

# Train Control ETCS 2 on High Speed Network

## ETCS System Compatibility Test Description

### Document Management

	Name	Signature Date	Signature
<b>Written</b>	Thomas Destrée		
<b>Checked</b>	Patrick Janssens		
<b>Approved</b>	Yves Werner		

This document is the property of Infrabel and contains confidential information. This document may not be reproduced to third parties within or outside Infrabel in any way whatsoever without the written permission of the service Signalling Projects.

**History**

Author	Version	Date	§ Adapted	Reason
T. Destrée	1.1 draft 1	16/09/2020	/	Creation of the document
T. Destrée	1.1 draft 2	09/02/2021		Update after review comments.
T. Destrée	1.1	09/02/2021		Major version
T. Destrée	1.2	5/05/2022		Update test case ESC_L2LGV_2

**Abrogated documents**

Name	Version	Date

**Distribution of the document**

<input type="checkbox"/>	Server	<server id> <path>	
<input type="checkbox"/>	Intranet	<path>	
<input type="checkbox"/>	SharePoint	<name>	
<input type="checkbox"/>	Circular letter	<nr>	
<input type="checkbox"/>	Message	<nr>	
<input type="checkbox"/>	Note	<nr>	
<input type="checkbox"/>	E-mail	<name>	@infrabel.be
		<name>	@<...>
<input type="checkbox"/>	Paper	<name>	<address>

**Announce of the publication of the document on intranet**

<input type="checkbox"/>	E-mail	<name>@infrabel.be
--------------------------	--------	--------------------

## Table of Contents

<b>1. INTRODUCTION</b>	<b>4</b>
1.1 PURPOSE OF THE DOCUMENT	4
1.2 BASIC DOCUMENTS	4
1.3 REFERENCE DOCUMENTS	4
1.4 ANNEXES	4
1.5 SCOPE	4
1.6 DEFINITIONS, SYMBOLS AND ABBREVIATIONS	4
1.7 KNOWN IMPERFECTIONS	5
<b>2. ON-BOARD EQUIPMENT</b>	<b>5</b>
<b>3. FUNCTIONALITIES</b>	<b>5</b>
<b>4. TEST SCENARIOS</b>	<b>6</b>
4.1 ESC_L2LGV_1: CR843	6
4.1.1 Description	6
4.1.2 Scenario diagram	8
4.2 ESC_L2LGV_2: MESSAGE 33 LINKING A BG LOCATED UNDER THE TRAIN	9
4.2.1 Description	9
4.2.2 Scenario diagram	11

# 1. Introduction

## 1.1 Purpose of the document

The purpose of this document is to define the test scenarios to perform in order to prove the ETCS System Compatibility (ESC) between the On-board and the trackside ETCS Level 2 on High Speed Lines with system version 1.Y.

The test scenarios describe more in detail each “high level” scenarios defined in the ESC test plan [1]. The success of these test scenarios shall prove the technical compatibility between ETCS On-board and the Trackside part ETCS of the CCS subsystems within the ETCS2 with system version 1.Y area on Infrabel high-speed network.

The technical specification for interoperability used inside an ETCS2 high speed area on Infrabel network is Baseline Corridor 2007 v2, SRS v2.2.2 (+ CR748, CR770 for level 2).

These test scenarios for ETCS system compatibility do not cover all design rules used in an ETC2 high-speed area. If required, Infrabel can provide additional operational test scenarios performed during the verification that the trackside subsystem complies with the requirement of the TSI.

In case of doubt concerning the ESC of the board with the trackside, the railway undertaking shall take the required action with his supplier and inform Infrabel.

## 1.2 Basic documents

<b>Ref.</b>	<b>Title</b>	<b>Owner</b>
[1]	PSI (TC,ETCSsys,z) ESC TST PLN 1.4	Infrabel

## 1.3 Reference documents

<b>Ref.</b>	<b>Title</b>	<b>Owner</b>
[2]	None	

## 1.4 Annexes

<b>Ref.</b>	<b>Title</b>	<b>Owner</b>
[3]	None	

## 1.5 Scope

This document is applicable for all trains would run under the protection of ETCS level 2 in an ETCS2 with system version 1.Y area on the Infrabel high speed network.

## 1.6 Definitions, symbols and abbreviations

CCS	Control Command System
DMI	Driver Machine Interface
ESC	ETCS System Compatibility
ETCS	European Train Control System
IBG	Infill Balise Group
LS	Limited Supervision
NR	Not Relevant
SBG	Signal Balise Group
TSI	Technical Specification for Interoperability
VLS	Vitesse Limitée Snelheidsbeperking

### 1.7 *Known imperfections*

None

## 2. On-board Equipment

Out of scope of railway manager Infrabel.

## 3. Functionalities

The tested functionalities are described in the table here under:

Test scenario (ref ESC TST PLN [1])	Tested functionality
ESC_L2LGV_1	CR843
ESC_L2LGV_2	Message 33 linking a BG located under the train

The document will only describe the sequences to perform the scenarios but not all the actions to prepare the execution of the test scenarios.

