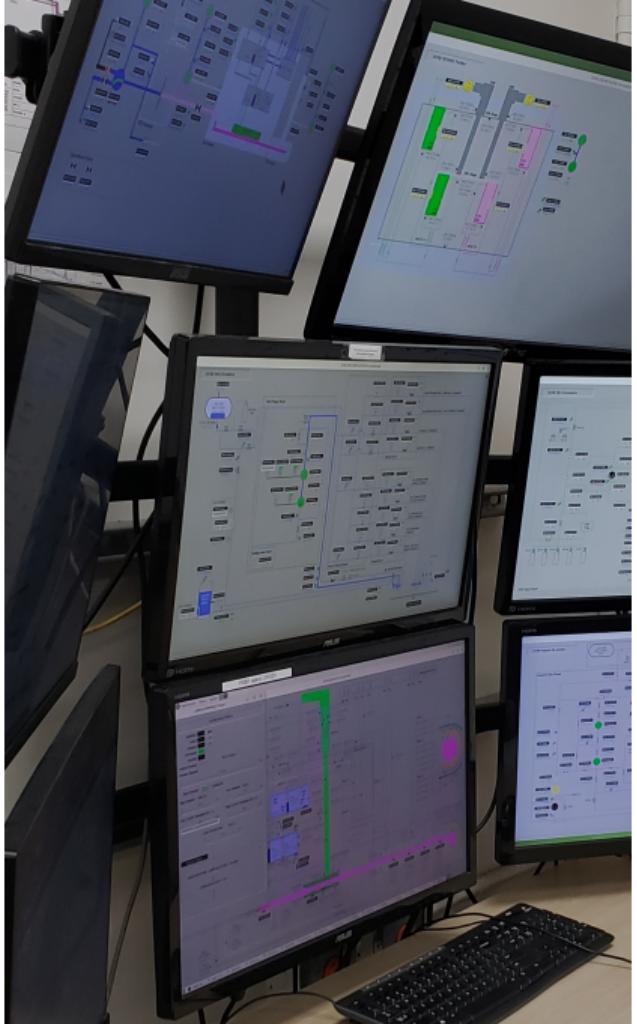


## UCN Data Acquisition

D. Fujimoto

T. Lindner

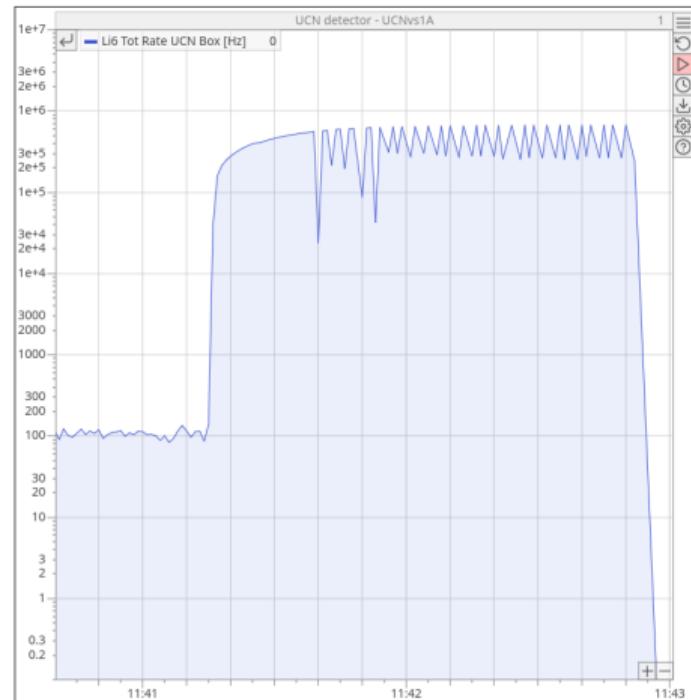
2026-02-17



# Year in Review

# Fixes and improvements to DAQ

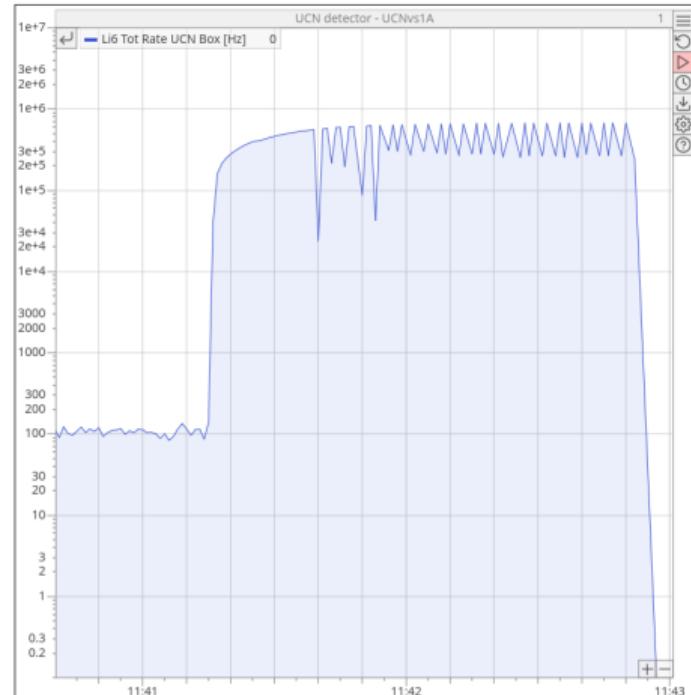
- ${}^6\text{Li}$  detector data streaming up to  $\sim 500$  kHz [elog]
  - From buffer of 64 packets with 80 hits/packet to 32 packets with 400 hits/packet
  - Data packets still contain some unnecessary waveform samples. If we remove those samples we should hopefully be able to push the maximum sustainable hit rate to  $\sim 1$  MHz



Rates from Jan 21, 2026:  ${}^6\text{Li}$  detector, no foil, continuous production

