



















TCCS - Data Model_00_Release Notes


SPT2TS-122465 - Revisions of CCS/TMS Extended ERA Ontology and CCS/TMS Data Model


In the following table, the revision history of the CCS/TMS modelling developments (first as standalone ERJU development, now integral part of ERA Ontology) is documented, containing details about the release notes and the review activities. The feedback for one release leads to improvements within the next iteration of the data model and its documentation. Also, schemas are added or extended to cover more use cases of ERJU System Pillar. Besides the history, the planned releases are listed to give an overview of the next steps.


Data Model Version	Release Date	Release Notes	Publish and Review
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Data Model Version	Release Date	Release Notes	Publish and Review
0.1	31.03.2023	<p>By the following documentation, we would like to inform you about the defined scope and mode of work of SP TCCS SD1, i.e. regarding the derived  SPT2TS-2040 - CCS/TMS Extended ERA Ontology (CCS/TMS Data Model) and the intended collaboration with the other domains/FAs:</p> <p>  TCCS SD1 - Scope and Approach for Collaboration and Specification</p> <p>Attachments:</p> <p>  TCCS SD1 - Data Model</p> <p>  TCCS SD1 - Data Model Schema</p> <p>We kindly ask you to take note and provide comments in Polarion (or exported word file).</p> <p>Some additional contexts regarding the  SPT2TS-2040 - CCS/TMS Extended ERA Ontology (CCS/TMS Data Model): The data model initially focuses on the first layers (topology, geometry) and shall demonstrate the SD1 approach in a practical way. This paves the way and defines a base for further extensions in collaboration with you. Besides just providing clarification about the scope and approach of SD1, we also encourage (i.e. the FAs) to give feedback based on their implementation experiences.</p>	<p>The release (Polarion, PDF, JSON) has been shared via email and presentation with:</p> <ul style="list-style-type: none"> • All System Pillar Domain Leads for further distribution to responsible domain members • Innovation Pillar FA1 (incl. CDM) • Innovation Pillar FA2 (WP27) <p>The documentation was used for general scope & approach alignment rather than detailed model content discussion. The received comments (written form, discussions) are used to improve the explanations and structure of documents.</p>
0.2	05.07.2023	<p>Version 0.2 of the  SPT2TS-2040 - CCS/TMS Extended ERA Ontology (CCS/TMS Data Model) has been updated with incoming needs from first use cases</p>	<p>The release (Polarion, PDF, JSON, XML) has been shared with:</p> <ul style="list-style-type: none"> • All System Pillar Domain Leads for


		<p>like ETCS, ATO, and Train Protection. In addition, the document structure has been modified to provide data model separation between different domains with sufficient linking between the domains.</p> <p>The  SPT2TS-2040 - CCS/TMS Extended ERA Ontology (CCS/TMS Data Model) version 0.2 contains the following set of documents:</p> <p> TCCS SD1 - Scope and Approach for Collaboration and Specification (for additional information)</p> <p> TCCS SD1 - Data Model_00_Release Notes (this document)</p> <p> TCCS SD1 - Data Model_01_Introduction</p> <p> TCCS SD1 - Data Model_02_Schema</p> <p> TCCS SD1 - Data Model_10_INFRA</p> <p> TCCS SD1 - Data Model_11_ATO</p> <p> TCCS SD1 - Data Model_11_ENG</p> <p> TCCS SD1 - Data Model_11_TP</p> <p>We ask you to take note and provide comments in Polarion (or exported word file).</p>	<p>further distribution to responsible domain members</p> <ul style="list-style-type: none"> • Innovation Pillar FA1 (incl. CDM) • Innovation Pillar FA2 (i.e. WP27, WP13, WP44) <p>Amongst others, the release with extended model content was used for the following collaborations:</p> <ul style="list-style-type: none"> • Discussion and model improvement together with FA2 WP13 and WP27 experts regarding data model needs for Moving Block demonstrator (TP, INFRA schema) • Discussion of needs regarding the onboard system (e.g. localisation) data needs with FA2 WP27 experts (INFRA Schema) • Discussion with engineering and tool development experts regarding data and model needs, i.e. for ETCS, Interlocking, and Infrastructure; including practical feedback from tool development supporting the data model for import/export. All feedback comments are used for model improvement (ENG/INFRA schema) to ensure applicability for implementation. • Check of ATO schema against actual ATO configuration data (i.e. Segment Profiles) <p>All relevant data model schemata have been commented on within Polarion (or by PDF comments).</p>
0.3	31.08.23	Correction release based on all comments of previous release. In addition, more	The release was used for SP Steering Group information in Sep 23, which led to an

clarification is given in the  [TCCS - Data Model_02_Methodology](#) document regarding the structure and linking of data model schemas, identification and referencing (between data model parts and between instances).

