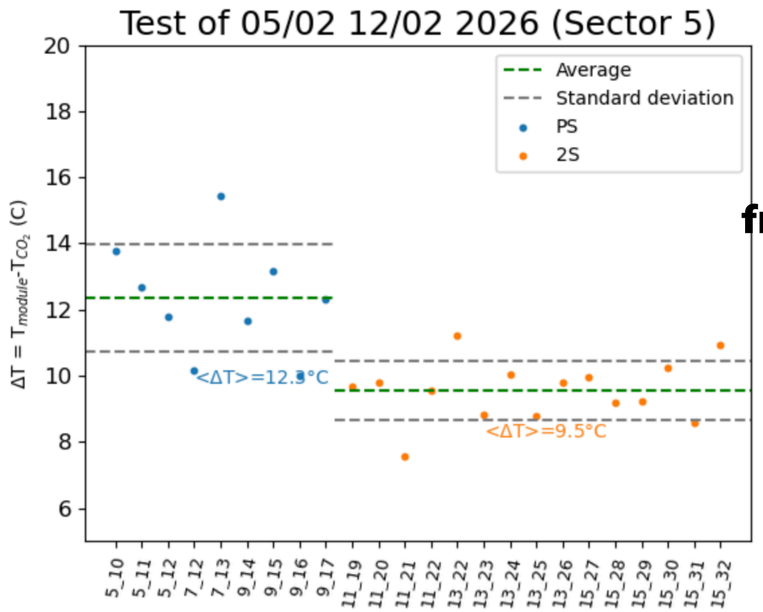

CMS Preliminary
PS IPG-10017 | FEHL noise distribution
Reception Test Bench: mean 4.10, RMS 0.24
Cold 29 Sep 2026, Run 157: mean 3.66, RMS 0.22
Normalized entries
Noise


CMS Preliminary
PS IPG-10017 | FEHR noise distribution
Reception Test Bench: mean 4.90, RMS 0.41
Cold 29 Sep 2026, Run 157: mean 4.43, RMS 0.29
Normalized entries
Noise

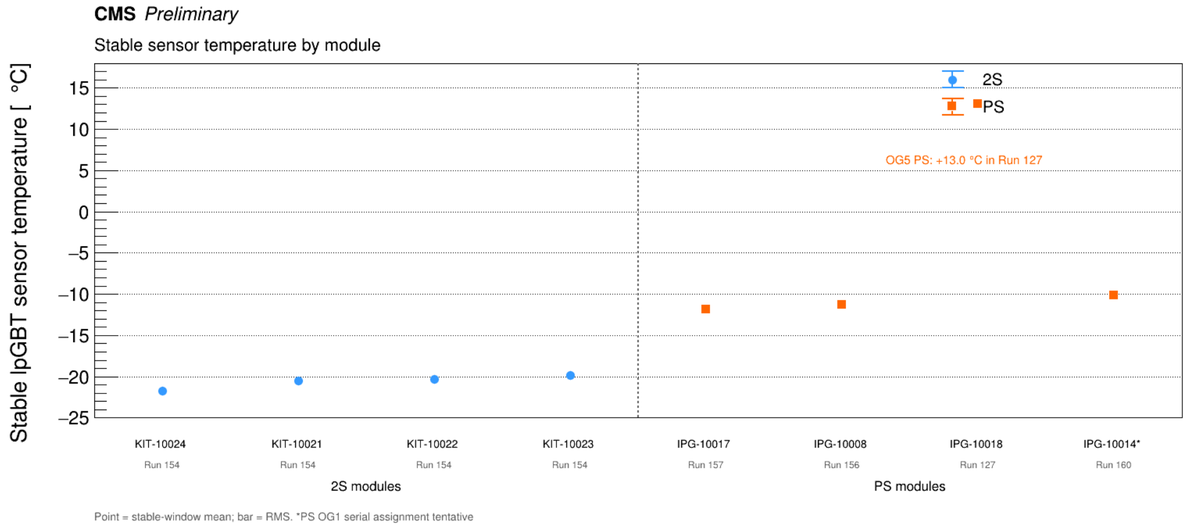

CMS Preliminary
PS IPG-10017 | FEHL noise versus channel
Reception Test Bench
Cold 29 Sep 2026, Run 157
Noise
Channel


