




ERJU SYSTEM PILLAR

TCCS - Data Model_11_MAP



TCCS - Data Model_11_MAP

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Abstract	This document extends the CCS/TMS data model with data model for defining a Map / views on infrastructure.
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2 Package "Map"

2.1 Package Header


SPT2TS-124910 - Package header

```
{
  "$schema": "ERJU meta-model.json",
  "isDefinedBy": "http://ERJU/datamodel/1.3/map",
  "name": "Map",
  "containerStruct": "MapSet",
  "prefix": "map",
  "intId": 7,
  "version": "1.3",
  "info": "Data model to build map",
  "enums": [], "structs": []
} [ ]
```

2.2 Map

SPT2TS-124911 - A map is considered a kind of projection of real-world elements in 2D/3D space. As there are many possible projections, adding special coordinates as part of the specification of real-world objects is not reasonable. Contrary, the maps are constructed by the specification of coordinates in a special coordinate system. Most geo-coordinate systems are specified by the European Petroleum Survey Group Geodesy (EPSG), which assigned unique 4-5 digits-key-numbers to all possible geo-coordinate systems. Several MapArea objects having the same epsg-code represent one map. As the EPSG-code starts at 1024, the value '1' can be assigned to monitor coordinates.

Different functional elements like Marker boards, Points, Balises, etc. can have projections on the map.

[ Open]

SPMS-7543 - Map

Defines Map for an area

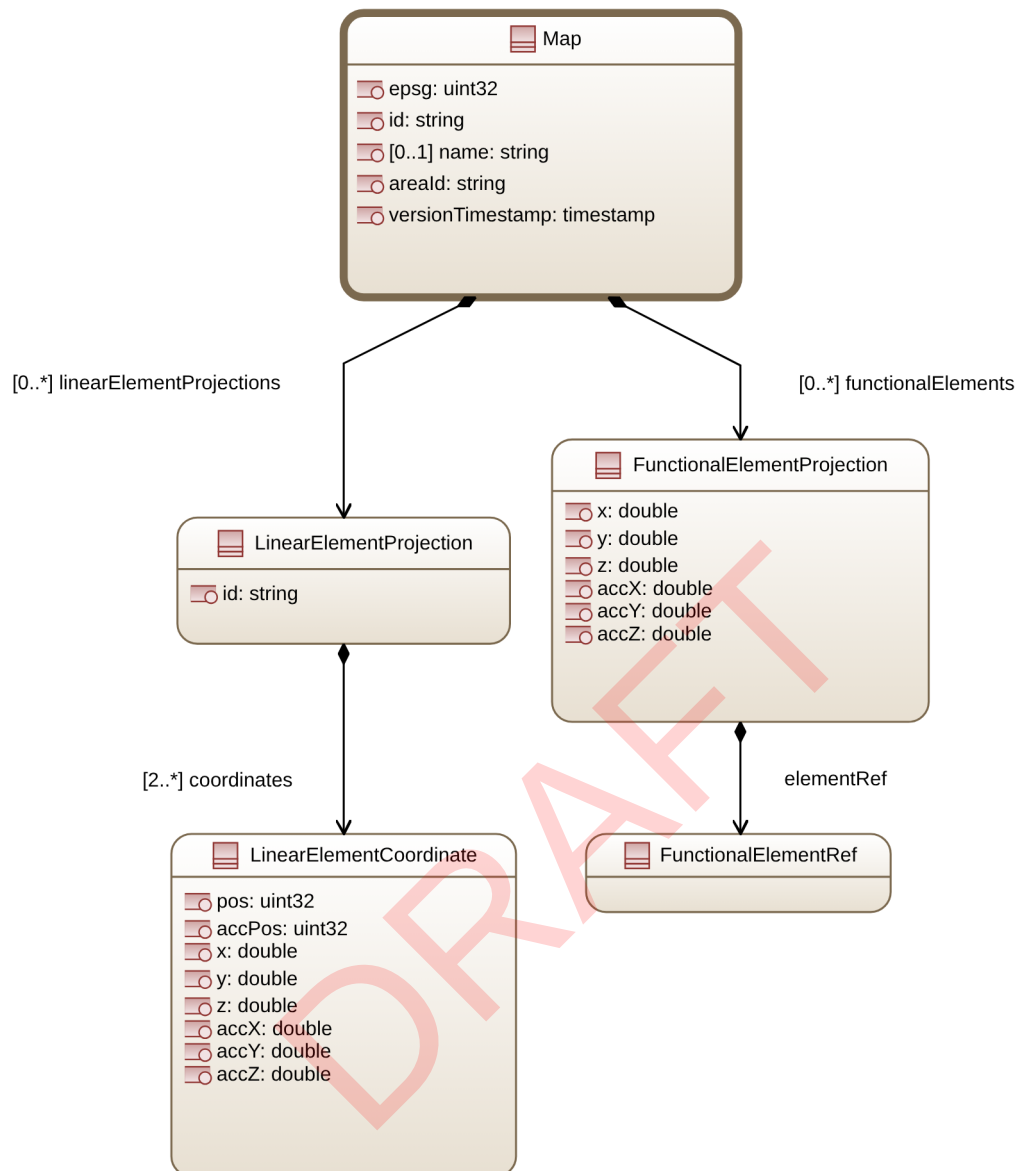


Figure 1 Tree View of Map

SPT2TS-63836 - Map

```

{
  "structs": [
    {
      "name": "Map",
      "info": "Defines Map for an area",
      "attrs": [
        {
          "intId": 1, "name": "id", "dataType": "string", "key": "global", "info": "Identity of the object; used for referencing"},
        {
          "intId": 2, "name": "name", "dataType": "string", "info": "User-friendly name, only if different from id", "multiplicity": "0..1"},
      ]
    }
  ]
}
  
