




ERJU SYSTEM PILLAR

# TCCS - Data Model\_02\_Schema



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Abstract	Model Schema of CCS/TMS Data Model from System Pillar TCCS (Subdomain 1)
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## 2 Description

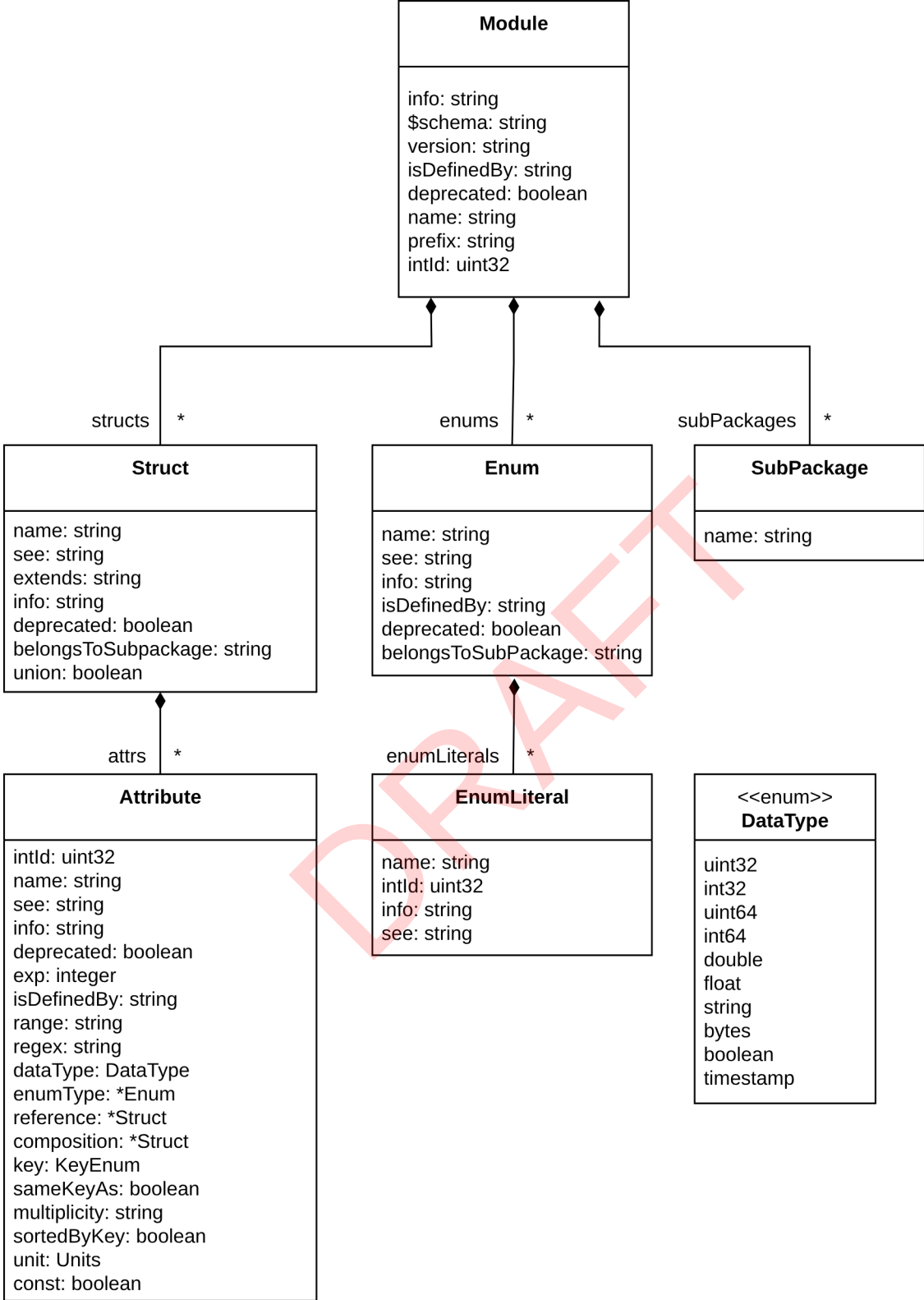
**SPT2TS-124877** - The Schema can also be found in the ERTMS sharepoint.

