

**ERTMS/ETCS**

**FIS Juridical Recording**

REF : SUBSET-027

ISSUE : 3.1.0

DATE : 2014-05-12

## 1. MODIFICATION HISTORY

Issue Number Date	Section Number	Modification / Description	Author
0.0.1 1999-07-27	All	Creation	Sonia Valero avier Congosto
0.1.0 1999-09-30	All	Modifications after review comments	Sonia Valero avier Congosto
1.0.0 1999-10-07	All	Final version	Sonia Valero avier Congosto
1.1.0 2000-02-18	All	Updating to SRS 2.0.0	Sonia Valero
1.2.0 2000-02-24		4.1.2.4.5, Final for distribution	U. Dräger (ed)
1.2.1 2000-03-28	All	Modifications after review with ECSAG (2000-03-22)	Sonia Valero
2.0.0 2000-03-30		Final issue to ECSAG	U.D. (ed)
2.0.1 2001-10-31		Update with Proposal 0.0.4 to SUBSET-027 v2.0.1	Sonia Valero
2.2.2 10-02-03		Raised in issue for release to the Users Group. No technical changes	WLH
2.2.3 2003-07-07		Eliminate all reference to M_VOLTAGE as requested by the Users Group.	Sonia Valero
2.2.4 2005-01-03	All	Including all CLRs included in the UNISIG data base related to the FFFIS JRU- Downloading tool v. 2.2.3 up to 03/01/2005 and the problems detected during the CEDEX interoperability tests. It also contains changes included in SRS v 2.2.2 affecting the juridical recorder functionality.	Sonia Valero
2.2.5 2005-04-21	All	Updating to SRS 2.2.6. The chapter about the physical interface has been not	Sonia Valero

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		updated.	
2.2.6 2005-09-05	3.2.1.12 4.1.2.5.2 4.1.2.5.11 4.1.2.5.25 4.1.2.5.26 4.1.2.6.5.1 4.1.3.1.1.1 5.1.2.1 6.1.2.1	Update to include proposals from CEDEX and comments to version 2.2.5.	Sonia Valero
2.2.7 2005-10-13		Update to include comments from SuperGroup	Sonia Valero
2.2.8 2005-10-17		Update after revision	Sonia Valero
2.2.9 2005-10-17		Update of referenced documents	Sonia Valero/HK
2.2.12 2009-02-25		Update in the frame of 2.3.0d: update according to CRs 240, 262, 394, 643, 703 and 775.	Philippe Prieels
2.3.0 2009-04-22		Update in the frame of 2.3.0d regarding CR240 modifications	Jörg Liesche
2.3.1 2011-09-06		Upgrade of the whole document to baseline 3	Eric Lepailleur
2.3.2 2012-02-01			Eric Lepailleur
2.3.3 2012-02-27		Update to include editorial comments from UNISIG and to incorporate STM related juridical data	Eric Lepailleur Alain Hougardy
2.3.4 2012-03-01		Minor editorial comments	Alain Hougardy
3.0.0 2012-03-02		Baseline 3 release version	Alain Hougardy
3.0.1 2014-04-04		CR's 1124, 1173, 1231	Olivier Gemine

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3.0.2 2014-04-23		Baseline 3 1 <sup>st</sup> maintenance pre-release version	Olivier Gemine
3.0.3 2014-05-06		CR 1223 Baseline 3 1 <sup>st</sup> maintenance 2 <sup>nd</sup> pre-release version	Olivier Gemine
3.1.0 2014-05-12		Baseline 3 1 <sup>st</sup> maintenance release version	Olivier Gemine

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## 3. INTRODUCTION

### 3.1 Scope

- 3.1.1.1 This document is a Function Interface Specification for juridical recording.
- 3.1.1.2 It describes the functional interface between the ERTMS/ETCS on-board function charged to provide juridical data and the on-board recording device.
- 3.1.1.3 It defines the format and content of the data messages sent by the ERTMS/ETCS on-board, as well as the list of on-board events that trigger the transmission of the related messages.
- 3.1.1.4 This document is inside the ERTMS/ETCS project scope. It is based on the documents [1], [2], [3], [4], [5], [6], and [7].

## 3.2 References

- [1] System Requirements Specification - SUBSET-026,
- [2] FFFIS STM Application Layer - SUBSET-058,
- [3] ETCS Driver Machine Interface - ERA\_ERTMS\_015560,
- [4] Train Interface FIS - SUBSET-034,
- [5] Glossary of Terms and Abbreviations - SUBSET-023,
- [6] STM FFFIS Safe Time Layer - SUBSET-056,
- [7] STM FFFIS Safe Link Layer - SUBSET-057.

## 3.3 Abbreviations

- 3.3.1.1 For general terms, definitions and abbreviations refer to document [5].

## 4. FUNCTIONAL INTERFACE DEFINITION

### 4.1 Principles

- 4.1.1.1 The ERTMS/ETCS on-board equipment shall detect occurrence of specific events and provide the corresponding message to the on-board recording device (see section 4.3, table 2).
- 4.1.1.2 When such an event occurs, the ERTMS/ETCS on-board equipment shall register:
  - a) the date and time of the occurrence of the event using Universal Time Co-ordinated (UTC)
  - b) The train position and speed at the occurrence of the event
  - c) The operated system version, level and mode at the occurrence of the event
- 4.1.1.3 This date and time information shall be used to timestamp the corresponding message(s) to be sent over the interface according to the table 1.
- 4.1.1.4 The juridical data included in a message shall be forwarded over the interface less than 5 seconds after the occurrence of the event that triggered the message.
- 4.1.1.5 When sending one message or several messages together in relation with the same triggering event, the encapsulated data shall be consistent with each other regarding the time stamping.



## 4.2 Juridical Recording information (Messages / Variables)

### 4.2.1 Messages list

4.2.1.1 Each message has a variable in its header that contains a number to have a way to distinguish the messages. The list of all the messages, associated number and purpose is shown in Table 1:

<b>NID_MESSAGE</b>	<b>MESSAGE</b>	<b>PAGE</b>
1	GENERAL MESSAGE	18
2	TRAIN DATA	18
3	EMERGENCY BRAKE COMMAND STATE	27
4	SERVICE BRAKE COMMAND STATE	27
5	MESSAGE TO RADIO INFILL UNIT	28
6	TELEGRAM FROM BALISE	28
7	MESSAGE FROM EUROLOOP	28
8	MESSAGE FROM RADIO INFILL UNIT	28
9	MESSAGE FROM RBC	29
10	MESSAGE TO RBC	29
11	DRIVER'S ACTIONS	29
12	BALISE GROUP ERROR	31
13	RADIO ERROR	32
14	STM INFORMATION	32
15	INFORMATION FROM COLD MOVEMENT DETECTOR	35
16	START DISPLAYING FIXED TEXT MESSAGE	36
17	STOP DISPLAYING FIXED TEXT MESSAGE	36
18	START DISPLAYING PLAIN TEXT MESSAGE	36
19	STOP DISPLAYING PLAIN TEXT MESSAGE	36
20	SPEED AND DISTANCE MONITORING INFORMATION	37

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21	DMI SYMBOL STATUS	39
22	DMI SOUND STATUS	41
23	DMI SYSTEM STATUS MESSAGE	42
24	ADDITIONAL DATA	43
25	SR SPEED/DISTANCE ENTERED BY THE DRIVER	44
26	NTC SELECTED	45
27	SAFETY CRITICAL FAULT IN MODE SL, NL OR PS	45
28	VIRTUAL BALISE COVER SET BY THE DRIVER	45
29	VIRTUAL BALISE COVER REMOVED BY THE DRIVER	45
30	SLEEPING INPUT	46
31	PASSIVE SHUNTING INPUT	46
32	NON LEADING INPUT	46
33	REGENERATIVE BRAKE STATUS	47
34	MAGNETIC SHOE BRAKE STATUS	47
35	EDDY CURRENT BRAKE STATUS	48
36	ELECTRO PNEUMATIC BRAKE STATUS	48
37	ADDITIONAL BRAKE STATUS	49
38	CAB STATUS	49
39	DIRECTION CONTROLLER POSITION	50
40	TRACTION STATUS	51
41	TYPE OF TRAIN DATA	51
42	NATIONAL SYSTEM ISOLATION	52
43	TRACTION CUT OFF COMMAND STATE	52
44	LOWEST SUPERVISED SPEED WITHIN THE MOVEMENT AUTHORITY	53
45-254	SPARE	
255	ETCS ON-BOARD PROPRIETARY JURIDICAL DATA	53

**Table 1: Juridical Recording messages list**

### 4.2.2 General structure of the messages

4.2.2.1 All the messages have the same structure with a common header and a set of variables depending on the message sent.