# Fixes and improvements to DAQ

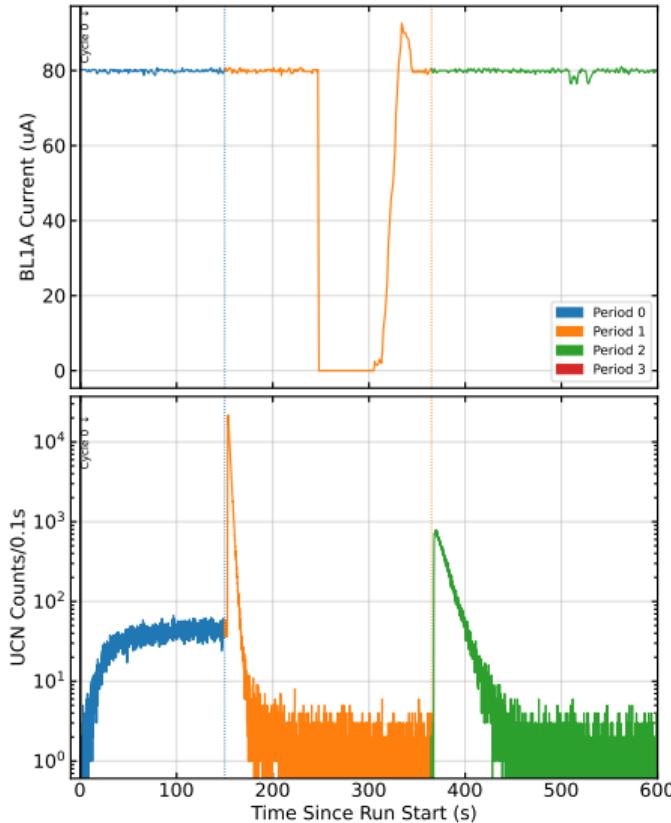
- ${}^6\text{Li}$  detector data streaming up to  $\sim 500$  kHz [elog]
  - From buffer of 64 packets with 80 hits/packet to 32 packets with 400 hits/packet
  - Data packets still contain some unnecessary waveform samples. If we remove those samples we should hopefully be able to push the maximum sustainable hit rate to  $\sim 1$  MHz
- Fixed history plots losing points in scrolling mode
  - Changed how often the data is flushed to MySQL



Rates from Jan 21, 2026:  ${}^6\text{Li}$  detector, no foil, continuous production

