ERTMS/ETCS
FFFIS STM **Application Layer**
REF : SUBSET-058 ISSUE : 3.2.0 DATE : 2015-12-16

Company	Technical Approval	Management approval
ALSTOM		
ANSALDO		
AZD		
BOMBARDIER		
CAF		
SIEMENS		
THALES		

1. MODIFICATION HISTORY

Issue Number Date	Section Number	Modification / Description	Author
0.0.4 19-04-00	Most sections	Modified according to review comments circulated before and found during UNISIG STM meeting 000417-000418 in Brussels.	J. Näsström
0.0.5 10-05-00	Most sections	All variables moved to new chapter 23. Modified taking into account "Cenelec review of Application Layer 004" 19-04-00, Invensys review comments per 04-05-2000, Alcatel comments and Alstom comment reply. Alstom "Review and comment on Application Layer" 25-04-2000 has been integrated.	J. Näsström
0.0.6 30-05-00	General General Picture 6.1.1.3 17.1.1.1 4.2.1.2 19.1 17.4.4 17.6.5 & 23.1.1.144 22.2.1	Editorial corrections Empty lines in packets Deleted. Editorial Updated Legend of drawings Clarified JRU introduction Configuration clarified Added variable for Availability of Additional TI. NID_STM added	J. Näsström
2.0.0 31-05-00		Final version.	J. Näsström
2.0.1 17-12-02		Modified during the STM Meeting in Brussels- 17.12.02	R. Ramos (Invensys)
2.0.2 14-01-03		Modified during the STM Meeting in Paris	R. Ramos (Invensys)

Issue Number Date	Section Number	Modification / Description	Author
2.0.3 26/01/03		Modification according to agreed comments	M. Deladrière (Alstom)
2.0.4 2003-01-30		Modified during the Meeting of the STM Workgroup in Brussels.	R. Ramos (Invensys)
2.0.5 2003-03-13		Modified during the Meeting of the STM Workgroup in Brussels.	P. Lührs (Siemens)
2.0.6 2003-03-26		JRU requirements moved to SUBSET-035. Modified during the Meeting of the STM Workgroup in Braunschweig.	P. Lührs (Siemens)
2.0.7 2003-04-15	All	Override packets from STM to STM control function and from STM control function to STM added to the specification according to comment INV058-30. Suppress T_INTERVENT & N_EOAOVERPASS according to Als058-39/40 D_NOMODO_LRBG variable added according to comment SIE058-035. Packet STM-37 deleted according to comment SIE058-045	M. Deladrière (Alstom)
2.0.8 27/05/2003	All	Up-date according to new Subset-035 and comments proposals.	M. Deladrière (Alstom)
2.0.9 25/06/2003	All	Traceability and consistency to Subset-035 A-27 has been performed. Taking into accounts Invensys comments to the previous issue.	M. Deladrière (Alstom)
2.0.10 25/06/2003	All	Modification performed during WG meeting in Stockholm: Added STM provider within the packet for DRU	M. Deladrière (Alstom)

Issue Number Date	Section Number	Modification / Description	Author
2.0.11 25/07/2003	All	Modification performed during WG meeting in Brussels	M. Deladrière (Alstom)
2.0.12 12-08-03	All	Modification according to review process and review sheet UNISIG_ALL_COM_WP_STM_SUBSET058_V2011_v001.doc	M. Deladrière (Alstom)
2.0.13	All	Modification according to review process and review sheet UNISIG_ALL_COM_WP_STM_SUBSET058_V2012_ v001.doc	M. Deladrière (Alstom)
2.0.14	All	Modification done during the meeting in Stuttgart on the 7-8/10/2003	M. Deladrière (Alstom)
2.0.15	All	Modification done after the meeting in Stuttgart on the 7-8/10/2003 and agreed during the meeting according to UNISIG_ALL_COM_WP_STM_SUBSET058_V2012_ v002.doc	M. Deladrière (Alstom)
2.0.16	All	Modification done at the meeting in Madrid on the 22-23/10/2003 and agreed during the meeting according to UNISIG_ALL_COM_WP_STM_SUBSET058_V2015_ v002.doc	M. Deladrière (Alstom)
2.1.0	All	Modification according to comment sheet UNISIG_ALL_COM_WP_STM_SUBSET058_V2016_v001.doc	M. Deladrière (Alstom)

Issue Number Date	Section Number	Modification / Description	Author
2.1.1	7.2.3 7.2.16 8.1.36 8.1.44 8.1.48 8.1.68 8.1.109 8.1.152 8.1.153 8.1.158 8.1.159	Modification according to EEIG comments on the issue 2.1.0	M. Deladrière (Alstom)

Issue Number Date	Section Number	Modification / Description	Author
2.2.0	5.2.1.2	Compatibility version	A. Schoevaerts (Alstom)
	7.2.17	WG-10: § updated	
	7.8.2 ,7.8.3 , 8.1.14 , 8.1.16	WG-4, § updated	
	8.1.19	WG-7 § updated.	
	8.1.17 , 8.1.27 , 8.1.50	WG-8: § updated.	
	7.1.1 7.2.16	WG-12: Note added WG-13: § updated.	
	8.1.3	WG-15 : § updated.	
	8.1.102 , 8.1.104 , 8.1.105	WG-16: § updated.	
	7.1.1 , 8.1.68, 8.1.69	WG-20 : § updated.	
	NID_DRIVER, 7.2.14	WG-5 : § updated.	
	7.2.16 , 7.2.17	WG-22 : § updated.	
	7.9.1.	WG-21: § updated and added	
	8.1.112 , 8.1.113 , 8.1.110	WG-11 : § updated.	
	7.2.21	WG-23 : § updated	

Issue Number Date	Section Number	Modification / Description	Author
2.2.0	8.1.14, 8.1.16, 7.8.2, 7.8.3 7.3.1 8 7.7.1, 7.7.4, 8.1.33, 8.1.34 8.1.32, 8.1.35 7.5.10, 8.1.72, 8.1.80 7.3.2 8	WG-27: Requirements updated. WG-29: Requirement updated, the associated variables deleted. WG-28, Requirements updated, New requirements. WG-24, Requirements updated, new requirement. WG-31: Requirement updated, the associated variables deleted.	A. Fanea (Ansaldo Signal)
2.2.0.	7.2	WG-32 packet STM-45 deleted.	A. Schoevaerts (Alstom)
2.2.0.	1	Change manual to automatic references.	A. Schoevaerts (Alstom)
2.2.0	6.1.4.11.1	WG-32 packet STM-45 deleted.	P. Lührs (Siemens)

Issue Number Date	Section Number	Modification / Description	Author
2.2.0	7.9.1	WG-38 packet STM-161 updated	J. Sukup
	1.1.1	WG-45 variable M_MODE updated, new modes PS, LS added	(AZD)
	7.4 7.5.8	mode SE deleted, variables connected to mode SE deleted, STM-42 deleted	
	8.1.84	Variable NID_STMTYPE updated	
	7.2.2	STM-4 updated	
	7.2.14	WG-5 NID_DRIVER updated	
	M_BRAKE_POSITION, 8.1.17, 7.2.13	WG-35 brake percentage and position added	
	8.1.8	WG-39 variable updated	
	7.2.12, 8.1.49	WG-40 STM-175 updated, variables updated and added	
	7.2.5, 7.2.15, 8.1.100	WG-43 Override EOA -> Override	
	7.2.15	WG-44 STM-178 updated, new variables added and updated	
		WG-47 variable updated	
	M_ADHESION 7.2.22, 8.1.2	WG-48 STM-45 brought back and updated	
		WG-49 STM-18 name updated	
	7.2.10	WG-50 STM-177 updated	
	7.2.14		

Issue Number Date	Section Number	Modification / Description	Author
2.2.0	8.1.115, 7.5.9	WG-51 variable and STM-43 updated	J.Sukup (AZD)
	8.1.111, 7.5.9	WG-52 variable and STM-43 updated	
	7.2.13	WG-53 STM-176 name updated	
	7.2.13	WG-56 STM-176 and variable updated	
	7.9.1	WG-57 STM-161 updated	
	8.1.102	WG-54 Q_INDICATE updated	
	6.1.4.13.1	WG-36 requirement added	
	8.1.49, 8.1.97	WG-59 variables updated	
	5.2.1.2	WG-60 final version TBD	
	7.2.15, 7.5.9, 8.1.17, 7.2.1, 7.2.3, 8.1.112, 8.1.113, 8.1.110, 8.1.117, 8.1.61	WG-62 editorial changes	
	7.2.21	WG-63 STM-184 updated	
	NID_DRIVER	WG-64 variable updated	
	8.1.102, 8.1.104, 8.1.105	WG-65 variables updated	
	6.1.12.1	WG-66 note deleted	
	7.2.1, 8.1.63, 8.1.94	WG-67 STM-2 and variables updated	
	7.2.13	WG-68 Figure 3 updated	
	figure 3	WG-69 variables and STM-176 updated	
	A_EB_CHAR, A_SB_CHAR, V_EB_CHAR, V_SB_CHAR, 7.2.13		
	NID_OPERATIONAL	WG-70 variable updated	
	7.2.15	WG-71 variables and STM-178 updated	
	6.1.4.15	WG-72 chapter updated	
2.2.0	7	WG-30 references in packets updated, relevant states added	J.Sukup (AZD)

Issue Number Date	Section Number	Modification / Description	Author
2.2.0	8.1.1, 8.1.2, 8.1.3, 8.1.4 T_YEAR First page 8.1.10 7.2.15 6.1.4.6, 6.1.4.7, 7.2.3, 7.2.17, 7.2.18, 7.2.20, 7.5.2, 7.5.3, 7.5.4, 7.5.10, 8.1.9, 8.1.64, 8.1.68, 8.1.69, 8.1.72, 8.1.80, 8.1.84	WG-73 variables updated WG-74 variable updated WG-75 first page updated WG-76 variable updated WG-61 note to STM-178 added WG-78 CR802 Level STM -> Level NTC, NID_STM ->NID_NTC, STM national -> National system	J.Sukup (AZD)
2.2.0 2010-12-17	7.2.12 V_NVALLOWOVTRP 7.9.1, 8	WG-79 variable updated (CR953) WG-80 variable updated WG-77 STM-161 updated, variables NID_JRUMESSAGE, L_JRUMESSAGE, NID_LRBG, D_LRBG, Q_DIRLRBG, Q_DLRBG, L_DOUBTOVER, L_DOUBTUNDER, V_TRAIN deleted	J.Sukup (AZD)
2.9.1	7, 8 7.2.15 7.2.12	ERA comment #1 on v2.2.0: Description of variables that may be referenced to SRS were deleted. They are now referenced in packet description. CR927, CR1003 impact considered: update of National Value packet CR 731 impact considered: Variable M_TRACTION is replaced with M_VOLTAGE & NID_CTRACTION	J.Sukup (AZD)

Issue Number Date	Section Number	Modification / Description	Author
	7.2.13, 8.1.101, 8.1.102	WG-89 A_MAX is removed and the brake delays are transmitted as T_EQUIVALENT_EB_EF & T_EQUIVALENT_SB_EF (covers ERA comment #22)	
	7.3.2, 8	WG-90 variables Q_NOM_ODO, Q_SAFE_DIR removed (covers ERA comment #29)	
	7.2.22, 8.1.2	CR904: STM-45 updated, D_NOMODO_BG updated	
	6.1.4.16, 7.2.1, 7.2.2, 8.1.71	CR 1042: STM-2 updated, STM-4 deleted, NID_PACKET updated	
2.9.1	5, 7.1.1, 8.1.51, 8.1.52	CR 1043: chapter 5 deleted, STM-1 updated, relevant variables deleted/updated, paragraph under history about compatibility deleted	J.Sukup (AZD)
	7.2.23, 7.2.24, 7.2.25, 8.1.29, 8.1.77	CR 1045: new packets STM-21, STM-22, STM-23 added, new variables NID_TEST, M_TESTOK added	
	7.2.1, 7.2.27, 7.6, 8.1.66, 8.1.54, 8.1.55, 8.1.56, 8.1.57, 8.1.58, 8.1.81, 8.1.82, 8.1.83, 8.1.84, 8.1.85, 8	CR 1073: packet STM-2 updated, new packet STM-31, packet STM-77 deleted, new variable NID_DMICHANNEL, variables updated (DMI, JD), unused variables (DRU, EUROSUP, CLOCK) deleted	
	7.2.16, 7.2.17, 7.2.18, 7.2.19, 7.2.20, 7.2.21, 8.1.92, 8.1.99, 8.1.25, 8.1.65, 8.1.12, 8.1.121	CR 1074: packets STM-181, 179, 180, 182, 183, 184 updated and corresponding variables updated	

