CSS Developments at Diamond Light Source

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Introduction

- Can we use CSS?
- Developments of CSS at Diamond
  - CSS as an EDM Replacement
  - CSS as an Interface to the Fast Archiver
  - CSS for Photon Beamline Control
- Summary

Why choose CSS?

- CSS provides a lot of infrastructure
- CSS is used widely in the EPICS community
  - Several active developers
  - Too big to fail (!)
- CSS conversion tools are improving
- Common client side platform between Controls and Data Acquisition at Diamond (DAWN and GDA)
  - Subject to many caveats
- CSS works on Windows

Why not choose CSS?

- GUIs are too slow
- GUIs don't look nice
- Eclipse works better on Windows than Linux
- (hypothetical) we can't get BOY to perform well enough
- (hypothetical) CSS crashes too regularly
- (hypothetical) we can't convert enough screens accurately enough
- Do we like the Eclipse platform?

CSS as an EDM Replacement

Why Replace EDM?

- Concern EDM is nearing end of life
- EDM's libraries are being phased out
- EDM is has limited support
- See problems with EDM on each OS uplift
  - Fonts, operation over NX
- We could benefit from the rest of the infrastructure CSS provides

Can CSS replace EDM?

- To use CSS to replace EDM
  - We need to be able to programmatically and accurately convert 100s of screens
    - Screens use lots EDM features and tricks
  - There are too many screens to hand build them all from scratch in CSS
  - We need operators to be able to use windows across Linux workspaces
  - CSS out-of-the box isn't a direct replacement EDM

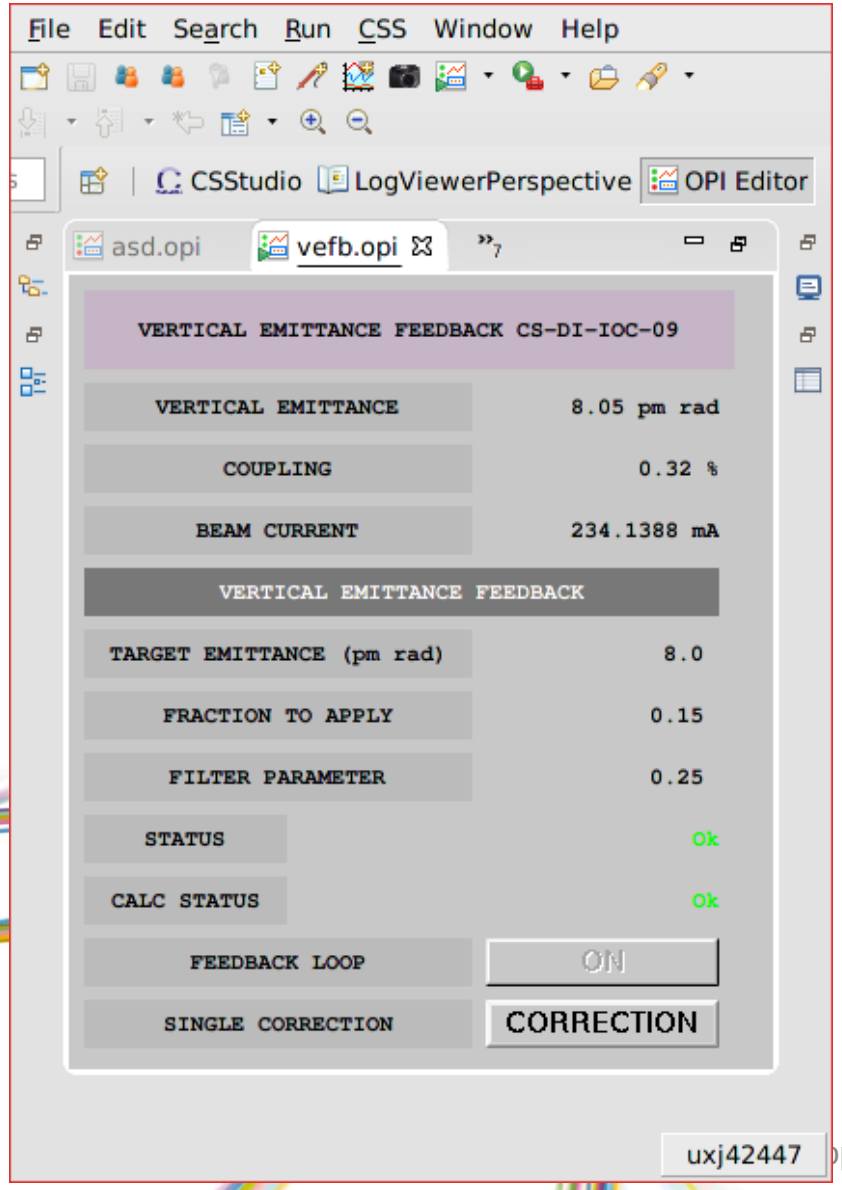
Things we're working on

- CSS
  - Eclipse 4, and EDM Mode
- The EDM to CSS Converter
  - Batch conversion
  - Many tweaks to the converter
- CSS widgets
  - 'Enum' PVs – used for selecting items in a screen
  - 'Calc' PVs
  - 'Menu mux' buttons
  - Nudge buttons
  - Click throughs

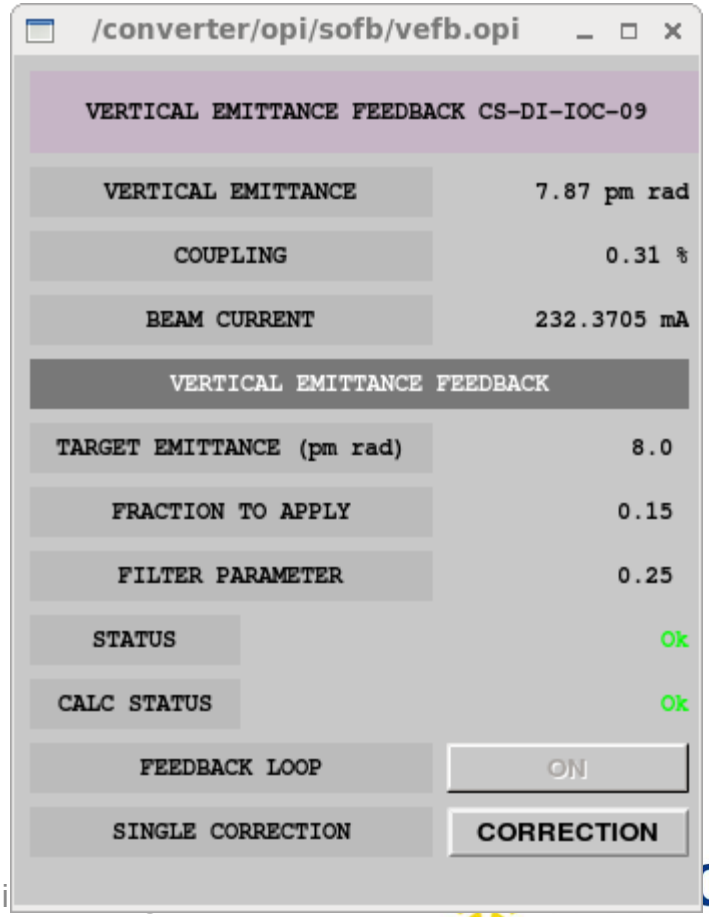
EDM Mode

- Machine operators understand the opertio of accelerators through the UI
  - Sensitive to changes in UI
    - This can impact operational performance/reliability
- Can we persuade CSS to resemble EDM?
  - Separate windows per UI (optional)
- We've got pretty close
  - CSS EDM Mode