The  SPT2TS-2040 - CCS/TMS Extended ERA Ontology (CCS/TMS Data Model) version 0.3 contains the following set of documents:


 [CCS/TMS Data Model - Scope and Approach for Collaboration and Specification](#): updated i.e. regarding top-down / bottom-up development process


 [TCCS SD1 - Data Model_00_Release Notes](#): this document


 [TCCS SD1 - Data Model_01_Introduction](#): more details regarding modelling language, structure, linking, identification


 [TCCS SD1 - Data](#)

[Model_02_Schema](#) : error corrections

 [TCCS SD1 - Data Model_10_INFRA](#) : processed feedback from model usage and review

 [TCCS SD1 - Data Model_11_ATO](#): processed feedback from model usage and review)












 [TCCS SD1 - Data Model_11_ENG](#): processed feedback from model usage and review



 [TCCS SD1 - Data Model_11_TP](#): processed feedback from model review







In addition to the documentation, the data model for implementation in the formats JSON, XML and the JSON Schema will be




official sharing of the data model to Innovation Pillar for specification and demonstration purposes.


In addition, the release was shared and discussed with ERA to clarify the connection to ERA vocabulary.


		<p>published.</p> <p>The following use cases are in the focus of this release regarding test case scenarios (e.g. in collaboration with Innovation Pillar)</p> <ul style="list-style-type: none"> - ETCS/Balise Engineering - ATO Engineering 	
0.4	22.12.2023	<p>The  SPT2TS-2040 - CCS/TMS Extended ERA Ontology (CCS/TMS Data Model) is now extended with Data Model for CCS - TMS Interface (SCI-OP) and semantic linking for ERA. In addition, corrections based on all comments of the previous release were performed.</p> <p>The  SPT2TS-2040 - CCS/TMS Extended ERA Ontology (CCS/TMS Data Model) version 0.4 contains the following set of documents:</p> <ul style="list-style-type: none">  TCCS - Data Model_01_Approach: processed feedback from model review  TCCS - Data Model_00_Release Notes: this document  TCCS - Data Model_02_Methodology: processed feedback from model review  TCCS - Data Model_02_Schema: processed feedback from model review  TCCS - Data Model_10_INFRA: processed feedback from model usage and review; added ERA Linking  TCCS - Data Model_11_OI: processed feedback from model usage and review  TCCS - Data Model_11_ENG: processed feedback from practical model usage, comparison against other engineering model, and review; added Fouling Point and other details required for engineering phase.  TCCS - Data Model_11_TP: processed 	<p>Besides the release of documents (Polarion and PDF in SP Open Share), the automatically created data model files (json, xml/xsd,...) are provided for further review and usage within specification and demonstration.</p> <p>Links to SP Open Share:</p> <ul style="list-style-type: none"> • Data Model Files (json) • JSON Schemata • UML diagrams / UML pdf version • XSD Files <p>In addition, based on the alignment process started with ERA, a semantic version (TTL files) of  SPT2TS-2040 - CCS/TMS Extended ERA Ontology (CCS/TMS Data Model) is provided for this release, including linking to ERA vocabulary:</p> <ul style="list-style-type: none"> • CCS TMS Data Model Semantic (ttl) <p>The model will further evolve during the further collaboration with ERA.</p>

