**System Analysis**

**Display Text Messages coming from Trackside**

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**Reviewers:**

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Historical evolution of this document:

**Input documents:**

* Subset 26 § 3.12.3 Text Transmission
* <List Number="72" Name="Packet for sending plain text messages" />
* <List Number="76" Name="Packet for sending fixed text messages" />
* Message 158: Text Message Acknowledged by Driver
* *List of input documents*

#### Packet Number 72: Packet for sending plain text messages

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** |  | | |
| ***Transmitted by*** | Balise, RBC | | |
| ***Content*** | **Variable** | Length | **Comment** |
|  | NID\_PACKET |  |  |
|  | Q\_DIR |  |  |
|  | L\_PACKET |  |  |
|  | Q\_SCALE |  |  |
|  | Q\_TEXTCLASS |  |  |
|  | Q\_TEXTDISPLAY | 1 | Start/end events relation |
|  | D\_TEXTDISPLAY | 15 | Start event |
|  | M\_MODETEXTDISPLAY |  | Start event |
|  | M\_LEVELTEXTDISPLAY |  | Start event |
|  | NID\_NTC |  | If M\_LEVELTEXTDISPLAY = 1 (NTC) |
|  | L\_TEXTDISPLAY | 15 | End event |
|  | T\_TEXTDISPLAY |  | End event |
|  | M\_MODETEXTDISPLAY |  | End event |
|  | M\_LEVELTEXTDISPLAY |  | End event |
|  | NID\_NTC |  | If M\_LEVELTEXTDISPLAY = 1 (NTC) |
|  | Q\_TEXTCONFIRM | 2 |  |
|  | Q\_CONFTEXTDISPLAY |  | If Q\_TEXTCONFIRM ≠ 0 |
|  | Q\_TEXTREPORT |  | If Q\_TEXTCONFIRM ≠ 0 |
|  | NID\_TEXTMESSAGE |  | Only If Q\_TEXTREPORT = 1 |
|  | NID\_C |  | Only If Q\_TEXTREPORT = 1 |
|  | NID\_RBC |  | Only If Q\_TEXTREPORT = 1 |
|  | L\_TEXT | 8 |  |
|  | X\_TEXT(L\_TEXT) |  |  |

#### Packet Number 76: Packet for sending fixed text messages

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Description*** |  | | | |
| ***Transmitted by*** | Balise, RBC | | | |
| ***Content*** | **Variable** | Length | | **Comment** |
|  | NID\_PACKET | 8 | |  |
|  | Q\_DIR |  | |  |
|  | L\_PACKET |  | |  |
|  | Q\_SCALE |  | |  |
|  | Q\_TEXTCLASS |  | |  |
|  | Q\_TEXTDISPLAY |  | | Start/end events relation |
|  | D\_TEXTDISPLAY | 15 | | Start eventcondition |
|  | M\_MODETEXTDISPLAY |  | | Start event |
|  | M\_LEVELTEXTDISPLAY |  | | Start event |
|  | NID\_NTC |  | | If M\_LEVELTEXTDISPLAY = 1 (NTC) |
|  | L\_TEXTDISPLAY |  | | End event |
|  | T\_TEXTDISPLAY |  | | End event |
|  | M\_MODETEXTDISPLAY |  | | End event |
|  | M\_LEVELTEXTDISPLAY |  | | End event |
|  | NID\_NTC |  | | If M\_LEVELTEXTDISPLAY = 1 (NTC) |
|  | Q\_TEXTCONFIRM | 2 | |  |
|  | Q\_CONFTEXTDISPLAY |  | If Q\_TEXTCONFIRM ≠ 0 | |
|  | Q\_TEXTREPORT | 1 | | If Q\_TEXTCONFIRM ≠ 0 |
|  | NID\_TEXTMESSAGE |  | | Only If Q\_TEXTREPORT = 1 |
|  | NID\_C |  | | Only If Q\_TEXTREPORT = 1 |
|  | NID\_RBC |  | | Only If Q\_TEXTREPORT = 1 |
|  | Q\_TEXT | 8 | |  |

##### 7.5.1.98.1 NID\_TEXTMESSAGE

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | Text message identifier | | |
| ***Description*** | Identity of a text message from trackside to be used in a report of driver acknowledgement to the RBC | | |
| ***Length of variable*** | ***Minimum Value*** | ***Maximum Value*** | ***Resolution/formula*** |
| 8 bits | 0 | 255 | Number |