CSS EDM Mode



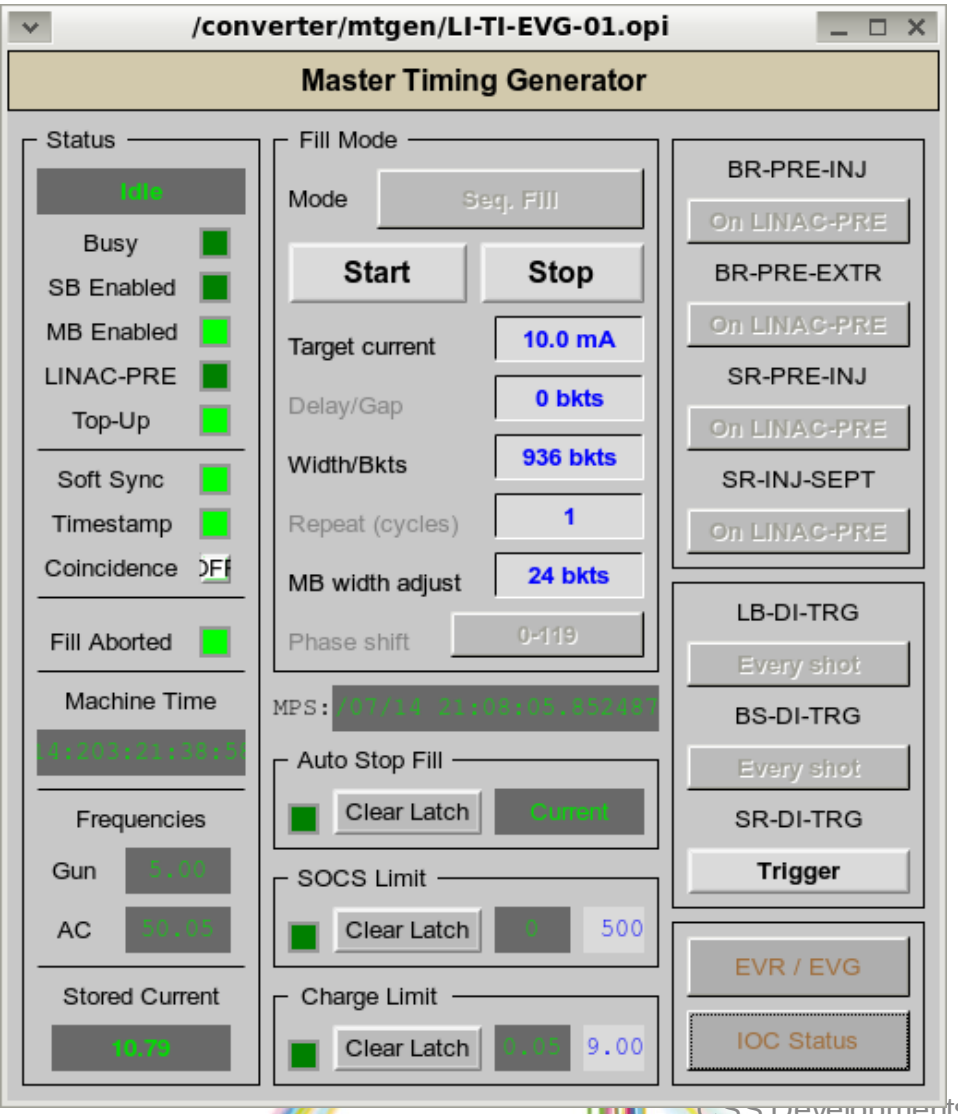
- Panels launched in an SWT Shell

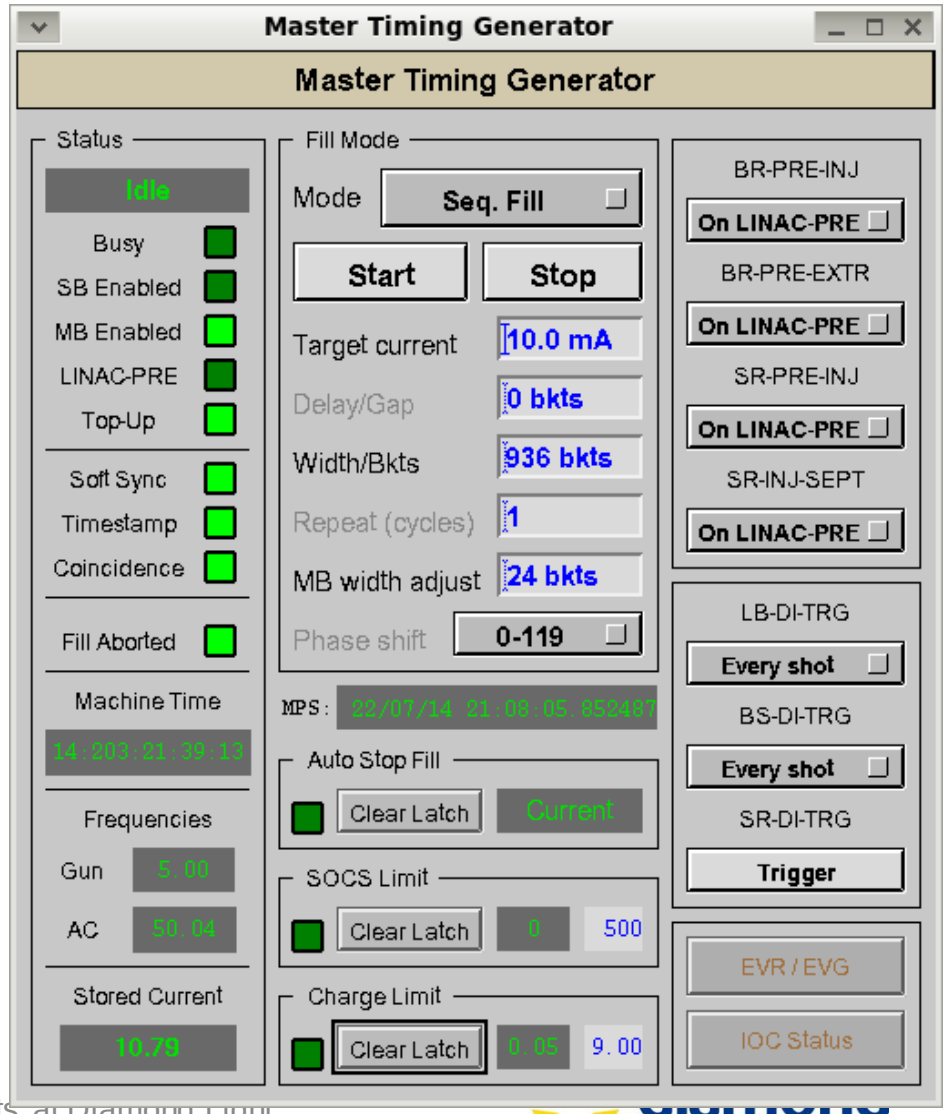


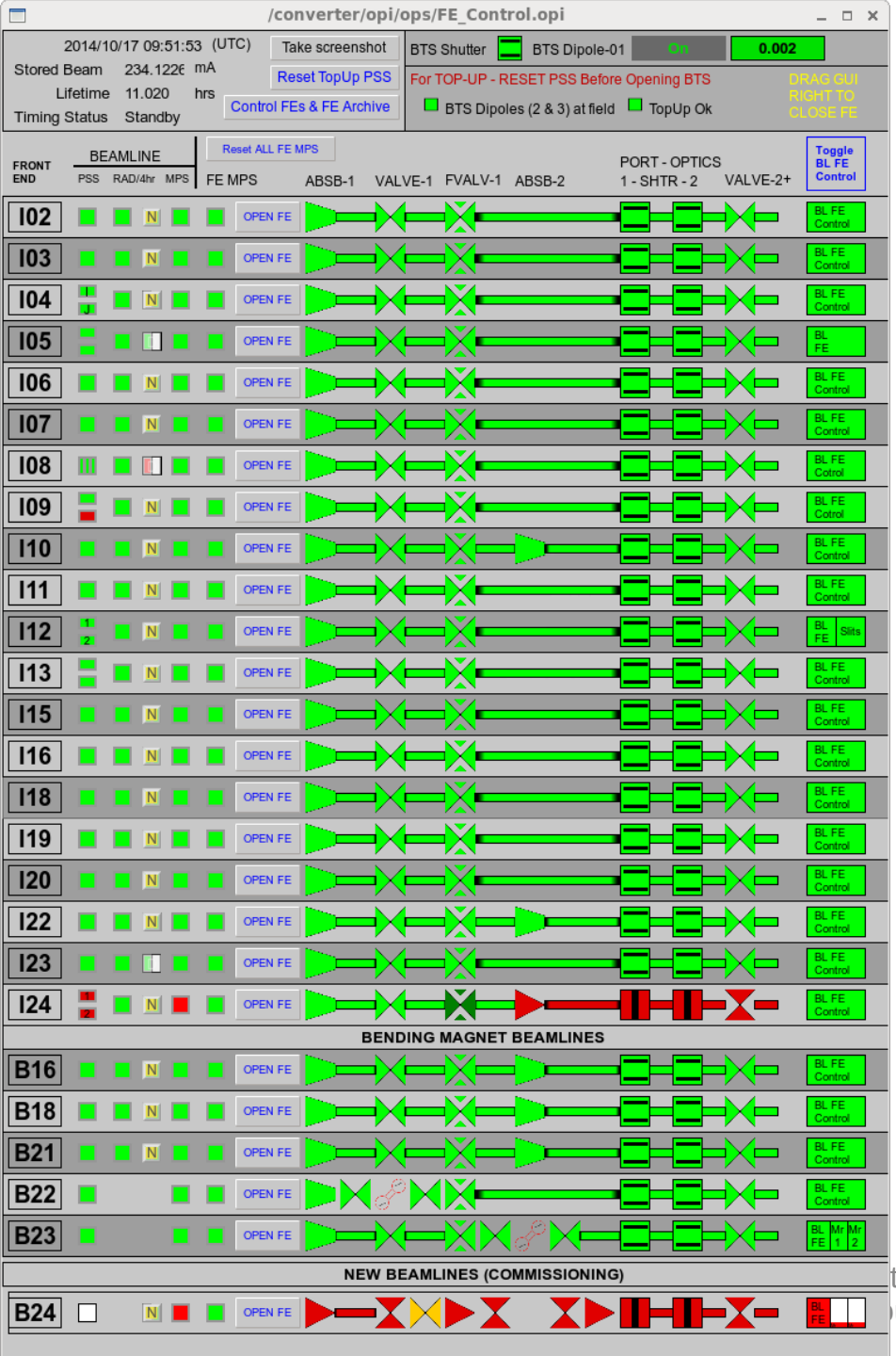
CSS-EDM Mode: tricky bits

- Right-click context menu has been lost
  - No zooming on graphs
- BOY handles clicks differently to EDM
  - If one widget is above another, the lower widget does not receive a click
- Fonts don’t map!
- Graphs are still a difficultly

Converting Panels



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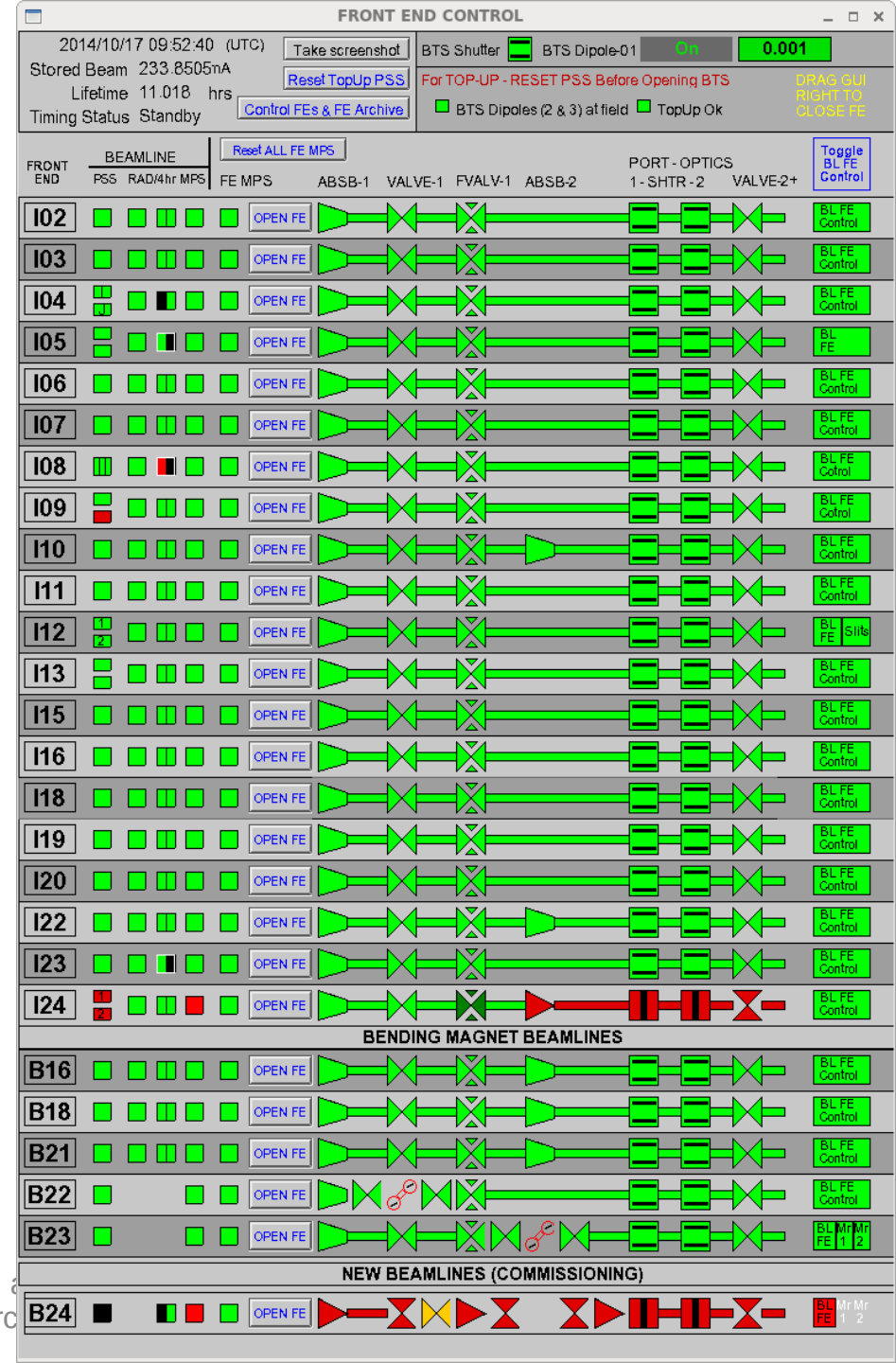
2014/10/17 09:51:53 (UTC)
Stored Beam 234.1226 mA
Lifetime 11.020 hrs
Timing Status Standby
Take screenshot
Reset TopUp PSS
Control FEs & FE Archive
BTS Shutter
BTS Dipole-01
On
0.002
For TOP-UP - RESET PSS Before Opening BTS
BTS Dipoles (2 & 3) at field
TopUp Ok
DRAG GUI RIGHT TO CLOSE FE
FRONT END
BEAMLINE
PSS RAD/4hr MPS
Reset ALL FE MPS
FE MPS
ABSB-1 VALVE-1 FVALV-1 ABSB-2
PORT - OPTICS
1 - SHTR - 2 VALVE-2+
Toggle BL FE Control
I02 I03 I04 I05 I06 I07 I08 I09 I10 I11 I12 I13 I15 I16 I18 I19 I20 I22 I23 I24
OPEN FE
BL FE Control
Slits
BENDING MAGNET BEAMLINES
B16 B18 B21 B22 B23
Mr 1 Mr 2
NEW BEAMLINES (COMMISSIONING)
B24


FRONT END CONTROL
2014/10/17 09:52:40 (UTC)
Stored Beam 233.8505mA
Lifetime 11.018 hrs
Timing Status Standby
Take screenshot
Reset TopUp PSS
Control FEs & FE Archive
BTS Shutter
BTS Dipole-01
On
0.001
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BTS Dipoles (2 & 3) at field
TopUp Ok
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OPEN FE
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BENDING MAGNET BEAMLINES
B16 B18 B21 B22 B23
Mr 1 Mr 2
NEW BEAMLINES (COMMISSIONING)
B24

Operations - Absolute Temperatures

STORAGE RING

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Cooled Taper Flange
EBPM Block

Incoming Flange
Crotch Pumping Port
On-side Cooling Channel
Crotch Absorber Port
Crotch Bellows Flange
EBPM Block
EBPM Block

X-ray Leg End Top
X-ray Leg End Bottom
Crotch Absorber Port
Crotch Pumping Port
On-side Cooling Channel
Cooled Taper Flange

Tunnel Cell Air

Quadrupole water
Sextupole water
Taper / Vessel water

Dipole water
Cooling Slit/Crotch water
Quadrupole water
Sextupole water
Straight Vessel water

Dipole water
Cooling Slit/Crotch water
Quadrupole water
Sextupole water
Beam Port / Cooled Taper
Straight Vessel water

Injection 1 / ID Straight 1
Injection 2 / ID Straight 2
Injection 3 / ID Straight 3
Injection 4 / ID Straight 4
Injection 5 / ID Straight 5
Injection 6
Injection 7
Injection 8

SIS Terminals
TEMP-01
TEMP-02
TEMP-03
TEMP-04

Crotch Absorber Body
Crotch Absorber Body
Water Cooled Beam Abs
Water Cooled Beam Abs
Crotch Absorber Body
Crotch Absorber Body
Water Cooled Beam Abs
Water Cooled Beam Abs

PLC Temperatures (>50 deg.C will drop beam)

Valve Flange
End Flange
Primary EBPM
X-RayLeg End 1
X-RayLeg End 2
EBPM Body
EBPM Body
Primary EBPM
Incoming Flange
Valve Flange

Crotch Absorber (21)
Crotch Absorber (31)

FRONT ENDS

I02 I03 I04 I05 I06 I07 I08 I09 I10 I11 I12 I13 I15 B16 I16 B18 I18 I19 I20 B21 B22 I22 I23 I24

Aperture 1 - T1
Aperture 1 - T2
Aperture 2 - T1
Aperture 2 - T2
Aperture 2 - T3
Aperture 2 - T4
Aperture 3 - T1
Aperture 3 - T2
Aperture 3 - T3
Aperture 3 - T4
Aperture 3 - T5
Aperture 3 - T6
Aperture 4 - T1
Aperture 4 - T2
Aperture 4 - T3
Aperture 4 - T4
Absorber 1 - T1
Absorber 1 - T2
Absorber 1 - T3
Absorber 1 - T4
Absorber 2 - T1
Absorber 2 - T2
Absorber 2 - T3
Absorber 2 - T4
PBPM 1 - T1
PBPM 1 - T2
PBPM 2 - T1
PBPM 2 - T2

