ALS-U Naming convention

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TOPIC APPROVERS

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AL-1249-8663	A.4	PRJ-SE-NAMING-TRENCH	JIANINIU	12/04/2019
AL-1249-8664	A.4	PRJ-SE-NAMING-SERIAL WTPART	JIANINIU	12/05/2019
AL-1249-8665	A.4	PRJ-SE-NAMING-PV	JIANINIU	02/07/2020
AL-1249-8675	A.1	PV EXAMPLE.PNG	JIANINIU	02/07/2020
AL-1249-9046	A.1	TRENCH NAMING.PNG	JIANINIU	12/04/2019
AL-1249-9048	A.1	WALLPLOT.PNG	JIANINIU	12/05/2019
AL-1249-9058	A.4	PRJ-SE-NAMING-PENETRATION	JIANINIU	12/04/2019
AL-1249-9059	A.5	PRJ-SE-NAMING-WALL	JIANINIU	12/05/2019
AL-1249-9092	A.1	WALL STANDS.PNG	JIANINIU	12/04/2019
AL-1249-9093	A.1	NAMING CONVENTION - CABLE LABELING.PNG	JIANINIU	02/07/2020
AL-1249-9094	A.1	NAMING CONVENTION - EQUIPMENT BOX.PNG	JIANINIU	02/13/2020
AL-1249-9095	A.1	NAMING CONVENTION - JUNCTION BOX.PNG	JIANINIU	02/13/2020
AL-1249-9098	A.1	NAMING CONVENTION - TRENCH.PNG	JIANINIU	12/04/2019
AL-1249-9100	A.1	NAMING CONVENTION - WALL.PNG	JIANINIU	12/05/2019
AL-1249-9101	A.1	NAMING CONVENTION - WTPART.PNG	JIANINIU	12/05/2019
AL-1249-9112	C.2	PRJ-SE-NAMING-ABBREVIATION AND ACRONYMS	JIANINIU	05/06/2021
AL-1249-9113	A.2	PRJ-SE-NAMING-INTRODUCTION	JIANINIU	12/04/2019
AL-1249-9114	A.2	PRJ-SE-NAMING-SUPPORT STANDS	JIANINIU	12/04/2019
AL-1249-9115	A.2	PRJ-SE-NAMING-CABLE LABELING	JIANINIU	02/07/2020

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AL-1249-9116	A.2	PRJ-SE-NAMING-JUNCTION AND EQUIPMENT BOX	JIANINIU	02/13/2020
AL-1249-9117	C.2	PRJ-SE-NAMING-CHASSIS	WLWALDRON	06/21/2022
AL-1249-9118	B.4	PRJ-SE-NAMING-RACK	JIANINIU	06/30/2020
AL-1249-9135	A.1	WALL STANDS2.PNG	JIANINIU	12/04/2019
AL-1250-2584	A.1	NAMING CONVENTION - DITA TOPICS.PNG	JIANINIU	12/04/2019
AL-1250-2585	A.1	NAMING CONVENTION - CAD MODELS.PNG	JIANINIU	12/05/2019
AL-1250-2586	A.1	NAMING CONVENTION - PENETRATION (1).PNG	JIANINIU	12/04/2019
AL-1250-2978	B.3	PRJ-SE-NAMING-DITA TOPIC	JIANINIU	05/06/2021
AL-1250-2979	A.3	PRJ-SE-NAMING-CAD MODELS	JIANINIU	12/05/2019
AL-1337-8063	A.1	RACK NAMING CONVENTION.PNG	KPCHOW	05/14/2021
AL-1395-3936	C.3	PRJ-SE-NAMING-MAGNETS	JIANINIU	06/27/2022
AL-1425-1487	A.1	CHASSIS EXAMPLE.PNG	SRBURNS,JIANINIU	04/15/2021
AL-1444-6904	B.2	REVISION HISTORY (TOPIC)	JIANINIU	06/27/2022
AL-1446-2643	A.6	PRJ-SE-NAMING-WIRING METHONDS	SRBURNS,WLWALDRON,JIANINIU	06/03/2021
AL-1446-2986	A.1	WIRING METHOD OVERVIEW.PNG	SRBURNS,WLWALDRON,JIANINIU	06/03/2021
AL-1446-2987	A.1	WIRING EXAMPLE2.PNG	SRBURNS,WLWALDRON,JIANINIU	06/03/2021
AL-1446-2988	A.1	WIRING EXAMPLE1.PNG	SRBURNS,WLWALDRON,JIANINIU	06/03/2021
AL-1446-3049	A.1	WIRING METHOD PICTURE.PNG	SRBURNS,WLWALDRON,JIANINIU	06/03/2021
AL-1472-4410	B.10	PRJ-SE-NAMING-DEVICE	JIANINIU	11/19/2021
AL-1474-3511	A.1	DEVICE NAMING.PNG	JIANINIU	09/16/2021
AL-1502-1536	A.1	RACKDEVICE.PNG	JIANINIU	11/19/2021
AL-1570-5708	A.1	MAGNET CAD ID EXAMPLE.PNG	JIANINIU	06/27/2022
AL-1570-5709	A.1	MAGNET CONTROL ID EXAMPLE.PNG	JIANINIU	06/27/2022

