VDA German Association of the Automotive Industry

Recommendation

Object Identification in the Automotive Industry

VDA 5014
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Abstract

This recommendation describes how the unique identification of objects in the automotive industry can be achieved.

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Content

List of Abbreviations 4

Recommendations and Standards 5

1 Introduction 6

2 Recommended Structure for Object Identifiers in the Automotive Industry 7

2.1 Object Identifier with three Data Elements (IAC, CIN, SN) 7
2.2 Object Identifier with five Data Elements (IAC, CIN, OT, +, SN) 8
2.3 Data Identifier (DI) 9
2.4 Issuing Agency Code (IAC) 9
2.5 Company Identification Number (CIN) 9
2.6 Object Type (OT) 10
2.7 Serial Number (SN) 10

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List of Abbreviations

an	Alphanumeric
ANSI	American National Standards Institute
CIN	Company Identification Number
DI	Data Identifier
DUNS	Data Universal Numbering System
IAC	Issuing Agency Code
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
JAIF	Joint Automotive Industry Forum
OT	Object Type
RFID	Radio-Frequency Identification
SN	Serial Number
VDA	German Association of the Automotive Industry
VIN	Vehicle Identification Number

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Recommendations and Standards

Other related and relevant recommendations and standards are listed below.

ISO	
ISO 15394	Packaging - Bar code and two-dimensional symbols for shipping, transport and receiving labels
ISO/IEC 15418	Information technology - Automatic identification and data capture techniques - GS1 Application Identifiers and ASC MH10 Data Identifiers and maintenance
ISO/IEC 15459-2	Information technology - Automatic identification and data capture techniques - Unique identification, Part 2: Registration procedures
ISO/IEC 17360	Automatic identification and data capture techniques - Supply chain applications of RFID - Product tagging, product packaging, transport units, returnable transport units and returnable packaging items
ISO/IEC 6523	Information technology - Structure for the identification of organizations and organization parts
JAIF	
JA01	Data Identifiers for Use in AutoID
Odette	
B21/LR05	RFID Item Level Standard
LR02	RFID in Vehicle Distribution Processes
LR03	RFID for Tracking of Parts and Assemblies
LR06	Capturing Supply Chain Events with auto-ID
LR07	Implementing RFID in the Automotive Supply Chain
RC-6/LR04	Returnable Transport Items Identification
VDA	
5006	Unique Partner Identification Key (UPIK) (German only)
5500	Basic Principles for RFID Application in the Automotive Industry
5501	RFID for Container Management in the Supply Chain
5509	AutoID/RFID-Application and Data Transfer for Tracking Parts and Components in the Vehicle Development Process
5510	RFID for Tracking Parts and Components in the Automotive Industry
5520	RFID for Vehicle Identification in Production, Logistics and for the Realization of Services
5530	EPCIS - Automotive Business Vocabulary

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1 Introduction

In the automotive industry, the unique identification of objects plays a central role due to legal requirements for tracking the life cycle, automation or digitalisation of processes. To achieve this, each object is assigned an ID when it is created. This ID is an alphanumeric (an) character string with a specific structure. It is used, for example, to identify specific parts, equipment, components, containers, products, transport equipment or means of transport. The identifiers can take the form of plain text or other digital data carriers such as 1D barcodes, QR codes, data matrix codes or AutoID tags.

In contrast to simple character strings, object identifiers are used to initially recognise which object type is being identified by means of data identifiers (see chapter 2.3 Data Identifier (DI)). In the automotive industry, identifiers with 3 or 5 data elements are used depending on the object type. The specific structure is described in chapter 2.

Various parameters must be taken into account when planning the use of object identifiers:

- It is advisable to use the object identifier as a whole (incl. data identifier) as a unique key to ensure singularity. If it is necessary to use the content of individual data elements from the object identifier, this information should be stored or processed in addition to the object identifier.
- Depending on the use case, the requirements from IT systems or the technologies used, there may be restrictions on the maximum length of object identifiers.

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2 Recommended Structure for Object Identifiers in the Automotive Industry

2.1 Object Identifier with three Data Elements (IAC, CIN, SN)

	DI	IAC	CIN	SN
Description	Data Identifier	Issuing Agency Code	Company Identification Number	Serial Number
Character	an A-Z and 0-9	OD - Odette UN - DUNS an A-Z and 0-9	6an for IAC OD 9n for IAC UN (numerical (n) / an)	Restricted character set: A-Z, 0-9 As well as the characters space, minus, dot and comma
Length	1..4	2		1..n
Responsible	ISO/IEC 15418, ANSI MH10.8.2, JA01 JAIF Data Identifiers for Use in AutoID	ISO 15459-2	Odette ID for IAC OD Dun & Bradstreet for IAC UN	Owner of the CIN
Comment	The format for DIs is an uppercase letter preceded by one, two or three digits.			Reasons for the restricted character set include use in legacy systems and security requirements as well as technical requirements of certain technologies such as RFID.
Examples				
Asset Serial-number	*25S*	*UN*	*321456789*	*ABC123-456789*
Location	*25L*	*UN*	*891456712*	*DE.W70.G04.OG1.R15*
Location	*25L*	*UN*	*891456712*	*shift.triangle.study*

