VME Fan-tray Monitoring

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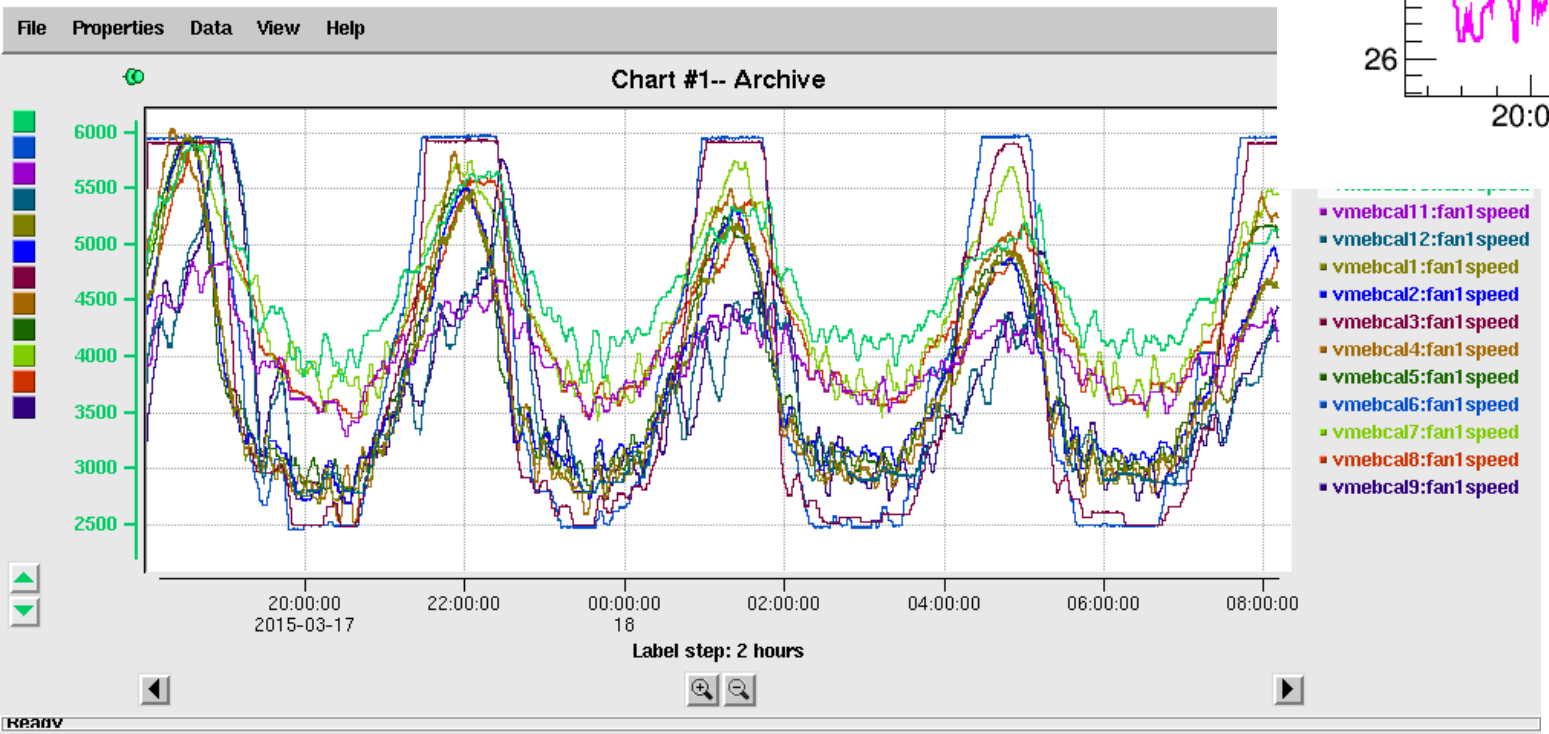
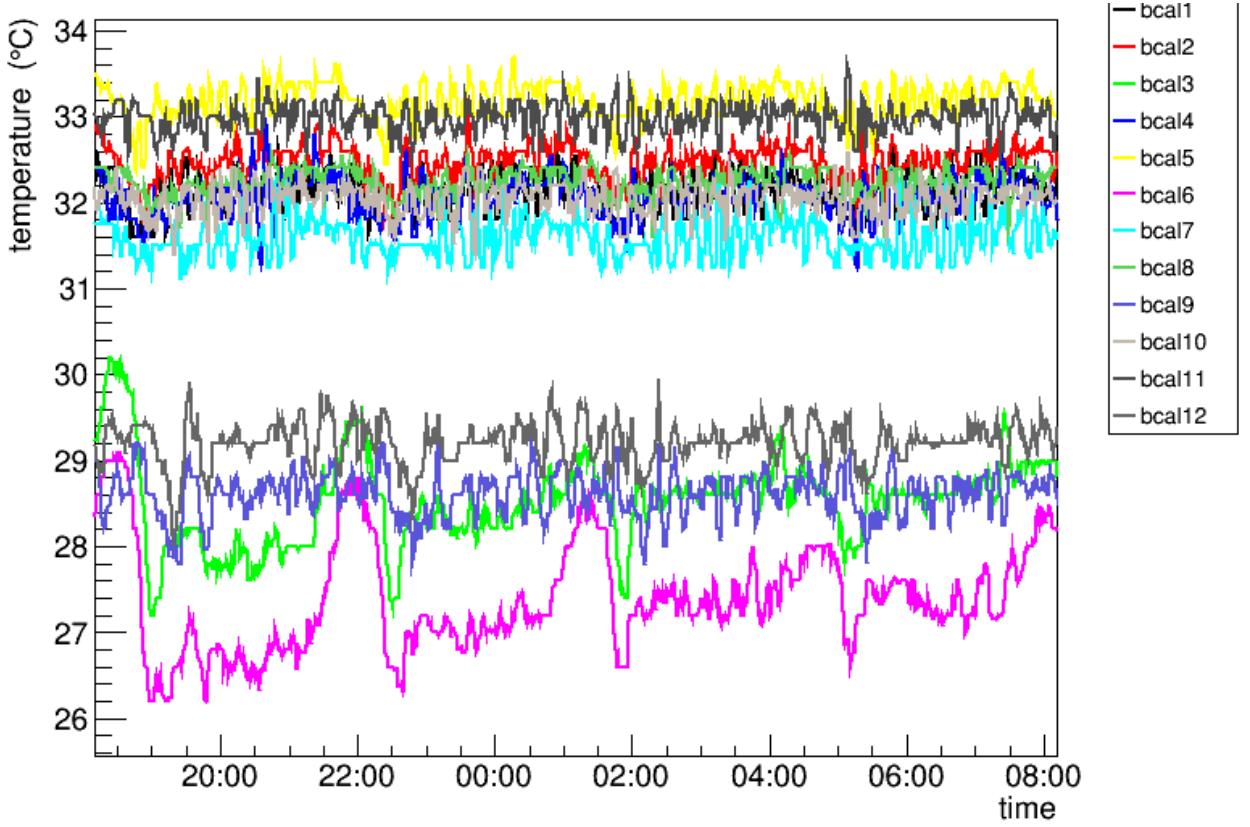
Introduction

