Quality Assurance

ATLAS PART IDENTIFICATION

Abstract

This document defines the ATLAS PART IDENTIFIER, which shall be used to identify uniquely all physical products that will be processed or produced in the many production sites during the construction of the ATLAS Detector.

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Distribution List

- **QA Authors**
- **ATLAS Production Database WG**

Table of Contents

History of Changes

Version.Revision	Date	Pages	Description
Draft releases	May 1996 Nov. 1996		Draft Reviews by QA Authors (Gérard Bachy, Bertrand Niquevert)
1.0	15 Nov. 1996		First issue – for EB approval
1.1	28 Jan. 1997	6,7	Updated list of Master PBS Names
1.2	04 June 1997		PBS Names update (S & H), FIC
2.0	June 1999	all	Completely rewritten following consensus reached during Production Database Workshop to adopt the scheme proposed in ATL-IT-QA-0007 [1]
2.1	Sept. 1999	all	Replaced ‘Production Center’ by ‘ATLAS Institute’ – industrial suppliers obtain no codes equivalent to ATLAS Institutes. Added section 5: IDENTFICATION OF INDUSTRIAL PRODUCTS. Also modified Author list, Distribution list, Checked by ...
2.2	Oct. 1999	4, 5	Possibility of alpha-numeric sequential numbers moved from footnote to main text. Better description of the role of the “reserved digit” in the sequential number.

1 INTRODUCTION

It is important for quality assurance of production processes and for future repair to identify uniquely each instance of a part that goes into the ATLAS detector. To be useful, the ATLAS PART IDENTIFIER must also be attached to all documents related to a specific part instance. An example might be that some electronics chips were produced in different batches, and after 5 years of operation more and more of these chips are failing. If one could determine that the failed chips were all from one production run, it would be possible to focus the repair efforts on the modules with chips from that batch. New chips might have to be produced, and the existence of complete quality assurance data from the original production runs could allow to pin-point the cause for the failure, and permit to exclude that the new chips would be produced with the same weakness.

2 PURPOSE

This document provides to the ATLAS Collaboration the rules to:

- create ATLAS PART IDENTIFIERs which are unique throughout the LHC project (accelerator & experiments);
- identify uniquely all instances of parts as individual items or as batches of many identical items.

3 SCOPE

In ref. [2], a common part identification and coding scheme has been proposed for the LHC and its experiments, with Code 128 as the recommended barcode symbology. Parts belonging to ATLAS shall be identified by a 14-character alpha-numeric code with the character '2' in the first character position[1].

The present document defines the coding scheme for the 13 remaining character positions.

The ATLAS PART IDENTIFIER defined here applies to:

- all ATLAS Detector systems, sub-systems, assemblies, sub-assemblies and components;
- all stages of fabrication and assembly;
- all involved Institutes concerned with the ATLAS Project.

4 STRUCTURE OF THE ATLAS PART IDENTIFIER

The primary role of the ATLAS PART IDENTIFIER is to serve as a unique key permitting to search for, and retrieve efficiently all pertinent information about instances of parts stored in logbooks or databases (e.g. production logs, component traceability records, QA/QC records, test results, maintenance records, etc...). In a world-wide distributed production such as for the ATLAS detector, it is necessary that participating institutes are independent and autonomous in generating new identifiers as needed. The ATLAS PART IDENTIFIER is therefore divided into two main areas: a prefix and a sequential number, the role of the prefix being to uniquely identify the issuer of the sequential number.

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[1] In the first version, ref. [2] proposes specifically to use '20' in the first two character positions for parts of the ATLAS Detector. Since then, it has been agreed that any code beginning with '2' may be used for any part belonging to ATLAS, without restriction to parts of the ATLAS Detector.

In the ATLAS PART IDENTIFIER no information is encoded about different types of parts. Any ATLAS PART IDENTIFIER can thus be attributed to any part. It is recommended not to use the sequential number for any kind of classification. This helps to avoid errors and simplifies identification procedures.

The structure of the ATLAS PART IDENTIFIER is displayed in Figure 1. It is a fixed-length, 14-character alpha-numeric code composed of a prefix and a sequential number. It is modeled after the international EAN system used in commerce and industry [3].

