



CCDB Conventions





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 EUROPEAN SPALLATION SOURCE	<h1>CCDB Conventions</h1>	 EUROPEAN SPALLATION SOURCE
Program: Construction	Work Package: 3 Core Software Components	Work Unit: 3.1 Controls Configuration Data Management
Author: R. Fernandes	Version: 1.2	Date: 2015-10-15

Approval Matrix

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Version Summary

Version	Date	Description
0.9	2015-07-30	Draft document
0.91	2015-08-05	Minor updates/corrections
1.0	2015-08-06	Initial document
1.1	2015-10-01	<ul style="list-style-type: none"> Reorder data entries conventions in Section 2. Updated IOC convention with the latest specifications in Section 3. Minor updates/corrections.
1.2	2015-10-15	<ul style="list-style-type: none"> Added short description about units, enumerations, properties, device types, devices, containers and slots. Added mandatory convention in the units concerning base-unit, super-unit and sub-unit.





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TABLE OF CONTENTS

- 1. SUMMARY 1
- 2. DATA ENTRIES 1
 - 2.1. UNITS 1
 - 2.2. ENUMERATIONS 2
 - 2.3. PROPERTIES 2
 - 2.4. DEVICE TYPES 2
 - 2.5. DEVICES 3
 - 2.6. CONTAINERS 3
 - 2.7. SLOTS 4
- 3. DATA PATTERNS 5
 - 3.1. SIGNALS LIST 5
 - 3.2. RACKS 5
 - 3.3. IOCS 5

 EUROPEAN SPALLATION SOURCE	<h1>CCDB Conventions</h1>	 EUROPEAN SPALLATION SOURCE
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LIST OF FIGURES

NO TABLE OF FIGURES ENTRIES FOUND.

 EUROPEAN SPALLATION SOURCE	<h1>CCDB Conventions</h1>	 EUROPEAN SPALLATION SOURCE
Program: Construction	Work Package: 3 Core Software Components	Work Unit: 3.1 Controls Configuration Data Management
Author: R. Fernandes	Version: 1.2	Date: 2015-10-15

LIST OF TABLES

TABLE 1: DATA ENTRY CONVENTION FOR THE UNITS 1

TABLE 2: DATA ENTRY CONVENTION FOR THE ENUMERATIONS 2



TABLE 3: DATA ENTRY CONVENTION FOR THE PROPERTIES 2

TABLE 4: DATA ENTRY CONVENTION FOR THE DEVICE TYPES 3

TABLE 5: DATA ENTRY CONVENTION FOR THE DEVICES 3

TABLE 6: DATA ENTRY CONVENTION FOR THE CONTAINERS 3

TABLE 7: DATA ENTRY CONVENTION FOR THE SLOTS 4

 EUROPEAN SPALLATION SOURCE	CCDB Conventions	 EUROPEAN SPALLATION SOURCE
Program: Construction	Work Package: 3 Core Software Components	Work Unit: 3.1 Controls Configuration Data Management
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1. SUMMARY

This document enumerates and describes conventions that shall be followed by different actors when managing data in the Controls Configuration Database (CCDB). More specifically, it is a guideline for both the administrators and the end-users to correctly insert, update, delete and organize data stored in this application. This will increase data integrity/consistency – avoiding data chaos that can emerge otherwise – for external applications (e.g. Cable Database, IOC Factory) to consume this data properly and enable these to successfully perform their domain specific businesses. This guideline will be actively updated by the administrators of the CCDB whenever a new convention is defined.

The conventions presented in this document can roughly be organized in “Data Entries” and “Data Patterns”. The “Data Entries” describes conventions to follow when defining units, enumerations, properties, devices types, devices, containers and slots in the CCDB. The “Data Patterns” describes how to deal with data entries that repeat themselves. Typical examples of such repetition (or pattern) are signals list, racks and IOCs.



2. DATA ENTRIES

2.1. Units

A unit is a quantity chosen as a standard in terms of which other quantities may be expressed. It can also be seen as a definite magnitude of a physical quantity, defined and adopted by convention or by law. Examples of a unit are meter, liter and celsius.

Field	Mandatory	Recommendation
Name	<ul style="list-style-type: none"> Shall be upper camel-case. Example: MyUnit Shall be expressed in the base-unit (and not in a super-unit or in a sub-unit). Example: length is expressed in meter (and not in kilometre or centimetre). 	<ul style="list-style-type: none"> Should be less or equal than 20 chars long Should use a dot (.) – and not a comma (,) – to represent fractional numbers
Description	None	None
Symbol	None	<ul style="list-style-type: none"> Should follow ISO standards when applicable

Table 1: Data entry convention for the Units

 EUROPEAN SPALLATION SOURCE	CCDB Conventions	 EUROPEAN SPALLATION SOURCE
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2.2. Enumerations

An enumeration groups values according to a certain interest/context. For example, the ESS lifecycle can be enumerated with the “construction”, “commission”, “operation” and “decommission” values.

Field	Mandatory	Recommendation
Name	<ul style="list-style-type: none"> Shall be upper camel-case. Example: MyEnumeration 	<ul style="list-style-type: none"> Should be less or equal than 20 chars long
Description	None	None
Definition	<ul style="list-style-type: none"> Shall be upper-case. Example: WINDOWS Shall have multiple words separated by an underscore (_). Example: WINDOWS_XP 	<ul style="list-style-type: none"> Should be less or equal than 20 chars long

Table 2: Data entry convention for the Enumerations

2.3. Properties

A property describes a certain device in terms of its characteristics/attributes/features. Examples of a property are manufacturer, model, price and serial number.