### 8.6.16 Message 158: Text Message Acknowledged by Driver

|  |  |  |
| --- | --- | --- |
| Field No. | VARIABLE/ PACKET | Remarks |
|  | NID\_MESSAGE |  |
|  | L\_MESSAGE |  |
|  | T\_TRAIN |  |
|  | NID\_ENGINE |  |
|  | NID\_TEXTMESSAGE | Identity of the text message that the driver has acknowledged. |
|  | Packet 0 or 1 |  |

**Description**

*Picture + textual description*

“Subset 26 § 3.12.3 Text Transmission” is quite clear except the following open questions:

* How many text messages must be displayed to the driver at the same time
* DMI Interface specification?
* How many text message at maximum must be stored in the “Display Text Messages coming from Trackside” function at the same time? : Subset 40, 4.3.2 h)
* Start location for a displaying a text message:   
  D\_TEXTDISPLAY = Distance from where on a text shall be displayed  
  Where is the starting location for this Distance: current location ? Reference Location + D\_TEXTDISPLAY
* How many fixed text messages must be stored on-board in all languages that can be selected by the driver?

**Functions**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Occurrence** | **Type** | **Description** |
| Name | 1 | T\_Text | **Read-only Repository for fixed Driver Text Messages** |
| Definition | 1 | T\_Definition |  |
| *Input* | *0..n* | *T\_Variable* | *Selector for Text Message (ID, Language)* |
| *Output* | *0..n* | *T\_Variable* |  |
| *Local* | *0..n* | *T\_Variable* |  |
| *Parameter* | *0..n* | *T\_Constant* |  |
| *Requirement* | *0..n* | *T\_Requirement* |  |
| *Block* | *1 (optional)* | *T\_FunctionalBlock* |  |
| *Parent* | *0..1* | *T\_Function* |  |
| *Allocation* | *1* | *T\_System* |  |
| Safety | 1 | Boolean |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Occurrence** | **Type** | **Description** |
| Name | 1 | T\_Text | **Buffer for all received Driver Text Messages to be displayed** |
| Definition | 1 | T\_Definition |  |
| *Input* | *0..n* | *T\_Variable* |  |
| *Output* | *0..n* | *T\_Variable* |  |
| *Local* | *0..n* | *T\_Variable* |  |
| *Parameter* | *0..n* | *T\_Constant* |  |
| *Requirement* | *0..n* | *T\_Requirement* |  |
| *Block* | *1 (optional)* | *T\_FunctionalBlock* |  |
| *Parent* | *0..1* | *T\_Function* |  |
| *Allocation* | *1* | *T\_System* |  |
| Safety | 1 | Boolean |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Occurrence** | **Type** | **Description** |
| Name | 1 | T\_Text | **Store Driver Message received from Trackside** |
| Definition | 1 | T\_Definition |  |
| *Input* | *0..n* | *T\_Variable* |  |
| *Output* | *0..n* | *T\_Variable* |  |
| *Local* | *0..n* | *T\_Variable* |  |
| *Parameter* | *0..n* | *T\_Constant* |  |
| *Requirement* | *0..n* | *T\_Requirement* |  |
| *Block* | *1 (optional)* | *T\_FunctionalBlock* |  |
| *Parent* | *0..1* | *T\_Function* |  |
| *Allocation* | *1* | *T\_System* |  |
| Safety | 1 | Boolean |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Occurrence** | **Type** | **Description** |
| Name | 1 | T\_Text | **Delete Driver Message received from Trackside** |
| Definition | 1 | T\_Definition |  |
| *Input* | *0..n* | *T\_Variable* |  |
| *Output* | *0..n* | *T\_Variable* |  |
| *Local* | *0..n* | *T\_Variable* |  |
| *Parameter* | *0..n* | *T\_Constant* |  |
| *Requirement* | *0..n* | *T\_Requirement* |  |
| *Block* | *1 (optional)* | *T\_FunctionalBlock* |  |
| *Parent* | *0..1* | *T\_Function* |  |
| *Allocation* | *1* | *T\_System* |  |
| Safety | 1 | Boolean |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Occurrence** | **Type** | **Description** |
| Name | 1 | T\_Text | **Display (Activate) Text Message on DMI** |
| Definition | 1 | T\_Definition |  |
| *Input* | *0..n* | *T\_Variable* |  |
| *Output* | *0..n* | *T\_Variable* |  |
| *Local* | *0..n* | *T\_Variable* |  |
| *Parameter* | *0..n* | *T\_Constant* |  |
| *Requirement* | *0..n* | *T\_Requirement* |  |
| *Block* | *1 (optional)* | *T\_FunctionalBlock* |  |
| *Parent* | *0..1* | *T\_Function* |  |
| *Allocation* | *1* | *T\_System* |  |
| Safety | 1 | Boolean |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Occurrence** | **Type** | **Description** |
| Name | 1 | T\_Text | **Receive Driver Acknowledge from DMI** |
| Definition | 1 | T\_Definition |  |
| *Input* | *0..n* | *T\_Variable* |  |
| *Output* | *0..n* | *T\_Variable* |  |
| *Local* | *0..n* | *T\_Variable* |  |
| *Parameter* | *0..n* | *T\_Constant* |  |
| *Requirement* | *0..n* | *T\_Requirement* |  |
| *Block* | *1 (optional)* | *T\_FunctionalBlock* |  |
| *Parent* | *0..1* | *T\_Function* |  |
| *Allocation* | *1* | *T\_System* |  |
| Safety | 1 | Boolean |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Occurrence** | **Type** | **Description** |
| Name | 1 | T\_Text | **Send Driver Acknowledge to RBC** |
| Definition | 1 | T\_Definition |  |
| *Input* | *0..n* | *T\_Variable* |  |
| *Output* | *0..n* | *T\_Variable* |  |
| *Local* | *0..n* | *T\_Variable* |  |
| *Parameter* | *0..n* | *T\_Constant* |  |
| *Requirement* | *0..n* | *T\_Requirement* |  |
| *Block* | *1 (optional)* | *T\_FunctionalBlock* |  |
| *Parent* | *0..1* | *T\_Function* |  |
| *Allocation* | *1* | *T\_System* |  |
| Safety | 1 | Boolean |  |

