



EULYNX Initiative



Europe's Rail Joint Undertaking

Generic interface and subsystem requirements for SCI

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Generic interface and subsystem requirements for SCI			
ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.1	Head	1 Introduction	
Eu.Gen-SCI.2	Head	1.1 Release information	
Eu.Gen-SCI.3	Info	[Eu.Doc.119] EULYNX Generic interface and subsystem requirements for SCI CENELEC Phase: 4 Version: 1.1 (0.A) Approval date: 29.05.2024	
Eu.Gen-SCI.4	Info	Version history	
Eu.Gen-SCI.532	Info	version number: 1.0 (0.A) date: 16.05.2022 author: Dennis Kunz, Filip Giering generic profile version: 18 review: CCB changes: EUAR-508, EUAR-510, EUAR-522, EUAR-523, EUAR-524, EUAR-526, EUAR-535, EUAR-536	
Eu.Gen-SCI.549	Info	version number: 1.0 (1.A) date: 31.03.2023 author: Filip Giering generic profile version: 21 review: changes: EUAR-546, EUAR-552, EUAR-553, EUAR-564, EUAR-582	
Eu.Gen-SCI.581	Info	version number: 1.0 (2.A) date: 11.05.2023 author: Dominik Smajgl, Filip Giering model version: 22 review: cluster changes: EUAR-589, EUAR-592	
Eu.Gen-SCI.591	Info	version number: 1.0 (3.A) date: 27.06.2023 author: Filip Giering model version: 22 review: TACS Mirror Group changes: EUAR-586, EUAR-600, EUAR-601, EUAR-612, EUAR-613	
Eu.Gen-SCI.618	Info	version number: 1.0 (4.A) date: 15.12.2023 author: Filip Giering model version: 25 review: M&T changes: EUAR-550, EUAR-662, EUAR-663, EUAR-664, EUAR-665, EUAR-666, EUAR-667, EUAR-668, EUAR-672, EUAR-675	
Eu.Gen-SCI.685	Info	version number: 1.0 (5.A) date: 22.03.2024 author: Filip Giering, Philipp Wolber model version: 26 review: cluster changes: EUAR-434, EUAR-608, EUAR-609, EUAR-638, EUAR-698, EUAR-703, EUAR-704, EUAR-705	
Eu.Gen-SCI.731	Info	version number: 1.1 (0.A) date: 18.06.2024 author: Filip Giering, Philipp Wolber model version: 26 review: TACS Mirror Group changes: EUAR-681, EUAR-701, EUAR-702, EUAR-708, EUAR-740, EUAR-745	
Eu.Gen-SCI.6	Head	1.2 Impressum	
Eu.Gen-SCI.7	Info	Publishers: Europe's Rail Joint Undertaking https://rail-research.europa.eu EULYNX Initiative https://eulynx.eu/	
Eu.Gen-SCI.8	Info	Responsible for this document: EU-Rail System Pillar Trackside Assets Control and Supervision domain	
Eu.Gen-SCI.9	Info	<p>This document is drafted by and belongs to EU Rail.</p> <p>EU Rail encourages the distribution and re-use of this document, the technical specifications and the information it contains. EU Rail holds several intellectual property rights, such as copyright and trade mark rights, which need to be considered when this document is used.</p> <p>EU Rail authorizes you to re-publish, re-use, copy and store this document without changing it, provided that you indicate its source and include the following mention [EU Rail trade mark, title of the document, year of publication, version of document].</p> <p>EU Rail makes no representation or warranty as to the accuracy or completeness of the information contained within these documents. EU Rail shall have no liability to any party as a result of the use of the information contained herein. EU Rail will have no liability whatsoever for any indirect or consequential loss or damage, and any such liability is expressly excluded.</p> <p>You may study, research, implement, adapt, improve and otherwise use the information, the content and the models in this document for your own purposes. If you decide to publish or disclose any adapted, modified or improved version of this document, any amended implementation or derivative work, then you must indicate that you have modified this document, with a reference to the document name and the terms of use of this document. You may not use EU Rail's trade marks or name in any way that may state or suggest, directly or indirectly, that EU Rail is the author of your adaptations. EU Rail cannot be held responsible for your product, even if you have used this document and its content. It is your responsibility to verify the quality, completeness and the accuracy of the information you use, for your own purposes.</p>	
Eu.Gen-SCI.10	Head	1.3 Purpose	

Generic interface and subsystem requirements for SCI			
ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.11	Info	The purpose of the document is the specification of generic requirements for the development of the EULYNX System. The generic requirements complement the specific interface and subsystem requirements.	
Eu.Gen-SCI.12	Info	This document describes: <ul style="list-style-type: none">generic functional requirements for the interface SCI-XX between an EULYNX field element Subsystem and the Subsystem - Electronic Interlockinggeneric functional requirements for the interface SCI-XX between an adjacent system and the Subsystem - Electronic Interlocking which are describing only the interface parts of each communication partner	
Eu.Gen-SCI.13	Info	This document is intended for the following users: <ul style="list-style-type: none">safety authoritiesinfrastructure managerssafety assessorssignalling system suppliersvalidators	
Eu.Gen-SCI.14	Info	This document is the basis for the implementation by the supplier and for approval by the infrastructure manager.	
Eu.Gen-SCI.590	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.Gen-SCI.15	Head	1.4 Applicable standards and regulations	
Eu.Gen-SCI.16	Info	A list of applicable standards and regulations used in EULYNX is listed in the EULYNX Reference Document List [Eu.Doc.12].	
Eu.Gen-SCI.17	Head	1.5 Applicable documents	
Eu.Gen-SCI.18	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].	
Eu.Gen-SCI.19	Head	1.6 Terms and abbreviations	
Eu.Gen-SCI.20	Info	The terms and abbreviations are listed in the EULYNX Glossary [Eu.Doc.9].	
Eu.Gen-SCI.21	Head	1.7 Variability management	
Eu.Gen-SCI.22	Info	This document describes harmonised requirements. Variability management is not applicable. The specific applicability of requirements is captured in individual interface specifications.	
Eu.Gen-SCI.23	Head	1.8 Definition of object types	
Eu.Gen-SCI.24	Info	The following definition for object types is applied in this document:	
Eu.Gen-SCI.25	Info	<ul style="list-style-type: none">"Req" - This denotes a mandatory requirement.	
Eu.Gen-SCI.619	Info	<ul style="list-style-type: none">"Def" - This denotes referenceable model elements that are used in the model-based creation of requirements	
Eu.Gen-SCI.26	Info	<ul style="list-style-type: none">"Info" - This denotes additional information to help understand the specification. These objects do not specify any additional requirements.	
Eu.Gen-SCI.27	Info	<ul style="list-style-type: none">"Head" - This denotes chapter headings.	
Eu.Gen-SCI.28	Head	1.9 Modelling	
Eu.Gen-SCI.29	Info	The section "Generic requirements for SCI" follows a model based systems engineering process using Systems Modelling Language (SysML) and defines the functional system requirements for the EULYNX field element Subsystem in stimulus-response form. Furthermore the information objects (stimuli and responses) exchanged over the interfaces of the EULYNX field element Subsystem, Subsystem - Electronic Interlocking and the adjacent systems are defined.	
Eu.Gen-SCI.30	Info	The diagrams presented in this document are modelled in SysML [SysML].	
Eu.Gen-SCI.31	Info	The rules for the interpretation of the model based parts of specification are defined in [Eu.Doc.29].	
Eu.Gen-SCI.32	Info	In chapter 3 "Generic requirements for SCI" the functional system requirements, defined in the form of a SysML model in the PTC Integrity Modeler are depicted as a surrogate of this model in the form of DOORS-objects.	
Eu.Gen-SCI.33	Info	A requirement thereby consists of the respective SysML model element, for instance a SysML diagram, and if necessary an additional extension of the requirement.	
Eu.Gen-SCI.34	Info	In the column "Requirement Part 1" the particular SysML model element is depicted and in the column "Requirement Part 2" the corresponding extension of the definition is given. The stated object type normally applies both to "Requirement Part 1" and to "Requirement Part 2".	
Eu.Gen-SCI.35	Info	There are requirements with type "Req" given, where the column "Requirement Part 2" or a part of it is provided with the heading "Information". In this case, the defined type only applies to the column "Requirement Part 1" and the part of "Requirement Part 2", which is not labelled as "Information".	
Eu.Gen-SCI.620	Info	State machines or several state machines linked together in a Functional Architecture define the totality of all functional requirements of an SUS or an SIUS in a coherent and consistent manner. State diagrams of a corresponding state machine are marked with the object type "Req". For the later design and implementation, it is not the description language SysML that is binding, but the domain-specific meaning expressed by it. The specified behaviour can be converted into a vendor specific language but must retain the domain specific meaning describing the functional requirements. The specific model elements are additionally specified and defined by object type "Def" to allow for traceability to supplier designs or test cases. The compliance of products to the specifications must be demonstrated by testing against EULYNX test cases, which are derived from the functionality specified by the models.	
Eu.Gen-SCI.36	Head	2 Conditions of use	
Eu.Gen-SCI.37	Info	The specifications defined in this document shall follow the requirements of the EULYNX System Architecture Specification [Eu.Doc.16].	
Eu.Gen-SCI.524	Req	All references to [Eu.Doc.20] refer to Generic interface and subsystem requirements version 4.0 (6.A).	
Eu.Gen-SCI.686	Head	2.1 Primary and secondary communication partner	
Eu.Gen-SCI.687	Req	For the PDI connection between the Subsystem - Electronic Interlocking and a EULYNX field element subsystem (including External Level Crossing System), the following shall be applied: <ul style="list-style-type: none">The Subsystem - Electronic Interlocking shall be the primary communication partnerThe EULYNX field element subsystem shall be the secondary communication partner	
Eu.Gen-SCI.688	Req	For the PDI connection between the Subsystem - Electronic Interlocking and an adjacent system (excluding Adjacent Interlocking System and External Level Crossing System), the following shall be applied: <ul style="list-style-type: none">The adjacent system shall be the primary communication partnerThe Subsystem - Electronic Interlocking shall be the secondary communication partner	
Eu.Gen-SCI.689	Req	For the PDI connection for SCI-ILS, with two equal communication partners, the primary and secondary communication partners shall be defined by configuration.	
Eu.Gen-SCI.690	Req	The Subsystem - Electronic Interlocking can be connected to more than one Adjacent Interlocking System. The designation of primary and secondary is independent for each instance of the connection.	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.38	Head	3 Generic requirements for SCI	
Eu.Gen-SCI.220	Head	3.1 Field element interfaces	
Eu.Gen-SCI.221	Head	3.1.1 Interface between Subsystem - Electronic Interlocking and EfeS (SCI-XX EfeS)	
Eu.Gen-SCI.409	Head	3.1.1.1 SCI-XX EfeS - Logical Viewpoint	
Eu.Gen-SCI.410	Head	3.1.1.1.1 SCI-XX EfeS - Logical Context	
Eu.Gen-SCI.411	Def	<div><div>[Package] SCI-XX EfeS - Logical Context [Logical Viewpoint - Interface Definition]</div><div><div>bdd [Package] SCI-XX EfeS - Logical Context [Logical Viewpoint - Interface Definition]</div><div><div><div><div>«logical structural entity» SCI-XX EfeS</div><div><div>«logical structural entity» Subsystem - Electronic Interlocking</div><div><div>«logical structural entity» EULYNX field element Subsystem</div></div></div><div><div>1</div><div>SCI-XX EfeS</div><div>1</div><div>SCI-XX EfeS</div></div></div></div></div></div></div>	
Eu.Gen-SCI.401	Head	3.1.1.2 SCI-XX EfeS - Information Flows	
Eu.Gen-SCI.526	Info	The InformationFlows between F_EST_EfeS and F_SCI_EfeS_Sec are specified in [Eu.Doc.20].	
Eu.Gen-SCI.402	Def	<div><div>[Package] SCI-XX EfeS - Information Flows [Interface Requirements - Direction of Information Objects]</div><div><div>bdd [Package] SCI-XX EfeS - Information Flows [Interface Requirements - Direction of Information Objects]</div><div><div><div><div><div>«information flow» SCI_GEN</div><div><div>prov «signal» Cd_PDI_Version_Check</div><div>reqd «signal» Msg_PDI_Version_Check</div><div>prov «signal» Cd_Close_PDI</div><div>prov «signal» Cd_Initialisation_Request</div><div>reqd «signal» Msg_Start_Initialisation</div><div>reqd «signal» Msg_Initialisation_Completed</div><div>prov «signal» Cd_Release_PDI_for_Maintenance</div><div>reqd «signal» Msg_PDI_Available</div><div>reqd «signal» Msg_PDI_Not_Available</div><div>reqd «signal» Msg_Reset_PDI</div></div></div></div><div><div><div>«information flow» SCI-XX EfeS EfeS</div><div><div>proxyPorts</div><div>«ProxyPort» P1inout : SCI_GEN</div></div></div><div><div><div>«information flow» SCI-XX EfeS EIL</div><div><div>proxyPorts</div><div>«ProxyPort» P1inout : SCI_GEN</div></div></div></div></div></div></div></div></div>	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.403	Def	<div><div>[Package] SCI-XX EfeS - Information Flows [Interface Requirements - Information Objects]</div><div><div>bdd [Package] SCI-XX EfeS - Information Flows [Interface Requirements - Information Objects]</div><div><div><div><div>«information object» signal Cd_PDI_Version_Check</div><div>«information object» signal Cd_Initialisation_Request</div><div>«information object» signal Msg_Start_Initialisation</div><div>«information object» signal Msg_Initialisation_Completed</div><div>«information object» signal Cd_Release_PDI_for_Maintenance</div></div><div><div>«information object» signal Msg_PDI_Version_Check</div><div>Result : String ChecksumData : String PDIVersion : String</div><div>«information object» signal Msg_PDI_Available</div><div>«information object» signal Msg_PDI_Not_Available</div></div><div><div>«information object» signal Msg_Reset_PDI ReportedResetReason : ResetReason</div><div>«valueType (enumeration)» ResetReason ProtocolError FormalTelegramError ContentTelegramError</div><div>«information object» signal Cd_Close_PDI RequestedCloseReason : CloseReason</div><div>«valueType (enumeration)» CloseReason NormalClose OtherVersionRequired Timeout ProtocolError FormalTelegramError ContentTelegramError ChecksumMismatch</div></div></div><div>ReportedResetReason</div><div>RequestedCloseReason</div></div></div></div>	
Eu.Gen-SCI.404	Info	The shown information objects for this Interface can be found in SCI-XX - Information Flows.	
Eu.Gen-SCI.222	Head	3.1.1.3 SCI-XX EfeS - Functional Viewpoint	
Eu.Gen-SCI.437	Head	3.1.1.3.1 Definition of time values	
Eu.Gen-SCI.438	Def	Con_tmax_PDI_Connection	If the establishment of the PDI connection, measured from the sending of Cd_PDI_Version_Check to the receipt of Msg_Initialisation_Completed, is not completed within this configured time period the safe communication is terminated. A diagnostic message is issued. The Safe communication is then re-established.
Eu.Gen-SCI.439	Head	3.1.1.3.2 SCI-XX EfeS - Functional Context	
Eu.Gen-SCI.555	Info	<div><div>[Package] SCI-XX EfeS - Functional Context [Interface Definition - UseCases - Initialisation]</div><div><div>uc [Package] SCI-XX EfeS - Functional Context [Interface Definition - UseCases - Initialisation]</div><div><div><div>SCI-XX EfeS</div><div><div><div>Subsystem - Electronic Interlocking</div><div>SCI-XX EfeS IFUC1.1: Establish PDI connection</div><div>SCI-XX EfeS IFUC1.2: Close PDI connection</div><div>EULYNX field element Subsystem</div></div></div></div></div></div></div>	
Eu.Gen-SCI.440	Info	SCI-XX EfeS IFUC1.1: Establish PDI connection	The Subsystem-UseCase SCI-XX EfeS IFUC1.1: Establish PDI connection defines the process to establish a PDI connection between Subsystem - Electronic Interlocking and EULYNX field element Subsystem.