4.2.2.2 A message shall be composed of:

1. A common header (fields 1 to 11). Therefore the variables 3 to 11 must be captured with each event of the table 2.
2. Complementary variables as needed by application (fields 12-N) according to the messages list.

Field No	FIELDS	Remarks
1	NID_MESSAGE	Message identification number
2	L_MESSAGE	Message length including fields 1 to N
3	DATE	Current date
4	TIME	Current time
5	TRAIN_POSITION	Current train position
6	V_TRAIN	Current train speed
7	DRIVER_ID	Driver identifier
8	NID_ENGINE	On-board ETCS identity
9	SYSTEM_VERSION	Currently operated system version
10	LEVEL	Current level
11	MODE	Current mode
12 ...	Complementary variables	Data associated to the message. Its length depends on the message content, but it's always rounded up to a bytes unit.

Note: To be coherent the length of the variables defined in other documents is not included in the following description.

### 4.2.3 Common Fields Description

#### 4.2.3.1 NID\_MESSAGE

<b>Description</b>	This field contains the message identifier.		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_MESSAGE	8	

#### NID\_MESSAGE

<b>Name</b>	Message identifier		
<b>Description</b>	Identifier of the message		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
8 bits	0	255	Numbers
<b>Special/Reserved Values</b>			

#### 4.2.3.2 L\_MESSAGE

<b>Description</b>	This field contains the message length.		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	L_MESSAGE	11	

#### L\_MESSAGE

<b>Name</b>	Message length		
<b>Description</b>	L_MESSAGE indicates the length of the message in bytes, including all variables defined in the message header (L_MESSAGE also).		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
11 bits	0	2047	1 Byte
<b>Special/Reserved Values</b>			

#### 4.2.3.3 DATE

<b>Description</b>	It contains the date.		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	YEAR	7	
	MONTH	4	
	DAY	5	

#### YEAR

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<b>Name</b>	Official year		
<b>Description</b>	It's used to label data recorded. Only the last two figures of the year are recorded (unit and ten).		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
7 bits	00	99	1 year
<b>Special/Reserved Values</b>	110 0100	100	not used
	...	...	...
	111 1110	126	not used
	111 1111	127	year unknown

**MONTH**

<b>Name</b>	Official month		
<b>Description</b>	It's used to label data recorded.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
4 bits	01	12	1 month
<b>Special/Reserved Values</b>	0000	0	not used
	1101	13	not used
	1110	14	not used
	1111	15	month unknown

**DAY**

<b>Name</b>	Official day		
<b>Description</b>	It's used to label data recorded.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
5 bits	01	31	1 day
<b>Special/Reserved Values</b>	0 0000	0	day unknown

4.2.3.4 TIME

<b>Description</b>	It contains the time in Universal Time Co-ordinated (UTC).		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	HOUR	5	
	MINUTES	6	
	SECONDS	6	
	TTS	5	

**HOUR**

<b>Name</b>	Official hour		
<b>Description</b>	It's used to label data recorded.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
5 bits	00	23	1 hour
<b>Special/Reserved Values</b>	1 1000	24	not used
	...	...	...
	1 1110	30	not used
	1 1111	31	hour unknown

**MINUTES**

<b>Name</b>	Official minutes		
<b>Description</b>	It's used to label data recorded.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
6 bits	00	59	1 minute
<b>Special/Reserved Values</b>	11 1100	60	not used
	11 1101	61	not used
	11 1110	62	not used
	11 1111	63	minutes unknown

**SECONDS**

<b>Name</b>	Official seconds		
<b>Description</b>	It's used to label data recorded.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
6 bits	00	59	1 second
<b>Special/Reserved Values</b>	11 1100	60	not used
	11 1101	61	not used
	11 1110	62	not used
	11 1111	63	seconds unknown

TTS

<b>Name</b>	Official hundredth of second		
<b>Description</b>	It's used to label data recorded. Used only in conjunction with HOUR, MINUTES and SECONDS.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
5 bits	000 ms	950 ms	050 ms
<b>Special/Reserved Values</b>	10100 to 11110  11111		not used  hundredth of second unknown

4.2.3.5 TRAIN\_POSITION

<b>Description</b>	This field contains the position of the train. This position is calculated with the distance to the last LRBG.		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	Q_SCALE		Defined in Chapter 7 of [1]
	NID_LRBG		Defined in Chapter 7 of [1]
	D_LRBG		Defined in Chapter 7 of [1]
	Q_DIRLRBG		Defined in Chapter 7 of [1]
	Q_DLRBG		Defined in Chapter 7 of [1]
	L_DOUBTOVER		Defined in Chapter 7 of [1]
	L_DOUBTUNDER		Defined in Chapter 7 of [1]

4.2.3.6 V\_TRAIN

<b>Description</b>	This field contains the current speed of the train.		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	V_TRAIN	10	

V\_TRAIN

<b>Name</b>	Current train speed		
<b>Description</b>			
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
10 bits	0 km/h	600 km/h	1 km/h
<b>Special/reserved value</b>	601 – 1022	Spare	
	1023	Standstill	

4.2.3.7 DRIVER\_ID

<b>Description</b>	This field contains the driver identifier number.		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	DRIVER_ID	128 bits	

DRIVER\_ID

<b>Name</b>	Driver identifier number		
<b>Description</b>			
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
128 bits			16 alphanumeric characters (ISO 8859-1, also known as Latin Alphabet #1)
<b>Special/reserved value</b>	'????????????????'	Unknown	

4.2.3.8 NID\_ENGINE

<b>Description</b>	This field contains the onboard ETCS identity.		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_ENGINE		Defined in Chapter 7 of [1]

4.2.3.9 SYSTEM\_VERSION

<b>Description</b>	This field contains the currently operated system version.		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	M_VERSION		Defined in Chapter 7 of [1]



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4.2.3.10 LEVEL

<b>Description</b>	This field contains the current level.		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	M_LEVEL		Defined in Chapter 7 of [1]

4.2.3.11 MODE

<b>Description</b>	This field contains the current mode.		
<b>Content</b>	<b>Variable</b>	<b>Length</b>	<b>Comment</b>
	M_MODE		Defined in Chapter 7 of [1]

## 4.2.4 Message Description

### 4.2.4.1 GENERAL MESSAGE

<b>Description</b>	This message contains the common header only.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	Null		

### 4.2.4.2 TRAIN DATA

<b>Description</b>	This message contains the train data.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	V_MAXTRAIN		Maximum train speed for the train. Defined in Chapter 7 of [1]
	NC_CDTRAIN		Cant deficiency train category. Defined in Chapter 7 of [1]
	NC_TRAIN		Other international train category. Defined in Chapter 7 of [1]
	L_TRAIN		Train length. Defined in Chapter 7 of [1]
	T_TRACTION_CUT_OFF	12	
	M_BRAKE_POSITION	2	
	M_NOM_ROT_MASS	5	
	M_REGENERATIVEBRAKE	2	
	M_EDDYCURRENTBRAKE	2	
	M_MAGNETICSHOEBRAKE	2	
	M_ELECTROPNEUMATICBRAKE	2	
	Q_TRACTIONCUTOFFINTERFACE	1	
	Q_SERVICEBRAKEINTERFACE	1	
	Q_SERVICEBRAKEFEEDBACK	1	
	Q_BRAKE_CAPT_TYPE	1	
	M_BRAKE_PERCENTAGE	8	Only if Q_BRAKE_CAPT_TYPE = 0
	N_BRAKE_CONF	4	Only if Q_BRAKE_CAPT_TYPE = 0
	M_BRAKE_LAMBDA_CONF(k)	3	Only if Q_BRAKE_CAPT_TYPE = 0: specific configuration of the special brakes for lambda train