Front End Interlocked Temperatures
See Below for Limits

I15-APTR-01 = 120 deg.C
I15-ABSB-01 = 80 deg.C
B22-ABSB-01 = 50 deg.C

Temp.Scale Front Ends Only
10 20 30 40 50 60 70 80 90 100
Deg.C

DIAGNOSTICS

COLLIMATORS :
COL-01V Upper
COL-01V Lower
COL-01H Right
COL-01H Left

PINGER VESSEL:
TEMP-01
TEMP-02
TEMP-03
TEMP-04

VLE
PLC Temperatures
>50 deg.C will drop beam
TEMP-01
TEMP-02
TEMP-03
TEMP-04
TEMP-05
TEMP-06

Beam Current (mA) 234.7
SoCS (nC^2) 291.2

SR-RF

02 03

FBT HOM Water OUT 1
FBT HOM Water OUT 2
FBT HOM Water OUT 3
RBT HOM Water OUT 1
RBT HOM Water OUT 2
RBT HOM Water OUT 3

FBT HOM Water In
FBT Flange
FBT Slide Joint
RBT HOM Water In
RBT Taper Out
RBT Taper 1
RBT Taper 2
RBT Taper 3
RBT Taper 4
RBT Taper 5
RBT Taper 6
RBT Taper Flange
RBT Connect
RF Window Water In
RF Window Water Out

Mini Beta Corrector (SR13):
FRAME-01
FRAME-02
COIL-01
COIL-02

Average/Max/Min
5 10 15 20 25 30 35 40 45 50
Deg.C

Close

/converter/opi/ops/MPS-Temperatures.opi

Operations - Absolute Temperatures

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Injection 6
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Injection 8

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End Flange
Primary EBPM
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Crotch Absorber (31)

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I02 I03 I04 I05 I06 I07 I08 I09 I10 I11 I12 I13 I15 B16 I16 B18 I18 I19 I20 B21 B22 I22 I23 I24

Aperture 1 - T1
Aperture 1 - T2

Aperture 2 - T1
Aperture 2 - T2
Aperture 2 - T3
Aperture 2 - T4

Aperture 3 - T1
Aperture 3 - T2
Aperture 3 - T3
Aperture 3 - T4
Aperture 3 - T5
Aperture 3 - T6

Aperture 4 - T1
Aperture 4 - T2
Aperture 4 - T3
Aperture 4 - T4

Absorber 1 - T1
Absorber 1 - T2
Absorber 1 - T3
Absorber 1 - T4

Absorber 2 - T1
Absorber 2 - T2
Absorber 2 - T3
Absorber 2 - T4

PBPM 1 - T1
PBPM 1 - T2

PBPM 2 - T1
PBPM 2 - T2

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TEMP-01
TEMP-02
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TEMP-06

Beam Current (mA) 231.9
SoCS (nC^2) 283.7

SR-RF

02 03

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FBT HOM Water OUT 3
RBT HOM Water OUT 1
RBT HOM Water OUT 2
RBT HOM Water OUT 3

FBT HOM Water In
FBT Flange
FBT Slide Joint
RBT HOM Water In
RBT Taper Out
RBT Taper 1
RBT Taper 2
RBT Taper 3
RBT Taper 4
RBT Taper 5
RBT Taper 6
RBT Taper Flange
RBT Connect
RF Window Water In
RF Window Water Out

Mini Beta Corrector (SR13):
FRAME-01
FRAME-02
COIL-01
COIL-02

Average/Max/Min
5 10 15 20 25 30 35 40 45 50
Deg.C

Close

Quad and Sext Current Overview

Quadrupole and Sextapole - Current Overview

?

Details

Inherit settings

Type	Set Point	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Type
Q1D		72.545 72.5688			76.473 76.4958	76.294 76.3169			206.991 207.013	154.330 154.3532			216.029 216.050	165.579 165.6016			72.706 72.7277	72.708 72.7290			73.035 73.0596	73.392 73.4149			73.041 73.0625	Q1D
Q1B		125.018 125.064	124.668 124.915	124.775 124.8217	124.136 124.1643	125.445 125.4895	124.406 124.4498	125.200 125.2451	125.369 125.4156	125.332 125.3787	124.553 124.5993	124.035 124.0810	127.935 127.0304	125.033 125.0786	125.138 125.1630	126.093 126.3652	124.657 124.7040	123.609 123.6543	125.226 125.2713	124.633 124.6777	123.701 123.7479	125.132 125.1769	125.009 125.054	125.417 125.4634	123.985 124.0313	Q1B
			124.948 124.9920	124.302 124.3479			124.607 124.8516	125.914 125.9595			124.577 124.6206	126.901 125.9945			125.994 125.2845	124.211 124.2558			124.555 124.6007	123.968 124.0139			124.666 124.7120	124.974 125.0184		
Q2D		128.643 128.9499			129.863 130.170	129.319 129.6253			129.626 129.9327	127.757 128.0634			128.236 128.5420	127.884 128.1902			128.883 129.189	128.475 128.7807			128.775 129.0794	129.223 129.5300			129.403 129.7098	Q2D
Q2B		151.209 151.2419	150.333 150.3686	149.979 150.0140	148.780 148.8134	149.308 149.3431	148.324 148.3584	148.428 148.4621	147.992 148.0286	149.524 149.5579	149.319 149.3533	148.324 148.3582	149.267 148.6659	147.656 147.6925	147.608 147.6431	148.576 148.1197	147.840 147.874	150.244 150.2781	149.648 149.6816	149.541 149.5757	149.503 149.5386	150.155 150.1895	149.636 149.671	149.909 149.9446	149.988 150.0226	Q2B
			149.694 149.7280	150.504 150.5392			148.356 148.3894	148.109 148.1424			148.290 148.3252	149.608 149.0060			149.482 149.0245	148.586 148.6198			150.094 150.1270	149.767 149.8010			148.919 148.9540	150.098 150.1327		
Q3D		98.818 100.2626			96.615 96.0573	96.133 97.5765			100.316 101.7601	97.943 99.3868			100.568 102.0113	98.679 100.1228			98.427 99.8704	98.994 100.4360			98.936 100.3801	96.534 97.9773			99.262 100.7046	Q3D
Q3B		87.034 87.0735	88.610 88.6523	87.703 87.7421	87.462 87.5232	87.020 87.0590	87.305 87.3483	87.170 87.2103	86.441 86.4812	87.063 87.1025	86.497 86.5384	87.705 87.7449	88.349 86.6514	86.884 86.9242	85.413 85.4536	88.717 87.4461	87.443 87.4841	88.255 88.2950	88.403 88.4429	86.593 86.6351	88.351 88.3981	88.919 88.9609	86.476 86.5183	87.560 87.6001	88.506 88.5453	Q3B
			87.646 87.6651	88.031 88.0691			87.058 87.0986	86.603 86.6437			86.695 86.7362	86.608 86.9102			88.890 87.6185	88.142 88.1824			89.107 89.1483	88.217 88.2589			86.612 86.6512	87.711 87.7507		
Q2AD		99.188 99.1878			98.757 98.7578	98.799 98.7977			98.233 98.2328	99.302 99.3018			96.843 96.8423	99.288 99.2897			98.010 98.0093	98.639 98.6386			98.519 98.5182	100.486 100.4853			99.173 99.1742	Q2AD
Q2AB		105.831 105.8305	105.502 105.5025	105.750 105.750	105.691 105.6913	105.435 105.4346	104.887 104.8871	106.169 106.169	105.012 105.0125	105.373 105.3744	105.116 105.1170	106.032 106.0320	104.856 104.8549	104.781 104.7814	105.266 105.2656	105.880 105.8800	105.359 105.3593	105.545 105.5450	105.312 105.3126	106.227 106.2266	106.976 106.9764	105.632 105.6312	106.601 106.601	106.235 106.2342	106.294 106.2947	Q2AB
			105.316 105.3168	105.662 105.6615			105.035 105.0362	104.473 104.4730			105.747 105.7478	105.044 105.0433			105.192 105.193	105.094 105.094			105.105 105.1050	105.309 105.3089			104.712 104.7122	105.655 105.6551		
Q1AD		126.928 126.9278			126.099 126.0981	125.412 125.4123			125.663 125.6635	126.136 126.1361			125.075 125.0747	126.755 126.7562			124.852 124.8521	124.572 124.5726			125.829 125.8265	127.171 127.1719			125.910 125.9099	Q1AD
Q1AB		129.142 129.1412	129.829 129.829	129.054 129.0550	129.174 129.1725	128.534 128.5332	129.535 129.5358	129.041 129.0415	129.373 129.373	128.579 128.5789	129.157 129.1570	127.242 127.2420	129.513 129.5116	128.601 128.5986	127.478 127.4762	128.996 128.9964	129.451 129.4512	129.659 129.8596	129.749 129.7470	129.764 129.7853	130.390 130.3892	129.415 129.4156	129.506 129.5054	129.132 129.1317	129.346 129.3459	Q1AB
			128.407 128.407	128.968 128.9682			128.621 128.621	129.413 129.4130			128.448 128.4476	129.674 129.6752			129.902 129.9033	127.028 127.0291			129.468 129.4670	130.332 130.3325			129.692 129.8910	128.277 128.2769		
S1D		20.880 20.8800			20.881 20.8800	20.960 20.9603			20.961 20.9603	20.880 20.8802			20.880 20.8802	20.880 20.8800			20.881 20.8800	20.960 20.9603			20.957 20.9603	20.880 20.8802			20.881 20.8802	S1D
S1B			31.582 31.5829	31.583 31.5829			31.589 31.5888	31.588 31.5888			31.585 31.5849	31.584 31.5849			31.584 31.5829	31.584 31.5829			31.590 31.5888	31.588 31.5888			31.585 31.5849	31.585 31.5849		S1B
			31.584 31.5829	31.583 31.5829			31.589 31.5888	31.587 31.5888			31.583 31.5849	31.585 31.5849			31.582 31.5829	31.582 31.5829			31.588 31.5888	31.589 31.5888			31.582 31.5849	31.586 31.5849		
S1C		25.425 25.4244			25.425 25.4244	25.655 25.6529			25.653 25.6529	25.420 25.4203			25.420 25.4203	25.424 25.4244			25.424 25.4244	25.654 25.6529			25.654 25.6529	25.421 25.4203			25.420 25.4203	S1C
S2D		50.700 50.7002			50.702 50.7002	50.233 50.2340			50.234 50.2340	50.703 50.7028			50.701 50.7028	50.700 50.7002			50.701 50.7002	50.235 50.2340			50.237 50.2340	50.703 50.7028			50.700 50.7028	S2D
S2B			50.280 50.2783	50.279 50.2783			50.365 50.3644	50.364 50.3644			50.276 50.2792	50.279 50.2791			50.279 50.2783	50.276 50.2763			50.364 50.3644	50.362 50.3644			50.279 50.2792	50.279 50.2791		S2B
			50.278 50.2783	50.278 50.2784			50.363 50.3644	50.366 50.3644			50.279 50.2791	50.279 50.2791			50.279 50.2783	50.261 50.2763			50.363 50.3644	50.363 50.3644			100.557 100.5585	50.278 50.2792		
S2C		32.680 32.6799			32.679 32.6799	32.614 32.6141			32.614 32.6141	32.675 32.6743			32.674 32.6743	32.679 32.6799			32.680 32.6799	32.615 32.6141			32.614 32.6141	32.673 32.6743			32.676 32.6743	S2C
S2AX		55.652 55.6527	55.653 55.6527	55.652 55.6527	55.653 55.6527	55.487 55.4879	55.488 55.4879	55.488 55.4879	55.488 55.4879	55.653 55.6548	55.655 55.6548	55.655 55.6548	55.654 55.6548	55.653 55.6527	55.653 55.6527	55.651 55.6527	55.653 55.6527	55.488 55.4879	55.488 55.4879	55.489 55.4879	55.486 55.4879	55.654 55.6548	55.655 55.6548	55.656 55.6548	55.654 55.6548	S2AX
S2AV		55.532 55.5312	55.532 55.5312	55.530 55.5312	55.532 55.5312	55.365 55.3665	55.366 55.3665	55.367 55.3665	55.367 55.3665	55.534 55.5333	55.530 55.5333	55.536 55.5333	55.532 55.5333	55.534 55.5312	55.533 55.5312	55.534 55.5312	55.532 55.5312	55.367 55.3665	55.365 55.3665	55.364 55.3665	55.366 55.3665	55.533 55.5333	55.532 55.5333	55.534 55.5333	55.533 55.5333	S2AV
S1A		61.051 61.0516	61.052 61.0516	61.052 61.0516	61.051 61.0516	60.965 60.9645	60.965 60.9645	60.964 60.9645	60.964 60.9645	61.055 61.0549	61.055 61.0549	61.055 61.0549	61.054 61.0549	61.052 61.0516	61.051 61.0516	61.052 61.0516	61.052 61.0516	60.964 60.9645	60.965 60.9645	60.965 60.9645	60.964 60.9645	61.055 61.0549	61.056 61.0549	61.055 61.0549	61.054 61.0549	S1A

