

**CATENA-X**  
STANDARD



**CX - 0019 Aspect Model SerialPart v2.0.0**

Contact: [standardisierung@catena-x.net](mailto:standardisierung@catena-x.net)

## Table of Contents

CX - 0019 Aspect Model SerialPart v2.0.0

Table of Contents

ABOUT THIS DOCUMENT & MOTIVATION

DISCLAIMER & LIABILITY

REVISIONS & UPDATE

COPYRIGHT & TRADEMARKS

ABSTRACT

1. INTRODUCTION

1.1 AUDIENCE & SCOPE

1.2 CONTEXT

1.3 ARCHITECTURE OVERVIEW

1.4 CONFORMANCE

1.5 PROOF OF CONFORMITY

1.6 EXAMPLES

1.7 TERMINOLOGY

2 ASPECT MODEL "SerialPart"

2.1 INTRODUCTION

2.2 SPECIFICATION ARTIFACTS

2.3 LICENSE

2.4 IDENTIFIER OF SEMANTIC MODEL

2.5 FORMATS OF SEMANTIC MODEL

2.5.1 RDF Turtle

2.5.2 JSON Schema

2.5.3 aasx

3 REFERENCES

3.1 NORMATIVE REFERENCES

3.2 NON-NORMATIVE REFERENCES

3.3 REFERENCE IMPLEMENTATIONS

ANNEXES

FIGURES

TABLES

## ABOUT THIS DOCUMENT & MOTIVATION

Catena-X is the first open and collaborative data ecosystem. The goal is to provide an environment for the creation, operation, and joint use of end-to-end data chains along the entire automotive value chain. All partners are on an equal ground, have sovereign control over their data and no lock-in effects occur. This situation provides a sustainable solution for the digitalization of supply chains, especially for medium-sized and small companies, and supports the cooperation and collaboration of market participants and competitors.

The ever-growing Catena-X ecosystem will enable enormous amounts of data to be integrated and collaboratively harnessed. To ensure that these complex data volumes can be sent, received, and processed smoothly across all stages of the value chain, one language for all players: common standards. The standards of the Catena-X data ecosystem define how the exchange of data and information in our network works. They are the basis for ensuring that the technologies, components, and processes used are developed and operated according to uniform rules.

Common standards create added value for all partners: Within our network, data flows more smoothly through interfaces. In addition, we avoid cumbersome individual IT solutions for sharing data with other partners. In the field of international standardization, Catena-X follows the proven international standardization institutions: ISO/IEC/ITU and CEN-CENELEC/ETSI.

For users and data providers, implementation of standards will reduce the costs that would arise from adapting different systems. In addition, no important data is lost. On the contrary, it even becomes easier to collect data across companies. For operators and developers, standards will create a framework that provides reliable orientation and planning security.

The following document describes one of the standards used in the Catena-X ecosystem and the requirements needed to implement it. Here, it serves as main resource to illustrate the following data model. It contains information starting from the format of the model, up to the conceptual and physical model. The standardisation of the data model will enable faster information sharing and homogeneity throughout the entire Catena-X ecosystem.

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## ABSTRACT

The semantic model described below describes a submodel for a digital twin of a serialised part providing essential information about this part. A serialized part is an instance of a part, where the particular instance can be uniquely identified by means of a serial number, a similar identifier (e.g. VAN) or a combination of multiple identifiers (e.g. combination of manufacturer, date and number).

## 1. INTRODUCTION

This standardization introduces the standardized aspect model for serialized parts with corresponding JSON schemas and payloads for guidance and orientation on how to provision and exchange the corresponding data within Catena-X. This aspect model is needed to provide minimal but essential information about a serialised part to enable Catena-X use cases on an instance level like traceability.

Note: The presented aspect model is in version 1.0.1.

### 1.1 AUDIENCE & SCOPE

*This section is non-normative*

This standard applies to the roles:

1. Data Provider / Consumer
2. Business Application Provider

The described semantic model or submodel template MUST be provided by Traceability applications provisioning data as well as all data providers in the traceability use-case.