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T_BRAKE_SERVICE(k)	12	Only if Q_BRAKE_CAPT_TYPE = 0: service Brake delay time
N_BRAKE_CONF	4	Only if Q_BRAKE_CAPT_TYPE = 1 (gamma type), N_BRAKE_CONF and the following variables follow until A_BRAKE_SERVICE_COMP inclusive
M_BRAKE_GAMMA_CONF(k)	4	Specific configuration of the special brakes for gamma trains
T_BRAKE_EMERGENCY(k)	12	Emergency Brake delay time
N_BRAKE_SECTIONS(k)	3	Number of sections in order to build the following brake model.
V_BRAKE_EMERGENCY_COMP(k, m)	10	Speed component of the emergency brake nominal deceleration.
A_BRAKE_EMERGENCY_COMP(k, m)	8	Acceleration component of the emergency brake nominal deceleration.
M_KDRY_RST(A_BRAKE_EMERGENCY_COMP(k, m), 0)	5	Rolling stock correction factor on dry rail for a confidence level equal to 50 %
M_KDRY_RST(A_BRAKE_EMERGENCY_COMP(k, m), 1)	5	Rolling stock correction factor on dry rail for a confidence level equal to 90 %
M_KDRY_RST(A_BRAKE_EMERGENCY_COMP(k, m), 2)	5	Rolling stock correction factor on dry rail for a confidence level equal to 99 %
M_KDRY_RST(A_BRAKE_EMERGENCY_COMP(k, m), 3)	5	Rolling stock correction factor on dry rail for a confidence level equal to 99,9 %
M_KDRY_RST(A_BRAKE_EMERGENCY_COMP(k, m), 4)	5	Rolling stock correction factor on dry rail for a confidence level equal to 99,99 %
M_KDRY_RST(A_BRAKE_EMERGENCY_COMP(k, m), 5)	5	Rolling stock correction factor on dry rail for a confidence level equal to 99,999 %
M_KDRY_RST(A_BRAKE_EMERGENCY_COMP(k, m), 6)	5	Rolling stock correction factor on dry rail for a confidence level equal to 99,9999 %
M_KDRY_RST(A_BRAKE_EMERGENCY_COMP(k, m), 7)	5	Rolling stock correction factor on dry rail for a confidence level equal to 99,99999 %

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M_KDRY_RST(A_BRAKE_EMERGENCY_COMP(k, m), 8)	5	Rolling stock correction factor on dry rail for a confidence level equal to 99,999999 %
M_KDRY_RST(A_BRAKE_EMERGENCY_COMP(k, m), 9)	5	Rolling stock correction factor on dry rail for a confidence level equal to 99,9999999 %
M_KWET_RST(A_BRAKE_EMERGENCY_COMP(k, m))	5	Rolling stock correction factor on wet rail
T_BRAKE_SERVICE(k)	12	Service Brake delay time
N_BRAKE_SECTIONS(k)	3	Number of sections in order to build the following brake model.
V_BRAKE_SERVICE_COMP(k, m)	10	Speed component of the service brake nominal deceleration.
A_BRAKE_SERVICE_COMP(k, m)	8	Acceleration component of the service brake nominal deceleration.
M_LOADINGGAUGE		Loading gauge. Defined in Chapter 7 of [1]
N_AXLE		Axle number of the engine. Defined in Chapter 7 of [1]
M_AXLELOADCAT		Axle load category. Defined in Chapter 7 of [1]
N_ITER		Number of iterations. Defined in Chapter 7 of [1]
M_VOLTAGE(k)		Traction system voltage. Defined in Chapter 7 of [1]
NID_CTRACTION(k)		Only if M_VOLTAGE(k) ≠ 0. Country identifier of the traction system. Defined in Chapter 7 of [1]
N_ITER		Number of iterations. Defined in Chapter 7 of [1]
NID_NTC(k)		National system identity. Defined in Chapter 7 of [1]
M_AIRTIGHT		Airtight system presence. Defined in Chapter 7 of [1]

**T\_TRACTION\_CUT\_OFF**

<b>Name</b>	Time to cut-off traction		
<b>Description</b>	It is the time delay from the traction cut-off command by the on-board to the moment the acceleration due to traction is guaranteed to be zero.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
12 bits	0 s	40.95 s	0.01 s

**M\_BRAKE\_POSITION**

<b>Name</b>	Brake position		
<b>Description</b>	The brake position defines the behaviour of the brake for specific train types.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
2 bits			
<b>Special/reserved value</b>	0	Passenger train in P	
	1	Freight train in P	
	2	Freight train in G	
	3	Spare	

**M\_NOM\_ROT\_MASS**

<b>Name</b>	Nominal rotating mass of the train		
<b>Description</b>	It defines the nominal rotating mass as a percentage of the total train weight.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
5 bits	0 %	15 %	1 %
<b>Special/reserved value</b>	16	Unknown	
	17-31	Spare	

**M\_REGENERATIVEBRAKE**

<b>Name</b>	Regenerative brake interface		
<b>Description</b>	It describes the interface with regenerative brake and whether it affects the braking curve calculation.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
2 bits			
<b>Special/Reserved Values</b>	00	No interface	
	01	Interface exists and affects only EB	
	10	Interface exists and affects only SB	
	11	Interface exists and affects EB and SB	

**M\_EDDYCURRENTBRAKE**

<b>Name</b>	Eddy current brake interface		
<b>Description</b>	Describes the interface with eddy current brake and whether it affects the braking curve calculation.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
2 bits			
<b>Special/Reserved Values</b>	00	No interface	
	01	Interface exists and affects only EB	
	10	Interface exists and affects only SB	
	11	Interface exists and affects EB and SB	

**M\_MAGNETICSHOEBRAKE**

<b>Name</b>	Magnetic shoe brake interface		
<b>Description</b>	Describes the interface with magnetic shoe brake and whether it affects the braking curve calculation.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
2 bits			
<b>Special/Reserved Values</b>	00	No interface	
	01	Interface exists and affects only EB	
	10	Spare	
	11	Spare	

**M\_ELECTROPNEUMATICBRAKE**

<b>Name</b>	Electro pneumatic brake interface		
<b>Description</b>	Describes the interface with electro pneumatic brake and whether it affects the braking curve calculation.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
2 bits			
<b>Special/Reserved Values</b>	00	No interface	
	01	Interface exists and affects only SB	
	10	Interface exists and affects EB and SB	
	11	Spare	

**Q\_TRACTIONCUTOFFINTERFACE**

<b>Name</b>	Qualifier for traction cut off interface		
<b>Description</b>	Indicates whether the traction cut off command is implemented or not.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/Reserved Values</b>	0	Not implemented	
	1	Implemented	

**Q\_SERVICEBRAKEINTERFACE**

<b>Name</b>	Qualifier for service brake interface		
<b>Description</b>	Indicates whether the service brake command is implemented or no.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/Reserved Values</b>	0	Not implemented	
	1	Implemented	

**Q\_SERVICEBRAKEFEEDBACK**

<b>Name</b>	Qualifier for service brake feedback interface		
<b>Description</b>	Indicates whether the service brake feedback is implemented or not.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/Reserved Values</b>	0	Not implemented	
	1	Implemented	

**Q\_BRAKE\_CAPT\_TYPE**

<b>Name</b>	Qualifier for gamma/lambda discrimination		
<b>Description</b>	This variable discriminates the type of capture of the brake parameters.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/Reserved Values</b>	0	Lambda type: the brake percentage is acquired as Train Data and the conversion model is applicable	
	1	Gamma type: all other captures	

**M\_BRAKE\_PERCENTAGE**

<b>Name</b>	Brake percentage value		
<b>Description</b>	The brake percentage is used to derive the brake parameters in conjunction with the conversion model.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
8 bits	0 %	250 %	1 %
<b>Special/reserved value</b>	251-255	Spare	

**N\_BRAKE\_CONF**

<b>Name</b>	Special brakes configuration number		
<b>Description</b>	Number of iterations of special brake configuration(s) applicable to the selection of the appropriate brake parameter(s), following this variable in the message		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
4 bits	1	16	