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CONTENTS

1 REVISION HISTORY 3
2 ABBREVIATIONS AND ACRONYMS 3
3 INTRODUCTION 4
4 PROCESS VARIABLES 4
5 WTPART INSTANCES 4
6 INNER SHIELDING WALL 5
7 SHIELDING PENETRATIONS 6
8 TRENCHES 7
9 ELECTRONIC EQUIPMENT RACKS 8
10 ELECTRONICS CHASSIS 9
11 JUNCTION AND EQUIPMENT BOXES 11
12 ACCUMULATOR RING SUPPORT STANDS 11
13 CABLES LABELING 13
14 CAD MODELS 13
15 MAGNET 14
16 ARBORTEXT DITA TOPIC 15
17 WIRING METHODS 16
18 DEVICE NAMING 19

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1 REVISION HISTORY

Rev.	CM Number	Description of Change
A		First release
B		1. Update the chassis naming 2. Add magnet naming 3. Add control device naming 4. Add arbortext topic naming
C		1. Add wiring naming 2. Add device naming
D		1. Update chassis naming 2. Update magnet naming

2 ABBREVIATIONS AND ACRONYMS

ACL	Acceptance criteria list
ADS	Assumption documents
ALS	Advanced Light Source
ALS-U	Advanced Light Source Upgrade
CCBA	Cross-connect block assembly
COM	Commissioning
DI	Device instance
EPICS	Experimental Physical and Industrial Control System
ESD	Specification
GEN	General
ICD	Interface control document
LBNL	Lawrence Berkeley National Laboratory
MAG	Magnet
PRJ	Project
PSTG	Prestaging
PV	Process variable
RQMT	Requirement

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TIP	Test and inspection plan
WI	Work instruction
wtPart	Windchill Technology Part

3 INTRODUCTION

This document describes the naming conventions of objects used, as part of the ALS-U project and later to be inherited in ALS, to provide a consistent language used throughout the entire ALS-U project. The types of objects covered in this document include process variables, wtPart instances, trenches, electronic and electrical equipment and cables.

4 PROCESS VARIABLES

A process variable (PV) is a unique name used in the control system, EPICS in this case, to define a device or instrument and provide the capability to assign a specific set of data (e.g. calibration data). A PV name comprises of three colon-separated segments:

LocSubloc:DeviceDI-Subdevice:Signal

LocSubloc - describes the location of the device.

DeviceDI-Subdevice - specifies the device type, device instance (DI) and subdevice. The device type shall not end with a number. DI is an integer starting from 1. Subdevice is an optional field, separated from DeviceDI by a dash (-). The DeviceDI field is intended to provide additional specificity to the naming convention and is considered optional.

Signal - specifies the signal name of the PV. The signal name is based on the application.

Example 1

Example 2

5 WTPART INSTANCES

wtPart stands for Windchill Technology Part, and is converted derived from a CAD model. A wtPart can have multiple instances. An instance is a digital representation of a physical component and thus requires a unique identifier for tracking purposes. The naming convention follows below format

PN-ISEQ

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PN - starts with a prefix AL, followed by an integer of 8. The prefix and integer are carried from the part number of the CAD model that the wtPart is converted from.

ISEQ - a 4 digit sequence number for the instances, starting from 0001. It is appended to the part number with a (-) dash.

Example
The first instance of the dipole magnet (CAD model AL-1030-6477):

6 INNER SHIELDING WALL

The segments of the inner shielding wall are named based on their associated sector. The syntax is:

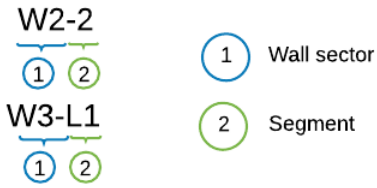
WS-G

W Wall

SSector; 1-12

G Wall segment; 1, 2, L (labyrinth), T (transfer line, booster to storage ring)

Example



Example sketch until drawing is produced:

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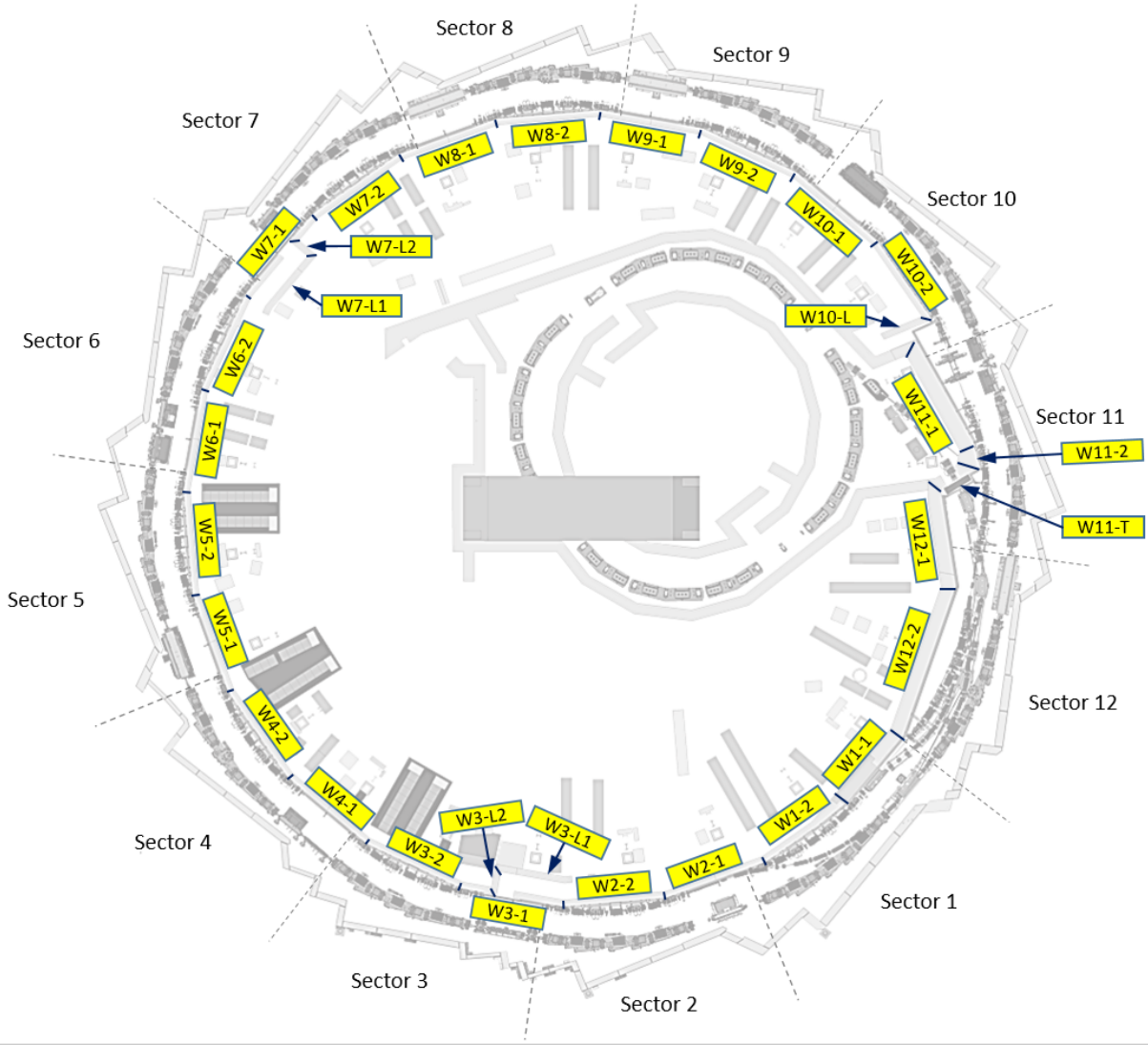

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7 SHIELDING PENETRATIONS

Penetrations in shielding walls or roof used for cabling and other utilities, excluding HVAC, are part of the routing pathway. Penetration names appear in AL-1120-3075 Inner Shielding Wall Penetrations Catalog, AL-1120-0640 AR Metal Wireway Sizing Calculator and AL-1119-9956 SR Metal Wireway Sizing Calculator. Syntax is:

AAXX-YYZZ

AA — location: Storage ring, Booster ring

XX — Sector number 01–12

YY — Shielding type: IB (Inner wall bore); RB (Roof wall bore); OB (Outer wall bore);

ZZ — sequence number 01–99, generally clockwise starting at the upstream end of the sector

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Example

8 TRENCHES

The 36 original named trenches in the ALS facility are named sequentially, with a prefix “T” followed with a number: T1-T36. T1-T7 are in the booster ring, T9-T36 are in the storage ring, there is no T8. Trench names are part of the cable routing path and Additional trenches are named relative to their location, defined as:

TN.OD

TN— the name of the preceding original trench.

OD— the clockwise offset in degrees from the preceding original trench.