Issue Number Date	Section Number	Modification / Description	Author
		CR1066:	
	6.1.3.12, 6.1.3.13, 6.1.3.15	Text transmitted in 1 or 2 bytes	
	7.5.2, 7.5.3, 7.5.4, 7.5.5, 7.5.6, 7.5.7, 7.5.9, 7.5.10,	STM-32, 34, 35, 38, 39, 40, 43, 46 updated,	
	8,	M_SUP, Q_INDICATE, Q_INDICATIONLIMIT, Q_WARNINGLIMIT deleted,	
	8.1.7, 8.1.8, 8.1.11, 8.1.18, 8.1.26, 8.1.27, 8.1.50, 8.1.63, 8.1.64, 8.1.68, 8.1.69, 8.1.70, 8.1.72, 8.1.78, 8.1.101, 8.1.109, 8.1.111, 8.1.114, 8.1.115, 8.1.118, 8.1.119, 8.1.120,	D_TARGET, L_CAPTION, L_TEXT, M_BUT_ATTRIB, M_FREQ, M_IND_ATTRIB, M_XATTRIBUTE, NID_BUTPOS, NID_BUTTON, NID_ICON, NID_INDICATOR, NID_INDPOS, NID_SOUND, NID_XMESSAGE, Q_SOUND, T_SOUND, V_INTERV, V_PERMIT, V_RELEASE, V_TARGET, X_CAPTION, X_TEXT updated,	
	8.1.19, 8.1.20, 8.1.21, 8.1.22, 8.1.23, 8.1.94, 8.1.95, 8.1.96, 8.1.97, 8.1.98	new variables M_COLOUR_SP/PS/TS/RS/IS, Q_DISPLAY_IS/PS/TS/RS/TD	
	8.1.73	CR 1044: NID_STM updated	
	4.1	Table of references and all references updated	
	6.1.1.2.1	ERA comment #2 on v2.2.0: Paragraphs deleted (obsolete)	
	6.1.2.3, 6.1.2.4, 6.1.2.12.x	Paragraphs deleted (obsolete)	
	6.1.4.11.4, 6.1.4.11.5	Exceptions deleted (obsolete)	
	6.1.4.11.7	ERA comment #4 on v2.2.0: Note deleted	
	6.1.4.11.6	Exception updated (JRU → JD)	

Issue Number Date	Section Number	Modification / Description	Author
	6.1.4.13	ERA comment #6 on v2.2.0: Wording improved	
	6.1.4.14, 6.1.4.16	Wording improved	
2.9.1 2012-01-21	6.1.4.6, 6.1.4.8	ERA comment #3 on v2.2.0: References to Subset-035 deleted (obsolete)	
	6.1.3.9, 6.1.3.10, 7.2.22, 7.9.1, 8.1.61	ERA comment #14 on v2.2.0: N_L_ITER → N_LITER	
	7.7.1, 7.7.4, 8	ERA comment #20/28 on v2.2.0: Passenger EB deleted	
	8	ERA comment #21 on v2.2.0: Term "Boolean" deleted wherever wrong	
	7.2.3, 1.1.1	New variable M_MODESTM and STM-5 updated, because M_MODE of SRS does not contain PS mode	
	7.2.11	Packet STM-19 deleted (CR1045 additional impact)	
	7.5.1, 7.2.26	Packet STM-30 moved from DMI function to STM Control Function (CR1073 additional impact)	
	7.2.14, 8	Packet STM-177 updated: NID_DRIVER removed	
	8	Variables A_EB_CHAR, A_SB_CHAR, V_EB_CHAR, V_SB_CHAR deleted	
	8.1.14, 8.1.16	Variables M_BIEB_STATUS & M_BISB_STATUS updated as availability status	
	7	Unified text in packet description (Direction of information) References to SS035 in all packets updated	
	8.1.15	Variable M_BISB_CMD updated (value 00)	

Issue Number Date	Section Number	Modification / Description	Author
	7.2.17	"Maximum value = 16 if the maximum length has been used for all caption texts." removed: no added value	
2.9.2 2012-02-18	Front Page 7.7.3, 8.1.48, 8.1.30 7.8.2 [10] 6.1.4.12 7.1.2, 8.1.74 7.2.12 7.2.13, 8, 8.1.17 7.2.22, 8.1.2 7.3.1 7.3.2, 8.1.1, 8.1.110	ERA/SG comment #1 on v2.9.1 ERA comment #2 on v2.9.1: Definition of packet 139, variables M_TITR_STATUS & M_TICAB_STATUS updated ERA comment #3 on v2.9.1: brake command status -> brake status ERA comment #4 on v2.9.1: Formal change of referenced document ERA comment #5 on v2.9.1: requirement deleted ERA comment #6 on v2.9.1: description updated ERA comment #7 on v2.9.1: variable name updated ERA comment #8 on v2.9.1: variables refer to SS027, variables deleted, M_BRAKE_PERCENTAGE renamed to M_BRAKE_PERCENTAGE_STM ERA comment #9 on v2.9.1: DNOMODO_BG => D_ESTODO_BG, comment updated ERA comment #10 on v2.9.1: Description updated ERA comment #11 on v2.9.1: D_NOM replaced with D_EST, V_NOM replaced with V_EST	T.Mandry (Alstom), J.Sukup (AZD)

Issue Number Date	Section Number	Modification / Description	Author
	7.8.3	ERA comment #12 on v2.9.1: M_BIEB_STATUS and M_BISB_STATUS removed	
	8.1.108	T_SBMAXDELAY updated	
	7.8.3	Last sentence in description deleted	
	8.1.3, 8.1.4	ERA comment #13 on v2.9.1: variables updated	
	8.1.1	ERA comment #14 on v2.9.1: variable renamed and updated	
	8.1.2	ERA comment #15 on v2.9.1: variable renamed and updated	
	6.1.2.12	SG comment #2 on v2.9.1: Subchapters where part of intentionally deleted part	
	6.1.4.13	SG comment #3 on v2.9.1: editorial	
	7.5.2	SG comment #6 on v2.9.1: X_CAPTION(k)-> X_CAPTION(k,j)	
	8.1.18, 8.1.27, 8.1.50	SG comments #7/#8 on v2.9.1: variables description added/updated	
	7.2.28, 8.1.92, 8.1.88, 8.1.62	CR1049: STM-20 added, variables Q_CHECKNEEDED, Q_ANTN_BTM_ACTIVE, NID_ANTENNA_BTM added	
	7.2.29, 8.1.90, 8.1.89	CR1126: STM-47 added, variables Q_BTM_ALARM, Q_BMM_ANNOUNCED added	
	All	Reference documents are referenced with numbers only.	
	4.1	Reference to Subsets 027 and 034 added, title of Subset-059 corrected	

Issue Number Date	Section Number	Modification / Description	Author
	All All 7.2.1, 7.7, 7.8, 8.1.53, 8.1.60, 8.1.103, 8.1.108 7.2.14, 8 7.2.26 7.2.27 7.8.3 8.1.103, 8.1.108	Consolidation of Capital letters in the names of functions Minor editorial corrections "Train Interface" replaced by "TIU" ; "Brake Interface" replaced by "BIU" Variables for Date & Time defined by reference to SS027, variables deleted "DE & CS" state added as allowed for sending "All states" replaced by "PO, CO, DE, CS, HS, DA" Packet STM-143 renamed Resolution changed (was too high compared to SS059 requirement)	
2.9.3 2012-02-29	7.2.22, 7.9.1	Add "Maximum value = 228" in comment to N_LITER (limitation resulting from lower layers)	Thomas Mandry (Alstom)
2.9.4 2012-03-02	7.2.22	Change to "Maximum value = 222" in comment to N_LITER (limitation resulting from lower layers for a SIL4 STM, limitation used in Subset-040)	Thomas Mandry (Alstom)
3.0.0 2012-03-02	No change	Baseline 3 release version	Thomas Mandry (Alstom)
3.0.1 2013-10-31	7.2.14, 8.1.70.1 6.1.3.18, 7.2.22	Update according to CR1173 #4 Update according to CR1173 #6	J. Sukup (AZD)
3.0.2 2014-03-04	7.5.2, 8.1.63, 8.1.70	Update according to CR1173 #8	J. Sukup (AZD)
3.0.3 2014-04-24	6.1.3.18 8.1.70.1 Front page	Requirement wording update Numbering correction Baseline 3 1st Maintenance pre-release version	Thomas Mandry (Alstom)
3.1.0 2014-05-09	-	Baseline 3 1st Maintenance release version	Philippe Prieels

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3.1.1 2015-11-12	7.1.1, 7.1.2, 7.2.7, 7.2.10, 7.2.16, 7.2.17, 7.2.19, 7.2.22, 7.2.25, 7.2.27, 7.5.2, 7.5.4, 7.5.5, 7.8.1, 7.8.2, 7.8.3, 8.1.57	CR1242	J. Sukup (AZD)
3.2.0 2015-12-16	-	Baseline 3 2nd release version	Thomas Mandry (Alstom)

2. TABLE OF CONTENTS

3. SCOPE

3.1.1.1 The FFFIS STM Application Layer specifies data formats that shall be used in the communication between Specific Transmission Module STM and ERTMS/ETCS on-board.

3.1.1.2 The boundary to lower layers is the Safe Time Layer.

3.1.1.3 The boundary to higher layer is the application processes within the STM and the ERTMS/ETCS on-board.

3.1.1.4 The scope of this document is the Application Layer only.

3.1.1.5 The transmitted message is embedded in a safety protocol structure as defined by Safe Time Layer and Safe Link Layer. (See [5] and [6]).

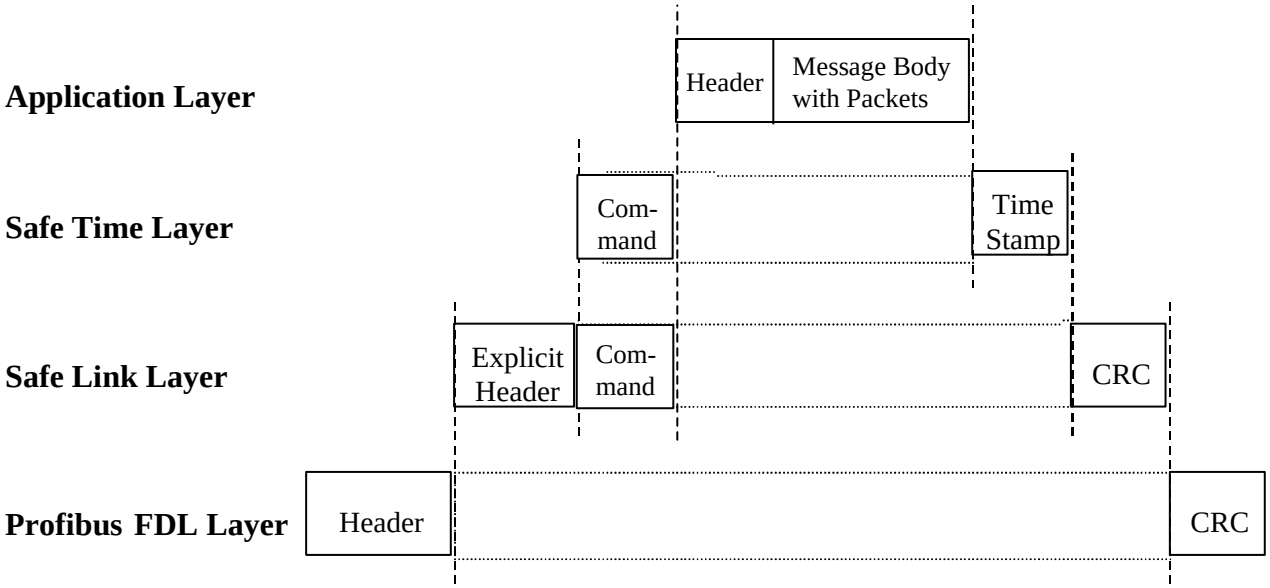

Figure 1: FFFIS STM Layers

4. INTRODUCTION

4.1 References

Ref. N°	Document Reference	Title
[1]	SUBSET-026	System Requirements Specification
[2]	SUBSET-027	FIS Juridical Recording
[3]	SUBSET-034	Train Interface FIS
[4]	SUBSET-035	Specific Transmision Module FFFIS
[5]	SUBSET-056	STM FFFIS Safe Time Layer
[6]	SUBSET-057	STM FFFIS Safe Link Layer
[7]	SUBSET-059	Performance requirements for STMs
[8]	ISO 639-1:2002(E/F)	Codes for the representation of names of languages-Part 1: Alpha-2 Code
[9]	ISO 10646 Annex R	Information technology — Universal Multiple-Octet Coded Character Set (UCS) - UCS Transformation Format 8 (UTF-8)
[10]	ERA_ERTMS_015560	ETCS Driver Machine interface

5. INTENTIONALLY DELETED

6. COMPONENTS OF FFFIS STM LANGUAGE

6.1.1 Introduction

6.1.1.1 The FFFIS STM language is used for transmitting information over the Profibus link between the STM and the ERTMS/ETCS on-board functions.

6.1.1.2 The FFFIS STM language is based on variables, packets, and messages (variables are described in §6.1.2, packets are described in §6.1.3, and messages are described in §6.1.3.18).

6.1.1.2.1 Intentionally deleted

Application message	Message Header	NID_STM
		L_MESSAGE
	First Packet	NID_PACKET
		L_PACKET
		Other variables in First Packet
	. Other packets in application message if any .	
	Packet-N last data packet if different from Packet-1	NID_PACKET
		L_PACKET
		Other variables in Packet
	Padding bits	0 to 7 bits

Figure 2: Application message detailed structure

6.1.2 Definition of Variables and rules for variable coding

6.1.2.1 Variables shall be used to encode single data values. Variables cannot be splitted in minor units. The whole variable has one type (meaning).

6.1.2.2 Variables may have special values, which are related to the basic meaning of the variable.

6.1.2.3 Intentionally deleted

6.1.2.4 Intentionally deleted

6.1.2.5 Names of variables are unique. A variable is used in context with the meaning as described in the variable definition. Variables with different meanings have different names.