/converter/opi/psc/pscL3-SPOverview.opi

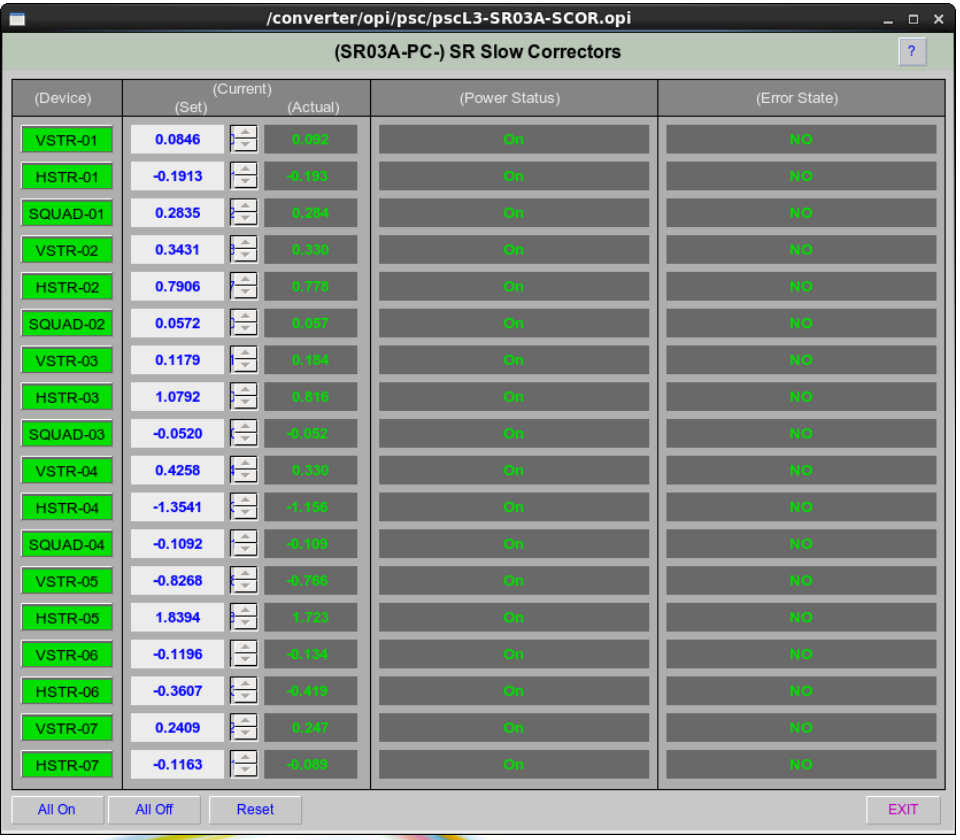
Quadrupole and Sextapole - Current Overview

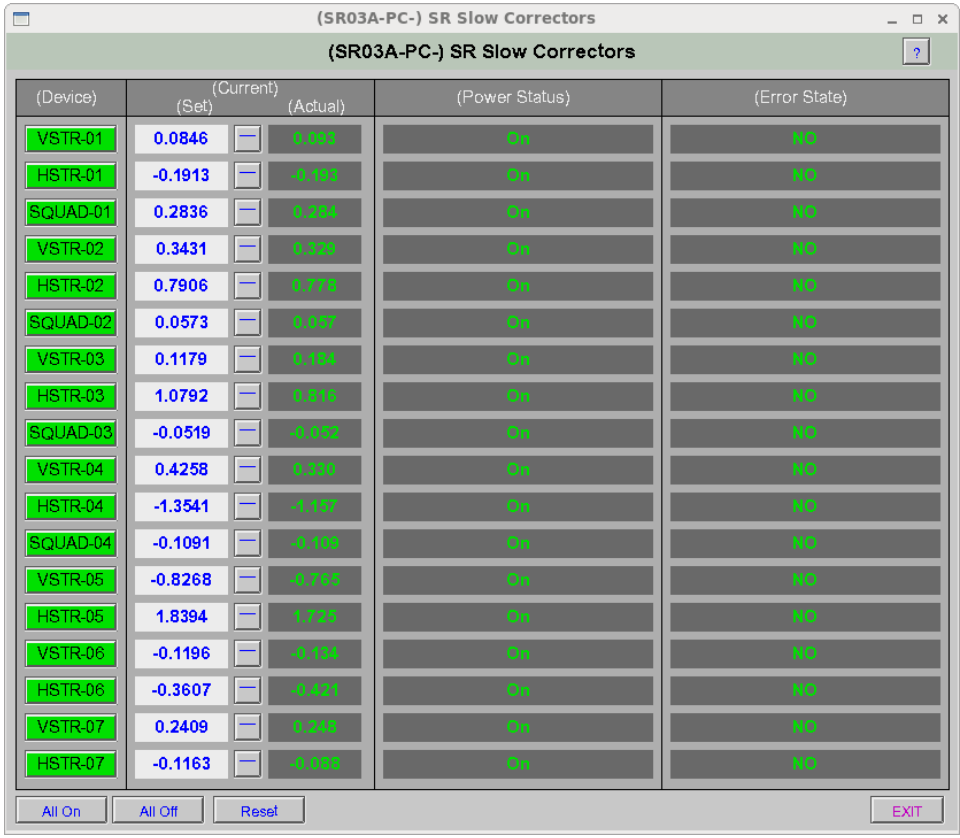
?

