

# New SC Pattern Selection Display

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# Agenda

- Motivation For New Display
- New Display Features
- Demo
- Road Map

# Motivation for Overhauling the Display

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- Multiple Destination Patterns
  - Can do this with current system, but is not great
  - Would need to work on the pattern programmer for programmatically assigning destinations anyways
    - Makes large parts of the pattern programmer unneeded
  - New display can handle mixed fixed rate and AC timing sources
- Fix Issues with the current display
  - Display dies each time the mode changes
  - Ambiguous pattern selection
  - Ect.

# New Global Display

**LCLS SC EVENT** **TIMING GLOBAL MAIN** 03/07/2024 10:18:18 DEVELOPMENT

Running Pattern: **SC\_DIAGO\_STD\_AC\_30\_Hz\_off\_3\_SC\_BSYD\_STD\_FR\_10\_Hz\_SC\_SXR\_EXP\_FR\_510\_Hz\_off\_7**  
Mode: **SC18** TPG Clock: **2024/03/07 10:18:18.942973949**

Destination:	LASER	SC_DIAGO	SC_BSYD	SC_HXR	SC_SXR
Actual Rate (Hz):	0 Hz	0 Hz	10 Hz	0 Hz	500 Hz
MPS Trip Recovery:	1% MAP	BC10Hz	Tuning	Beam Off	BC120Hz
Requested Rate (Hz):	510 Hz	0 Hz	510 Hz	0 Hz	500 Hz
Loaded Rate (Hz):	10 Hz off 0+510 Hz off 7	STD AC 30 Hz off 3	10 Hz off 0+510 Hz off 7	STD FR 0 Hz	EXP FR 510 Hz off 7
MPS Beam Class:	Unlimited	Unlimited	Unlimited	Beam Off	Unlimited
TPG Beam Class:	Tuning	Diagnostic	Tuning	Beam Off	Tuning
Charge Set Point:	50 pC				
BCS Permits:	SOC:SYS0:BC01:OutPermit2_A SOC:SYS0:BC01:OutPermit2_B				

evnt/global\_main  
DEVELOPMENT 03/07/2024 10:18:18

- Only recovery controls on the main display
- Focus on readbacks and navigation
- Timing based map to come

# New Pattern Selection Display

The screenshot shows the 'SC Timing Controls - PyDM' interface. The main window is titled 'SC Timing Pattern Selection'. At the top, it displays 'LCLS SC Event' and the date '03/07/2024 10:08:26'. The 'SC Timing Status' section shows the running pattern: 'SC\_DIAGO\_STD\_AC\_30\_Hz\_off\_3\_SC\_BSYD\_STD\_FR\_10\_Hz\_SC\_SXR\_EXP\_FR\_510\_Hz\_off\_7' and the mode: 'SC18'. Below this, the destination settings are shown for LASER, SC\_DIAGO, SC\_BSYD, SC\_HXR, and SC\_SXR. The 'Actual Rate (Hz)' is displayed in green for each destination: LASER (0 Hz), SC\_DIAGO (0 Hz), SC\_BSYD (10 Hz), SC\_HXR (0 Hz), and SC\_SXR (500 Hz). The 'Requested Rate (Hz)' and 'Loaded Rate (Hz)' are also shown for each destination. The 'MPS Beam Class' is 'Unlimited' for LASER, SC\_DIAGO, and SC\_SXR, and 'Beam Off' for SC\_HXR. The 'Slow Beam Readback' is 'Tuning' for LASER, SC\_BSYD, and SC\_SXR, and 'Beam Off' for SC\_DIAGO and SC\_HXR. The 'Charge Set Point' is 50 pC. The 'Search Parameters' section shows 'Pattern Type' set to 'Continuous' and 'Destination' set to 'LASER'. The 'Patterns' table is shown below, with columns for DIAGO (Hz), BSYD (Hz), HXR (Hz), and SXR (Hz). The table contains several rows of data, with the last row highlighted in blue: 30 AC, 10 FR, 0, 510 FR. The 'Controls' section at the bottom shows the running pattern, log, bunch charge set point (50 pC), and buttons for 'Machine Mode', 'Patterns', 'View Pattern', and 'Apply Pattern'.