6.1.2.6 Signed values shall be encoded as 2's complement.

6.1.2.7 One bit variables (Boolean) shall always use 0 for false and 1 for true.

6.1.2.8 Offsets for numerical values shall be avoided (0 shall be used for 0, 1 for 1, etc.) except where justified.

6.1.2.9 When transmitting, the most significant bit must be transmitted first.

6.1.2.10 All Variables have one of the following prefixes:

A_	Acceleration
D_	Distance
G_	Gradient
L_	Length
M_	Miscellaneous
N_	Number
NC_	Class Number
NID_	Identity Number
Q_	Qualifier
T_	Time/Date
V_	Speed
X_	Text

6.1.2.11 Length of variables is given in bits, unless otherwise stated.

6.1.2.12 Intentionally deleted

6.1.2.13 Reserved values and spare values for variables shall not be used.

6.1.3 Definition of Packets and rules for packets handling

6.1.3.1 Packets are multiple variables grouped into a single unit, with a defined internal structure.

6.1.3.2 This structure consists of a unique packet number, the length of the packet in bits and an information section containing a defined set of variables. The packet structure is defined as follows:

Description	This is the format of packets when transmitted over FFFIS STM.		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier
	L_PACKET	13	Packet length
	Q_SCALE	2	Specifies which distance scale is used for all distance information within the packet. There is no Q_SCALE variable in packets, which do not contain distance information in a variable, which requires the information in Q_SCALE.
	Other variables in packet if any	*N*	*Refer to packet definition in §7*

6.1.3.3 The data element transmission order shall respect the order of data elements listed in the packet definition (from top to bottom).

6.1.3.4 The packet length (number of bits) shall be the length in bits of the whole packet. It shall take into account the following variables NID_PACKET and L_PACKET plus all other packet variables length as well as iterations for its value computation.

6.1.3.5 All currently not defined packet identifiers are reserved for future use. All future packet definitions shall follow the above-defined structure.

6.1.3.6 The sender of a packet shall ensure that the packet length will fit within one message.

6.1.3.7 The variable N_ITER in a packet shall specify the number of iterations of a variable or group of variables, which follow.

6.1.3.8 If N_ITER is 0 then no variable(s) which belong to the iteration given by N_ITER shall follow.

6.1.3.9 The variable N_LITER in a packet shall specify the number of iterations of a variable or group of variables, which follow.

6.1.3.10 If N_LITER is 0 then no variable(s) which belong to the iteration given by N_LITER shall follow.

6.1.3.11 Two nested levels of iterations shall be possible.

6.1.3.12 The variable L_CAPTION in a packet shall specify the number of bytes in a data label, button label, or indicator label.

6.1.3.13 The variable L_VALUE in a packet shall specify the number of bytes in a data value.

6.1.3.14 If L_VALUE is 0 then no variable(s) for characters shall follow.

6.1.3.15 The variable L_TEXT in a packet shall specify the number of bytes in a text string.

6.1.3.16 If L_TEXT is 0 then no variable(s) for characters shall follow.

6.1.3.17 If, depending on the value of a previous qualifier variable in the packet, a variable is optional, it is written indented in the packet definition.

6.1.3.18 If the full ETCS packet 44 to transmit through packet STM-45 is not composed of an integer number of bytes, padding shall be added at the end of the last iteration of M_DATA(k) within this packet.

6.1.4 Definition of a message and rules for messages handling

6.1.4.1 A message is the whole application data transmitted at a given time on the interface between an ERTMS/ETCS on-board function and an STM or between an STM and an ERTMS/ETCS on-board function.

6.1.4.2 The message shall have the format as defined in Figure 2: Application message detailed structure.

6.1.4.3 The data element transmission order shall respect the order of data elements listed in the message format (from top to bottom).

6.1.4.4 The sender of messages shall transmit the messages in a chronological way. The first transmitted message shall be the oldest.

6.1.4.5 Messages belonging to the same ERTMS/ETCS on-board function shall be treated by the receiver in the order of their reception.

6.1.4.6 The message header shall be composed of the NID_STM and the L_MESSAGE variables.

6.1.4.7 The NID_STM in the message header shall indicate the STM, which is the receiver or transmitter of the message.

6.1.4.8 The message header shall be part of the message at every transmission.

6.1.4.9 The message header shall be the same for all connections to ERTMS/ETCS on-board functions in both directions (from STM to ERTMS/ETCS function and from ERTMS/ETCS function to STM).

6.1.4.10 The Message Body shall consist of one or many packets.

6.1.4.11 It shall be forbidden to send more instances of the same packet type in the same message.

6.1.4.11.1 Exception 1: It shall be possible that a message contains several ETCS airgap messages for STM (packet STM-45).

6.1.4.11.2 Exception 2: It shall be possible that a message contains several 'Text message' (packet STM-38)

6.1.4.11.3 Exception 3: It shall be possible that a message contains several 'Delete text message' (packet STM-39)

6.1.4.11.4 Intentionally deleted

6.1.4.11.5 Intentionally deleted

6.1.4.11.6 Exception 4: It shall be possible that a message contains several STM information to Juridical Data Function (packet STM-161)

6.1.4.11.7 Intentionally deleted

6.1.4.12 Intentionally deleted

6.1.4.13 The receiver of a message shall process the packets of this message in a way that the result is the same as if each packet has been processed separately in the received order.

6.1.4.14 Packets within a message depend on what has to be transmitted according to the requirements in [4].

6.1.4.15 The message shall be completed by arbitrary padding bits to have the whole message length to be byte aligned for transmission through the safety layers. (See [5] and [6]).

6.1.4.16 Transmission of non standard packets (i.e. packets which are not described in this document, but whose numbers are within the allocated range of non standard packets, see NID_PACKET definition): in case a message includes such non standard packet(s) unknown to the receiver, the non standard packet(s) shall be ignored and the message shall not be rejected.

7. PACKET DEFINITIONS

7.1 Packets related to all on-board functions (ETCS+STM)

7.1.1 Packet STM-1 STM/ETCS function version number

Subset-035 Ref.	§.7.1, 7.1.2.1, 7.1.2.2, 7.1.2.3, 7.1.2.4, 8.2.1.3, 16.3		
Allowed to send in states	PO, CO, DE, CS, HS, DA, FA		
Description	This packet contains implicitly the connection request from the STM or the connection confirmation from the ERTMS/ETCS on-board function and provide also FFFIS STM version number for check.		
Direction of information	**From STM to ERTMS/ETCS on-board function** **From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value=1
	L_PACKET	13	Packet length
	N_VERMAJOR	8	FFFIS STM version number, major number: X
	N_VERMINOR	8	FFFIS STM version number, minor number: Y

7.1.2 Packet STM-15: State report from STM

Subset-035 Ref.	§5.2.7.1, 9.3.1.4, 9.3.1.4.1, 10.1.1.2, 10.3.2.3, 10.3.2.4, 10.3.3.1, 10.3.3.2, 10.3.3.3, 10.3.3.4, 10.3.3.6, 10.3.3.7, 10.14.1.1, 13.2.1.5, 13.2.1.6		
Allowed to send in states	PO, CO, DE, CS, HS, DA, FA		
Description	Indicates to the ERTMS/ETCS on-board the STM state.		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 15
	L_PACKET	13	Packet length
	NID_STMSTATE	4	Current STM state

7.2 Packets related to the STM Control Function

7.2.1 Packet STM-2: ERTMS/ETCS on-board physical addresses and safety levels

Subset-035 Ref.	§5.2.7.9, 6.2.1.1, 6.4, 8.2.1.5, 10.1.1.4		
Allowed to send in state	PO		
Description	Message defining each ERTMS/ETCS on-board function physical bus address, and associated safety level.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 2
	L_PACKET	13	Packet length
	N_ADDR_JD	7	Address of Juridical Data Function
	Q_ADDR_JD	2	Safety level/Availability of Juridical Data Function
	N_ADDR_DMI_CHANNEL1	7	Address of DMI channel 1
	Q_ADDR_DMI_CHANNEL1	2	Safety level of DMI channel 1
	N_ADDR_DMI_CHANNEL2	7	Address of DMI channel 2
	Q_ADDR_DMI_CHANNEL2	2	Safety level/Availability of DMI channel 2
	N_ADDR_DMI_CHANNEL3	7	Address of DMI channel 3
	Q_ADDR_DMI_CHANNEL3	2	Safety level/Availability of DMI channel 3
	N_ADDR_DMI_CHANNEL4	7	Address of DMI channel 4
	Q_ADDR_DMI_CHANNEL4	2	Safety level/Availability of DMI channel 4
	N_ADDR_ODO	7	Address of Odometer Function
	Q_ADDR_ODO	2	Safety level of Odometer Function
	N_ADDR_TI	7	Address of TIU Function
	Q_ADDR_TI	2	Safety level of TIU Function
	N_ADDR_BI	7	Address of BIU Function
	Q_ADDR_BI	2	Safety level of BIU Function

7.2.2 Intentionally deleted

7.2.3 Packet STM-5: ETCS status data

Subset-035 Ref.	§5.2.7.3, 8.2.1.6, 10.5.1.1		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	This packet contains the ERTMS/ETCS on-board current status (ETCS mode and ETCS level of operation) for the STM.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value=5
	L_PACKET	13	Packet length
	M_LEVEL		Defined in Chapter 7 of [1]
	NID_NTC		If M_LEVEL = 1 (NTC), this value shall be transmitted only in Level NTC. Variable defined in Chapter 7 of [1]
	M_MODESTM	4	ETCS mode

7.2.4 Packet STM-6: Override activation

Subset-035 Ref.	§5.2.7.6, 10.10.1.2, 10.10.2.1, 10.10.2.2		
Allowed to send in state	DA		
Description	Report of the activation of the STM Override procedure from the STM to the ERTMS/ETCS on-board STM Control Function.		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 6
	L_PACKET	13	Packet length

7.2.5 Packet STM-7: Override status

Subset-035 Ref.	§5.2.7.6, 10.10.1.2, 10.10.2.3		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	Reports a change of the ETCS Override status from the ERTMS/ETCS on-board STM Control Function to the STMs.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 7
	L_PACKET	13	Packet length
	Q_OVR_STATUS	1	ETCS Override status

7.2.6 Packet STM-13: State request from STM

Subset-035 Ref.	§5.2.7.1, 8.2.1.6, 8.3.1.3, 8.3.1.4, 8.3.1.5, 8.4.1.3, 8.4.1.4, 10.3.2.4		
Allowed to send in states	PO, CO, DE		
Description	Reports a request for a state change from the STM to the ERTMS/ETCS on-board STM Control Function.		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 13
	L_PACKET	13	Packet length
	NID_STMSTATEREQUEST	4	Request to change state

7.2.7 Packet STM-14: State order to STM

Subset-035 Ref.	§5.2.7.1, 8.6.1.4, 8.7.1.2, 9.2.1.2.1, 10.2.1.2, 10.3.2.2, 10.3.2.4, 10.3.2.6, 10.3.2.6.1, 10.3.2.6.2, , 10.3.2.7, 10.3.3.1, 10.3.3.2, 10.3.3.3, 10.14.1.1		
Allowed to send in states	PO, CO, DE, CS, HS, DA, FA		
Description	State order to STM.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 14
	L_PACKET	13	Packet length
	NID_STMSTATEORDER	4	STM state order

7.2.8 Packet STM-16: Transition variables STM max speed from STM

Subset-035 Ref.	§5.2.7.8, 8.6.1.2, 10.12.1.1, 10.12.1.2, 10.12.1.3, 10.12.1.6, 10.12.2.1, 10.12.2.2, 10.12.2.3¨		
Allowed to send in state	HS		
Description	Transmit to the ERTMS/ETCS on-board the STM max speed.		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 16
	L_PACKET	13	Packet length
	V_STMMAX	7	STM max speed

7.2.9 Packet STM-17: Transition variables STM system speed and distance from STM

Subset-035 Ref.	§5.2.7.8, 8.6.1.3, 10.12.1.4, 10.12.1.5, 10.12.1.6		
Allowed to send in state	HS		
Description	Transmit to the ERTMS/ETCS on-board the STM system speed and distance.		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 17
	L_PACKET	13	Packet length
	V_STMSYS	7	STM system speed
	D_STMSYS	15	STM system distance

7.2.10 Packet STM-18: National Trip Procedure

Subset-035 Ref.	§9.2.1.2.1, 9.2.1.3, 10.3.2.4, 10.3.3.3, 10.13.1.1		
Allowed to send in state	DA		
Description	Indicates to the ERTMS/ETCS on-board that the STM is currently in a National Trip Procedure.		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 18
	L_PACKET	13	Packet length

7.2.11 Intentionally deleted

7.2.12 Packet STM-175: Train Data

Subset-035 Ref.	§5.2.7.2, 8.3.1.1, 8.3.1.2, 8.3.1.2.1, 10.4.1.1, 10.4.1.2, 10.4.1.7, 10.7.4.4, 10.7.4.9		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	Validated train data.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value =175
	L_PACKET	13	Packet length
	NC_CDTRAIN		Defined in Chapter 7 of [1]
	NC_TRAIN		Defined in Chapter 7 of [1]
	L_TRAIN		Defined in Chapter 7 of [1]
	V_MAXTRAIN		Defined in Chapter 7 of [1]
	M_LOADINGGAUGE		Defined in Chapter 7 of [1]
	M_AXLELOADCAT		Defined in Chapter 7 of [1]
	M_AIRTIGHT		Defined in Chapter 7 of [1]
	M_TRAINTYPE	8	Train type
	N_ITER		Defined in Chapter 7 of[1]
	M_VOLTAGE(k)		Defined in Chapter 7 of [1]
	NID_CTRACTION(k)		NID_CTRACTION(k) given only if M_VOLTAGE(k) $\neq 0$ Defined in Chapter 7 of [1]

