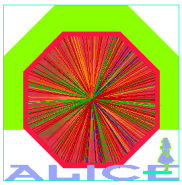

Naming and Numbering Convention for the ALICE Detector Part Identification – Generic Scheme

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Naming and Numbering Convention for ALICE Detector Part Identification – Generic Scheme

Abstract

This document outlines a convention for naming and numbering of individual detector parts. The goal of the convention is to provide a straightforward and independent method for deriving a unique part identification number for each sub-detector component produced in the ALICE detector groups and used in the construction of the ALICE detector. The part identification numbers will be used for physical labelling of components, as database identifiers in the various ALICE and external databases, and to ensure traceability of the parts carrying an identifier throughout the lifetime of the experiment.

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1. Introduction

This document outlines a standard convention for assignment of a unique part identifier for every physical component in the ALICE detector. As all naming conventions, this one will be effective only if adopted by all institutes and laboratories participating in the ALICE experiment and is an integral part of the global ALICE naming and numbering scheme: the ALICE coordinate system [1] and the rules for the determination of equipment functional position names in a sub-detector [2]. Following the guidelines from [2], all detector groups in ALICE should establish a document that defines the convention for functional position names for the sub-detectors under their responsibility.

The concept of a globally applicable and accepted convention is of special importance in view of the distributed production of the ALICE sub-detectors. The convention should allow for an independent part identification number generation on-site, with enough built-in protection to assure that the generated ID is not duplicated elsewhere. During the construction phase the part identifiers will simplify the installation of the ALICE detector from its sub-detector components and will allow the creation of a centralized part repository from the individual sub-detector repositories. It will also facilitate traceability of components used in the detector and during part replacement, which is now mandatory due to INB regulations.

The ALICE detector part identifier convention is based on principles widely used in industry and outlined in the EAN international standard [3]. Similar schemes are adopted by other LHC experiments, notably ATLAS [4] and CMS.

2. Application and scope of the convention

A physical object in a sub-detector should get a part identifier if it can be described as:

- An indivisible logical component or an assembly of components with a set of characteristics that have to be stored and to be retrievable for subsequent use. For example: an electronics chip, spool of wire, a readout card, detector module;
- A service or connection element. For example: electronics crate, power supply, signal cable, gas or water pipe.

The decision to assign a part identifier to an object is at the discretion of the detector group, since trivial objects do not necessitate having one.

3. Structure of the part identifier

The part identifier is a fixed length, 16-character alpha-numeric code composed of:

- A 7 character prefix, which carries information about the sub-detector and the detector group. The prefix is codified and can only contain a fixed set of codes;
- A 9 character field, which contains two reserved positions with special functions (see section 3.3) and a serial number with 9 999 999 possible values, assigned by the detector groups. The serial number should contain only digits from 0-9 in every position.

An example of the part identifier structure and position assignment is given in Figure 1.

