




ERJU SYSTEM PILLAR

TCCS - Data Model_00_Release Notes



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


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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
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> <ul style="list-style-type: none">  TCCS SD1 - Scope and Approach for Collaboration and Specification  TCCS SD1 - Data Model  TCCS SD1 - Data Model Schema <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 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</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 further distribution to responsible domain members • Innovation Pillar FA1 (incl. CDM) • Innovation Pillar FA2 (i.e. WP27, WP13, WP44)

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		<p>Extended ERA Ontology (CCS/TMS Data Model) version 0.2 contains the following set of documents:</p> <ul style="list-style-type: none">  TCCS SD1 - Scope and Approach for Collaboration and Specification (for additional information)  TCCS SD1 - Data Model_00_Release Notes (this document)  TCCS SD1 - Data Model_01_Introduction  TCCS SD1 - Data Model_02_Schema  TCCS SD1 - Data Model_10_INFRA  TCCS SD1 - Data Model_11_ATO  TCCS SD1 - Data Model_11_ENG  TCCS SD1 - Data Model_11_TP <p>We ask you to take note and provide comments in Polarion (or exported word file).</p>	<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	<p>Correction release based on all comments of previous release. In addition, more clarification is given in the <i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Introduction to Data Model : 712615</i> document regarding the structure and linking of data model schemas, identification and referencing (between data model parts and between instances).</p> <p>The  SPT2TS-2040 - CCS/TMS Extended ERA Ontology (CCS/TMS Data Model) version 0.3 contains the following set of documents:</p> <ul style="list-style-type: none">  CCS/TMS Data Model - Scope and Approach for Collaboration and Specification: updated i.e. regarding top-down / bottom-up development process  TCCS SD1 - Data 	<p>The release was used for SP Steering Group information in Sep 23, which led to an official sharing of the data model to Innovation Pillar for specification and demonstration purposes.</p> <p>In addition, the release was shared and discussed with ERA to clarify the connection to ERA vocabulary.</p>



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		<p>Model_00_Release Notes: this document</p> <p> TCCS SD1 - Data</p> <p>Model_01_Introduction: more details regarding modelling language, structure, linking, identification</p> <p> TCCS SD1 - Data</p> <p>Model_02_Schema : error corrections</p> <p> TCCS SD1 - Data</p> <p>Model_10_INFRA : processed feedback from model usage and review</p> <p> TCCS SD1 - Data Model_11_ATO: processed feedback from model usage and review)</p> <p> TCCS SD1 - Data Model_11_ENG: processed feedback from model usage and review</p> <p> TCCS SD1 - Data Model_11_TP: processed feedback from model review</p> <p>In addition to the documentation, the data model for implementation in the formats JSON, XML and the JSON Schema will be 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> <p><i>SPT2TS/30 SD1 Deliverables/TCCS SD1 - Scope and Approach for Collaboration and Specification : 712615:</i> processed feedback from model review</p> <p><i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Data Model_00_Release Notes : 712615:</i> this document</p> <p><i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Introduction to Data Model : 712615:</i> processed feedback from model review</p> <p><i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Data Model_02_Schema : 712615:</i> processed feedback from model review</p> <p><i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Data Model_INFRA : 712615:</i></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 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</p>

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		<p>processed feedback from model usage and review; added ERA Linking <i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Data Model_ATO : 712615:</i> processed feedback from model usage and review <i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Data Model_ENG : 712615:</i> processed feedback from practical model usage, comparison against other engineering model, and review; added Fouling Point and other details required for engineering phase. <i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Data Model_11_TP : 712615:</i> processed feedback from model review ; added Field Object Controller with first details as required by first demonstrators <i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Data Model_11_OPP : 712615 :</i> 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 collaboration with TMS (and Traffic CS) in 2024 <i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Data Model_11_MAP : 712615:</i> 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>	<p>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>
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: <i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Data Model_INFRA : 712615:</i> integrated feedback from IP FA2 Moving Block Demonstrator <i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Data Model_ATO : 712615:</i> minor changes to the data model <i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Data Model_ENG : 712615:</i> Replace mileage by Km-Signs.</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).</p> <p>Links to SP Open Share for XML, UML, JSON, and PlantUML exports: results</p>

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		<p><i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Data Model_11_TP : 712615:</i> integrated feedback from IP FA2 Moving Block Demonstrator</p> <p><i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Data Model_11_OPP : 712615 :</i> integrated feedback from Task 3 CMS/TMS and added upstream data model objects.</p>	
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><i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Data Model_11_OPP : 712615 :</i> integrated feedback from Task 3 CMS/TMS and IP FA2 Moving Block Demonstrator</p> <p><i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Data Model_11_TP : 712615:</i> 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>
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 <i>SPT2TS/TCCS SD1 - Data Model/TCCS SD1 - Data Model_20_Equipment : 712615</i>, 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>

Data Model Version	Release Date	Release Notes	Publish and Review
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:</p> <ul style="list-style-type: none"> • ERA Ontology CCS/TMS Extension: https://gitlab.com/era-europa-eu/public/interoperable-data-programme/era-ontology/era-ontology/-/tree/ext-ccstms?ref_type=heads • Derived Data Model: https://github.com/StructLab/CCSTMS-Data-Model (and Polarion  CCS/TMS Data Model)

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1.1.1	23.05.2025	<p>Minor release of the CCS/TMS Data Model in framework of remit SC2.4.</p> <ul style="list-style-type: none"> Includes naming changes to all domains keeping the naming consistent with ERA Vocabulary. 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:</p> <ul style="list-style-type: none"> ERA Ontology CCS/TMS Extension: https://gitlab.com/era-europa-eu/public/interoperable-data-programme/era-ontology/era-ontology/-/tree/ext-ccstms?ref_type=heads Derived Data Model: https://github.com/StructLab/CCSTMS-Data-Model (and Polarion  CCS/TMS Data Model)
1.3	15.08.2025	<p>Final release of CCS/TMS Data Model for remit period SC2.4.</p> <ul style="list-style-type: none"> Includes minor changes to TP, MAP, OPP, INFRA Domain. Includes new down I-PREP to depict data model structure for the configuration data required by CCS Systems like ETPS, ATO-TS, PE, and TMS. 	<p>As usual, all model files are created for this release. The files are published on ERJU GitHub:</p> <ul style="list-style-type: none"> ERA Ontology CCS/TMS Extension: https://gitlab.com/era-europa-eu/public/interoperable-data-programme/era-ontology/era-ontology/-/tree/ext-ccstms?ref_type=heads Derived Data Model: https://gitlab.com/era-europa-eu/public/interoperable-data-programme/era-ontology/era-ontology/-/tree/ext-ccstms/releases/v1.3?ref_type=heads (and Polarion  CCS/TMS Data Model)

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