

LCLS Magnet PV Attributes

LCLS Magnet Device Name Attributes

- [LCLS Magnet Device Names](#)
- [Magnet Application Programming Interface\(API\)](#)
- [Magnet Control Functions available by Device](#)
- [Information by Location](#)
- [Naming Conventions](#)
- [Matlab for LCLS Applications](#)
- [EPICS](#)
- [How-to Modify the Magnet Databases](#)

EPICS IOC Databases

- [Common](#)
- [Injector](#)
- [Linac Sector 21](#)
- [Linac Sector 22](#)
- [Linac Sector 23](#)
- [Linac Sector 24](#)
- [Linac Sector 25](#)
- [Linac Sector 26](#)
- [Linac Sector 27](#)
- [Linac Sector 28](#)
- [Linac Sector 29](#)
- [Linac Sector 30](#)
- [Beam Switch Yard \(BSY\)](#)
- [Linac-To-Undulator \(LTU\)](#)
- [Undulator](#)
- [E-Dump](#)

SLC Databases

- [Injector Databases](#)
 - [mgntim20](#)
- [Linac Sector 21](#)
 - [mgntlm21](#)
 - [lgpsli21](#)
 - [quadli21](#)
 - [xcorli21](#)
 - [ycorli21](#)
- [Linac Sector 24](#)
 - [mgntlm24](#)
 - [lgpsli24](#)
 - [quadli24](#)
 - [xcorli24](#)
 - [ycorli24](#)
- [Linac Sector 25](#)
 - [mgntlm25](#)
 - [lgpsli25](#)
 - [quadli25](#)
 - [xcorli25](#)
 - [ycorli25](#)

Table 1.0 provides the format of the EPICS PV name and the SLC database name. Table 1.1 lists the Magnet Primaries used for LCLS. Table 1.2 is a subset of most commonly used EPICS PV name attributes. For a complete lists see Table 1.3 below.

Magnet Device Name Examples	
Table 1.0	
EPICS Device	SLC Device
<Primary>.<Area>.<Position>.<Attribute>.	<Micro>.<Primary>.<Unit>.<Secondary>

Magnet Primaries	
Table 1.1	
Primary Name	Magnet Device Type
BEND	Bending (Dipole Magnet). Used for strings and individual magnet
SOLN	Solenoid

QUAD	Quadrupole
XCOR	Horizontal Corrector
YCOR	Vertical Corrector
BTRM	Trim Coil for a Bending Magnet
QTRM	Trim Coil for a Quadrupole Magnet
LGPS	Large Power Supply

Magnet Device Examples			
Table 1.2			
EPICS PV	MAD NAME	Purpose	Range
SOLN:IN20:121:BDES	SOL1	Magnet desired B-field	BDES.LOPR-BDES.HOPR
BEND:IN20:231:CTRL	BXG	Magnet Control Function	see Table 1.4
BTRM:IN20:451:BCTRL	BXH2 Trim	Set B-field and Perturb; updates BDES	BCTRL.LOPR-BCTRL.HOPR
QUAD:IN20:425:BACT	QE01	Actual B-field; actual value of B from ps	BACT.LOPR-BACT.HOPR

Table 1.3 is a subset of EPICS PV Attributes for a single device. For a complete list of attributes and a detailed description please read the [Magnet Application Programming Interface](#).

Note: as of Sep 21, 2006 the Magnet Controls EPICS PV Attributes list is still under development. So check for updates.

EPICS PV Attributes		
Table 1.3		
EPICS PV Attribute	SLC Secondary	Description
BEFF		Effective B-field value (for mains w/trim=main+trim B-field)
BDES	BDES	Desired B-field. IDES calculated from BDES but current is not set until TRIM or PERTURB is selected.
BCTRL	N/A	Set B field value, then PERTURB, bypass sequence. Similar to using a knob in SLC
BACT	BACT	Actual B-field (calculated from the current).
BMON	BMON	Second Actual B-field. From an EPSC 2nd Analog Signal. Not available from an MCOR
BMAX	BMAX	Maximum Magnetic Strength
BMIN	BMIN	Minimum Magnetic Strength
BDES.DRVL	N/A	B-field maximum drive (operating) limit. Entries above this limit will be clipped
BDES.DRVH	N/A	B-field minimum drive (operating) limit. Entries below this limit will be clipped
IDES	BDES	Desired B-field. IDES calculated from BDES but current is not set until TRIM or PERTURB is selected.
ICTRL	N/A	Set B field value, then PERTURB, bypass sequence. Similar to using a knob in SLC
IACT	IVA	Actual B-field (calculated from the current).
IMON	IVA2	Second Actual B-field. From an EPSC 2nd Analog Signal. Not available from an MCOR
IMAX	IMMO(2)	Maximum Operating B-field permitted
IMIN	IMMO(1)	Minimum Operating B-field.
IDES.DRVL	N/A	B-field maximum drive (operating) limit. Entries above this limit will be clipped
IDES.DRVH	N/A	B-field minimum drive (operating) limit. Entries below this limit will be clipped
TRIMBTOL	TOLS(1)	Absolute TRIM Tolerance (Warning delta)
TRIMBTOLR	TOLS(2)	Relative TRIM Tolerance (Warning fraction)
CHCKTOL	TOLS(3)	Absolute Check Tolerance (Alarm Delta)
CHCKTOLR	TOLS(4)	Relative Check Tolerance (Alarm Fraction)
BDELTAS.F	TOLF	Monitor Fraction

