EULYNX Initiative

Europe's Rail Joint Undertaking

Interface specification SDI-TDS

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Contents

ID	Type	Requirement	Meaning	Model Type	Data Type	Event/Timepoint	Attribute Type	Optionality	Func. Pkg.
Eu.SDI-TDS.1	Head	**1 Introduction**							
Eu.SDI-TDS.2	Head	**1.1 Release information**							
Eu.SDI-TDS.3	Info	[Eu.Doc.81] Interface specification SDI-TDS CENELEC Phase: 5 Version: 4.0 (0.A) Approval date: 15.06.2023							
Eu.SDI-TDS.4	Info	**Version history**							
Eu.SDI-TDS.538	Info	version number: 3.0 (0.A) date: 17.05.2022 author: Marie Gehrmann review: CCB changes: EUTDS-403, EUTDS-404, EUTDS-411							
Eu.SDI-TDS.540	Info	version number: 3.1 (0.A) date: 08.06.2023 author: SDI task force review: changes: EUTDS-423, EUTDS-426, EUTDS-435, EUTDS-449							
Eu.SDI-TDS.654	Info	version number: 4.0 (0.A) date: 27.06.2023 author: SDI task force review: TACS Mirror Group changes: EUTDS-460, EUTDS-462, EUTDS-465							
Eu.SDI-TDS.6	Head	**1.2 Impressum**							
Eu.SDI-TDS.7	Info	Publishers: **Europe's Rail Joint Undertaking** https://rail-research.europa.eu/ **EULYNX Initiative** A full list of the EULYNX Partners can be found on www.eulynx.eu/index.php/members							
Eu.SDI-TDS.8	Info	Responsible for this document: EU-Rail System Pillar Trackside Assets Control and Supervision domain							
Eu.SDI-TDS.9	Info	Copyright EULYNX Partners All information included or disclosed in this document is licensed under the European Union Public License EUPL, Version 1.2 or later.							
Eu.SDI-TDS.10	Head	**1.3 Purpose**							
Eu.SDI-TDS.11	Info	This document specifies the diagnostic messages (data point IDs and values) as parts of the telegram contents of the standardised diagnosis interface for a communication between the Subsystem - Maintenance and Data Management and Subsystem – Train Detection System (SDI-TDS).							
Eu.SDI-TDS.78	Info	This document contains the Subsystem - Train Detection System specific diagnostic messages. The specifications defined in this document shall be complemented by the generic specification defined in Interface specification SDI Generic [Eu.Doc.94].							
Eu.SDI-TDS.80	Info	Some items, referring to "interface-related" functionality of the communication partners, have been added to this specification as information, providing an overview only. In any case these are subject to appropriate systems (national) specification.							
Eu.SDI-TDS.13	Info	This document is intended for the following users: • safety authorities • infrastructure managers • safety assessors • signalling system suppliers • validators							
Eu.SDI-TDS.541	Info	This document is applicable for both the EU-Rail System Pillar target architecture and the EULYNX architecture. The document is delivered as a single specification fitting both the System Pillar documentation sets and the EULYNX documentation sets. EU-Rail System Pillar is the technical authority for this document.							
Eu.SDI-TDS.14	Head	**1.4 Applicable standards and regulations**							
Eu.SDI-TDS.15	Info	The applicable standards and regulations used in EULYNX are listed in the EULYNX Reference Document List [Eu.Doc.12].							
Eu.SDI-TDS.81	Info	The references listed in the EULYNX Reference Document List [Eu.Doc.12] shall be considered where they are indicated as being applicable to SDI in the "Applies to" column of the EULYNX Reference Document List [Eu.Doc.12].							
Eu.SDI-TDS.16	Head	**1.5 Applicable documents**							
Eu.SDI-TDS.17	Info	The current versions of documents used as input or related to this document are listed in the EULYNX Documentation Plan [Eu.Doc.11]. The relationships between the documents are displayed in the Appendix A1 Documentation plan and structure [Eu.Doc.11_A1].							

ID	Type	Requirement	Meaning	Model Type	Data Type	Event/Timepoint	Attribute Type	Optionality	Func. Pkg.
