

Interface between train control systems and rolling stock

RiSSB

RAIL INDUSTRY SAFETY AND STANDARDS BOARD

Train Control Systems Standard



This Australian Standard® AS 7726 Interface between train control systems and rolling stock was prepared by a Rail Industry Safety and Standards Board (RISSB) Development Group consisting of representatives from the following organisations:

V/Line	2XM Consulting	Rail, Tram, and Bus Union
Queensland Rail	Transport for NSW	Systra
Rail Safety and Standards Board	PTA WA	DoT Victoria
UGL	Progress Rail	Suburban Rail Loop Authority
Metro Trains Melbourne		

The Standard was approved by the Development Group and the Train Control Systems Standing Committee in April, 2023. On June 21, 2023 the RISSB Board approved the Standard for release.

This standard was issued for public consultation and was independently reviewed before being approved.

Development of the Standard was undertaken in accordance with RISSB's accredited process. As part of the approval process, the Standing Committee verified that proper process was followed in developing the Standard.

RISSB wishes to acknowledge the positive contribution of subject matter experts in the development of this Standard. Their efforts ranged from membership of the Development Group through to individuals providing comments on a draft of the Standard during the open review.

I commend this Standard to the Australasian rail industry as it represents industry good practice and has been developed through a rigorous process.



Damien White
Chief Executive Officer
Rail Industry Safety and Standards Board

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This Standard was prepared by the Rail Industry Safety and Standards Board (RISSB) Development Group AS 7726 Interface between train control systems and rolling stock. Membership of this Development Group consisted of representatives from the organisations listed on the inside cover of this document.

Objective

The objective of this standard is to provide guidance to rail infrastructure managers (RIMs) and rolling stock operators (RSOs) on how to manage the various interfaces between rolling stock and the train control systems (TCS).

Compliance

There are four types of provisions contained within Australian Standards developed by RISSB:

1. Requirements.
2. Recommendations.
3. Permissions.
4. Constraints.

Requirements – it is mandatory to follow all requirements to claim full compliance with the Standard. Requirements are identified within the text by the term 'shall'.

Recommendations – do not mention or exclude other possibilities but do offer the one that is preferred. Recommendations are identified within the text by the term 'should'.

Recommendations recognise that there could be limitations to the universal application of the control, i.e. the identified control is not able to be applied or other controls are more appropriate or better.

Permissions – conveys consent by providing an allowable option. Permissions are identified within the text by the term 'may'.

Constraints - provided by an external source such as legislation. Constraints are identified within the text by the term 'must'.

For compliance purposes, where a recommended control is not applied as written in the standard, it could be incumbent on the adopter of the standard to demonstrate their actual method of controlling the risk as part of their WHS or Rail Safety National Law obligations. Similarly, it could also be incumbent on an adopter of the standard to demonstrate their method of controlling the risk to contracting entities or interfacing organisations where the risk may be shared.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

Notes to the text contain information and guidance and are not considered to be an integral part of the Standard.

RISSB Standards address known hazards within the railway industry. Hazards and clauses within this Standard that address those hazards are listed in Appendix A

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AS 7726 Preview Only

1 Scope and general

1.1 Scope

In a generic railway control system architecture, a device control layer consisting of device control systems translates commands to a physical output received by linked devices and monitors and reports on the physical state of those devices.

This Standard provides guidance on the management of the interfaces enabling this functionality within the bounds of one railway, with the scope limited to the rail vehicle as the linked device and the device control systems therefore being the train control systems.

This delineation is best described by the RCA Logical Architecture Overview diagram developed by the ERTMS Users Group and EULYNX consortium. This is provided in Figure 1-1.

Note that the figure has been modified to ensure applicability for a railway with any GoA.

