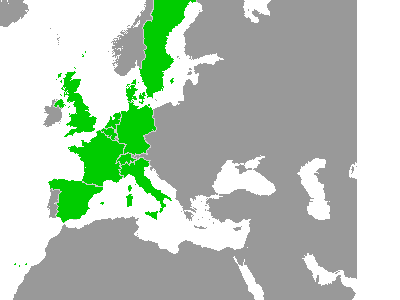
Frame to be used to indicate a customer reference number.

|  |  |  |  |
| --- | --- | --- | --- |
| Client : |  | C/Ref. : |  |

Work-Package 2 : “Requirements”

API Requirements for OpenETCS – appendix - Application Layer v1.2

N. Boverie September 2014



Amendment record

| Rev.**[[1]](#footnote-1)** | Author | Version | Date | § | Modifications |
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|  | N. Boverie | 1.0 | 06/02/2014 | All | creation of the document |
|  | N. Boverie | 1.1 | 03/07/2014 | All | \* According to review sheet OETCS\_API\_review\_2014\_07\_03\_SINGLE\_sheet.xlsx |
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Table of Content

1. Introduction 4

1.1 Subject 4

1.2 Field of application 4

1.3 Document description 4

2. Documents & terminology 5

2.1 Reference documents 5

2.2 Applicable documents 5

2.3 Definitions 5

2.4 Abbreviations 5

3. OpenETCS application - DMI interface 6

3.1 telegram structure and principles 6

3.2 telegram header 7

3.3 Packets 8

3.4 Variables 34

4. OpenETCS application - JRU interface 77

4.1 JRU messages definition 77

4.2 OpenETCS application – JRU control messages 78

4.3 OpenETCS application-JRU Data messages 79

5. OpenETCS application - TIU interface 100

5.1 Components of Language 100

5.1.1 Introduction 100

5.1.2 Definition of Variables 100

5.1.3 Definition of Packets 101

5.2 PACKETS 102

5.2.1 List of Packets 102

5.2.2 PACKETS: TIU to OpenETCS application 103

5.2.3 PACKETS: OpenETCS application to TIU 108

5.3 VARIABLES 114

5.3.1 List of Variables 114

# Introduction

## Subject

This appendix document provides the OpenETCS application layer interface definition (telegram definition) for:

* the DMI interface
* the JRU interface
* the TIU interface

This document is an appendix document of the ALSTOM proposal for the Application Programming Interface (API) Specification of the OpenETCS Onboard Application Software (applicable document /5/).

This specification shall be directly based on the Application Programming Interface (API) Specification of the ALSTOM ERTMS Onboard CORE Application Software.

## Field of application

This document is to be considered in the frame of the OpenETCS program.

This specification is compliant to Unisig Baseline 3 of the ETCS Onboard unless explicitly mentioned in the document.

As the ALSTOM development for the ETCS Baseline 3 is still in progress, this document could be modified in the future.

This document is an appendix of the applicable document /5/.

Note : the modifications of this version 1.2 of the present document (compared to the previous 1.1 version) consist in a revision of the DMI interface in order to be as well as possible compliant to Baseline 3.

## Document description

For each interface, the following definition is provided:

* Telegram structure
* Packets
* Variables

# Documents & terminology

## Reference documents

1. System Requirements Specification, ref. SUBSET-026, v3.3.0
2. Glossary of terms and abreviations, ref. SUBSET-023, v3.0.0
3. ERTMS/ETCS – ETCS Driver Machine Interface, ERA\_ERTMS\_015560, v.3.3.0
4. FIS Juridical Recording, ref SUBSET-027, v3.0.0

## Applicable documents

1. API Requirements for OpenETCS

## Definitions

|  |  |
| --- | --- |
|  | Refer to /5/ |

Refer also to /2/

## Abbreviations

|  |  |
| --- | --- |
|  | Refer to /5/ |

Refer also to /2/

# OpenETCS application - DMI interface

## telegram structure and principles

This section describes the messages of the proprietary application layer between the DMI and the OpenETCS application (EVC CORE board).

This section provides the list of packets for each function.

The packets are grouped together into telegrams.

The telegrams between the OpenETCS application and the DMI are transmitted in an aperiodic way.

The telegram from/to the OpenETCS application shall be composed of a telegram header followed by zero, one or several packets.

The typical maximum number of packets in a single applicative telegram from the OpenETCS application to the DMI is 30 packets.

The applicative telegram from the DMI to the OpenETCS application shall not contain more than 10 packets.

The Application telegram structure is described below:



Application Telegram structure

The general telegram between the OpenETCS application and the DMI shall be built as following.

|  |  |  |
| --- | --- | --- |
| **Description** | General telegram structure between DMI and OpenETCS | |
| ***Content*** | **Group** | **Comment** |
| Telegram header | General telegram header between DMI and OpenETCS. |
| Packet(s) | Optional packets (0 to N packets) as needed by application |
| Padding | 0 to 7 bits when required. |

The same packet may be present more than one time in a telegram.

If needed to obtain an integer number of bytes, padding shall be added at the end of the telegram.

The padding bits value shall always be set to 1.

However, no monitoring of the padding bits value is required for the OpenETCS or the DMI.

Each packet and the header are composed of several variables.

The following packets shall always be followed (immediately or not) by the corresponding packet 5 (menu button accessibility) in the same telegram:

Packet 3: confirmation request,

Packet 6: Screen request,

Packet 15: data view request,

Packet 41: Menu window request,

Packet 179: Request for additional data entry,

Packet 181: Confirmation for additional data entry.

## telegram header

The header shall be built as following.

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | General telegram header between DMI and OpenETCS | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_TELEGRAM | 8 | Telegram Identification Number:  1: Telegram from EVC (OpenETCS application) to DMI  3: Telegram from DMI to EVC (OpenETCS application) |
| DMI\_L\_TELEGRAM | 16 | Telegram length in bytes including everything (from DMI\_NID\_TELEGRAM to padding). |

In case the telegram length is not as expected in the header, the DMI shall reject the telegram.

In case the packet length is not as expected in the packet, the DMI shall reject the telegram.

In case the packet identifier is not not known by the DMI, the DMI shall skip the packet based on the packet length, without rejecting the whole telegram.

## Packets

Packet 02: Delete instantiated element (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | EVC commands the deletion of an instantiated message (text message or acknowledgeable indicator). | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_NID\_EVC\_MESSAGE | 8 | Message instance identifier. |

Packet 03: Confirmation request (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet is sent from the EVC to the DMI when a confirmation screen has to be displayed. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_M\_CONFIRMATION\_WINDOW | 8 | Identifier of the confirmation screen |
| DMI\_N\_ITER\_TEXT | 5 | Number of i-iteration. |
| DMI\_Q\_TEXT\_CONFIRM (i) | 8 | Identifier of the predefined text for confirmation |
| DMI\_L\_TEXT (i) | 8 | Number of characters in text field. Length of free text to be added at the end of the predefined text. |
| DMI\_X\_TEXT (i,j) | 8 | Characters of text field to be added at the end of the predefined text.  The number of iterations is equal to the value of DMI\_L\_TEXT. |
| DMI\_N\_ITER | 5 | Number of k-iterations. |
| DMI\_NID\_DATA (k) | 10 | Identifier of the kth data |
| DMI\_Q\_VALUE\_TYPE (k) | 2 | Type of the kth data value |
| DMI\_Q\_DATA\_STATUS (k) | 3 | Status of the kth data value for display purpose. |
| DMI\_L\_VALUE (k) | 8 | If DMI\_Q\_VALUE\_TYPE = 1 \*:  String size of the kth data value (number of DMI\_X\_VALUE) |
| DMI\_X\_VALUE (k,l) | 8 | If DMI\_Q\_VALUE\_TYPE = 1 \*:  lth text string element of the kth data value |
| DMI\_NID\_VALUE (k) | 8 | If DMI\_Q\_VALUE\_TYPE = 2 \*:  Identifier of the kth data value |
| DMI\_T\_CLOCK (k) | 32 | If DMI\_Q\_VALUE\_TYPE = 3 \*:  kth data value (if it is a clock) |

\*: if DMI\_Q\_VALUE\_TYPE has another value, this variable is not transmitted.

Packet 04 : Screen control (From EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet sends to the DMI information to manage each display unit. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| BUILD\_IMAGE | 1 | DMI activity |
| PRIMARY\_DISPLAY\_OTHER | 1 | Function allocation for primary display |
| PRIMARY\_DISPLAY\_PA | 1 | Function allocation for primary display |
| PRIMARY\_DISPLAY\_SPEEDO | 1 | Function allocation for primary display |
| PRIMARY\_DISPLAY\_SPARE | 1 | Spare (defined for any possible future use not to impact the interface) |
| SECONDARY\_DISPLAY\_OTHER | 1 | Function allocation for secondary display |
| SECONDARY\_DISPLAY\_PA | 1 | Function allocation for secondary display |
| SECONDARY\_DISPLAY\_SPEEDO | 1 | Function allocation for secondary display |
| SECONDARY\_DISPLAY\_SPARE | 1 | Spare (defined for any possible future use not to impact the interface) |

Packet 05: Menu button accessibility (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains information to configure menu button accessibility.  This packet is sent only when the button accessibility change.  This packet contains only buttons concerned by the modification of button accessibility. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_N\_ITER\_BUTTON | 8 | Number of i-iterations. |
| DMI\_NID\_BUTTON (i) | 10 | Identifier of button |
| DMI\_M\_BUTTON\_STATUS (i) | 1 | Status of button |

Packet 06: Screen request (From EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet is used when a screen shall be displayed  All the leaves are always listed in the packet.  DMI\_Q\_VALUE\_TYPE(1) corresponds to the default value sent by EVC.  DMI\_Q\_VALUE\_TYPE(2) corresponds to a predefined choice sent by EVC | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_M\_ENTRY\_WINDOW | 8 | Screen request identifier |
| DMI\_N\_ITER | 5 | Number of i-iterations. |
| DMI\_NID\_DATA (i) | 10 | Identifier of the ith data |
| DMI\_Q\_VALUE\_TYPE(1) (i) | 2 | Type of the default value for the ith data. |
| DMI\_L\_VALUE (i) | 8 | If DMI\_Q\_VALUE\_TYPE = 1 \*:  String size of the ith default data value (number of DMI\_X\_VALUE) |
| DMI\_X\_VALUE (i,j) | 8 | If DMI\_Q\_VALUE\_TYPE = 1 \*:  jth text string element of the ith default data value. |
| DMI\_NID\_VALUE (i) | 8 | If DMI\_Q\_VALUE\_TYPE = 2 \*:  Identifier of the ith default data value |
| DMI\_T\_CLOCK (i) | 32 | If DMI\_Q\_VALUE\_TYPE = 3 \*:  ith default data value (if it is a clock) |
| DMI\_Q\_VALUE\_TYPE(2) (i) | 2 | Type of predefined values for the ith data. |
| DMI\_N\_ITER\_VALUE (i) | 5 | If DMI\_Q\_VALUE\_TYPE(2) (i) ≠ 0:  Number of predefined values for the ith data. |
| DMI\_L\_VALUE (i,k) | 8 | If DMI\_Q\_VALUE\_TYPE(2) (i) = 1 \*:  Size of the kth predefined value for the ith data (when it is a string). |
| DMI\_X\_VALUE (i,k,l) | 8 | If DMI\_Q\_VALUE\_TYPE = 1 \*:  lth text string element of the kth predefined value for the ith data (when it is a string). |
| DMI\_NID\_VALUE (i,k) | 8 | If DMI\_Q\_VALUE\_TYPE(2) (i) = 2 \*:  Identifier of the kth predefined value for the ith data (when it is not a string). |
| DMI\_T\_CLOCK (i,k) | 32 | If DMI\_Q\_VALUE\_TYPE(2) (i) = 3 \*:  kth predefined value for the ith data (if it is a clock). |

\*: if DMI\_Q\_VALUE\_TYPE has another value, this variable is not transmitted.

Packet 07: Sound activation (From EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | EVC command to generate a sound. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_NID\_EVC\_SOUND | 8 | Sound identifier |
| DMI\_Q\_SOUND | 8 | Sound qualifier |

Packet 08: Analog train speed info (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains speed driving information (from EVC to DMI) to be displayed by means of CSG needle. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_V\_TRAIN\_ANALOG | 10 | Analogic value of current train speed |

Packet 09: EVC Text message (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | Text message for the DMI with or without acknowledgement transmitted from EVC to DMI | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_NID\_EVC\_MESSAGE | 8 | Message instance identifier |
| DMI\_M\_XATTRIBUTE | 10 | Attribute of message |
| DMI\_Q\_ACK | 1 | Acknowledgement qualifier |
| DMI\_Q\_PRIORITY | 1 | Priority qualifier |
| DMI\_Q\_TEXT | 8 | Predefined text qualifier |
| DMI\_L\_TEXT | 8 | Number of DMI\_X\_TEXT |
| DMI\_X\_TEXT (i) | 8 | ith text string element. |

Packet 11: Update indicator (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains indicator displayed in the LCD screen. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_N\_ITER\_INDICATOR | 8 | Number of i-iterations. |
| DMI\_NID\_EVC\_INDICATOR(i) | 10 | Indicator Identifier |
| DMI\_NID\_EVC\_ICON(i) | 8 | Icon identifier |
| DMI\_Q\_INDICATOR(i) | 2 | Indicator qualifier |

Packet 13: Echo Data (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet is used to send Echo Data to the DMI | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_N\_ITER | 5 | Number of i-iterations. |
| DMI\_NID\_DATA (i) | 10 | Identifier of the ith data |
| DMI\_Q\_VALUE\_TYPE (i) | 2 | Type of value for the ith data. |
| DMI\_Q\_DATA\_STATUS (i) | 3 | If DMI\_Q\_VALUE\_TYPE (i) ≠ 0 :  Data status of the ith data. |
| DMI\_L\_VALUE (i) | 8 | If DMI\_Q\_VALUE\_TYPE (i) = 1 \*:  String size for the ith value (when it is a string). |
| DMI\_X\_VALUE (i, j) | 8 | If DMI\_Q\_VALUE\_TYPE (i) = 1 \*:  jth character of the ith value (when it is a string). |
| DMI\_NID\_VALUE (i) | 8 | If DMI\_Q\_VALUE\_TYPE (i) = 2 \*:  Value identifier of the ith data. |
| DMI\_T\_CLOCK (i) | 32 | If DMI\_Q\_VALUE\_TYPE (i) = 3 \*:  Value of the ith data (if it is a clock). |

\*: if DMI\_Q\_VALUE\_TYPE has another value, this variable is not transmitted.

Packet 15: Data view (From EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet is used to request a data view window and transmit ETCS and technical data for data view purpose. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_M\_VIEW\_WINDOW | 8 | Data View window request identifier. |
| DMI\_N\_ITER\_DATA\_VIEW | 8 | Number of i-iterations. |
| DMI\_NID\_DATA (i) | 10 | Identifier of the ith data |
| DMI\_Q\_VALUE\_TYPE (i) | 2 | Type of value for the ith data. |
| DMI\_L\_VALUE (i) | 8 | If DMI\_Q\_VALUE\_TYPE (i) = 1 \*:  String size for the ith value (when it is a string). |
| DMI\_X\_VALUE (i,j) | 8 | If DMI\_Q\_VALUE\_TYPE (i) = 1 \*:  jth character of the ith value (when it is a string). |
| DMI\_NID\_VALUE (i) | 8 | If DMI\_Q\_VALUE\_TYPE (i) = 2 \*:  Value identifier of the ith value. |
| DMI\_T\_CLOCK (i) | 32 | If DMI\_Q\_VALUE\_TYPE (i) = 3 \*:  ith value (when it is a clock). |

\*: if DMI\_Q\_VALUE\_TYPE has another value, this variable is not transmitted.

Packet 16 : EVC connection request (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains the connection or disconnection request to the DMI. This packet is also used for connection deny. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_Q\_CONNECT | 4 | Qualifier of the connection |

Packet 17: Local time (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains local time information (from EVC to DMI) | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_T\_CLOCK | 32 | Local clock |

Packet 18: Planning area icons info (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains planning area icons to display on D2/D3/D4 , D6 orD8 location | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_Q\_SCALE | 2 | Scale of DMI\_D\_TARGET |
| DMI\_N\_ITER | 5 | Number of i-iterations. |
| DMI\_NID\_EVC\_ICON(i) | 8 | Identifier of the ith icon to display |
| DMI\_NID\_AREA(i) | 2 | Part of the planning area where the ith icon shall be displayed |
| DMI\_D\_TARGET(i) | 15 | Distance at which the ith icon shall be displayed |

Packet 19: Planning area speed restrictions info (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains planning area speed profile displayed on D7 area | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_Q\_SCALE | 2 | Scale of DMI\_D\_TARGET |
| DMI\_N\_ITER | 5 | Number of i-iterations. |
| DMI\_Q\_WIDTH(i) | 7 | Width of the ith speed restriction |
| DMI\_D\_TARGET(i) | 15 | Distance at which the ith speed restriction shall end (its start is the previous speed restriction end, or 0 if this is the first speed restriction) |

Packet 20: data transmission start / stop (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet informs the DMI about the start and stop of a transmission process. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_Q\_START\_STOP | 2 | Indicates the beginning or the end of the transmission process. |

Packet 23: Set speed info (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains the set speed indication information (from EVC to DMI) to be displayed on CSG by means of a specific icon. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_V\_SET\_SPEED | 10 | Set speed value |
| DMI\_NID\_EVC\_ICON | 8 | Icon to display. |

Packet 26: Planning area gradient profiles info (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains gradient profiles information displayed numerically on the D5 area. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_Q\_SCALE | 2 | Scale of DMI\_D\_TARGET |
| DMI\_N\_ITER | 5 | Number of i-iterations. |
| DMI\_Q\_GRAD\_DIR(i) | 1 | Qualifier for ith gradient slope |
| DMI\_M\_GRAD(i) | 8 | Absolute value of the ith gradient |
| DMI\_D\_TARGET(i) | 15 | Distance at which the ith gradient profile ends (its start is the previous gradient profile end, or 0 if this is the first speed restriction) |

Packet 27: Freeze Data Entry (From EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet is used to send Freeze Data Entry to the DMI | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_Q\_FREEZE | 1 | Screen State |

Packet 29: Freeze Confirmation Screen (From EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet is used to send Freeze Confirmation Screen to the DMI | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_Q\_FREEZE | 1 | Screen State |

Packet 30: Driver language transmission (from DMI to EVC or from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | Driver language selection.  Each DMI sends this packet on EVC applicative connexion (after packet 16 exchange) and on DMI language modification.  DMI updates its language when EVC sends this message to DMI. If new language is unknown by DMI, this packet is ignored. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
|  | DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_NID\_DRV\_LANG | 16 | Driver language selection |

Packet 31: Planning area displaying (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains the planning area status for displaying on D location | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_M\_PLANNING | 1 | Displaying status of the planning area |

Packet 32: Tunnel stopping area distance information (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains the tunnel stopping area status for displaying | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_Q\_DISPLAY\_TUN\_STOPPING | 1 | Display status of the tunnel stopping area. |
| DMI\_D\_TUN\_STOPPING | 24 | Distance of tunnel stopping area |

Packet 33: Geographical position information (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains the Geographical position information for displaying | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_Q\_DISPLAY\_GEO\_POS | 1 | Display status of the geographical position. |
| DMI\_D\_GEO\_POS | 24 | Value of kilometre point |

Packet 37: STM specific test request (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | Text message for the DMI indicating request for specific test request from STM.  Text is displayed as high priority one and managed as an EVC text Message. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_NID\_EVC\_MESSAGE | 8 | Message instance identifier |
| STM\_M\_XATTRIBUTE | 10 | Attribute for text string of the data and its associated value(s) |
| DMI\_L\_TEXT | 8 | Size of the text string. |
| DMI\_X\_TEXT (i) | 8 | ith text string element. |

Packet 41: Menu window request (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet is used by EVC to request a menu window. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_M\_MENU\_WINDOW | 8 | Menu window identifier. |
| DMI\_Q\_HOUR\_GLASS | 1 | Hour glass display qualifier. |

Packet 43: Speed and distance supervision information (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains speed bargraph information (from EVC to DMI) to be displayed on the Circular Speed Gauge. Many different coloured segments may be displayed according to information in variables. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_Q\_SCALE | 2 | Scale of DMI\_D\_TARGET |
| DMI\_V\_PERMIT | 10 | Permitted speed |
| DMI\_V\_TARGET | 7 | Target speed |
| DMI\_V\_RELEASE | 10 | Release speed |
| DMI\_V\_INTERV | 10 | Intervention speed |
| DMI\_D\_TARGET | 15 | Target distance |
| DMI\_M\_COLOUR\_SP | 3 | Colour of speed pointer (needle) |
| DMI\_M\_COLOUR\_PS | 3 | Colour of permitted speed |
| DMI\_Q\_DISPLAY\_PS | 2 | Display of permitted speed |
| DMI\_M\_COLOUR\_TS | 3 | Colour of target speed |
| DMI\_Q\_DISPLAY\_TS | 2 | Display of target speed |
| DMI\_M\_COLOUR\_RS | 3 | Colour of release speed |
| DMI\_Q\_DISPLAY\_RS | 2 | Display of release speed |
| DMI\_M\_COLOUR\_IS | 3 | Colour of intervention speed |
| DMI\_Q\_DISPLAY\_IS | 2 | Display of intervention speed |
| DMI\_Q\_DISPLAY\_TD | 2 | Display of target distance |

Packet 44: ETCS Speed and distance display inhibition (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet is sent from the EVC to the DMI to inhibit the display of ETCS speed. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_Q\_INH\_ETCS\_SPD\_DIST\_DISPLAY | 1 | ETCS Speed and Distance Display inhibition. |

Packet 47 : STM accessibility (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains information on the accessibility to the DMI for a STM (from EVC to DMI). This packet informs the DMI whether to treat the packets sent by STM and how. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| STM\_NID\_STM | 8 | STM identity |
| DMI\_ACCEPTANCE\_STATE | 2 | State of the acceptance for the STM |

Packet 48 : STM error on DMI (from DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains information on error related to STM packet reception. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| STM\_NID\_STM | 8 | STM identity |

Packet 50: Acknowledgement reply (from DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | Report from ETCS on driver acknowledgement. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_NID\_EVC\_MESSAGE | 8 | Acknowledged message instance identifier |

Packet 52: Driver request (from DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | Driver action reported to the EVC. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_NID\_BUTTON | 10 | Identifier of button |

Packet 53: Driver data reply (from DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | Driver data sent to the EVC. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_NID\_DATA | 10 | Identifier of the data |
| DMI\_Q\_VALUE\_TYPE | 2 | Type of the returned value. |
| DMI\_L\_VALUE | 8 | If DMI\_Q\_VALUE\_TYPE = 1 \*:  Size of the data value string |
| DMI\_X\_VALUE (i) | 8 | If DMI\_Q\_VALUE\_TYPE = 1 \*:  ith data value text string element |
| DMI\_NID\_VALUE | 8 | If DMI\_Q\_VALUE\_TYPE = 2 \*:  Identifier of a value |
| DMI\_T\_CLOCK | 32 | If DMI\_Q\_VALUE\_TYPE = 3 \*:  Data value (when it is a clock). |

\*: if DMI\_Q\_VALUE\_TYPE has another value, this variable is not transmitted.

