

MPEX I&C Variable Naming Convention
MATERIAL PLASMA EXPOSURE EXPERIMENT
(MPEX-06-SPC-040)
Rev 2023-07-21

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**MPEX I&C Variable Naming Convention
for the
Material Plasma Exposure Experiment Project**

MPEX-06-SPC-040

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Revision History

Revision	Date	DESCRIPTION OF CHANGE	REVISION TYPE	
			Major	Minor
0		Initial Issue	<input type="checkbox"/>	<input type="checkbox"/>
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ACRONYMS

TLA	Three Letter Acronym
MPEX	Material Plasma Exposure Experiment
TPO	Technical Project Officer

1 PURPOSE

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

2 SCOPE

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

3 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.

4 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:QuenchI-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

5 REFERENCES

- [1] John Munroe, "Instruction Manual for Component Naming", URL: <https://ics-web.sns.ornl.gov/STANDARDS/Naming%20Conventions%20Instructional%20Document.pdf>
- [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

6 APPENDIX A – PROPOSED NAMES

6.1 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

6.2 DEVICE NAMES

Acl	Accelerometer	Mod	Modulator
Anlzt	Analyzer	Mon	Monitor
Ant	Antenna	Mot	Motor
BdgR	Badge Reader	MT	Mag Field Transmitter
Beak	Beakon	Osc	Oscillator
BG	Baratron Gauge	PGV	Pump Gate Valve
Calc	Calculation	PIT	Pres Transmitter/Indicator
CCG	Cold Cathode Gauge	PLC	PLC
Coil	Coil	PT	Pres Transmitter
Comp	Compressor	Pwr	Power Supply
CP	Cryo Pump	Pump	Pump
Enunc	Enunciator	RGA	Residual Gas Analyzer
Fan	Fan	RGV	Roughing Gate Valve
FGV	Foreline Gate Valve	RP	Roughing Pump
FIT	Flow Transmitter/Indicator	SGV	Section Gate Valve
Flt	Filter	SP	Scroll Pump
FP	Foreline Pump	Sum	Summary
FT	Flow Transmitter	TCG	Themocouple Gauge
GtV	Gate Valve	TIT	Temp Transmitter/Indicator
Horn	Horn	TMP	Turbo Molecular Pump
IP	Ion Pum	TT	Temp Transmitter
Lamp	Lamp	UPS	Uninterruptable Power Supply
Laser	Laser	VGC	Vacuum Gauge Controller
LIT	Level Transmitter/Indicator	Vlv	Valve
Light	Light	WIT	Weight/Force Transmitter/Indicator
LT	Level Transmitter	WT	Weight/Force Transmitter
Lck	Lock	Xmt	Transmitter
MIT	Mag Field Transmitter/Indicator	Z	Switch

6.3 SIGNAL NAMES

Acs	Access	Dly	Delay
Act	Active	Din	Digital In
ADC	Ana Dig Converter	Diam	Diameter
Addr	Address	Dist	Distance
Ain	Analog In	Dout	Digital Out
Alm	Alarm	Door	Door
Amp	Amplitude	Dose	Accumulated Radiation Dose
Ang	Angle	DoseRte	Instantaneous (or averaged) Radiation Dose Rate
Aout	Analog Out		
Axis	Ax	Dsbl	Disable
B	Magnetic Flux Desity	Dsbld	Disabled
Bit	Bit	Enbl	Enable
Byte	Byte	Enbld	Enabled
Break	Breaker	Enc	Encoder
Buf	Buffer	Energy	Energy
Bypass	Bypass	EStop	Emergency stop
Calc	Calculation	EU	Engineering Units
Cfg	Configuration	Err	Error code or message
Chan	Channel	Ev	Event
Cls	Close	E	Voltage
Clsd	Closed	F	Flow
Cnt	Count	Fail	Failure
Code	Code	FW,Firmware	Firmware ID
Coef	Coefficient	HW,Hardware	Hardware ID
Cfg	Config Data	Fld	Field Strength
DAC	Dig Ana Converter	Frq	Frequency
Date	Date	Fwd	Forward
Detct	Detector	Gain	Gain

Gap	Gap	Off	Power Off
Gate	Gate	Opn	Open
H	Magnetic Field	Opnd	Opened
Hi	High	Opr	Operation
Hys	Hysteresis	Out	out
Hgt	Height	Pause	Pause
Hour	Hour	Phs	Phase
I	Current	Pol	Polarity
Id	Identification	Pos	Position
In	In	Pow	Power
Inact	Inactive	P	Pressure
Inten	Intensity	PD	Pulse Delay
Intlk	Interlock	PR	Pulse Rate
Intvl	Interval	PW	Pulse Width
IP	IP Addr	Pwr	Power
Lck	Lock	Radius	Radius
Lckd	Locked	Rate	Rate
Leak	Leak	Rdy	Ready
Len	Length	Reg	Register
Lim	Limit	Rly	Relay
L, Lvl	Level	Rst	Reset
Lo	Low	Rn	Run
MAC	MAC Addr	S	Speed
Md	Mode	Sec	Second
Min	Minute	Setpt	Set Point
Mon	Monitor	Sol	Solenoid
Note	Notification	SN	Serial Number
Ofs	Offset	Strt	Start
OnOff	Power On/Off	Stat	Status
On	Power On	State	State

Stp	Stop	Ver	Version
Strb	Strobe	Vib	Vibration
Sum	Summary	Val	Value
T	Temperature	Vac	Vacuum
Tag	Tag	Ver	Ve
Tap	Cable Tap	Vld	Valid
Time	Time	Vol	Volume
Tmo	Timeout	Wt	Weight or Force
Tol	Tolerance	Warn	Warning
Trig	Trigger	WD	Watch Dog
Trip	Interlock trip	Wth	Width
Tst	Test	X	Horizontal Position
Type	Type (of device)	Y	Vertical Position
Units	Units		

6.4 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

6.5 SIGNAL DOMAIN NAMES

6.5.1 Signals written to device

MCmd	Command - momentary digital value
Cmd,Sel	Command or Select - enumerated value
SP	Setpoint - integer or real

6.5.2 Confirmation of written signals

RCmd	Command Readback
RSel	Select Readback
RSP	Setpoint Readback

6.5.3 Signals read from device

Ind	Indicator - integer or real
Sts	Status - enumerated value

6.5.4 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