# Fixes and improvements to DAQ

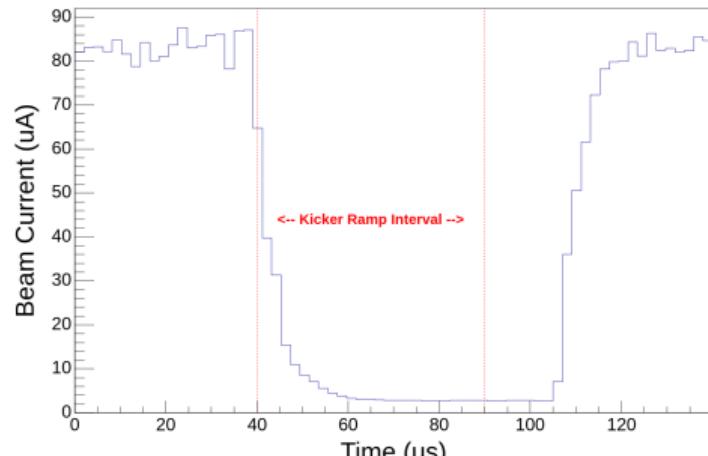
- Precise timings of cycle starts fixed
  - Timing is now synced to KTM beam-on signal plugged directly into the V1725 digitizer



Run 3215, Jan 26, 2026

# Fixes and improvements to DAQ

- Precise timings of cycle starts fixed
  - Timing is now synced to KTM beam-on signal plugged directly into the V1725 digitizer
- New KTM display with off-the-shelf CAEN digitizer (with backup module)



New KTM display graph

# New and updated MIDAS pages

- Autostat
- Shift scheduler
- Phone notifications
- Liquifier production

UCN

Status  
Transition  
ODB  
Messages  
Blog  
Alarms  
Programs  
History  
Help  
Buffers  
ODB History

Autostat  
Liquifier Production  
OnlineDisplay  
PhoneNotify  
QuickLinks  
Runlog  
Sequencer2018  
Shift Goals  
Shift Schedule  
Source/Manual  
UCN Counts

PID\_TransLineTemp  
PID\_NV101  
PID\_Conference (needs PIDs set)  
PID\_20K3field  
PID\_1093field  
PID\_WallTemp  
PID\_zcular

UCN2:HE4P7V12:POS  
UCN2:HE4P7V10:POS  
UCN2:HE4P7V001:FLDW  
UCN2:HE4P7V205:POS  
UCN2:CRY7500:RDTMPK  
UCN2:CRY7506:RDTMPK  
UCN2:HE4P7V207:POS  
UCN2:HE4P7V209:POS  
UCN2:CRY7502:RDTMPK  
UCN2:CRY7525:RDTMPK

60  
10  
209  
50  
109  
100  
40

PID\_TransLineTemp  
PID\_NV101  
PID\_Conference (needs PIDs set)  
PID\_20K3field  
PID\_1093field  
PID\_WallTemp  
PID\_zcular

UCN2:CRY7510:RDTMPK  
UCN2:CRY7512:RDTMPK  
UCN2:CRY7511:RDTMPK  
UCN2:CRY7519:RDTMPK

70  
70  
20  
20

PID\_PUR\_H70K  
PID\_PUR\_IS07K  
PID\_PUR\_H21K  
PID\_PUR\_IS02K

UCN2:HE3:HTR105:CUR  
UCN2:HE3:HTR10:CUR  
UCN2:HE3:HTR107:CUR  
UCN2:HE3:HTR102:CUR

353  
402  
397  
394

PID\_HTR001  
PID\_HTR003  
PID\_HTR004  
PID\_HTR005  
PID\_HTR006  
PID\_HTR007  
PID\_HTR008

UCN2:HE3:TS111:RDTMPK  
UCN2:SDT:TS003:RDTMPK  
UCN2:SDT:TS004:RDTMPK  
UCN2:SDT:TS005:RDTMPK  
UCN2:SDT:TS006:RDTMPK  
UCN2:SDT:TS007:RDTMPK  
UCN2:SDT:TS008:RDTMPK

353  
402  
397  
394  
399  
353  
323

Notes

T5010 is 36-31 K offset from T5008  
T5011 is 32-33 K offset from T5009  
T5019 is 26-30 K offset from T5012  
T5020 is 24-25 K offset from T5013