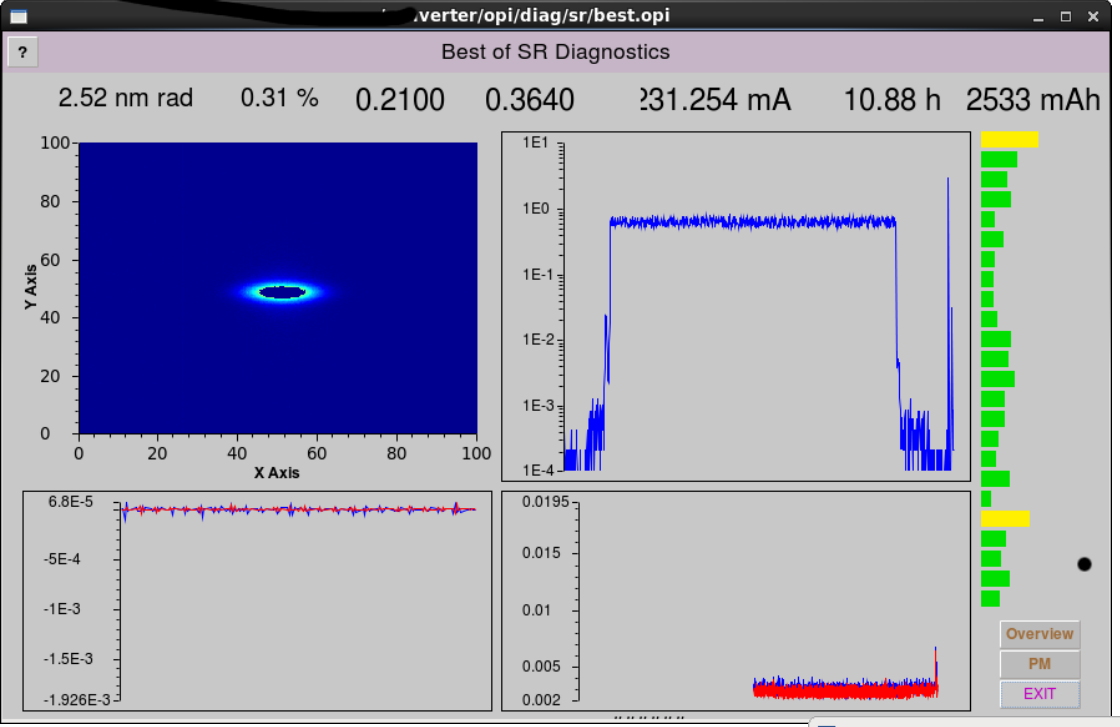
Details

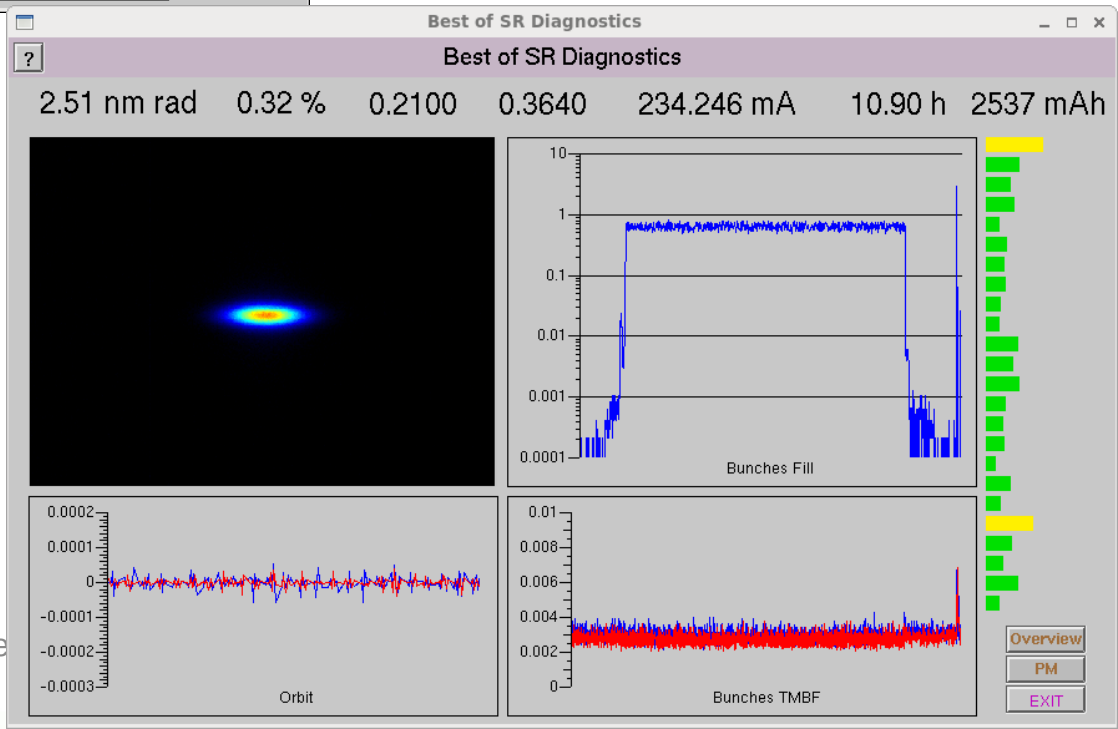
Inherit settings

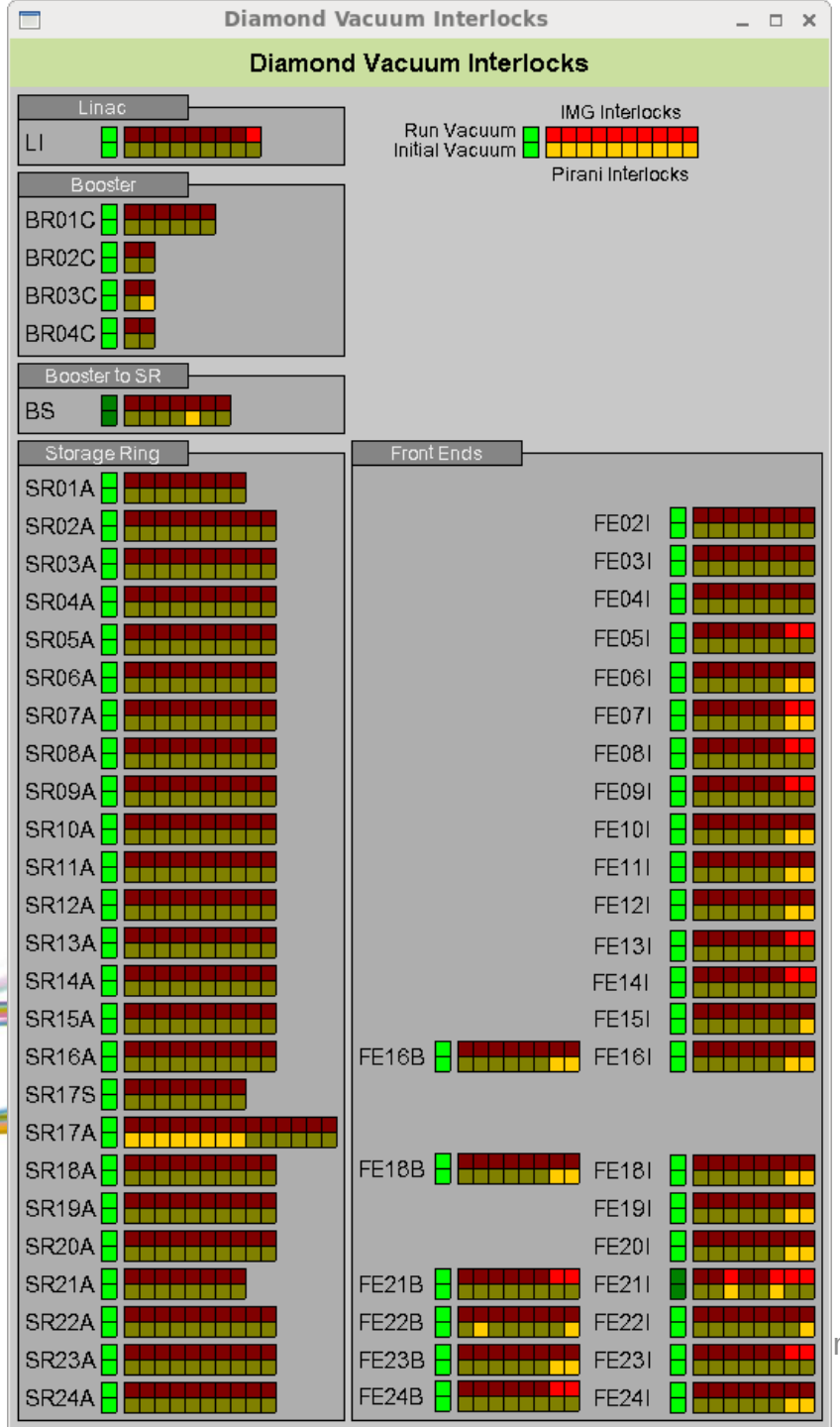
Type	Set Point	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Type
Q1D		72.545 72.5688			76.473 76.4956	76.293 76.3169			206.991 207.0136	154.329 154.3532			216.028 216.0505	165.579 165.6016			72.704 72.7277	72.705 72.7290			73.039 73.0596	73.392 73.4149			73.040 73.0625	Q1D
Q1B		125.019 125.0641	124.869 124.9153	124.775 124.8217	124.141 124.1843	125.445 125.4899	124.404 124.4498	125.199 125.2451	125.370 125.4156	125.332 125.3787	124.553 124.5993	124.036 124.0810	127.934 127.0304	125.034 125.0788	125.136 125.1830	126.094 125.3852	124.658 124.7040	123.606 123.6548	125.225 125.2713	124.632 124.6777	123.702 123.7479	125.132 125.1769	125.008 125.0541	125.416 125.4634	123.984 124.0313	Q1B
			124.948 124.9920	124.299 124.3479			124.805 124.8518	125.915 125.9595			124.575 124.6206	126.899 125.9945			125.993 125.2845	124.212 124.2558			124.556 124.6007	123.969 124.0139			124.665 124.7120	124.973 125.0184		
Q2D		128.644 128.9495			129.863 130.1701	129.319 129.6253			129.626 129.9327	127.758 128.0634			128.237 128.5426	127.885 128.1902			128.882 129.1893	128.474 128.7807			128.772 129.0798	129.224 129.5300			129.403 129.7098	Q2D
Q2B		151.206 151.2419	150.334 150.3686	149.980 150.0140	148.779 148.8134	149.307 149.3431	148.324 148.3584	148.426 148.4621	147.993 148.0280	149.524 149.5579	149.318 149.3533	148.323 148.3582	149.267 148.6659	147.655 147.6929	147.610 147.6431	148.576 148.1193	147.839 147.8741	150.243 150.2783	149.647 149.6818	149.541 149.5757	149.504 149.5386	150.156 150.1899	149.637 149.6711	149.910 149.9448	149.986 150.0226	Q2B
			149.694 149.7286	150.504 150.5392			148.356 148.3894	148.106 148.1424			148.290 148.3252	149.608 149.0060			149.483 149.0245	148.584 148.6198			150.093 150.1270	149.767 149.8010			148.918 148.9540	150.097 150.1327		
Q3D		98.819 100.2626			96.615 98.0573	96.133 97.5765			100.317 101.7605	97.943 99.3868			100.569 102.0118	98.680 100.1228			98.426 99.8704	98.995 100.4386			98.940 100.3807	96.534 97.9773			99.260 100.7046	Q3D
Q3B		87.034 87.0735	88.611 88.6523	87.701 87.7421	87.482 87.5232	87.018 87.0590	87.307 87.3483	87.169 87.2103	86.440 86.4812	87.060 87.1025	86.499 86.5384	87.703 87.7449	88.350 86.6514	86.885 86.9242	85.412 85.4536	88.717 87.4461	87.444 87.4841	88.255 88.2950	88.402 88.4429	86.594 86.6351	88.356 88.3981	88.919 88.9609	86.478 86.5183	87.561 87.6001	88.503 88.5453	Q3B
			87.645 87.6851	88.031 88.0691			87.058 87.0986	86.602 86.6437			86.696 86.7362	88.607 86.9102			88.889 87.6185	88.141 88.1824			89.107 89.1483	88.218 88.2589			86.610 86.6512	87.710 87.7507		
Q2AD		99.188 99.1878			98.756 98.7578	98.797 98.7977			98.233 98.2328	99.302 99.3018			96.842 96.8423	99.290 99.2897			98.011 98.0093	98.639 98.6386			98.518 98.5182	100.485 100.4853			99.174 99.1742	Q2AD
Q2AB		105.830 105.8305	105.503 105.5029	105.751 105.7501	105.693 105.6913	105.435 105.4346	104.886 104.8873	106.169 106.1691	105.012 105.0125	105.374 105.3744	105.116 105.1170	106.031 106.0320	104.855 104.8549	104.781 104.7814	105.266 105.2658	105.879 105.8800	105.359 105.3593	105.545 105.5450	105.312 105.3126	106.227 106.2266	106.975 106.9764	105.631 105.6312	106.600 106.6011	106.234 106.2342	106.295 106.2947	Q2AB
			105.317 105.3168	105.662 105.6613			105.038 105.0362	104.473 104.4730			105.747 105.7478	105.043 105.0433			105.194 105.1931	105.094 105.0941			105.104 105.1050	105.309 105.3089			104.713 104.7122	105.656 105.6551		
Q1AD		126.928 126.9278			126.098 126.0983	125.412 125.4123			125.684 125.6835	126.136 126.1361			125.074 125.0747	126.757 126.7562			124.852 124.8521	124.572 124.5728			125.827 125.8265	127.173 127.1719			125.912 125.9099	Q1AD
Q1AB		129.140 129.1412	129.829 129.8291	129.057 129.0550	129.173 129.1725	128.533 128.5332	129.536 129.5358	129.042 129.0419	129.374 129.3731	128.579 128.5788	129.157 129.1570	127.242 127.2420	129.511 129.5118	128.599 128.5986	127.477 127.4762	128.998 128.9965	129.451 129.4512	129.861 129.8596	129.747 129.7470	129.785 129.7853	130.389 130.3892	129.415 129.4156	129.504 129.5054	129.132 129.1317	129.345 129.3459	Q1AB
			128.408 128.4071	128.969 128.9682			128.621 128.6211	129.413 129.4130			128.450 128.4476	129.677 129.6752			129.904 129.9033	127.028 127.0291			129.467 129.4670	130.332 130.3325			129.892 129.8910	128.278 128.2769		
S1D		20.880 20.8800			20.881 20.8800	20.960 20.9603			20.958 20.9603	20.879 20.8802			20.878 20.8802	20.880 20.8800			20.880 20.8800	20.960 20.9603			20.960 20.9603	20.881 20.8802			20.878 20.8802	S1D
S1B			31.583 31.5829	31.583 31.5829			31.589 31.5888	31.589 31.5888			31.585 31.5849	31.585 31.5849			31.583 31.5829	31.583 31.5829			31.590 31.5888	31.589 31.5888			31.585 31.5849	31.585 31.5849		S1B
			31.583 31.5829	31.586 31.5829			31.588 31.5888	31.587 31.5888			31.584 31.5849	31.582 31.5849			31.580 31.5829	31.586 31.5829			31.591 31.5888	31.591 31.5888			31.585 31.5849	31.585 31.5849		
S1C		25.423 25.4244			25.424 25.4244	25.652 25.6529			25.652 25.6529	25.422 25.4203			25.421 25.4203	25.422 25.4244			25.424 25.4244	25.655 25.6529			25.654 25.6529	25.423 25.4203			25.420 25.4203	S1C
S2D		50.700 50.7002			50.701 50.7002	50.234 50.2340			50.233 50.2340	50.702 50.7028			50.704 50.7028	50.700 50.7002			50.700 50.7002	50.234 50.2340			50.235 50.2340	50.703 50.7028			50.704 50.7028	S2D
S2B			50.277 50.2783	50.277 50.2783			50.365 50.3644	50.365 50.3644			50.279 50.2792	50.279 50.2791			50.278 50.2783	50.279 50.2783			50.365 50.3644	50.364 50.3644			50.279 50.2792	50.280 50.2791		S2B
			50.278 50.2783	50.278 50.2784			50.365 50.3644	50.365 50.3644			50.280 50.2791	50.276 50.2791			50.280 50.2783	50.281 50.2783			50.363 50.3644	50.367 50.3644			100.560 100.5585	50.279 50.2792		
S2C		32.680 32.6799			32.680 32.6799	32.612 32.6141			32.615 32.6141	32.673 32.6743			32.674 32.6743	32.679 32.6799			32.679 32.6799	32.616 32.6141			32.615 32.6141	32.677 32.6743			32.674 32.6743	S2C
S2AX		55.652 55.6527	55.652 55.6527	55.652 55.6527	55.654 55.6527	55.486 55.4879	55.487 55.4879	55.488 55.4879	55.487 55.4879	55.655 55.6548	55.653 55.6548	55.655 55.6548	55.656 55.6548	55.652 55.6527	55.653 55.6527	55.653 55.6527	55.653 55.6527	55.488 55.4879	55.487 55.4879	55.488 55.4879	55.489 55.4879	55.654 55.6548	55.655 55.6548	55.655 55.6548	55.654 55.6548	S2AX
S2AV		55.532 55.5312	55.532 55.5312	55.532 55.5312	55.530 55.5312	55.367 55.3665	55.364 55.3665	55.370 55.3665	55.367 55.3665	55.536 55.5333	55.534 55.5333	55.533 55.5333	55.532 55.5333	55.531 55.5312	55.531 55.5312	55.531 55.5312	55.531 55.5312	55.367 55.3665	55.368 55.3665	55.362 55.3665	55.367 55.3665	55.535 55.5333	55.532 55.5333	55.532 55.5333	55.532 55.5333	S2AV
S1A		61.051 61.0516	61.051 61.0516	61.052 61.0516	61.052 61.0516	60.964 60.9645	60.965 60.9645	60.965 60.9645	60.965 60.9645	61.055 61.0549	61.054 61.0549	61.054 61.0549	61.055 61.0549	61.051 61.0516	61.051 61.0516	61.051 61.0516	61.052 61.0516	60.964 60.9645	60.965 60.9645	60.965 60.9645	60.965 60.9645	61.054 61.0549	61.055 61.0549	61.055 61.0549	61.055 61.0549	S1A

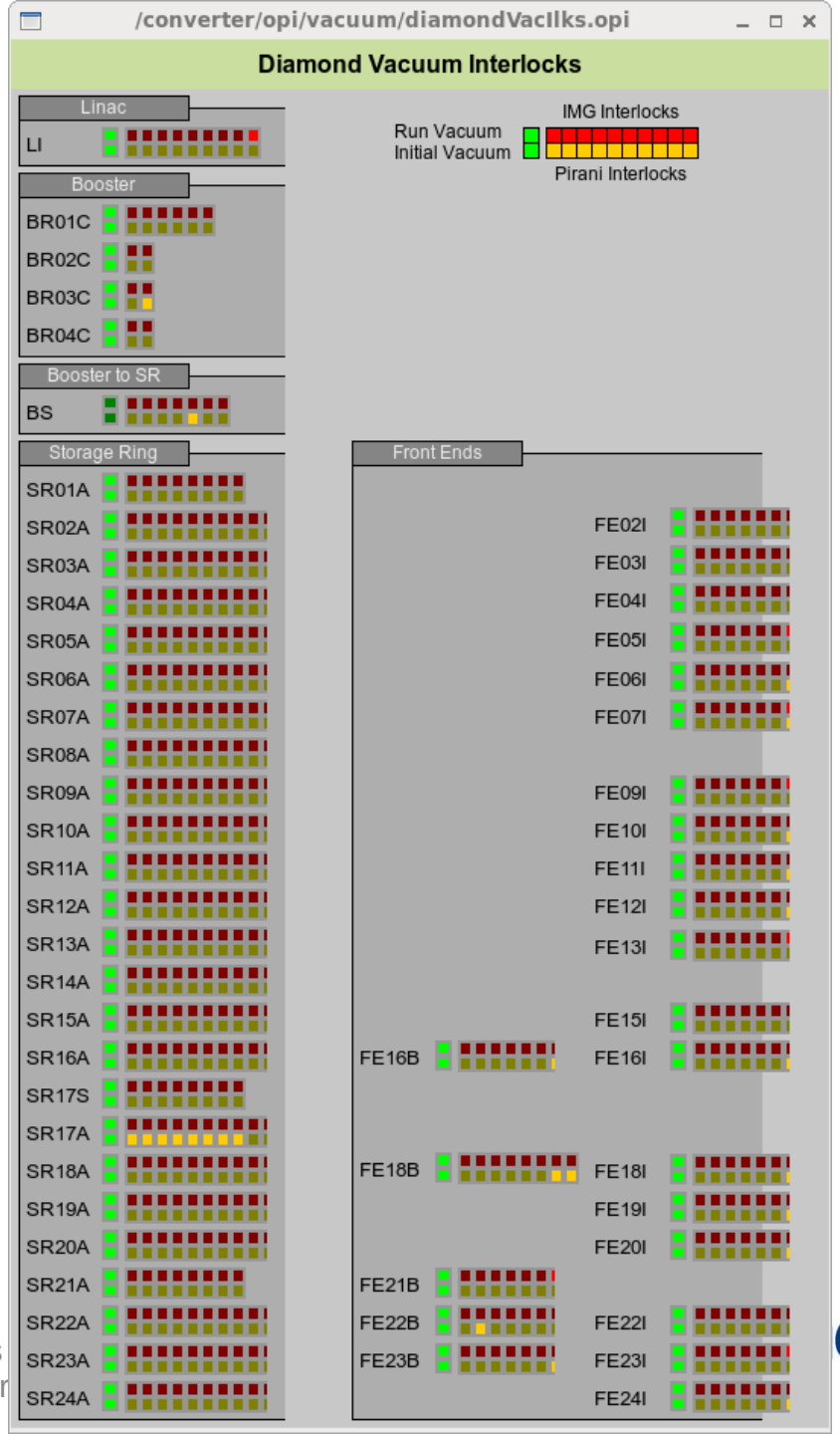

/converter/opi/psc/pscL3-SR03A-SCOR.opi
(SR03A-PC-) SR Slow Correctors
(Device)
(Current)
(Set)
(Actual)
(Power Status)
(Error State)
VSTR-01 0.0846 0.092 On NO
HSTR-01 -0.1913 -0.193 On NO
SQUAD-01 0.2835 0.284 On NO
VSTR-02 0.3431 0.330 On NO
HSTR-02 0.7906 0.779 On NO
SQUAD-02 0.0572 0.057 On NO
VSTR-03 0.1179 0.184 On NO
HSTR-03 1.0792 0.816 On NO
SQUAD-03 -0.0520 -0.662 On NO
VSTR-04 0.4258 0.330 On NO
HSTR-04 -1.3541 -1.156 On NO
SQUAD-04 -0.1092 -0.109 On NO
VSTR-05 -0.8268 -0.766 On NO
HSTR-05 1.8394 1.723 On NO
VSTR-06 -0.1196 -0.134 On NO
HSTR-06 -0.3607 -0.419 On NO
VSTR-07 0.2409 0.247 On NO
HSTR-07 -0.1163 -0.089 On NO
All On
All Off
Reset
EXIT