Packet 54: Confirmation reply (From DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | Driver reply sent to the EVC | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_M\_CONFIRMATION\_WINDOW | 8 | Identifier of the confirmation window |
| One bit to 0 | 1 | Value = 0 (not used)  This bit is kept to avoid integration problems |
| DMI\_Q\_CONFIRM | 1 | Driver Confirmation |
| DMI\_N\_ITER | 5 | Number of i-iterations |
| DMI\_NID\_DATA (i) | 10 | Identifier of the data |
| DMI\_Q\_VALUE\_TYPE (i) | 2 | Type of the ith data value |
| DMI\_L\_VALUE (i) | 8 | If DMI\_Q\_VALUE\_TYPE = 1 \*:  Size of string for the ith data value |
| DMI\_X\_VALUE (i,j) | 8 | If DMI\_Q\_VALUE\_TYPE = 1 \*:  jth text string element of the ith data value |
| DMI\_NID\_VALUE (i) | 8 | If DMI\_Q\_VALUE\_TYPE = 2 \*:  Identifier of the ith data value |
| DMI\_T\_CLOCK (i) | 32 | If DMI\_Q\_VALUE\_TYPE = 3 \*:  ith data value (when it is a clock). |

\*: if DMI\_Q\_VALUE\_TYPE has another value, this variable is not transmitted.

Packet 56: Text message deleted stack full (from DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | Report from ETCS on deletion of text message when the stack is full. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_NID\_EVC\_MESSAGE | 8 | Message instance identifier |

Packet 57 : DMI connection confirm (From DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains the connection confirmation with the versions of DMI software and configuration data. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_Q\_CONNECT | 4 | Qualifier of the connection |
| SW\_INTERFACE\_EVC\_DMI\_VERSION | 24 | SW interface between DMI and EVC |
| DP\_INTERFACE\_EVC\_DMI\_VERSION | 24 | DP interface between DMI and EVC |

Packet 58 : DMI state (from DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains the actual state of the DMI | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_Q\_STATE | 4 | DMI state qualifier |
| SCREEN\_STATE\_MAIN | 2 | Primary screen status |
|  | SCREEN\_STATE\_SECONDARY | 2 | Secondary screen status |

Packet 59: Event report (from DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | The DMI reports an internal event to be recorded by the JRU. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_NID\_EVENT | 8 | Event identifier |

Packet 66: DMI-controlled window request (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet is sent from the EVC to the DMI when a DMI-controlled window has to be displayed. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_M\_DMI\_CONTROLLED\_WINDOW | 8 | Identifier of the DMI-controlled window to be displayed. |

Packet 67: DMI-controlled window exit request (from DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet is sent from DMI to EVC when a (local) condition is fulfilled by the DMI to exit of current DMI-controlled menu window. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |

Packet 68: Acknowledgeable indicator (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | Indicator to be acknowledged by the driver. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_NID\_EVC\_MESSAGE | 8 | Message instance identifier.  Common use with packet 9 message instance identifiers. |
| DMI\_NID\_EVC\_INDICATOR | 10 | Indicator Identifier |
| DMI\_NID\_EVC\_ICON | 8 | Icon identifier |

Packet 69: ACK Retention (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet indicates if the ACK requests have to be buffered by the DMI or can be treated immediately. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_Q\_ACK\_RETENTION | 1 | ACK retention |

Packet 70: On-going Acknowledgement (from DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | Indicates when the DMI begins or ends the process of its acknowledgement FIFO. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_Q\_ONGOING\_ACK | 1 | Acknowledgement process beginning / end |

Packet 71: Digital train speed info (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet contains numeric speed driving information to be displayed with 3 digits in the centre of the needle. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_V\_TRAIN\_NUM | 10 | Numerical train speed |

Packet 72: Question box request (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet is used by EVC to request the display of a question box to the DMI. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_Q\_DISPLAY\_QUESTION\_BOX | 8 | Question box to be displayed. |

Packet 73: Question box reply (from DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet is used by DMI to send to the EVC the driver answer to a question box. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_Q\_DISPLAY\_QUESTION\_BOX | 8 | Question box to be displayed. |
| DMI\_Q\_QUESTION\_REPLY | 1 | Driver answer to the question box. |

Packet 76: Fixed text messages (From EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | Text message from track to train transmitted from EVC to DMI  This packet is derived from subset 26 packet 76 | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_NID\_TRACK\_MESSAGE | 8 | Instance identifier of the message |
| Q\_TEXTCLASS | 2 | Class of message to be displayed. |
| DMI\_Q\_TEXTACK | 2 | Qualifier of acknowledgement of the fixed text message. |
| Q\_TEXT | 8 | qualifier of predefined text |

Packet 77: Track acknowledgement reply (from DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | Report from ETCS on acknowledgement of text message.  If text message is deleted before acknowledgement, this packet is not transmitted. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_NID\_TRACK\_MESSAGE | 8 | Instance identifier of the ack message |

Packet 78: Delete track text message (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | EVC commands the deletion of text message. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_NID\_TRACK\_MESSAGE | 8 | Instance identifier of the message |

Packet 79: Track message deleted stack full (from DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | Report from ETCS on deletion of text message when the stack is full... | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_NID\_TRACK\_MESSAGE | 8 | Instance identifier of the message |

Packet 82: Manage ATP test (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | ATP test state during morning test.  EVC sends this message once ATP to test is activated | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| NID\_ATP\_TEST | 9 | ATP identity |
| ATP\_TEST\_STATE | 8 | Current state of the ATP test |

Packet 85: iBox\_state (from DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet notifies EVC for iBox status modification. It is sent to EVC on iBox connection and on iBox status modification. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| DMI\_IBOX\_FAULT\_REPORT | 16 | Bitfield for iBox fault report |
| DMI\_L\_FAULT\_STATUS | 8 | Length of status list |
| DMI\_X\_FAULT\_STATUS (i) | 8 | Fault status array. |

Packet 87: ATP test result (from DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | Indicates that the ATP daily test is over and gives the result. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| NID\_ATP\_TEST | 9 | ATP identity |
| ATP\_TEST\_RESULT | 8 | Result of the ATP test |

Packet 179: Request for additional data entry (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet creates and initialises additional data entry.  Transmitted from EVC to DMI to allow the driver to select the value for all parameters. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| STM\_NID\_STM | 8 | STM requesting additional data |
| DMI\_M\_STRING\_FORMAT | 2 | String format |
| DMI\_N\_ITER | 5 | Number of j-iterations  Maximum value = 15 |
| STM\_NID\_DATA (j) | 8 | Functional identity of the jth STM data to be entered. |
| STM\_L\_DATA\_CAPTION (j) | 6 | Size of the jth data caption string  maximum value :  = 40 if DMI\_M\_STRING\_FORMAT is UTF-8 (20 characters max coded in UTF-8 on 2 bytes)  = 20 if DMI\_M\_STRING\_FORMAT is ISO 8859-1 |
| STM\_X\_DATA\_CAPTION (j,q) | 8 | qth text byte string of the jth data caption(ISO 8859-1 or UTF-8 on 1 or 2 bytes). |
| STM\_L\_VALUE (j) | 5 | String length of the jth default data value.  Maximum value:  = 20 if DMI\_M\_STRING\_FORMAT is UTF-8 (10 characters max coded in UTF-8 on 2 bytes)  = 10 if DMI\_M\_STRING\_FORMAT is ISO 8859-1  = 0 if there is no current value |
| STM\_X\_VALUE (j,i) | 8 | ith text byte of the jth default data value string (ISO 8859-1 or UTF-8 on 1 or 2 bytes) |
| DMI\_N\_ITER\_VALUE (j) | 5 | Number of i-iterations.  Maximum iteration data value = 31 |
| STM\_L\_VALUE (j,i) | 5 | Length of ith predefined value string for the jth value.  maximum value :  = 20 if DMI\_M\_STRING\_FORMAT is UTF-8 (10 characters max coded in UTF-8 on 2 bytes)  = 10 if DMI\_M\_STRING\_FORMAT is ISO 8859-1 |
| STM\_X\_VALUE (j,i,k) | 8 | kth text byte of the ith predefined value for the jth data (ISO 8859-1 or UTF-8 on 1 or 2 bytes) |

Packet 180: Driver selection for additional data entry (from DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet is the report of the driver selection for each additional data entry parameter | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| STM\_NID\_STM | 8 | STM requesting additional data variables. |
| DMI\_M\_STRING\_FORMAT | 2 | String format |
| STM\_NID\_DATA | 8 | Functional identity of a STM data to be entered. |
| STM\_L\_VALUE | 5 | Length of data value string.  maximum value :  = 20 if DMI\_M\_STRING\_FORMAT is UTF-8 (10 characters max coded in UTF-8 on 2 bytes)  = 10 if DMI\_M\_STRING\_FORMAT is ISO 8859-1 |
| STM\_X\_VALUE(j) | 8 | jth byte of the data value string (ISO 8859-1 or UTF-8 on 1 or 2 bytes). |

Packet 181: Confirmation for additional data entry (From EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet is sent by the EVC to the DMI to display to the driver all the parameters to be validated and request him to validate them. The validation is performed by pressing the key “screen confirmed” and the non-validation is performed by pressing the key “screen not confirmed”. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| STM\_NID\_STM | 8 | STM requesting additional data |
| DMI\_M\_STRING\_FORMAT | 2 | String format |
| DMI\_N\_ITER | 5 | Number of j-iterations.  Maximum iteration data = 15 |
| DMI\_Q\_DATA\_STATUS(j) | 3 | Data status of the jth value. |
| STM\_L\_DATA\_CAPTION(j) | 6 | Length of data caption for the jth data.  maximum value :  = 40 if DMI\_M\_STRING\_FORMAT is UTF-8 (20 characters max coded in UTF-8 on 2 bytes)  = 20 if DMI\_M\_STRING\_FORMAT is ISO 8859-1 |
| STM\_X\_DATA\_CAPTION(j,k) | 8 | kth string byte for the jth data caption (ISO 8859-1 or UTF-8 on 1 or 2 bytes) |
| STM\_L\_VALUE(j) | 5 | Length of data value string for the jth data.  maximum value :  = 40 if DMI\_M\_STRING\_FORMAT is UTF-8 (20 characters max coded in UTF-8 on 2 bytes)  = 20 if DMI\_M\_STRING\_FORMAT is ISO 8859-1 |
| STM\_X\_VALUE(j,i) | 8 | ith data value string byte for the jth data (ISO 8859-1 or UTF-8 on 1 or 2 bytes) |

Packet 183: Specific STM data view values (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet creates and initialises additional view entry.  Transmitted from EVC to DMI to allow the driver to show the value for all parameters. | | |
| **Content** | **Variable** | Length | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| STM\_NID\_STM | 8 | STM requesting additional data |
| DMI\_M\_STRING\_FORMAT | 2 | String format |
| N\_ITER | 5 | Number of j-iterations.  Maximum value = 15 |
| STM\_L\_DATA\_CAPTION(j) | 6 | Length of data caption for the jth data.  Maximum value :  = 40 if DMI\_M\_STRING\_FORMAT is UTF-8 (20 characters max coded in UTF-8 on 2 bytes)  = 20 if DMI\_M\_STRING\_FORMAT is ISO 8859-1 |
| STM\_X\_DATA\_CAPTION(j,q) | 8 | qth string byte for the jth data caption (ISO 8859-1 or UTF-8 on 1 or 2 bytes) |
| STM\_L\_VALUE(j) | 5 | Length of data value string for the jth data.  Maximum value:  = 20 if DMI\_M\_STRING\_FORMAT is UTF-8 (10 characters max coded in UTF-8 on 2 bytes)  = 10 if DMI\_M\_STRING\_FORMAT is ISO 8859-1  = 0 if there is no current value |
| STM\_X\_VALUE(j,i) | 8 | ith data value string byte for the jth data (ISO 8859-1 or UTF-8 on 1 or 2 bytes) |

Packet 185: Echo Data for additional data entry (from EVC to DMI)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet is used to send Echo Data related to STM data entry to the DMI. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| STM\_NID\_STM | 8 | STM requesting additional data |
| DMI\_M\_STRING\_FORMAT | 2 | String format |
| DMI\_N\_ITER | 5 | Number of i-iterations  Maximum iteration data = 15 |
| STM\_NID\_DATA(i) | 8 | Identifier of the ith data. |
| DMI\_Q\_DATA\_STATUS(i) | 3 | Data status of the ith data. |
| STM\_L\_DATA\_CAPTION(i) | 6 | Size of the ith data caption string  maximum value :  = 40 if DMI\_M\_STRING\_FORMAT is UTF-8 (20 characters max coded in UTF-8 on 2 bytes)  = 20 if DMI\_M\_STRING\_FORMAT is ISO 8859-1 |
| STM\_X\_DATA\_CAPTION(i,j) | 8 | jth text byte string of the ith data caption (ISO 8859-1 or UTF-8 on 1 or 2 bytes). |
| STM\_L\_VALUE(i) | 5 | String length of the ith data value.  Maximum value:  = 20 if DMI\_M\_STRING\_FORMAT is UTF-8 (10 characters max coded in UTF-8 on 2 bytes)  = 10 if DMI\_M\_STRING\_FORMAT is ISO 8859-1  = 0 if there is no current value |
| STM\_X\_VALUE(i,j) | 8 | jth text byte of the ith data value string (ISO 8859-1 or UTF-8 on 1 or 2 bytes) |

Packet 189: Driver confirmation for additional data entry (from DMI to EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | This packet is the driver selection for the validation of additional data entry parameters. | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
| DMI\_NID\_PACKET | 8 | Packet identifier |
| DMI\_L\_PACKET | 16 | Packet length |
| STM\_Q\_CONFIRM | 1 | Confirmation answer |

## Variables

All variables start with the DMI\_ prefix.

The following letter enables to determine the nature of a variable:

|  |  |  |
| --- | --- | --- |
| A | | Acceleration |
| D | | Distance |
| NID | | Identifier |
| L | | Length |
| M | | Miscellaneous |
| N | | number of items |
| Q | | Qualifier |
| V | | Speed |
| X | | Text |
| T | Time related data | |

The minimum and maximum values are only specified for non-enumerate values (like numbers, distances). When applicable, special and reserved enumerate values are described in the corresponding cell of the variable description.

Variable dictionary :

ATP\_TEST\_RESULT

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Result of ATP test | | |
| **Description** | Indicates the ATP daily test status | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** | 0 : ATP test OK  1 : ATP test KO  2..255 : Spare | | |

ATP\_TEST\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | State of ATP test | | |
| **Description** | Indicate if DMI shall start or finish STM test sequence | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** | 0 : ATP acceptance OFF  1 : ATP acceptance IN PROGRESS  2 : ATP acceptance ON  3 : ATP test ABORTED  4..255 : Spare | | |

BUILD\_IMAGE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | DMI activity | | |
| **Description** | This variable is sent by EVC to activate the DMI screen | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | 0 : DMI CPU shall be inactive.  1 : DMI CPU shall be active. | | |

CYCLE\_NUMBER

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Cycle number | | |
| **Description** | Synchronization number for display verification | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits | 0 | 127 |  |
| **Special/Reserved Values** | -1 : this value disables the safety verification. EVC shall use this value at standstill when the screen may be covered by technical menu or data entry.  -128..-2 : Spare | | |

DMI\_ACCEPTANCE\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | State of acceptance | | |
| **Description** | Tell if the STM “y” can have access to the DMI | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 2 bits |  |  |  |
| **Special/Reserved Values** | 00 : NON\_ACCEPTANCE  01 : ACCEPTANCE  10 : PRELIMINARY ACCEPTANCE  11 : Spare | | |

DMI\_DISPLAY\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | State of the DMI terminal display | | |
| **Description** | Indicate the DRU its terminal used for log display is no more visible | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** | 1 : the DMI terminal is cleaned | | |

DMI\_D\_GEO\_POS

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Geographical position | | |
| **Description** | Provides the kilometre point of the geographical position | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 24 bits | 0 | 16777214 m | 1 m |
| **Special/Reserved Values** | 16777215: value out of range | | |

DMI\_D\_TARGET

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Target Distance | | |
| **Description** | Next Target Distance (in BTS and BEOA sections) shows the remaining distance to the brake target. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 15 bits | 0 m | 327,660 km | 10 cm, 1m or 10 m depending on DMI\_Q\_SCALE |
| **Special/Reserved Values** | 32767: target unknown | | |

DMI\_D\_TUN\_STOPPING

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Distance of tunnel stopping area | | |
| **Description** | Provides the distance value of the tunnel stopping area | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 24 bits | 0 | 16 777 214 m | 1 m |
| **Special/Reserved Values** | 16 777 215: distance out of range | | |

DMI\_IBOX\_FAULT\_REPORT

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | IBOX fault report | | |
| **Description** | Bitfield for IBOX fault report | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 16 bits |  |  | Bitfield |
| **Special/Reserved Values** | Bit 0 : defect in national system selection  Bit 1 : defect in cabin selection  Bit 2 : link lost between iBox & (ATB/NG, TBL2/3, LZB/PZB or ATP/BR)  Bit 3 : voltage loss on national system (ATB/NG,TBL2/3, LZB/PZB ou ATP/BR)  Bit 4 : defect on the 0..20 mA entry (real speed measurement)  Bit 5 : defect on frequential entry (V4 or V5)  Bit 6 : defect on safety display  Bit 7 : internal iBox defect  Bit 8 : EVC isolation detected  Bit 9 : timeout on answer from DMI  Bit 10-15 : spare  Bit 0, 1or 7 sets indicates a defect on iBox.  Bit 6 or bit 9 set indicates a defect on DMI  Bit 2, 3, 4 or 5 set indicates a defect on a national ATP  Bit 8 shall never be set on packet 85 reception | | |

DMI\_L\_FAULT\_STATUS

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Fault status length | | |
| **Description** | Length of iBox status length | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits | 0 | 255 | 1 byte |
| **Special/Reserved Values** |  | | |

