

Naming Convention Original

LCLS EPICS Record Naming Convention (First Proposal - No Longer in Effect)

EPICS Record Naming Convention

This page describes the EPICS database record naming convention for all LCLS records.

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Description

In order to limit the number of alias names required, naming is used that allows LCLS PVs to be used by [SLC control system CA clients](#) and also provides for simple translation from SLC control system names to PV names by the SLC-aware IOC. These names may also fit in more nicely with existing SLAC documentation tools.

The [LCLS Linac Current Beamline Design Optics Files|<http://www-ssrl.slac.stanford.edu/lcls/linac/optics>] is a good reference when creating device names. The current primary, location, units for optics elements in the injector and sector 21 is [here](#). The ["How to Add an EPICS Process Variable" |http://www.slac.stanford.edu/grp/cd/soft/share/slaonly/how-to/add_pv.html] for ESD IOC applications is a good reference. A similar page for LCLS IOC applications needs to be written.

The SLC-aware IOC naming conventions are VERY strict, stricter than those for the SLC CA clients, and so drive the requirements:

PRIM:LOCA:UNIT:ATTRIBUTE

1. All record names consist of exactly 4 parts separated by colons.
2. All upper-case.
3. First part (PRIM) indicates device type and is 1 to 4 characters. For records on SLC-aware IOCs that are used by the SLC control system, PRIM must be one of the SLC control system primaries.
4. Second part (LOCA) is location and must be 4 characters, no more, no less. The first two characters must be non-numeric and the last two characters must be numeric.
5. Third part (UNIT) is the device "unit" integer number between 1 and 9999 (with no leading zeros) and is unique for the specified PRIM and LOCA. It's like a simple serial number. For "one-of" items, use 1. When 2 values are needed for a unit number (ie, device 3 on girder 2), use a zero to separate (ie, 203). For devices on girders, the first part of the unit number is the girder number for the sector and the second part is the count of that device on the girder. The preference is for unit numbers no greater than 3 characters.
6. Fourth part (ATTRIBUTE) is the device attribute and is 1 to 12 characters. In the SLC control system, attributes are known as secondaries.

IOC Micro Name List

Micro names for the existing SLC control system are listed in [microname.dat](#) file. All SLC-aware IOCs must be assigned a unique micro name which is then added to this file using the ESD ["Adding a Micro to the SLC Control System"|[http://mccdev.slac.stanford.edu/doc\\$database/how_to_add_micro.mem](http://mccdev.slac.stanford.edu/doc$database/how_to_add_micro.mem)] procedure. A micro name is used as the location (LOCA) name in a record if the record is IOC-specific. Micro names for IOCs are listed in the [LCLS production IOCs](#) and [LCLS development IOCs](#).

Record Name Examples

- **XCOR:LI21:302:BACT**

X Corrector, LINAC sector 21, IOC micro LM21, corrector 2 on girder 3 in sector 21, readback of magnetic field (ACT stands for actual)

- **BPMS:LI21:201:S**

BPM, LINAC sector 21, IOC micro LB21, BPM 1 on girder 2 in sector 21, position in the LINAC

- **DT:XE00:1:V**

Diagnostics tank, X-ray beamline front end enclosure, unit 1, HVPS voltage readback

- **VVPG:ZN01:99:STATE**

Vacuum pneumatic gate valve, X-ray beamline near experimental hall hutch 1, unit 99, open/closed/transition/invalid state

- **SLC:LC28:1:EXRESTART**

Restart the SLC-aware interface via the exec task on BPM IOC micro LC28, LINAC sector 28

- add more examples here....

Primary (PRIM) List

Some of the following list of primaries are extracted from the SLC control system [primary.dbs|http://www-mcc.slac.stanford.edu/ref_dbfile/primary.dbs] file for devices that are SLC-Aware.

