



COVER DOCUMENT

System Pillar / EULYNX

Baseline Set 4 Release 4

Version: 4.0
Date: 18-06-2025



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 |
| 3.1 | 20240822 | Versions of Eu.Doc.38 and Eu.Doc.46 corrected | Nico Hurman |
| 3.2 | 20241017 | Error corrections Release 3 | Nico Hurman |
| 3.3 | 20241213 | Additional error corrections Release 3 | Nico Hurman |
| 4.0 | 20250618 | Mirror Group approval of Release 4 | Nico Hurman |
| | | | |

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 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 4. 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 4 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 on those limited topics where this was not yet fully reached in the previous releases. The release is 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 4, delivering additional 24 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.

Cybersecurity specifications

This release is fully aligned with and refers to the Cybersecurity Specification V1.0 as published by the EU-Rail System Pillar in February 2025 and does not contain separate specifications related to security. In the additional specifications published by EULYNX only the EULYNX Security Concept is retained. Its content has been reduced to references to the Cybersecurity Specification V1.0 and necessary context clarifications.

Further information to support Infrastructure Managers with the implementation of the requirements of the Cybersecurity Specification V1.0 in the context of the EULYNX architecture will be provided in a supporting document, the EULYNX Security Guideline.

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. The currently planned timeline foresees publication of Baseline Set 5 in June 2027.

Documents

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

| Document ID | Document Name | Document Version | CENELEC Phase | Release |
|-------------|---|------------------|---------------|---------|
| Eu.Doc.18 | Maintenance and data management specification | 4.1 (1.A) | 4 | 06/2025 |
| Eu.Doc.20 | Generic interface and subsystem requirements | 4.0 (7.A) | 4 | 06/2025 |
| Eu.Doc.119 | Generic interface and subsystem requirements for SCI | 1.1 (2.A) | 4 | 06/2025 |
| Eu.Doc.120 | Generic interface and subsystem requirements for SMI | 1.2 (1.A) | 4 | 06/2025 |
| Eu.Doc.92 | Interface definition SCI | 4.3 (1.A) | 5 | 06/2025 |
| Eu.Doc.93 | Interface specification SCI Generic | 3.3 (1.A) | 5 | 06/2025 |
| Eu.Doc.77 | Interface definition SDI | 3.3 (1.A) | 5 | 06/2025 |
| Eu.Doc.94 | Interface specification SDI Generic | 4.3 (1.A) | 5 | 06/2025 |
| Eu.Doc.100 | Specification of Point of Service - Signalling | 2.2 (2.A) | 4 | 06/2025 |
| Eu.Doc.76 | Interface definition and specification SMI | 2.3 (1.A) | 5 | 06/2025 |
| Eu.Doc.32 | Requirements specification for subsystem Light Signal | 4.3 (1.A) | 4 | 06/2025 |
| Eu.Doc.33 | Interface specification SCI-LS | 4.3 (1.A) | 5 | 06/2025 |
| Eu.Doc.78 | Interface specification SDI-LS | 4.3 (1.A) | 5 | 06/2025 |
| Eu.Doc.36 | Requirements specification for subsystem Point | 4.5 (1.A) | 4 | 06/2025 |
| Eu.Doc.38 | Interface specification SCI-P | 4.2 (2.A) | 5 | 06/2025 |
| Eu.Doc.80 | Interface specification SDI-P | 4.3 (1.A) | 5 | 06/2025 |
| Eu.Doc.45 | Requirements specification for subsystem Generic IO | 4.3 (1.A) | 4 | 06/2025 |
| Eu.Doc.46 | Interface specification SCI-IO | 4.0 (4.A) | 5 | 06/2025 |
| Eu.Doc.82 | Interface specification SDI-IO | 4.2 (1.A) | 5 | 06/2025 |
| Eu.Doc.43 | Requirements specification for subsystem TDS | 4.2 (1.A) | 4 | 06/2025 |
| Eu.Doc.44 | Interface specification SCI-TDS | 4.1 (1.A) | 5 | 06/2025 |
| Eu.Doc.81 | Interface specification SDI-TDS | 4.2 (1.A) | 5 | 06/2025 |
| Eu.Doc.108 | Requirements specification for subsystem Level Crossing | 2.3 (2.A) | 4 | 06/2025 |
| Eu.Doc.109 | Interface specification SCI-LC | 2.2 (1.A) | 5 | 06/2025 |
| Eu.Doc.110 | Interface specification SDI-LC | 3.3 (1.A) | 5 | 06/2025 |

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 4.

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 R4 Compatibility matrices.

Copyright information

The content provided in this Baseline Set is published jointly by EU-Rail System Pillar and EULYNX.

The documents are drafted by and belong to EU-Rail.

EU-Rail encourages the distribution and re-use of these documents, the technical specifications and the information they contain. EU-Rail holds several intellectual property rights, such as copyright and trade mark rights, which need to be considered when each document is used.

EU-Rail authorizes you to re-publish, re-use, copy and store each 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].

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.

You may study, research, implement, adapt, improve and otherwise use the information, the content and the models in these documents for your own purposes. If you decide to publish or disclose any adapted, modified or improved version of any document, any amended implementation or derivative work, then you must indicate that you have modified the 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 these documents and their content. It is your responsibility to verify the quality, completeness and the accuracy of the information you use, for your own purposes.

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>

EULYNX Consortium office can be contacted through eulynx.eu and consortium@eulynx.eu