DMI\_L\_PACKET

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Packet length | | |
| **Description** | DMI\_L\_PACKET indicates the length of the packet in bits, including all bits of the packet header | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 16 bits | 0 | 65535 | 1 bit |
| **Special/Reserved Values** |  | | |

DMI\_L\_TELEGRAM

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Telegram length | | |
| **Description** | Indicates the length of the telegram in bytes, including all packets and all variables defined in the telegrams header and padding bits if any. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 16 bits | 0 | 65535 | 1 byte |
| **Special/Reserved Values** |  | | |

DMI\_L\_TEXT

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Length of text string | | |
| **Description** | DMI\_L\_TEXT defines the length of a text string (DMI\_TEXT \* DMI\_X\_TEXT) | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits | 1 | 255 | 1 Text String Element |
| **Special/Reserved Values** | 0 : No string  No DMI\_X\_TEXT in following DMI\_L\_TEXT | | |

DMI\_L\_VALUE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Length of text data bytestring for value | | |
| **Description** | DMI\_L\_VALUE defines the length of a text data bytestring for value (DMI\_L\_VALUE \* DMI\_X\_VALUE) | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits | 1 | 255 | 1 Text Sting Element |
| **Special/Reserved Values** | 0 : No String – no DMI\_X\_VALUE in following DMI\_L\_VALUE | | |

DMI\_M\_BUTTON\_STATUS

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Status of a Driver menu tree leaf | | |
| **Description** | A menu tree leaf (button) may be sensitive or not | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | 0 : Button is not enabled  1 : Button is enabled | | |

DMI\_M\_COLOUR\_IS

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Colour of intervention speed | | |
| **Description** | Colour of intervention speed indication for speed supervision; the colours are identical to those defined by ERA in /3/. | | |
| **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 | | |

DMI\_M\_COLOUR\_PS

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Colour of permitted speed | | |
| **Description** | Colour of permitted speed indication for speed supervision; the colours are identical to those defined by ERA in /3/. | | |
| **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 | | |

DMI\_M\_COLOUR\_RS

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Colour of release speed | | |
| **Description** | Colour of release speed indication for speed supervision; the colours are identical to those defined by ERA in /3/. | | |
| **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 | | |

DMI\_M\_COLOUR\_SP

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Colour of speed pointer (needle) | | |
| **Description** | Colour of analogic speed needle for speed supervision; the colours are identical to those defined by ERA in /3/. | | |
| **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 | | |

DMI\_M\_COLOUR\_TS

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Colour of target speed | | |
| **Description** | Colour of target speed indication for speed supervision; the colours are identical to those defined by ERA in /3/. | | |
| **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 | | |

DMI\_M\_CONFIRMATION\_WINDOW

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Confirmation Screen identifier | | |
| **Description** |  | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** |  | | |

DMI\_M\_DMI\_CONTROLLED\_WINDOW

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | DMI-controlled window identifier. | | |
| **Description** | Identification number of the data entry window to be displayed. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** |  | | |

DMI\_M\_ENTRY\_WINDOW

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Data entry window identifier. | | |
| **Description** | Identification number of the data entry window to be displayed. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** |  | | |

DMI\_M\_GRAD

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Absolute safe gradient value | | |
| **Description** | DMI\_G\_GRAD is the value of the gradient to be displayed on the planning area. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits | 0 | 254 | 1 ‰ |
| **Special/Reserved Values** | 255 : spare | | |

DMI\_M\_PLANNING

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Status of the planning area displaying | | |
| **Description** | Inform whether the planning area shall be displayed or hidden | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | 0 : planning area is disabled  1 : planning area is enabled | | |

DMI\_M\_MENU\_WINDOW

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Menu window identifier | | |
| **Description** | Identification number of the menu window to be displayed by the DMI. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** |  | | |

DMI\_M\_STRING\_FORMAT

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Format of exchanged strings. | | |
| **Description** | Format of the string to be displayed by DMI when receiving STM-related proprietary packets. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 2 bits |  |  |  |
| **Special/Reserved Values** | 0: ISO 8859-1, also known as Latin Alphabet.  1: UTF-8 with 1 or 2 bytes.  2: reserved  3: reserved | | |

DMI\_M\_VIEW\_WINDOW

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Data view window identifier | | |
| **Description** | Identification number of the data view window to be displayed by the DMI. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** |  | | |

DMI\_M\_XATTRIBUTE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Attributes for text string used by EVC and DRU | | |
| **Description** | Attributes are either selected explicitly using foreground and background colour etc, or using predefined attributes selected by the DMI. The predefined attributes should be consistent with attributes used in ETCS levels of operation  Colour shall be defined in the configuration data “Colour” | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 10 bits |  |  |  |
| **Special/Reserved Values** | 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  Xxxx000xxx : Dark blue background  Xxxx001xxx : White background  Xxxx010xxx : Red background  Xxxx011xxx : Blue background  Xxxx100xxx : Green background  Xxxx101xxx : Yellow background  Xxxx110xxx : Light red background  Xxxx111xxx : Light green background | | |

DMI\_N\_ITER

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Number of iterations of a data set following this variable in a packet | | |
| **Description** | Two nested levels of iterations can exist. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 5 bits | 0 | 31 | integer |
| **Special/Reserved Values** |  | | |

DMI\_N\_ITER\_DATA\_VIEW

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Number of iterations of a data set following this variable in a packet | | |
| **Description** | Two nested levels of iterations can exist. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits | 0 | 63 | integer |
| **Special/Reserved Values** |  | | |

DMI\_N\_ITER\_BUTTON

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Number of iterations of BUTTON following this variable in a packet | | |
| **Description** | Number of iterations of BUTTON following this variable in a packet | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits | 0 | 255 | integer |
| **Special/Reserved Values** |  | | |

DMI\_N\_ITER\_INDICATOR

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Number of iterations of indicator in a packet | | |
| **Description** | Number of iterations of indicator in a packet. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8bits | 0 | 255 | Integer |
| **Special/Reserved Values** |  | | |

DMI\_N\_ITER\_READBACK

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | Number of iterations of readback objects | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits | 0 | 65535 | integer |
| **Special/Reserved Values** |  | | |

DMI\_N\_ITER\_TECH\_INDICATOR

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Number of iterations of technical indicator in a packet | | |
| **Description** | Number of iterations of technical indicator in a packet | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits | 0 | 255 | Integer |
| **Special/Reserved Values** |  | | |

DMI\_N\_ITER\_TEXT

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Number of iterations of a TEXT following this variable in a packet | | |
| **Description** | Number of iterations of a TEXT following this variable in a packet. Two nested levels of iterations can exist. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 5 bits | 0 | 31 | integer |
| **Special/Reserved Values** |  | | |

DMI\_N\_ITER\_VALUE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Number of iterations of a data set following this variable in a packet | | |
| **Description** | Number of iterations of a data set following this variable in a packet | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 5 bits | 0 | 31 | Integer |
| **Special/Reserved Values** |  | | |

DMI\_NID\_ACK

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Qualifier of the acknowledgement | | |
| **Description** | DMI\_NID\_ACK is a qualifier of the acknowledgement. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 2 bits |  |  |  |
| **Special/Reserved Values** | “0 : false : data is not acknowledged, “  “1 : true : data is acknowledged.”  “2..3 : spare” | | |

DMI\_NID\_AREA

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Qualifier of the display area of the planning area | | |
| **Description** | DMI\_NID\_AREA is a qualifier to select the display area of the planning area. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 2 bits |  |  |  |
| **Special/Reserved Values** | 0 : area D2/3/4 (track conditions)  1 : area D6 (flags)  2 : area D8 (indication point)  3 : Spare | | |

DMI\_NID\_BUTTON

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Button identifier | | |
| **Description** | Functional identifier of requested button. Allows DMI to apply customisation, if defined within the DMI.  Functional identity is dependent of button state.  Each button are defined in the data prep | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 10 bits |  |  |  |
| **Special/Reserved Values** |  | | |

DMI\_NID\_DATA

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | DATA identifier | | |
| **Description** | Identifier of train data | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 10 bits |  |  |  |
| **Special/Reserved Values** |  | | |

DMI\_NID\_DRU\_MESSAGE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | DRU message instance identifier | | |
| **Description** | Identifier of a DRU message | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  | integer |
| **Special/Reserved Values** |  | | |

DMI\_NID\_DRV\_LANG

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | Driver Language Selection  This table includes a subset of the language identifiers included in the norm. | | |
| ***Length of variable*** | ***Value*** | ***Language*** |  |
| 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 | |

DMI\_NID\_EVC\_ICON

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Icon identifier | | |
| **Description** | Identifier of icon. Allow DMI to apply customisation, if defined within the DMI. Functional identify is part of button or indication. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** |  | | |

DMI\_NID\_EVC\_INDICATOR

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Indicator Identifier | | |
| **Description** | Functional identity of indicator. Allows DMI to apply customisation, if defined within the DMI. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 10 bits |  |  |  |
| **Special/Reserved Values** |  | | |

DMI\_NID\_EVC\_MESSAGE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | EVC message instance identifier | | |
| **Description** | Instance identifier of an EVC message (text message, acknowledgeable indicator). | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  | integer |
| **Special/Reserved Values** | Each new message has a different instance identifier, allowing the receptor to distinguish it from previous messages. | | |

DMI\_NID\_EVC\_SOUND

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Identifier of sound | | |
| **Description** | Identifier of sound | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** |  | | |

DMI\_NID\_EVENT

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | DMI internal event identifier. | | |
| **Description** | Identifier of a DMI internal event to be recorded by the JRU. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** | 0: spare  1: DR01 icon displayed  2: DR01 icon removed  3: DR02 icon displayed  4: DR02 icon removed  5: DR03 icon displayed  6: DR03 icon removed  7: DR04 icon displayed  8: DR04 icon removed  9: DR05 icon displayed  10: DR05 icon removed  11: Sinfo sound is played – acknowledgement displayed  12: Sinfo sound is played – high priority text message displayed  13..255: reserved for future use. | | |

DMI\_NID\_LANGUAGE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Driver Languages | | |
| **Description** | This variable contains the driver language choice. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 6 bits |  |  |  |
| **Special/Reserved Values** |  | | |

DMI\_NID\_PACKET

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Packet identifier | | |
| **Description** | This is used in the header for each packet, allowing the receiving equipment to identify data which follows. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  | Numbers |
| **Special/Reserved Values** | Values reserved according to packet identifiers attribution. | | |

DMI\_NID\_TECH\_ICON

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Technical Icon identifier | | |
| **Description** | Identifier of technical icon. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 10 bits |  |  |  |
| **Special/Reserved Values** | 0 : erase the current indicator content | | |

DMI\_NID\_TECH\_INDICATOR

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Technical Indicator Identifier | | |
| **Description** | Functional identity of technical indicator. Allows DMI to apply customisation, if defined within the DMI. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** | . | | |

DMI\_NID\_TELEGRAM

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Telegram identifier | | |
| **Description** | Telegram identifier | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** | 1: Telegram from EVC application SW (ETCS application)  2: Telegram from EVC basic SW  3: Telegram to EVC application SW (ETCS application)  4: Telegram to EVC basic SW  5: Telegram from EVC diagnostic application  6: Telegram to EVC diagnostic application  9: diagnostic Telegram  10: Telegram from DRU ERTMS application  11: Telegram to DRU ERTMS application  12: Telegram from diagnostic application (technical function)  13: Telegram to diagnostic application (technical function)  14..21: Spare  22: Telegram from EVC to Safety module  23: Telegram from Safety module to EVC  24..255: Spare | | |

DMI\_NID\_TRACK\_MESSAGE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Track message instance identifier | | |
| **Description** | Instance identifier a track message | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** | Each new text message has a different instance identifier, allowing the receptor to distinguish it from previous messages. | | |

DMI\_NID\_VALUE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Identifier of a data value | | |
| **Description** | Each data value is identified by DMI\_NID\_VALUE and DMI\_NID\_DATA. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** |  | | |

DMI\_OBJECT\_ID

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Graphical object identifier | | |
| **Description** | Each object that can be readback by the DMI have one unique identifier. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** | This identifier is specified in READBACK SIL0 application configuration file. | | |

DMI\_Q\_ACK

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

DMI\_Q\_ACK\_RETENTION

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Acknowledgement retention qualifier | | |
| **Description** | The qualifier for ACK retention allows the EVC to prevent / allow the DMI to process and display its ACK requests. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | 0: ACK allowed.  1: ACK to be postponed. | | |

DMI\_Q\_CONFIRM

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Confirmation screen qualifier | | |
| **Description** | The variable is used to identify if the confirmation screen is confirmed or not. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | Value = 0 : screen no confirmed  Value = 1 : screen confirmed | | |

DMI\_Q\_CONNECT

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | State of connection | | |
| **Description** | Reports protocol state of connection or command | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 4 bits |  |  |  |
| **Special/Reserved Values** | 0 : connection request  1 : connection confirmation  2 : disconnection request  3 :disconnection confirmation  4 : connection deny  5-15 : spare | | |

DMI\_Q\_DATA\_STATUS

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Status of echo data | | |
| **Description** | Indicates the echo data status | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 3 bits |  |  |  |
| **Special/Reserved Values** | 0: Data not accepted by the driver  1: Data accepted by the driver  2: Technical range check failed  3: Technical resolution check failed  4: Technical cross-check failed  5: Operational range check failed  6: Operational cross-check failed  7: spare | | |

DMI\_Q\_DISPLAY\_GEO\_POS

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Status of the geographical position display | | |
| **Description** | Inform whether the geographical position shall be displayed or hidden. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | 0 : geographical position is not shown  1 : geographical position is shown | | |

DMI\_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 | | |

DMI\_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 | | |

DMI\_Q\_DISPLAY\_QUESTION\_BOX

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Question box to be displayed | | |
| **Description** | This variable is used to determine the question box to be displayed. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** | 0: no display  1: Track Ahead Free  2..255: reserved for future use | | |

DMI\_Q\_DISPLAY\_RS

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Display mode for release speed | | |
| **Description** | Display mode for release speed | | |
| **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 | | |

DMI\_Q\_DISPLAY\_TD

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Display mode for target distance | | |
| **Description** | Display mode for target distance | | |
| **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 | | |

DMI\_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 | | |

DMI\_Q\_DISPLAY\_TUN\_STOPPING

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Status of the tunnel stopping area display | | |
| **Description** | Inform whether the tunnel stopping area distance shall be displayed or hidden | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | 0 : distance of tunnel stopping area is not shown  1 : distance of tunnel stopping area is shown | | |

DMI\_Q\_DRU\_CONNECT

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | State of DRU connection | | |
| **Description** | Reports protocol state of connection or command | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 4 bits |  |  |  |
| **Special/Reserved Values** | 0 : undefined  1 : connect request  2 : connect confirm  3 : connect denied  4 : disconnect request  5 : disconnect confirm  6..15 : spare | | |

DMI\_Q\_DRU\_TEXT

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Fixed message to be displayed. | | |
| **Description** | DMI\_Q\_DRU\_TEXT is a pointer to select a fixed text message from the defined in the DMI configuration data. The language selected by the driver for the DMI shall be used additionally as a qualifier to choose the appropriate language table. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** |  | | |

DMI\_Q\_FREEZE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Frozen state of the DMI | | |
| **Description** | DMI\_Q\_FREEZE is a qualifier indicating if the data entry currently displayed on the DMI shall be frozen or not | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | 0 : not frozen  1 : frozen | | |

DMI\_Q\_GRAD\_DIR

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Qualifier for gradient slope of the planning area | | |
| **Description** | DMI\_Q\_GRAD\_DIR is a qualifier indicating the direction of the gradient to be displayed on the planning area. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | 0 : downhill  1 : uphill | | |

DMI\_Q\_HOUR\_GLASS

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Qualifier for Hour glass display. | | |
| **Description** | The qualifier for Hour Glass display allows to display or not the hour glass on the title area of the corresponding menu window. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | 0: no hour glass displayed.  1: hour glass displayed. | | |

DMI\_Q\_INDICATOR

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Status of DMI indicator | | |
| **Description** | The DMI\_Q\_INDICATOR variable is a status that controls icon objet. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 2 bits |  |  |  |
| **Special/Reserved Values** | 0 : The icon is not displayed (the area is cleared)  1 : The icon is displayed with no flashing  2 : The icon is displayed with slow flashing  3 : The icon is displayed with fast flashing | | |

DMI\_Q\_INH\_ETCS\_SPD\_DIST\_DISPLAY

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | ETCS speed and distance display inhibition | | |
| **Description** | The variable is used by the EVC to inhibit the display of ETCS speed and distance. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | 0 : ETCS Speed and Distance Display enabled.  1 : ETCS Speed and Distance Display inhibited. | | |

DMI\_Q\_ONGOING\_ACK

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Indicator of on-going ACK process | | |
| **Description** | The qualifier of on-going ACK allows the DMI to inform the EVC that an ACK request is being treated and displayed. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | 0: there is no more ACK being treated and displayed by the DMI.  1: there is an ACK being treated and displayed by the DMI. | | |

DMI\_Q\_PRIORITY

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Message text priority | | |
| **Description** | This variable defines the priorities of the message. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | 0 : low priorities  1 : high priorities | | |

DMI\_Q\_QUESTION\_REPLY

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Reply to the question box | | |
| **Description** | This variable informs the EVC about the driver answer to a question box. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | 0: answer is “No”,  1: answer is “yes”. | | |

DMI\_Q\_SCALE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Qualifier for the distance scale. | | |
| **Description** | Qualifier to indicate the same scale used for describing all distances inside the packet that contains Q\_SCALE. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 2 bits |  |  |  |
| **Special/Reserved Values** | 0 : 10 cm scale  1 : 1 m scale  2 : 10 m scale  3 : spare | | |

DMI\_Q\_SOUND

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | sound qualifier | | |
| **Description** | Indicate to the sound generator if the sound defined by DMI\_NID\_EVC\_SOUND shall be activated or stopped | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits | 1 | 254 |  |
| **Special/Reserved Values** | 0 : the sound shall be stopped  1..254 : the sound shall be activated X times (x is the value of DMI\_Q\_SOUND)  255 : the sound shall be activated infinitely | | |

DMI\_Q\_START\_STOP

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Qualifier of the transmission process beginning and end. | | |
| **Description** | This variable indicates to the DMI that the beginning of the data transmission process is beginning, or that no more data has to be transmistted. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 2 bits |  |  |  |
| **Special/Reserved Values** | 0: not used.  1: start of the transmission process  2: stop of the transmission process  3: not used | | |

DMI\_Q\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | DMI STATE qualifier | | |
| **Description** | Indicate to the state of the DMI (operational mode) | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 4 bits |  |  |  |
| **Special/Reserved Values** | 0 : Self-test mode  1 : Initialisation mode  2 : Awaiting ETCS / TCMS connection mode  3 : Establish connection mode  4 : Partially ETCS mode  5 : Nominal ETCS mode  6 : Failure mode  7..15 : spare | | |

DMI\_Q\_TEXT

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Fixed message to be displayed. | | |
| **Description** | DMI\_Q\_TEXT is a pointer to select a fixed text message defined in the DMI configuration data. The language selected by the driver for the DMI shall be used as a qualifier to choose the appropriate language table. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** |  | | |

DMI\_Q\_TEXTACK

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Qualifier of acknowledgement of the fixed text message. | | |
| **Description** | DMI\_Q\_TEXTACK is a qualifier to determine if the text message has to be acknowledged or not | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 2 bits |  |  |  |
| **Special/Reserved Values** | 0 : No acknowledgement  1 : acknowledgement required  2..3 : Spare | | |

DMI\_Q\_TEXT\_CONFIRM

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | DMI\_Q\_TEXT\_CONFIRM is a pointer to select a fixed text message from the defined table the DMI configuration data. The language selected by the driver for the DMI shall be used additionally as a qualifier to choose the appropriate language table. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** |  | | |

DMI\_Q\_VALUE\_TYPE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Qualifier of value type. | | |
| **Description** | DMI\_Q\_VALUE\_TYPE is a qualifier to define the type of data value transmitted in a packet. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 2 bits |  |  |  |
| **Special/Reserved Values** | 0 : No value  1 : Character string  2 : Value identifier  3 : clock (see variable DMI\_T\_CLOCK) | | |

DMI\_Q\_WIDTH

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Qualifier of the speed restriction width of the planning area | | |
| **Description** | DMI\_Q\_WITDH is a qualifier to select the speed restriction width of the planning area. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 7 bits | 0 | 100 | 1% |
| **Special/Reserved Values** | 101-127 : Spare | | |