Sensor Offsets

Alarms: None 21 Jan 2020, 16:05:32 UTC-6

**PID Control Loops**

Re\_autostat.pid program is running

Flows

Program	Controlling	Target	Target Setpoint	Enabled
PID_TransLineTemp	UCN2:HE4P7V12:POS	UCN2:HE4P7V10:POS	60	<input checked="" type="checkbox"/>
PID_NV101	UCN2:HE4P7V10:POS	UCN2:HE4P7V001:FLDW	10	<input type="checkbox"/>
PID_Conference (needs PIDs set)	UCN2:HE4P7V001:FLDW	UCN2:HE4P7V205:POS	209	<input type="checkbox"/>
PID_20K3field	UCN2:HE4P7V205:POS	UCN2:CRY7500:RDTMPK	50	<input type="checkbox"/>
PID_1093field	UCN2:CRY7500:RDTMPK	UCN2:CRY7506:RDTMPK	109	<input type="checkbox"/>
PID_WallTemp	UCN2:CRY7506:RDTMPK	UCN2:HE4P7V207:POS	100	<input type="checkbox"/>
PID_zcular	UCN2:HE4P7V207:POS	UCN2:CRY7502:RDTMPK	40	<input type="checkbox"/>

Purifier Heaters

Program	Controlling	Target	Target Setpoint	Enabled
PID_PUR_H70K	UCN2:HE3:HTR105:CUR	UCN2:CRY7510:RDTMPK	70	<input checked="" type="checkbox"/>
PID_PUR_IS07K	UCN2:HE3:HTR10:CUR	UCN2:CRY7512:RDTMPK	70	<input checked="" type="checkbox"/>
PID_PUR_H21K	UCN2:HE3:HTR107:CUR	UCN2:CRY7511:RDTMPK	20	<input checked="" type="checkbox"/>
PID_PUR_IS02K	UCN2:HE3:HTR102:CUR	UCN2:CRY7519:RDTMPK	20	<input checked="" type="checkbox"/>

Tall Section Heaters

Program	Controlling	Target	Target Setpoint	Enabled
PID_HTR001	UCN2:SDT:TS001:CUR	UCN2:HE3:TS111:RDTMPK	353	<input type="checkbox"/>
PID_HTR003	UCN2:SDT:TS003:CUR	UCN2:SDT:TS002:RDTMPK	402	<input type="checkbox"/>
PID_HTR004	UCN2:SDT:TS004:CUR	UCN2:SDT:TS003:RDTMPK	397	<input type="checkbox"/>
PID_HTR005	UCN2:SDT:TS005:CUR	UCN2:SDT:TS001:RDTMPK	394	<input type="checkbox"/>
PID_HTR006	UCN2:SDT:TS006:CUR	UCN2:SDT:TS002:RDTMPK	399	<input type="checkbox"/>
PID_HTR007	UCN2:SDT:TS007:CUR	UCN2:SDT:TS001:RDTMPK	353	<input type="checkbox"/>
PID_HTR008	UCN2:SDT:TS008:CUR	UCN2:HE3:TS124:RDTMPK	323	<input type="checkbox"/>

Notes

T5010 is 36-31 K offset from T5008  
T5011 is 32-33 K offset from T5009  
T5019 is 26-30 K offset from T5012  
T5020 is 24-25 K offset from T5013