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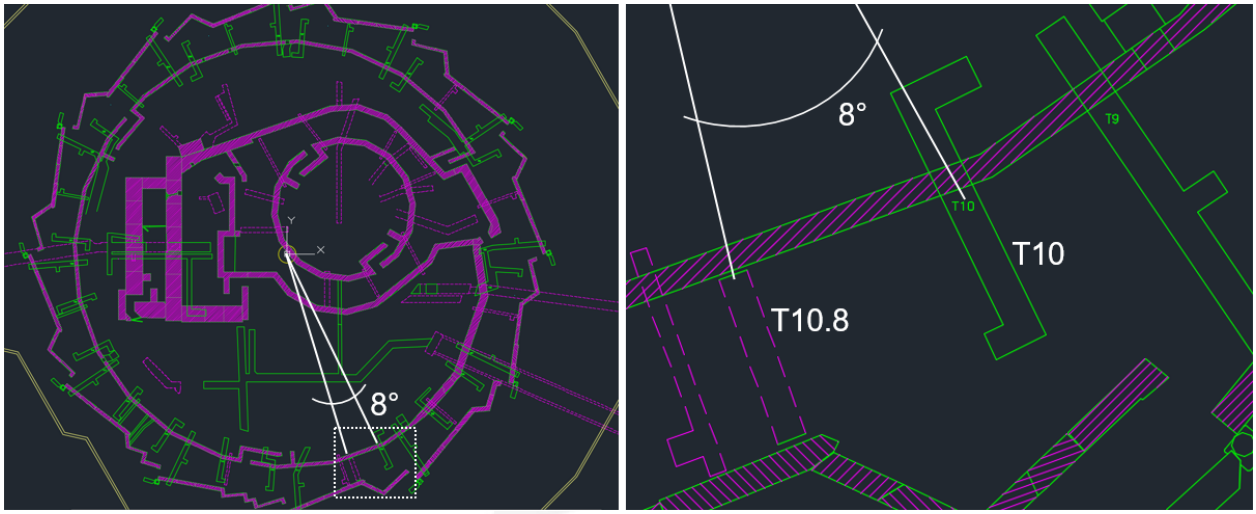
Example
The trench located 8° clockwise from T10 would be named T10.8



9 ELECTRONIC EQUIPMENT RACKS

A rack is assigned a unique alphanumeric identifier in the following format:

AreaSectorRack

Area – defines the area/component for which the rack serves. Table 8.1 is a list of existing area/component abbreviations.

Table 1. Area/component abbreviation.

Area	Description	Number of sectors
LI	Linac	N/A
B	Booster Ring	4
A	Accumulator Ring	12
S	Storage Ring	12
BTA	Booster to Accumulator Transfer Line	N/A
ATS	Accumulator to Storage Transfer Line	N/A
STA	Storage to Accumulator Transfer Line	N/A

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Table 1 Area/component abbreviation. (continued)

BL	Beamlines	12
CR	Control Room	N/A
BTF	Beam Test Facility	N/A
PE	Portable Racks	N/A

Sector – A two-digit number, with a leading zero where applicable, that identifies the sector which the rack serves. This is omitted from the rack designation for those areas in the above table that have no sectors.

Rack - A two-digit number, with a leading zero where applicable, that identifies the sequential number assigned to the racks installed in those areas.

Examples

A rack for the storage ring for sector 6 with a rack number 14 would be defined as 'S0614'. Similarly, a rack for the Linac (with no sector) with rack number 20 would be defined as 'LI20'.

Figure 1.

10 ELECTRONICS CHASSIS

Electronic Chassis are created for specific purposes, these chassis can be placed in numerous locations. Therefore, the designated numbering for a specific electronic chassis is meant to be applied as a label, sticker, or similar and not specifically silkscreened or permanently marked on the chassis. The numbering scheme should be considered a temporary marking which can be removed or replaced when the chassis is moved to different rack locations.

For standard electronics chassis that are installed in the racks, the numbering convention is:

AreaSubsectorRackSpaceRear

AreaSubsectorRack — identifies the rack in which this chassis is installed. See section 9 for the naming convention definition of the rack.

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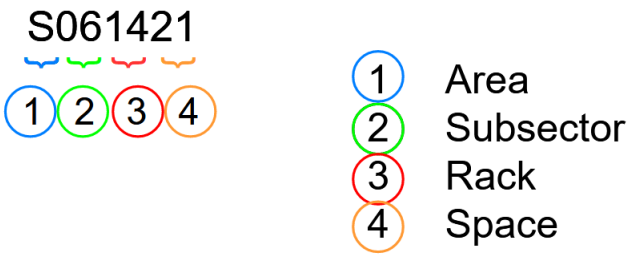
Space —the number of the lowest rack space that is occupied by this chassis. The number shall be written in two digits. This number begins at 01 at the top of the rack and increases as you move vertically down the rack. See below for more detailed information about this field.

Example
A 3U high chassis installed in storage ring sector 6, rack 14 and occupying the rack space 19, 20, and 21 would be defined as 'S061421'.

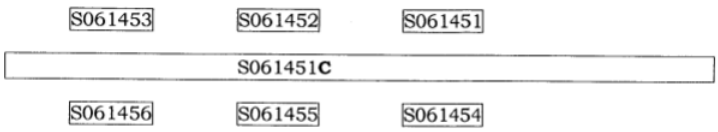


Equipment which is located/mounted at the rear of the rack shall end in an “R” (for example “A101436R”). Under normal circumstances where a chassis is mounted to the front, this is blank, as shown in the image above.