Eu.SDI-TDS.18	Head	**1.6 Appendices**							
Eu.SDI-TDS.19	Info	*- intentionally left blank -*							
Eu.SDI-TDS.20	Head	**1.7 Terms and abbreviations**							
Eu.SDI-TDS.21	Info	The terms and abbreviations are listed in the EULYNX Glossary [Eu.Doc.9].							
Eu.SDI-TDS.22	Head	**1.8 Variability management**							
Eu.SDI-TDS.23	Info	This document describes harmonised requirements. Variability management is not applicable.							
Eu.SDI-TDS.24	Head	**1.9 Definition of object types**							
Eu.SDI-TDS.25	Info	The following definition for object types is applied in this document:							
Eu.SDI-TDS.26	Info	• "Req" - This denotes a mandatory requirement.							
Eu.SDI-TDS.27	Info	• "Info" - This denotes additional information to help understand the specification. These objects do not specify any additional requirements.							
Eu.SDI-TDS.28	Info	• "Head" - This denotes chapter headings.							
Eu.SDI-TDS.30	Head	**2 Telegram SDI**							
Eu.SDI-TDS.534	Req	All references to Eu.Doc.94 refer to Interface specification SDI Generic version 4.0 (0.A).							Basic TDS AC Basic TDS TDP Basic TDS TC
Eu.SDI-TDS.31	Info	This chapter defines the diagnostic messages - specifically the data points and values applied in the SDI-TDS telegrams. The generic data points are defined in Eu.Doc.94.							Basic TDS AC Basic TDS TDP Basic TDS TC
Eu.SDI-TDS.536	Info	The defined diagnostic messages are mandatory only when the physical interfaces related to the specific diagnostic message are available on the Subsystem – Train Detection System.							Basic TDS AC Basic TDS TDP Basic TDS TC
Eu.SDI-TDS.542	Head	**2.1 Definition of columns**							
Eu.SDI-TDS.543	Info	**Model Type:** Column that marks whether an entry is a model class (Class), a diagnostic data point (Attribute), an enumeration header (ValueType (Enumeration)) or an enumeration value (Enumeration Literal).							Basic TDS AC Basic TDS TDP Basic TDS TC
Eu.SDI-TDS.544	Info	**Data Type:** Column that indicates the data type for the diagnostic data points. Enumeration values are defined in the section 'Enumeration'.							Basic TDS AC Basic TDS TDP Basic TDS TC
Eu.SDI-TDS.545	Info	**Event/Timepoint:** Column that indicates the trigger events to send a diagnostic data point.							Basic TDS AC Basic TDS TDP Basic TDS TC
Eu.SDI-TDS.546	Info	**Attribute Type:** Column that indicates the type of diagnostic information contained in the data point. **raw data**: uninterpreted data that is measured. **diagnosis**: an attribute with discrete values (enumeration or boolean) that interprets the status of a system. There must be a table that directly links diagnostic enumeration values to statusTechnical values of that system. **configuration**: data that is not measured but often set by the manufacturer or operator; it describes characteristics of the system.							Basic TDS AC Basic TDS TDP Basic TDS TC
Eu.SDI-TDS.547	Info	**Optionality :** Column that indicates whether a diagnostic data point in mandatory inside the model class (1), or optional (0..1). The diagnostic data of optional attributes may be required by national specifications. If an equipment or subsystem has the capability to collect and report the related diagnostic data, it must be reported in this data point. Note: In future phases of the System Pillar, national specifications will be replaced by harmonised specifications.							Basic TDS AC Basic TDS TDP Basic TDS TC