- BCAL group observed that the pedestals from FADC250 vary with temperature of the crates, about 3-4 hours period
  - Significant enough in size to seriously complicate offline data analysis.
- Temperature and fan speed monitoring is available in EPICS.
  - Eight temperature sensors per crate, but not all eight are instrumented,
  - Three fans with a single setpoint for fan speed.
- Mark Dalton started regulating the temperature of the crates by controlling the fan speed.
  - Temperature and fan speeds are available in EPICS and are being archived.
  - Mark changed the fanspeed to keep the average temperature from instrumented sensors on individual crate constant.
  - Seemed to work if the fan speed range is from 3000RPMs to 6000RPMs.
- In order to monitor online what is happening with the fan trays we needed to have a set of GUIs.
- It is better to run the temperature regulation code in EPICS, which is exactly what was done.

Mark's Scheme

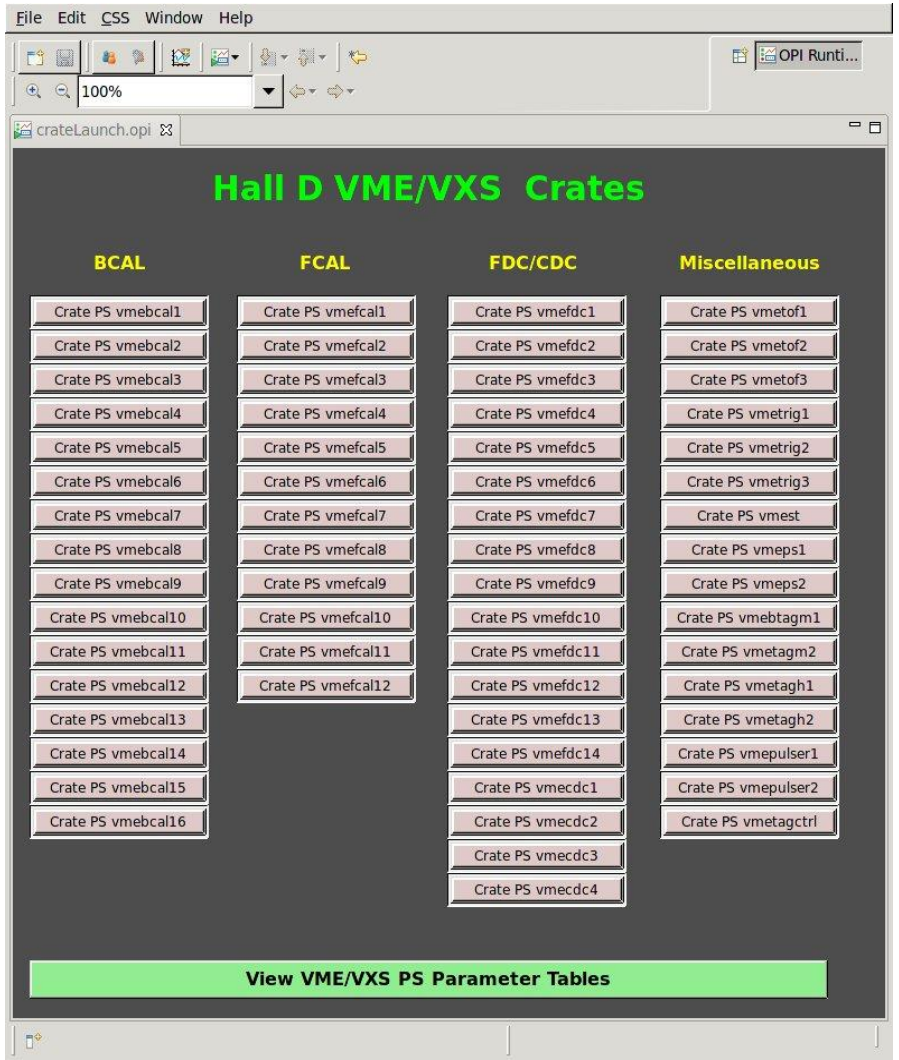
Fan Speeds





Crate Temperatures

VME GUIs


File Edit CSS Window Help
OPI Runti...
100%
crateLaunch.opi
Hall D VME/VXS Crates