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.449	Info	<div><div>[Interaction] SCI-XX EfeS IFUC1.2 Close PDI connection Timeout - Alternative Scenario [SCI-XX EfeS IF SD 1.2.3]</div><div><div>sd [Interaction] SCI-XX EfeS IFUC1.2 Close PDI connection Timeout - Alternative Scenario [SCI-XX EfeS IF SD 1.2.3]</div><div><div><div>Subsystem - Electronic Interlocking</div><div>:EULYNX field element Subsystem</div></div><div><div></div><div></div><div>Cd_Close_PDI</div></div></div></div><div><p>Alternative Scenario: Close PDI connection - Timeout of PDI establishment</p><p>Precondition:</p><p>The EULYNX field element Subsystem is in INITIALISING state, in substate WAITING_FOR_PDI and the PDI connection is in state ESTABLISHING.</p><p>Interaction 1.2.3.A:</p><ol style="list-style-type: none">- The Subsystem - Electronic Interlocking detects that the timer Con_tmax_PDI_Connection expires.The EULYNX field element Subsystem receives from the Subsystem - Electronic Interlocking the request to close the PDI connection with reason Timeout.<p>Postcondition:</p><p>The EULYNX field element Subsystem is in state INITIALISING, in substate WAITING_FOR_PDI_OR_MAINTENANCE. Ready to establish PDI connection.</p></div></div>	
Eu.Gen-SCI.450	Info	<div><div>[Interaction] SCI-XX EfeS IFUC1.2 Communication Error detected by EfeS - Alternative Scenario [SCI-XX EfeS IF SD 1.2.4]</div><div><div>sd [Interaction] SCI-XX EfeS IFUC1.2 Communication Error detected by EfeS - Alternative Scenario [SCI-XX EfeS IF SD 1.2.4]</div><div><div><div>Subsystem - Electronic Interlocking</div><div>:EULYNX field element Subsystem</div></div><div><div></div><div></div><div></div><div>alt</div><div>Formal Telegram Error Detected</div><div>Content Telegram Error</div><div>Protocol Error</div><div>Msg_Reset_PDI</div></div></div></div><div><p>Alternative Scenario: Communication Error</p><p>Precondition:</p><p>The EULYNX field element Subsystem is in OPERATIONAL state and the PDI connection is in state ESTABLISHED or the EULYNX field element Subsystem is in INITIALISING state, in substate WAITING_FOR_PDI and the PDI connection is in state ESTABLISHING.</p><p>Interaction 1.2.4.A:</p><p>alt</p><ol style="list-style-type: none">- The EULYNX field element Subsystem detects a communication error of the type Formal Telegram Error.<p>else alt</p><ol style="list-style-type: none">- The EULYNX field element Subsystem detects a communication error of the type Content Telegram Error.<p>else alt</p><ol style="list-style-type: none">- The EULYNX field element Subsystem detects a communication error of the type Protocol Error.<p>end alt</p><ol style="list-style-type: none">The EULYNX field element Subsystem reports a reset of the PDI connection to the Subsystem - Electronic Interlocking. The information includes the type of communication error.<p>Postcondition:</p><p>The EULYNX field element Subsystem is in INITIALISING, in substate WAITING_FOR_PDI_OR_MAINTENANCE. Ready to establish PDI connection. The PDI connection is IMPERMISSIBLE.</p></div></div>	
Eu.Gen-SCI.451	Info	<div><div>[Interaction] SCI-XX EfeS IFUC1.2 Communication Error detected by EIL- Alternative Scenario [SCI-XX EfeS IF SD 1.2.5]</div><div><div>sd [Interaction] SCI-XX EfeS IFUC1.2 Communication Error detected by EIL- Alternative Scenario [SCI-XX EfeS IF SD 1.2.5]</div><div><div><div>Subsystem - Electronic Interlocking</div><div>:EULYNX field element Subsystem</div></div><div><div></div><div></div><div></div><div>alt</div><div>Formal Telegram Error Detected</div><div>Content Telegram Error</div><div>Protocol Error</div><div>Cd_Close_PDI</div></div></div></div><div><p>Alternative Scenario: Communication Error</p><p>Precondition:</p><p>The EULYNX field element Subsystem is in OPERATIONAL state and the PDI connection is in state ESTABLISHED or the EULYNX field element Subsystem is in INITIALISING state, in substate WAITING_FOR_PDI and the PDI connection is in state ESTABLISHING.</p><p>Interaction 1.2.5.A:</p><p>alt</p><ol style="list-style-type: none">- The Subsystem - Electronic Interlocking detects a communication error of the type Formal Telegram Error.<p>else alt</p><ol style="list-style-type: none">- The Subsystem - Electronic Interlocking detects a communication error of the type Content Telegram Error.<p>else alt</p><ol style="list-style-type: none">- The Subsystem - Electronic Interlocking detects a communication error of the type Protocol Error.<p>end alt</p><ol style="list-style-type: none">The EULYNX field element Subsystem receives from the Subsystem - Electronic Interlocking the request to close the PDI connection.<p>Postcondition:</p><p>The EULYNX field element Subsystem is in INITIALISING, in substate WAITING_FOR_PDI_OR_MAINTENANCE. Ready to establish PDI connection. The PDI connection is IMPERMISSIBLE.</p></div></div>	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.452	Info	<div>[Interaction] SCI-XX EfeS IFUC1.2 EfeS PDI unavailability - Alternative Scenario [SCI-XX EfeS IF SD 1.2.6]</div> <div><div>sd [Interaction] SCI-XX EfeS IFUC1.2 EfeS PDI unavailability - Alternative Scenario [SCI-XX EfeS IF SD 1.2.6]</div><div><div><div><div></div><div>Subsystem - Electronic Interlocking</div></div><div><div>:EULYNX field element Subsystem</div><div></div></div></div><div><div><div></div><div></div><div></div></div><div><div></div><div>Msg_PDI_Not_Available</div><div></div></div></div></div><div><p>Alternative Scenario: EfeS PDI unavailability</p><p>Precondition:</p><p>The :EULYNX field element Subsystem is in OPERATIONAL and the PDI connection is in state ESTABLISHED or the EULYNX field element Subsystem is in INITIALISING state, in substate WAITING_FOR_PDI and the PDI connection is in state ESTABLISHING.</p><p>Interaction 1.2.6.A:</p><p>1. - The :EULYNX field element Subsystem is no longer available for the PDI connection.</p><p>2. The EULYNX field element Subsystem reports to Subsystem - Electronic Interlocking that it is not available.</p><p>Postcondition:</p><p>The PDI connection is SUSPENDED.</p></div></div>	Note: If it is technically not possible to send the telegram Msg_PDI_Not_Available, the secondary communication partner must terminate the safe communication protocol. The postcondition can correspond to several states of the EULYNX field element Subsystem: NO_OPERATING_VOLTAGE BOOTING FALLBACK_MODE
Eu.Gen-SCI.399	Head	3.1.1.3.3 SCI-XX EfeS - Functional Partitioning	
Eu.Gen-SCI.400	Def	<div>[Package] SCI-XX EfeS - Functional Partitioning [Functional Viewpoint - Interface Requirements]</div> <div><div>bdd [Package] SCI-XX EfeS - Functional Partitioning [Functional Viewpoint - Interface Requirements]</div><div><div><div><div><div>«logical structural entity» SCI-XX EfeS</div></div><div><div><div><div>«logical structural entity» Subsystem - Electronic Interlocking</div><div>1</div></div><div><div>SCI-XX EfeS</div><div>1</div></div><div><div>«logical structural entity» EULYNX field element Subsystem</div><div>1</div></div><div><div>SCI-XX EfeS</div><div>1</div></div></div><div><div><div><div>«functional entity» S_SCI_EfeS_Prim</div><div>1</div></div><div><div>«functional entity» F_SCI_EfeS_Sec</div><div>1</div></div></div><div><div>SCI-XX EfeS Prim</div><div>SCI-XX EfeS Sec</div></div></div></div><div><div>SCI-XX EfeS - Functional Entities</div></div></div></div></div></div>	
Eu.Gen-SCI.223	Head	3.1.1.3.4 SCI-XX EfeS - Functional Architecture	
Eu.Gen-SCI.224	Info	SCI-XX EfeS	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.225	Def	<div><div>[Block] SCI-XX EfeS [Functional Viewpoint - Interface Requirements - Functional Architecture]</div><div><div>ibb [Block] SCI-XX EfeS [Functional Viewpoint - Interface Requirements - Functional Architecture]</div><div><div><div>«logical structural entity» SCI-XX EfeS</div><div><div><div><div>«participant» {end = SCI-XX EfeS} «logical structural entity» InLink : Subsystem - Electronic Interlocking</div><div><div><div><div>D2in_Con_tmax_PDI_Connection</div><div>D39in_Con_Last_PDI_Version</div><div>D3in_Con_PDI_Version</div><div>D4in_Con_Checksum_Data</div><div>T10in_SCP_Connection_Terminated</div><div>T20in_Protocol_Error</div><div>T21in_Formal_Telegram_Error</div><div>T22in_Content_Telegram_Error</div><div>T44in_Initiate_Maintenance</div><div>T45in_Reset_Severe_Error</div><div>«functional entity» SCI-XX EfeS Prim : S_SCI_EfeS_Prim</div><div>T5in_SCP_Connection_Established</div><div>d60out_PDI_Close_Reason</div><div>T6out_Establish_SCP_Connection</div><div>T46out_Con_Other_PDI_Version_Request</div><div>T12out_Terminate_SCP_Connection</div><div>d50out_PDI_Connection_State</div><div>T49in_Enable_Or_Connect_PDI_EfeS</div><div>T48in_Disable_Or_Disconnect_PDI_EfeS</div><div>T47in_Con_Other_PDI_Version_Available</div></div></div><div><div>EILX : SCI-XX EfeS EIL</div><div>«equal»</div><div>P1inout : ~SCI_GEN</div></div></div><div><div>«participant» {end = SCI-XX EfeS} «logical structural entity» InLink : EULYNX field element Subsystem</div><div><div>EfeSX : SCI-XX EfeS EfeS</div><div>«equal»</div><div>P1inout : SCI_GEN</div></div><div><div>P1inout : SCI_GEN</div><div>P1inout : ~SCI_GEN</div></div><div><div>D3in_Con_PDI_Version</div><div>D4in_Con_Checksum_Data</div><div>d50out_PDI_Connection_State</div><div>T10in_SCP_Connection_Terminated</div><div>T12out_Terminate_SCP_Connection</div><div>p2inout : EST_SCI_GEN</div><div>p3inout : ~F_SCI_Specific</div><div>«functional entity» SCI-XX EfeS Sec : F_SCI_EfeS_Sec</div><div>T20in_Protocol_Error</div><div>T21in_Formal_Telegram_Error</div><div>T22in_Content_Telegram_Error</div><div>T5in_SCP_Connection_Established</div><div>d60out_PDI_Close_Reason</div></div></div></div></div></div></div></div></div></div>	
Eu.Gen-SCI.226	Head	3.1.1.3.5 SCI-XX EfeS - Functional Entities	
Eu.Gen-SCI.303	Info	S_SCI_EfeS_Prim	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.304	Req	<div><div>[Block] S_SCI_EfeS_Prim [Functional Viewpoint - Interface Requirements - Functional Entity]</div><div><div>ibd [Block] S_SCI_EfeS_Prim [Functional Viewpoint - Interface Requirements - Functional Entity]</div><div><div><div><div>«functional entity»</div><div>S_SCI_EfeS_Prim</div><div>values</div><div>«BlockProperty» Mem_Checksum_Data : String</div><div>«BlockProperty» Mem_PDI_Version_Result : String</div><div>Operation</div><div>«Operation» cOp1_init ()</div></div><div><div><div>D2in_Con_tmax_PDI_Connection : Integer</div><div>d60out_PDI_Close_Reason : String</div></div><div><div><div>D39in_Con_Last_PDI_Version : Boolean</div><div>T46out_Con_Other_PDI_Version_Request : PulsedOut</div></div><div><div><div>D3in_Con_PDI_Version : String</div><div>T6out_Establish_SCP_Connection : PulsedOut</div></div><div><div><div>D4in_Con_Checksum_Data : String</div><div>d50out_PDI_Connection_State : String</div></div><div><div><div>T47in_Con_Other_PDI_Version_Available : PulsedIn</div><div>T12out_Terminate_SCP_Connection : PulsedOut</div></div><div><div><div>T10in_SCP_Connection_Terminated : PulsedIn</div><div>P1inout : ~SCI_GEN</div></div><div><div><div>T5in_SCP_Connection_Established : PulsedIn</div><div></div></div><div><div><div>T20in_Protocol_Error : PulsedIn</div><div></div></div><div><div><div>T21in_Formal_Telegram_Error : PulsedIn</div><div></div></div><div><div><div>T22in_Content_Telegram_Error : PulsedIn</div><div></div></div><div><div><div>T44in_Initiate_Maintenance : PulsedIn</div><div></div></div><div><div><div>T45in_Reset_Severe_Error : PulsedIn</div><div></div></div><div><div><div>T48in_Disable_Or_Disconnect_PDI_EfeS : PulsedIn</div><div></div></div><div><div><div>T49in_Enable_Or_Connect_PDI_EfeS : PulsedIn</div><div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div>	
Eu.Gen-SCI.305	Def	<div>/* cOp1_init */ d60out_PDI_Close_Reason := "No Error"; Mem_PDI_Version_Result := "unknown"; Mem_Checksum_Data := D4in_Con_Checksum_Data;</div>	cOp1_init
Eu.Gen-SCI.308	Def	D2in_Con_tmax_PDI_Connection	The port D2in_Con_tmax_PDI_Connection provides the time value Con_tmax_PDI_Connection.
Eu.Gen-SCI.310	Def	D3in_Con_PDI_Version	The port D3in_Con_PDI_Version provides the configured PDIVer.
Eu.Gen-SCI.311	Def	D4in_Con_Checksum_Data	The port D4in_Con_Checksum_Data provides the configured CSS.
Eu.Gen-SCI.306	Def	T5in_SCP_Connection_Established	The port T5in_SCP_Connection_Established represents the event of the established SCP connection.
Eu.Gen-SCI.326	Def	T6out_Establish_SCP_Connection	<div>The port T6out_Establish_SCP_Connection represents the event for the SCP to establish the SCP connection.</div> <div>Note: It is assumed that the implementation of the SCP connection handle each connection error by itself after sending the trigger on T6out_Establish_SCP_Connection. A retriggering of SCP connection is not in responsibility of SCI layer. In case of a successful established connection the trigger T5in_SCP_Connection_Established is expected.</div>
Eu.Gen-SCI.315	Def	T10in_SCP_Connection_Terminated	The port T10in_SCP_Connection_Terminated represents the event of the terminated SCP connection.
Eu.Gen-SCI.316	Def	T12out_Terminate_SCP_Connection	The port T12out_Terminate_SCP_Connection represents the event to terminate the SCP connection.
Eu.Gen-SCI.317	Def	T20in_Protocol_Error	The port T20in_Protocol_Error represents the event of a protocol error.
Eu.Gen-SCI.318	Def	T21in_Formal_Telegram_Error	The port T21in_Formal_Telegram_Error represents the event of a formal telegram error.
Eu.Gen-SCI.319	Def	T22in_Content_Telegram_Error	The port T22in_Content_Telegram_Error represents the event of a content telegram error.
Eu.Gen-SCI.309	Def	D39in_Con_Last_PDI_Version	The port D39in_Con_Last_PDI_Version indicates if this was the last possible PDI version for a new version check cycle.
Eu.Gen-SCI.320	Def	T44in_Initiate_Maintenance	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.321	Def	T45in_Reset_Severe_Error	
Eu.Gen-SCI.322	Def	T46out_Con_Other_PDI_Version_Request	
Eu.Gen-SCI.323	Def	T47in_Con_Other_PDI_Version_Available	
Eu.Gen-SCI.324	Def	T48in_Disable_Or_Disconnect_PDI_EfeS	
Eu.Gen-SCI.325	Def	T49in_Enable_Or_Connect_PDI_EfeS	
Eu.Gen-SCI.312	Def	d50out_PDI_Connection_State	The port d50out_PDI_Connection_State provides the status of the PDI connection.
Eu.Gen-SCI.313	Def	d60out_PDI_Close_Reason	
Eu.Gen-SCI.314	Def	P1inout	The port P1inout exchanges information objects according to SCI_GEN.
Eu.Gen-SCI.327	Info	S_SCI_EfeS_Prim - Behaviour	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.344	Req	<div>Functional Viewpoint - Subsystem Requirements - Functional Entity STD 1</div> <div>stm [State Machine] S_SCI_EfeS_Prim - Behaviour [Functional Viewpoint - Subsystem Requirements - Functional Entity STD 1]</div> <p>The diagram illustrates the state transitions for the S_SCI_EfeS_Prim functional entity. It starts at an initial state and moves through various states based on external events and internal actions. Key states include DISCONNECTED_NO_SCP, REQUESTED_NO_SCP, IMPERMISSIBLE_NO_SCP, DISCONNECTED, ACTIVE, ESTABLISHING, WAITING_FOR_VERSION_CHECK, OTHER_VERSION_REQUIRED, WAITING_FOR_INITIALISATION, RECEIVING_STATUS, ESTABLISHED, and SUSPENDED. Transitions are triggered by events such as /cOp1_init(), T48in_Disable_Or_Disconnect_PDI_EfeS, T49in_Enable_Or_Connect_PDI_EfeS, T10in_SCP_Connection_Terminated, T5in_SCP_Connection_Established, T45in_Reset_Severe_Error, T20in_Protocol_Error, T21in_Formal_Telegram_Error, T22in_Content_Telegram_Error, T44in_Initiate_Maintenance, and T10in_SCP_Connection_Terminated. Actions include sending Cd_Close_PDI, Cd_Release_PDI_for_Maintenance, Cd_Initialisation_Request, and Cd_PDI_Version_Check, as well as setting connection states and reasons.</p> <div>This state machine diagram describes the requirements for the following functionalities:</div> <div><ul style="list-style-type: none">- establishment and closure of PDI connection- reaction to communication errors- interaction with safe communication protocol</div>	
Eu.Gen-SCI.328	Def	DISCONNECTED	
Eu.Gen-SCI.329	Def	entry/d50out_PDI_Connection_State := "DISCONNECTED";{State-internal in DISCONNECTED}	
Eu.Gen-SCI.330	Def	when(T10in_SCP_Connection_Terminated)/{DISCONNECTED - DISCONNECTED_NO_SCP}	