7.2.13 Packet STM-176: Train data traction/brake parameters to STM

Subset-035 Ref.	§5.2.7.2, 8.3.1.1, 8.3.1.2, 8.3.1.2.1, 8.3.1.2.2, 10.4.1.1, 10.4.1.4, 10.4.1.7, 10.7.1.2		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	Validated train data traction/brake parameters.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 176
	L_PACKET	13	Packet length
	T_BRAKE_SERVICE		Defined in [2]
	T_BRAKE_EMERGENCY		Defined in [2]
	T_TRACTION_CUT_OFF		Defined in [2]
	M_BRAKE_POSITION		Defined in [2]
	M_BRAKE_PERCENTAGE_STM	8	Brake percentage

7.2.14 Packet STM-177: Additional Data Values and date/time to STM

Subset-035 Ref.	§5.2.7.2, 8.3.1.1, 8.3.1.2, 8.3.1.2.1, 10.4.1.5, 10.4.1.7, 10.4.1.8, 10.7.1.2		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	ETCS additional data and date / time.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 177
	L_PACKET	13	Packet length
	NID_ENGINE		Defined in Chapter 7 of [1]
	M_ADHESION		Defined in Chapter 7 of [1]
	YEAR		Defined in [2]
	MONTH		Defined in [2]
	DAY		Defined in [2]
	HOUR		Defined in [2]
	MINUTES		Defined in [2]
	SECONDS		Defined in [2]
	TTS		Defined in [2]
	NID_OPERATIONAL_STM	32	Train Running Number

7.2.15 Packet STM-178: National Values to STM

Subset-035 Ref.	§5.2.7.2, 8.3.1.1, 8.3.1.2.1, 10.4.1.6, 10.4.1.7, 10.4.1.9, 10.7.1.2		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	Downloads a set of National Values. Note: See [1] chapter 7.4.2.1.1 [Packet Number 3: National Values].		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 178
	L_PACKET	13	Packet length
	Q_SCALE		Defined in Chapter 7 of [1]
	V_NVSHUNT		Defined in Chapter 7 of [1]
	V_NVSTFF		Defined in Chapter 7 of [1]
	V_NVONSIGHT		Defined in Chapter 7 of [1]
	V_NVLIMSUPERV		Defined in Chapter 7 of [1]
	V_NVUNFIT		Defined in Chapter 7 of [1]
	V_NVREL		Defined in Chapter 7 of [1]
	D_NVROLL		Defined in Chapter 7 of [1]
	Q_NVSBTSMPERM		Defined in Chapter 7 of [1]
	Q_NVEMRRLS		Defined in Chapter 7 of [1]
	Q_NVGUIPERM		Defined in Chapter 7 of [1]
	Q_NVSBFBPERM		Defined in Chapter 7 of [1]
	Q_NVINHSMICPERM		Defined in Chapter 7 of [1]
	V_NVALLOWOVTRP		Defined in Chapter 7 of [1]
	V_NVSUPOVTRP		Defined in Chapter 7 of [1]
	D_NVOVTRP		Defined in Chapter 7 of [1]
	T_NVOVTRP		Defined in Chapter 7 of [1]
	D_NVPOTRP		Defined in Chapter 7 of [1]
	M_NVCONTACT		Defined in Chapter 7 of [1]
	T_NVCONTACT		Defined in Chapter 7 of [1]
	M_NVDERUN		Defined in Chapter 7 of [1]
	D_NVSTFF		Defined in Chapter 7 of [1]
	Q_NVDRIVER_ADHES		Defined in Chapter 7 of [1]

	A_NVMAXREDADH1		Defined in Chapter 7 of [1]
	A_NVMAXREDADH2		Defined in Chapter 7 of [1]
	A_NVMAXREDADH3		Defined in Chapter 7 of [1]
	Q_NVLOCACC		Defined in Chapter 7 of [1]
	M_NVAVADH		Defined in Chapter 7 of [1]
	M_NVEBCL		Defined in Chapter 7 of [1]
	Q_NVKINT		Defined in Chapter 7 of [1]
	Q_NVKVINTSET		Only if Q_NVKINT = 1, Q_NVKVINTSET and the following variables follow Defined in Chapter 7 of [1]
	A_NVP12		Only if Q_NVKVINTSET = 1 Defined in Chapter 7 of [1]
	A_NVP23		Only if Q_NVKVINTSET = 1 Defined in Chapter 7 of [1]
	V_NVKVINT		= 0 km/h Defined in Chapter 7 of [1]
	M_NVKVINT		Valid between V_NVKVINT and V_NVKVINT(1) Defined in Chapter 7 of [1]
	M_NVKVINT		Only if Q_NVKVINTSET = 1 Valid between V_NVKVINT and V_NVKVINT(1) Defined in Chapter 7 of [1]
	N_ITER		Defined in Chapter 7 of [1]
	V_NVKVINT(n)		Defined in Chapter 7 of [1]
	M_NVKVINT(n)		Defined in Chapter 7 of [1]
	M_NVKVINT(n)		Only if Q_NVKVINTSET = 1 Defined in Chapter 7 of [1]
	N_ITER		Defined in Chapter 7 of [1]
	Q_NVKVINTSET(k)		Defined in Chapter 7 of [1]
	A_NVP12(k)		Only if Q_NVKVINTSET(k) = 1 Defined in Chapter 7 of [1]
	A_NVP23(k)		Only if Q_NVKVINTSET(k) = 1 Defined in Chapter 7 of [1]
	V_NVKVINT(k)		Defined in Chapter 7 of [1]

	M_NVKVINT(k)		Defined in Chapter 7 of [1]
	M_NVKVINT(k)		Only if Q_NVKVINTSET(k) = 1 Defined in Chapter 7 of [1]
	N_ITER(k)		Defined in Chapter 7 of [1]
	V_NVKVINT(k,m)		Defined in Chapter 7 of [1]
	M_NVKVINT(k,m)		Defined in Chapter 7 of [1]
	M_NVKVINT(k,m)		Only if Q_NVKVINTSET(k) = 1 Defined in Chapter 7 of [1]
	L_NVKRINT		Defined in Chapter 7 of [1]
	M_NVKRINT		Defined in Chapter 7 of [1]
	N_ITER		Defined in Chapter 7 of [1]
	L_NVKRINT(l)		Defined in Chapter 7 of [1]
	M_NVKRINT(l)		Defined in Chapter 7 of [1]
	M_NVKTINT		Defined in Chapter 7 of [1]

7.2.16 Packet STM-181: Specific NTC Data Need

Subset-035 Ref.	§8.2.1.4, 10.3.2.4, 10.7.3.2, 10.7.3.4, 10.7.5		
Allowed to send in states	PO, CO, CS, HS, DA		
Description	STM need for Specific NTC Data Entry. Note: At PO state STM-181 indicates that the STM will request for a Specific NTC Data during a Specific NTC Data Entry procedure. In all other states STM-181 indicates the current need of Specific NTC Data to the driver.		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 181
	L_PACKET	13	Packet length
	Q_DATAENTRY	1	Need for Specific NTC Data Entry

7.2.17 Packet STM-179: Specific NTC Data Entry request

Subset-035 Ref.	§8.3.1.3, 8.4.1.1, 10.7.3.3, 10.7.3.6, 10.7.4.3, 10.7.4.5, 10.7.4.6, 10.7.4.8, 10.7.4.9, 10.7.5, 15.2.1.1, 15.2.1.4		
Allowed to send in states	DE, CS, HS, DA		
Description	Request for Specific NTC Data Entry. This packet can be grouped with other STM-179 packets by using the Q_FOLLOWING indicator in order to form one common Specific NTC Data Entry request. Note: The STM indicates the "End of Specific NTC Data Entry" by a packet STM-179, with N_ITER=0.		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 179
	L_PACKET	13	Packet length
	Q_FOLLOWING	1	Indicate a following STM-179 packet
	N_ITER	5	Maximum iteration data =0 if there is “End of Specific NTC Data Entry” Maximum value = 15 Variable defined in Chapter 7 of [1]
	NID_DATA(j)	8	Identifier of a Specific NTC Data to be entered.
	L_CAPTION(j)	6	Length of X_CAPTION for data label in bytes Maximum value = 40
	X_CAPTION(j,q)	8	Data label caption text byte string
	L_VALUE(j)	5	Length of X_VALUE for default value in bytes. Maximum value = 20
	X_VALUE(j,i)	8	Data value caption text byte string

	N_ITER(j)		Maximum iteration data dedicated keyboard values =0 if there is no dedicated keyboard Variable defined in Chapter 7 of [1]
	L_VALUE(j,i)	5	Length of X_VALUE for dedicated keyboard value in bytes Maximum value = 20
	X_VALUE(j,i,k)	8	Data for dedicated keyboard value caption text byte string

7.2.18 Packet STM-180: Specific NTC Data values

Subset-035 Ref.	§10.7.5, 15.2.1.2, 15.2.1.4		
Allowed to send in states	DE, CS, HS, DA		
Description	ERTMS/ETCS on-board report of the Specific NTC Data Entry values requested by the STM.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 180
	L_PACKET	13	Packet length
	N_ITER		Maximum iteration data Maximum value = 15 Variable defined in Chapter 7 of [1]
	NID_DATA(j)	8	Identifier of a Specific NTC Data to be selected by the driver.
	L_VALUE(j)	5	Length of X_VALUE in bytes Maximum value = 20
	X_VALUE(j,k)	8	Data value caption text byte string selected by the driver

7.2.19 Packet STM-182: Request for Specific NTC Data View values

Subset-035 Ref.	§5.2.7.2, 10.8.1.1, 10.8.1.2, 10.8.1.5		
Allowed to send in states	CS, HS, DA		
Description	Request for Specific NTC Data View values. This request is sent to the STM when the Data View procedure is triggered.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 182
	L_PACKET	13	Packet length

7.2.20 Packet STM-183: Specific NTC Data View values

Subset-035 Ref.	§5.2.7.2, 10.3.2.4, 10.8.1.1, 10.8.1.3, 10.8.1.4, 10.8.1.5, 15.2.1.3, 15.2.1.4		
Allowed to send in states	CS, HS, DA		
Description	Specific NTC Data View values. Those data are sent by the STM when the data view procedure is triggered and the ERTMS/ETCS on-board has requested for the data. This packet can be grouped with other STM-183 packets by using the Q_FOLLOWING indicator in order to form one common set of “Specific NTC Data View values”.		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 183
	L_PACKET	13	Packet length
	Q_FOLLOWING	1	Indicate a following STM-183 packet
	N_ITER		Maximum iteration data =0 if there is “No Specific Data Values” Maximum value = 15 Variable defined in Chapter 7 of [1]
	NID_DATA(j)	8	Identifier of the Specific NTC Data
	L_CAPTION(j)	6	Length of X_CAPTION for data label in bytes Maximum value = 40
	X_CAPTION(j,q)	8	Data label caption text byte string
	L_VALUE(j)	5	Length of X_VALUE for current value in bytes. Maximum value = 20 =0 if there is no current value
	X_VALUE(j,i)	8	Data value caption text byte string

7.2.21 Packet STM-184: Specific NTC Data Entry flag

Subset-035 Ref.	§8.3.1.5, 8.4.1.2, 8.4.1.3, 8.4.1.4, 10.7.3.1, 10.7.3.3, 10.7.4.1, 10.7.4.2, 10.7.4.3, 10.7.4.4, 10.7.5		
Allowed to send in states	CO, DE, CS, HS, DA		
Description	Specific NTC Data Entry flag ERTMS/ETCS on-board shall indicate to the STM the beginning of its Specific NTC Data Entry procedure by sending the START flag and the end of its Specific NTC Data Entry procedure by sending the STOP flag.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 184
	L_PACKET	13	Packet length
	M_DATAENTRYFLAG	1	Indicate the beginning or the end of the Specific NTC Data Entry procedure to each STM.