DMI\_RB\_VALUE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Displayed value read back by the DMI | | |
| **Description** | This variable contains the value that has been read back by the DMI. The value is associated to the DMI\_OBJECT\_ID and depends on the object type.  ANALOGICAL SPEED : speed pointed by needle  NUMERICAL SPEED : speed displayed by numerical speed object  ICON : checksum of a pictogram  TARGET DISTANCE : distance displayed on vertical bargraph  Note: because 100 pixels can represent 3000 m, target distance readback value cannot be accurate. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 32 bits | 0 | 4294967295 |  |
| **Special/Reserved Values** |  | | |

DMI\_T\_CLOCK

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Local time | | |
| **Description** | This variable gives the local time, in order to allow the DMI clock to update its value. This is an absolute time, the original date for time 0 is fixed on the 01/01/2000 | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 32 bits | 0s | 4294967294 s (> 130 years) | 1 s |
| **Special/Reserved Values** | 0xFFFF FFFF: no time | | |

DMI\_V\_INTERV

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Intervention speed value | | |
| **Description** | Intervention speed value for CSG displaying | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 10 bits | 0 | 600 km/h | 1 km/h |
| **Special/Reserved Values** | 601..1022 : Spare (no value displayed)  1023 speed unknown | | |

DMI\_V\_PERMIT

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Permitted speed value | | |
| **Description** | Value of the permitted speed from EVC for CSG displaying | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 10 bits | 0 | 600 km/h | 1 km/h |
| **Special/Reserved Values** | 601..1022 : Spare (no value displayed)  1023 speed unknown | | |

DMI\_V\_RELEASE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Release speed value | | |
| **Description** | Release speed value for numeric release speed indication and CSG displaying | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 10 bits | 0 | 600 km/h | 1 km/h |
| **Special/Reserved Values** | 601:1022 : Spare (no value displayed)  1023 speed unknown | | |

DMI\_V\_SET\_SPEED

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Set speed value | | |
| **Description** | Value of the speed which is set by the driver (on an external cruise control system). | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 10 bits | 0 | 600 km/h | 1 km/h |
| **Special/Reserved Values** | 601..1022 : Spare (no icon displayed)  1023 speed unknown (no icon displayed) | | |

DMI\_V\_TARGET

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Target speed value | | |
| **Description** | Target speed value for CSG displaying | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 7 bits | 0 | 600 km/h | 5 km/h |
| **Special/Reserved Values** | 121..126 : Spare (no value displayed)  127 speed unknown | | |

DMI\_V\_TRAIN\_ANALOG

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Current train speed analogic value | | |
| **Description** | Current train speed analogic value | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 10 bits | 0 | 600 km/h | 1 km/h |
| **Special/Reserved Values** | 601..1022 : Spare (no value displayed)  1023 speed unknown | | |

DMI\_V\_TRAIN\_NUM

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Current train speed numeric value | | |
| **Description** | Current train speed numeric value | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 10 bits | 0 | 600 km/h | 1 km/h |
| **Special/Reserved Values** | 601..1022 : Spare (no value displayed)  1023 speed unknown | | |

DMI\_X\_FAULT\_STATUS

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Fault status | | |
| **Description** | iBox status indicating gravity of fault encountered. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** | Indicate for each DMI\_IBOX\_FAULT\_REPORT the gravity level.  The gravity is represented with one byte corresponding to the DMI\_IBOX\_FAULT\_REPORT bit : DMI\_X\_FAULT\_STATUS[0] is linked to DMI\_IBOX\_FAULT\_REPORT(bit 0)  The value of each byte is :  0 : none  1 : minor  2 : major  3 : critical  4 : safety related  4..255 : Spare | | |

DMI\_X\_TEXT

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Text String Element | | |
| **Description** | Text strings are used to transmit plain text messages. Each element of a text string contains a single character encoded as ISO 8859-1, also known as Latin Alphabet # or ISO 8859-7, Latin-greek in function fo the driver languages | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  | ASCII |
| **Special/Reserved Values** |  | | |

DMI\_X\_VALUE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Data Value Text String Element | | |
| **Description** | Text Bytestring for data value  Character set ISO 8859-1 (Latin Alphabet #1) or ISO 8859-7 (Latin-Greek) in function of the driver languages | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  | ASCII |
| **Special/Reserved Values** |  | | |

DP\_INTERFACE\_EVC\_DMI\_VERSION

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Version of the data preparation interface between EVC & DMI | | |
| **Description** | This version is sent by the DMI and checked by the EVC. It is part of the DMI data preparation | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 24 bits |  |  | String of 3 characters | |
| **Special/Reserved Values** |  | | |

DP\_INTERFACE\_TRU\_DMI\_VERSION

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Version of the data preparation interface between TRU & DMI | | |
| **Description** | This version is sent by the TRU and checked by the EVC. It is part of the DMI data preparation | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 24 bits |  |  | String of 3 characters | |
| **Special/Reserved Values** |  | | |

DRU\_L\_PACKET

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | DRU Packet length | | |
| **Description** | DRU\_L\_PACKET indicates the length of the packet in bytes, including all variables. | | |
| **Source of definition** | TRU definition | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 16 bits | 0 | 65535 | 1 Byte |
| **Special/Reserved Values** |  | | |

DRU\_M\_DIAG

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Diagnostic code | | |
| **Description** | Identity number of diagnostic code. | | |
| **Source of definition** | DRU definition | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 12 bits | 0 | 4095 |  |
| **Special/Reserved Values** |  | | |

DRU\_N\_PACKET

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Number of packets in a DRU Telegram. | | |
| **Description** | Number of packets in a DRU Telegram. | | |
| **Source of definition** | TRU definition | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 4 bits | 0 | 31 |  |
| **Special/Reserved Values** |  | | |

DRU\_NID\_CHANNEL

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Channel number identification | | |
| **Description** | Identity number of the channel number – or like - which issue the message | | |
| **Source of definition** | DRU definition | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 4 bits |  |  |  |
| **Special/Reserved Values** | 1 : Cab A  2 : Cab B | | |

DRU\_NID\_PACKET

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Packet identifier | | |
| **Description** | This is used in the header for each packet, allowing the receiving equipment to identify data which follows. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** |  | | |

DRU\_NID\_SOURCE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Identification of the source | | |
| **Description** | Defines the source that is sending the diagnostic code message.  This variable is required in order to select the proper documentation for interpreting the diagnostic log. | | |
| **Source of definition** | DRU definition | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** | 4: DMI | | |

DRU\_T\_TRAIN

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Profibus safety layers profibus local reference time | | |
| **Description** | Value of the Profibus safety layers local reference time | | |
| **Source of definition** | DRU definition | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 32 bits | 0 | 42949672.94 s | 0.01 s |
| **Special/Reserved Values** |  | | |

NID\_ATP\_TEST

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | ATP identity | | |
| **Description** | The identifier of an ATP connected to DMI | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 9 bits |  |  |  |
| **Special/Reserved Values** | Value 256 is reserved for EVC identification. | | |

PRIMARY\_DISPLAY\_OTHER

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Function allocation of the primary screen | | |
| **Description** | This variable is sent by EVC to perform the functional repartition of the graphical objects. ALSTOM DMI will treat this data by displaying all the ERTMS data available, including Planning Area. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | 0 : DMI shall not display any ERTMS data  1 : DMI shall display ERTMS data | | |

PRIMARY\_DISPLAY\_PA

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Function allocation of the primary screen | | |
| **Description** | This variable is sent by EVC to indicate that the DMI shall display the Planning Area on its primary display. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | This variable will not be used by ALSTOM DMI in a first step. | | |

PRIMARY\_DISPLAY\_SPARE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Function allocation of the primary screen | | |
| **Description** | This variable is currently not used. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit | 0 | 1 | Bit |
| **Special/Reserved Values** |  | | |

Q\_TEXTCLASS

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Class of message to be displayed. | | |
| **Description** | Q\_TEXTCLASS specifies the class of the text message included in the same packet (either plain or fixed message) | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 2 bits |  |  |  |
| **Special/Reserved Values** | 0 : Auxiliary Information  1 : Important Information  2..3: spare | | |

PRIMARY\_DISPLAY\_SPEEDO

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Function allocation of the primary screen | | |
| **Description** | This variable is sent by EVC to perform the functional repartition of the graphical objects. ALSTOM DMI will treat this data by displaying only the speedo. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | 0 : DMI shall not display the alone speedo  1 : DMI shall display the alone speedo | | |

SECONDARY\_DISPLAY\_OTHER

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Function allocation of the seconday screen | | |
| **Description** | This variable is sent by EVC to perform the functional repartition of the graphical objects on the secondary screen. ALSTOM DMI will treat this data by displaying all the ERTMS data available, including Planning Area. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | 0 : DMI shall not display any ERTMS data  1 : DMI shall display ERTMS data | | |

SECONDARY\_DISPLAY\_PA

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Function allocation of the primary screen | | |
| **Description** | This variable is sent by EVC to indicate that the DMI shall display the Planning Area on its secondary display. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | This variable will not be used by ALSTOM DMI in a first step. | | |

SECONDARY\_DISPLAY\_SPARE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Function allocation of the primary screen | | |
| **Description** | This variable is currently not used. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** |  | | |

SECONDARY\_DISPLAY\_SPEEDO

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Function allocation of the primary screen | | |
| **Description** | This variable is sent by EVC to perform the functional repartition of the graphical objects. ALSTOM DMI will treat this data by displaying only the speedo. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | 0 : DMI shall not display the alone speedo  1 : DMI shall display the alone speedo | | |

SCREEN\_NUMBER

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Screen number | | |
| **Description** | Identifier of the current screen displayed. This identifier is used to determine the screen configuration and define what objects must be verified.  In the way EVC 🡪 DMI : indicates the screen requested  In the way DMI 🡪 EVC : indicates what screen has been checked  The values of SCREEN\_NUMBER shall be configurable. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** | For PP : screen number shall always be 1 | | |

SCREEN\_STATE\_MAIN

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Primary screen state | | |
| **Description** | This variable is sent by DMI to indicate the status of the primary screen | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 2 bits |  |  |  |
| **Special/Reserved Values** | 0 : Primary screen state is OK  1 : Primary screen state is KO  2 : Primary screen state is UNKNOWN  3 : Primary screen state is NOT INSTALLED | | |

SCREEN\_STATE\_SECONDARY

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Secondary screen state | | |
| **Description** | This variable is sent by DMI to indicate the status of the secondary screen | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 2 bits |  |  |  |
| **Special/Reserved Values** | 0 : Secondary screen state is OK  1 : Secondary screen state is KO  2 : Secondary screen state is UNKNOWN  3 : Secondary screen state is NOT INSTALLED | | |

STM\_L\_DATA\_CAPTION

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Length of text caption bytestring | | |
| **Description** | STM\_L\_DATA\_CAPTION defines the length of text caption string in bytes (STM\_L\_DATA\_CAPTION\*STM\_X\_DATA\_CAPTION).  Corresponds to the number of bytes transmitted for caption characters coded in UTF-8. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 6 bits | 1 | 40 | 1 byte |
| **Special/Reserved Values** | 0 : No string, only icon should be used  No STM\_X\_DATA\_CAPTION following STM\_L\_DATA\_CAPTION  41 to 63 not used since the maximum number of characters (coded in UTF-8 with 1 or 2 bytes) for data caption is limited to 20. | | |

STM\_L\_VALUE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Length of text data bytestring for value | | |
| **Description** | STM\_L\_VALUE defines the length of a text data string in bytes for value (STM\_L\_VALUE \* STM\_X\_VALUE) encoded in UTF-8 with 1 or 2 bytes. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 5 bits | 0 | 20 | 1 byte |
| **Special/Reserved Values** | 0 : No String  No STM\_X\_VALUE in following STM\_L\_VALUE  21 to 31 not used since the maximum number of characters (coded in UTF-8 with 1 or 2 bytes) for value is limited to 10. | | |

STM\_M\_XATTRIBUTE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Attributes for text string used by STM | | |
| **Description** | Attributes are either selected explicitly using foreground and background colour etc, or using predefined attributes selected by the MMI. The predefined attributes should be consistent with attributes used in ETCS levels of operation | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 10 bits |  |  |  |
| **Special/Reserved Values** | 0xxxxxxxxx : Not displayed (Note: this allows to “remove” associated object from display)  x0xxxxxxxx : Indicator Normal flashing  x1xxxxxxxx : Indicator Counterphase flashing  Xx00xxxxxx : Indicator No flashing  Xx01xxxxxx : Indicator Slow flashing  Xx10xxxxxx : Indicator Fast flashing  Xx11xxxxxx : Reserved  xxxx000xxx : Dark blue background (applicable while no icon is referenced)  xxxx001xxx : White indicator background (applicable while no icon is referenced)  xxxx010xxx : Red indicator background (applicable while no icon is referenced)  xxxx011xxx : Blue indicator background (applicable while no icon is referenced)  xxxx100xxx : Green indicator background (applicable while no icon is referenced)  xxxx101xxx : Yellow indicator background (applicable while no icon is referenced)  xxxx110xxx : Light red indicator background (applicable while no icon is referenced)  xxxx111xxx : Light green indicator background (applicable while no icon is referenced)  xxxxxxx000 : Black text label (applicable while no icon is referenced)  xxxxxxx001 : White text label (applicable while no icon is referenced)  xxxxxxx010 : Red text label (applicable while no icon is referenced)  xxxxxxx011 : Blue text label (applicable while no icon is referenced)  xxxxxxx100 : Green text label (applicable while no icon is referenced)  xxxxxxx101 : Yellow text label (applicable while no icon is referenced)  xxxxxxx110 : Light red text label (applicable while no icon is referenced)  xxxxxxx111 : Light green text label (applicable while no icon is referenced) | | |

STM\_NID\_DATA

See NID\_DATA description in UNISIG Subset 58.

STM\_NID\_STM

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | STM Identity | | |
| **Description** | This variable is the identifier of the Specific Transmission Module requesting specific data entry or data view through ETCS EVC | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  |  |
| **Special/Reserved Values** | 255 reserved for multicast | | |

STM\_Q\_CONFIRM

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Confirmation screen qualifier | | |
| **Description** | The variable is used to identify if the additional data entry confirmation screen is confirmed or not. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 1 bit |  |  |  |
| **Special/Reserved Values** | Value = 0 : screen no confirmed  Value = 1 : screen confirmed | | |

STM\_X\_DATA\_CAPTION

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Caption Text Byte | | |
| **Description** | First or second (if any) byte of bytestring used for text caption of DMI objects (label of button, indicator and data)  Encoded in UTF-8 with 1 or 2 bytes. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  | UTF-8 with 1 or 2 bytes |
| **Special/Reserved Values** |  | | |

STM\_X\_VALUE

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Data Value Text Byte | | |
| **Description** | First or second (if any) byte of byte string used for data value.  Encoded in UTF-8 with 1 or 2 bytes. | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 8 bits |  |  | UTF-8 with 1 or 2 bytes |
| **Special/Reserved Values** |  | | |

SW\_INTERFACE\_EVC\_DMI\_VERSION

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Version of the software interface between EVC & DMI | | |
| **Description** | This version is sent by the DMI and checked by the EVC. It is part of the DMI data preparation | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 24 bits |  |  | String of 3 characters | |
| **Special/Reserved Values** |  | | |

SW\_INTERFACE\_TRU\_DMI\_VERSION

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | Version of the software interface between TRU & DMI | | |
| **Description** | This version is sent by the TRU and checked by the EVC. It is part of the DMI data preparation | | |
| **Length of variable** | **Minimum Value** | **Maximum Value** | **Resolution/formula** |
| 24 bits |  |  | String of 3 characters | |
| **Special/Reserved Values** |  | | |

# OpenETCS application - JRU interface

## JRU messages definition

The list defines the type of messages with the corresponding Message Identifier   
( “TRU\_NID\_MESSAGE”) and the Message Name.

|  |  |  |
| --- | --- | --- |
| **TRU\_NID\_MESSAGE** | **MESSAGE NAME** | **TYPE OF MESSAGE** |
| 0 | DATA MESSAGE | DATA MESSAGE |
| 1 | TRU STATE | CONTROL MESSAGE |
| 2 | TRU STATE REQUEST | CONTROL MESSAGE |
| 3 | JRU FAILURE | CONTROL MESSAGE |
| 4 | JRU UTC TIME REQUEST | CONTROL MESSAGE |
| 5 | JRU UTC TIME | CONTROL MESSAGE |
| 6 | JRU LOCAL TIME REQUEST | CONTROL MESSAGE |
| 7 | JRU LOCAL TIME | CONTROL MESSAGE |

Only the juridical data messages shall be recorded in the juridical protected memory. The control messages are exchanged with the OpenETCS application (EVC CORE board) but not recorded by the JRU.

## OpenETCS application – JRU control messages

Message 1: TRU STATE (JRU 🡪 EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Field N°** | **VARIABLE** | **Bits** | **Remarks** |
| 1 | TRU\_NID\_MESSAGE | 8 | Type of message |
| 2 | TRU\_M\_STATUS | 8 | State of TRU |

Message 2: TRU State Request (EVC 🡪 JRU)

|  |  |  |  |
| --- | --- | --- | --- |
| **Field N°** | **VARIABLE** | **Bits** | **Remarks** |
| 1 | TRU\_NID\_MESSAGE | 8 | Type of message |

Message 3: JRU Failure (JRU 🡪 EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Field N°** | **VARIABLE** | **Bits** | **Remarks** |
| 1 | TRU\_NID\_MESSAGE | 8 | Type of message |

Message 4 : UTC Request (EVC 🡪 JRU)

|  |  |  |  |
| --- | --- | --- | --- |
| **Field N°** | **VARIABLE** | **Bits** | **Remarks** |
| 1 | TRU\_NID\_MESSAGE | 8 | Type of message |
| 2 | JRU\_T\_TRAIN | 32 | EVC Clock |

Message 5 : JRU\_UTC Time (JRU 🡪 EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Field N°** | **VARIABLE** | **Bits** | **Remarks** |
| 1 | TRU\_NID\_MESSAGE | 8 | Type of message |
| 2 | JRU\_T\_UTC | 38 | Universal time |
| 3 | JRU\_T\_TRAIN | 32 | EVC Clock |
| 4 | Padding bit | 2 | Fix value = 2 bits |

Message 6 : JRU Local Time request (EVC 🡪JRU)

|  |  |  |  |
| --- | --- | --- | --- |
| **Field N°** | **VARIABLE** | **Bits** | **Remarks** |
| 1 | TRU\_NID\_MESSAGE | 8 | Type of message |
| 2 | JRU\_NID\_C | 10 | Identifier of country |
| 3 | JRU\_T\_TRAIN | 32 | EVC Clock |
| 4 | Padding bit | 6 | Fix value = 6 bits |

Message 7: JRU Local Time (JRU 🡪 EVC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Field N°** | **VARIABLE** | **Bits** | **Remarks** |
| 1 | TRU\_NID\_MESSAGE | 8 | Type of message |
| 2 | JRU\_T\_LOCAL\_TIME | 32 | Local time |
| 3 | JRU\_T\_TRAIN | 32 | EVC Clock |

## OpenETCS application-JRU Data messages

The data message generated by the EVC is composed of a common header with potentially a set of predefined packets.

The following section gives the list of packets with the corresponding packet Identifier “JRU\_NID\_PACKET.” and the packet name.

