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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Identification link - iTeh Standards

Part 2: Types/models, lots/batches, items and characteristics

Lien d'identification -

Partie 2: Types/modèles, lots/lots unitaires, éléments et caractéristiques

IEC 61406-2:2024

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

IDENTIFICATION LINK –

Part 2: Types/models, lots/batches, items and characteristics

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IEC 61406-2 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
65E/1075/FDIS	65E/1081/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 61406 series, published under the general title *Identification Link*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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INTRODUCTION

For the encoded Identification Link (IL) string in IEC 61406-1 basic assumptions are:

- the Identification Link designates and links to exactly one individual physical object;
- the Identification Link does not require any additional syntactical or semantical intelligence to use it.

In practice, these two assumptions do not always apply. IEC 61406-2 closes these gaps by specifying additional requirements for cases where:

- data elements with standardized syntax and semantics are encoded in the Structured Identification Link, which gives further information about the kind of identified object, for example product, person, location or document. It can contain additional data elements or classifications:
- for products, the Structured Identification Link can designate and link to the unique information of lots/batches or product codes, and is not limited to the uniqueness of individual items.

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IDENTIFICATION LINK -

Part 2: Types/models, lots/batches, items and characteristics

1 Scope

The part of IEC 61406 complements IEC 61406-1 by providing additional requirements for those cases where data elements are encoded within the Structured Identification Link string with standardized syntax and semantics.

In addition, this document covers cases where the uniqueness relates to product types/models or lots/batches. The default assumption is that the Identification Link identifies unique objects such as unique serialized products, assets, persons or packages, unless otherwise identified.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-351, International Electrotechnical Vocabulary (IEV) – Part 351: Control technology (available at www.electropedia.org)

IEC 61406-1:2022, Identification Link - Part 1: General requirements

ISO/IEC 15418, Information technology – Automatic identification and data capture techniques – GS1 Application Identifiers and ASC MH10 Data Identifiers and maintenance

ISO/IEC 19762:2016, Information technology – Automatic identification and data capture (AIDC) techniques – Harmonized vocabulary

ANSI MH10.8.2, Data Identifier

IETF RFC 3986:2005, Uniform Resource Identifier (URI): Generic Syntax

3 Terms and definitions

For the purposes of this document, the terms, definitions and abbreviations given in IEC 60050-351, ISO/IEC 19762, IEC 61406-1 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1

data carrier

device or medium used to store data as a relay mechanism in an AIDC system

Note 1 to entry: Bar code, OCR character string and RF tag are examples of data carriers.

[SOURCE: ISO/IEC 19762:2016, 01.01.59]

3.2

physical object

technical equipment such as vessels, units, machines, electronic devices and components, assemblies, batteries, components, spare parts, etc.

3.3

product type

result of a specific development process for a range of products belonging to the same product

[SOURCE: IEC 62569-1:2017, 3.1.11]

3.4

lot

definite quantity of some commodity manufactured or produced under conditions that are presumed uniform

Note 1 to entry: Lot is primarily a commercial term.

[SOURCE: ISO 15270:2008, 3.19] / Standards.iteh.ai)

3.5

batch

quantity of material regarded as a single unit, and having a unique reference

Note 1 to entry: Batch is primarily a processing term.

[SOURCE: ISO 15270:2008, 3.3]

3 6

Structured Identification Link

combination of 2D symbol or NFC tag and contained Structured Identification Link string

3.7

Structured Identification Link string

structured data string in URL syntax which is used for globally unique identification and which points to related information on the internet

3.8

System Identifier Data Identifier

sinı

combination of a dot "." as system identifier and an ISO/IEC 15418 conformant Data Identifier

EXAMPLE ".1P", ".S", ".18V", ".16D"

4 General

This document provides:

- instructions on how to encode data elements in the Structured Identification Link string;
- instructions on how to distinguish Structured Identification Link strings conforming to IEC 61406-2 from other URLs, including from generic Identification Link strings conforming to IEC 61406-1;
- instructions on how to implicitly encode the level of uniqueness in data elements in the Structured Identification Link string;
- instructions on how to alter the Structured Identification Link frame when the encoded Structured Identification Link string does relate to unique lots/batches or product codes;
- rationale and additional information behind the requirements to aid understanding by the user.

To ensure that the Structured Identification Link string can be easily and consistently processed and interpreted by the various parties and that the existing markings are affected as little as possible, this document reuses existing standards where possible. The syntax for data elements conforms with IETF RFC 3986 and its method of encoding parameters in URLs. The semantics are taken from ISO/IEC 15148 and ANSI MH10.8.2 because these require only a few additional characters and are widely used in automatic identification.

An Identification Link complying with this document is designated as a "Structured Identification Link".

EXAMPLE https://www.bestmanufacturer.com/asdf?.1P=A1B2C3&.S=123X45 shows a Structured Identification Link for a manufacturer identified by the domain "bestmanufacturer.com" with the manufacturer-assigned product code "A1B2C3" and the manufacturer-assigned serial number "123X45".