CMS Preliminary
PS IPG-10017 | FEHR noise versus channel
Reception Test Bench
Cold 29 Sep 2026, Run 157
Noise
Channel



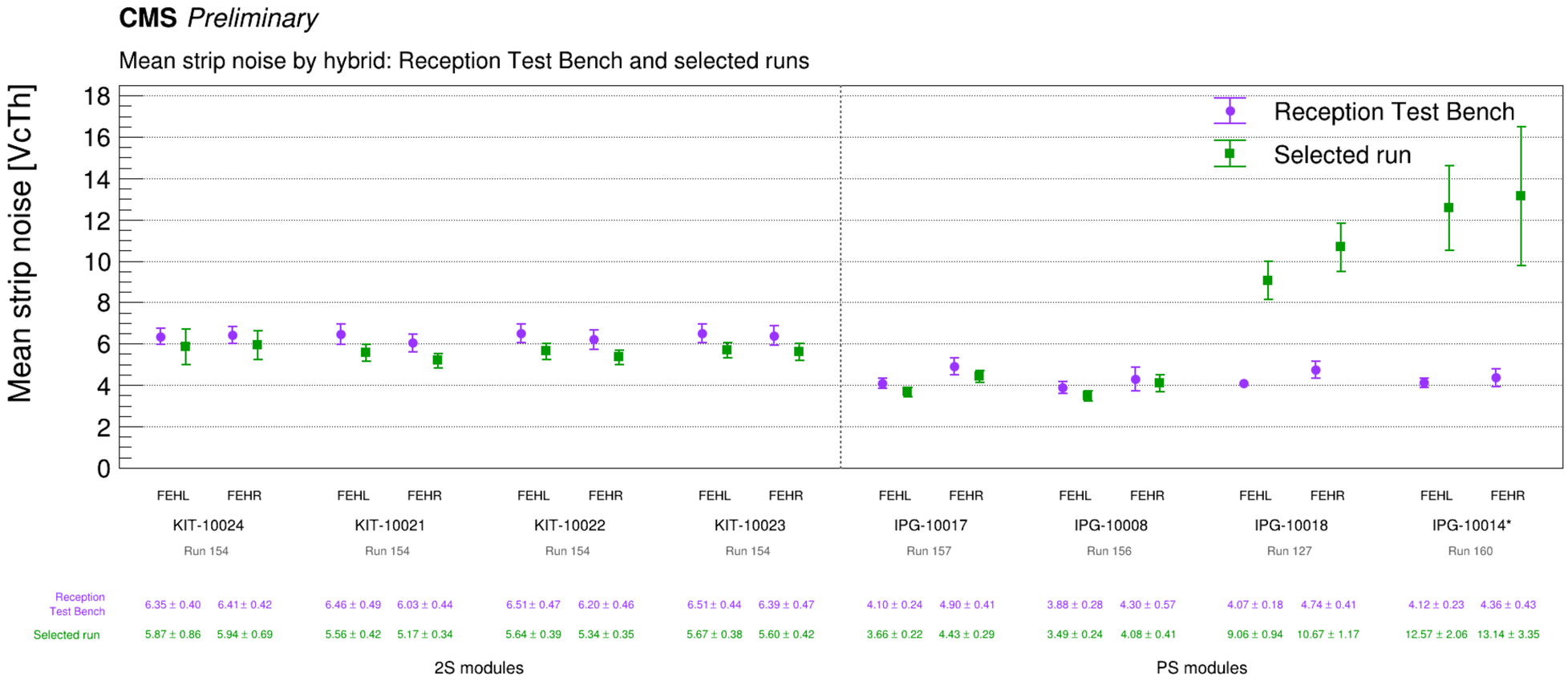


from Dummy module test
credit: Muriel



from Real module test

Pedestal Noise Measurements



Point = histogram mean; bar = histogram RMS. *PS OG1 serial assignment tentative

PS modules at room temp