BCAL
FCAL
FDC/CDC
Miscellaneous
Crate PS vmebcal1
Crate PS vmebcal2
Crate PS vmebcal3
Crate PS vmebcal4
Crate PS vmebcal5
Crate PS vmebcal6
Crate PS vmebcal7
Crate PS vmebcal8
Crate PS vmebcal9
Crate PS vmebcal10
Crate PS vmebcal11
Crate PS vmebcal12
Crate PS vmebcal13
Crate PS vmebcal14
Crate PS vmebcal15
Crate PS vmebcal16
Crate PS vmefcal1
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Crate PS vmefcal12
Crate PS vmefdc1
Crate PS vmefdc2
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Crate PS vmefdc7
Crate PS vmefdc8
Crate PS vmefdc9
Crate PS vmefdc10
Crate PS vmefdc11
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Crate PS vmefdc14
Crate PS vmecdc1
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Crate PS vmecdc3
Crate PS vmecdc4
Crate PS vmetof1
Crate PS vmetof2
Crate PS vmetof3
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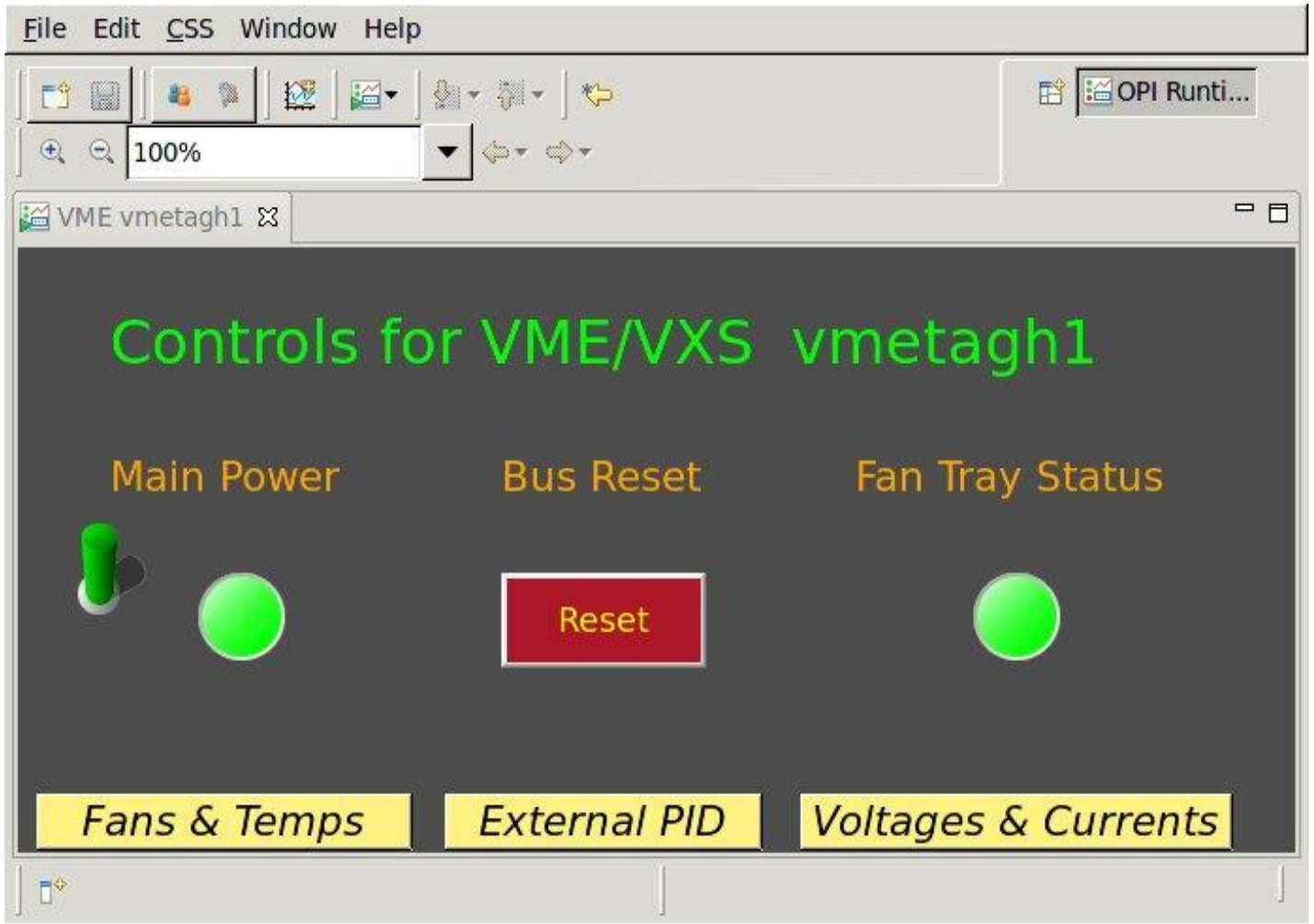
Crate PS vmest
Crate PS vmeps1
Crate PS vmeps2
Crate PS vmebtagm1
Crate PS vmetagm2
Crate PS vmetagh1
Crate PS vmetagh2
Crate PS vmepulser1
Crate PS vmepulser2
Crate PS vmetagctrl
View VME/VXS PS Parameter Tables