**M\_BRAKE\_LAMBDA\_CONF**

<b>Name</b>	Specific special brakes configuration for lambda trains		
<b>Description</b>	It describes a specific special brake configuration to which the related brake parameters are applicable.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
3 bits			Bit set
<b>Special/reserved value</b>	000	No interface to special brakes exists or all status are inactive	
	xx1	Regenerative brake interface exists and status is active	
	x1x	Eddy current brake interface exists and status is active	
	1xx	Ep brake interface exists and status is active	

**T\_BRAKE\_SERVICE**

<b>Name</b>	Service Brake delay time		
<b>Description</b>	This is the build up time for the service brake.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
12 bits	0 s	204.75 s	0.05 s



**M\_BRAKE\_GAMMA\_CONF**

<b>Name</b>	Specific special brakes configuration for gamma trains		
<b>Description</b>	It describes a specific special brake configuration to which the related brake parameters are applicable.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
4 bits			Bit set
<b>Special/reserved value</b>	0000	No interface to special brakes exists or all status are inactive	
	xxx1	Regenerative brake interface exists and status is active	
	xx1x	Eddy current brake interface exists and status is active	
	x1xx	Magnetic shoe brake interface exists and status is active	
	1xxx	Ep brake interface exists and status is active	

**T\_BRAKE\_EMERGENCY**

<b>Name</b>	Emergency Brake delay time		
<b>Description</b>	This is the build up time for the emergency brake.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
12 bits	0 s	204.75 s	0.05 s

**N\_BRAKE\_SECTIONS**

<b>Name</b>	Brake number of sections		
<b>Description</b>	Number of iterations of speed sections needed to build a brake model, following this variable in the message.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
3 bits	1	7	
<b>Special/reserved value</b>	0	Spare	

**V\_BRAKE\_EMERGENCY\_COMP**

<b>Name</b>	Emergency brake speed component		
<b>Description</b>	It contains the lowest speed value of the speed section to which the related emergency brake deceleration component is applicable.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
10 bits	0 km/h	600 km/h	1 km/h
<b>Special/reserved value</b>	601 – 1023	Spare	

**A\_BRAKE\_EMERGENCY\_COMP**

<b>Name</b>	Emergency brake deceleration component		
<b>Description</b>	It contains the value of the emergency brake deceleration component which is applicable to the related speed section.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
8 bits	0 m/s <sup>2</sup>	2.55 m/s <sup>2</sup>	0.01 m/s <sup>2</sup>

**M\_KDRY\_RST**

<b>Name</b>	Rolling stock correction factor on dry rails		
<b>Description</b>	This variable is a correction factor applicable to the emergency brake deceleration according to the variable M_NVEBCL defined in chapter 7 of [1].		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
5 bits	0	1.55	0.05

**M\_KWET\_RST**

<b>Name</b>	Rolling stock correction factor on wet rail		
<b>Description</b>	This variable is a correction factor applicable to the emergency brake deceleration according to the variable M_NVAVADH defined in chapter 7 of [1].		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
5 bits	0	1.55	0.05

**V\_BRAKE\_SERVICE\_COMP**

<b>Name</b>	Service brake speed component		
<b>Description</b>	It contains the lowest speed value of the speed section to which the related service brake deceleration component is applicable.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
10 bits	0 km/h	600 km/h	1 km/h
<b>Special/reserved value</b>	601 – 1023	Spare	

**A\_BRAKE\_SERVICE\_COMP**

<b>Name</b>	Service brake deceleration component		
<b>Description</b>	It contains the value of the service brake deceleration component which is applicable to the related speed section.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
8 bits	0 m/s <sup>2</sup>	2.55 m/s <sup>2</sup>	0.01 m/s <sup>2</sup>

## 4.2.4.3 EMERGENCY BRAKE COMMAND STATE

<b>Description</b>	This message records the emergency brake application command state.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_BRAKE_COMMAND_STATE	1	

**M\_BRAKE\_COMMAND\_STATE**

<b>Name</b>	Brake command state		
<b>Description</b>	It contains the command state of the brakes.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/reserved value</b>	0	Not commanded	
	1	Commanded	

## 4.2.4.4 SERVICE BRAKE COMMAND STATE

<b>Description</b>	This message records the service brake application command state.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_BRAKE_COMMAND_STATE	1	Defined in 4.2.4.3

## 4.2.4.5 MESSAGE TO RADIO INFILL UNIT

<b>Description</b>	This message shall be sent after sending a message to an RIU.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_C		Defined in Chapter 7 of [1]
	NID_RIU		Defined in Chapter 7 of [1]. ETCS identity (NID_C + NID_RIU) of the RIU to which the following message has been sent.
	Message, as defined in Chapters 7 and 8 of [1], sent to the referenced RIU.		

## 4.2.4.6 TELEGRAM FROM BALISE

<b>Description</b>	This message is sent after receiving a telegram from a balise.
<b>Content</b>	The content of this message is the telegram coming from a balise as defined in Chapters 7 and 8 of [1].

## 4.2.4.7 MESSAGE FROM EUROLOOP

<b>Description</b>	This message is sent after receiving a message from an Euroloop.
<b>Content</b>	The content of this message is any message coming from an Euroloop as defined in Chapters 7 and 8 of [1].

## 4.2.4.8 MESSAGE FROM RADIO INFILL UNIT

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<b>Description</b>	This message is sent after receiving a message from a radio infill unit.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_C		Defined in Chapter 7 of [1]
	NID_RIU		Defined in Chapter 7 of [1]. ETCS identity (NID_C + NID_RIU) of the RIU from which the following message has been received.
	Message, as defined in Chapters 7 and 8 of [1], coming from the referenced RIU.		

4.2.4.9 MESSAGE FROM RBC

<b>Description</b>	This message is sent after receiving a message from an RBC.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_C		Defined in Chapter 7 of [1]
	NID_RBC		Defined in Chapter 7 of [1]. ETCS identity (NID_C + NID_RBC) of the RBC from which the following message has been received.
	Message, as defined in [1], coming from the referenced RBC.		

4.2.4.10 MESSAGE TO RBC

<b>Description</b>	This message is sent after sending a message to an RBC.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_C		Defined in Chapter 7 of [1]
	NID_RBC		Defined in Chapter 7 of [1]. ETCS identity (NID_C + NID_RBC) of the RBC to which the following message has been sent.
	Message, as defined in [1], sent to the referenced RBC.		

4.2.4.11 DRIVER'S ACTIONS

<b>Description</b>	This message is sent whenever the driver acts on the on board system via the ERTMS/ETCS DMI.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_DRIVERACTIONS	8	

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M\_DRIVERACTIONS

Name	Driver's actions.		
Description	This variable contains the driver's action.		
Length of variable	Minimum Value	Maximum Value	Resolution/formula
8 bit			
<b>Special/Reserved Values</b>	0000 0000	Ack of On Sight mode	
	0000 0001	Ack of Shunting mode	
	0000 0010	Ack of Train Trip	
	0000 0011	Ack of Staff Responsible mode	
	0000 0100	Ack of Unfitted mode	
	0000 0101	Ack of Reversing mode	
	0000 0110	Ack level 0	
	0000 0111	Ack level 1	
	0000 1000	Ack level 2	
	0000 1001	Ack level 3	
	0000 1010	Ack level NTC	
	0000 1011	Shunting selected	
	0000 1100	Non Leading selected	
	0000 1101	Ack of Limited Supervision mode	
	0000 1110	Override selected	
	0000 1111	"Continue Shunting on desk closure" selected	
	0001 0000	Brake release acknowledgement	
	0001 0001	Exit of Shunting selected	
	0001 0010	Isolation selected	
	0001 0011	Start selected	
	0001 0100	Train Data Entry requested	
	0001 0101	Validation of train data	
	0001 0110	Confirmation of Track Ahead Free	
	0001 0111	Ack of Plain Text information	
	0001 1000	Ack of Fixed Text information	
	0001 1001	Request to hide supervision limits	
	0001 1010	Train integrity confirmation	
	0001 1011	Request to show supervision limits	
	0001 1100	Ack of SN mode	
	0001 1101	Selection of Language	
	0001 1110	Request to show geographical position	
	0001 1111	Spare	
	0010 0000	Spare	
	0010 0001	Request to hide geographical position	
	0010 0010	Level 0 selected	
	0010 0011	Level 1 selected	
	0010 0100	Level 2 selected	