		<p>feedback from model review ; added Field Object Controller with first details as required by fist demonstrators</p> <p> TCCS - Data Model_11_OPP : new schema to cover needs of CCS-TMS interface. The current state is aligned with Concept_Interface_TMS_CCS_V1_2 and will be further developed in collaboaration with TMS (and Traffic CS) in 2024</p> <p> TCCS - Data Model_11_MAP: Map data model (coordinates) has been extracted out of INFRA as a new domain.</p> <p>Not included: the connection to the diagnostic data model as developed by the responsible taskforce has not been included yet due to needed alignment with other model parts. The plan is to include it in the next release.</p>	
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0.4.1	04.04.2024	<p>This is a minor release of the  SPT2TS-2040 - CCS/TMS Extended ERA Ontology (CCS/TMS Data Model) with an update of the data model for CCS - TMS Interface as well as further improvements based on inputs from Innovation Pillar FA2 Demonstrators.</p> <p>Updated documents:</p> <ul style="list-style-type: none">  TCCS - Data Model_10_INFRA: integrated feedback from IP FA2 Moving Block Demonstrator  TCCS - Data Model_11_OI: minor changes to the data model  TCCS - Data Model_11_ENG: Replace mileage by Km-Signs.  TCCS - Data Model_11_TP: integrated feedback from IP FA2 Moving Block Demonstrator  TCCS - Data Model_11_OPP : integrated feedback from Task 3 CMS/TMS and added upstream data model objects. 	<p>Besides the release of documents (Polarion and PDF in SP Open Share), the automatically created data model files (json, xml/xsd,...) are provided for further review and usage within specifications and demonstrators (IP FA1, FA2, FA3, FA5, and FA6).</p> <p>Links to SP Open Share for XML, UML, JSON, and PlantUML exports: results</p>

Data Model Version	Release Date	Release Notes	Publish and Review
0.4.2	28.06.2024	<p>This is a minor release of the  SPT2TS-2040 - CCS/TMS Extended ERA Ontology (CCS/TMS Data Model) with following changes:</p> <p> TCCS - Data Model_11_OPP : integrated feedback from Task 3 CMS/TMS and IP FA2 Moving Block Demonstrator</p> <p> TCCS - Data Model_11_TP: integrated feedback from IP FA2 Moving Block Demonstrator</p> <p>Amended certain naming conventions in the data model to make the data model compatible for ERA integration.</p>	<p>Besides the release of documents (Polarion and PDF in SP Open Share), the automatically created data model files (json, xml/xsd,...) are provided for further review and usage within specifications and demonstrators (IP FA1, FA2, FA3, FA5, and FA6). In addition the ontology version for ERA integration is published.</p> <p>Links to SP Open Share for Ontology, XML, UML, JSON, and PlantUML exports: https://eeigertms.sharepoint.com/sites/SPOpenShare/Gedeelde%20documenten/Forms/AllItems.aspx?FolderCTID=0x0120009759543C5D980E4786FE7B845BBBAF5A&id=%2Fsites%2FSPOpenShare%2FGedeelde%20documenten%2FGeneral%2F24%2D06%2D28%20TCCS%20CCS%20TMS%20Data%20Model%20v0%2E4%2E2&viewid=7d2094bc%2D4ed7%2D4bd4%2D8055%2Dcda6a753bac3</p>

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1.0	04.09.2024	<p>Final release of CCS/TMS Data Model for remit period SC2.3</p> <ul style="list-style-type: none"> • Improvements based on Innovation Pillar demonstrator feedback • Alignment with domains and already defined interfaces - including feedback from domain approval • Improvements after Mirror Group Approval • added schema  TCCS - Data Model_20_SDI_Generic, imported from already approved Equipment Model from EULYNX (partial transfer based on needs, to be extended by other aspects according user needs during next remit period, i.e. for OC configuration and diagnosis) 	<p>As usual, all model files are created for this release. The files are published on ERJU GitHub and Polarion.</p>

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1.1	21.03.2025	<p>Minor release of the CCS/TMS Data Model in framework of remit SC2.4</p> <ul style="list-style-type: none"> • First data model release that is aligned with ERA Ontology Extension, see extended-era-ontology Includes naming changes to all domains keeping the naming consistent with ERA Vocabulary. • New Domain On-Board Infrastructure (OI) has been introduced. OI now the static on-board infrastructure data needs for systems like Perception, ASTP, ATO, etc. • Includes updates data model classes in TP and OI domain based on needs coming Innovation Pillar 	<p>As usual, all model files are created for this release. The files are published on ERJU GitHub and Polarion  CCS/TMS Data Model .</p>

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