1. Controlled Devices (SLC-Aware):
 - BEND - BEND (LARGE DIPOLE) MAGNET
 - BTRM - BEND MAGNET TRIM WINDINGS
 - SOLN - SOLENOID MAGNET
 - QTRM - QUAD MAGNET TRIM WINDINGS
 - QUAD - QUADRUPOLE MAGNET
 - XCOR - HORIZONTAL STEERING CORRECTOR MAGNET
 - YCOR - VERTICAL STEERING CORRECTOR MAGNET
 - KICK - KICKER MAGNET
 - LGPS - LARGE POWER SUPPLY
 - SMPS - SMALL POWER SUPPLY
2. Controlled Devices (non-SLC-Aware):
 - WIRE - MOVING WIRE SCANNER
 - CAMR - Camera
 - COLL - COLLIMATOR
 - KICK - KICKER MAGNET
 - MIRR - Alignment Mirror
3. Gated ADC Devices (SLC-Aware):
 - BPMS - BEAM POSITION MONITOR (Attributes are X,Y,TMIT)
 - TORO - TOROID (Attribute is TMIT)
 - BLEN - Bunch Length Monitor (Attribute is WIDTH?)
4. Gated ADC Devices (non-SLC-Aware):
 - PMTS - Photo Multiplier Tube Beam Loss Monitor Signal
 - PICS - Protection Ion Chamber Signal
 - YAGS - YAG screen
 - OTRS - OTR screen
 - PHOS - Phosphor screen
 - PROF - YAGS, OTRS, PHOS monitor (SLC dummy devices only)
5. Vacuum Gauges:
 - VGKL = Vacuum Gauge associated with a Klystron
 - VGPR = Vacuum Pirani Gauge
 - VGCC = Vacuum Cold Cathode Gauge
 - VGTC = Vacuum ThermoCouple Gauge
 - VGCP = Vacuum Convection-enhanced Pirani Gauge
 - VGHF = Vacuum Hot Filament Gauge
6. Vacuum Valves:
 - VVKL = Vacuum Valve associated with a Klystron
 - VVPG = Vacuum Pneumatic Gate Valve
 - VVMG = Vacuum Manual Gate Valve
 - VVPR = Vacuum Pneumatic Roughing Valve
 - VVMR = Vacuum Manual Roughing Valve
 - VVPF = Vacuum Pneumatic Fore Valve
 - VVMF = Vacuum Manual Fore Valve
 - VVPV = Vacuum Pneumatic Vent Valve
 - VVMV = Vacuum Manual Vent Valve
 - VVFS = Vacuum Fast Valve
7. Vacuum Pumps:
 - VPKL = Vacuum Pump associated with a Klystron
 - VPCR = CRyo Pump
 - VPIO = IOOn Pump
 - VPTM = TurboMolecular Pump
 - VPTS = Ti Sublimation Pump
 - VPFO = Fore Pump
 - VPRO = Roughing Pump
8. Other Devices:
 - PLIC - Panofsky Long Ion Chamber (Attribute is LOSS)
 - FAN - Fan (Attribute is SPEED)
 - DT - Diagnostic tank
 - GASA - Gas Attenuator
 - KLYS - Klystron
 - SBST - Sub-Booster
 - FARC - Faraday Cup
 - DOOR - PPS Door
 - STPR - Beam Stopper

- SBD - Single Beam Dump
 - LENS - LENS MAGNET
 - SEPT - SEPTUM MAGNET
 - CATH - Cathode
 - DUMP - Beam Dump
 - Add others here...
9. Subsystems and Groups/Collections:
- LLRF - Low Level RF
 - LCW - Low Conductivity Water
 - AIR - Air
 - PPS - PPS (Personel Protection System)
 - MPS - MPS (Machine Protection System)
 - BCS - Beam Containment System
 - HVAC - Heating, Ventilation, and AC System
 - SLC - SLC-Aware IOC Diagnostics
 - MDEF - Measurement Definition
 - ARRY - Group of Channels on a Gated ADC for SLC-Aware only
 - Add others here...
10. Controls Hardware:
- IOC - Input/Output Controller
 - PLC - Programmable Logic Controller
 - CRAT - VME Crate
 - BPMP - BEAM POSITION MODULE
 - GADC - Gated ADC Module (not BPMP)
 - EVG - Event Generator
 - EVR - Event Receiver
 - MPG - MASTER PATTERN GENERATOR
 - PNET - PNET Module
 - DTIZ - DIGITIZER
 - ADC - ADC MODULE
 - VSAM - VME Smart Analog Module
 - DAC - DAC MODULE
 - TDC - TIME-TO-DIGITAL CONVERTER
 - DOM - DIGITAL OUTPUT MODULE
 - DIM - DIGITAL INPUT MODULE
 - SCLR - SCALER MODULE
 - LVDT - Linear Variable Differential Transformer
 - Add others here...