Note that the existing ALS racks follow a slightly different notation method. Therefore, an ALS-U rack side by side with an ALS rack will not have chassis notations in alignment.

A cross-connect block assembly (CCBA) is a special type of chassis that is installed in the bottom of a rack. It does not follow the naming convention described above. The naming of CCBA chassis follows the Lawrence Livermore National Laboratory standard. A CCBA assembly consists of a frame, 6 blocks and a common copper bus bar. When the assembly is installed in a rack, the 6 blocks are numbered right-to-left, then top-to-bottom as viewed from the rear of the rack. The common copper bus bar will be assigned the same number as the first cross-connect block followed with the suffix “C”.

Examples



Standard Livermore cross-connect block numbering – rear view

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11 JUNCTION AND EQUIPMENT BOXES

The naming convention for junctions (J) and equipment (E) boxes are similar to that of fixed racks but with an additional **J** or **E** after the Area segment

AreaJSubsectorRack

AreaESubsectorRack

Area — is defined as described in Section 8.1

J — stands for junction box

E — stands for equipment box

Subsector — is defined as described in Section 8.1

Rack — is defined as described in Section 8.1

Examples
Linac junction box number 20 would be defined as 'LIJ20'.
Storage ring sector 6, equipment box number 14 would be defined as 'SE0614'.

12 ACCUMULATOR RING SUPPORT STANDS

The AR (Accumulator Ring) support stands locate AR beam-line components. The components supported repeat from sector to sector as do many of the stands. To simplify the communication about and identification of the location and function of the support stands they require a unique identifier. The naming convention follows the format shown below using selection options from below Figure:

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Example 1

S01-S2

1 2

1 Sector: 1

2 AR Component: Sextupole-2

Example 2

S05-R1

1 2

1 Sector: 5

2 AR Component: Raft-1

Example 3

S11-B3

1 2

1 Sector: 11

2 AR Component: Bend Magnet 3

Example 4

S11-B2R3

1 2

1 Sector: 11

2 AR Component: Bend Magnet-2 & Raft-3

Sector		AR Component		Component Number
S01	*Sector-1*	**S**	*Sextupole*	1
S02	*Sector-2*	**R**	*Raft Assembly*	2
S03	*Sector-3*	**B**	*Bend Magnet (Dipole)*	3
S04	*Sector-4*			4
S05	*Sector-5*			
S06	*Sector-6*			
S07	*Sector-7*			
S08	*Sector-8*			
S09	*Sector-9*			
S10	*Sector-10*			
S11	*Sector-11*			
S12	*Sector-12*			

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13 CABLES LABELING

A cable establishes the physical connection between two connectors. Each of the two opposing ends of a cable is plugged into a connector. Cable ends shall be labeled with text that indicates the destination and the source of the physical connection:

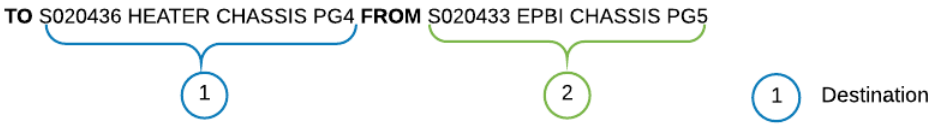
TO Destination **FROM** Source

Destinationspecifies the connector into which this cable end shall be plugged.

Sourcespecifies the connector into which the opposite cable end shall be plugged.

Examples:
For a cable connected between S020436 heater chassis PG4 and S020433 EPBI chassis PG5:

Label on one end of a cable



Label on the other end of the cable

14 CAD MODELS

Class, Modifiers, ...Modifiers

Class identifies what it is

Modifier describes the intrinsic properties of the item, such as geometry dimensions, material. Below is a few examples of modifiers

Options	Description
By functional group type	Electrical, Hydraulic, Pneumatic, Cooling, Support, etc.
By size	OD, ID, Length, Width, Height, etc.
By type / shape	Ball, Elbow, Roller, Round, Conical, etc.
By material type	Al (Aluminum), SS (Stainless Steel), MS(Mild steel), Rubber, etc.
By assembly type	Kit, Bulk, etc.
By color	Yellow, Black, Red, etc.