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	0010 0101	Level 3 selected
	0010 0110	Level NTC selected
	0010 0111	Request to show tunnel stopping area information
	0010 1000	Request to hide tunnel stopping area information
	0010 1001	Scroll up button activated
	0010 1010	Scroll down button activated

4.2.4.12 BALISE GROUP ERROR

<b>Description</b>	This message contains a balise group related error as identified by M_ERROR.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_C		Defined in Chapter 7 of [1]
	NID_ERRORBG	14	
	M_ERROR		Defined in Chapter 7 of [1]

**NID\_ERRORBG**

<b>Name</b>	Identity number of the balise group which triggered the error		
<b>Description</b>	It contains the identity number of the balise group to which the error is related.  NID_ERRORBG is identical to NID_BG (defined in chapter 7 of [1]) except for the NID_ERRORBG Special Value "16383" which has the meaning "unknown" and covers the case that, due to the error, the balise group identity is unknown		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
14 bits	0	16382	Numbers
<b>Special/reserved value</b>	16383	Unknown	

## 4.2.4.13 RADIO ERROR

<b>Description</b>	This message contains an error related to communication with an RBC as identified by M_ERROR.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_C		Defined in Chapter 7 of [1]
	NID_RBC		Defined in Chapter 7 of [1]. ETCS identity (NID_C + NID_RBC) of the RBC to which the error is related
	M_ERROR		Defined in Chapter 7 of [1]

## 4.2.4.14 STM INFORMATION

<b>Description</b>	This message is sent to the on-board recording device on an STM event, i.e. when certain STM packets are exchanged, certain system status messages in relation to NTCs are displayed or a disconnection of the STM Control Function connection happens.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_STMX	8	STM relevant for the event
	NID_STMEVENT	2	STM Event type
	M_DISCSENDER	1	If NID_STMEVENT = 0, sender of disconnect request
	M_DISCTYPE	1	If NID_STMEVENT = 0, type of disconnection.
	M_DISCREASON		If NID_STMEVENT = 0, disconnection reason as defined in [7], chapter 5.2.5.9 and [6] chapter 5.3.1.3
	STM_SYSTEM_STATUS_MESSAGE	3	If NID_STMEVENT = 1
	NID_STMPACKET	8	If NID_STMEVENT = 2
	L_STMPACKET	13	If NID_STMEVENT = 2, length of M_STMPACKETDATA
	If NID_STMEVENT = 2, STM packet variables (without NID_PACKET and L_PACKET) as described in Chapters 7 & 8 of [2]		



**NID\_STMX**

<b>Name</b>	STM identification		
<b>Description</b>	STM relevant for the event For STM-packets or disconnect requests sent from an STM or to a single STM, its value is given by the NID_STM as defined in [2].		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
8 bits	0	254	
<b>Special/reserved value</b>	255	For STM-packets or disconnect requests sent to all (connected) STMs	

**NID\_STMEVENT**

<b>Name</b>	STM Event type		
<b>Description</b>			
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
2 bits			
<b>Special/reserved value</b>	0	Disconnection	
	1	Display of system status message	
	2	Reception/sending of STM packet	
	3	Spare	

**M\_DISCSENDER**

<b>Name</b>	Sender of disconnect request		
<b>Description</b>	Sender of disconnect request (STM or STM Control Function).		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/reserved value</b>	0	Disconnect request sent from STM	
	1	Disconnect request sent from STM Control Function	

**M\_DISCTYPE**

<b>Name</b>	Type of disconnection		
<b>Description</b>	Type of disconnection, see [7], section 5.2.5.9 (line "New setup desired")		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/reserved value</b>	0	Final disconnection	
	1	Non final disconnection	

**STM\_SYSTEM\_STATUS\_MESSAGE**

<b>Name</b>	STM SYSTEM STATUS MESSAGE		
<b>Description</b>	System status message displayed to the driver A bit set to '1' means that the corresponding system status message is displayed		
<b>Length of variable</b>	<b>Bit number</b>	<b>Definition</b>	<b>Resolution/formula</b>
4 bits		as in chapter 15 of [3]	Bitset The least significant bit of the variable corresponds to bit 01.
<b>Special/Reserved Values</b>	Bit 01	NTC brake demand	
	Bit 02	NTC needs data	
	Bit 03	NTC failed	
	Bit 04	NTC is not available	

**NID\_STMPACKET**

<b>Name</b>	STM packet identification		
<b>Description</b>	STM-packet number, i.e. NID_PACKET as defined in Chapter 8 of [2].		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
8 bits			
<b>Special/reserved value</b>	6	Override activation	
	14	State order to STM	
	15	State report from STM	
	16	Transition variables STM max speed from STM	
	17	Transition variables STM system speed and distance from STM	
	18	National Trip Procedure	
	20	Antenna/BTM ID	
	21	Test Procedure Permission Request	
	22	Test Procedure Permission	
	23	End of Test Procedure	
	31	Active DMI channel	
	32	Button Request	
	34	Button event report	
	35	Indicator request	
38	Text message		
39	Delete text message		

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	40	Acknowledgement reply
	43	Speed and distance supervision information
	46	Sound command
	47	ETCS BTM status message to STM
	128	STM emergency and service brake command to brake interface
	129	STM specific brake control command
	130	STM commands to train interface
	161	NTC juridical data from STM
	Other values	Spare

**L\_STMPACKET**

<b>Name</b>	Length of STM packet		
<b>Description</b>			
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
13 bits	0	1867 As allowed by maximum length of application data.	1 bit
<b>Special/reserved value</b>	1868-8191	Spare	

4.2.4.15 INFORMATION FROM COLD MOVEMENT DETECTOR

<b>Description</b>	This message gives the information from the cold movement detector at the power-up.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_COLD_MVT	2	

**M\_COLD\_MVT**

<b>Name</b>	Cold movement detector information		
<b>Description</b>	Indicates whether no cold movement has occurred or if a cold movement has been detected or if no cold movement information is available.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
2 bits			

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<b>Special/reserved value</b>	0	No cold movement occurred
	1	Cold movement detected
	2	No cold movement information available
	3	Spare

4.2.4.16 START DISPLAYING FIXED TEXT MESSAGE

<b>Description</b>	This message contains a fixed text message from the trackside that is currently being shown to the driver.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	Q_TEXT		Defined in Chapter 7 of [1]

4.2.4.17 STOP DISPLAYING FIXED TEXT MESSAGE

<b>Description</b>	This message contains a fixed text message from the trackside that is not shown to the driver any more.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	Q_TEXT		Defined in Chapter 7 of [1]

4.2.4.18 START DISPLAYING PLAIN TEXT MESSAGE

<b>Description</b>	This message contains a plain text message from the trackside that is currently being shown to the driver.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	L_TEXT		Defined in Chapter 7 of [1]
	X_TEXT(L_TEXT)		Defined in Chapter 7 of [1]

4.2.4.19 STOP DISPLAYING PLAIN TEXT MESSAGE

<b>Description</b>	This message contains a plain text message from the trackside that is not shown to the driver any more.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	L_TEXT		Defined in Chapter 7 of [1]
	X_TEXT(L_TEXT)		Defined in Chapter 7 of [1]

4.2.4.20 SPEED AND DISTANCE MONITORING INFORMATION

<b>Description</b>	This message contains Speed and Distance monitoring data, in relation to the information displayed to the driver		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_SDMTYPE	2	
	M_SDMSUPSTAT	3	
	V_PERM	10	
	V_SBI	10	
	V_TARGET	10	
	D_TARGET	15	
	V_RELEASE	10	

**M\_SDMTYPE**

<b>Name</b>	Speed and distance monitoring type		
<b>Description</b>	Type of the speed and distance monitoring		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
2 bits			
<b>Special/reserved value</b>	0	Ceiling speed monitoring (CSM)	
	1	Pre indication monitoring (PIM)	
	2	Target speed monitoring (TSM)	
	3	Release speed monitoring (RSM)	