This state machine diagram describes the requirements for the following functionalities:

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.331	Def	when(T49in_Enable_Or_Connect_PDI_EfeS)/{DISCONNECTED - ACTIVE}	
Eu.Gen-SCI.332	Def	DISCONNECTED_NO_SCP	
Eu.Gen-SCI.333	Def	entry/d50out_PDI_Connection_State := "DISCONNECTED_NO_SCP";{State-internal in DISCONNECTED_NO_SCP}	
Eu.Gen-SCI.334	Def	when(T5in_SCP_Connection_Established)/{DISCONNECTED_NO_SCP - DISCONNECTED}	
Eu.Gen-SCI.335	Def	when(T49in_Enable_Or_Connect_PDI_EfeS)/{DISCONNECTED_NO_SCP - REQUESTED_NO_SCP}	
Eu.Gen-SCI.336	Def	IMPERMISSIBLE	
Eu.Gen-SCI.337	Def	entry/d50out_PDI_Connection_State := "IMPERMISSIBLE";{State-internal in IMPERMISSIBLE}	
Eu.Gen-SCI.338	Def	when(T10in_SCP_Connection_Terminated)/{IMPERMISSIBLE - IMPERMISSIBLE_NO_SCP}	
Eu.Gen-SCI.339	Def	when(T45in_Reset_Severe_Error)/{IMPERMISSIBLE - ACTIVE}	
Eu.Gen-SCI.340	Def	IMPERMISSIBLE_NO_SCP	
Eu.Gen-SCI.341	Def	entry/d50out_PDI_Connection_State := "IMPERMISSIBLE_NO_SCP";{State-internal in IMPERMISSIBLE_NO_SCP}	
Eu.Gen-SCI.342	Def	when(T5in_SCP_Connection_Established)/{IMPERMISSIBLE_NO_SCP - IMPERMISSIBLE}	
Eu.Gen-SCI.343	Def	when(T45in_Reset_Severe_Error)/{IMPERMISSIBLE_NO_SCP - REQUESTED_NO_SCP}	
Eu.Gen-SCI.345	Def	Initial0	
Eu.Gen-SCI.346	Def	/cOp1_init();{Initial0 - DISCONNECTED_NO_SCP}	
Eu.Gen-SCI.347	Def	REQUESTED_NO_SCP	
Eu.Gen-SCI.348	Def	entry/d50out_PDI_Connection_State := "REQUESTED_NO_SCP"; T6out_Establish_SCP_Connection := TRUE;{State-internal in REQUESTED_NO_SCP}	
Eu.Gen-SCI.349	Def	when(T5in_SCP_Connection_Established){REQUESTED_NO_SCP - ACTIVE}	
Eu.Gen-SCI.350	Def	when(T48in_Disable_Or_Disconnect_PDI_EfeS){REQUESTED_NO_SCP - DISCONNECTED_NO_SCP}	
Eu.Gen-SCI.360	Def	ACTIVE	
Eu.Gen-SCI.361	Def	ESTABLISHED	
Eu.Gen-SCI.362	Def	entry/d50out_PDI_Connection_State := "ESTABLISHED";{State-internal in ESTABLISHED}	
Eu.Gen-SCI.363	Def	ESTABLISHING	
Eu.Gen-SCI.364	Def	after(D2in_Con_tmax_PDI_Connection)/ send Cd_Close_PDI(Timeout) to P1inout; d60out_PDI_Close_Reason := "PDI Timeout";{ESTABLISHING - ESTABLISHING}	
Eu.Gen-SCI.365	Def	Initial2	
Eu.Gen-SCI.366	Def	/send Cd_PDI_Version_Check(D3in_Con_PDI_Version) to P1inout;{Initial2 - WAITING_FOR_VERSION_CHECK}	
Eu.Gen-SCI.367	Def	Junction0	
Eu.Gen-SCI.368	Def	[Result = "match"]/{Junction0 - Junction2}	
Eu.Gen-SCI.369	Def	[Result = "not match"]/{Junction0 - Junction3}	
Eu.Gen-SCI.373	Def	Junction2	
Eu.Gen-SCI.374	Def	[NOT (ChecksumData = D4in_Con_Checksum_Data)]/ send Cd_Release_PDI_for_Maintenance to P1inout;{Junction2 - SUSPENDED}	
Eu.Gen-SCI.375	Def	[ChecksumData = D4in_Con_Checksum_Data]/ send Cd_Initialisation_Request to P1inout;{Junction2 - WAITING_FOR_INITIALISATION}	
Eu.Gen-SCI.376	Def	RECEIVING_STATUS	
Eu.Gen-SCI.377	Def	Msg_Initialisation_Completed/{RECEIVING_STATUS - ESTABLISHED}	
Eu.Gen-SCI.378	Def	entry/d50out_PDI_Connection_State := "RECEIVING_STATUS";{State-internal in RECEIVING_STATUS}	
Eu.Gen-SCI.379	Def	WAITING_FOR_INITIALISATION	
Eu.Gen-SCI.380	Def	Msg_Start_Initialisation/{WAITING_FOR_INITIALISATION - RECEIVING_STATUS}	
Eu.Gen-SCI.381	Def	entry/d50out_PDI_Connection_State := "WAITING_FOR_INITIALISATION";{State-internal in WAITING_FOR_INITIALISATION}	
Eu.Gen-SCI.382	Def	WAITING_FOR_VERSION_CHECK	
Eu.Gen-SCI.383	Def	Msg_PDI_Version_Check/Mem_PDI_Version_Result := Result; Mem_Checksum_Data := ChecksumData;{WAITING_FOR_VERSION_CHECK - Junction0}	
Eu.Gen-SCI.384	Def	entry/d50out_PDI_Connection_State := "WAITING_FOR_VERSION_CHECK";{State-internal in WAITING_FOR_VERSION_CHECK}	
Eu.Gen-SCI.357	Def	Junction3	
Eu.Gen-SCI.358	Def	[D39in_Con_Last_PDI_Version = TRUE]/ send Cd_Release_PDI_for_Maintenance to P1inout;{Junction3 - SUSPENDED}	
Eu.Gen-SCI.359	Def	[D39in_Con_Last_PDI_Version = FALSE]/ T46out_Con_Other_PDI_Version_Request := TRUE; send Cd_Close_PDI(OtherVersionRequired) to P1inout; d60out_PDI_Close_Reason := "PDI Other Version Required";{Junction3 - OTHER_VERSION_REQUIRED}	
Eu.Gen-SCI.396	Def	OTHER_VERSION_REQUIRED	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.397	Def	when(T47in_Con_Other_PDI_Version_Available)/{OTHER_VERSION_REQUIRED - ESTABLISHING}	
Eu.Gen-SCI.471	Def	entry/d50out_PDI_Connection_State := "OTHER_VERSION_REQUIRED";{State-internal in OTHER_VERSION_REQUIRED}	
Eu.Gen-SCI.385	Def	Initial1	
Eu.Gen-SCI.386	Def	/ {Initial1 - ESTABLISHING}	
Eu.Gen-SCI.387	Def	Msg_PDI_Not_Available/{ACTIVE - SUSPENDED}	
Eu.Gen-SCI.388	Def	Msg_Reset_PDI[ReportedResetReason = ProtocolError]/ d60out_PDI_Close_Reason := "EfeS Protocol Error";{ACTIVE - IMPERMISSIBLE}	
Eu.Gen-SCI.389	Def	Msg_Reset_PDI[ReportedResetReason = ContentTelegramError]/ d60out_PDI_Close_Reason := "EfeS Content Telegram Error";{ACTIVE - IMPERMISSIBLE}	
Eu.Gen-SCI.390	Def	Msg_Reset_PDI[ReportedResetReason = FormalTelegramError]/ d60out_PDI_Close_Reason := "EfeS Formal Telegram Error";{ACTIVE - IMPERMISSIBLE}	
Eu.Gen-SCI.391	Def	when(T20in_Protocol_Error)/ d60out_PDI_Close_Reason := "EIL Protocol Error"; send Cd_Close_PDI(ProtocolError) to P1inout;{ACTIVE - IMPERMISSIBLE}	
Eu.Gen-SCI.392	Def	when(T21in_FormaI_Telegram_Error)/ d60out_PDI_Close_Reason := "EIL Formal Telegram Error"; send Cd_Close_PDI(FormalTelegramError) to P1inout;{ACTIVE - IMPERMISSIBLE}	
Eu.Gen-SCI.393	Def	when(T22in_Content_Telegram_Error)/ d60out_PDI_Close_Reason := "EIL Content Telegram Error"; send Cd_Close_PDI(ContentTelegramError) to P1inout;{ACTIVE - IMPERMISSIBLE}	
Eu.Gen-SCI.394	Def	when(T44in_Initiate_Maintenance)/ send Cd_Release_PDI_for_Maintenance to P1inout;{ACTIVE - SUSPENDED}	
Eu.Gen-SCI.395	Def	when(T48in_Disable_Or_Disconnect_PDI_EfeS)/ send Cd_Close_PDI(NormalClose) to P1inout; d60out_PDI_Close_Reason := "PDI Normal Close";{ACTIVE - DISCONNECTED}	
Eu.Gen-SCI.398	Def	when(T10in_SCP_Connection_Terminated)/{ACTIVE - REQUESTED_NO_SCP}	
Eu.Gen-SCI.352	Def	SUSPENDED	
Eu.Gen-SCI.353	Def	Msg_PDI_Available/{SUSPENDED - ACTIVE}	
Eu.Gen-SCI.354	Def	entry/d50out_PDI_Connection_State := "SUSPENDED";{State-internal in SUSPENDED}	
Eu.Gen-SCI.472	Def	when(T10in_SCP_Connection_Terminated)/{SUSPENDED - REQUESTED_NO_SCP}	
Eu.Gen-SCI.473	Def	when(T48in_Disable_Or_Disconnect_PDI_EfeS)/{SUSPENDED - DISCONNECTED}	
Eu.Gen-SCI.227	Info	F_SCI_EfeS_Sec	
Eu.Gen-SCI.228	Req	<div><div>[Block] F_SCI_EfeS_Sec [Functional Viewpoint - Interface Requirements - Functional Entity]</div><div><div><div><div><div>«functional entity»</div><div>F_SCI_EfeS_Sec</div><div>values</div><div>«BlockProperty» Mem_PDI_Version : String</div><div>Operation</div><div>«Operation» cOp1_init ()</div></div></div><div><div><div><div>D3in_Con_PDI_Version : String</div><div>d50out_PDI_Connection_State : String</div></div><div><div>D4in_Con_Checksum_Data : String</div><div>T12out_Terminate_SCP_Connection : PulsedOut</div></div><div><div>T20in_Protocol_Error : PulsedIn</div><div>d60out_PDI_Close_Reason : String</div></div><div><div>T21in_FormaI_Telegram_Error : PulsedIn</div><div>p2inout : EST_SCI_GEN</div></div><div><div>T22in_Content_Telegram_Error : PulsedIn</div><div>P1inout : SCI_GEN</div></div><div><div>T5in_SCP_Connection_Established : PulsedIn</div><div>p3inout : ~F_SCI_Specific</div></div><div><div>T10in_SCP_Connection_Terminated : PulsedIn</div><div></div></div></div></div></div></div></div>	
Eu.Gen-SCI.229	Def	<div>/* cOp1_init */</div> <div>Mem_PDI_Version := D3in_Con_PDI_Version;</div>	cOp1_init
Eu.Gen-SCI.231	Def	D3in_Con_PDI_Version	The port D3in_Con_PDI_Version provides the configured PDIVer.
Eu.Gen-SCI.232	Def	D4in_Con_Checksum_Data	The port D4in_Con_Checksum_Data provides the configured CSS.
Eu.Gen-SCI.302	Def	T5in_SCP_Connection_Established	The port T5in_SCP_Connection_Established represents the event of the established SCP connection.