1. Increased LV current threshold from 1.0 A (shared by Louvain group) to 1.5A



PS modules at Cold temp

1. Increased LV current threshold from 1.0 A (shared by Louvain group) to 1.5A
2. But at Cold the upper limit is OK!



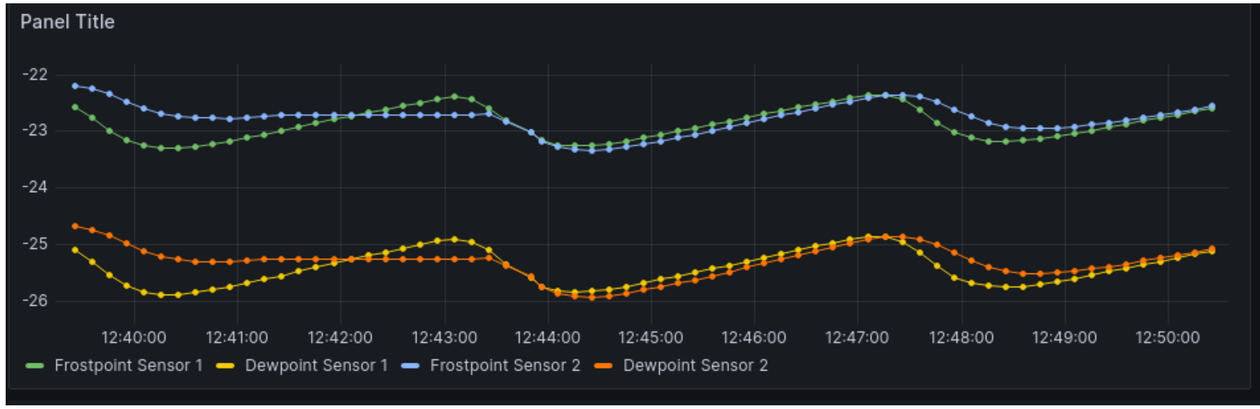
PS modules at Cold temp

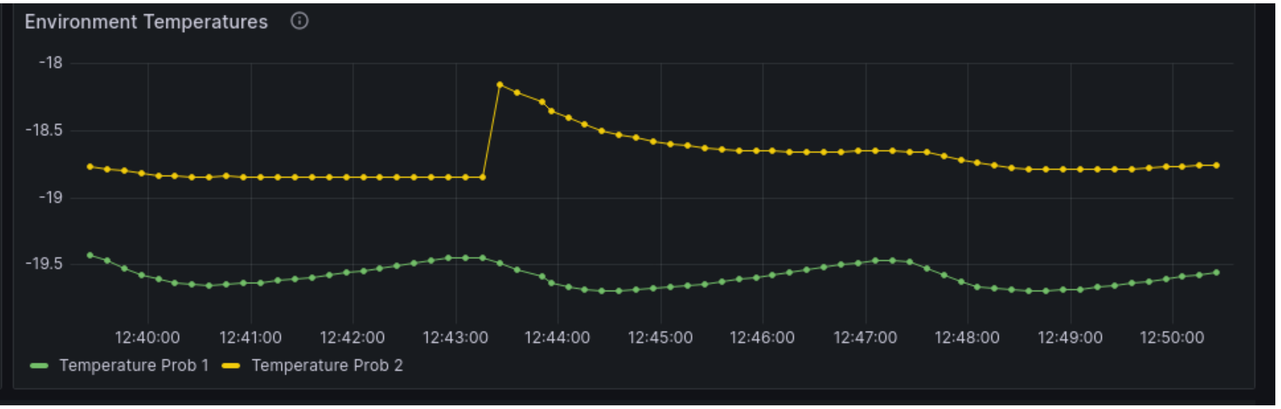
1. Problem with Module IPG
2. The LpGBT is stuck at configuring stage.