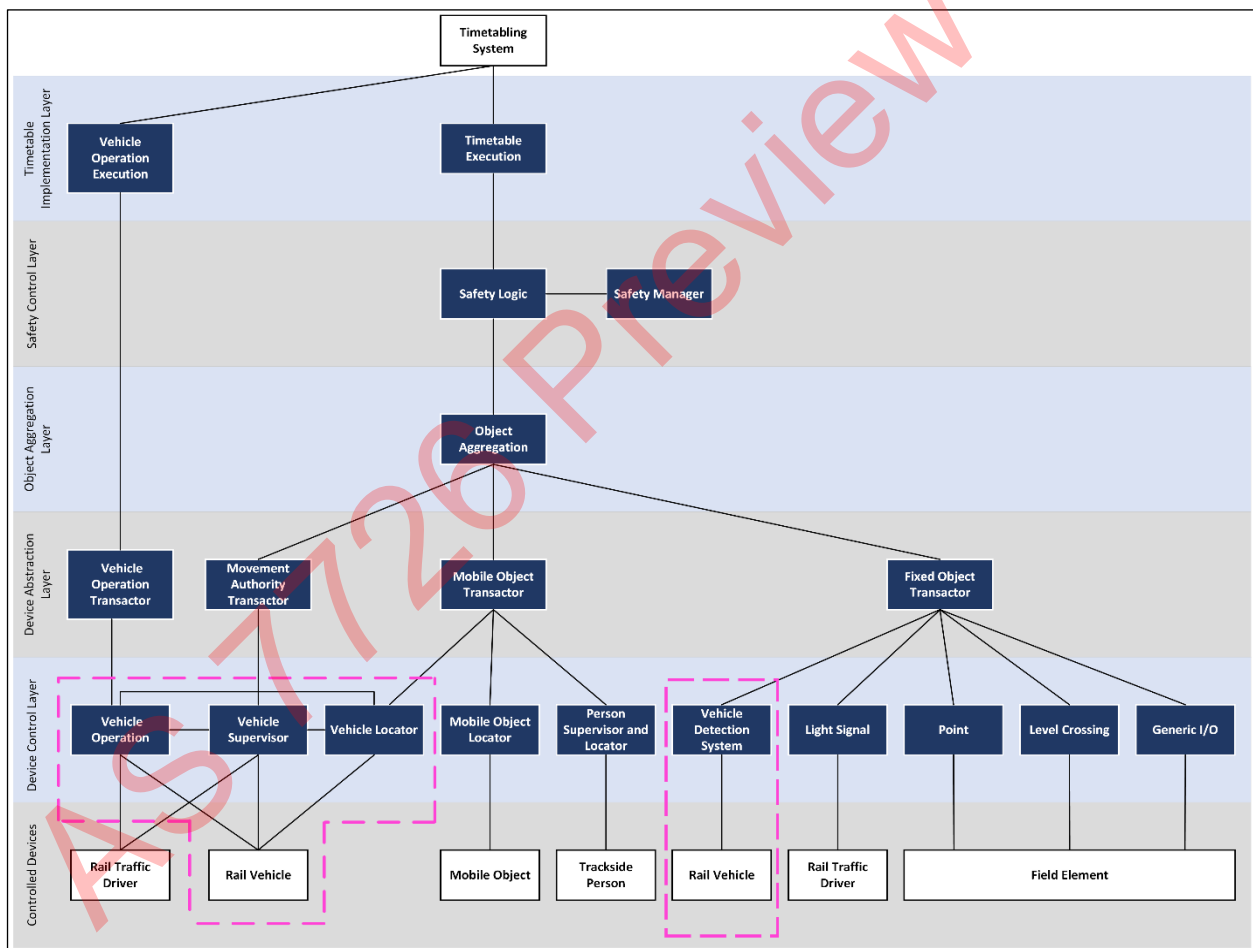


Figure 1-1: RCA logical architecture overview¹

From the figure above, the train control systems can be identified as the following:

- (a) vehicle operation;
- (b) vehicle supervisor;

¹ Railway Reference CCS Architecture developed by the ERTMS Users Group and EULYNX consortium.

- (c) vehicle locator; and
- (d) vehicle detection system.

A system architecture diagram describing the interfaces between the above train control systems and the rail vehicle at a subsystem level is provided in Section 2.1.

1.2 Exclusions

Consideration of human factors is outside the scope of this Standard. As such, the operation of the rail vehicle via the rail traffic driver has been excluded from the scope.

This Standard is not intended to cover rolling stock used on cane railway and monorail networks. However, items from this Standard may be applied to such systems as deemed appropriate by the relevant RIM.

This Standard is not intended to cover interfaces between the rail vehicle and multiple device control layers situated in multiple RIM territories. However, items from this Standard may be applied to such circumstances as deemed appropriate by the relevant RIMs.

This Standard does not provide guidance on the management of interfaces between train control systems and rolling stock in degraded modes of operation. For interface management in degraded modes of operation, please refer to applicable safety procedures set out by the RIM.

1.3 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document:

- AS 7450 Rail systems interoperability.
- AS 7505 Signalling detection interference.
- AS 7507 Rolling stock outlines.
- AS 7510 Braking systems.
- AS 7511 Train protection systems.
- AS 7514 Wheels.
- AS 7522 Access and egress.
- AS 7533 Driving cabs.
- AS 7631 Railway infrastructure – sighting.
- AS 7632 Railway infrastructure – signage.
- AS 7644 Rail corridor access.
- AS 7651 Axle counters.
- AS 7666 Train protection and control interoperability.
- AS 7704 Train control systems change management.
- AS 7711 Signalling principles.
- AS 7715 Train detection.
- AS 7721 Lineside signals, indicators and signal signage.
- AS 7722 EMC management.