



COVER DOCUMENT

System Pillar / EULYNX

Baseline Set 4 Release 3

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Revision History

Revision #	Revision Date	Description of Change	Author
1	20230630	Mirror Group approval of Release 2	Nico Hurman, Mirko Blazic
2	20231004	Error corrections Release 2	Nico Hurman
3	20240621	Mirror Group approval of Release 3	Nico Hurman, Mirko Blazic

Introduction

Europe's Rail Joint Undertaking (EU-Rail) is established by Council Regulation (EU) 2021/2085 of 19 November 2021. It is the new European partnership on rail research and innovation established under the Horizon Europe programme (2020-2027) and the universal successor of the Shift2Rail Joint Undertaking. The vision of EU-Rail is to deliver, via an integrated system approach, a high capacity, flexible, multi-modal and reliable integrated European railway network by eliminating barriers to interoperability and providing solutions for full integration, for European citizens and cargo.

The EULYNX Consortium (EULYNX) is an initiative of 15 European infrastructure managers, started in 2014 with a common goal for standardisation of signalling systems. Aiming for defining and standardising CCS interfaces, the goal is a significant reduction of the lifecycle cost for signalling systems. EULYNX regularly publishes specification documents as Baseline Sets.

EU-Rail and EULYNX have published a common documentation release EULYNX Baseline Set 4 Release 3. This release has been prepared in close collaboration with the European rail control-command and signalling (CCS) sector under the organisation of EU-Rail System Pillar, bringing a part of the EULYNX development under technical authority of the EU-Rail System Pillar.

The EULYNX Baseline Set 4 Release 3 is a documentation update release within the EULYNX Baseline Set 4, continuing the development based on previous releases. The primary focus of this release is to incorporate remaining feedback from the industry and reach a stable maturity level, fully integrated into the EU-Rail System Pillar. All specifications related to trackside assets and transversal functions are applicable for both the current EULYNX architecture and the future rail target architecture, agreed in the framework of the EU-Rail System Pillar, therefore published as a single set of specifications under a common publication by EULYNX and EU-Rail, delivering in total 25 specification documents. The EU-Rail System Pillar takes the role of the technical authority for the documents of the common publication and will ensure their maintenance.

In addition to the common documentation release, EULYNX published also additional specifications and supporting documents for the current EULYNX architecture, which are integrated in the EULYNX part of Baseline Set 4 Release 3, delivering additional 29 documents.

All deliverables are available in PDF format. In addition to the PDF documents, the following supporting artefacts are delivered:

- For all deliverables originating from DOORS, the requirements interchange format ReqIF is available.
- For all model-based deliverables, the underlying models are available as an export from the EULYNX model.

- For all EULYNX field element subsystem specifications, the simulators developed by EULYNX for verification and validation of requirements are available.

Security specifications

This release does not provide an update of the specifications related to security. The EULYNX BL4R2 security specifications remain applicable. In future phases, the EULYNX security specifications will be integrated and replaced by harmonised specifications published by the EU-Rail System Pillar Security domain. Publication of the first set of harmonised specifications by the EU-Rail System Pillar Cyber Security domain is currently foreseen for January 2025. This first set will contain 4 specification documents:

- Security Program Requirements
- Secure Component Specification
- Secure Communication Specification
- Shared Security Services Specification

Planning next releases

With this release, the specification documents of Baseline Set 4 have reached a stable maturity level. The current baseline set is closed for changes in functionality or new functions. Individual specifications may receive further updates due to error corrections or change requests.

Further developments in EULYNX and EU-Rail System Pillar will be introduced as part of Baseline Set 5. A concrete timeline for the next baseline set has not yet been defined, its publication will not be earlier than June 2026.

Documents

The System Pillar / EULYNX Baseline Set 4 Release 3 includes the following documents:

Document ID	Document Name	Document Version	CENELEC Phase	Release
Eu.Doc.18	Maintenance and data management specification	4.0 (2.A)	4	06/2023
Eu.Doc.20	Generic interface and subsystem requirements	4.0 (6.A)	4	06/2024
Eu.Doc.119	Generic interface and subsystem requirements for SCI	1.1 (0.A)	4	06/2024
Eu.Doc.120	Generic interface and subsystem requirements for SMI	1.1 (0.A)	4	06/2024
Eu.Doc.92	Interface definition SCI	4.3 (0.A)	5	06/2024
Eu.Doc.93	Interface specification SCI Generic	3.3 (0.A)	5	06/2024
Eu.Doc.77	Interface definition SDI	3.2 (0.A)	5	06/2024
Eu.Doc.94	Interface specification SDI Generic	4.2 (0.A)	5	06/2024
Eu.Doc.100	Specification of Point of Service - Signalling	2.2 (0.A)	4	06/2024
Eu.Doc.76	Interface definition and specification SMI	2.2 (0.A)	5	06/2024
Eu.Doc.32	Requirements specification for subsystem Light Signal	4.3 (0.A)	4	06/2024
Eu.Doc.33	Interface specification SCI-LS	4.3 (0.A)	5	06/2024
Eu.Doc.78	Interface specification SDI-LS	4.2 (0.A)	5	06/2024
Eu.Doc.36	Requirements specification for subsystem Point	4.4 (0.A)	4	06/2024
Eu.Doc.38	Interface specification SCI-P	4.2 (0.A)	5	06/2023
Eu.Doc.80	Interface specification SDI-P	4.2 (0.A)	5	06/2024
Eu.Doc.45	Requirements specification for subsystem Generic IO	4.3 (0.A)	4	06/2024
Eu.Doc.46	Interface specification SCI-IO	4.0 (2.A)	5	06/2023
Eu.Doc.82	Interface specification SDI-IO	4.2 (0.A)	5	06/2024
Eu.Doc.43	Requirements specification for subsystem TDS	4.2 (0.A)	4	06/2024
Eu.Doc.44	Interface specification SCI-TDS	4.1 (0.A)	5	06/2024
Eu.Doc.81	Interface specification SDI-TDS	4.2 (0.A)	5	06/2024
Eu.Doc.108	Requirements specification for subsystem Level Crossing	2.3 (0.A)	4	06/2024
Eu.Doc.109	Interface specification SCI-LC	2.2 (0.A)	5	06/2024
Eu.Doc.110	Interface specification SDI-LC	3.2 (0.A)	5	06/2024

Error corrections

The following table will list Change Requests that describe error corrections that shall be considered when applying the documents of EULYNX Baseline Set 4 Release 3.

No Change Requests are listed currently.

<i>CR ID</i>	<i>CR Description</i>	<i>IDs of impacted documents</i>	<i>CR date</i>

Functional packages

Documents related to the EULYNX field element subsystems (Light Signal, Generic IO, Point, TDS, Level Crossing) are divided into functional packages. These packages define coherent blocks of capabilities that can be implemented in a product. The packages can be used to delimit the required scope of the functionality of a product, either in the context of tenders for specific implementation projects or in the context of generic product testing and/or certification.

There are two types of packages related to the product capabilities:

- 'Basic packages': One or more packages, at least one of them must be implemented. It is optionally allowed to combine and implement more than one 'basic package' in a product.
- 'Optional package': One or more packages that can be optionally implemented in addition to (one of) the basic package(s).

Backwards compatibility

The specifications documents of Baseline Set 4 do not include automatic backwards compatibility. Products developed according to the EULYNX specifications of BL4 can't communicate with products developed according to earlier baselines of the EULYNX specifications. Products that must support communication with other products of both BL4 and the previous EULYNX baseline, e.g. because of migration scenarios, must be developed according to a superset of specification documents from different baselines.

The specification documents of Baseline Set 4 are structured in such a way that in a future release it is possible to release a new version of the specification documents related to SCI, SDI, SMI or SSI without the need to publish a new version of the specification document related to the other interfaces. In this way, compatibility of different versions of the four EULYNX interfaces can be managed independent from each other.

Even when the specifications for the interfaces SCI, SDI, SMI and SSI are managed independently in separate documents, there can be technical reasons that create interdependencies between them. This can e.g. be the introduction of a new functionality that requires an update on both SCI and SMI. The new functionality can only be used if a EULYNX product implements the newer version of both SCI and SMI.

To manage this, EULYNX will maintain a compatibility matrix for every subsystem/interface. Every time a new version is released of the defining specification document of one of the 4 interfaces, the compatibility matrix will list all defined versions of the other interfaces with which this new interface version can be combined. The compatibility matrices are listed in the document EULYNX BL4 R3 Compatibility matrices.

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Further information

Further information is available from EU-Rail System Pillar unit or the EULYNX Consortium Office.

EU-Rail System Pillar can be contacted through <https://rail-research.europa.eu/about-europes-rail/contact>

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