CALBTOD	CTIM	Last successful calibration time
TRIMTOD	TTIM	Last successful TRIM time
STDZTOD	KTIM	Last successful standardize time
STDZLOSTTOD	ZTIM	Last time standardize was lost

CTRL	N/A	Magnet Control function, see table 1.5
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HSTACTRL	N/A	Translate SLC HSTA to individual EPICS records (no longer used)
HSTA	HSTA	Hardware Status bitmask
CALBDISABLE	N/A	Permit calibrate control function, 1=disable, 0=enable
FBCK	N/A	Feedback enabled
OUTOFSERVICE	N/A	B-field is Out-of-Tolernace.
STDZDIRECTION	N/A	Standardize direction, 0=Up, 1=down
STDZENABLE	N/A	Permit Standardize control function, 1=enable, 0=disable
TRIMDISABLE	N/A	Permit TRIM control function, 1=disable, 0=enable

UNAVAIL	N/A	1=unavailable; 0=available
ONOFFCTRL	N/A	1=on/off control; 0=no on/off control
NOANLGCTRL	N/A	1=no analog control ps; 0=analog control ps
OPTURNEDOFF	N/A	1=ps turned off by operator; 0=ps not turned off by operator
TRIPPED	N/A	1=ps tripped; 0=ps not tripped

IDES	IDES	Desired Control Value (amperes)
IACT	IACT	Control Value from Hardware (Primary)
IACTPREVOK	IPRV	Last Good Readback
IACT.ADEL	ATOL(1)	Standardization Delta
IDELTAS.C	ATOL(2)	Standardization Fraction
ICTRL.DRVL	IMMO(1)	Minimum Operating Current
ICTRL.DRVH	IMMO(2)	Maximum Operating Current
IDAC	DACV	DAC Readback
IMON	IMON	Control Value from Hardware (Secondary)
IRIPL	RIPL	Ripple Current Readback

POLYCOEF.A to L	IVBU/D	Polynomial Coefficients
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STAT	STAT	Status bitmask
CALBOK	STAT bit	Calibrate Status, 1=Calibrated, 0=Not Calibrated
STDZOK	STAT bit	Standardize Status, 1=Standardized,0=Not Standardize
TRIMOK		TRIM Status, 1=TRIMmed, 0=Not TRIMmed

CTRLSTATE	MBBO	Status of Magnet Control Function
BUSY	BI	Busy State of Magnet Control Function, 1=Busy, 0=Not Busy

STDZIMIN	IMMS(1)	Minmum Standardize Current
STDZIMAX	IMMS(2)	Maximum Standardize Current
STDZIFINAL	IMMS(3)	Final Standardize Current
STDZRAMPRATE	RAMP(2)	Standardizazion di/dt
STDZTOD.TIME	KTOD	Last Successful standardization time
STDZLOSTTOD	ZTIM	Lst time standardization lost

TRIMTOD	N/A	Last successfule TRIM time
TRIMTRYCNT	ITRY	Number of attempts required for a TRIM

Machine Areas with Magnets				
Table 1.4				
Production				
Area	EPICS IOC	SLC Aware Micro	SLC Micro	SLC DGRP
Injector	IOC-IN20-MG01	IM20		
Linac Sector 21	IOC-LI21-MG01	LM21	LI21	
Linac Sector 22	IOC-LI22-MG01	LM22	LI22	
Linac Sector 23	IOC-LI23-MG01	LM23	LI23	
Linac Sector 24	IOC-LI24-MG01	LM24	LI24	
Linac Sector 25	SIOC-LI25-MG01		LI25	
Linac Sector 26	SIOC-LI26-MG01		LI26	
Linac Sector 27	SIOC-LI27-MG01		LI27	
Linac Sector 28	SIOC-LI28-MG01		LI28	
Linac Sector 29	SIOC-LI29-MG01		LI29	
Linac Sector 30	SIOC-LI30MG01		LI30	
Beam Switch Yard (B136)	IOC-BSY0-MG01		CA11	
Linac-To-Undultor (B005)	IOC-LTU0-MG01			
Linac-To-Undulator(B911)	IOC-LTU1-MG01			
Linac-To-Undulator(B912)	IOC-LTU1-MG02			
Undulator (B913)	IOC-UND1-MG01			
E-DUMP &Undulator (B921)	IOC-DMP1-MG01			
Development				
Test 1	XL01	XX01		
Test 2	IOC-B15-MG01	XX02		
Test 3	LCLSDEV-17	XX03		

*Magnet Control Functions *	
Table 1.5	
PV String Value	PV Numeric Value
READY	0
PERTURB_SLIDE	1
TRIM	2
CALIBRATE	3
STANDARDIZE	4
DEGAUSS	5

PERTURB	6
DAC_ZERO	7
RESET	8
TURN_ON	9
TURN_OFF	10
SAVE_BDES	11
LOAD_BDES	12
UNDO_BDES	13
FEEDBACK	14
BCON_TO_BDES	15