**M\_SDMSUPSTAT**

<b>Name</b>	Speed and distance monitoring supervision status.		
<b>Description</b>	Supervision status of the speed and distance monitoring		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
3 bits			
<b>Special/reserved value</b>	0	Normal Status	
	1	Indication Status	
	2	Overspeed Status	
	3	Warning Status	
	4	Intervention Status	
	5...7	Spare	

**V\_PERM**

<b>Name</b>	Permitted speed.		
<b>Description</b>	Permitted speed displayed to the driver		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
10 bits	0 km/h	600 km/h	1 km/h
<b>Special/reserved value</b>	601 – 1022	Spare	
	1023	None	

**V\_SBI**

<b>Name</b>	Service brake intervention speed.		
<b>Description</b>	SBI speed displayed to the driver		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
10 bits	0 km/h	600 km/h	1 km/h
<b>Special/reserved value</b>	601 – 1022	Spare	
	1023	None	

**V\_TARGET**

<b>Name</b>	Target speed.		
<b>Description</b>	Target speed displayed to the driver		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
10 bits	0 km/h	600 km/h	1 km/h
<b>Special/reserved value</b>	601 – 1022	Spare	
	1023	None	

**D\_TARGET**

<b>Name</b>	Target distance.		
<b>Description</b>	Target distance displayed to the driver		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
15 bits	0 m	32766 m	1 m
<b>Special/reserved value</b>	32767	None	

**V\_RELEASE**

<b>Name</b>	Release speed.		
<b>Description</b>	Release speed displayed to the driver.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
10 bits	0 km/h	600 km/h	1 km/h
<b>Special/reserved value</b>	601-1022	Spare	
	1023	None	

## 4.2.4.21 DMI SYMBOL STATUS

<b>Description</b>	This message contains the status of the set of symbols that can be displayed on the DMI (except planning, navigation and settings related symbols that are not considered as relevant for juridical recording).		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	DMI_SYMB_STATUS	66	

**DMI\_SYMB\_STATUS**

<b>Name</b>	DMI SYMBOL STATUS		
<b>Description</b>	Status of the symbols displayed to the driver A bit set to '1' means that the corresponding symbol is displayed.		
<b>Length of variable</b>	<b>Bit number</b>	<b>Definition</b>	<b>Resolution/formula</b>
87 bits		as in chapter 13 of [3]	Bitset The bit 01 corresponds to the least significant bit of the variable
<b>Special/Reserved Values</b>	Bit 01	LE01	
	Bit 02	LE02	
	Bit 03	LE03	
	Bit 04	LE04	
	Bit 05	LE05	
	Bit 06	LE06	
	Bit 07	LE07	
	Bit 08	LE08	
	Bit 09	LE09	
	Bit 10	LE10	
	Bit 11	LE11	
	Bit 12	LE12	
	Bit 13	LE13	

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	Bit 14	LE14
	Bit 15	LE15
	Bit 16	MO01
	Bit 17	MO02
	Bit 18	MO03
	Bit 19	MO04
	Bit 20	MO05
	Bit 21	MO06
	Bit 22	MO07
	Bit 23	MO08
	Bit 24	MO09
	Bit 25	MO10
	Bit 26	MO11
	Bit 27	MO12
	Bit 28	MO13
	Bit 29	MO14
	Bit 30	MO15
	Bit 31	MO16
	Bit 32	MO17
	Bit 33	MO18
	Bit 34	MO19
	Bit 35	MO20
	Bit 36	MO21
	Bit 37	MO22
	Bit 38	ST01
	Bit 39	ST02
	Bit 40	ST03
	Bit 41	ST04
	Bit 42	ST05
	Bit 43	ST06
	Bit 44	TC01
	Bit 45	TC02
	Bit 46	TC03
	Bit 47	TC04
	Bit 48	TC05
	Bit 49	TC06
	Bit 50	TC07
	Bit 51	TC08
	Bit 52	TC09
	Bit 53	TC10
	Bit 54	TC11
	Bit 55	TC12
	Bit 56	TC13
	Bit 57	TC14
	Bit 58	TC15
	Bit 59	TC16
	Bit 60	TC17
	Bit 61	TC18



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	Bit 62	TC19
	Bit 63	TC20
	Bit 64	TC21
	Bit 65	TC22
	Bit 66	TC23
	Bit 67	TC24
	Bit 68	TC25
	Bit 69	TC26
	Bit 70	TC27
	Bit 71	TC28
	Bit 72	TC29
	Bit 73	TC30
	Bit 74	TC31
	Bit 75	TC32
	Bit 76	TC33
	Bit 77	TC34
	Bit 78	TC35
	Bit 79	TC36
	Bit 80	TC37
	Bit 81	DR01
	Bit 82	DR02
	Bit 83	DR03
	Bit 84	DR04
	Bit 85	DR05
	Bit 86	LX01
	Bit 87	LS01

4.2.4.22 DMI SOUND STATUS

<b>Description</b>	This message contains the status of the sounds that are used to draw the driver's attention from the outside to the display.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	DMI_SOUND_STATUS	3	

## DMI\_SOUND\_STATUS

<b>Name</b>	DMI SOUND STATUS		
<b>Description</b>	Status of the audible information played to the driver A bit set to '1' means that the corresponding sound is generated		
<b>Length of variable</b>	<b>Bit number</b>	<b>Definition</b>	<b>Resolution/formula</b>
3 bits		as in chapter 14 of [3]	Bitset The bit 01 corresponds to the least significant bit of the variable
<b>Special/Reserved Values</b>	Bit 01	Sound Sinfo - Information on DMI	
	Bit 02	Sound S1 – Over-speed	
	Bit 03	Sound S2 – Warning	

## 4.2.4.23 DMI SYSTEM STATUS MESSAGE

<b>Description</b>	This message contains which system status messages are displayed to the driver		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	SYSTEM_STATUS_MESSAGE	23	

## SYSTEM\_STATUS\_MESSAGE

<b>Name</b>	SYSTEM STATUS MESSAGE		
<b>Description</b>	System status message displayed to the driver A bitset to '1' means that the corresponding system status message is displayed		
<b>Length of variable</b>	<b>Bit number</b>	<b>Definition</b>	<b>Resolution/formula</b>
23 bits		as in chapter 15 of [3]	Bitset The least significant bit of the variable corresponds to bit 01.
<b>Special/Reserved Values</b>	Bit 01	Balise read error	
	Bit 02	Trackside malfunction	
	Bit 03	Communication error	
	Bit 04	Entering FS	
	Bit 05	Entering OS	
	Bit 06	Runaway movement	
	Bit 07	SH refused	
	Bit 08	SH request failed	
	Bit 09	Trackside not compatible	
	Bit 10	Train data changed	
	Bit 11	Train is rejected	
	Bit 12	Unauthorized passing of EOA / LOA	
	Bit 13	No MA received at level transition	

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	Bit 14	SR distance exceeded
	Bit 15	SH stop order
	Bit 16	SR stop order
	Bit 17	Emergency stop
	Bit 18	RV distance exceeded
	Bit 19	No track description
	Bit 20	Route unsuitable – axle load category
	Bit 21	Route unsuitable – loading gauge
	Bit 22	Route unsuitable – traction system
	Bit 23	Radio network registration failed

4.2.4.24 ADDITIONAL DATA

<b>Description</b>	This message contains the additional data (see section 3.18.4 of [1]).		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_ADHESION		Adhesion factor. Defined in Chapter 7 of [1]
	NID_MN		Identity of Radio Network. Defined in Chapter 7 of [1]
	Q_RBCENTRY	2	
	NID_C		Only if Q_RBCENTRY = 2 Identity of the country or region complementing the RBC identity number. Defined in chapter 7 of [1]
	NID_RBC		Only if Q_RBCENTRY = 2 RBC ETCS identity number. Defined in Chapter 7 of [1]
	NID_RADIO		Only if Q_RBCENTRY = 2 Radio subscriber number. Defined in Chapter 7 of [1]
	NID_OPERATIONAL		Train Running Number. Defined in Chapter 7 of [1]