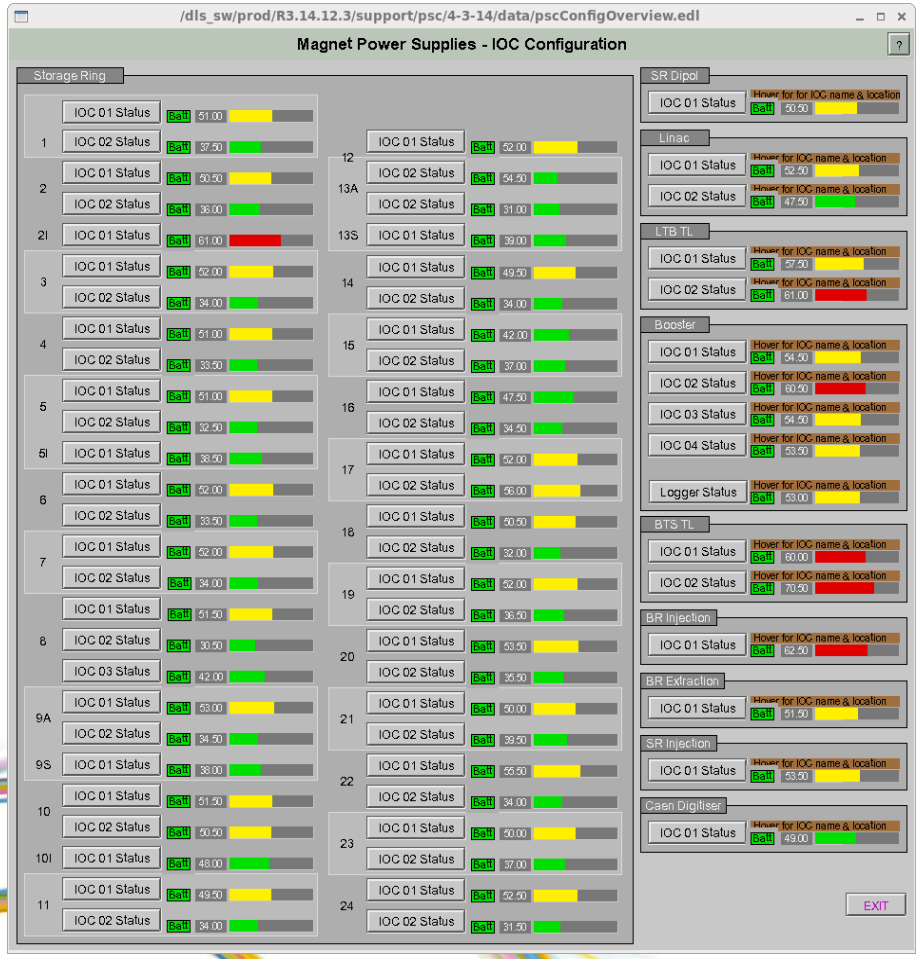

(SR03A-PC-) SR Slow Correctors
(SR03A-PC-) SR Slow Correctors
(Device)
(Current)
(Set)
(Actual)
(Power Status)
(Error State)
VSTR-01 0.0846 0.093 On NO
HSTR-01 -0.1913 -0.193 On NO
SQUAD-01 0.2836 0.284 On NO
VSTR-02 0.3431 0.329 On NO
HSTR-02 0.7906 0.778 On NO
SQUAD-02 0.0573 0.057 On NO
VSTR-03 0.1179 0.184 On NO
HSTR-03 1.0792 0.816 On NO
SQUAD-03 -0.0519 -0.652 On NO
VSTR-04 0.4258 0.330 On NO
HSTR-04 -1.3541 -1.157 On NO
SQUAD-04 -0.1091 -0.109 On NO
VSTR-05 -0.8268 -0.765 On NO
HSTR-05 1.8394 1.725 On NO
VSTR-06 -0.1196 -0.134 On NO
HSTR-06 -0.3607 -0.421 On NO
VSTR-07 0.2409 0.248 On NO
HSTR-07 -0.1163 -0.088 On NO
All On
All Off
Reset
EXIT

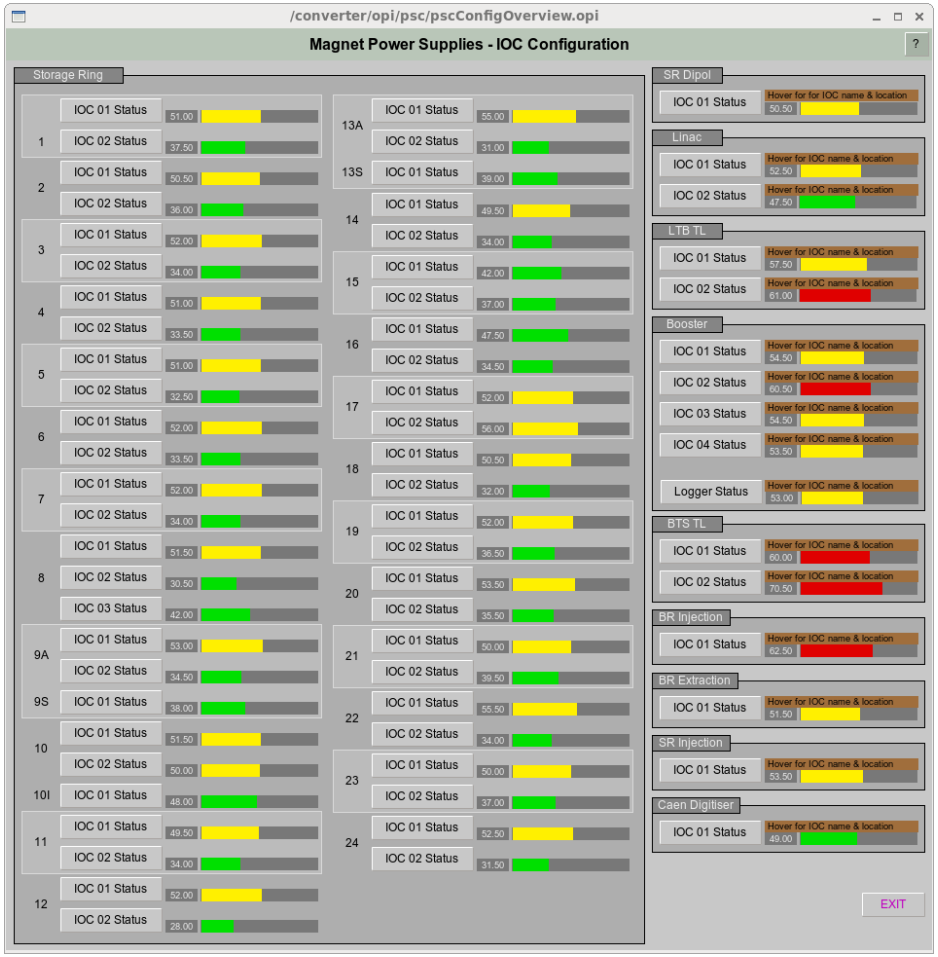

verter/opi/diag/sr/best.opi
Best of SR Diagnostics
2.52 nm rad
0.31 %
0.2100
0.3640
231.254 mA
10.88 h
2533 mAh
Y Axis
X Axis
Overview
PM
EXIT


Best of SR Diagnostics
Best of SR Diagnostics
2.51 nm rad
0.32 %
0.2100
0.3640
234.246 mA
10.90 h
2537 mAh
Bunches Fill
Orbit
Bunches TMBF
Overview
PM
EXIT


Diamond Vacuum Interlocks
Diamond Vacuum Interlocks
Linac
LI
Booster
BR01C
BR02C
BR03C
BR04C
Booster to SR
BS
Storage Ring
SR01A
SR02A
SR03A
SR04A
SR05A
SR06A
SR07A
SR08A
SR09A
SR10A
SR11A
SR12A
SR13A
SR14A
SR15A
SR16A
SR17S
SR17A
SR18A
SR19A
SR20A
SR21A
SR22A
SR23A
SR24A
IMG Interlocks
Run Vacuum
Initial Vacuum
Pirani Interlocks
Front Ends
FE02I
FE03I
FE04I
FE05I
FE06I
FE07I
FE08I
FE09I
FE10I
FE11I
FE12I
FE13I
FE14I
FE15I
FE16B
FE16I
FE18B
FE18I
FE19I
FE20I
FE21B
FE21I
FE22B
FE22I
FE23B
FE23I
FE24B
FE24I


/converter/opi/vacuum/diamondVacIlks.opi
Diamond Vacuum Interlocks
Linac
LI
Booster
BR01C
BR02C
BR03C
BR04C
Booster to SR
BS
Storage Ring
SR01A
SR02A
SR03A
SR04A
SR05A
SR06A
SR07A
SR08A
SR09A
SR10A
SR11A
SR12A
SR13A
SR14A
SR15A
SR16A
SR17S
SR17A
SR18A
SR19A
SR20A
SR21A
SR22A
SR23A
SR24A
IMG Interlocks
Run Vacuum
Initial Vacuum
Pirani Interlocks
Front Ends
FE02I
FE03I
FE04I
FE05I
FE06I
FE07I
FE09I
FE10I
FE11I
FE12I
FE13I
FE15I
FE16B
FE16I
FE18B
FE18I
FE19I
FE20I
FE21B
FE22B
FE22I
FE23B
FE23I
FE24I


/dls_sw/prod/R3.14.12.3/support/psc/4-3-14/data/pscConfigOverview.edl
Magnet Power Supplies - IOC Configuration
Storage Ring
SR Dipol
Linac
LTB TL
Booster
BTS TL
BR Injection
BR Extraction
SR Injection
Caen Digitiser
EXIT


/converter/opi/psc/pscConfigOverview.opi
Magnet Power Supplies - IOC Configuration
Storage Ring
SR Dipol
Linac
LTB TL
Booster
BTS TL
BR Injection
BR Extraction
SR Injection
Caen Digitiser
EXIT

CSS Performance

- CSS uses a lot of memory
  - EDM doesn't
- Some screens use a lot of CPU
  - We need to track them down
- Occasionally CSS crashes
  - Occasionally EDM crashes
- Screens load slightly slower than EDM (acceptable)
  - We may need to live with this
- Performance doesn't appear to decay over time
  - Stable over a weekend
- Memory scales with number of screens open
  - 2GB is enough for a lot of screens
  - If you run out of memory, CSS will be unrecoverable

In Summary EDM Mode

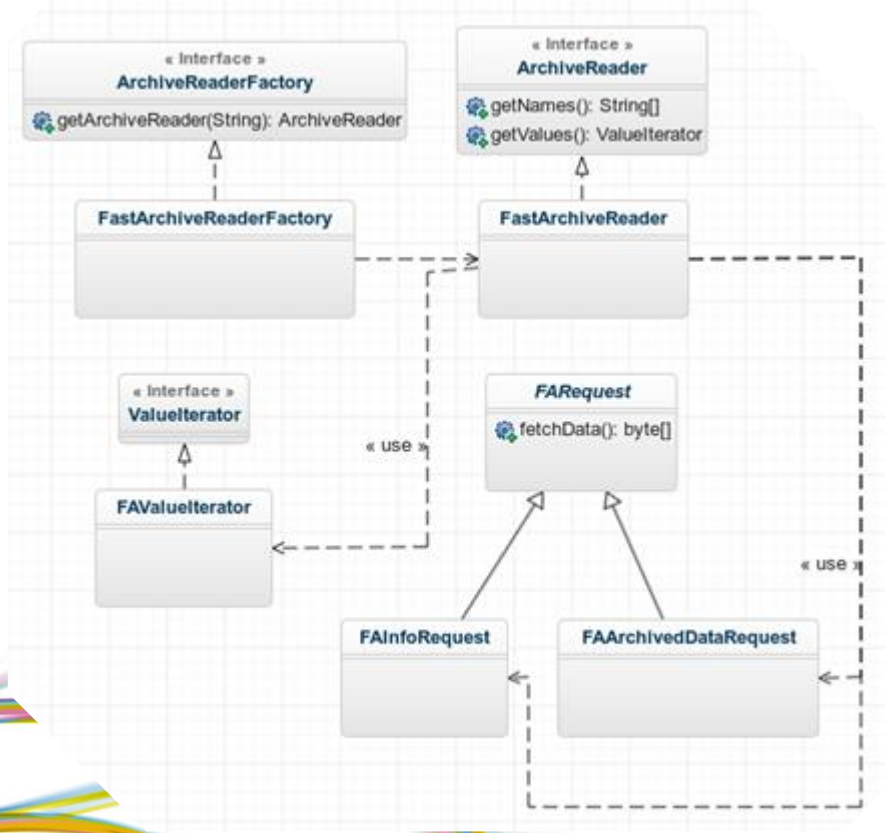
- Demonstrated that CSS can be used as a replacement for EDM
  - Direct panel translation
  - Compatible behaviour
  - Acceptable performance
- Still work to do on conversion, workspace management, performance, stability ….
- Next stage is a project to manage the conversion of all operational panels, testing, deployment