```

```
{
  "intId": 3, "name": "versionTimestamp", "dataType": "timestamp", "info": "Defines the version information which is valid since timestamp"},
  {"intId": 4, "name": "areaId", "dataType": "string", "info": "Defines the areaIds for a Map. There could be several maps representing one area"},
  {"intId": 5, "name": "epsg", "dataType": "uint32", "info": "Defines the applicable EPSG code for the map area. Use 1 for monitor coordinates"},
  {"intId": 6, "name": "linearElementProjections", "composition": "LinearElementProjection", "ordered": "byKey", "multiplicity": "*", "info": "Defines container for projections of linearElements on same mapping system"},
  {"intId": 7, "name": "functionalElements", "composition": "FunctionalElementProjection", "multiplicity": "*", "info": "Defines a container for a reference to a functional element of the infrastructure"}
}
}
} [ ]
```

SPT2TS-125485 - LinearElementProjection (TrackEdgeProjection)

```
{
  "structs": [
    {
      "name": "LinearElementProjection",
      "attrs": [
        {"intId": 1, "name": "id", "dataType": "string", "key": "global", "sameKeyAs": "infra.LinearElement", "info": "Identity of the object; used for referencing"},
        {"intId": 2, "name": "coordinates", "composition": "LinearElementCoordinate", "multiplicity": "2..*", "ordered": "byIndex", "info": "Defines a sequence of coordinates representing a mapping of a linear element"}
      ]
    },
    {
      "name": "LinearElementCoordinate",
      "attrs": [
        {"intId": 1, "name": "pos", "dataType": "uint32", "unit": "m", "exp": -3, "info": "Defines position on the associated LinearElement"},
        {"intId": 2, "name": "x", "dataType": "double", "info": "Defines the x coordiante value, mapping to each EPSG-code"},
        {"intId": 3, "name": "y", "dataType": "double", "info": "Defines the y coordiante value, mapping to each EPSG-code"},
        {"intId": 4, "name": "z", "dataType": "double", "info": "Defines the z coordiante value, mapping to each EPSG-code"},
        {"intId": 5, "name": "accPos", "dataType": "uint32", "unit": "m", "exp": -3, "info": "absolute accuracy as 1sigma. Use 0 if not defined"},
        {"intId": 6, "name": "accX", "dataType": "double", "info": "absolute accuracy as 1sigma. Use 0.0 if not defined"},
        {"intId": 7, "name": "accY", "dataType": "double", "info": "absolute accuracy as 1sigma. Use 0.0 if not defined"},
        {"intId": 8, "name": "accZ", "dataType": "double", "info": "absolute accuracy as 1sigma. Use 0.0 if not defined"}
      ]
    }
  ]
} [ ]
```

SPT2TS-125486 - FunctionalElementProjection

```
{
  "structs": [
    {
      "name": "FunctionalElementProjection",
```

```

"attrs": [
{"intId": 1, "name": "elementRef", "composition": "FunctionalElementRef", "info": "Defines reference
container for which the coordinate is defined"},
{"intId": 2, "name": "x", "dataType": "double", "info": "todo: mapping to each EPSG-code"},
{"intId": 3, "name": "y", "dataType": "double", "info": "todo: mapping to each EPSG-code"},
{"intId": 4, "name": "z", "dataType": "double", "info": "todo: mapping to each EPSG-code"},
{"intId": 5, "name": "accX", "dataType": "double", "info": "absolute accuracy as 1sigma. Use 0.0 if not
defined"},
{"intId": 6, "name": "accY", "dataType": "double", "info": "absolute accuracy as 1sigma. Use 0.0 if not
defined"},
{"intId": 7, "name": "accZ", "dataType": "double", "info": "absolute accuracy as 1sigma. Use 0.0 if not
defined"}
],
{
"name": "FunctionalElementRef",
"union": true,
"attrs": [
{"intId": 1, "name": "switch", "reference": "infra.Switch", "info": "refers to switch/simple point"},
{"intId": 2, "name": "etcsMarker", "reference": "infra.ETCSMarker", "info": "refers to ETCS marker"},
{"intId": 3, "name": "stopLocation", "reference": "infra.StopLocation", "info": "refers to stop location"},
{"intId": 4, "name": "timingPoint", "reference": "infra.TimingPoint", "info": "Defines a reference to a timing
point"},
{"intId": 5, "name": "operationalPoint", "reference": "infra.OperationalPoint", "info": "Defines a reference to
an operational point (station, siding etc)."},
{"intId": 6, "name": "balise", "reference": "infra.Balise", "info": "Defines a reference to a functional balise"},
{"intId": 7, "name": "derailer", "reference": "infra.Derailer", "info": "Defines a reference to a functional
derailer"}
]
}
]
} []

SPT2TS-125484 - MapSet
{
"structs": [
{
"name": "MapSet",
"attrs": [
{"intId": 1, "name": "maps", "composition": "Map", "multiplicity": "*", "ordered": "byKey", "info": "Defines
container for all Maps in a system"}
]
}
]
} []

```