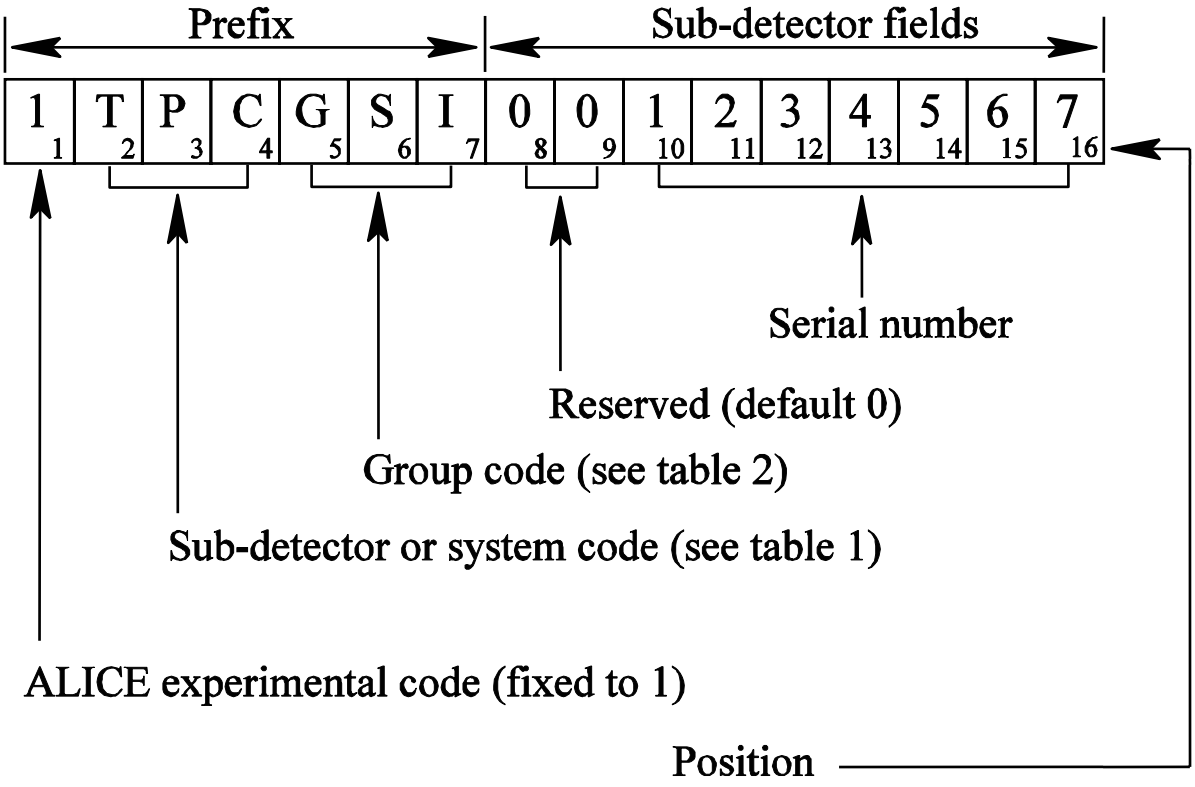

Figure 1. ALICE part identifier structure and position assignment. In the example, the part belongs to the TPC sub-detector and is produced at GSI Darmstadt.

Position No.1 in the prefix is used for the experiment's code. For ALICE, its value is 1. The ATLAS collaboration code is 2.

3.1 The part identifier prefix, positions 1 to 7

The main role of the prefix is to assure that all part identifiers issued by a sub-detector group are unique and to provide some information on the part origin and its sub-detector association. All allowed prefixes and their assignment to systems and sub-detectors are given in table 1 and to groups are given in table 2.

3.2 The part identifier sub-detector fields, positions 8 to 16

The detector groups assign the value in the reserved positions 8 and 9 and the serial number (positions 10-16). The rules for the use of the reserved fields are given in section 3.3.

In principle, the serial number is not supposed to describe the type or nature of the part it identifies. In practice, ranges of numbers may be reserved in advance for similar parts, for example numbers from 1-10000 can be retained for readout cards, numbers from 10001 to 10100 can be set aside for optical fibres, etc. If needed, a range of numbers can be assigned by the detector group for external use, for example by a subcontractor. The general rule is that the use of serial numbers should be sufficiently documented by each detector group by keeping a log of the number to part type relation and through databases.

3.3 Reserved positions

Position No.1 in the part identifier prefix assures that all parts, which belong to the ALICE experiment, can be identified in the LHC environment by a person or automatic bar code reader without any knowledge of the ALICE naming and numbering convention. This functionality and the value of 1 are mandated by a centrally defined coding scheme, outlined in [5] .

Position No.8 is to be used by the detector groups for additional distinction of the part origin:

- The value remains zero if the part is produced by the detector group;
- Digits other than zero or letters can be assigned to an external supplier of a given part. The detector group should document the meaning of the number or letter combination.

Position No.9 is to be used for the special case, when the part is a cable (signal, LV, HV, communication, fibre optics), or a gas or water pipe. Its value is zero for all other components. A cable is signified by a letter C in this position, a pipe is signified by letter P.

4. Bar code standard for production of part identifier stickers

It will often be necessary to encode the part identifier into a bar code sticker for a specific part. The most commonly used bar code standard today is UCC/EAN-128 [3]. This is one of the most compact linear bar code systems, an important advantage for labelling of small objects. The code also incorporates two independent self-checking features that improve the scanning reliability. The use of barcodes for part labelling is mandatory and will facilitate operation and bookkeeping.

5. Sub-detector and group codes

Table 1 lists the mnemonic codes for the sub-detectors and systems to be used in positions 2-4 and table 2 gives the group codes to be used in positions 5-7 of the part identifier.