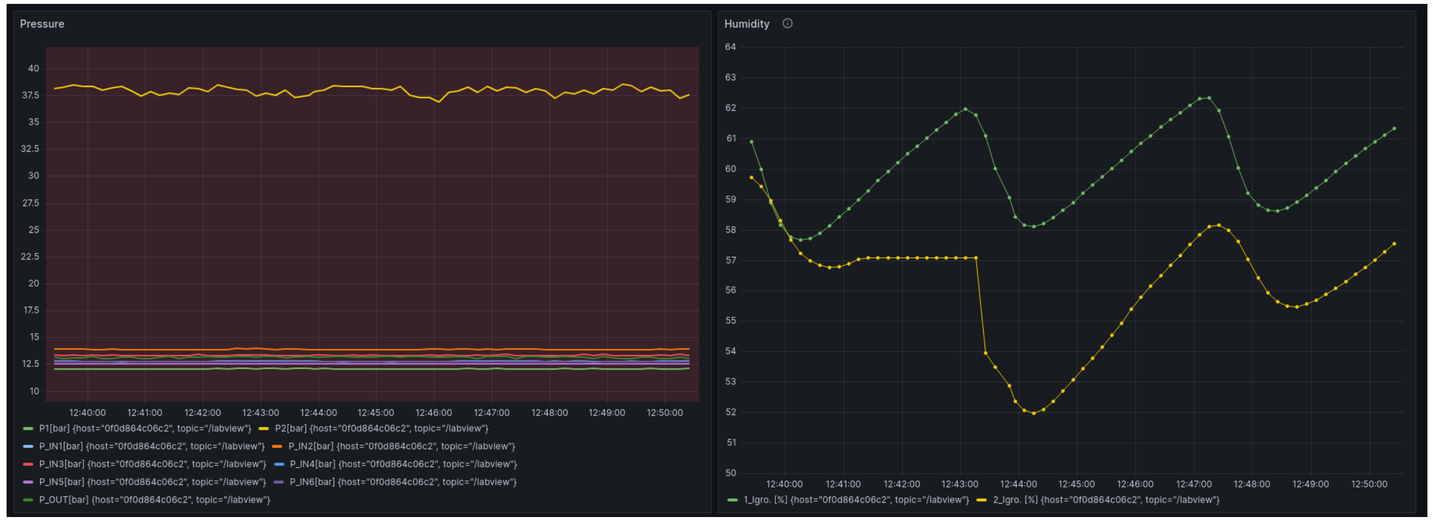


DCS Update

1. Added the Dewpoint and frostpoint monitoring.







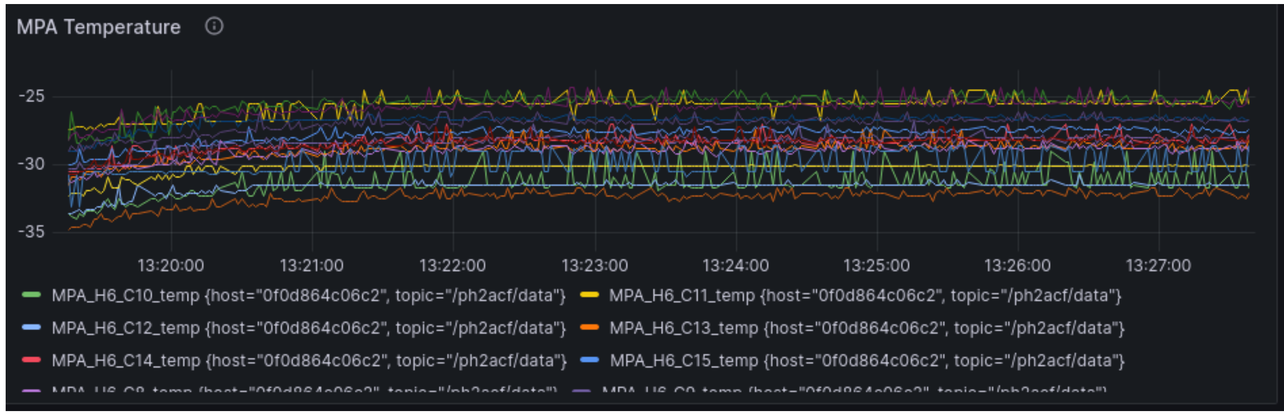
DCS Update

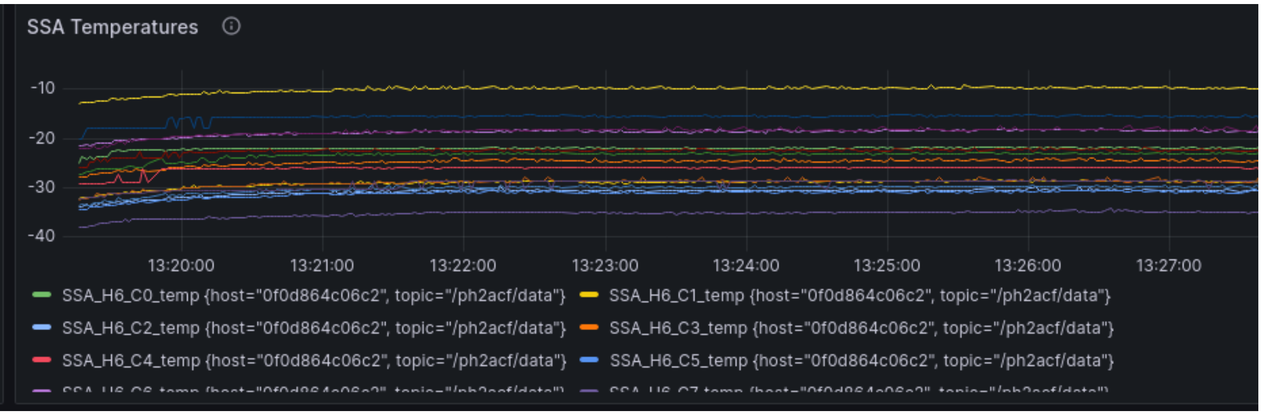