Download Folder: TCCS SD1 - Data Model Schema: <https://eeigertms.sharepoint.com/:f:/r/sites/SPOpenShare/Gedeelde%20documenten/General/23-07-06%20TCCS%20SD1%20Data%20Model%20v0.2?csf=1&web=1&e=OLAihJ>

 Content to be approved ]

DRAFT

SPT2TS-127928 - A class diagram representing the schema.



[ Open ]

SPT2TS-123924 -

```
{
  "$id": "https://ERJU",
  "$schema": "http://json-schema.org/draft-08/schema#",
}
```

```

"definitions": {
  "attr": {
    "type": "object",
    "properties": {
      "intId": { "type": "integer", "minimum": 1, "description": "zero-based position" },
      "name": { "type": "string", "pattern": "^[a-z][a-zA-Z0-9_]{0,64}$",
        "description": "Expressive name of the attribute. Given in camelCase and must be accepted as an attribute name
        by well known programming languages."
      },
      "dataType": {
        "type": "string",
        "enum": ["uint32", "int32", "uint64", "int64", "double", "float", "string", "bytes", "boolean", "timestamp"],
        "description": "The data type of an attribute. Bytes are given as base64 string"
      },
      "composition": {
        "type": "string", "description": "Reference to an owned class. In format prefix.ClassName. Prefix is needed only if
        in a different namespace."
      },
      "reference": {
        "type": "string",
        "description": "Reference to a shared class. In format prefix.ClassName, Prefix is needed only if in a different
        namespace."
      },
      "enumType": {
        "type": "string",
        "description": "Reference to an enumeration. In format prefix.EnumerationName, prefix is needed only if in a
        different namespace."
      },
      "key": {
        "type": "string", "default": "none",
        "description": "defines if the data-object is addressable by this attribute",
        "enum": ["none", "local", "global"]
      },
      "sameKeyAs": {
        "type": "string",
        "description": "if a big class is splitted into parts (layers), all parts share the same key representing original
        object. Here is the reference to other part-class e.g. infra.TrackEdge"
      },
      "multiplicity": {
        "type": "string",
        "description": "The range of occurrences, e.g. 2, 1..2, 1..*",
        "pattern": "(\\d\\.\\.?(\\d+|\\*))|\\d+|\\*",
        "default": "1"
      },
      "ordered": {
        "type": "string", "default": "none",
        "enum": ["none", "byIndex", "byKey"],
        "description": "true, if the elements are sorted according to their key-attribute"
      },
      "unit": {

```

```

"type": "string",
"enum": ["m", "s", "minute", "km/h", "m/s", "m/s2", "m2", "m3", "kg", "kN",
"Pa", "V", "W", "A", "Ohm", "K", "Hz", "degree", "rad", "1/m2", "W/m2", "permill", "percent", "1/m"]
},
"info": {"type": "string"},
"isDefinedBy": {"type": "string", "description": "Reference URL"},
"deprecated": {"type": "boolean", "default": false},
"exp": {"type": "integer", "description": "factor to use int for fixed point e.g. 23e-3=0.023"},
"range": {"type": "string", "pattern": "\\d+\\.\\.\\.\\d+", "description": "for integer values if known"}
},
"required": ["intId", "name"],
"oneOf": [
{"required": ["dataType"]},
{"required": ["composition"]},
{"required": ["reference"]},
{"required": ["enumType"]}
],
"additionalProperties": false,
},
"EnumLiteral": {
"type": "object",
"properties": {
"name": {"type": "string", "pattern": "^([a-zA-Z][a-zA-Z0-9_]{0,120})$",
"description": "Name of the enumerator (aka field). Accepted in well known programming languages. Preferably
in capitals"
},
"intId": {"type": "integer",
"description": "integer value to which this enumerator maps. Typically zero-based. The most commonly used
enumerator should evaluate to 0"
},
"info": {"type": "string", "description": "=description"},
"see": {"type": "string", "description": "URL pointing to authoratative documentation, anywhere on the web"}
},
"required": ["name", "intId"],
"additionalProperties": false
},
"struct" : {
"type": "object",
"properties": {
"name": {"type": "string", "pattern": "^([A-Z][a-zA-Z0-9_]{0,64})$",
"description": "Expressive name of the struct, written in PascalCase and accepted in well known programming
languages."
},
"see": {
"type": "string", "description": "reference to an ontology defining the term"
}
},
"extends": {"type": "string",
"description": "a reference to another struct written as prefix.StructName where prefix is an abbreviation of the
namespace URL"
},