Code	Sub-detector or system	Code	Sub-detector or system
SPD	ITS SPD	**MTR**	Muon trigger
SDD	ITS SDD	**ZDC**	ZDC
SSD	ITS SSD	**EMC**	EMCAL
TPC	TPC	**TRI**	Trigger
TRD	TRD	**HLT**	HLT
TOF	TOF	**DAQ**	Central DAQ
PHS	PHOS	**DCS**	DCS
CPV	CPV	**FRA**	Front absorber
HMP	HMPID	**SAA**	Small angle abs.
FMD	FMD	**SFR**	Space frame
PMD	PMD	**L3M**	L3 magnet
V00	V0	**DIM**	Dipole magnet
T00	T0	**BMP**	Beam pipe
MCH	Muon tracker	**EXH**	Experimental hall
INT	Integration	**OTR**	Other(not classif.)

Table 1. Sub-detectors and systems mnemonic codes

6. Bibliography

[1] Definition of the ALICE Coordinate System and Basic Rules for Sub-detector Components Numbering, *ALICE-INT-2003-038, EDMS No.*406391

[2] Rules for Development of Functional Position Description for the ALICE Sub-Detectors, *to be submitted as ALICE Internal Note.*

[3] EAN International Article Numbering Association EAN INTERNATIONAL, Rue Royale 145, 1000 Brussels, BELGIUM, http://www.ean-int.org

[4] ATLAS Part Identification, *ATC-OQ-QA-2040 (1999).*

[5] Coding Schemes and Barcodes for Part Identifiers, CEDAR, *EDMS No.*100243

Code	Institute	Code	Institute	Code	Institute
ALE	ALESSANDRIA	FRA	FRANKFURT	ORS	ORSAY
ALI	ALIGARH	GAT	GATCHINA	OSL	OSLO
AMS	AMSTERDAM	HDP	HEIDELBERG-PHYS.	PAD	PADOVA
ATH	ATHENS	KIP	HEIDELBERG-KIRS.	POH	POHANG
BAI	BARI Politecnico	JAI	JAIPUR	PRG	PRAGUE
BAI	BARI University	JAM	JAMMU	PRO	PROTVINO
BEI	BEIJING	HIP	JYVASKYLA	PUE	PUEBLA
BUC	BERGEN College	KAN	KANGNUNG	REZ	REZ
BUR	BHUBANESWAR	KPT	KHARKOV IPT	ROM	ROMA LA SAPIENZA
BIR	BIRMINGHAM	KIE	KIEV	SAC	SACLAY
BRA	BRATISLAVA	KSA	KOLKATA SAHA	SAL	SALERNO
BIP	BUCHAREST IPNE	KVE	KOLKATA VECC	SAR	SAROV VNIIEF
BIS	BUCHAREST ISS	KHS	KHARKOV SRTIIE	SFE	SPLIT FESB
BOL	BOLOGNA	KOS	KOSICE IEP	SPB	ST PETERSBURG SU
BUD	BUDAPEST	KRA	KRAKOW	STR	STRASBOURG
UCT	CAPE TOWN	KUR	KURCHATOV	TBG	TBILISI GA
CAG	CAGLIARI	LNL	LEGNARO	TBS	TBILISI SU
CAT	CATANIA	LIS	LISBON	TOR	TORINO
CER	CERN	LUN	LUND	TRI	TRIESTE
CHA	CHANDIGARH	LYO	LYON	UTR	UTRECHT
CLR	CLERMONT-FERRAND	MEX	MEXICO	WAI	WARSAW Soltan Inst.
OSU	COLUMBUS State Univ	MIN	MOSCOW INR	WAU	WARSAW Univ. Tech.
OSC	COLUMBUS S.C. Centre	MME	MOSCOW MEPHI	WOR	WORMS
CRE	CREIGHTON	MTE	MOSCOW ITEP	WUH	WUHAN
NBI	COPENHAGEN	MUE	MUENSTER	YER	YEREVAN
GSI	DARMSTADT GSI	NAN	NANTES	RBI	ZAGREB
IKF	DARMSTADT IKF	NOV	NOVOSIBIRSK		
JIN	DUBNA JINR / RCANP	OAK	OAK RIDGE		

Table 2. Group mnemonic codes