7.2.22 Packet STM-45: ETCS airgap message for STM

Subset-035 Ref.	§5.2.7.7, 10.2.1.2, 10.11.1.1, 10.11.1.2, 10.11.1.3		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	ETCS airgap packet that is forwarded to STM.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 45
	L_PACKET	13	Packet length
	D_ESTODO_BG	32	Value of the estimated distance given from the ERTMS/ETCS on-board Odometer Function (D_EST) at the location reference of the balise group, which transmitted the airgap message included within this packet, or the LRBG of the message if it was received by radio.
	N_LITER	8	Number of bytes in ETCS packet Maximum value = 222
	M_DATA(k)	8	Full ETCS packet 44 (containing also ETCS packet number…) See also 6.1.3.18

7.2.23 Packet STM-21: Test Procedure Permission Request

Subset-035 Ref.	§5.2.7.5, 10.9.1.1, 10.9.1.2		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	Request to perform a Test Procedure		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 21
	L_PACKET	13	Packet length
	NID_TEST	8	Test Identity

7.2.24 Packet STM-22: Test Procedure Permission

Subset-035 Ref.	§5.2.7.5, 10.9.1.2, 10.9.1.3		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	Grant permission to perform a Test Procedure.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 22
	L_PACKET	13	Packet length

7.2.25 Packet STM-23: End of Test Procedure

Subset-035 Ref.	§5.2.7.5, 10.9.1.3		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	Reports the end and result of a Test Procedure		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 23
	L_PACKET	13	Packet length
	M_TESTOK	1	1=Test(s) successful
	L_TEXT	8	Number of bytes in text string Maximum value = 80
	X_TEXT(k)	8	Text character

7.2.26 Packet STM-30: Driver language transmission

Subset-035 Ref.	§5.2.7.4, 10.6.1.1		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	Driver language selection.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 30
	L_PACKET	13	Packet length
	NID_DRV_LANG	16	Driver language selection

7.2.27 Packet STM-31: Active DMI channel

Subset-035 Ref.	§10.1.1.5, 13.3.1.1, 13.3.1.2		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	Informs the STM about the active DMI channel		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 31
	L_PACKET	13	Packet length
	NID_DMICHANNEL	3	Active DMI channel identifier

7.2.28 Packet STM-20: Antenna/BTM ID

Subset-035 Ref.	§5.2.7.11, 10.15		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	Identifier of the ERTMS/ETCS on-board Antenna/BTM that is currently active on Interface ‘K’.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 20
	L_PACKET	13	Packet length
	Q_CHECKNEEDED	1	Indicates if KER STM has to perform the check
	Q_ANTN_BTM_ACTIVE	1	Only if Q_CHECKNEEDED=1 Indicates if there is an Antenna/BTM active
	NID_ANTENNA_BTM	2	Only if Q_ANTN_BTM_ACTIVE=1 Valid Antenna/BTM ID

7.2.29 Packet STM-47: ETCS BTM status message to STM

Subset-035 Ref.	§5.2.7.12, 10.16		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	Indicates the start and stop of BTM alarms and if a Big Metal Mass track condition has been announced in case of BTM alarm		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 47
	L_PACKET	13	Packet length
	Q_BTM_ALARM	1	BTM alarm status
	Q_BMM_ANNOUNCED	1	Only if Q_BTM_ALARM = 1, Announced Big Metal Mass

7.3 Packets related to the Odometer Function

7.3.1 Packet STM-9: Odometer parameters to STM

Subset-035 Ref.	§5.2.3.1, 6.5.1.5, 8.3.1.2, 12.4.1.1, 12.4.1.2, 12.4.1.4		
Allowed to send in states	any state, multicast		
Description	Configuration data and performance parameters from the odometer. The packet is multicast by ERTMS/ETCS on-board from Odometer Function.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 9
	L_PACKET	13	Packet length
	T_ODOCYCLE	8	Typical cycle time of odometer function
	T_ODOMAXPROD	8	Maximum production delay time.

7.3.2 Packet STM-8: Odometer multicast

Subset-035 Ref.	§5.2.3.1, 5.3.1.1, 6.5.1.5, 12.1, 12.2, 12.3		
Allowed to send in states	any state, multicast		
Description	Periodic transmission of odometer data.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 8
	L_PACKET	13	Packet length
	T_ODO	32	Timestamp
	V_MAX	16	Upper bound of the measured speed.
	V_EST	16	Estimated speed value.
	V_MIN	16	Lower bound of the measured speed.
	D_MAX	32	Positive direction side of the confidence interval.
	D_EST	32	Estimated value of distance.
	D_MIN	32	Negative direction side of the confidence interval.
	D_RES	8	Resolution of distance measurement.

7.4 Intentionally deleted

7.5 Packets related to the DMI Function

7.5.1 Intentionally deleted

7.5.2 Packet STM-32: Button Request

Subset-035 Ref.	§5.2.8.1 a), 13.4.1, 13.4.4, 13.5.1.1.4, 13.5.1.1.5, 13.5.1.1.8, 15.1.1.1 b)		
Allowed to send in state	HS, DA		
Description	Create or update the visual states of buttons by STM. Only referenced buttons are updated.		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value=32
	L_PACKET	13	Packet length
	N_ITER		Maximum value = 24 Variable defined in Chapter 7 of [1]
	NID_BUTTON(k)	8	Button identifier
	NID_BUTPOS(k)	5	Button position identifier
	NID_ICON(k)	8	Icon identifier
	M_BUT_ATTRIB(k)	10	Attributes of the button
	L_CAPTION(k)	6	Length of X_CAPTION in bytes Maximum value = 24
	X_CAPTION(k, j)	8	Caption text bytestring

7.5.3 Packet STM-34: Button event report

Subset-035 Ref.	§5.2.8.1 a), 13.4.1, 13.4.4		
Allowed to send in states	DA		
Description	Report the button events.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value=34
	L_PACKET	13	Packet length
	N_ITER		Number of events being reported Variable defined in Chapter 7 of [1]
	NID_BUTTON(k)	8	Button identifier
	Q_BUTTON(k)	1	Button event
	T_BUTTONEVENT(k)	32	Event timestamp

7.5.4 Packet STM-35: Indicator request

Subset-035 Ref.	§5.2.8.1 b), 13.4.1, 13.4.3, 13.5.1.1.2, 13.5.1.1.3, 13.5.1.1.8, 15.1.1.1 b)		
Allowed to send in states	HS, DA		
Description	Create or update the visual states of indicators by STM. Only referenced indicators are updated.		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 35
	L_PACKET	13	Packet length
	N_ITER		Maximum value = 24 Variable defined in Chapter 7 of [1]
	NID_INDICATOR(k)	8	Indicator identifier
	NID_INDPOS(k)	5	Indicator position identifier
	NID_ICON(k)	8	Icon identifier
	M_IND_ATTRIB(k)	10	Attributes of the indicator
	L_CAPTION(k)	6	Length of X_CAPTION Maximum value = 24
	X_CAPTION(k,j)	8	Caption text bytestring

7.5.5 Packet STM-38: Text message

Subset-035 Ref.	§5.2.8.1 d), 13.4.2, 15.1.1.1 a)		
Allowed to send in states	HS, DA		
Description	Text messages for the DMI, with or without acknowledgement.		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 38
	L_PACKET	13	Packet length
	NID_XMESSAGE	8	Text message identifier
	M_XATTRIBUTE	10	Attributes of text
	Q_ACK	1	Acknowledgement qualifier
	L_TEXT	8	Number of bytes in text string Maximum value = 80
	X_TEXT(k)	8	Text character

7.5.6 Packet STM-39: Delete text message

Subset-035 Ref.	§5.2.8.1 d), 13.4.2		
Allowed to send in states	HS, DA		
Description	STM commands the deletion of text message.		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 39
	L_PACKET	13	Packet length
	NID_XMESSAGE	8	Text message identifier

7.5.7 Packet STM-40: Acknowledgement reply

Subset-035 Ref.	§5.2.8.1 d), 13.4.2		
Allowed to send in state	DA		
Description	Report from ERTMS/ETCS on-board on acknowledgement of text message.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 40
	L_PACKET	13	Packet length
	NID_XMESSAGE	8	Text message identifier

7.5.8 Intentionally deleted

7.5.9 Packet STM-43: Speed and distance supervision information

Subset-035 Ref.	§5.2.8.1e), 13.4.6, 13.5.1.1.7		
Allowed to send in states	HS, DA		
Description	Speed and distance supervision information with values, colours and display modes		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 43
	L_PACKET	13	Packet length
	Q_SCALE		Defined in Chapter 7 of [1]
	V_PERMIT	10	Permitted speed
	V_TARGET	7	Target speed
	V_RELEASE	10	Release speed
	V_INTERV	10	Intervention speed
	D_TARGET	15	Target distance
	M_COLOUR_SP	3	Colour of speed pointer
	M_COLOUR_PS	3	Colour of permitted speed
	Q_DISPLAY_PS	2	Display of permitted speed
	M_COLOUR_TS	3	Colour of target speed
	Q_DISPLAY_TS	2	Display of target speed
	M_COLOUR_RS	3	Colour of release speed
	Q_DISPLAY_RS	2	Display of release speed
	M_COLOUR_IS	3	Colour of intervention speed
	Q_DISPLAY_IS	2	Display of intervention speed
	Q_DISPLAY_TD	2	Display of target distance

7.5.10 Packet STM-46: Sound command

Subset-035 Ref.	§5.2.8.1.c), 13.4.1, 13.4.5, 13.5.1.1.9		
Allowed to send in states	HS, DA		
Description	Commands sound.		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 46
	L_PACKET	13	Packet length
	N_ITER		Number of sounds to be generated Maximum value = 2 The STM is able to request to the ERTMS/ETCS on-board to generate a maximum of two sounds at the same time. Variable defined in Chapter 7 of [1]
	NID_SOUND(n)	8	Sound identifier
	Q_SOUND(n)	2	Continuous/ Not continuous/ Stopped
	N_ITER(n)		Number of segments of sound Variable defined in Chapter 7 of [1]
	M_FREQ (n,k)	8	Frequency of a segment
	T_SOUND(n,k)	8	Duration of segment

7.6 Intentionally deleted

7.7 Packets related to the TIU Function

7.7.1 Packet STM-129: STM specific brake control command

Subset-035 Ref.	§5.2.4.1, 5.2.4.3, 5.3.1.1, 6.5.1.5,		
Allowed to send in states	DA		
Description	STM specific brake command control.		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 129
	L_PACKET	13	Packet length
	M_TIRB_CMD	2	Inhibit regenerative brake
	M_TIMSH_CMD	2	Inhibit magnetic shoes brake
	M_TIEDCBEB_CMD	2	Inhibit Eddy current brake for Emergency Brake
	M_TIEDCBSB_CMD	2	Inhibit Eddy current brake for Service Brake

7.7.2 Packet STM-130: STM commands to train interface

Subset-035 Ref.	§5.2.4.1, 5.2.4.3, 5.3.1.1, 6.5.1.5		
Allowed to send in state	DA		
Description	Transmission of the STM commands to the train interface.		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 130
	L_PACKET	13	Packet length
	M_TIPANTO_CMD	2	Pantograph
	M_TIFLAP_CMD	2	Air tightness
	M_TIMS_CMD	2	Main switch/Circuit breaker
	M_TITR_C_CMD	2	Traction cut-off

7.7.3 Packet STM-139: Train interface inputs status/availability to STM

Subset-035 Ref.	§5.2.4.1, 5.2.4.4, 5.3.1.1, 6.5.1.5, 8.3.1.2, 8.3.1.2.1, 11.1.1.1		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	Transmission of the train interface inputs status/availability to STM.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 139
	L_PACKET	13	Packet length
	M_TITR_STATUS	2	Traction status
	M_TIDIR_STATUS	3	Direction Controller position
	M_TICAB_STATUS	2	Cab status

7.7.4 Packet STM-141: Train interface command configuration to STM

Subset-035 Ref.	§5.2.4.1, 5.2.4.3, 5.3.1.1, 6.5.1.5, 8.3.1.2, 8.3.1.2.1, 11.1.1.1		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	Transmission of the train interface commands availability to STM.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 141
	L_PACKET	13	Packet length
	M_TIRB_CMD_AVAIL	1	Inhibit regenerative brake command availability
	M_TIMSH_CMD_AVAIL	1	Inhibit magnetic shoes brake command availability
	M_TIEDCBEB_CMD_AVAIL	1	Inhibit Eddy current brake for Emergency Brake command availability
	M_TIEDCBSB_CMD_AVAIL	1	Inhibit Eddy current brake for Service Brake command availability
	M_TIPANTO_CMD_AVAIL	1	Pantograph command availability
	M_TIFLAP_CMD_AVAIL	1	Air tightness command availability
	M_TIMS_CMD_AVAIL	1	Main switch/Circuit breaker command availability
	M_TITR_C_CMD_AVAIL	1	Traction cut-off command availability

7.8 Packets related to the BIU Function

7.8.1 Packet STM-128: STM emergency and service brake command to brake interface

Subset-035 Ref.	§5.2.5.1, 10.3.3.3, 10.3.3.4, 10.3.3.6, 10.7.3.9, 11.1.1.3		
Allowed to send in state	DA		
Description	Transmission of the STM EB and SB command to the brake interface.		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 128
	L_PACKET	13	Packet length
	M_BIEB_CMD	2	EB command
	M_BISB_CMD	2	SB command

7.8.2 Packet STM-136: Brake interface emergency and service brake status/availability to STM

Subset-035 Ref.	§5.2.5.1, 8.3.1.2, 11.1.1.3		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	Transmission of the brake status / availability to STM.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 136
	L_PACKET	13	Packet length
	M_BIEB_STATUS	2	EB status / availability
	M_BISB_STATUS	2	SB status / availability

7.8.3 Packet STM-143: Emergency and service brake parameters to STM

Subset-035 Ref.	§5.2.5.1, 8.3.1.2, 8.3.1.2.1, 11.1.1.2		
Allowed to send in states	PO, CO, DE, CS, HS, DA		
Description	Transmission of the train interface EB and SB configuration to STM.		
Direction of information	**From ERTMS/ETCS on-board function to STM**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 143
	L_PACKET	13	Packet length
	T_EB_MAXDELAY	8	Maximum emergency brake command issue time delay
	T_SB_MAXDELAY	8	Maximum service brake command issue time delay

7.9 Packets related to the Juridical Data Function (JD)

7.9.1 Packet STM-161: STM information to JD

Subset-035 Ref.	§5.2.6.1, 5.3.1.1, 6.5.1.5, 14		
Allowed to send in states	PO, CO, DE, CS, HS, DA, FA		
Description	National STM data transmitted to the JD. (Structure of the data internal to each company)		
Direction of information	**From STM to ERTMS/ETCS on-board function**		
Content	**Variable**	**Length**	**Comment**
	NID_PACKET	8	Packet identifier Value = 161
	L_PACKET	13	Packet length
	T_JD	32	Time Stamp
	N_LITER	8	Number of data bytes in message Maximum value = 228
	M_DATA(k)	8	Information to JD

8. VARIABLES

8.1.1 D_EST

Name	Estimated value of a measured distance		
Description	Signed estimated value of a measured distance provided by the odometer to STM. Coded as two's complement		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
32 bits	- 2 147 483 648 cm	+ 2 147 483 647 cm	Signed, unit 1 cm.
Special/Reserved Values			