## Q\_RBCENTRY

<b>Name</b>	Qualifier for the RBC contact information		
<b>Description</b>	This variable indicates the type of driver's selection for the RBC data		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
2 bit			
<b>Special/reserved value</b>	0	Contact last known RBC	
	1	Use short number	
	2	Enter RBC data	
	3	Spare	

## 4.2.4.25 SR SPEED/DISTANCE ENTERED BY THE DRIVER

<b>Description</b>	This message contains the change of the SR Speed or Distance entered by the driver.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	D_SR	17	
	V_SR	10	

## D\_SR

<b>Name</b>	Staff Responsible distance.		
<b>Description</b>	Distance allowed running in Staff Responsible, modified by the driver through the DMI. The maximum value corresponds to the one that is considered appropriate from operational point of view.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
17 bits	0 m	100000 m	1 m
<b>Special/reserved value</b>	100001-131071	Spare	

## V\_SR

<b>Name</b>	Staff Responsible speed		
<b>Description</b>	Speed allowed running in Staff Responsible, modified by the driver through the DMI.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
10 bits	0 km/h	600 km/h	1 km/h
Special/reserved value	601-1023	Spare	

## 4.2.4.26 NTC SELECTED

<b>Description</b>	This message contains the identity of the NTC when the selected level is NTC.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_NTC		Defined in Chapter 7 of [1].

## 4.2.4.27 SAFETY CRITICAL FAULT IN MODE SL, NL OR PS

<b>Description</b>	This message records the occurrence of a safety critical fault in mode SL, NL or PS.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	Null		

## 4.2.4.28 VIRTUAL BALISE COVER SET BY THE DRIVER

<b>Description</b>	This message reflects the code entered by the driver to set a VBC.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_VBCMK		Defined in Chapter 7 of [1].
	NID_C		Defined in Chapter 7 of [1].
	T_VBC		Defined in Chapter 7 of [1].

## 4.2.4.29 VIRTUAL BALISE COVER REMOVED BY THE DRIVER

<b>Description</b>	This message reflects the code entered by the driver to remove a VBC.		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_C		Defined in Chapter 7 of [1].
	NID_VBCMK		Defined in Chapter 7 of [1].

4.2.4.30 SLEEPING INPUT

<b>Description</b>	This message allows to transmit the state of the sleeping input (see [4] 2.2.1).		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_SLEEPING	1	

**M\_SLEEPING**

<b>Name</b>	Sleeping input state		
<b>Description</b>	This variable contains the state of the sleeping input.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/reserved value</b>	0	Sleeping not requested	
	1	Sleeping requested	

4.2.4.31 PASSIVE SHUNTING INPUT

<b>Description</b>	This message allows to transmit the state of the passive shunting input (see [4] 2.2.2).		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_PASSIVE_SHUNTING	1	

**M\_PASSIVE\_SHUNTING**

<b>Name</b>	Passive shunting input state		
<b>Description</b>	This variable contains the state of the passive shunting input.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/reserved value</b>	0	Passive shunting not permitted	
	1	Passive shunting permitted	

4.2.4.32 NON LEADING INPUT

<b>Description</b>	This message allows to transmit the state of the non leading input (see [4] 2.2.3).		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_NON_LEADING	1	

**M\_NON\_LEADING**

<b>Name</b>	Non leading input state		
<b>Description</b>	This variable contains the state of the non leading input.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/reserved value</b>	0	Non leading not permitted	
	1	Non leading permitted	

## 4.2.4.33 REGENERATIVE BRAKE STATUS

<b>Description</b>	This message allows to transmit the regenerative brake status (see [4] 2.3.6).		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_RB_STATUS	1	

**M\_RB\_STATUS**

<b>Name</b>	Status of the regenerative brake		
<b>Description</b>	This variable contains the status of the regenerative brake		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/reserved value</b>	0	Not active	
	1	Active	

## 4.2.4.34 MAGNETIC SHOE BRAKE STATUS

<b>Description</b>	This message allows to transmit the magnetic shoe brake status (see [4] 2.3.6).		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_MSB_STATUS	1	

**M\_MSB\_STATUS**

<b>Name</b>	Status of the magnetic shoe brake		
<b>Description</b>	This variable contains the status of the magnetic shoe brake		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/reserved value</b>	0	Not active	
	1	Active	

## 4.2.4.35 EDDY CURRENT BRAKE STATUS

<b>Description</b>	This message allows to transmit the eddy current brake status (see [4] 2.3.6).		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_ECB_STATUS	1	

**M\_ECB\_STATUS**

<b>Name</b>	Status of the eddy current brake		
<b>Description</b>	This variable contains the status of the eddy current brake		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/reserved value</b>	0	Not active	
	1	Active	

## 4.2.4.36 ELECTRO PNEUMATIC BRAKE STATUS

<b>Description</b>	This message allows to transmit the electro pneumatic brake status (see [4] 2.3.6).		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_EP_STATUS	1	



**M\_EP\_STATUS**

<b>Name</b>	Status of the electro pneumatic brake		
<b>Description</b>	This variable contains the status of the electro pneumatic brake		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/reserved value</b>	0	Not active	
	1	Active	

## 4.2.4.37 ADDITIONAL BRAKE STATUS

<b>Description</b>	This message allows to transmit the additional brake status (see [4] 2.3.6).		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_AB_STATUS	1	

**M\_AB\_STATUS**

<b>Name</b>	Status of the additional brakes		
<b>Description</b>	This variable contains the status of the additional brakes		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/reserved value</b>	0	Not active	
	1	Active	

## 4.2.4.38 CAB STATUS

<b>Description</b>	This message allows to transmit the cab status that the ERTMS/ETCS onboard received from the train interface (see [4] 2.5.1).		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_CAB_A_STATUS	1	
	Q_CAB_B	1	
	M_CAB_B_STATUS	1	Only if Q_CAB_B = 1

**M\_CAB\_A\_STATUS**

<b>Name</b>	Cab A status		
<b>Description</b>	This variable contains the cab A status. In case the ERTMS/ETCS onboard is connected to only one cab, this cab is considered as being the cab A.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/reserved value</b>	0	Not active	
	1	Active	

**Q\_CAB\_B**

<b>Name</b>	Qualifier for cab B		
<b>Description</b>	Qualifier to indicate whether a second cab is connected to the ERTMS/ETCS onboard.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/reserved value</b>	0	No	
	1	Yes	

**M\_CAB\_B\_STATUS**

<b>Name</b>	Cab B status		
<b>Description</b>	This variable contains the cab B status.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/reserved value</b>	0	Not active	
	1	Active	

## 4.2.4.39 DIRECTION CONTROLLER POSITION

<b>Description</b>	This message allows to transmit the direction controller position (see [4] 2.5.2).		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_DIRECTION_CONTROLLER	2	

**M\_DIRECTION\_CONTROLLER**

<b>Name</b>	Direction controller state		
<b>Description</b>	This variable contains the direction controller input state.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
2 bits			
<b>Special/reserved value</b>	00	Neutral	
	01	Backward	
	10	Forward	
	11	Spare	

## 4.2.4.40 TRACTION STATUS

<b>Description</b>	This message allows to transmit the traction status (see [4] 2.5.4).		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_TRACTION_STATUS	1	

**M\_TRACTION\_STATUS**

<b>Name</b>	Traction status		
<b>Description</b>	This variable contains the traction status		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/reserved value</b>	0	Off	
	1	On	

## 4.2.4.41 TYPE OF TRAIN DATA ENTRY

<b>Description</b>	This message allows to transmit the type of train data entry (see [4] 2.6.1).		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_TRAIN_DATA_ENTRY	2	

**M\_TRAIN\_DATA\_ENTRY**

<b>Name</b>	Type of train data entry		
<b>Description</b>	This variable contains the type of train data entry		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
2 bit			
<b>Special/reserved value</b>	0	Fixed	
	1	Flexible	
	2	Switchable	
	3	Spare	