This list is based on the list of messages defined in FIS Juridical recording.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Type of packet** | **Origin** | **Remarks** |
| 1 | GENERAL MESSAGE | EVC |  |
| 2 | TRAIN DATA | EVC |  |
| 3 | EMERGENCY BRAKE COMMAND STATE | EVC |  |
| 4 | SERVICE BRAKE COMMAND STATE | EVC |  |
| 5 | MESSAGE TO RADIO INFILL UNIT | EVC |  |
| 6 | MESSAGE FROM BALISE | EVC |  |
| 7 | MESSAGE FROM EUROLOOP | EVC |  |
| 8 | MESSAGE FROM RADIO INFILL UNIT | EVC |  |
| 9 | MESSAGE FROM RBC | EVC |  |
| 10 | MESSAGE TO RBC | EVC |  |
| 11 | DRIVER’S ACTIONS | EVC |  |
| 12 | BALISES GROUP ERROR | EVC |  |
| 13 | RADIO ERROR | EVC |  |
| 14 | STM INFORMATION | STM |  |
| 15 | INFORMATION FROM COLD MOVEMENT DETECTOR | EVC |  |
| 16 | START DISPLAYING FIXED TEXT MESSAGE | EVC |  |
| 17 | STOP DISPLAYING FIXED TEXT MESSAGE | EVC |  |
| 18 | START DISPLAYING PLAIN TEXT MESSAGE | EVC |  |
| 19 | STOP DISPLAYING PLAIN TEXT MESSAGE | EVC |  |
| 20 | SPEED AND DISTANCE MONITORING INFORMATION | EVC |  |
| 21 | DMI SYMBOL STATUS | EVC |  |
| 22 | DMI SOUND STATUS | EVC |  |
| 23 | DMI SYSTEM STATUS MESSAGE | EVC |  |
| 24 | ADDITIONAL DATA | EVC |  |
| 25 | SR SPEED/DISTANCE ENTERED BY THE DRIVER | EVC |  |
| 26 | NTC SELECTED | EVC |  |
| 27 | SAFETY CRITICAL FAULT IN MODE SL, NL OR PS | EVC |  |
| 28 | VIRTUAL BALISE COVER SET BY THE DRIVER | EVC |  |
| 29 | VIRTUAL BALISE COVER REMOVED BY THE DRIVER | EVC |  |
| 30 | SLEEPING INPUT | EVC |  |
| 31 | PASSIVE SHUNTING INPUT | EVC |  |
| 32 | NON LEADING INPUT | EVC |  |
| 33 | REGENERATIVE BRAKE STATUS | EVC |  |
| 34 | MAGNETIC SHOE BRAKE STATUS | EVC |  |
| 35 | EDDY CURRENT BRAKE STATUS | EVC |  |
| 36 | ELECTRO PNEUMATIC BRAKE STATUS | EVC |  |
| 37 | ADDITIONAL BRAKE STATUS | EVC |  |
| 38 | CAB STATUS | EVC |  |
| 39 | DIRECTION CONTROLLER POSITION | EVC |  |
| 40 | TRACTION STATUS | EVC |  |
| 41 | TYPE OF TRAIN DATA | EVC |  |
| 42 | NATIONAL SYSTEM ISOLATION | EVC |  |
| 43 | TRACTION CUT OFF COMMAND STATE | EVC |  |
| 44-254 | SPARE |  |  |
| 255 | ETCS ON-BOARD PROPRIETARY JURIDICAL DATA | EVC |  |

Common header:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field No.** | | **Variable** | **Bits** | **Remarks** |
| 1 | TRU\_NID\_MESSAGE | | 8 | Type of message (for data message = 0) |
| 2 | JRU\_L\_MESSAGE | | 16 | Total message length (Fields 1 to 19 and packets) |
| 3 | JRU\_T\_TRAIN | | 32 | EVC clock |
| 4 | Reserved | | 8 | Fix value = 8 bits reserved for conversion to T\_UTC |
| 5 | JRU\_Q\_SCALE | | 2 | Current train position |
| 6 | JRU\_NID\_LRBG | | 10+14 | Current train position |
| 7 | JRU\_D\_LRBG | | 15 | Current train position |
| 8 | JRU\_Q\_DIRLRBG | | 2 | Current train position |
| 9 | JRU\_Q\_DLRBG | | 2 | Current train position |
| 10 | JRU\_L\_DOUBTOVER | | 15 | Current train position |
| 11 | JRU\_L\_DOUBTUNDER | | 15 | Current train position |
| 12 | JRU\_V\_TRAIN | | 10 | Current train speed |
| 13 | JRU\_DRIVER\_ID | | 128 | Driver identifier |
| 14 | JRU\_NID\_ENGINE | | 24 | Train running number |
| 15 | JRU\_SYSTEM\_VERSION | | 7 | Version of ETCS System |
| 16 | JRU\_M\_LEVEL | | 3 | Current level |
| 17 | JRU\_M\_MODE | | 4 | Current mode |
| 18 | Padding | | 1 | Fix value = 1 bit |
| 19 | JRU\_N\_PACKET | | 4 | Number of packets in message |
| N | Packets | |  | 0 to N Packets |

Note: The total length of a message is always a multiple of bytes.

The JRU\_NID\_PACKET, the JRU\_L\_PACKET and the JRU\_T\_TRAIN are the only fields to be read by the JRU to process the message as necessary from its reception from the EVC up to its transmission to the JDR. The content of the packets as well as the structure of the packets is to be considered by the JRU as 'transparent'.

The table here below defined the value to be given to a data when it is to be considered as 'unknown'.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **Variable** | **Value** | **Definition** |
| 5 | JRU\_Q\_SCALE | 0 | Pre-set |
| 6 | JRU\_NID\_LRBG | 16777215 | Unknown |
| 7 | JRU\_D\_LRBG | 32767 | Unknown |
| 8 | JRU\_Q\_DIRLRBG | 2 | Unknown |
| 9 | JRU\_Q\_DLRBG | 2 | Unknown |
| 10 | JRU\_L\_DOUBTOVER | 32767 | Unknown |
| 11 | JRU\_L\_DOUBTUNDER | 32767 | Unknown |
| 12 | JRU\_V\_TRAIN | 1023 | Standstill |
| 13 | JRU\_DRIVER\_ID | ???????????????? | Unknown |
| 14 | JRU\_NID\_ENGINE | FFFF FFFF | Pre-set |
| 15 | JRU\_SYSTEM\_VERSION | 127 | Spare |
| 16 | JRU\_M\_LEVEL | 0 | Pre-set |
| 17 | JRU\_M\_MODE | 0 except 10 when EVC isolation | Pre-set |

Packet 1: GENERAL MESSAGE

The JRU common header contents all the necessary data to create the 'General Message'. Only, the variable JRU\_T\_TRAIN is to be replaced by the variables DATE and TIME (UTC).

Packet 2: TRAIN DATA

This packet is sent by the EVC when the driver enters the data at start of mission and each time the driver changes the data values during the mission.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length  bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_V\_MAXTRAIN | 7 |  |
| 4 | JRU\_NC\_CDTRAIN | 4 |  |
| 5 | JRU\_NC\_TRAIN | 15 |  |
| 6 | JRU\_L\_TRAIN | 12 |  |
| 7 | JRU\_T\_TRACTION\_CUT\_OFF | 12 |  |
| 8 | JRU\_M\_BRAKE\_POSITION | 2 |  |
| 9 | JRU\_M\_NOM\_ROT\_MASS | 5 |  |
| 10 | JRU\_M\_REGENERATIVEBRAKE | 2 |  |
| 11 | JRU\_M\_EDDYCURRENTBRAKE | 2 |  |
| 12 | JRU\_M\_MAGNETICSHOEBRAKE | 2 |  |
| 13 | JRU\_M\_ELECTROPNEUMATICBRAKE | 2 |  |
| 14 | JRU\_Q\_TRACTIONCUTOFFINTERFACE | 1 |  |
| 15 | JRU\_Q\_SERVICEBRAKEINTERFACE | 1 |  |
| 16 | JRU\_Q\_SERVICEBRAKEFEEDBACK | 1 |  |
| 17 | JRU\_Q\_BRAKE\_CAPT\_TYPE | 1 |  |
| 18 | JRU\_M\_BRAKE\_PERCENTAGE | 8 | Only if Q\_BRAKE\_CAPT\_TYPE = 0 |
| 19 | JRU\_N\_BRAKE\_CONF | 4 | Only if Q\_BRAKE\_CAPT\_TYPE = 0 |
| 20 | JRU\_M\_BRAKE\_LAMBDA\_CONF(k) | 3 | Only if Q\_BRAKE\_CAPT\_TYPE = 0: specific configuration of the special brakes for lambda train |
| 21 | JRU\_T\_BRAKE\_SERVICE(k) | 12 | Only if Q\_BRAKE\_CAPT\_TYPE = 0: service Brake delay time |
| 22 | JRU\_N\_BRAKE\_CONF | 4 | Only if Q\_BRAKE\_CAPT\_TYPE = 1 (gamma type), N\_BRAKE\_CONF and the following variables follow until A\_BRAKE\_SERVICE\_COMP inclusive |
| 23 | JRU\_M\_BRAKE\_GAMMA\_CONF(k) | 4 |  |
| 24 | JRU\_T\_BRAKE\_EMERGENCY(k) | 12 |  |
| 25 | JRU\_N\_BRAKE\_SECTIONS(k) | 3 |  |
| 26 | JRU\_V\_BRAKE\_EMERGENCY\_COMP(k, m) | 10 |  |
| 27 | JRU\_A\_BRAKE\_EMERGENCY\_COMP(k, m) | 8 |  |
| 28 | JRU\_M\_KDRY\_RST(A\_BRAKE\_EMERGENCY\_COMP(k, m), 0) | 5 |  |
| 29 | JRU\_M\_KDRY\_RST(A\_BRAKE\_EMERGENCY\_COMP(k, m), 1) | 5 |  |
| 30 | JRU\_M\_KDRY\_RST(A\_BRAKE\_EMERGENCY\_COMP(k, m), 2) | 5 |  |
| 31 | JRU\_M\_KDRY\_RST(A\_BRAKE\_EMERGENCY\_COMP(k, m), 3) | 5 |  |
| 32 | JRU\_M\_KDRY\_RST(A\_BRAKE\_EMERGENCY\_COMP(k, m), 4) | 5 |  |
| 33 | JRU\_M\_KDRY\_RST(A\_BRAKE\_EMERGENCY\_COMP(k, m), 5) | 5 |  |
| 34 | JRU\_M\_KDRY\_RST(A\_BRAKE\_EMERGENCY\_COMP(k, m), 6) | 5 |  |
| 35 | JRU\_M\_KDRY\_RST(A\_BRAKE\_EMERGENCY\_COMP(k, m), 7) | 5 |  |
| 36 | JRU\_M\_KDRY\_RST(A\_BRAKE\_EMERGENCY\_COMP(k, m), 8) | 5 |  |
| 37 | JRU\_M\_KDRY\_RST(A\_BRAKE\_EMERGENCY\_COMP(k, m), 9) | 5 |  |
| 38 | JRU\_M\_KWET\_RST(A\_BRAKE\_EMERGENCY\_COMP(k, m)) | 5 |  |
| 39 | JRU\_T\_BRAKE\_SERVICE(k) | 12 |  |
| 40 | JRU\_N\_BRAKE\_SECTIONS(k) | 3 |  |
| 41 | JRU\_V\_BRAKE\_SERVICE\_COMP(k, m) | 10 |  |
| 42 | JRU\_A\_BRAKE\_SERVICE\_COMP(k, m) | 8 |  |
| 43 | JRU\_M\_LOADINGGAUGE | 8 |  |
| 44 | JRU\_N\_AXLE | 10 |  |
| 45 | JRU\_M\_AXLELOADCAT | 7 |  |
| 46 | JRU\_N\_ITER | 5 |  |
| 47 | JRU\_M\_VOLTAGE (k) | 4 |  |
| 48 | JRU\_NID\_CTRACTION(k) | 10 | Only if M\_VOLTAGE(k) ≠ 0. |
| 49 | JRU\_N\_ITER | 5 |  |
| 50 | JRU\_NID\_NTC(k) | 8 |  |
| 51 | JRU\_M\_AIRTIGHT | 2 |  |
| 52 | Padding |  |  |

Packet 3: EMERGENCY BRAKE COMMAND STATE

This packet is used to record the emergency brake application order. This information will be stored, independently, whether the action has been either performed by the driver or triggered by the system.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 | |  |
| 2 | JRU\_L\_PACKET | 16 |  | |
| 3 | JRU\_M\_BRAKE\_COMMAND\_STATE | 1 | |  |
| 4 | Padding bits | 7 | |  |

Packet 4: SERVICE BRAKE COMMAND STATE

This packet shall record the service brake application order. This information will be stored, independently, whether the action has been either performed by the driver or triggered by the system.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_M\_BRAKE\_COMMAND\_STATE | 1 |  |
| 4 | Padding bits | 7 |  |

Packet 5: MESSAGE TO RADIO INFILL UNIT

This packet shall be sent after sending a message to an RIU.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_NID\_C | 10 |  |
| 4 | JRU\_NID\_RIU | 14 |  |
| 5 | Radio infill bytes |  | The size of “Radio infill bytes” is variable |

Packet 6: MESSAGE FROM BALISE

This packet shall be sent to the JRU after receiving a balise. The content of this packet is all message packets defined in Unisig documents.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | Balises bytes |  | The size of “Balises bytes” is variable |

Packet 7: MESSAGE FROM EUROLOOP

This packet shall be sent to the JRU after receiving a packet from an EUROLOOP unit.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | Euroloop bytes |  | The size of “euroloop bytes” is variable |

Packet 8: MESSAGE FROM RADIO INFILL UNIT

This packet shall be sent to the JRU after receiving a message from a radio infill unit. The content of this packet is all message packets defined in Unisig document

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_NID\_C | 10 |  |
| 4 | JRU\_NID\_RIU | 14 |  |
| 5 | Radio infill bytes |  | The size of “Radio infill bytes” is variable |

Packet 9: MESSAGE FROM RBC

This packet shall be sent to the JRU after receiving a message from the RBC. The content of this packet is all message packets defined in Unisig document.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_NID\_C | 10 |  |
| 4 | JRU\_NID\_RBC | 14 |  |
| 5 | RBC bytes |  | The size of “RBC bytes” is variable |

Packet 10: MESSAGE TO RBC

This This packet shall be sent to the JRU after sending a message to the RBC. The content of this packet is all message packets defined in Unisig document.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_ PACKET | 16 |  |
| 3 | JRU\_NID\_C | 10 |  |
| 4 | JRU\_NID\_RBC | 14 |  |
| 5 | RBC bytes |  | The size of “RBC bytes” is variable |

Packet 11: DRIVER’S ACTIONS

This packet shall be sent to the JRU when the driver acts on the on board system (MMI, TIU).

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_ PACKET | 16 |  |
| 3 | JRU\_M\_DRIVERACTIONS | 8 |  |

Packet 12: BALISES GROUP ERROR

This packet contains the balise identity. The packet contains the variable: JRU\_NID\_LRBG. All kinds of balise group error can be recorded inside the JRU.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_ PACKET | 16 |  |
| 3 | JRU\_NID\_LRBG | 10+14 |  |
| 4 | JRU\_M\_ERROR | 8 |  |

Packet 13: RADIO ERROR

This packet contains the identifier of the error triggered within a radio transmission. All kinds of radio error can be recorded inside the JRU.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_ PACKET | 16 |  |
| 3 | JRU\_NID\_C | 10 |  |
| 4 | JRU\_NID\_RBC | 14 |  |
| 5 | JRU\_M\_ERROR | 8 |  |

Packet 14: STM INFORMATION

This packet contains all STM data that have to be recorded by the JRU.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_ PACKET | 16 |  |
| 3 | NID\_STMX | 8 | STM identification from general header STM |
| 4 | NID\_STMEVENT | 2 | STM Event type |
| 5 | M\_DISCENDER | 1 | If NID\_STMEVENT = 0 |
| 6 | M\_DISCTYPE | 1 | If NID\_STMEVENT = 0 |
| 7 | M\_DISCREASON | 8 | If NID\_STMEVENT = 0 |
| 8 | STM\_SYSTEM\_STATUS\_MESSAGE | 3 | If NID\_STMEVENT = 1 |
| 9 | NID\_STMPACKET | 8 | If NID\_STMEVENT = 2  Packet identifier |
| 10 | L\_STMPACKET | 13 | If NID\_STMEVENT = 2   Packet length |
| 11 | T\_JRU | 32 | Time Stamp |
| 12 | N\_L\_ITER | 8 | Number of data bytes in message |
| 13 | M\_DATA (k) | 8 | Information to JRU |

Packet 15: INFORMATION FROM COLD MOVEMENT DETECTOR

This packet gives the information from the cold movement detector at the power-up.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_ M\_COLD\_MVT | 2 |  |
| 4 | Padding | 6 |  |

Packet 16: START DISPLAYING FIXED TEXT MESSAGE

This packet shall record a fixed text message from the trackside that is currently being shown to the driver.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_Q\_TEXT | 8 |  |

Packet 17: STOP DISPLAYING FIXED TEXT MESSAGE

This packet shall record fixed text message from the trackside that is not shown to the driver any more.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_Q\_TEXT | 8 |  |

Packet 18: START DISPLAYING PLAIN TEXT MESSAGE

This packet shall record a plain text messages from the trackside that is currently being shown to the driver.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_L\_TEXT | 8 | JRU\_L\_TEXT defines the number (L) of characters X |
| 4 | JRU\_X\_TEXT | L x 8 |  |

Packet 19: STOP DISPLAYING PLAIN TEXT MESSAGE

This packet shall record a plain text messages from the trackside that is not shown to the driver any more.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_L\_TEXT | 8 | JRU\_L\_TEXT defines the number (L) of characters X |
| 4 | JRU\_X\_TEXT | L x 8 |  |

Packet 20: SPEED AND DISTANCE MONITORING INFORMATION

This packet shall record the Speed and Distance monitoring data displayed to the driver.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_M\_SDMTYPE | 2 |  |
| 4 | JRU\_M\_SDMSUPSTAT | 3 |  |
| 5 | JRU\_V\_PERM | 10 |  |
| 6 | JRU\_V\_FLOI | 10 |  |
| 7 | JRU\_V\_TARGET | 10 |  |
| 8 | JRU\_D\_TARGET | 15 |  |
| 9 | JRU\_V\_RELEASE | 10 |  |
| 4 | Padding | 4 |  |

Packet 21: DMI SYMBOL STATUS

This packet shall record the status of the set of symbols that can be displayed on the DMI.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_DMI\_SYMB\_STATUS | 86 |  |
| 4 | Padding | 2 |  |

Packet 22: DMI SOUND STATUS

This packet shall record the status of the sounds that are used to draw the driver’s attention from the outside to the display.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_DMI\_SOUND\_STATUS | 3 |  |
| 4 | Padding | 5 |  |

Packet 23: DMI SYSTEM STATUS MESSAGE

This packet shall record which system status messages are displayed to the driver.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_SYSTEM\_STATUS\_MESSAGE | 23 |  |
| 4 | Padding | 1 |  |

Packet 24: ADDITIONAL DATA

This packet shall record the additional data.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_M\_ADHESION | 1 |  |
| 4 | JRU\_NID\_MN | 24 |  |
| 5 | JRU\_Q\_RBCENTRY | 2 |  |
| 6 | JRU\_NID\_C | 10 | Only if JRU\_Q\_RBCENTRY = 2 |
| 7 | JRU\_NID\_RBC | 14 | Only if JRU\_Q\_RBCENTRY = 2 |
| 8 | JRU\_NID\_RADIO | 64 | Only if JRU\_Q\_RBCENTRY = 2 |
| 9 | JRU\_NID\_OPERATIONAL | 32 |  |

Packet 25: SR SPEED/DISTANCE ENTERED BY THE DRIVER

This packet shall record the change of the SR Speed or Distance entered by the driver.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_D\_SR | 17 |  |
| 4 | JRU\_V\_SR | 10 |  |
| 5 | PADDING | 5 |  |

Packet 26: NTC SELECTED

This packet shall record the identity of the NTC when the selected level is NTC.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | NID\_NTC | 8 |  |

Packet 27: SAFETY CRITICAL FAULT IN MODE SL, NL OR PS

This packet records the occurrence of a safety critical fault in mode SL, NL or PS.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |

Packet 28: VIRTUAL BALISE COVER SET BY THE DRIVER

This packet records the code entered by the driver to set a VBC.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_NID\_VBCMK | 6 |  |
| 4 | JRU\_NID\_C | 10 |  |
| 5 | JRU\_T\_VBC | 8 |  |

Packet 29: VIRTUAL BALISE COVER REMOVED BY THE DRIVER

This packet records the code entered by the driver to remove a VBC

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_NID\_C | 10 |  |
| 4 | JRU\_NID\_VBCMK | 6 |  |

Packet 30: SLEEPING INPUT

This packet records the state of the sleeping input.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_M\_SLEEPING | 1 |  |
| 4 | PADDING | 7 |  |

Packet 31: PASSIVE SHUNTING INPUT

This packet records the state of the passing shunting input.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_M\_PASSIVE\_SHUNTING | 1 |  |
| 4 | PADDING | 7 |  |

Packet 32: NON LEADING INPUT

This message records the state of the Non leading input.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_M\_NON\_LEADING | 1 |  |
| 4 | PADDING | 7 |  |

Packet 33: REGENERATIVE BRAKE STATUS

This packet shall record the regenerative brake status.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_M\_RB\_STATUS | 1 |  |
| 4 | Padding | 7 |  |

Packet 34: MAGNETIC SHOE BRAKE STATUS

This packet shall record the magnetic shoe brake status .

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_M\_MSB\_STATUS | 1 |  |
| 4 | Padding | 7 |  |

Packet 35: EDDY CURRENT BRAKE STATUS

This packet shall record the eddy current brake status .

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_M\_ECB\_STATUS | 1 |  |
| 4 | Padding | 7 |  |

Packet 36: ELECTRO PNEUMATIC BRAKE STATUS

This packet shall record the electro pneumatic brake status.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_M\_EP\_STATUS | 1 |  |
| 4 | Padding | 7 |  |

Packet 37: ADDITIONAL BRAKE STATUS

This packet shall record the additional brake status .

