Interface specification SCI-P

Contents

ID	Type	Requirement	Func. Pkg.
Eu.SCI-P.PDI.4	Head	**1 Introduction**	
Eu.SCI-P.PDI.5	Head	**1.1 Release information**	
Eu.SCI-P.PDI.6	Info	[Eu.Doc.38] Interface specification SCI-P CENELEC Phase: 5 Version: 4.2 (0.A) Approval date: 15.06.2023	
Eu.SCI-P.PDI.1	Info	**Version history**	
Eu.SCI-P.PDI.288	Info	version number: 4.0 (0.A) date: 16.05.2022 author: Andreas Staudte review: CCB changes: EUP-386, EUP-387, EUP-390	
Eu.SCI-P.PDI.289	Info	version number: 4.1 (0.A) date: 14.04.2023 author: Philipp Wolber, Filip Giering review: changes: EUP-429, EUP-436, EUP-437, EUP-445	
Eu.SCI-P.PDI.290	Info	version number: 4.1 (1.A) date: 01.06.2023 author: Dominik Smajgl, Philipp Wolber review: cluster changes: EUP-454, EUP-481, EUP-492, EUP-498	
Eu.SCI-P.PDI.293	Info	version number: 4.2 (0.A) date: 27.06.2023 author: Philipp Wolber review: TACS Mirror Group changes: EUP-502, EUP-504, EUP-506, EUP-510	
Eu.SCI-P.PDI.7	Head	**1.2 Impressum**	

ID	Type	Requirement	Func. Pkg.
Eu.SCI-P.PDI.8	Info	Publishers: **Europe's Rail Joint Undertaking** https://rail-research.europa.eu **EULYNX Initiative** A full list of the **EULYNX Partners** can be found on www.eulynx.eu/index.php/members	
Eu.SCI-P.PDI.9	Info	Responsible for this document: EU-Rail System Pillar Trackside Assets Control and Supervision domain	
Eu.SCI-P.PDI.203	Info	Copyright EULYNX Partners All information included or disclosed in this document is licensed under the European Union Public Licence EUPL, Version 1.2 or later.	
Eu.SCI-P.PDI.10	Head	**1.3 Purpose**	
Eu.SCI-P.PDI.11	Info	This document specifies the application layer of the standardised interface for safe communication between the Subsystem - Electronic Interlocking and Subsystem - Point (SCI-P).	
Eu.SCI-P.PDI.12	Info	This application layer is designated as SCI-P.PDI.	
Eu.SCI-P.PDI.13	Info	This document contains the general requirements for communication and the technical specification (e.g. telegrams) of the SCI-P.PDI.	
Eu.SCI-P.PDI.14	Info	This specification does not define the detailed behaviour of the interfacing partners (Subsystem - Electronic Interlocking and Subsystem - Point), nor the situations in which the defined telegrams are sent. This behaviour is the subject of the individual system specifications.	
Eu.SCI-P.PDI.15	Info	Some items, referring to "interface-related" functionality of the communication partners, have been added to this specification as information, providing an overview only. In any case these are subject to appropriate systems (national) specification.	
Eu.SCI-P.PDI.16	Info	This document is intended for the following users: • safety authorities • infrastructure managers • safety assessors • signalling system suppliers • validators	

ID	Type	Requirement	Func. Pkg.
Eu.SCI-P.PDI.291	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.SCI-P.PDI.18	Head	**1.4 Applicable standards and regulations**	
Eu.SCI-P.PDI.19	Info	The applicable standards and regulations used in EULYNX are listed in the EULYNX Reference Document List [Eu.Doc.12].	
Eu.SCI-P.PDI.201	Info	The applicability of each reference of this specification is provided by the column "applicability" in the EULYNX Reference Document [Eu.Doc.12], when the value "SCI-P" is stated.	
Eu.SCI-P.PDI.20	Head	**1.5 Applicable documents**	
Eu.SCI-P.PDI.21	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.SCI-P.PDI.24	Head	**1.6 Appendices**	
Eu.SCI-P.PDI.25	Info	*- intentionally left blank -*	
Eu.SCI-P.PDI.150	Head	**1.7 Terms and abbreviations**	
Eu.SCI-P.PDI.151	Info	The terms and abbreviations are listed in the EULYNX Glossary [Eu.Doc.9].	
Eu.SCI-P.PDI.152	Head	**1.8 Variability management**	
Eu.SCI-P.PDI.153	Info	This document describes harmonised requirements. Variability management is not applicable.	
Eu.SCI-P.PDI.26	Head	**1.9 Definition of object types**	
Eu.SCI-P.PDI.27	Info	The following definition for object types is applied in this document:	
Eu.SCI-P.PDI.28	Info	• "Req" - This denotes a mandatory requirement.	
Eu.SCI-P.PDI.31	Info	• "Info" - This denotes additional information to help understand the specification. These objects do not specify any additional requirements.	
Eu.SCI-P.PDI.32	Info	• "Head" - This denotes chapter headings.	