## 4. Test scenarios

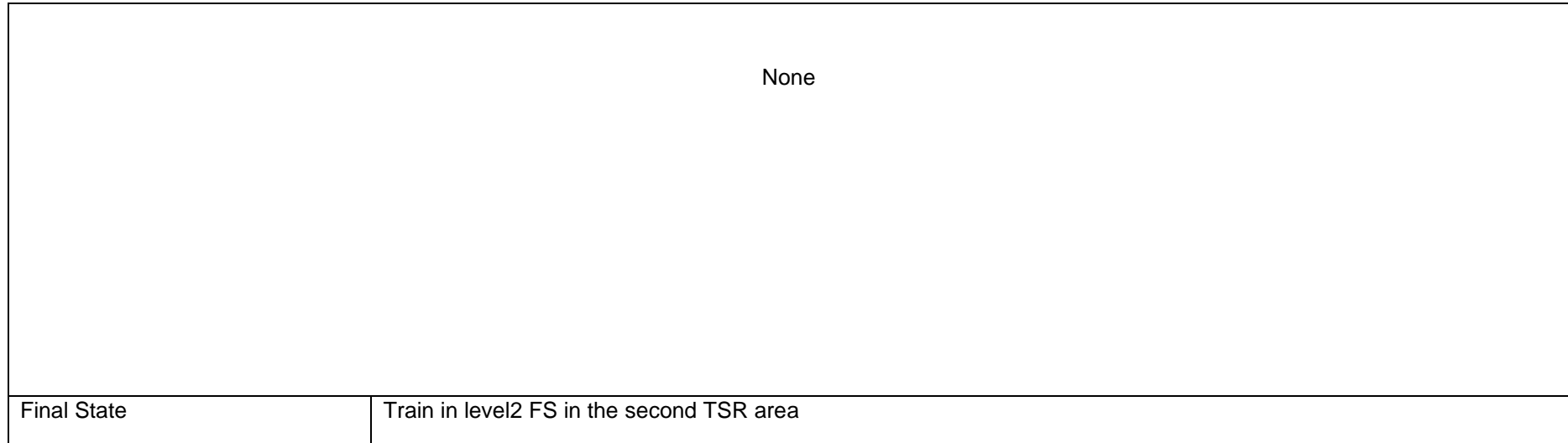
### 4.1 ESC\_L2LGV\_1: CR843

#### 4.1.1 Description

ID	Date	Location / Line		
ESC_L2LGV_1	<dd/mm/yyyy>	<Line>		
Description	Functionalities tested : <ul style="list-style-type: none"> <li>ESC_L2LGV_1: CR843</li> </ul> Multiple non-revocable TSR are sent in a single message.			
Signal passed				
Name	Trackside datafile in service			
Test Scenarios				
Starting condition	VLS (TSR) are set on two consecutive sections.			
	Train A <ul style="list-style-type: none"> <li>Train A is in Level 2 mode FS on HSL-Zuid approaching the border in the direction of Belgium</li> <li>A VLS (TSR) is set on 2 sections beyond the border (leave 1 section without VLS (TSR) between both sections).</li> </ul>			
	<b>Be sure all authorisations are filled in before performing the test scenarios</b>			
Sequences of the test scenario				
Step	Step description	Description of what to be tested	Statement	Comment
1	Train receives a non revocable TSR.	Speed profile is updated.	Pass / Fail	
2	Train receives a second non revocable TSR	Speed profile is updated.	Pass / Fail	
3	Train enters the first TSR area	Permitted speed is reduced to <TSR 1 speed> km/h.	Pass / Fail	

4	Train leaves the TSR area	Permitted speed is not reduced.	Pass / Fail	
5	Train enters the second TSR area.	Permitted speed is reduced to <TSR 2 speed> km/h.	Pass / Fail	
Test scenario finished				

4.1.2 Scenario diagram





## 4.2 ESC\_L2LGV\_2: Message 33 linking a BG located under the train

### 4.2.1 Description

ID	Date	Location / Line		
ESC_L2LGV_2	<dd/mm/yyyy>	<Line>		
Description	Functionalities tested : <ul style="list-style-type: none"> <li>ESC_L2LGV_2: Message 33 linking a BG located under the train</li> </ul> The front of the train crosses a BG. This is read by the on-board and used as LRBG but the end of the train does not cross the BG. The driver then performs a change of front, and performs a SoM. The train receives a message 33 (MA with shifted location) and moves on accordingly. In packet 5, the BG under the train is chained with the reaction "Service brake" although it is located behind the antenna.			
Signal passed				
Name		Trackside datafile in service		
Signal S1: <signal name> is open				
Signal S2: <signal name> is closed				
Signal S3: <signal name> is closed				
Test Scenarios				
Starting condition		Train is upwards signal S1 in ETCS 2 FS. If the rear cab has his own EVC, it is in SL mode.		
		The route is set between S1 and track A ( Track <track number>) and the BG1 <NID_C NID_BG> is installed on track A.		
		Each cab of the train shall be equipped with its own OBU.		
		<b>Be sure all authorisations are filled in before performing the test scenarios</b>		
Sequences of the test scenario				
Step	Step description	Description of what to be tested	Statement	Comment
1	Train passes signal S1, stops on track A after the front of the train passes BG <NID_C NID_BG>. The rear of the train has not passed the BG1 <NID_C NID_BG>	Train is in level 2 FS.	Pass / Fail	

2	Driver changes cab and performs a start of mission. The length of the train known by the OBU should be at least 20 meters longer than the distance between SBG of S2 and BG1. A route is set to track <track id>.	Train is in ETCS2 mode SR.	Pass / Fail	
3	Train passes the SBG of signal S2.	a) Train remains in SR mode. b) DMI displays a TAF request.	Pass / Fail	
4	Driver acknowledge the TAF.	The train receives an MA with shifted location reference where the reference is the SBG of signal S2 and BG1 is included in the linking information. Train changes to mode FS and continues without linking reaction.	Pass / Fail	
Test scenario finished				

4.2.2 Scenario diagram