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_M\_AB\_STATUS | 1 |  |
| 4 | Padding | 7 |  |

Packet 38: CAB STATUS

This packet shall record the cab status that the ERTMS/ETCS on-board received from the train interface.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_M\_CAB\_A\_STATUS | 1 |  |
| 4 | JRU\_Q\_CAB\_B | 1 |  |
| 5 | JRU\_M\_CAB\_B\_STATUS | 1 | Only if JRU\_Q\_CAB\_B = 1 |
| 6 | JRU\_Q\_SINGLE\_DESK | 1 | Only if JRU\_Q\_CAB\_B = 0 |
| 7 | JRU\_M\_ORIENTATION | 1 | ONLY if JRU\_Q\_SINGLE\_DESK = 1 |
| 8 | PADDING |  |  |

Packet 39: DIRECTION CONTROLLER POSITION

This packet shall record the direction controller position.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_M\_DIRECTION\_CONTROLLER | 2 |  |
| 4 | PADDING | 6 |  |

Packet 40: TRACTION STATUS

This packet shall record the traction status.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_M\_TRACTION\_STATUS | 1 |  |
| 4 | PADDING | 7 |  |

Packet 41: TYPE OF TRAIN DATA

This packet shall record the type of train data entry.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_M\_TRAIN\_DATA\_ENTRY | 2 |  |
| 4 | PADDING | 6 |  |

Packet 42: NATIONAL SYSTEM ISOLATION

This packet shall record that a National System, which is interfaced to the on-board through an STM, is isolated or not.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | NID\_NTC | 8 |  |
| 4 | JRU\_M\_NATIONAL\_SYSTEM\_ISOLATION | 1 |  |
| 5 | PADDING | 7 |  |

Packet 43: TRACTION CUT OFF COMMAND STATE

This packet shall record the traction cut off command state.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | JRU\_M\_TCO\_COMMAND\_STATE | 1 |  |
| 4 | Padding | 7 |  |

Packet 255: ETCS ON-BOARD PROPRIETARY JURIDICAL DATA

This packet shall record information that is specific to an ETCS on-board equipment.

|  |  |  |  |
| --- | --- | --- | --- |
| **Field No.** | **VARIABLE/ PACKET** | **Length in bits** | **Remarks** |
| 1 | JRU\_NID\_PACKET | 8 |  |
| 2 | JRU\_L\_PACKET | 16 |  |
| 3 | Proprietary Data |  |  |

# OpenETCS application - TIU interface

## Components of Language

### Introduction

The language is used in transmitting information between the OpenETCS application to the TIU.

The language is based on variables and packets.

### Definition of Variables

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

Variables may have special values that are related to the basic meaning of the variable.

Signed values shall be encoded as 2’s complement.

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

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

When transmitting over the transmission media, the most significant bit must be transmitted first.

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 |
| CCPU\_ | Data generated by Core CPU board |
| TIU\_ | Data generated by TIU board |

### Definition of Packets

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

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

|  |  |  |
| --- | --- | --- |
| Number | NID\_PACKET | Packet identifier |
| Length | L\_PACKET | Number of bits in the packet |
| Scale | Q\_SCALE | Specifies which distance scale is used for all distance information within the packet.  There is no Q\_SCALE variable in packets that do not contain distance information. |
| Information | ...... | Well-defined set(s) of variables. |

The packet definition does not change when transmitted over different transmission media.

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

N\_ITER specifies the number of iterations of a variable or group of variables that follow.

If N\_ITER is 0 then no variables follow.

Two nested levels of iterations can exist.

Indented variables are optional, depending on the value of the previous qualifier variable in the packet.

## PACKETS

### List of Packets

#### TIU to OpenETCS application

| Packet Number | Packet Name |
| --- | --- |
| 0 | Inputs from train devices |
| 1 | Plain text message |
| 2 | Fixed text message |
| 3 | brake models |
| 4 | *Not used* |
| 5 | *Not used* |
| 6 | Test and failure detection |
| 7 | STMs specific behaviour |
| 8 | Specific from MVB (Specific to Alstom implementation) |
| 12 | Diagnostic |
| 13 | Inhibition Level (Specific to Alstom implementation) |

#### OpenETCS application to TIU

| Packet Number | Packet Name |
| --- | --- |
| 0 | Commands |
| 1 | Track conditions |
| 2 | Odometric data |
| 3 | Other information |
| 4 | Train type |
| 5 | Track condition change of traction power |
| 6 | Location reference update |
| 7 | Sporadic commands |
| 8 | STMs states |
| 9 | Train information |
| 10 | Doors control section |
| 11 | Track description deletion information |
| 14 | Gradients |

### PACKETS: TIU to OpenETCS application

Packet Number 0 : Inputs from train devices

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | Gives the state of the train devices, received from the I/O board inputs, or from the optional CAN/train bus. | | |
| ***Sent*** | Sporadically | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
|  | NID\_PACKET | 8 |  |
|  | L\_PACKET | 13 |  |
|  |  |  |  |
|  | V\_TIU\_EB\_STATE\_FILTERED | 2 |  |
|  | V\_TIU\_SB\_STATE\_FILTERED | 2 |  |
|  | V\_TIU\_TRACTION\_CUT\_OFF\_STATE\_FILTERED | 2 |  |
|  | V\_TIU\_ISOLATION\_STATE\_FILTERED | 2 |  |
|  | V\_TIU\_SLEEPING\_STATE\_FILTERED | 2 |  |
|  | V\_TIU\_TILTING\_STATE\_FILTERED | 2 |  |
|  | V\_TIU\_DIRCONT\_STATE\_FILTERED | 3 |  |
|  | V\_TIU\_DESKS\_STATE\_FILTERED | 3 |  |
|  | V\_TIU\_INTEGRITY\_STATE\_FILTERED | 2 |  |
|  | V\_TIU\_DRIVEREM\_STATE\_FILTERED | 2 |  |
|  | V\_TIU\_VIGIL\_ACTION\_STATE\_FILTERED | 2 |  |
|  | V\_TIU\_VIGIL\_DISABLE\_STATE\_FILTERED | 2 |  |
|  | V\_TIU\_COLD\_MOVE\_STATE\_FILTERED | 2 |  |
|  |  |  |  |
|  | V\_TIU\_EB\_STATE | 2 |  |
|  | V\_TIU\_SB\_STATE | 2 |  |
|  | V\_TIU\_TRACTION\_CUT\_OFF\_STATE | 2 |  |
|  | V\_TIU\_ISOLATION\_STATE | 2 |  |
|  | V\_TIU\_SLEEPING\_STATE | 2 |  |
|  | V\_TIU\_TILTING\_STATE | 2 |  |
|  | V\_TIU\_DIRCONT\_STATE | 3 |  |
|  | V\_TIU\_DESKS\_STATE | 3 |  |
|  | V\_TIU\_INTEGRITY\_STATE | 2 |  |
|  | V\_TIU\_DRIVEREM\_STATE | 2 |  |
|  | V\_TIU\_VIGIL\_ACTION\_STATE | 2 |  |
|  | V\_TIU\_VIGIL\_DISABLE\_STATE | 2 |  |
|  | V\_TIU\_COLD\_MOVE\_STATE | 2 |  |
|  |  |  |  |
|  | CIRCUIT\_BREAKER\_COHERENCY | 3 |  |
|  | PANTOGRAPH\_COHERENCY | 3 |  |
|  | V\_TIU\_COMMANDING\_EB | 1 |  |
|  | V\_TIU\_COMMANDING\_SB | 1 |  |
|  | V\_TIU\_TRACTION\_STATUS | 3 |  |
|  |  |  |  |

Packet Number 1 : Plain text message

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | Plain text given by TIU, to be displayed on the MMI by the Core CPU | | |
| ***Sent*** | Sporadically (sending triggered by event) | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
|  | NID\_PACKET | 8 |  |
|  | L\_PACKET | 13 |  |
|  | Q\_SCALE | 2 |  | |
|  | TIU\_Q\_TEXTCLASS | 2 |  |
|  | TIU\_Q\_TEXTDISPLAY | 1 |  | |
|  | TIU\_L\_TEXTDISPLAY | 15 | End condition | |
|  | TIU\_T\_TEXTDISPLAY | 10 | End condition | |
|  | TIU\_Q\_TEXTCONFIRM | 2 |  | |
|  | TIU\_L\_TEXT | 5 |  |
|  | TIU\_X\_TEXT (TIU\_L\_TEXT) | 8 |  |

Packet Number 2 : Fixed text message

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | Fixed text given by TIU, to be displayed on the MMI by the Core CPU | | |
| ***Sent*** | Sporadically (sending triggered by event) | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
|  | NID\_PACKET | 8 |  |
|  | L\_PACKET | 13 |  |
|  | Q\_SCALE | 2 |  | |
|  | TIU\_Q\_TEXTCLASS | 2 |  |
|  | TIU\_Q\_TEXTDISPLAY | 1 |  | |
|  | TIU\_L\_TEXTDISPLAY | 15 | End condition | |
|  | TIU\_T\_TEXTDISPLAY | 10 | End condition |
|  | TIU\_Q\_TEXTCONFIRM | 2 |  | |
|  | TIU\_Q\_TEXT | 8 |  |

Packet Number 3 : Brake models

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | Model of the emergency brake, traction, and service brake (if present), to be used by the Core CPU | | |
| ***Sent*** | Sporadically (sending triggered by event) | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
|  | NID\_PACKET | 8 |  |
|  | L\_PACKET | 13 |  |
|  | TIU\_MODEL\_BEGIN\_BRAKE | 8 | Part of EB model |
|  | TIU\_MODEL\_FULL\_BRAKE | 11 | Part of EB model |
|  | N\_ITER | 5 | Part of EB model  In this case range=0..5 |
|  | TIU\_MODEL\_SPEED(k) | 8 | Part of EB model |
|  | TIU\_MODEL\_DECELER(k) | 8 | Part of EB model |
|  | TIU\_CUT\_TRACT\_DELAY | 8 | Part of traction model |
|  | TIU\_TRAIN\_MAX\_ACC | 10 | Part of traction model |
|  | TIU\_ACC\_COEF\_SB\_UNUSED | 7 | Part of traction model |
|  | TIU\_ACC\_COEF\_SB\_USED | 7 | Part of traction model |
|  | Q\_SB\_MODEL\_PRESENT | 1 | Part of SB model |
|  | TIU\_MODEL\_BEGIN\_BRAKE | 8 | Part of SB model |
|  | TIU\_MODEL\_FULL\_BRAKE | 11 | Part of SB model |
|  | N\_ITER | 5 | Part of SB model  In this case range=0..5 |
|  | TIU\_MODEL\_SPEED(k) | 8 | Part of SB model |
|  | TIU\_MODEL\_DECELER(k) | 8 | Part of SB model |
|  | TIU\_MIN\_ROT\_MASS\_PERCENT | 8 | Part of rot mass model |
|  | TIU\_NOM\_ROT\_MASS\_PERCENT | 8 | Part of rot mass model |
|  | TIU\_MAX\_ROT\_MASS\_PERCENT | 8 | Part of rot mass model |
|  | TIU\_T\_W | 13 | Part of driver delay |
|  | TIU\_T\_P | 13 | Part of driver delay |
|  | TIU\_T\_I\_P | 13 | Part of driver delay |
|  | TIU\_T\_RSMA | 13 | Part of driver delay |

Packet Number 6 : Test and failure detection

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | Result of EB tests on demand and safety failure detection | | |
| ***Sent*** | Sporadically (sending triggered by event) | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
|  | NID\_PACKET | 8 |  |
|  | L\_PACKET | 13 |  |
|  | TIU\_EB\_TESTS\_ON\_DEMAND\_RESULT | 3 |  |
|  | TIU\_SAFETYFAIL\_DETECT | 2 |  |

Packet Number 7 : STMs specific behavior

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | List of STMs identified by the TIU as "having an inappropriate behavior" or "having a specific behavior after an inappropriate behavior"  This packet is related to the management of the TI and BI units for STM interfaces. | | |
| ***Sent*** | Sporadically | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
|  | NID\_PACKET | 8 |  |
|  | L\_PACKET | 13 |  |
|  | N\_ITER | 5 |  |
|  | NID\_STM | 8 |  |
|  | NID\_STMSPECIFICSTATE | 3 |  |

Packet Number 8 : Specific\_from\_MVB (Specific to Alstom implementation)

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | "non discrete" info coming from MVB and to be sent to the Core CPU | | |
| ***Sent*** | At each computer cycle | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
|  | NID\_PACKET | 8 |  |
|  | L\_PACKET | 13 |  |
|  | Q\_SET\_TARGET\_SPEED | 1 |  |
|  | SET\_TARGET\_SPEED | 16 | if Q\_SET\_TARGET\_SPEED = 1 |

Packet Number 12: Diagnostic

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Description*** | The packet gives reason information about diagnostic : emergency and service braking. | | | |
| ***Sent*** | Sporadically (sending triggered by event) | | |
| ***Content*** | **Variable** | **Length** | **Comment** | |
|  | NID\_PACKET | 8 |  | |
|  | L\_PACKET | 13 |  | |
|  | N\_ITER\_EVENT | 5 |  |
|  | TIU\_MAINTENANCE\_EVENT\_ID | 8 |  | |

Packet Number 13: Inhibition Level (Specific to Alstom implementation)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Description*** | The packet gives the command of inhibition of level. | | | |
| ***Sent*** | Sporadically (sending triggered by event) | | |
| ***Content*** | **Variable** | **Length** | **Comment** | |
|  | NID\_PACKET | 8 |  | |
|  | L\_PACKET | 13 |  | |
|  | N\_ITER | 5 |  |
|  | CCPU\_LEVEL(k) | 3 |  | |
|  | NID\_NTC(k) (if CCPU\_LEVEL = NTC) | 8 |  | |
|  | LEVEL\_CHANGE\_ORIGIN(k) | 2 |  | |

### PACKETS: OpenETCS application to TIU

Packet Number 0 : Cyclic Commands

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | Any command given by the Core CPU | | |
| ***Sent*** | At each computer cycle | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
|  | NID\_PACKET | 8 |  |
|  | L\_PACKET | 13 |  |
|  | CCPU\_EB\_COMMAND | 1 |  |
|  | CCPU\_SB\_COMMAND | 2 |  |
|  | CCPU\_TRACTION\_CUT\_OFF | 1 |  |
|  | CCPU\_VIGIL\_DISABLE\_ORDER | 1 |  |
|  |  |  |  |

Packet Number 1: Track Conditions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Description*** | The packet gives details concerning the track ahead to support the driver when e.g. lower pantograph | | | |
| ***Sent*** | Sporadically (sending triggered by event) | | |
| ***Content*** | **Variable** | **Length** | **Comment** | |
|  | NID\_PACKET | 8 |  | |
|  | L\_PACKET | 13 |  | |
|  | Q\_SCALE | 2 |  | |
|  | CCPU\_NID\_C | 10 |  | |
|  | CCPU\_NID\_BG | 14 |  | |
|  | Q\_LINK | 1 |  | |
|  | Q\_TRACKINIT | 1 |  | |
|  | D\_TRACKINIT | 16 | Only if Q\_TRACKINIT = 1 | |
|  | D\_TRACKCOND | 16 | Only if Q\_TRACKINIT = 0 | |
|  | L\_TRACKCOND | 16 | Only if Q\_TRACKINIT = 0 | |
|  | M\_TRACKCOND | 4 | Only if Q\_TRACKINIT = 0 | |
|  | N\_ITER | 5 | Only if Q\_TRACKINIT = 0 | |
|  | D\_TRACKCOND(k) | 15 |  | |
|  | L\_TRACKCOND(k) | 16 |  | |
|  | M\_TRACKCOND(k) | 4 |  | |

Packet Number 2 : Odometric data

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | Periodic transmission of odometric data | | |
| ***Sent*** | At each computer cycle | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
|  | NID\_PACKET | 8 |  |
|  | L\_PACKET | 13 |  |
|  | Q\_LOCATION\_PRESENT | 1 |  |
|  | Q\_SCALE | 2 | present only if Q\_LOCATION\_PRESENT = 1 |
|  | CCPU\_NID\_C | 10 | idem |
|  | CCPU\_NID\_BG | 14 | idem |
|  | CCPU\_L\_MAX\_SAFE\_FRONT\_END | 16 | idem |
|  | CCPU\_L\_MIN\_SAFE\_FRONT\_END | 16 | idem |
|  | CCPU\_L\_ESTIMATED\_FRONT\_END | 16 | idem |
|  | CCPU\_L\_MIN\_SAFE\_REAR\_END | 16 | idem |
|  | CCPU\_NO\_MOTION | 2 |  |
|  | CCPU\_TRAIN\_MOVEMENT | 2 |  |
|  | CCPU\_V\_TRAIN\_NOMINAL | 15 |  |
|  | CCPU\_A\_TRAIN\_NOMINAL | 11 |  |
|  | CCPU\_D\_TRAIN\_NOMINAL | 32 |  |

Packet Number 3 : Other information

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | Other information required by the TIU from the Core CPU | | |
| ***Sent*** | At each computer cycle | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
|  | NID\_PACKET | 8 |  |
|  | L\_PACKET | 13 |  |
|  | CCPU\_MODE | 4 |  |
|  | CCPU\_LEVEL | 3 |  |
|  | NID\_NTC | 8 | If CCPU\_LEVEL = NTC |

Packet Number 4 : Train type

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | Information used by the TIU smart board, to select appropriate models to be sent to the Core CPU | | |
| ***Sent*** | Sporadically (sending triggered by event) | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
|  | NID\_PACKET | 8 |  |
|  | L\_PACKET | 13 |  |
|  | CCPU\_DECELERATION\_CLASS\_ID | 8 |  |
|  | CCPU\_BRAKE\_DELAY\_CLASS\_ID | 8 |  |

Packet Number 5: Track Condition Change of traction power

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Description*** | The packet gives information about change of the traction power system. | | | |
| ***Sent*** | Sporadically (sending triggered by event) | | |
| ***Content*** | **Variable** | **Length** | **Comment** | |
|  | NID\_PACKET | 8 |  | |
|  | L\_PACKET | 13 |  | |
|  | Q\_SCALE | 2 |  |
|  | CCPU\_NID\_C | 10 |  |
|  | CCPU\_NID\_BG | 14 |  |
|  | Q\_LINK | 1 |  | |
|  | Q\_TRACKINIT | 1 |  | |
|  | D\_TRACKINIT | 16 | Only if Q\_TRACKINIT = 1 | |
|  | D\_TRACTION\_MAX | 16 | Only if Q\_TRACKINIT = 0  Related to max safe front end | |
|  | D\_TRACTION\_MIN | 16 | Only if Q\_TRACKINIT = 0  Related to min safe rear end | |
|  | M\_VOLTAGE | 4 | Type of traction, only if Q\_TRACKINIT = 0. | |
|  | NID\_CTRACTION | 10 | Only if M\_VOLTAGE <> 0 | |

Packet Number 6: Location reference update

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Description*** | The packet gives information about the new reference location balise group to be used by the TIU | | | |
| ***Sent*** | Sporadically (sending triggered by event) | | |
| ***Content*** | **Variable** | **Length** | **Comment** | |
|  | NID\_PACKET | 8 |  | |
|  | L\_PACKET | 13 |  | |
|  | Q\_SCALE | 2 |  | |
|  | CCPU\_NID\_C\_OLD | 10 |  | |
|  | CCPU\_NID\_BG\_OLD | 14 |  | |
|  | CCPU\_NID\_C\_NEW | 10 |  | |
|  | CCPU\_NID\_BG\_NEW | 14 |  | |
|  | CCPU\_D\_OLD\_TO\_NEW\_LINKED\_ESTI | 16 |  | |
|  | CCPU\_D\_OLD\_TO\_NEW\_LINKED\_MIN | 16 |  | |
|  | CCPU\_D\_OLD\_TO\_NEW\_LINKED\_MAX | 16 |  | |
|  | CCPU\_D\_OLD\_TO\_NEW\_NOT\_LINKED\_ESTI | 16 |  | |
|  | CCPU\_D\_OLD\_TO\_NEW\_NOT\_LINKED\_MIN | 16 |  | |
|  | CCPU\_D\_OLD\_TO\_NEW\_NOT\_LINKED\_MAX | 16 |  | |

Packet Number 7 : Sporadic commands

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | Any sporadic command given by the Core CPU | | |
| ***Sent*** | Sporadically (sending triggered by event) | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
|  | NID\_PACKET | 8 |  |
|  | L\_PACKET | 13 |  |
|  | CCPU\_START\_EB\_TESTS\_ON\_DEMAND | 2 |  |
|  | CCPU\_VIGIL\_RESET\_ORDER | 1 |  |
|  | CCPU\_SB\_MONITORING\_STATE | 1 |  |

