MPEX I&C Variable Naming Convention

MATERIAL PLASMA EXPOSURE EXPERIMENT

(MPEX-06-SPC-040)

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Prepared by

OAK RIDGE NATIONAL LABORATORY  
Oak Ridge, TN 37831-6283

Managed by

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Material Plasma Exposure Experiment Project

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**Performer:**

[Author], [Title] Date

**Reviewers:**

[Name], [Title] Date

[Name], [Title] Date

**Approver:**

[Name], [Title] Date

Distribution:

[Name], [Title]

[Name], [Title]

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Revision History

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| **Revision** | **Date** | **DESCRIPTION OF CHANGE** | **REVISION TYPE** | |
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ACRONYMS

TLA Three Letter Acronym

MPEX Material Plasma Exposure Experiment

TPO Technical Project Officer

# purpose

This document specifies a convention for naming systems, devices and signals for the MPEX integrated control system.

# scope

Naming conventions described in this document apply to all EPICS process variables in the MPEX control system.

# Introduction

Naming standards are arbitrary. The naming format and content proposals in this document are an attempt to codify the results of discussion with a number of experienced practitioners and the consideration of practices at other institutions [1,2,3,4]. The relative importance of adherence with these conventions for each component of a name is give in the following:

* System
  + The System name component should be chosen from this document without exception. If a system has been omitted or misrepresented, this document can be revised to include the new content.
* Device
  + The Device name component should be treated like the System with the exception that it may contain a leading decorator.
* Signal
  + The Signal name component is intended to be the most flexible part of the fully qualified name. The goal is to provide a list of names with consistent meaning and familiar form. Often, devices contain many configuration properties that cannot be anticipated. In addition, it is often beneficial to qualify signal names to increase specificity or clarity. As a result, signal names may be decorated creatively but the final characters of the name must be taken from the signal name list plus an optional instance number. As with the System and Device components, the Signal name list will be updated as required.
* Signal Domain
  + The Signal Domain component should be chosen from this document without exception. Like the others, the list will accommodate evolving requirements.

# Name production

Symbol conventions

[] optional

{} iteration

The general form of a fully qualified name is

System[:Device]:Signal-SignalDomain[Scope]

For example:

* Heli:Sum-Sts overall helicon operation status summary
* Heli\_Vac:Sum-Sts helicon vacuum operation status summary
* ECH\_Vac:TCG3:P-Sts helicon vacuum TC gauge pressure reading status
* ECH\_Vac:TCG3:P-Ind helicon vacuum TC gauge pressure indication
* Mag\_CSS:Estop-Cmd magnet safety system estop
* Mag\_RT\_CIS:Sum-Sts interlock status summary for all room temp magnets
* Mag:Coil18\_Tap2:QunchI-Ind quench current for magnet coil
* Mag\_Cryo:TT4:InnerT1-Ind inner temp reading for mag cryo insulating vac
* Mag\_Cryo:TT4:ShldT2-Ind shield temp reading for mag cryo insulating vac

The form of each component of the name follows.

System = Name+[Instance]+[{\_Name+[Instance]}]

Where

* Name = item from system name list
* Optional Instance = {\*numeric characters\*}

System name depth probably will be 1 to 3, for example

* Heli helicon
* Heli\_Vac helicon vacuum
* PMI plasma/material interaction chamber
* PMI\_Vac plasma/material interaction chamber vacuum
* Mag magnets
* Mag\_SC superconducting magnets
* Mag\_RT\_CSS room temp magnets safety system

Proposed system names are listed in Appendix A.

Device = [Decoration]+Name+[Instance]+[{\_ [Decoration]+Name+[Instance]}]

Where

* Name = item from device name list
* Optional Instance = {\*numeric characters\*}

Device name depth will probably be 1, for example

* VGC1 vac gauge controller
* Pwr4 power supply
* Comp3 compressor
* HeComp3 helium compressor

Proposed device names are listed in Appendix A.