ID	Type	Requirement	Func. Pkg.
Eu.SCI-P.PDI.33	Head	**2 General requirements**	
Eu.SCI-P.PDI.284	Req	All references to Eu.Doc.36 refer to Requirements specification for subsystem Point version 4.3 (0.A).	
Eu.SCI-P.PDI.241	Req	All references to Eu.Doc.93 refer to Interface specification SCI Generic version 3.2 (0.A).	
Eu.SCI-P.PDI.42	Head	**2.1 Version handling**	
Eu.SCI-P.PDI.211	Info	The Version handling is described in Eu.Doc.93.	
Eu.SCI-P.PDI.242	Req	The PDI-version of the SCI-P as described in this document is 0x04.	
Eu.SCI-P.PDI.49	Head	**2.2 Communication requirements**	
Eu.SCI-P.PDI.232	Info	The Communication requirements are described in Eu.Doc.93.	
Eu.SCI-P.PDI.285	Head	**2.3 Functional requirements**	
Eu.SCI-P.PDI.286	Info	The functional requirements for SCI-P are described in Eu.Doc.36.	
Eu.SCI-P.PDI.54	Head	**3 Telegrams SCI-P.PDI**	
Eu.SCI-P.PDI.55	Info	This chapter defines the SCI-P.PDI telegrams.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.56	Head	**3.1 Telegram structure**	
Eu.SCI-P.PDI.212	Info	The telegram structure is specified in Eu.Doc.93.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.64	Head	**3.2 Sender and Receiver Identifier**	
Eu.SCI-P.PDI.213	Info	The identification of communications partners is specified in Eu.Doc.93.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P

ID	Type	Requirement	Func. Pkg.
Eu.SCI-P.PDI.70	Head	**3.3 Message and command type overview**	
Eu.SCI-P.PDI.71	Info	The following table shows permitted subsystem specific message types for the SCI-P.PDI. The permitted generic message types are specified in Eu.Doc.93. <table><tr><th>Message Type</th><th>Value</th><th>Sender</th><th>Receiver</th><th>Purpose</th></tr><tr><td>*command* Move Point</td><td>0x0001</td><td>Subsystem - Electronic Interlocking</td><td>Subsystem Point</td><td>Command for Move Point into the commanded position</td></tr><tr><td>*message* Point Position</td><td>0x000B</td><td>Subsystem Point</td><td>Subsystem - Electronic Interlocking</td><td>Message about current Point Position</td></tr><tr><td>*message* Movement Failed</td><td>0x000C</td><td>Subsystem Point</td><td>Subsystem - Electronic Interlocking</td><td>The movement has failed</td></tr><tr><td>*message* Ability To Move Point</td><td>0x000D</td><td>Subsystem Point</td><td>Subsystem - Electronic Interlocking</td><td>Message about current state of Ability To Move Point</td></tr></table>	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P Option Able to move
Eu.SCI-P.PDI.72	Head	**3.4 Telegram definitions**	
Eu.SCI-P.PDI.73	Info	In this chapter, specific telegrams for SCI-P.PDI are defined. The generic telegrams are defined in Eu.Doc.93.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.158	Head	**3.4.1 Command "Move Point"**	
Eu.SCI-P.PDI.159	Info	With this telegram the Subsystem - Electronic Interlocking commands the Subsystem - Point to move the point. This telegram refines the InformationFlow "Cd_Move_Point" specified in the requirements specification (ID Eu.P.6183).	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.160	Info	Telegram definition for command "Move Point"	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P