Packet Number 8 : STMs states

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | States of STMs given by the Core CPU | | |
| ***Sent*** | Sporadically | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
|  | NID\_PACKET | 8 |  |
|  | L\_PACKET | 13 |  |
|  | N\_ITER | 5 |  |
|  | NID\_STM | 8 |  |
|  | NID\_STMSTATE | 4 |  |
|  | NID\_STMSTATEORDER | 4 |  |

Packet Number 9 : Train information

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | Other information required by the TIU from the Core CPU | | |
| ***Sent*** | Sporadically | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
|  | NID\_PACKET | 8 |  |
|  | L\_PACKET | 13 |  |
|  |  |  |  |
|  | CCPU\_CORE\_INHIBITION | 1 |  |
|  | CCPU\_NID\_OPERATIONAL | 32 |  |
|  | CCPU\_RUNNING\_DIRECTION\_CHANGE\_FOR\_DATA | 1 |  |
|  | CCPU\_TRAIN\_LENGTH | 12 |  |

Packet Number 10 : Doors control section

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | Information required by the TIU from the Core CPU to manage a doors control section | | |
| ***Sent*** | Sporadically | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
|  | NID\_PACKET | 8 |  |
|  | L\_PACKET | 13 |  |
|  | Q\_SCALE | 2 |  |
|  | CCPU\_NID\_C | 10 |  |
|  | CCPU\_NID\_BG | 14 |  |
|  | Q\_LINK | 1 |  | |
|  | D\_DOORS\_SECTION\_START | 16 |  |
|  | D\_DOORS\_SECTION\_END | 16 |  |
|  | CCPU\_M\_SIDE\_DOOR | 2 |  |

Packet Number 11: Track description deletion information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Description*** | The packet gives deletion information about track description. | | | |
| ***Sent*** | Sporadically (sending triggered by event) | | |
| ***Content*** | **Variable** | **Length** | **Comment** | |
|  | NID\_PACKET | 8 |  | |
|  | L\_PACKET | 13 |  | |
|  | Q\_SCALE | 2 |  |
|  | CCPU\_NID\_C | 10 |  |
|  | CCPU\_NID\_BG | 14 |  |
|  | TRACK\_DESC\_DELETION\_LOCATION\_ESTI | 16 | not used by the TIU | |
|  | TRACK\_DESC\_DELETION\_LOCATION\_MIN | 16 |  | |
|  | TRACK\_DESC\_DELETION\_LOCATION\_MAX | 16 | not used by the TIU | |

Packet Number 14: Gradients information

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | The packet gives gradient information about track description. | | |
| ***Sent*** | Sporadically (sending triggered by event) | | |
| ***Content*** | **Variable** | **Length** | **Comment** |
|  | NID\_PACKET | 8 |  |
|  | L\_PACKET | 13 |  |
|  | Q\_SCALE | 2 |  |
|  | CCPU\_NID\_C | 10 |  |
|  | CCPU\_NID\_BG | 14 |  |
|  | N\_GRADIENTS | 6 |  |
|  | D\_GRADIENT(k) | 16 |  |
|  | G\_GRADIENT(k) | 9 |  |

## VARIABLES

### List of Variables

CCPU\_A\_TRAIN\_NOMINAL

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Nominal train acceleration | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 11 bits | -10.24 [m/s²] | 10.23 [m/s²] | 0.01 |
| ***Special/Reserved Values*** |  |  | |

CCPU\_BRAKE\_DELAY\_CLASS\_ID

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | brake delay class ID | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits | 0 | 255 | 1 |
| ***Special/Reserved Values*** |  |  | |

CCPU\_CORE\_INHIBITION

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Core signal to inhibit pantograph optimization in powerless section and change of traction power | | |
| ***Description*** | / | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 1 bit |  |  |  |
| ***Special/Reserved Values*** | 0 | Do\_not\_inhibit | |
|  | 1 | Inhibit | |

CCPU\_D\_OLD\_TO\_NEW\_LINKED\_ESTI

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | / | | |
| ***Description*** | Estimated distance between the old (the previous) reference balise group and the new reference balise group with information linked to the balise | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327680 m | 327 670 m | 10cm, 1m or 10m, depending on Q\_SCALE |

CCPU\_D\_OLD\_TO\_NEW\_LINKED\_MAX

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | / | | |
| ***Description*** | Maximum distance maximum between the old (the previous) reference balise group and the new reference balise group with information linked to the balise | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327680 m | 327 670 m | 10cm, 1m or 10m, depending on Q\_SCALE |

CCPU\_D\_OLD\_TO\_NEW\_LINKED\_MIN

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | / | | |
| ***Description*** | Minimum distance between the old (the previous) reference balise group and the new reference balise group with information linked to the balise | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327680 m | 327 670 m | 10cm, 1m or 10m, depending on Q\_SCALE |

CCPU\_D\_OLD\_TO\_NEW\_NOT\_LINKED\_ESTI

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | / | | |
| ***Description*** | Estimated distance between the old (the previous) reference balise group and the new reference balise group with information not linked to the balise | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327680 m | 327 670 m | 10cm, 1m or 10m, depending on Q\_SCALE |

CCPU\_D\_OLD\_TO\_NEW\_NOT\_LINKED\_MAX

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | / | | |
| ***Description*** | Maximum distance between the old (the previous) reference balise group and the new reference balise group with information not linked to the balise | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327680 m | 327 670 m | 10cm, 1m or 10m, depending on Q\_SCALE |

CCPU\_D\_OLD\_TO\_NEW\_NOT\_LINKED\_MIN

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | / | | |
| ***Description*** | Minimum distance between the old (the previous) reference balise group and the new reference balise group with information not linked to the balise | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327680 m | 327 670 m | 10cm, 1m or 10m, depending on Q\_SCALE |

CCPU\_D\_TRAIN\_NOMINAL

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | / | | |
| ***Description*** | Absolute distance moved | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 32 bits | -15 000 000.00 m | 15 000 000.00 m | 0.01 m |
| ***Special/Reserved Values*** |  |  | |

CCPU\_DECELERATION\_CLASS\_ID

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | deceleration class ID | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits | 0 | 255 | 1 |
| ***Special/Reserved Values*** |  |  | |

CCPU\_EB\_COMMAND

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Emergency brake command | | |
| ***Description*** | / | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 1 bit |  |  |  |
| ***Special/Reserved Values*** | 0 | Do\_no\_apply\_EB | |
|  | 1 | Apply\_EB | |

CCPU\_L\_ESTIMATED\_FRONT\_END

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Absolute location of the estimated front end of the train | | |
| ***Description*** | / | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327680 m | 327 670 m | 10cm, 1m or 10m, depending on Q\_SCALE |

CCPU\_L\_MAX\_SAFE\_FRONT\_END

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Absolute location of the maximum safe front end of the train | | |
| ***Description*** | / | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327680 m | 327 670 m | 10cm, 1m or 10m, depending on Q\_SCALE |

CCPU\_L\_MIN\_SAFE\_FRONT\_END

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Absolute location of the minimum safe front end of the train | | |
| ***Description*** | / | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327680 m | 327 670 m | 10cm, 1m or 10m, depending on Q\_SCALE |

CCPU\_L\_MIN\_SAFE\_REAR\_END

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Absolute location of the minimum safe rear end of the train | | |
| ***Description*** | / | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327680 m | 327 670 m | 10cm, 1m or 10m, depending on Q\_SCALE |

CCPU\_LEVEL

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Current Operating Level | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 3 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Level 0 | |
|  | 1 | Level NTC specified by NID\_NTC | |
|  | 2 | Level 1 | |
|  | 3 | Level 2 | |
|  | 4 | Level 3 | |
|  | 5-7 | Spare | |

CCPU\_M\_SIDE\_DOOR

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Side(s) authorized to be opened inside the allowed area | | |
| ***Description*** | / | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Door side to open : left | |
|  | 1 | Door side to open : right | |
|  | 2 | Door side to open : both | |
|  | 3 | Spare | |

CCPU\_M\_TRACTION

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Type of traction | | |
| ***Description*** | See subset 026, chapter 7, variable M\_TRACTION | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits | 0 | 255 | 1 |
| ***Special/Reserved Values*** |  |  | |

CCPU\_MODE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Generic Onboard operating mode | | |
| ***Description*** |  | | |
| ***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 | STM National | |
|  | 14 | Reversing | |
|  | 15 | Passive Shunting | |

CCPU\_NID\_BG

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Identity number of the balise group used as reference for the related distances/locations | | |
| ***Description*** | Identity number of a balise group or loop within the country or region defined by NID\_C. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 14 bits | 0 | 16382 | 1 |
| ***Special/Reserved Values*** | / | / | |

CCPU\_NID\_BG\_NEW

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Identity number of the new balise group to use as reference for the related distances/locations | | |
| ***Description*** | Identity number of a balise group or loop within the country or region defined by NID\_C. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 14 bits | 0 | 16382 | 1 |
| ***Special/Reserved Values*** | / | / | |

CCPU\_NID\_BG\_OLD

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Identity number of the current (old) balise group used as reference for the related distances/locations | | |
| ***Description*** | Identity number of a balise group or loop within the country or region defined by NID\_C. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 14 bits | 0 | 16382 | 1 |
| ***Special/Reserved Values*** | / | / | |

CCPU\_NID\_C

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Identity number of the country or region where is located the reference balise group | | |
| ***Description*** | Code used to identify the country or region in which the balise group is situated. These need not necessarily follow administrative or political boundaries. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 10 bits | 0 | 1023 | 1 |
| ***Special/Reserved Values*** |  |  | |

CCPU\_NID\_C\_NEW

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Identity number of the country or region where is located the new reference balise group | | |
| ***Description*** | Code used to identify the country or region in which the balise group is situated. These need not necessarily follow administrative or political boundaries. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 10 bits | 0 | 1023 | 1 |
| ***Special/Reserved Values*** |  |  | |

CCPU\_NID\_C\_OLD

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Identity number of the country or region where is located the current (old) reference balise group | | |
| ***Description*** | Code used to identify the country or region in which the balise group is situated. These need not necessarily follow administrative or political boundaries. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 10 bits | 0 | 1023 | 1 |
| ***Special/Reserved Values*** |  |  | |

CCPU\_NID\_OPERATIONAL

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Train Running Number | | |
| ***Description*** | See subset 026, chapter 7, variable NID\_OPERATIONAL | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 32 bits | 0 | 9999 9999 | Binary Coded Decimal |

CCPU\_NO\_MOTION

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Movement state of train | | |
| ***Description*** | Indicates if a movement of the train is detected or if a no mortion state can be considered. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Motion | |
|  | 1 | No Motion | |
|  | 2 | Unknown | |
|  | 3 | Spare | |

CCPU\_RUNNING\_DIRECTION\_CHANGE\_FOR\_DATA

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Running direction change for data | | |
| ***Description*** | That flag indicates if a modification of orientation has to be taken into account for the data supervision. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 1 bit |  |  |  |
| ***Special/Reserved Values*** | 0 | no running direction change for data supervision | |
|  | 1 | a running direction change occurred at this cycle for data supervision | |

CCPU\_SB\_COMMAND

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Service brake command | | |
| ***Description*** | / | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Do\_no\_apply\_SB | |
|  | 1 | Apply\_SB | |
|  | 2 | Apply\_SB\_not\_protected | |
|  | 3 | spare | |

CCPU\_SB\_MONITORING\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | State of SB monitoring by CORE | | |
| ***Description*** | Result of SB monitoring by CORE | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 1 bit |  |  |  |
| ***Special/Reserved Values*** | 0 | NOT\_RELEVANT (no monitoring running or running in order) | |
|  | 1 | FAILED (monitoring running and failed) | |

CCPU\_START\_EB\_TESTS\_ON\_DEMAND

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | EB tests on demand start | | |
| ***Description*** | Triggers the EB tests on demand | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | NO\_TEST : do not start brake tests (but do not stop them if already started) | |
|  | 1 | start EB tests | |
|  | 2 | start SB tests | |
|  | 3 | spare | |

CCPU\_TRACTION\_CUT\_OFF

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Cut off traction command | | |
| ***Description*** | / | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 1 bit |  |  |  |
| ***Special/Reserved Values*** | 0 | False (=Release traction cut off command) | |
|  | 1 | True (=Cut off traction) | |

CCPU\_TRAIN\_LENGTH

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Train length deduced from validated train data. The train length takes the value “Unknown” if the train data are not validated or not correct. | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 12 bits | 0 | 4094 [m] | 1 |
| ***Special/Reserved Values*** | 4095 | Unknown | |

CCPU\_TRAIN\_MOVEMENT

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Direction of train movement in relation to the LRBG orientation | | |
| ***Description*** | Indicates the running direction of the train, with respect to the active cab | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Backward | |
|  | 1 | Forward | |
|  | 2 | Unknown | |
|  | 3 | Spare | |

CCPU\_V\_TRAIN\_NOMINAL

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Nominal train speed | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 15 bits | 0 | 327.67 [m/s] | 0.01 |
| ***Special/Reserved Values*** |  |  | |

CCPU\_VIGIL\_DISABLE\_ORDER

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Order to disable the external driver vigilance device | | |
| ***Description*** | / | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 1 bit |  |  |  |
| ***Special/Reserved Values*** | 0 | False (do not disable the device) | |
|  | 1 | True (disable the device) | |

CCPU\_VIGIL\_RESET\_ORDER

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Order to reset the external driver vigilance device | | |
| ***Description*** | When the driver touches the MMI, this can be considered as a vigilance action by the external driver vigilance device | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 1 bit |  |  |  |
| ***Special/Reserved Values*** | 0 | False (do not reset) | |
|  | 1 | True (reset) | |

CIRCUIT\_BREAKER\_COHERENCY

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | State of the circuit breaker device | | |
| ***Description*** | Information from the sensor of the circuit breaker state | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 3 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | CIRCUIT\_BREAKER\_CLOSED\_OK | |
|  | 1 | CIRCUIT\_BREAKER\_CLOSED\_NOT\_OK | |
|  | 2 | CIRCUIT\_BREAKER\_OPEN\_OK | |
|  | 3 | CIRCUIT\_BREAKER\_OPEN\_NOT\_OK | |
|  | 4 | FAIL\_STATE | |
|  | 5 | INFORMATION\_NOT\_AVAILABLE | |

D\_DOORS\_SECTION\_END

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Distance to the end location of the doors control section | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327.680 km | 327.670 km | 10 cm, 1m or 10 m depending on Q\_SCALE |

D\_DOORS\_SECTION\_START

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Distance to the start location of the doors control section | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327.680 km | 327.670 km | 10 cm, 1m or 10 m depending on Q\_SCALE |

D\_GRADIENTS

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Distance to the start location of next gradient | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327.680 km | 327.670 km | 10 cm, 1m or 10 m depending on Q\_SCALE |

D\_TRACKCOND

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Track condition distance | | |
| ***Description*** | The incremental distance to where the track conditions change. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327.680 km | 327.670 km | 10 cm, 1m or 10 m depending on Q\_SCALE |

D\_TRACKINIT

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Distance to start of empty profile | | |
| ***Description*** | Distance to where initial states of the related track description in the packet shall be resumed | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327.680 km | 327.670 km | 10 cm, 1m or 10 m depending on Q\_SCALE |

G\_GRADIENTS

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Value of gradient of the given gradient segment | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 9 bits | -254 | 254 | 0.1 % |

TRACK\_DESC\_DELETION\_LOCATION\_ESTI

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Estimated distance to whom every track descriptions shall be truncated | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327.680 km | 327.670 km | 10 cm, 1m or 10 m depending on Q\_SCALE |

TRACK\_DESC\_DELETION\_LOCATION\_MAX

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Maximum distance to whom every track descriptions shall be truncated | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327.680 km | 327.670 km | 10 cm, 1m or 10 m depending on Q\_SCALE |

TRACK\_DESC\_DELETION\_LOCATION\_MIN

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Minimum distance to whom every track descriptions shall be truncated | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327.680 km | 327.670 km | 10 cm, 1m or 10 m depending on Q\_SCALE |

D\_TRACTION\_MAX

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Distance to the start location of the track condition change of traction power | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327.680 km | 327.670 km | 10 cm, 1m or 10 m depending on Q\_SCALE |

D\_TRACTION\_MIN

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Distance to the end location of the track condition change of traction power | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327.680 km | 327.670 km | 10 cm, 1m or 10 m depending on Q\_SCALE |

LEVEL\_CHANGE\_ORIGIN

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | **Level change origin** | | |
| ***Description*** | Indicate the origin to which the level is inhibitid for | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits | 0 | 2 | 0 = FOR\_DRIVER  1 = FOR\_TRACKSIDE  2 = FOR\_DRIVER\_AND\_TRACKSIDE  3 = SPARE |

L\_PACKET

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Packet **length** | | |
| ***Description*** | L\_PACKET indicates the **length** of the packet in bits, including all bits of the packet header | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 13 | 0 | 8191 | 1 bit |
| ***Special/Reserved Values*** |  |  | |

L\_TRACKCOND

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | **Length** for which the defined track condition is valid | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | -327.680 km | 327.670 km | 10 cm, 1m or 10 m depending on Q\_SCALE |

M\_TRACKCOND

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Type of track condition | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 4 bits |  |  |  |
| ***Special/Reserved Values*** | 0000 | Non stopping area. Initial state: stopping permitted | |
|  | 0001 | Tunnel stopping area. Initial state: no tunnel stopping area | |
|  | 0010 | Sound horn. Initial state: no request for sound horn | |
|  | 0011 | Powerless section – lower pantograph. Initial state: not powerless section | |
|  | 0100 | Radio hole (stop supervising T\_NVCONTACT). Initial state: supervise T\_NVCONTACT | |
|  | 0101 | Air tightness. Initial state: no request for air tightness | |
|  | 0110 | Switch off regenerative brake. Initial state: regenerative brake on | |
|  | 0111 | Switch off eddy current brake for service brake. Initial state: eddy current brake for service brake on | |
|  | 1000 | Switch off magnetic shoe brake. Initial state: magnetic shoe brake on | |
|  | 1001 | Powerless section – switch off the main power switch. Initial state: not powerless section | |
|  | 1010 | Switch off eddy current brake for emergency brake. Initial state: eddy current brake for emergency brake on | |
|  | 1011 –1111 | Spare | |

M\_TRACTION

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Traction System Type | | |
| ***Description*** | It defines the traction system to be used on a specific line (diesel/electric/kind of power pickup etc.) | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits |  |  |  |

N\_GRADIENTS

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Number of iterations of a data set following this variable in a packet | | |
| ***Description*** | If N\_GRADIENTS is 0 then no data set is following. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 6 bits | 0 | 50 | integers |

N\_ITER

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Number of iterations of a data set following this variable in a packet | | |
| ***Description*** | If N\_ITER is 0 then no data set is following. Two nested levels of iterations can exist. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 5 bits | 0 | 31 | integers |

N\_ITER\_EVENT

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Number of iterations of a data set following this variable in a packet | | |
| ***Description*** | If N\_ITER\_EVENT is 0 then no data set is following. Two nested levels of iterations can exist. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 5 bits | 0 | 31 | integers |

NID\_NTC

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | STM identity | | |
| ***Description*** | One value of this variable represents the identity of an NTC reflecting each composition of national infrastructure. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits | 0 | 255 | Numbers |

NID\_PACKET

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Packet identifier | | |
| ***Description*** | This is used in the header for each packet, allowing the receiving equipment to identify the data that follows. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits | 0 | 255 | Numbers |

NID\_STM

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | STM identity | | |
| ***Description*** | One value of this variable represents the identity of an STM equipment designed for operation on national infrastructures. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits | 0 | 255 | Numbers |

NID\_STMSPECIFICSTATE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Current specific behavior of a given STM. | | |
| ***Description*** | Indicates a specific state of a STM (disconnected, temporary disconnected, again connected after temporary disconnection, STM not in correct mode) | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 3 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | CONNECTED (after versions validation) | |
|  | 1 | DISCONNECTED (at TIU request if no validation of the versions included in STM packet 1 or at STM request) | |
|  | 2 | TEMPORARY\_DISCONNECTED | |
|  | 3 | CONNECTED\_AGAIN (end of temporary disconnection) | |
|  | 4 | FAILURE\_REQUESTED (STM not in correct state, packet 15 lack,...) | |
|  | 5-7 | Spare | |