DIAGO (Hz)	BSYD (Hz)	HXR (Hz)	SXR (Hz)
0	0	0	51 FR
0	0	0	510 FR
10 AC	10 FR	0	204 FR
0	0	0	204 FR
30 AC	102 FR	0	1000 FR
0	0	0	33000 FR
0	0	0	5100 FR
0	0	0	23000 FR
0	0	0	10000 FR
30 AC	10 FR	0	204 FR
0	0	0	1 FR
30 AC	10 FR	0	510 FR
0	0	0	1000 FR

## Main differences and Philosophy

- Machine status is now at the top of the page to make the current machine status more obvious to users
- Continue to search by frequency. However, patterns with matched frequency are returned in the patterns window.
- Can search by a destination's timing source, rather than a global timing source (AC vs Fixed Rate)

# Implemented Features – Status



SC Timing Status  
 Running Pattern: SC\_DIAGO\_STD\_AC\_30\_Hz\_off\_3\_SC\_BSYD\_STD\_FR\_10\_Hz\_SC\_SXR\_EXP\_FR\_510\_Hz\_off\_7  
 Mode: SC18 TPG Clock: 2024/03/07 10:16:55.628054788

Destination:	LASER	SC_DIAGO	SC_BSYD	SC_HXR	SC_SXR
Actual Rate (Hz):	0 Hz	0 Hz	10 Hz	0 Hz	500 Hz
MPS Trip Recovery:	1% MAP	BC10Hz	Tuning	Beam Off	BC120Hz
Requested Rate (Hz):	510 Hz	0 Hz	510 Hz	0 Hz	500 Hz
Loaded Rate (Hz):	10 Hz off 0+510 Hz off 7	STD AC 30 Hz off 3	10 Hz off 0+510 Hz off 7	STD FR 0 Hz	EXP FR 510 Hz off 7
MPS Beam Class:	Unlimited	Unlimited	Unlimited	Beam Off	Unlimited
TPG Beam Class:	Tuning	Diagnostic	Tuning	Beam Off	Tuning

Charge Set Point: 50 pC  
 BCS Permits: SOC:SYS0:BC01:OutPermit2\_A SOC:SYS0:BC01:OutPermit2\_B

## SC Timing Status Box

Reordered statuses so they are adjacent to related statuses

Renamed statuses with more meaningful names

Changed the styling on select statuses to make the display more readable

Added Beam Class Defs related display for ease of use

Emphasized the TPG rate recover after MPS trip

**SC TIMING STATUS**

Destination:	LASER	SC_DIAGO	SC_BSYD	SC_HXR	SC_SXR	SC_DASEL
Request Rate:	100	10	100	0	1000	0
Actual Rate:	0	10	100	0	1000	0
MPS Beam Class RBV:	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited	Beam Off
Timing Beam Class set PV:	1% MAP	Unlimited	1% MAP	Tuning	1% MAP	Beam Off
Timing Beam Class RBV:	Diagnostic	BC10Hz	1% MAP	Beam Off	1% MAP	Beam Off
Loaded Pattern:	STD FR 100 Hz	EXP FR 10 Hz off 3	STD FR 100 Hz	STD FR 0 Hz	EXP FR 1.0 kHz off 7	STD FR 0 Hz
Charge Set Point RBV:	50	pC				
BCS Permits:	ca://SOC:SYS0:BC01:OutPermit2_A ca://SOC:SYS0:BC01:OutPermit2_B					

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# Pause For Demo

# Road Map– Pattern View

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1. Add a window that has more data for the selected pattern
  1. UUID
  2. More parameters for burst patterns
  3. Tag system
2. Add more search features as needed
3. Add more data columns for each pattern as needed
4. Add 'Beam Stop' Button
5. Back end development



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Thank You!  
Questions?

# Thankyou/ questions \*\*\* change style

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