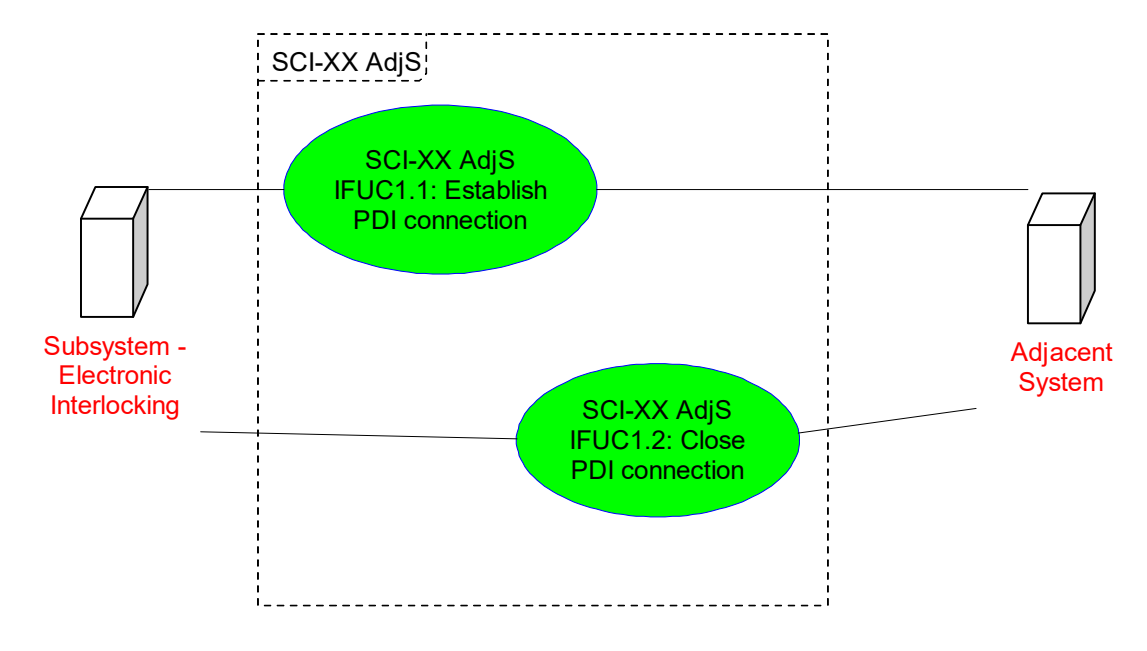
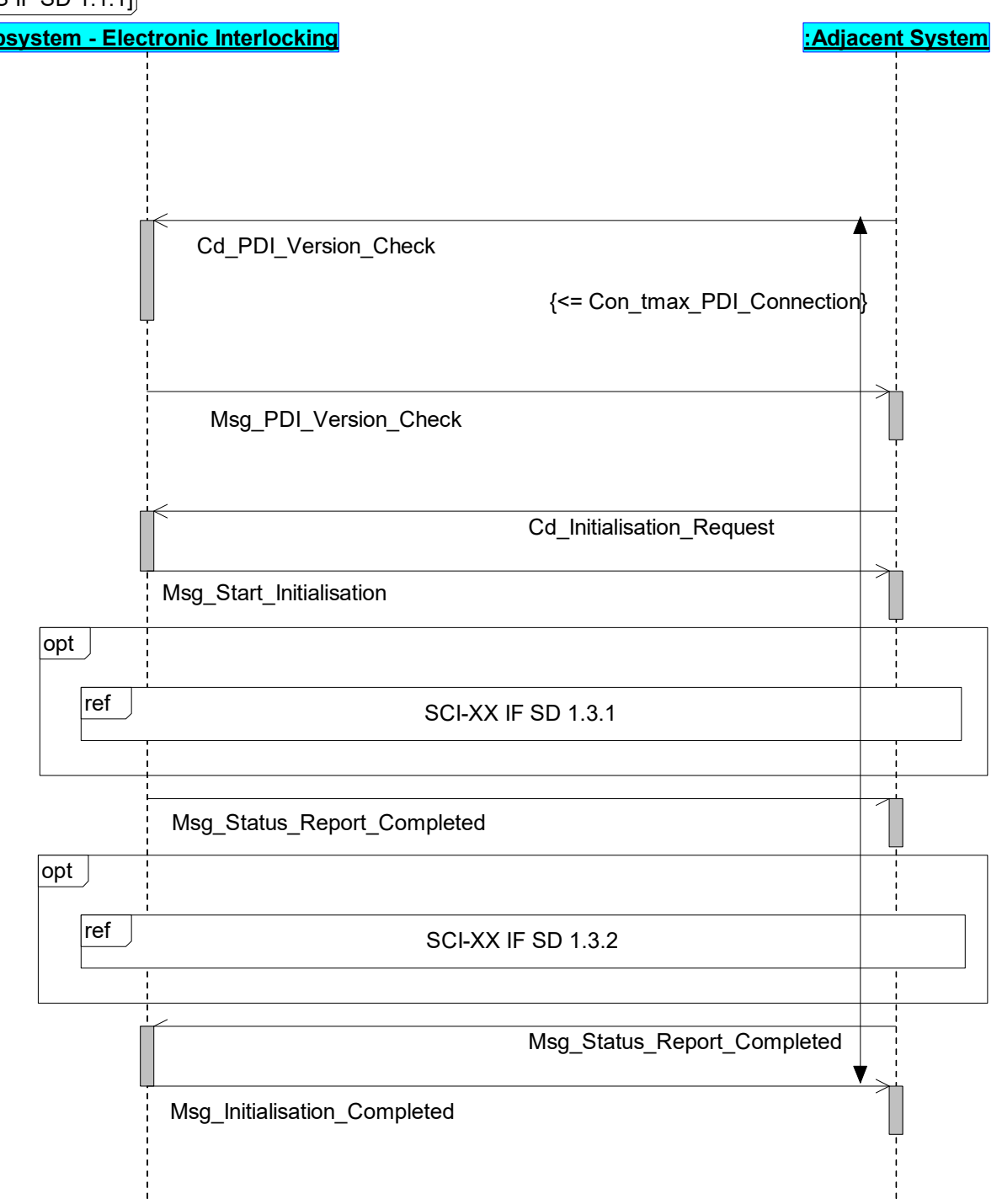
ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.297	Def	T10in_SCP_Connection_Terminated	The port T10in_SCP_Connection_Terminated represents the event of the terminated SCP connection.
Eu.Gen-SCI.298	Def	T12out_Terminate_SCP_Connection	The port T12out_Terminate_SCP_Connection represents the event to terminate the SCP connection.
Eu.Gen-SCI.299	Def	T20in_Protocol_Error	The port T20in_Protocol_Error represents the event of a protocol error.
Eu.Gen-SCI.300	Def	T21in_Formal_Telegram_Error	The port T21in_Formal_Telegram_Error represents the event of a formal telegram error.
Eu.Gen-SCI.301	Def	T22in_Content_Telegram_Error	The port T22in_Content_Telegram_Error represents the event of a content telegram error.
Eu.Gen-SCI.233	Def	d50out_PDI_Connection_State	The port d50out_PDI_Connection_State provides the status of the PDI connection.
Eu.Gen-SCI.505	Def	d60out_PDI_Close_Reason	
Eu.Gen-SCI.294	Def	p2inout	
Eu.Gen-SCI.295	Def	P1inout	The port P1inout exchanges information objects according to SCI_GEN.
Eu.Gen-SCI.296	Def	p3inout	
Eu.Gen-SCI.234	Info	F_SCI_EfeS_Sec - Behaviour	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.239	Req	<div>Functional Viewpoint - Subsystem Requirements - Functional Entity STD 2</div> <div>stm [State Machine] F_SCI_EfeS_Sec - Behaviour [Functional Viewpoint - Subsystem Requirements - Functional Entity STD 2]</div> <div><p>The diagram illustrates the state machine for the functional entity STD 2. It starts with an initial state 'Initial0' leading to 'NOT_READY_FOR_PDI_NO_SCP'. Transitions include 'Ready_For_PDI_Connection/' to 'READY_FOR_PDI_NO_SCP' and 'NotReady_For_PDI_Connection/' back. A 'when' condition 'T10in_SCP_Connection_Terminated' leads to 'ACTIVE'. Inside 'ACTIVE', there is an 'ESTABLISHING' state with a junction 'Junction0' that branches based on version checks. It leads to 'VERSION_UNEQUAL', 'READY_FOR_INITIALISATION', 'SENDING_STATUS', and 'ESTABLISHED'. 'ESTABLISHED' can transition to 'SUSPENDED' or back to 'NOT_READY_FOR_PDI_NO_SCP'. 'SUSPENDED' can transition back to 'READY_FOR_PDI_NO_SCP' or 'READY_FOR_PDI'. 'READY_FOR_PDI' has multiple close events leading to 'NOT_READY_FOR_PDI'. A 'when' condition 'T5in_SCP_Connection_Established' leads from 'READY_FOR_PDI' to 'READY_FOR_PDI_NO_SCP'.</p></div>	<div>This state machine diagram describes the requirements for the following functionalities:</div> <div><ul style="list-style-type: none">- establishment and closure of PDI connection- reaction to communication errors- interaction with safe communication protocol</div>
Eu.Gen-SCI.240	Def	Initial0	
Eu.Gen-SCI.557	Def	/cOp1_init();{Initial0 - NOT_READY_FOR_PDI_NO_SCP}	
Eu.Gen-SCI.246	Def	ACTIVE	
Eu.Gen-SCI.247	Def	Cd_Close_PDI[RequestedCloseReason = NormalClose]/ send PDI_Connection_Closed to p2inout; d60out_PDI_Close_Reason := "PDI Normal Close";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.248	Def	Cd_Release_PDI_for_Maintenance/{ACTIVE - SUSPENDED}	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.249	Def	ESTABLISHING	
Eu.Gen-SCI.250	Def	Initial2	
Eu.Gen-SCI.251	Def	/{Initial2 - Junction0}	
Eu.Gen-SCI.252	Def	Junction0	
Eu.Gen-SCI.254	Def	[Mem_PDI_Version = D3in_Con_PDI_Version]/ send Msg_PDI_Version_Check("match", D4in_Con_Checksum_Data,D3in_Con_PDI_Version) to P1inout;{Junction0 - READY_FOR_INITIALISATION}	
Eu.Gen-SCI.257	Def	[NOT (Mem_PDI_Version = D3in_Con_PDI_Version)]/ send Msg_PDI_Version_Check("not match",D4in_Con_Checksum_Data,D3in_Con_PDI_Version) to P1inout;{Junction0 - VERSION_UNEQUAL}	
Eu.Gen-SCI.261	Def	VERSION_UNEQUAL	
Eu.Gen-SCI.262	Def	entry/d50out_PDI_Connection_State := "VERSION_UNEQUAL";{State-internal in VERSION_UNEQUAL}	
Eu.Gen-SCI.263	Def	READY_FOR_INITIALISATION	
Eu.Gen-SCI.264	Def	Cd_Initialisation_Request/ send Msg_Start_Initialisation to P1inout;{READY_FOR_INITIALISATION - SENDING_STATUS}	
Eu.Gen-SCI.265	Def	entry/d50out_PDI_Connection_State := "READY_FOR_INITIALISATION";{State-internal in READY_FOR_INITIALISATION}	
Eu.Gen-SCI.266	Def	SENDING_STATUS	
Eu.Gen-SCI.267	Def	Status_Report_Completed/ send Msg_Initialisation_Completed to P1inout;{SENDING_STATUS - ESTABLISHED}	
Eu.Gen-SCI.268	Def	entry/d50out_PDI_Connection_State := "SENDING_STATUS"; send Start_Status_Report to p3inout;{State-internal in SENDING_STATUS}	
Eu.Gen-SCI.269	Def	Initial1	
Eu.Gen-SCI.270	Def	/{Initial1 - ESTABLISHING}	
Eu.Gen-SCI.271	Def	NotReady_For_PDI_Connection/ send Msg_PDI_Not_Available to P1inout;{ACTIVE - SUSPENDED}	Note: If it is technically not possible to send the telegram Msg_PDI_Not_Available, the secondary communication partner must terminate the safe communication protocol. This will cause a transition to the state 'NOT_READY_FOR_PDI_NO_SCP'.
Eu.Gen-SCI.272	Def	ESTABLISHED	
Eu.Gen-SCI.273	Def	entry/d50out_PDI_Connection_State := "ESTABLISHED"; send PDI_Connection_Established to p2inout;{State-internal in ESTABLISHED}	
Eu.Gen-SCI.276	Def	when(T20in_Protocol_Error)/ send Msg_Reset_PDI(ProtocolError) to P1inout; send PDI_Connection_Closed to p2inout; d60out_PDI_Close_Reason := "EfeS Protocol Error";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.277	Def	when(T21in_Formal_Telegram_Error)/ send Msg_Reset_PDI(FormalTelegramError) to P1inout; send PDI_Connection_Closed to p2inout; d60out_PDI_Close_Reason := "EfeS Formal Telegram Error";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.278	Def	when(T22in_Content_Telegram_Error)/ send Msg_Reset_PDI(ContentTelegramError) to P1inout; send PDI_Connection_Closed to p2inout; d60out_PDI_Close_Reason := "EfeS Content Telegram Error";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.506	Def	Cd_Close_PDI[RequestedCloseReason = OtherVersionRequired]/ send PDI_Connection_Closed to p2inout; d60out_PDI_Close_Reason := "PDI Other Version Required";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.507	Def	Cd_Close_PDI[RequestedCloseReason = Timeout]/ send PDI_Connection_Closed to p2inout; d60out_PDI_Close_Reason := "PDI Timeout";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.508	Def	Cd_Close_PDI[RequestedCloseReason = FormalTelegramError]/ send PDI_Connection_Closed to p2inout; d60out_PDI_Close_Reason := "EIL Formal Telegram Error";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.509	Def	Cd_Close_PDI[RequestedCloseReason = ContentTelegramError]/ send PDI_Connection_Closed to p2inout; d60out_PDI_Close_Reason := "EIL Content Telegram Error";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.510	Def	Cd_Close_PDI[RequestedCloseReason = ProtocolError]/ send PDI_Connection_Closed to p2inout; d60out_PDI_Close_Reason := "EIL Protocol Error";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.556	Def	when(T10in_SCP_Connection_Terminated)/ send PDI_Connection_Closed to p2inout;{ACTIVE - READY_FOR_PDI_NO_SCP}	
Eu.Gen-SCI.279	Def	SUSPENDED	
Eu.Gen-SCI.280	Def	Ready_For_PDI_Connection/send Msg_PDI_Available to P1inout;{SUSPENDED - READY_FOR_PDI}	
Eu.Gen-SCI.281	Def	entry/d50out_PDI_Connection_State := "SUSPENDED"; send PDI_Released_For_Maintenance to p2inout;{State-internal in SUSPENDED}	
Eu.Gen-SCI.568	Def	when(T10in_SCP_Connection_Terminated)/{SUSPENDED - NOT_READY_FOR_PDI_NO_SCP}	
Eu.Gen-SCI.283	Def	READY_FOR_PDI	
Eu.Gen-SCI.284	Def	Cd_PDI_Version_Check/ Mem_PDI_Version := PDI_Version; send PDI_Connection_Started to p2inout;{READY_FOR_PDI - ACTIVE}	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.285	Def	NotReady_For_PDI_Connection/{READY_FOR_PDI - NOT_READY_FOR_PDI}	
Eu.Gen-SCI.286	Def	entry/d50out_PDI_Connection_State := "READY_FOR_PDI";{State-internal in READY_FOR_PDI}	
Eu.Gen-SCI.563	Def	when(T10in_SCP_Connection_Terminated)/{READY_FOR_PDI - READY_FOR_PDI_NO_SCP}	
Eu.Gen-SCI.288	Def	NOT_READY_FOR_PDI	
Eu.Gen-SCI.289	Def	Cd_PDI_Version_Check/send Msg_PDI_Not_Available to P1inout;{NOT_READY_FOR_PDI - SUSPENDED}	
Eu.Gen-SCI.290	Def	Ready_For_PDI_Connection/{NOT_READY_FOR_PDI - READY_FOR_PDI}	
Eu.Gen-SCI.291	Def	entry/d50out_PDI_Connection_State := "NOT_READY_FOR_PDI";{State-internal in NOT_READY_FOR_PDI}	
Eu.Gen-SCI.558	Def	when(T10in_SCP_Connection_Terminated)/{NOT_READY_FOR_PDI - NOT_READY_FOR_PDI_NO_SCP}	
Eu.Gen-SCI.559	Def	NOT_READY_FOR_PDI_NO_SCP	
Eu.Gen-SCI.560	Def	Ready_For_PDI_Connection/{NOT_READY_FOR_PDI_NO_SCP - READY_FOR_PDI_NO_SCP}	
Eu.Gen-SCI.561	Def	entry/d50out_PDI_Connection_State := "NOT_READY_FOR_PDI_NO_SCP";{State-internal in NOT_READY_FOR_PDI_NO_SCP}	
Eu.Gen-SCI.562	Def	when(T5in_SCP_Connection_Established)/{NOT_READY_FOR_PDI_NO_SCP - NOT_READY_FOR_PDI}	
Eu.Gen-SCI.564	Def	READY_FOR_PDI_NO_SCP	
Eu.Gen-SCI.565	Def	NotReady_For_PDI_Connection/{READY_FOR_PDI_NO_SCP - NOT_READY_FOR_PDI_NO_SCP}	
Eu.Gen-SCI.566	Def	entry/d50out_PDI_Connection_State := "READY_FOR_PDI_NO_SCP";{State-internal in READY_FOR_PDI_NO_SCP}	
Eu.Gen-SCI.567	Def	when(T5in_SCP_Connection_Established)/{READY_FOR_PDI_NO_SCP - READY_FOR_PDI}	
Eu.Gen-SCI.512	Head	3.1.1.4 SCI-XX EfeS - General Infos and Assumptions	
Eu.Gen-SCI.455	Info	When a termination of the SCP connection occurs while the PDI connection is suspended, the PDI connection is no longer considered suspended.	
Eu.Gen-SCI.456	Info	The termination or establishment of the SCP connection does not change the impermissibility of the PDI Connection to a specific EULYNX field element Subsystem.	
Eu.Gen-SCI.459	Info	The termination or establishment of the SCP connection does not change the disconnection of the PDI Connection to a specific EULYNX field element Subsystem.	
Eu.Gen-SCI.461	Info	The termination or establishment of the SCP connection does not change the availability of the EULYNX field element Subsystem for PDI Connection.	
Eu.Gen-SCI.513	Info	When the impermissibility of the PDI connection to a specific EULYNX field element Subsystem is reset while the SCP connection is available, the PDI connection will be re-established.	
Eu.Gen-SCI.514	Info	When the impermissibility of the PDI connection to a specific EULYNX field element Subsystem is reset while no SCP connection is available, the PDI connection will be re-established when the SCP connection becomes available.	
Eu.Gen-SCI.515	Info	When the PDI connection to a specific EULYNX field element Subsystem is enabled while the SCP connection is available, the PDI connection will be established.	
Eu.Gen-SCI.516	Info	When the PDI connection to a specific EULYNX field element Subsystem is enabled while no SCP connection is available, the PDI connection will be established when the SCP connection becomes available.	
Eu.Gen-SCI.517	Info	If the PDI connection to a specific EULYNX field element Subsystem is not disconnected nor impermissible, and no SCP connection is available, the primary communication partner establishes the SCP connection.	
Eu.Gen-SCI.454	Head	3.1.2 SCI-XX EfeS - Internal Behaviour of Subsystem - Electronic Interlocking	
Eu.Gen-SCI.457	Req	It shall be possible to reset the impermissibility of the PDI connection to a specific EULYNX field element Subsystem by a trigger to the Subsystem - Electronic Interlocking.	
Eu.Gen-SCI.458	Req	It shall be possible to disable or disconnect the PDI connection to a specific EULYNX field element Subsystem by a trigger to the Subsystem - Electronic Interlocking. Note: The SCP connection is not affected when PDI connection is disconnected.	
Eu.Gen-SCI.460	Req	It shall be possible to enable or connect the PDI connection to a specific EULYNX field element Subsystem by a trigger to the Subsystem - Electronic Interlocking.	
Eu.Gen-SCI.474	Head	3.1.3 SCI-XX EfeS - Internal Information Flows	
Eu.Gen-SCI.475	Def	<div><div>[Package] SCI-XX EfeS - Internal Information Flows [Internal Interface Requirements - Direction of Information Objects]</div><div><div><div><div><div>bdd [Package] SCI-XX EfeS - Internal Information Flows [Internal Interface Requirements - Direction of Information Objects]</div></div><div><div><div>«information flow» F_SCI_Specific</div><div>prov «signal» Start_Status_Report reqd «signal» Status_Report_Completed</div></div></div></div></div></div></div>	
Eu.Gen-SCI.477	Def	Start_Status_Report	
Eu.Gen-SCI.478	Def	Status_Report_Completed	
Eu.Gen-SCI.39	Head	3.2 Adjacent systems interfaces	
Eu.Gen-SCI.601	Info	This chapter is not part of the EU-Rail System Pillar scope in the current release.	
Eu.Gen-SCI.40	Head	3.2.1 Interface between Subsystem - Electronic Interlocking and AdjS (SCI-XX AdjS)	
Eu.Gen-SCI.217	Head	3.2.1.1 SCI-XX AdjS - Logical Viewpoint	
Eu.Gen-SCI.218	Head	3.2.1.1.1 SCI-XX AdjS - Logical Context	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.219	Def	<div><div>[Package] SCI-XX AdjS - Logical Context [Logical Viewpoint - Interface Definition]</div><div><div><div><div><div>«logical structural entity» SCI-XX AdjS</div></div><div><div><div>«logical structural entity» Subsystem - Electronic Interlocking</div><div>1</div><div>SCI-XX</div></div><div><div><div>«environmental structural entity» Adjacent System</div><div>1</div><div>SCI-XX</div></div></div></div></div></div></div></div>	
Eu.Gen-SCI.200	Head	3.2.1.2 SCI-XX AdjS - Information Flows	
Eu.Gen-SCI.201	Def	<div><div>[Package] SCI-XX AdjS - Information Flows [Interface Requirements - Direction of Information Objects]</div><div><div><div><div><div>«information flow» PDI_GEN_ADJ</div><div>prov «signal» Cd_PDI_Version_Check reqd «signal» Msg_PDI_Version_Check prov «signal» Cd_Close_PDI prov «signal» Cd_Initialisation_Request reqd «signal» Msg_Start_Initialisation reqd «signal» Msg_Reset_PDI provreqd «signal» Msg_Status_Report_Completed reqd «signal» Msg_Initialisation_Completed</div></div><div><div>«information flow» Adj SCI-XX AdjS</div><div>proxyPorts «ProxyPort» P1inout : PDI_GEN_ADJ</div></div><div><div>«information flow» Adj SCI-XX EIL</div><div>proxyPorts «ProxyPort» P1inout : PDI_GEN_ADJ</div></div></div></div></div></div>	