```

```

"attrs": {"type": "array", "items": {"$ref": "#/definitions/attr"}},
"info": {"type": "string", "description": "Semantics of the class; unequivocal and clear description intended for
subject matter experts"},
"see": {"type": "string", "description": "URL pointing to authoratative documentation, anywhere on the web"},
"deprecated": {"type": "boolean", "default": false},
"belongsToSubPackage": {"type": "string", "description": "Reference to a package that the class belongs to, this
expresses that this class is in a subject area inside the present namespace"},
"union": {"type": "boolean", "default": false, "info": "only one attribute is allowed. Valid for dataTypes, enumTypes,
compositions and references in mixture."}
},
"required": ["name"],
"additionalProperties": false
},
"enum": {
"type": "object",
"properties": {
"name": {"type": "string", "pattern": "^[A-Z][a-zA-Z0-9_]{0,64}$",
"description": "Expressive name of the enumeration, written in PascalCase and accepted in well known
programming languages."
},
"see": {
"type": "string", "description": "reference to an ontology defining the term"
}
},
"enumLiterals": {"type": "array", "items": {"$ref": "#/definitions/EnumLiteral"}},
"info": {"type": "string"},
"isDefinedBy": {"type": "string", "description": "Reference url"},
"deprecated": {"type": "boolean", "default": false},
"belongsToSubPackage": {"type": "string", "description": "belongs to package listed in the same namespace in
subPackages-property."}
},
"required": ["name", "enumLiterals"],
"additionalProperties": false
},
"package": {
"type": "object",
"properties": {
"name": {"type": "string",
"description": "groups classes of a similar concern within the namespace for the purpose of documentation"
}
},
"required": ["name"],
"additionalProperties": false
}
},
"type": "object",
"description": "Definition of the namespace (module)",
"properties": {
"info": {"type": "string"},
"$schema": {"type": "string", "description": "reference to this schema in each module"},
"version": {"type": "string", "description": "E.g. 1.02a or 2021-10-07"},

```

```

"isDefinedBy": {"type": "string", "description": "Reference url, e.g. http://example.eu/domain/topology"},
"containerStruct": {
  "type": "string",
  "description": "name of the struct representing the main container of the package. It is used for creating
  references /nameOfContainerStruct/nameOfAttr/nameOfAttr/nameOfAttr"
},
"deprecated": {"type": "boolean", "default": false, "description": "true when this namespace will be deleted from
  future releases"},
"name": {"type": "string",
  "description": "Name of this namespace that expresses the discipline, e.g. Power Supply. Typically the same as,
  or similar to, the last part of the namespace"
},
"prefix": {
  "type": "string", "description": "namespace abbreviation used for name resolution. E.g. TP.TrackEdge is found
  inside the namespace given by isDefinedBy."
},
"intId": {"type": "integer", "minimum": 1,
  "description": "
  use-case1: referencing in Data (Timetable.Trip = /30/7) - main use-case,
  use-case2: for binary protocols replacing attr-names Protobuf/OPC-UA,
  use-case3: referencing in Model (TP.TrackEdge) - use prefix.localName instead"
},
"enums": {"type": "array", "items": {"$ref": "#/definitions/enum"}},
"structs": {"type": "array", "items": {"$ref": "#/definitions/struct"}},
"subPackages": {"type": "array", "items": {"$ref": "#/definitions/package"}},
"description": "list of packages"
}
},
"required": ["intId", "prefix", "name", "isDefinedBy"],
"additionalProperties": false
} [🔗 Open ]

```