File Edit CSS Window Help
OPI Runti...
100%
VME vmetagh1
Controls for VME/VXS vmetagh1
Main Power
Bus Reset
Fan Tray Status
Reset
Fans & Temps
External PID
Voltages & Currents

File Edit CSS Window Help

85%

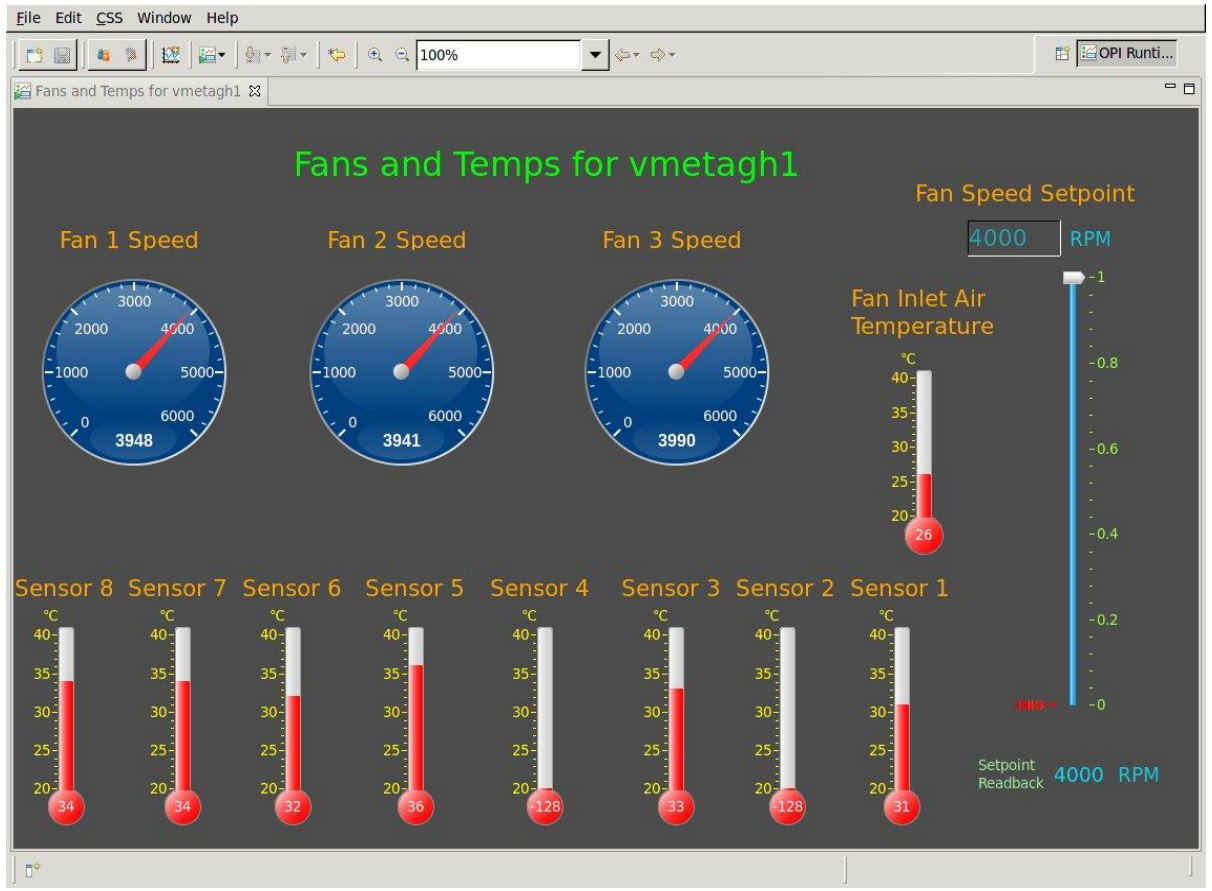
OPI Runti...