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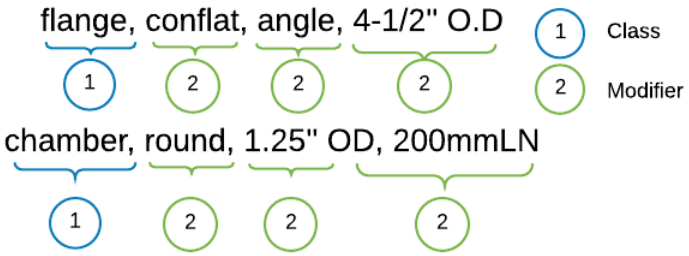
Class can be followed by one or multiply modifiers. Class and modifiers are seperated by comma. The model name shall be less then 100 characters in total

Examples



15 MAGNET

Two magnet naming conventions are described in this section

For the use of control ID, the naming follows below rule:

Location Sublocation Magnetfamily Identifier

Location: the main location that the magnet installed, options include AR, SR, BTA, ATS, STA

Sublocation : identify the sector and arc/straight portion of the sector the magnet is installed

Magnetfamily: each magnet family refers to a set of magnets that have commonalities in design

Identifier: sequence number of the same magnet family in one sector

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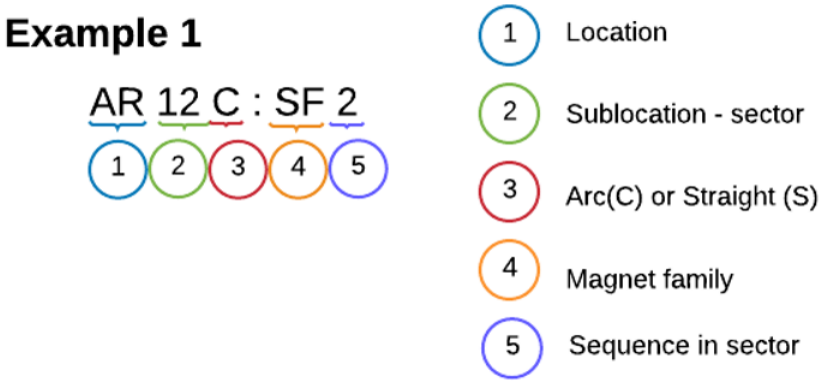

Figure 2. Example of the magnet control ID naming

For the use of CAD model, the namings follows below convention:

Magnettype Magnetconfiguration

Figure 3. Example of the magnet CAD naming

Please reference AL-1328-3647, ALS-U Magnet Nomenclature for names of each magnet

16 ARBORTEXT DITA TOPIC

A DITA topics is a modular document that provides discrete information about a single subject. Authoring a DITA topic is similar to working with other types of XML documents.

All the DITA topics are stored under the same folder in Windchill. In order to improve the searching efficiency, anaming convention for DITA topics is developed as below

System-Type of map the topic is used in-Scope-Description

Below is a table of abbreviation the project is maintaining

System	Type of map the topic is used in	Scope
R&I	ADS	AR

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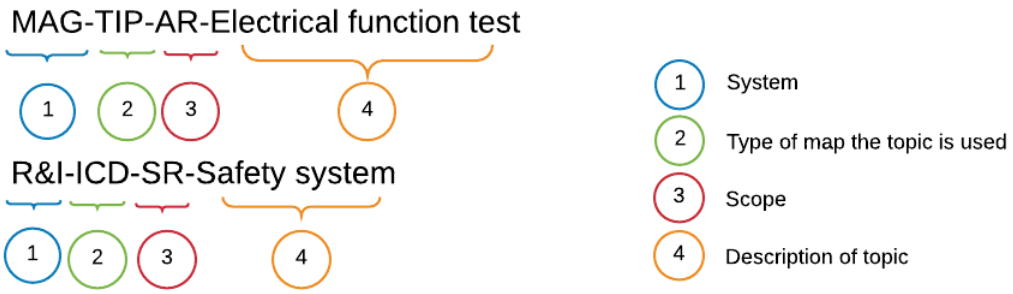
MAG	ESD	SR
GEN	ICD	BTA
COM	RQMT	ATS
PRJ	ACL	STA
PSTG	TIP	GEN
	WI	
	GEN	
	NOTE	

Examples



17 WIRING METHODS

SectorLocationOrdinate

Sector- This is the sector which the tray is associated with.

Location- This is a single character representing the rough location of the tray.

Below are the location letters and what they stand for.

Letter	Description
R	Rack
N	Network
W	Wheel
P	Penetration
A	AR (in tunnel)
S	SR (in tunnel)
T	Trench

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D	Destination tray

Ordinate- A number used to delineate different trays in the same sector. The ALS-U design will have the ordinate increasing going clockwise, and will leave a few empty numbers for future trays to be placed in between. Also, for any trays which are stacked on top of one another, the ordinate increases from the bottom up.

Examples

A 'network' cable tray in the sector 9 pit might be defined as 09N15

Additionally, many wiring methods (such as cable trays) have subdivisions within them which are useful to refer to. The naming conventions for these subdivisions is given below:

SectorLocationOrdinate.Subdivision

Subdivision - This represents the division within the wiring method.