Eu.SDI-TDS.34	Head	**2.2 Telegrams SDI-TDS**							
Eu.SDI-TDS.548	Req	Tds	Represents each instance of a physical device for track vacancy proving	Class					Basic TDS AC Basic TDS TDP Basic TDS TC
Eu.SDI-TDS.549	Req	isActive	True: the detection of vehicles or vehicle components is active	Attribute	isActive : Boolean	on mdm connect || on change	raw data	1	Basic TDS AC Basic TDS TDP Basic TDS TC
Eu.SDI-TDS.550	Req	isReadingFailure	True: There is a fault when reading the state of the track vacancy proving device	Attribute	isReadingFailure : Boolean	on mdm connect || on change	diagnosis	1	Basic TDS AC Basic TDS TDP Basic TDS TC
Eu.SDI-TDS.552	Req	statusTechnical	Indicates the generic technical status of the physical device for track vacancy proving. Note: Enumeration values defined in in Interface specification SDI Generic [Eu.Doc.94]	Attribute	statusTechnical : StatusTechnical	on mdm connect || on change	diagnosis	1	Basic TDS AC Basic TDS TDP Basic TDS TC
Eu.SDI-TDS.553	Req	statusTechnicalManufacturerSpecificMessage	Must be used by the supplier to describe the reasons for a StatusTechnical != OK, that cannot be explained by existing datapoints. This Information MUST be provided from the supplier, if there is not already a defined attribute that explains a statusTechnical other than	Attribute	statusTechnicalManufacturerSpecificMessage : MultiStateDiscreteTypeSupplier [0..1]	on mdm connect || on change	diagnosis	0..1	Basic TDS AC Basic TDS TDP Basic TDS TC

ID	Type	Requirement	Meaning	Model Type	Data Type	Event/Timepoint	Attribute Type	Optionality	Func. Pkg.
			Ok. Allows to extend "StatusTechnical" for future uses from IMs & Suppliers if the StatusTechnical = not OK-. This should provide flexibility for future uses. Multiple states can be indicated at the same time if multiple reasons are present. Note: Enumeration values defined in in Interface specification SDI Generic [Eu.Doc.94]						
Eu.SDI-TDS.554	Req	TdsLightBarrier		Class					Basic TDS TDP
Eu.SDI-TDS.555	Req	TdsLinear		Class					Basic TDS TC
Eu.SDI-TDS.556	Req	isVehicleDetected		Attribute	isVehicleDetected : Boolean	on mdm connect || on change	raw data	1	Basic TDS TC
Eu.SDI-TDS.557	Req	TdsLinearLoop		Class					Basic TDS TC
Eu.SDI-TDS.558	Req	TdsLinearTrackCircuit		Class					Basic TDS TC
Eu.SDI-TDS.559	Req	TdsPunctiformAxleCounter	Represents the counting point used in an axle counter system	Class					Basic TDS AC Basic TDS TDP
Eu.SDI-TDS.562	Req	counterAxlesAgainstReferenceDirection	Number of detected axles that have passed the counting point against reference direction since the first installation	Attribute	counterAxlesAgainstReferenceDirection : Long	on mdm connect || on change	raw data	1	Basic TDS AC Basic TDS TDP
Eu.SDI-TDS.563	Req	counterAxlesReferenceDirection	Number of detected axles that have passed the counting point in reference direction since the first installation	Attribute	counterAxlesReferenceDirection : Long	on mdm connect || on change	raw data	1	Basic TDS AC Basic TDS TDP
Eu.SDI-TDS.564	Req	counterUninterpretableOrUndefinedPattern	Number of uninterpretable or undefined patterns that have been detected at the counting point since the first installation	Attribute	counterUninterpretableOrUndefinedPattern : Long	on mdm reconnect || on change	raw data	1	Basic TDS AC Basic TDS TDP