Sensor Offsets

**Scripts**

Re\_autostat.script program is running

Persistent

Set_PID_TransLineTemp	If LVL203 > 95% - 1%, then set the PID_TransLineTemp setpoint to 100 K. If LVL203 < 95% - 1%, then set the PID_TransLineTemp setpoint to 60 K.	<input checked="" type="checkbox"/>
Optimize_ShieldFlows	If PN202 > 45 min, open next PIV. If PN202 < 20 min, close next PIV. (PIV on 100% 37.5 min, PIV on 50% 20 min, PIV on 25% 10 min) Each each transition, wait 60 seconds. Ignore PIVs with setpoint of 0%. This script does not change the % setpoints, only the open/close state.	<input checked="" type="checkbox"/>
KeepHEXTUliquid	If TS133 > 1.0 K, open MP101 by 1% every 30 s. If NV101 > 10%, set MP201 to 70 Hz (triggers once per enables). If TS133 < 3 K or NV101 < 10%, set MP101 and MP102 to 90 Hz and open GV101 and GV102. When TS133 < 1.4 K, reverse NV101 + 1%, MP101, MP102, GV101, GV102.	<input checked="" type="checkbox"/>
FillH2Bypass (CONTROLLING PV001)	If first in sequence, then open U4200 + 40K and MD_LVL204 + 40K, then open CRV201 to 4%. If tag LVL205 > 30% or MD_LVL204 < 30%, then close CRV201. Average LVL205 over 30 s to remove noise. (LVL205) = 26.79K.	<input type="checkbox"/>
Pulse_HTR_With_Beam	If B1V3SM4:BOF#PID indicates that the beam is on, then set HTR001 to 0 mK. When the beam is off, set HTR001 to 0 mK. Currents are set when beam is toggled.	<input type="checkbox"/>
He Purifier	He Purifier	<input type="checkbox"/>
StopCirculation	Wait until MP001 integrated volume > 52000 Sl, ignoring rates > 0.5 SL/min. Protects against overpressure and chugging.	<input type="checkbox"/>
StartRecovery	Close circulation path and set heater PID = 20 K.	<input type="checkbox"/>
StopRecovery	When PT004 and PT005 are both < 10 mbar, close AV924 and AV025.	<input type="checkbox"/>
StartRegeneration	CPs off, BPI02 on, then wait until AV053 > 0.3 bar. Turn off MP1 and close recovery path. Open AV050 and AV051, set heater PID = 180 K. Wait until T > 90 K or FM238 > 0.5 L/min.	<input type="checkbox"/>
StopRegeneration	Wait until all four TS < 180 K, and FM206 > 0.30 SL/min, then close AV050, AV051, turn off BP002, and turn off heaters.	<input type="checkbox"/>
StartCooling	CPs on, and heater PID setpoints = 70 K.	<input type="checkbox"/>
StopCooling	Wait until T < 70 K.	<input type="checkbox"/>

Queue

Start	On start, run queue from index 0. At end, run queue 0 more times.
Script Name	Re_start
Setpoints and Current Values	Setpoints and Current Values

Clear All Queue

# New and updated MIDAS pages

- Autostat
- Shift scheduler
- Phone notifications
- Liquifier production

UCN

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Runlog  
Sequencer2018  
Shift Goals  
Shift Schedule  
Source/Manual  
UCN Counts

Shift Assignments

On shift now: Alexis Brossard, Charles Mao, Tahereh Mohammadi

Viewing: 01 / 22 / 2026 ☰ to 02 / 04 / 2026 ☰ Last Week Today Next Week  1wk  2wk  3wk

Assign shifters with role:  Highlight cells:

Highlight No Availability  Edit Shifter  + New Shifter  Shifts may only be assigned to available shifters

Alarms: None 21 Jan 2026, 16:09:41 UTC-6

Schedule															
	Thursday Jan 22	Friday Jan 23	Saturday Jan 24	Sunday Jan 25	Monday Jan 26	Tuesday Jan 27	Wednesday Jan 28	Thursday Jan 29	Friday Jan 30	Saturday Jan 31	Sunday Feb 1	Monday Feb 2	Tuesday Feb 3	Wednesday Feb 4	
None	beam	beam	beam	beam	beam	beam	beam	beam	beam	warm up	warm up	warm up			
OWL 23:00-07:00	Kate Dong (Exp) (Remote Cryo)	Mark McCaa (Remote Cryo)	Derek Fujimoto (Cryo)	Derek Fujimoto (Cryo)	Derek Fujimoto (Cryo)	Derek Fujimoto (Cryo)	Derek Fujimoto (Cryo)	Yuto Fujitani (Exp)	Yuto Fujitani (Cryo)	Yuto Fujitani (Exp)	Yuto Fujitani (Exp)	Takashi Higuchi (Cryo)	Takashi Higuchi (Cryo)	Mark McCaa (Remote Cryo)	
DAV 07:00-15:00	Dew Chiba (Cryo)	Eric Miller (Cryo)	Jeff Martin (Cryo)	Dew Chiba (Cryo) Jeff Martin (Exp)	Jeff Martin (Cryo)	Dew Chiba (Cryo)	Albee Zahra (Cryo)	Albee Zahra (Cryo)	Albee Zahra (Cryo)	Albee Zahra (Cryo)	Dew Chiba (Cryo)	Dew Chiba (Cryo)			
EVE 17:00-23:00	Charles Mao (Cryo)	Charles Mao (Cryo)	Dennis Salazar (Exp)	Dennis Salazar (Exp)	Dennis Salazar (Exp)	Chris Yu (Exp) Tahereh Mohammadi (Cryo)	Chris Yu (Exp) Tahereh Mohammadi (Cryo)	Amelia Jason (Cryo)	Amelia Jason (Cryo)	Charles Mao (Cryo)	Charles Mao (Cryo)	Chris Ye (Cryo)	Ryan Stutters (Cryo)		
Run Coordinator	Alexis Brossard	Alexis Brossard	Alexis Brossard	Alexis Brossard	Alexis Brossard Noah Yazdandoost	Noah Yazdandoost	Noah Yazdandoost	Noah Yazdandoost Sean Vorbergen	Noah Yazdandoost Sean Vorbergen	Sean Vorbergen	Sean Vorbergen	Sean Vorbergen	Sean Vorbergen		