Signal = [Decoration]+Name+[Instance]+[{\_[Decoration]+Name+[Instance]}]

Where

* Optional Decoration = {\*alpha characters\*}
* Name = item from signal name list
* Optional Instance = {\*numeric characters\*}

Signal name depth will probably be 1, for example

* P1 pressure
* ShldT2 shield temperature
* Pos position

Proposed signal names are listed in Appendix A.

SignalDomain = item from signal domain list

Signal domain examples:

* Sel select state
* RSel select readback
* SP setpoint
* RSP setpoint readback
* Ind indicator
* Sts status

Proposed signal domain names are listed in Appendix A.

Scope = ”\_”

A trailing “\_” character indicates a private scope and designates the signal as one that should not be referenced elsewhere.

Usage example:

* PMI:DeltaT1-Calc\_ private variable used by software calculation

# REFERENCES

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2. Brookhaven National Laboratory, NSLS-II Controls, “Standards-Naming Convention”*,* URL: https://wiki.bnl.gov/nsls2controls/index.php/Standards-Naming\_Convention
3. SLAC, *“SPEAR EPICS* Record Naming Convention”*,* URL: https://www.slac.stanford.edu/~spear/epics/app/RecNameConv.html
4. K. Vijayan, S. J. Singleton, M. T. Heron, Diamond Light Source Ltd, Oxfordshire, UK, “Diamond Light Source Control Systems Relational Database”, Proceedings of the 9th International Workshop on Personal Computers and Particle Accelerator Controls, WEPD52 (2012): 87-89

# AppendiX A – Proposed names

## System/SUBSYSTEM Names

CA Compress Air

CF Conventional Facilities

CIS Central Interlock System

Comm Communications

Cool Cooling

Cryo Cryo Coolers and Related

CSS Central Safety System

CT Cooling Tower

Diag Diagnostics

Dump Plasma Dump

ECH Electron Cyclotron Heating

Elec Power

Exhst Exhaust

GF Gas Fueling

GVac Guard (insulating) Vacuum

Gyro Gyrotron

Heli Helicon

HPRF High Power RF

ICH Ion Cyclotron Heating

ICS Integrated Control System - for PVs which are summaries of multiple systems and such