Location (LOCA) List

1. Gun and Injector
 - IN20: Gun and Injector Near Sector 20
 - LI20: CAMAC-controlled Injector klystrons (rerouted from LINAC sector 20)
2. LINAC and Beam Switchyard (BSY)
 - - LE20: PNET/EVG Timing System in Sector 20
 - LI21 to LI30: Sectors 21 to 30
 - BY01: BSY Front End
 - BY02: BSY Back End
 - CA11: CAMAC-controlled devices in BSY front end
 - CB00: CAMAC-controlled devices in BSY back end
1. LINAC-to-Undulator (LTU) and Undulator
 - - LTUW: LTU West
 - LTUE: LTU East
 - U???: Undulator
1. X-ray Transport and Optics Diagnostics (XTOD)

Xabc, where:

- - X = XTOD
 - a = area, where:

E = Front End Enclosure

N = Near Hall

F = Far Hall

T = Transport

X = non-specific (XTOD-wide)

- - b = hutch or section (rough Z), where:

1 to 3 for hutch

1 to 9 for section

0 for non-specific (area-wide)

- ◦ c = equipment or split beam line (tunnel) or vacuum station (fine Z), where:

C = Collimator

D = Diagnostic (tank)

I = Ion-chamber

1 to 3 for split beam line (tunnel) or vacuum station

0 = non-specific (hutch-wide or section-wide)

- ◦ or bc combined = specific device, where:

GA = Gas Attenuator

FL = FLipper Mirror

Mm = Mirror m (m=A, B, C)

XS = Xray Slit

Attribute (or Secondary) List

1. Analog:

- ◦ V or VACT - voltage readback
- ◦ I or IACT - current readback
- ◦ B or BACT - magnetic field readback
- ◦ A or AACT - amplitude readback
- ◦ P or PACT - phase readback
- ◦ VACM - vacuum readback
- ◦ TEMP - temperature readback
- ◦ TMIT - bunch charge
- ◦ FLOW - flow rate
- ◦ SPEED - speed readback
- ◦ RAMP - ramp rate
- ◦ LOSS - loss rate
- ◦ WIDTH - pulse width
- ◦ DELAY - pulse delay
- ◦ TIME - delta time
- ◦ CNT - count
- ◦ ID - unique integer identification
- ◦ ENER - energy
- ◦ PWR - power
- ◦ FREQ - frequency
- ◦ ANGL - angle
- ◦ POSN- position
- ◦ GAP - gap
- ◦ X, Y, Z, H - horizontal, vertical, longitudinal, and ?? position
- ◦ S - beamline position (m)
- ◦ ROLL, PITCH, YAW - for motors?
- ◦ xAVG - average of x where x is one of the above
- ◦ xRMS - RMS
- ◦ xMAX or xHI - maximum
- ◦ xMIN or xLO - minimum
- ◦ xDES - x setpoint
- ◦ xACT - x readback
- ◦ xHST - x history
- ◦ Add others here...

1. IOC Attributes:

- ◦ MEM - Memory in-use
- ◦ CPU - CPU in-use
- ◦ CACONNCNT - CA connection count
- ◦ CACHANCNT - CA connected channel count
- ◦ FDCNT - File descriptor in-use count
- ◦ MBUFCNT - Memory buffer in-use count
- ◦ GOTIME - Time since boot
- ◦ RESTARTTOD - Date/time of IOC restart

- ○ TOD - Current date/time

1. Event Timing Attributes:

- ○ YY - unique meas acq trigger number
- ○ PP - beam code number
- ○ PULSEID - synchronized beam pulse ID
- ○ MODIFIER - part of the timing pattern that "modifies" the beam code
- ○ INCLUSION - timing pattern modifier inclusion mask
- ○ EXCLUSION - timing pattern modifier exclusion mask

1. Finite State (Digitals and Multibits):

- ○ STAT - special bit mask reserved for the SLC control system
- ○ STATUS - status (for inputs)
- ○ STATE - state (for inputs)
- ○ MODE - mode (for inputs and outputs)
- ○ CTRL - control or command (for outputs)
- ○ RESET - reset action (for outputs)
- ○ RESTART - restart action (for outputs)
- ○ GO - go action (for outputs)
- ○ STOP - stop action (for outputs)
- ○ CHECK - check action (for outputs)
- ○ xHI, xLO - high or low state for x (x=LIMIT, V, I, VACM, TEMP, FLOW, SYS, etc)

1. XTOD States:

- ○ DEGAS - degas on/off state
- ○ EMISSION - emission high/low state
- ○ AUTOVENT - auto-vent state
- ○ STARTMODE - start mode

1. Strings and other record types:

- ○ NAME - name
- ○ USERNAME - user ID
- ○ FAN or FANOUT - fanout
- ○ TOD - timestamp (date/time)

::[SLC-Aware IOC Home Page|http://www.slac.stanford.edu/grp/lcls/controls/global/sw/slc_ioc/] |

[LCLS Controls|<http://www.slac.stanford.edu/grp/lcls/controls/>] |

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