1. Successfully stored the MQTT messages to influxdb and added a grafana dashboard. (Monitor only)



DCS Update

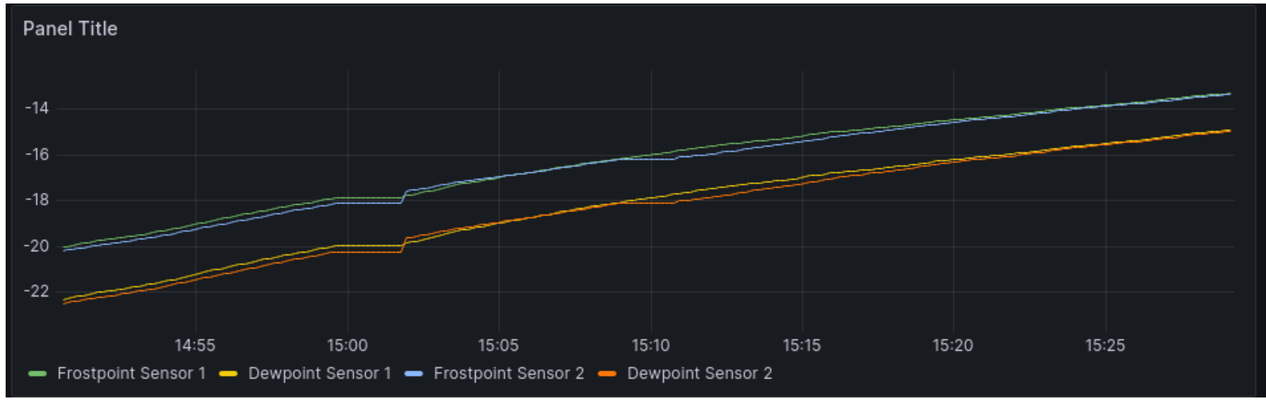
1. Successfully stored the MQTT messages to influxdb and added a grafana dashboard. (Monitor only)