Field	Mandatory	Recommendation
Name	<ul style="list-style-type: none"> Shall be upper camel-case. Example: MyProperty 	<ul style="list-style-type: none"> Should be less or equal than 20 chars long
Description	None	None

Table 3: Data entry convention for the Properties

2.4. Device Types

A device type describes a certain device in an abstract way by associating one or more properties to it. Examples of a device type are pump, valve, motor and PLC.

Field	Mandatory	Recommendation
Name	<ul style="list-style-type: none"> Shall be upper-case. Example: CAMERA Shall have multiple words separated by an underscore (_). Example: MY_CAMERA_XYZ 	<ul style="list-style-type: none"> Should be less or equal than 20 chars long Should use a dot (.) – and not a comma (,) – to represent fractional numbers

 EUROPEAN SPALLATION SOURCE	CCDB Conventions	 EUROPEAN SPALLATION SOURCE
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		<ul style="list-style-type: none"> Should start with the name of the manufacturer. Example: SIEMENS_DI_CARD
Description	None	None

Table 4: Data entry convention for the Device Types

2.5. Devices

A device is an instance of a certain device type. Examples of a device are pump_0001, valve_1234, motor_9998 and PLC_7575.

Field	Mandatory	Recommendation
Inventory ID	<ul style="list-style-type: none"> Shall be exactly the same as the device type name followed by a suffix composed of 4 digits when the device is not registered in an inventory system. Example: CAMERA_0001 Shall be exactly the same as the ID of the device registered in an inventory system when in such system. 	<ul style="list-style-type: none"> Should be less or equal than 20 chars long



Table 5: Data entry convention for the Devices

2.6. Containers

A container is basically a folder that may have other containers and/or slots. Examples of a container are ICS, TARGET and ACCELERATOR_DIVISION.

Field	Mandatory	Recommendation
Name	<ul style="list-style-type: none"> Shall be upper-case. Example: CONTAINER Shall have multiple words separated by an underscore (_). Example: MY_CONTAINER 	<ul style="list-style-type: none"> Should be less or equal than 20 chars long
Description	None	None

Table 6: Data entry convention for the Containers



 EUROPEAN SPALLATION SOURCE	<h1>CCDB Conventions</h1>	 EUROPEAN SPALLATION SOURCE
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2.7. Slots

A slot is a placeholder for a certain device to be installed in. Examples of a slot are LEBT-00:Ctrl-Crate-1, Tgt-PCool:Equ-Flow-01 and Tgt-PCool:Equ-Val-01.

Field	Mandatory	Recommendation
Name	<ul style="list-style-type: none"> Shall follow ESS naming convention. Example: LEBT-00:Ctrl-Rack-1 	None
Description	None	None

Table 7: Data entry convention for the Slots

 EUROPEAN SPALLATION SOURCE	<h1>CCDB Conventions</h1>	 EUROPEAN SPALLATION SOURCE
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3. DATA PATTERNS

3.1. Signals List

A signals list refers to the information that enumerates and describes signals that a certain device has. This information is composed mandatorily by a name and a description and, optionally, a type (e.g. digital input, analog output) and a voltage for each signal. For the signals list of a certain device to be correctly stored/represented in the CCDB, the following conditions must be respected:

- The type of the device shall have the following installation slot properties (these properties are already predefined in the CCDB):
 - SignalName<0...X> (mandatory)
 - SignalDescription<0...X> (mandatory)
 - SignalType<0...X> (optional)
 - SignalVoltage<0...X> (optional)
- The device shall be installed in an appropriate slot.
- An EXCEL template file named “ccdb_signals_list.xlsx” can be downloaded from the CCDB and used to describe the signals of the device.
- The EXCEL template file “ccdb_signals_list.xlsx” can be uploaded in the CCDB to effectively store the signals list in the installed slot device.



3.2. Racks

To be defined in due time.

3.3. IOCs

An Input/Output Controller (IOC) is an application providing an executable that utilizes resources from EPICS modules. Typical usage of an IOC is to interface and control a certain device. For a certain IOC to be correctly stored/represented in the CCDB, the following conditions must be respected:

- The type of the device that runs an IOC (e.g. CPU) shall have an installation slot property named “OperatingSystem”. This property, which is already predefined in the CCDB, is of type enumeration and specifies the operating system platform/architecture (e.g. SL6-x86_64, centos7-x86_64) that the type of the device uses.

 EUROPEAN SPALLATION SOURCE	<h2 style="text-align: center;">CCDB Conventions</h2>		 EUROPEAN SPALLATION SOURCE
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- The type of the device that runs an IOC (e.g. CPU) shall be installed in an appropriate slot and has its installation slot property "OperatingSystem" specified with the correct platform/architecture (e.g. SL6-x86_64, centos7-x86_64).
- The installed slot device that runs an IOC (e.g. CPU) shall have a relationship of type "Contains" with the IOC.
- The IOC shall be installed in an appropriate slot and has a relationship of type "Controls" with each device that it interfaces.
- Each device that the installed slot IOC interfaces shall have a device type property named "EPICSModule" and "EPICSSnippet" (these properties are already predefined in the CCDB). The property "EPICSModule" is of type strings list and shall be used to enumerate all EPICS modules (e.g. SIS8300BCM, asyn) needed to interface the device; the property "EPICSSnippet" is of type strings list and shall enumerate all EPICS snippets (e.g. sis8300bcmChannel, sis8300bcmChannelCommon) also needed to interface the device.