Examples

The 2nd division in a cable tray in the 'wheel' tray in sector 4 would be defined as 04W03.B

The snapshot below shows a few examples of the tray naming convention

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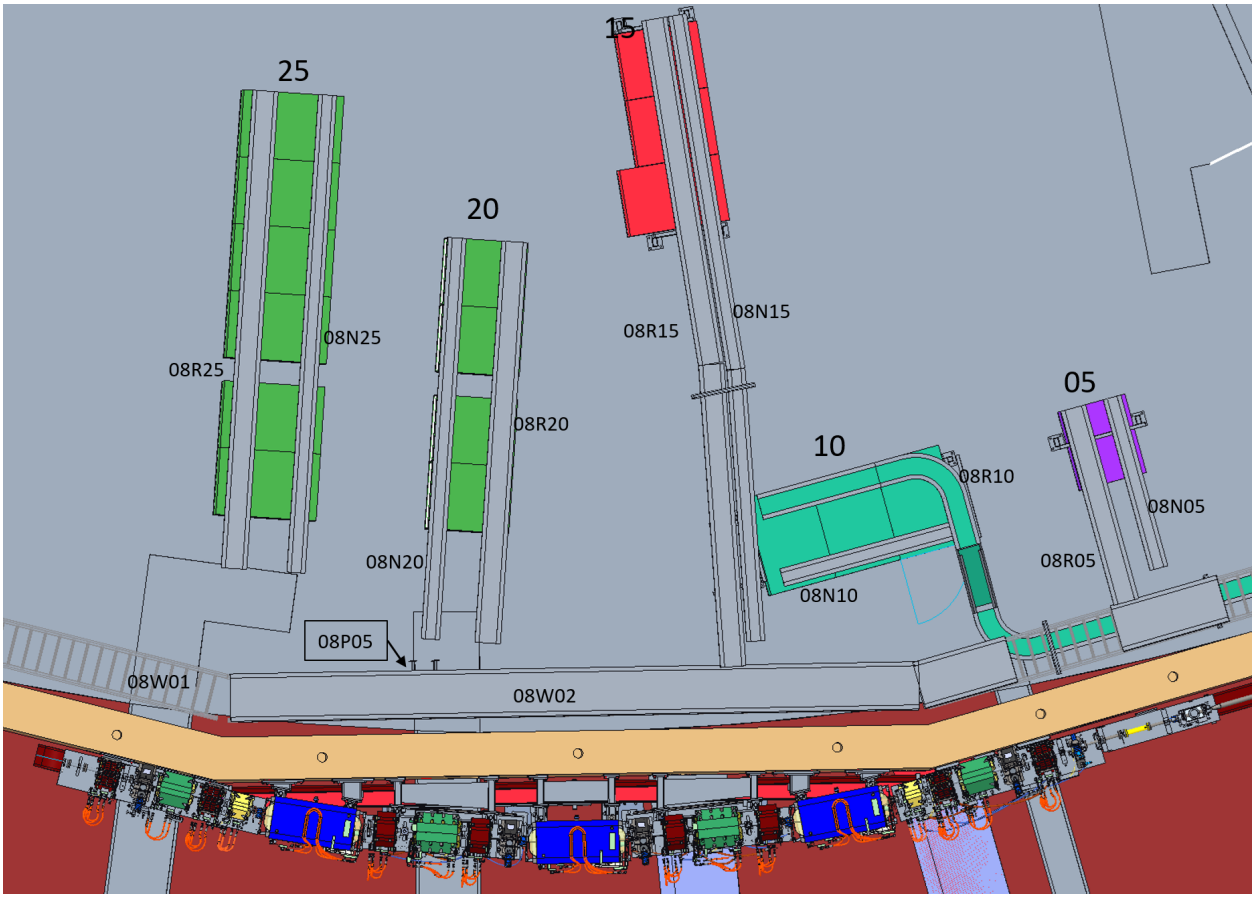
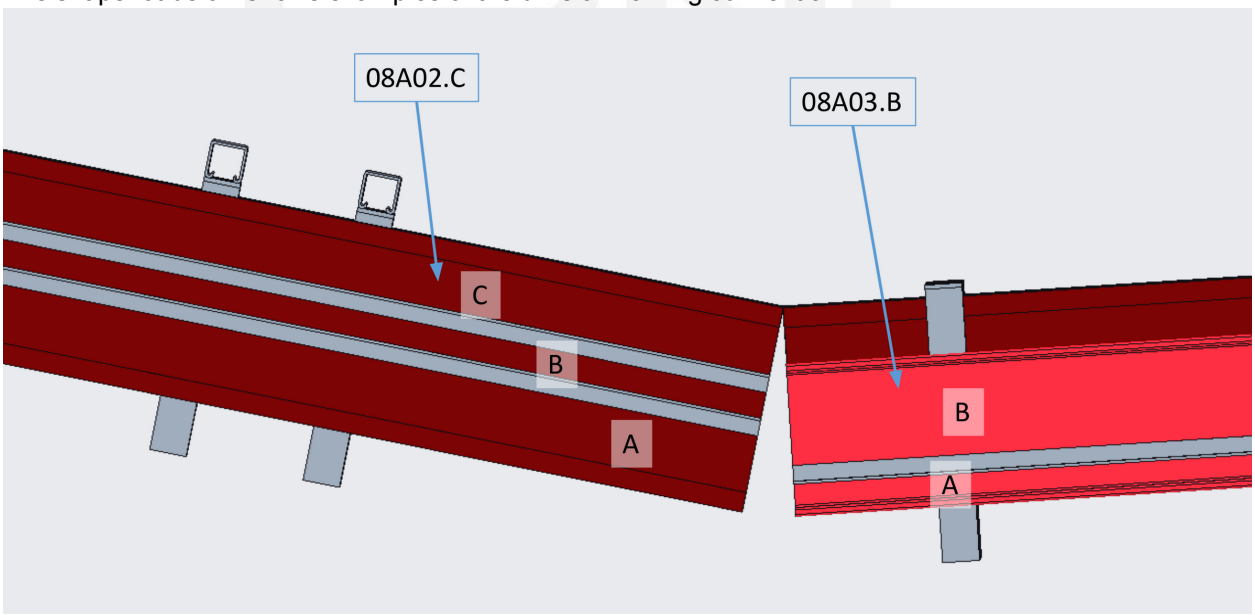