NID\_STMSTATE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Actual STM state | | |
| ***Description*** | Tell the STM state | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 4 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | NO\_ORDER | |
| 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 | Data Available\_For\_Test (DA\_FOR\_TEST) | |
| 10 | *Spare value* | |
| 11 | *Spare value* | |
| 12 | *Spare value* | |
| 13 | *Spare value* | |
| 14 | *Spare value* | |
| 15 | *Spare value* | |

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 | NO\_ORDER | |
| 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 | Data Available\_For\_Test (DA\_FOR\_TEST) | |
| 10 | *Spare value* | |
| 11 | *Spare value* | |
| 12 | *Spare value* | |
| 13 | *Spare value* | |
| 14 | *Spare value* | |
| 15 | *Spare value* | |

PANTOGRAPH\_COHERENCY

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Coherency of the pantograph state according to currently expected state | | |
| ***Description*** | Information computed only when pantograph is inside the track condition. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 3 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | PANTO\_UP\_OK | |
|  | 1 | PANTO\_UP\_NOT\_OK | |
|  | 2 | PANTO\_DOWN\_OK | |
|  | 3 | PANTO\_DOWN\_NOT\_OK | |
|  | 4 | INFO\_NOT\_AVAILABLE | |

Q\_LINK

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | / | | |
| ***Description*** | Qualifier indicating if the track conditions defined in the packet 1 or 5 are linked to the balise or not | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 1 bit |  |  |  |
| ***Special/Reserved Values*** | 0 | not linked | |
|  | 1 | linked | |

Q\_LOCATION\_PRESENT

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | / | | |
| ***Description*** | Qualifier indicating if train location information is present in the packet or not | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 1 bit |  |  |  |
| ***Special/Reserved Values*** | 0 | not present | |
|  | 1 | present | |

Q\_SB\_MODEL\_PRESENT

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | / | | |
| ***Description*** | Qualifier for indicate if a SB model has been found or not | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 1 bit |  |  |  |
| ***Special/Reserved Values*** | 0 | Model is not found | |
|  | 1 | Model is found | |

Q\_SCALE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Qualifier for the distance scale. | | |
| ***Description*** | Qualifier to indicate the scale used for describing all distances inside the packet that contains Q\_SCALE. Exception is made for variable CCPU\_LRBG\_ABSOLUTE\_LOC that is always in [m] | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | 10 cm scale | |
|  | 1 | 1 m scale | |
|  | 2 | 10 m scale | |
|  | 3 | Spare | |

Q\_SET\_TARGET\_SPEED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Qualifier for presence of set target speed | | |
| ***Description*** | Qualifier to tell if the packet contains the variable SET\_TARGET\_SPEED or not | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 1 bit |  |  |  |
| ***Special/Reserved Values*** | 0 | variable SET\_TARGET\_SPEED is NOT present in the packet | |
|  | 1 | variable SET\_TARGET\_SPEED is present in the packet | |

Q\_TRACKINIT

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Qualifier for resuming the initial states of the related track description of the packet. | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 1 bit |  |  |  |
| ***Special/Reserved Values*** | 0 | No initial states to be resumed, profile to follow | |
|  | 1 | Empty profile, initial states to be resumed | |

SET\_TARGET\_SPEED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | set target speed | | |
| ***Description*** | speed which is set by the driver (on an external cruise control system) | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 16 bits | 0 km/h | 600 km/h | 1 km/h |
| ***Special/Reserved Values*** | 601- 2^16 - 1 | spare | |

TIU\_ACC\_COEF\_SB\_UNUSED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Acceleration coefficient when the service brake is not present or not available. | | |
| ***Description*** | Ponderation coefficient to be applied on maximum train acceleration when the service brake is not available. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 7 bits | 0 | 1,00 | 0,01 |
| ***Special/Reserved Values*** | 1,01 to 1,27 | Spare values, non significant. | |

TIU\_ACC\_COEF\_SB\_USED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Acceleration coefficient when the service brake is available. | | |
| ***Description*** | Ponderation coefficient to be applied on maximum train acceleration acceleration when the service brake is available.. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 7 bits | 0 | 1,00 | 0,01 |
| ***Special/Reserved Values*** | 1,01 to 1,27 | Spare values, non significant. | |

TIU\_CUT\_TRACT\_DELAY

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Delay to cut off traction | | |
| ***Description*** | Delay between the ordering of traction cut off and the effective cut off of the traction | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits | 0 s | 25,5 s | 0,1 s |
| ***Special/Reserved Values*** |  |  | |

TIU\_EB\_TESTS\_ON\_DEMAND\_RESULT

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | EB tests on demand result | | |
| ***Description*** | / | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 3 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | EB tests on demand not OK on both EV (fatal error(s) has been detected during EB tests on demand) | |
|  | 1 | EB tests on demand not OK on EV1 (fatal error(s) has been detected during EB tests on demand) | |
|  | 2 | EB tests on demand not OK on EV2 (fatal error(s) has been detected during EB tests on demand) | |
|  | 3 | EB tests on demand OK | |
|  | 4 | EB tests on demand aborted | |
|  | 5 | Irrelevant | |
|  | 6 | Reserved | |
|  | 7 | Reserved | |

TIU\_L\_TEXT

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | **Length** of text string | | |
| ***Description*** | L\_TEXT defines the **length** of a text string (L\_TEXT \* X\_TEXT) | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 5 bits | 0 | 31 | 1 Text String Element |

TIU\_L\_TEXTDISPLAY

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | **Length** on which a text shall be displayed | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 15 bits | 0 cm | 327.660 km | 10 cm, 1m or 10 m depends on Q\_SCALE |
| ***Special/Reserved Values*** | 32767 | The display of the text shall not be distance limited. | |

TIU\_MAINTENANCE\_EVENT\_ID

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Current specific reason of an emergency or service braking. | | |
| ***Description*** | Indicates a list of specific reason of a present braking | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits | 0 | 255 |  |
| ***Special/Reserved Values*** | 0 | Bowl EB Request | |
|  | 1 | Reception\_from\_STM\_Command\_SB\_Request | |
|  | 2 | Reception\_from\_STM\_Command\_EB\_Request | |
|  | 3 | Bad Pneumatic Insertion\_EB\_Request | |
|  | 4 | Protect\_SB\_by\_EB\_Request | |
|  | 5 | EB\_Failure\_EB\_Request | |
|  | 6 | Use of Failed Port\_SB\_Request | |
|  | 7 | Use of Failed Port\_EB\_Request (reserved) | |
|  | 8 | Error Hamming on port\_SB\_Request | |
|  | 9 | Error Hamming on port\_EB\_Request (reserved) | |
|  | 10 | Monitoring result needs\_SB\_Request | |
|  | 11 | Monitoring result needs\_EB\_Request | |
|  | 12 – 255 | Spare | |

TIU\_MAX\_ROT\_MASS\_PERCENT

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | maximum rotating mass percentage | | |
| ***Description*** | maximum rotating mass of the train, expressed as a percentage of the total weight of the train | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits | 0 % | 25,5 % | 0,1 % |
| ***Special/Reserved Values*** | / | / | |

TIU\_MIN\_ROT\_MASS\_PERCENT

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | minimum rotating mass percentage | | |
| ***Description*** | minimum rotating mass of the train, expressed as a percentage of the total weight of the train | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits | 0 % | 25,5 % | 0,1 % |
| ***Special/Reserved Values*** | / | / | |

TIU\_MODEL\_BEGIN\_BRAKE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Delay for beginning of application of brake | | |
| ***Description*** | Delay between ordering a brake application, and when brake begins to be applied (more than 0%) | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits | 0 s | 25,5 s | 0,1 s |
| ***Special/Reserved Values*** | / | / | |

TIU\_MODEL\_DECELER

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Brake model deceleration point | | |
| ***Description*** | Coordinate on the Y axis (=train deceleration) of a point of the deceleration model | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits | 0 m/s² | 2,55 m/s² | 0,01 m/s² |
| ***Special/Reserved Values*** |  |  | |

TIU\_MODEL\_FULL\_BRAKE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Delay for full application of brake | | |
| ***Description*** | Delay between when the braking effort begins (>0%) and when the full braking effort is reached (100%) | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 11 bits | 0 s | 120,0 s | 0,1 s |
| ***Special/Reserved Values*** | / | / | |

TIU\_MODEL\_SPEED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Brake model speed point | | |
| ***Description*** | Coordinate on the X axis (=train speed) of a point of the deceleration model | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits | 0 km/h | 600 km/h | 5 km/h |
| ***Special/Reserved Values*** | 121-255 | spare | |

TIU\_NOM\_ROT\_MASS\_PERCENT

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | nominal rotating mass percentage | | |
| ***Description*** | nominal rotating mass of the train, expressed as a percentage of the total weight of the train | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits | 0 % | 25,5 % | 0,1 % |
| ***Special/Reserved Values*** | / | / | |

TIU\_Q\_TEXT

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Fixed message to be displayed. | | |
| ***Description*** | TIU\_Q\_TEXT is a pointer to select a fixed text message from the defined table. The language selected by the driver for the MMI shall be used additionally as a qualifier to choose the appropriate language table. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits | 0 | 255 |  |
| ***Special/Reserved Values*** | 1 | Emergency brake command error | |
|  | 3 | Pneumatic insertion error | |
|  | 4 | Service brake command error | |
|  | 5 | Service brake release error | |
|  | 6 | Traction cut off error | |
|  | 105 … 135 | IO1\_MONITORING\_ERROR … IO31\_MONITORING\_ERROR | |
|  | 139 | PANTO\_ACTION\_NOT\_OK\_FOR\_TRACK\_CONDITION | |
|  | 140 | CIRCUIT\_BREAKER\_ACTION\_NOT\_OK\_FOR\_TRACK\_CONDITION | |
|  | 141 | TRACTION\_CUT\_OFF\_ACTION\_NOT\_OK\_FOR\_TRACK\_CONDITION | |

TIU\_Q\_TEXTCLASS

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Class of message to be displayed. | | |
| ***Description*** | Q\_TEXTCLASS specifies the class of the text message included in the same packet (either plain or fixed message) | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 00 | Auxiliary Information | |
|  | 01 | Important Information | |
|  | 10 | Spare | |
|  | 11 | Spare | |

TIU\_Q\_TEXTCONFIRM

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Qualifies the need / reaction of text confirmation | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 00 | No confirmation required | |
|  | 01 | Continue display until confirmed | |
|  | 10 | Apply service brake if not confirmed when end conditions reached | |
|  | 11 | Spare | |

TIU\_Q\_TEXTDISPLAY

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Qualifier for the combination of text message conditions | | |
| ***Description*** | Q\_TEXTDISPLAY defines whether the start/end conditions for text message are to be combined or not | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 1 bit |  |  |  |
| ***Special/Reserved Values*** | 0 | No, display as soon as / until one of the conditions is fulfilled | |
|  | 1 | Yes, display as soon as / until all conditions are fulfilled | |

TIU\_SAFETYFAIL\_DETECT

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Safety failure detected | | |
| ***Description*** | / | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 1 bit |  |  |  |
| ***Special/Reserved Values*** | 0 | False : no safety failure is detected | |
|  | 1 | True : a safety failure(s) is(are) detected | |
|  | 2 | Irrelevant : no diagnostic to be expected (diagnostic function is inhibited) | |
|  | 3 | Spare | |

TIU\_T\_I\_P

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | T\_i\_p | | |
| ***Description*** | parameter used by the Core in the braking curve calculation | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 13 bits | 0 | 600 s | 0,1 s |
| ***Special/Reserved Values*** | / |  | |

TIU\_T\_P

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | T\_p | | |
| ***Description*** | parameter used by the Core in the braking curve calculation | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 13 bits | 0 | 600 s | 0,1 s |
| ***Special/Reserved Values*** | / |  | |

TIU\_T\_RSMA

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | T\_rsma | | |
| ***Description*** | parameter used by the Core in the braking curve calculation | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 13 bits | 0 | 600 s | 0,1 s |
| ***Special/Reserved Values*** | / |  | |

TIU\_T\_TEXTDISPLAY

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Time until when a text shall be displayed | | |
| ***Description*** |  | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 10 bits | 0 | 1022 s | 1 s |
| ***Special/Reserved Values*** | 1023 | Display of text not limited by time. | |

TIU\_T\_W

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | T\_w | | |
| ***Description*** | parameter used by the Core for the braking curve calculation | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 13 bits | 0 | 600 s | 0,1 s |
| ***Special/Reserved Values*** | / | / | |

TIU\_TRAIN\_MAX\_ACC

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Maximum train acceleration | | |
| ***Description*** | Maximum acceleration that the train is able to reach | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 10 bits | 0 m/s² | 10,23 m/s² | 0,01 m/s² |
| ***Special/Reserved Values*** | / | / | |

TIU\_X\_TEXT

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Text String Element | | |
| ***Description*** | Text strings are used to transmit plain text messages. Each element of a text string contains a single character encoded as ISO 8859-1, also known as Latin Alphabet #1. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits |  |  |  |
| ***Special/Reserved Values*** |  |  | |

V\_TIU\_COLD\_MOVE\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | State of the cold movement | | |
| ***Description*** | Information from the sensor of train movement used when the onboard is powered off | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | No movement | |
|  | 1 | Detected movement | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_COLD\_MOVE\_STATE\_FILTERED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Filtered state of the cold movement | | |
| ***Description*** | Information from the sensor of train movement used when the onboard is powered off | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | No movement | |
|  | 1 | Detected movement | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_COMMANDING\_EB

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | . | | |
| ***Description*** | TIU informs the Core that TIU is commanding EB | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 1 bit |  |  |  |
| ***Special/Reserved Values*** | 0 | Do\_no\_apply\_EB | |
|  | 1 | Apply\_EB | |

V\_TIU\_COMMANDING\_SB

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** |  | | |
| ***Description*** | TIU informs the Core that TIU is commanding SB. | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 1 bit |  |  |  |
| ***Special/Reserved Values*** | 0 | Do\_no\_apply\_SB | |
|  | 1 | Apply\_SB | |

V\_TIU\_DESKS\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Desks state | | |
| ***Description*** | Information from the sensor of the desk(s) state | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 3 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Desk\_A\_open\_only | |
|  | 1 | Desk\_B\_open\_only | |
|  | 2 | Desk\_A\_and\_desk\_B\_open | |
|  | 3 | No\_desk\_open | |
|  | 4-5 | Spare values | |
|  | 6 | Fail\_state (of the sensor) | |
|  | 7 | Information\_not\_available | |

V\_TIU\_DESKS\_STATE\_FILTERED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Filtered desks state | | |
| ***Description*** | Information from the sensor of the desk(s) state | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 3 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Desk\_A\_open\_only | |
|  | 1 | Desk\_B\_open\_only | |
|  | 2 | Desk\_A\_and\_desk\_B\_open | |
|  | 3 | No\_desk\_open | |
|  | 4-5 | Spare values | |
|  | 6 | Fail\_state (of the sensor) | |
|  | 7 | Information\_not\_available | |

V\_TIU\_DIRCONT\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Direction controller state | | |
| ***Description*** | Information from the sensor of the direction controller state of the active cab | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 3 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Neutral | |
|  | 1 | Forward | |
|  | 2 | Backward | |
|  | 3-5 | Spare values | |
|  | 6 | Fail\_state (of the sensor) | |
|  | 7 | Information\_not available | |

V\_TIU\_DIRCONT\_STATE\_FILTERED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Filtered direction controller state | | |
| ***Description*** | Information from the sensor of the direction controller state of the active cab | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 3 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Neutral | |
|  | 1 | Forward | |
|  | 2 | Backward | |
|  | 3-5 | Spare values | |
|  | 6 | Fail\_state (of the sensor) | |
|  | 7 | Information\_not available | |

V\_TIU\_DRIVEREM\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | State of the driver emergency | | |
| ***Description*** | Information from the sensor of the driver emergency (=emergency button) | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 00 | Emergency\_button\_pushed | |
|  | 01 | Emergency\_button\_released | |
|  | 10 | Fail\_state (of the emergency button) | |
|  | 11 | Information\_not\_available | |

V\_TIU\_DRIVEREM\_STATE\_FILTERED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Filtered state of the driver emergency | | |
| ***Description*** | Information from the sensor of the driver emergency (=emergency button) | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 00 | Emergency\_button\_pushed | |
|  | 01 | Emergency\_button\_released | |
|  | 10 | Fail\_state (of the emergency button) | |
|  | 11 | Information\_not\_available | |

V\_TIU\_EB\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | State of the emergency brake | | |
| ***Description*** | Information from the sensor of the emergency brake state | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | EB\_not\_applied | |
|  | 1 | EB\_applied | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_EB\_STATE\_FILTERED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Filtered state of the emergency brake | | |
| ***Description*** | Information from the sensor of the emergency brake state | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | EB\_not\_applied | |
|  | 1 | EB\_applied | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_INTEGRITY\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | State of the train integrity | | |
| ***Description*** | Information from the sensor of the train integrity state | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Train\_integrity\_not\_OK | |
|  | 1 | Train\_integrity\_OK | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_INTEGRITY\_STATE\_FILTERED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Filtered state of the train integrity | | |
| ***Description*** | Information from the sensor of the train integrity state | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Train\_integrity\_not\_OK | |
|  | 1 | Train\_integrity\_OK | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_ISOLATION\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | State of isolation switch | | |
| ***Description*** | Information from the sensor of the isolation switch state | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Isolated | |
|  | 1 | Not\_Isolated | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_ISOLATION\_STATE\_FILTERED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Filtered state of isolation switch | | |
| ***Description*** | Information from the sensor of the isolation switch state | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Isolated | |
|  | 1 | Not\_Isolated | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_SB\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | State of the service brake | | |
| ***Description*** | Information from the sensor of the service brake state | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | SB\_not\_applied | |
|  | 1 | SB\_applied | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_SB\_STATE\_FILTERED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Filtered state of the service brake | | |
| ***Description*** | Information from the sensor of the service brake state | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | SB\_not\_applied | |
|  | 1 | SB\_applied | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_SLEEPING\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | State of the remote control connection | | |
| ***Description*** | Information from the sensor of the remote control connection | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Go\_to\_sleeping | |
|  | 1 | Do\_not\_go\_to\_sleeping | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_SLEEPING\_STATE\_FILTERED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Filtered state of the remote control connection | | |
| ***Description*** | Information from the sensor of the remote control connection | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Go\_to\_sleeping | |
|  | 1 | Do\_not\_go\_to\_sleeping | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_TILTING\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | State of the tilting device | | |
| ***Description*** | Information from the sensor of the tilting device state | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Tilting\_system\_is\_active | |
|  | 1 | Tilting\_system\_is\_passive | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_TILTING\_STATE\_FILTERED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Filtered state of the tilting device | | |
| ***Description*** | Information from the sensor of the tilting device state | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Tilting\_system\_is\_acitve | |
|  | 1 | Tilting\_system\_is\_passive | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_TRACTION\_CUT\_OFF\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | State of the traction cut off | | |
| ***Description*** | Information from the sensor of the traction cut off state | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Traction cut off is disabled | |
|  | 1 | Traction cut off is enabled | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_TRACTION\_CUT\_OFF\_STATE\_FILTERED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Filtered state of the traction cut off | | |
| ***Description*** | Information from the sensor of the traction cut off state | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Traction cut off is disabled | |
|  | 1 | Traction cut off is enabled | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_TRACTION\_STATUS

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Traction status calculated by TIU ASW | | |
| ***Description*** | Information deduced from traction and/or braking type | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 3 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | null | |
|  | 1 | positive | |
|  | 2 | negative | |
|  | 3 | not\_null | |
|  | 4 | Fail\_state | |
|  | 5 | Information\_not\_available | |
|  | 6-7 | Spare | |

V\_TIU\_VIGIL\_ACTION\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | State of the driver vigilance | | |
| ***Description*** | Information from the sensor of the driver vigilance | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Driver\_reaction | |
|  | 1 | No\_driver\_reaction | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_VIGIL\_ACTION\_STATE\_FILTERED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Filtered state of the driver vigilance | | |
| ***Description*** | Information from the sensor of the driver vigilance | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | Driver\_reaction | |
|  | 1 | No\_driver\_reaction | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_VIGIL\_DISABLE\_STATE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | State of the external vigilance system | | |
| ***Description*** | Information from the sensor of the driver vigilance | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | External vigilance system active | |
|  | 1 | External vigilance system not active | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

V\_TIU\_VIGIL\_DISABLE\_STATE\_FILTERED

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Filtered state of the external vigilance system | | |
| ***Description*** | Information from the sensor of the driver vigilance | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 2 bits |  |  |  |
| ***Special/Reserved Values*** | 0 | External vigilance system active | |
|  | 1 | External vigilance system not active | |
|  | 2 | Fail\_state (of the sensor) | |
|  | 3 | Information\_not\_available | |

1. M : meeting review, R : read-back process [↑](#footnote-ref-1)