8.1.2 D_ESTODO_BG

Name	Estimated distance reference of the balise group		
Description	Signed value of the estimated distance given from the ERTMS/ETCS on-board Odometer Function (D_EST) at the location reference of the balise group, which transmitted the airgap message included within this packet, or the LRBG of the message if it was received by radio. Coded as two's complement		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
32 bits	- 2 147 483 648 cm	+ 2 147 483 647 cm	1 cm
Special/Reserved Values			

8.1.3 D_MAX

Name	Upper bound of the confidence interval of a measured distance		
Description	D_MAX is defined as the most positive position of the vehicle in the vehicle coordinate system at the time given in the odometer packet, with all over- and under-reading amounts accumulated since the last reset of the odometry.Coded as two's complement.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
32 bits	- 2 147 483 648 cm	+ 2 147 483 647 cm	Signed, unit 1 cm.
Special/Reserved Values			

8.1.4 D_MIN

Name	Lower bound of the confidence interval of a measured distance		
Description	D_MIN is defined as the most negative position of the vehicle in the vehicle coordinate system at the time given in the odometer packet, with all over- and under-reading amounts accumulated since the last reset of the odometry. Coded as two's complement		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
32 bits	- 2 147 483 648 cm	+ 2 147 483 647 cm	Signed, unit 1 cm.
Special/Reserved Values			

8.1.5 D_RES

Name	Distance resolution		
Description	Current distance resolution included in the odometer data transmitted from the ERTMS/ETCS on-board Odometer Function to the STMs.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/ formula***
8 bits	0cm	255cm	1cm
Special/Reserved Values			

8.1.6 D_STMSYS

Name	STM system distance		
Description	Distance to beginning of STM system speed area measured from the level transition border.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
15 bits	0 m	327.670 Km	10 m
Special/Reserved Values			

8.1.7 D_TARGET

Name	Target distance		
Description	Target distance		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
15 bits	0 m	327.660 Km	10 cm, 1 m or 10 m depends on Q_SCALE
Special/Reserved Values	32767	Unknown value	

8.1.8 L_CAPTION

Name	Length of caption text string in bytes for button, indicator and data.		
Description	L_CAPTION defines the length of a text caption bytestring (L_CAPTION * X_CAPTION) Additional restrictions for maximum allowed length are specified in the respective packet. Additional restrictions for maximum length in character in UTF-8 coding are found in [4] chapter 15.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
6 bits	1	63	1 byte
Special/Reserved Values	0	No X_CAPTION follows	

8.1.9 L_MESSAGE

Name	Message length		
Description	L_MESSAGE indicates the length of the message in bytes, including all packets and all variables defined in the message header (NID_STM and L_MESSAGE also).		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	5	238	1 Byte
Special/Reserved Values	0-4	Reserved	
	239-255	Reserved	

8.1.10 L_PACKET

Name	Packet length		
Description	L_PACKET indicates the length of the transmitted packet in bits, including NID_PACKET, L_PACKET, Q_SCALE (if included) and all other packet variables.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
13 bits	0	1888 As allowed by maximum length of application data.	1 bit
Special/Reserved Values	1889-8191	Spare	

8.1.11 L_TEXT

Name	Length of text string in bytes		
Description	L_TEXT defines the length of a text string (L_TEXT * X_TEXT) Additional restrictions for maximum allowed length are specified in the respective packet. Additional restrictions for maximum length in character in UTF-8 coding are found in [4] chapter 15.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	1	255	1 byte
Special/Reserved Values	0	No X_TEXT follows	

8.1.12 L_VALUE

Name	Length of text string in bytes for value used for data value, default value of data and for dedicated keyboard values.		
Description	L_VALUE defines the length of a data caption bytestring in bytes (L_VALUE * X_VALUE) Additional restrictions for maximum length in character in UTF-8 coding are found in [4] chapter 15.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
5 bits	1	20	1 Text String byte Element
Special/Reserved Values	0	No X_VALUE shall follow.	
	21-31	Reserved	

8.1.13 M_BIEB_CMD

Name	Emergency brake command		
Description	Information telling if the emergency brake must be applied or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	Reserved	
	01	Command to apply EB	
	10	Command to release EB	
	11	No command from STM ->Keep current output status	

8.1.14 M_BIEB_STATUS

Name	Emergency brake availability status		
Description	Information telling if the emergency brake is failed, available or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	Fail	
	01	Not available	
	10	Available	
	11	Reserved	

8.1.15 M_BISB_CMD

Name	Service brake command		
Description	Information telling if the service brake must be applied or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	Apply SB, or EB in case the SB fails to be applied	
	01	Apply SB	
	10	Release SB	
	11	No command from STM ->Keep current output status	

8.1.16 M_BISB_STATUS

Name	Service brake availability status		
Description	Information telling if the service brake is failed, available or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	Fail	
	01	Not available	
	10	Available	
	11	Reserved	

8.1.17 M_BRAKE_PERCENTAGE_STM

Name	Brake percentage		
Description	Information telling actual brake percentage value		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	0	250	
Special/Reserved Values	251-254	Spare	
	255	Unknown value	

8.1.18 M_BUT_ATTRIB

Name	Attributes for buttons.		
Description	Specifies flashing mode, text & background colour for buttons.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
10 bits			
Special/Reserved Values	0xxxxxxxx	Not displayed (Note: This allow to “removing” a button from display.)	
	10xxxxxxx	Button Normal flashing (only relevant in case "Button Slow flashing" or "Button Fast flashing" is transmitted in the same variable).	
	11xxxxxxx	Button Counterphase flashing (only relevant in case "Button Slow flashing" or "Button Fast flashing" is transmitted in the same variable).	
	1x00xxxxx	Button No flashing	
	1x01xxxxx	Button Slow flashing	
	1x10xxxxx	Button Fast flashing	
	1x11xxxxx	Reserved	
	1xxx000xxx	Dark blue button background	
	1xxx001xxx	White button background	
	1xxx010xxx	Red button background	
	1xxx011xxx	Blue button background	
	1xxx100xxx	Green button background	
	1xxx101xxx	Yellow button background	
	1xxx110xxx	Light red button background	
	1xxx111xxx	Light green button background	
	1xxxxxx000	Black text label	
	1xxxxxx001	White text label	
	1xxxxxx010	Red text label	
	1xxxxxx011	Blue text label	
	1xxxxxx100	Green text label	
	1xxxxxx101	Yellow text label	
	1xxxxxx110	Light red text label	
	1xxxxxx111	Light green text label	

8.1.19 M_COLOUR_IS

Name	Colour for intervention speed		
Description	Colour of intervention speed indication for speed supervision Definition of these colours is identical to the one provided in [10].		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
3 bits			
Special/Reserved Values	0	White	
	1	Grey	
	2	Medium grey	
	3	Dark grey	
	4	Yellow	
	5	Orange	
	6	Red	
	7	Reserved	

8.1.20 M_COLOUR_PS

Name	Colour for permitted speed		
Description	Colour of permitted speed indication for speed supervision Definition of these colours is identical to the one provided in [10].		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
3 bits			
Special/Reserved Values	0	White	
	1	Grey	
	2	Medium grey	
	3	Dark grey	
	4	Yellow	
	5	Orange	
	6	Red	
	7	Reserved	

8.1.21 M_COLOUR_RS

Name	Colour for release speed		
Description	Colour of release speed indication for speed supervision Definition of these colours is identical to the one provided in [10].		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
3 bits			
Special/Reserved Values	0	White	
	1	Grey	
	2	Medium grey	
	3	Dark grey	
	4	Yellow	
	5	Orange	
	6	Red	
	7	Reserved	

8.1.22 M_COLOUR_SP

Name	Colour for speed pointer		
Description	Colour of speed pointer for speed supervision Definition of these colours is identical to the one provided in [10].		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
3 bits			
Special/Reserved Values	0	White	
	1	Grey	
	2	Medium grey	
	3	Dark grey	
	4	Yellow	
	5	Orange	
	6	Red	
	7	Reserved	

8.1.23 M_COLOUR_TS

Name	Colour for target speed		
Description	Colour of target speed indication for speed supervision Definition of these colours is identical to the one provided in [10].		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
3 bits			
Special/Reserved Values	0	White	
	1	Grey	
	2	Medium grey	
	3	Dark grey	
	4	Yellow	
	5	Orange	
	6	Red	
	7	Reserved	

8.1.24 M_DATA

Name	Data		
Description	Data to be transmitted transparently.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	0	255	
Special/Reserved Values			

8.1.25 M_DATAENTRYFLAG

Name	Specific NTC Data Entry flag		
Description	It is sent before sending the first packet of ETCS Train Data, with the value START, and after finishing or aborting the Specific NTC Data Entry, with the value STOP.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bit			
Special/Reserved Values	0	Stop	
	1	Start	

8.1.26 M_FREQ

Name	Sound segment frequency		
Description	Frequency of sound segment.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	128 Hz	8160 Hz	F = M_FREQ * 32 Hz Resolution: 32 Hz
Special/Reserved Values	0	Silence	
	1	Spare	
	2	Spare	
	3	Spare	

8.1.27 M_IND_ATTRIB

Name	Attributes for indicators.		
Description	Specifies flashing mode, text & background colour for indicators.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
10 bits			
Special/Reserved Values	0xxxxxxxx	Not displayed (Note: This allow to “removing” an indicator from display.)	
	10xxxxxxx	Indicator Normal flashing (only relevant in case "indicator slow flashing" or "Indicator Fast flashing" is transmitted in the same variable).	
	11xxxxxxx	Indicator Counterphase flashing (only relevant in case "indicator slow flashing" or "Indicator Fast flashing" is transmitted in the same variable).	
	1x00xxxxx	Indicator No flashing	
	1x01xxxxx	Indicator Slow flashing	
	1x10xxxxx	Indicator Fast flashing	
	1x11xxxxx	Reserved	
	1xxx000xxx	Dark blue indicator background	
	1xxx001xxx	White indicator background	
	1xxx010xxx	Red indicator background	
	1xxx011xxx	Blue indicator background	
	1xxx100xxx	Green indicator background	
	1xxx101xxx	Yellow indicator background	
	1xxx110xxx	Light red indicator background	
	1xxx111xxx	Light green indicator background	
	1xxxxxx000	Black text label	
	1xxxxxx001	White text label	
	1xxxxxx010	Red text label	
	1xxxxxx011	Blue text label	
	1xxxxxx100	Green text label	
	1xxxxxx101	Yellow text label	
	1xxxxxx110	Light red text label	
	1xxxxxx111	Light green text label	

8.1.28 M_MODESTM

Name	On-board operating mode		
Description	ETCS mode Different from M_MODE defined in [1] by the addition of Passive Shunting mode		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
4 bits			
Special/Reserved Values	0	Full Supervision	
	1	On Sight	
	2	Staff Responsible	
	3	Shunting	
	4	Unfitted	
	5	Sleeping	
	6	Stand By	
	7	Trip	
	8	Post Trip	
	9	System Failure	
	10	Isolation	
	11	Non Leading	
	12	Limited Supervision	
	13	National System	
	14	Reversing	
	15	Passive Shunting	

8.1.29 M_TESTOK

Name	STM Test result		
Description	Indicates the result of the STM Test		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bit			
Special/Reserved Values	0	Test(s) not successful	
	1	Test(s) successful	

8.1.30 M_TICAB_STATUS

Name	Cab status on Train Interface		
Description	Information defining the active cab. For single cab locos with only one desk, this status provides the active virtual cab (see [3]).		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	Fail state (information not received from Train Interface)	
	01	Cab A active	
	10	Cab B active	
	11	No cab active	

8.1.31 M_TIDIR_STATUS

Name	Direction handle train interface status		
Description	Information defining the position of the driver direction handle.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
3 bits			
Special/Reserved Values	000	Fail state	
	001	Forward	
	010	Neutral	
	011	Reserved	
	100	Backward	
	101	Reserved	
	110	Reserved	
	111	Status information not available	

8.1.32 M_TIEDCBEB_CMD

Name	Train interface for Eddy Current Brake for Emergency Brake command		
Description	Information telling if the eddy current brake system use is allowed for Emergency Brake command or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	Reserved	
	01	Allow eddy current brake for Emergency Brake command (on)	
	10	Suppress eddy current brake for Emergency Brake command (off)	
	11	No command from STM->Keep current output status	

8.1.33 M_TIEDCBSB_CMD

Name	Train interface for Eddy Current Brake for Service Brake command		
Description	Information telling if the eddy current brake system use is allowed for Service Brake command or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	Reserved	
	01	Allow eddy current brake for Service Brake command (on)	
	10	Suppress eddy current brake for Service Brake command (off)	
	11	No command from STM->Keep current output status	

8.1.34 M_TIEDCBEB_CMD_AVAIL

Name	Train interface for Eddy Current Brake for Emergency Brake command availability		
Description	Boolean information telling if the eddy current brake system for Emergency Brake command is available or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bit			
Special/Reserved Values	0	Eddy current brake system for Emergency Brake command is not available	
	1	Eddy current brake system for Emergency Brake command is available	

8.1.35 M_TIEDCBSB_CMD_AVAIL

Name	Train interface for Eddy Current Brake for Service Brake command availability		
Description	Boolean information telling if the eddy current brake system for Service Brake command is available or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bit			
Special/Reserved Values	0	Eddy current brake system for Service Brake command is not available	
	1	Eddy current brake system for Service Brake command is available	

8.1.36 M_TIFLAP_CMD

Name	Air tightness/Flap control train interface command		
Description	Information for opening or closing the Flap control (air conditioning).		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	Reserved	
	01	Flap open (air conditioning on)	
	10	Flap close (air conditioning off)	
	11	No command from STM->Keep current output status	