Set availability for:

Availability														
	Thursday Jan 22	Friday Jan 23	Saturday Jan 24	Sunday Jan 25	Monday Jan 26	Tuesday Jan 27	Wednesday Jan 28	Thursday Jan 29	Friday Jan 30	Saturday Jan 31	Sunday Feb 1	Monday Feb 2	Tuesday Feb 3	Wednesday Feb 4
None	beam	beam	beam	beam	beam	beam	beam	beam	beam	warm up	warm up	warm up		

# New and updated MIDAS pages

- Autostat
- Shift scheduler
- Phone notifications
- Liquifier production

The screenshot shows the MIDAS UCN interface with the following sections:

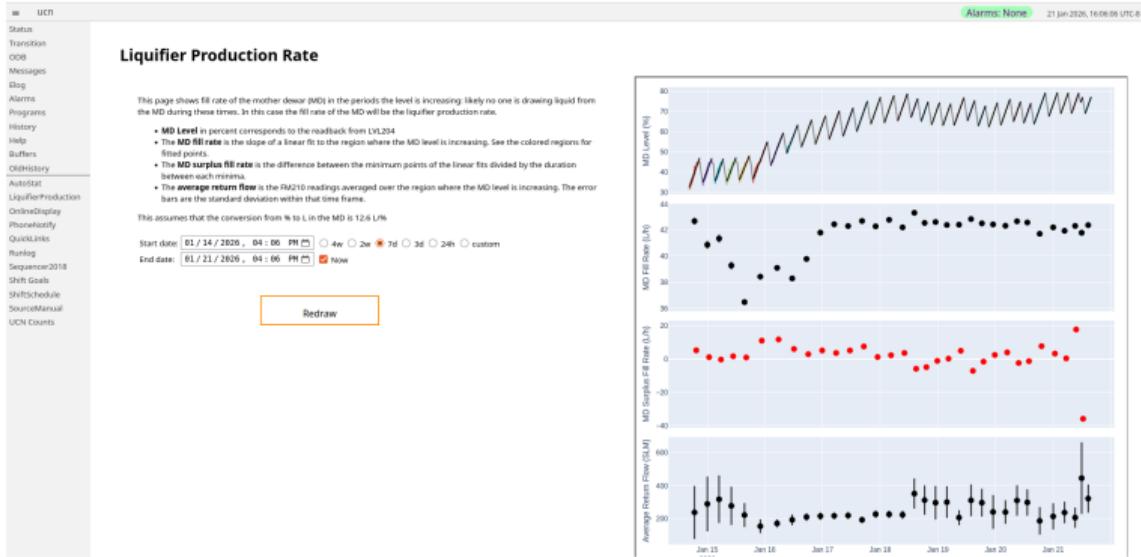
- Phone Notifications**: A configuration page for phone notifications. It lists on-shift shiftners and their contact details (name, phone number, and a 'trigger after' time). A dropdown menu is open for 'Raediger Picker'. A note says: "If the alarm hasn't been reset before then...".
- Setup and Testing**: A section for testing the system. It includes a note about the call originating from +1 226-458-8892 and instructions to enter a contact for bypassing 'do not disturb'. It also mentions a full test that triggers a test alarm and notes about receiving calls without activating alarms.
- Emergency Contacts**: A list of contacts with their names and phone numbers. The list includes:

Raediger Picker (cell)	604-352-0820
Raediger Picker (home)	604-484-1830
Alexis Brossard	613-328-9547
Sean Van Bergen	250-218-8091
Eric Miller	778-888-5106
Derek Fujimoto	778-873-0054

At the bottom of the interface, the URL is visible: [dq01.sch.ubc.ca/midas/customs/page=PhoneNotify](http://dq01.sch.ubc.ca/midas/customs/page=PhoneNotify)