Fast Archiver Data Browser

CSS Interface to Fast Archiver

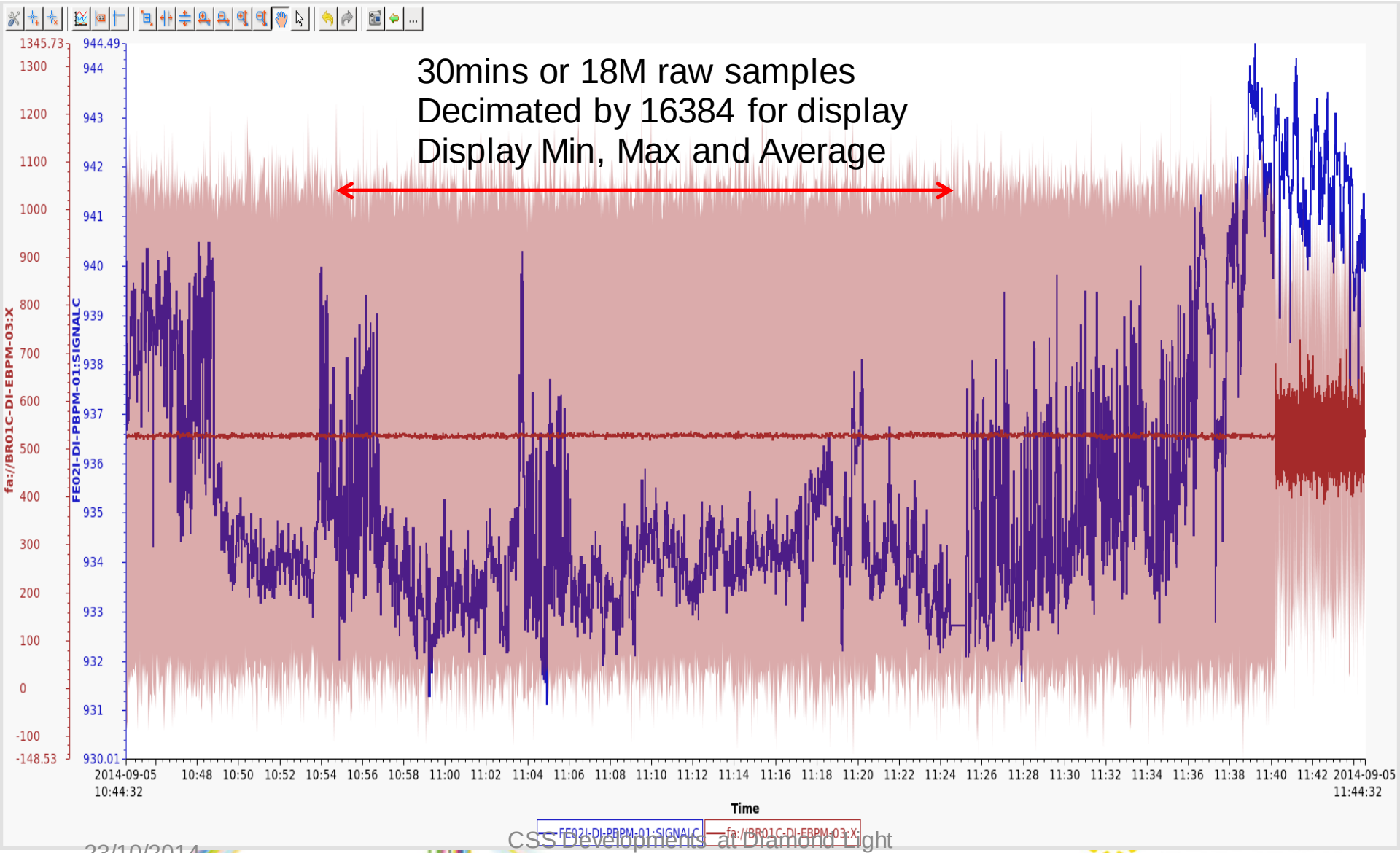
- Fast Archiver (FA)
  - Record 255 BPMs X and Y data at 10kHz ~21MB/sec
    - 16 days~30TB ring buffer
  - Calculate decimated (by 64 and 16384) versions of the data
    - Decimated sample rates: 150 Hz and 0.75 Hz
  - Integrate the Fast Archiver into CSS's Data Browser
    - Provide integration of FA data and CA PVs

Fast Archive Reader

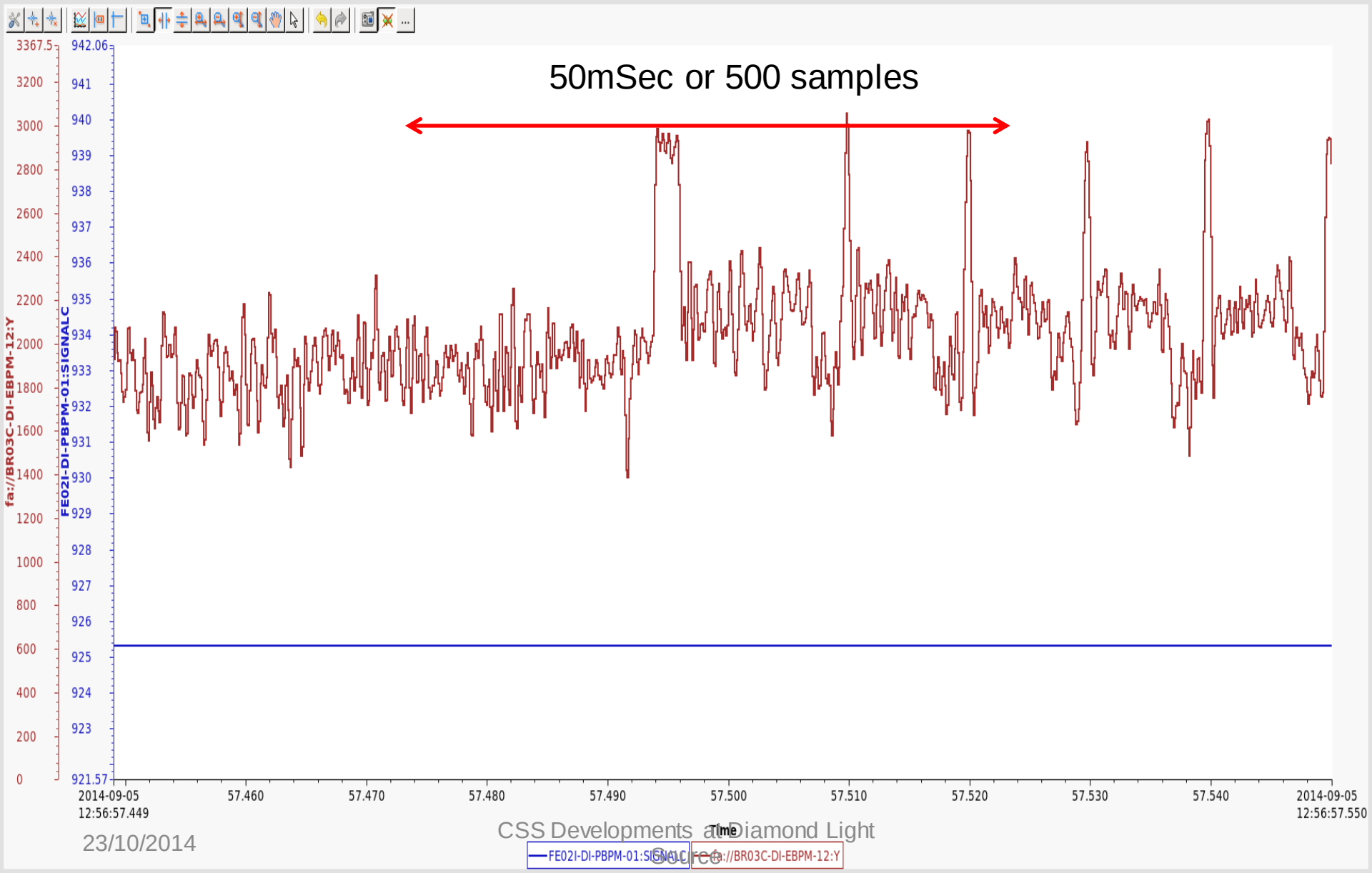


- FA data source provide Min/Max and Std dev of data
  - Added option to CSS for Std dev
- CSS assumption every item corresponds to a PV
  - FA Archiver items do not (at least, not directly)
  - Needed to simulate live PVs

Fast Archiver in DataBrowser

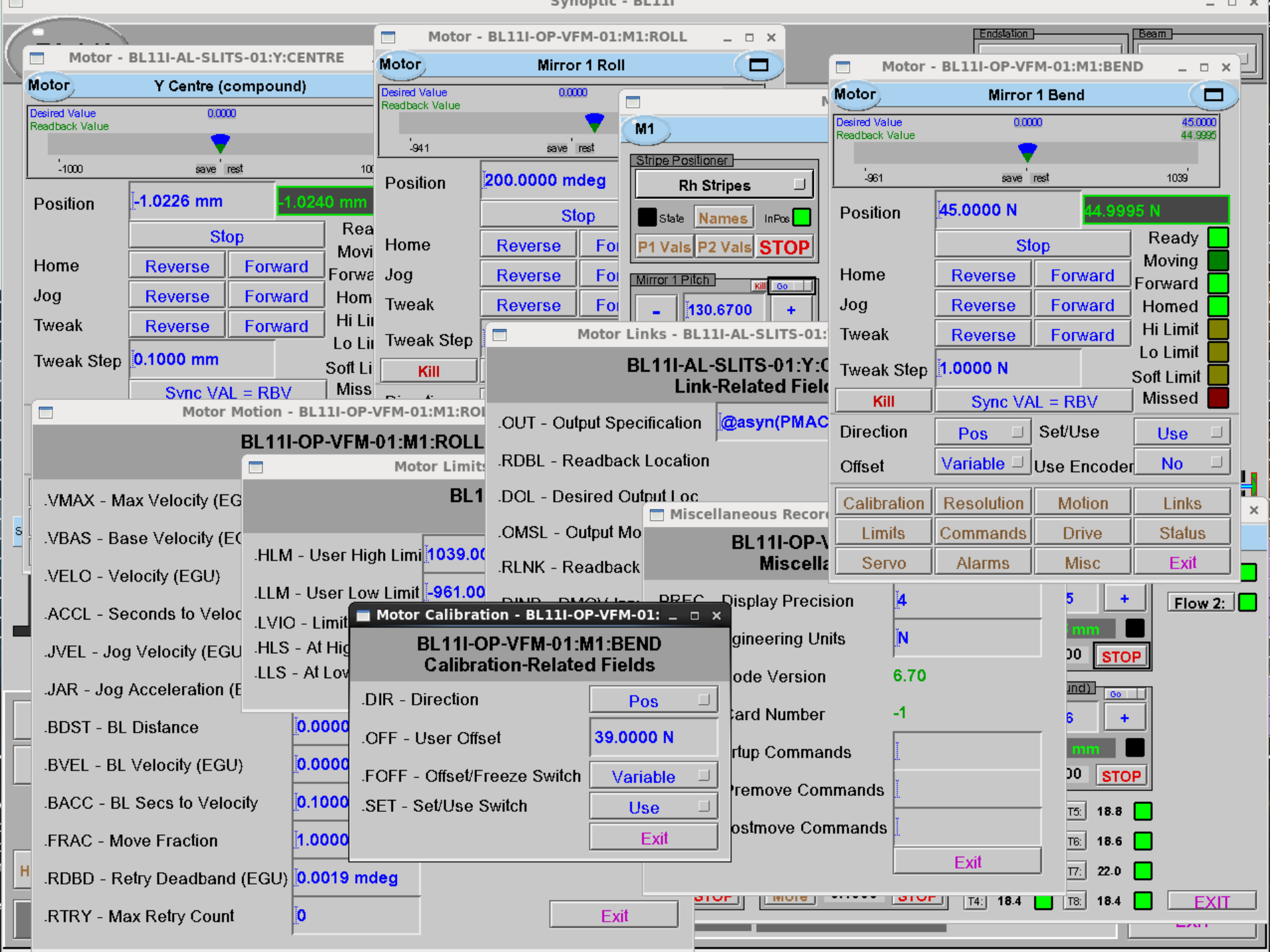


Zoomed In


50mSec or 500 samples
fa://BR03C-DI-EBPM-12:Y
FE02I-DI-PBPM-01:SIGNALC
3367.5
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
942.06
941
940
939
938
937
936
935
934
933
932
931
930
929
928
927
926
925
924
923
921.57
2014-09-05
12:56:57.449
57.460
57.470
57.480
57.490
57.500
57.510
57.520
57.530
57.540
2014-09-05
12:56:57.550
Time
FE02I-DI-PBPM-01:SIGNALC
fa://BR03C-DI-EBPM-12:Y