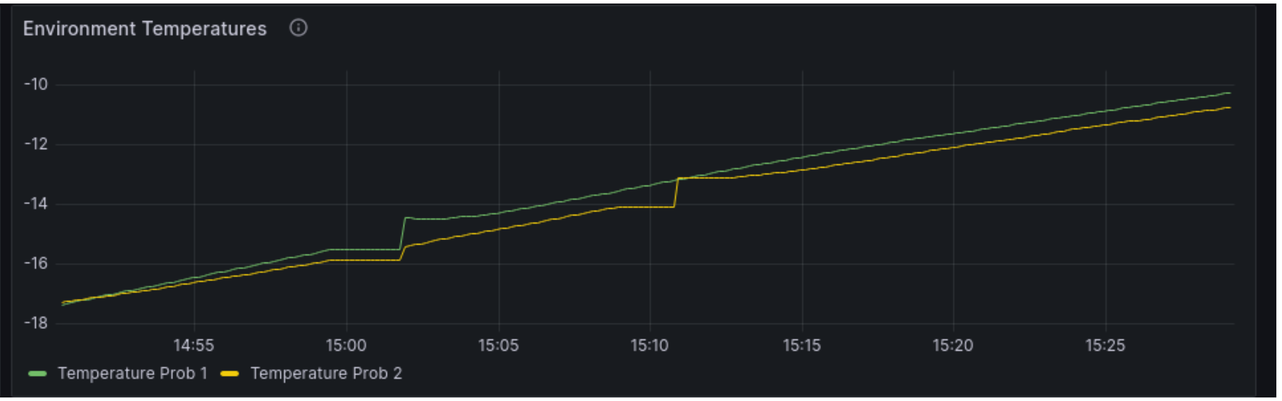




DCS Update

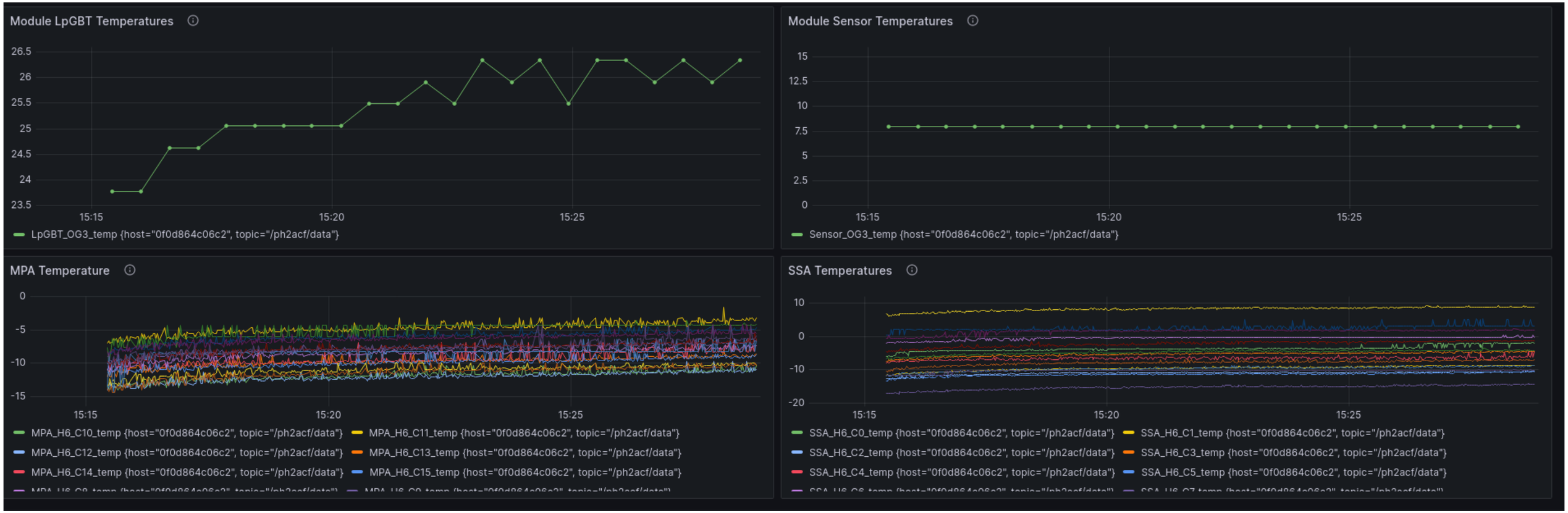
1. Successfully stored the MQTT messages to influxdb and added a grafana dashboard. (Monitor only)