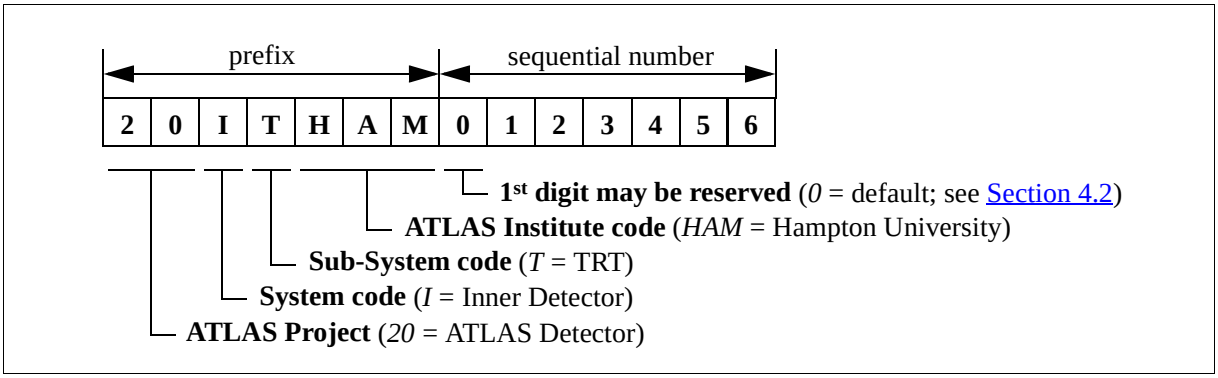

Figure 1: Structure of the ATLAS PART IDENTIFIER.

4.1 Prefix

Different ATLAS Projects [4], [5] shall use the following numeric codes in character positions (1 – 2):

ATLAS Project Code		ATLAS Project name
numeric	mnemonic	
‘20’	ATL	ATLAS Detector
‘21’	ATF	ATLAS General Facilities
‘22’	ATA	ATLAS Assembly and Test Areas
‘23’	ATO	ATLAS Offline Computing
‘24’	ATC	ATLAS Technical Co-ordination

Character positions (3) and (4) are used for the mnemonic SYSTEM CODE and SUB-SYSTEM CODE, respectively, defined in ref. [6]. Positions (5 – 7) identify the ATLAS INSTITUTE [7] which generates and assigns ATLAS PART IDENTIFIERS according to the present document.

The mnemonic codes in character positions (3 – 7) may be replaced by numeric codes to obtain all-numeric ATLAS PART IDENTIFIERs. This is of interest e.g. when the space for a barcode label is a premium, since Code-128 yields substantially smaller barcodes for all-numeric codes [2]. The so-called PBS NUMBERs [6] shall be used as numeric SYSTEM and SUB-SYSTEM CODEs, except for the Trigger/DAQ system which shall use ‘0’ instead of ‘10’. Numeric ATLAS INSTITUTE CODEs are defined and maintained together with their mnemonic counterparts [7].

4.2 Sequential number

The 7-digit sequential number allows each ATLAS INSTITUTE to issue up to 10 million identifiers. The sequential number may be extended to be alpha-numeric, if an institute risks to overrun the limit of 10^7 identifiers. Commercially available and affordable label generating software typically includes 'counters' to generate sequential numbers. Such packages also provide simple means for adding the constant, custom-defined prefix, and allow to print any other information on labels which carry ATLAS PART IDENTIFIERs.

Sequential numbers are generated under the responsibility of the ATLAS INSTITUTE indicated in the prefix. They must be unique, in compliance with this procedure, and traceable.

It is recommended to reserve (where possible) the first digit in order to define multiple ranges of 1 million identifiers [x000000...x999999], which can then be used in parallel. For example, this enables an institute to introduce an independent label generator in another location, such as a second assembly area, a store room or goods reception area, or even at the site of an industrial contractor (c.f. Section 5).

5 IDENTIFICATION OF INDUSTRIAL PRODUCTS

Industrial suppliers normally use established internal procedures to satisfy traceablity requirements and to identify products delivered to clients. In most cases, products from industrial suppliers shall be assigned ATLAS PART IDENTIFIERs by the receiving ATLAS INSTITUTE. This institute is responsible for ensuring full traceability for industrial products by relating the supplier's part identifier to the corresponding ATLAS PART IDENTIFER in a production database.

Exceptionally, an industrial supplier may deliver products already labelled with ATLAS PART IDENTIFERs conforming to this document. Such identifiers shall use the ATLAS INSTITUTE CODE of the institute signing the contract, followed by a unique code (a single letter or digit) in the first position of the sequential number (the reserved digit, see Section 4.2). This code is assigned by the ATLAS INSTITUTE, which is responsible for its uniqueness. The supplier shall guarantee the uniqueness of the sequential numbers for all parts delivered under a contract with the same ATLAS INSTITUTE.

REFERENCES

Note that all documents (except for ref. [3]) can be retrieved via the World Wide Web from the URL

http://edmsoraweb.cern.ch:8001/cedar/doc.search

1 ATL-IT-QA-0007 Part Identification for the ATLAS TRT.

2 EDMS Doc 100243 Coding schemes and barcodes standards for part identifiers.

3 EAN International Article Numbering Association:
EAN INTERNATIONAL, Rue Royale 145 1000 BRUXELLES
http://www.ean.be/

4 ATC-OQ-QA-3031 Product Breakdown Structure

5 ATC-GE-ER-0001 Technical Co-ordination Technical Design Report,
CERN/LHCC/99-01 ATLAS TDR 13, 31 January 1999

6 ATC-OQ-QA-2031 System and Sub-System Codes

7 ATL-GE-QA-2032 ATLAS Institute Codes