

ISO 7856:2025-06 (E)

Intelligent transport systems - Remote support for low speed automated driving systems (RS-LSADS) - Performance requirements, system requirements and performance test procedures

Contents

Page

- Foreword..... v
- Introduction..... vi
- 1 Scope..... 1
- 2 Normative references..... 1
- 3 Terms and definitions..... 1
- 4 Symbols and abbreviated terms..... 3
 - 4.1 Symbols..... 3
 - 4.2 Abbreviated terms..... 3
- 5 RS-LSADS architecture..... 4
- 6 Functions of RS-LSADS..... 6
 - 6.1 General..... 6
 - 6.2 Remote monitoring..... 6
 - 6.3 Remote assistance..... 6
 - 6.4 Remote driving..... 6
- 7 RS-LSADS functional scenarios..... 7
 - 7.1 Remote support scenarios..... 7
 - 7.1.1 Scenario 1: Re-starting after stopping at the bus bay..... 7
 - 7.1.2 Scenario 2: Entering the unsignalized intersection..... 8
 - 7.1.3 Scenario 3: Entering the signalized intersection (signal information only)..... 9
 - 7.1.4 Scenario 4: Entering the signalized intersection (signal information and both lateral directions check)..... 9
 - 7.1.5 Scenario 5: Bypassing obstacles that block the vehicle path..... 10
 - 7.1.6 Scenario 6: Out of ODD due to environmental conditions..... 11
- 8 System requirements..... 12
 - 8.1 General..... 12
 - 8.2 RS-LSADS state transition diagram..... 12
 - 8.2.1 State functional descriptions..... 14
 - 8.2.2 State transition descriptions..... 15
- 9 Communication performance for remote support..... 16
 - 9.1 General..... 16
 - 9.2 Latency in remote support..... 17
 - 9.3 End-to-end information latency..... 17
 - 9.4 Information update rate..... 18
 - 9.5 Distance error due to latency..... 18
 - 9.6 Communication messages for remote support..... 19
 - 9.6.1 Vehicle data..... 19
 - 9.6.2 LSADS data..... 20
 - 9.6.3 Driving environment data..... 20
 - 9.6.4 Driving environment audio and video information..... 20
 - 9.6.5 Passenger status onboard audio and video information..... 20
 - 9.6.6 Remote assistance data..... 20
 - 9.6.7 Remote driving control data..... 20
 - 9.6.8 Infrastructure sensors data..... 20
 - 9.6.9 Infrastructure audio and video information..... 20

10	RS-LSADS performance requirements	21
10.1	Remote monitoring performance.....	21
10.1.1	End-to-end communication requirement during remote assistance standby or remote driving standby.....	21
10.2	Remote assistance performance.....	21
10.2.1	Monitoring data for remote assistant.....	21
10.2.2	Roles of remote assistant.....	21
10.2.3	Remote assistant response to RFI.....	22
10.2.4	Remote assistance HMI, and video field of view and audio.....	23
10.2.5	End-to-end communication requirements during remote assistance.....	23
10.2.6	Data storage requirements for remote assistance.....	23
10.3	Remote driving performance.....	24
10.3.1	Monitoring data for remote driver.....	24
10.3.2	Remote driving response to RFD.....	24
10.3.3	Remote driving HMI, video field of view and audio.....	24
10.3.4	End-to-end communication requirements during remote driving.....	25
10.3.5	Limitations of remote driving.....	25
10.3.6	Alert and warning in remote driving.....	25
10.3.7	Data storage requirements for remote driving.....	25
11	Scenario evaluation test procedures	25
11.1	General.....	25
11.2	Test conditions.....	26
11.2.1	Subject vehicle conditions.....	26
11.2.2	Target vehicle or objects conditions.....	26
11.2.3	Environmental conditions.....	26
11.2.4	End-to-end communication setup for scenario tests.....	26
11.3	Test procedures.....	27
11.3.1	General.....	27
11.3.2	Tests for remote assistance.....	27
11.3.3	Tests for Remote driving.....	38
	Annex A (informative) An Example of RS-LSADS Implementation	46
	Annex B (informative) An example of the interaction between the control centre and the vehicle for LSADS equipped vehicle mobility service	47
	Annex C (informative) Examples of remote support required scenarios and specific operations by RS-LSADS	49
	Bibliography	57