LLRF Low Level RF

Mag Magnets

Mech HVAC and utilities systems

MFA Machine Fenced Area

MTF Magnet Test Facility

Net Network

ODH Oxygen Deficiency Hazard protection system

Pit Pit Area

PMI Plasma Material Interaction Chamber

Rad Radiation

RF Radiofrequency

RFTF RF Test Facility

RT Room Temp Section

SC Superconducting Section

St Site

Tgt Target

TEC Target Exchange Cart Chamber

Tim Timing

Trnspt Transport

Util Utility

User User Facilities

Vac Vacuum

Vent Ventilation

Wste Waste

### 

## device names

Acl Accelerometer

Anlzr Analizer

Ant Antenna

BdgR Badge Reader

Beak Beakon

BG Baratron Gauge

Calc Calculation

CCG Cold Cathode Gauge

Coil Coil

Comp Compressor

CP Cryo Pump

Enunc Enunciator

Fan Fan

FGV Foreline Gate Valve

FIT Flow Transmitter/Indicator

Flt Filter

FP Foreline Pump

FT Flow Transmitter

GtV Gate Valve

Horn Horn

IP Ion Pum

Lamp Lamp

Laser Laser

LIT Level Transmitter/Indicator

Light Light

LT Level Transmitter

Lck Lock

MIT Mag Field Transmitter/Indicator

Mod Modulator

Mon Monitor

Mot Motor

MT Mag Field Transmitter

Osc Oscillator

PGV Pump Gate Valve

PIT Pres Transmitter/Indicator

PLC PLC

PT Pres Transmitter

Pwr Power Supply

Pump Pump

RGA Residual Gas Analyzer

RGV Roughing Gate Valve

RP Roughing Pump

SGV Section Gate Valve

SP Scroll Pump

Sum Summary

TCG Themocouple Gauge

TIT Temp Transmitter/Indicator

TMP Turbo Molecular Pump

TT Temp Transmitter

UPS Uninterruptable Power Supply

VGC Vacuum Gauge Controller

Vlv Valve

WIT Weight/Force Transmitter/Indicator

WT Weight/Force Transmitter

Xmt Transmitter

Z Switch

## signal names

Acs Access

Act Active

ADC Ana Dig Converter

Addr Address

Ain Analog In

Alm Alarm

Amp Amplitude

Ang Angle

Aout Analog Out

Axis Ax

B Magnetic Flux Desity

Bit Bit

Byte Byte

Break Breaker

Buf Buffer

Bypass Bypass

Calc Calculation

Cfg Configuration

Chan Channel

Cls Close

Clsd Closed

Cnt Count

Code Code

Coef Coefficient

Cfg Config Data

DAC Dig Ana Converter

Date Date

Detct Detector

Dly Delay

Din Digital In

Diam Diameter

Dist Distance

Dout Digital Out

Door Door

Dose Accumulated Radiation Dose

DoseRte Instantaneous (or averaged)  
Radiation Dose Rate

Dsbl Disable

Dsbld Disabled

Enbl Enable

Enbld Enabled

Enc Encoder

Energy Energy

EStop Emergency stop

EU Engineering Units

Err Error code or message

Ev Event

E Voltage

F Flow

Fail Failure

FW,Firmware Firmware ID

HW,Hardware Hardware ID

Fld Field Strength

Frq Frequency

Fwd Forward

Gain Gain

Gap Gap

Gate Gate

H Magnetic Field

Hi High

Hys Hysteresis

Hgt Height

Hour Hour

I Current

Id Identification

In In

Inact Inactive

Inten Intensity

Intlk Interlock

Intvl Interval

IP IP Addr

Lck Lock

Lckd Locked

Leak Leak

Len Length

Lim Limit

L, Lvl Level

Lo Low

MAC MAC Addr

Md Mode

Min Minute

Mon Monitor

Note Notification

Ofs Offset

OnOff Power On/Off

On Power On

Off Power Off

Opn Open

Opnd Opened

Opr Operation

Out out

Pause Pause

Phs Phase

Pol Polarity

Pos Position

Pow Power

P Pressure

PD Pulse Delay

PR Pulse Rate

PW Pulse Width

Pwr Power

Radius Radius

Rate Rate

Rdy Ready

Reg Register

Rly Relay

Rst Reset

Rn Run

S Speed

Sec Second

Setpt Set Point

Sol Solenoid

SN Serial Number

Strt Start

Stat Status

State State

Stp Stop

Strb Strobe

Sum Summary

T Temperature

Tag Tag

Tap Cable Tap

Time Time

Tmo Timeout

Tol Tolerance

Trig Trigger

Trip Interlock trip

Tst Test

Type Type (of device)

Units Units

Ver Version

Vib Vibration

Val Value

Vac Vacuum

Ver Ve

Vld Valid

Vol Volume

Wt Weight or Force

Warn Warning

WD Watch Dog

Wth Width

X Horizontal Position

Y Vertical Position

## name Decoration examples

These may apply to devices, signals or both.

Aux Auxilliary

Avg Average

Center Center

Central Central

Hist History

Inner Inner

Input Input

Inside Inside

Lower Lower

Main Main

Max Maximum

Min Minimum

Neg Negative

Outer Outer

Output Output

Outside Outside

Pos Positive

Qnch Quench

Raw Unconverted Reading

Ref Reference

RMS Root Mean Square

Rpl Ripple

RT Room Temperature

SC Superconducting

Shld Shield

Surf Surface

Upper Upper

## signal domain names

### Signals written to device

MCmd Command - momentary digital value

Cmd,Sel Command or Select - enumerated value

SP Setpoint - integer or real

### Confirmation of written signals

RCmd Command Readback

RSel Select Readback

RSP Setpoint Readback

### Signals read from device

Ind Indicator - integer or real

Sts Status - enumerated value

### Internal EPICS database PVs

ASub Array subroutine

Avg Average

Buf Buffer

Calc Calculation

Calcout Calcout record

Cfg Configuration

FOut Fanout

Max Maximum

Min Minimum

PID PID Record