**Variables**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Occurrence** | **Type** | **Description** |
| Name | 1 | T\_Text |  |
| Definition | 1 | T\_Definition |  |
| Source | 1 | T\_SourceDocument |  |
| Nature | 1 | T\_VariableNature |  |
| MinimalValue | 0..1 | T\_Text |  |
| MaximalValue | 0..1 | T\_Text |  |
| SpecialValue | 0..n | T\_Text |  |
| Allocation | 1 | * Interface * Packet * Internal |  |
| *Requirement* | *1..n* | *T\_Requirement* | *The set of requirement which defined the variable (at least one)* |
| Store | 0..1 | T\_Variable |  |
| Resolution | 0..1 | T\_VariableNature |  |
| Safety | 1 | Boolean |  |

**Requirements**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Occurrence** | **Type** | **Description** |
| Name | 1 | T\_Text |  |
| Definition | 1 | T\_Definition |  |
| Nature | 1 | * Structural * Functional * Definition |  |
| Source | 1 | T\_SourceDocument |  |
| Discussion | 1 (Optional) | T\_Text |  |
| Parent | 0..1 | T\_Requirement | 3.12.3 |
| Allocation | 0..1 | T\_System |  |
| Safety | 1 | Boolean |  |

#### **Exported Requirements :**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Occurrence** | **Type** | **Description** |
| Name | 1 | T\_Text |  |
| Definition | 1 | T\_Definition |  |
| Source | 1 | T\_SourceDocument |  |
| Allocation | 0..1 | T\_System |  |
| Safety | 1 | Boolean |  |

**Type:**

* Boolean
* Integer
* Floating point
* T\_text: textual description
* T\_ident: based on a textual description
* T\_Version = {3.0.0, 3.3.0}
* T\_VariableNature = {Acceleration, Distance, Gradient, Length, Miscellaneous, Number, ClassNumber, IdentityNumber, Qualifier, TimeDate, Speed, Text}
* T\_SourceDocument = {subset-26, subset-34}
* T\_Definition : a textual and graphical description (all kind of picture, table and diagram are allowed)

**Constant: T\_Constant**

*Do we need to separate Variables and constants ?*

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Occurrence** | **Type** | **Description** |
| Definition | 1 | T\_Definition | Textual and graphical description of the variable |
| Source | 1 | T\_SourceDocument | the document where the variable is defined the first time (SRS, FIS, SSRS,...) |
| Nature | 1 | T\_VariableNature | Nature of the Variable (Acceleration, Speed, Ident,...) |
| Value | 1 | T\_Text |  |
| Allocation | 1 | * Interface * Packet * Internal |  |
| *Requirement* | *1..n* | *T\_Requirement* | *The set of requirement which defined the constant (at least one)* |
|  |  |  |  |

**Functional Block: T\_FunctionalBlock**

*Are functional blocks really necessary ?*

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Occurrence** | **Type** | **Description** |
| Definition | 1 | T\_Definition | Textual and graphical description of the function |
| *Function* | *1..n* | *T\_Function* | *Set of function of this block* |
|  |  |  |  |