NOTE 1 In this document product type and product model are used as synonyms.

NOTE 2 In this document product lot and product batch are used as synonyms.

The informative Annex A provides an example of a process flow to parse Identification Link strings.

The informative Annex B provides examples of Structured Identification Link strings.

The informative Annex C provides considerations for the use case of Identification Links in Digital Product Passports.

The informative Annex D provides information on how to include a digital signature conforming to ISO/IEC 20248 in the Structured Identification Link.

The informative Annex E provides information on how a default hostname can be derived from an Identification Link string.

The informative Annex F provides information on how Identification Link Strings can be embedded into DevIDs according to IEEE 802.1AR™-2018.

5 URL parameter

5.1 Data elements encoded in URL parameters

5.1.1 Requirements

All data elements for product types or lot or batch identification, or characteristics, shall be encoded as parameters in the query string according to IETF RFC 3986.

The manufacturer may include additional data elements elsewhere in the URL, for example in the path or further parameters without the SIDI syntax. Such data elements are not expected to be relevant for users other than the manufacturer.

5.1.2 Rationale and supplemental guidance

By using the existing URL syntax for parameters, the generic and widely established logic to parse URLs can be used for extracting the data elements from the Structured Identification Link string.

By having all structured information contained in URL parameters, and not within the other URL components (host, path, fragment) of the URL there is no additional need to parse the path. This reduces the complexity of the parsing and facilitates grouping or redirecting with the path.

EXAMPLE For redirecting: www.domain-abc.com/oldportal?.1P=1A2B3C&.S=54321 can be redirected to www.domain-abc.com/newportal?.1P=1A2B3C&.S=54321

5.2 Parameter name and value tuples for data elements

5.2.1 Requirement

The parameter name shall be the data element name and the parameter value shall be the data element value.

5.2.2 Rationale and supplemental guidance

By using the existing URL syntax for parameters, the generic and widely established logic to parse URLs can be used for extracting the data elements out of the URL in tuples of names and values.

NOTE Parameter name and parameter value are separated by an equal sign "=".

5.3 SIDIs as parameter names

5.3.1 Requirement

The parameter name shall start with a dot "." as System Identifier and be followed by Data Identifiers in conformance with ISO/IEC 15418.

Only parameters that have Data Identifiers in conformance with ISO/IEC 15418 shall start with a dot ".".

5.3.2 Rationale and supplemental guidance

This concatenation of the System Identifier dot "." and a Data Identifier is abbreviated as "SIDI". It has the format of a dot "." followed by zero to three digits and one uppercase alphabetic character, i.e. a maximum number of four characters.

The dot "." as prefix for the Data Identifier serves as System Identifier to indicate that a data element with an ISO/IEC 15418 Data Identifier follows.

Parameters other than SIDIs are allowed but can be ignored when parsing the Structured Identification Link string.

NOTE 1 ISO/IEC 15418 refers to ANSI MH 10.8.2 for the definitions of Data Identifiers.

NOTE 2 In ANSI MH 10.8.2 System Identifiers are designated as "flag characters".

NOTE 3 The dot "." has the code 46 in the ASCII table.

EXAMPLE ".1P", ".S", ".18V", ".16D"

5.4 One data element per parameter

5.4.1 Requirement

There shall be only one data element encoded per parameter.

5.4.2 Rationale and supplemental guidance

If more than one data element has to be encoded in the Structured Identification Link string, the standard URL parsing logic can be used by taking a single parameter for each data element. This does not preclude the use of the data structures and semantics defined in ISO/IEC 15418 or ANSI MH 10.8.2 for specific data identifiers. Multiple pieces of information can be combined in the data element value.

Parameter names can be repeated in the Structured Identification Link string, for example when several lots are included in one package.

5.5 Order of parameters is irrelevant

5.5.1 Requirement

There shall be no logic encoded in the order of the parameters in the string.

5.5.2 Rationale and supplemental guidance

The order of parameters can easily be lost during processing in databases. Requirements on the order of the parameters would add complexity in subsequent processing and are not necessary because of the standardized semantics of the Data Identifiers.

5.6 Parameter values conform to Data Identifier specifications

5.6.1 Requirement

Parameter values associated with SIDIs used as parameter names shall conform in syntax and semantics to the specifications of ISO/IEC 15418 and ANSI MH 10.8.2 Data Identifiers.

5.6.2 Rationale and supplemental guidance

ISO/IEC 15418 points to ANSI MH 10.8.2 for the definitions of the Data Identifiers and the associated syntax and semantics. Data Identifiers have been standardized for decades and are well-established in barcode applications. This encoding requires only a few characters, which is an important aspect of the 2D-code size.

The Structured Identification Link string can also include parameters that do not use SIDIs, for example for internal data of the manufacturer that is not expected to be processed and interpreted by others.

NOTE 1 ISO/IEC 15418 Data Identifiers have the structure of zero to three integers followed by one uppercase alphabetic character.

NOTE 2 New Data Identifiers can be requested from the Data Identifier Maintenance Committee (DIMC).