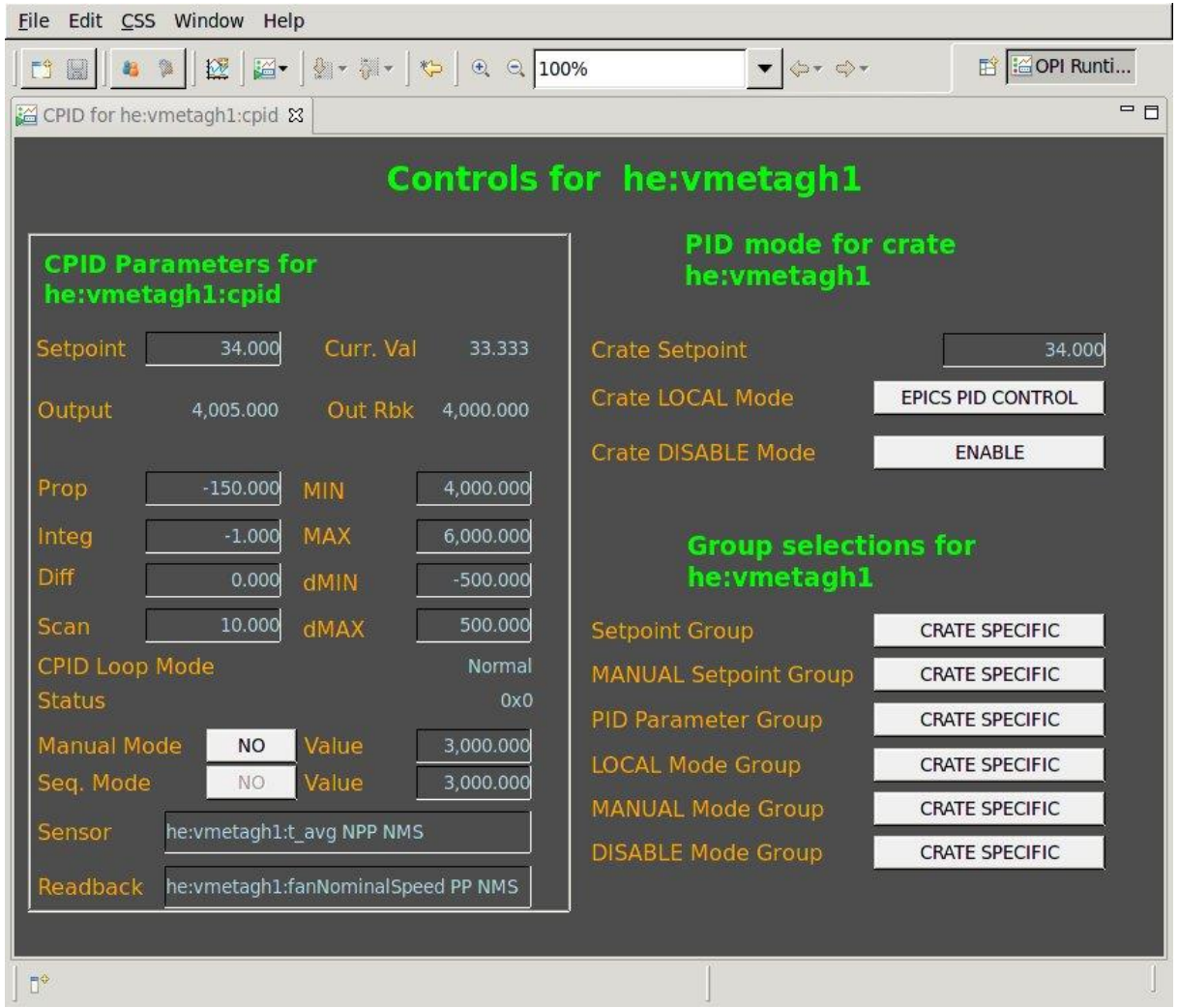
calorimetryCrateParameters.opi

HALL D CALORIMTERY (BCAL & FCAL) VME/VXS CRATE PARAMETERS

Crate Name	+5V (V)	+12V (V)	+3V (V)	-12V (V)	+5V (A)	+12V (A)	+3V (A)	-12V (A)	T1 (C)	T2 (C)	T3 (C)	T4 (C)	T5 (C)	T6 (C)	T7 (C)	T8 (C)	Tin (C)	Fan1 (rpm)	Fan2 (rpm)	Fan3 (rpm)	Fan SP RB	Fan SP	Turn ON/OFF
vmebcal1	5.010	12.010	3.300	12.010	44.840	5.260	82.120	5.920	35	-128	37	-128	39	36	-128	38	32	3971	3963	3997	4000	4,000	OFF
vmebcal2	5.000	12.010	3.300	11.950	42.450	5.150	79.090	4.530	34	-128	36	-128	38	-128	40	37	33	4203	4207	4215	4239	4,227	OFF
vmebcal3	5.020	11.950	3.310	11.960	20.870	4.380	38.620	2.560	31	31	-128	34	-128	37	-128	34	27	4695	4736	4743	4753	4,641	OFF
vmebcal4	5.050	12.040	3.310	11.980	44.600	5.200	81.700	4.660	33	-128	36	-128	39	-128	38	38	28	4507	4368	4458	4472	4,408	OFF
vmebcal5	4.990	11.960	3.320	12.010	32.310	4.900	65.130	4.440	33	-128	-128	36	37	-128	36	37	32	5647	5647	5673	5692	5,646	OFF
vmebcal6	4.990	12.030	3.300	11.990	21.050	4.320	38.840	2.550	30	-128	31	-128	33	34	-128	33	26	5456	5456	5475	5482	5,379	OFF
vmebcal7	5.010	11.990	3.300	11.980	26.930	5.130	58.490	4.670	32	-128	32	-128	-128	33	-128	34	35	5940	5921	5977	6000	6,000	OFF
vmebcal8	4.990	11.990	3.310	11.990	39.100	5.060	73.190	4.540	33	-128	33	-128	35	-128	37	35	32	5921	5932	6030	6000	6,000	OFF
vmebcal9	5.020	11.980	3.320	12.020	21.000	4.340	39.070	2.560	30	30	-128	32	-128	33	-128	30	32	5928	5940	6015	6000	6,000	OFF
vmebcal10	5.000	12.030	3.310	12.040	35.560	5.040	69.320	4.470	32	-128	34	-128	35	-128	35	35	33	5910	5940	6022	6000	6,000	OFF
vmebcal11	5.000	11.990	3.300	12.010	44.310	5.220	80.860	4.650	32	-128	34	-128	35	-128	37	35	30	5842	5958	6015	5985	5,992	OFF
vmebcal12	4.990	11.990	3.290	12.040	20.770	4.330	38.900	2.580	31	30	-128	32	-128	34	-128	31	30	5868	5872	5902	5921	5,969	OFF
vmebcal13	5.020	12.010	3.320	11.980	65.710	9.150	0.000	9.180	33	-128	37	-128	38	-128	36	32	31	2921	2951	3015	3000	3,000	OFF