Eu.SDI-TDS.565	Req	TdsPunctiform		Class					Basic TDS AC Basic TDS TDP
Eu.SDI-TDS.566	Req	index	Sequence number of the detection point	Attribute	index : Integer	on system init||on Sw or Cfg change	configuration	1	Basic TDS AC Basic TDS TDP
Eu.SDI-TDS.567	Req	TdsPunctiformAxleCounterMagnetic	Represents the counting point implemented with a magnetic field	Class					Basic TDS AC Basic TDS TDP
Eu.SDI-TDS.568	Req	driftStatus	The drift tolerance status of the magnetic counting point.	Attribute	driftStatus : DriftStatus	on mdm connect || on change	diagnosis	1	Basic TDS AC Basic TDS TDP
Eu.SDI-TDS.569	Req	isMagneticFieldBuildUpFailure	True: The buildup of the magnetic field is not possible	Attribute	isMagneticFieldBuildUpFailure : Boolean	on mdm connect || on change	diagnosis	1	Basic TDS AC Basic TDS TDP
Eu.SDI-TDS.570	Req	TdsPunctiformWheelSensor		Class					Basic TDS TDP
Eu.SDI-TDS.571	Req	isWheelDetected	True: a wheel is currently detected	Attribute	isWheelDetected : Boolean	on mdm connect || on change	raw data	1	Basic TDS TDP
Eu.SDI-TDS.572	Req	TrainDetectionPoint		Class					Basic TDS TDP
Eu.SDI-TDS.573	Req	operationalidentifier	Operational identifier of the TDP (see Eu.SAS.1784)	Attribute	operationalidentifier : Byte	on system init||on Sw or Cfg change	configuration	1	Basic TDS TDP
Eu.SDI-TDS.574	Req	TrainDetectionSystem		Class					Basic TDS AC Basic TDS TDP Basic TDS TC
Eu.SDI-TDS.575	Req	TvpSection	Represents each instance of a track vacancy proving section controlled by the Subsystem TDS	Class					Basic TDS AC Basic TDS TC
Eu.SDI-TDS.576	Req	isFailureOperational	True: Track Vacancy Protection Section has failed (operational)	Attribute	isFailureOperational : Boolean	on mdm connect || on change	diagnosis	1	Basic TDS AC Basic TDS TC
Eu.SDI-TDS.577	Req	isFailureTechnical	True: Track Vacancy Protection Section has failed technically.	Attribute	isFailureTechnical : Boolean	on mdm connect || on change	diagnosis	1	Basic TDS AC Basic TDS TC
Eu.SDI-TDS.578	Req	operationalidentifier	Operational identifier of the TVPS (see Eu.SAS.1784)	Attribute	operationalidentifier : Byte	on system init||on Sw or Cfg change	configuration	1	Basic TDS AC Basic TDS TC
Eu.SDI-TDS.580	Req	statusTechnical	Indicates the generic technical status of the track vacancy proving section. Note: Enumeration values defined in Interface specification SDI Generic [Eu.Doc.94]	Attribute	statusTechnical : StatusTechnical	on mdm connect || on change	diagnosis	1	Basic TDS AC Basic TDS TC
Eu.SDI-TDS.581	Req	statusTechnicalManufacturerSpecificMessage	Must be used by the supplier to describe the reasons for a StatusTechnical != OK, that cannot be explained by existing datapoints. This Information MUST be provided from the supplier, if there is not already a defined attribute that explains a statusTechnical other than Ok. Allows to extend "StatusTechnical" for future uses from IMs & Suppliers if the StatusTechnical = not OK-. This should provide flexibility for future uses. Multiple states can be indicated at the same time if multiple reasons are present. Note: Enumeration values defined in Interface specification SDI Generic [Eu.Doc.94]	Attribute	statusTechnicalManufacturerSpecificMessage : MultiStateDiscreteTypeSupplier [0..1]	on mdm connect || on change	diagnosis	0..1	Basic TDS AC Basic TDS TC

ID	Type	Requirement	Meaning	Model Type	Data Type	Event/Timepoint	Attribute Type	Optionality	Func. Pkg.