ID	Type	Requirement	Func. Pkg.
		<table><tr><th>Byte-Nr.</th><th>Content</th></tr><tr><td>00</td><td>Protocol Type: 0x40 (1 Byte binary)</td></tr><tr><td>01..02</td><td>Message Type: 0x0001 (2 Bytes binary)</td></tr><tr><td>03..22</td><td>Sender Identifier (20 Bytes ISO IEC 8859-1:1998)</td></tr><tr><td>23..42</td><td>Receiver Identifier (20 Bytes ISO IEC 8859-1:1998)</td></tr><tr><td>43</td><td>Commanded Point Position (1 Byte binary)</td></tr></table>	
Eu.SCI-P.PDI.161	Info	Permitted values for command "Move Point":	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.162	Req	**Message Type** The message bytes 1 and 2 shall be set to 0x0001.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.163	Req	**Sender Identifier** The message bytes 3 - 22 shall contain the technical identifier of the Subsystem - Electronic Interlocking according to ID Eu.SCI-XX.PDI.59 in ISO IEC 8859-1:1998 format.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.164	Req	**Receiver Identifier** The message bytes 23 - 42 shall contain the operational identifier of Subsystem - Point according to ID Eu.SCI-XX.PDI.59 in ISO IEC 8859-1:1998 format.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.165	Req	**Commanded Point Position** The message byte 43 shall contain the commanded position of the point. Permitted values: value meaning ----------------- ---------------	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.167	Req	0x01 The Subsystem - Electronic Interlocking requests a right hand point moving.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P

ID	Type	Requirement	Func. Pkg.
Eu.SCI-P.PDI.168	Req	0x02 The Subsystem - Electronic Interlocking requests a left hand point moving.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.181	Head	**3.4.2 Message "Point Position"**	
Eu.SCI-P.PDI.182	Info	With this telegram the Subsystem - Point informs Subsystem - Electronic Interlocking about the actual Point Position. This telegram refines the InformationFlow "Msg_Point_Position" specified in the requirements specification (ID Eu.P.6187).	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.183	Info	Telegram definition for message "Point Position"	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.184	Info	Permitted values for message "Point Position":	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.185	Req	**Message Type** The message bytes 1 and 2 shall be set to 0x000B.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.186	Req	**Sender Identifier** The message bytes 3 - 22 shall contain the operational identifier of the Subsystem - Point according to ID Eu.SCI-XX.PDI.59 in ISO IEC 8859-1:1998 format.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P

Within the Eu.SCI-P.PDI.183 row, the telegram definition table:

Byte-Nr.	Content
00	Protocol Type: 0x40 (1 Byte binary)
01..02	Message Type: 0x000B (2 Bytes binary)
03..22	Sender Identifier (20 Bytes ISO IEC 8859-1:1998)
23..42	Receiver Identifier (20 Bytes ISO IEC 8859-1:1998)
43	Reported Point Position (1 Byte binary)
44	Reported Degraded Point Position (1 Byte binary)

ID	Type	Requirement	Func. Pkg.
Eu.SCI-P.PDI.187	Req	**Receiver Identifier** The message bytes 23 - 42 shall contain the technical identifier of the Subsystem - Electronic Interlocking according to ID Eu.SCI-XX.PDI.59 in ISO IEC 8859-1:1998 format.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.188	Req	**Reported Point Position** The message byte 43 shall contain the position of the point. The valid values are: value meaning ------------------ ----------------	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.190	Req	0x01 The Point is in a right hand position (defined end position).	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.191	Req	0x02 The Point is in a left hand position (defined end position).	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.192	Req	0x03 The Point is in no end position.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.193	Req	0x04 The Point is in unintended position.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.279	Req	**Reported Degraded Point Position** The message byte 44 shall contain the degraded position of the point. The valid values are: value meaning ------------------ ----------------	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.280	Req	0x01 The Point is in a degraded right hand position.	Basic non-4-wire multiple P Basic 4-wire multiple P
Eu.SCI-P.PDI.281	Req	0x02 The Point is in a degraded left hand position.	Basic non-4-wire multiple P Basic 4-wire multiple P