## 1.2 CONTEXT

*This section is non-normative*

This submodel template or aspect model is required to identify a part instance within Catena-X. It links local identifiers like manufacturerPartId, customerPartId and other data like manufacturing information and part type information to the actual unique ID being used within Catena-X, which is a UUIDv4 with the prefix "urn:uuid:". Therefore by accessing this aspect you can link a physical part to its representation within the Traceability Use-Case in Catena-X.

## 1.3 ARCHITECTURE OVERVIEW

*This section is non-normative*

## 1.4 CONFORMANCE

As well as sections marked as non-normative, all authoring guidelines, diagrams, examples, and notes in this specification are non-normative. Everything else in this specification is normative.

The key words **MAY**, **MUST**, **MUST NOT**, **OPTIONAL**, **RECOMMENDED**, **REQUIRED**, **SHOULD** and **SHOULD NOT** in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

## 1.5 PROOF OF CONFORMITY

*This section is non-normative*

All participants\* and their solutions **MUST** prove, that they are conform with the Catena-X standards. To validate that the standards are applied correctly, Catena-X employs Conformity Assessment Bodies (CABs).

The proof of conformity for a single semantic model is done according to the general rules for proving the conformity of data provided to a semantic model or the ability to consume the corresponding data.

*\*Disclaimer: The operating model released by the Catena-X association will define the roadmap, content and scope for the certification process. This will include the roles, certification and further assessment procedures as well as the rollout phases.*

## 1.6 EXAMPLES

Example JSON payload: Submodel "SerialPart" for a Vehicle

```
{
  "localIdentifiers": [
    {
      "key": "manufacturerId",
      "value": "BPNL7588787849VQ"
    },
    {
      "key": "manufacturerPartId",
      "value": "95657362-83"
    },
    {
      "key": "partInstanceId",
      "value": "OEM-A-F8LM95T92WJ9KNDD3HA5P"
    },
    {
```

```

    "key": "van",
    "value": "OEM-A-F8LM95T92WJ9KNDD3HA5P"
  }
],
"manufacturingInformation": {
  "date": "2022-02-04T14:48:54",
  "country": "DEU"
},
"catenaXId": "urn:uuid:580d3adf-1981-44a0-a214-13d6ceed9379",
"partTypeInformation": {
  "manufacturerPartID": "QX-39",
  "classification": "product",
  "nameAtManufacturer": "Vehicle Model A"
}
}

```

Example JSON payload: Submodel "SerialPart" for a Serialized Part (Non-Vehicle)

```

{
  "localIdentifiers": [
    {
      "key": "manufacturerId",
      "value": "BPNL7588787849VQ"
    },
    {
      "key": "manufacturerPartId",
      "value": "95657362-83"
    },
    {
      "key": "partInstanceId",
      "value": "NO-574868639429552535768526"
    }
  ],
  "manufacturingInformation": {
    "date": "2022-02-04T14:48:54",
    "country": "DEU"
  },
  "catenaXId": "urn:uuid:d60b99b0-f269-42f5-94d0-64fe0946ed04",
  "partTypeInformation": {
    "manufacturerPartID": "95657362-83",
    "customerPartId": "798-515297795-A",
    "classification": "component",
    "nameAtManufacturer": "High Voltage Battery",
    "nameAtCustomer": "High Voltage Battery"
  }
}

```

## 1.7 TERMINOLOGY

*This section is non-normative*

Aspect Model : a formal, machine-readable semantic description (expressed with RDF/turtle) of data accessible from an Aspect.

: Note 1 to entry: An Aspect Model must adhere to the Semantic Aspect Meta Model (SAMM), i.e., it utilizes elements and relations defined in the Semantic Aspect Meta Model and is compliant to the validity rules defined by the Semantic Aspect Meta Model.

: Note 2 to entry: Aspect model are logical data models which can be used to detail a conceptual model in order to describe the semantics of runtime data related to a concept. Further, elements of an Aspect model can/should refer to terms of a standardized Business Glossary (if existing).

*[Source: Catena-X, CX-0002, note 3 removed]*

Additional terminology used in this standard can be looked up in the glossary on the association homepage.