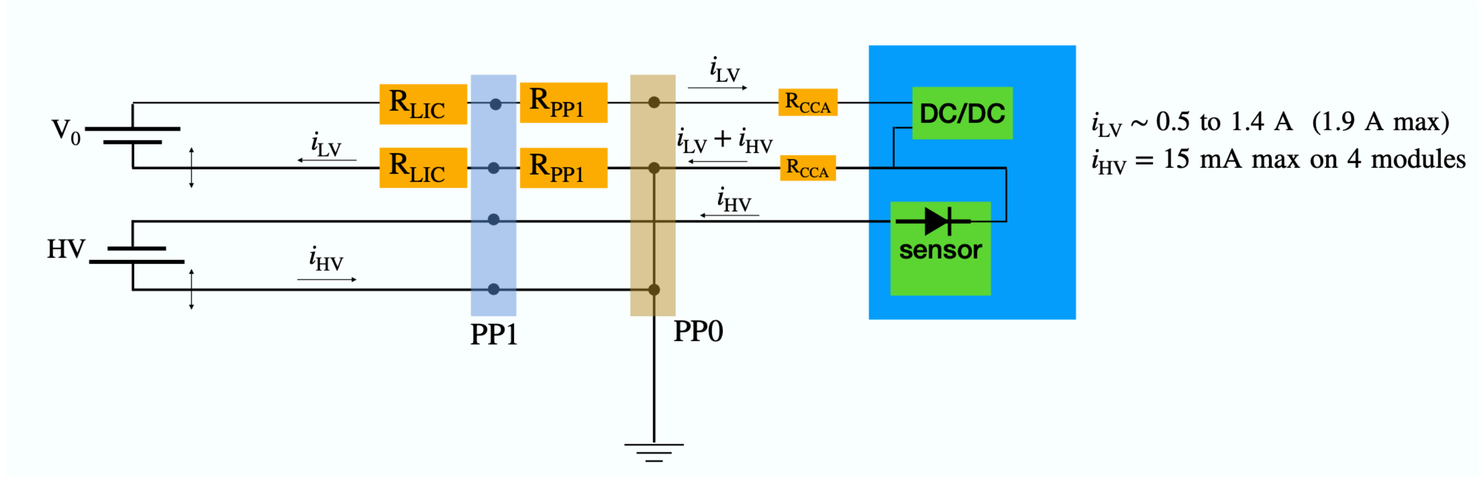


DCS Update

1. Successfully stored the MQTT messages to influxdb and added a grafana dashboard. (Monitor only)



PS modules







Common Ground for PP0 to CAEN