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2.2 Object Identifier with five Data Elements (IAC, CIN, OT, +, SN)

	DI	IAC	CIN	OT	+	SN
Description	Data Identifier	Issuing Agency Code	Company Identification Number	Object Type	Separator	Serial Number
Character	an A-Z and 0-9	OD - Odette UN - DUNS an A-Z and 0-9	6an for IAC OD 9n for IAC UN (numerical (n) / an)	Restricted character set: A-Z, 0-9 As well as the characters Space, minus, dot and comma	+	Restricted character set: A-Z, 0-9 As well as the characters Space, minus, dot and comma
Length	1..4	2		1..n	1	1..n
Responsible	ISO/IEC 15418, ANSI MH10.8.2, JA01 JAIF Data Identifiers for Use in AutoID	ISO 15459-2	Odette ID für IAC OD Dun & Bradstreet for IAC UN	Owner of the CIN		Owner of the CIN
Comment	The format for DIs is an uppercase letter preceded by one, two or three digits.			Reasons for the restricted character set include use in legacy systems and security requirements as well as technical requirements of certain technologies such as RFID.		Reasons for the restricted character set include use in legacy systems and security requirements as well as technical requirements of certain technologies such as RFID.
Examples						
Generic reusable container	*26B*	*UN*	*123456789*	*47113215*	+	*ABC123456*
Component	*37S*	*OD*	*A12301*	*99755512300FFF-AS01*	+	*123456*

The object identifiers for vehicles have a special status. The chassis number (VIN) administered by the Federal Motor Transport Authority is used here. Its structure is standardised in ISO 3779 - Road Vehicles - Vehicle Identification Number (VIN) and its use is described in VDA 5520.

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2.3 Data Identifier (DI)

Data identifiers specify the type of object to be identified.

ISO/IEC 15418 and ANSI MH10.8.2 define the list of data identifiers to be used. The Joint Automotive Industry Forum has published a subset of this list as ‘JA01 JAIF Data Identifiers for Use in AutoID’. This subset was agreed with the JAIF members and contains the data identifiers actually used in the automotive industry.

The format for DIs is a capital letter preceded by one, two or three digits. The permitted alpha-numeric character set is A-Z and 0-9.

In the MH10.8.2 standard, the DIs are divided into 26 alphabetical categories, depending on the type of data they identify. Depending on the data identifier, there may also be a length, format and/or structure specification.

The DIs in ‘Category 25: Container Information (Y-999Y)’ occupy a special position. Identifiers with this DI may only be used in a closed system environment.

2.4 Issuing Agency Code (IAC)

The IAC indicates which issuing organisation has issued the CIN of the ObjectID. The issuing organisation must be an official institution in accordance with ISO/IEC 15459-2. This table contains the two recommended issuing organisations for the CIN in the automotive industry in Europe and internationally.

Issuing Organisation	Description	IAC	Character
Dun & Bradstreet	Data Universal Numbering System (DUNS)	UN	2 (an)
Odette Europe	Odette Numbering System	OD	2 (an)

Table 1: Recommended Issuing Organisations for the Company Identification Number (CIN)

According to Odette the IAC is predominantly used in Europe, outside of Germany. In accordance with VDA 5006, the VDA recommends the use of numbers from the Data Universal Numbering System (DUNS numbers).

2.5 Company Identification Number (CIN)

The CIN is issued by the above-mentioned official issuing organisations and ensures the unique identification of companies and/or organisational units.

According to DUNS, the CIN consists of nine numeric (n) characters.

Odette specifies the character length with six alphanumeric characters.

Odette IDs beginning with ‘X’ are assigned exclusively for the identification of data exchange stations and may not be used for object identification in accordance with this recommendation.

Six-digit Odette IDs consist of a four-digit main entity ID and a two-digit sub-entity ID. The organisation assigned to a main entity ID is responsible for assigning the sub-entity ID.

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2.6 Object Type (OT)

The object type describes the category of a specific object. It is only permitted for certain data identifiers. For example, the packaging type is specified in the object type for data identifier 26B. The length of the object type is generally variable. As it is separated from the next data element, the serial number, by a separator (+), its detection is guaranteed. According to ANSI MH10.8.2, the total length of OT+SN is limited for some DIs. The company identified by the CIN or the corresponding organisational unit ensures the uniqueness of the object type.

2.7 Serial Number (SN)

The unique labelling of objects is ensured with the help of the serial number. The holder of the CIN manages the SN and is therefore also responsible for its uniqueness. It is not necessary to increment the SN consecutively or without gaps. The length of the serial number is generally variable. According to ANSI MH10.8.2, the total length of SNs is limited for some DIs. The company identified by the CIN or the corresponding organisational unit ensures the uniqueness of the serial number.

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