8.1.37 M_TIFLAP_CMD_AVAIL

Name	Air tightness train interface command availability		
Description	Boolean information telling if the Air tightness system command is available or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bits			
Special/Reserved Values	0	Air tightness system command is not available	
	1	Air tightness system command is available	

8.1.38 M_TIMS_CMD

Name	Main switch/Circuit breaker train interface command		
Description	Information for closing or opening the Main switch.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	Reserved	
	01	Main switch close (on)	
	10	Main switch open (off)	
	11	No command from STM->Keep current output status	

8.1.39 M_TIMS_CMD_AVAIL

Name	Main switch/Circuit breaker train interface command availability		
Description	Boolean information telling if the Main switch/Circuit breaker system command is available or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bits			
Special/Reserved Values	0	Main switch/Circuit breaker system command is not available	
	1	Main switch/Circuit breaker system command is available	

8.1.40 M_TIMSH_CMD

Name	Magnetic brake system train interface command		
Description	Information telling if the magnetic brake system use is allowed or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	Reserved	
	01	Allow MB (on)	
	10	Suppress MB (off)	
	11	No command from STM->Keep current output status	

8.1.41 M_TIMSH_CMD_AVAIL

Name	Magnetic shoe brake train interface command availability		
Description	Boolean information telling if the magnetic shoe brake system command is available or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bits			
Special/Reserved Values	0	Magnetic shoe brake system command is not available	
	1	Magnetic shoe brake system command is available	

8.1.42 M_TIPANTO_CMD

Name	Pantograph train interface command		
Description	Information for lifting or lowering a pantograph.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	Reserved	
	01	Pantograph lift	
	10	Pantograph lower	
	11	No command from STM->Keep current output status	

8.1.43 M_TIPANTO_CMD_AVAIL

Name	Pantograph train interface command availability		
Description	Boolean information telling if the Pantograph system command is available or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bits			
Special/Reserved Values	0	Pantograph system command is not available	
	1	Pantograph system command is available	

8.1.44 M_TIRB_CMD

Name	Regenerative brake train interface command		
Description	Information telling if the regenerative brake system use is allowed or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	Reserved	
	01	Allow regenerative brake (on)	
	10	Suppress regenerative brake (off)	
	11	No command from STM->Keep current output status	

8.1.45 M_TIRB_CMD_AVAIL

Name	Regenerative brake train interface command availability		
Description	Boolean information telling if the regenerative brake system command is available or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bits			
Special/Reserved Values	0	Regenerative brake system command is not available	
	1	Regenerative brake system command is available	

8.1.46 M_TITR_C_CMD

Name	Traction cut off train interface command		
Description	Information for cutting the traction power.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	Reserved	
	01	Traction cut off	
	10	No traction cut off	
	11	No command from STM->Keep current output status	

8.1.47 M_TITR_C_CMD_AVAIL

Name	Traction cut-off train interface command availability		
Description	Boolean information telling if the Traction cut-off system command is available or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bits			
Special/Reserved Values	0	Traction cut-off system command is not available	
	1	Traction cut-off system command is available	

8.1.48 M_TITR_STATUS

Name	Traction status on Train Interface		
Description	Information defining if the traction power is on or off.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	Fail status (information not received from Train Interface)	
	01	Traction off	
	10	Traction on	
	11	Spare	

8.1.49 M_TRAINTYPE

Name	Train type		
Description	It defines type of train as defined in [10].		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	0	254	
Special/Reserved Values	255	Undefined	

8.1.50 M_XATTRIBUTE

Name	Text message attribute		
Description	Specifies group, flashing mode, text & background colour for text messages.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
10 bits			
Special/Reserved Values	0xxxxxxxxx	Text message shall be displayed in group 1	
	1xxxxxxxxx	Text message shall be displayed in group 2	
	x0xxxxxxxx	Normal flashing (only relevant in case "slow flashing" or "Fast flashing" is transmitted in the same variable).	
	x1xxxxxxxx	Counterphase flashing (only relevant in case "slow flashing" or "Fast flashing" is transmitted in the same variable).	
	xx00xxxxxx	No flashing	
	xx01xxxxxx	Slow flashing	
	xx10xxxxxx	Fast flashing	
	xx11xxxxxx	Reserved	
	xxxx000xxx	Dark blue text background	
	xxxx001xxx	White text background	
	xxxx010xxx	Red text background	
	xxxx011xxx	Blue text background	
	xxxx100xxx	Green text background	
	xxxx101xxx	Yellow text background	
	xxxx110xxx	Light red text background	
	xxxx111xxx	Light green text background	
	xxxxxxx000	Black text	
	xxxxxxx001	White text	
	xxxxxxx010	Red text	
	xxxxxxx011	Blue text	
	xxxxxxx100	Green text	
	xxxxxxx101	Yellow text	
	xxxxxxx110	Light red text	
	xxxxxxx111	Light green text	

8.1.51 N_VERMAJOR

Name	FFFIS STM version major number X		
Description			
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	0	255	Integer
Special/Reserved Values			

8.1.52 N_VERMINOR

Name	FFFIS STM version minor number Y		
Description			
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	0	255	Integer
Special/Reserved Values			

8.1.53 N_ADDR_BI

Name	Address of BIU Function		
Description	Declares at what address the BIU Function is allocated.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
7 bits	0	19	
Special/Reserved Values	2	STM Control Function	
	20-126	Reserved	
	127	Reserved for multicast	

8.1.54 N_ADDR_DMI_CHANNEL1

Name	Address of DMI channel 1		
Description	Declares at what address the DMI channel 1 is allocated.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
7 bits	0	19	
Special/Reserved Values	2	STM Control Function	
	20-126	Reserved	
	127	Reserved for multicast	

8.1.55 N_ADDR_DMI_CHANNEL2

Name	Address of DMI channel 2		
Description	Declares at what address the DMI channel 2 is allocated.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
7 bits	0	19	
Special/Reserved Values	2	STM Control Function	
	20-126	Reserved	
	127	Reserved for multicast	

8.1.56 N_ADDR_DMI_CHANNEL3

Name	Address of DMI channel 3		
Description	Declares at what address the DMI channel 3 is allocated.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
7 bits	0	19	
Special/Reserved Values	2	STM Control Function	
	20-126	Reserved	
	127	Reserved for multicast	

8.1.57 N_ADDR_DMI_CHANNEL4

Name	Address of DMI channel 4		
Description	Declares at what address the DMI channel 4 is allocated.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
7 bits	0	19	
Special/Reserved Values	2	STM Control Function	
	20-126	Reserved	
	127	Reserved for multicast	

8.1.58 N_ADDR_JD

Name	Address of JD Function		
Description	Declares at what address the JD Function is allocated.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
7 bits	0	19	
Special/Reserved Values	2	STM Control Function	
	20-126	Reserved	
	127	Reserved for multicast	

8.1.59 N_ADDR_ODO

Name	Address of the Odometer Function		
Description	Declares at what address the Odometer Function is allocated.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
7 bits	0	19	
Special/Reserved Values	2	STM Control Function	
	20-126	Reserved	
	127	Reserved for multicast	

8.1.60 N_ADDR_TI

Name	Address of TIU Function		
Description	Declares at what address the TIU Function is allocated.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
7 bits	0	19	
Special/Reserved Values	2	STM Control Function	
	20-126	Reserved	
	127	Reserved for multicast	

8.1.61 N_LITER

Name	Number of iterations of a data set following this variable in a packet		
Description	If 0 then no data set is following. Two nested levels of iterations can exist.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	0	As allowed by maximum length of application data but always under 255.	Integers
Special/Reserved Values			

8.1.62 NID_ANTENNA_BTM

Name	Valid Antenna/BTM ID		
Description	Identifier of the Antenna/BTM that is currently active on Interface ‘K’.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	Antenna 1	
	01	Antenna 2	
	10	Antenna 3	
	11	Antenna 4	

8.1.63 NID_BUTPOS

Name	Button Position Identifier		
Description	Specifies the position to display the button on DMI. For the unified DMI service special values are reserved for the available areas of the ETCS DMI layout specified in [10]. For the customisable DMI service the available button position identifiers are specified in the DMI layout configuration of the STM.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
5 bits	1	24	
Special/Reserved Values	Button areas used for unified DMI service		
		Soft key technology	Touch screen technology
	1	F8	F8
	2	F9	F9
	3	F10	C2
	4	H2	C3
	5	H3	C4
	6	H4	C5
	7	Reserved	C6
	8	Reserved	G1
	9	Reserved	G2
	10	Reserved	G3
	11	Reserved	G4
	12	Reserved	G5
	13	Reserved	G6
	14	Reserved	G7
	15	Reserved	G8
	16	Reserved	G9
	17	Reserved	G10
	18-24	Reserved, when unified DMI service is used	
	25-31	Reserved independent of used DMI service	

8.1.64 NID_BUTTON

Name	Button Identifier		
Description	The button identifier is used to change the state of buttons and to move or remove them. The button identifier is also used to transmit the buttons events to the STM. If the customisable DMI service is used, it is also used to retrieve the configurable properties of the button.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	0	255	
Special/Reserved Values			

8.1.65 NID_DATA

Name	Identifier of a Specific NTC Data		
Description	One value of this variable represents a Specific NTC Data required by the STM.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	0	255	
Special/Reserved Values			

8.1.66 NID_DMICHANNEL

Name	DMI channel Identifier		
Description	Give the identifier of the active DMI channel.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
3 bits			
Special/Reserved Values	0	No DMI channel	
	1	DMI channel 1	
	2	DMI channel 2	
	3	DMI channel 3	
	4	DMI channel 4	
	5-7	Reserved	

8.1.67 NID_DRV_LANG

Name	Driver language Identifier		
Description	Driver Language Selection Defined according to [8] This table includes a subset of the language identifiers included in the norm.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
16 bits (2 characters)			
Special/Reserved Values	en	ENGLISH	
	de	GERMAN	
	fr	FRENCH	
	es	SPANISH	
	it	ITALIAN	
	nl	DUTCH	
	hu	HUNGARIAN	
	da	DANISH	
	fi	FINNISH	
	no	NORWEGIAN	
	sv	SWEDISH	
	bg	BULGARIAN	
	hr	CROATIAN	
	cs	CZECH	
	et	ESTONIAN	
	el	GREEK	
	pl	POLISH	
	pt	PORTUGUESE	
	ro	ROMANIAN	
	ru	RUSSIAN	
	sr	SERBIAN	
	sh	SERBO-CROATIAN	
	sk	SLOVAK	
	sl	SLOVENIAN	
	tr	TURKISH	
	lv	LATVIAN	
	lt	LITHUANIAN	

8.1.68 NID_ICON

Name	Icon Identifier		
Description	Specifies bitmap to use for display of icon in case of customisable DMI service.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/Formula***
8 bits	1	255	
Special/Reserved Values	0	No icon referenced	

8.1.69 NID_INDICATOR

Name	Indicator Identifier		
Description	The indicator identifier is used to change the state of the indicators and to move or remove them. If the customisable DMI service is used, it is also used to retrieve the configurable properties of the indicator.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	0	255	
Special/Reserved Values			

8.1.70 NID_INDPOS

Name	Indicator Position Identifier		
Description	Specifies the appropriate position to display the indicator on DMI. For the unified DMI service, special values are reserved for the available areas of the ETCS DMI layout specified in [10]. For the customisable DMI service, the available indicator position identifiers are specified in the DMI layout configuration of the STM.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
5 bits	1	24	
Special/Reserved Values	Indicator areas used for unified DMI service		
	1	B3	
	2	B4	
	3	B5	
	4	H1 (Reserved in touch screen technology)	
	5	C2	
	6	C3	
	7	C4	
	8	C5	
	9	C6	
	10	G1	
	11	G2	
	12	G3	
	13	G4	
	14	G5	
	15	G6	
	16	G7	
	17	G8	
	18	G9	
	19	G10	
	20-24	Reserved, when unified DMI service is used	
	25-31	Reserved independent of used DMI service	

8.1.70.1 NID_OPERATIONAL_STM

Name	Train Running Number		
Description	This is the operational train running number. The NID_OPERATIONAL_STM consists of up to 8 digits which are entered left adjusted into the data field, the leftmost digit is the digit to be entered first. In case the NID_OPERATIONAL_STM is shorter than 8 digits, the remaining space is to be filled with special character “F”.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
32 bits	0	9999 9999	Binary Coded Decimal
Special/Reserved Values	For each digit :		
	Values A – E	Spare	
	F	Use value F for digit to indicate no digit (if number shorter than 8 digits)	
	FFFF FFFF	Unknown	

8.1.71 NID_PACKET

Name	Packet Identifier		
Description	This is used in each packet, allowing the receiving equipment to identify the data, which follows.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	0	199	Numbers
Special/Reserved Values	200-255	Non standard packet, supplier specific	

8.1.72 NID_SOUND

Name	Sound Identifier		
Description	Specifies wave file to use for playing sound in case of customisable DMI service. In case of unified DMI service only used to stop a sound.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	1	255	
Special/Reserved Values	0	No Sound identifier	

8.1.73 NID_STM

Name	STM identity		
Description	Each value of this variable represents the identifier of a Specific Transmission Module. Values are equal to NID_NTC values, allocated according to the rule defined in [4], chapter 4.1.1.1.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	0	254	
Special/Reserved Values	255	Reserved for multicast	