Eu.SDI-TDS.582	Req	TvpSectionAxleCounter	Represents each instance of a track vacancy proving section that works with axle counters	Class					Basic TDS AC
Eu.SDI-TDS.583	Req	axleCounterBeforeTriggered	Number of axles in the section before the last operation of DRFC or FC	Attribute	axleCounterBeforeTriggered : Integer	on isFCCTriggered || on isDRFCTriggered	raw data	1	Basic TDS AC
Eu.SDI-TDS.584	Req	counterDrfcFc	Sum of the DRFC and FC in the track vacancy proving section since the first installation.	Attribute	counterDrfcFc : Long	on mdm connect || on change	raw data	1	Basic TDS AC
Eu.SDI-TDS.585	Req	fillingLevel	Current number of axles in the section	Attribute	fillingLevel : Integer	on mdm connect || on change	raw data	1	Basic TDS AC
Eu.SDI-TDS.586	Req	isFillingLevelNegative	True: the filling level of the track vacancy proving section is negative	Attribute	isFillingLevelNegative : Boolean	on mdm connect || on change	raw data	1	Basic TDS AC
Eu.SDI-TDS.587	Req	isInitialState	True: the track vacancy proving section is in the basic state.	Attribute	isInitialState : Boolean	on mdm connect || on change	raw data	1	Basic TDS AC
Eu.SDI-TDS.588	Req	status	occupancy status of track vacancy proving section	Attribute	status : TvpSectionStatusAxleCounter	on mdm connect || on change	raw data	1	Basic TDS AC
Eu.SDI-TDS.589	Req	TvpSectionTrackCircuit	Represents each instance of a track vacancy proving section that works with track circuits	Class					Basic TDS TC
Eu.SDI-TDS.590	Req	pomStatus	status of the power off monitoring	Attribute	pomStatus : TvpSectionPomStatus	on mdm connect || on change	raw data	1	Basic TDS TC
Eu.SDI-TDS.591	Req	status	occupancy status of track vacancy proving section	Attribute	status : TvpSectionStatusTrackCircuit	on mdm connect || on change	raw data	1	Basic TDS TC
Eu.SDI-TDS.647	Req	LogEventTvpSectionAxleCounterCommand	Class for events that represent received commands	Class					Basic TDS AC
Eu.SDI-TDS.648	Req	commandReceived	Type of command received from the interlocking or maintainer	Attribute	commandReceived : TvpSectionCommandType	on event	raw data	1	Basic TDS AC
Eu.SDI-TDS.649	Req	commandTriggeredByRole	Indicates from which source the command was received	Attribute	commandTriggeredByRole : CommandTriggeredByRole	on event	raw data	1	Basic TDS AC
Eu.SDI-TDS.650	Req	fillingLevel	Number of axes in the section when the command is received	Attribute	fillingLevel : Integer	on event	raw data	1	Basic TDS AC
Eu.SDI-TDS.651	Req	isRejected	True: The received command has been rejected	Attribute	isRejected : Boolean	on event	raw data	1	Basic TDS AC
Eu.SDI-TDS.652	Req	LogEventTvpSectionAxleCounterSweepingFails	Class for events that represent a failure of the sweeping process	Class					Option FC-P/-A
Eu.SDI-TDS.653	Req	SweepingFailureReason	Indicates the reason why the sweeping process has failed	Attribute	SweepingFailureReason : SweepingFailureReason	on event	diagnosis	1	Option FC-P/-A
Eu.SDI-TDS.592	Head	**2.2.1 Enumeration**		Package					
Eu.SDI-TDS.593	Req	CommandTriggeredByRole	Enumeration	ValueType (Enumeration)					Basic TDS AC
Eu.SDI-TDS.595	Req	Maintainer	1	Enumeration Literal					Basic TDS AC
Eu.SDI-TDS.594	Req	Interlocking	2	Enumeration Literal					Basic TDS AC
Eu.SDI-TDS.596	Req	DriftStatus	Enumeration	ValueType (Enumeration)					Basic TDS AC Basic TDS TDP
Eu.SDI-TDS.601	Req	Unknown	0	Enumeration Literal					Basic TDS AC Basic TDS TDP
Eu.SDI-TDS.597	Req	NotOutOfTolerance	1	Enumeration Literal					Basic TDS AC Basic TDS TDP
Eu.SDI-TDS.599	Req	OutOfToleranceUnspecifiedLimit	2	Enumeration Literal					Basic TDS AC Basic TDS TDP