## 4.2.4.42 NATIONAL SYSTEM ISOLATION

<b>Description</b>	This message allows to transmit the indication that a National System, which is interfaced to the on-board through an STM, is isolated or not (see [4] 2.7.1).		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	NID_NTC		Defined in [1]
	M_NATIONAL_SYSTEM_ISOLATION	1	

**M\_NATIONAL\_SYSTEM\_ISOLATION**

<b>Name</b>	Isolation of the National System		
<b>Description</b>	This variable contains the indication of isolation of the National System		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/reserved value</b>	0	NTC isolated	
	1	NTC not isolated	

## 4.2.4.43 TRACTION CUT OFF COMMAND STATE

<b>Description</b>	This message allows to transmit the traction cut off command state (see [4] 2.4.6)		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	M_TCO_COMMAND_STATE	1	

## M\_TCO\_COMMAND\_STATE

<b>Name</b>	Traction cut off command state		
<b>Description</b>	This variable contains the command state of the traction cut off.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
1 bit			
<b>Special/reserved value</b>	0	Not commanded	
	1	Commanded	

## 4.2.4.44 LOWEST SUPERVISED SPEED WITHIN THE MOVEMENT AUTHORITY

<b>Description</b>	This message allows to transmit the LSSMA displayed to the driver		
<b>Content</b>	<b>Complementary Variable</b>	<b>Length</b>	<b>Comment</b>
	V_LSSMA	10	

## V\_LSSMA

<b>Name</b>	Lowest Speed Supervised within the Movement Authority.		
<b>Description</b>	LSSMA displayed to the driver.		
<b>Length of variable</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Resolution/formula</b>
10 bits	0 km/h	600 km/h	1 km/h
<b>Special/reserved value</b>	601-1022	Spare	
	1013	None	

## 4.2.4.255 ETCS ON-BOARD PROPRIETARY JURIDICAL DATA

<b>Description</b>	This message allows to record information that is specific to an ETCS on-board equipment <sup>1</sup> .
<b>Content</b>	Proprietary data

<sup>1</sup> If needed, the non harmonised information referred to in [4] can be included in this message.

### 4.3 Triggering events list

4.3.1.1 The following table gives the list of events that trigger the sending of a juridical data message by the ERTMS/ETCS on-board equipment.

TRIGGERING EVENT	NID_MESSAGE
Every 5 seconds	1
When the operated system version changes	1
When the level changes	1 (and 26 when level changes to NTC)
When the mode changes	1
When train data are validated at SoM	2
When train data are changed	2
When the state of the emergency brake command changes	3
When the state of the service brake command changes	4
When a telegram from an Eurobalise is received	6
When a message from an Euroloop is received	7
When a message from a RIU is received	8
When a message to a RIU is sent	5
When a message from a RBC is received	9
When a message to a RBC is sent	10
When a balise group error is detected	12
When a radio message error is detected	13
When a safety critical fault in mode SL, NL or PS occurs	27
At start up <sup>2</sup>	15
When the driver acts on the on-board system through the DMI	11

<sup>2</sup> i.e. once the ERTMS/ETCS on-board is powered up, when the connection with the On-board Recording Device is established.

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When a fixed text message is shown to the driver	16
When a fixed text message is not shown any more to the driver	17
When a plain text message is shown to the driver	18
When a plain text message is not shown any more to the driver	19
When any of the speed and distance monitoring information changes	20
When the LSSMA appears, changes or disappears on the DMI	44
When any of the DMI symbols appears or disappears	21
When the playing of any audible information to the driver is started	22
When any of the system status messages appears or disappears on the DMI	23
When any of the STM related system status messages appears or disappears on the DMI	14
When any of the additional data is entered/changed by the driver	24
When the driver changes the SR speed/distance	25
When the driver sets a Virtual Balise Cover	28
When the driver removes a Virtual Balise Cover	29
In any of the following events <ul style="list-style-type: none"> <li>• At start up<sup>2</sup></li> <li>• When the sleeping input state changes</li> </ul>	30
In any of the following events <ul style="list-style-type: none"> <li>• At start up<sup>2</sup></li> <li>• When the passive shunting input state changes</li> </ul>	31
At start up <sup>2</sup> and when the non leading input state changes	32
Only if the ERTMS/ETCS onboard is interfaced with the regenerative brake:	33

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<ul style="list-style-type: none"> <li>• At start up<sup>2</sup></li> <li>• When the status of the regenerative brake changes</li> </ul>	
<p>Only if the ERTMS/ETCS onboard is interfaced with the magnetic shoe brake in any of the following events:</p> <ul style="list-style-type: none"> <li>• At start up<sup>2</sup></li> <li>• When the status of the magnetic shoe brake changes</li> </ul>	34
<p>Only if the ERTMS/ETCS onboard is interfaced with the eddy current brake in any of the following events:</p> <ul style="list-style-type: none"> <li>• At start up<sup>2</sup></li> <li>• When the status of the eddy current brake changes</li> </ul>	35
<p>Only if the ERTMS/ETCS onboard is interfaced with the electro pneumatic brake in any of the following events:</p> <ul style="list-style-type: none"> <li>• At start up<sup>2</sup></li> <li>• When the status of the electro pneumatic brake changes</li> </ul>	36
<p>Only if the ERTMS/ETCS onboard is interfaced with the additional brakes in any of the following events</p> <ul style="list-style-type: none"> <li>• At start up<sup>2</sup></li> <li>• When the status of the additional brake changes</li> </ul>	37
<p>At start up<sup>2</sup> and when the cab status changes</p>	38
<p>In any of the following events:</p> <ul style="list-style-type: none"> <li>• At start up<sup>2</sup> if a cab is already active</li> <li>• When a cab becomes active</li> <li>• When the direction controller input state changes</li> </ul>	39
<p>In any of the following events:</p> <ul style="list-style-type: none"> <li>• At start up<sup>2</sup></li> <li>• When the status of the traction changes</li> </ul>	40
<p>In any of the following events:</p> <ul style="list-style-type: none"> <li>• At start up<sup>2</sup> if a cab is already active</li> </ul>	41



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<ul style="list-style-type: none"> <li>• When a cab becomes active</li> <li>• When the type of the train data changes</li> </ul>	
<p>In any of the following events:</p> <ul style="list-style-type: none"> <li>• At start up<sup>2</sup></li> <li>• When the isolation status of any National System changes</li> </ul>	42
<p>When the traction cut off command state changes</p>	43
<p>When any of the following packets is sent to an STM:</p> <ul style="list-style-type: none"> <li>• STM-14 State order</li> <li>• STM-20 Antenna/BTM ID</li> <li>• STM-22 Test Procedure Permission</li> <li>• STM-31 Active DMI channel</li> <li>• STM-34 Button event report</li> <li>• STM-40 Acknowledgement reply</li> <li>• STM-47 ETCS BTM status message to STM</li> </ul>	14
<p>When any of the following packets is received from an STM:</p> <ul style="list-style-type: none"> <li>• STM-6 Override activation</li> <li>• STM-16 STM max speed</li> <li>• STM-17 STM system speed and distance</li> <li>• STM-18 National Trip Procedure</li> <li>• STM-21 Test Procedure Permission Request</li> <li>• STM-23 End of Test Procedure</li> <li>• STM-32 Button Request</li> <li>• STM-35 Indicator request</li> <li>• STM-38 Text message</li> <li>• STM-39 Delete text message</li> <li>• STM-46 Sound command</li> </ul>	14

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<ul style="list-style-type: none"> <li>• STM-128 Brake command</li> <li>• STM-129 STM specific brake control command</li> <li>• STM-130 STM commands to train interface</li> <li>• STM-161 NTC juridical data</li> </ul>	
<p>When packet STM-15 State report from STM is received from an STM:</p> <ul style="list-style-type: none"> <li>• after a (re)connection</li> <li>• or with a different value of NID_STMSTATE with regards to previously-received packet STM-15</li> </ul>	14
<p>When packet STM-43 Speed and distance supervision information is received from an STM with a different value of any variable except D_TARGET with regards to previously-received packet STM-43</p>	14
<p>At any STM disconnect event</p>	14

**Table 2: List of triggering events and related messages**

## 5. INTENTIONALLY DELETED

## 6. INTENTIONALLY DELETED