ID	Type	Requirement	Func. Pkg.
Eu.SCI-P.PDI.283	Req	0x03 The Point is not in a degraded position.	Basic non-4-wire multiple P Basic 4-wire multiple P
Eu.SCI-P.PDI.282	Req	0xFF Degraded point position is not applicable.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.194	Head	**3.4.3 Message "Movement Failed"**	
Eu.SCI-P.PDI.195	Info	With this telegram the Subsystem - Point informs the Subsystem - Electronic Interlocking, that the movement has failed. This telegram refines the InformationFlow "Msg_Movement_Failed" specified in the requirements specification (ID Eu.P.6190).	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.196	Info	Telegram definition for message "Movement Failed" | Byte-Nr.	Content
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00	Protocol Type: 0x40 (1 Byte binary)
01..02	Message Type: 0x000C (2 Bytes binary)
03..22	Sender Identifier (20 Bytes ISO IEC 8859-1:1998)
23..42	Receiver Identifier (20 Bytes ISO IEC 8859-1:1998)		Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.197	Info	Permitted values for message "Movement Failed":	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.198	Req	**Message Type** The message bytes 1 - 2 shall be set to 0x000C.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.199	Req	**Sender Identifier** The message bytes 3 - 22 shall contain the operational identifier of Subsystem - Point according to ID Eu.SCI-XX.PDI.59 in ISO IEC 8859-1:1998 format.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P

ID	Type	Requirement	Func. Pkg.
Eu.SCI-P.PDI.200	Req	**Receiver Identifier** The message bytes 23 - 42 shall contain the technical identifier of the Subsystem - Electronic Interlocking according to ID Eu.SCI-XX.PDI.59 in ISO IEC 8859-1:1998 format.	Basic non-4-wire single P Basic non-4-wire multiple P Basic 4-wire single P Basic 4-wire multiple P
Eu.SCI-P.PDI.265	Head	**3.4.4 Message "Ability To Move Point"**	
Eu.SCI-P.PDI.266	Info	With this telegram the Subsystem - Point informs Subsystem - Electronic Interlocking about the ability to move point. This telegram refines the InformationFlow "Msg_Ability_To_Move_Point" specified in the requirements specification (ID Eu.P.6185).	Option Able to move
Eu.SCI-P.PDI.267	Info	Telegram definition for message "Ability To Move Point "<table><tr><th>Byte-Nr.</th><th>Content</th></tr><tr><td>00</td><td>Protocol Type: 0x40 (1 Byte binary)</td></tr><tr><td>01..02</td><td>Message Type: 0x000D (2 Bytes binary)</td></tr><tr><td>03..22</td><td>Sender Identifier (20 Bytes ISO IEC 8859-1:1998)</td></tr><tr><td>23..42</td><td>Receiver Identifier (20 Bytes ISO IEC 8859-1:1998)</td></tr><tr><td>43</td><td>Reported Ability To Move Point Status (1 Byte binary)</td></tr></table>	Option Able to move
Eu.SCI-P.PDI.268	Info	Permitted values for message "Ability To Move Point":	Option Able to move
Eu.SCI-P.PDI.269	Req	**Message Type** The message bytes 1 and 2 shall be set to 0x000D.	Option Able to move
Eu.SCI-P.PDI.270	Req	**Sender Identifier** The message bytes 3 - 22 shall contain the operational identifier of the Subsystem - Point according to ID Eu.SCI-XX.PDI.59 in ISO IEC 8859-1:1998 format.	Option Able to move
Eu.SCI-P.PDI.271	Req	**Receiver Identifier** The message bytes 23 - 42 shall contain the technical identifier of the Subsystem - Electronic Interlocking according to ID Eu.SCI-XX.PDI.59 in ISO IEC 8859-1:1998 format.	Option Able to move

ID	Type	Requirement	Func. Pkg.
Eu.SCI-P.PDI.272	Req	**Reported Ability To Move Point Status** The message byte 43 shall contain the ability to move point status. The valid values are: value meaning ------------------ ----------------	Option Able to move
Eu.SCI-P.PDI.273	Req	0x01 The Point is able to move.	Option Able to move
Eu.SCI-P.PDI.274	Req	0x02 The Point is unable to move.	Option Able to move