Eu.Gen-SCI.202	Def	<div><div>[Package] SCI-XX AdjS - Information Flows [Interface Requirements - Information Objects]</div><div><div><div><div><div><div>«information object» signal Cd_PDI_Version_Check</div><div>PDI_Version : String</div></div><div><div>«information object» signal Msg_Initialisation_Completed</div></div><div><div>«information object» signal Msg_Status_Report_Completed</div></div><div><div>«information object» signal Cd_Initialisation_Request</div></div><div><div>«information object» signal Msg_Start_Initialisation</div></div><div><div>«information object» signal Msg_PDI_Version_Check</div><div>Result : String ChecksumData : String PDIVersion : String</div></div><div><div>«information object» signal Msg_Reset_PDI</div><div>ReportedResetReason : ResetReason</div><div><div>«valueType (enumeration)» ResetReason</div><div>ProtocolError FormalTelegramError ContentTelegramError</div></div><div><div>«information object» signal Cd_Close_PDI</div><div>RequestedCloseReason : CloseReason</div><div><div>«valueType (enumeration)» CloseReason</div><div>NormalClose OtherVersionRequired Timeout ProtocolError FormalTelegramError ContentTelegramError ChecksumMismatch</div></div></div><div><div>ReportedResetReason</div><div>RequestedCloseReason</div></div></div></div></div></div></div></div>	
Eu.Gen-SCI.216	Info	The referenced information objects for this Interface can be found in SCI-XX - Information Flows.	
Eu.Gen-SCI.41	Head	3.2.1.3 SCI-XX AdjS - Functional Viewpoint	
Eu.Gen-SCI.198	Head	3.2.1.3.1 Definition of time values	
Eu.Gen-SCI.199	Def	Con_tmax_PDI_Connection	If the establishment of the PDI connection, measured from the sending of Cd_PDI_Version_Check to the receipt of Msg_Initialisation_Completed, is not completed within this configured time period the safe communication is terminated. A diagnostic message is issued. The Safe communication is then re-established.
Eu.Gen-SCI.45	Head	3.2.1.3.2 SCI-XX AdjS - Functional Context	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.550	Info	<div><div>[Package] SCI-XX AdjS - Functional Context [Interface Definition - UseCases - Initialisation]</div><div>uc [Package] SCI-XX AdjS - Functional Context [Interface Definition - UseCases - Initialisation]</div><div></div></div>	
Eu.Gen-SCI.46	Info	SCI-XX AdjS IFUC1.1: Establish PDI connection	The UseCase SCI-XX AdjS IFUC1.1: Establish PDI connection defines the process to establish a PDI connection between Subsystem - Electronic Interlocking and Adjacent System.
Eu.Gen-SCI.49	Info	<div><div>[Interaction] SCI-XX AdjS IFUC1.1 - Main Success Scenario [SCI-XX AdjS IF SD 1.1.1]</div><div>sd [Interaction] SCI-XX AdjS IFUC1.1 - Main Success Scenario [SCI-XX AdjS IF SD 1.1.1]</div><div></div></div>	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.47	Info	<div><div>[Interaction] SCI-XX AdjS IFUC1.1 - Alternative Scenario [SCI-XX AdjS IF SD 1.1.2]</div><div><div>sd [Interaction] SCI-XX AdjS IFUC1.1 - Alternative Scenario [SCI-XX AdjS IF SD 1.1.2]</div><div><div><div>:Subsystem - Electronic Interlocking</div><div><div>:Adjacent System</div></div></div><div><p>Alternative Scenario: PDI version is unequal</p><p>Precondition:</p><p>The SCP connection is established.</p><p>Interaction 1.1.2.A:</p><p>1. - Subsystem - Electronic Interlocking receives from Adjacent System the request to verify the match between the transmitted PDIVer and the PDIVer present in the Subsystem - Electronic Interlocking.</p><p>2. Subsystem - Electronic Interlocking evaluates that the PDI versions are unequal.</p><p>3. Subsystem - Electronic Interlocking reports to Adjacent System that PDIVer does not match.</p><p>4. Adjacent System requests from Subsystem - Electronic Interlocking to close the PDI connection.</p><p>Postcondition:</p><p>The PDI connection is impermissible.</p></div><div><pre>sequenceDiagram participant S as :Subsystem - Electronic Interlocking participant A as :Adjacent System Note over S: Activation A->>S: Cd_PDI_Version_Check Note over S: Activation S->>A: Msg_PDI_Version_Check Note over A: Activation A->>S: Cd_Close_PDI Note over S: Activation Note over S: Deactivation Note over A: Deactivation</pre></div></div></div></div>	
Eu.Gen-SCI.48	Info	<div><div>[Interaction] SCI-XX AdjS IFUC1.1 - Alternative Scenario [SCI-XX AdjS IF SD 1.1.3]</div><div><div>sd [Interaction] SCI-XX AdjS IFUC1.1 - Alternative Scenario [SCI-XX AdjS IF SD 1.1.3]</div><div><div><div>:Subsystem - Electronic Interlocking</div><div><div>:Adjacent System</div></div></div><div><p>Alternative Scenario: CSS is unequal</p><p>Precondition:</p><p>The SCP connection is established.</p><p>Interaction 1.1.3.A:</p><p>1. - Subsystem - Electronic Interlocking receives from Adjacent System the request to verify the match between the transmitted PDIVer and the PDIVer present in the Subsystem - Electronic Interlocking.</p><p>2. Subsystem - Electronic Interlocking evaluates that the PDI versions are equal.</p><p>3. Subsystem - Electronic Interlocking reports to Adjacent System the used PDIVer and newly calculated CSS.</p><p>4. Adjacent System evaluates that the received CSS is unequal to the configured value for the communication partner.</p><p>5. Adjacent System requests from Subsystem - Electronic Interlocking to close the PDI connection.</p><p>Postcondition:</p><p>The PDI connection is impermissible.</p></div><div><pre>sequenceDiagram participant S as :Subsystem - Electronic Interlocking participant A as :Adjacent System Note over S: Activation A->>S: Cd_PDI_Version_Check Note over S: Activation S->>A: Msg_PDI_Version_Check Note over A: Activation A->>S: Cd_Close_PDI Note over S: Activation Note over S: Deactivation Note over A: Deactivation</pre></div></div></div></div>	
Eu.Gen-SCI.50	Info	SCI-XX AdjS IFUC1.2: Close PDI connection	The UseCase SCI-XX AdjS IFUC1.2: Close PDI connection defines the process to close a PDI connection between Subsystem - Electronic Interlocking and Adjacent System.
Eu.Gen-SCI.51	Info	<div><div>[Interaction] SCI-XX AdjS IFUC1.2 - Alternative Scenario [SCI-XX AdjS IF SD 1.2.1]</div><div><div>sd [Interaction] SCI-XX AdjS IFUC1.2 - Alternative Scenario [SCI-XX AdjS IF SD 1.2.1]</div><div><div><div>:Subsystem - Electronic Interlocking</div><div><div>:Adjacent System</div></div></div><div><p>Alternative Scenario: Communication Error</p><p>Precondition:</p><p>The PDI connection is in state ESTABLISHED or in state ESTABLISHING.</p><p>Interaction 1.2.1.A:</p><p>alt</p><p>1. - The Adjacent System detects a communication error of the type Formal Telegram Error.</p><p>else alt</p><p>2. - The Adjacent System detects a communication error of the type Content Telegram Error.</p><p>else alt</p><p>3. - The Adjacent System detects a communication error of the type Protocol Error.</p><p>end alt</p><p>4. The Adjacent System requests from Subsystem - Electronic Interlocking to close the PDI connection.</p><p>Postcondition:</p><p>The PDI connection is impermissible.</p></div><div><pre>sequenceDiagram participant S as :Subsystem - Electronic Interlocking participant A as :Adjacent System alt A->>S: Formal Telegram Error Detected or A->>S: Content Telegram Error Detected or A->>S: Protocol Error Detected end Note over S: Activation A->>S: Cd_Close_PDI Note over S: Activation Note over S: Deactivation Note over A: Deactivation</pre></div></div></div></div>	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.44	Def	<div><div>[Block] SCI-XX AdjS [Functional Viewpoint - Interface Requirements - Functional Architecture]</div><div><div>ibb [Block] SCI-XX AdjS [Functional Viewpoint - Interface Requirements - Functional Architecture]</div><div><div>«logical structural entity» SCI-XX AdjS</div><div><div><div><div>«participant» {end = SCI-XX} «logical structural entity» InLink : Adjacent System</div><div><div><div>D2in_Con_tmax_PDI_Connection</div><div>D3in_Con_PDI_Version</div><div>D4in_Con_Checksum_Data</div><div>T5in_SCP_Connection_Established</div><div>T6out_Establish_SCP_Connection</div><div>T10in_SCP_Connection_Terminated</div><div>P1inout : ~PDI_GEN_ADJ</div><div>T20in_Protocol_Error</div><div>T21in_Formal_Telegram_Error</div><div>«functional entity» SCI-XX AdjS : S_SCI_Adj_Prim</div><div>T22in_Content_Telegram_Error</div><div>t25in_Sec_Status_Report_Complete</div><div>t27out_Check_Sec_Status</div><div>T45in_Reset_Severe_Error</div><div>d60out_PDI_Close_Reason</div><div>D50out_PDI_Connection_State</div><div>p2inout : ~SCI_AdjS_Prim_Specific</div></div></div><div>AdjSX : Adj SCI-XX AdjS</div></div><div><div><div>«participant» {end = SCI-XX} «logical structural entity» InLink : Subsystem - Electronic Interlocking</div><div><div><div>D3in_Con_PDI_Version</div><div>D4in_Con_Checksum_Data</div><div>T5in_SCP_Connection_Established</div><div>d60_PDI_Close_Reason : String</div><div>T10in_SCP_Connection_Terminated</div><div>P1inout : PDI_GEN_ADJ</div><div>T11out_PDI_Connection_Established</div><div>T17out_PDI_Connection_Closed</div><div>«functional entity» SCI-XX EIL : S_SCI_Adj_Sec</div><div>T20in_Protocol_Error</div><div>T21in_Formal_Telegram_Error</div><div>T22in_Content_Telegram_Error</div><div>t25in_Prim_Status_Report_Complete</div><div>t27out_Check_Prim_Status</div><div>D50out_PDI_Connection_State</div><div>p2inout : ~SCI_AdjS_Sec_Specific</div></div></div><div>EILX : Adj SCI-XX EIL</div></div></div><div><div>P1inout : PDI_GEN_ADJ</div><div>«equal»</div><div>P1inout : ~PDI_GEN_ADJ</div><div>«equal»</div><div>P1inout : PDI_GEN_ADJ</div></div></div></div></div></div></div>	
Eu.Gen-SCI.53	Head	3.2.1.3.5 SCI-XX AdjS - Functional Entities	
Eu.Gen-SCI.54	Info	S_SCI_Adj_Prim	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.55	Req	<div>[Block] S_SCI_Adj_Prim [Functional Viewpoint - Interface Requirements - Functional Entity]</div> <div><div>ibd [Block] S_SCI_Adj_Prim [Functional Viewpoint - Interface Requirements - Functional Entity]</div><div><div><div>«functional entity» S_SCI_Adj_Prim</div><div>values «BlockProperty» Mem_PDI_Version_Check_Result : String «BlockProperty» Mem_PDI_Version_ChecksumData : String</div><div>Operation «Operation» cOp1_init ()</div></div><div><div>D2in_Con_tmax_PDI_Connection : Integer</div><div>D50out_PDI_Connection_State : String</div></div><div><div>D3in_Con_PDI_Version : String</div><div>d60out_PDI_Close_Reason : String</div></div><div><div>D4in_Con_Checksum_Data : String</div><div>T6out_Establish_SCP_Connection : PulsedOut</div></div><div><div>t27out_Check_Sec_Status : PulsedOut</div></div><div><div>T5in_SCP_Connection_Established : PulsedIn</div><div>P1inout : ~PDI_GEN_ADJ</div></div><div><div>T10in_SCP_Connection_Terminated : PulsedIn</div><div>p2inout : ~SCI_AdjS_Prim_Specific</div></div><div><div>T20in_Protocol_Error : PulsedIn</div></div><div><div>T21in_Formal_Telegram_Error : PulsedIn</div></div><div><div>T22in_Content_Telegram_Error : PulsedIn</div></div><div><div>t25in_Sec_Status_Report_Complete : PulsedIn</div></div><div><div>T45in_Reset_Severe_Error : PulsedIn</div></div></div></div>	
Eu.Gen-SCI.56	Def	<div>/* cOp1_init */</div> <div>Mem_PDI_Version_Check_Result := "unknown";</div> <div>Mem_PDI_Version_ChecksumData := D4in_Con_Checksum_Data;</div>	cOp1_init
Eu.Gen-SCI.58	Def	D2in_Con_tmax_PDI_Connection	The port D2in_Con_tmax_PDI_Connection provides the time value Con_tmax_PDI_Connection.
Eu.Gen-SCI.59	Def	D3in_Con_PDI_Version	The port D3in_Con_PDI_Version provides the configured PDIVer.
Eu.Gen-SCI.60	Def	D4in_Con_Checksum_Data	The port D4in_Con_Checksum_Data provides the configured or calculated CSS.
Eu.Gen-SCI.128	Def	T5in_SCP_Connection_Established	The port T5in_SCP_Connection_Established represents the event of the established SCP connection.
Eu.Gen-SCI.129	Def	T6out_Establish_SCP_Connection	<div>The port T6out_Establish_SCP_Connection represents the event for the SCP to establish the SCP connection.</div> <div>Note: It is assumed that the SCP layer handle each connection error by itself after sending the trigger on T6out_Establish_SCP_Connection. A retrigging of SCP connection is not in responsibility of SCI layer. In case of a successful established connection the trigger T5in_SCP_Connection_Established is expected.</div>
Eu.Gen-SCI.121	Def	T10in_SCP_Connection_Terminated	The port T10in_SCP_Connection_Terminated represents the event of the terminated SCP connection.
Eu.Gen-SCI.122	Def	T20in_Protocol_Error	The port T20in_Protocol_Error represents the event of a protocol error. Definition can be found in Eu.SAS.1567.
Eu.Gen-SCI.123	Def	T21in_Formal_Telegram_Error	The port T21in_Formal_Telegram_Error represents the event of a formal telegram error. Definition can be found in Eu.SAS.1567.
Eu.Gen-SCI.124	Def	T22in_Content_Telegram_Error	The port T22in_Content_Telegram_Error represents the event of a content telegram error. Definition can be found in Eu.SAS.1567.
Eu.Gen-SCI.125	Def	t25in_Sec_Status_Report_Complete	
Eu.Gen-SCI.126	Def	t27out_Check_Sec_Status	
Eu.Gen-SCI.127	Def	T45in_Reset_Severe_Error	The port T45in_Reset_Severe_Error represents the event of a reset of severe errors.
Eu.Gen-SCI.61	Def	D50out_PDI_Connection_State	The port D50out_PDI_Connection_State provides the status of the PDI connection.
Eu.Gen-SCI.62	Def	d60out_PDI_Close_Reason	
Eu.Gen-SCI.63	Def	P1inout	The port P1inout exchanges information objects according to PDI_GEN_ADJ.