## 2 ASPECT MODEL “SerialPart”

*This section is normative*

This submodel template or aspect model is required to identify a part instance within Traceability in Catena-X. It also holds basic information on the part itself.

### 2.1 INTRODUCTION

This aspect model links local identifiers like manufacturerPartId, customerPartId and other data like manufacturing information and part type information to the actual catenaXId from Catena-X, which is a UUIDv4. This allows decoupling of the network identifiers from the actual business process. By accessing this aspect you can link a physical part to its representation within the Traceability Use-Case in Catena-X. Every data provider of SerialPart data **MUST** provide the data conformant to the semantic model specified in this document. The unique identifier of the semantic model specified in this document **MUST** be used by the data provider to define the semantics of the data being transferred. Every certified business application relying on SerialPart data **MUST** be able to consume data conformant to the semantic model specified in this document. This semantic model **MUST** be made available in the central Semantic Hub. Data consumers and data provider **MUST** comply with the license of the semantic model.

The submodel data **MUST** be transferred using the IDS Protocol as described in CX-0018 and CX-0002. Data providers **MUST** provide the data as part of a digital twin of the asset for serialized parts conformant to CX - 0002 DIGITAL TWINS IN CATENA-X . The JSON Payload of data providers **MUST** be conformant to the JSON Schema as specified in this document.

### 2.2 SPECIFICATION ARTIFACTS

The modeling of the semantic model specified in this document was done in accordance to the “semantic driven workflow” to create a submodel template specification [SMT](#).

This aspect model is written in BMM 2.0.0 as a modeling language conformant to CX-0003 as input for the semantic driven workflow.

Like all Catena-X data models, this model is available in a machine-readable format on GitHub conformant to CX-0003.

### 2.3 LICENSE

This Catena-X data model is made available under the terms of the Creative Commons Attribution 4.0 International (CC-BY-4.0) license, which is available at Creative Commons.

### 2.4 IDENTIFER OF SEMANTIC MODEL

The semantic model has the unique identifier

urn:bamm:io.catenax.serial\_part:1.0.1#SerialPart

## 2.5 FORMATS OF SEMANTIC MODEL

### 2.5.1 RDF Turtle

The rdf turtle file, an instance of the Semantic Aspect Meta Model, is the master for generating additional file formats and serializations.

[https://github.com/eclipse-tractusx/sldt-semantic-models/blob/main/io.catenax.serial\\_part/1.0.1/SerialPart.ttl](https://github.com/eclipse-tractusx/sldt-semantic-models/blob/main/io.catenax.serial_part/1.0.1/SerialPart.ttl)

The open source command line tool of the Eclipse Semantic Modeling Framework is used for generation of other file formats like for example a JSON Schema, aasx for Asset Administration Shell Submodel Template or a HTML documentation.

### 2.5.2 JSON Schema

A JSON Schema can be generated from the RDF Turtle file. The JSON Schema defines the Value-Only payload of the Asset Administration Shell for the API operation "GetSubmodel".

### 2.5.3 aasx

An AASX file can be generated from the RDF Turtle file. The AASX file defines one of the requested artifacts for a Submodel Template Specification conformant to [\[SMT\]](#).

## 3 REFERENCES

### 3.1 NORMATIVE REFERENCES

CX-0002 DIGITAL TWINS IN CATENA-X

CX-0003 BAMB Aspect Meta Model

CX-0004 GOVERNANCE PROCESS

CX-0018 ECLIPSE DATA SPACE CONNECTOR (EDC)

### 3.2 NON-NORMATIVE REFERENCES

*This section is non-normative [SMT] How to create a submodel template specification. Guideline. Download from:*  
<https://industrialdigitaltwin.org/wp-content/uploads/2022/12/140-IDTA-WS-Process-How-to-write-a-SMT-FINAL-.pdf>

### 3.3 REFERENCE IMPLEMENTATIONS

*This section is non-normative*

## ANNEXES

### FIGURES

*This section is non-normative*

### TABLES

*This section is non-normative*