8.1.74 NID_STMSTATE

Name	Current STM state		
Description	Tell the current state of the STM.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
4 bits			
Special/Reserved Values	0	Reserved (mapped to NP for consistency)	
	1	Power On (PO)	
	2	Configuration (CO)	
	3	Data Entry (DE)	
	4	Cold Standby (CS)	
	5	Reserved (mapped to CS for consistency)	
	6	Hot Standby (HS)	
	7	Data Available (DA)	
	8	Failure (FA)	
	9-15	Spare values	

8.1.75 NID_STMSTATEORDER

Name	STM state order		
Description	Tell the STM state ordered by the ERTMS/ETCS on-board		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
4 bits			
Special/Reserved Values	0	Reserved (mapped to NP for consistency)	
	1	Reserved (mapped to PO for consistency)	
	2	Configuration (CO)	
	3	Data Entry (DE)	
	4	Unconditional Cold Standby (U-CS)	
	5	Conditional Cold Standby (C-CS)	
	6	Hot Standby (HS)	
	7	Data Available (DA)	
	8	Failure (FA)	
	9-15	Spare values	

8.1.76 NID_STMSTATEREQUEST

Name	STM state request		
Description	State requested by the STM, in which the STM is intended to pass.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
4 bits			
Special/Reserved Values	0	Reserved (mapped to NP for consistency)	
	1	Reserved (mapped to PO for consistency)	
	2	Configuration (CO)	
	3	Data Entry (DE)	
	4	Cold Standby (CS)	
	5	Reserved (mapped to CS for consistency)	
	6	Reserved (mapped to HS for consistency)	
	7	Reserved (mapped to DA for consistency)	
	8	Reserved (mapped to FA for consistency)	
	9-15	Spare values	

8.1.77 NID_TEST

Name	STM Test Identity		
Description	Enables to identify the type of test that the STM requests. Its meaning is supplier-specific.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	0	255	
Special/Reserved Values			

8.1.78 NID_XMESSAGE

Name	Text message Identifier		
Description	Text message Identifier for deletion and acknowledgement of a text message.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	0	255	Integer
Special/Reserved Values			

8.1.79 Q_ACK

Name	Acknowledgement qualifier		
Description	Tell if a text message (NID_XMESSAGE) must be acknowledged or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bit			Boolean
Special/Reserved Values	0	No acknowledgement required	
	1	Acknowledgement required	

8.1.80 Q_ADDR_BI

Name	Safety level of Brake Interface connection		
Description	Declares the highest safety level for the connection to the function at the address N_ADDR_BI.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	0	SL0	
	1	SL2	
	2	SL4	
	3	Reserved	

8.1.81 Q_ADDR_DMI_CHANNEL1

Name	Safety level of DMI channel 1 connection		
Description	Declares the highest safety level for the connection to the function at the address N_ADDR_DMI_CHANNEL1.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	0	SL0	
	1	SL2	
	2	SL4	
	3	Reserved	

8.1.82 Q_ADDR_DMI_CHANNEL2

Name	Safety level/Availability of DMI channel 2 connection		
Description	Declares the highest safety level for the connection to the function at the address N_ADDR_DMI_CHANNEL2 or if the function is not available.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	0	SL0	
	1	SL2	
	2	SL4	
	3	Function not available	

8.1.83 Q_ADDR_DMI_CHANNEL3

Name	Safety level/Availability of DMI channel 3 connection		
Description	Declares the highest safety level for the connection to the function at the address N_ADDR_DMI_CHANNEL3 or if the function is not available.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	0	SL0	
	1	SL2	
	2	SL4	
	3	Function not available	

8.1.84 Q_ADDR_DMI_CHANNEL4

Name	Safety level/Availability of DMI channel 4 connection		
Description	Declares the highest safety level for the connection to the function at the address N_ADDR_DMI_CHANNEL4 or if the function is not available.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	0	SL0	
	1	SL2	
	2	SL4	
	3	Function not available	

8.1.85 Q_ADDR_JD

Name	Safety level/Availability of JD connection		
Description	Declares the highest safety level for the connection to the function at the address N_ADDR_JD or if the function is not available.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	0	SL0	
	1	SL2	
	2	SL4	
	3	Function not available	

8.1.86 Q_ADDR_ODO

Name	Safety level of Odometer connection		
Description	Declares the highest safety level for the connection to the function at the address N_ADDR_ODO.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	0	Reserved	
	1	Reserved	
	2	SL4	
	3	Reserved	

8.1.87 Q_ADDR_TI

Name	Safety level of Train Interface connection		
Description	Declares the highest safety level for the connection to the function at the address N_ADDR_TI.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/ Reserved Values	0	SL0	
	1	SL2	
	2	SL4	
	3	Reserved	

8.1.88 Q_ANTN_BTM_ACTIVE

Name	Qualifier indicating if there is an active Antenna/BTM		
Description	This is dynamic information depending on e.g. cabin selection.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bit			
Special/Reserved Values	0	No Antenna/BTM active	
	1	One Antenna/BTM active	

8.1.89 Q_BMM_ANNOUNCED

Name	Big Metal Mass announced		
Description	Indicates if the train antenna is within a Big Metal Mass track condition		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bit			
Special/Reserved Values	0	Not within a Big Metal Mass track condition	
	1	Within a Big Metal Mass track condition	

8.1.90 Q_BTM_ALARM

Name	BTM alarm		
Description	Status of the BTM alarm		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bit			
Special/Reserved Values	0	BTM alarm not active	
	1	BTM alarm active	

8.1.91 Q_BUTTON

Name	Button Event		
Description	Qualifier for the button event		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bit			
Special/ Reserved Values	0	Push event	
	1	Release event	

8.1.92 Q_CHECKNEEDED

Name	Qualifier for need of checking the Interface 'K' Antenna/BTM ID		
Description	This is static information depending on ERTMS/ETCS on-board implementation. "Check needed" value is used if ERTMS/ETCS on-board cannot guarantee by its own that the interface 'K' data is coming from the intended Antenna/BTM.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bit			
Special/Reserved Values	0	No check needed	
	1	Check needed	

8.1.93 Q_DATAENTRY

Name	Need for Specific NTC Data Entry		
Description	Qualifier indicating if the STM needs Specific NTC Data or not		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bit			
Special/ Reserved Values	0	No Specifc NTC Data needed	
	1	Specific NTC Data needed	

8.1.94 Q_DISPLAY_IS

Name	Display mode for intervention speed		
Description	Display mode for intervention speed		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	No display	
	01	Display with normal bar width	
	10	Display with wide bar width	
	11	Spare	

8.1.95 Q_DISPLAY_PS

Name	Display mode for permitted speed		
Description	Display mode for permitted speed		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	No display	
	01	Hook only displayed	
	10	Speed bar displayed without hook	
	11	Speed bar displayed with hook	

8.1.96 Q_DISPLAY_RS

Name	Display mode for Release Speed		
Description	Display mode for release speed supervision information		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	No display	
	01	Digital indicator only displayed	
	10	Bar indication only displayed	
	11	Bar and digital indicator displayed	

8.1.97 Q_DISPLAY_TD

Name	Display mode for Target Distance		
Description	Display mode for target distance supervision information		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	No display	
	01	Digital indicator only displayed	
	10	Bar indication only displayed	
	11	Bar and digital indicator displayed	

8.1.98 Q_DISPLAY_TS

Name	Display mode for target speed		
Description	Display mode for target speed		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	00	No display	
	01	Hook only displayed	
	10	Speed bar displayed without hook	
	11	Speed bar displayed with hook	

8.1.99 Q_FOLLOWING

Name	Indicate a following request		
Description	Due to the possible length of an STM request for Specific NTC Data, this qualifier is used to indicate to the ERTMS/ETCS on-board whether the request for Specific NTC Data is composed of several STM-179 packets or not. It shall also be used for the Specific NTC data View values to indicate to the ERTMS/ETCS on-board whether it is composed of several STM-183 packets or not.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bit			
Special/Reserved Values	0	No following packet to be managed together with the current one.	
	1	There is a following packet to be managed together with the current one.	

8.1.100 Q_OVR_STATUS

Name	ETCS Override status		
Description	Indicate to all STMs that an override has been triggered		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
1 bits			
Special/Reserved Values	0	ETCS Override status not active	
	1	ETCS Override status active	

8.1.101 Q_SOUND

Name	Sound qualifier		
Description	Qualifier for the sound generation		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
2 bits			
Special/Reserved Values	0	Stop sound generation for specified sound identifier	
	1	One shot play (Sound is played once)	
	2	Continuous play (Sound is played again when definition ends)	
	3	Reserved	

8.1.102 T_BUTTONEVENT

Name	Time stamping of a button event		
Description	Local Reference Time of the button event as specified in [5], chapter 3.4.8		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
32 bits	0	4 294 967 295	1 ms
Special/Reserved Values			

8.1.103 T_EB_MAXDELAY

Name	Brake interface maximum emergency brake command issue time		
Description	This is the maximum processing of the STM brake command by the ERTMS/ETCS on-board BIU Function. This is the time from the moment the BIU Function receives the STM command on the Profibus and the time the brake command is issued on the Train Interface.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	10 ms	2550 ms	Step of 10 ms
Special/Reserved Values	0	Reserved	

8.1.104 T_JD

Name	Time stamping of a JD message		
Description	Local Reference Time when the data sent to the JD was valid as specified in [5], chapter 3.4.8		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
32 bits	0	4 294 967 295	1ms
Special/Reserved Values			

8.1.105 T_ODO

Name	Time stamping of an odometer measurement		
Description	Local Reference Time when the odometer data were valid as specified in [5], chapter 3.4.8		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
32 bits	0	4 294 967 295	1ms
Special/Reserved Values			

8.1.106 T_ODOCYCLE

Name	Typical cycle time of ERTMS/ETCS on-board Odometer Function		
Description			
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	0 ms	2550 ms	Step of 10 ms
Special/Reserved Values			

8.1.107 T_ODOMAXPROD

Name	Maximum production delay time		
Description	Refer to [4] §12.4.1.4		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	10 ms	2550 ms	Step of 10ms
Special/Reserved Values	0	Reserved	

8.1.108 T_SB_MAXDELAY

Name	Brake interface maximum service brake command issue time		
Description	This is the maximum processing of the STM brake command by the ERTMS/ETCS on-board BIU Function. This is the time from the moment the BIU Function receives the STM command on the Profibus and the time the brake command is issued on the Train Interface.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	10 ms	2550 ms	Step of 10 ms
Special/Reserved Values	0	Not applicable (SB command not available)	

8.1.109 T_SOUND

Name	Sound segment duration		
Description	Duration of a sound segment.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	100 ms	10 000 ms	T = T_SOUND * 100 ms Range 100 ms to 10 seconds
Special/Reserved Values	0	Reserved	
	101-255	Spare	

8.1.110 V_EST

Name	Estimated value of a measured speed		
Description	Signed estimated value of a measured speed provided by the odometer to STM. Coded as two's complement .		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
16 bits	- 32 768 cm/s	+ 32 767 cm/s	Signed, unit 1 cm/s
Special/Reserved Values			

8.1.111 V_INTERV

Name	Intervention speed		
Description			
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
10 bits	0 km/h	600 km/h	1 km/h
Special/Reserved Values	601-1022	Spare	
	1023	Unknown value	

8.1.112 V_MAX

Name	Upper bound of the functional confidence interval of a measured speed		
Description	Signed value of the upper bound of the functional confidence interval of a measured speed provided by the odometer to STM. Coded as two's complement .		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
16 bits	- 32 768 cm/s	+ 32 767 cm/s	Signed, unit 1 cm/s.
Special/Reserved Values			

8.1.113 V_MIN

Name	Lower bound of the functional confidence interval of a measured speed		
Description	Signed value of the lower bound of the functional confidence interval of a measured speed provided by the odometer to STM. Coded as two's complement .		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
16 bits	- 32 768 cm/s	+ 32 767 cm/s	Signed, unit 1 cm/s
Special/Reserved Values			

8.1.114 V_PERMIT

Name	Permitted speed		
Description			
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
10 bits	0 Km/h	600 Km/h	1 Km/h
Special/Reserved Values	601-1023	Spare	

8.1.115 V_RELEASE

Name	Release speed		
Description			
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
10 bits	0 km/h	600 km/h	1 km/h
Special/Reserved Values	601-1022	Spare	
	1023	Unknown value	

8.1.116 V_STMMAX

Name	STM max speed		
Description			
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
7 bits	0 km/h	600 km/h	5 km/h
Special/Reserved Values	121-126	Spare	
	127	No STM max speed to be supervised.	

8.1.117 V_STMSYS

Name	STM system speed		
Description			
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
7 bits	0 km/h	600 km/h	5 km/h
Special/Reserved Values	121-126	Spare	
	127	No STM system speed to be supervised.	

8.1.118 V_TARGET

Name	Target speed		
Description			
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
7 bits	0 Km/h	600	5 km/h
Special/Reserved Values	121-126	Spare	
	127	Unknown value	

8.1.119 X_CAPTION

Name	Caption text byte		
Description	Byte of bytestring used for caption text of button, indicator and data. Encoded in UTF-8 according to [9] with 1 or 2 bytes.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	0	255	
Special/Reserved Values			

8.1.120 X_TEXT

Name	Text byte		
Description	Byte of bytestring used for text message string. Encoded in UTF-8 according to [9] with 1 or 2 bytes.		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	0	255	
Special/Reserved Values			

8.1.121 X_VALUE

Name	Value byte		
Description	Byte of bytestring used for data value, default value of data and for dedicated keyboard values. Encoded in UTF-8 according to [9].		
Length of variable	***Minimum Value***	***Maximum Value***	***Resolution/formula***
8 bits	0	255	
Special/Reserved Values			