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.64	Def	p2inout	
Eu.Gen-SCI.65	Info	S_SCI_AdjS_Prim - Behaviour	
Eu.Gen-SCI.66	Req	<div>Functional Viewpoint - Interface Requirements - Functional Entity STD 3</div> <div>stm [State Machine] S_SCI_AdjS_Prim - Behaviour [Functional Viewpoint - Interface Requirements - Functional Entity STD 3]</div> <p>The diagram illustrates the state machine for the S_SCI_AdjS_Prim - Behaviour. It starts with an initial state 'Initial0' leading to 'REQUESTED_NO_SCP'. From there, it transitions to 'ACTIVE' upon 'T5in_SCP_Connection_Established'. 'ACTIVE' leads to 'ESTABLISHING', which then leads to 'WAITING_FOR_VERSION_CHECK'. This state checks the 'Msg_PDI_Version_Check' and sends 'Cd_Initilisation_Request' to 'P1inout'. It then transitions to 'WAITING_FOR_INITIALISATION', which sends 'Msg_Start_Initilisation/' to 'RECEIVING_SEC_STATUS'. This leads to 'CHECKING_SEC_STATUS', which sends 'Msg_Status_Report_Completed/' to 'SENDING_PRIM_STATUS'. This leads to 'WAITING_FOR_INIT_COMPLETION', which sends 'Msg_Status_Report_Completed' to 'P1inout' and 'D50out_PDI_Connection_State' to 'WAITING_FOR_INIT_COMPLETION'. Upon 'Msg_Initilisation_Completed/', it transitions to 'ESTABLISHED', which sends 'PDI_Connection_Established' to 'p2inout' and 'PDI_Connection_Closed' to 'p2inout'. Various error conditions lead to 'IMPERMISSIBLE_NO_SCP' or 'IMPERMISSIBLE' states, which then lead back to 'REQUESTED_NO_SCP' or 'IMPERMISSIBLE' respectively.</p> <div><p>This state machine diagram describes the requirements for the following functionalities:</p><ul style="list-style-type: none">- establishment and closure of PDI connection- reaction to communication errors- interaction with safe communication protocol</div>	