# New and updated MIDAS pages

- Autostat
- Shift scheduler
- Phone notifications
- Liquifier production

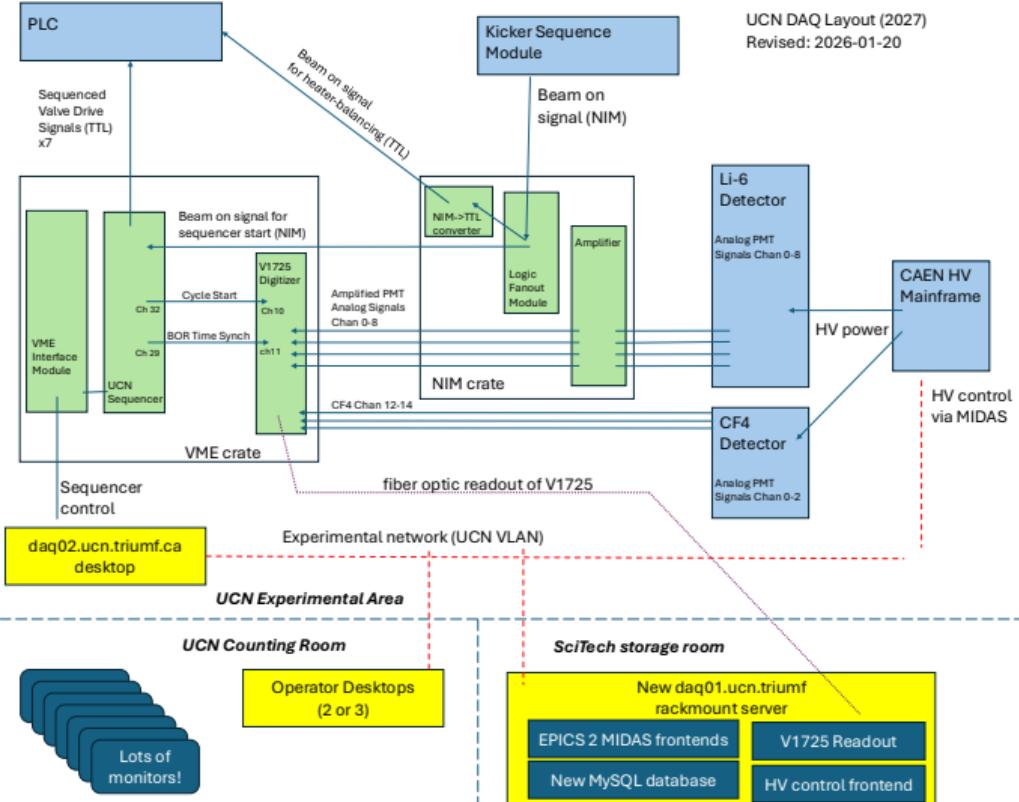


# New Updates and Improvements

# Network layout

Planned updates:

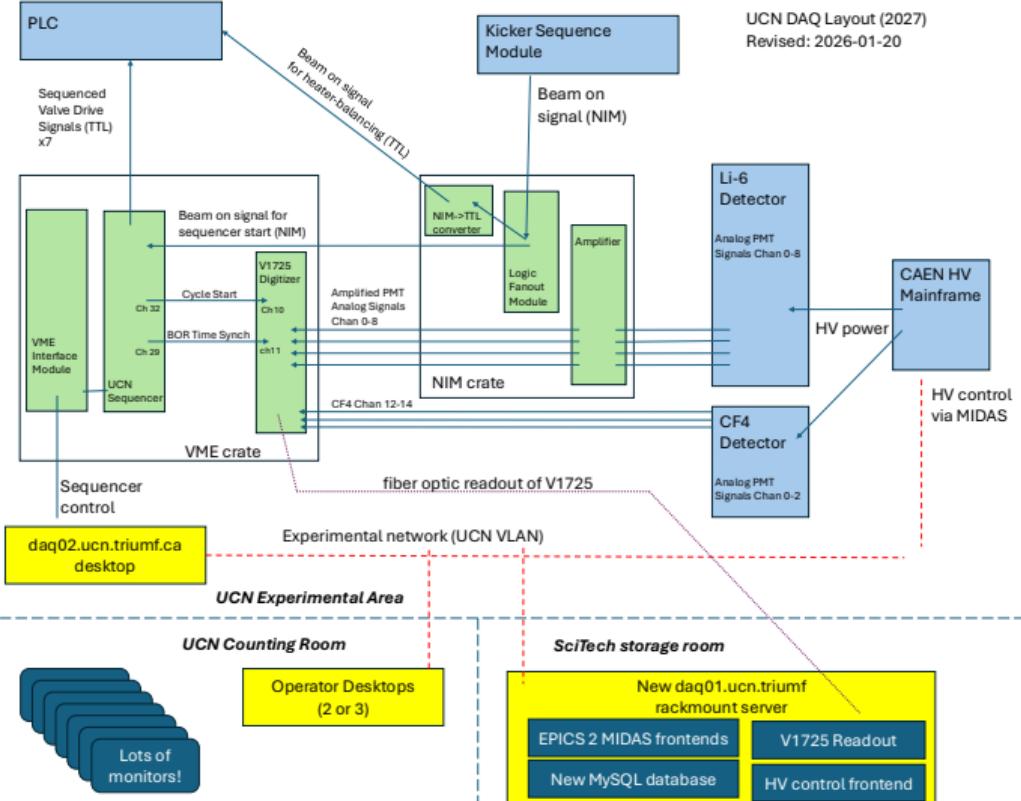
- Replace daq01 with rack-mounted machine
- Decommission daq02, send data directly to daq01 via fiber optic + USB
- Remote control of  ${}^6\text{Li}$  detector HV
- No new digitizer needed (16 channels)