vmebcal14	5.000	12.000	3.290	11.980	66.710	9.280	0.000	9.280	37	-128	37	-128	38	35	-128	33	31	2936	2951	3011	3000	3,000	OFF
vmebcal15	4.990	12.030	3.290	11.980	65.600	9.280	0.000	9.240	37	-128	38	-128	40	-128	37	33	35	2917	2947	3033	3000	3,000	OFF
vmebcal16	5.020	11.990	3.300	12.010	65.390	9.270	0.000	9.230	36	-128	38	38	-128	36	-128	33	28	2921	2955	3011	3000	3,000	OFF
vmefcal1	5.010	11.960	3.300	12.000	52.250	6.430	100.790	6.410	36	-128	36	-128	40	-128	36	36	32	5752	5752	5801	5794	5,770	OFF
vmefcal2	4.990	11.990	3.300	11.960	32.280	6.090	76.090	5.510	32	-128	33	-128	35	-128	37	34	35	5816	5820	5962	5895	5,871	OFF
vmefcal3	5.010	12.010	3.320	11.980	35.620	6.130	81.690	5.520	32	-128	33	-128	35	-128	35	34	35	5943	5838	5910	5916	5,904	OFF
vmefcal4	5.010	11.990	3.310	11.980	48.360	6.020	94.110	5.300	32	-128	35	-128	36	35	-128	36	33	5767	5737	5865	5839	5,795	OFF
vmefcal5	4.990	11.970	3.310	11.980	48.860	6.370	98.560	5.710	33	-128	35	-128	38	35	-128	36	31	5760	5861	5793	5826	5,777	OFF
vmefcal6	4.990	11.980	3.310	12.010	48.590	6.040	94.370	5.250	32	-128	34	-128	36	33	-128	34	31	5835	5895	5928	5908	5,904	OFF
vmefcal7	5.020	12.010	3.300	12.020	49.950	6.060	94.120	5.300	34	37	-128	35	-128	35	-128	34	32	5898	5898	6022	5963	5,979	OFF
vmefcal8	4.990	11.980	3.310	12.000	50.240	6.460	101.800	5.660	32	-128	34	-128	36	-128	37	36	33	5966	5842	6030	5994	5,990	OFF
vmefcal9	5.010	11.970	3.300	12.010	35.980	5.800	77.110	5.200	30	-128	31	-128	33	-128	33	33	31	5868	5943	6011	5966	5,946	OFF
vmefcal10	4.990	11.990	3.310	12.020	50.870	6.420	101.820	5.690	35	-128	37	-128	38	36	-128	37	33	5913	5707	5861	5846	5,832	OFF
vmefcal11	5.020	11.980	3.310	11.970	48.170	6.440	98.920	5.650	34	36	-128	35	-128	35	-128	34	30	5951	5951	5958	6000	5,990	OFF
vmefcal12	4.990	11.950	3.320	11.980	41.670	6.300	89.410	5.610	32	-128	34	-128	36	-128	35	37	35	5981	5820	5876	5903	5,861	OFF