This state machine diagram describes the requirements for the following functionalities:

- establishment and closure of PDI connection
- reaction to communication errors
- interaction with safe communication protocol

Generic interface and subsystem requirements for SCI			
ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.67	Def	Initial0	
Eu.Gen-SCI.68	Def	/cOp1_init();{Initial0 - REQUESTED_NO_SCP}	
Eu.Gen-SCI.69	Def	REQUESTED_NO_SCP	
Eu.Gen-SCI.70	Def	entry/D50out_PDI_Connection_State := "REQUESTED_NO_SCP"; T6out_Establish_SCP_Connection := TRUE;{State-internal in REQUESTED_NO_SCP}	
Eu.Gen-SCI.71	Def	when(T5in_SCP_Connection_Established)/{REQUESTED_NO_SCP - ACTIVE}	
Eu.Gen-SCI.72	Def	IMPERMISSIBLE	
Eu.Gen-SCI.73	Def	entry/D50out_PDI_Connection_State := "IMPERMISSIBLE";{State-internal in IMPERMISSIBLE}	
Eu.Gen-SCI.74	Def	when(T10in_SCP_Connection_Terminated)/{IMPERMISSIBLE - IMPERMISSIBLE_NO_SCP}	
Eu.Gen-SCI.75	Def	when(T45in_Reset_Severe_Error)/{IMPERMISSIBLE - ACTIVE}	
Eu.Gen-SCI.76	Def	IMPERMISSIBLE_NO_SCP	
Eu.Gen-SCI.77	Def	entry/D50out_PDI_Connection_State := "IMPERMISSIBLE_NO_SCP";{State-internal in IMPERMISSIBLE_NO_SCP}	
Eu.Gen-SCI.78	Def	when(T45in_Reset_Severe_Error)/{IMPERMISSIBLE_NO_SCP - REQUESTED_NO_SCP}	
Eu.Gen-SCI.79	Def	when(T5in_SCP_Connection_Established)/{IMPERMISSIBLE_NO_SCP - IMPERMISSIBLE}	
Eu.Gen-SCI.83	Def	ACTIVE	
Eu.Gen-SCI.84	Def	ESTABLISHING	
Eu.Gen-SCI.85	Def	after(D2in_Con_tmax_PDI_Connection)/ send PDI_Connection_Closed to p2inout; send Cd_Close_PDI(Timeout) to P1inout; d60out_PDI_Close_Reason := "PDI Timeout";{ESTABLISHING - ESTABLISHING}	
Eu.Gen-SCI.86	Def	CHECKING_SEC_STATUS	
Eu.Gen-SCI.87	Def	entry/t27out_Check_Sec_Status := TRUE; D50out_PDI_Connection_State := "CHECKING_SEC_STATUS";{State-internal in CHECKING_SEC_STATUS}	
Eu.Gen-SCI.88	Def	when(t25in_Sec_Status_Report_Complete)/{CHECKING_SEC_STATUS - SENDING_PRIM_STATUS}	
Eu.Gen-SCI.89	Def	Initial2	
Eu.Gen-SCI.90	Def	/send Establishing_PDI_Connection to p2inout; send Cd_PDI_Version_Check(D3in_Con_PDI_Version) to P1inout;{Initial2 - WAITING_FOR_VERSION_CHECK}	
Eu.Gen-SCI.91	Def	RECEIVING_SEC_STATUS	
Eu.Gen-SCI.92	Def	Msg_Status_Report_Completed/{RECEIVING_SEC_STATUS - CHECKING_SEC_STATUS}	
Eu.Gen-SCI.93	Def	entry/D50out_PDI_Connection_State := "RECEIVING_SEC_STATUS";{State-internal in RECEIVING_SEC_STATUS}	
Eu.Gen-SCI.94	Def	SENDING_PRIM_STATUS	
Eu.Gen-SCI.95	Def	Prim_Status_Report_Completed/{SENDING_PRIM_STATUS - WAITING_FOR_INIT_COMPLETION}	
Eu.Gen-SCI.96	Def	entry/send Start_Prim_Status_Report to p2inout; D50out_PDI_Connection_State := "SENDING_PRIM_STATUS";{State-internal in SENDING_PRIM_STATUS}	
Eu.Gen-SCI.97	Def	WAITING_FOR_INIT_COMPLETION	
Eu.Gen-SCI.98	Def	Msg_Initialisation_Completed/{WAITING_FOR_INIT_COMPLETION - ESTABLISHED}	
Eu.Gen-SCI.99	Def	entry/send Msg_Status_Report_Completed to P1inout; D50out_PDI_Connection_State := "WAITING_FOR_INIT_COMPLETION";{State-internal in WAITING_FOR_INIT_COMPLETION}	
Eu.Gen-SCI.100	Def	WAITING_FOR_INITIALISATION	
Eu.Gen-SCI.101	Def	Msg_Start_Initialisation/{WAITING_FOR_INITIALISATION - RECEIVING_SEC_STATUS}	
Eu.Gen-SCI.102	Def	entry/D50out_PDI_Connection_State := "WAITING_FOR_INITIALISATION";{State-internal in WAITING_FOR_INITIALISATION}	
Eu.Gen-SCI.103	Def	WAITING_FOR_VERSION_CHECK	
Eu.Gen-SCI.105	Def	Msg_PDI_Version_Check[Result = "not match"]/ d60out_PDI_Close_Reason := "PDI Other Version Required"; send Cd_Close_PDI(OtherVersionRequired) to P1inout;{WAITING_FOR_VERSION_CHECK - IMPERMISSIBLE}	
Eu.Gen-SCI.106	Def	Msg_PDI_Version_Check[Result = "match" AND ChecksumData = D4in_Con_Checksum_Data]/ send Cd_Initialisation_Request to P1inout;{WAITING_FOR_VERSION_CHECK - WAITING_FOR_INITIALISATION}	
Eu.Gen-SCI.107	Def	Msg_PDI_Version_Check[Result = "match" AND NOT (ChecksumData = D4in_Con_Checksum_Data)]/ d60out_PDI_Close_Reason := "PDI Checksum Mismatch"; send Cd_Close_PDI(ChecksumMismatch) to P1inout;{WAITING_FOR_VERSION_CHECK - IMPERMISSIBLE}	
Eu.Gen-SCI.108	Def	entry/D50out_PDI_Connection_State := "WAITING_FOR_VERSION_CHECK";{State-internal in WAITING_FOR_VERSION_CHECK}	
Eu.Gen-SCI.109	Def	Initial1	
Eu.Gen-SCI.110	Def	/ {Initial1 - ESTABLISHING}	
Eu.Gen-SCI.111	Def	Msg_Reset_PDI[ReportedResetReason = ProtocolError]/ d60out_PDI_Close_Reason := "Sec Protocol Error";{ACTIVE - IMPERMISSIBLE}	
Eu.Gen-SCI.112	Def	Msg_Reset_PDI[ReportedResetReason = FormalTelegramError]/ d60out_PDI_Close_Reason := "Sec Formal Telegram Error";{ACTIVE - IMPERMISSIBLE}	

Generic interface and subsystem requirements for SCI			
ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.113	Def	Msg_Reset_PDI[ReportedResetReason = ContentTelegramError]/ d60out_PDI_Close_Reason := "Sec Content Telegram Error";{ACTIVE - IMPERMISSIBLE}	
Eu.Gen-SCI.114	Def	ESTABLISHED	
Eu.Gen-SCI.115	Def	entry/D50out_PDI_Connection_State := "ESTABLISHED"; send PDI_Connection_Established to p2inout;{State-internal in ESTABLISHED}	
Eu.Gen-SCI.491	Def	exit/send PDI_Connection_Closed to p2inout;{State-internal in ESTABLISHED}	
Eu.Gen-SCI.116	Def	when(T20in_Protocol_Error)/ d60out_PDI_Close_Reason := "Prim Protocol Error"; send Cd_Close_PDI(ProtocolError) to P1inout;{ACTIVE - IMPERMISSIBLE}	
Eu.Gen-SCI.117	Def	when(T21in_Formal_Telegram_Error)/ d60out_PDI_Close_Reason := "Prim Formal Telegram Error"; send Cd_Close_PDI(FormalTelegramError) to P1inout;{ACTIVE - IMPERMISSIBLE}	
Eu.Gen-SCI.118	Def	when(T22in_Content_Telegram_Error)/ d60out_PDI_Close_Reason := "Prim Content Telegram Error"; send Cd_Close_PDI(ContentTelegramError) to P1inout;{ACTIVE - IMPERMISSIBLE}	
Eu.Gen-SCI.120	Def	when(T10in_SCP_Connection_Terminated)/{ACTIVE - REQUESTED_NO_SCP}	
Eu.Gen-SCI.130	Info	S_SCI_Adj_Sec	
Eu.Gen-SCI.131	Req	<div><div>[Block] S_SCI_Adj_Sec [Functional Viewpoint - Interface Requirements - Functional Entity]</div><div><div>ibd [Block] S_SCI_Adj_Sec [Functional Viewpoint - Interface Requirements - Functional Entity]</div><div><div><div>«functional entity» S_SCI_Adj_Sec</div><div>values</div><div>«BlockProperty» Mem_PDI_Version : String</div><div>Operation</div><div>«Operation» cOp1_init ()</div></div><div><div>T10in_SCP_Connection_Terminated : PulsedIn</div><div>T5in_SCP_Connection_Established : PulsedIn</div><div>t25in_Prim_Status_Report_Complete : PulsedIn</div><div>D3in_Con_PDI_Version : String</div><div>D4in_Con_Checksum_Data : String</div><div>T20in_Protocol_Error : PulsedIn</div><div>T21in_Formal_Telegram_Error : PulsedIn</div><div>T22in_Content_Telegram_Error : PulsedIn</div><div>T11out_PDI_Connection_Established : PulsedOut</div><div>T17out_PDI_Connection_Closed : PulsedOut</div><div>t27out_Check_Prim_Status : PulsedOut</div><div>D50out_PDI_Connection_State : String</div><div>P1inout : PDI_GEN_ADJ</div><div>p2inout : ~SCI_AdjS_Sec_Specific</div><div>d60_PDI_Close_Reason : String</div></div></div></div></div>	
Eu.Gen-SCI.132	Def	/* cOp1_init */ Mem_PDI_Version := D3in_Con_PDI_Version;	cOp1_init
Eu.Gen-SCI.134	Def	D3in_Con_PDI_Version	The port D3in_Con_PDI_Version provides the configured PDIVer.
Eu.Gen-SCI.135	Def	D4in_Con_Checksum_Data	The port D4in_Con_Checksum_Data provides the configured CSS.
Eu.Gen-SCI.194	Def	T5in_SCP_Connection_Established	The port T5in_SCP_Connection_Established represents the event of the established SCP connection.
Eu.Gen-SCI.195	Def	t25in_Prim_Status_Report_Complete	
Eu.Gen-SCI.187	Def	T10in_SCP_Connection_Terminated	The port T10in_SCP_Connection_Terminated represents the event of the terminated SCP connection.
Eu.Gen-SCI.188	Def	T11out_PDI_Connection_Established	The port T11out_PDI_Connection_Established represents the event of the established PDI connection.
Eu.Gen-SCI.189	Def	T17out_PDI_Connection_Closed	The port T11out_PDI_Connection_Established represents the event of the closed PDI connection.
Eu.Gen-SCI.190	Def	T20in_Protocol_Error	The port T20in_Protocol_Error represents the event of a protocol error.
Eu.Gen-SCI.191	Def	T21in_Formal_Telegram_Error	The port T21in_Formal_Telegram_Error represents the event of a formal telegram error.
Eu.Gen-SCI.192	Def	T22in_Content_Telegram_Error	The port T22in_Content_Telegram_Error represents the event of a content telegram error.
Eu.Gen-SCI.193	Def	t27out_Check_Prim_Status	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.136	Def	D50out_PDI_Connection_State	The port d50out_PDI_Connection_State provides the status of the PDI connection.
Eu.Gen-SCI.525	Def	d60_PDI_Close_Reason	
Eu.Gen-SCI.185	Def	P1inout	The port P1inout exchanges information objects according to PDI_GEN_ADJ.
Eu.Gen-SCI.186	Def	p2inout	
Eu.Gen-SCI.137	Info	S_SCI_AdjS_Sec - Behaviour	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.138	Req	<div>Functional Viewpoint - Interface Requirements - Functional Entity STD 4</div> <div>stm [State Machine] S_SCI_AdjS_Sec - Behaviour [Functional Viewpoint - Interface Requirements - Functional Entity STD 4]</div> <div><p>The diagram illustrates the state machine for the S_SCI_AdjS_Sec - Behaviour. It starts with an initial state 'Initial0' leading to the 'REQUESTED_NO_SCP' state. From 'REQUESTED_NO_SCP', a transition 'when(T5in_SCP_Connection_Established)/' leads to the 'READY_FOR_PDI' state, and a transition 'when(T10in_SCP_Connection_Terminated)/' leads back. The 'REQUESTED_NO_SCP' state has an entry action 'D50out_PDI_Connection_State := "REQUESTED_NO_SCP";'. The 'READY_FOR_PDI' state has an entry action 'D50out_PDI_Connection_State := "READY_FOR_PDI";'. A large 'ACTIVE' state contains an 'ESTABLISHING' state. The 'ESTABLISHING' state starts at 'Initial1' and leads to the 'VERSION_UNEQUAL' state. The 'VERSION_UNEQUAL' state has an entry action 'D50out_PDI_Connection_State := "VERSION_UNEQUAL";' and a transition '[NOT (Mem_PDI_Version = D3in_Con_PDI_Version)]/' leading to a junction 'Junction0'. From 'Junction0', a transition '[Mem_PDI_Version = D3in_Con_PDI_Version]/' leads to the 'READY_FOR_INITIALISATION' state, and another leads back to 'VERSION_UNEQUAL'. The 'READY_FOR_INITIALISATION' state has an entry action 'D50out_PDI_Connection_State := "READY_FOR_INITIALISATION";' and a transition 'Cd_Initialisation_Request/ send Msg_Start_Initialisation to P1inout;' leading to the 'SENDING_SEC_STATUS' state. The 'SENDING_SEC_STATUS' state has an entry action 'D50out_PDI_Connection_State := "SENDING_SEC_STATUS";' and a transition 'send Start_Sec_Status_Report to p2inout;' leading to the 'RECEIVING_PRIM_STATUS' state. The 'RECEIVING_PRIM_STATUS' state has an entry action 'D50out_PDI_Connection_State := "RECEIVING_PRIM_STATUS";' and a transition 'send Msg_Status_Report_Completed to P1inout;' leading to the 'CHECKING_PRIM_STATUS' state. The 'CHECKING_PRIM_STATUS' state has an entry action 'D50out_PDI_Connection_State := "CHECKING_PRIM_STATUS";' and a transition 't27out_Check_Prim_Status := TRUE;' leading to the 'ESTABLISHED' state. The 'ESTABLISHED' state has an entry action 'D50out_PDI_Connection_State := "ESTABLISHED";', a transition 'send PDI_Connection_Established to p2inout;', and an exit action 'send PDI_Connection_Closed to p2inout;'. A transition 'when(t25in_Prim_Status_Report_Complete)/ send Msg_Initialisation_Completed to P1inout;' leads from 'CHECKING_PRIM_STATUS' back to 'READY_FOR_INITIALISATION'. To the right of the 'ACTIVE' state, a list of actions for 'Cd_Close_PDI' is provided: 'Cd_Close_PDI[RequestedCloseReason = Timeout]/ d60_PDI_Close_Reason := "PDI Timeout";', 'Cd_Close_PDI[RequestedCloseReason = ChecksumMismatch]/ d60_PDI_Close_Reason := "PDI Checksum Mismatch";', 'Cd_Close_PDI[RequestedCloseReason = OtherVersionRequired]/ d60_PDI_Close_Reason := "PDI Other Version Required";', 'Cd_Close_PDI[RequestedCloseReason = ProtocolError]/ d60_PDI_Close_Reason := "Prim Protocol Error";', 'Cd_Close_PDI[RequestedCloseReason = FormalTelegramError]/ d60_PDI_Close_Reason := "Prim Formal Telegram Error";', and 'Cd_Close_PDI[RequestedCloseReason = ContentTelegramError]/ d60_PDI_Close_Reason := "Prim Content Telegram Error";'. Below these, a transition 'Cd_PDI_Version_Check/Mem_PDI_Version := PDI_Version;' leads to a junction. From this junction, a transition 'when(T22in_Content_Telegram_Error)/' leads to 'send Msg_Reset_PDI (ContentTelegramError) to P1inout; d60_PDI_Close_Reason := "Sec Content Telegram Error";', and another 'when(T21in_Formal_Telegram_Error)/' leads to 'send Msg_Reset_PDI (FormalTelegramError) to P1inout; d60_PDI_Close_Reason := "Sec Formal Telegram Error";'. A final transition 'when(T20in_Protocol_Error)/' leads to 'send Msg_Reset_PDI (ProtocolError) to P1inout; d60_PDI_Close_Reason := "Sec Protocol Error";'.</p></div>	<div>This state machine diagram describes the requirements for the following functionalities:</div> <div><ul style="list-style-type: none">- establishment and closure of PDI connection- reaction to communication errors- interaction with safe communication protocol</div>
Eu.Gen-SCI.139	Def	Initial0	
Eu.Gen-SCI.140	Def	/cOp1_init();{Initial0 - REQUESTED_NO_SCP}	
Eu.Gen-SCI.141	Def	REQUESTED_NO_SCP	
Eu.Gen-SCI.142	Def	entry/D50out_PDI_Connection_State := "REQUESTED_NO_SCP";{State-internal in REQUESTED_NO_SCP}	
Eu.Gen-SCI.143	Def	when(T5in_SCP_Connection_Established)/{REQUESTED_NO_SCP - READY_FOR_PDI}	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.144	Def	ACTIVE	
Eu.Gen-SCI.145	Def	Cd_Close_PDI[RequestedCloseReason = Timeout]/ d60_PDI_Close_Reason := "PDI Timeout";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.146	Def	ESTABLISHING	
Eu.Gen-SCI.147	Def	CHECKING_PRIM_STATUS	
Eu.Gen-SCI.148	Def	entry/D50out_PDI_Connection_State := "CHECKING_PRIM_STATUS"; t27out_Check_Prim_Status := TRUE;{State-internal in CHECKING_PRIM_STATUS}	
Eu.Gen-SCI.149	Def	when(t25in_Prim_Status_Report_Complete)/ send Msg_Initialisation_Completed to P1inout;{CHECKING_PRIM_STATUS - ESTABLISHED}	
Eu.Gen-SCI.150	Def	Initial2	
Eu.Gen-SCI.151	Def	/ {Initial2 - Junction0}	
Eu.Gen-SCI.152	Def	Junction0	
Eu.Gen-SCI.153	Def	[NOT (Mem_PDI_Version = D3in_Con_PDI_Version)]/ send Msg_PDI_Version_Check("not match", D4in_Con_Checksum_Data, D3in_Con_PDI_Version) to P1inout;{Junction0 - VERSION_UNEQUAL}	
Eu.Gen-SCI.154	Def	[Mem_PDI_Version = D3in_Con_PDI_Version]/ send Msg_PDI_Version_Check("match", D4in_Con_Checksum_Data, D3in_Con_PDI_Version) to P1inout;{Junction0 - READY_FOR_INITIALISATION}	
Eu.Gen-SCI.161	Def	VERSION_UNEQUAL	
Eu.Gen-SCI.162	Def	entry/D50out_PDI_Connection_State := "VERSION_UNEQUAL";{State-internal in VERSION_UNEQUAL}	
Eu.Gen-SCI.163	Def	READY_FOR_INITIALISATION	
Eu.Gen-SCI.164	Def	Cd_Initialisation_Request/ send Msg_Start_Initialisation to P1inout;{READY_FOR_INITIALISATION - SENDING_SEC_STATUS}	
Eu.Gen-SCI.165	Def	entry/D50out_PDI_Connection_State := "READY_FOR_INITIALISATION";{State-internal in READY_FOR_INITIALISATION}	
Eu.Gen-SCI.166	Def	RECEIVING_PRIM_STATUS	
Eu.Gen-SCI.167	Def	Msg_Status_Report_Completed/{RECEIVING_PRIM_STATUS - CHECKING_PRIM_STATUS}	
Eu.Gen-SCI.168	Def	entry/D50out_PDI_Connection_State := "RECEIVING_PRIM_STATUS"; send Msg_Status_Report_Completed to P1inout;{State-internal in RECEIVING_PRIM_STATUS}	
Eu.Gen-SCI.169	Def	SENDING_SEC_STATUS	
Eu.Gen-SCI.170	Def	Sec_Status_Report_Completed/{SENDING_SEC_STATUS - RECEIVING_PRIM_STATUS}	
Eu.Gen-SCI.171	Def	entry/D50out_PDI_Connection_State := "SENDING_SEC_STATUS"; send Start_Sec_Status_Report to p2inout;{State-internal in SENDING_SEC_STATUS}	
Eu.Gen-SCI.172	Def	Initial1	
Eu.Gen-SCI.173	Def	/send Establishing_PDI_Connection to p2inout;{Initial1 - ESTABLISHING}	
Eu.Gen-SCI.174	Def	ESTABLISHED	
Eu.Gen-SCI.175	Def	entry/D50out_PDI_Connection_State := "ESTABLISHED"; send PDI_Connection_Established to p2inout;{State-internal in ESTABLISHED}	
Eu.Gen-SCI.176	Def	exit/send PDI_Connection_Closed to p2inout;{State-internal in ESTABLISHED}	
Eu.Gen-SCI.177	Def	when(T10in_SCP_Connection_Terminated)/{ACTIVE - REQUESTED_NO_SCP}	
Eu.Gen-SCI.178	Def	when(T20in_Protocol_Error)/ send Msg_Reset_PDI (ProtocolError) to P1inout; d60_PDI_Close_Reason := "Sec Protocol Error";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.179	Def	when(T21in_Formal_Telegram_Error)/ send Msg_Reset_PDI (FormalTelegramError) to P1inout; d60_PDI_Close_Reason := "Sec Formal Telegram Error";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.180	Def	when(T22in_Content_Telegram_Error)/ send Msg_Reset_PDI (ContentTelegramError) to P1inout; d60_PDI_Close_Reason := "Sec Content Telegram Error";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.492	Def	Cd_Close_PDI[RequestedCloseReason = ContentTelegramError]/ d60_PDI_Close_Reason := "Prim Content Telegram Error";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.493	Def	Cd_Close_PDI[RequestedCloseReason = FormalTelegramError]/ d60_PDI_Close_Reason := "Prim Formal Telegram Error";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.494	Def	Cd_Close_PDI[RequestedCloseReason = ProtocolError]/ d60_PDI_Close_Reason := "Prim Protocol Error";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.495	Def	Cd_Close_PDI[RequestedCloseReason = OtherVersionRequired]/ d60_PDI_Close_Reason := "PDI Other Version Required";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.496	Def	Cd_Close_PDI[RequestedCloseReason = ChecksumMismatch]/ d60_PDI_Close_Reason := "PDI Checksum Mismatch";{ACTIVE - READY_FOR_PDI}	
Eu.Gen-SCI.181	Def	READY_FOR_PDI	
Eu.Gen-SCI.182	Def	Cd_PDI_Version_Check/Mem_PDI_Version := PDI_Version;{READY_FOR_PDI - ACTIVE}	
Eu.Gen-SCI.183	Def	entry/D50out_PDI_Connection_State := "READY_FOR_PDI";{State-internal in READY_FOR_PDI}	
Eu.Gen-SCI.184	Def	when(T10in_SCP_Connection_Terminated)/{READY_FOR_PDI - REQUESTED_NO_SCP}	