The snapshot below shows examples of the division naming convention.



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18 DEVICE NAMING

1. Devices installed in the ring

Devices installed in the ring follows the following convention:

LocationSublocation:DevicetypeIdentifier

Sublocation - describes the sub location that the device is located. It contains the sector number followed with S or C where S stands for straight and C stands for Curve.

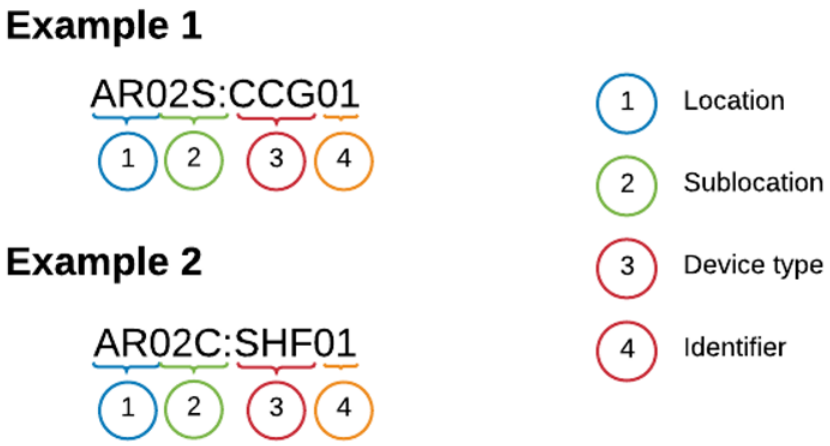
Devicetype - specifies the type of device. The device type shall not end with a number

A list of the Devicetype can be found in windchill (AL-1476-7602).

There is a working google doc that subsystems can use to propose new device type Here is the link to the googlesheetThe newly proposed devicetype shall be added and marked as “Proposed” in the working google doc by subsystems and inform Han Lee and Jiani Niu for review and release in windchill

Identifier - a sequential integer number for devices of the same device type in the same sublocation. The sequence starting from 01, and increases follow the beam direction.

Location - describes the main area where the device is located, include AR, SR, BTA, ATS, STA



The device names that follow this naming convention are called out in the sector layout drawings

Drawing name	Windchill number
AR ASSEMBLY SECTOR 1	AL-1003-7460
AR ASSEMBLY SECTOR 2	AL-1189–0912
AR ASSEMBLY SECTOR 3	AL-1189–0913

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AR ASSEMBLY SECTOR 4	AL-1189–0914
AR ASSEMBLY SECTOR 5	AL-1189–0915
AR ASSEMBLY SECTOR 6	AL-1189–0916
AR ASSEMBLY SECTOR 7	AL-1189–0917
AR ASSEMBLY SECTOR 8	AL-1189–0917
AR ASSEMBLY SECTOR 9	AL-1189–0917
AR ASSEMBLY SECTOR 10	AL-1031-0176
AR ASSEMBLY SECTOR 11	AL-1015-2498

2. Devices installed in the racks

Devices installed in the rack follows the following convention:

ChassisIocation:Devicetype:Additional identifier

ChassisIocation - describes the chassis location that the device is installed in. It follows the chassis naming convention which are described in a earlier section

Devicetype - specifies the type of device. The device type shall not end with a number

A list of the Devicetype can be found in windchill (AL-1476-7602).

There is a working google doc that subsystems can use to propose new device type Here is the link to the googlesheetThe newly proposed devicetype shall be added and marked as “Proposed” in the working google doc by subsystems and inform Han Lee and Jiani Niu for review and release in windchill

Additional identifier - this is an optional field that subsystem use to further describe the device

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Example 1

1 Chassis location

2 Device type

3 Additional identifier

Example 2

Here are the links to the subsystems device namings that follows the proposed naming convention

Subsystem	Link
Control system	Here is the link
Power supplies system	Here is the link

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