# Network layout

New daq01 machine: Supermicro server preferred by DAQ group not available. Options:

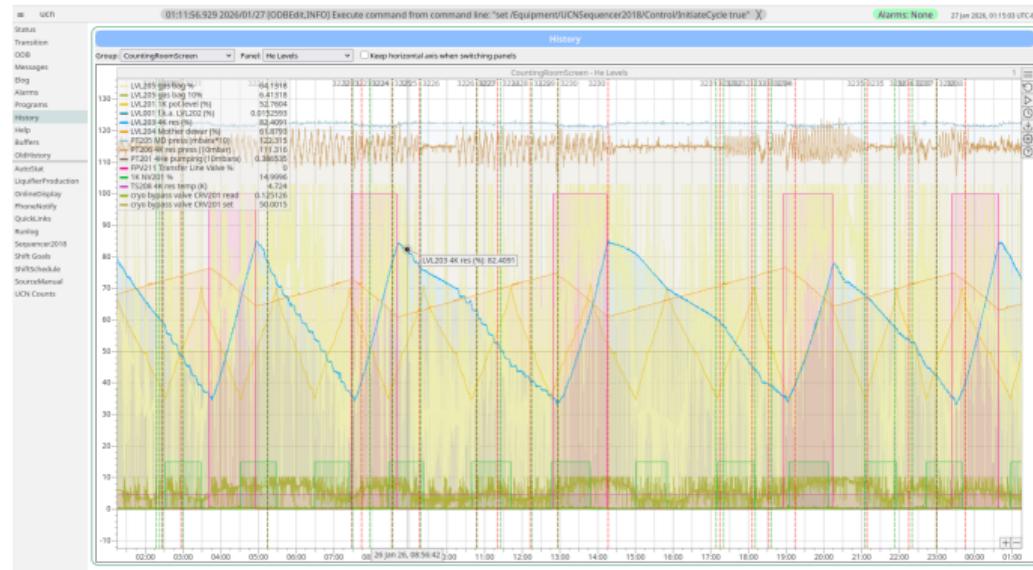
- DAQ could try to spec a new server from Gigabit, purchasing with DAQ funds. If it proves viable we could sell it to UCN. Timeline uncertain.
- Use a new desktop for the next 2-3 years. Not as reliable or as easy to service.



## History

## Planned updates:

- Reorganize variables by subsystem (HE4, HE3, ISO, etc)
- Add missing EPICS variables
- Remove delays for adding variables to MySQL database (with foresight to EDM subsystems)



# Sequencer

## Planned updates:

- Re-write for stability, handle long runs
- Some wishlist items:
  - Checkboxes to skip specific cycles
  - Start button on sequencer page
  - Flexible number cycles/periods/valves
  - Better valve ids

Disucssion points:

- Improvements to data streaming, timings
- MIDAS pages: Autostat, shift scheduler, notifications, liquifier
- Network changes
- New daq01 machine
- History improvements
- Sequencer improvements
- Integrating EDM subsystems into MIDAS