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.497	Head	3.2.1.4 SCI-XX AdjS - General Infos and Assumptions	
Eu.Gen-SCI.426	Info	The termination or establishment of the SCP connection does not change the impermissibility of the PDI Connection to a specific EULYNX field element Subsystem.	
Eu.Gen-SCI.498	Info	When the impermissibility of the PDI connection is reset while the SCP connection is available, the PDI connection will be re-established.	
Eu.Gen-SCI.499	Info	When the impermissibility of the PDI connection is reset while no SCP connection is available, the PDI connection will be re-established when the SCP connection becomes available.	
Eu.Gen-SCI.500	Info	If the PDI connection is not disconnected nor impermissible, and no SCP connection is available, the primary communication partner re-establishes the SCP connection.	
Eu.Gen-SCI.425	Head	3.2.2 SCI-XX AdjS - Internal behaviour of Adjacent Systems	
Eu.Gen-SCI.427	Req	It shall be possible to reset the impermissibility of the PDI connection to the Subsystem - Electronic Interlocking by a trigger to the Adjacent system.	
Eu.Gen-SCI.428	Head	3.2.3 SCI-XX AdjS - Internal Information Flows	
Eu.Gen-SCI.429	Def	<div><div>[Package] Adjacent Systems - Internal Information Flows [Internal Interface Requirements - Direction of Information Objects]</div><div><div>bdd [Package] Adjacent Systems - Internal Information Flows [Internal Interface Requirements - Direction of Information Objects]</div><div><div><div><div>«information flow» SCI_AdjS_Prim_Specific</div><div>prov «signal» Start_Prim_Status_Report reqd «signal» Prim_Status_Report_Completed prov «signal» PDI_Connection_Closed prov «signal» PDI_Connection_Established prov «signal» Establishing_PDI_Connection</div></div><div><div>«information flow» SCI_AdjS_Sec_Specific</div><div>prov «signal» Start_Sec_Status_Report reqd «signal» Sec_Status_Report_Completed prov «signal» PDI_Connection_Closed prov «signal» PDI_Connection_Established prov «signal» Establishing_PDI_Connection</div></div></div></div></div></div>	
Eu.Gen-SCI.463	Def	Establishing_PDI_Connection	
Eu.Gen-SCI.464	Def	PDI_Connection_Closed	
Eu.Gen-SCI.465	Def	PDI_Connection_Established	
Eu.Gen-SCI.466	Def	Prim_Status_Report_Completed	
Eu.Gen-SCI.467	Def	Sec_Status_Report_Completed	
Eu.Gen-SCI.468	Def	Start_Prim_Status_Report	
Eu.Gen-SCI.469	Def	Start_Sec_Status_Report	
Eu.Gen-SCI.412	Head	3.3 SCI-XX - Information Flows	
Eu.Gen-SCI.479	Def	Cd_Close_PDI	Command (Cd) from primary communication partner to secondary communication partner to close the PDI connection.
Eu.Gen-SCI.480	Def	Cd_Initialisation_Request	Command (Cd) from primary communication partner to secondary communication partner to to transmit the status information of the secondary communication partner.
Eu.Gen-SCI.481	Def	Cd_PDI_Version_Check	Command (Cd) from primary communication partner to secondary communication partner to check the compatibility of parameter PDIVer.
Eu.Gen-SCI.482	Def	Cd_Release_PDI_for_Maintenance	Command (Cd) from primary communication partner to secondary communication partner to release the PDI connection for maintenance. This is only applicable to field element interfaces.
Eu.Gen-SCI.483	Def	Msg_Initialisation_Completed	Message (Msg) from secondary communication partner to primary communication partner that transmission of status information is complete.
Eu.Gen-SCI.484	Def	Msg_PDI_Available	Message (Msg) from secondary communication partner to primary communication partner that the PDI connection is available. This is only applicable to field element interfaces.
Eu.Gen-SCI.485	Def	Msg_PDI_Not_Available	Message (Msg) from secondary communication partner to primary communication partner that the PDI connection is not available. This is only applicable to field element interfaces.
Eu.Gen-SCI.486	Def	Msg_PDI_Version_Check	Message (Msg) from secondary communication partner to primary communication partner that the transmitted PDIVer is either equal or unequal. In case of equality the secondary communication partner additionally sends the configured value PDIVer and the newly calculated CSS. Otherwise, only the configured value PDIVer is sent.
Eu.Gen-SCI.487	Def	Msg_Reset_PDI	Message (Msg) from secondary communication partner to primary communication partner to inform about a detected communication error to reset the PDI connection.
Eu.Gen-SCI.488	Def	Msg_Start_Initialisation	Message (Msg) from secondary communication partner to primary communication partner that transmission of status information will start.

ID	Type	Requirement Part 1	Requirement Part 2
Eu.Gen-SCI.489	Def	Msg_Status_Report_Completed	Message (Msg) from secondary communication partner to primary communication partner or from primary communication partner to secondary communication partner that status message transmission of one partner is completed. This is only applicable to adjacent system interfaces.
Eu.Gen-SCI.695	Head	4 Technical requirements	
Eu.Gen-SCI.696	Head	4.1 SCI PDI checksum mechanism	
Eu.Gen-SCI.697	Req	The primary communication partner shall determine the validity of the configuration and engineering data of the secondary communication partner using the checksum method.	
Eu.Gen-SCI.700	Req	The configuration data for a primary communication partner shall contain the checksum data for each PDI connection with a secondary communication partner separately.	
Eu.Gen-SCI.699	Req	The secondary communication partner shall calculate the checksum data based on its configuration and engineering data for each PDI connection separately.	
Eu.Gen-SCI.698	Info	The calculation method of the CSS may be chosen by the supplier of the secondary communication partner, if it can provide the corresponding checksum data that must be available in the primary communication partner.	
Eu.Gen-SCI.701	Req	The security and integrity level of the chosen calculation method of the CSS shall be at least equivalent to [MD5] (16 Bytes).	
Eu.Gen-SCI.702	Head	4.2 Configuration and engineering data	
Eu.Gen-SCI.703	Head	4.2.1 SCI-XX EfeS - Value configuration	
Eu.Gen-SCI.705	Req	Con_tmax_PDI_Connection The time value shall be configured in accordance with: Resolution of configuration: 1 s Configurable range: between 1 and 60 s The default value for the configurable period Con_tmax_PDI_Connection is 20 s. Con_tmax_PDI_Connection is defined in Eu.Gen-SCI.438.	
Eu.Gen-SCI.704	Head	4.2.2 SCI-XX AdjS - Value configuration	
Eu.Gen-SCI.706	Req	Con_tmax_PDI_Connection The time value shall be configured in accordance with: Resolution of configuration: 1 s Configurable range: between 1 and 60 s. The default value for the configurable period Con_tmax_PDI_Connection is 20 s. Con_tmax_PDI_Connection is defined in Eu.Gen-SCI.199.	