Eu.SDI-TDS.598	Req	OutOfToleranceLowerLimit	3	Enumeration Literal					Basic TDS AC Basic TDS TDP
Eu.SDI-TDS.600	Req	OutOfToleranceUpperLimit	4	Enumeration Literal					Basic TDS AC Basic TDS TDP
Eu.SDI-TDS.602	Req	SweepingFailureReason	Enumeration	ValueType (Enumeration)					Option FC-P/-A
Eu.SDI-TDS.604	Req	IncorrectCountOfSweepingTrain	1	Enumeration Literal					Option FC-P/-A
Eu.SDI-TDS.608	Req	TimeoutExpired	2	Enumeration Literal					Option FC-P/-A
Eu.SDI-TDS.603	Req	DetectionPointNotPermittedForFC-P-AorFC-P	3	Enumeration Literal					Option FC-P/-A
Eu.SDI-TDS.605	Req	Intentionally deleted	4	Enumeration Literal					Option FC-P/-A
Eu.SDI-TDS.606	Req	OutgoingAxleBeforeMinimumTimer	5	Enumeration Literal					Option FC-P/-A
Eu.SDI-TDS.607	Req	ProcessCancelled	6	Enumeration Literal					Option FC-P/-A
Eu.SDI-TDS.609	Req	TvpSectionCommandType	Enumeration	ValueType (Enumeration)					Basic TDS AC
Eu.SDI-TDS.614	Req	FC-UReceived	1	Enumeration Literal					Basic TDS AC

ID	Type	Requirement	Meaning	Model Type	Data Type	Event/Timepoint	Attribute Type	Optionality	Func. Pkg.
Eu.SDI-TDS.611	Req	FC-CReceived	2	Enumeration Literal					Basic TDS AC
Eu.SDI-TDS.612	Req	FC-P-AReceived	3	Enumeration Literal					Option FC-P/-A
Eu.SDI-TDS.613	Req	FC-PReceived	4	Enumeration Literal					Option FC-P/-A
Eu.SDI-TDS.610	Req	DRFC	5	Enumeration Literal					Basic TDS AC
Eu.SDI-TDS.615	Req	UpdateFillingLevel	6	Enumeration Literal					Option Update FL
Eu.SDI-TDS.616	Req	TvpSectionPomStatus	Enumeration	ValueType (Enumeration)					Basic TDS TC
Eu.SDI-TDS.619	Req	Unknown	0	Enumeration Literal					Basic TDS TC
Eu.SDI-TDS.618	Req	Ok	1	Enumeration Literal					Basic TDS TC
Eu.SDI-TDS.617	Req	Nok	2	Enumeration Literal					Basic TDS TC
Eu.SDI-TDS.620	Req	TvpSectionStatusAxleCounter	Enumeration	ValueType (Enumeration)					Basic TDS AC
Eu.SDI-TDS.627	Req	Vacant	1	Enumeration Literal					Basic TDS AC
Eu.SDI-TDS.622	Req	OccupiedAndNotAbleToFC	2	Enumeration Literal					Basic TDS AC
Eu.SDI-TDS.621	Req	OccupiedAndAbleToFC	3	Enumeration Literal					Basic TDS AC
Eu.SDI-TDS.624	Req	OperationallyDisturbedAndNotAbleToFC	4	Enumeration Literal					Basic TDS AC
Eu.SDI-TDS.623	Req	OperationallyDisturbedAndAbleToFC	5	Enumeration Literal					Basic TDS AC
Eu.SDI-TDS.626	Req	TechnicallyDisturbed	6	Enumeration Literal					Basic TDS AC
Eu.SDI-TDS.629	Req	WaitingForSweepingTrainAfterFC-P-AorFC-P	7	Enumeration Literal					Option FC-P/-A
Eu.SDI-TDS.628	Req	WaitingForAcknowledgmentAfterFC-P-A	8	Enumeration Literal					Option FC-P/-A
Eu.SDI-TDS.625	Req	SweepingTrainDetected	9	Enumeration Literal					Option FC-P/-A
Eu.SDI-TDS.630	Req	TvpSectionStatusTrackCircuit	Enumeration	ValueType (Enumeration)					Basic TDS TC
Eu.SDI-TDS.633	Req	Vacant	1	Enumeration Literal					Basic TDS TC
Eu.SDI-TDS.631	Req	Occupied	2	Enumeration Literal					Basic TDS TC
Eu.SDI-TDS.632	Req	TechnicallyDisturbed	3	Enumeration Literal					Basic TDS TC
Eu.SDI-TDS.634	Req	TvpSectionUnitInputType	Enumeration	ValueType (Enumeration)					Basic TDS AC Basic TDS TDP Basic TDS TC
Eu.SDI-TDS.635	Req	Current	1	Enumeration Literal					Basic TDS AC Basic TDS TDP Basic TDS TC
Eu.SDI-TDS.636	Req	Voltage	2	Enumeration Literal					Basic TDS AC Basic TDS TDP Basic TDS TC
Eu.SDI-TDS.637	Head	**2.2.2 TDS class diagram**		Package					
Eu.SDI-TDS.639	Info	Train Detection class diagram See Figure 1 on page 6.		Class Diagram					Basic TDS AC Basic TDS TDP Basic TDS TC
Eu.SDI-TDS.638	Info	Axle Counter class diagram See Figure 2 on page 7.		Class Diagram					Basic TDS AC Basic TDS TDP Basic TDS TC

Figure 1: From object 639 on page 5.