- The Fast Archiver Data Browser interface implemented by Friederike Jöhlinger
  - Summer intern at Diamond

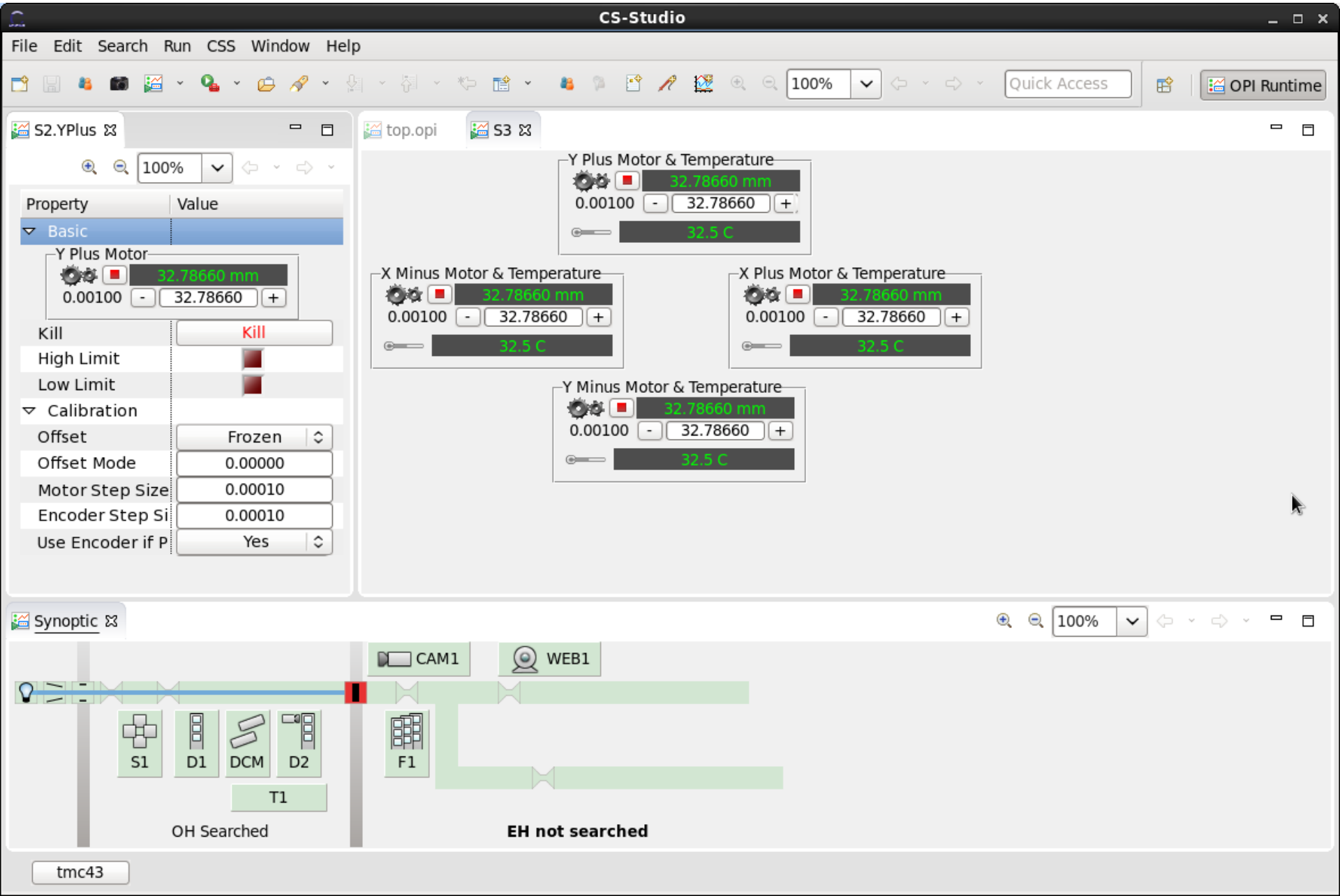
CSS for Photon Beamline Control


Motor - BL11I-AL-SLITS-01:Y:CENTRE
Motor
Y Centre (compound)
Desired Value
Readback Value
0.0000
-1000
save
rest
Position
-1.0226 mm
-1.0240 mm
Stop
Home
Reverse
Forward
Jog
Reverse
Forward
Tweak
Reverse
Forward
Tweak Step
0.1000 mm
Sync VAL = RBV
Motor - BL11I-OP-VFM-01:M1:ROLL
Motor
Mirror 1 Roll
Desired Value
Readback Value
0.0000
-941
save
rest
Position
200.0000 mdeg
Stop
Home
Reverse
Jog
Reverse
Tweak
Reverse
Tweak Step
Kill
M1
Stripe Positioner
Rh Stripes
State
Names
InPos
P1 Vals
P2 Vals
STOP
Mirror 1 Pitch
Kill
Go
130.6700
Motor - BL11I-OP-VFM-01:M1:BEND
Motor
Mirror 1 Bend
Desired Value
Readback Value
0.0000
45.0000
44.9995
-961
save
rest
1039
Position
45.0000 N
44.9995 N
Stop
Home
Reverse
Forward
Jog
Reverse
Forward
Tweak
Reverse
Forward
Tweak Step
1.0000 N
Kill
Sync VAL = RBV
Direction
Pos
Set/Use
Use
Offset
Variable
Use Encoder
No
Ready
Moving
Forward
Homed
Hi Limit
Lo Limit
Soft Limit
Missed
Calibration
Resolution
Motion
Links
Limits
Commands
Drive
Status
Servo
Alarms
Misc
Exit
Motor Links - BL11I-AL-SLITS-01:
BL11I-AL-SLITS-01:Y:C
Link-Related Field
.OUT - Output Specification
@asyn(PMAC
.RDBL - Readback Location
.DOL - Desired Output Loc
.OMSL - Output Mo
.RLNK - Readback
Motor Motion - BL11I-OP-VFM-01:M1:ROL
BL11I-OP-VFM-01:M1:ROLL
.VMAX - Max Velocity (EG
.VBAS - Base Velocity (EC
.VELO - Velocity (EGU)
.ACCL - Seconds to Veloc
.JVEL - Jog Velocity (EGU
.JAR - Jog Acceleration (E
.BDST - BL Distance
.BVEL - BL Velocity (EGU)
.BACC - BL Secs to Velocity
.FRAC - Move Fraction
.RDBD - Retry Deadband (EGU)
0.0019 mdeg
.RTRY - Max Retry Count
0
Motor Limits
BL1
.HLM - User High Limi
1039.00
.LLM - User Low Limit
-961.00
.LVIO - Limit
.HLS - At Hig
.LLS - At Low
Miscellaneous Recor
BL11I-OP-V
Miscella
PREC - Display Precision
4
gineering Units
N
ode Version
6.70
ard Number
-1
rtup Commands
remove Commands
ostmove Commands
Exit
Motor Calibration - BL11I-OP-VFM-01:
BL11I-OP-VFM-01:M1:BEND
Calibration-Related Fields
.DIR - Direction
Pos
.OFF - User Offset
39.0000 N
.FOFF - Offset/Freeze Switch
Variable
.SET - Set/Use Switch
Use
Exit
Endstation
Beam
Flow 2:
STOP
EXIT
T4:
18.4
T5:
18.8
T6:
18.6
T7:
22.0
T8:
18.4

Beamlines what doesn't work?

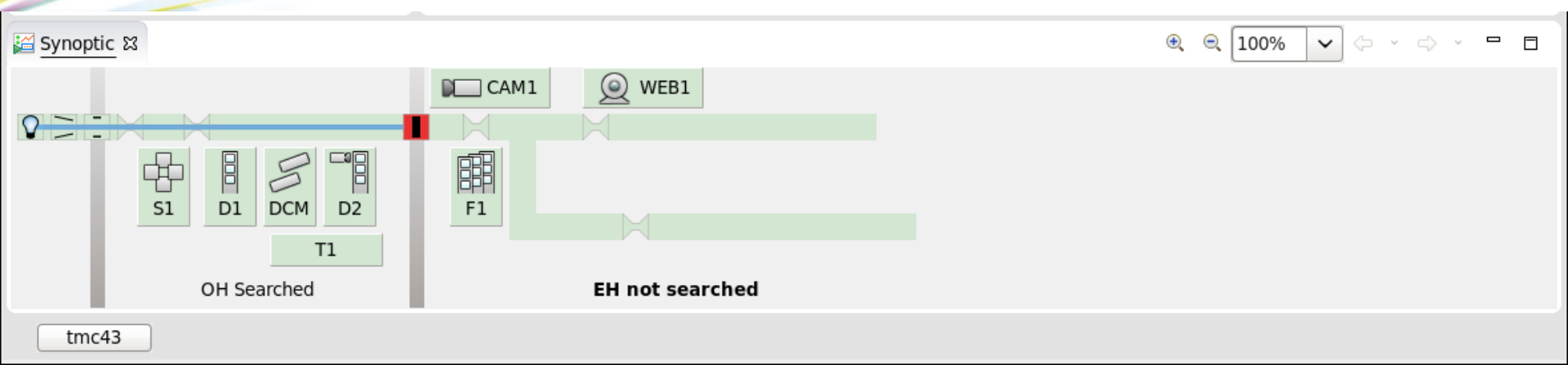
- Proliferation of windows obscures synoptic
- Autogenerated screens useful, but are too inflexible
- Client side fonts don't work well over NX and will probably stop working in RHEL8
- Can't easily share screens between EPICS and GDA
- Very little integration between tools, e.g. Striptool and archive viewer

What might Beamline CS-Studio look like?



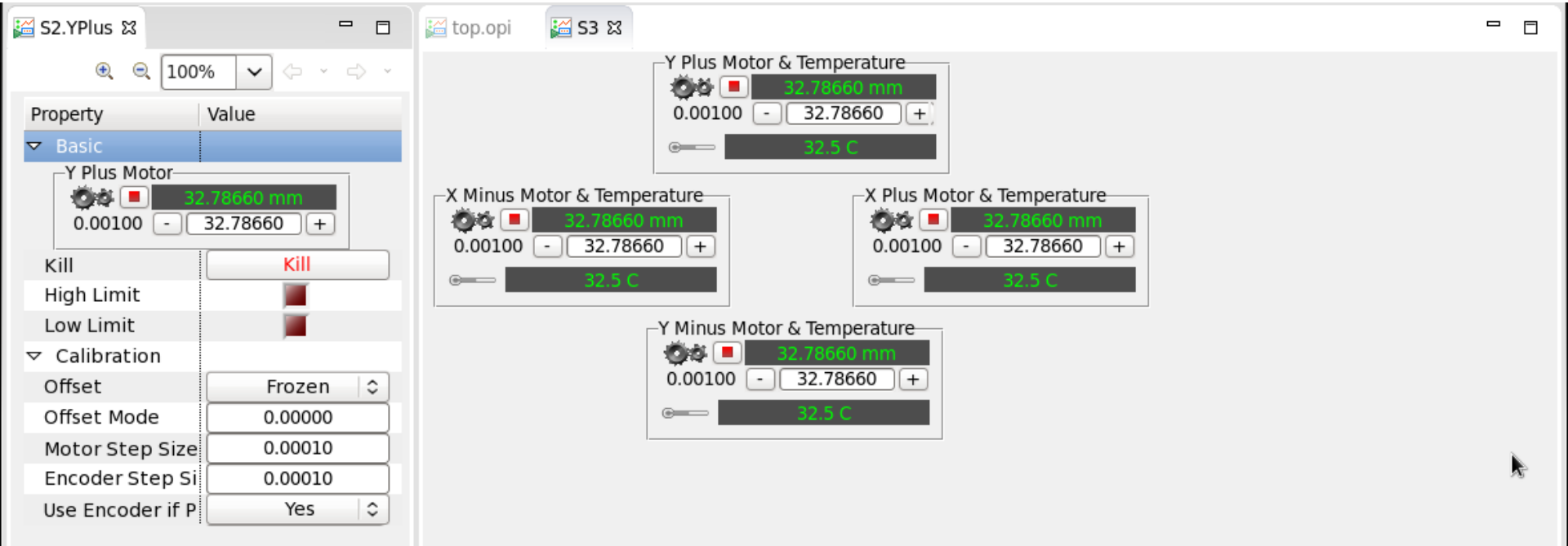
How does it solve our problems?

- Proliferation of windows obscures synoptic
  - Shrunk synoptic bar at the bottom of the screen
  - Each icon shows alarm status
  - Action to acknowledge alarm status
  - Scripting to make beam stop at blocking component and allow right-left flipping



How does it solve our problems?

- Proliferation of windows obscures synoptic
  - New “Detail widget” that allows searching/filtering of property names
  - Tabbed areas for component views and detail widgets



Summary

- Diamond is looking at using and extending CSS
- Looks promising that all future UIs will be CSS based
- We will have flavours of CSS
  - True Eclipse CSS
  - EDM like CSS

Thank You