VME Temperature GUIs





Grouping

- In order to make management simpler groups are defined for VME fantray parameters:
  - GLOBAL, BCAL, FCAL, CONTROLS, DISCRIMINATORS, FDC, CDC, …
  - Can assign individual VME crates to one of the groups or to be CRATE SPECIFIC
- Each group can have the following parameters defined for it:
    - T-setpoint
    - Manual RPM-setpoint
    - PID parameters
    - LOCAL Mode choice
    - MANUAL Mode choice
    - DISABLE Mode choice
  - All crates in the same group have the same parameters
    - If CRATE SPECIFIC is selected for the group, then parameters for the particular VME crate applies.

Summary

- We have EPICS GUIs to monitor the status of the fan trays.
- Fan speeds and crate temperatures are being archived.
- Programmed PID loops for each crate in EPICS:
  - Mark Dalton's program sets the T-setpoint for BCAL, FCAL, FDC, CDC VME/VXS crate PID loops since the RPM-range is not sufficient to keep the temperature at a fixed value all the time.
  - Other crates have their EPICS PID loops disabled and set to a fixed RPMs.
- EPICS set upper and lower limit for RPM values:
  - VXS: 3000RPMs – 6000RPMs
  - VME: 2500RPMs – 3000RPMs
- Detectors group should select the mode of operations for their VME crates.
- Comments and suggestions are welcome.