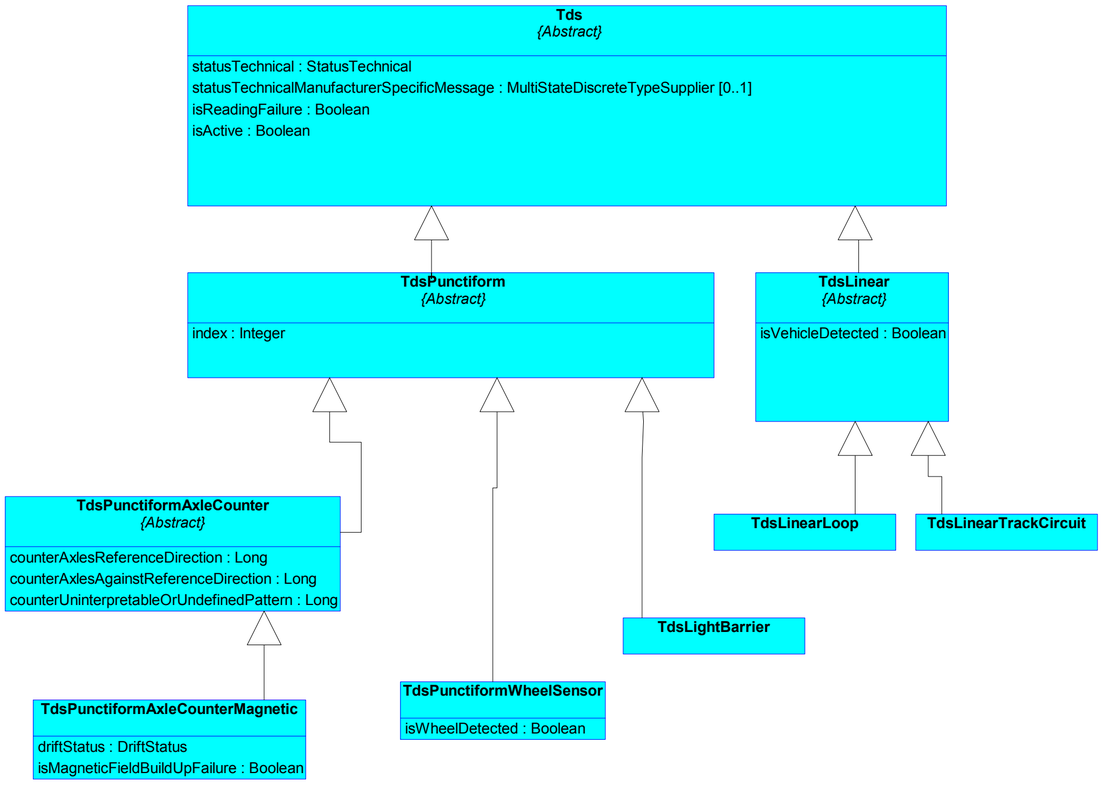

Figure 2: From object 638 on page 5.